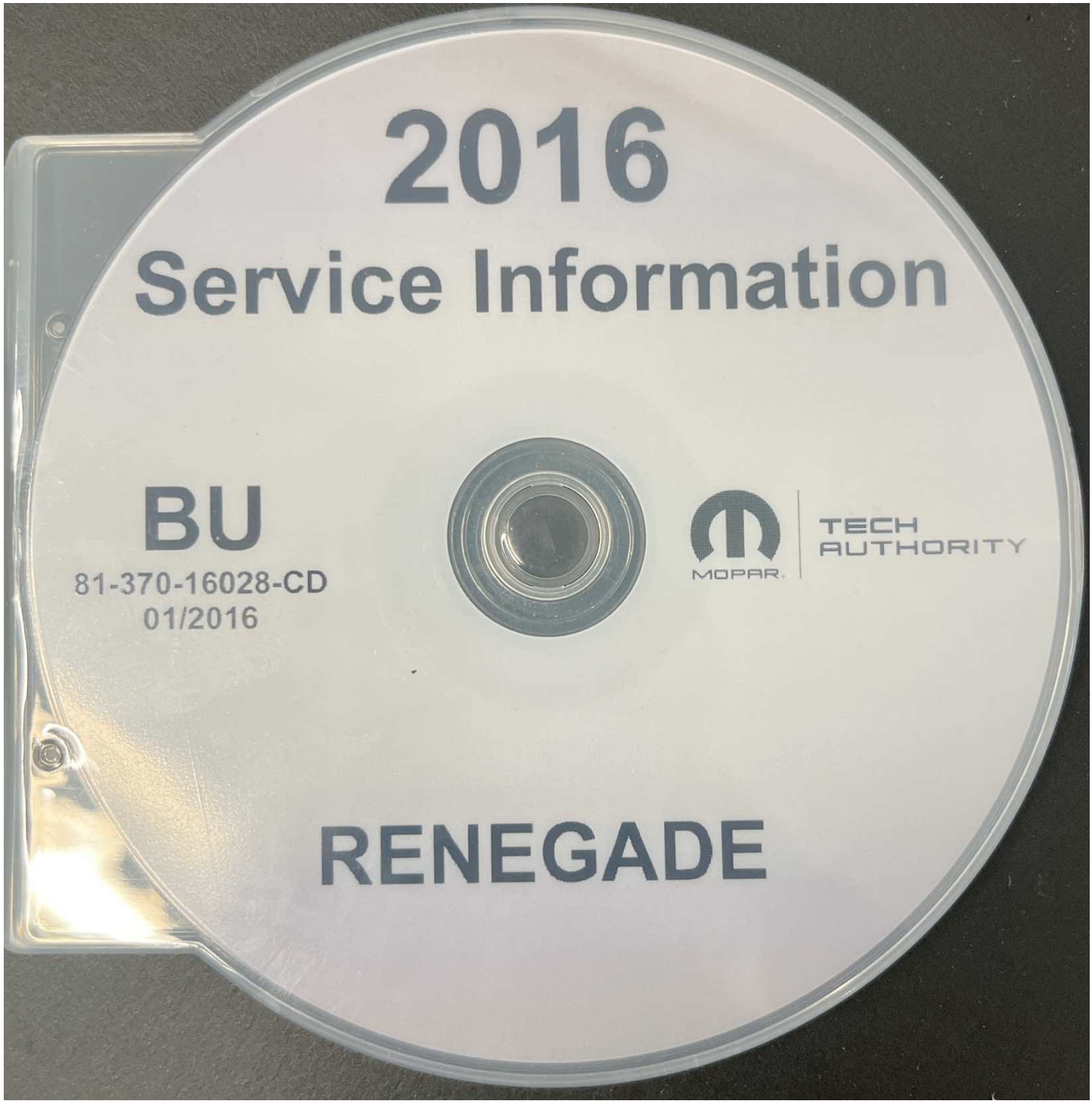

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12. Relationship of Parties. Nothing in this agreement will constitute or be construed to create a partnership, joint venture, or any other agency or employment relationship between You and Chrysler. You are not authorized to enter into any agreement on behalf of, assume any obligation for, or otherwise bind Chrysler Corporation financially or otherwise.

13. Entire agreement, Amendment. This agreement (including any other agreements expressly referenced in this agreement) is the complete understanding regarding its subject matter between You and Chrysler regarding your access to this information and will be governed by and construed in accordance with the laws of the State of Michigan as if fully performed therein and without regard to its conflict of laws principles. Except as provided below, this agreement may be amended or modified only by an express writing signed and dated by You and Chrysler.

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14. Governing Law, Jurisdiction, Venue. This agreement is to be construed in accordance with and governed by the laws of the State of Michigan, as if entirely performed within Michigan, and without reference to its conflict of law provisions. Any action arising out of or related to this agreement will be brought exclusively in the United States District Court for the Eastern District of Michigan, or the Circuit Court of Oakland County, Michigan (as their respective jurisdictions may lie), and You consent to personal jurisdiction and venue in these courts.

15. Waiver. A party (You or Chrysler) may waive any of its rights under this agreement only by an appropriate writing signed by it that specifically refers to the contractual right being waived, but a failure by a party to enforce a right, including without limitation, a right arising as a result of a breach of this agreement, or to insist upon performance of an obligation arising from this agreement, may not be construed as a waiver of any of that right, does not affect the validity of this agreement or any part of it, and does not prejudice that party's rights regarding any subsequent action.

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- 00 - Vehicle Data
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    - International Vehicle Control and Display Symbols
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        - DESCRIPTION
    - LABEL, Vehicle Emission Certification Information (VECI)
      - Description
        - DESCRIPTION
    - Vehicle Certification Label
      - Description
        - DESCRIPTION
    - Vehicle Identification Number – NAFTA and Arabian Gulf Vehicles Only
      - Description
        - DESCRIPTION – NAFTA and Arabian Gulf Vehicles Only
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      - Description
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    - KNUCKLE, Steering
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    - LINK, Stabilizer Bar
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  - Specifications
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    - SPECIFICATIONS NAFTA/JAPAN
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    - Description
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      - DIAGNOSIS AND TESTING - HALF SHAFT
    - Specifications
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    - Special Tools
      - SPECIAL TOOLS
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      - 1.4L TURBO MULTIAIR, WITHOUT INTERMEDIATE SHAFT
      - 1.6L and 2.0L TURBO DIESEL (120 / 140 HP) WITHOUT INTERMEDIATE SHAFT
      - 2.0L TURBO DIESEL (170 HP), 2.4L MULTIAIR WITHOUT INTERMEDIATE SHAFT
      - AWD / 4WD RIGHT SIDE, WITHOUT INTERMEDIATE SHAFT
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      - OPERATION
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      - REAR DRIVE UNIT (RDU) OPERATION
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      - Standard Procedure
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    - ACTUATOR, Axle Shaft
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- 04 - Vehicle Quick Reference
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      - Demanding Use Of The Car
      - 15,000KM SERVICE (2.4L MultiAir2 1.4L Turbo MultiAir 1.6L E-Torque)
      - 20,000KM SERVICE (2.0L Turbo Diesel 1.6L Turbo Diesel)
      - 30,000KM SERVICE (1.4L Turbo MultiAir 2.4L MultiAir2 1.6L E-Torque)
      - 40,000KM SERVICE (2.0L Turbo Diesel 1.6L Turbo Diesel)
      - 45,000KM SERVICE (1.4L Turbo MultiAir 2.4L MultiAir2 1.6L E-Torque)
      - 60,000KM SERVICE (1.4L Turbo MultiAir 1.6L Turbo Diesel 1.6L E-Torque 2.0L Turbo Diesel 2.4L MultiAir2)
      - 75,000KM SERVICE (1.4L Turbo MultiAir 1.6L E-Torque 2.4L MultiAir2)
      - 80,000KM SERVICE (2.0L Turbo Diesel 1.6L Turbo Diesel)
      - 90,000KM SERVICE (1.4L Turbo MultiAir 1.6L E-Torque 2.4L MultiAir2)
      - 100,000KM SERVICE (2.0L Turbo Diesel 1.6L Turbo Diesel)
      - 105,000KM SERVICE (1.4L Turbo MultiAir 1.6L E-Torque 2.4L MultiAir2)
      - 120,000KM SERVICE (2.0L Turbo Diesel 1.4L Turbo MultiAir 1.6L E-Torque 1.6L Turbo Diesel 2.4L MultiAir2)
      - 135,000KM SERVICE (1.4L Turbo MultiAir 1.6L E-Torque 2.4L MultiAir2)
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05 - Brakes, ABS

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- Description and Operation

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- REMOVAL AND INSTALLATION

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05 - Brakes, Base

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- CAUTION

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    - Left Front Brake Tube

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- Right Front Brake Tube - 1.4L
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  - CLUTCH VIBRATION OR HARSHNESS
  - CLUTCH PEDAL ON THE FLOOR
  - THE CLUTCH DOES NOT ENGAGE
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  - VEHICLE CREEPS AND / OR ENGINE STALLS WITH CLUTCH DISENGAGED
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    - DDCT Odd Gears
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- DISC, CLUTCH -1.4 MULTIAIR
- DISC, 1.6 E - TORQUE
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  - FLYWHEEL - MANUAL TRANSMISSION
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  - FLYWHEEL - FOR VERSION WITH MANUAL TRANSMISSION AND 4X4
  - FLYWHEEL - CLUTCH REMOVED FOR VERSIONS WITH MANUAL TRANSMISSION
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- Engine
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  - COOLANT
    - Description and Operation
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      - DIAGNOSIS AND TESTING - COOLANT CONCENTRATION TESTING
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      - 2.4L Multi Air
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      - 1.4L
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- Removal and Installation
  - 1.4L Turbo Multi Air
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- THERMOSTAT
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - 1.4L Multi Air Turbo
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- Transmission
  - COOLER, Transmission Oil
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - TUBES AND HOSES, Transmission Oil Cooler
    - Standard Procedure
      - STANDARD PROCEDURE - TRANSMISSION COOLER LINE QUICK CONNECT FITTING DISASSEMBLY/ASSEMBLY
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- 08 - Electrical
  - Special Tools
    - SPECIAL TOOLS
  - 8A - Audio/Video/Entertainment/Connectivity
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Diagnosis and Testing
      - DIAGNOSIS AND TESTING - AUDIO
    - AMPLIFIER
      - Description and Operation
        - DESCRIPTION AND OPERATION
      - Diagnosis and Testing
        - DIAGNOSIS AND TESTING - AUDIO POWER AMPLIFIER
      - Removal and Installation
        - REMOVAL AND INSTALLATION
    - ANTENNA, Satellite, Audio
      - Description and Operation
        - DESCRIPTION AND OPERATION
      - Diagnosis and Testing
        - DIAGNOSIS AND TESTING - SATELLITE ANTENNA
      - Removal and Installation
        - REMOVAL AND INSTALLATION
    - CAMERA, Rear
      - Description and Operation
        - DESCRIPTION AND OPERATION
      - Diagnosis and Testing

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- DIAGNOSIS AND TESTING - REAR CAMERA
- Cleaning
  - CLEANING
- Removal and Installation
  - REMOVAL AND INSTALLATION
- MEDIA HUB
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- RADIO
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SPEAKER
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - SPEAKER
  - Removal and Installation
    - INSTRUMENT PANEL END SPEAKER
    - REAR DOOR TWEETER
    - DOOR SPEAKER
    - SUBWOOFER
- SWITCH, Remote Radio
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - REMOTE RADIO SWITCHES
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- 8B - Chime/Buzzer/Driver Assist
  - Description and Operation
    - Blind Spot Monitor System
    - Chime Warning System
    - FORWARD COLLISION WARNING
    - LANE DEPARTURE WARNING SYSTEM
    - Park Assist System
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - BLIND SPOT MONITOR SYSTEM
    - DIAGNOSIS AND TESTING - CHIME WARNING SYSTEM
    - DIAGNOSIS AND TESTING - FORWARD COLLISION WARNING
    - DIAGNOSIS AND TESTING - LANE DEPARTURE WARNING SYSTEM
    - DIAGNOSIS AND TESTING - PARK ASSIST SYSTEM
  - DISPLAY, Blind Spot
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Diagnosis and Testing
      - DIAGNOSIS AND TESTING - BLIND SPOT DISPLAY
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - MODULE, Blind Spot
    - Description and Operation
      - DESCRIPTION AND OPERATION

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- Removal and Installation
  - REMOVAL AND INSTALLATION
- MODULE, Park Assist
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - PARK ASSIST MODULE
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SENSOR, Blind Spot
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - BLIND SPOT SENSOR
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SENSOR, Park Assist
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - PARK ASSIST SENSOR
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SWITCH, Park Assist
  - Description and Operation
    - DESCRIPTION AND OPERATION

8E - Electronic Control Modules

- Standard Procedure
  - MODULE REPLACEMENT GUIDE (RF-HUB, PCM, BCM, ESL)
  - MODULE PROXI REQUIREMENTS
- COMMUNICATION
  - Description and Operation
    - DESCRIPTION AND OPERATION
- CONNECTOR, Data Link
  - Description and Operation
    - DESCRIPTION AND OPERATION
    - MICROPOD II
- MODULE, Adaptive Cruise Control
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - ACC SENSOR / MODULE
    - ACC BRACKET
  - Module Programming
    - MODULE ALIGNMENT - EMEA
    - MODULE ALIGNMENT - NAFTA
- MODULE, Anti-Lock Brake System
  - Removal and Installation
    - Removal and Installation
- MODULE, Body Control
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - LEFT HAND DRIVE
    - RIGHT HAND DRIVE
  - Module Programming

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- PROGRAMMING
- PROGRAMMING KEYS TO THE BCM

MODULE, Comfort Seat and Wheel
- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - REMOVAL AND INSTALLATION

MODULE, Compass
- Removal and Installation
  - REMOVAL AND INSTALLATION

MODULE, Drivetrain Control
- Removal and Installation
  - REMOVAL AND INSTALLATION

MODULE, Electric Power Steering
- Description and Operation
  - DESCRIPTION AND OPERATION

MODULE, Electronic Shift
- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - REMOVAL AND INSTALLATION

MODULE, Electronic Steering Lock (ESL)
- Removal and Installation
  - REMOVAL AND INSTALLATION
- Module Programming
  - ESL PROGRAMMING

MODULE, Forward Facing Camera
- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - REMOVAL AND INSTALLATION
- Module Programming
  - LDW+ Calibration Procedure

MODULE, HVAC
- Removal and Installation
  - REMOVAL AND INSTALLATION

MODULE, Instrument Panel Cluster
- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - REMOVAL AND INSTALLATION
- Module Programming
  - PROGRAM THE IPC (Instrument Panel Cluster)

MODULE, Keyless Ignition Node
- Removal and Installation
  - REMOVAL AND INSTALLATION

MODULE, Occupant Restraint
- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - REMOVAL AND INSTALLATION

MODULE, Park Assist
- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - REMOVAL AND INSTALLATION

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- MODULE, Powertrain Control
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - 1.4L
    - 2.4L
  - Module Programming
    - PROGRAMMING THE CUSW PCM
- MODULE, Radio Frequency (RF Hub)
  - Description and Operation
    - DESCRIPTION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
  - Module Programming
    - PROGRAMMING THE RF-HUB
    - KEYS/FOBIKS - RFHUB EQUIPPED
- MODULE, Radio Receiver
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
  - Module Programming
    - PROGRAM THE RADIO
- MODULE, Tire Pressure Monitoring (TPM)
  - Description and Operation
    - Description and Operation
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING
  - Removal and Installation
    - REMOVAL AND INSTALLATION
  - Module Programming
    - PROGRAMMING
- MODULE, Trailer Tow
  - Description and Operation
    - DESCRIPTION AND OPERATION
- MODULE, Transmission Control
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - 948TE TRANSMISSION
    - DUAL DISC CLUTCH TRANSMISSION (DDCT)
  - Module Programming
    - TCM PROGRAMMING-948TE

8F - Engine Systems

- Battery System
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Specifications
    - BATTERY
    - TORQUE
  - BATTERY
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Diagnosis and Testing
      - DIAGNOSIS AND TESTING - BATTERY
    - Standard Procedure

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- BATTERY CHARGING
- GR8 BATTERY TESTER / CHARGER
- IGNITION-OFF DRAW TEST
- OPEN-CIRCUIT VOLTAGE TEST
- Removal and Installation
  - 1.4L
  - 1.6L - 2.0L DIESEL
- CABLES, Battery
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - 1.4L
    - 1.6L DIESEL
    - 2.0L 4WD Removal and Installation
- MODULE, Voltage Stability (VSM)
  - Description and Operation
    - DESCRIPTION AND OPERATION
- TRAY, Battery
  - Removal and Installation
    - 1.6L - 2.0L DIESEL
    - 2.4L

Charging
- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - CHARGING SYSTEM
- Specifications
  - GENERATOR
  - TORQUE
- GENERATOR
  - Removal and Installation
    - 1.4L
    - 1.6L DIESEL
    - 1.6L GAS
    - 2.0L
    - 2.4L
- REGULATOR, Voltage
  - Removal and Installation
    - 1.6L - 2.0L DIESEL
    - 1.6L GAS
- PULLEY OR FAN, Generator
  - Removal and Installation
    - 1.6L GAS
    - REMOVAL AND INSTALLATION

Starting
- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - STARTING SYSTEM
- Specifications
  - STARTER
  - TORQUE
- SENSOR, Neutral Position
  - Removal and Installation
    - REMOVAL AND INSTALLATION

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- STARTER
  - Removal and Installation
    - 1.4L
    - 1.6L DIESEL
    - 1.6L GAS
    - 2.0L
    - 2.4L
- SWITCH, Ignition
  - Removal and Installation
    - REMOVAL AND INSTALLATION

8G - Heated/Cooled Systems
- Heated Glass
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - ELECTRIC BACK LIGHT (EBL) SYSTEM
- Heated Seats
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - HEATED SEAT SYSTEM
  - PAD, Heater
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Steering Wheel
  - Description and Operation
    - DESCRIPTION AND OPERATION

8H - Horn
- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - HORN SYSTEM
- HORN
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - HORN
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- RELAY, Horn
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - HORN RELAY
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SWITCH, Horn
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - HORN SWITCH
  - Removal and Installation
    - REMOVAL AND INSTALLATION

8I - Ignition Control
- Specifications
  - TORQUE
- COIL, Ignition
  - Removal and Installation

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- REMOVAL AND INSTALLATION
- PLUG, Glow
  - Diagnosis and Testing
    - DIESEL COLD START SYSTEM
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SPARK PLUG
  - Removal and Installation
    - 2.4L
- SENSOR, Camshaft Position
  - Removal and Installation
    - 1.4L
    - 1.6L DIESEL
    - 2.0L
    - 2.4L Removal and Installation
- SENSOR, Knock
  - Removal and Installation
    - 1.4L
    - 2.4L
- SWITCH, Ignition
  - Diagnosis and Testing
    - Diagnosis and Testing
  - Removal and Installation
    - REMOVAL AND INSTALLATION

8J - Instrument Cluster

- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - INSTRUMENT CLUSTER
  - ABS WARNING LIGHT ON
  - AIRBAG INDICATOR OFF (DOES NOT CARRY OUT INITIAL TEST)
  - AMBIENT TEMPERATURE DOES NOT DISPLAY
  - CLOCK DOES NOT WORK
  - DOOR OPEN INDICATOR ALWAYS ON
  - ENGINE COOLANT TEMPERATURE LIGHT DOES NOT WORK
  - EVIC NEVER DISPLAYS DANGER ICE WITH LOW EXTERNAL TEMPERATURE
  - EVIC SIGNALS DANGER ICE WITH ELEVATED EXTERNAL TEMPERATURE
  - FUEL WARNING LIGHT DOES NOT WORK
  - GENERATOR LIGHT DOES NOT WORK
  - LOW OIL PRESSURE LIGHT DOES NOT WORK
  - MIL WARNING LIGHT FLASHES
  - ODOMETER DOES NOT WORK
  - SPEEDOMETER DOES NOT WORK
  - TACHOMETER DOES NOT WORK
- Standard Procedure
  - STANDARD PROCEDURE - ENHANCED SEATBELT REMINDER PROGRAMMING
- Removal and Installation
  - REMOVAL AND INSTALLATION
- GAUGE PACK, Instrument Cluster
  - Description and Operation
    - DESCRIPTION AND OPERATION
- INDICATORS, Instrument Cluster
  - Description and Operation
    - DESCRIPTION AND OPERATION
- POD, Switch

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- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - REMOVAL AND INSTALLATION

8L - Lamps and Lighting

Lamps/Lighting - Exterior

- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - EXTERIOR LIGHTING
- UNIT, Front Lamp
  - Standard Procedure
    - LAMP LENS DEFOGGING
  - Removal and Installation
    - FRONT LAMP UNIT
    - FRONT LAMP UNIT BRACKET
- LAMP, Backup
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LAMP, Center High Mounted Stop
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LAMP, Fog
  - Removal and Installation
    - FRONT FOG LAMP
    - REAR FOG LAMP
- LAMP, License Plate
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LAMP, Park and Turn Signal
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LAMP, Mirror
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LAMP, Tail
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SWITCH, Headlamp
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SWITCH, Multifunction
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SWITCH, Stop Lamp
  - Removal and Installation
    - REMOVAL AND INSTALLATION

Lamps/Lighting - Interior

- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - INTERIOR LIGHTING
- LAMP, Dome
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LAMP, Cargo

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- Removal and Installation
  - REAR CARGO DOME LAMP
  - REAR CARGO LAMP
- 8M - Message Center
  - CENTER, Electronic Vehicle Information
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Diagnosis and Testing
      - DIAGNOSIS AND TESTING - ELECTRONIC VEHICLE INFORMATION CENTER
    - Standard Procedure
      - RESET OIL CHANGE INDICATOR
  - SWITCH, EVIC Control
    - Description and Operation
      - DESCRIPTION AND OPERATION
- 8N - Power Systems
  - Power Locks
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Diagnosis and Testing
      - DIAGNOSIS AND TESTING - POWER LOCKS AND REMOTE KEYLESS ENTRY SYSTEM
    - ANTENNA, Passive Entry
      - Removal and Installation
        - FLOOR CONSOLE
        - LIFTGATE
        - REAR DOOR
        - REAR FASCIA
    - SWITCH, Lock
      - Removal and Installation
        - REMOVAL AND INSTALLATION
  - Power Mirrors
    - SWITCH, Mirror
      - Diagnosis and Testing
        - DIAGNOSIS AND TESTING
  - Power Seats
    - MOTOR, Lumbar
      - Removal and Installation
        - REMOVAL AND INSTALLATION
    - MOTOR, Seat
      - Removal and Installation
        - SEAT CUSHION LIFT MOTOR
        - SEAT FORE - AFT MOTOR
        - SEAT HEIGHT ADJUST MOTOR
    - SWITCH, Lumbar Control
      - Removal and Installation
        - SEAT BACK
        - FOUR WAY
    - SWITCH, Seat, Power
      - Removal and Installation
        - REMOVAL AND INSTALLATION
  - Power Top, Sunroof
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - MOTOR, Sunroof
      - Removal and Installation
        - REMOVAL AND INSTALLATION
  - Power Windows

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- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - POWER WINDOWS
- MOTOR, Window Regulator
  - Removal and Installation
    - Removal and Installation
- SWITCH, Power Window
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - POWER WINDOW SWITCHES
  - Removal and Installation
    - REMOVAL AND INSTALLATION

8P - Speed Control
- Description and Operation
  - Adaptive
  - Conventional
- SWITCH, Speed Control
  - Removal and Installation
    - REMOVAL AND INSTALLATION

8Q - Vehicle Theft Security
- Description and Operation
  - VEHICLE THEFT SECURITY SYSTEM
  - SENTRY KEY IMMOBILIZER SYSTEM
  - VEHICLE THEFT ALARM
- Diagnosis and Testing
  - VEHICLE THEFT SECURITY SYSTEM
  - SENTRY KEY IMMOBILIZER SYSTEM
  - VEHICLE THEFT ALARM
- ANTENNA, Sentry Key
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- KEY, Transponder
  - Description and Operation
    - DESCRIPTION AND OPERATION
- MODULE, Shaft Lock
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- MODULE, Ultrasonic and Anti-tilt
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - ULTRASONIC AND ANTI-TILT MODULE
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SIREN
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SWITCH, Hood Ajar
  - Description and Operation
    - DESCRIPTION AND OPERATION

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- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - HOOD AJAR SWITCH
- Removal and Installation
  - REMOVAL AND INSTALLATION

8R - Wipers/Washers
- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - FRONT WIPER AND WASHER SYSTEM
  - REAR WIPER AND WASHER SYSTEM
- Specifications
  - TORQUE SPECIFICATIONS
- Cleaning
  - FRONT WASHER SYSTEM
  - FRONT WIPER SYSTEM
  - REAR WASHER SYSTEM
  - REAR WIPER SYSTEM
- Inspection
  - FRONT WASHER SYSTEM
  - FRONT WIPER SYSTEM
  - REAR WASHER SYSTEM
  - REAR WIPER SYSTEM
- ARM, Wiper
  - Description and Operation
    - FRONT WIPER ARM
    - REAR WIPER ARM
  - Removal and Installation
    - FRONT WIPER ARM
    - REAR WIPER ARM
- BLADE, Wiper
  - Description and Operation
    - FRONT WIPER BLADE
    - REAR WIPER BLADE
  - Removal and Installation
    - FRONT WIPER BLADE
    - REAR WIPER BLADE
- CHECK VALVE, Washer
  - Description and Operation
    - FRONT CHECK VALVE
    - REAR CHECK VALVE
  - Removal and Installation
    - FRONT CHECK VALVE
    - REAR CHECK VALVE
- HOSES AND TUBES, Washer
  - Description and Operation
    - FRONT WASHER HOSES AND TUBES
    - REAR WASHER HOSES AND TUBES
- LINKAGE, Wiper Arm
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- MODULE, Light Rain Sensor
  - Description and Operation
    - DESCRIPTION AND OPERATION

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- Standard Procedure
  - PROTECTIVE CAP REMOVAL
  - SILICONE GELATIN PAD REPLACEMENT
- Removal and Installation
  - REMOVAL AND INSTALLATION
- MOTOR, Wiper
- Description and Operation
  - FRONT WIPER MOTOR
  - REAR WIPER MOTOR
- Removal and Installation
  - FRONT WIPER MOTOR
  - REAR WIPER MOTOR
- NOZZLE, Washer
- Description and Operation
  - FRONT WASHER NOZZLE
  - REAR WASHER NOZZLE
- Removal and Installation
  - FRONT WASHER NOZZLE
  - REAR WASHER NOZZLE
- PUMP, Windshield Washer
- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - REMOVAL AND INSTALLATION
- RESERVOIR, Windshield Washer
- Description and Operation
  - DESCRIPTION AND OPERATION
- Removal and Installation
  - FILLER NECK
  - WASHER RESERVOIR
- SWITCH, Multifunction, Right
- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - RIGHT MULTIFUNCTION SWITCH
- Removal and Installation
  - REMOVAL AND INSTALLATION

- 8T - Navigation/Telecommunication
- Description and Operation
  - HANDS FREE PHONE
  - NAVIGATION
  - UCONNECT ACCESS
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - HANDS FREE PHONE
  - DIAGNOSIS AND TESTING - NAVIGATION
  - DIAGNOSIS AND TESTING - UCONNECT ACCESS
- Standard Procedure
  - NAVIGATION SYSTEM - RESTORE OR UPDATE
  - UCONNECT ACCESS SYSTEM - REINSTALL APPLICATIONS
  - UCONNECT ACCESS SYSTEM - REMOVE ACCOUNTS
- ANTENNA, Navigation
- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING

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- Removal and Installation
  - REMOVAL AND INSTALLATION
- MICROPHONE
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- 8W - Power Distribution
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - MODULE, Power Inverter
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - OUTLET, Power
    - Diagnosis and Testing
      - DIAGNOSIS AND TESTING - POWER OUTLET
    - Removal and Installation
      - FRONT POWER OUTLET
      - MID POWER OUTLET
      - REAR POWER OUTLET
- 09 - Engine, 1.6L/2.0L Diesel
  - Diagnosis and Testing
    - INTRODUCTION
    - ENGINE PERFORMANCE DIAGNOSTIC TABLE
    - NOISY OPERATION
    - ENGINE MECHANICAL DIAGNOSTIC TABLE
    - CYLINDER COMPRESSION TEST
    - CYLINDER LEAKAGE TEST
    - OIL CONSUMPTION TEST AND DIAGNOSIS
    - ENGINE LUBRICATION DIAGNOSTIC TABLE
  - Standard Procedure
    - DUST COVERS AND CAPS
    - ENGINE GASKET SURFACE PREPARATION
    - FORM-IN-PLACE GASKETS AND SEALERS
    - HYDROSTATIC LOCKED ENGINE
    - REPAIR DAMAGED OR WORN THREADS
  - Specifications
    - SPECIFICATIONS
    - TORQUE SPECIFICATIONS
  - Removal and Installation
    - 1.6L DIESEL WITH MANUAL TRANSMISSION
    - 2.0L DIESEL WITH AUTOMATIC TRANSMISSION
    - 2.0L DIESEL WITH MANUAL TRANSMISSION
    - ENGINE - POSITION ON STAND AND REMOVE - 1.6L
    - ENGINE - POSITION ON STAND AND REMOVE - 2.0L - 120/140CV
    - ENGINE - POSITION ON STAND AND REMOVE - 2.0L - 170CV
    - ENGINE (MANUAL TRANSMISSION) SEPARATION AND REASSEMBLY - 1.6L Turbo Diesel
    - ENGINE (AUTOMATIC TRANSMISSION) SEPARATION AND REASSEMBLY - 2.0L Turbo Diesel
    - ENGINE (MANUAL TRANSMISSION) SEPARATION AND REASSEMBLY - 2.0L Turbo Diesel 120CV / 140CV
  - Disassembly and Assembly

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- DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 1.6L
- DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 2.0L 120/140CV
- DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 2.0L 170CV
- REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION - 1.6L
- REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION - 2.0L 120/140CV
- REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION - 2.0L 170CV

Special Tools
- SPECIAL TOOLS

COVER, Engine
Removal and Installation
- REMOVAL AND INSTALLATION

Cylinder Head
Description and Operation
- DESCRIPTION AND OPERATION

Diagnosis and Testing
- CYLINDER HEAD GASKET

Cleaning
- CLEANING

Inspection
- INSPECTION

Removal and Installation
- 1.6L AND 2.0L-120/140CV
- 2.0L DIESEL 170CV

CAMSHAFT, Engine
Inspection
- INSPECTION

Removal and Installation
- 1.6L–2.0L

LIFTER(S), Hydraulic
Removal and Installation
- 1.6L - 2.0L

Engine Block
Standard Procedure
- CYLINDER BORE DEGLAZING
- MEASURING BEARING CLEARANCE USING PLASTIGAGE

MODULE, Balance Shaft
Removal and Installation
- 2.0L DIESEL

DAMPER, Vibration
Removal and Installation
- 1.6L Diesel
- 2.0L Diesel

RING(S), Piston
Removal and Installation
- 1.6L DIESEL
- 2.0L DIESEL

ROD, Piston and Connecting
Removal and Installation
- 1.6L
- 2.0L

Disassembly and Assembly
- DISASSEMBLY AND ASSEMBLY

SEAL, Crankshaft Oil, Rear
Removal and Installation

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- 1.6L
- 2.0L

Manifolds
- MANIFOLD, Exhaust
  - Removal and Installation
    - 1.6L Diesel
    - 2.0L Diesel 120/140 CV
    - 2.0L Diesel 170 CV
- MANIFOLD, Intake
  - Removal and Installation
    - 1.6L Diesel
    - 2.0L Diesel

Lubrication
- Diagnosis and Testing
  - CHECKING ENGINE OIL PRESSURE
- COOLER, Oil
  - Removal and Installation
    - 1.6L
    - 2.0L
    - OIL COOLER LINES
- FILTER, Engine Oil
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PAN, Oil
  - Removal and Installation
    - 1.6L Diesel
    - 2.0L Diesel
- SENSOR, Oil Pressure
  - Removal and Installation
    - 1.6L Diesel Warning Light
    - 1.6L Diesel High Pressure
    - 2.0L Diesel Warning Light
    - 2.0L Diesel High Pressure
- PUMP, Engine Oil
  - Removal and Installation
    - 1.6L–2.0L
- REGULATOR, Oil Pressure
  - Removal and Installation
    - 1.6L/2.0L Diesel

Turbocharger System
- COOLER and HOSES, Charge Air
  - Removal and Installation
    - 2.0L Diesel 120/140 CV
    - 2.0L Diesel 170 CV
- SENSOR, Turbo Boost Pressure
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- TURBOCHARGER
  - Removal and Installation
    - TURBOCHARGER 1.6L
    - TURBOCHARGER 2.0L 120CV/140CV
    - TURBOCHARGER 2.0L 170CV

Valve Timing
- Standard Procedure
  - 1.6L-2.0L - VALVE TIMING VERIFICATION
- BELT, Timing

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- Removal and Installation
  - 1.6L DIESEL
  - 2.0L
- CHAIN and SPROCKETS, Timing
  - Removal and Installation
    - 1.6L - 2.0L CAMSHAFT SPROCKET
    - 1.6L CRANKSHAFT SPROCKET
    - 2.0L 120CV - 140CV CRANKSHAFT SPROCKET
    - 2.0L 170CV CRANKSHAFT SPROCKET
  - Inspection
    - INSPECTION
- PULLEY, Timing Belt Idler
  - Removal and Installation
    - 2.0L TIMING BELT IDLER PULLEY
- TENSIONER, Engine Timing
  - Removal and Installation
    - 1.6L - 2.0L TIMING BELT TENSIONER

09 - Engine, 1.4L I4 16V Turbo

- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - ENGINE PERFORMANCE DIAGNOSTIC TABLE
  - ENGINE MECHANICAL DIAGNOSTIC TABLE
  - CYLINDER COMPRESSION TEST
  - CYLINDER LEAKAGE TEST
  - OIL CONSUMPTION TEST AND DIAGNOSIS
  - ENGINE LUBRICATION DIAGNOSTIC TABLE
- Standard Procedure
  - DUST COVERS AND CAPS
  - ENGINE GASKET SURFACE PREPARATION
  - FORM-IN-PLACE GASKETS AND SEALERS
  - HYDROSTATIC LOCKED ENGINE
  - REPAIR DAMAGED OR WORN THREADS
- Specifications
  - SPECIFICATIONS
  - TORQUE SPECIFICATIONS
- Removal and Installation
  - 1.4L ENGINE WITH MANUAL TRANSMISSION - 4x4
  - 1.4L ENGINE WITH MANUAL TRANSMISSION
  - ENGINE (MANUAL TRANSMISSION) SEPARATION AND REASSEMBLY - 1.4L Turbo MultiAir
  - ENGINE (MANUAL TRANSMISSION) SEPARATION AND REASSEMBLY - 1.4L Turbo MultiAir 4X4
  - ENGINE - POSITION ON STAND AND REMOVE - 1.4L
- Disassembly and Assembly
  - REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION - 1.4L
  - DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 1.4L
- Special Tools
  - SPECIAL TOOLS
- COVER, Engine
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- Air Intake System
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - BODY, Air Cleaner
    - Removal and Installation

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- 1.4L Multi Air
- 1.4L Multi Air 4x4

Cylinder Head
- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - CYLINDER HEAD GASKET
- Cleaning
  - CLEANING
- Inspection
  - INSPECTION
- Removal and Installation
  - 1.4L MultiAir Turbo 4x4
  - 1.4L MultiAir Turbo
- CAMSHAFT, Engine
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Inspection
    - INSPECTION
  - Removal and Installation
    - 1.4L
- COVER(S), Cylinder Head
  - Removal and Installation
    - 1.4L MULTIAIR TURBO
    - 1.4L MULTIAIR TURBO 4X4
- LIFTER(S), Hydraulic
  - Removal and Installation
    - 1.4L
- ASSEMBLY, Variable Valve Actuation
  - Inspection
    - INSPECTION
  - Removal and Installation
    - 1.4L

Engine Block
- Standard Procedure
  - CYLINDER BORE DEGLAZING
  - MEASURING BEARING CLEARANCE USING PLASTIGAGE
- DAMPER, Vibration
  - Removal and Installation
    - 1.4L Multi Air
    - 1.4L Multi Air 4x4
- RING(S), Piston
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- ROD, Piston and Connecting
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SEAL, Crankshaft Oil, Rear
  - Removal and Installation
    - 1.4L
    - 1.4 4X4

Manifolds
- MANIFOLD, Intake
  - Removal and Installation
    - 1.4L Multi Air
    - 1.4L Multi Air 4x4

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- Lubrication
  - Diagnosis and Testing
    - CHECKING ENGINE OIL PRESSURE
  - COOLER, Oil
    - Removal and Installation
      - 1.4L
  - FILTER, Engine Oil
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - PAN, Oil
    - Removal and Installation
      - 1.4L Multi Air
      - 1.4L Multi Air 4x4
  - SENSOR, Oil Pressure
    - Removal and Installation
      - 1.4L Multi Air
      - 1.4L Multi Air 4x4
  - PUMP, Engine Oil
    - Removal and Installation
      - 1.4L
      - 1.4L – 4WD
- Turbocharger System
  - COOLER and HOSES, Charge Air
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SENSOR, Turbo Boost Pressure
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - TURBOCHARGER
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SOLENOID, Wastegate
    - Removal and Installation
      - BLADE POSITION ACTUATOR
- Valve Timing
  - BELT, Timing
    - Removal and Installation
      - 1.4L
      - 1.4L 4WD Removal and Installation
  - CHAIN and SPROCKETS, Timing
    - Removal and Installation
      - 1.4L CAMSHAFT SPROCKET
      - 1.4L CRANKSHAFT SPROCKET
  - TENSIONER, Engine Timing
    - Removal and Installation
      - 1.4L TIMING BELT TENSIONER

- 09 - Engine, 1.6L E-Torque
  - Description
    - DESCRIPTION
  - Diagnosis and Testing
    - ENGINE PERFORMANCE DIAGNOSTIC TABLE
    - ENGINE MECHANICAL DIAGNOSTIC TABLE
    - CYLINDER COMPRESSION TEST
    - CYLINDER LEAKAGE TEST
    - OIL CONSUMPTION TEST AND DIAGNOSIS
    - ENGINE LUBRICATION DIAGNOSTIC TABLE

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- Standard Procedure
  - DUST COVERS AND CAPS
  - ENGINE GASKET SURFACE PREPARATION
  - FORM-IN-PLACE GASKETS AND SEALERS
  - HYDROSTATIC LOCKED ENGINE
  - REPAIR DAMAGED OR WORN THREADS
- Specifications
  - SPECIFICATIONS
  - TORQUE SPECIFICATIONS
- Special Tools
  - SPECIAL TOOLS
- Removal and Installation
  - REMOVAL AND INSTALLATION
  - ENGINE - POSITION ON STAND AND REMOVE
- Disassembly and Assembly
  - DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION
  - REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION
  - DISASSEMBLE-REASSEMBLE-FOLLOWING-INSPECTION
- COVER, Engine
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- Air Intake System
  - BODY, Air Cleaner
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - HOSE, Clean Air
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Cylinder Head
  - Description and Operation
    - DESCRIPTION
  - Diagnosis and Testing
    - CYLINDER HEAD GASKET
    - HYDRAULIC LASH ADJUSTER
  - Cleaning
    - CLEANING
  - Inspection
    - INSPECTION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
    - DISASSEMBLY AND REASSEMBLY
  - CAMSHAFT, Engine
    - Description
      - DESCRIPTION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - COVER(S), Cylinder Head
    - Description
      - DESCRIPTION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - LIFTER(S), Hydraulic
    - Description
      - DESCRIPTION
    - Removal and Installation

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- REMOVAL AND INSTALLATION
- VALVE GUIDES
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- Engine Block
  - Description
    - DESCRIPTION
  - Standard Procedure
    - CYLINDER BORE DEGLAZING
    - MEASURING BEARING CLEARANCE USING PLASTIGAGE
  - DAMPER, Vibration
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - RING(S), Piston
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - ROD, Piston and Connecting
    - Description
      - DESCRIPTION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Manifolds
  - MANIFOLD, Intake
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - MANIFOLD, Exhaust
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Lubrication
  - Description
    - DESCRIPTION
  - Diagnosis and Testing
    - ENGINE OIL LEAK
  - FILTER, Engine Oil
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - PAN, Oil
    - Description
      - DESCRIPTION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SENSOR, Oil Pressure
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - PUMP, Engine Oil
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Valve Timing
  - Description and Operation
    - DESCRIPTION-AND-OPERATION
  - CHAIN and SPROCKETS, Timing
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - COVER(S), Engine Timing

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- Removal and Installation
  - REMOVAL AND INSTALLATION
- TENSIONER, Engine Timing
  - Description
    - DESCRIPTION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- 09 - Engine, 1.8L
  - Engine - 1.8L
    - ATTENTION / ATENÇÃO
- 09 - Engine, 2.4L Multiair
  - Diagnosis and Testing
    - INTRODUCTION
    - ENGINE PERFORMANCE DIAGNOSTIC TABLE
    - NOISY OPERATION
    - ENGINE MECHANICAL DIAGNOSTIC TABLE
    - CYLINDER COMPRESSION TEST
    - CYLINDER LEAKAGE TEST
    - OIL CONSUMPTION TEST AND DIAGNOSIS
    - ENGINE LUBRICATION DIAGNOSTIC TABLE
  - Standard Procedure
    - DUST COVERS AND CAPS
    - ENGINE GASKET SURFACE PREPARATION
    - FORM-IN-PLACE GASKETS AND SEALERS
    - HYDROSTATIC LOCKED ENGINE
    - REPAIR DAMAGED OR WORN THREADS
  - Specifications
    - SPECIFICATIONS
    - TORQUE SPECIFICATIONS
  - Special Tools
    - SPECIAL TOOLS
  - Removal and Installation
    - 2.4L WITH AUTOMATIC TRANSMISSION
    - 2.4L WITH AUTOMATIC TRANSMISSION - 4x4
    - ENGINE (AUTOMATIC TRANSMISSION) SEPARATION AND REASSEMBLY - 2.4L MultiAir
    - ENGINE (AUTOMATIC TRANSMISSION) SEPARATION AND REASSEMBLY - 2.4L MultiAir 4X4
    - ENGINE - POSITION ON STAND AND REMOVE - 2.4L
  - Disassembly and Assembly
    - REMOVE CYLINDER HEAD AND OIL PAN FOR INSPECTION - 2.4L
    - DISASSEMBLY AND REASSEMBLY FOLLOWING INSPECTION - 2.4L
  - COVER, Engine
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - Air Intake System
    - BODY, Air Cleaner
      - Removal and Installation
        - 2.4L Multi Air
  - Cylinder Head
    - Diagnosis and Testing
      - CYLINDER HEAD GASKET
      - HYDRAULIC LASH ADJUSTER
    - Cleaning
      - CLEANING
    - Inspection
      - INSPECTION

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- Removal and Installation
  - REMOVAL AND INSTALLATION
- CAMSHAFT, Engine
  - Inspection
    - INSPECTION
  - Removal and Installation
    - 2.4L
- COVER(S), Cylinder Head
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LIFTER(S), Hydraulic
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - LASH ADJUSTER (TAPPET) NOISE
  - Removal and Installation
    - 2.4L
- ASSEMBLY, Variable Valve Actuation
  - Inspection
    - INSPECTION
  - Removal and Installation
    - 2.4L

Engine Block

- Standard Procedure
  - CYLINDER BORE DEGLAZING
  - MEASURING BEARING CLEARANCE USING PLASTIGAGE
- DAMPER, Vibration
  - Removal and Installation
    - 2.4L Multi Air
- RING(S), Piston
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- ROD, Piston and Connecting
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Standard Procedure
    - Piston Fitting
    - Connecting Rod Side Clearance
  - Cleaning
    - CLEANING
  - Inspection
    - INSPECTION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SEAL, Crankshaft Oil, Front
  - Removal and Installation
    - 2.4L Multi Air
- SEAL, Crankshaft Oil, Rear
  - Removal and Installation
    - 2.4L

Manifolds

- MANIFOLD, Exhaust
  - Removal and Installation
    - 2.4L Multi Air
- MANIFOLD, Intake
  - Removal and Installation
    - 2.4L Multi Air

Lubrication

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- COOLER, Oil
  - Removal and Installation
    - 2.4L
    - OIL COOLER LINES
- FILTER, Engine Oil
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PAN, Oil
  - Removal and Installation
    - 2.4L Multi Air
- SENSOR, Oil Pressure
  - Removal and Installation
    - 2.4L Multi Air
- PUMP, Engine Oil
  - Removal and Installation
    - 2.4L
- SENSOR, Oil Temperature
  - Removal and Installation
    - 2.4L

Valve Timing
- Standard Procedure
  - 2.4L - VALVE TIMING VERIFICATION
- CHAIN and SPROCKETS, Timing
  - Removal and Installation
    - TIMING CHAIN
  - Inspection
    - INSPECTION
- GUIDES, Timing Chain
  - Removal and Installation
    - 2.4L TIMING CHAIN GUIDE SHOE
    - 2.4L TIMING CHAIN GUIDE TENSIONER
- COVER(S), Engine Timing
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- TENSIONER, Engine Timing
  - Removal and Installation
    - 2.4L ENGINE TIMING TENSIONER

10 - Restraints
- Warning
  - WARNING
- Description and Operation
  - SUPPLEMENTAL RESTRAINT SYSTEM
  - ACTIVE RESTRAINTS
  - PASSIVE RESTRAINTS
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING
- Standard Procedure
  - HANDLING NON-DEPLOYED SUPPLEMENTAL RESTRAINTS
  - SERVICE AFTER A SUPPLEMENTAL RESTRAINT SYSTEM DEPLOYMENT
  - SUPPLEMENTAL RESTRAINT STORAGE
  - SUPPLEMENTAL RESTRAINT SYSTEM VERIFICATION TEST
  - SUPPLEMENTAL RESTRAINT SYSTEM WIRING REPAIRS
- Specifications
  - TORQUE SPECIFICATIONS
- Special Tools
  - SPECIAL TOOLS

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- ADJUSTER, Seat Belt Turning Loop
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- AIR BAG, Driver
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- AIR BAG, Knee Blocker
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- AIR BAG, Passenger
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- AIR BAG, Seat
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- AIR BAG, Side Curtain
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - B-PILLAR DEPLOY BRACKET
    - C-PILLAR DEPLOY BRACKET
    - SIDE CURTAIN AIRBAG
- ANCHOR, Child Seat
  - Description and Operation
    - DESCRIPTION AND OPERATION
- BUCKLE, Seat Belt
  - Standard Procedure
    - STANDARD PROCEDURE - REAR CENTER SEAT BELT LOWER ANCHOR BUCKLE RELEASE
  - Removal and Installation
    - SEAT BELT BUCKLE - FRONT
    - SEAT BELT BUCKLE - REAR
- CLOCKSPRING
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Standard Procedure
    - STANDARD PROCEDURE - CLOCKSPRING CENTERING
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- INDICATOR, Passenger Air Bag
  - Description and Operation
    - DESCRIPTION AND OPERATION
- INDICATOR, Seat Belt Reminder (SBR)
  - Description and Operation
    - DESCRIPTION AND OPERATION
- MODULE, Occupant Restraint Controller
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation

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- REMOVAL AND INSTALLATION
- RESTRAINT, Active Head
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Standard Procedure
    - STANDARD PROCEDURE - ACTIVE HEAD RESTRAINT RESET
- RETRACTOR, Seat Belt
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - SEAT BELT RETRACTOR - FRONT
    - SEAT BELT RETRACTOR - REAR CENTER
    - SEAT BELT RETRACTOR - REAR OUTBOARD
- SENSOR, Impact
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - IMPACT SENSOR - B-PILLAR
    - IMPACT SENSOR - FRONT DOOR
    - FRONT IMPACT SENSOR - EMEA
    - FRONT IMPACT SENSOR - NAFTA
- SENSOR, Occupant Detection
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SENSOR, Seat Track Position
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SWITCH, Seat Belt
  - Description and Operation
    - DESCRIPTION AND OPERATION
- TENSIONER, Seat Belt
  - Description and Operation
    - DESCRIPTION AND OPERATION

- 11 - Exhaust System
  - Diagnosis and Testing
    - EXHAUST EMISSION TESTING
  - Adjustments
    - ADJUSTMENTS
  - Specifications
    - TORQUE SPECIFICATIONS
  - Inspection
    - INSPECTION
  - CONVERTER, Catalytic
    - Inspection
      - INSPECTION
    - Removal and Installation
      - 1.4L
      - 1.6L E-Torque
      - 2.4L
  - FILTER, Diesel Particulate
    - Removal and Installation

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- 1.6L DIESEL
- 2.0L DIESEL 120/140CV
- 2.0 DIESEL 170CV

MUFFLER, Exhaust
- Removal and Installation
  - REMOVAL
  - 1.6L E-Torque
  - Front
  - Center Pipe

PIPE, Exhaust
- Removal and Installation
  - 1.4L
  - 1.6L E-Torque
  - 1.6L DIESEL
  - 2.0L DIESEL 120/140CV
  - 2.0L DIESEL 170CV
  - 2.4L
  - 2.4L 4X4

SENSOR, Differential Pressure
- Removal and Installation
  - 1.6L AND 2.0L

SENSOR, Exhaust Temperature
- Removal and Installation
  - EXHAUST TEMPERATURE SENSOR
  - TURBO INLET TEMPERATURE SENSOR

13 - Frame and Bumpers

Special Tools
- SPECIAL TOOLS

Specifications
- TORQUE SPECIFICATIONS

Bumpers
- FASCIA, Front
  - Disassembly and Assembly
    - Disassembly and Assembly
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- FASCIA, Rear
  - Disassembly and Assembly
    - Disassembly and Assembly
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- REINFORCEMENT, Bumper, Front
  - Removal and Installation
    - REMOVAL AND INSTALLATION

Frame
- Warning
  - USE OF HEAT DURING REPAIR
  - WARNINGS
- CROSSMEMBER, Front Suspension
  - Removal and Installation
    - 2.0L Turbo Diesel 120HP/140HP
    - 2.4L MultiAir2 , 1.4L Turbo MultiAir
    - 2.0L Turbo Diesel 170HP
    - 1.6L Turbo Diesel
- CROSSMEMBER, Rear Suspension

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- Removal and Installation
  - 2.4L MultiAir2 , 1.4L Turbo MultiAir
  - 4X4
- LOAD BEAM, Lower
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- Under Body Protection
  - BELLY PAN
    - Removal and Installation
      - Removal and Installation
  - BELLY PAN, Side
    - Removal and Installation
      - Removal and Installation

14 - Fuel System
- Fuel Delivery
  - Description and Operation
    - 1.4L MULTIAIR TURBO
  - Diagnosis and Testing
    - HARD TO FILL WITH FUEL
    - DIESEL FUEL SYSTEM PRELIMINARY TESTS
  - Standard Procedure
    - FUEL CUTOFF RESET
  - Specifications
    - TORQUE SPECIFICATIONS
  - Special Tools
    - SPECIAL TOOLS
  - FILTER, Fuel
    - Removal and Installation
      - 1.6L, 2.0L
  - PUMP, Fuel Injection
    - Removal and Installation
      - 1.6L, 2.0L
  - LINES, Fuel
    - Removal and Installation
      - 1.4L
      - 1.6L E-Torque
      - 1.6L
      - 2.0L
      - 2.4L
  - SENSOR, Fuel Rail Pressure
    - Removal and Installation
      - 1.6L, 2.0L
  - MODULE, Fuel Pump
    - Removal and Installation
      - 1.4L
      - 1.6L E-Torque
      - 1.6L, 2.0L
      - 2.4L
  - RAIL, Fuel
    - Removal and Installation
      - 1.4L MULTIAIR
      - 1.6L E-Torque
      - 2.4L MULTIAIR
  - SENDING UNIT and SENSOR, Fuel Level
    - Description and Operation
      - DESCRIPTION AND OPERATION

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- RECEPTACLE, Fuel Fill
  - Removal and Installation
    - 1.4L, 1.6L, 1.6L E-Torque, 2.0L
- TANK, Fuel
  - Removal and Installation
    - 1.4L FWD
    - 1.4L 4X4
    - 1.6L E-Torque
    - 1.6L
    - 2.0L
    - 2.4L
- TUBE, Fuel Tank Filler
  - Removal and Installation
    - 1.4 FWD, 1.6L, 1.6L E-Torque, 2.0L
    - 1.4L 4X4
    - 2.4L
- SENSOR, Water in Fuel
  - Removal and Installation
    - 1.6L, 2.0L

Fuel Injection

- Specifications
  - TORQUE SPECIFICATIONS
- INJECTOR(S), Fuel
  - Removal and Installation
    - 1.4L
    - 1.4L 4X4
    - 1.6L E-Torque
    - 1.6L
    - 2.0L
    - 2.4L
- SENSOR, Accelerator Pedal Position
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SENSOR, Air Temperature, Intake
  - Removal and Installation
    - 2.4L
- SENSOR, Crankshaft Position
  - Description and Operation
    - 1.4L MULTIAIR TURBO (EMEA)
    - 1.4L MULTIAIR TURBO (NAFTA)
    - 2.0L DIESEL
    - 2.4L MULTIAIR
  - Removal and Installation
    - 1.4L – EMEA
    - 1.4L – NAFTA
    - 1.6L
    - 2.0L
    - 2.4L
- SENSOR, Manifold Air Pressure (MAP)
  - Removal and Installation
    - 1.4L
    - 2.4L
- SENSOR, Mass Airflow (MAF)
  - Removal and Installation
    - 1.6L – 2.0L

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- SENSOR, Oxygen
  - Removal and Installation
    - 1.4L 2WD DOWNSTREAM
    - 1.4L 2WD UPSTREAM
    - 1.4L 4WD
    - 1.6L E-Torque UP STREAM
    - 1.6L E-Torque DOWNSTREAM
    - 1.6L
    - 2.0L - 120HP / 140 HP
    - 2.0L - 170HP
    - 2.4L DOWNSTREAM
    - 2.4L UPSTREAM
- SENSOR, TMAP-Intake Manifold
  - Description and Operation
    - 1.6L E-Torque
  - Removal and Installation
    - 1.4L
    - 1.6L E-Torque
- THROTTLE BODY
  - Description and Operation
    - 1.4L MULTIAIR TURBO
  - Removal and Installation
    - 1.4L
    - 1.6L E-Torque
    - 1.6L, 2.0L
    - 2.4L

17 - Rear Suspension
- Warning
  - WARNING
- Description
  - DESCRIPTION
- Special Tools
  - SPECIAL TOOLS
- Specifications
  - TECHNICAL SPECIFICATIONS
  - TORQUE SPECIFICATIONS
- ARM, Lower Control
  - Removal and Installation
    - Front
    - Rear
- HUB AND BEARING
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - HUB BEARING - NOISE
  - Removal and Installation
    - Removal And Installation
    - 4x4
- KNUCKLE, Rear
  - Removal and Installation
    - Removal And Installation
    - 4x4
- LINK, Trailing, Rear
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- STABILIZER BAR, Rear Suspension
  - Removal and Installation

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- REMOVAL AND INSTALLATION
- STRUT, Rear
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- 19 - Steering
  - Description and Operation
    - Description and Operation
  - Diagnosis and Testing
    - STEERING SYSTEM DIAGNOSIS CHARTS
  - Special Tools
    - SPECIAL TOOLS
  - Specifications
    - TECHNICAL SPECIFICATIONS
    - TORQUE SPECIFICATIONS
  - Column
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
    - SHROUD, Steering Column
      - Removal and Installation
        - REMOVAL AND INSTALLATION
    - WHEEL, Steering
      - Removal and Installation
        - REMOVAL AND INSTALLATION
  - Gear
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- 21 - Transmission and Transfer Case
  - Automatic - 948TE/9HP48
    - Diagnosis and Testing
      - DIAGNOSIS AND TESTING - AUTOMATIC TRANSMISSION - GENERAL CONDITIONS
      - PRELIMINARY DIAGNOSIS
      - ROAD TEST
      - EMERGENCY RUNNING FUNCTION - LIMP IN MODE
    - Standard Procedures
      - BEARING TURNING TORQUE MEASUREMENT
      - INPUT SHAFT END PLAY MEASUREMENT
    - Specifications
      - TORQUE SPECIFICATIONS
      - CLUTCH SPECIFICATIONS
      - TRANSMISSION GEAR RATIOS
    - Schematics and Diagrams
      - INTERNAL HYDRAULIC PASSAGES
    - Special Tools
      - SPECIAL TOOLS
    - Removal and Installation
      - REMOVAL AND INSTALLATION
    - Disassembly and Assembly
      - DISASSEMBLY AND ASSEMBLY
    - BEARINGS, Differential
      - Removal and Installation
        - REMOVAL AND INSTALLATION
    - BEARINGS, Transfer Gear
      - Removal and Installation

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- TRANSFER GEAR INNER BEARING
- TRANSFER GEAR INNER BEARING RACE
- TRANSFER GEAR OUTER BEARING
- TRANSFER GEAR OUTER BEARING RACE

BELLHOUSING
- Removal and Installation
  - REMOVAL AND INSTALLATION

CABLE, Shift
- Adjustments
  - ADJUSTMENTS
- Removal and Installation
  - REMOVAL AND INSTALLATION

CLUTCH, B
- Adjustments
  - B-CLUTCH MEASUREMENT
- Disassembly and Assembly
  - DISASSEMBLY AND ASSEMBLY

CLUTCH, C
- Adjustments
  - C-CLUTCH MEASUREMENT

CLUTCH, D
- Adjustments
  - D-CLUTCH MEASUREMENT

CLUTCH, E
- Adjustments
  - E-CLUTCH MEASUREMENT
- Disassembly and Assembly
  - DISASSEMBLY AND ASSEMBLY

CLUTCH, F Dog
- Disassembly and Assembly
  - DISASSEMBLY AND ASSEMBLY

DIFFERENTIAL AND RING GEAR
- Disassembly and Assembly
  - DISASSEMBLY AND ASSEMBLY

FLUID and FILTER
- Standard Procedure
  - FLUID LEVEL CHECK
  - FLUID AND FILTER SERVICE
- Removal and Installation
  - REMOVAL AND INSTALLATION

MANUAL LEVER AND PARK ROD
- Removal and Installation
  - REMOVAL AND INSTALLATION

NEEDLE BEARING, Oil Pump Sprocket
- Removal and Installation
  - REMOVAL AND INSTALLATION

PARKING SPRAG AND GUIDE
- Removal and Installation
  - REMOVAL AND INSTALLATION

PUMP, Fluid
- Removal and Installation
  - REMOVAL AND INSTALLATION

SENSOR, Fluid Pressure
- Removal and Installation
  - REMOVAL AND INSTALLATION

SEAL, Axle

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- Removal and Installation
  - REMOVAL AND INSTALLATION - FWD BOTH SIDES - AWD AND 4WD LEFT SIDE
  - REMOVAL AND INSTALLATION - AWD AND 4WD RIGHT SIDE
- SEAL, Input Shaft
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SENSORS, Speed
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SHAFT, Reaction
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SHIFTER, Floor Console
  - Removal and Installation
    - SHIFTER BEZEL
    - SHIFTER KNOB
    - GEAR SHIFTER
- TUBE, Oil
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- VALVE BODY
  - Removal and Installation
    - 2.0 TURBO DIESEL -170 HP
    - GASOLINE ENGINE
  - Disassembly and Assembly
    - DISASSEMBLY AND ASSEMBLY

Automatic - C635 DDCT

- Description and Operation
  - Description and Operation
- Specifications
  - TORQUE SPECIFICATIONS
- Removal and Installation
  - REMOVAL AND INSTALLATION
- Special Tools
  - SPECIAL TOOLS
- FLUID
  - Standard Procedure
    - DRAINING AND FILLING
    - TRANSMISSION FLUID LEVEL CHECK
    - HYDRAULIC SYSTEM FILTER
    - HYDRAULIC FLUID LEVEL CHECK AND FILLING
- RESERVOIR, Hydraulic Circuit
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SEAL, Input Shaft
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SHIFTER, Floor Console
  - Removal and Installation
    - SHIFTER BEZEL
    - SHIFTER KNOB
    - GEAR SHIFTER
- UNIT, Smart Drive
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- UNIT, Transmission Hydraulic Power

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- Removal and Installation
  - POWER UNIT
  - MOTOR
  - ACCUMULATOR
- VALVE BODY
  - Removal and Installation
    -
- Manual, C510
  - Description
    - DESCRIPTION C510 MANUAL
  - Diagnosis and Testing
    - COMMON PROBLEM CAUSES
  - Specifications
    - SPECIFICATIONS
  - Removal and Installation
    - REMOVAL AND INSTALLATION
  - Disassembly and Assembly
    - DISASSEMBLY AND ASSEMBLY
    - FIFTH GEAR DISASSEMBLY AND ASSEMBLY
  - Special Tools
    - SPECIAL TOOLS
  - BOOT, Gearshift
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - DIFFERENTIAL, Transaxle
    - Disassembly and Assembly
      - DISASSEMBLY AND ASSEMBLY
  - FLUID
    - Standard Procedure
      - FLUID DRAIN AND FILL
  - KNOB, Gearshift
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SEAL, Axle Drive Shaft
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SWITCH, Backup Lamp
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Manual, C635
  - Description
    - DESCRIPTION
  - Diagnosis and Testing
    - COMMON PROBLEM CAUSES
  - Specifications
    - TORQUE SPECIFICATIONS
  - Removal and Installation
    - 1.4 TURBO MULTIAIR
    - 1.6L TURBO DIESEL
    - 2.0 TURBO DIESEL - AWD / 4WD
  - Disassembly and Assembly
    - DISASSEMBLY AND ASSEMBLY
  - Cleaning
    - CLEANING
  - Special Tools
    - SPECIAL TOOLS

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- KNOB, Gearshift
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- CABLE, Gearshift Control
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- DIFFERENTIAL, Transaxle
  - Disassembly and Assembly
    - DISASSEMBLY AND ASSEMBLY
- FLUID
  - Standard Procedure
    - FLUID DRAIN AND FILL
    - FLUID LEVEL INSPECTION
- MECHANISM, Gearshift
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SEAL, Axle Drive Shaft
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SEAL, Input Shaft
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SWITCH, Backup Lamp
  - Removal and Installation
    - REMOVAL AND INSTALLATION

- Power Transfer Unit
  - Standard Procedure
    - POWER TRANSFER UNIT (PTU) FLUID FILL
  - Specifications
    - SPECIFICATIONS
  - Removal and Installation
    - 1.4 TURBO MULTIAIR
    - 2.0 TURBO DIESEL -120/140 HP
    - 2.0 TURBO DIESEL -170 HP
    - 2.4L MULTIAIR
  - ACTUATOR, Shift
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SWITCH, Transfer Case
    - Removal and Installation
      - REMOVAL AND INSTALLATION

- 22 - Tires and Wheels
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - TIRE AND WHEEL VIBRATION
  - Standard Procedure
    - TIRE AND WHEEL BALANCE
    - TIRE AND WHEEL ROTATION
  - Specifications
    - TECHNICAL SPECIFICATIONS
    - TORQUE SPECIFICATIONS
  - Removal and Installation
    - REMOVAL AND INSTALLATION
    - Right Front Wheel
    - Left Rear Wheel
    - Right Rear Wheel
    - Front Wheels (Two)

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- Rear Wheels (Two)
- Wheels (Four)

Tire Pressure Monitoring
- Description and Operation
  - Description and Operation
- SENSOR, Tire Pressure Monitoring (TPM)
  - Removal and Installation
    - REMOVAL AND INSTALLATION

Tires
- Description
  - TIRE
  - REPLACEMENT TIRES
  - SPARE TIRE
- Diagnosis and Testing
  - TIRE NOISE
  - TIRE/VEHICLE LEAD
  - TIRE WEAR PATTERNS
  - TREAD WEAR INDICATORS
- Standard Procedure
  - TIRE INFLATION PRESSURES
  - TIRE LEAK REPAIRING

Wheels
- Description
  - DESCRIPTION
- Diagnosis and Testing
  - DIAGNOSIS AND TESTING - WHEEL INSPECTION
- Cleaning
  - CLEANING

23 - Body
- Warning
  - USE OF HEAT DURING REPAIR
  - WARNINGS
- Diagnosis and Testing
  - FRONT DOOR LOCK TESTING
  - GLOVE BOX LOCK TESTING
  - ROAD TESTING
  - WATER LEAKS
  - WIND NOISE
- Standard Procedure
  - BUZZ, SQUEAKS AND RATTLES
  - HEAT STAKING
  - NET, FORM AND PIERCE REPAIR
  - PLASTIC BODY PANEL REPAIR
- Specifications
  - BODY LUBRICATION
  - LOADS AND REINFORCEMENTS
  - THERMOPLASTIC RECYCLABLE MATERIALS
  - THERMOSETTING ELASTOMERS
  - THERMOSETTING RECYCLABLE MATERIALS
  - TORQUE SPECIFICATIONS
  - VEHICLE DIMENSIONS
  - VEHICLE WEIGHT
- Special Tools
  - SPECIAL TOOLS

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- Body Structure
  - Description
    - GENERAL PANELS AND FRAMEWORK
    - SYMBOLS REMOVAL AND INSTALLATION
  - Gap and Flush
    - Specifications
      - SPECIFICATIONS
  - BEAM, Load Path
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - BOW, Roof
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - PAN, Floor
    - Removal and Installation
      - Center Floor Pan Removal and Installation
      - Rear Floor Pan Removal and Installation
      - Rear Floor Pan Extension Removal and Installation
  - PANEL, Body Side Aperture
    - Removal and Installation
      - Sill-Body Side Aperture Removal and Installation
      - Sill Section-Body Side Aperture Removal and Installation
      - Upper-Body Side Aperture Removal and Installation
  - PANEL, Quarter
    - Removal and Installation
      - Quarter Panel Removal and Installation
      - Quarter Panel Extension Removal and Installation
      - Quarter Panel Inner Removal and Installation
  - PANEL, Rear Closure
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - PANEL, Roof
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - PANEL, Taillamp Mounting
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - PLATE, Front Siderail
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - RAIL, Front Frame
    - Removal and Installation
      - REMOVAL AND INSTALLATION
      - Sectioning Removal and Installation
  - RAIL, Rear Frame
    - Removal and Installation
      - REMOVAL AND INSTALLATION
      - Sectioning Removal and Installation
  - REINFORCEMENT, B-Pillar
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - REINFORCEMENT, Cowl Side
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - REINFORCEMENT, Fuel Filler Door
    - Removal and Installation

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- REMOVAL AND INSTALLATION
- TROUGH, Liftgate Opening
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- WHEELHOUSE, Front
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- WHEELHOUSE, Rear
  - Removal and Installation
    - INNER REAR WHEELHOUSE REMOVAL AND INSTALLATION
    - OUTER REAR WHEELHOUSE REMOVAL AND INSTALLATION
    - REINFORCEMENT REAR WHEELHOUSE REMOVAL AND INSTALLATION

Decklid/Hatch/Liftgate/Tailgate
- HINGE, Liftgate
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LATCH, Liftgate
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- LIFTGATE
  - Disassembly and Assembly
    - Disassembly and Assembly
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PANEL, Trim, Liftgate
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PROP, Gas, Liftgate
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SPOILER, Decklid
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- STRIKER, Liftgate Latch
  - Removal and Installation
    - REMOVAL AND INSTALLATION

Door - Front
- CHECK, Door
  - Removal and Installation
    - Removal and Installation
- CYLINDER, Door Lock
  - Removal and Installation
    - Removal and Installation
- DOOR
  - Adjustments
    - ADJUSTMENTS
  - Disassembly and Assembly
    - Disassembly and Assembly
  - Removal and Installation
    - Removal and Installation
- GLASS, Door
  - Removal and Installation
    - Removal and Installation
- HANDLE, Exterior
  - Removal and Installation
    - Removal and Installation

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- HANDLE, Interior
  - Removal and Installation
    - Removal and Installation
- HINGE, Door
  - Removal and Installation
    - Removal and Installation
- LATCH, Door
  - Removal and Installation
    - Removal and Installation
- PANEL, Door Trim
  - Removal and Installation
    - Removal and Installation
- PLATE, Carrier
  - Removal and Installation
    - Removal and Installation
- STRIKER, Door Latch
  - Adjustments
    - REMOVAL
  - Removal and Installation
    - Removal and Installation

Doors - Rear

- CHECK, Door
  - Removal and Installation
    - Removal and Installation
- DOOR, Rear
  - Disassembly and Assembly
    - Disassembly and Assembly
  - Removal and Installation
    - Removal and Installation
- HINGE, Door
  - Removal and Installation
    - Removal and Installation
- STRIKER, Door Latch
  - Adjustments
    - REMOVAL
  - Removal and Installation
    - Removal and Installation

Exterior

- BRACKET, Fender Mounting
  - Removal and Installation
    - Removal and Installation
- COVER, Cowl Panel
  - Removal and Installation
    - Removal and Installation
- CROSSMEMBER, Headlamp Mounting
  - Disassembly and Assembly
    - Disassembly and Assembly
  - Removal and Installation
    - Removal and Installation
- DOOR, Fuel Fill
  - Removal and Installation
    - Removal and Installation
- FENDER, Front
  - Removal and Installation
    - Removal and Installation
- GRILLE
  - Removal and Installation

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- Removal and Installation
- HOUSING, Fuel Fill
  - Removal and Installation
    - Removal and Installation
- MIRROR, Outside Rearview
  - Removal and Installation
    - Removal and Installation
- RACK, Luggage
  - Removal and Installation
    - Removal and Installation
- SHIELD, Splash, Front Wheelhouse
  - Removal and Installation
    - Removal and Installation
- SHIELD, Splash, Rear Wheelhouse
  - Removal and Installation
    - Removal and Installation

- Hood
  - CABLE, Hood Release
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - HINGE, Hood
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - HOOD
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - LATCH, Hood
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Instrument Panel
  - BEZEL, Instrument Cluster
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - CARRIER, Instrument Panel
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - COVER, Instrument Panel
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - COVER, Steering Column Opening
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - CYLINDER, Glove Box Lock
    - Removal
      - REMOVAL
    - Installation
      - INSTALLATION
  - GLOVE BOX, Instrument Panel
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Interior
  - CONSOLE, Floor
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - CONSOLE, Overhead, Front
    - Removal and Installation
      - REMOVAL AND INSTALLATION

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- HEADLINER
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- MIRROR, Rearview
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PANEL, A-Pillar Trim
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PANEL, B-Pillar Trim, Lower
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PANEL, B-Pillar Trim, Upper
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PANEL, Cowl Trim
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PANEL, Quarter Trim
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- PLATE, Scuff, Liftgate Sill
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- VISOR
  - Removal and Installation
    - REMOVAL AND INSTALLATION

- Paint
  - Specifications
    - SPECIFICATIONS
- Seats, First Row
  - Warning
    - WARNING
  - COVER, Seat Back, Front
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - COVER, Seat Cushion, Front
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SEAT BACK, Front
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SEAT, Front
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SIDE SHIELDS, Seat Cushion, Front
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - TRACK, Manual Front
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Seats, Rear
  - ARMREST, Second Row
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - SEAT BACK, Rear
    - Removal and Installation

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- REMOVAL AND INSTALLATION
- SEAT CUSHION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- Stationary Glass
  - Warning
    - WARNING
  - Specifications
    - BODYWORK GLASS AND WINDOWS
  - GLASS, Liftgate
    - Removal and Installation
      - Removal and Installation
  - GLASS, Quarter
    - Removal and Installation
      - Removal and Installation
  - WINDSHIELD
    - Removal and Installation
      - Removal and Installation
- Sunroof, Dual Pane
  - Removal and Installation
    - Sunroof Assembly
    - Sunroof Handle
  - GLASS, Sunroof, Rear
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - GUIDE, Sunroof, Glass
    - Removal and Installation
      - Sunroof Guide
      - Sunroof Cable Assembly
  - DEFLECTOR, Wind
    - Removal and Installation
      - REMOVAL AND INSTALLATION
- Weatherstrip/Seals
  - Caution
    - CAUTION
  - SEAL, Door Opening, Front
    - Removal and Installation
      - Removal and Installation
  - SEAL, Door Opening, Rear
    - Removal and Installation
      - Removal and Installation

24 - Heating and Air Conditioning
- Description and Operation
  - DESCRIPTION AND OPERATION
- Diagnosis and Testing
  - A/C BLOWER MOTOR DOES NOT WORK AT DIFFERENT SPEEDS – ATC
  - A/C BLOWER MOTOR DOES NOT WORK AT DIFFERENT SPEEDS – MTC
  - A/C BLOWS AIR IRREGULARLY – ATC
  - A/C BLOWS AIR IRREGULARLY – MTC
  - A/C DOES NOT COOL – ATC
  - A/C DOES NOT COOL – MTC
  - A/C DOES NOT COOL TO DESIRED TEMPERATURE – ATC
  - A/C DOES NOT COOL TO DESIRED TEMPERATURE – MTC
  - A/C DOES NOT WORK IN ANY MODE – ATC
  - A/C DOES NOT WORK IN ANY MODE – MTC

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- A/C NOISE FROM ENGINE COMPARTMENT
- A/C RECIRCULATION DOES NOT WORK
- ODORS FROM A/C
- HEATER PERFORMANCE

Standard Procedure
- STANDARD PROCEDURE - A/C EVAPORATOR CLEANING

Specifications
- A/C SYSTEM
- TORQUE SPECIFICATIONS

Special Tools
- SPECIAL TOOLS

Controls
- ACTUATOR, Blend Door
  - Description and Operation
    - DESCRIPTION AND OPERATION
- ACTUATOR, Mode Door
  - Description and Operation
    - DESCRIPTION AND OPERATION
- ACTUATOR, Recirculation Door
  - Description and Operation
    - DESCRIPTION AND OPERATION
- CONTROL, A/C and Heater
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- MODULE, Power, Blower Motor
  - Description and Operation
    - DESCRIPTION AND OPERATION
- SENSOR, Ambient Temperature
  - Description and Operation
    - DESCRIPTION AND OPERATION
- SENSOR, Evaporator Temperature
  - Description and Operation
    - DESCRIPTION AND OPERATION
- SENSOR, Humidity
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SENSOR, Sun
  - Description and Operation
    - DESCRIPTION
  - Removal and Installation
    - REMOVAL AND INSTALLATION
- SENSOR, Temperature, Air Outlet
  - Description and Operation
    - DESCRIPTION AND OPERATION
  - Removal and Installation
    - AIR OUTLET TEMPERATURE SENSOR – LOWER LEFT
    - AIR OUTLET TEMPERATURE SENSOR – LOWER RIGHT
    - AIR OUTLET TEMPERATURE SENSOR – UPPER LEFT
    - AIR OUTLET TEMPERATURE SENSOR – UPPER RIGHT
- SENSOR, Temperature, In-Car
  - Description and Operation
    - DESCRIPTION

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- Removal and Installation
  - REMOVAL AND INSTALLATION
- Distribution
  - FILTER, Cabin Air
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - HOUSING, HVAC
    - Removal and Installation
      - HOUSING-HVAC
    - Disassembly and Assembly
      - Disassembly and Assembly – Gears and Levers
  - MOTOR, Blower
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - OUTLET, Air
    - Removal and Installation
      - AIR OUTLETS – CENTER
      - AIR OUTLETS – DEMISTER
      - AIR OUTLETS – FRONT FLOOR
      - AIR OUTLET – LEFT OUTER
      - AIR OUTLET – RIGHT OUTER
- Plumbing
  - Warning
    - WARNING
  - Caution
    - CAUTION
  - Diagnosis and Testing
    - DIAGNOSIS AND TESTING - REFRIGERANT SYSTEM LEAKS
  - Standard Procedure
    - R-1234YF REFRIGERANT SYSTEM RECOVERY
    - R-1234YF REFRIGERANT SYSTEM EVACUATE
    - R-1234YF REFRIGERANT SYSTEM CHARGE
    - R-1234YF REFRIGERANT SYSTEM RECOVERY – EMEA
    - R-1234YF REFRIGERANT SYSTEM CHARGE – EMEA
  - COMPRESSOR, A/C
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Removal and Installation
      - A/C COMPRESSOR – 1.4L
      - A/C COMPRESSOR – 1.6L Turbo Diesel
      - A/C COMPRESSOR – 2.0L Turbo Diesel 120 HP/ 140 HP
      - A/C COMPRESSOR – 2.0L Turbo Diesel 170 HP
      - A/C COMPRESSOR – 2.4L
  - CONDENSER, A/C
    - Description and Operation
      - DESCRIPTION AND OPERATION
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - CORE, Heater
    - Removal and Installation
      - REMOVAL AND INSTALLATION
  - EVAPORATOR, A/C
    - Description and Operation

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- DESCRIPTION AND OPERATION
- LINE, A/C Discharge
  - Removal and Installation
    - 1.4L
    - 2.4L
- LINE, A/C Discharge Jumper
  - Removal and Installation
    - 1.4L
- LINE, A/C Liquid
  - Removal and Installation
    - 1.4L
    - 2.4L
- LINE, A/C Suction
  - Removal and Installation
    - 1.4L
    - 2.4L
- LINE, A/C Suction Jumper
  - Removal and Installation
    - 1.4L
- OIL, Refrigerant
  - Standard Procedure
    - COMPRESSOR OIL DRAIN PROCEDURE
    - STANDARD PROCEDURE - REFRIGERANT OIL LEVEL
- REFRIGERANT
  - Specifications
    - SPECIFICATIONS
- TUBE, Condensation Drain
  - Removal and Installation
    - REMOVAL AND INSTALLATION

- Cabin Heater
  - UNIT, Heater
    - Description and Operation
      - DESCRIPTION
    - Removal and Installation
      - REMOVAL AND INSTALLATION

- 25 - Emissions Control
  - Specifications
    - EMISSION CONTROL SYSTEM
    - TORQUE
  - Evaporative Emissions
    - Diagnosis and Testing
      - EMISSIONS DIAGNOSIS
      - Checking C.O. Level
    - CANISTER, Vapor
      - Removal and Installation
        - REMOVAL AND INSTALLATION
  - Evaporative Emissions, Diesel
    - TUBE, Crankcase Breather
      - Removal and Installation
        - REMOVAL AND INSTALLATION
        - REMOVAL AND INSTALLATION
  - Exhaust Gas Recirculation
    - COOLER, Exhaust Gas Recirculation (EGR)
      - Removal and Installation
        - REMOVAL AND INSTALLATION
        - VACUUM TANK

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- SENSOR, EGR Temperature
  - Removal and Installation
    - EXHAUST GAS TEMPERATURE SENSOR ON EGR SOLENOID VALVE TO INTAKE MANIFOLD
    - 2.0L 120HP / 140HP EXHAUST GAS TEMPERATURE SENSOR UPSTREAM OF CATALYST
    - 2.0L 120HP / 140HP EXHAUST GAS TEMPERATURE SENSOR UPSTREAM OF DPF
    - 2.0L 120HP / 140HP EXHAUST GAS TEMPERATURE SENSOR UPSTREAM OF DPF
    - 2.0L 170HP EXHAUST GAS TEMPERATURE UPSTREAM OF CATALYST
    - 2.0L 170CV EXHAUST GAS TEMPERATURE SENSOR TO TO DPF
- SOLENOID, Exhaust Gas Recirculation (EGR)
  - Removal and Installation
    - EGR SOLENOID
- VALVE, Exhaust Gas Recirculation (EGR)
  - Removal and Installation
    - EGR VALVE DISASSEMBLY AND ASSEMBLY
    - 1.6L EGR VALVE ASSEMBLY
    - 2.0L EGR VALVE ASSEMBLY
    - 2.0L HIGH PRESSURE EGR VALVE
    - 2.0L HIGH PRESSURE EGR VALVE MOUNTING
    - 2.0L LOW PRESSURE EGR VALVE
    - 2.0L LOW PRESSURE EGR VALVE MOUNTING
    - 2.0L LOW PRESSURE EGR VALVE SENSOR
    - 2.0L LOW PRESSURE EXHAUST COOLER
    - 2.0L EGR SUPPLY AND RETURN DUPLEX PIPE

28 - DTC-Based Diagnostics
- Standard Procedure
  - PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE
  - TESTING FOR AN INTERMITTENT CONDITION
- Circuit Testing Procedures
  - Warning
    - GENERAL WARNINGS
  - Description
    - CIRCUIT FUNCTIONS
    - CIRCUIT INFORMATION
  - Diagnosis and Testing
    - WIRING HARNESS TESTING
  - Standard Procedure
    - CHECK A 12-VOLT FUSED BATTERY B(+) CIRCUIT FOR VOLTAGE
    - CHECK A 12-VOLT SWITCHED BATTERY B(+) CIRCUIT FOR VOLTAGE
    - CHECK A 5-VOLT SUPPLY CIRCUIT FOR VOLTAGE
    - CHECK A CIRCUIT FOR A SHORT TO GROUND
    - CHECK A CIRCUIT FOR A SHORT TO VOLTAGE
    - CHECK FOR AN OPEN GROUND CIRCUIT
    - CHECK FOR A SHORT BETWEEN MULTIPLE CIRCUITS
    - CHECK THE RESISTANCE OF A CIRCUIT USING AN OHMMETER
    - CHECK FOR EXCESSIVE CURRENT DRAW
    - CIRCUIT LOAD TESTING PROCEDURE
    - VOLTAGE DROP TEST PROCEDURE
    - ELECTROSTATIC DISCHARGE (ESD) SENSITIVE DEVICES
    - WIRE SPLICING
  - Removal
    - CONNECTOR TERMINAL REMOVAL
  - Installation
    - CONNECTOR TERMINAL INSTALLATION

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- AMPLIFIER (AMP), Base
  - Diagnosis and Testing
    - B1400-11-CHANNEL 1 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO GROUND
    - B1400-12-CHANNEL 1 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO BATTERY
    - B1400-13-CHANNEL 1 AUDIO SPEAKER OUTPUT - CIRCUIT OPEN
    - B1400-1A-CHANNEL 1 AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
    - B1400-92-CHANNEL 1 AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION
    - B1401-11-CHANNEL 2 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO GROUND
    - B1401-12-CHANNEL 2 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO BATTERY
    - B1401-13-CHANNEL 2 AUDIO SPEAKER OUTPUT - CIRCUIT OPEN
    - B1401-1A-CHANNEL 2 AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
    - B1401-92-CHANNEL 2 AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION
    - B1402-11-CHANNEL 3 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO GROUND
    - B1402-12-CHANNEL 3 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO BATTERY
    - B1402-13-CHANNEL 3 AUDIO SPEAKER OUTPUT - CIRCUIT OPEN
    - B1402-1A-CHANNEL 3 AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
    - B1402-92-CHANNEL 3 AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION
    - B1403-11-CHANNEL 4 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO GROUND
    - B1403-12-CHANNEL 4 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO BATTERY
    - B1403-13-CHANNEL 4 AUDIO SPEAKER OUTPUT - CIRCUIT OPEN
    - B1403-1A-CHANNEL 4 AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
    - B1403-92-CHANNEL 4 AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION
    - B1404-11-CHANNEL 5 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO GROUND
    - B1404-12-CHANNEL 5 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO BATTERY
    - B1404-13-CHANNEL 5 AUDIO SPEAKER OUTPUT - CIRCUIT OPEN
    - B1404-1A-CHANNEL 5 AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
    - B1404-92-CHANNEL 5 AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION
    - B1405-11-CHANNEL 6 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO GROUND
    - B1405-12-CHANNEL 6 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO BATTERY
    - B1405-13-CHANNEL 6 AUDIO SPEAKER OUTPUT - CIRCUIT OPEN
    - B1405-1A-CHANNEL 6 AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
    - B1405-92-CHANNEL 6 AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION
    - B1406-11-CHANNEL 7 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO GROUND
    - B1406-12-CHANNEL 7 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO BATTERY
    - B1406-13-CHANNEL 7 AUDIO SPEAKER OUTPUT - CIRCUIT OPEN
    - B1406-1A-CHANNEL 7 AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
    - B1406-92-CHANNEL 7 AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION
    - B1407-11-CHANNEL 8 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO GROUND
    - B1407-12-CHANNEL 8 AUDIO SPEAKER OUTPUT - CIRCUIT SHORT TO BATTERY
    - B1407-13-CHANNEL 8 AUDIO SPEAKER OUTPUT - CIRCUIT OPEN

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- B1407-1A-CHANNEL 8 AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1407-92-CHANNEL 8 AUDIO SPEAKER OUTPUT - PERFORMANCE OR INCORRECT OPERATION
- B1408-49-ECU AMP 1 (INTERNAL) - INTERNAL ELECTRONIC FAILURE
- B1409-98-ECU AMP 2 (OVER TEMPERATURE) - COMPONENT OR SYSTEM OVER TEMPERATURE
- B1410-16-ECU AMP 3 (UNDER/OVER VOLTAGE) - CIRCUIT VOLTAGE BELOW THRESHOLD
- B1410-17-ECU AMP 3 (UNDER/OVER VOLTAGE) - CIRCUIT VOLTAGE ABOVE THRESHOLD
- B1411-05-EQUALIZATION CURVE - SYSTEM PROGRAMMING FAILURES
- U0001-87 CAN LINE - MISSING MESSAGE
- U0001-88-C1 CAN BUS - BUS OFF
- U1700-86-BCM BODY COMPUTER MODULE-SIGNAL INVALID
- U1700-87-BCM-BODY CONTROL MODULE-MISSING MESSAGE
- U1703-86 INSTRUMENT PANEL CLUSTER (IPC) - SIGNAL INVALID
- U1703-87 INSTRUMENT PANEL CLUSTER (IPC) - MISSING MESSAGE
- U1736-86-ETM (ENTERTAINMENT TELEMATIC MODULE) - SIGNAL INVALID
- U1736-87-ETM (ENTERTAINMENT TELEMATIC MODULE) - MISSING MESSAGE
- U1751-86-LEFT BLIND SPOT SENSOR (LBSS) - SIGNAL INVALID
- U1751-87-LEFT BLIND SPOT SENSOR (LBSS) - MISSING MESSAGE
- U1752-86-RIGHT BLIND SPOT SENSOR (RBSS) - SIGNAL INVALID
- U1752-87-RIGHT BLIND SPOT SENSOR (RBSS) - MISSING MESSAGE
- U1931-87 TRIPA B MESSAGE FROM INSTRUMENT PANEL CLUSTER - MISSING MESSAGE
- U2001-87-MESSAGE CTRL_AMP FROM ENTERTAINMENT TELEMATIC MODULE - MISSING MESSAGE
- U2002-87-MESSAGE IPC_VEHICLE_SETUP FROM INSTRUMENT PANEL CLUSTER - MISSING MESSAGE
- U2003-87-MESSAGE STATUS_LBSS FROM LEFT BLIND SPOT SENSOR - MISSING MESSAGE
- U2004-87-MESSAGE STATUS_RBSS FROM RIGHT BLIND SPOT SENSOR - MISSING MESSAGE
- U2005-87-MESSAGE HAPTIC1 FROM BODY CONTROL MODULE - MISSING MESSAGE
- U2006-64-MESSAGE STATUS_CCAN3 VEHICLESPEEDVSOSIGFAILSTS FROM BODY CONTROL MODULE - SIGNAL PLAUSIBILITY FAILURE
- U2006-87-MESSAGE STATUS_CCAN3 VEHICLESPEEDVSOSIGFAILSTS FROM BODY CONTROL MODULE - MISSING MESSAGE
- U2007-64-MESSAGE STATUS_TELEMATIC AUDIOSTS_TELEMATIC FROM ENTERTAINMENT TELEMATIC MODULE - SIGNAL PLAUSIBILITY FAILURE
- U2008-64-MESSAGE STATUS_LBSS BSS_LT_CHIME_TYPESTS 1 FROM LEFT BLIND SPOT SENSOR - SIGNAL PLAUSIBILITY FAILURE
- U2009-64-MESSAGE STATUS_LBSS BSS_LT_CHIME_TYPESTS 2 FROM LEFT BLIND SPOT SENSOR - SIGNAL PLAUSIBILITY FAILURE
- U2010-64-MESSAGE STATUS_RBSS BSS_RT_CHIME_TYPESTS 1 FROM RIGHT BLIND SPOT SENSOR - SIGNAL PLAUSIBILITY FAILURE
- U2011-64-MESSAGE STATUS_RBSS BSS_RT_CHIME_TYPESTS 2 FROM RIGHT BLIND SPOT SENSOR - SIGNAL PLAUSIBILITY FAILURE
- U2012-64-MESSAGE HAPTIC1 HALF_CHIME_TYPESTS 1 FROM BODY CONTROL MODULE - SIGNAL PLAUSIBILITY FAILURE
- U2013-64-MESSAGE HAPTIC1 HALF_CHIME_TYPESTS 2 FROM BODY CONTROL MODULE - SIGNAL PLAUSIBILITY FAILURE
- U2014-64-MESSAGE CTRL_AMP INFO1_AUD_TYPE 1 FROM ENTERTAINMENT TELEMATIC MODULE - SIGNAL PLAUSIBILITY FAILURE
- U2016-64-MESSAGE CTRL_AMP INFO2_AUD_TYPE 1 FROM ENTERTAINMENT TELEMATIC MODULE - SIGNAL PLAUSIBILITY FAILURE
- U2017-64-MESSAGE CTRL_AMP INFO2_AUD_TYPE 2 FROM ENTERTAINMENT TELEMATIC

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MODULE - SIGNAL PLAUSIBILITY FAILURE
U2018-64-MESSAGE STATUS_TELEMATIC CURRENTSOURCE 1 FROM ENTERTAINMENT TELEMATIC MODULE - SIGNAL PLAUSIBILITY FAILURE
U2019-64-MESSAGE STATUS_TELEMATIC CURRENTSOURCE 2 FROM ENTERTAINMENT TELEMATIC MODULE - SIGNAL PLAUSIBILITY FAILURE
U2020-87-VIN MESSAGE - MISSING MESSAGE
U2021-87-MESSAGE STATUS_TELEMATIC CURRENTSOURCE 3 FROM ENTERTAINMENT TELEMATIC MODULE - MISSING MESSAGE
U2022-64-MESSAGE STATUS_BH_BCM1 OPERATIONALMODESTS FROM BODY CONTROL MODULE - SIGNAL PLAUSIBILITY FAILURE
U2023-87-MESSAGE STATUS_BH_BCM1 FROM BODY CONTROL MODULE - MISSING MESSAGE
U2024-87-MESSAGE STATUS_BH_BCM1 ECU_OPERATIONALMODESTS INFO FROM BODY CONTROL MODULE - MISSING MESSAGE
U2025-87-MESSAGE STATUS_BH_BCM2 FROM BODY CONTROL MODULE - MISSING MESSAGE
U2026-87-MESSAGE STATUS_CCAN3 FROM BODY CONTROL MODULE - MISSING MESSAGE
U2027-64-AMP_OPERATIONALMODESTS INFO INTERNAL SIGNAL - SIGNAL PLAUSIBILITY FAILURE
U2015-64-MESSAGE CTRL_AMP INFO1_AUD_TYPE 2 FROM ENTERTAINMENT TELEMATIC MODULE - SIGNAL PLAUSIBILITY FAILURE
CLUSTER, Instrument
Diagnosis and Testing
B1000-44 ELECTRONIC CONTROL UNIT - DATA MEMORY FAILURE
B1000-45 ELECTRONIC CONTROL UNIT - PROGRAM MEMORY FAILURE
B1000-46 ELECTRONIC CONTROL UNIT - CALIBRATION/PARAMETER MEMORY FAILURE
B1000-47-ELECTRONIC CONTROL UNIT - WATCHDOG/SAFETY µC FAILURE
B1002-64-IPC_OPERATIONALMODESTS.INFO - SIGNAL PLAUSIBILITY FAILURE
B1003-12-ASSIST LIGHT U_CALL_GREEN_LED_FAILURE - CIRCUIT SHORT TO BATTERY
B1003-13-ASSIST LIGHT U_CALL_GREEN_LED_FAILURE - CIRCUIT OPEN
B1004-12-ASSIST LIGHT U_CALL_RED_LED_FAILURE - CIRCUIT SHORT TO BATTERY
B1004-13-ASSIST LIGHT U_CALL_RED_LED_FAILURE - CIRCUIT OPEN
B1005-12-ECSB E_CALL_SWITCH_FAILURE - CIRCUIT SHORT TO BATTERY
B1006-12-ECSB U_CALL_SWITCH_FAILURE - CIRCUIT SHORT TO BATTERY
B1007-12-EMERGENCY LIGHT E_CALL_GREEN_LED_FAILURE - CIRCUIT SHORT TO BATTERY
B1007-13-EMERGENCY LIGHT E_CALL_GREEN_LED_FAILURE - CIRCUIT OPEN
B1008-12-EMERGENCY LIGHT E_CALL_RED_LED_FAILURE - CIRCUIT SHORT TO BATTERY
B1019-45-ECSB_ELECTRIC_FAILURE - PROGRAM MEMORY FAILURE
B1019-46-ECSB_ELECTRIC_FAILURE - CALIBRATION/PARAMETER MEMORY FAILURE
B1019-8F-ECSB_ELECTRIC_FAILURE - ERRATIC
B1020-64-SCCM_CRS_CTRL.CRUISECONTROLFAILSTS - SIGNAL PLAUSIBILITY FAILURE
B1021-64-SCCM_CRS_CTRL.MC_CSWC_1 - SIGNAL PLAUSIBILITY FAILURE
B1022-64-SCCM_CRS_CTRL.CRC_CSWC_1 - SIGNAL PLAUSIBILITY FAILURE
B1023-09-SCCM_CRS_CTRL - COMPONENT FAILURES
B1024-64-BRAKE1.VEHICLESPEEDVSOSIG BRAKE1.VEHICLESPEEDVSOSIGFAILSTS - SIGNAL PLAUSIBILITY FAILURE
B1025-64-ENGINE1.ENGINESPEED ENGINE1.ENGINESPEEDFAILSTS - SIGNAL PLAUSIBILITY FAILURE
B1900-01-SECURE WARNING LAMPS - GENERAL ELECTRICAL FAILURE
U0001-87-C CAN - MISSING MESSAGE
U0001-88-C CAN - BUS OFF
U0010-87-B CAN - MISSING MESSAGE
U0010-88-B CAN - BUS OFF

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- U1442-87-HUM - MISSING MESSAGE
- U1446-87-COM - MISSING MESSAGE
- U144B-87-ECSB - MISSING MESSAGE
- U1700-86-BODY COMPUTER MODULE (BCM) - SIGNAL INVALID
- U1700-87 BODY COMPUTER MODULE (BCM) - MISSING MESSAGE
- U1701-86-ENGINE CONTROL MODULE (ECM) - SIGNAL INVALID
- U1701-87-ENGINE CONTROL MODULE (ECM) - MISSING MESSAGE
- U1706-86 BRAKING SYSTEM MODULE (BSM) - SIGNAL INVALID
- U1706-87 BRAKING SYSTEM MODULE (BSM) - MISSING MESSAGE
- U1711-86-DUAL CLUTCH TRANSMISSION MODULE (DCTM) - SIGNAL INVALID
- U1711-87-DUAL CLUTCH TRANSMISSION MODULE (DCTM) - MISSING MESSAGE
- U1726-86-OCCUPANT RESTRAINT CONTROL (ORC) - SIGNAL INVALID
- U1726-87-OCCUPANT RESTRAINT CONTROL (ORC) - MISSING MESSAGE
- U1736-86-ETM (ENTERTAINMENT TELEMATIC MODULE) - SIGNAL INVALID
- U1736-87-ETM (ENTERTAINMENT TELEMATIC MODULE) - MISSING MESSAGE
- U1751-86-LEFT BLIND SPOT SENSOR (LBSS) - SIGNAL INVALID
- U1751-87-LEFT BLIND SPOT SENSOR (LBSS) - MISSING MESSAGE
- U1752-86-RIGHT BLIND SPOT SENSOR (RBSS) - SIGNAL INVALID
- U1752-87-RIGHT BLIND SPOT SENSOR (RBSS) - MISSING MESSAGE
- U1757-86-DRIVE ASSISTANT SYSTEM MODULE (DASM) - SIGNAL INVALID
- U1757-87-DRIVE ASSISTANT SYSTEM MODULE (DASM) - MISSING MESSAGE
- U1765-86-RADIO FREQUENCY HUB MODULE (RFHM) - SIGNAL INVALID
- U1765-87-RADIO FREQUENCY HUB MODULE (RFHM) - MISSING MESSAGE
- U1767-86-DRIVE TRAIN CONTROL MODULE (DTCM) - SIGNAL INVALID
- U1767-87-DRIVE TRAIN CONTROL MODULE (DTCM) - MISSING MESSAGE
- U1801-08-LIN IPC - BUS SIGNAL/MESSAGE FAILURE

⊟ CONTROLLER, Occupant Restraint (ORC)

⊟ Diagnosis and Testing

- B0004-01-FRONT DRIVER KNEEBAG - GENERAL ELECTRICAL FAILURE
- B0004-11-FRONT DRIVER KNEEBAG SQUIB CONTROL - CIRCUIT SHORT TO GROUND
- B0004-12-FRONT DRIVER KNEEBAG SQUIB CONTROL - CIRCUIT SHORT TO BATTERY
- B0004-1A FRONT DRIVER KNEEBAG - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0004-1B FRONT DRIVER KNEEBAG - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0050-01-FRONT DRIVER BUCKLE SWITCH - GENERAL ELECTRONIC FAILURE
- B0050-11-FRONT DRIVER SEATBELT BUCKLE SWITCH - CIRCUIT SHORT TO GROUND
- B0050-12-FRONT DRIVER BUCKLE SWITCH - CIRCUIT SHORT TO BATTERY
- B0050-13-FRONT DRIVER BUCKLE SWITCH - CIRCUIT OPEN
- B0050-1D-FRONT DRIVER BUCKLE SWITCH - CIRCUIT CURRENT OUT OF RANGE
- B0052-01-FRONT PASSENGER BUCKLE SWITCH - GENERAL ELECTRICAL FAILURE
- B0052-11-FRONT PASSENGER BUCKLE SWITCH - CIRCUIT SHORT TO GROUND
- B0052-12-FRONT PASSENGER BUCKLE SWITCH - CIRCUIT SHORT TO BATTERY
- B0052-13-FRONT PASSENGER BUCKLE SWITCH - CIRCUIT OPEN
- B0052-1D-FRONT PASSENGER BUCKLE SWITCH - CIRCUIT CURRENT OUT OF RANGE
- B0099-00-ROLLOVER CRASH - NO SUBTYPE INFORMATION
- B00B5-01-FRONT DRIVER SEAT TRACK POSITION SENSOR - GENERAL ELECTRICAL FAILURE
- B00B5-11-DRIVER SEAT TRACK POSITION SENSOR - CIRCUIT SHORT TO GROUND
- B00B5-12-DRIVER SEAT TRACK POSITION SENSOR - CIRCUIT SHORT TO BATTERY
- B00B5-13-DRIVER TRACK POSITION SENSOR - CIRCUIT OPEN
- B00B5-1D-FRONT DRIVER SEAT TRACK POSITION SENSOR - CIRCUIT CURRENT OUT OF RANGE
- B00C5-01-FRONT PASSENGER SEAT TRACK POSITION SENSOR - GENERAL ELECTRICAL FAILURE

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- B00C5-11-PASSENGER SEAT TRACK POSITION SENSOR - CIRCUIT SHORT TO GROUND
- B00C5-12-PASSENGER SEAT TRACK POSITION SENSOR - CIRCUIT SHORT TO BATTERY
- B00C5-13-PASSENGER SEAT TRACK POSITION SENSOR - CIRCUIT OPEN
- B00C5-1D-FRONT PASSENGER SEAT TRACK POSITION SENSOR - CIRCUIT CURRENT OUT OF RANGE
- B00D5-12-PASSENGER AIRBAG DISABLE INDICATOR - CIRCUIT SHORT TO BATTERY
- B00D5-14-PASSENGER AIRBAG DISABLE INDICATOR - CIRCUIT SHORT TO GROUND OR OPEN
- B00D6-12-PASSENGER AIRBAG ENABLE INDICATOR - CIRCUIT SHORT TO BATTERY
- B00D6-14-PASSENGER AIRBAG ENABLE INDICATOR - CIRCUIT SHORT TO GROUND OR OPEN
- B0100-49-ECU INTERNAL ERRORS - INTERNAL ELECTRONIC FAILURE
- B0101-16-POWER SUPPLY - CIRCUIT VOLTAGE BELOW THRESHOLD
- B0101-17-POWER SUPPLY - CIRCUIT VOLTAGE ABOVE THRESHOLD
- B0103-01-FRONT DRIVER AIRBAG 1ST STAGE - GENERAL ELECTRICAL FAILURE
- B0103-11-FRONT DRIVER AIRBAG 1ST STAGE - CIRCUIT SHORT TO GROUND
- B0103-12-FRONT DRIVER AIRBAG 1ST STAGE - CIRCUIT SHORT TO BATTERY
- B0103-1A-DRIVER AIRBAG 1ST STAGE - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0103-1B-FRONT DRIVER AIRBAG 1ST STAGE - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0104-01-FRONT PASSENGER AIRBAG 1ST STAGE - GENERAL ELECTRICAL FAILURE
- B0104-11-FRONT PASSENGER AIRBAG 1ST STAGE - CIRCUIT SHORT TO GROUND
- B0104-12-FRONT PASSENGER AIRBAG 1ST STAGE - CIRCUIT SHORT TO BATTERY
- B0104-1A-FRONT PASSENGER AIRBAG 1ST STAGE - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0104-1B-FRONT PASSENGER AIRBAG 1ST STAGE - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0105-01-FRONT PASSENGER AIRBAG 2ND STAGE - GENERAL ELECTRICAL FAILURE
- B0105-11-FRONT PASSENGER AIRBAG 2ND STAGE - CIRCUIT SHORT TO GROUND
- B0105-12-FRONT PASSENGER AIRBAG 2ND STAGE - CIRCUIT SHORT TO BATTERY
- B0105-1A-FRONT PASSENGER AIRBAG 2ND STAGE - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0105-1B-FRONT PASSENGER AIRBAG 2ND STAGE - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0106-01-FRONT DRIVER PRETENSIONER (ANCHOR) - GENERAL ELECTRICAL FAILURE
- B0106-11-FRONT DRIVER PRETENSIONER - CIRCUIT SHORT TO GROUND
- B0106-12-FRONT DRIVER PRETENSIONER - CIRCUIT SHORT TO BATTERY
- B0106-1A-FRONT DRIVER PRETENSIONER - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0106-1B-FRONT DRIVER PRETENSIONER - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0107-01-FRONT PASSENGER PRETENSIONER (ANCHOR) - GENERAL ELECTRICAL FAILURE
- B0107-11-FRONT PASSENGER PRETENSIONER - CIRCUIT SHORT TO GROUND
- B0107-12-FRONT PASSENGER PRETENSIONER - CIRCUIT SHORT TO BATTERY
- B0107-1A-FRONT PASSENGER PRETENSIONER - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0107-1B-FRONT PASSENGER PRETENSIONER - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0108-01-FRONT LEFT SIDEBAG - GENERAL ELECTRICAL FAILURE
- B0108-11-FRONT LEFT SIDEBAG - CIRCUIT SHORT TO GROUND
- B0108-12-FRONT LEFT SIDEBAG - CIRCUIT SHORT TO BATTERY
- B0108-1A-FRONT LEFT SIDEBAG - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0108-1B-FRONT LEFT SIDEBAG - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0109-01-FRONT RIGHT SIDEBAG - GENERAL ELECTRICAL FAILURE
- B0109-11-FRONT RIGHT SIDEBAG - CIRCUIT SHORT TO GROUND

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- B0109-12-FRONT RIGHT SIDEBAG - CIRCUIT SHORT TO BATTERY
- B0109-1A-FRONT RIGHT SIDEBAG - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0109-1B-FRONT RIGHT SIDEBAG - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0110-01-FRONT PASSENGER AIRBAG 3RD STAGE - GENERAL ELECTRICAL FAILURE
- B0110-11-FRONT PASSENGER AIRBAG 3RD STAGE - CIRCUIT SHORT TO GROUND
- B0110-12-FRONT PASSENGER AIRBAG 3RD STAGE - CIRCUIT SHORT TO BATTERY
- B0110-1A-FRONT PASSENGER AIRBAG 3RD STAGE - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0110-1B-FRONT PASSENGER AIRBAG 3RD STAGE - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0111-1C DRIVER REMOTE ACCELERATION SENSOR (SATELLITE) B PILLAR - CIRCUIT VOLTAGE OUT OF RANGE
- B0111-2F DRIVER REMOTE ACCELERATION SENSOR (SATELLITE) B PILLAR - SIGNAL ERRATIC
- B0111-64-DRIVER REMOTE ACCELERATION SENSOR (SATELLITE) - SIGNAL PLAUSIBILITY FAILURE
- B0111-96-DRIVER REMOTE ACCELERATION SENSOR (SATELLITE) - COMPONENT INTERNAL FAILURE
- B0112-1C PASSENGER REMOTE ACCELERATION SENSOR (SATELLITE) B PILLAR - CIRCUIT VOLTAGE OUT OF RANGE
- B0112-2F-PASSENGER REMOTE ACCELERATION (SATELLITE) - SIGNAL ERRATIC
- B0112-64-PASSENGER REMOTE ACCELERATION (SATELLITE) - SIGNAL PLAUSIBILITY FAILURE
- B0112-96-PASSENGER REMOTE ACCELERATION (SATELLITE) - COMPONENT INTERNAL FAILURE
- B0114-01-LEFT CURTAIN AIRBAG - GENERAL ELECTRICAL FAILURE
- B0014-11-LEFT CURTAIN AIRBAG - CIRCUIT SHORT TO GROUND
- B0014-12-LEFT CURTAIN AIRBAG - CIRCUIT SHORT TO BATTERY
- B0014-1A-LEFT CURTAIN AIRBAG - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0014-1B-LEFT CURTAIN AIRBAG - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0115-01-RIGHT CURTAIN AIRBAG - GENERAL ELECTRICAL FAILURE
- B0015-11-RIGHT CURTAIN AIRBAG - CIRCUIT SHORT TO GROUND
- B0015-12-RIGHT CURTAIN AIRBAG - CIRCUIT SHORT TO BATTERY
- B0015-1A-RIGHT CURTAIN AIRBAG - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0015-1B-RIGHT CURTAIN AIRBAG - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0118-95-CONFIGURATION MISMATCH - INCORRECT ASSEMBLY
- B0119-00-PRETENSIONER CRASH DATA - NO SUBTYPE INFORMATION
- B0120-00-FRONT CRASH DATA - NO SUBTYPE INFORMATION
- B0121-00-DRIVER SIDE CRASH DATA - NO SUBTYPE INFORMATION
- B0122-00-PASSENGER SIDE CRASH DATA - NO SUBTYPE INFORMATION
- B0123-01-FRONT DRIVER SILL END PRETENSIONER - GENERAL ELECTRICAL FAILURE
- B0123-11-FRONT DRIVER SILL END PRETENSIONER - CIRCUIT SHORT TO GROUND
- B0123-12-FRONT DRIVER SILL END PRETENSIONER - CIRCUIT SHORT TO BATTERY
- B0123-1A-FRONT DRIVER SILL END PRETENSIONER - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0123-1B-FRONT DRIVER SILL END PRETENSIONER - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B0124-01-FRONT PASSENGER SILL END PRETENSIONER - GENERAL ELECTRICAL FAILURE
- B0124-11-FRONT PASSENGER SILL END PRETENSIONER - CIRCUIT SHORT TO GROUND
- B0124-12-FRONT PASSENGER SILL END PRETENSIONER - CIRCUIT SHORT TO BATTERY
- B0124-1A-FRONT PASSENGER SILL END PRETENSIONER - CIRCUIT RESISTANCE BELOW THRESHOLD
- B0124-1B-FRONT PASSENGER SILL END PRETENSIONER - CIRCUIT RESISTANCE ABOVE THRESHOLD

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- B0126-54-CALIBRATION MISSING - MISSING CALIBRATION
- B0127-00-SWOP CRASH DATA - NO SUBTYPE INFORMATION
- B010F-01-FRONT DRIVER AIRBAG 2ND STAGE - GENERAL ELECTRICAL FAILURE
- B010F-11-FRONT DRIVER AIRBAG 2ND STAGE - CIRCUIT SHORT TO GROUND
- B010F-12-FRONT DRIVER AIRBAG 2ND STAGE - CIRCUIT SHORT TO BATTERY
- B010F-1A-FRONT DRIVER AIRBAG 2ND STAGE - CIRCUIT RESISTANCE BELOW THRESHOLD
- B010F-1B-FRONT DRIVER AIRBAG 2ND STAGE - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B012B-01-FRONT LEFT ACCELERATION IMPACT SENSOR - GENERAL ELECTRICAL FAILURE
- B012B-11-FRONT LEFT ACCELERATION IMPACT SENSOR - CIRCUIT SHORT TO GROUND
- B012B-12-FRONT LEFT ACCELERATION IMPACT SENSOR - CIRCUIT SHORT TO BATTERY
- B012B-1C-DRIVER EARLY CRASH SENSOR - CIRCUIT VOLTAGE OUT OF RANGE
- B012B-2F-DRIVER EARLY CRASH SENSOR - SIGNAL ERRATIC
- B012B-64-DRIVER EARLY CRASH SENSOR - SIGNAL PLAUSIBILITY FAILURE
- B012B-96-DRIVER EARLY CRASH SENSOR - COMPONENT INTERNAL FAILURE
- B012C-01-FRONT RIGHT ACCELERATION IMPACT SENSOR - GENERAL ELECTRICAL FAILURE
- B012C-11-FRONT RIGHT ACCELERATION IMPACT SENSOR - CIRCUIT SHORT TO GROUND
- B012C-12-FRONT RIGHT ACCELERATION IMPACT SENSOR - CIRCUIT SHORT TO BATTERY
- B012C-1C-PASSENGER EARLY CRASH SENSOR - CIRCUIT VOLTAGE OUT OF RANGE
- B012C-2F-PASSENGER EARLY CRASH SENSOR - SIGNAL ERRATIC
- B012C-64-PASSENGER EARLY CRASH SIGNAL SENSOR - SIGNAL PLAUSIBILITY FAILURE
- B012C-96-PASSENGER EARLY CRASH SENSOR - COMPONENT INTERNAL FAILURE
- B012D-1C DRIVER DOOR PRESSURE SENSOR (SATELLITE) - CIRCUIT VOLTAGE OUT OF RANGE
- B012D-2F-DRIVER DOOR PRESSURE SENSOR (SATELLITE) - SIGNAL ERRATIC
- B012D-64-DRIVER DOOR PRESSURE SENSOR (SATELLITE) - SIGNAL PLAUSIBILITY FAILURE
- B012D-96-DRIVER DOOR PRESSURE SENSOR (SATELLITE) - COMPONENT INTERNAL FAILURE
- B012E-1C-PASSENGER DOOR PRESSURE SENSOR (SATELLITE) - CIRCUIT VOLTAGE OUT OF RANGE
- B012E-2F-PASSENGER DOOR PRESSURE SENSOR (SATELLITE) - SIGNAL ERRATIC
- B012E-64-PASSENGER DOOR PRESSURE SENSOR (SATELLITE) - SIGNAL PLAUSIBILITY FAILURE
- B012E-96-PASSENGER DOOR PRESSURE SENSOR (SATELLITE) - COMPONENT INTERNAL FAILURE
- B012F-00-DEPLOYMENT DATA RECORD FULL
- B0131-00-REAR CRASH - NO SUBTYPE INFORMATION
- B0135-09-IPC INSTRUMENT PANEL CONTROL LAMP FEEDBACK AWL - COMPONENT FAILURES
- B0135-64-IPC INSTRUMENT PANEL CONTROL LAMP FEEDBACK AWL - SIGNAL PLAUSIBILITY FAILURE
- B0135-1E-FRONT PASSENGER PRESENCE DETECTION (PPD) - CIRCUIT RESISTANCE OUT OF RANGE
- B2734-01-PASSENGER PRESENCE DETECTOR - GENERAL ELECTRICAL FAILURE
- B2734-12-PASSENGER PRESENCE DETECTOR - CIRCUIT SHORT TO BATTERY
- B2734-13-PASSENGER PRESENCE DETECTOR - CIRCUIT OPEN
- B2761-01-LEFT SIDE SENSORS BUS (REMOTE ACCELERATION/PRESSURE DOOR) - GENERAL ELECTRICAL FAILURE
- B2761-11-LEFT SIDE SENSORS BUS (REMOTE ACCELERATION/PRESSURE DOOR) - CIRCUIT SHORT TO GROUND
- B2761-12-LEFT SIDE SENSORS BUS (REMOTE ACCELERATION/PRESSURE DOOR) - CIRCUIT SHORT TO BATTERY
- B2764-01-RIGHT SIDE SENSORS BUS (REMOTE ACCELERATION/PRESSURE DOOR) -

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GENERAL ELECTRICAL FAILURE
B2764-11-RIGHT SIDE SENSORS BUS REMOTE ACCELERATION-PRESSURE DOOR - CIRCUIT SHORT TO GROUND
B2764-12-RIGHT SIDE SENSORS BUS (REMOTE ACCELERATION/PRESSURE DOOR) - CIRCUIT SHORT TO BATTERY
C0061-09-AY SENSOR - COMPONENT FAILURES
C0061-64-AY SENSOR - SIGNAL PLAUSIBILITY FAILURE
C0062-09-AX SENSOR - COMPONENT FAILURES
C0062-64-AX SENSOR - SIGNAL PLAUSIBILITY FAILURE
C0063-09-YAW RATE SENSOR - COMPONENT FAILURES
C0063-64-YAW RATE SENSOR - SIGNAL PLAUSIBILITY FAILURE
U0001-87-C1 CAN BUS - MISSING MESSAGE
U0001-88-C1 CAN BUS - BUS OFF
U0101-87-C2 CAN BUS - MISSING MESSAGE
U0101-88-C2 CAN BUS - BUS OFF
U1701-86-ENGINE CONTROL MODULE (ECM) - SIGNAL INVALID
U1701-87-ECM ENGINE CONTROL MODULE - MISSING MESSAGE
U1700-87-BCM - MISSING MESSAGE
U1703-86 IPC (INSTRUMENT CONTROL PANEL) - SIGNAL INVALID
U1703-87 IPC (INSTRUMENT PANNEL CLUSTER) NODE - MISSING MESSAGE
U1706-64-BSM - BRAKE SYSTEM MODULE -NODE - SIGNAL PLAUSIBILITY FAILURE
U1706-86-BSM BRAKING SYESTEM MODULE - SIGNAL INVALID
U1706-87-BSM BRAKING SYESTEM MODULE - MISSING MESSAGE
U1930-86-INTERNAL IGNITION WORKING CONDITION SIGNAL - SIGNAL INVALID
U1932-86-IGNITION WORKING CONDITION SIGNAL FROM BCM - SIGNAL INVALID
Standard Procedure
RESTRAINTS SYSTEM INTERMITTENT TEST
RESTRAINTS SYSTEM PRE-DIAGNOSTIC PROCEDURE
RESTRAINTS SYSTEM VERIFICATION TEST
HVAC
Diagnosis and Testing
B1901-11-DISTRIBUTION MOTOR FEEDBACK - CIRCUIT SHORT TO GROUND
B1901-15-DISTRIBUTION MOTOR FEEDBACK - CIRCUIT SHORT TO BATTERY OR OPEN
B1902-11-DISTRIBUTION MOTOR COMMAND - CIRCUIT SHORT TO GROUND
B1902-12-DISTRIBUTION MOTOR COMMAND - CIRCUIT SHORT TO BATTERY
B1902-77-DISTRIBUTION MOTOR COMMAND - COMMANDED POSITION NOT REACHABLE
B1905-11-MIXER MOTOR FEEDBACK LEFT SIDE - CIRCUIT SHORT TO GROUND
B1905-15-MIXER MOTOR FEEDBACK LEFT SIDE - CIRCUIT SHORT TO BATTERY OR OPEN
B1906-11-MIXER MOTOR COMMAND LEFT SIDE - CIRCUIT SHORT TO GROUND
B1906-12-MIXER MOTOR COMMAND LEFT SIDE - CIRCUIT SHORT TO BATTERY
B1906-77-MIXER MOTOR COMMAND LEFT SIDE - COMMANDED POSITION NOT REACHABLE
B1907-11-MIXER MOTOR FEEDBACK RIGHT SIDE - CIRCUIT SHORT TO GROUND
B1907-15-MIXER MOTOR FEEDBACK RIGHT SIDE - CIRCUIT SHORT TO BATTERY OR OPEN
B1908-11-MIXER MOTOR COMMAND RIGHT SIDE - CIRCUIT SHORT TO GROUND
B1908-12-MIXER MOTOR COMMAND RIGHT SIDE - CIRCUIT SHORT TO BATTERY
B1908-77-MIXER MOTOR COMMAND RIGHT SIDE - COMMANDED POSITION NOT REACHABLE
B1909-11-RECIRCULATION MOTOR COMMAND - CIRCUIT SHORT TO GROUND
B1909-12-RECIRCULATION MOTOR COMMAND - CIRCUIT SHORT TO BATTERY
B1909-77-RECIRCULATION MOTOR COMMAND - COMMANDED POSITION NOT REACHABLE
B1910-11-SUN IRRADIATION SENSOR LEFT SIDE - CIRCUIT SHORT TO GROUND
B1910-15-SUN IRRADIATION SENSOR LEFT SIDE - CIRCUIT SHORT TO BATTERY OR OPEN
B1911-11-SUN IRRADIATION SENSOR RIGHT SIDE - CIRCUIT SHORT TO GROUND

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- B1911-15-SUN IRRADIATION SENSOR RIGHT SIDE - CIRCUIT SHORT TO BATTERY OR OPEN
- B1912-11-TREATED AIR TEMPERATURE SENSOR INPUT VENT RIGHT SIDE - CIRCUIT SHORT TO GROUND
- B1912-15-TREATED AIR TEMPERATURE SENSOR INPUT VENT RIGHT SIDE - CIRCUIT SHORT TO BATTERY OR OPEN
- B1913-11-TREATED AIR TEMPERATURE SENSOR INPUT FLOOR RIGHT SIDE - CIRCUIT SHORT TO GROUND
- B1913-15-TREATED AIR TEMPERATURE SENSOR INPUT FLOOR RIGHT SIDE - CIRCUIT SHORT TO BATTERY OR OPEN
- B1914-11-TREATED AIR TEMPERATURE SENSOR INPUT VENT LEFT SIDE - CIRCUIT SHORT TO GROUND
- B1914-15-TREATED AIR TEMPERATURE SENSOR INPUT VENT LEFT SIDE - CIRCUIT SHORT TO BATTERY OR OPEN
- B1915-11-TREATED AIR TEMPERATURE SENSOR INPUT FLOOR LEFT SIDE - CIRCUIT SHORT TO GROUND
- B1915-15-TREATED AIR TEMPERATURE SENSOR INPUT FLOOR LEFT SIDE - CIRCUIT SHORT TO BATTERY OR OPEN
- B1916-11-EVAPORATOR TEMPERATURE SENSOR - CIRCUIT SHORT TO GROUND
- B1916-15-EVAPORATOR TEMPERATURE SENSOR - CIRCUIT SHORT TO BATTERY OR OPEN
- B1917-11-INTERNAL TEMPERATURE SENSOR - CIRCUIT SHORT TO GROUND
- B1917-15-INTERNAL TEMPERATURE SENSOR - CIRCUIT SHORT TO BATTERY OR OPEN
- B1919-11-BLOWER MODULE - CIRCUIT SHORT TO GROUND
- B1919-12-BLOWER MODULE - CIRCUIT SHORT TO BATTERY
- B1919-14-BLOWER MODULE - CIRCUIT SHORT TO GROUND OR OPEN
- B1919-15-BLOWER MODULE - CIRCUIT SHORT TO BATTERY OR OPEN
- B1919-1C-BLOWER MODULE - CIRCUIT VOLTAGE OUT OF RANGE
- B1923-42-RAM ROM EEPROM - ETC INTERNAL FAILURE - GENERAL MEMORY FAILURE
- B1924-49-KEYBOARD - JAMMED KEY INTERNAL ELECTRONIC FAILURE
- B1926-11-MOTORS POSITIONING FEEDBACK POWERSUPPLY - CIRCUIT SHORT TO GROUND
- B1926-12-MOTORS POSITIONING FEEDBACK POWERSUPPLY - CIRCUIT SHORT TO BATTERY
- B1931-11-PTC LOW POWER RELAY DRIVING COMMAND OUTPUT - CIRCUIT SHORT TO GROUND
- B1931-15-PTC LOW POWER RELAY DRIVING COMMAND OUTPUT - CIRCUIT SHORT TO BATTERY OR OPEN
- B1932-11-PTC HIGH POWER RELAY DRIVING COMMAND OUTPUT - CIRCUIT SHORT TO GROUND
- B1932-15-PTC HIGH POWER RELAY DRIVING COMMAND OUTPUT - CIRCUIT SHORT TO BATTERY OR OPEN
- B1933-11-ECVD COMMAND - CIRCUIT SHORT TO GROUND
- B1933-15-ECVD COMMAND - CIRCUIT SHORT TO BATTERY OR OPEN
- B1935-11-RECIRCULATION MOTOR FEEDBACK - CIRCUIT SHORT TO GROUND
- B1935-15-RECIRCULATION MOTOR FEEDBACK - CIRCUIT SHORT TO BATTERY OR OPEN
- U0001-87 CAN LINE - MISSING MESSAGE
- U0001-88 CAN LINE - BUS OFF
- U1700-86 BODY CONTROL MODULE (BCM) - SIGNAL INVALID
- U1700-87 BODY COMPUTER MODULE (BCM) - MISSING MESSAGE
- U1703-86 INSTRUMENT PANEL CLUSTER (IPC) - SIGNAL INVALID
- U1703-87 INSTRUMENT PANEL CLUSTER (IPC) - MISSING MESSAGE
- U1930-64-MCM_OPERATIONALMODESTS.INFO - SIGNAL PLAUSABILITY FAILURE
- U1930-86-ACM-OPERATIONALMODESTSINFO - INVALID SIGNAL
- U1931-87-TRIP-A-B MESSAGE - MISSING MESSAGE
- U1932-86-STATUS-BH-BCM1 MESSAGE 3 - INVALID SIGNAL

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- U1932-87-STATUS-BH-BCM1 MESSAGE 3 - MISSING MESSAGE
- U1934-87-STATUS-BH-BCM1 MESSAGE AND STATUS-BH-BCM2 MESSAGE - MISSING MESSAGE
- U2001-87-BODY 6 MESSAGE - MISSING MESSAGE
- U2002-87-HUMIDITY SENSOR HR MESSAGE - MISSING MESSAGE
- U2003-87-STATUS_BH_BCM1 MESSAGE 1-MISSING MESSAGE
- U2004-87-STATUS_BH_BCM1 MESSAGE 2-MISSING MESSAGE
- U2005-87-STATUS_BH_BCM2 MESSAGE 1-MISSING MESSAGE
- U2006-87-STATUS_BH_BCM2 MESSAGE 2-MISSING MESSAGE
- U2007-64-STATUS_CCAN 3 MESSAGE - SIGNAL PLAUSABILITY FAILURE
- U2007-87-STATUS_CCAN3 - MISSING MESSAGE
- U2008-87-VIN MESSAGE - MISSING MESSAGE
- U2021-87-EXTERNAL TEMPERATURE MESSAGE 1 - MISSING MESSAGE
- U2022-87-EXTERNAL TEMPERATURE MESSAGE 2 - MISSING MESSAGE
- U2024-87-COMPRESSOR STATUS MESSAGE - MISSING MESSAGE
- U2025-87-ENGINE STATUS MESSAGE - MISSING MESSAGE
- U2026-87-ENGINE WATER TEMPERATURE MESSAGE 1 - MISSING MESSAGE
- U2027-87-ENGINE WATER TEMPERATURE MESSAGE 2 - MISSING MESSAGE
- U2028-87-AIR CONDITIONER PRESSURE MESSAGE - MISSING MESSAGE
- U2029-87-VEHICLE SPEED MESSAGE - MISSING MESSAGE
- U2030-87-ENGINE SPEED MESSAGE 1 - MISSING MESSAGE
- U2031-87-ENGINE SPEED MESSAGE 2 - MISSING MESSAGE

Standard Procedure

- HVAC VERIFICATION TEST
- PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

MODULE, Adaptive Cruise Control (ACC)

Diagnosis and Testing

- C1200-16-BATTERY VOLTAGE - CIRCUIT VOLTAGE BELOW THRESHOLD
- C1200-17-BATTERY VOLTAGE - CIRCUIT VOLTAGE ABOVE THRESHOLD
- C1400-86-MASTER CYLINDER PRESSURE FAULT - SIGNAL INVALID
- C1401-86-WHEEL SPEED PLAUSIBILITY FAILURE - SIGNAL INVALID
- C1402-86-MULTI AXIS ACCELERATION SENSORS FROM BSM FAILURE - SIGNAL INVALID
- C1403-86-ELECTRICAL POWER STEERING FAILURE - SIGNAL INVALID
- C1404-86-ENGINE SIGNAL FAILURE - SIGNAL INVALID
- C1405-86-TRAILER TOW MODULE FAIL - SIGNAL INVALID
- C1406-86-BRAKE SWITCH PLAUSIBILITY - SIGNAL INVALID
- C1407-86-ACKNOWLEDGE SIGNAL FAIL FROM BRAKE SYSTEM MODULE - SIGNAL INVALID
- C1408-86-ESC FAIL STATUS PRESENT - SIGNAL INVALID
- C1409-97-RADAR SENSOR BLIND - COMPONENT OR SYSTEM OPERATION OBSTRUCTED OR BLOCKED
- C140A-55-VEHICLE EOL CONFIGURATION - NOT CONFIGURED
- C140B-05-VEHICLE EOL CONFIGURATION FAULT - SYSTEM PROGRAMMING FAILURE
- C140C-86-DASM INTERVENTION REQUEST TIME OUT OF RANGE - SIGNAL INVALID
- C140D-86-SEAT BELT INFORMATION FAILURE - SIGNAL INVALID
- C1410-87-C2_IGW1 MESSAGE FROM BODY COMPUTER MISSING - MISSING MESSAGE
- C1411-49-CONTROL UNIT - INTERNAL ELECTRONIC FAILURE
- C1412-54-CALIBRATION PROCEDURE - MISSING CALIBRATION
- C1413-86-EXTERNAL LIGHT MESSAGE - SIGNAL INVALID
- C1413-87-EXTERNAL LIGHT MESSAGE - MISSING MESSAGE
- C1414-87-CLUSTER 2 MESSAGE ABSENT FROM IPC - MISSING MESSAGE
- C1416-87-VIN MESSAGE - MISSING MESSAGE
- C1417-78-HORIZONTAL MISALIGNMENT SENSOR - ALIGNMENT OR ADJUSTMENT INCORRECT

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- C1418-78-VERTICAL MISALIGNMENT SENSOR - ALIGNMENT OR ADJUSTMENT INCORRECT
- C1419-64-INTERNAL WHEEL SPEED PLAUSIBILITY FAILURE - SIGNAL PLAUSIBILTY FAILURE
- C141A-64-INTERNAL STEERING WHEEL ANGLE PLAUSIBILITY FAILURE - SIGNAL PLAUSIBILTY FAILURE
- C141B-97-VIDEO CAMERA BLIND - COMPONENT OR SYSTEM OPERATION OBSTRUCTED OR BLOCKED
- C141C-86-VIDEO CAMERA PRIVATE CAN COMMUNICATION FAILURE - SIGNAL INVALID
- C141D-47-MICROCONTROLLER FAILURE - WATCHDOG SAFETY MICROCONTROLLER FAILURE
- C141E-49-COMPONENT INTERNAL COMMUNICATION FAILURE - INTERNAL ELECTRONIC FAILURE
- C141F-96-HARDWARE RESET FAILURE - COMPONENT INTERNAL FAILURE
- C1420-25-RADAR SIGNAL FAILURE - SIGNAL SHAPE WAVEFORM FAILURE
- C1420-66-RADAR SIGNAL FAILURE - SIGNAL HAS TOO MANY TRANSITIONS EVENTS
- C1421-64-INTERNAL MULTI AXIS ACCELERATION PLAUSIBILITY FAILURE - SIGNAL PLAUSIBILTY FAILURE
- C1422-49-INTERNAL HW PLAUSIBILITY CHECK - INTERNAL ELECTRONIC FAILURE
- C1422-66-INTERNAL HW PLAUSIBILITY CHECK - SIGNAL HAS TOO MANY TRANSITIONS EVENTS
- C1423-4B-SENSOR INTERNAL TEMPERATURE - OVER TEMPERATURE
- C1424-4B-COMPONENT INTERNAL TEMPERATURE - OVER TEMPERATURE
- C1425-45-FLASHED SW IN ECU NOT COMPATIBLE - PROGRAM MEMORY FAILURE
- C1426-49-CONTROL UNIT PERMANET FAILURE - INTERNAL ELECTRONIC FAULURE
- C1427-66-RADAR MODULATION DISTURBED - SIGNAL HAS TOO MANY TRANSITIONS EVENTS
- C1427-68-RADAR MODULATION DISTURBED - EVENT INFORMATION
- C1428-68-RADAR UNAVAILABILITY SITUATION - EVENT INFORMATION
- C1429-66-RADAR HW OVERTEMPERATURE - SIGNAL HAS TOO MANY TRANSITIONS EVENTS
- C1429-68-RADAR HW OVERTEMPERATURE - EVENT INFORMATION
- C1430-86-VIN PLAUSIBILITY CHECK FAILURE - SIGNAL INVALID
- C1431-86-YAW RATE ACCELERATION SENSOR FROM BSM FAILURE - SIGNAL INVALID
- C1432-86-TURN INDICATOR SIGNAL FAILURE FROM BCM - SIGNAL INVALID
- C1433-86-EXTERNAL BRAKE SIGNAL FAILURE FROM BSM - SIGNAL INVALID
- C1434-86-BRAKE JERK REQUEST NOT PLAUSIBLE - SIGNAL INVALID
- U0001-87-C1 CAN BUS - MISSING MESSAGE
- U0001-88-C1 CAN BUS - BUS OFF
- U1700-87 BODY COMPUTER MODULE (BCM) - MISSING MESSAGE
- U1701-86-ENGINE CONTROL MODULE (ECM) - SIGNAL INVALID
- U1701-87-ENGINE CONTROL MODULE (ECM) - MISSING MESSAGE
- U1702-87-ELECTRICAL POWER STEERING (EPS) - MISSING MESSAGE
- U1703-87 INSTRUMENT PANEL CLUSTER (IPC) - MISSING MESSAGE
- U1706-86-BRAKE SYSTEM MODULE (BSM) - SIGNAL INVALID
- U1706-87-BRAKE SYSTEM MODULE (BSM) - MISSING MESSAGE
- U1726-87-AIRBAG SYSTEM - MISSING MESSAGE
- U1763-87-TRAILER TOW MODULE (TTM) - MISSING MESSAGE
- U1930-86-INTERNAL IGNITION WORKING CONDITION SIGNAL - SIGNAL INVALID
- U1932-86-IGNITION WORKING CONDITION FROM BCM (BODY COMPUTER MODULE) NOT VALID - SIGNAL INVALID
- U1933-87-BCM COMMAND MESSAGE FROM BCM (BODY COMPUTER MODULE) ABSENT - MISSING MESSAGE
- U1934-87-BCM COMMAND AND BODY2 MESSAGE FROM BCM (BODY COMPUTER MODULE) ABSENT - MISSING MESSAGE
- U1950-83-MESSAGE COUNTER/CRC FAULT IN BCM COMMAND (FROM BODY CONTROL

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MODULE) MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1952-83-MESSAGE COUNTER/CRC FAULT IN BRAKE 1 (FROM BRAKE SYSTEM MODULE) MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1958-83-MESSAGE COUNTER-CRC FAULT IN BSM YRS DATA - FROM BRAKE SYSTEM MODULE - MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1960-83-MESSAGE COUNTER/CRC FAULT IN ENGINE1 (FROM ENGINE CONTROL MODULE) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1966-83-MESSAGE COUNTER/CRC FAULT IN GE (FROM ELECTRICAL POWER STEERING) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1970-83-MESSAGE COUNTER/CRC FAULT IN MOT TRANSM3 (FROM ENGINE CONTROL MODULE) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1982-83-MESSAGE COUNTER/CRC FAULT IN WHEEL INFO (FROM BRAKE SYSTEM MODULE) MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1984-83-MESSAGE COUNTER/CRC FAULT IN WHEEL SPEED (FROM BRAKE SYSTEM MODULE) MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U198A-83-MESSAGE COUNTER/CRC FAULT IN BRAKE 7 (FROM BRAKE SYSTEM MODULE) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
Standard Procedure
ADAPTIVE CRUISE CONTROL VERIFICATION TEST
MODULE, Antilock Brake (ABS)
Diagnosis and Testing
C0010-01-LEFT FRONT INLET VALVE - GENERAL ELECTRICAL FAILURE
C0011-01-LEFT FRONT OUTLET VALVE - GENERAL ELECTRICAL FAILURE
C0014-01-RIGHT FRONT INLET VALVE - GENERAL ELECTRICAL FAILURE
C0015-01-RIGHT FRONT OUTLET VALVE - GENERAL ELECTRICAL FAILURE
C0018-01-LEFT REAR INLET VALVE - GENERAL ELECTRICAL FAILURE
C0019-01-LEFT REAR OUTLET VALVE - GENERAL ELECTRICAL FAILURE
C001C-01-RIGHT REAR INLET VALVE - GENERAL ELECTRICAL FAILURE
C001D-01-RIGHT REAR OUTLET VALVE - GENERAL ELECTRICAL FAILURE
C0020-49-RECIRCULATION PUMP - INTERNAL ELECTRONIC FAILURE
C0030-29-LEFT FRONT TONE WHEEL - INVALID SIGNAL
C0031-01-LEFT FRONT SPEED SENSOR - GENERAL ELECTRICAL FAILURE
C0031-29-LEFT FRONT SPEED SENSOR - INVALID SIGNAL
C0031-4A-LEFT FRONT WHEEL SPEED SENSOR - INCORRECT COMPONENT INSTALLED
C0033-29-RIGHT FRONT TONE WHEEL - INVALID SIGNAL
C0034-01-RIGHT FRONT SPEED SENSOR - GENERAL ELECTRICAL FAILURE
C0034-29-RIGHT FRONT SPEED SENSOR - INVALID SIGNAL
C0034-4A-RIGHT FRONT WHEEL SPEED SENSOR - INCORRECT COMPONENT INSTALLED
C0036-29-LEFT REAR TONE WHEEL - INVALID SIGNAL
C0037-01-LEFT REAR SPEED SENSOR - GENERAL ELECTRICAL FAILURE
C0037-29-LEFT REAR SPEED SENSOR - INVALID SIGNAL
C0037-4A-LEFT REAR WHEEL SPEED SENSOR - INCORRECT COMPONENT INSTALLED
C0037-95-SPEED SENSOR REAR LEFT - INCORRECT ASSEMBLY
C0039-29-RIGHT REAR TONE WHEEL - INVALID SIGNAL
C003A-01-RIGHT REAR SPEED SENSOR - GENERAL ELECTRICAL FAILURE
C003A-29-RIGHT REAR SPEED SENSOR - INVALID SIGNAL
C003A-4A-RIGHT REAR WHEEL SPEED SENSOR - INCORRECT COMPONENT INSTALLED
C003A-95-SPEED SENSOR REAR RIGHT - INCORRECT ASSEMBLY
C003B-95-ERRATIC TIRE DETECTED - INCORRECT ASSEMBLY
C0047-01-BRAKE PRESSURE SENSOR - GENERAL ELECTRICAL FAILURE
C0047-29-BRAKE PRESSURE SENSOR - INVALID SIGNAL
C0047-62-BRAKE PRESSURE SENSOR - SIGNAL COMPARE FAILURE
C0051-29-STEERING ANGLE SENSOR (ESP) - INVALID SIGNAL
C0051-54-STEERING ANGLE SENSOR (EPS) - MISSING CONFIGURED

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- C0051-86-STEERING ANGLE SENSOR (EPS) - BUS SIGNAL INVALID
- C0052-86-LWS SPEED SIGNAL FAULT - SIGNAL INVALID
- C0061-29-LATERAL ACCELERATION SENSOR IN AIRBAG SYSTEM - SIGNAL INVALID
- C0061-86-LATERAL ACCELERATION SENSOR IN AIRBAG SYSTEM - SIGNAL INVALID
- C0062-29-LONGITUDINAL ACCELERATION SENSOR - INVALID SIGNAL
- C0062-86-LONGITUDINAL ACCELERATION SENSOR IN AIRBAG SYSTEM - SIGNAL INVALID
- C0063-29-YAW RATE SENSOR - INVALID SIGNAL
- C0063-86-YAW RATE SENSOR IN AIRBAG SYSTEM - SIGNAL INVALID
- C006A-29-MULTI-AXIS ACCELERATION SENSOR - SIGNAL INVALID
- C006A-54-MULTI-AXIS ACCELERATION SENSOR - MISSING CALIBRATION
- C006C-4A-MULTI AXIS ACCELERATION SENSOR IDENTIFICATION FAULT IN AIRBAG SYSTEM - INCORRECT COMPONENT INSTALLED
- C0075-86-STEERING COLUMN TORQUE VALID DATA - SIGNAL INVALID
- C0076-68-DST FAULT CAUSED FROM EPS SYSTEM - EVENT INFORMATION
- C0077-87-EPS TORQUE OVERLAY MESSAGE - MISSING MESSAGE
- C0078-86-ASSISTANCE TORQUE VALID DATA - SIGNAL INVALID
- C1200-16-BATTERY VOLTAGE - BELOW THRESHOLD
- C1200-17-BATTERY VOLTAGE - ABOVE THRESHOLD
- C1200-1C-BATTERY VOLTAGE - CIRCUIT VOLTAGE OUT OF RANGE
- C1201-16-BATTERY VOLTAGE ELECTRIC PARK BRAKE - CIRCUIT VOLTAGE BELOW THRESHOLD
- C1201-17-BATTERY VOLTAGE ELECTRIC PARK BRAKE - CIRCUIT VOLTAGE ABOVE THRESHOLD
- C1202-01-VACUUM SENSOR FAULT - GENERAL ELECTRICAL FAILURE
- C1202-29-VACUUM SENSOR FAULT - SIGNAL INVALID
- C1205-01-VALVE RELAY - GENERAL ELECTRICAL FAILURE
- C1205-49-VALVE RELAY - INTERNAL ELECTRONIC FAILURE
- C1206-01-PRIMING VALVE 1 - GENERAL ELECTRICAL FAILURE
- C1207-01-PRIMING VALVE 2 - GENERAL ELECTRICAL FAILURE
- C1208-01-PILOT VALVE 1 - GENERAL ELECTRICAL FAILURE
- C1209-01-PILOT VALVE 2 - GENERAL ELECTRICAL FAILURE
- C120A-24-ESC SWITCH - SIGNAL STUCK HIGH
- C120C-24-HDC SWITCH FAULT - SIGNAL STUCK HIGH
- C1210-86-ABS/ESC LAMP COMMUNICATION - INVALID SIGNAL
- C1211-49-ABS MODULE - INTERNAL ELECTRONIC FAILURE
- C1211-96-ABS MODULE - COMPONENT INTERNAL FAILURE
- C1212-49-CONTROL UNIT EPB SECTION - INTERNAL ELECTRONIC FAILURE
- C1215-29-BRAKE LIGHT SWITCH - INVALID SIGNAL
- C1215-86-BRAKE LIGHT SWITCH - SIGNAL INVALID
- C1217-23-REVERSE GEAR SWITCH - SIGNAL STUCK LOW
- C1217-24-REVERSE GEAR SWITCH - SIGNAL STUCK HIGH
- C1217-86-REVERSE GEAR SWITCH - SIGNAL INVALID
- C1218-4B-VALVES ACTUATED TOO LONG BY TESTER - OVER TEMPERATURE
- C1219-16-PUMP SUPPLY VOLTAGE - BELOW THRESHOLD
- C1220-86-CLUTCH SIGNAL - SIGNAL INVALID
- C1221-86-PCM BUS SIGNAL INVALID
- C1222-87-ENGINE 5 MESSAGE - MISSING MESSAGE
- C1230-55-VEHICLE EOL CONFIGURATION - NOT CONFIGURED
- C1240-86-AUTOMATIC/ROBOTIC GEAR BOX SIGNAL FAULT - SIGNAL INVALID
- C1251-86-AWD SIGNAL FAULT - SIGNAL INVALID
- C1252-86-CCM SIGNAL FAULT - SIGNAL INVALID
- C1253-86-DRIVE STYLE STATUS SIGNAL FROM BCM FAULT - SIGNAL INVALID
- C1254-86-REQUEST FROM DASM NOT VALID - SIGNAL INVALID

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- C1260-86-HILL DESCENT CONTROL FUNCTION FAULT - SIGNAL INVALID
- C1261-55-VEHICLE IDENTIFICATION NUMBER (VIN) VIRGIN - NOT CONFIGURED
- C1262-05-VEHICLE IDENTIFICATION NUMBER (VIN) MISMATCH - SYSTEM PROGRAMMING FAILURES
- C1400-01-ELECTRIC PARK BRAKE SWITCH - GENERAL ELECTRICAL FAILURE
- C1400-13-ELECTRIC PARK BRAKE SWITCH - CIRCUIT OPEN
- C1400-97-ELECTRIC PARK BRAKE SWITCH - COMPONENT OR SYSTEM OPERATION OBSTRUCTED OR BLOCKED
- C1403-01-ELECTRIC PARK BRAKE MOTOR RIGHT - GENERAL ELECTRICAL FAILURE
- C1403-11-ELECTRIC PARK BRAKE MOTOR RIGHT - CIRCUIT SHORT TO GROUND
- C1403-13-ELECTRIC PARK BRAKE MOTOR RIGHT - CIRCUIT OPEN
- C1403-15-ELECTRIC PARK BRAKE MOTOR RIGHT - CIRCUIT SHORT TO BATTERY OR OPEN
- C1405-01-ELECTRIC PARK BRAKE MOTOR LEFT - GENERAL ELECTRICAL FAILURE
- C1405-11-ELECTRIC PARK BRAKE MOTOR LEFT - CIRCUIT SHORT TO GROUND
- C1405-13-ELECTRIC PARK BRAKE MOTOR LEFT - CIRCUIT OPEN
- C1405-15-ELECTRIC PARK BRAKE MOTOR LEFT - CIRCUIT SHORT TO BATTERY OR OPEN
- C1406-86-ELECTRIC PARK BRAKE SIGNAL FAULT - SIGNAL INVALID
- C1407-19-ELECTRIC PARK BRAKE REQUEST ACTUATION FAULT MOTOR RIGHT - CIRCUIT CURRENT ABOVE THRESHOLD
- C1407-77-ELECTRIC PARK BRAKE REQUEST ACTUATION FAULT MOTOR RIGHT - COMMANDED POSITION NOT REACHABLE
- C1408-19-ELECTRIC PARK BRAKE REQUEST ACTUATION FAULT MOTOR LEFT - CIRCUIT CURRENT ABOVE THRESHOLD
- C1408-77-ELECTRIC PARK BRAKE REQUEST ACTUATION FAULT MOTOR LEFT - COMMANDED POSITION NOT REACHABLE
- C1409-07-MECHANICAL FAULT RIGHT EPB ACTUATOR - MECHANICAL FAILURES
- C140A-07-MECHANICAL FAULT LEFT EPB ACTUATOR - MECHANICAL FAILURES
- C140B-94-INCOHERENT STATE OF EPB - UNEXPECTED OPERATION
- C140C-04-ELECTRIC PARK BRAKE SOFTWARE INCOMPATIBLE - SYSTEM INTERNAL FAILURE
- C140D-54-ASSEMBLY CHECK NOT PERFORMED - MISSING CALIBRATION
- C140E-53-ELECTRIC PARK BRAKE IN MAINTENANCE MODE - DEACTIVATED
- C140F-53-ELECTRIC PARK BRAKE AUTOMATIC FUNCTIONS - DEACTIVATED
- C1416-87-VIN MESSAGE - MISSING MESSAGE
- C1420-64-DASM IMPLAUSIBILITY REQUEST - SIGNAL PLAUSIBILITY FAILURE
- C1421-67-DASM REQUEST DURING FAIL - SIGNAL INCORRECT AFTER EVENT
- C1422-64-TIME LONG DURATION REQUEST FROM DASM - SIGNAL PLAUSIBILITY FAILURE
- C1423-86-DECELERATION REQUEST FROM DASM OUT OF RANGE - SIGNAL INVALD
- C1424-64-STANDSTILL REQUEST FROM DASM - SIGNAL PLAUSIBILITY FAILURE
- C1425-01-LED SWITCH EPB FAULT - GENERAL ELECTRICAL FAILURE
- C1426-86-ENGINE STATUS VALID DATA - SIGNAL INVALID
- C1427-87-ORC YRS DATA MESSAGE (FROM OCCUPANT RESTRAINT CONTROLLER) - MISSING MESSAGE
- C1428-87-AIRBAG 1 MESSAGE (FROM OCCUPANT RESTRAINT CONTROLLER) - MISSING MESSAGE
- C1429-86-SEAT BELT INFORMATION FAILURE - SIGNAL INVALID
- C1430-87-AIRBAG 2 MESSAGE (FROM OCCUPANT RESTRAINT CONTROLLER) - MISSING MESSAGE
- C1431-86-SIGNAL NOT VALID FROM TRANSM3 MESSAGE - SIGNAL INVALID
- C1432-87-TRANSM 2 MESSAGE (FROM DUAL CLUTCH TRANSMISSION MODULE) - MISSING MESSAGE
- U0001-87-C1 CAN BUS - MISSING MESSAGE
- U0001-88-C1 CAN BUS - BUS OFF
- U1001-87-C2 CAN BUS - MISSING MESSAGE

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- U0001-88-C2 CAN BUS - BUS OFF
- U1700-86-IMPLAUSIBLE DATA RECEIVED FROM BCM
- U1700-87 BODY COMPUTER MODULE (BCM) - MISSING MESSAGE
- U1701-86-ENGINE CONTROL MODULE (ECM) - SIGNAL INVALID
- U1701-87 ENGINE CONTROL MODULE (ECM) - MISSING MESSAGE
- U1702-87-ELECTRICAL POWER STEERING (EPS) - MISSING MESSAGE
- U1703-86 INSTRUMENT PANEL CLUSTER (IPC) - SIGNAL INVALID
- U1703-87 INSTRUMENT PANEL CLUSTER (IPC) - MISSING MESSAGE
- U1711-86-DUAL CLUTCH TRANSMISSION MODULE (DCTM) - SIGNAL INVALID
- U1711-87-DUAL CLUTCH TRANSMISSION MODULE (DCTM) - MISSING MESSAGE
- U1726-87-AIRBAG SYSTEM - MISSING MESSAGE
- U1757-86-DRIVE ASSISTANT SYSTEM MODULE (DASM) - SIGNAL INVALID
- U1757-87-DRIVE ASSISTANT SYSTEM MODULE (DASM) - MISSING MESSAGE
- U1767-87-DRIVE TRAIN CONTROL MODULE (DTCM) - MISSING MESSAGE
- U1930-86-INTERNAL IGNITION WORKING CONDITION SIGNAL - SIGNAL INVALID
- U1932-86-IGNITION WORKING CONDITION SIGNAL FROM BODY CONTROL MODULE - SIGNAL INVALID
- U1933-87-BCM COMMAND MESSAGE FROM BCM (BODY COMPUTER MODULE) ABSENT - MISSING MESSAGE
- U1934-87-BCM COMMAND AND BODY2 MESSAGE FROM BCM (BODY COMPUTER MODULE) ABSENT - MISSING MESSAGE
- U1950-83-MESSAGE COUNTER/CRC FAULT IN BCM COMMAND (FROM BODY CONTROL MODULE) MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U195A-83-MESSAGE COUNTER CRC FAULT IN DASM INFO FROM DRIVER ASSISTANT SYSTEM MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U195C-83-MESSAGE COUNTER CRC FAULT IN DRIVETRAIN1 FROM DRIVETRAIN CONTROL MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U195E-83-CRC FAULT IN EPS TORQUE OVERLAY FROM ELECTRICAL POWER STEERING - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U195F-83-MESSAGE COUNTER FAULT IN EPS TORQUE OVERLAY FROM ELECTRICAL POWER STEERING - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1960-83-MESSAGE COUNTER/CRC FAULT IN ENGINE1 (FROM ENGINE CONTROL MODULE) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1962-83-MESSAGE COUNTER-CRC FAULT ON ENGINE3 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1964-83-MESSAGE COUNTER-CRC FAULT ON ENGINE4 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1966-83-MESSAGE COUNTER/CRC FAULT IN GE (FROM ELECTRICAL POWER STEERING) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1970-83-MESSAGE COUNTER/CRC FAULT IN MOT TRANSM3 (FROM ENGINE CONTROL MODULE) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1972-83-MESSAGE COUNTER CRC FAULT IN ORC YRS DATA FROM OCCUPANT RESTRAINT CONTROLLER - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U197C-83-MESSAGE COUNTER CRC FAULT IN TRANSM2 FROM DUAL CLUTCH TRANSMISSION MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U198E-83-MESSAGE COUNTER CRC FAULT IN TRANSM3 FROM DUAL CLUTCH TRANSMISSION MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1990-83-MESSAGE COUNTER CRC FAULT IN AIRBAG2 FROM OCCUPANT RESTRAINT CONTROLLER - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT

⊟ Standard Procedure

- ABS INTERMITTENT CONDITION
- ABS VERIFICATION TEST

⊟ MODULE, Body Control (BCM)

⊟ Diagnosis and Testing

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- B1000-44-ECU INTERNAL - DATA MEMORY FAILURE
- B1000-45-ECU INTERNAL - PROGRAM MEMORY FAILURE
- B1000-46-ECU INTERNAL - CALIBRATION MEMORY FAILURE
- B1000-47-ECU INTERNAL - WATCHDOG MICRO FAILURE
- B1001-61-TRANSPONDER-SIGNAL CALCULATION FAILURE
- B1001-62-TRANSPONDER-SIGNAL COMPARE FAILURE
- B1001-68-TRANSPONDER-EVENT INFORMATION
- B1001-79-TRANSPONDER-MECHANICAL LINKAGE FAILURE
- B1002-02-IMMOBILIZER COIL - GENERAL SIGNAL FAILURE
- B1002-13-IMMOBILIZER COIL - CIRCUIT OPEN
- B1003-08-RF MODULE-BUS SIGNAL/MESSAGE FAILURE
- B1006-11-FUEL LEVEL SIGNAL-CIRCUIT SHORT TO GROUND
- B1006-15-FUEL LEVEL SIGNAL-CIRCUIT SHORT TO BATTERY OR OPEN
- B1007-15-FRONT-LATERAL LEFT TURN LIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1007-18-FRONT-LATERAL LEFT TURN LIGHT-CIRCUIT CURRENT BELOW THRESHOLD
- B1007-19-FRONT-LATERAL LEFT TURN LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1008-15-FRONT-LATERAL RIGHT TURN LIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1008-18-FRONT-LATERAL RIGHT TURN LIGHT-CIRCUIT CURRENT BELOW THRESHOLD
- B1008-19-FRONT-LATERAL RIGHT TURN LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1009-15-COMBINED REAR LEFT LIGHT 1-CIRCUIT SHORT TO BATTERY OR OPEN
- B1009-18-COMBINED REAR LEFT LIGHT 1-CIRCUIT CURRENT BELOW THRESHOLD
- B1009-19-COMBINED REAR LEFT LIGHT 1-CIRCUIT CURRENT ABOVE THRESHOLD
- B100A-15-COMBINED REAR RIGHT LIGHT 1-CIRCUIT SHORT TO BATTERY OR OPEN
- B100A-18-COMBINED REAR RIGHT LIGHT 1-CIRCUIT CURRENT BELOW THRESHOLD
- B100A-19-COMBINED REAR RIGHT LIGHT 1-CIRCUIT CURRENT ABOVE THRESHOLD
- B1010-64-BRAKE SWITCHES - SIGNAL PLAUSIBILITY FAILURE
- B1010-67-BRAKESWITCHES-SIGNAL INCORRECT AFTER EVENT
- B1011-15-LICENSE PLATE LIGHTS-CIRCUIT SHORT TO BATTERY OR OPEN
- B1011-18-LICENCE PLATE LIGHTS - CIRCUIT CURRENT BELOW THRESHOLD
- B1011-19-LICENCE PLATE LIGHTS - CIRCUIT CURRENT ABOVE THRESHOLD
- B1017-15-CENTRAL HIGH MOUNTED STOP LIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1017-19-CENTRAL HIGH MOUNTED STOP LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1018-15-BACKUP LIGHT LEFT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1018-19-BACKUP LIGHT LEFT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1019-15-BACKUP LIGHT RIGHT-CIRCUIT SHORT TO BATTERY OR OPEN-DOMESTIC
- B1019-15-BACKUP LIGHT RIGHT-CIRCUIT SHORT TO BATTERY OR OPEN-EXPORT
- B1019-19-BACKUP LIGHT RIGHT-CIRCUIT CURRENT ABOVE THRESHOLD-DOMESTIC
- B1019-19-BACKUP LIGHT RIGHT-CIRCUIT CURRENT ABOVE THRESHOLD-EXPORT
- B1020-15-BACKUP LIGHT (LEFT AND RIGHT)-CIRCUIT SHORT TO BATTERY OR OPEN
- B1020-19-BACKUP LIGHT (LEFT AND RIGHT)-CIRCUIT CURRENT ABOVE THRESHOLD
- B1022-15-DAY TIME RUNNING AND PARKING LIGHT LEFT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1022-19-DAY TIME RUNNING AND PARKING LIGHT LEFT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1023-15-DAY TIME RUNNING AND PARKING LIGHT RIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1023-19-DAY TIME RUNNING AND PARKING LIGHT RIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B102C-15-REAR FOG LIGHTS-CIRCUIT SHORT TO BATTERY OR OPEN
- B102C-19-REAR FOG LIGHTS-CIRCUIT CURRENT ABOVE THRESHOLD
- B1030-19-FRONT CEILING LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1032-19-CEILING LIGHT REAR LEFT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1033-19-CEILING LIGHT REAR RIGHT-CIRCUIT CURRENT ABOVE THRESHOLD

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- B1040-12-FRONT WIPER RELAY 1ST SPEED-CIRCUIT SHORT TO BATTERY
- B1040-13-FRONT WIPER RELAY 1ST SPEED-CIRCUIT OPEN
- B1040-19-FRONT WIPER RELAY 1ST SPEED-CIRCUIT CURRENT ABOVE THRESHOLD
- B1041-13-FRONT WIPER RELAY 2ND SPEED-CIRCUIT OPEN
- B1041-19-FRONT WIPER RELAY 2ND SPEED-CIRCUIT CURRENT ABOVE THRESHOLD
- B1042-64-FRONT WIPER PARK CONTACT-SIGNAL PLAUSIBILITY FAILURE
- B1042-71-FRONT WIPER PARK CONTACT-ACTUATOR STUCK
- B1045-13-REAR WIPER-CIRCUIT OPEN
- B1045-19-REAR WIPER-CIRCUIT CURRENT ABOVE THRESHOLD
- B1046-64-REAR WIPER PARK CONTACT-SIGNAL PLAUSIBILITY FAILURE
- B1046-71-REAR WIPER PARK CONTACT-ACTUATOR STUCK
- B1048-12-HEATED REAR WINDOW RELAY-CIRCUIT SHORT TO BATTERY
- B1049-14-HEAD LAMP WASHER-CIRCUIT SHORT TO GROUND OR OPEN
- B1049-19-HEAD LAMP WASHER-CIRCUIT CURRENT ABOVE THRESHOLD
- B104A-15-WINDSHIELD HEATER-CIRCUIT SHORT TO BATTERY OR OPEN
- B104A-19-WINDSHIELD HEATER-CIRCUIT CURRENT ABOVE THRESHOLD
- B1050-15-COLUMN SWITCH MODULE MAINLIGHTS-CIRCUIT SHORT TO BATTERY OR OPEN
- B1051-15-COLUMN SWITCH MODULE TURNLIGHTS-CIRCUIT SHORT TO BATTERY OR OPEN
- B1051-19-COLUMN SWITCH MODULE TURNLIGHTS-CIRCUIT CURRENT ABOVE THRESHOLD
- B1052-15-COLUMN SWITCH MODULE FRONT WIPER COMMANDS-CIRCUIT SHORT TO BATTERY OR OPEN
- B1053-15-COLUMN SWITCH MODULE REAR WIPER COMMANDS-CIRCUIT SHORT TO BATTERY OR OPEN
- B105A-64-DOORS LOCK ALL-SIGNAL PLAUSIBILITY FAILURE
- B105B-64-DOORS UNLOCK ALL-SIGNAL PLAUSIBILITY FAILURE
- B105D-64-DOORS DEADLOCK OR UNLOCK DRIVER-SIGNAL PLAUSIBILITY FAILURE
- B105F-64-TRUNK RELEASE RELAY-SIGNAL PLAUSIBILITY FAILURE
- B1061-19-DRIVER DOOR AJAR TO MTA-CIRCUIT CURRENT ABOVE THRESHOLD
- B1062-11-ELECTRIC SEAT MOVIMENTATION-CIRCUIT SHORT TO GROUND
- B1063-00-COMFORT ENABLE-NO SUBTYPE INFORMATION
- B106C-11-ECO BUTTON-CIRCUIT SHORT TO GROUND
- B106C-13-ECO BUTTON-CIRCUIT OPEN
- B106C-23-ECO BUTTON-SIGNAL STUCK LOW
- B106D-19-ECO-SPORT BUTTON LED-CIRCUIT CURRENT ABOVE THRESHOLD
- B1071-19-SBMT (SUPPLY BATTERY MONITORING TIME)-CIRCUIT CURRENT ABOVE THRESHOLD
- B1077-01-FUEL FILTER HEATER RELAY-GENERAL ELECTRICAL FAILURE
- B1078-15-BRAKES LIQUID LEVEL SWITCH-CIRCUIT SHORT TO BATTERY OR OPEN
- B107B-11-EXTERNAL TEMPERATURE SENSOR-CIRCUIT SHORT TO GROUND
- B107B-13-EXTERNAL TEMPERATURE SENSOR-CIRCUIT OPEN
- B1080-64-ORC (OCCUPANT RESTRAINT CONTROL) FPS (FIRE PROTECTION STRATEGY) FAILURE-SIGNAL PLAUSIBILITY FAILURE
- B1080-86-ORC (OCCUPANT RESTRAINT CONTROL) FPS (FIRE PROTECTION STRATEGY) FAILURE-SIGNAL INVALID
- B1081-86-ECM (ENGINE CONTROL MODULE) FPS (FIRE PROTECTION STRATEGY) FAILURE-SIGNAL INVALID
- B1082-00-ORC-OCCUPANT RESTRAINT CONTROL-FPS-FIRE PROTECTION STRATEGY-ACTIVATED
- B1083-23-STOP AND START BUTTON SWITCH STUCK-SIGNAL STUCK LOW
- B1085-18-STOP AND START VOLTAGE STABILIZER-CIRCUIT CURRENT BELOW THRESHOLD
- B1086-87-STOP AND START RELAY (BCM CRANKING RELAY)-MISSING MESSAGE
- B10AA-4A CHECK CONFIGURATION FAILED-INCORRECT COMPONENT INSTALLED
- B1100-68-DIAGNOSTIC GATEWAY BUFFER OVERFLOW-EVENT INFORMATION

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- B1101-72-RUN START RELAY COMMAND-ACTUATOR STUCK OPEN
- B1101-73-RUN START RELAY COMMAND-ACTUATOR STUCK CLOSED
- B1104-24-PHYSICAL KEY IN START POSITION-SIGNAL STUCK HIGH
- B1105-86-PHYSICAL KEY IN FAULT-SIGNAL INVALID
- B1106-64-IGNITION STATUS-SIGNAL PLAUSIBILITY FAILURE
- B1107-15-REAR LEFT TURN LIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1107-18-REAR LEFT TURN LIGHT-CIRCUIT CURRENT BELOW THRESHOLD
- B1107-19-REAR LEFT TURN LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1108-15-REAR RIGHT TURN LIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1108-18-REAR RIGHT TURN LIGHT-CIRCUIT CURRENT BELOW THRESHOLD
- B1108-19-REAR RIGHT TURN LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1109-15-COMBINED REAR LEFT LIGHT 2-CIRCUIT SHORT TO BATTERY OR OPEN
- B1109-18-COMBINED REAR LEFT LIGHT 2-CIRCUIT CURRENT BELOW THRESHOLD
- B1109-19-COMBINED REAR LEFT LIGHT 2-CIRCUIT CURRENT ABOVE THRESHOLD
- B110A-15-COMBINED REAR RIGHT LIGHT 2-CIRCUIT SHORT TO BATTERY OR OPEN
- B110A-18-COMBINED REAR RIGHT LIGHT 2-CIRCUIT CURRENT BELOW THRESHOLD
- B110A-19-COMBINED REAR RIGHT LIGHT 2-CIRCUIT CURRENT ABOVE THRESHOLD
- B110F-15-FRONT FOG LIGHT LEFT-CIRCUIT SHORT TO BATTERY OR OPEN
- B110F-19-FRONT FOG LIGHT LEFT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1110-15-FRONT FOG LIGHT RIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1110-19-FRONT FOG LIGHT RIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1112-18-RUN RELAY COMMAND-CIRCUIT CURRENT BELOW THRESHOLD
- B1112-19-RUN RELAY COMMAND-CIRCUIT CURRENT ABOVE THRESHOLD
- B112C-15-SIDE MARKER LIGHTS-CIRCUIT SHORT TO BATTERY OR OPEN
- B112C-19-SIDE MARKER LIGHTS-CIRCUIT CURRENT ABOVE THRESHOLD
- B1139-19-AMBIENT DIMMING LIGHT BULB-CIRCUIT CURRENT ABOVE THRESHOLD
- B1161-64-HAZARD BUTTON SWITCH-SIGNAL PLAUSIBILITY FAILURE
- B1164-71-WINDOW LIFTER FRONT DRIVER MOTOR-ACTUATOR STUCK
- B1166-71-WINDOW LIFTER FRONT PASSENGER MOTOR-ACTUATOR STUCK
- B116D-19-STOP-START LED-CIRCUIT CURRENT ABOVE THRESHOLD
- B1239-19-INSTRUMENT PANEL DIMMING LIGHT BULB-CIRCUIT CURRENT ABOVE THRESHOLD
- B1265-23-PASSENGER WINDOW LIFTER SWITCH DRIVER SIDE-SIGNAL STUCK LOW
- B1265-24-PASSENGER WINDOW LIFTER SWITCH DRIVER SIDE-SIGNAL STUCK HIGH
- B1267-23-REAR RIGHT WINDOW LIFTER SWITCH DRIVER SIDE-SIGNAL STUCK LOW
- B1267-24-REAR RIGHT WINDOW LIFTER SWITCH DRIVER SIDE-SIGNAL STUCK HIGH
- B1268-23-REAR LEFT WINDOW LIFTER SWITCH-SIGNAL STUCK LOW
- B1268-24-REAR LEFT WINDOW LIFTER SWITCH-SIGNAL STUCK HIGH
- B1269-23-REAR LEFT WINDOW LIFTER SWITCH DRIVER SIDE-SIGNAL STUCK LOW
- B1269-24-REAR LEFT WINDOW LIFTER SWITCH DRIVER SIDE-SIGNAL STUCK HIGH
- B126A-23-REAR RIGHT WINDOW LIFTER SWITCH-SIGNAL STUCK LOW
- B126A-24-REAR RIGHT WINDOW LIFTER SWITCH-SIGNAL STUCK HIGH
- B12AD-11-DRIVER DOOR AJAR SWITCH-CIRCUIT SHORT TO GROUND
- B12AD-15-DRIVER DOOR AJAR SWITCH-CIRCUIT SHORT TO BATTERY OR OPEN
- B12D3-19-HORN CONTROL-CIRCUIT CURRENT ABOVE THRESHOLD
- B1414-09-LIGHT SENSOR-COMPONENT FAILURES
- B145E-01-LEFT HAND REAR BANK SWITCHES-GENERAL ELECTRICAL FAILURE
- B145F-01-RIGHT HAND REAR BANK SWITCHES-GENERAL ELECTRICAL FAILURE
- B1460-01-LEFT HAND FRONT BANK SWITCHES-GENERAL ELECTRICAL FAILURE
- B1514-09-RAIN SENSOR-COMPONENT FAILURES
- B162A-15-LEFT LOW BEAM LIGHT - CIRCUIT SHORT TO BATTERY OR OPEN
- B162A-19-LEFT LOW BEAM LIGHT - CIRCUIT CURRENT ABOVE THRESHOLD

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- B162E-15-RIGHT LOW BEAM LIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B162E-19-RIGHT LOW BEAM LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1632-15-LEFT HIGH BEAM LIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1632-19-LEFT HIGH BEAM LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B1636-15-RIGHT HIGH BEAM LIGHT-CIRCUIT SHORT TO BATTERY OR OPEN
- B1636-19-RIGHT HIGH BEAM LIGHT-CIRCUIT CURRENT ABOVE THRESHOLD
- B165A-68-IAM (INTELLIGENT ALTERNATOR MODULE)-EVENT INFORMATION
- B1A7D-23-START BUTTON-SIGNAL STUCK LOW
- U0001-87-C1 CAN BUS - MISSING MESSAGE
- U0001-88-C1 CAN BUS - BUS OFF
- U0010-87-B CAN - MISSING MESSAGE
- U0010-88-CAN BH BUS - BUS OFF
- U0101-87-C2 CAN BUS - MISSING MESSAGE
- U0101-88-C2 CAN BUS - BUS OFF
- U0151-86-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC) ON C2-SIGNAL INVALID
- U0151-87-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC) ON C2-MISSING MESSAGE
- U0254-86-LOST COMMUNICATION WITH REMOTE START MODULE-SIGNAL INVALID
- U0254-87-LOST COMMUNICATION WITH REMOTE START MODULE-MISSING MESSAGE
- U0402-86-INVALID DATA RECEIVED FROM TRANSMISSION CONTROL MODULE-SIGNAL INVALID
- U0403-86-HILL DESCENT CONTROL FEEDBACK-SIGNAL INVALID
- U0405-00-INVALID DATA RECEIVED FROM CRUISE CONTROL MODULE
- U0418-00-INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE
- U0426-64-CODE RESPONSE FROM ESL (ELECTRIC STEERING LOCK) ERROR-SIGNAL PLAUSIBILITY FAILURE
- U0426-87-CODE RESPONSE FROM ESL (ELECTRIC STEERING LOCK) ERROR-MISSING MESSAGE
- U0427-64-CODE RESPONSE FROM RFHM (RADIO FREQUENCY HUB MODULE) ERROR-SIGNAL PLAUSIBILITY FAILURE
- U0427-87-CODE RESPONSE FROM RFHM (RADIO FREQUENCY HUB MODULE) ERROR-MISSING MESSAGE
- U0429-64-DTCM (DRIVE TRAIN CONTROL MODULE) PLAUSIBILITY ERROR-SIGNAL PLAUSIBILITY FAILURE
- U0432-68-SECURITY ACCESS VIOLATION-EVENT INFORMATION
- U0433-64-MINIKRIPT ERROR-SIGNAL PLAUSIBILITY FAILURE
- U0433-87-MINIKRIPT ERROR-MISSING MESSAGE
- U0434-64-BCM (BODY CONTROL MODULE) START RELAY FEEDBACK-SIGNAL PLAUSIBILITY FAILURE
- U0435-64-ECM (ENGINE CONTROL MODULE) START RELAY FEEDBACK-SIGNAL PLAUSIBILITY FAILURE
- U1411-09-IBS (BATTERY SENSOR NODE)-COMPONENT FAILURES
- U1411-87-IBS (BATTERY SENSOR NODE)-MISSING MESSAGE
- U1412-09-ASU (ALARM SIREN UNIT)-COMPONENT FAILURES
- U1412-87-ASU (ALARM SIREN UNIT)-MISSING MESSAGE
- U1413-09-UAM (ULTRASONIC AND ANTITILT MODULE)-COMPONENT FAILURES
- U1413-87-UAM (ULTRASONIC AND ANTITILT MODULE)-MISSING MESSAGE
- U1414-87-RLS (RAIN LIGHT SENSOR)-MISSING MESSAGE
- U1421-87-WSMD (WINDOW SMART MOTOR DRIVER)-MISSING MESSAGE
- U1422-87-WSMP (WINDOW SMART MOTOR PASSENGER)-MISSING MESSAGE
- U1451-87-RVCM (REAR VIEW CAMERA MODULE)-MISSING MESSAGE
- U1459-09-CSWC (CRUISE CONTROL STEERING WHEEL COMMANDS)-COMPONENT FAILURES

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- U1459-87-CSWC (CRUISE CONTROL STEERING WHEEL COMMANDS)-MISSING MESSAGE
- U145E-87-SWS (STEERING WHEEL SWITCH)-MISSING MESSAGE
- U145F-09-TSBM (TERRAIN SELECTOR SWITCHBANK MODULE)-COMPONENT FAILURES
- U145F-87-TSBM (TERRAIN SELECTOR SWITCHBANK MODULE)-MISSING MESSAGE
- U1701-86-ENGINE CONTROL MODULE (ECM) - SIGNAL INVALID
- U1701-87 ENGINE CONTROL MODULE (ECM) - MISSING MESSAGE
- U1701-8F-ECM (ENGINE CONTROL MODULE)-ERRATIC
- U1702-86-EPS (ELECTRIC POWER STEERING)-SIGNAL INVALID
- U1702-87-ELECTRICAL POWER STEERING (EPS) - MISSING MESSAGE
- U1703-86-IPC (INSTRUMENT PANEL CLUSTER) ON C CAN1-SIGNAL INVALID
- U1703-87-IPC (INSTRUMENT PANEL CLUSTER) ON C CAN1-MISSING MESSAGE
- U1705-86-RRM (RADIO RECEIVER MODULE)-SIGNAL INVALID
- U1705-87-RRM (RADIO RECEIVER MODULE)-MISSING MESSAGE
- U1706-86-BSM BRAKING SYESTEM MODULE - SIGNAL INVALID
- U1706-87-BSM BRAKING SYESTEM MODULE - MISSING MESSAGE
- U1710-86-ECC (ELECTRONIC CLIMATE CONTROL)-SIGNAL INVALID
- U1710-87-ECC (ELECTRONIC CLIMATE CONTROL)-MISSING MESSAGE
- U1711-86 DUAL CLUTCH TRANSMISSION MODULE (DCTM) OR TRANSMISSION CONTROL MODULE (TCM) - SIGNAL INVALID
- U1711-87 DUAL CLUTCH TRANSMISSION MODULE (DCTM) OR TRANSMISSION CONTROL MODULE (TCM) - MISSING MESSAGE
- U1721-86-ESL (ELECTRIC STEERING LOCK)-SIGNAL INVALID
- U1721-87-ESL (ELECTRIC STEERING LOCK)-MISSING MESSAGE
- U1722-86-AGSM-DCSM (GEAR SELECTOR MODULE) ON C CAN-SIGNAL INVALID
- U1722-87-AGSM-DCSM (GEAR SELECTOR MODULE) ON C CAN-MISSING MESSAGE
- U1724-86-PAM (PARKING ASSISTANT MODULE)-SIGNAL INVALID
- U1724-87-PAM (PARKING ASSISTANT MODULE)-MISSING MESSAGE
- U1726-86-OCCUPANT RESTRAINT CONTROL (ORC) - SIGNAL INVALID
- U1726-87-OCCUPANT RESTRAINT CONTROL (ORC) - MISSING MESSAGE
- U1729-86-AFLM (ADAPTIVE FRONT LIGHT MODULE)-SIGNAL INVALID
- U1729-87-AFLM (ADAPTIVE FRONT LIGHT MODULE)-MISSING MESSAGE
- U1730-86-HALF (HAPTIC LANE FEEDBACK)-SIGNAL INVALID
- U1730-87-HALF (HAPTIC LANE FEEDBACK)-MISSING MESSAGE
- U1736-86-LTM (LOWLEVEL TELEMATIC MODULE)-ETM (ENTERTAINMENT TELEMATIC MODULE)-SIGNAL INVALID
- U1736-87-LTM (LOWLEVEL TELEMATIC MODULE)-ETM (ENTERTAINMENT TELEMATIC MODULE)-MISSING MESSAGE
- U1746-86-AMP (AMPLIFIER MODULE)-SIGNAL INVALID
- U1746-87-AMP (AMPLIFIER MODULE)-MISSING MESSAGE
- U1748-86-CSWM (COMFORT SEAT WHEEL MODULE)-SIGNAL INVALID
- U1748-87-CSWM (COMFORT SEAT WHEEL MODULE)-MISSING MESSAGE
- U1751-86-LEFT BLIND SPOT SENSOR (LBSS) - SIGNAL INVALID
- U1751-87-LEFT BLIND SPOT SENSOR (LBSS) - MISSING MESSAGE
- U1752-86-RIGHT BLIND SPOT SENSOR (RBSS) - SIGNAL INVALID
- U1752-87-RIGHT BLIND SPOT SENSOR (RBSS) - MISSING MESSAGE
- U1757-86-DRIVE ASSISTANT SYSTEM MODULE (DASM) - SIGNAL INVALID
- U1757-87-DRIVE ASSISTANT SYSTEM MODULE (DASM) - MISSING MESSAGE
- U1763-86-TTM (TRAILER TOW MODULE)-SIGNAL INVALID
- U1763-87-TRAILER TOW MODULE (TTM) - MISSING MESSAGE
- U1765-86-RADIO FREQUENCY HUB MODULE (RFHM) - SIGNAL INVALID
- U1765-87-RADIO FREQUENCY HUB MODULE (RFHM) - MISSING MESSAGE
- U1767-86-DRIVE TRAIN CONTROL MODULE (DTCM) - SIGNAL INVALID
- U1767-87-DRIVE TRAIN CONTROL MODULE (DTCM) - MISSING MESSAGE

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- U1801-08-LIN 1-BUS SIGNAL/MESSAGE FAILURE
- U1802-08-LIN 2-BUS SIGNAL/MESSAGE FAILURE
- U1803-08-LIN 3-BUS SIGNAL/MESSAGE FAILURE
- U1804-08-LIN 4-BUS SIGNAL/MESSAGE FAILURE
- U1930-86-ECU OPERATIONALMODESTS-SIGNAL INVALID
- U1931-86-IPC (INSTRUMENT PANEL CLUSTER) ON BH CAN-SIGNAL INVALID
- U1931-87-IPC (INSTRUMENT PANEL CLUSTER) ON BH CAN-MISSING MESSAGE
- U1953-83-MESSAGE BRAKE1 PLAUSIBILITY ERROR (COUNTER)-VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1960-83-MESSAGE ENGINE1 PLAUSIBILITY ERROR-VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U196A-83-MESSAGE IMPACT INFO PLAUSIBILITY ERROR-VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U197C-67-MESSAGE TRANSM2 PLAUSIBILITY ERROR-SIGNAL INCORRECT AFTER EVENT
- U197C-83-MESSAGE TRANSM2 PLAUSIBILITY ERROR-VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U198C-83-MESSAGE CSWC 1 CRC PLAUSIBILITY ERROR (COUNTER)-VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U198D-83-MESSAGE CSWC 1 PLAUSIBILITY ERROR (CHECKSUM CALCULATION)-VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1990-67-MESSAGE RFHUB1 PLAUSIBILITY ERROR-SIGNAL INCORRECT AFTER EVENT
- U1990-83-MESSAGE RFHUB1 PLAUSIBILITY ERROR-VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT

Standard Procedure

- COMMUNICATION PRE-DIAGNOSTIC PROCEDURE
- BODY VERIFICATION TEST

MODULE, Comfort Seat and Wheel (CSWM)

Diagnosis and Testing

- B10C4-11-HEATED STEERING WHEEL CONTROL - CIRCUIT SHORT TO GROUND
- B10C4-12-HEATED STEERING WHEEL CONTROL - CIRCUIT SHORT TO BATTERY
- B10C4-13-HEATED STEERING WHEEL CONTROL - CIRCUIT OPEN
- B11C1-13-STEERING WHEEL HEATER POWER SUPPLY - CIRCUIT OPEN
- B1E99-11-FRONT LEFT HEATER CONTROL CIRCUIT - CIRCUIT SHORT TO GROUND
- B1E99-12-FRONT LEFT HEATER CONTROL CIRCUIT - CIRCUIT SHORT TO BATTERY
- B1E99-13-FRONT LEFT HEATER CONTROL CIRCUIT - CIRCUIT OPEN
- B1E99-1E-FRONT LEFT HEATER CONTROL CIRCUIT - CIRCUIT RESISTANCE OUT OF RANGE
- B1E9A-11-FRONT RIGHT HEATER CONTROL CIRCUIT - CIRCUIT SHORT TO GROUND
- B1E9A-12-FRONT RIGHT HEATER CONTROL CIRCUIT - CIRCUIT SHORT TO BATTERY
- B1E9A-13-FRONT RIGHT HEATER CONTROL CIRCUIT - CIRCUIT OPEN
- B1E9A-1E-FRONT RIGHT HEATER CONTROL CIRCUIT - CIRCUIT RESISTANCE OUT OF RANGE
- B1EB1-1A-FRONT LEFT SEAT HEATER SENSOR - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1EB1-1B-FRONT LEFT SEAT HEATER SENSOR - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B1EB2-1A-FRONT RIGHT SEAT HEATER SENSOR - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1EB2-1B-FRONT RIGHT SEAT HEATER SENSOR - CIRCUIT RESISTANCE ABOVE THRESHOLD
- B210C-16-BATTERY VOLTAGE - CIRCUIT VOLTAGE BELOW THRESHOLD
- B210C-17-BATTERY VOLTAGE - CIRCUIT VOLTAGE ABOVE THRESHOLD
- U0010-87-CAN BH BUS - MISSING MESSAGE
- U0010-88-CAN BH BUS - BUS OFF

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- U1446-64-IMPLAUSIBLE HEATED STEERING WHEEL TEMPERATURE MESSAGE (HSW TEMPERATURE SENSOR FAULT SIGNAL NOT AVAILABLE) - SIGNAL PLAUSIBILITY FAILURE
- U1700-86-BCM BODY COMPUTER MODULE-SIGNAL INVALID
- U1700-87-BCM-BODY CONTROL MODULE-MISSING MESSAGE
- U1700-87 BODY COMPUTER MODULE (BCM) - MISSING MESSAGE
- U1703-87-IPC (INSTRUMENT PANEL CLUSTER) - MISSING MESSAGE
- U1930-86-CSWM (COMFORT SEAT WHEEL MODULE) OPERATIONAL MODE STATUS - SIGNAL INVALID
- U1932-86-IGNITION WORKING CONDITION SIGNAL FROM BCM (BODY CONTROL MODULE) - SIGNAL INVALID

MODULE, Drivetrain Control (DTCM)

Diagnosis and Testing

- C2006-16-BATTERY VOLTAGE - CIRCUIT VOLTAGE BELOW THRESHOLD
- C2006-17-BATTERY VOLTAGE - CIRCUIT VOLTAGE ABOVE THRESHOLD
- C2010-16-BATTERY VOLTAGE 2ND THRESHOLD - CIRCUIT VOLTAGE BELOW THRESHOLD
- C2010-17-BATTERY VOLTAGE 2ND THRESHOLD - CIRCUIT VOLTAGE ABOVE THRESHOLD
- C2020-01-ECU INTERNAL FAULT - GENERAL ELECTRICAL FAILURE
- C2020-47-ECU INTERNAL FAULT - WATCHDOG-SAFETY uC FAILURE
- C2020-48-ECU INTERNAL FAULT - SUPERVISION SOFTWARE FAILURE
- C2020-94-ECU INTERNAL FAULT - UNEXPECTED OPERATION
- C2030-42-ECU SOFTWARE FAILURE - GENERAL MEMORY FAILURE
- C2050-1C-HALL SENSORS SUPPLY - CIRCUIT VOLTAGE OUT OF RANGE
- C2060-09-HALL SENSOR 1 - COMPONENT FAILURES
- C2070-09-HALL SENSOR 2 - COMPONENT FAILURES
- C2080-09-MOTOR 1 TEMPERATURE SENSOR - COMPONENT FAILURES
- C2080-64-MOTOR 1 TEMPERATURE SENSOR - SIGNAL PLAUSIBILITY FAILURE
- C2090-09-MOTOR 2 TEMPERATURE SENSOR - COMPONENT FAILURES
- C2100-04-MOTOR 1 - SYSTEM INTERNAL FAILURES
- C2100-13-MOTOR 1 - CIRCUIT OPEN
- C2100-14-MOTOR 1 - CIRCUIT SHORT TO GROUND
- C2100-15-MOTOR 1 - CIRCUIT SHORT TO BATTERY
- C2120-04-MOTOR 2 - SYSTEM INTERNAL FAILURES
- C2120-13-MOTOR 2 - CIRCUIT OPEN
- C2120-14-MOTOR 2 - CIRCUIT SHORT TO GROUND
- C2120-15-MOTOR 2 - CIRCUIT SHORT TO BATTERY
- C2150-98-MOTOR 1 POWER STAGE TEMP - COMPONENT OR SYSTEM OVER TEMPERATURE
- C2160-04-MOTOR 1 POWER STAGE TEST FAILURE - SYSTEM INTERNAL FAILURES
- C2180-98-MOTOR 2 POWER STAGE SWITCH TEMP - COMPONENT OR SYSTEM OVER TEMPERATURE
- C2190-98-MOTOR 2 POWER STAGE OVERLOAD - COMPONENT OR SYSTEM OVER TEMPERATURE
- C2200-04-MOTOR 2 POWER STAGE TEST - SYSTEM INTERNAL FAILURES
- C2201-64-OPERATIONALMODEST SIGNAL NOT AVAILABLE FROM BCM-COMMAND MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2202-64-TERRAINSWSTAT SIGNAL NOT AVAILABLE FROM LIN-BCM-IGW1 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2203-24-SWITCH1-RQ SIGNAL FROM LIN-BCM-IGW1 MESSAGE - SIGNAL STUCK HIGH
- C2204-24-SWITCH2-RQ SIGNAL FROM LIN-BCM-IGW1 MESSAGE - SIGNAL STUCK HIGH
- C2205-24-BODY2 EXTERNALTEMPERATURE - SIGNAL PLAUSIBILITY FAILURE
- C2206-64-LWSANGLE SIGNAL NOT AVAILABLE FROM GE MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2208-64-OVERSTEERING SIGNAL NOT AVAILABLE FROM BRAKE3 MESSAGE - SIGNAL PLAUSIBILITY FAILURE

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- C2209-64-UNDERSTEERING SIGNAL NOT AVAILABLE FROM BRAKE3 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2210-92-ETM HALL SENSOR - PERFORMANCE OR INCORRECT OPERATION
- C221B-64-ELDFAILSTS SIGNAL NOT VALID FROM BRAKE7 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C221D-98-MOTOR 1 POWER STAGE PERM - COMPONENT OR SYSTEM OVER TEMPERATURE
- C221E-64-BRAKE PEDAL SWITCH FAIL STATUS - SIGNAL PLAUSIBILITY FAILURE
- C221F-64-DRIVE STYLE STATUS SIGNAL - SIGNAL PLAUSIBILITY FAILURE
- C2220-54-ETM CALIBRATION ERROR - MISSING CALIBRATION
- C2224-64-ENGINESPEED SIGNAL NOT AVAILABLE FROM ENGINE1 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2225-64-ENGINESTS SIGNAL NOT AVAILABLE FROM ENGINE1 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2226-64-REVERSEGEARSTS SIGNAL NOT AVAILABLE FROM ENGINE1 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2227-64-ENGINETORQUE SIGNAL NOT AVAILABLE FROM ENGINE4 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2228-64-GASPEDALGRADIENT SIGNAL NOT AVAILABLE FROM ENGINE4 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2229-64-GEARENGAGED SIGNAL NOT AVAILABLE FROM TRANSM2 MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- C2230-98-ETM-ACTIVE-OVERHEAT-PROTECTION - COMPONENT OR SYSTEM OVER TEMPERATURE
- C2240-92-ETM MOTOR FREE RUNNING - PERFORMANCE OR INCORRECT OPERATION
- C2250-78-INVALID BACKLASH COUPLING - ALIGNMENT OR ADJUSTMENT INCORRECT
- C2260-63-INIT TIMEOUT EXPIRED - CIRCUIT/COMPONENT PROTECTION TIME-OUT
- C2270-77-EDA HALL SENSOR - COMMANDED POSITION NOT REACHABLE
- C2280-92-EDA CURRENT - PERFORMANCE OR INCORRECT OPERATION
- C2290-92-EDA MOTOR FREE RUNNING - PERFORMANCE OR INCORRECT OPERATION
- C2300-00-RDM CLASSIFICATION NOT VALID - NO SUBTYPE INFORMATION
- C2400-55-PROXI CONFIGURATION – NOT CONFIGURED OR PROXY DATA CONTAINS VALUES INVALID OR NOT CORRECT
- C2501-87-BRAKE8 OR GE OR LIN-BCM-IGW1 OR STATUS-ECM OR MOT-TRANSM3 MESSAGE MISSING - MISSING MESSAGE
- C2502-64-STATUS-ECM TCFAILSTS OR TRANSM2 TRANSMISSIONFAILSTS OR BRAKE8 DSTFAILSTS OR BRAKE8 ESCFAILSTS OR STATUS-ECM EMSFAILSTS OR GE ELECTRICSTEERINGFAILSTS - SIGNAL PLAUSIBILITY FAILURE
- C2503-87-INSTRUMENT PANEL CLUSTER - IPC - ABSENT
- C2504-87-BRAKE1 - MISSING MESSAGE
- C2506-64-TRANSM2 SHIFTLEVELPOSITION - SIGNAL PLAUSIBILITY FAILURE
- C2507-64-ENGINE3 ENGINETORQUEDRIVERREQ - SIGNAL PLAUSIBILITY FAILURE
- C2508-64-ENGINE 3 - MAX ENGINE TORQUE
- C2509-64-MOT TRANSM 1 - ENGINE TORQUE SELECT D TTC
- U0001-88-C CAN-1 BUS - BUS OFF
- U1700-87-BODY CONTROL MODULE - BCM - ABSENT
- U1701-87-ENGINE CONTROL MODULE - ECM - ABSENT
- U1702-87-ELECTRICAL POWER STEERING - EPS - ABSENT
- U1706-87-BRAKE SYSTEM MODULE - BSM - ABSENT
- U1710-87-BCM-COMMAND - MISSING MESSAGE
- U1711-87-AUTOMATIC-ROBOTIC GEAR BOX NCA-NCR - ABSENT
- U1952-83-MESSAGE COUNTER-CRC FAULT ON BRAKE1 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1956-83-MESSAGE COUNTER-CRC FAULT ON BRAKE3 MESSAGE - VALUE OF SIGNAL

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PROTECTION CALCULATION INCORRECT
U1958-83-MESSAGE COUNTER-CRC FAULT IN BSM YRS DATA - FROM BRAKE SYSTEM MODULE - MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1960-83-MESSAGE COUNTER-CRC FAULT ON ENGINE1 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1962-83-MESSAGE COUNTER-CRC FAULT ON ENGINE3 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1964-83-MESSAGE COUNTER-CRC FAULT ON ENGINE4 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1966-83-MESSAGE COUNTER/CRC FAULT IN GE (FROM ELECTRICAL POWER STEERING) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U196C-83-MESSAGE COUNTER/CRC FAULT ON MOT_TRANSM1 (FROM ENGINE CONTROL MODULE)MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1970-83-MESSAGE COUNTER-CRC FAULT ON TRANSM3 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1976-83-MESSAGE COUNTER-CRC FAULT ON BCM-COMMAND MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1978-83-MESSAGE COUNTER-CRC FAULT ON STATUS-EPB MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U197A-83-MESSAGE COUNTER-CRC FAULT ON TRANSM1 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U197C-83-MESSAGE COUNTER-CRC FAULT ON TRANSM2 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1984-83-MESSAGE COUNTER-CRC FAULT ON WHEEL-SPEED MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U198A-83-MESSAGE COUNTER-CRC FAULT ON BRAKE7 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U199A-87-BRAKE3 OR BSM-YRS-DATA MESSAGE MISSING - MISSING MESSAGE
U199B-87-BRAKE6 OR BRAKE7 OR BRAKE8 OR STATUS EPB MESSAGE MISSING - MISSING MESSAGE
U2000-64-WHEEL-SPEED-FRONT - SIGNAL PLAUSIBILITY FAILURE
U2001-64-WHEEL-SPEED -REAR - SIGNAL PLAUSIBILITY FAILURE
U2002-87-WHEEL-SPEED - MISSING MESSAGE
U2003-64-BSM-YRS-DATA LATACCELERATION OR BSM-YRS-DATA YAWRATE - SIGNAL PLAUSIBILITY FAILURE
U2004-64-BSM-YRS-DATA LONGACCELERATION - SIGNAL PLAUSIBILITY FAILURE
U2005-64-ENGINE1 GASPEDALPOSITION - SIGNAL PLAUSIBILITY FAILURE
U2006-64-STATUS-EPB EPBSTS - SIGNAL PLAUSIBILITY FAILURE
Standard Procedure
DTCM VERIFICATION TEST
TRANSFER CASE VERIFICATION TEST
MODULE, Dual Clutch Selector (DCSM)
Diagnosis and Testing
P0562-00-SYSTEM VOLTAGE LOW
P0563-00-SYSTEM VOLTAGE HIGH
P0606-00-CONTROL MODULE PROCESSOR
P0607-00-CONTROL MODULE PERFORMANCE
P060A-00-INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE
P0814-00-TRANSMISSION RANGE DISPLAY CIRCUIT
P081C-00-PARK INPUT CIRCUIT
P0914-00-GEAR SHIFT POSITION CIRCUIT LIGHT FAULT
P0919-00-GEAR SHIFT POSITION CONTROL ERROR HEAVY FAULT
P0928-00-GEAR SHIFT LOCK SOLENOID-ACTUATOR CONTROL CIRCUIT A-OPEN
P0929-00-GEAR SHIFT LOCK SOLENOID-ACTUATOR CONTROL CIRCUIT A RANGE-PERFORMANCE

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- P0955-00-AUTO SHIFT MANUAL MODE CIRCUIT GENERAL ELECTRICAL FAILURE
- P1C73-00-PARK SWITCH CIRCUIT STUCK
- P1C82-00-AUTO SHIFT MANUAL MODE CIRCUIT SIGNAL STUCK
- U0001-00-DUAL CLUTCH SHIFTER MODULE DCSM CAN COMMUNICATION BUS BUS OFF
- U0002-00-DUAL CLUTCH SHIFTER MODULE DCSM CAN COMMUNICATION BUS PERFORMANCE NODE MUTE
- U0100-00-LOST COMMUNICATION WITH ECM/PCM
- U0101-00-LOST COMMUNICATION WITH DCTM
- U0155-00-LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER IPC CONTROL MODULE
- U0401-00-INVALID DATA RECEIVED FROM ECM PCM A
- U0402-00-INVALID DATA RECEIVED FROM DCTM
- U0422-00-INVALID DATA RECEIVED FROM BODY CONTROL MODULE
- U0423-00-INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL
- U1400-00-LOST COMMUNICATION WITH BODY CONTROL MODULE
- U1701-00-ENGINE1 (FROM ENGINE CONTROL MODULE) MISSING MESSAGE
- U1930-00-DCSM_OPERATIONALMODESTS SNA PLAUSIBILITY
- U1932-00-BCM-COMMAND OPERATIONAL MODE STS (SNA) PLAUSIBILITY
- U1933-00-BCM_COMMAND (FROM BODY CONTROL MODULE) MISSING MESSAGE
- U1934-00-BCM_COMMAND FROM BCM AND BODY2 FROM BCM MISSING MESSAGE
- U193C-00-BCM_COMMAND (FROM BCM) AND ENGINE1 (FROM ECM) MISSING MESSAGE
- U1950-00-BCM COMMAND (FROM BODY CONTROL MODULE) MESSAGE CRC OR MESSAGE COUNTER FAULT
- U1960-00-ENGINE1 FROM ENGINE CONTROL MODULE MESSAGE CRC OR MESSAGE COUNTER FAULT
- U197C-00-TRANSM2 FROM TRANSMISSION CONTROL MODULE MESSAGE CRC OR MESSAGE COUNTER FAULT

Standard Procedure

- DCSM PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE
- DCSM VERIFICATION TEST

MODULE, Electric Power Steering (EPS)

Diagnosis and Testing

- C1000-68-ELECTRIC POWER STEERING (EPS) OVER TEMPERATURE - EVENT INFORMATION
- C1000-98-EPS OVER TEMPERATURE - COMPONENT OR SYSTEM OVER TEMPERATURE
- C1001-48-INTERNAL ERROR - SUPERVISION SOFTWARE FAILURE
- C1001-49-EPS - INTERNAL ELECTRONIC FAIILURE
- C1002-25-ABSOLUTE POSITION SENSOR - SIGNAL SHAPE/WAVEFORM FAILURE
- C1003-86-VEHICLE SPEED VSO SIGNAL - SIGNAL INVALID
- C1004-49-TORQUE SENSOR ERROR - INTERNAL ELECTRONIC FAILURE
- C1005-68-ELECTRIC POWER STEERING (EPS) LAMP FAILURE - EVENT INFORMATION
- C1005-86-STATUS LAMP FAILURE BCM - SIGNAL INVALID
- C1006-01-ELECTRIC MOTOR - GENERAL ELECTRICAL FAILURE
- C1007-87-C1 IGW1 MESSAGE FROM BODY CONTROL MODULE (BCM) IS MISSING - MISSING MESSAGE
- C1008-54-ABSOLUTE STEERING POSITION SENSOR NOT CALIBRATED- MISSING CALIBRATION
- C1009-09-EPS PERMANENT FAULT - COMPONENT FAILURE
- C100A-61-MESSAGE COUNTER FROM BRAKE2 MESSAGE - SIGNAL CALCULATION FAILURE
- C100A-86-MESSAGE COUNTER FROM BRAKE2 MESSAGE - SIGNAL INVALID
- C100B-86-MAX TIME TORQUE REQUEST FROM BRAKE SYSTEM MODULE (BSM) - SIGNAL INVALID
- C100C-86-MAX TIME TORQUE REQUEST FROM ABS - SIGNAL INVALID
- C100D-86-MAX VALUE OR EXOR FROM BRAKE SYSTEM MODULE (BSM) - SIGNAL INVALID

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C100E-86-TORQUE OVERLAY CONTROLLER (TOC) STATUS ERROR FROM BSM - SIGNAL INVALID
C100F-08-BRAKE2 MESSAGE FROM BRAKE SYSTEM MODULE (BSM) - BUS SIGNAL/MESSAGE FAILURE
C100F-86-TOC STATUS ERROR FROM ABS - SIGNAL INVALID
C100F-87-BRAKE2 MESSAGE FROM BRAKE SYSTEM MODULE (BSM) - MISSING MESSAGE
C1010-86-MAX RATE FROM BRAKE SYSTEM MODULE (BSM) - SIGNAL INVALID
C1011-85-MAX VALUE FROM HALF MODULE (HALF) - SIGNAL INVALID
C1012-85-MAX RATE FROM HALF MODULE (HALF) - SIGNAL ABOVE ALLOWABLE RANGE
C1013-49-HALF MODULE FAULTY - INTERNAL ELECTRONIC FAILURE
C1013-86-HALF MODULE FAULTY - SIGNAL INVALID
C1014-86-PARKING AID MODULE (PAM) INCORRECT DEACTIVATION - SIGNAL INVALID
C1015-92-PARKING AID MODULE (PAM) - PERFORMANCE OR INCORRECT OPERATION
C1016-85-PARKING AID MODULE (PAM) - SIGNAL ABOVE ALLOWABLE RANGE
C1017-86-DRIVESTYLE STS SIGNAL FROM BODY2 MESSAGE NOT VALID - SIGNAL INVALID
C1018-68-VIN MESSAGE FROM BODY CONTROL MODULE (BCM) IS MISSING - EVENT INFORMATION
C1019-68-VEHICLE STANDSTILL STS SIGNAL FROM BRAKE4 MESSAGE IS MISSING - EVENT INFORMATION
C1020-68-WHEEL INFO MESSAGE IS MISSING - EVENT INFORMATION
C1200-16-BATTERY VOLTAGE - BELOW TRESHOLD
C1200-17-BATTERY VOLTAGE - ABOVE THRESHOLD
C1200-1C-BATTERY VOLTAGE - CIRCUIT VOLTAGE OUT OF RANGE
C1200-1F-BATTERY VOLTAGE - CIRCUIT INTERMITTENT
C1214-62-CONF DATA CODE REQUEST MESSAGE - SIGNAL COMPARE FAILURE
C1214-87-CONF DATA CODE REQUEST MESSAGE - MISSING MESSAGE
C1230-51-BCM PROXI NOT PROGRAMMED - NOT PROGRAMMED
U1001-87-CAN C BUS - MISSING MESSAGE
U1001-88-CAN C BUS - BUS OFF
U1700-86-BCM BODY COMPUTER MODULE - SIGNAL INVALID
U1700-87 BODY COMPUTER MODULE (BCM) - MISSING MESSAGE
U1701-86-ENGINE CONTROL MODULE (ECM) - SIGNAL INVALID
U1701-87-ENGINE CONTROL MODULE (ECM) - MISSING MESSAGE
U1703-87-INSTRUMENT PANEL CLUSTER (IPC) - MISSING MESSAGE
U1706-87-BRAKE SYSTEM MODULE (BSM) - MISSING MESSAGE
U1724-87-PARKING AID MODULE (PAM) - MISSING MESSAGE
U1730-87-HAPTIC LANE FEEDBACK MODULE (HALF) - MISSING MESSAGE
U1932-86-OPERATIONAL MODE STS SIGNAL FROM BCM COMMAND MESSAGE NOT VALID - SIGNAL INVALID
U1950-83-MESSAGE COUNTER/CRC FAULT ON BCM COMMAND MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1952-83-MESSAGE COUNTER/CRC FAULT ON BRAKE1 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1954-83-CYCLIC REDUNDANCY CHECK (CRC) FROM BRAKE2 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1960-83-MESSAGE COUNTER/CRC FAULT ON ENGINE1 MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1968-83-MESSAGE COUNTER/CRC FAULT ON HALF STEER CONTROL MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1976-83-MESSAGE COUNTER/CRC FAULT ON SPM STEER CONTROL MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
U1982-83-MESSAGE COUNTER/CRC FAULT ON WHEEL INFO MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT

Standard Procedure

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- EPS VERIFICATION TEST
- EPS - STEERING ANGLE CALIBRATION PROCEDURE

MODULE, Electronic Shift (ESM), 948TE

Diagnosis and Testing

- P0562-00-SYSTEM VOLTAGE LOW
- P0563-00-SYSTEM VOLTAGE HIGH
- P0606-00-CONTROL MODULE PROCESSOR
- P0607-00-CONTROL MODULE PERFORMANCE
- P060A-00-INTERNAL CONTROL MODULE MONITORING PROCESSOR PERFORMANCE
- P0814-00-TRANSMISSION RANGE DISPLAY CIRCUIT
- P081C-00-PARK INPUT CIRCUIT
- P0914-00-GEAR SHIFT POSITION CIRCUIT (LIGHT FAULT)
- P0919-00-GEAR SHIFT POSITION CONTROL ERROR (HEAVY FAULT)
- P0928-00-GEAR SHIFT LOCK SOLENOID ACTUATOR CONTROL CIRCUIT A OPEN
- P0929-00-GEAR SHIFT LOCK SOLENOID ACTUATOR CONTROL CIRCUIT A RANGE PERFORMANCE
- P0955-00-AUTO SHIFT MANUAL MODE CIRCUIT (GENERAL ELECTRICAL FAILURE)
- P1C73-00-PARK SWITCH CIRCUIT STUCK
- P1C82-00-AUTO SHIFT MANUAL MODE CIRCUIT (SIGNAL STUCK)
- P1CA7-00-IGNITION SOLENOID CONTROL CIRCUIT (SHORT TO BATTERY OR OPEN)
- P1CA8-00-IGNITION SOLENOID CONTROL CIRCUIT (SHORT TO GROUND)
- U0001-00-AUTOMATIC GEARBOX SHIFTER MODULE (AGSM) CAN COMMUNICATION BUS (BUS OFF)
- U0002-00-AUTOMATIC GEARBOX SHIFTER MODULE (AGSM) CAN COMMUNICATION BUS PERFORMANCE (NODE MUTE)
- U0100-00-LOST COMMUNICATION WITH ECM/PCM
- U0101-00-LOST COMMUNICATION WITH TCM
- U0129-00-LOST COMMUNICATION WITH BRAKE SYSTEM CONTROL MODULE
- U0140-00-LOST COMMUNICATION WITH BODY CONTROL MODULE
- U0155-00-LOST COMMUNICATION WITH CLUSTER-CCN
- U0401-00-INVALID DATA RECEIVED FROM ECM PCM A
- U0402-00-INVALID DATA RECEIVED FROM TCM
- U0418-00-INVALID DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE
- U0422-00-INVALID DATA RECEIVED FROM BODY CONTROL MODULE
- U0423-00-INVALID DATA RECEIVED FROM INSTRUMENT PANEL CLUSTER CONTROL
- U1701-00-ENGINE1 (FROM ENGINE CONTROL MODULE) MISSING MESSAGE
- U1930-00-AGSM_OPERATIONALMODESTS (SNA) PLAUSIBILITY
- U1932-00-BCM-COMMAND OPERATIONAL MODE STS (SNA) PLAUSIBILITY
- U1933-00-BCM_COMMAND (FROM BODY CONTROL MODULE) MISSING MESSAGE
- U1934-00-BCM_COMMAND (FROM BCM) AND BODY2 (FROM BCM) MISSING MESSAGE
- U193C-00-BCM_COMMAND (FROM BCM) AND ENGINE1 (FROM ECM) MISSING MESSAGE
- U1950-00-BCM COMMAND (FROM BODY CONTROL MODULE) MESSAGE CRC OR MESSAGE COUNTER FAULT

Standard Procedure

- PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE
- ELECTRONIC SHIFT MODULE (ESM) VERIFICATION TEST

MODULE, Electronic Steering Lock (ESL)

Diagnosis and Testing

- B1000-01-ELECTRONIC CONTROL UNIT - GENERAL ELECTRICAL FAILURE
- B1001-16-POWER SUPPLY - CIRCUIT VOLTAGE BELOW THRESHOLD
- B1001-17-POWER SUPPLY - CIRCUIT VOLTAGE ABOVE THRESHOLD
- B100A-64-COMMAND IGNITION STATUS - SIGNAL PLAUSIBILITY FAILURE
- B1010-09-STEERING LOCK MOTOR - COMPONENT FAILURES

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- B1010-71-STEERING LOCK MOTOR - ACTUATOR STUCK
- B1011-64-STEERING LOCK MOTOR SENSOR - SIGNAL PLAUSIBILITY FAILURE
- B1013-62-HARDWIRED VEHICLE SPEED SIGNAL FROM BSM BRAKING SYSTEM MODULE - SIGNAL COMPARE FAILURE
- B1014-86-VEHICHLE SPEED FROM BRAKING SYSTEM MODULE BSM - SIGNAL INVALID
- B1015-23-INT SIGNAL 15V - SIGNAL STUCK LOW
- B1015-67-INT SIGNAL 15V - SIGNAL INCORRECT AFTER EVENT
- U0001-87-C CAN - MISSING MESSAGE
- U0001-88-C CAN - BUS OFF
- U0426-31-MINICRYPT ERROR - NO SIGNAL
- U0426-62-MINICRYPT ERROR - SIGNAL COMPARE FAILURE
- U1700-86-BCM BODY COMPUTER MODULE-SIGNAL INVALID
- U1700-87 BODY COMPUTER MODULE (BCM) - MISSING MESSAGE
- U1700-8F-BODY CONTROL MODULE BCM - ERRATIC
- U1701-86-ENGINE CONTROL MODULE (ECM) - SIGNAL INVALID
- U1701-87 ENGINE CONTROL MODULE (ECM) - MISSING MESSAGE
- U1703-86 INSTRUMENT PANEL CLUSTER (IPC) - SIGNAL INVALID
- U1703-87-IPC (INSTRUMENT PANEL CLUSTER) - MISSING MESSAGE
- U1706-86-BRAKE SYSTEM MODULE (BSM) - SIGNAL INVALID
- U1706-87 BRAKING SYSTEM MODULE (BSM) - MISSING MESSAGE
- U1930-86-OPERATIONAL MODE STATUS - SIGNAL INVALID
- U1932-86-OPERATIONAL MODE STATUS SIGNAL FROM CAN - SIGNAL INVALID
- U1950-83-MESSAGE BCM COMMAND PLAUSIBILITY ERROR - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1952-83-MESSAGE BRAKE1 PLAUSIBILITY ERROR - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT

⊟ Standard Procedures

- ELECTRONIC STEERING LOCK (ESL) PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE
- ELECTRONIC STEERING LOCK (ESL) VERIFICATION TEST

⊟ MODULE, Forward Facing Camera (FFCM)

⊟ Diagnosis and Testing

- B1001-16-POWER SUPPLY - CIRCUIT VOLTAGE BELOW THRESHOLD
- B1001-17-POWER SUPPLY - CIRCUIT VOLTAGE ABOVE THRESHOLD
- B1006-49-HALF (HAPTIC LANE FEEDBACK) - INTERNAL ELECTRONIC FAILURE
- B1007-54-HALF (HAPTIC LANE FEEDBACK) - MISSING CALIBRATION
- C0063-29-YAW RATE SENSOR FROM BRAKE SYSTEM MODULE - SIGNAL - SIGNAL INVALID
- C0546-00-VIN (VEHICLE IDENTIFICATION NUMBER) IMPLAUSIBLE OR INCOMPATIBLE FROM BODY CONTROL MODULE - NO SUBTYPE INFORMATION
- C1003-29-VEHICLE SPEED INFORMATION FROM BRAKE SYSTEM MODULE - SIGNAL - SIGNAL INVALID
- C14A5-97-SENSOR BLINDED - COMPONENT OR SYSTEM OPERATION OBSTRUCTED OR BLOCKED
- C14AA-64-SENSOR ADJUSTMENT REQUIRED - SIGNAL PLAUSIBILITY FAILURE
- C2210-4B-ECU OVERTEMPERATURE - OVER TEMPERATURE
- U0001-88-C3 CAN BUS (PRIVATE) - BUS OFF
- U0101-87-C2 CAN BUS - MISSING MESSAGE
- U0101-88-C2 CAN BUS - BUS OFF
- U0422-29-IMPLAUSIBLE DATA RECEIVED FROM BODY CONTROL MODULE - SIGNAL - SIGNAL INVALID
- U1700-86-BODY COMPUTER (BCM) - NODE FAULTY
- U1700-87-BODY COMPUTER (BCM) - NODE ABSENT
- U1701-87 ENGINE CONTROL MODULE (ECM) - MISSING MESSAGE
- U1702-29-ELECTRIC POWER STEERING (EPS) - SIGNAL - SIGNAL INVALID

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- U1702-64-ELECTRIC POWER STEERING (EPS) - SIGNAL PLAUSIBILITY FAILURE
- U1702-86-ELECTRIC POWER STEERING (EPS) - SIGNAL INVALID
- U1702-87-ELECTRICAL POWER STEERING (EPS) - MISSING MESSAGE
- U1706-86-BRAKE SYSTEM MODULE (BSM) - SIGNAL INVALID
- U1706-87-BRAKE SYSTEM MODULE (BSM) - MISSING MESSAGE
- U1931-86-HALF (HAPTIC LANE FEEDBACK) OPERATIONAL MODE STATUS - SIGNAL INVALID
- U1932-86-IGNITION WORKING CONDITION SIGNAL FROM BODY CONTROL MODULE - SIGNAL INVALID
- U1950-83-BCM_COMMAND (FROM BODY CONTROL MODULE) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1952-83-BRAKE1 (FROM BRAKE SYSTEM MODULE) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1958-83-BSM_YRS_DATA (FROM BRAKE SYSTEM MODULE) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U195E-83-EPS_TORQUE_OVERLAY (FROM ELECTRIC POWER STEERING) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1966-83-GE (FROM ELECTRIC POWER STEERING) - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT

⊟ Standard Procedure

- FORWARD FACING CAMERA VERIFICATION TEST

⊟ MODULE, Powertrain Control (PCM), EMEA

⊟ Diagnosis and Testing

- P0016-00 OFFSET BETWEEN CAMSHAFT AND CRANKSHAFT (WRONG MOUNTING POSITION)
- P0031-00 UPSTREAM LAMBDA SENSOR HEATER COMMAND (CIRCUIT SHORT TO GROUND OR OPEN)
- P0032-00 UPSTREAM LAMBDA SENSOR HEATER COMMAND (CIRCUIT SHORT TO BATTERY)
- P0033-00 DUMP VALVE TURBO (OPEN CIRCUIT)
- P0034-00 DUMP VALVE TURBO (CIRCUIT SHORT TO BATTERY)
- P0035-00 DUMP VALVE TURBO (CIRCUIT SHORT TO GROUND)
- P0037-00 DOWNSTREAM LAMBDA SENSOR HEATER COMMAND (CIRCUIT SHORT TO GROUND OR OPEN)
- P0038-00 DOWNSTREAM LAMBDA SENSOR HEATER COMMAND (CIRCUIT SHORT TO BATTERY)
- P0039-00-DUMP VALVE FUNCTIONAL TEST (ACTUATOR STUCK CLOSED)
- P0054-00-DOWNSTREAM LAMBDA SENSOR RESISTANCE (SIGNAL COMPARE FAILURE)
- P0068-00-MANIFOLD PRESSURE UP THROTTLE AT KEY ON (SIGNAL COMPARE FAILURE)
- P0069-00 MANIFOLD PRESSURE AND ATMOSPHERIC PRESSURE PLAUSIBILITY (SIGNAL COMPARE FAILURE)
- P0105-00 INTAKE MANIFOLD PRESSURE SENSOR (SIGNAL RATE OF CHANGE BELOW THRESHOLD)
- P0106-00 INTAKE MANIFOLD PRESSURE SENSOR (SIGNAL RATE OF CHANGE ABOVE THRESHOLD)
- P0107-00 INTAKE MANIFOLD PRESSURE SENSOR (CIRCUIT SHORT TO GROUND OR OPEN)
- P0108-00 INTAKE MANIFOLD PRESSURE SENSOR (CIRCUIT SHORT TO BATTERY)
- P0111-00 AIR TEMPERATURE SENSOR PLAUSIBILITY (SIGNAL COMPARE FAILURE)
- P0112-00 AIR TEMPERATURE SENSOR ELETRICAL FAILURE (CIRCUIT SHORT TO GROUND)
- P0113-00 AIR TEMPERATURE SENSOR ELETRICAL FAILURE (CIRCUIT SHORT TO BATTERY OR OPEN)
- P0114-00 AIR TEMPERATURE SENSOR ELETRICAL FAILURE (SIGNAL HAS TOO MANY PULSES)
- P0116-00 ENGINE COOLANT TEMPERATURE SENSOR PLAUSIBILITY (SIGNAL COMPARE FAILURE)
- P0117-00 ENGINE COOLANT TEMPERATURE SENSOR SIGNAL (CIRCUIT SHORT TO GROUND)

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- P0118-00 ENGINE COOLANT TEMPERATURE SENSOR SIGNAL (CIRCUIT SHORT TO BATTERY OR OPEN)
- P0119-00 ENGINE COOLANT TEMPERATURE SENSOR (SIGNAL HAS TOO MANY PULSES)
- P0122-00 THROTTLE POTENTIOMETER SENSOR 1 (CIRCUIT SHORT TO GROUND OR OPEN)
- P0123-00 THROTTLE POTENTIOMETER SENSOR 1 (CIRCUIT SHORT TO BATTERY)
- P0130-00 UPSTREAM LAMBDA SENSOR ELECTRICAL TEST (GENERAL ELECTRICAL FAILURE)
- P0133-00 UPSTREAM LAMBDA SENSOR SLOW RESPONCE (SIGNAL COMPARE FAILURE)
- P0138-00 DOWNSTREAM LAMBDA SENSOR ELECTRICAL TEST (CIRCUIT SHORT TO BATTERY)
- P0139-00 DOWNSTREAM LAMBDA SENSOR SLOW RESPONSE (SIGNAL COMPARE FAILURE)
- P0171-00 FUEL SYSTEM LEAN (SIGNAL COMPARE FAILURE)
- P0172-00 FUEL SYSTEM RICH (SIGNAL COMPARE FAILURE)
- P0196-00-OIL TEMPERATURE SENSOR (SIGNAL AMPLITUDE <MINIMUM)
- P0197-00 ENGINE OIL TEMPERATURE SENSOR (CIRCUIT SHORT TO GROUND)
- P0198-00 ENGINE OIL TEMPERATURE SENSOR (CIRCUIT SHORT TO BATTERY OR OPEN)
- P0199-00-OIL TEMPERATURE SENSOR (SIGNAL HAS TOO MANY PULSES)
- P0201-00 INJECTOR 1 COMMAND (OPEN CIRCUIT)
- P0202-00 INJECTOR 2 COMMAND (OPEN CIRCUIT)
- P0203-00 INJECTOR 3 COMMAND (OPEN CIRCUIT)
- P0204-00 INJECTOR 4 COMMAND (OPEN CIRCUIT)
- P0219-00 ENGINE OVERSPEED RECOGNITION (EVENT INFORMATION)
- P0222-00 THROTTLE POTENTIOMETER SENSOR 2 (CIRCUIT SHORT TO GROUND OR OPEN)
- P0223-00 THROTTLE POTENTIOMETER SENSOR 2 (CIRCUIT SHORT TO BATTERY)
- P0234-00 WASTE GATE VALVE (SIGNAL CALCULATION FAILURE)
- P0236-00-AIR LEAKAGE IN TURBOCHARGER (SIGNAL COMPARE FAILURE)
- P0237-00 TURBOCHARGER PRESSURE SENSOR (CIRCUIT SHORT TO GROUND OR OPEN)
- P0238-00 TURBOCHARGER PRESSURE SENSOR (CIRCUIT SHORT TO BATTERY)
- P023D-00-TURBOCHARGER PRESSURE AND MANIFOLD PRESSURE PLAUSIBILITY (SIGNAL RATE OF CHANGE ABOVE THRESHOLD)
- P023E-00-TURBOCHARGER PRESSURE AND MANIFOLD PRESSURE PLAUSIBILITY (SIGNAL RATE OF CHANGE BELOW THRESHOLD)
- P0243-00 WASTE GATE VALVE (OPEN CIRCUIT)
- P0245-00 WASTE GATE VALVE (CIRCUIT SHORT TO GROUND)
- P0246-00 WASTE GATE VALVE (CIRCUIT SHORT TO BATTERY)
- P0261-00 INJECTOR 1 COMMAND (CIRCUIT SHORT TO GROUND)
- P0262-00 INJECTOR 1 COMMAND (CIRCUIT SHORT TO BATTERY)
- P0264-00 INJECTOR 2 COMMAND (CIRCUIT SHORT TO GROUND)
- P0265-00 INJECTOR 2 COMMAND (CIRCUIT SHORT TO BATTERY)
- P0267-00 INJECTOR 3 COMMAND (CIRCUIT SHORT TO GROUND)
- P0268-00 INJECTOR 3 COMMAND (CIRCUIT SHORT TO BATTERY)
- P0270-00 INJECTOR 4 COMMAND (CIRCUIT SHORT TO GROUND)
- P0271-00 INJECTOR 4 COMMAND (CIRCUIT SHORT TO BATTERY)
- P0299-00 WASTE GATE VALVE (SIGNAL COMPARE FAILURE)
- P0300-00 MISFIRE RANDOM (PERFORMANCE OR INCORRECT OPERATION OR COMPONENT OR SYSTEM OVER TEMPERATURE MISFIRE 1000 OR MISFIRE 200)
- P0301-00 MISFIRE CYLINDER 1 (PERFORMANCE OR INCORRECT OPERATION COMPONENT OR SYSTEM OVER TEMPERATURE OR MISFIRE 1000)
- P0302-00 MISFIRE CYLINDER 2 (PERFORMANCE OR INCORRECT OPERATION COMPONENT OR SYSTEM OVER TEMPERATURE OR MISFIRE 1000)
- P0303-00 MISFIRE CYLINDER 3 (PERFORMANCE OR INCORRECT OPERATION COMPONENT OR SYSTEM OVER TEMPERATURE OR MISFIRE 1000)

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- P0304-00 MISFIRE CYLINDER 4 (PERFORMANCE OR INCORRECT OPERATION COMPONENT OR SYSTEM OVER TEMPERATURE OR MISFIRE 1000)
- P0324-00 KNOCK SENSOR (ENGINE NOT RUNNING OR INTERNAL ELECTRONIC FAILURE)
- P0325-00 KNOCK SENSOR (CIRCUIT SHORT TO BATTERY)
- P0326-00 KNOCK SENSOR (ENGINE NOT RUNNING OR SIGNAL PLAUSIBILITY FAILURE)
- P0327-00 KNOCK SENSOR (ENGINE NOT RUNNING OR CIRCUIT SHORT TO GROUND)
- P0328-00 KNOCK SENSOR (ENGINE NOT RUNNING OR CIRCUIT SHORT TO BATTERY)
- P0335-00 ENGINE SPEED SENSOR (SIGNAL COMPARE FAILURE)
- P0340-00 CAMSHAFT SENSOR (SIGNAL COMPARE FAILURE)
- P0342-00 CAMSHAFT SENSOR (CIRCUIT SHORT TO GROUND)
- P0343-00 CAMSHAFT SENSOR (CIRCUIT SHORT TO BATTERY OR OPEN)
- P0351-00 CYLINDER 1 IGNITION COIL (CIRCUIT SHORT TO GROUND OR OPEN)
- P0352-00 CYLINDER 2 IGNITION COIL (CIRCUIT SHORT TO GROUND OR OPEN)
- P0353-00 CYLINDER 3 IGNITION COIL (CIRCUIT SHORT TO GROUND OR OPEN)
- P0354-00 CYLINDER 4 IGNITION COIL (CIRCUIT SHORT TO GROUND OR OPEN)
- P0420-00 CATALYST EFFICIENCY (SIGNAL COMPARE FAILURE)
- P0444-00 PURGE CANISTER VALVE (OPEN CIRCUIT)
- P0453-00-PURGE CANISTER VALVE (ACTUATOR STUCK OPEN)
- P0458-00 PURGE CANISTER VALVE (CIRCUIT SHORT TO GROUND)
- P0459-00 PURGE CANISTER VALVE (CIRCUIT SHORT TO BATTERY)
- P0460-00-FUEL LEVEL SENSOR (FAULT INFO FROM BODY CONTROL MODULE SIGNAL INVALID)
- P0480-00 COOLING FAN 1 (OPEN CIRCUIT)
- P0481-00 COOLING FAN 2 (OPEN CIRCUIT)
- P0500-00 VEHICLE SPEED (EVENT INFORMATION)
- P0503-00-VEHICLE SPEED (SIGNAL PLAUSIBILITY FAILURE)
- P0504-00-BRAKE PEDAL SWITCH (SIGNAL COMPARE FAILURE OR INVALID SIGNAL)
- P0513-00 IMMOBILIZER (SIGNAL COMPARE FAILURE)
- P0520-00 OIL PRESSURE SWITCH (SIGNAL INCORRECT AFTER EVENT)
- P0532-00 AIR CONDITIONER PRESSURE SENSOR (CIRCUIT SHORT TO GROUND OR OPEN)
- P0533-00 AIR CONDITIONER PRESSURE SENSOR (CIRCUIT SHORT TO BATTERY)
- P0562-00 UPSTREAM MAIN RELAY BATTERY VOLTAGE (CIRCUIT VOLTAGE BELOW THRESHOLD)
- P0563-00 UPSTREAM MAIN RELAY BATTERY VOLTAGE (CIRCUIT VOLTAGE ABOVE THRESHOLD)
- P0564-00 CRUISE CONTROL OR SPEED LIMITER (SIGNAL INVALID)
- P0571-00 BRAKE SWITCH (STUCK OPEN OR OPEN CIRCUIT)
- P0572-00 BRAKE SWITCH (STUCK CLOSED)
- P0578-00-CRUISE CONTROL OR SPEED LIMITER SWITCH COMMAND STUCK
- P0604-00 CONTROL UNIT FAULTY (RAM SIGNAL COMPARE FAILURE)
- P0605-00 CONTROL UNIT FAULTY (ROM INTERNAL ELECTRONIC FAILURE)
- P0606-00 CONTROL UNIT FAULTY (MICROPROCESSOR WATCHDOG/SAFETY µC FAILURE)
- P0607-00 CONTROL UNIT FAULTY (MICROPROCESSOR PERFORMANCE OR INCORRECT OPERATION)
- P060B-00 A/D CONVERTER (INTERNAL ELECTRONIC FAILURE)
- P060C-00 CONTROL UNIT FAULTY (SAFETY STOP ENGINE SIGNAL COMPARE FAILURE)
- P0615-00 STARTER RELAY COMMAND (OPEN CIRCUIT)
- P0616-00 STARTER RELAY COMMAND (CIRCUIT SHORT TO GROUND)
- P0617-00 STARTER RELAY COMMAND (CIRCUIT SHORT TO BATTERY)
- P0627-00 FUEL PUMP RELAY COMMAND (OPEN CIRCUIT)
- P0628-00 FUEL PUMP RELAY COMMAND - CIRCUIT SHORT TO GROUND
- P0629-00 FUEL PUMP RELAY COMMAND - CIRCUIT SHORT TO BATTERY
- P062F-00 CONTROL UNIT FAULTY (EEPROM OR DATA MEMORY FAILURE)

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- P0641-00 SENSOR SUPPLY 1 (INTERNAL ELECTRONIC FAILURE)
- P0645-00 AIR CONDITIONER COMPRESSOR RELAY (OPEN CIRCUIT)
- P0646-00 AIR CONDITIONER COMPRESSOR RELAY (CIRCUIT SHORT TO GROUND)
- P0647-00 AIR CONDITIONER COMPRESSOR RELAY (CIRCUIT SHORT TO BATTERY)
- P0651-00 SENSOR SUPPLY 2 (INTERNAL ELECTRONIC FAILURE)
- P0658-00 DOWNSTREAM MAIN RELAY BATTERY VOLTAGE (CIRCUIT VOLTAGE BELOW THRESHOLD)
- P0659-00 DOWNSTREAM MAIN RELAY BATTERY VOLTAGE (CIRCUIT VOLTAGE ABOVE THRESHOLD)
- P065A-00-INTELLIGENT ALTERNATOR MODULE PERFORMANCE (EVENT INFORMATION)
- P065B-00-INTELLIGENT ALTERNATOR MODULE (GENERAL ELECTRICAL FAILURE)
- P065C-00-INTELLIGENT ALTERNATOR MODULE (MECHANICAL FAILURES)
- P0685-00 MAIN RELAY COMMAND (OPEN CIRCUIT)
- P0686-00 MAIN RELAY COMMAND (CIRCUIT SHORT TO GROUND)
- P0687-00 MAIN RELAY COMMAND (CIRCUIT SHORT TO BATTERY)
- P0691-00 COOLING FAN 1 (CIRCUIT SHORT TO GROUND)
- P0692-00 COOLING FAN 1 (CIRCUIT SHORT TO BATTERY)
- P0693-00 COOLING FAN 2 (CIRCUIT SHORT TO GROUND)
- P0694-00 COOLING FAN 2 (CIRCUIT SHORT TO BATTERY)
- P0697-00 SENSOR SUPPLY 3 (INTERNAL ELECTRONIC FAILURE)
- P0703-00 REDUNDANT BRAKE SWITCH (STUCK OPEN OR OPEN CIRCUIT)
- P0806-00 CLUTCH PEDAL POSITION SENSOR CIRCUIT RANGE/PERFORMANCE (SIGNAL PLAUSIBILITY FAILURE)
- P0807-00 CLUTCH PEDAL POSITION SENSOR (CIRCUIT SHORT TO GROUND OR OPEN)
- P0808-00 CLUTCH PEDAL POSITION SENSOR (CIRCUIT SHORT TO BATTERY)
- P080A-00 CLUTCH POSITION NOT LEARNT (NOT CONFIGURED)
- P0810-00 CLUTCH POSITION NOT LEARNT (SIGNAL COMPARE FAILURE)
- P0812-00-REVERSE GEAR SWITCH - UNEXPECTED OPERATION
- P086A-00-NEUTRAL GEAR POSITION PLAUSIBILITY
- P086B-00-NEUTRAL GEAR SENSOR (SIGNAL FREQUENCY INCORRECT)
- P086C-00-NEUTRAL GEAR SENSOR (CIRCUIT SHORT TO GROUND)
- P086D-00-NEUTRAL GEAR SENSOR (CIRCUIT SHORT TO BATTERY OR OPEN)
- P086E-00-NEUTRAL GEAR SENSOR FREQUENCY (SIGNAL FREQUENCY INCORRECT)
- P086F-00-FIRST AND NEUTRAL GEAR POSITION LEARNING (NOT CONFIGURED)
- P0A1A-00-INTELLIGENT ALTERNATOR MODULE OVERTEMPERATURE (COMPONENT OR SYSTEM OVER TEMPERATURE)
- P1000-00-FIRST START POWER LIMITATION (SIGNAL INVALID)
- P101A-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE (CIRCUIT CURRENT ABOVE THRESHOLD)
- P101B-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE (CIRCUIT CURRENT ABOVE THRESHOLD)
- P101C-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE (CIRCUIT CURRENT ABOVE THRESHOLD)
- P101D-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE (CIRCUIT CURRENT ABOVE THRESHOLD)
- P1021-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE DRIVE (PROGRAM MEMORY FAILURE)
- P1022-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE DRIVE (PROGRAM MEMORY FAILURE)
- P1023-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE DRIVE (PROGRAM MEMORY FAILURE)
- P1024-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE DRIVE (PROGRAM MEMORY FAILURE)
- P1025-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE DRIVE (CIRCUIT VOLTAGE

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BELOW THRESHOLD)
P1026-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE DRIVE (CIRCUIT VOLTAGE ABOVE THRESHOLD)
P1027-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE DRIVE (CIRCUIT VOLTAGE BELOW THRESHOLD)
P1028-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE DRIVE (CIRCUIT VOLTAGE ABOVE THRESHOLD)
P1029-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE DRIVE (CIRCUIT VOLTAGE BELOW THRESHOLD)
P102A-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE DRIVE (CIRCUIT VOLTAGE ABOVE THRESHOLD)
P102B-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE DRIVE (CIRCUIT VOLTAGE BELOW THRESHOLD)
P102C-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE DRIVE (CIRCUIT VOLTAGE ABOVE THRESHOLD)
P1031-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (SIGNAL PLAUSIBILITY FAILURE)
P1032-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (SIGNAL PLAUSIBILITY FAILURE)
P1033-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (SIGNAL PLAUSIBILITY FAILURE)
P1034-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (SIGNAL PLAUSIBILITY FAILURE)
P1035-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (OPEN CIRCUIT)
P1036-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (CIRCUIT SHORT TO BATTERY)
P1037-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (CIRCUIT SHORT TO GROUND)
P1038-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (OPEN CIRCUIT)
P1039-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (CIRCUIT SHORT TO BATTERY)
P103A-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (CIRCUIT SHORT TO GROUND)
P103B-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (OPEN CIRCUIT)
P103C-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (CIRCUIT SHORT TO BATTERY)
P103D-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (CIRCUIT SHORT TO GROUND)
P103E-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (OPEN CIRCUIT)
P103F-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (CIRCUIT SHORT TO BATTERY)
P1040-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE POWER STAGE (CIRCUIT SHORT TO GROUND)
P1041-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (CIRCUIT CURRENT OUT OF RANGE)
P1042-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (CIRCUIT CURRENT OUT OF RANGE)
P1043-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (CIRCUIT CURRENT OUT OF RANGE)
P1044-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (CIRCUIT CURRENT OUT OF RANGE)

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P1045-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (SIGNAL SHAPE/WAVEFORM FAILURE)
P1046-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (SIGNAL INVALID)
P1047-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (SIGNAL SHAPE/WAVEFORM FAILURE)
P1048-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (SIGNAL INVALID)
P1049-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (SIGNAL SHAPE/WAVEFORM FAILURE)
P104A-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (SIGNAL INVALID)
P104B-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (SIGNAL SHAPE/WAVEFORM FAILURE)
P104C-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE DRIVE CURRENT FEEDBACK (SIGNAL INVALID)
P1061-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK)
P1062-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK)
P1063-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK)
P1064-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK)
P1065-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK OPEN)
P1066-00 CYLINDER 1 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK CLOSED)
P1067-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK OPEN)
P1068-00 CYLINDER 2 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK CLOSED)
P1069-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK OPEN)
P106A-00 CYLINDER 3 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK CLOSED)
P106B-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK OPEN)
P106C-00 CYLINDER 4 UNIAIR ACTUATION ELECTROVALVE SIGNAL (ACTUATOR STUCK CLOSED)
P1170-00-FUEL SYSTEM LEAN (SIGNAL PLAUSIBILITY FAILURE)
P1171-00-FUEL SYSTEM LEAN (SIGNAL INCORRECT AFTER EVENT)
P1172-00-FUEL SYSTEM RICH (SIGNAL PLAUSIBILITY FAILURE)
P1173-00-FUEL SYSTEM RICH (SIGNAL INCORRECT AFTER EVENT)
P1191-00-MISSING RAIL BLEED (MISSING CALIBRATION)
P1192-00-MISSING FUEL PRIME (MISSING CALIBRATION)
P1195-00-OIL TEMPERATURE SENSOR (SIGNAL AMPLITUDE >MAXIMUM)
P1212-00 ENGINE OIL TEMPERATURE SENSOR (OVER TEMPERATURE)
P1277-00-PLAUSIBILITY CHECK VSENSING (SHORT TO GOUND OR OPEN CIRCUIT DURING CRANK)
P1278-00-PLAUSIBILITY CHECK RELAY1 AND RELAY2 (STUCK CLOSED OR SHORT CIRCUIT TO BATTERY VSENSING AT IGNITION ON)
P1279-00-PLAUSIBILITY CHECK RELAY1 OR RELAY2 (STUCK OPEN CRANKING MISSED)
P1300-00 PHONIC WHEEL MISSED SELF LEARNING (NOT CONFIGURED)
P130A-00-MISFIRE 200 (COMPONENT OR SYSTEM OVER TEMPERATURE)
P148C-00-LENGTHY STARTUP BY KEY (SIGNAL INVALID)
P1506-00-UNEXPECTED SPEED LIMITER DEACTIVATION
P1507-00-SPEED LIMITER: VEHICLE SPEED INCREMENT WITHOUT SET+ ACTIVATION

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- P1508-00-IMPLAUSIBILITY BETWEEN VEHICLE SPEED AND SPEED LIMITER CONTROL
- P1515-00-PLAUSIBILITY CHECK RELAY1 STUCK CLOSED OR VSENSING SHORT TO BATTERY IN ENGINE RUNNING
- P1518-00-PLAUSIBILITY CHECK RELAY2 STUCK CLOSED OR VSENSING SHORT TO BATTERY IN ENGINE RUNNING
- P1524-00 SPARK PLUG ANTI FOULING DIAGNOSIS (MECHANICAL LINKAGE FAILURE)
- P1525-00-SPARK PLUG ANTI FOULING DIAGNOSIS (LOW FLUID LEVEL)
- P165B-00-INTELLIGENT ALTERNATOR MODULE (FUNCTIONAL TEST) GENERAL ELECTRICAL FAILURE (CIRCUIT SHORT TO GROUND)
- P16A0-00 THROTTLE ERROR POSITION (SIGNAL CALCULATION FAILURE)
- P16A1-00-MOTORIZED THROTTLE SELF LEARNING (LOW BATTERY UNEXPECTED OPERATION)
- P16A2-00 MOTORIZED THROTTLE SELF LEARNING (LIMPHOME POSITION TEST OR COMMANDED POSITION NOT REACHABLE)
- P16A3-00 MOTORIZED THROTTLE SELF LEARNING (MECHANICAL THROTTLE CLOSURE OR PERFORMANCE OR INCORRECT OPERATION)
- P16A4-00 MOTORIZED THROTTLE SELF LEARNING (TEST SPRING THROTTLE CLOSED OR COMMANDED POSITION NOT REACHABLE)
- P16A5-00 MOTORIZED THROTTLE SELF LEARNING (TEST SPRING THROTTLE OPEN OR COMMANDED POSITION NOT REACHABLE)
- P16AA-00 CRUISE CONTROL ANOMALIES (DISABLE FOR HIGH ACCELERATION OR SIGNAL COMPARE FAILURE)
- P16AB-00 CRUISE CONTROL ANOMALIES (DISABLED FOR HIGH DECELERATION OR SIGNAL COMPARE FAILURE)
- P186F-00-FIRST AND NEUTRAL GEAR POSITION LEARNING (SIGNAL COMPARE FAILURE)
- P1946-00-FIRE PREVENTION SYSTEM (CRASH EVENT DETECTED)
- P1D7F-00 MOTORIZED THROTTLE SELF LEARNING (INTERRUPTED LEARNING OR UNEXPECTED OPERATION)
- P1D80-00 CONTROL UNIT FAULTY (ROM GENERAL CHECKSUM FAILURE)
- P1D81-00-DOWNSTREAM LAMBDA SENSOR (FUNCTIONAL TEST) - SIGNAL STUCK LOW
- P1D82-00-DOWNSTREAM LAMBDA SENSOR (FUNCTIONAL TEST) - SIGNAL STUCK HIGH
- P1D83-00-OIL TEMPERATURE SENSOR (SIGNAL PLAUSIBILITY FAILURE)
- P2100-00 THROTTLE VALVE ACTUATOR COMMAND (OPEN CIRCUIT)
- P2101-00 THROTTLE VALVE ACTUATOR COMMAND (SIGNAL CALCULATION FAILURE)
- P2102-00 THROTTLE VALVE ACTUATOR COMMAND (CIRCUIT SHORT TO GROUND)
- P2103-00 THROTTLE VALVE ACTUATOR COMMAND (CIRCUIT SHORT TO BATTERY)
- P2122-00 ACCELERATOR PEDAL POTENTIOMETER 1 (CIRCUIT SHORT TO GROUND OR OPEN)
- P2123-00 ACCELERATOR PEDAL POTENTIOMETER 1 (CIRCUIT SHORT TO BATTERY)
- P2127-00 ACCELERATOR PEDAL POTENTIOMETER 2 (CIRCUIT SHORT TO GROUND OR OPEN)
- P2128-00 ACCELERATOR PEDAL POTENTIOMETER 2 (CIRCUIT SHORT TO BATTERY)
- P2135-00 THROTTLE POTENTIOMETER 1 AND 2 CONGRUENCE (SIGNAL COMPARE FAILURE)
- P2138-00 ACCELERATOR PEDAL POTENTIOMETER 1 AND 2 CONGRUENCE (SIGNAL COMPARE FAILURE)
- P2173-00 AIR LEAKAGE IN MANIFOLD (SIGNAL COMPARE FAILURE)
- P2175-00 MANIFOLD PRESSURE TOO LOW (SIGNAL COMPARE FAILURE)
- P2227-00 ATMOSPHERIC PRESSURE AT KEY ON (SIGNAL COMPARE FAILURE)
- P2228-00 ATMOSPHERIC AIR PRESSURE SENSOR (CIRCUIT SHORT TO GROUND OR OPEN)
- P2229-00 ATMOSPHERIC AIR PRESSURE SENSOR (CIRCUIT SHORT TO BATTERY)
- P2244-00 VOLTAGE REFERENCE FOR LAMBDA SENSOR (PERFORMANCE OR INCORRECT OPERATION)
- P2299-00 BRAKE AND ACCELERATOR PEDAL COHERENCE (SIGNAL COMPARE FAILURE)

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- P2301-00 CYLINDER 1 IGNITION COIL (CIRCUIT SHORT TO BATTERY)
- P2304-00 CYLINDER 2 IGNITION COIL (CIRCUIT SHORT TO BATTERY)
- P2307-00 CYLINDER 3 IGNITION COIL (CIRCUIT SHORT TO BATTERY)
- P2310-00 CYLINDER 4 IGNITION COIL (CIRCUIT SHORT TO BATTERY)
- U0001-00 ENGINE CONTROL MODULE MUTE STATUS
- U0002-00 ENGINE CONTROL MODULE BUS OFF STATUS
- U0101-00-LOST COMMUNICATION WITH TRANSMISSION CONTROL MODULE (TCM/DTCM)
- U0120-00-INTELLIGENT ALTERNATOR MODULE FUNCTIONAL DIAGNOSIS (MISSING MESSAGE)
- U0129-00-LOST COMMUNICATION WITH BRAKE SYSTEM MODULE (BSM)
- U012D-00-INTELLIGENT ALTERNATOR MODULE (IAM) LIN TRANSMISSION (BUS SIGNAL/MESSAGE FAILURE)
- U0140-00 LOST COMMUNICATION WITH BODY CONTROL MODULE (BCM)
- U0155-00 LOST COMMUNICATION WITH INSTRUMENT PANEL CONTROL (IPC)
- U0168-00 IMMOBILIZER (CIRCUIT/COMPONENT PROTECTION TIME OUT)
- U0331-00-FIRE PREVENTION SYSTEM STATUS FROM BODY CONTROL MODULE (ERRATIC)
- U040F-00 FIRE PREVENTION SYSTEM STATUS FROM BODY CONTROL MODULE (INVALID SERIAL DATA RECEIVED)
- U0423-00 INSTRUMENT PANEL CONTROL (IPC) FAULTY (WRONG DATA LENGTH CODE)
- U0426-00 IMMOBILIZER (NOT PROGRAMMED)
- U0427-00 IMMOBILIZER (WRONG CODE IN THE IMMOBILIZER)
- U0431-00-TIME&DATE FROM BODY CONTROL MODULE (MISSING MESSAGE)
- U0433-00-TIME&DATE FROM BODY CONTROL MODULE (SIGNAL PLAUSIBILTY FAILURE)
- U0469-00-INVALID DATA RECEIVED FROM INTELLIGENT ALTERNATOR MODULE (SIGNAL NOT VALID)
- U05AB-00-BODY2 DRIVE STYLE STATUS (FROM BODY CONTROL MODULE) SIGNAL NOT AVAIBLE
- U120F-00-INVALID DATA RECEIVED FROM INTELLIGENT ALTERNATOR MODULE CIRCUIT-COMPONENT PROTECTION TIME OUT
- U1450-00-DRIVE TRAIN CONTROL MODULE (DTCM) FAULTY (WRONG DATA LENGTH CODE)
- U1490-00-SPEED LIMITER BY DRIVER REVERSIBLE SHUT OFF DUE TO PLAUSIBILITY CHECK
- U1502-00-TRANSMISSION CONTROL MODULE FAULTY (WRONG DATA LENGTH CODE)
- U1506-00-BRAKE SYSTEM MODULE FAULTY (WRONG DATA LENGTH CODE)
- U150A-00-BODY CONTROL MODULE FAULTY (WRONG DATA LENGTH CODE)
- U1930-00-ECM_OPERATIONALMODESTS PLAUSIBILITY (FROM ENGINE CONTROL MODULE)
- U1932-00 BCM_COMMAND.OPERATIONALMODESTS (FROM BODY CONTROL MODULE) NOT AVAILABLE
- U1933-00-BCM_COMMAND (FROM BODY CONTROL MODULE) MISSING MESSAGE
- U1934-00 BCM_COMMAND AND BODY2 (FROM BODY CONTROL MODULE) MISSING MESSAGE
- U1935-00-BRAKE3 (FROM BRAKE SYSTEM MODULE) MISSING MESSAGE
- U1937-00-TRANSM_MOT3 (FROM DUAL CLUTCH TRANSMISSION MODULE) MISSING MESSAGE
- U1938-00-TRANSM_MOT1 (FROM TRANSMISSION CONTROL MODULE) MISSING MESSAGE
- U1939-00-CLUSTER 2 (FROM INSTRUMENT PANEL CONTROL) MISSING MESSAGE
- U193A-00-SCCM_CRS_CTRL (CRUISE MESSAGE FROM BODY CONTROL MODULE) MISSING MESSAGE
- U193B-00-BSM_YRS_DATA (FROM BRAKE SYSTEM MODULE) MISSING MESSAGE
- U193E-00-DRIVETRAIN1 (FROM DRIVE TRAIN CONTROL MODULE) MESSAGE PLAUSIBILITY
- U1950-00-BCM_COMMAND (FROM BODY CONTROL MODULE) CRC OR MESSAGE COUNTER ERROR
- U1952-00-BRAKE1 (FROM BRAKE SYSTEM MODULE) CRC OR MESSAGE COUNTER ERROR
- U1956-00-BRAKE3 (FROM BRAKE SYSTEM MODULE) CRC OR MESSAGE COUNTER ERROR

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- U1958-00-BSM_YRS_DATA (FROM BRAKE SYSTEM MODULE) CRC OR MESSAGE COUNTER ERROR
- U195C-00 DRIVETRAIN1 (FROM DRIVETRAIN CONTROL MODULE) CRC OR MESSAGE COUNTER ERROR
- U197A-00-TRANSM1 (FROM TRANSMISSION CONTROL MODULE) CRC OR MESSAGE COUNTER ERROR
- U197C-00-TRANSM2 (FROM TRANSMISSION CONTROL MODULE) CRC OR MESSAGE COUNTER ERROR
- U197E-00-TRANSM_MOT1 (FROM TRANSMISSION CONTROL MODULE) CRC OR MESSAGE COUNTER ERROR
- U1980-00-TRANSM_MOT3 (FROM DUAL CLUTCH TRANSMISSION MODULE) CRC OR MESSAGE COUNTER ERROR
- U1984-00-WHEEL_SPEED (FROM BRAKE SYSTEM MODULE) CRC OR MESSAGE COUNTER ERROR
- U1986-00-SCCM CRS CTRL (CRUISE MESSAGE FROM BODY CONTROL MODULE) CRC OR MESSAGE COUNTER ERROR

Standard Procedure

- INTERMITTENT CONDITION
- POWERTRAIN VERIFICATION TEST
- PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

MODULE, Powertrain Control (PCM)

Diagnosis and Testing

- P0016-00-CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT - BANK 1 SENSOR 1
- P0031-00-O2-SENSOR 1/1 HEATER CIRCUIT LOW
- P0032-00-O2 SENSOR 1/1 HEATER CIRCUIT HIGH
- P0033-00-TURBOCHARGER SURGE VALVE CONTROL CIRCUIT OPEN
- P0034-00-TURBOCHARGER SURGE VALVE CONTROL CIRCUIT LOW
- P0035-00-TURBOCHARGER SURGE VALVE CONTROL CIRCUIT HIGH
- P0037-00-O2 SENSOR 1/2 HEATER CIRCUIT LOW
- P0038-00-O2 SENSOR 1/2 HEATER CIRCUIT HIGH
- P0069-00-MANIFOLD PRESSURE/BAROMETRIC PRESSURE CORRELATION
- P006C-00-TURBOCHARGER INLET PRESSURE CORRELATION
- P006D-00-BAROMETRIC PRESSURE - INLET AIR PRESSURE CORRELATION
- P0071-00-AMBIENT AIR TEMPERATURE SENSOR PERFORMANCE
- P0072-00-AMBIENT AIR TEMPERATURE SENSOR CIRCUIT LOW
- P0073-00-AMBIENT AIR TEMPERATURE SENSOR CIRCUIT HIGH
- P0105-00-MANIFOLD ABSOLUTE PRESSURE SENSOR / BAROMETRIC PRESSURE SENSOR CIRCUIT
- P0106-00-MANIFOLD ABSOLUTE PRESSURE SENSOR PERFORMANCE
- P0107-00-MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT LOW
- P0108-00-MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT HIGH
- P0111-00-INTAKE AIR TEMPERATURE SENSOR 1 PERFORMANCE
- P0112-00-INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW
- P0113-00-INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH
- P0114-00-INTAKE AIR TEMPERATURE SENSOR ERRATIC
- P0116-00-ENGINE COOLANT TEMPERATURE SENSOR PERFORMANCE
- P0117-00-ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT LOW
- P0118-00-ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH
- P0119-00-ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT INTERMITTENT
- P0122-00-THROTTLE POSITION SENSOR 1 CIRCUIT LOW
- P0123-00-THROTTLE POSITION SENSOR 1 CIRCUIT HIGH
- P0128-00-THERMOSTAT RATIONALITY
- P012B-00-TURBOCHARGER INLET PRESSURE SENSOR CIRCUIT PERFORMANCE
- P0130-00-O2 SENSOR 1/1 CIRCUIT OPEN

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- P0131-00-O2 SENSOR 1/1 CIRCUIT LOW
- P0132-00-O2 SENSOR 1/1 CIRCUIT HIGH
- P0133-00-O2 SENSOR 1/1 SLOW RESPONSE
- P0135-00-O2 SENSOR 1/1 HEATER PERFORMANCE
- P0137-00-O2 SENSOR 1/2 CIRCUIT LOW
- P0138-00-O2 SENSOR 1/2 CIRCUIT HIGH
- P0139-00-O2 SENSOR 1/2 SLOW RESPONSE
- P0140-00-O2 SENSOR 1/2 NO ACTIVITY DETECTED
- P0141-00-O2 SENSOR 1/2 HEATER PERFORMANCE
- P0171-00-FUEL SYSTEM 1/1 LEAN
- P0172-00-FUEL SYSTEM 1/1 RICH
- P0197-00-ENGINE OIL TEMPERATURE SENSOR CIRCUIT LOW
- P0198-00-ENGINE OIL TEMPERATURE SENSOR CIRCUIT HIGH
- P0201-00-FUEL INJECTOR 1 CIRCUIT OPEN
- P0202-00–FUEL INJECTOR 2 CIRCUIT OPEN
- P0203-00-FUEL INJECTOR 3 CIRCUIT OPEN
- P0204-00-FUEL INJECTOR 4 CIRCUIT OPEN
- P0219-00-ENGINE OVERSPEED
- P0222-00-THROTTLE POSITION SENSOR 2 CIRCUIT LOW
- P0223-00-THROTTLE POSITION SENSOR 2 CIRCUIT HIGH
- P0234-00-TURBOCHARGER OVERBOOST CONDITION
- P0237-00-TURBO BOOST PRESSURE SENSOR CIRCUIT LOW
- P0238-00-TURBO BOOST PRESSURE SENSOR CIRCUIT HIGH
- P0243-00-TURBOCHARGER WASTEGATE CONTROL CIRCUIT
- P0245-00-TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID CONTROL CIRCUIT LOW
- P0246-00-TURBOCHARGER/SUPERCHARGER WASTEGATE SOLENOID CONTROL CIRCUIT HIGH
- P0261-00-INJECTOR 1 CONTROL CIRCUIT LOW
- P0262-00-INJECTOR 1 CONTROL CIRCUIT HIGH
- P0264-00-INJECTOR 2 CONTROL CIRCUIT LOW
- P0265-00-INJECTOR 2 CONTROL CIRCUIT HIGH
- P0267-00-INJECTOR 3 CONTROL CIRCUIT LOW
- P0268-00-INJECTOR 3 CONTROL CIRCUIT HIGH
- P0270-00-INJECTOR 4 CONTROL CIRCUIT LOW
- P0271-00-INJECTOR 4 CONTROL CIRCUIT HIGH
- P0298-00-ENGINE OIL TEMPERATURE TOO HIGH
- P0299-00-TURBOCHARGER UNDERBOOST CONDITION
- P0300-00-MULTIPLE CYLINDER MISFIRE
- P0301-00-CYLINDER 1 MISFIRE
- P0302-00-CYLINDER 2 MISFIRE
- P0303-00-CYLINDER 3 MISFIRE
- P0304-00-CYLINDER 4 MISFIRE
- P0315-00-NO CRANK SENSOR LEARNED
- P0324-00-KNOCK CONTROL SYSTEM
- P0325-00-KNOCK SENSOR 1 CIRCUIT
- P0326-00-KNOCK SENSOR 1 CIRCUIT PERFORMANCE
- P0327-00-KNOCK SENSOR 1 CIRCUIT LOW
- P0328-00-KNOCK SENSOR 1 CIRCUIT HIGH
- P0335-00-CRANKSHAFT POSITION SENSOR CIRCUIT
- P0339-00-CRANKSHAFT POSITION SENSOR INTERMITTENT
- P0340-00-CAMSHAFT POSITION SENSOR CIRCUIT
- P0342-00-CAMSHAFT POSITION SENSOR CIRCUIT LOW

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- P0343-00-CAMSHAFT POSITION SENSOR CIRCUIT HIGH
- P0351-00-IGNITION COIL 1 PRIMARY CIRCUIT
- P0352-00-IGNITION COIL 2 PRIMARY CIRCUIT
- P0353-00-IGNITION COIL 3 PRIMARY CIRCUIT
- P0354-00-IGNITION COIL 4 PRIMARY CIRCUIT
- P0420-00-CATALYST EFFICIENCY (BANK 1)
- P0440-00-GENERAL EVAP SYSTEM FAILURE
- P0441-00-EVAP PURGE SYSTEM PERFORMANCE
- P0444-00-EVAP PURGE SOLENOID CIRCUIT OPEN
- P0452-00-EVAP PRESSURE SWITCH STUCK CLOSED
- P0455-00-EVAP PURGE SYSTEM LARGE LEAK
- P0456-00-EVAP PURGE SYSTEM SMALL LEAK
- P0457-00-LOOSE FUEL CAP
- P0458-00-EVAP PURGE SOLENOID CIRCUIT LOW
- P0459-00-EVAP PURGE SOLENIOD CIRCUIT HIGH
- P0461-00-FUEL LEVEL SENSOR 1 PERFORMANCE
- P0462-00-FUEL LEVEL SENSOR 1 CIRCUIT LOW
- P0463-00-FUEL LEVEL SENSOR 1 CIRCUIT HIGH
- P0480-00-COOLING FAN 1 CONTROL CIRCUIT
- P0481-00-COOLING FAN 2 CONTROL CIRCUIT
- P0498-00-EVAP SYSTEM VENT VALVE CONTROL CIRCUIT LOW
- P0499-00-EVAP VENT VALVE CONTROL CIRCUIT HIGH
- P04DB-00-CRANKCASE VENTILATION SYSTEM DISCONNECTED
- P0500-00-VEHICLE SPEED SENSOR 1 CIRCUIT
- P0501-00-VEHICLE SPEED SENSOR 1 PERFORMANCE
- P0506-00-IDLE SPEED PERFORMANCE LOWER THAN EXCEPTED
- P0507-00-IDLE SPEED PERFORMANCE HIGHER THAN EXCEPTED
- P050B-00-COLD START IGNITION TIMING PERFORMANCE
- P0513-00-INVALID SKIM KEY
- P051C-00-CRANKCASE PRESSURE SENSOR CIRCUIT LOW
- P051D-00-CRANKCASE PRESSURE SENSOR CIRCUIT HIGH
- P0520-00-ENGINE OIL PRESSURE SENSOR CIRCUIT
- P0532-00-A/C PRESSURE SENSOR CIRCUIT LOW
- P0533-00-A/C PRESSURE SENSOR CIRCUIT HIGH
- P0562-00-BATTERY/SYSTEM VOLTAGE LOW
- P0563-00-BATTERY/SYSTEM VOLTAGE HIGH
- P0564-00-SPEED CONTROL SWITCH 1
- P0571-00-BRAKE SWITCH 1 PERFORMANCE
- P0572-00-BRAKE SWITCH 1 STUCK ON
- P0573-00-BRAKE SWITCH 1 STUCK OFF
- P0604-00-INTERNAL CONTROL MODULE RAM ERROR
- P0605-00-INTERNAL CONTROL MODULE ROM
- P0606-00-INTERNAL CONTROL PROCESSOR
- P0607-00-ECU INTERNAL PERFORMANCE
- P060B-00-INTERNAL CONTROL MODULE A/D PROCESSING PERFORMANCE
- P060C-00-INTERNAL CONTROL MODULE MAIN PROCESSOR PERFORMANCE
- P0610-00-ECU VEHICLE OPTIONS MISMATCH
- P0615-00-STARTER CONTROL CIRCUIT/OPEN
- P0616-00-STARTER CONTROL CIRCUIT LOW
- P0617-00-STARTER CONTROL CIRCUIT HIGH
- P061A-00-INTERNAL CONTROL MODULE TORQUE PERFORMANCE
- P0625-00-GENERATOR FIELD CONTROL CIRCUIT LOW

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- P0626-00-GENERATOR FIELD CONTROL CIRCUIT HIGH
- P0627-00-FUEL PUMP CONTROL CIRCUIT OPEN
- P0628-00-FUEL PUMP CONTROL CIRCUIT LOW
- P0629-00-FUEL PUMP CONTROL CIRCUIT HIGH
- P062F-00-INTERNAL CONTROL MODULE EEPROM ERROR
- P0630-VIN NOT PROGRAMMED IN PCM
- P0641-00-SENSOR REFERENCE VOLTAGE 1 CIRCUIT
- P0645-00-A/C CONTROL CIRCUIT/OPEN
- P0646-00-A/C CONTROL CIRCUIT LOW
- P0647-00-A/C CONTROL CIRCUIT HIGH
- P0651-00-SENSOR REFERENCE VOLTAGE 2 CIRCUIT
- P0658-00-ACTUATOR SUPPLY VOLTAGE "A" CIRCUIT LOW
- P0659-00-ACTUATOR SUPPLY VOLTAGE "A" CIRCUIT HIGH
- P0685-00-ASD/MAIN CONTROL CIRCUIT
- P0686-00-ECM MAIN CONTROL CIRCUIT LOW
- P0687-00-ECM MAIN CONTROL CIRCUIT HIGH
- P0691-00-COOLING FAN 1 CONTROL CIRCUIT LOW
- P0692-00-COOLING FAN 1 CONTROL CIRCUIT HIGH
- P0693-00-COOLING FAN 2 CONTROL CIRCUIT LOW
- P0694-00-COOLING FAN 2 CONTROL CIRCUIT HIGH
- P0697-00-SENSOR REFERENCE VOLTAGE 3 CIRCUIT
- P0703-00-BRAKE SWITCH 2 PERFORMANCE
- P0806-00-CLUTCH POSITION SENSOR 1 CIRCUIT PERFORMANCE
- P0807-00-CLUTCH POSITION SENSOR 1 CIRCUIT LOW
- P0808-00-CLUTCH POSITION SENSOR 1 CIRCUIT HIGH
- P080A-00-CLUTCH POSITION NOT LEARNED
- P0810-00-CLUTCH POSITION CONTROL ERROR - 948TE ONLY- WITHOUT 3.6L
- P101A-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE RETURN CONTROL CIRCUIT
- P101B-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE RETURN CONTROL CIRCUIT
- P101C-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE RETURN CONTROL CIRCUIT
- P101D-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE RETURN CONTROL CIRCUIT
- P1021-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE COMPONENT DAMAGE
- P1022-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE COMPONENT DAMAGE
- P1023-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE COMPONENT DAMAGE
- P1024-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE COMPONENT DAMAGE
- P1025-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE UNDER VOLTAGE
- P1026-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE OVER VOLTAGE
- P1027-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE UNDER VOLTAGE
- P1028-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE OVER VOLTAGE
- P1029-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE UNDER VOLTAGE
- P102A-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE OVER VOLTAGE
- P102B-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE UNDER VOLTAGE
- P102C-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE OVER VOLTAGE
- P1031-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE DRIVER VOLTAGE IMPLAUSIBLE
- P1032-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE DRIVER VOLTAGE IMPLAUSIBLE
- P1033-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE DRIVER VOLTAGE IMPLAUSIBLE
- P1034-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE DRIVER VOLTAGE IMPLAUSIBLE
- P1035-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE OPEN CIRCUIT
- P1036-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO BATTERY
- P1037-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO GROUND
- P1038-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE DRIVER OPEN CIRCUIT
- P1039-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO BATTERY

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- P103A-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO GROUND
- P103B-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE DRIVER OPEN CIRCUIT
- P103C-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO BATTERY
- P103D-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO GROUND
- P103E-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE DRIVER OPEN CIRCUIT
- P103F-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO BATTERY
- P1040-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE SHORT TO GROUND
- P1041-00-IMPLAUSIBLE DATA FROM CYLINDER 1 OIL SUPPLY SOLENOID VALVE RECEIVED
- P1042-00-IMPLAUSIBLE DATA FROM CYLINDER 2 OIL SUPPLY SOLENOID VALVE RECEIVED
- P1043-00-IMPLAUSIBLE DATA FROM CYLINDER 3 OIL SUPPLY SOLENOID VALVE RECEIVED
- P1044-00-IMPLAUSIBLE DATA FROM CYLINDER 4 OIL SUPPLY SOLENOID VALVE RECEIVED
- P1045-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE VOLTAGE OUT OF RANGE
- P1046-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE OVERCURRENT
- P1047-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE VOLTAGE OUT OF RANGE
- P1048-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE OVERCURRENT
- P1049-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE VOLTAGE OUT OF RANGE
- P104A-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE OVERCURRENT
- P104B-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE VOLTAGE OUT OF RANGE
- P104C-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE OVERCURRENT
- P1061-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE STUCK
- P1062-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE STUCK
- P1063-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE STUCK
- P1064-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE STUCK
- P1065-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE SWITCH ON TIME OUT OF RANGE
- P1066-00-CYLINDER 1 OIL SUPPLY SOLENOID VALVE SWITCH OFF TIME OUT OF RANGE
- P1067-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE SWITCH ON TIME OUT OF RANGE
- P1068-00-CYLINDER 2 OIL SUPPLY SOLENOID VALVE SWITCH OFF TIME OUT OF RANGE
- P1069-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE SWITCH ON TIME OUT OF RANGE
- P106A-00-CYLINDER 3 OIL SUPPLY SOLENOID VALVE SWITCH OFF TIME OUT OF RANGE
- P106B-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE SWITCH ON TIME OUT OF RANGE
- P106C-00-CYLINDER 4 OIL SUPPLY SOLENOID VALVE SWITCH OFF TIME OUT OF RANGE
- P1115-00-GENERAL TEMPERATURE RATIONALITY
- P1128-00-CLOSED LOOP FUELING NOT ACHIEVED - BANK 1 UPSTREAM
- P113D-00-O2 SENSOR 1/1 SLOW RESPONSE (HIGH FREQUENCY)
- P1185-00-GENERAL PRESSURE SENSOR CORRELATION
- P1212-00-ENGINE OIL TEMPERATURE HIGH - RPM LIMITED
- P1239-00-ENGINE OIL TEMPERATURE TOO LOW
- P1300-00-CRANKSHAFT POSITON LEARN OUT OF RANGE
- P1456-00-FUEL TANK PRESSURE SENSOR CIRCUIT LOW
- P1457-00-FUEL TANK PRESSURE SENSOR CIRCUIT HIGH
- P1487-00-AFTER RUN COOLANT PUMP CONTROL CIRCUIT OPEN
- P1488-00-AFTER RUN COOLANT PUMP CONTROL CIRCUIT LOW
- P1489-00-AFTER RUN COOLANT PUMP CONTROL CIRCUIT HIGH
- P1490-00-AFTER RUN COOLANT PUMP PERFORMANCE
- P1491-00-AFTER RUN COOLANT PUMP CIRCUIT HIGH
- P1500-00-ECU CONFIGURATION MISMATCH
- P1523-00-VVA LOW OIL PRESSURE
- P1524-00-OIL PRESSURE OUT OF RANGE - CAMSHAFT ADVANCE/RETARD DISABLED
- P1572-00-BRAKE PEDAL STUCK ON
- P1573-00-BRAKE PEDAL STUCK OFF
- P1593-00-SPEED CONTROL SWITCH 1/2 STUCK
- P1607-00-PCM INTERNAL SHUTDOWN TIMER RATIONALITY

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- P16A0-00-ETC MOTOR ERROR POSITION
- P16A2-00-ETC MOTOR SELF-LEARNING (LIMP HOME POSITION)
- P16A3-00-ETC MOTOR SELF-LEARNING (MECHANICAL THROTTLE CLOSURE)
- P16A4-00-ETC MOTOR SELF LEARNING (SPRING CLOSURE)
- P16A5-00-ETC MOTOR SELF LEARNING (SPRING OPENING)
- P16AA-00-SPEED CONTROL DISABLED DUE TO HIGH ACCELERATION
- P16AB-00-SPEED CONTROL DISABLED DUE TO EXCESSIVE DECELERATION
- P1C57-00-REDUCTANT CONTROL MODULE SHUTDOWN - CRASH EVENT DETECTED
- P1CEA-00-BOOST SIDE EVAP PURGE SYSTEM PERFORMANCE
- P1D7F-00-ETC SELF-LEARNING FAILURE
- P1D80-00-INTERNAL CONTROL MODULE EEPROM ERROR
- P1E09-00-CLOSED LOOP FUELING NOT ACHIEVED - BANK 1 DOWNSTREAM
- P2096-00-DOWNSTREAM FUEL TRIM SYSTEM 1 LEAN
- P2097-00-DOWNSTREAM FUEL TRIM SYSTEM 1 RICH
- P2100-00-ELECTRONIC THROTTLE CONTROL MOTOR CIRCUIT/OPEN - BANK 1
- P2101-00-ELECTRONIC THROTTLE CONTROL MOTOR PERFORMANCE - BANK 1
- P2102-00-ELECTRONIC THROTTLE CONTROL MOTOR CIRCUIT LOW
- P2103-00-ELECTRONIC THROTTLE CONTROL MOTOR CIRCUIT HIGH
- P2115-00-ACCELERATOR PEDAL POSITION SENSOR 1 MINIMUM STOP PERFORMANCE
- P2116-00-ACCELERATOR PEDAL POSITION SENSOR 2 MINIMUM STOP PERFORMANCE
- P2122-00-ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT LOW
- P2123-00-ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT HIGH
- P2127-00-ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT LOW
- P2128-00-ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT HIGH
- P2135-00-THROTTLE POSITION SENSOR 1/2 CORRELATION
- P2138-00-ACCELERATOR PEDAL POSITION SENSOR 1/2 CORRELATION
- P2166-00-ACCELERATOR PEDAL POSITION SENSOR 1 MAXIMUM STOP PERFORMANCE
- P2167-00-ACCELERATOR PEDAL POSITION SENSOR 2 MAXIMUM STOP PERFORMANCE
- P2172-00-HIGH AIRFLOW VACUUM LEAK DETECTED (INSTANTANEOUS ACCUMULATION)
- P2173-00-THROTTLE ACTUATOR CONTROL SYSTEM HIGH AIR FLOW DETECTED
- P2175-00-THROTTLE ACTUATOR CONTROL SYSTEM - LOW AIR FLOW DETECTED
- P219A-00 BANK 1 AIR/FUEL RATIO IMBALANCE
- P2226-00-BAROMETRIC PRESSURE SENSOR
- P2227-00-BAROMETRIC PRESSURE CIRCUIT PERFORMANCE
- P2228-00-BAROMETRIC PRESSURE CIRCUIT LOW
- P2229-00-BAROMETRIC PRESSURE CIRCUIT HIGH
- P2237-00-O2 SENSOR 1/1 PUMP CELL CURRENT CIRCUIT/OPEN
- P2238-00-O2 SENSOR 1/1 PUMP CELL CURRENT CIRCUIT LOW
- P2239-00-O2 SENSOR 1/1 PUMP CELL CURRENT CIRCUIT HIGH
- P2243-00-O2 SENSOR 1/1 REFERENCE VOLTAGE CIRCUIT/OPEN
- P2244-00-O2 SENSOR 1/1 REFERENCE VOLTAGE PERFORMANCE
- P2245-00-O2 SENSOR 1/1 REFERENCE VOLTAGE CIRCUIT LOW
- P2246-00-O2 SENSOR 1/1 REFERENCE VOLTAGE CIRCUIT HIGH
- P2251-00-O2 SENSOR 1/1 NEGATIVE CURRENT CONTROL CIRCUIT/OPEN
- P2252-00-O2 SENSOR 1/1 NEGATIVE CURRENT CONTROL CIRCUIT LOW
- P2253-00-O2 SENSOR 1/1 NEGATIVE CURRENT CONTROL CIRCUIT HIGH
- P2261-00-TURBOCHARGER BYPASS VALVE - MECHANICAL
- P2262-00-TURBOCHARGER BOOST PRESSURE NOT DETECTED - MECHANICAL
- P2271-00-O2 SENSOR 1/2 SIGNAL STUCK RICH
- P2299-00-BRAKE PEDAL POSITION/ACCELERATOR PEDAL POSITION INCOMPATIBLE
- P2301-00-IGNITION COIL 1 CIRCUIT HIGH
- P2304-00-IGNITION COIL 2 CIRCUIT HIGH

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- P2307-00-IGNITION COIL 3 CIRCUIT HIGH
- P2310-00-IGNITION COIL 4 CIRCUIT HIGH
- P2610-00-PCM INTERNAL ENGINE OFF TIMER PERFORMANCE
- P2626-00-SENSOR 1/1 PUMP CELL CURRENT TRIM CIRCUIT/OPEN
- P2627-00-O2 SENSOR 1/1 PUMP CELL CURRENT TRIM CIRCUIT LOW
- P2628-00-O2 SENSOR 1/1 PUMP CELL CURRENT TRIM CIRCUIT HIGH
- U0001-00-CAN C BUS
- U0002-00-CAN C BUS OFF PERFORMANCE
- U0102-00-LOST COMMUNICATION WITH TRANSFER CASE CONTROL MODULE / AWD
- U0121-00-LOST COMMUNICATION WITH ANTI-LOCK BRAKE SYSTEM (ABS) CONTROL MODULE
- U0140-00-LOST COMMUNICATION WITH BODY CONTROL MODULE (BCM)
- U0151-00-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC)
- U0155-00-LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER IPC CONTROL MODULE
- U0168-00-LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE
- U0212-00-LOST COMMUNICATION WITH SCM
- U0402-IMPLAUSIBLE DATA RECEIVED FROM TCM
- U0405-00-INVALID DATA RECEIVED CRUISE CONTROL MODULE
- U040F-INVALID DATA RECIEVED FROM REDUNDANT CONTROL MODULE
- U0415-00-IMPLAUSIBLE DATA RECEIVED FROM ABS
- U0418-00-IMPLAUSIBLE DATA RECEIVED FROM BRAKE SYSTEM CONTROL MODULE
- U0422-00-IMPLAUSIBLE DATA RECEIVED FROM BODY CONTROL MODULE
- U0423-00-IMPLAUSABLE DATA RECIEVED FROM THE CLUSTER/CCN
- U0426-00-INVALID DATA RECEIVED FROM VEHICLE IMMOBILIZER CONTROL MODULE
- U0427-00-INVALID DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE
- U110C-00-LOST FUEL LEVEL MESSAGE
- U110E-00-LOST AMBIENT TEMPERATURE MESSAGE
- U11DD-BODY CONTROL MODULE SIGNAL INVALID
- U11DE-00-LOST SPEED CONTROL MESSAGE
- U1403-00-IMPLAUSIBLE FUEL LEVEL SIGNAL RECEIVED

Standard Procedure

- INTERMITTENT CONDITION
- POWERTRAIN VERIFICATION TEST
- PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

MODULE, Powertrain Control (PCM)

Diagnosis and Testing

- P0008-00-ENGINE POSITION PERFORMANCE SIGNAL COMPARE FAILURE
- P0010-00 VARIABLE VALVE TIMING VVT DIAGNOSIS OPEN CIRCUIT
- P0011-00-VARIABLE VALVE TIMING VVT POSTION DIAGNOSIS SIGNAL CALCULATION FAILURE
- P0012-00-VARIABLE VALVE TIMING VVT SPEED DIAGNOSIS SIGNAL HAS TOO FEW TRANSITIONS EVENTS
- P0014-00-VARIABLE VALVE TIMING VVT SPEED DIAGNOSIS SIGNAL HAS TOO MANY TRANSITIONS EVENTS
- P0016-00-OFFSET BETWEEN CAMSHAFT AND CRANKSHAFT WRONG MOUNTING POSITION
- P0031-00-UPSTREAM LAMBDA PROBE HEATER COMMAND CIRCUIT SHORT TO GROUND OR OPEN
- P0032-00-UPSTREAM LAMBDA SENSOR HEATER COMMAND CIRCUIT SHORT TO BATTERY
- P0037-00-DOWNSTREAM LAMBDA SENSOR HEATER COMMAND CIRCUIT SHORT TO GROUND OR OPEN
- P0038-00-DOWNSTREAM LAMBDA SENSOR HEATER COMMAND CIRCUIT SHORT TO BATTERY
- P0053-00-UPSTREAM LAMBDA SENSOR RESISTANCE SIGNAL COMPARE FAILURE

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- P0054-00-DOWNSTREAM LAMBDA SENSOR RESISTANCE SIGNAL COMPARE FAILURE
- P0069-00-MANIFOLD PRESSURE AND ATMOSPHERIC PRESSURE PLAUSIBILITY SIGNAL COMPARE FAILURE
- P0105-00-INTAKE MANIFOLD PRESSURE SENSOR SIGNAL RATE OF CHANGE BELOW THRESHOLD
- P0106-00-INTAKE MANIFOLD PRESSURE SENSOR SIGNAL RATE OF CHANGE ABOVE THRESHOLD
- P0107-00-INTAKE MANIFOLD PRESSURE SENSOR CIRCUIT SHORT TO GROUND OR OPEN
- P0108-00-INTAKE MANIFOLD PRESSURE SENSOR CIRCUIT SHORT TO BATTERY
- P0112-00-AIR TEMPERATURE SENSOR ELETRICAL FAILURE CIRCUIT SHORT TO GROUND
- P0113-00-AIR TEMPERATURE SENSOR ELETRICAL FAILURE CIRCUIT SHORT TO BATTERY OR OPEN
- P0114-00-AIR TEMPERATURE SENSOR ELETRICAL FAILURE SIGNAL HAS TOO MANY PULSES
- P0117-00-ENGINE COOLANT TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO GROUND
- P0118-00-ENGINE COOLANT TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO BATTERY OR OPEN
- P0119-00-ENGINE COOLANT TEMPERATURE SENSOR SIGNAL HAS TOO MANY PULSES
- P0122-00-THROTTLE POTENTIOMETER SENSOR 1 CIRCUIT SHORT TO GROUND OR OPEN
- P0123-00-THROTTLE POTENTIOMETER SENSOR 1 CIRCUIT SHORT TO BATTERY
- P0130-00-UPSTREAM LAMBDA PROBE ELECTRICAL TEST GENERAL ELECTRICAL FAILURE
- P0131-00-UPSTREAM LAMBDA PROBE FUNCTIONAL TEST SIGNAL STUCK LOW
- P0132-00-UPSTREAM LAMBDA PROBE FUNCTIONAL TEST SIGNAL STUCK HIGH
- P0133-00-UPSTREAM LAMBDA PROBE SLOW RESPONCE SIGNAL COMPARE FAILURE
- P0138-00-DOWNSTREAM LAMBDA PROBE ELECTRICAL TEST CIRCUIT SHORT TO BATTERY
- P0139-00-DOWNSTREAM LAMBDA PROBE SLOW RESPONSE SIGNAL COMPARE FAILURE
- P0171-00-FUEL SYSTEM LEAN SIGNAL COMPARE FAILURE
- P0172-00-FUEL SYSTEM RICH SIGNAL COMPARE FAILURE
- P0201-00-INJECTOR 1 COMMAND OPEN CIRCUIT
- P0202-00-INJECTOR 2 COMMAND OPEN CIRCUIT
- P0203-00-INJECTOR 3 COMMAND OPEN CIRCUIT
- P0204-00-INJECTOR 4 COMMAND OPEN CIRCUIT
- P0219-00-ENGINE OVERSPEED RECOGNITION EVENT INFORMATION
- P0222-00-THROTTLE POTENTIOMETER SENSOR 2 CIRCUIT SHORT TO GROUND OR OPEN
- P0223-00-THROTTLE POTENTIOMETER SENSOR 2 CIRCUIT SHORT TO BATTERY
- P0261-00-INJECTOR 1 COMMAND CIRCUIT SHORT TO GROUND
- P0262-00-INJECTOR 1 COMMAND CIRCUIT SHORT TO BATTERY
- P0264-00-INJECTOR 2 COMMAND CIRCUIT SHORT TO GROUND
- P0265-00-INJECTOR 2 COMMAND CIRCUIT SHORT TO BATTERY
- P0267-00-INJECTOR 3 COMMAND CIRCUIT SHORT TO GROUND
- P0268-00-INJECTOR 3 COMMAND CIRCUIT SHORT TO BATTERY
- P0270-00-INJECTOR 4 COMMAND CIRCUIT SHORT TO GROUND
- P0271-00-INJECTOR 4 COMMAND CIRCUIT SHORT TO BATTERY
- P0300-00-MISFIRE RANDOM PERFORMANCE OR INCORRECT OPERATION OR COMPONENT OR SYSTEM OVER TEMPERATURE MISFIRE 1000 OR MISFIRE 200
- P0301-00-MISFIRE CYLINDER 1 PERFORMANCE OR INCORRECT OPERATION COMPONENT OR SYSTEM OVER TEMPERATURE MISFIRE 1000
- P0302-00-MISFIRE CYLINDER 2 PERFORMANCE OR INCORRECT OPERATION COMPONENT OR SYSTEM OVER TEMPERATURE MISFIRE 1000
- P0303-00-MISFIRE CYLINDER 3 PERFORMANCE OR INCORRECT OPERATION COMPONENT OR SYSTEM OVER TEMPERATURE MISFIRE 1000
- P0304-00-MISFIRE CYLINDER 4 PERFORMANCE OR INCORRECT OPERATION COMPONENT OR SYSTEM OVER TEMPERATURE MISFIRE 1000

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- P0324-00-KNOCK SENSOR ENGINE NOT RUNNING INTERNAL ELECTRONIC FAILURE
- P0325-00-KNOCK SENSOR CIRCUIT SHORT TO BATTERY
- P0326-00-KNOCK SENSOR ENGINE NOT RUNNING SIGNAL PLAUSIBILITY FAILURE
- P0327-00-KNOCK SENSOR ENGINE NOT RUNNING CIRCUIT SHORT TO GROUND
- P0328-00-KNOCK SENSOR ENGINE NOT RUNNING CIRCUIT SHORT TO BATTERY
- P0335-00-ENGINE SPEED SENSOR SIGNAL COMPARE FAILURE
- P0340-00-CAMSHAFT SENSOR SIGNAL COMPARE FAILURE
- P0342-00-CAMSHAFT SENSOR CIRCUIT SHORT TO GROUND
- P0343-00-CAMSHAFT SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P0351-00-CYLINDER 1 IGNITION COIL CIRCUIT SHORT TO GROUND OR OPEN
- P0352-00-CYLINDER 2 IGNITION COIL CIRCUIT SHORT TO GROUND OR OPEN
- P0353-00-CYLINDER 3 IGNITION COIL CIRCUIT SHORT TO GROUND OR OPEN
- P0354-00-CYLINDER 4 IGNITION COIL CIRCUIT SHORT TO GROUND OR OPEN
- P0420-00-CATALYST EFFICIENCY SIGNAL COMPARE FAILURE
- P0444-00-PURGE CANISTER VALVE OPEN CIRCUIT
- P0458-00-PURGE CANISTER VALVE CIRCUIT SHORT TO GROUND
- P0459-00-PURGE CANISTER VALVE CIRCUIT SHORT TO BATTERY
- P0460-00-FUEL LEVEL SENSOR FAULT INFO FROM BODY CONTROL MODULE SIGNAL INVALID
- P0480-00-COOLING FAN 1 OPEN CIRCUIT
- P0481-00-COOLING FAN 2 OPEN CIRCUIT
- P0500-00-VEHICLE SPEED EVENT INFORMATION
- P0503-00-VEHICLE SPEED SIGNAL PLAUSIBILITY FAILURE
- P0504-00-BRAKE PEDAL SWITCH SIGNAL COMPARE FAILURE OR INVALID SIGNAL
- P0513-00-IMMOBILIZER SIGNAL COMPARE FAILURE
- P0520-00-OIL PRESSURE SWITCH SIGNAL INCORRECT AFTER EVENT
- P0532-00-AIR CONDITIONER PRESSURE SENSOR CIRCUIT SHORT TO GROUND OR OPEN
- P0533-00-AIR CONDITIONER PRESSURE SENSOR CIRCUIT SHORT TO BATTERY
- P0562-00-UPSTREAM MAIN RELAY BATTERY VOLTAGE CIRCUIT VOLTAGE BELOW THRESHOLD
- P0563-00-UPSTREAM MAIN RELAY BATTERY VOLTAGE CIRCUIT VOLTAGE ABOVE THRESHOLD
- P0564-00-CRUISE CONTROL OR SPEED LIMITER SIGNAL INVALID
- P0571-00-BRAKE SWITCH STUCK OPEN OR OPEN CIRCUIT
- P0572-00-BRAKE SWITCH STUCK CLOSED
- P0578-00-CRUISE CONTROL OR SPEED LIMITER SWITCH COMMAND STUCK
- P0604-00-CONTROL UNIT FAULTY RAM SIGNAL COMPARE FAILURE
- P0605-00-CONTROL UNIT FAULTY ROM INTERNAL ELECTRONIC FAILURE
- P0606-00-CONTROL UNIT FAULTY MICROPROCESSOR WATCHDOGSAFETY µC FAILURE
- P0607-00-CONTROL UNIT FAULTY MICROPROCESSOR PERFORMANCE OR INCORRECT OPERATION
- P060B-00-AD CONVERTER INTERNAL ELECTRONIC FAILURE
- P060C-00-CONTROL UNIT FAULTY SAFETY STOP ENGINE SIGNAL COMPARE FAILURE
- P0615-00-STARTER RELAY COMMAND OPEN CIRCUIT
- P0616-00-STARTER RELAY COMMAND CIRCUIT SHORT TO GROUND
- P0617-00-STARTER RELAY COMMAND CIRCUIT SHORT TO BATTERY
- P0628-00-FUEL PUMP RELAY COMMAND CIRCUIT SHORT TO GROUND
- P0629-00-FUEL PUMP RELAY COMMAND CIRCUIT SHORT TO BATTERY
- P062F-00-CONTROL UNIT FAULTY EEPROM DATA MEMORY FAILURE
- P0641-00-SENSOR SUPPLY 1 INTERNAL ELECTRONIC FAILURE
- P0645-00-AIR CONDITIONER COMPRESSOR RELAY OPEN CIRCUIT
- P0646-00-AIR CONDITIONER COMPRESSOR RELAY CIRCUIT SHORT TO GROUND
- P0647-00-AIR CONDITIONER COMPRESSOR RELAY CIRCUIT SHORT TO BATTERY

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- P0651-00-SENSOR SUPPLY 2 INTERNAL ELECTRONIC FAILURE
- P0658-00-DOWNSTREAM MAIN RELAY BATTERY VOLTAGE CIRCUIT VOLTAGE BELOW THRESHOLD
- P0659-00-DOWNSTREAM MAIN RELAY BATTERY VOLTAGE CIRCUIT VOLTAGE ABOVE THRESHOLD
- P065A-00-INTELLIGENT ALTERNATOR MODULE PERFORMANCE EVENT INFORMATION
- P065B-00-INTELLIGENT ALTERNATOR MODULE GENERAL ELECTRICAL FAILURE
- P065C-00-INTELLIGENT ALTERNATOR MODULE MECHANICAL FAILURES
- P0685-00-MAIN RELAY COMMAND OPEN CIRCUIT
- P0686-00-MAIN RELAY COMMAND CIRCUIT SHORT TO GROUND
- P0687-00-MAIN RELAY COMMAND CIRCUIT SHORT TO BATTERY
- P0691-00-COOLING FAN 1 CIRCUIT SHORT TO GROUND
- P0692-00-COOLING FAN 1 CIRCUIT SHORT TO BATTERY
- P0693-00-COOLING FAN 2 CIRCUIT SHORT TO GROUND
- P0694-00-COOLING FAN 2 CIRCUIT SHORT TO BATTERY
- P0703-00-REDUNDANT BRAKE SWITCH STUCK OPEN OR OPEN CIRCUIT
- P0806-00-CLUTCH PEDAL POSITION SENSOR CIRCUIT RANGEPERFORMANCE SIGNAL PLAUSIBILITY FAILURE
- P0807-00-CLUTCH PEDAL POSITION SENSOR CIRCUIT SHORT TO GROUND OR OPEN
- P0808-00-CLUTCH PEDAL POSITION SENSOR CIRCUIT SHORT TO BATTERY
- P080A-00-CLUTCH POSITION NOT LEARNT NOT CONFIGURED
- P0810-00-CLUTCH POSITION NOT LEARNT SIGNAL COMPARE FAILURE
- P0812-00-REVERSE GEAR SWITCH UNEXPECTED OPERATION
- P086A-00-NEUTRAL GEAR POSITION PLAUSIBILITY
- P086B-00-NEUTRAL GEAR SENSOR SIGNAL FREQUENCY INCORRECT
- P086C-00-NEUTRAL GEAR SENSOR CIRCUIT SHORT TO GROUND
- P086D-00-NEUTRAL GEAR SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P086E-00-NEUTRAL GEAR SENSOR FREQUENCY SIGNAL FREQUENCY INCORRECT
- P086F-00-FIRST AND NEUTRAL GEAR POSITION LEARNING NOT CONFIGURED
- P0A1A-00-INTELLIGENT ALTERNATOR MODULE OVERTEMPERATURE COMPONENT OR SYSTEM OVER TEMPERATURE
- P1170-00-FUEL SYSTEM LEAN SIGNAL PLAUSIBILITY FAILURE
- P1171-00-FUEL SYSTEM LEAN SIGNAL INCORRECT AFTER EVENT
- P1172-00-FUEL SYSTEM RICH SIGNAL PLAUSIBILITY FAILURE
- P1173-00-FUEL SYSTEM RICH SIGNAL INCORRECT AFTER EVENT
- P1191-00-MISSING RAIL BLEED MISSING CALIBRATION
- P1192-00-MISSING FUEL PRIME MISSING CALIBRATION
- P1277-00-PLAUSIBILITY CHECK VSENSING SHORT TO GOUND OR OPEN CIRCUIT DURING CRANK
- P1278-00-PLAUSIBILITY CHECK RELAY1 AND RELAY2 STUCK CLOSED OR SHORT CIRCUIT TO BATTERY VSENSING AT IGNITIONON
- P1279-00-PLAUSIBILITY CHECK RELAY1 OR RELAY2 STUCK OPEN CRANKING MISSED
- P1300-00-PHONIC WHEEL MISSED SELF LEARNING NOT CONFIGURED
- P130A-00-MISFIRE 200 COMPONENT OR SYSTEM OVER TEMPERATURE
- P1506-00-UNEXPECTED SPEED LIMITER DEACTIVATION
- P1507-00-SPEED LIMITER: VEHICLE SPEED INCREMENT WITHOUT SET ACTIVATION
- P1508-00-IMPLAUSIBILITY BETWEEN VEHICLE SPEED AND SPEED LIMITER CONTROL
- P1515-00-PLAUSIBILITY CHECK RELAY1 STUCK CLOSED OR VSENSING SHORT TO BATTERY IN ENGINE RUNNING
- P1518-00-PLAUSIBILITY CHECK RELAY2 STUCK CLOSED OR VSENSING SHORT TO BATTERY IN ENGINE RUNNING
- P165B-00-INTELLIGENT ALTERNATOR MODULE FUNCTIONAL TEST GENERAL ELECTRICAL FAILURE CIRCUIT SHORT TO GROUND

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- P16A0-00-THROTTLE ERROR POSITION SIGNAL CALCULATION FAILURE
- P16A1-00-MOTORIZED THROTTLE SELF LEARNING LOW BATTERY UNEXPECTED OPERATION
- P16A2-00-MOTORIZED THROTTLE SELF LEARNING LIMPHOME POSITION TEST COMMANDED POSITION NOT REACHABLE
- P16A3-00-MOTORIZED THROTTLE SELF LEARNING MECHANICAL THROTTLE CLOSURE PERFORMANCE OR INCORRECT OPERATION
- P16A4-00-MOTORIZED THROTTLE SELF LEARNING TEST SPRING THROTTLE CLOSED COMMANDED POSITION NOT REACHABLE
- P16A5-00-MOTORIZED THROTTLE SELF LEARNING TEST SPRING THROTTLE OPEN COMMANDED POSITION NOT REACHABLE
- P16AA-00-CRUISE CONTROL ANOMALIES DISABLE FOR HIGH ACCELERATION SIGNAL COMPARE FAILURE
- P16AB-00-CRUISE CONTROL ANOMALIES DISABLED FOR HIGH DECELERATION SIGNAL COMPARE FAILURE
- P186F-00-FIRST AND NEUTRAL GEAR POSITION LEARNING SIGNAL COMPARE FAILURE
- P1946-00-FIRE PREVENTION SYSTEM CRASH EVENT DETECTED
- P1D7F-00-MOTORIZED THROTTLE SELF LEARNING INTERRUPTED LEARNING UNEXPECTED OPERATION
- P1D80-00-CONTROL UNIT FAULTY ROM GENERAL CHECKSUM FAILURE
- P1D81-00-DOWNSTREAM LAMBDA PROBE FUNCTIONAL TEST SIGNAL STUCK LOW
- P1D82-00-DOWNSTREAM LAMBDA PROBE FUNCTIONAL TEST SIGNAL STUCK HIGH
- P2100-00-THROTTLE VALVE ACTUATOR COMMAND OPEN CIRCUIT
- P2101-00-THROTTLE VALVE ACTUATOR COMMAND SIGNAL CALCULATION FAILURE
- P2102-00-THROTTLE VALVE ACTUATOR COMMAND CIRCUIT SHORT TO GROUND
- P2103-00-THROTTLE VALVE ACTUATOR COMMAND CIRCUIT SHORT TO BATTERY
- P2122-00-ACCELERATOR PEDAL POTENTIOMETER 1 CIRCUIT SHORT TO GROUND OR OPEN
- P2123-00-ACCELERATOR PEDAL POTENTIOMETER 1 CIRCUIT SHORT TO BATTERY
- P2127-00-ACCELERATOR PEDAL POTENTIOMETER 2 CIRCUIT SHORT TO GROUND OR OPEN
- P2128-00-ACCELERATOR PEDAL POTENTIOMETER 2 CIRCUIT SHORT TO BATTERY
- P2135-00-THROTTLE POTENTIOMETER 1 AND 2 CONGRUENCE SIGNAL COMPARE FAILURE
- P2138-00-ACCELERATOR PEDAL POTENTIOMETER 1 AND 2 CONGRUENCE SIGNAL COMPARE FAILURE
- P2173-00-AIR LEAKAGE IN MANIFOLD SIGNAL COMPARE FAILURE
- P2175-00-MANIFOLD PRESSURE TOO LOW SIGNAL COMPARE FAILURE
- P2228-00 ATMOSPHERIC AIR PRESSURE SENSOR CIRCUIT SHORT TO GROUND OR OPEN
- P2229-00 ATMOSPHERIC AIR PRESSURE SENSOR CIRCUIT SHORT TO BATTERY
- P2299-00-BRAKE AND ACCELERATOR PEDAL COHERENCE SIGNAL COMPARE FAILURE
- P2301-00-CYLINDER 1 IGNITION COIL CIRCUIT SHORT TO BATTERY
- P2304-00-CYLINDER 2 IGNITION COIL CIRCUIT SHORT TO BATTERY
- P2307-00-CYLINDER 3 IGNITION COIL CIRCUIT SHORT TO BATTERY
- P2310-00-CYLINDER 4 IGNITION COIL CIRCUIT SHORT TO BATTERY
- U0001-00-ENGINE CONTROL MODULE MUTE STATUS
- U0002-00-ENGINE CONTROL MODULE BUS OFF STATUS
- U0120-00-INTELLIGENT ALTERNATOR MODULE FUNCTIONAL DIAGNOSIS MISSING MESSAGE
- U0129-00-LOST COMMUNICATION WITH BRAKE SYSTEM MODULE BSM
- U012D-00-INTELLIGENT ALTERNATOR MODULE IAM LIN TRANSMISSION BUS SIGNAL MESSAGE FAILURE
- U0140-00-LOST COMMUNICATION WITH BODY CONTROL MODULE BCM
- U0155-00-LOST COMMUNICATION WITH INSTRUMENT PANEL CONTROL IPC
- U0168-00-IMMOBILIZER CIRCUITCOMPONENT PROTECTION TIME OUT

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- U0331-00-FIRE PREVENTION SYSTEM STATUS FROM BODY CONTROL MODULE ERRATIC
- U040F-00-FIRE PREVENTION SYSTEM STATUS FROM BODY CONTROL MODULE INVALID SERIAL DATA RECEIVED
- U0423-00-INSTRUMENT PANEL CONTROL IPC WRONG DATA LENGTH CODE
- U0426-00-IMMOBILIZER NOT PROGRAMMED
- U0427-00-IMMOBILIZER WRONG CODE IN THE IMMOBILIZER
- U0431-00-TIME&DATE FROM BODY CONTROL MODULE MISSING MESSAGE
- U0433-00-TIME&DATE FROM BODY CONTROL MODULE SIGNAL PLAUSIBILTY FAILURE
- U0469-00-INVALID DATA RECEIVED FROM INTELLIGENT ALTERNATOR MODULE SIGNAL NOT VALID
- U05AB-00-BODY2 DRIVE STYLE STATUS FROM BODY CONTROL MODULE SIGNAL NOT AVAIBLE
- U120F-00-INVALID DATA RECEIVED FROM INTELLIGENT ALTERNATOR MODULE CIRCUIT COMPONENT PROTECTION TIME OUT
- U1490-00-SPEED LIMITER BY DRIVER REVERSIBLE SHUT OFF DUE TO PLAUSIBILITY CHECK
- U1506-00-BRAKE SYSTEM MODULE FAULTY WRONG DATA LENGTH CODE
- U150A-00-BODY CONTROL MODULE FAULTY WRONG DATA LENGTH CODE
- U1930-00-ECM OPERATIONAL MODESTS PLAUSIBILITY FROM ENGINE CONTROL MODULE
- U1932-00-BCM COMMAND OPERATIONAL MODESTS FROM BODY CONTROL MODULE NOT AVAILABLE
- U1933-00-BCM COMMAND FROM BODY CONTROL MODULE MISSING MESSAGE
- U1934-00-BCM COMMAND AND BODY 2 FROM BODY CONTROL MODULE MISSING MESSAGE
- U1935-00-BRAKE 3 FROM BRAKE SYSTEM MODULE MISSING MESSAGE
- U1939-00-CLUSTER 2 FROM INSTRUMENT PANEL CONTROL MISSING MESSAGE
- U193A-00-SCCMCRSCTRL CRUISE MESSAGE FROM BODY CONTROL MODULE MISSING MESSAGE
- U193B-00-BSMYRSDATA FROM BRAKE SYSTEM MODULE MISSING MESSAGE
- U1950-00-BCMCOMMAND FROM BODY CONTROL MODULE CRC OR MESSAGE COUNTER ERROR
- U1952-00-BRAKE 1 FROM BRAKE SYSTEM MODULE CRC OR MESSAGE COUNTER ERROR
- U1956-00-BRAKE 3 FROM BRAKE SYSTEM MODULE CRC OR MESSAGE COUNTER ERROR
- U1958-00-BSM YRS DATA FROM BRAKE SYSTEM MODULE CRC OR MESSAGE COUNTER ERROR
- U1984-00-WHEEL SPEED FROM BRAKE SYSTEM MODULE CRC OR MESSAGE COUNTER ERROR
- U1986-00-SCCM CRS CTRL CRUISE MESSAGE FROM BODY CONTROL MODULE CRC OR MESSAGE COUNTER ERROR

Standard Procedure

- INTERMITTENT CONDITION
- POWERTRAIN VERIFICATION TEST
- PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

MODULE, Powertrain Control (PCM), 1.6L/2.0L Diesel

Diagnosis and Testing

- P0016-00-OFFSET BETWEEN CAMSHAFT AND CRANKSHAFT WRONG MOUNTING POSITION
- P0030-00-UPSTREAM LAMBDA SENSOR HEATER COMMAND OPEN CIRCUIT
- P0031-00-UPSTREAM LAMBDA SENSOR HEATER COMMAND CIRCUIT SHORT TO GROUND OR OPEN
- P0032-00-UPSTREAM LAMBDA SENSOR HEATER COMMAND CIRCUIT SHORT TO BATTERY
- P0036-00-DOWNSTREAM LAMBDA SENSOR HEATER COMMAND OPEN CIRCUIT
- P0037-00-DOWNSTREAM LAMBDA SENSOR HEATER COMMAND CIRCUIT SHORT TO GROUND
- P0038-00-DOWNSTREAM LAMBDA SENSOR HEATER COMMAND CIRCUIT SHORT TO

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BATTERY
- P0045-00-VARIABLE GEOMETRY TURBOCHARGER ACTUATOR COMMAND SIGNAL OPEN
- P0046-00-VARIABLE GEOMETRY TURBOCHARGER ACTUATOR COMMAND OVERLOADOVERTEMPERATURE
- P0047-00-VARIABLE GEOMETRY TURBOCHARGER OUTPUT 1 SIGNAL LOW
- P0048-00-VARIABLE GEOMETRY TURBOCHARGER OUTPUT 1 SIGNAL HIGH
- P004C-00-VARIABLE GEOMETRY TURBOCHARGER OUTPUT 2 SIGNAL LOW
- P004D-00-VARIABLE GEOMETRY TURBOCHARGER OUTPUT 2 SIGNAL HIGH
- P0053-00-UPSTREAM LAMBDA SENSOR RESISTANCE SIGNAL COMPARE FAILURE
- P0054-00-DOWNSTREAM LAMBDA SENSOR RESISTANCE SIGNAL COMPARE FAILURE
- P0069-00-MANIFOLD PRESSURE AND ATMOSPHERIC PRESSURE PLAUSIBILITY SIGNAL COMPARE FAILURE
- P006E-00-VARIABLE GEOMETRY TURBOCHARGER ACTUATOR COMMAND UNDER VOLTAGE
- P0087-00-POSITIVE FUEL PRESSURE GOVERNOR DEVIATION STEP 1 LOW PRESSURE SIGNAL ABOVE UPPER LIMIT
- P0088-00-RAIL PRESSURE TOO HIGH SIGNAL AMPLITUDE > MAXIMUM
- P0092-00-POSITIVE FUEL PRESSURE GOVERNOR DEVIATION STEP 2 LOW PRESSURE SIGNAL ABOVE UPPER LIMIT
- P0093-00-FUEL PRESSURE NEGATIVE GOVERNOR DEVIATION HIGH PRESSURE SIGNAL BELOW LOWER LIMIT
- P0094-00-MINIMUM RAIL PRESSURE SIGNAL BELOW LOWER LIMIT
- P0097-00-AIR INTAKE MANIFOLD TEMPERATURE CIRCUIT SHORT TO GROUND
- P0098-00-AIR INTAKE MANIFOLD TEMPERATURE CIRCUIT SHORT TO BATTERY OR OPEN
- P0100-00-AIR MASS METER SENSITIVITY DRIFT SIGNAL BELOW LOWER LIMIT
- P0101-00-AIR MASS METER GENERAL ELECTRICAL FAILURE
- P0102-00-AIR MASS METER SIGNAL HIGH TIME BELOW THRESHOLD
- P0103-00-AIR MASS METER SIGNAL HIGH TIME ABOVE THRESHOLD
- P0104-00-AIR MASS METER SENSITIVITY DRIFT SIGNAL ABOVE UPPER LIMIT
- P0111-00-AIR MASS FLOW METER TEMPERATURE SIGNAL COMPARE FAILURE
- P0112-00-AIR TEMPERATURE SENSOR ELECTRICAL FAILURE CIRCUIT SHORT TO GROUND
- P0113-00-AIR TEMPERATURE SENSOR ELECTRICAL FAILURE CIRCUIT SHORT TO BATTERY OR OPEN
- P0115-00-ENGINE COOLANT TEMPERATURE PLAUSIBILITY CHECK
- P0116-00-ENGINE COOLANT TEMPERATURE SENSOR PLAUSIBILITY
- P0117-00-ENGINE COOLANT TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO GROUND
- P0118-00-ENGINE COOLANT TEMPERATURE SENSOR SIGNAL CIRCUIT SHORT TO BATTERY OR OPEN
- P0122-00-ACCELERATOR PEDAL CONNECTOR DISCONNECTED
- P0127-00-EGR HIGH PRESSURE INTAKE AIR MANIFOLD OVERHEATING
- P0130-00-LAMBDA SENSOR UPSTREAM WIRE DIAGNOSIS OPEN CIRCUIT
- P0131-00-LAMBDA SENSOR UPSTREAM WIRE DIAGNOSIS CIRCUIT SHORT TO GROUND
- P0132-00-LAMBDA SENSOR UPSTREAM WIRE DIAGNOSIS CIRCUIT SHORT TO BATTERY
- P0133-00-LAMBDA SENSOR UPSTREAM WIRE DIAGNOSIS CIRCUIT PLAUSIBILITY
- P0134-00-LAMBDA SENSOR UPSTREAM SERIAL PERIPHERAL INTERFACE ERROR DETECTION GENERICAL ELECTRICAL FAILURE
- P0136-00-LAMBDA SENSOR DOWNSTREAM WIRE DIAGNOSIS OPEN CIRCUIT
- P0137-00-LAMBDA SENSOR DOWNSTREAM WIRE DIAGNOSIS CIRCUIT SHORT TO GROUND
- P0138-00-LAMBDA SENSOR DOWNSTREAM WIRE DIAGNOSIS CIRCUIT SHORT TO BATTERY
- P0139-00-LAMBDA SENSOR DOWNSTREAM WIRE DIAGNOSIS CIRCUIT PLAUSIBILITY
- P0140-00-LAMBDA SENSOR DOWNSTREAM SERIAL PERIPHERAL INTERFACE ERROR DETECTION
- P0182-00-FUEL TEMPERATURE SENSOR CIRCUIT SHORT TO GROUND

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- P0183-00-FUEL TEMPERATURE SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P0192-00-RAIL PRESSURE SENSOR CIRCUIT SHORT TO GROUND
- P0193-00-RAIL PRESSURE SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P0201-00-INJECTOR 1 COMMAND OPEN
- P0202-00-INJECTOR 2 COMMAND OPEN
- P0203-00-INJECTOR 3 COMMAND OPEN
- P0204-00-INJECTOR 4 COMMAND OPEN
- P0216-00-ENERGIZING TIME MONITORING GENERAL SIGNAL FAILURE
- P0219-00-ENGINE OVERSPEED RECOGNITION
- P0235-00-TURBOCHARGER PRESSURE SENSOR SIGNAL CIRCUIT SHORT TO GROUND
- P0236-00-TURBOCHARGER PRESSURE SENSOR SIGNAL CIRCUIT SHORT TO BATTERY OR OPEN CIRCUIT
- P0237-00-NEGATIVE BOOST PRESSURE GOVERNOR DEVIATION HIGH PRESSURE SIGNAL CALCULATION FAILURE
- P0238-00-POSITIVE BOOST PRESSURE GOVERNOR DEVIATION LOW PRESSURE SIGNAL CALCULATION FAILURE
- P0251-00-METERING UNIT ELECTRICAL FAILURE OPEN CIRCUIT
- P0253-00-METERING UNIT ELECTRICAL FAILURE CIRCUIT SHORT TO GROUND
- P0254-00-METERING UNIT ELECTRICAL FAILURE CIRCUIT SHORT TO BATTERY
- P0257-00-METERING UNIT ELECTRICAL FAILURE OVER TEMPERATURE
- P0261-00-SHORT CIRCUIT OF THE POWER STAGE LOW SIDE CYLINDER 1 ERROR
- P0262-00-SHORT CIRCUIT BETWEEN HIGH SIDE AND LOW SIDE OF THE POWER STAGE CYLINDER 1
- P0264-00-SHORT CIRCUIT OF THE POWER STAGE LOW SIDE CYLINDER 2 ERROR
- P0266-00-SHORT CIRCUIT BETWEEN HIGH SIDE AND LOW SIDE OF THE POWER STAGE CYLINDER 2
- P0267-00-SHORT CIRCUIT POWER STAGE LOW SIDE-ERROR CYLINDER 3
- P0268-00-SHORT CIRCUIT BETWEEN HIGH SIDE AND LOW SIDE OF THE POWER STAGE CYLINDER 3
- P0270-00-SHORT CIRCUIT OF THE POWER STAGE LOW SIDE CYLINDER 4 ERROR
- P0271-00-SHORT CIRCUIT BETWEEN HIGH SIDE AND LOW SIDE OF THE POWER STAGE CYLINDER 4
- P0335-00-ENGINE SPEED SENSOR GENERAL ELECTRICAL FAILURE
- P0336-00-ENGINE SPEED SENSOR SIGNAL DISTURBANCE
- P0340-00-CAMSHAFT SENSOR SIGNAL INVALID
- P0341-00-CAMSHAFT SENSOR GENERAL ELECTRICAL FAILURE
- P0383-00-GLOW PLUG RELAY COMMAND CIRCUIT SHORT TO GROUND
- P0384-00-GLOW PLUG RELAY COMMAND CIRCUIT SHORT TO BATTERY
- P0401-00-AIR CONTROL POSITIVE GOVERNOR DEVIATION HIGH AIR QUANTITY
- P0402-00-AIR CONTROL NEGATIVE GOVERNOR DEVIATION LOW AIR QUANTITY
- P0403-00-EGR HIGH PRESSURE VALVE CONTROL OPEN
- P0404-00-EGR HIGH PRESSURE VALVE CONTROL CIRCUIT CURRENT ABOVE THRESHOLD
- P0405-00-EGR HIGH PRESSURE VALVE POSITION SENSOR ELECTRICAL TEST CIRCUIT SHORT TO GROUND OR OPEN
- P0406-00-EGR HIGH PRESSURE VALVE POSITION SENSOR ELECTRICAL TEST CIRCUIT SHORT TO BATTERY
- P0407-00-EGR LOW PRESSURE VALVE POSITION SENSOR ELECTRICAL TEST (CIRCUIT SHORT TO GROUND OR OPEN)
- P0408-00-EGR LOW PRESSURE VALVE POSITION SENSOR ELECTRICAL TEST (CIRCUIT SHORT TO BATTERY)
- P0409-00-EGR HIGH PRESSURE VALVE POSITION SENSOR FUNCTIONAL TEST ALIGNMENT OR ADJUSTMENT INCORRECT
- P040C-00-EGR HIGH PRESSURE COOLER DOWNSTREAM TEMPERATURE SENSOR CIRCUIT SHORT TO GROUND

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- P040D-00-EGR HIGH PRESSURE COOLER DOWNSTREAM TEMPERATURE SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P041C-00-EGR LOW PRESSURE COOLER DOWNSTREAM TEMPERATURE SENSOR (CIRCUIT SHORT TO GROUND)
- P041D-00-EGR LOW PRESSURE COOLER DOWNSTREAM TEMPERATURE SENSOR (CIRCUIT SHORT TO BATTERY OR OPEN)
- P042E-00-EGR HIGH PRESSURE VALVE ACTUATOR STUCK OPEN
- P045A-00-EGR LOW PRESSURE VALVE CONTROL OPEN
- P045B-00-EGR LOW PRESSURE VALVE CONTROL CIRCUIT CURRENT ABOVE THRESHOLD
- P045C-00-EGR LOW PRESSURE VALVE CONTROL OUT 1 CIRCUIT SHORT TO GROUND
- P045D-00-EGR LOW PRESSURE VALVE CONTROL OUT 1 CIRCUIT SHORT TO BATTERY
- P045E-00-EGR LOW PRESSURE VALVE CONTROL STUCK OPEN
- P046C-00-EGR HIGH PRESSURE VALVE POSITIVE POSITION DEVIATION SIGNAL ABOVE UPPER LIMIT
- P046E-00-EGR LOW PRESSURE VALVE POSITIVE POSITION DEVIATION SIGNAL ABOVE UPPER LIMIT
- P0480-00-COOLING FAN 1 OPEN CIRCUIT
- P0481-00-COOLING FAN 2 OPEN CIRCUIT
- P0484-00-COOLING FAN 1 OVER TEMPERATURE
- P0486-0-00-EGR LOW PRESSURE VALVE POSITION SENSOR FUNCTIONAL TEST ALIGNMENT OR ADJUSTMENT INCORRECT
- P0489-00-EGR HIGH PRESSURE VALVE CONTROL OUT 1 CIRCUIT SHORT TO GROUND
- P0490-00-EGR HIGH PRESSURE VALVE CONTROL OUT 1 CIRCUIT SHORT TO BATTERY
- P0500-00-VEHICLE SPEED RECEIVED FROM CAN WRONG
- P0501-00-VEHICLE SPEED SIGNAL ABOVE ALLOWABLE RANGE
- P0503-00-VEHICLE SPEED SIGNAL PLAUSIBILITY ANOMALY
- P0504-00-BRAKE PEDAL SWITCH SIGNAL COMPARE FAILURE
- P0513-00-IMMOBILIZER WRONG KEY
- P0520-00-OIL PRESSURE SWITCH SIGNAL INCORRECT AFTER EVENT
- P0521-00-PLAUSIBILITY MONITORING BETWEEN TWO ENGINE OIL PRESSURE SWITCH INVERTED MOUNTING
- P0525-00-CRUISE CONTROL DISABLING DUE TO LEVEL 2 MONITORING OF DRIVER ASSISTANCE SYSTEM SYSTEM INTERNAL FAILURES
- P0532-00-AIR CONDITIONER PRESSURE SENSOR CIRCUIT SHORT TO GROUND OR OPEN
- P0533-00-AIR CONDITIONER PRESSURE SENSOR CIRCUIT SHORT TO BATTERY
- P053A-00-BLOW BY HEATER RELAY COMMAND CIRCUIT OPEN
- P053B-00-BLOW BY HEATER RELAY COMMAND CIRCUIT SHORT TO GROUND
- P053C-00-BLOW BY HEATER RELAY COMMAND CIRCUIT SHORT TO BATTERY
- P0544-00- EXHAUST GAS TEMPERATURE SENSOR CIRCUIT - BANK 1 SENSOR 1
- P0545-00-EXHAUST GAS TEMPERATURE SENSOR CIRCUIT LOW-BANK 1 SENSOR 1
- P0546-00-EXHAUST GAS TEMPERATURE SENSOR CIRCUIT HIGH-BANK 1 SENSOR 1
- P0548-00-OUTLET DIESEL PARTICULATE FILTER EXHAUST GAS TEMPERATURE SENSOR CIRCUIT SHORT TO GROUND
- P0549-00-OUTLET DIESEL PARTICULATE FILTER EXHAUST GAS TEMPERATURE SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P0562-00-UPSTREAM MAIN RELAY BATTERY VOLTAGE BELOW THRESHOLD
- P0563-00-UPSTREAM MAIN RELAY BATTERY VOLTAGE ABOVE THRESHOLD
- P0571-00-BRAKE PEDAL SWITCH STUCK OPEN
- P0572-00-BRAKE PEDAL SWITCH SIGNAL INCORRECT AFTER EVENT
- P0575-00-CRUISE CONTROL REVERSIBLE SHUT OFF FOR AUTOMATIC TRANSMISSION REQUEST
- P0578-00-CRUISE OR SPEED LIMITER SWITCH COMMAND STUCK
- P0579-00-CRUISE CONTROL REVERSIBLE DISABLING EVENT INFORMATION
- P0596-00-CRUISE CONTROL DISABLING DUE TO LEVEL 2 MONITORING OF DRIVER

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ASSISTANCE SYSTEM GENERAL SIGNAL FAILURE
- P0600-00-ECU INTERNAL MONITORING 2 SYSTEM INTERNAL FAILURES
- P0601-00-ERROR STATE OF EEPROM DATA MEMORY FAILURE
- P0602-00-ERROR STATE OF EEPROM PROGRAM MEMORY FAILURE
- P0604-00-INTERNAL CONTROL MODULE WRITE IN MEMORY DATA MEMORY FAILURE
- P0605-00-INTERNAL CONTROL MODULE WRITE IN MEMORY SPECIAL MEMORY FAILURE
- P060A-00-ECU INTERNAL MONITORING 2 COMPONENT INTERNAL FAILURE
- P060B-00-AD CONVERTER GENERAL SIGNAL FAILURE
- P060C-00-ECM MICRO RESET FOR SECOND SAFETY LEVEL
- P060D-00-ECU INTERNAL MONITORING 4 COMPONENT INTERNAL FAILURE
- P0611-00-FUEL INJECTOR CONTROL MODULE PERFORMANCE
- P0615-00-STARTER RELAY COMMAND OPEN CIRCUIT
- P0616-00-STARTER RELAY COMMAND CIRCUIT SHORT TO GROUND
- P0617-00-STARTER RELAY COMMAND CIRCUIT SHORT TO BATTERY
- P061A-00-TORQUE MONITORING INTERNAL ELECTRONIC FAILURE
- P0048-00-VARIABLE GEOMETRY TURBOCHARGER OUTPUT 1 SIGNAL HIGH
- P061B-00-TORQUE MONITORING SIGNAL COMPARE FAILURE
- P061C-00-ECU INTERNAL MONITORING 5 SYSTEM INTERNAL FAILURES
- P061D-00-CONTROL UNIT EGR HIGH PRESSURE DRIVER INTERNAL ELECTRONIC FAILURE UNDERVOLTAGE
- P0627-00-FUEL PUMP RELAY COMMAND OPEN CIRCUIT
- P0628-00-FUEL PUMP RELAY COMMAND CIRCUIT SHORT TO GROUND
- P0629-00-FUEL PUMP RELAY COMMAND CIRCUIT SHORT TO BATTERY
- P062A-00-FUEL PUMP RELAY COMMAND OVER TEMPERATURE
- P062B-00-ENERGIZING TIME MONITORING SYSTEM INTERNAL FAILURES
- P0633-00-IMMOBILIZER CODE NOT STORED IN EEPROM
- P0638-00-THROTTLE VALVE ACTUATOR PERMANENT CONTROL DEVIATION SIGNAL AMPLITUDE-MAXIMUM
- P0641-00-SENSOR SUPPLY 1 VOLTAGE OUT OF RANGE
- P0645-00-AIR CONDITIONER COMPRESSOR RELAY OPEN CIRCUIT
- P0646-00-AIR CONDITIONER COMPRESSOR RELAY CIRCUIT SHORT TO GROUND
- P0647-00-AIR CONDITIONER COMPRESSOR RELAY CIRCUIT SHORT TO BATTERY
- P0651-00-SENSOR SUPPLY 2 VOLTAGE OUT OF RANGE
- P065A-00-INTELLIGENT ALTERNATOR MODULE PERFORMANCE
- P065B-00-INTELLIGENT ALTERNATOR MODULE FUNCTIONAL TEST GENERAL ELECTRICAL FAILURE CIRCUIT SHORT TO BATTERY OR OPEN
- P065C-00-INTELLIGENT ALTERNATOR MODULE FUNCTIONAL TEST MECHANICAL FAILURE
- P066A-00-GLOW PLUG 1 CIRCUIT SHORT TO GROUND
- P066C-00-GLOW PLUG 2 CIRCUIT SHORT TO GROUND
- P066E-00-GLOW PLUG 3 CIRCUIT SHORT TO GROUND
- P0670-00-GLOW CONTROL UNIT INTERNAL FAILURE
- P0671-00-GLOW PLUG 1 OPEN CIRCUIT
- P0672-00-GLOW PLUG 2 OPEN CIRCUIT
- P0673-00-GLOW PLUG 3 OPEN CIRCUIT
- P0674-00-GLOW PLUG 4 OPEN CIRCUIT
- P067A-00-GLOW PLUG 4 CIRCUIT SHORT TO GROUND
- P0683-00-GLOW PLUG UNIT ERROR INVALID SERIAL DATA RECEIVED
- P0685-00-MAIN RELAY COMMAND ACTUATOR SLIPPING
- P0686-00-MAIN RELAY COMMAND UNEXPECTED OPERATION
- P068A-00-BATTERY DISCONNECTION
- P0691-00-COOLING FAN 1 CIRCUIT SHORT TO GROUND
- P0692-00-COOLING FAN 1 CIRCUIT SHORT TO BATTERY
- P0693-00-COOLING FAN 2 CIRCUIT SHORT TO GROUND

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- P0694-00-COOLING FAN 2 CIRCUIT SHORT TO BATTERY
- P0697-00-SENSOR SUPPLY 3 VOLTAGE OUT OF RANGE
- P06A4-00-SENSOR SUPPLY ECU INTERNAL VOLTAGE REGULATOR VDD5 UNDER VOLTAGE
- P06A5-00-SENSOR SUPPLY ECU INTERNAL VOLTAGE REGULATOR VDD5 OVERVOLTAGE
- P06DA-00-VARIABLE DISPLACEMENT OIL PUMP COMMAND OPEN CIRCUIT
- P06DB-00-VARIABLE DISPLACEMENT OIL PUMP COMMAND CIRCUIT SHORT TO GROUND
- P06DC-00-VARIABLE DISPLACEMENT OIL PUMP COMMAND CIRCUIT SHORT TO BATTERY
- P06DD-00-VARIABLE DISPLACEMENT OIL PUMP PRESSURE BLOCKED
- P06DE-00-VARIABLE DISPLACEMENT OIL PUMP PLAUSIBILITY
- P0703-00-BRAKE PEDAL SWITCH SIGNAL SEQUENCE INCORRECT
- P0806-00-CLUTCH PEDAL POSITION SENSOR CIRCUIT RANGEPERFORMANCE SIGNAL PLAUSIBILITY FAILURE
- P0807-00-CLUTCH PEDAL POSITION SENSOR CIRCUIT SHORT TO GROUND OR OPEN
- P0808-00-CLUTCH PEDAL POSITION SENSOR CIRCUIT SHORT TO BATTERY
- P0810-00-CLUTCH POSITION NOT LEARNED SIGNAL COMPARE FAILURE
- P080A-00-CLUTCH POSITION NOT LEARNT NOT CONFIGURED
- P0812-00-REVERSE GEAR SWITCH UNEXPECTED OPERATION
- P086A-00-NEUTRAL GEAR POSITION PLAUSIBILITY
- P086B-00-NEUTRAL GEAR SENSOR SIGNAL FREQUENCY INCORRECT
- P086C-00-NEUTRAL GEAR SENSOR CIRCUIT SHORT TO GROUND
- P086D-00-NEUTRAL GEAR SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P086E-00-NEUTRAL GEAR SENSOR FREQUENCY SIGNAL FREQUENCY INCORRECT
- P086F-00-FIRST AND NEUTRAL GEAR POSITION LEARNING NOT CONFIGURED
- P0A1A-00-INTELLIGENT ALTERNATOR MODULE OVERTEMPERATURE
- P1000-00-PERFORMANCE LIMITATION FOR HIGH FUEL TEMPERATURE
- P112A-00-LAMBDA SENSOR UPSTREAM SIGNAL PLAUSIBILITY CHECK SIGNAL AMPLITUDE LESS THAN MINIMUM
- P112B-00-LAMBDA SENSOR UPSTREAM SIGNAL PLAUSIBILITY CHECK SIGNAL AMPLITUDE MORE THAN MAXIMUM
- P112C-00-LAMBDA SENSOR DOWNSTREAM SIGNAL PLAUSIBILITY CHECK SIGNAL AMPLITUDE LESS THAN MINIMUM
- P112D-00-LAMBDA SENSOR DOWNSTREAM SIGNAL PLAUSIBILITY CHECK SIGNAL AMPLITUDE MORE THAN MAXIMUM
- P1213-00-VARIABLE DISPLACEMENT OIL PUMP COMMAND OVER TEMPERATURE
- P1216-00-ENERGIZING TIME MONITORING INTERNAL ELECTRONIC FAILURE
- P1217-00-ENERGIZING TIME MONITORING SIGNAL PLAUSIBILITY FAILURE
- P1218-00-RECOVERY HARDWARE OF CONTROL UNIT CONTROL UNIT RESET
- P1219-00-ENERGIZING TIME MONITORING COMPONENT INTERNAL FAILURE
- P1275-00-AIR CONDITIONER COMPRESSOR RELAY OVER TEMPERATURE
- P1277-00-PLAUSIBILITY CHECK VSENSING SHORT TO GOUND OR OPEN CIRCUIT DURING CRANK
- P1278-00-PLAUSIBILITY CHECK R1 AND R2 STUCK CLOSED OR SHORT CIRCUIT TO BATTERY VSENSING AT IGNITION ON
- P1279-00-PLAUSIBILITY CHECK R1 OR R2 STUCK OPEN CRANKING MISSED
- P1451-00-DIESEL PARTICULATE FILTER EFFICIENCY RESULT
- P1489-00-EGR HIGH PRESSURE VALVE CONTROL OUT 2 CIRCUIT SHORT TO GROUND
- P1490-00-EGR HIGH PRESSURE VALVE CONTROL OUT 2 CIRCUIT SHORT TO BATTERY
- P1506-00-UNEXPECTED SPEED LIMITER DEACTIVATION
- P1507-00-SPEED LIMITER: VEHICLE SPEED INCREMENT WITHOUT SET+ ACTIVATION
- P1508-00-IMPLAUSIBILITY BETWEEN VEHICLE SPEED AND SPEED LIMITER CONTROL
- P1513-00-INTERNAL CONTROL MODULE AUTO RESTART REQUEST WITHOUT PERMISSION BY LEVEL 2
- P1515-00-PLAUSIBILITY CHECK R1 STUCK CLOSED OR VSENSING SHORT TO BATTERY IN

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ENGINE RUNNING
- P1518-00-PLAUSIBILITY CHECK R2 STUCK CLOSED OR VSENSING SHORT TO BATTERY IN ENGINE RUNNING
- P1542-00-SECOND OIL SWITCH PRESSURE PLAUSIBILITY MONITORING
- P1581-00-BLOW BY HEATER RELAY FEEDBACK CIRCUIT SHORT TO GROUND
- P1582-00-BLOW BY HEATER RELAY FEEDBACK CIRCUIT SHORT TO BATTERY OR OPEN
- P161D-00-CONTROL UNIT EGR HIGH PRESSURE DRIVER OVER TEMPERATURE
- P161E-00-CONTROL UNIT EGR LOW PRESSURE DRIVER INTERNAL ELECTRONIC FAILURE UNDERVOLTAGE
- P161F-00-CONTROL UNIT (EGR LOW PRESSURE DRIVER) OVER TEMPERATURE
- P1648-00-GLOW PLUG CONTROL MODULE INTERNAL ERROR
- P1649-00-GLOW PLUG MODULE POWER SUPPLY CIRCUIT
- P165B-00-INTELLIGENT ALTERNATOR MODULE FUNCTIONAL TEST GENERAL ELECTRICAL FAILURE CIRCUIT SHORT TO GROUND
- P1688-00-EGR LOW PRESSURE VALVE CONTROL OUT 2 CIRCUIT SHORT TO GROUND
- P1689-00-EGR LOW PRESSURE VALVE CONTROL OUT 2 CIRCUIT SHORT TO BATTERY
- P16AA-00-CRUISE CONTROL SPEED LIMITER BY DRIVER REVERSIBLE DISABLING FOR HIGH ACCELERATION
- P16AB-00-CRUISE CONTROL DISABLED FOR HIGH DECELERATION
- P1732-00-THROTTLE VALVE ACTUATOR OUTPUT 2 CIRCUIT LOW
- P1733-00-THROTTLE VALVE ACTUATOR OUTPUT 2 CIRCUIT HIGH
- P1734-00-THROTTLE VALVE ACTUATOR OUTPUT 1 CIRCUIT LOW
- P1735-00-THROTTLE VALVE ACTUATOR OUTPUT 1 CIRCUIT HIGH
- P186F-00-FIRST AND NEUTRAL GEAR POSITION LEARNING SIGNAL COMPARE FAILURE
- P1946-00-FIRE PREVENTION SYSTEM: CRASH EVENT DETECTED
- P1B11-00-TORQUE TO QUANTITY CONVERSION NOT STRICTLY MONOTONOUS CALIBRATION PARAMETER MEMORY FAILURE
- P1C5F-00-TOO LOW VISCOSITY LEVEL 1
- P1D30-00-TOO LOW VISCOSITY LEVEL 2
- P1D39-00-AD CONVERTER SYSTEM INTERNAL FAILURES
- P1D3B-00-ECU INTERNAL MONITORING 1 COMPONENT INTERNAL FAILURE
- P1D3C-00-ECU INTERNAL MONITORING 1 INTERNAL ELECTRONIC FAILURE
- P1D3D-00-ECU INTERNAL MONITORING 3 COMPONENT INTERNAL FAILURE
- P1D3E-00-ECU INTERNAL MONITORING 1 SYSTEM INTERNAL FAILURES
- P1D3F-00-ECU INTERNAL MONITORING 3 SYSTEM INTERNAL FAILURES
- P1D40-00-ECU INTERNAL MONITORING 3 INTERNAL ELECTRONIC FAILURE
- P1D41-00-ECU INTERNAL MONITORING 2 INTERNAL ELECTRONIC FAILURE
- P1D42-00-ECU INTERNAL MONITORING 1 SIGNAL PLAUSIBILITY FAILURE
- P1D43-00-ECU INTERNAL MONITORING 2 SIGNAL PLAUSIBILITY FAILURE
- P1D44-00-ECU INTERNAL MONITORING 3 SIGNAL PLAUSIBILITY FAILURE
- P1D45-00-INJECTION SYSTEM MONITORING INTERNAL ELECTRONIC FAILURE
- P1D49-00-ECU INTERNAL MONITORING 5 INTERNAL ELECTRONIC FAILURE
- P1D4A-00-ECU INTERNAL MONITORING 5 SIGNAL PLAUSIBILITY FAILURE
- P1D4C-00-INJECTION SYSTEM MONITORING SYSTEM INTERNAL FAILURES
- P1D4E-00-INJECTION SYSTEM MONITORING SYSTEM INTERNAL FAILURE
- P1D4C-00-INJECTION SYSTEM MONITORING SYSTEM INTERNAL FAILURES
- P1D56-00-SERIAL PERIPHERAL INTERFACE COMMUNICATION SYSTEM INTERNAL FAILURES
- P1D57-00-SERIAL PERIPHERAL INTERFACE COMMUNICATION SIGNAL PLAUSIBILITY FAILURE
- P1D58-00-SERIAL PERIPHERAL INTERFACE COMMUNICATION INTERNAL ELECTRONIC FAILURE
- P1DB6-00-VEHICLE SPEED SENSOR PLAUSIBILITY SIGNAL PLAUSIBILITY FAILURE

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- P1E14-00-COOLING FAN 2 OVER TEMPERATURE
- P2000-00-NOX STORAGE CATALYST DEFECTIVE
- P2002-00-DIESEL PARTICULATE FILTER FLOW RESISTANCE MONITORING TOO HIGH LEVEL 2 COMPONENT OR SYSTEM OPERATION OBSTRUCTED OR BLOCKED
- P2004-00-VARIABLE SWIRL ACTUATOR OPEN BLOCKED
- P2006-00-VARIABLE SWIRL ACTUATOR CLOSED BLOCKED
- P2008-00-VARIABLE SWIRL ACTUATOR ELECTRICAL FAILURE OPEN CIRCUIT
- P2009-00-VARIABLE SWIRL ACTUATOR ELECTRICAL FAILURE CIRCUIT SHORT TO GROUND
- P200A-00-VARIABLE SWIRL ACTUATOR SUPPLY VOLTAGE CIRCUIT VOLTAGE OUT OF RANGE
- P2010-00-VARIABLE SWIRL ACTUATOR ELECTRICAL FAILURE CIRCUIT SHORT TO BATTERY
- P2014-00-VARIABLE SWIRL ACTUATOR COMMAND PWM NO SIGNAL
- P2015-00-VARIABLE SWIRL ACTUATOR HW DAMAGE COMPONENT INTERNAL FAILURE
- P2016-00-VARIABLE SWIRL ACTUATOR FEEDBACK LINE CIRCUIT SHORT TO GROUND
- P2017-00-VARIABLE SWIRL ACTUATOR FEEDBACK LINE CIRCUIT SHORT TO BATTERY OR OPEN
- P2018-00-VARIABLE SWIRL ACTUATOR INTERMEDIATE POSITION BLOCKED
- P201B-00-VARIABLE SWIRL ACTUATOR EXCESS TEMPERATURE
- P201D-00-VARIABLE SWIRL ACTUATOR FREQUENCY ERROR
- P2031-00-OXIDATION CATALYST UPSTREAM TEMPERATURE SIGNAL PLAUSIBILITY
- P2032-00-OXIDATION CATALYST UPSTREAM TEMPERATURE SIGNAL LOW CIRCUIT SHORT TO GROUND
- P2033-00-OXIDATION CATALYST UPSTREAM TEMPERATURE SIGNAL HIGH CIRCUIT SHORT TO BATTERY OR OPEN
- P20F8-00-VARIABLE SWIRL ACTUATOR ELECTRICAL FAILURE OVER TEMPERATURE
- P2100-00-THROTTLE VALVE ACTUATOR COMMAND OPEN
- P2101-00-THROTTLE VALVE ACTUATOR EXCESS TEMPERATURE
- P2102-00-THROTTLE VALVE ACTUATOR COMMAND UNDERVOLTAGE
- P2103-00-THROTTLE VALVE ACTUATOR COMMAND OVERLOAD
- P2107-00-THROTTLE VALVE SENSOR PERMANENT CONTROL DEVIATION SIGNAL AMPLITUDE LESS THAN MINIMUM
- P2108-00-THROTTLE VALVE SENSOR POSITION DEVIATION CIRCUIT VOLTAGE BELOW THRESHOLD
- P2119-00-THROTTLE VALVE ACTUATOR POSITION DEVIATION CIRCUIT VOLTAGE ABOVE THRESHOLD
- P2123-00-ACCELERATOR PEDAL POTENTIOMETER 1 CIRCUIT SHORT TO BATTERY
- P2128-00-ACCELERATOR PEDAL POTENTIOMETER 2 CIRCUIT SHORT TO BATTERY
- P2138-00-ACCELERATOR PEDAL POTENTIOMETER CONGRUENCE SIGNAL COMPARE FAILURE
- P213B-00-EGR LOW PRESSURE VALVE NEGATIVE POSITION DEVIATION SIGNAL BELOW LOWER LIMIT
- P2148-00-POWER STAGE HIGH SIDE BANK 0 ERROR CIRCUIT CURRENT ABOVE THRESHOLD
- P2151-00-POWER STAGE HIGH SIDE BANK 1 ERROR CIRCUIT CURRENT ABOVE THRESHOLD
- P2228-00-ATMOSPHERIC AIR PRESSURE SENSOR CIRCUIT SHORT TO GROUND OR OPEN
- P2229-00-ATMOSPHERIC AIR PRESSURE SENSOR CIRCUIT SHORT TO BATTERY
- P2264-00-WATER IN FUEL FILTER SIGNAL INCORRECT AFTER EVENT
- P226D-00-DIESEL PARTICULATE FILTER HOSE LINE MONITORING 1 SIGNAL INVALID
- P2288-00-INJECTOR CONTROL PRESSURE TOO HIGH
- P2289-00-INJECTOR CONTROL PRESSURE TOO HIGH ENGINE OFF
- P2299-00-BRAKE AND ACCELERATOR PEDAL COHERENCE
- P2413-00-EGR HIGH PRESSURE VALVE NEGATIVE POSITION DEVIATION SIGNAL BELOW

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LOWER LIMIT
- P242B-00-INLET DIESEL PARTICULATE FILTER EXHAUST GAS TEMPERATURE SENSOR PLAUSIBILITY
- P242C-00-INLET DIESEL PARTICULATE FILTER EXHAUST GAS TEMPERATURE SENSOR CIRCUIT SHORT TO GROUND
- P242D-00-INLET DIESEL PARTICULATE FILTER EXHAUST GAS TEMPERATURE SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P244A-00-DIESEL PARTICULATE FILTER DELTA PRESSURE SENSOR CIRCUIT SHORT TO GROUND
- P244B-00-DIESEL PARTICULATE FILTER DELTA PRESSURE SENSOR CIRCUIT SHORT TO BATTERY OR OPEN
- P2453-00-DIESEL PARTICULATE FILTER DIFFERENTIAL PRESSURE SENSOR PLAUSIBILITY
- P2455-00-DIESEL PARTICULATE FILTER FLOW RESISTANCE MONITORING HIGH LEVEL 1 COMPONENT OR SYSTEM OPERATION OBSTRUCTED OR BLOCKED
- P2458-00-DIESEL PARTICULATE FILTER REGENERATION NOT ENDED
- P245A-00-EGR HIGH PRESSURE COOLER BYPASS COMMAND CIRCUIT OPEN
- P245B-00-EGR HIGH PRESSURE COOLER BYPASS COMMAND OVER TEMPERATURE
- P245C-00-EGR HIGH PRESSURE COOLER BYPASS COMMAND CIRCUIT SHORT TO GROUND
- P245D-00-EGR HIGH PRESSURE COOLER BYPASS COMMAND CIRCUIT SHORT TO BATTERY
- P246F-00-OUTLET DIESEL PARTICULATE FILTER EXHAUST GAS TEMPERATURE SENSOR PLAUSIBILITY
- P24A4-00-SOOT LOAD AND MILEAGE WITH DIESEL PARTICULATE FILTER LAMP ON
- P24C2-00-EXHAUST GAS TEMPERATURE FOR COLD START CONDITION 2 SIGNAL COMPARE FAILURE
- P2562-00-VARIABLE GEOMETRY TURBOCHARGER POSITION SENSOR ELECTRICAL FAILURE CIRCUIT SHORT TO GROUND OR OPEN CIRCUIT
- P2563-00-VARIABLE GEOMETRY TURBOCHARGER POSITION SENSOR ELECTRICAL FAILURE CIRCUIT SHORT TO BATTERY
- P2564-00-VARIABLE GEOMETRY TURBOCHARGER POSITION SENSOR DEVIATION SIGNAL AMPLITUDE LESS THAN MINIMUM
- P2565-00-VARIABLE GEOMETRY TURBOCHARGER POSITION SENSOR DEVIATION SIGNAL AMPLITUDE GREATER THAN MAXIMUM
- P263E-00-GLOW PLUG RELAY COMMAND OVER TEMPERATURE
- P268C-00-IMA CLASSIFICATION INJECTOR 1 MISSED PERSONALIZATION
- P268D-00-IMA CLASSIFICATION INJECTOR 2 MISSED PERSONALIZATION
- P268E-00-IMA CLASSIFICATION INJECTOR 3 MISSED PERSONALIZATION
- P268F-00-IMA CLASSIFICATION INJECTOR 4 MISSED PERSONALIZATION
- U0001-00-ECM NODE MUTE STATUS
- U0002-00-ECM NODE BUS OFF STATUS
- U0101-00-LOST COMMUNICATION WITH TRANSMISSION CONTROL MODULE TCM-DCTM
- U0102-00-LOST COMMUNICATION WITH DRIVE TRAIN CONTROL MODULE DTCM
- U0120-00-INTELLIGENT ALTERNATOR MODULE FUNCTIONAL DIAGNOSIS MISSING MESSAGE
- U0129-00-LOST COMMUNICATION WITH BRAKE SYSTEM MODULE BSM
- U012D-00-INTELLIGENT ALTERNATOR MODULE LIN TRANSMISSION BUS SIGNALMESSAGE FAILURE
- U0140-LOST COMMINICATION WITH BODY CONTROL MODULE
- U0151-00-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER ORC
- U0155-00-LOST COMMUNICATION WITH INSTRUMENT PANEL CLUSTER IPC
- U0168-00 IMMOBILIZER CIRCUIT-COMPONENT PROTECTION TIME OUT
- U0331-00-FIRE PREVENTION SYSTEM STATUS FROM BODY CONTROL MODULE ERRATIC
- U0405-IMPLAUSIBLE DATA RECEIVED FROM CRUISE CONTROL MODULE

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- U040F-00-FIRE PREVENTION SYSTEM STATUS FROM BODY CONTROL MODULE INVALID SERIAL DATA RECEIVED
- U0423-00-INSTRUMENT PANEL CLUSTER IPC FAULTY WRONG DATA LENGTH CODE
- U0426-00-IMMOBILIZER NOT PROGRAMMED
- U0427-00-IMMOBILIZER WRONG CODE IN THE IMMOBILIZER
- U0431-00-TIME_DATE FROM INSTRUMENT PANEL CLUSTER MISSING MESSAGE
- U0433-00-TIME_DATE FROM INSTRUMENT PANEL CLUSTER MESSAGE PLAUSIBILITY
- U0469-00-INVALID DATA RECEIVED FROM INTELLIGENT ALTERNATOR MODULE SIGNAL NOT VALID
- U05AB-00-DRIVESTYLESTS FROM BODY CONTROL MODULE SIGNAL NOT AVAILABLE
- U11DE-00-SPEED LIMITER BY DRIVER IRREVERSIBLE SHUT OFF DUE TO SCCM_CRS_CTRL.CRUISECONTROL FAIL STATUS PRESENT
- U120F-00-INVALID DATA RECEIVED FROM INTELLIGENT ALTERNATOR MODULE CIRCUITCOMPONENT PROTECTION TIME OUT
- U1450-00-DRIVE TRAIN CONTROL MODULE DTCM FAULTY WRONG DATA LENGTH CODE
- U1490-00-SPEED LIMITER BY DRIVER REVERSIBLE SHUT OFF DUE TO PLAUSIBILITY CHECK
- U1502-00-TRANSMISSION CONTROL MODULE TCM-DCTM FAULTY WRONG DATA LENGTH CODE
- U1506-00-BRAKE SYSTEM MODULE BSM FAULTY WRONG DATA LENGTH CODE
- U150A-00-BODY CONTROL MODULE BCM FAULTY WRONG DATA LENGTH CODE
- U1930-00-ECM_OPERATIONALMODESTS ECM INTERNAL SIGNAL NOT AVAILABLE
- U1932-00-BCM_COMMAND.OPERATIONALMODESTS FROM BODY CONTROL MODULE NOT AVAILABLE
- U1933-00-BCM_COMMAND FROM BODY CONTROL MODULE MISSING MESSAGE
- U1935-00-BRAKE3 FROM BRAKE SYSTEM MODULE MISSING MESSAGE
- U1936-00-BSM_YRS_DATA FROM BRAKE SYSTEM MODULE MISSING MESSAGE
- U1938-00-TRANSM_MOT1 FROM TRANSMISSION CONTROL MODULE MISSING MESSAGE
- U1939-00-CLUSTER2 FROM INSTRUMENT PANEL CLUSTER MISSING MESSAGE
- U193A-00-SCCM_CRS_CTRL CRUISE MESSAGE FROM BODY CONTROL MODULE MISSING MESSAGE
- U193B-00-CRUISE CONTROL REVERSIBLE SHUT OFF FOR MISSING MESSAGE
- U193C-00-CRUISE CONTROL AND SPEED LIMITER REVERSIBLE SHUT OFF FOR BRAKE1 MISSING MESSAGE
- U193E-00-DRIVETRAIN1 FROM DRIVE TRAIN CONTROL MODULE MESSAGE PLAUSIBILITY
- U1950-00-BCM_COMMAND FROM BODY CONTROL MODULE CRC OR MESSAGE COUNTER ERROR
- U1952-00-BRAKE1 FROM BRAKE SYSTEM MODULE CRC ERROR
- U1953-00-BRAKE1 FROM BRAKE SYSTEM MODULE MESSAGE COUNTER ERROR
- U1956-00-BRAKE3 FROM BRAKE SYSTEM MODULE CRC OR MESSAGE COUNTER ERROR
- U1957-00-BRAKE3 FROM BRAKE SYSTEM MODULE MESSAGE COUNTER ERROR
- U1958-00-BSM_YRS_DATA FROM BRAKE SYSTEM MODULE CRC OR MESSAGE COUNTER ERROR
- U195C-00-DRIVETRAIN1 FROM DRIVE TRAIN CONTROL MODULE CRC OR MESSAGE COUNTER ERROR
- U197A-00-TRANSM1 FROM TRANSMISSION CONTROL MODULE CRC OR MESSAGE COUNTER ERROR
- U197C-00-TRANSM2 FROM TRANSMISSION CONTROL MODULE CRC OR MESSAGE COUNTER ERROR
- U197E-00-TRANSM_MOT1 FROM TRANSMISSION CONTROL MODULE CRC OR MESSAGE COUNTER ERROR
- U197F-00-TRANSM_MOT1 FROM TRANSMISSION CONTROL MODULE MESSAGE COUNTER ERROR
- U1984-00-WHEEL_SPEED FROM BRAKE SYSTEM MODULE CRC OR MESSAGE COUNTER

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ERROR
U1986-00-SCCM_CRS_CTRL CRUISE MESSAGE FROM BODY CONTROL MODULE MESSAGE COUNTER ERROR
U1987-00-SCCM_CRS_CTRL CRUISE MESSAGE FROM BODY CONTROL MODULE CRC ERROR
Standard Procedure
PCM VERIFICATION TEST - 2.0L DIESEL
PCM/ECM / TCM PROGRAMMING
PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE
INTERMITTENT DTC
MODULE, Powertrain Control (PCM), 2.4L
Diagnosis and Testing
B104D-BLEND DOOR CONTROL CIRCUIT LOW
B104E-BLEND DOOR CONTROL CIRCUIT HIGH
B10E9-BLOWER MOTOR CONTROL CIRCUIT LOW
B10EA-BLOWER MOTOR CONTROL CIRCUIT HIGH
C0061-LATERAL ACCELERATION SENSOR
C0501-WHEEL SPEED SIGNAL LEFT FRONT RATIONALITY
C0507-WHEEL SPEED SIGNAL RIGHT FRONT RATIONALITY
C050D-WHEEL SPEED SIGNAL LEFT REAR RATIONALITY
C0513-WHEEL SPEED SIGNAL RIGHT REAR RATIONALITY
P0016-CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT - BANK 1 SENSOR 1
P0031-O2 SENSOR 1/1 HEATER CIRCUIT LOW
P0032-O2 SENSOR 1/1 HEATER CIRCUIT HIGH
P0037-O2 SENSOR 1/2 HEATER CIRCUIT LOW
P0038-O2 SENSOR 1/2 HEATER CIRCUIT HIGH
P0069-MANIFOLD PRESSURE/BAROMETRIC PRESSURE CORRELATION
P0071-AMBIENT AIR TEMPERATURE SENSOR PERFORMANCE
P0072-AMBIENT AIR TEMPERATURE SENSOR CIRCUIT LOW
P0073-AMBIENT AIR TEMPERATURE SENSOR CIRCUIT HIGH
P0101-MASS AIR FLOW SENSOR "A" CIRCUIT PERFORMANCE
P0102-MASS AIR FLOW SENSOR "A" CIRCUIT LOW
P0103-MASS AIR FLOW SENSOR "A" CIRCUIT HIGH
P0107-MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT LOW
P0108-MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT HIGH
P0111-INTAKE AIR TEMPERATURE SENSOR 1 PERFORMANCE
P0112-INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT LOW
P0113-INTAKE AIR TEMPERATURE SENSOR 1 CIRCUIT HIGH
P0116-ENGINE COOLANT TEMPERATURE SENSOR 1 PERFORMANCE
P0117-ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW
P0118-ENGINE COOLANT TEMPERATURE SENSOR 1 CIRCUIT HIGH
P0121-THROTTLE POSITION SENSOR 1 PERFORMANCE
P0122-THROTTLE POSITION SENSOR 1 CIRCUIT LOW
P0123-THROTTLE POSITION SENSOR 1 CIRCUIT HIGH
P0125-INSUFFICIENT COOLANT TEMP FOR CLOSED - LOOP FUEL CONTROL
P0128-THERMOSTAT RATIONALITY
P0133-O2 SENSOR 1/1 SLOW RESPONSE
P0135-O2 SENSOR 1/1 HEATER PERFORMANCE
P0137-O2 SENSOR 1/2 CIRCUIT LOW
P0138-O2 SENSOR 1/2 CIRCUIT HIGH
P0139-O2 SENSOR 1/2 SLOW RESPONSE
P0140-O2 SENSOR 1/2 SIGNAL INACTIVE
P0141-O2 SENSOR 1/2 HEATER PERFORMANCE

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- P0171-FUEL SYSTEM 1/1 LEAN
- P0172-FUEL SYSTEM 1/1 RICH
- P0196-ENGINE OIL TEMPERATURE SENSOR PERFORMANCE
- P0197-ENGINE OIL TEMPERATURE SENSOR CIRCUIT LOW
- P0198-ENGINE OIL TEMPERATURE SENSOR CIRCUIT HIGH
- P0199-ENGINE OIL TEMPERATURE SENSOR CIRCUIT INTERMITTENT
- P0201-FUEL INJECTOR 1 CIRCUIT/OPEN
- P0202-FUEL INJECTOR 2 CIRCUIT/OPEN
- P0203-FUEL INJECTOR 3 CIRCUIT/OPEN
- P0204-FUEL INJECTOR 4 CIRCUIT/OPEN
- P0221-THROTTLE POSITION SENSOR 2 CIRCUIT PERFORMANCE
- P0222-THROTTLE POSITION SENSOR 2 CIRCUIT LOW
- P0223-THROTTLE POSITION SENSOR 2 CIRCUIT HIGH
- P0298-ENGINE OIL TEMPERATURE TOO HIGH
- P0300-MULTIPLE CYLINDER MISFIRE
- P0301-CYLINDER 1 MISFIRE
- P0302-CYLINDER 2 MISFIRE
- P0303-CYLINDER 3 MISFIRE
- P0304-CYLINDER 4 MISFIRE
- P0325-KNOCK SENSOR 1 CIRCUIT
- P0335-CRANKSHAFT POSITION SENSOR CIRCUIT
- P0339-CRANKSHAFT POSITION SENSOR INTERMITTENT
- P0340-CAMSHAFT POSITION SENSOR CIRCUIT - BANK 1 SENSOR 1
- P0344-CAMSHAFT POSITION SENSOR INTERMITTENT - BANK 1 SENSOR 1
- P0420-CATALYST EFFICIENCY (BANK 1)
- P0440-GENERAL EVAP SYSTEM FAILURE
- P0441-EVAP PURGE SYSTEM PERFORMANCE
- P0443-EVAP PURGE 1 CONTROL CIRCUIT
- P0452-EVAP PRESSURE SWITCH STUCK CLOSED
- P0455-EVAP SYSTEM LARGE LEAK
- P0456-EVAP SYSTEM SMALL LEAK
- P0457-EVAP SYSTEM - LOOSE FUEL CAP
- P0461-FUEL LEVEL SENSOR 1 PERFORMANCE
- P0462-FUEL LEVEL SENSOR 1 CIRCUIT LOW
- P0463-FUEL LEVEL SENSOR 1 CIRCUIT HIGH
- P0480-COOLING FAN 1 CONTROL CIRCUIT/OPEN
- P0481-COOLING FAN 2 CONTROL CIRCUIT/OPEN
- P0501-VEHICLE SPEED SENSOR 1 PERFORMANCE
- P0503-VEHICLE SPEED SENSOR 1 ERRATIC
- P0506-IDLE SPEED PERFORMANCE LOWER THAN EXPECTED
- P0507-IDLE SPEED PERFORMANCE HIGHER THAN EXPECTED
- P050B-COLD START IGNITION TIMING PERFORMANCE
- P050D-COLD START ROUGH IDLE
- P0513-INVALID SKIM KEY
- P0520-ENGINE OIL PRESSURE SENSOR CIRCUIT
- P0521-ENGINE OIL PRESSURE SENSOR PERFORMANCE
- P0522-ENGINE OIL PRESSURE SENSOR CIRCUIT LOW
- P0523-ENGINE OIL PRESSURE SENSOR CIRCUIT HIGH
- P0532-A/C PRESSURE SENSOR CIRCUIT LOW
- P0533-A/C PRESSURE SENSOR CIRCUIT HIGH
- P0562-BATTERY/SYSTEM VOLTAGE LOW
- P0563-BATTERY/SYSTEM VOLTAGE HIGH

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- P0564-CRUISE CONTROL MULTI-FUNCTION INPUT A CIRCUIT
- P0571-BRAKE SWITCH 1 PERFORMANCE
- P0572-BRAKE SWITCH 1 STUCK ON
- P0573-BRAKE SWITCH 1 STUCK OFF
- P0579-SPEED CONTROL SWITCH 1 PERFORMANCE
- P0580-SPEED CONTROL SWITCH 1 CIRCUIT LOW
- P0581-SPEED CONTROL SWITCH 1 CIRCUIT HIGH
- P0585-SPEED CONTROL SWITCH 1/2 CORRELATION
- P0591-SPEED CONTROL SWITCH 2 PERFORMANCE
- P0592-SPEED CONTROL SWITCH 2 CIRCUIT LOW
- P0593-SPEED CONTROL SWITCH 2 CIRCUIT HIGH
- P0600-SERIAL COMMUNICATION LINK
- P0601-INTERNAL MEMORY CHECKSUM INVALID
- P0606-INTERNAL CONTROL PROCESSOR
- P060B-ETC A/D GROUND PERFORMANCE
- P060D-ETC LEVEL 2 APP PERFORMANCE
- P060E-ETC LEVEL 2 TPS PERFORMANCE
- P060F-ETC LEVEL 2 ECT PERFORMANCE
- P0610-ECU VEHICLE OPTIONS MISMATCH
- P061A-LEVEL 2 TORQUE PERFORMANCE
- P061C-ETC LEVEL 2 RPM PERFORMANCE
- P0622-GENERATOR FIELD CONTROL CIRCUIT/OPEN
- P0627-FUEL PUMP CONTROL CIRCUIT/OPEN
- P062C-ETC LEVEL 2 MPH PERFORMANCE
- P0630-VIN NOT PROGRAMMED IN PCM
- P0632-ODOMETER NOT PROGRAMMED IN PCM
- P0633-SKIM SECRET KEY NOT STORED IN PCM
- P063A-GENERATOR VOLTAGE SENSE CIRCUIT
- P0642-SENSOR REFERENCE VOLTAGE 1 CIRCUIT LOW
- P0643-SENSOR REFERENCE VOLTAGE 1 CIRCUIT HIGH
- P0645-A/C CONTROL CIRCUIT/OPEN
- P0652-SENSOR REFERENCE VOLTAGE 2 CIRCUIT LOW
- P0653-SENSOR REFERENCE VOLTAGE 2 CIRCUIT HIGH
- P0685-ASD/MAIN CONTROL CIRCUIT
- P0688-ASD/MAIN SENSE CIRCUIT
- P0703-BRAKE SWITCH 2 PERFORMANCE
- P0850-PARK/NEUTRAL SWITCH PERFORMANCE
- P1031-CYLINDER 1 OIL SUPPLY SOLENOID VALVE DRIVER VOLTAGE IMPLAUSIBLE
- P1032-CYLINDER 2 OIL SUPPLY SOLENOID VALVE DRIVER VOLTAGE IMPLAUSIBLE
- P1033-CYLINDER 3 OIL SUPPLY SOLENOID VALVE DRIVER VOLTAGE IMPLAUSIBLE
- P1034-CYLINDER 4 OIL SUPPLY SOLENOID VALVE DRIVER VOLTAGE IMPLAUSIBLE
- P1035-CYLINDER 1 OIL SUPPLY SOLENOID VALVE OPEN CIRCUIT
- P1036-CYLINDER 1 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO BATTERY
- P1037-CYLINDER 1 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO GROUND
- P1038-CYLINDER 2 OIL SUPPLY SOLENOID VALVE DRIVER OPEN CIRCUIT
- P1039-CYLINDER 2 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO BATTERY
- P103A-CYLINDER 2 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO GROUND
- P103B-CYLINDER 3 OIL SUPPLY SOLENOID VALVE DRIVER OPEN CIRCUIT
- P103C-CYLINDER 3 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO BATTERY
- P103D-CYLINDER 3 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO GROUND
- P103E-CYLINDER 4 OIL SUPPLY SOLENOID VALVE DRIVER OPEN CIRCUIT
- P103F-CYLINDER 4 OIL SUPPLY SOLENOID VALVE DRIVER SHORT TO BATTERY

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- P1040-CYLINDER 4 OIL SUPPLY SOLENOID VALVE SHORT TO GROUND
- P1041-IMPLAUSIBLE DATA FROM CYLINDER 1 OIL SUPPLY SOLENOID VALVE RECEIVED
- P1042-IMPLAUSIBLE DATA FROM CYLINDER 2 OIL SUPPLY SOLENOID VALVE RECEIVED
- P1043-IMPLAUSIBLE DATA FROM CYLINDER 3 OIL SUPPLY SOLENOID VALVE RECEIVED
- P1044-IMPLAUSIBLE DATA FROM CYLINDER 4 OIL SUPPLY SOLENOID VALVE RECEIVED
- P1045-CYLINDER 1 OIL SUPPLY SOLENOID VALVE VOLTAGE OUT OF RANGE
- P1046-CYLINDER 1 OIL SUPPLY SOLENOID VALVE OVERCURRENT
- P1047-CYLINDER 2 OIL SUPPLY SOLENOID VALVE VOLTAGE OUT OF RANGE
- P1048-CYLINDER 2 OIL SUPPLY SOLENOID VALVE OVERCURRENT
- P1049-CYLINDER 3 OIL SUPPLY SOLENOID VALVE VOLTAGE OUT OF RANGE
- P104A-CYLINDER 3 OIL SUPPLY SOLENOID VALVE OVERCURRENT
- P104B-CYLINDER 4 OIL SUPPLY SOLENOID VALVE VOLTAGE OUT OF RANGE
- P104C-CYLINDER 4 OIL SUPPLY SOLENOID VALVE OVERCURRENT
- P1061-CYLINDER 1 OIL SUPPLY SOLENOID VALVE STUCK
- P1062-CYLINDER 2 OIL SUPPLY SOLENOID VALVE STUCK
- P1063-CYLINDER 3 OIL SUPPLY SOLENOID VALVE STUCK
- P1064-CYLINDER 4 OIL SUPPLY SOLENOID VALVE STUCK
- P1065-CYLINDER 1 SOLINOID VALVE SWITCH ON TIME OUT OF RANGE
- P1066-CYLINDER 1 OIL SUPPLY SOLENOID VALVE SWITCH OFF TIME OUT OF RANGE
- P1067-CYLINDER 2 OIL SUPPLY SOLENOID VALVE SWITCH ON TIME OUT OF RANGE
- P1068-CYLINDER 2 OIL SUPPLY SOLENOID VALVE SWITCH OFF TIME OUT OF RANGE
- P1069-CYLINDER 3 OIL SUPPLY SOLENOID VALVE SWITCH ON TIME OUT OF RANGE
- P106A-CYLINDER 3 OIL SUPPLY SOLENOID VALVE SWITCH OFF TIME OUT OF RANGE
- P106B-CYLINDER 4 OIL SUPPLY SOLENOID VALVE SWITCH ON TIME OUT OF RANGE
- P106C-CYLINDER 4 OIL SUPPLY SOLENOID VALVE SWITCH OFF TIME OUT OF RANGE
- P1115-GENERAL TEMPERATURE RATIONALITY
- P1128-CLOSED LOOP FUELING NOT ACHIEVED - BANK 1 UPSTREAM
- P112A-O2 SENSOR 1/1 PUMPING UNDERCURRENT
- P112B-O2 SENSOR 1/1 PUMPING OVERCURRENT
- P112E-O2 SENSOR 1/1 PERFORMANCE
- P113D-O2 SENSOR 1/1 SLOW RESPONSE (HIGH FREQUENCY)
- P1185-GENERAL PRESSURE SENSOR CORRELATION
- P1212-ENGINE OIL TEMPERATURE HIGH - RPM LIMITED
- P1239-ENGINE OIL TEMPERATURE TOO LOW
- P1300-CRANKSHAFT POSITION LEARN OUT OF RANGE
- P1456-FUEL TANK PRESSURE SENSOR CIRCUIT LOW
- P1457-FUEL TANK PRESSURE SENSOR CIRCUIT HIGH
- P1500-ECU CONFIGURATION MISMATCH
- P150D-COLD START ROUGH IDLE - OPEN THROTTLE START
- P1523-VVA LOW OIL PRESSURE
- P1524-OIL PRESSURE OUT OF RANGE - CAMSHAFT ADVANCE/RETARD DISABLED
- P1572-BRAKE PEDAL STUCK ON
- P1573-BRAKE PEDAL STUCK OFF
- P1593-SPEED CONTROL SWITCH 1/2 STUCK
- P1607-PCM INTERNAL SHUTDOWN TIMER RATIONALITY
- P1609-INTERNAL CONTROL MODULE ENGINE OIL TEMPERATURE PERFORMANCE
- P1618-SENSOR REFERENCE VOLTAGE 1 ERRATIC
- P1621-O2 SENSOR REFERENCE VOLTAGE CIRCUIT LOW
- P1622-O2 SENSOR REFERENCE VOLTAGE CIRCUIT HIGH
- P1628-SENSOR REFERENCE VOLTAGE 2 ERRATIC
- P1696-EEPROM MEMORY WRITE DENIED INVALID
- P1697-EMR (SRI) MILEAGE NOT STORED

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- P1718-EEPROM INTEGRITY FAILURE
- P1C4E-ABS DTC PRESENT
- P1CEC-VARIABLE VALVE SOLENOID VALVE COLD START CLOSING POSITION 1 TIMING OVER-RETARD
- P1CED-VARIABLE VALVE TIMING SOLENOID VALVE COLD START CLOSING POSITION TIMING OVER-ADVANCE
- P1D65-CYLINDER 1 OIL SUPPLY SOLENOID VALVE PERFORMANCE
- P1D66-CYLINDER 2 OIL SUPPLY SOLENOID VALVE PERFORMANCE
- P1D67-CYLINDER 3 OIL SUPPLY SOLENOID VALVE PERFORMANCE
- P1D68-CYLINDER 4 OIL SUPPLY SOLENOID VALVE PERFORMANCE
- P1E09-CLOSED LOOP FUELING NOT ACHIEVED - BANK 1 DOWNSTREAM
- P2072-ELECTRONIC THROTTLE CONTROL SYSTEM - ICE BLOCKAGE
- P2096-DOWNSTREAM FUEL TRIM SYSTEM 1 LEAN
- P2097-DOWNSTREAM FUEL TRIM SYSTEM 1 RICH
- P2100-ELECTRONIC THROTTLE CONTROL MOTOR CIRCUIT/OPEN - BANK 1
- P2101-ELECTRONIC THROTTLE CONTROL MOTOR PERFORMANCE - BANK 1
- P2107-ELECTRONIC THROTTLE CONTROL MODULE PROCESSOR
- P2110-ELECTRONIC THROTTLE CONTROL SYSTEM BANK 1- FORCED LIMITED RPM
- P2111-ELECTRONIC THROTTLE CONTROL SYSTEM - UNABLE TO CLOSE - BANK 1
- P2112-ELECTRONIC THROTTLE CONTROL SYSTEM - UNABLE TO OPEN - BANK 1
- P2115-ACCELERATOR PEDAL POSITION SENSOR 1 MINIMUM STOP PERFORMANCE
- P2116-ACCELERATOR PEDAL POSITION SENSOR 2 MINIMUM STOP PERFORMANCE
- P2118-ELECTRONIC THROTTLE CONTROL MOTOR CURRENT PERFORMANCE - BANK 1
- P2122-ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT LOW
- P2123-ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT HIGH
- P2127-ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT LOW
- P2128-ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT HIGH
- P2135-THROTTLE POSITION SENSOR 1/2 CORRELATION
- P2138-ACCELERATOR PEDAL POSITION SENSOR 1/2 CORRELATION
- P2166-ACCELERATOR PEDAL POSITION SENSOR 1 MAXIMUM STOP PERFORMANCE
- P2167-ACCELERATOR PEDAL POSITION SENSOR 2 MAXIMUM STOP PERFORMANCE
- P2172-HIGH AIRFLOW/VACUUM LEAK DETECTED (INSTANTANEOUS ACCUMULATION)
- P2173-HIGH AIRFLOW/VACUUM LEAK DETECTED (SLOW ACCUMULATION)
- P2174-LOW AIRFLOW/RESTRICTION DETECTED (INSTANTANEOUS ACCUMULATION)
- P2181-COOLING SYSTEM PERFORMANCE
- P219A-BANK 1 AIR-FUEL RATIO IMBALANCE
- P2226-BAROMETRIC PRESSURE SENSOR
- P2228-BAROMETRIC PRESSURE CIRCUIT LOW
- P2229-BAROMETRIC PRESSURE CIRCUIT HIGH
- P2237-O2 SENSOR 1/1 PUMP CELL CURRENT CIRCUIT/OPEN
- P2238-O2 SENSOR 1/1 PUMP CELL CURRENT CIRCUIT LOW
- P2239-O2 SENSOR 1/1 PUMP CELL CURRENT CIRCUIT HIGH
- P2243-O2 SENSOR 1/1 REFERENCE VOLTAGE CIRCUIT/OPEN
- P2244-O2 SENSOR 1/1 REFERENCE VOLTAGE PERFORMANCE
- P2245-O2 SENSOR 1/1 REFERENCE VOLTAGE CIRCUIT LOW
- P2246-O2 SENSOR 1/1 REFERENCE VOLTAGE CIRCUIT HIGH
- P2251-O2 SENSOR 1/1 NEGATIVE CURRENT CONTROL CIRCUIT/OPEN
- P2252-O2 SENSOR 1/1 NEGATIVE CURRENT CONTROL CIRCUIT LOW
- P2253-O2 SENSOR 1/1 NEGATIVE CURRENT CONTROL CIRCUIT HIGH
- P2271-O2 SENSOR 1/2 SIGNAL BIASED RICH
- P2299-BRAKE PEDAL POSITION / ACCELERATOR PEDAL POSITION INCOMPATIBLE
- P2302-IGNITION COIL 1 SECONDARY CIRCUIT - INSUFFICIENT IONIZATION
- P2305-IGNITION COIL 2 SECONDARY CIRCUIT - INSUFFICIENT IONIZATION

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- P2308-IGNITION COIL 3 SECONDARY CIRCUIT - INSUFFICIENT IONIZATION
- P2311-IGNITION COIL 4 SECONDARY CIRCUIT - INSUFFICIENT IONIZATION
- P2503-CHARGING SYSTEM OUTPUT LOW
- P2504-CHARGING SYSTEM OUTPUT HIGH
- P2610-PCM INTERNAL ENGINE OFF TIMER PERFORMANCE
- P2626-O2 SENSOR 1/1 PUMP CELL CURRENT TRIM CIRCUIT/OPEN
- P2627-O2 SENSOR 1/1 PUMP CELL CURRENT TRIM CIRCUIT LOW
- P2628-O2 SENSOR 1/1 PUMP CELL CURRENT TRIM CIRCUIT HIGH
- U0001-CAN C BUS
- U0101-LOST COMMUNICATION WITH TCM
- U0103–LOST COMMUNICATION WITH ELECTRIC GEAR SHIFT MODULE
- U0121-LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE
- U0126-LOST COMMUNICATION WITH STEERING ANGLE SENSOR
- U0131-LOST COMMUNICATION WITH POWER STEERING CONTROL MODULE
- U0140-LOST COMMUNICATION WITH BODY CONTROL MODULE
- U0151-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC)
- U0155-LOST COMMUNICATION WITH CLUSTER/CCN
- U0164-LOST COMMUNICATION WITH HVAC CONTROL MODULE
- U0168-LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE
- U0300-INTERNAL CONTROL MODULE SOFTWARE INCOMPATIBILITY
- U0402-IMPLAUSIBLE DATA RECEIVED FROM TCM
- U0404-IMPLAUSIBLE DATA RECEIVED FROM ESM
- U0405-IMPLAUSIBLE DATA RECEIVED FROM CRUISE CONTROL MODULE
- U0416-IMPLAUSIBLE DATA RECEIVED FROM ESP
- U0422-IMPLAUSIBLE DATA RECEIVED FROM BODY CONTROL MODULE
- U0426-IMPLAUSIBLE DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE
- U0427-IMPLAUSIBLE DATA RECEIVED FROM VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)
- U0428-00-IMPLAUSIBLE DATA RECEIVED FROM STEERING ANGLE SENSOR MODULE
- U110A-LOST COMMUNICATION WITH SCM - CAN-C
- U110C-LOST FUEL LEVEL MESSAGE
- U110E-LOST AMBIENT TEMPERATURE MESSAGE
- U1110-LOST VEHICLE SPEED MESSAGE
- U1120-LOST WHEEL DISTANCE MESSAGE
- U1141-LOST ESP TORQUE REQUEST MESSAGE
- U11B9-LOST COMMUNICATION WITH RF HUB
- U11BC-LOST BRAKE SWITCH MESSAGE
- U11C2-LOST TRANSMISSION MESSAGE
- U11DE-LOST SPEED CONTROL MESSAGE
- U1403-IMPLAUSIBLE FUEL LEVEL SIGNAL RECEIVED
- U1409-IMPLAUSIBLE LEFT FRONT WHEEL SPEED SIGNAL RECEIVED
- U140A-IMPLAUSIBLE RIGHT FRONT WHEEL SPEED SIGNAL RECEIVED
- U140B-IMPLAUSIBLE LEFT REAR WHEEL SPEED SIGNAL RECEIVED
- U140C-IMPLAUSIBLE RIGHT REAR WHEEL SPEED SIGNAL RECEIVED
- U1412-IMPLAUSIBLE VEHICLE SPEED SIGNAL RECEIVED
- U1440-IMPLAUSIBLE TRANSFER CASE RATIO HIGH RECEIVED
- U1504-IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM STEERING ANGLE SENSOR

⊟ Standard Procedure

- INTERMITTENT CONDITION
- POWERTRAIN VERIFICATION TEST
- PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

⊟ MODULE, Park Assist, 4 Channel (PTM)

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- Diagnosis and Testing
  - B1000-44 ELECTRONIC CONTROL UNIT - DATA MEMORY FAILURE
  - B1000-45 ELECTRONIC CONTROL UNIT - PROGRAM MEMORY FAILURE
  - B1000-46 ELECTRONIC CONTROL UNIT - CALIBRATION/PARAMETER MEMORY FAILURE
  - B1000-47 ELECTRONIC CONTROL UNIT - WATCHDOG/SAFETY FAILURE
  - B1000-96 ELECTRONIC CONTROL UNIT - COMPONENT INTERNAL FAILURE
  - C100B-12-SENSOR REAR OUTER LEFT - CIRCUIT SHORT TO BATTERY
  - C100B-14-SENSOR REAR OUTER LEFT - CIRCUIT SHORT TO GROUND OR OPEN
  - C100B-29-SENSOR REAR OUTER LEFT - SIGNAL INVALID
  - C100C-12-SENSOR REAR INTERNAL LEFT - CIRCUIT SHORT TO BATTERY
  - C100C-14-SENSOR REAR INTERNAL LEFT - CIRCUIT SHORT TO GROUND OR OPEN
  - C100C-29-SENSOR REAR INTERNAL LEFT - SIGNAL INVALID
  - C100D-12-SENSOR REAR INTERNAL RIGHT - CIRCUIT SHORT TO BATTERY
  - C100D-14-SENSOR REAR INTERNAL RIGHT - CIRCUIT SHORT TO GROUND OR OPEN
  - C100D-29-SENSOR REAR INTERNAL RIGHT - SIGNAL INVALID
  - C100E-12-SENSOR REAR OUTER RIGHT - CIRCUIT SHORT TO BATTERY
  - C100E-14-SENSOR REAR OUTER RIGHT - CIRCUIT SHORT TO GROUND OR OPEN
  - C100E-29-SENSOR REAR OUTER RIGHT - SIGNAL INVALID
  - C1017-1C-SENSOR POWER SUPPLY - CIRCUIT VOLTAGE OUT OF RANGE
  - U0001-87-C CAN - MISSING MESSAGE
  - U1001-88-CAN C BUS - BUS OFF
  - U1700-29-CM BODY COMPUTER MODULE - SIGNAL INVALID
  - U1700-35-BCM BODY COMPUTER MODULE - SIGNAL HIGH TIME MAXIMUM
  - U1700-86-BCM BODY COMPUTER MODULE - SIGNAL INVALID
  - U1700-87-BCM BODY COMPUTER MODULE - MISSING MESSAGE
  - U1706-29-BSM BRAKE SYSTEM CONTROL MODULE - SIGNAL INVALID
  - U1706-86-BSM BRAKE SYSTEM CONTROL MODULE - SIGNAL INVALID
  - U1706-87-BSM BRAKE SYSTEM CONTROL MODULE - MISSING MESSAGE
  - U173F-29-TTM TRAILER TOW MODULE - SIGNAL INVALID
  - U173F-86-TTM TRAILER TOW MODULE - MISSING MESSAGE
  - U173F-87-TTM-TRAILER TOW MODULE-MISSING MESSAGE
  - U1930-29-IGNITION WORKING CONDITION SIGNAL FROM BCM - SIGNAL INVALID
  - U1933-86-BCM COMMAND FROM BODY COMPUTER MODULE - SIGNAL INVALID
  - U1933-87-BCM COMMAND FROM BODY COMPUTER MODULE - MISSING MESSAGE
  - U193B-29-BH IGW1 FROM BODY COMPUTER MODULE - SIGNAL INVALID
  - U193B-86-BH IGW1 FROM BODY COMPUTER MODULE- SIGNAL INVALID
  - U193B-87-BH IGW1 FROM BODY COMPUTER MODULE - MISSING MESSAGE
- MODULE, Park Assist, 12 Channel (PTM)
  - Diagnosis and Testing
    - B1000-44 ELECTRONIC CONTROL UNIT - DATA MEMORY FAILURE
    - B1000-45 ELECTRONIC CONTROL UNIT - PROGRAM MEMORY FAILURE
    - B1000-46 ELECTRONIC CONTROL UNIT - CALIBRATION/PARAMETER MEMORY FAILURE
    - B1000-47 ELECTRONIC CONTROL UNIT - WATCHDOG/SAFETY FAILURE
    - B1000-96 ELECTRONIC CONTROL UNIT - COMPONENT INTERNAL FAILURE
    - C1001-12-SENSOR FRONT OUTER LEFT-CIRCUIT SHORT TO BATTERY
    - C1001-14-SENSOR FRONT OUTER LEFT - CIRCUIT SHORT TO GROUND OR OPEN
    - C1001-29-SENSOR FRONT OUTER LEFT - SIGNAL INVALID
    - C1002-12-SENSOR FRONT INTERNAL LEFT - CIRCUIT SHORT TO BATTERY
    - C1002-14-SENSOR FRONT INTERNAL LEFT - CIRCUIT SHORT TO GROUND OR OPEN
    - C1002-29-SENSOR FRONT INTERNAL LEFT - SIGNAL INVALID
    - C1003-12-SENSOR FRONT INTERNAL RIGHT - CIRCUIT SHORT TO BATTERY
    - C1003-14-SENSOR FRONT INTERNAL RIGHT - CIRCUIT SHORT TO GROUND OR OPEN
    - C1003-29-SENSOR FRONT INTERNAL RIGHT - SIGNAL INVALID

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- C1004-12-SENSOR FRONT OUTER RIGHT - CIRCUIT SHORT TO BATTERY
- C1004-14-SENSOR FRONT OUTER RIGHT - CIRCUIT SHORT TO GROUND OR OPEN
- C1004-29-SENSOR FRONT OUTER RIGHT - SIGNAL INVALID
- C100B-12-SENSOR REAR OUTER LEFT - CIRCUIT SHORT TO BATTERY
- C100B-14-SENSOR REAR OUTER LEFT - CIRCUIT SHORT TO GROUND OR OPEN
- C100B-29-SENSOR REAR OUTER LEFT - SIGNAL INVALID
- C100C-12-SENSOR REAR INTERNAL LEFT - CIRCUIT SHORT TO BATTERY
- C100C-14-SENSOR REAR INTERNAL LEFT - CIRCUIT SHORT TO GROUND OR OPEN
- C100C-29-SENSOR REAR INTERNAL LEFT - SIGNAL INVALID
- C100D-12-SENSOR REAR INTERNAL RIGHT - CIRCUIT SHORT TO BATTERY
- C100D-14-SENSOR REAR INTERNAL RIGHT - CIRCUIT SHORT TO GROUND OR OPEN
- C100D-29-SENSOR REAR INTERNAL RIGHT - SIGNAL INVALID
- C100E-12-SENSOR REAR OUTER RIGHT - CIRCUIT SHORT TO BATTERY
- C100E-14-SENSOR REAR OUTER RIGHT - CIRCUIT SHORT TO GROUND OR OPEN
- C100E-29-SENSOR REAR OUTER RIGHT - SIGNAL INVALID
- C1013-12-PARKFIT SENSOR FRONT LEFT - CIRCUIT SHORT TO BATTERY
- C1013-14-PARKFIT SENSOR FRONT LEFT - CIRCUIT SHORT TO GROUND OR OPEN
- C1013-29-PARKFIT SENSOR FRONT LEFT - SIGNAL INVALID
- C1014-12-PARKFIT SENSOR FRONT RIGHT - CIRCUIT SHORT TO BATTERY
- C1014-14-PARKFIT SENSOR FRONT RIGHT - CIRCUIT SHORT TO GROUND OR OPEN
- C1014-29-PARKFIT SENSOR FRONT RIGHT - SIGNAL INVALID
- C1015-12-PARKFIT SENSOR REAR LEFT - CIRCUIT SHORT TO BATTERY
- C1015-14-PARKFIT SENSOR REAR LEFT - CIRCUIT SHORT TO GROUND OR OPEN
- C1015-29-PARKFIT SENSOR REAR LEFT - SIGNAL INVALID
- C1016-12-PARKFIT SENSOR REAR RIGHT - CIRCUIT SHORT TO BATTERY
- C1016-14-PARKFIT SENSOR REAR RIGHT - CIRCUIT SHORT TO GROUND OR OPEN
- C1016-29-PARKFIT SENSOR REAR RIGHT - SIGNAL INVALID
- C1017-1C-SENSOR POWER SUPPLY - CIRCUIT VOLTAGE OUT OF RANGE
- U0001-87-C CAN - MISSING MESSAGE
- U1001-88-CAN C BUS - BUS OFF
- U1700-24-BCM BODY COMPUTER MODULE - SIGNAL STUCK HIGH
- U1700-29-CM BODY COMPUTER MODULE - SIGNAL INVALID
- U1700-35-BCM BODY COMPUTER MODULE - SIGNAL HIGH TIME MAXIMUM
- U1700-86-BCM BODY COMPUTER MODULE - SIGNAL INVALID
- U1700-87-BCM BODY COMPUTER MODULE - MISSING MESSAGE
- U1702-29-EPS ELECTRIC POWER STEERING - SIGNAL INVALID
- U1702-86-EPS ELECTRIC POWER STEERING - SIGNAL INVALID
- U1702-87-EPS ELECTRIC POWER STEERING - MISSING MESSAGE
- U1706-29-BSM BRAKE SYSTEM CONTROL MODULE - SIGNAL INVALID
- U1706-86-BSM BRAKE SYSTEM CONTROL MODULE - SIGNAL INVALID
- U1706-87-BSM BRAKE SYSTEM CONTROL MODULE - MISSING MESSAGE
- U173F-29-TTM TRAILER TOW MODULE - SIGNAL INVALID
- U173F-86-TTM TRAILER TOW MODULE - MISSING MESSAGE
- U173F-87-TTM-TRAILER TOW MODULE-MISSING MESSAGE
- U1930-29-IGNITION WORKING CONDITION SIGNAL FROM BCM - SIGNAL INVALID
- U1933-86-BCM COMMAND FROM BODY COMPUTER MODULE - SIGNAL INVALID
- U1933-87-BCM COMMAND FROM BODY COMPUTER MODULE - MISSING MESSAGE
- U193B-29-BH IGW1 FROM BODY COMPUTER MODULE - SIGNAL INVALID
- U193B-86-BH IGW1 FROM BODY COMPUTER MODULE- SIGNAL INVALID
- U193B-87-BH IGW1 FROM BODY COMPUTER MODULE - MISSING MESSAGE
- U1950-83-BCM COMMAND FROM BODY COMPUTER MODULE CRC - MC - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT

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- U1952-83-BRAKE1 FROM BRAKE SYSTEM CONTROL MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1958-83-BSM YRS DATA FROM BRAKE SYSTEM CONTROL MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U195E-83-EPS TORQUE OVERLAY FROM ELECTRIC POWER STEERING - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1960-83-ENGINE1 FROM BODY COMPUTER MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1966-83-GE FROM ELECTRIC POWER STEERING - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U197C-83-TRANSM2 FROM BODY COMPUTER MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1982-83-WHEEL INFO FROM BRAKE SYSTEM CONTROL MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1984-83-WHEEL SPEED FROM BRAKE SYSTEM CONTROL MODULE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT

⊟ MODULE, Radio Frequency (RF Hub)

⊟ Diagnosis and Testing

- B1001-21 RKE FOB 1 - SIGNAL AMPLITUDE MINIMUM
- B1001-64 RKE FOB 1 - SIGNAL PLAUSIBILITY FAILURE
- B1002-21 RKE FOB 2 - SIGNAL AMPLITUDE MINIMUM
- B1002-64 RKE FOB 2 - SIGNAL PLAUSIBILITY FAILURE
- B1003-21 RKE FOB 3 - SIGNAL AMPLITUDE MINIMUM
- B1003-64 RKE FOB 3 - SIGNAL PLAUSIBILITY FAILURE
- B1004-21 RKE FOB 4 - SIGNAL AMPLITUDE MINIMUM
- B1004-64 RKE FOB 4 - SIGNAL PLAUSIBILITY FAILURE
- B1005-21 RKE FOB 5 - SIGNAL AMPLITUDE MINIMUM
- B1005-64 RKE FOB 5 - SIGNAL PLAUSIBILITY FAILURE
- B1006-21 RKE FOB 6 - SIGNAL AMPLITUDE MINIMUM
- B1006-64 RKE FOB 6 - SIGNAL PLAUSIBILITY FAILURE
- B1007-21 RKE FOB 7 - SIGNAL AMPLITUDE MINIMUM
- B1007-64 RKE FOB 7 - SIGNAL PLAUSIBILITY FAILURE
- B1008-21 RKE FOB 8 - SIGNAL AMPLITUDE MINIMUM
- B1008-64 RKE FOB 8 - SIGNAL PLAUSIBILITY FAILURE
- B1021-01 PASSIVE ENTRY OF ANTENNA 1 - GENERAL ELECTRICAL FAILURE
- B1021-11 PASSIVE ENTRY OF ANTENNA 1 - CIRCUIT SHORT TO GROUND
- B1021-12 PASSIVE ENTRY OF ANTENNA 1 - CIRCUIT SHORT TO BATTERY
- B1021-13 PASSIVE ENTRY OF ANTENNA 1 - CIRCUIT OPEN
- B1022-01 PASSIVE ENTRY OF ANTENNA 2 - GENERAL ELECTRICAL FAILURE
- B1022-11 PASSIVE ENTRY OF ANTENNA 2 - CIRCUIT SHORT TO GROUND
- B1022-12 PASSIVE ENTRY OF ANTENNA 2 - CIRCUIT SHORT TO BATTERY
- B1022-13 PASSIVE ENTRY OF ANTENNA 2 - CIRCUIT OPEN
- B1023-01 PASSIVE ENTRY OF ANTENNA 3 - GENERAL ELECTRICAL FAILURE
- B1023-11 PASSIVE ENTRY OF ANTENNA 3 - CIRCUIT SHORT TO GROUND
- B1023-12 PASSIVE ENTRY OF ANTENNA 3 - CIRCUIT SHORT TO BATTERY
- B1023-13 PASSIVE ENTRY OF ANTENNA 3 - CIRCUIT OPEN
- B1024-01 PASSIVE ENTRY OF ANTENNA 4 - GENERAL ELECTRICAL FAILURE
- B1024-11 PASSIVE ENTRY OF ANTENNA 4 - CIRCUIT SHORT TO GROUND
- B1024-12 PASSIVE ENTRY OF ANTENNA 4 - CIRCUIT SHORT TO BATTERY
- B1024-13 PASSIVE ENTRY OF ANTENNA 4 - CIRCUIT OPEN
- B1025-01 PASSIVE ENTRY OF ANTENNA 5 - GENERAL ELECTRICAL FAILURE
- B1025-11 PASSIVE ENTRY OF ANTENNA 5 - CIRCUIT SHORT TO GROUND
- B1025-12 PASSIVE ENTRY OF ANTENNA 5 - CIRCUIT SHORT TO BATTERY

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- B1025-13 PASSIVE ENTRY OF ANTENNA 5 - CIRCUIT OPEN
- B1031-01 IMMOBILIZER ANTENNA - GENERAL ELECTRICAL FAILURE
- B1032-31 RF MODULE COMMUNICATION - NO SIGNAL
- B1033-64 OPERATIONAL MODE STATUS 1 - SIGNAL PLAUSIBILITY FAILURE
- B1034-64 OPERATIONAL MODE STATUS 2 - SIGNAL PLAUSIBILITY FAILURE
- B1035-01 BUTTON PRESSED - GENERAL ELECTRICAL FAILURE
- B1035-71 BUTTON PRESSED - ACTUATOR STUCK
- B1036-12 IGNITION START - CIRCUIT SHORT TO BATTERY
- B1036-14 IGNITION START - CIRCUIT SHORT TO GROUND OR OPEN
- TRUNK LOCK SWITCH CIRCUIT SHORT TO GROUND
- B1040-64 OPERATIONAL MODE STATUS INFO 1 - SIGNAL PLAUSIBILITY FAILURE
- B1041-16 RFHM ELECTRIC FAILURE 1 - CIRCUIT VOLTAGE BELOW THRESHOLD
- B1041-17 RFHM ELECTRIC FAILURE 1 - CIRCUIT VOLTAGE ABOVE THRESHOLD
- B1042-42 RFHM ELECTRIC FAILURE 2 - GENERAL MEMORY FAILURE
- B1045-01 FRONT DRIVER DOOR HANDLE SENSE - GENERAL ELECTRICAL FAILURE
- B1045-11 FRONT DRIVER DOOR HANDLE SENSE - CIRCUIT SHORT TO GROUND
- B1045-49 FRONT DRIVER DOOR HANDLE SENSE - INTERNAL ELECTRONIC FAILURE
- B1046-01 FRONT PASSENGER DOOR HANDLE SENSE - GENERAL ELECTRICAL FAILURE
- B1046-11 FRONT PASSENGER DOOR HANDLE SENSE - CIRCUIT SHORT TO GROUND
- B1046-49 FRONT PASSENGER DOOR HANDLE SENSE - INTERNAL ELECTRONIC FAILURE
- B1051-55 RFHM PROXI PROCEDURE - NOT CONFIGURED
- B1052-13 REMOTE START ANTENNA - CIRCUIT OPEN
- B1053-64 RFHM (KIN COMMUNICATION) - SIGNAL PLAUSIBILITY FAILURE
- B1054-13 BRAKE PEDAL SWITCH - CIRCUIT OPEN
- B1054-62 BRAKE PEDAL SWITCH - SIGNAL COMPARE FAILURE
- B1054-67 BRAKE PEDAL SWITCH - SIGNAL INCORRECT AFTER EVENT
- B1054-86 BRAKE PEDAL SWITCH - SIGNAL INVALID
- C15CB-51 TIRE PRESSURE SENSORS PROCEDURE (PLACARD VALUE) - NOT PROGRAMMED
- C1501-07 TIRE PRESSURE SENSOR (FRONT LEFT) - MECHANICAL FAILURES
- C1501-16 TIRE PRESSURE SENSOR (FRONT LEFT) - CIRCUIT VOLTAGE BELOW THRESHOLD
- C1501-64 TIRE PRESSURE SENSOR (FRONT LEFT) - SIGNAL PLAUSIBILITY FAILURE
- C1502-07 TIRE PRESSURE SENSOR (FRONT RIGHT) - MECHANICAL FAILURES
- C1502-16 TIRE PRESSURE SENSOR (FRONT RIGHT) - CIRCUIT VOLTAGE BELOW THRESHOLD
- C1502-64 TIRE PRESSURE SENSOR (FRONT RIGHT) - SIGNAL PLAUSIBILITY FAILURE
- C1503-07 TIRE PRESSURE SENSOR (REAR LEFT) - MECHANICAL FAILURES
- C1503-16 TIRE PRESSURE SENSOR (REAR LEFT) - CIRCUIT VOLTAGE BELOW THRESHOLD
- C1503-64 TIRE PRESSURE SENSOR (REAR LEFT) - SIGNAL PLAUSIBILITY FAILURE
- C1504-07 TIRE PRESSURE SENSOR (REAR RIGHT) - MECHANICAL FAILURES
- C1504-16 TIRE PRESSURE SENSOR (REAR RIGHT) - CIRCUIT VOLTAGE BELOW THRESHOLD
- C1504-64 TIRE PRESSURE SENSOR (REAR RIGHT) - SIGNAL PLAUSIBILITY FAILURE
- C1510-54 TIRE PRESSURE SENSORS CALIBRATION - MISSING CALIBRATION
- C1512-88 TPM SENSOR LOCATION UNDETERMINED - BUS OFF
- C1597-53 TIRE PRESSURE SENSORS SYSTEM - DEACTIVATED
- U0001-87 CAN LINE - MISSING MESSAGE
- U0001-88 CAN LINE - BUS OFF
- U1001-64 BCM_CODE_TRM_REQUEST - SIGNAL PLAUSIBILITY FAILURE
- U1700-86 BODY CONTROL MODULE (BCM) - SIGNAL INVALID
- U1700-87 BODY COMPUTER MODULE (BCM) - MISSING MESSAGE
- U1701-86-ENGINE CONTROL MODULE (ECM) - SIGNAL INVALID

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- U1701-87 ENGINE CONTROL MODULE (ECM) - MISSING MESSAGE
- U1703-86 INSTRUMENT PANEL CLUSTER (IPC) - SIGNAL INVALID
- U1703-87 INSTRUMENT PANEL CLUSTER (IPC) - MISSING MESSAGE
- U1706-86 BRAKING SYSTEM MODULE (BSM) - SIGNAL INVALID
- U1706-87 BRAKING SYSTEM MODULE (BSM) - MISSING MESSAGE
- U1711-86 DUAL CLUTCH TRANSMISSION MODULE (DCTM) OR TRANSMISSION CONTROL MODULE (TCM) - SIGNAL INVALID
- U1711-87 DUAL CLUTCH TRANSMISSION MODULE (DCTM) OR TRANSMISSION CONTROL MODULE (TCM) - MISSING MESSAGE
- U1950-83 CRC AND MESSAGE COUNTER BCM_COMMAND - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1952-83 CRC AND MESSAGE COUNTER BRAKE1 - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1960-83 CRC AND MESSAGE COUNTER ENGINE1 - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1964-87 SC MESSAGE - MISSING MESSAGE
- U1974-83 CRC AND MESSAGE COUNTER SC MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U197C-83 CRC AND MESSAGE COUNTER TRANSM2 - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1982-83 CRC AND MESSAGE COUNTER WHEEL INFO MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U1984-83 CRC AND MESSAGE COUNTER WHEEL SPEED MESSAGE - VALUE OF SIGNAL PROTECTION CALCULATION INCORRECT
- U2051-87 BCM_CODE_TRM_REQUEST MESSAGE - MISSING MESSAGE
- U2052-87 BATTERY_INFO MESSAGE - MISSING MESSAGE
- U2053-87 BCM_COMMAND MESSAGE 1 - MISSING MESSAGE
- U2054-87 BCM_COMMAND MESSAGE 2 - MISSING MESSAGE
- U2055-87 BCM_COMMAND MESSAGE 3 - MISSING MESSAGE
- U2056-87 BODY2 MESSAGE - MISSING MESSAGE
- U2058-87 BODY4 MESSAGE - MISSING MESSAGE
- U2059-87 BODY4 FAST MESSAGE - MISSING MESSAGE
- U2061-87 BRAKE 1 MESSAGE - MISSING MESSAGE
- U2062-87 CLUSTER 1 (KEY IDENTIFICATION VF) MESSAGE - MISSING MESSAGE
- U2063-87 CLUSTER 1 (VIN VF) MESSAGE - MISSING MESSAGE
- U2064-87 CLUSTER 2 (REMOTE CONTROL VF) MESSAGE - MISSING MESSAGE
- U2065-87 ENGINE 1 (KEYLESS IGNITION VF) MESSAGE - MISSING MESSAGE
- U2066-87 ENGINE 1 (IGNITION WORKING CONDITION VF) MESSAGE - MISSING MESSAGE
- U2067-87 MOT_TRANSM4 MESSAGE - MISSING MESSAGE
- U2068-87 TIME AND DATE MESSAGE - MISSING MESSAGE
- U2069-87 TRANSM2 MESSAGE - MISSING MESSAGE
- U2070-87 VIN MESSAGE - MISSING MESSAGE
- U2071-67 BCM_COMMAND MESSAGE IN SNA STATUS - SIGNAL INCORRECT AFTER EVENT
- U2072-64 BODY4 PLAUSIBILITY MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- U2073-64 BRAKE 1 PLAUSIBILITY MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- U2081-87 WHEEL SPEED MESSAGE - MISSING MESSAGE
- U2082-87 WHEEL INFO MESSAGE - MISSING MESSAGE
- U2083-64 EXTERNAL TEMPERATURE MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- U2083-87 EXTERNAL TEMPERATURE MESSAGE - MISSING MESSAGE
- U2084-87 TIRE PRESSURE SENSOR INFO - MISSING MESSAGE
- U2085-64 ATMOSPHERIC PRESSURE MESSAGE - SIGNAL PLAUSIBILITY FAILURE
- U2086-64 BCM_COMMAND.BRAKEPEDALSWITCH - SIGNAL PLAUSIBILITY FAILURE

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- TPM SENSOR VERIFICATION TEST
- THEFT AND SECURITY SYSTEMS PRE-DIAGNOSTIC PROCEDURE
- THEFT AND SECURITY SYSTEM INTERMITTENT TEST
- THEFT AND SECURITY SYSTEM VERIFICATION TEST
- RADIO FREQUENCY HUB (RF HUB) VERIFICATION TEST

MODULE, Trailer Tow

Diagnosis and Testing

- B1000-96-ELECTRONIC CONTROL UNIT - COMPONENT INTERNAL FAILURE
- C1005-11-TURN LEFT LIGHT COMMAND - CIRCUIT SHORT TO GROUND
- C1005-12-TURN LEFT LIGHT COMMAND - CIRCUIT SHORT TO BATTERY
- C1005-13-TURN LEFT LIGHT COMMAND - CIRCUIT OPEN
- C1006-11-TURN RIGHT LIGHT COMMAND - CIRCUIT SHORT TO GROUND
- C1006-12-TURN RIGHT LIGHT COMMAND - CIRCUIT SHORT TO BATTERY
- C1006-13-TURN RIGHT LIGHT COMMAND - CIRCUIT OPEN
- C104B-11-REAR FOG LIGHT COMMAND-CIRCUIT SHORT TO GROUND
- C104B-12-REAR FOG LIGHT COMMAND-CIRCUIT SHORT TO BATTERY
- C104B-13-REAR FOG LIGHT COMMAND-CIRCUIT OPEN
- C104C-11-REVERSE LIGHT COMMAND - CIRCUIT SHORT TO GROUND
- C104C-12-REVERSE LIGHT COMMAND - CIRCUIT SHORT TO BATTERY
- C104C-13-REVERSE LIGHT COMMAND-CIRCUIT OPEN
- C104D-11-POSITION RIGHT LIGHT COMMAND - CIRCUIT SHORT TO GROUND
- C104D-12-POSITION RIGHT LIGHT COMMAND - CIRCUIT SHORT TO BATTERY
- C104D-13-POSITION RIGHT LIGHT COMMAND - CIRCUIT OPEN
- C104E-11-POSITION LEFT LIGHT COMMAND - CIRCUIT SHORT TO GROUND
- C104E-12-POSITION LEFT LIGHT COMMAND - CIRCUIT SHORT TO BATTERY
- C104E-13-POSITION LEFT LIGHT COMMAND - CIRCUIT OPEN
- C104F-64-TRAILER CONNECTED STATUS - SIGNAL PLAUSIBILITY FAILURE
- C105B-64-TURN LIGHT REAR LEFT - SIGNAL PLAUSIBILITY FAILURE
- C105C-64-TURN LIGHT REAR RIGHT - SIGNAL PLAUSIBILITY FAILURE
- C105D-8F-VEHICLE SPEED ERROR - ERRATIC
- C106D-11-STOP LEFT/RIGHT LIGHT COMMAND - CIRCUIT SHORT TO GROUND
- C106D-12-STOP LEFT/RIGHT LIGHT COMMAND - CIRCUIT SHORT TO BATTERY
- C106D-13-STOP LEFT/RIGHT LIGHT COMMAND - CIRCUIT OPEN
- U0010-87-BH CAN-MISSING MESSAGE
- U0010-88-BH CAN-BUS OFF
- U1700-86-BCM BODY COMPUTER MODULE - SIGNAL INVALID
- U1700-87-BCM BODY COMPUTER MODULE - MISSING MESSAGE
- U1703-86-IPC INSTRUMENT PANEL CLUSTER-SIGNAL INVALID
- U1703-86-IPC INSTRUMENT PANEL CLUSTER-MISSING MESSAGE
- U1930-86-INTERNAL IGNITION WORKING CONDITION SIGNAL-SIGNAL INVALID
- U1932-86-IGNITION WORKING CONDITION SIGNAL FROM BODY COMPUTER MODULE-SIGNAL INVALID
- U1933-87-STATUS_BH_BCM1-MISSING MESSAGE
- U1934-87-STATUS_CCAN3-MISSING MESSAGE

Standard Procedure

- STANDARD-PROCEDURE-TTM-VERIFICATION-TEST

MODULE, Transmission Control (TCM), 948TE/9HP48

Diagnosis and Testing

- P0219-00-ENGINE OVERSPEED
- P0562-00-SYSTEM VOLTAGE LOW
- P0563-00-SYSTEM VOLTAGE HIGH
- P0601-00-INTERNAL CONTROL MODULE MEMORY CHECKSUM ERROR
- P0607-00 ECU INTERNAL PERFORMANCE

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- P0610-00-ECU VEHICLE OPTIONS MISMATCH
- P0613-00-INTERNAL TRANSMISSION PROCESSOR
- P061B-00-INTERNAL CONTROL MODULE TORQUE CALCULATION PERFORMANCE
- P062F-00-INTERNAL CONTROL MODULE EEPROM ERROR
- P0631-00-VIN NOT PROGRAMMED OR INCOMPATIBLE TCM
- P0634-00-PCM-ECM-TCM INTERNAL TEMPERATURE TOO HIGH
- P0643-00-SENSOR REFERENCE VOLTAGE 1 CIRCUIT HIGH
- P064F-00-UNAUTHORIZED SOFTWARE-CALIBRATION DETECTED
- P0653-00-SENSOR REFERENCE VOLTAGE 2 CIRCUIT HIGH
- P0701-00-TRANSMISSION CONTROL SYSTEM PERFORMANCE
- P0703-00-BRAKE SWITCH 2 PERFORMANCE
- P0706-00-TRANSMISSION RANGE SENSOR PERFORMANCE
- P0707-00-TRANSMISSION RANGE SENSOR A CIRCUIT LOW
- P0708-00-TRANSMISSION RANGE SENSOR A CIRCUIT HIGH
- P0711-00-TRANSMISSION FLUID TEMPERATURE SENSOR A CIRCUIT RANGE-PERFORMANCE
- P0712-00-TRANSMISSION FLUID TEMPERATURE SENSOR A CIRCUIT LOW
- P0713-00-TRANSMISSION FLUID TEMPERATURE SENSOR A CIRCUIT HIGH
- P0716-00-INPUT SHAFT SPEED SENSOR 1 PERFORMANCE
- P0721-00-OUTPUT SHAFT SPEED SENSOR CIRCUIT PERFORMANCE
- P0729-00-GEAR 6 SHIFT INCORRECT RATIO
- P072F-00-STUCK IN GEAR 4
- P0731-00-GEAR 1 SHIFT INCORRECT RATIO
- P0732-00-GEAR 2 SHIFT INCORRECT RATIO
- P0733-00-GEAR 3 SHIFT INCORRECT RATIO
- P0734-00-GEAR 4 SHIFT INCORRECT RATIO
- P0735-00-GEAR 5 SHIFT INCORRECT RATIO
- P073E-00-UNABLE TO ENGAGE REVERSE
- P076F-00-GEAR 7 SHIFT INCORRECT RATIO
- P077C-00-OUTPUT SHAFT SPEED SENSOR CIRCUIT LOW
- P077D-00-OUTPUT SHAFT SPEED SENSOR CIRCUIT HIGH
- P077E-00-TRANSMISSION FLUID TEMPERATURE MULTIPLE SENSOR CORRELATION
- P07A7-00-TRANSMMISION FRICTION ELEMENT C STUCK ON
- P07BF-00-INPUT-TURBINE SHAFT SPEED SENSOR 1 CIRCUIT LOW
- P07C0-00-INPUT-TURBINE SHAFT SPEED SENSOR 1 CIRCUIT HIGH
- P07D9-00-GEAR 8 SHIFT INCORRECT RATIO
- P07F6-00-GEAR 9 INCORRECT RATIO
- P0810-00-CLUTCH POSITION CONTROL ERROR - 948TE ONLY- WITHOUT 3.6L
- P0850-00-PARK NEUTRAL SWITCH PERFORMANCE
- P0885-00-TCM POWER CONTROL CIRCUIT
- P0887-00-TCM POWER CONTROL CIRCUIT HIGH
- P0933-00-HYDRAULIC PRESSURE SENSOR RANGE-PERFORMANCE
- P0934-00-HYDRAULIC PRESSURE SENSOR CIRCUIT LOW
- P0935-00-HYDRAULIC PRESSURE SENSOR CIRCUIT HIGH
- P0960-00-PRESSURE CONTROL SOLENOID 1 CONTROL CIRCUIT OPEN
- P0962-00-PRESSURE CONTROL SOLENOID 1 CONTROL CIRCUIT LOW
- P0973-00-SHIFT SOLENOID 1 CONTROL CIRCUIT LOW
- P0974-00-SHIFT SOLENOID 1 CONTROL CIRCUIT HIGH
- P0975-00-SHIFT SOLENOID B CONTROL CIRCUIT PERFORMANCE
- P0976-00-SHIFT SOLENOID 2 CONTROL CIRCUIT LOW
- P0978-00-SHIFT SOLENOID 3 CONTROL CIRCUIT RANGE-PERFORMANCE
- P0979-00-SHIFT SOLENOID 3 CONTROL CIRCUIT LOW

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- P097B-00-SHIFT SOLENOID 2 CONTROL CIRCUIT OPEN
- P097C-00-SHIFT SOLENOID 3 CONTROL CIRCUIT OPEN
- P097D-00-SHIFT SOLENOID 4 CONTROL CIRCUIT OPEN
- P097E-00-SHIFT SOLENOID 5 CONTROL CIRCUIT OPEN
- P0981-00-SHIFT SOLENOID 4 CONTROL CIRCUIT RANGE-PERFORMANCE
- P0982-00-SHIFT SOLENOID 4 CONTROL CIRCUIT LOW
- P0984-00-SHIFT SOLENOID 5 CONTROL CIRCUIT RANGE-PERFORMANCE
- P0985-00-SHIFT SOLENOID 5 CONTROL CIRCUIT LOW
- P0998-00-SHIFT SOLENOID 6 CONTROL CIRCUIT LOW
- P0999-00-SHIFT SOLENOID 6 CONTROL CIRCUIT HIGH
- P099B-00-SHIFT SOLENOID 7 CONTROL CIRCUIT LOW
- P099C-00-SHIFT SOLENOID 7 CONTROL CIRCUIT HIGH
- P1500-00-ECU CONFIGURATION MISMATCH
- P1614-00-ECU RESET-RECOVERY OCCURRED
- P1634-00-TCM INTERNAL INTERNAL WATCHDOG PERFORMANCE
- P167A-00-CALIBRATION MISMATCH
- P1720-00-OUTPUT SPEED SENSOR-WHEEL SPEED RATIONALITY
- P1725-00-TRANSMISSION RANGE SENSOR C CIRCUIT LOW
- P1726-00-TRANSMISSION RANGE SENSOR C CIRCUIT HIGH
- P1727-00-TRANSMISSION RANGE SENSOR D CIRCUIT LOW
- P1728-00-TRANSMISSION RANGE SENSOR D CIRCUIT HIGH
- P1731-00-INCORRECT GEAR ENGAGED
- P176D-00-TRANSMISSION FLUID TEMPERATURE TOO HIGH
- P1B13-00-PARKBYWIRE UNINTENDED OUT OF PARK POSITION
- P1B14-00-PARK BY WIRE UNINTENDED PARK POSITION
- P1C4E-00-ABS DTC PRESENT
- P1C8C-00-SYSTEM VOLTAGE
- P1CC9-00-UNABLE TO ENGAGE GEAR
- P1D25-00-SHIFT CONTROL RATIONALITY
- P1D78-00-PARK SOLENOID CIRCUIT LOW
- P1D79-00-PARK SOLENOID CIRCUIT HIGH
- P1D8F-00-INCORRECT GEAR RATIO CLUTCH 1 DEFECTIVE
- P1D90-00-INCORRECT GEAR RATIO CLUTCH 2 DEFECTIVE
- P1D91-00-INCORRECT GEAR RATIO CLUTCH 3 DEFECTIVE
- P1D92-00-INCORRECT GEAR RATIO CLUTCH 4 DEFECTIVE
- P1D93-00-INCORRECT GEAR RATIO CLUTCH 5 DEFECTIVE
- P1D94-00-TCM INTERNAL SBW CALIBRATION MISMATCH
- P1D95-00-TCM CLUTCH FAILURE UNDETERMINED
- P1D98-00-INCORRECT GEAR RATIO CLUTCH B OR D DEFECTIVE
- P1D99-00-INCORRECT GEAR RATIO CLUTCH B OR E DEFECTIVE
- P1D9E-00-INCORRECT GEAR RATIO CLUTCH C OR E DEFECTIVE
- P1D9F-00-INCORRECT GEAR RATIO CLUTCH D OR E DEFECTIVE
- P1DA3-00-INCORRECT GEAR RATIO CLUTCH B D OR E DEFECTIVE
- P1DA5-00-INCORRECT GEAR RATIO CLUTCH C D OR E DEFECTIVE
- P1DA9-00-TRANSMISSION FLUID TEMPERATURE RATIONALITY
- P1DAB-00-VEHICLE SPEED UNDETERMINED
- P1DAD-00-INPUT SHAFT-OUTPUT SHAFT DIRECTION CORRELATION
- P1DAF-00-INCOMPATIBLE LIMP IN ACTION REQUESTED
- P1DB1-00-TCM SYSTEM VOLTAGE EXCESSIVELY LOW
- P1DB2-00-ACTUATOR SUPPLY VOLTAGE A CIRCUIT
- P1DB3-00-TCM ECU RESET-RECOVERY OCCURRED
- P1DB7-00-TORQUE CONVERTER CLUTCH PERFORMANCE

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- P1DB8-00-UNINTENDED TORQUE APPLIED WHILE IN NEUTRAL
- P1DB9-00-TCM ECU RESET EXTENDED LOW VOLTAGE
- P1DC8-00-CLUTCH TEMP THRESHOLD ACHIEVED AUTOSTICK INHIBIT
- P1DCD-00-TCM MONITORING PROCESSOR PERFORMANCE MULTIPLE CLUTCHES LOCKED UP
- P1DCE-00-TCM MONITORING PROCESSOR PERFORMANCE INCORRECT DRIVING DIRECTION
- P1DCF-00-TCM MONITORING PROCESSOR PERFORMANCE UNALLOWED PARK ENGAGEMENT DO TO ABS FAILURE
- P1DD0-00-TCM MONITORING PROCESSOR PERFORMANCE UNALLOWED PARK ENGAGEMENT
- P1DDC-00-TCM MONITORING PROCESSOR PERFORMANCE UNALLOWED REVERSE ENGAGEMENT
- P1DDD-00-TCM MONITORING PERFORMANCE UNABLE TO DISENGAGE DRIVE OR REVERSE
- P1DEB-00-INCORRECT GEAR DISPLAYED DUE TO INCORRECT GEAR RATIO
- P1DF3-00-ECU NOT INITIALIZED
- P1DF8-00-ACTUAL DECREASE OF ENGINE TORQUE HIGH
- P1E23-00-INCORRECT GEAR RATIO CLUTCH 6 DEFECTIVE
- P215C-00-OUTPUT SHAFT SPEED WHEEL SPEED CORRELATION
- P2761-00-TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT-OPEN
- P2764-00-TORQUE CONVERTER CLUTCH PRESSURE CONTROL SOLENOID CONTROL CIRCUIT LOW
- P2784-00-INPUT SPEED SENSOR 1-2 CORRELATION
- P2802-00-TRANSMISSION RANGE SENSOR B CIRCUIT LOW
- P2803-TRANSMISSION RANGE SENSOR "B" CIRCUIT HIGH
- P2879-00-CLUTCH 2 PERFORMANCE STUCK DISENGAGED
- U0001-00-CAN C BUS
- U0100-00-LOST COMMUNICATION WITH ECM/PCM
- U0102-00-LOST COMMUNICATION WITH TRANSFER CASE CONTROL MODULE / AWD
- U0103-00-LOST COMMUNICATION WITH ELECTRIC GEAR SHIFT MODULE
- U0121-00-LOST COMMUNICATION WITH ANTI-LOCK BRAKE SYSTEM (ABS) CONTROL MODULE
- U0131-00-LOST COMMUNICATION WITH ELECTRIC POWER STEERING CONTROL MODULE
- U0140-00-LOST COMMUNICATION WITH BODY CONTROL MODULE
- U0155-00-LOST COMMUNICATION WITH CLUSTER-CCN
- U0212-00-LOST COMMUNICATION WITH SCM
- U0401-00-IMPLAUSIBLE DATA RECEIVED FROM ECM-PCM
- U0403-00-IMPLAUSIBLE DATA RECEIVED FROM TCASE
- U0404-00-IMPLAUSIBLE DATA RECEIVED FROM ESM
- U0415-00-IMPLAUSIBLE DATA RECEIVED FROM ABS
- U0420-00-INVALID DATA RECEIVED FROM POWER STEERING CONTROL MODULE
- U0422-00-IMPLAUSIBLE DATA RECEIVED FROM BODY CONTROL MODULE
- U0423-00-IMPLAUSIBLE DATA RECEIVED FROM CLUSTER-CCN
- U0429-00-IMPLAUSIBLE DATA RECEIVED FROM SCM
- U11E3-00-TCM LOST COMMUNICATION WITH ESM ON DPT CAN
- U1400-00-IMPLAUSIBLE TPS SIGNAL RECEIVED
- U1401-00-IMPLAUSIBLE ENGINE SPEED SIGNAL RECEIVED
- U1408-00-IMPLAUSIBLE BRAKE SIGNAL RECEIVED
- U1412-00-IMPLAUSIBLE VEHICLE SPEED SIGNAL RECEIVED
- U1424-00-IMPLAUSIBLE ENGINE TORQUE SIGNAL RECEIVED
- U1461-00-IMPLAUSIBLE DATA RECEIVED FROM ESM ON DPT

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- U1465-00-IMPLAUSIBLE DRIVER SHIFT REQUEST SIGNAL RECEIVED
- U1467-00-IMPLAUSIBLE DRIVER SHIFT REQUEST SIGNAL RECEIVED ON CAN AND
- U1477-00-IMPLAUSIBLE PADDLE SHIFTER DATA RECEIVED
- U1932-00-BCM-COMMAND OPERATIONAL MODE STS (SNA) PLAUSIBILITY

Standard Procedure

- PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE
- TRANSMISSION VERIFICATION TEST - 948RE 9HP48
- TCM ADAPTATION - 948TE AND 9HP48

MODULE, Transmission Control (TCM), C635 DDCT

Diagnosis and Testing

- P0218-00-ECU TEMPERATURE - SIGNAL COMPARE FAILURE
- P0604-00-TRANSMISSION CONTROL UNIT FAULTY -RAM - DATA MEMORY FAILURE
- P0605-00-TRANSMISSION CONTROL UNIT FAULTY -ROM - DATA MEMORY FAILURE
- P0606-00-TRANSMISSION CONTROL UNIT FAULTY SAFETY MICROPROCESSOR -SMP - DATA MEMORY FAILURE
- P060B-00-TRANSMISSION CONTROL UNIT FAULTY A-D CONVERION -SMP - DATA MEMORY FAILURE
- P0610-00-ECU VEHICLE OPTIONS MISMATCH
- P0613-00-TRANSMISSION CONTROL UNIT FAULTY SAFETY MICROPROCESSOR -SMP- INTERVENTION - SUPERVISION SOFTWARE FAILURE
- P0614-00-SAFETY MICORPROCESSOR -SMP- PUNCTUALLY - INTERVENTION
- P062F-00-TRASMISSION CONTROL UNIT FAULTY -EEPROM - GENERAL CHECKSUM FAILURE
- P0711-00-SENSORS MODULE TEMPERATURE SENSOR - COMPONENT INTERNAL FAILURE
- P0712-00-SENSORS MODULE TEMPERATURE SENSOR - CIRCUIT SHORT TO GROUND
- P0713-00-SENSORS MODULE TEMPERATURE SENSOR - CIRCUIT SHORT TO BATTERY OR OPEN
- P0716-00-ODD GEARS CLUTCH DISK K1 SPEED - NO SIGNAL
- P0721-00-ENGINE OPERATING SPEED CHECK - SIGNAL INVALID
- P0730-00-1ST-3RD GEAR DISENGAGEMENT - SIGNAL COMPARE FAILURE
- P0747-00-OPPOSITE VALVE A BLOCKED OPEN DURING ENGAGEMENT - ACTUATOR STUCK ON
- P0777-00-OPPOSITE VALVE B BLOCKED OPEN DURING ENGAGEMENT - ACTUATOR STUCK
- P07B3-00-PARK POSITION SENSOR A - CIRCUIT SHORT TO GROUND
- P07B4-00-PARK POSITION SENSOR A - CIRCUIT SHORT TO BATTERY
- P07B5-00-PARK POSITION SENSOR A - CIRCUIT PERFORMANCE-LOW
- P07BE-00-TRANSMISSION PARK POSITION SENSOR A-B CORRELATION
- P0805-00-K1 CLUTCH POSITION SENSOR - SIGNAL FREQUENCY INCORRECT
- P0807-00-K1 CLUTCH POSITION SENSOR - CIRCUIT SHORT TO GROUND
- P0808-00-K1 CLUTCH POSITION SENSOR - CIRCUIT SHORT TO BATTERY OR OPEN
- P0841-00-K2 PRESSURE SENSOR - CIRCUIT VOLTAGE OUT OF RANGE
- P0842-00-K2 PRESSURE SENSOR - CIRCUIT SHORT TO GROUND
- P0843-00-K2 PRESSURE SENSOR - CIRCUIT SHORT TO BATTERY
- P0850-00-PARK POSITION SENSOR A - SIGNAL FREQUENCY INCORRECT
- P0893-00-UNWANTED DOUBLE ENGAGE - UNEXPECTED OPERATION
- P0904-00-SHIFT POSITION SENSOR - CIRCUIT SHORT TO GROUND
- P0905-00-SHIFT POSITION SENSOR - CIRCUIT VOLTAGE OUT OF RANGE
- P0906-00-SHIFT POSITION SENSOR - CIRCUIT SHORT TO GROUND
- P0907-00-SHIFT POSITION SENSOR - CIRCUIT SHORT TO BATTERY OR OPEN
- P0911-00-SHIFTER - SIGNAL AMPLITUDE MAXIMUM
- P0933-00-HYDRAULIC PRESSURE SENSOR - CIRCUIT VOLTAGE OUT OF RANGE
- P0934-00-HYDRAULIC PRESSURE SENSOR - CIRCUIT SHORT TO GROUND OR OPEN
- P0935-00-HYDRAULIC PRESSURE SENSOR - CIRCUIT SHORT TO BATTERY

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- P0942-00-HYDRAULIC PRESSURE - SIGNAL ABOVE-BELOW THRESHOLD
- P0944-00-HYDRAULIC PRESSURE - LOW FLUID LEVEL
- P0960-00-PPVS ELECTROVALVE SPECIFIC FAULT - CIRCUIT OPEN
- P0961-00-PPVS ELECTROVALVE SPECIFIC FAULT - CIRCUIT PERFORMANCE
- P0962-00-PPV1 ELECTROVALVE SPECIFIC FAULT - CIRCUIT SHORT TO GROUND
- P0963-00-PRESSURE CONTROL SOLENOID 1 CONTROL CIRCUIT HIGH
- P0964-00-PPV2 ELECTROVALVE SPECIFIC FAULT - CIRCUIT OPEN
- P0965-00-PPV2 ELECTROVALVE SPECIFIC FAULT - CIRCUIT PERFORMANCE
- P0966-00-PPV2 ELECTROVALVE SPECIFIC FAULT - CIRCUIT SHORT TO GROUND
- P0967-00-PPV2 ELECTROVALVE SPECIFIC FAULT - CIRCUIT SHORT TO BATTERY
- P0968-00-PPVS ELECTROVALVE SPECIFIC FAULT - CIRCUIT OPEN
- P0969-00-PPVS ELECTROVALVE SPECIFIC FAULT - CIRCUIT PERFORMANCE
- P0970-00-PPVS ELECTROVALVE SPECIFIC FAULT - CIRCUIT SHORT TO GROUND
- P0971-00-PPVS ELECTROVALVE SPECIFIC FAULT - CIRCUIT SHORT TO BATTERY
- P1500-00-ECU CONFIGURATION MISMATCH
- P1638-00-DUAL PORT RAM - COMPONENT INTERNAL FAILURE
- P16F0-00-MGS COMMUNICATION FAULT -K1 AND PPV2-PPV2-PPVS - INVALID SERIAL DATA RECEIVED
- P1703-00-BRAKE SWITCH FROM WIRE - CIRCUIT OPEN
- P1C97-00-GEAR POSITION SENSOR 1ST-3RD - CIRCUIT SHORT TO BATTERY OR OPEN
- P1C98-00-GEAR POSITION SENSOR 1ST-3RD - CIRCUIT SHORT TO GROUND
- P1C99-00-GEAR POSITION SENSOR 1ST-3RD - SIGNAL FREQUENCY INCORRECT
- P1C9B-00-GEAR POSITION SENSOR 2ND-4TH - CIRCUIT SHORT TO BATTERY OR OPEN
- P1C9C-00-GEAR POSITION SENSOR 2ND-4TH - CIRCUIT SHORT TO GROUND
- P1C9D-00-GEAR POSITION SENSOR 2ND-4TH - SIGNAL FREQUENCY INCORRECT
- P1C9F-00-GEAR POSITION SENSOR 5TH-RM - CIRCUIT SHORT TO BATTERY OR OPEN
- P1CA0-00-GEAR POSITION SENSOR 5TH-RM - CIRCUIT SHORT TO GROUND
- P1CA1-00-GEAR POSITION SENSOR 5TH-RM - SIGNAL FREQUENCY INCORRECT
- P1CA3-00-GEAR POSITION SENSOR 6TH - CIRCUIT SHORT TO BATTERY OR OPEN
- P1CA4-00-GEAR POSITION SENSOR 6TH - CIRCUIT SHORT TO GROUND
- P1CA5-00-GEAR POSITION SENSOR 6TH - SIGNAL FREQUENCY INCORRECT
- P1CA7-00-IGNITION SOLENOID CONTROL - CIRCUIT SHORT TO BATTERY OR OPEN
- P1CA8-00-IGNITION SOLENOID CONTROL - CIRCUIT SHORT TO GROUND
- P1CA9-00-K1 ELECTROVALVE SPECIFIC FAULT - CIRCUIT SHORT TO BATTERY
- P1CAA-00-K1 ELECTROVALVE SPECIFIC FAULT - CIRCUIT VOLTAGE BELOW THRESHOLD
- P1CAB-00-K1 ELECTROVALVE SPECIFIC FAULT - CIRCUIT OPEN
- P1CAC-00-K1 ELECTROVALVE SPECIFIC FAULT - GENERAL ELECTRICAL FAILURE
- P1CAD-00-1ST-3RD-5TH DISENGAGED - ACTUATOR STUCK CLOSED
- P1CAE-00-2ND-4TH-6TH DISENGAGED - ACTUATOR STUCK CLOSED
- P1CAF-00-1ST-3RD-5TH DISENGAGED - ACTUATOR SLIPPING
- P1CB0-00-2ND-4TH-6TH DISENGAGED - ACTUATOR SLIPPING
- P1CB1-00-1ST-3RD ENGAGED - ACTUATOR STUCK OPEN
- P1CB2-00-2ND-4TH ENGAGED - ACTUATOR STUCK OPEN
- P1CB3-00-5TH-RM ENGAGED - ACTUATOR STUCK OPEN
- P1CB4-00-6TH ENGAGED - ACTUATOR STUCK OPEN
- P1CB6-00-GEAR SHIFT ACTUATOR 1 CIRCUIT HIGH
- P1CBD-00-OIL LEAK OR OVERHEATING SOLENOID VALVES -PUMP SYSTEM - EVENT INFORMATION
- P1CBE-00-PUMP ALWAYS ON - CIRCUIT CURRENT ABOVE THRESHOLD
- P1CBF-00-ELECTROPUMP DRIVE UNIT -FEEDBACK - SIGNAL CALCULATION FAILURE
- P1CC0-00-PUMP ALWAYS OFF - CIRCUIT VOLTAGE BELOW THRESHOLD
- P1CC1-00-UNWANTED NEUTRAL DISENGAGE - MECHANICAL FAILURES
- P1CC2-00-K1 CLUTCH UNWANTED CLOSING - PERFORMANCE OR INCORRECT OPERATION

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- P1CC3-00-CLUTCH 2 TEMPERATURE TOO HIGH
- P1CC4-00-K2 UNWANTED OPENING - MECHANICAL LINKAGE FAILURE -PERFORMANCE OR INCORRECT OPERATION
- P1CC7-00-TRASMISSION CONTROL UNIT FAULTY MICROPROCESSOR -MMP- LOW VOLTAGE - CIRCUIT VOLTAGE BELOW THRESHOLD
- P1CC8-00-TRASMISSION CONTROL UNIT FAULTY SAFETY MICROPROCESSOR -SMP- LOW VOLTAGE - CIRCUIT VOLTAGE BELOW THRESHOLD
- P1CC9-00-TOTAL SELECTION & TOTAL ENGAGE FAILED - SIGNAL HAS TOO FEW TRANSITIONS-EVENTS
- P1CCA-00-CLUTCHES LOW TRANSMISSION - PERFORMANCE OR INCORRECT OPERATION
- P1CCB-00-EXCESSIVE HYDRAULIC FLUID LEAKAGE
- P1CCD-00-GEARBOX INIT FAILED - COMPONENT INTERNAL FAILURE
- P1CCE-00-SDU FEEDBACK - CIRCUIT SHORT TO BATTERY
- P125D-00-DOOR SWITCH FROM WIRE - WRONG VALUE
- P1D32-00-UNWANTED 1ST-4TH-5TH ENGAGED DURING OPPOSITE DISANGEGMENT - ACTUATOR STUCK CLOSED
- P1D33-00-SELFTUNING KISS POINT ROUTINE - NOT CONFIGURED
- P1D34-00-SELFTUNING EOL ROUTINE - NOT CONFIGURED
- P1D59-00-SUPPLY SENSOR A -VS1 - CIRCUIT VOLTAGE OUT OF RANGE
- P1D5A-00-SUPPLY SENSOR B -VS2 - CIRCUIT VOLTAGE OUT OF RANGE
- P1D5B-00-SUPPLY SENSOR C -VS3 - CIRCUIT VOLTAGE OUT OF RANGE
- P1D5C-00-SENSOR COMMON GROUND GNDSENS3 - CIRCUIT OPEN
- P1D5D-00-SENSOR COMMON GROUND GNDSENS1 AND GNDSENS2 - CIRCUIT OPEN
- P1D5E-00-BATTERY VOLTAGE LINE1 -VEHICLE CONNECTOR - CIRCUIT SHORT TO GROUND OR OPEN
- P1D5F-00-BATTERY VOLTAGE LINE2 -VEHICLE CONNECTOR - CIRCUIT SHORT TO GROUND OR OPEN
- P1D60-00-BATTERY VOLTAGE LINE3 -VEHICLE CONNECTOR - CIRCUIT SHORT TO GROUND OR OPEN
- P1D61-00-POWER SUPPLY -+15 - CIRCUIT SHORT TO BATTERY
- P1D6A-00-MECHANICAL OUT OF RANGE ON 1ST-3RD ACTUATOR - MECHANICAL FAILURES
- P1D6B-00-MECHANICAL OUT OF RANGE ON K1 CLUTCH - SIGNAL COMPARE FAILURE
- P1D6C-00-CLUTCHES FADING - COMPONENT OR SYSTEM OVER TEMPERATURE
- P1D74-00-MECHANICAL OUT OF RANGE ON 2SN-4TH ACTUATOR - MECHANICAL FAILURES
- P1D75-00-MECHANICAL OUT OF RANGE ON 5TH-RM ACTUATOR - MECHANICAL FAILURES
- P1D76-00-MECHANICAL OUT OF RANGE ON 6TH ACTUATOR - MECHANICAL FAILURES
- P1DC6-00-TCM NOT PROGRAMMED
- P1DDE-00-IGNITION RUN-START INPUT 1-2 CORRELATION - SIGNAL INVALID
- P2711-00-UNWANTED GEAR DISENGAGE - MECHANICAL FAILURES
- P2718-00-K2 ELECTROVALVE SPECIFIC FAULT - CIRCUIT OPEN
- P2719-00-K2 ELECTROVALVE SPECIFIC FAULT - GENERAL ELECTRICAL FAILURE
- P2720-00-K2 ELECTROVALVE SPECIFIC FAULT - CIRCUIT SHORT TO GROUND
- P2721-00-K2 ELECTROVALVE SPECIFIC FAULT - CIRCUIT SHORT TO BATTERY
- P2766-00-CLUTCH EVEN SPEED - NO SIGNAL
- P2787-00-CLUTCH 1 TEMPERATURE TOO HIGH
- P284D-00-1ST-3RD GEAR ENGAGE WITHOUT ANY COMMAND - UNEXPECTED OPERATION
- P2871-00-K1 CLUTCH UNWANTED OPENING - MECHANICAL LINKAGE FAILURE
- P2872-00-K1 CLUTCH UNWANTED CLOSING - UNEXPECTED OPERATION
- P2879-00-K2 CLUTCH UNWANTED OPENING - UNEXPECTED OPERATION
- P287A-00-K2 CLUTCH UNWANTED CLOSING - UNEXPECTED OPERATION
- U0001-00-DUAL CLUTCH TRANSMISSION MODULE CAN TRANSMISSION - BUS OFF
- U0002-00-CAN C BUS OFF PERFORMANCE
- U0100-00-ENGINE CONTROL MODULE -ECM-PCM- CAN SIGNAL - MISSING MESSAGE

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- U0103-00-COMMUNICATION WITH GEAR SHIFT MODULE A - SIGNAL INVALID
- U0121-00-BRAKE SYSTEM MODULE -BSM-ABS-ASR- CAN SIGNAL - MISSING MESSAGE
- U0141-00-INSTRUMENT PANEL CLUSTER -IPC- CAN SIGNAL - MISSING MESSAGE
- U0401-00-IMPLAUSIBLE DATA RECEIVED FROM ECM-PCM
- U0404-00-SHIFT LEVER FAIL STATUS -FROM GEAR SHIFT MODULE - SIGNAL INVALID
- U0405-00-VEHICLE SET SPEED -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U0415-00-SHIFT INTERFERENCE -FROM GEARBOX SELECTOR MODULE - SIGNAL NOT AVAILABLE
- U0416-00-IMPLAUSIBLE DATA RECEIVED FROM ESP
- U0418-00-INVALID DATA RECEIVED FROM ANTI-LOCK BRAKE SYSTEM -ABS-BSM- CONTROL MODULE - NODE FAULTY
- U0422-00-INVALID DATA RECEIVED FROM BODY CONTROL MODULE
- U1106-00-CAN C MUTE - SIGNAL MISSING
- U110E-00-LOST AMBIENT TEMPERATURE MESSAGE
- U1109-00-ENGINE STATUS -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U1110-00-MINIMUM ENGINE TORQUE -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U1111-00-MAXIMUM ENGINE TORQUE -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U1112-00-ENGINE TORQUE -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U1113-00-IGNICTION STATUS -FROM BODY CONTROL MODULE - SIGNAL NOT AVAILABLE
- U1114-00-REMOT START ACTIVATION STATUS -FROM BODY CONTROL MODULE - SIGNAL NOT AVAILABLE
- U11BC-00-BRAKE SWITCH SIGNAL - NOT VALID
- U11C0-00-MANUAL SHIFT LEVER SIGNAL RECEIVED -TIP - SIGNAL INVALID
- U11C6-00-ENGINE FRICTION TORQUE -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U11C7-00-LOST MAXIMUM ENGINE TORQUE MESSAGE
- U11C8-00-ENGINE WATER TEMPERATURE - SIGNAL INVALID
- U11C9-00-LOST LEFT FRONT WHEEL SPEED MEASSAGE
- U11CA-00-LOST RIGHT FRONT WHEEL SPEED MEASSAGE
- U11CB-00-LOST LEFT REAR WHEEL SPEED MEASSAGE
- U11CC-00-LOST RIGHT REAR WHEEL SPEED MEASSAGE
- U11CD-00-LOST BOTH REAR WHEEL SPEED MESSAGES
- U11CE-00-VEHICLE LATERAL ACCELERATION - SIGNAL INVALID
- U11CF-00-VEHICLE LONGITUDINAL ACCELERATION - SIGNAL INVALID
- U11D0-00-LOST IGNITION KEY STATUS MESSAGE
- U11D1-00-ENGINE LIMPHOME STATUS -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U11D2-00-AMBIENT TEMPERATURE - SIGNAL INVALID
- U11D4-00-GAS PEDAL POSITION -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U11D5-00-DRIVER POWER REQUEST -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U11D6-00-LOST ENGINE STATUS MESSAGE
- U11D7-00-LOST LOW TRACTION MESSAGE
- U11D9-00-LOST ENGINE OFF TIME MESSAGE
- U11DA-00-BRAKE TORQUE LEVEL MASTER CYLINDER PRESSURE - INVALID SERIAL DATA RECEIVED
- U11E2-00-PRESSURE ATMOSFERIC - INVALID SERIAL DATA RECEIVED
- U1420-00-SHIFT LEVER POSITION REQUEST -FROM GEAR SHIFT MODULE - SIGNAL NOT AVAILABLE
- U142A-00-PRNDL SIGNAL -FROM GEAR SHIFT MODULE - SIGNAL INVALID

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- U1437-00-INTAKE AIR TEMPERATURE FROM ECM - SIGNAL NOT AVAILABLE
- U1460-00-ENGINE IDLE REFERENCE SPEED -FROM ENGINE CONTROL MODULE - SIGNAL NOT AVAILABLE
- U1508-00-SHIFT LEVER POSITION REQUEST -FROM GEAR SHIFT MODULE - SIGNAL INVALID
- U1915-00-ENGINE1 -FROM ENGINE CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U1916-00-ENGINE3 -FROM ENGINE CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U1917-00-ENGINE4 -FROM ENGINE CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U1918-00-MOT_TRANSM1 -FROM ENGINE CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2916-00-MOT_TRANSM2 -FROM ENGINE CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2917-00-MOT_TRANSM3 -FROM ENGINE CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2918-00-MOT_TRANSM4 -FROM ENGINE CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2920-00-BCM_COMMAND -FROM BODY CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2921-00-BODY2 -FROM BODY CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2923-00-BODY4 -FROM BODY CONTROL MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2926-00-BRAKE_TRANSM1 -FROM BRAKE SYSTEM MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2927-00-BRAKE1 -FROM BRAKE SYSTEM MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2928-00-BRAKE2 -FROM BRAKE SYSTEM MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2929-00-BRAKE8 -FROM BRAKE SYSTEM MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2930-00-BSM_YRS_DATA -FROM BRAKE SYSTEM MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2931-00-WHEEL_INFO -FROM BRAKE SYSTEM MODULE - CRC-MC IN FAULT OR MISSING MESSAGE
- U2932-00-WHEEL_SPEED -FROM BRAKE SYSTEM MODULE - CRC-MC IN FAULT OR MISSING MESSAGE

Standard Procedure

- C635 DDCT TRANSMISSION VERIFICATION TEST
- C635 DDCT PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

RADIO (ETM)

Diagnosis and Testing

- B1400-11-FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND
- B1400-12-FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY
- B1400-13-FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN
- B1400-1A-FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD
- B1400-92-FRONT LEFT AUDIO SPEAKER OUTPUT-PERFORMANCE OR INCORRECT OPERATION
- B1404-11-FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND
- B1404-12-FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY
- B1404-13-FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN
- B1404-1A-FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW

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THRESHOLD
- B1404-92-FRONT RIGHT AUDIO SPEAKER OUTPUT-PERFORMANCE OR INCORRECT OPERATION
- B1408-11-REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND
- B1408-12-REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY
- B1408-13-REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN
- B1408-1A-REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD
- B1408-92-REAR LEFT AUDIO SPEAKER OUTPUT-PERFORMANCE OR INCORRECT OPERATION
- B140C-11-REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND
- B140C-12-REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY
- B140C-13-REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN
- B140C-1A-REAR RIGHT AUDIO SPEAKER OUTPUT - CIRCUIT RESISTANCE BELOW THRESHOLD
- B140C-92-REAR RIGHT AUDIO SPEAKER OUTPUT-PERFORMANCE OR INCORRECT OPERATION
- B142A-4B-RADIO UNIT HIGH TEMPERATURE - OVER TEMPERATURE
- B143A-11-MICROPHONE 1 - CIRCUIT SHORT TO GROUND
- B143A-12-MICROPHONE 1 - CIRCUIT SHORT TO BATTERY
- B143A-13-MICROPHONE 1 - CIRCUIT OPEN
- B143A-1A-MICROPHONE 1 - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1488-00-CABIN EQ MISMATCH PERFORMANCE
- B14DA-2A-HEAD UNIT BUTTON - STUCK
- B1552-2A-EMERGENCY CALL BUTTON-STUCK
- B1553-2A-ROAD ASSIST BUTTON-STUCK
- B1560-11-CELLULAR ANTENNA 1-CIRCUIT SHORT TO GROUND
- B1560-13-CELLULAR ANTENNA 1-CIRCUIT OPEN
- B1562-11-GPS ANTENNA - CIRCUIT SHORT TO GROUND
- B1562-13-GPS ANTENNA - CIRCUIT OPEN
- B1562-1A-GPS ANTENNA-CIRCUIT RESISTANCE BELOW THRESHOLD
- B156B-13-SATELLITE RADIO ANTENNA - CIRCUIT OPEN
- B156B-1A-SATELLITE RADIO ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1577-13-UNIVERSAL CONSUMER INTERFACE (UCI) - CIRCUIT OPEN
- B1570-19-USB COMMUNICATION - OVERCURRENT
- B1577-13-UNIVERSAL CONSUMER INTERFACE (UCI) - CIRCUIT OPEN
- B1578-13-AM/FM ANTENNA - CIRCUIT OPEN
- B1578-1A-AM/FM AUDIO ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1579-13 DIVERSITY ANTENNA - CIRCUIT OPEN
- B157A-13 DAB ANTENNA - CIRCUIT OPEN
- B1579-1A DIVERSITY ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B157A-1A DAB ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B157E-00-TOUCH SCREEN LOCKED
- B210A-16-SYSTEM VOLTAGE LOW - CIRCUIT VOLTAGE BELOW THRESHOLD
- B210B-17-SYSTEM VOLTAGE HIGH-CIRCUIT VOLTAGE ABOVE THRESHOLD
- B2206-00-CURRENT VIN MISSING/MISMATCH
- B221E-00-RADIO INTERNAL
- B222C-00-VEHICLE CONFIGURATION NOT PROGRAMMED
- B223B-00-VEHICLE CONFIGURATION MISMATCH
- B280B-00-REAR CAMERA VIDEO INPUT
- U0001-87-C1 CAN BUS - MISSING MESSAGE
- U0001-88-C1 CAN BUS - BUS OFF
- U0010-87-BH-CAN-MISSING MESSAGE

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- U0010-88 CAN BH BUS - BUS OFF
- U0100-87-LOST COMMUNICATION WITH ENGINE CONTROL MODULE-MISSING MESSAGE
- U0140-87-LOST COMMUNICATION WITH BODY CONTROL MODULE
- U0140-8F LOST COMMUNICATION WITH BODY CONTROL MODULE - ERRATIC
- U0155-87 LOST COMMUNICATION WITH CLUSTER/CCN - MISSING MESSAGE
- U0155-8F LOST COMMUNICATION WITH CLUSTER/CCN - ERRATIC
- U0186-00-LOST COMMUNICATION WITH AUDIO AMPLIFIER
- U0422-86-INVALID DATA RECEIVED FROM BODY CONTROL MODULE-SIGNAL INVALID
- U0549-86-REMOTE REQUEST-SIGNAL INVALID
- U1193-87 LOST COMMUNICATION WITH DRIVER SIDE BLIND SPOT SENSOR - MISSING MESSAGE
- U1194-87 LOST COMMUNICATION WITH PASSENGER SIDE BLIND SPOT SENSOR - MISSING MESSAGE
- U1930-86 OPERATIONAL MODE STATUS INTERNAL - SIGNAL INVALID
- U1932-86 OPERATIONAL MODE STATUS CAN SIGNAL - SIGNAL INVALID

⊟ MODULE, Radio Receiver (RRM)

⊟ Diagnosis and Testing

- B1400-11 FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND-BASE
- B1400-11 FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND-PREMIUM
- B1400-12 FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY-BASE
- B1400-12 FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY-PREMIUM
- B1400-13 FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN-BASE
- B1400-13 FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN-PREMIUM
- B1400-1A FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD-BASE
- B1400-1A FRONT LEFT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD-PREMIUM
- B1404-11 FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND-BASE
- B1404-11 FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND-PREMIUM
- B1404-12 FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY-BASE
- B1404-12 FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY-PREMIUM
- B1404-13 FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN-BASE
- B1404-13 FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN-PREMIUM
- B1404-1A FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD-BASE
- B1404-1A FRONT RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD-PREMIUM
- B1408-11 REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND-BASE
- B1408-11 REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND-PREMIUM
- B1408-12 REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY-BASE
- B1408-12 REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY-PREMIUM
- B1408-13 REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN-BASE
- B1408-13 REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN-PREMIUM
- B1408-1A REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD-BASE
- B1408-1A REAR LEFT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD-PREMIUM
- B140C-11 REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND-BASE
- B140C-11 REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO GROUND-PREMIUM
- B140C-12 REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY-BASE
- B140C-12 REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT SHORT TO BATTERY-PREMIUM
- B140C-13 REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN-BASE
- B140C-13 REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT OPEN-PREMIUM

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- B140C-1A REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD-BASE
- B140C-1A REAR RIGHT AUDIO SPEAKER OUTPUT-CIRCUIT RESISTANCE BELOW THRESHOLD-PREMIUM
- B142A-4B RADIO UNIT HIGH TEMPERATURE-OVER TEMPERATURE
- B1488-00 CABIN EQ MISMATCH PERFORMANCE
- B14DA-2A HEAD UNIT BUTTON - STUCK
- B1560-11 CELLULAR ANTENNA 1 - CIRCUIT SHORT TO GROUND
- B1560-13 CELLULAR ANTENNA 1 - CIRCUIT OPEN
- B1562-11 GPS ANTENNA - CIRCUIT SHORT TO GROUND
- B1562-12 GPS ANTENNA - CIRCUIT SHORT TO BATTERY
- B1562-13 GPS ANTENNA - CIRCUIT OPEN
- B1562-1A GPS ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B156B-13 SATELLITE RADIO ANTENNA - CIRCUIT OPEN
- B156B-1A SATELLITE RADIO ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1570-19 USB CONNECTION - CIRCUIT CURRENT ABOVE THRESHOLD
- B1577-13 UNIVERSAL CONSUMER INTERFACE UCI-CIRCUIT OPEN
- B1578-13 AM/FM ANTENNA - CIRCUIT OPEN
- B1578-1A AM/FM ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1579-13 DIVERSITY ANTENNA - CIRCUIT OPEN
- B1579-1A DIVERSITY ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B157A-13 DAB ANTENNA - CIRCUIT OPEN
- B157A-1A DAB ANTENNA - CIRCUIT RESISTANCE BELOW THRESHOLD
- B1EB0-87 LANE KEEPING ASSIST CONTROL CIRCUIT - MISSING MESSAGE
- B210A-16 SYSTEM VOLTAGE LOW - CIRCUIT VOLTAGE BELOW THRESHOLD
- B210A-17 SYSTEM VOLTAGE HIGH - CIRCUIT VOLTAGE ABOVE THRESHOLD
- B2206-00 CURRENT VIN MISSING / MISMATCH
- B221E-00 RADIO INTERNAL - NO SUBTYPE INFORMATION
- B222C-00 VEHICLE CONFIGURATION NOT PROGRAMMED - NO SUBTYPE INFORMATION
- B223B-00 VEHICLE CONFIGURATION MISMATCH - NO SUBTYPE INFORMATION
- B280B-00-REAR CAMERA VIDEO INPUT
- U0001-87-C1 CAN BUS - MISSING MESSAGE
- U0001-88-C1 CAN BUS - BUS OFF
- U0140-87-LOST COMMUNICATION WITH BODY CONTROL MODULE-MISSING MESSAGE
- U0140-8F LOST COMMUNICATION WITH BODY CONTROL MODULE - ERRATIC
- U0155-87 LOST COMMUNICATION WITH CLUSTER/CCN - MISSING MESSAGE
- U0155-8F LOST COMMUNICATION WITH CLUSTER/CCN - ERRATIC
- U0186-87 LOST COMMUNICATION WITH AUDIO AMPLIFIER - MISSING MESSAGE
- U1193-87 LOST COMMUNICATION WITH DRIVER SIDE BLIND SPOT SENSOR - MISSING MESSAGE
- U1194-87 LOST COMMUNICATION WITH PASSENGER SIDE BLIND SPOT SENSOR - MISSING MESSAGE
- U1930-86 OPERATIONAL MODE STATUS INTERNAL - SIGNAL INVALID
- U1932-86 OPERATIONAL MODE STATUS CAN SIGNAL - SIGNAL INVALID

⊟ SENSOR, Left Blind Spot (LBSS)

⊟ Diagnosis and Testing

- C1000-44-ELECTRONIC CONTROL UNIT-DATA MEMORY FAILURE
- C1000-45-ELECTRONIC CONTROL UNIT-PROGRAM MEMORY FAILURE
- C1000-46-ELECTRONIC CONTROL UNIT-CALIBRATION-PARAMETER MEMORY FAILURE
- C1000-47-ELECTRONIC CONTROL UNIT-WATCHDOG-SAFETY FAILURE
- C1002-02-LBSS RADAR SENSOR ADDRESS FAULT-GENERAL SIGNAL FAILURE
- C1003-04-BLIND SPOT SENSOR PROBLEM-SYSTEM INTERNAL FAILURES
- C1003-49-BLIND SPOT SENSOR PROBLEM-INTERNAL ELECTRONIC FAILURE

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- C1003-97-BLIND SPOT SENSOR PROBLEM-COMPONENT OR SYSTEM OPERATION OBSTRUCTED OR BLOCKED
- C1004-16-BATTERY VOLTAGE INPUT CIRCUIT-CIRCUIT VOLTAGE BELOW THRESHOLD
- C1004-17-BATTERY VOLTAGE INPUT CIRCUIT-CIRCUIT VOLTAGE ABOVE THRESHOLD
- C100B-11-LEFT BLIND SPOT SENSOR-CIRCUIT SHORT TO GROUND
- C100B-15-LEFT BLIND SPOT SENSOR-CIRCUIT SHORT TO BATTERY OR OPEN
- C100B-4B-LEFT BLIND SPOT SENSOR-OVER TEMPERATURE
- C2000-64-STATUS-TTM.TRAILERGENERICFAILSTS-SIGNAL PLAUSIBILITY FAILURE
- C2001-64-STATUS-BH-BCM1.PARKBRAKESTS-SIGNAL PLAUSIBILITY FAILURE
- C2002-64-STATUS-CCAN5.SHIFTLEVERPOSITION-SIGNAL PLAUSIBILITY FAILURE
- U0010-87-B CAN-MISSING MESSAGE
- U0010-88-B CAN-BUS OFF
- U146D-64-LBSS OPERATIONALMODESTS-SIGNAL PLAUSIBILITY FAILURE
- U148D-64-IPC-VEHICLE-SETUP.BSDENABLE-SIGNAL PLAUSIBILITY FAILURE
- U149D-64-STATUS-CCAN3.VEHICLESPEEDVSOSIGFAILSTS-SIGNAL PLAUSIBILITY FAILURE
- U1700-86-BODY COMPUTER MODULE (BCM)-SIGNAL INVALID
- U1700-87-BODY COMPUTER MODULE (BCM)-MISSING MESSAGE
- U1703-86-INSTRUMENT PANEL CLUSTER (IPC)-SIGNAL INVALID
- U1703-87-INSTRUMENT PANEL CLUSTER (IPC)-MISSING MESSAGE
- U1752-86-RIGHT BLIND SPOT SENSOR (RBSS)-SIGNAL INVALID
- U1752-87-RIGHT BLIND SPOT SENSOR (RBSS)-MISSING MESSAGE
- U1763-86-TTM (TRAILER TOW MODULE)-SIGNAL INVALID
- U1763-87-TTM (TRAILER TOW MODULE)-MISSING MESSAGE

SENSOR, Right Blind Spot (RBSS)

Diagnosis and Testing

- C1000-44-ELECTRONIC CONTROL UNIT-DATA MEMORY FAILURE
- C1000-45-ELECTRONIC CONTROL UNIT-PROGRAM MEMORY FAILURE
- C1000-46-ELECTRONIC CONTROL UNIT-CALIBRATION-PARAMETER MEMORY FAILURE
- C1000-47-ELECTRONIC CONTROL UNIT-WATCHDOG-SAFETY FAILURE
- C1003-04-BLIND SPOT SENSOR PROBLEM-SYSTEM INTERNAL FAILURES
- C1003-49-BLIND SPOT SENSOR PROBLEM-INTERNAL ELECTRONIC FAILURE
- C1003-97-BLIND SPOT SENSOR PROBLEM-COMPONENT OR SYSTEM OPERATION OBSTRUCTED OR BLOCKED
- C1004-16-BATTERY VOLTAGE INPUT CIRCUIT-CIRCUIT VOLTAGE BELOW THRESHOLD
- C1004-17-BATTERY VOLTAGE INPUT CIRCUIT-CIRCUIT VOLTAGE ABOVE THRESHOLD
- C1005-02-RBSS RADAR SENSOR ADDRESS FAULT - GENERAL SIGNAL FAILURE
- C100A-11-RIGHT BLIND SPOT SENSOR - CIRCUIT SHORT TO GROUND
- C100A-15-RIGHT BLIND SPOT SENSOR - CIRCUIT SHORT TO BATTERY OR OPEN
- C100A-4B-RIGHT BLIND SPOT SENSOR - OVER TEMPERATURE
- C2000-64-STATUS-TTM.TRAILERGENERICFAILSTS-SIGNAL PLAUSIBILITY FAILURE
- C2001-64-STATUS-BH-BCM1.PARKBRAKESTS-SIGNAL PLAUSIBILITY FAILURE
- C2002-64-STATUS-CCAN5.SHIFTLEVERPOSITION-SIGNAL PLAUSIBILITY FAILURE
- U0010-87-B CAN-MISSING MESSAGE
- U0010-88-B CAN-BUS OFF
- U147D-64-RBSS-OPERATIONALMODESTS - SIGNAL PLAUSIBILITY FAILURE
- U148D-64-IPC-VEHICLE-SETUP.BSDENABLE-SIGNAL PLAUSIBILITY FAILURE
- U149D-64-STATUS-CCAN3.VEHICLESPEEDVSOSIGFAILSTS-SIGNAL PLAUSIBILITY FAILURE
- U1700-86-BODY COMPUTER MODULE (BCM)-SIGNAL INVALID
- U1700-87-BODY COMPUTER MODULE (BCM)-MISSING MESSAGE
- U1703-86-INSTRUMENT PANEL CLUSTER (IPC)-SIGNAL INVALID
- U1703-87-INSTRUMENT PANEL CLUSTER (IPC)-MISSING MESSAGE
- U1751-86-LEFT BLIND SPOT SENSOR LBSS - SIGNAL INVALID
- U1751-87-LEFT BLIND SPOT SENSOR LBSS - MISSING MESSAGE

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- U1763-86-TTM (TRAILER TOW MODULE)-SIGNAL INVALID
- U1763-87-TTM (TRAILER TOW MODULE)-MISSING MESSAGE

29 - Non-DTC Diagnostics
- Circuit Testing Procedures
  - Warning
    - GENERAL WARNINGS
  - Description
    - CIRCUIT FUNCTIONS
    - CIRCUIT INFORMATION
  - Diagnosis and Testing
    - WIRING HARNESS TESTING
  - Standard Procedure
    - CHECK A 12-VOLT FUSED BATTERY B(+) CIRCUIT FOR VOLTAGE
    - CHECK A 12-VOLT SWITCHED BATTERY B(+) CIRCUIT FOR VOLTAGE
    - CHECK A 5-VOLT SUPPLY CIRCUIT FOR VOLTAGE
    - CHECK A CIRCUIT FOR A SHORT TO GROUND
    - CHECK A CIRCUIT FOR A SHORT TO VOLTAGE
    - CHECK FOR AN OPEN GROUND CIRCUIT
    - CHECK FOR A SHORT BETWEEN MULTIPLE CIRCUITS
    - CHECK THE RESISTANCE OF A CIRCUIT USING AN OHMMETER
    - CHECK FOR EXCESSIVE CURRENT DRAW
    - CIRCUIT LOAD TESTING PROCEDURE
    - VOLTAGE DROP TEST PROCEDURE
    - ELECTROSTATIC DISCHARGE (ESD) SENSITIVE DEVICES
    - WIRE SPLICING
  - Removal
    - CONNECTOR TERMINAL REMOVAL
  - Installation
    - CONNECTOR TERMINAL INSTALLATION
- Audio/Video
  - Diagnosis and Testing
    - POOR OR NO SATELLITE AUDIO RECEPTION
    - POOR OR NO AM/FM AUDIO RECEPTION
    - DIAGNOSIS AND TESTING - REAR CAMERA INOPERATIVE
    - MIT019 MULTI-MEDIA TESTER
- Communication
  - Diagnosis and Testing
    - SCAN TOOL WILL NOT COMMUNICATE WITH CAN C1
    - SCAN TOOL WILL NOT COMMUNICATE WITH CAN C2
    - SCAN TOOL WILL NOT COMMUNICATE WITH CAN IHS
    - NO RESPONSE FROM ABS (ANTI-LOCK BRAKE SYSTEM) MODULE
    - NO RESPONSE FROM ACC (ADAPTIVE CRUISE CONTROL) MODULE
    - NO RESPONSE FROM AMP (AMPLIFIER)
    - NO RESPONSE FROM BCM (BODY CONTROL MODULE)
    - NO RESPONSE FROM CSWM (COMFORT SEAT AND WHEEL MODULE)
    - NO RESPONSE FROM DCSM (DUAL CLUTCH SHIFTER MODULE)
    - NO RESPONSE FROM DTCM (DRIVE TRAIN CONTROL MODULE)
    - NO RESPONSE FROM EPS (ELECTRIC POWER STEERING MODULE)
    - NO RESPONSE FROM ESL (ELECTRONIC STEERING LOCK)
    - NO RESPONSE FROM ESM (ELECTRONIC SHIFT MODULE)
    - NO RESPONSE FROM IPC (INSTRUMENT PANEL CLUSTER)
    - NO RESPONSE FROM FFCM (FORWARD FACING CAMERA MODULE)
    - NO RESPONSE FROM HVAC
    - NO RESPONSE FROM LBSS (LEFT BLIND SPOT SENSOR)

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- NO RESPONSE FROM ORC (OCCUPANT RESTRAINT CONTROLLER)
- NO RESPONSE FROM PARK ASSIST MODULE (PAM)
- NO RESPONSE FROM PCM (POWERTRAIN CONTROL MODULE)
- NO RESPONSE FROM RADIO-ETM
- NO RESPONSE FROM RBSS (RIGHT BLIND SPOT SENSOR)
- NO RESPONSE FROM RFH (RADIO FREQUENCY HUB) MODULE
- NO RESPONSE FROM 9-SPEED TCM (TRANSMISSION CONTROL MODULE)
- NO RESPONSE FROM DDCT TCM (TRANSMISSION CONTROL MODULE)
- NO RESPONSE FROM TPM (TIRE PRESSURE MONITORING) MODULE
- NO RESPONSE FROM TTM (TRAILER TOW MODULE)

Drivability - Gas
- Diagnosis and Testing
  - CHECKING THE ENGINE MECHANICAL SYSTEM
  - CHECKING THE EXHAUST SYSTEM FOR LEAKS
  - CHECKING THE FUEL DELIVERY SYSTEM (HARD START)
  - CHECKING THE IGNITION COIL OPERATION
  - CHECKING THE MAP SENSOR OPERATION
  - CHECKING THE OXYGEN SENSOR OPERATION (6 WIRE)
  - CHECKING THE PCM POWER AND GROUND CIRCUITS
  - ENGINE CRANKS BUT DOES NOT START

Drivability - Gas
- Diagnosis and Testing
  - CHECKING THE CHARGING SYSTEM OPERATION
  - CHECKING THE ENGINE MECHANICAL SYSTEM
  - CHECKING THE EXHAUST SYSTEM FOR LEAKS
  - CHECKING THE FUEL DELIVERY SYSTEM (HARD START)
  - CHECKING THE IGNITION COIL OPERATION
  - CHECKING THE MAP SENSOR OPERATION
  - CHECKING THE OXYGEN SENSOR OPERATION
  - CHECKING THE PCM POWER AND GROUND CIRCUITS
  - ENGINE CRANKS BUT DOES NOT START

Starting
- Diagnosis and Testing
  - NO CRANK (BCM EQUIPPED)
  - REMOTE START INOPERATIVE (BCM - RF HUB EQUIPPED)

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03 - Differential and Driveline / Half Shaft, Front / Description

DESCRIPTION

This vehicle is equipped with halfshafts that consist of a fixed Constant Velocity (CV) joint at the outboard end connected by a solid shaft to a plunging CV joint on the inboard end. The inner CV joint has a splined connection into the transmission. The outer joint has a spline connection to the wheel hub and is retained with a steel lock nut.

All the halfshaft assemblies use the same type of inner and outer joints. The inner joint is a tripod joint that allows for the changes in halfshaft length through the jounce and rebound travel of the front suspension. The outer joint is a Rzeppa joint that allows articulation during front suspension travel and steering. Both tripod joints and Rzeppa joints are true constant velocity CV joint assemblies.

The inner tripod joints are designed with a retention feature that prevents the tripod rollers from coming out of the inner joint housing up to a specific load. If this feature is overcome and any of the rollers are pulled past the retention feature the joint will lock up and no longer function properly. The entire halfshaft assembly must be replaced if it locks up.

	1.4 Turbo MultiAir	1.6 16V Multijet	1.6 16V Multijet
DRIVE	Front	Front	AWD/4WD

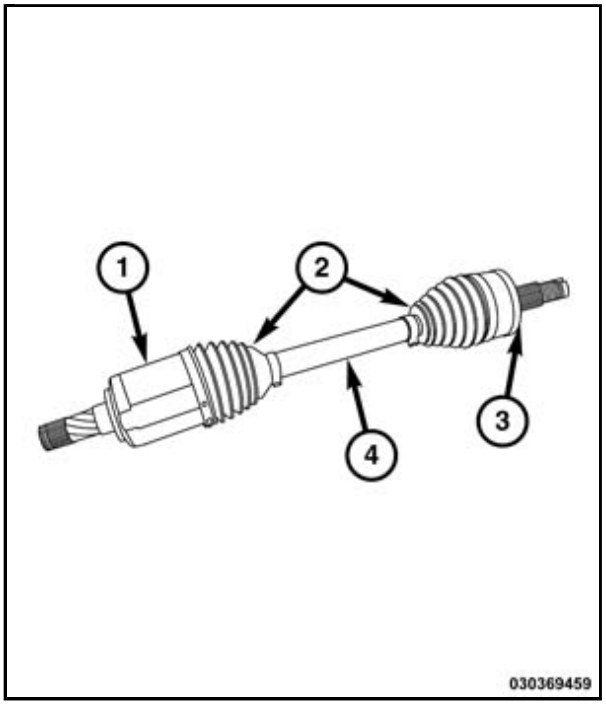
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03 - Differential and Driveline / Half Shaft, Front / Diagnosis and Testing

DIAGNOSIS AND TESTING - HALF SHAFT

VEHICLE INSPECTION

The general appearance of the halfshafts should be clean and oil free around the Constant Velocity (CV) joint (3) and tripod (1) boots (2). Grease on or around the boots is a sign of leakage and the boots or halfshaft should be replaced.



NOISE OR VIBRATION IN TURNS

Vibration associated with the Constant Velocity (CV) joints in the halfshafts occur in the 3rd and 6th order. Use a vibration analyzer to determine the frequency of the vibration.

SYMPTOM	POSSIBLE CAUSE	REPAIR
Clicking noise while turning.	Lack of lube in CV joint boots.	Replace the halfshaft.
Chuckling or snap noise while turning.	Loose wheel or hub nut.	Tighten wheel or hub nut. Replace damaged components.
Loud knocking noise centering on inner CV tripod joints.	Damaged Differential side/pinion gears.	Remove halfshaft and rotate side gears by hand. Replaced damaged transaxle components.

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Noise may also be caused by another component of the vehicle coming in contact with the halfshaft, brake or wheel assemblies.

CLUNKING NOISE DURING ACCELERATION

SYMPTOM	POSSIBLE CAUSE	REPAIR
Clunk/snap noise during launch or shifting into drive or reverse.	• Loose hub nut. • Damaged hub splines.	• Replace hub nut and properly tighten. • Replace hub bearing and halfshaft.
Clunking noise at low speed.	Severely worn or damaged tripod or CV joint.	Replace halfshaft.
Rattle/clunk over bumps. Grease slung around undercarriage.	Loss of lube in CV joint boots.	Replace halfshaft.

SHUDDER OR VIBRATION DURING ACCELERATION

SYMPTOM	POSSIBLE CAUSE	REPAIR
Shudder or vibration on acceleration.	• Engine rotating beyond limits. • Worn or damaged halfshaft inner tripod joint. • Severely worn or damaged suspension or steering component. • Front end severely out of alignment.	• Replaced damaged or worn engine/transaxle mounts. • Replace halfshaft. • Replace worn or damaged suspension or steering component. • Align front end (Refer to 02 - Front Suspension/Wheel Alignment - Standard Procedure) .

VIBRATION AT HIGHWAY SPEEDS

Vibration associated with the CV joints in the halfshafts occur in the 3rd and 6th order (3 or 6 events for each rotation). The inner tripod joint with three pivot axis has three events in each rotation of the halfshaft. This will produce a 3rd order vibration of the wheel rotation speed. The outer CV joint with 6 pivot axis balls has six events in each rotation of the halfshaft. This will produce a 6th order vibration of the wheel rotation speed. A 6th order vibration will create a high pitch sound, like gear noise. Use a vibration analyzer to determine the frequency of the vibration before replacing components.

SYMPTOM	POSSIBLE CAUSE	REPAIR
Low frequency vibration, matching wheel speed. Wheel balance and runout is OK.	Foreign material (plastic bags, organic sinew and road debris) fouling the half shaft.	Clean debris from around halfshaft.
	• Faulty inner tripod joint.	

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SYMPTOM	POSSIBLE CAUSE	REPAIR
High frequency vibration matching 3rd order wheel speed.	• Vehicle ride height is modified.	• Replace halfshaft. • Return vehicle to proper ride height.
High pitch whine sound with possible high frequency vibration in the floor matching 6th order wheel speed.	• Faulty outer CV joint. • Vehicle ride height is modified.	• Replace halfshaft. • Return vehicle to proper ride height.

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03 - Differential and Driveline / Half Shaft, Front / Specifications

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Hub Nut, All Engines	Refer to Halfshaft Installation procedure (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .			Do not reuse these fasteners. If removed, a **NEW** fastener must be installed and tightened to specifications.
Intermediate Shaft Bearing to Bracket Bolts, 1.4 Turbo MultiAir	26	19	–	
Intermediate Shaft Bearing to Bracket Bolts, 1.6 Turbo Diesel	20	15	–	
Intermediate Bracket to Engine Block and Oil Pan Bolts, 1.6 Turbo Diesel	50	37	–	

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03 - Differential and Driveline / Half Shaft, Front / Special Tools

SPECIAL TOOLS

Tool (EMEA)	Tool (NAFTA)	Name	Function
99341011	*	Jaws	Half Shaft Removal
1840005004	*	Puller Bridge	Half Shaft Removal
1845062000	*	Adaptor	Outer Constant Velocity (CV) Joint Removal
1847017001	*	Slide Hammer	Half Shaft Removal
1870815000	*	Spanner Wrench	Hub Nut Removal and Installation
1871000700	C-4150A	Tie Rod Separator	Tie Rod End Removal From Knuckle
1875063000	*	Installer	Tripod Installation
2000036600	*	Seal Installer	Seal Mounting on Differential
2000040443	8902A	Seal Installer	Dust Seal on Differential Assembly
2000001600	*	Puller	Removing Half Shaft from Hub
2000040488	*	Puller	Half Shaft Removal
*Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

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03 - Differential and Driveline / Half Shaft, Front / Removal and Installation

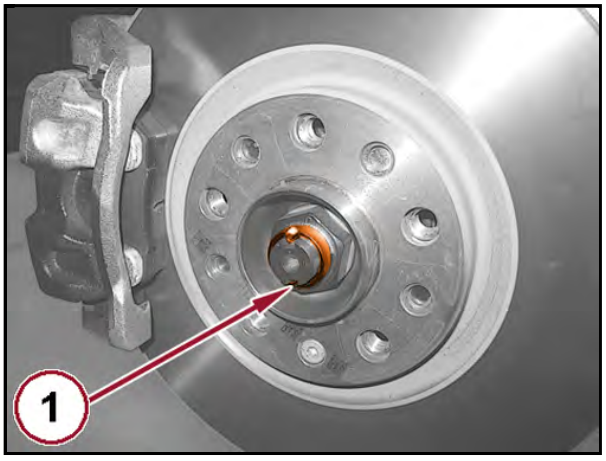
1.4L TURBO MULTIAIR, WITHOUT INTERMEDIATE SHAFT

⊞ **Special Tools:** Click to display a list of tools used in this procedure

REMOVAL

NOTE: Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.

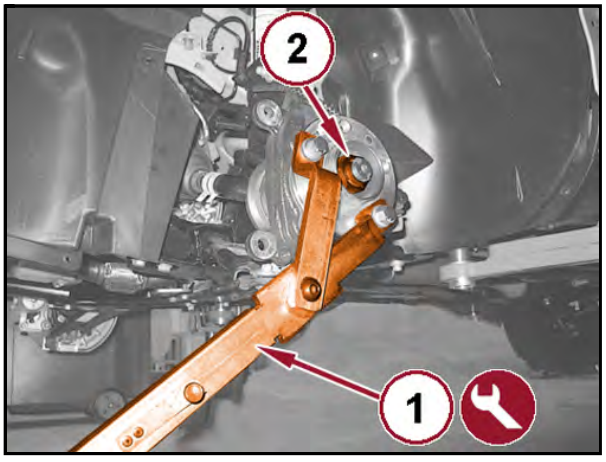
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Using a suitable punch, lift the two staked areas (1) in the hub nut to avoid damaging the halfshaft.



5. Fit the tool 1870815000 (1) to the brake disc.

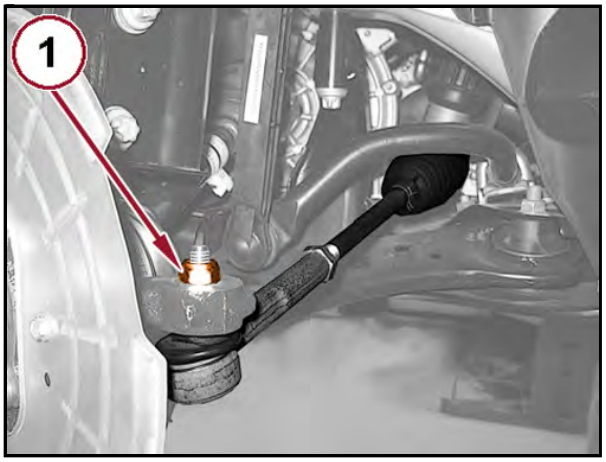
   NOTE: The used hub nut is not reusable.

6. Remove the hub nut (2) from the halfshaft and **DISCARD**.

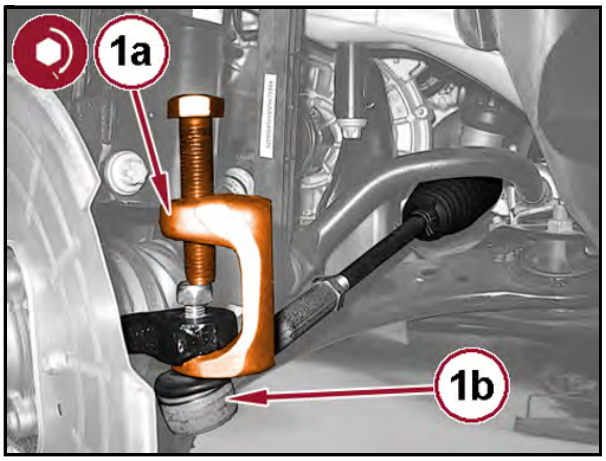


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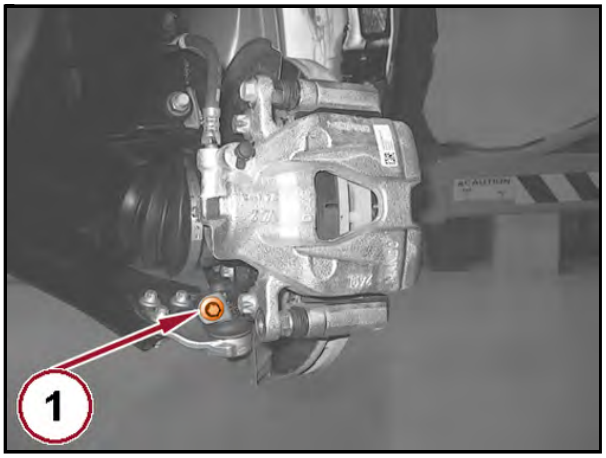
7. Unscrew and **DISCARD** the nut (1) securing the tie rod end to the steering knuckle.



8. Fit the tool 1871000700 (EMEA) or Press, Ball Joint C-4150A (NAFTA) (1a) and disconnect the tie rod (1b) from the steering knuckle.



9. Remove the ball joint pinch bolt (1).

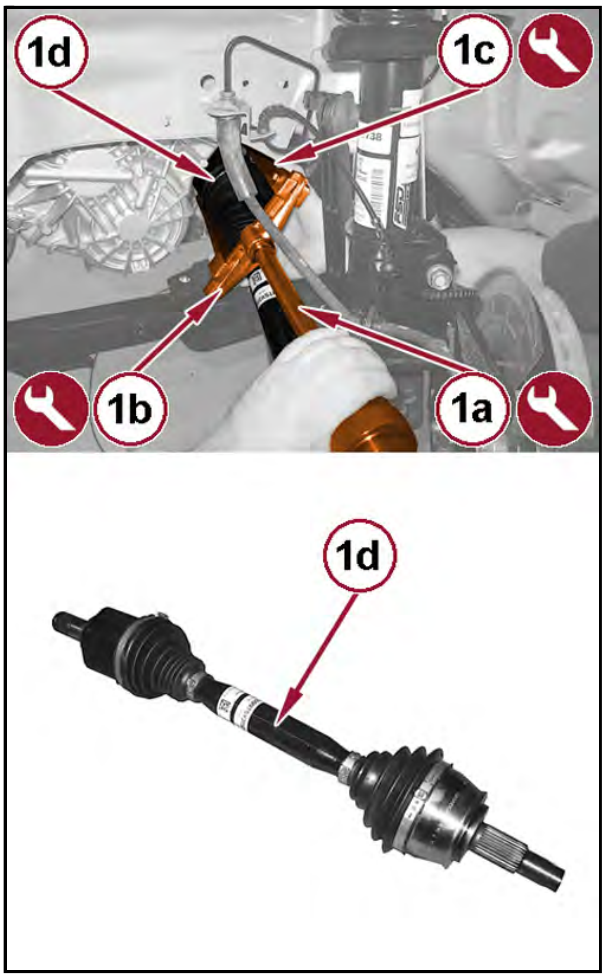


10. Disengage the ball joint from the steering knuckle.

11. Disengage the halfshaft from the wheel hub.

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12. With the tools 1847017001 (1a), 1840005004 (1b) and 99341011 (1c), remove the halfshaft (1d).



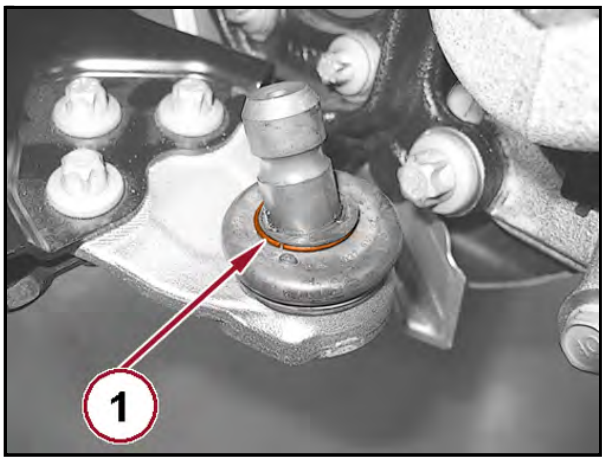
INSTALLATION

NOTE: **Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.**

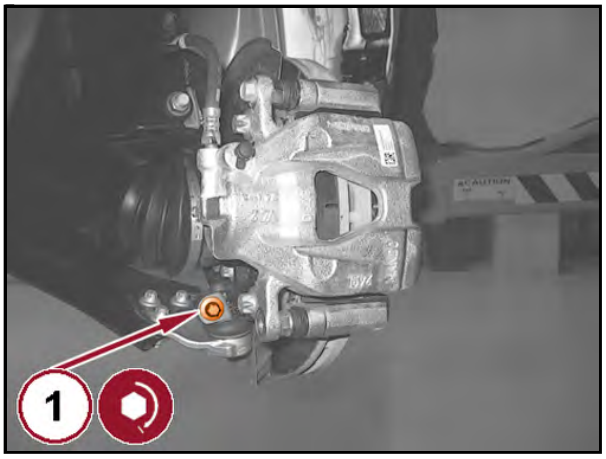
1. Inspect the ball joint boot and the boot tension ring (1) for damage.

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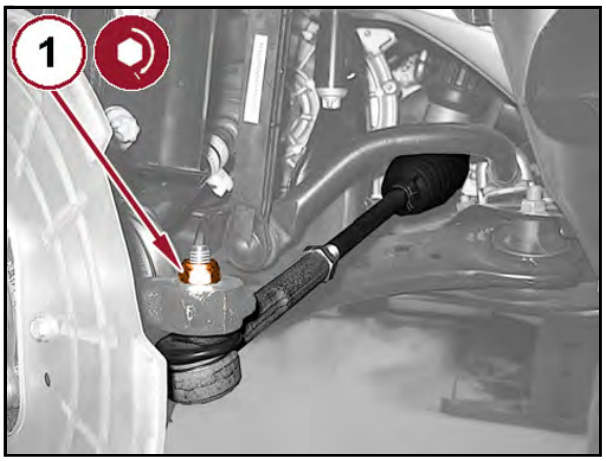
2. Position the halfshaft into the differential and wheel hub.



3. Position the ball joint stud into the steering knuckle tighten the pinch bolt (1) to the proper (Torque Specifications) .



4. Connect the tie rod end to the steering knuckle and tighten the **NEW** nut (1) to the proper (Torque Specifications) .



NOTE: **Always install a NEW hub nut. The original hub nut is one time use only and must be discarded when removed.**

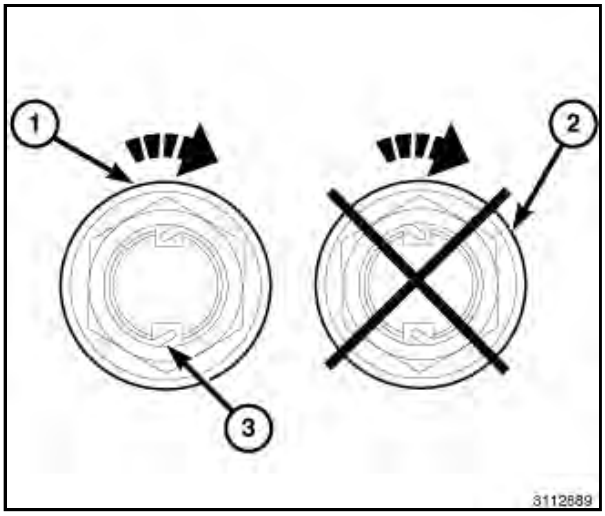
5. Fit the tool 1870815000 and install a **NEW** hub nut, tighten the nut using the following procedure:

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- tighten the nut to 70 N·m (52 Ft Lbs)
- tighten the nut an additional 63°

NOTE: Do not use air tools while staking hub nut.

NOTE: The hub nut must be staked so that it looks similar to Figure 1. Both edges must be split and bent into the shape shown (3). The staking must be opposite of the direction to tighten the nut.



6. Stake the hub nut as shown.

7. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

8. Install the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

9. Check and correct the transmission fluid level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

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03 - Differential and Driveline / Half Shaft, Front / Removal and Installation

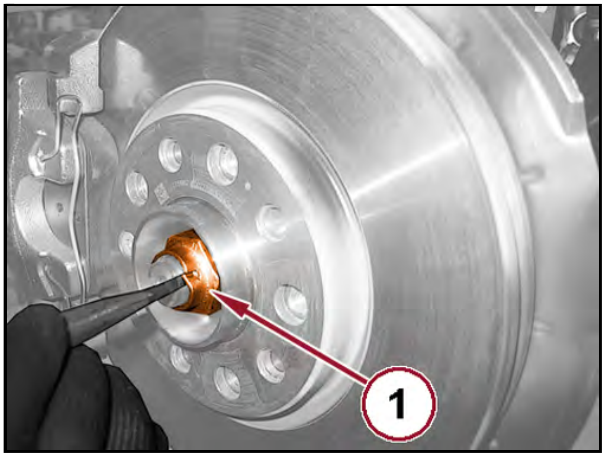
1.6L and 2.0L TURBO DIESEL (120 / 140 HP) WITHOUT INTERMEDIATE SHAFT

⊞ **Special Tools:** Click to display a list of tools used in this procedure

REMOVAL

NOTE: **Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.**

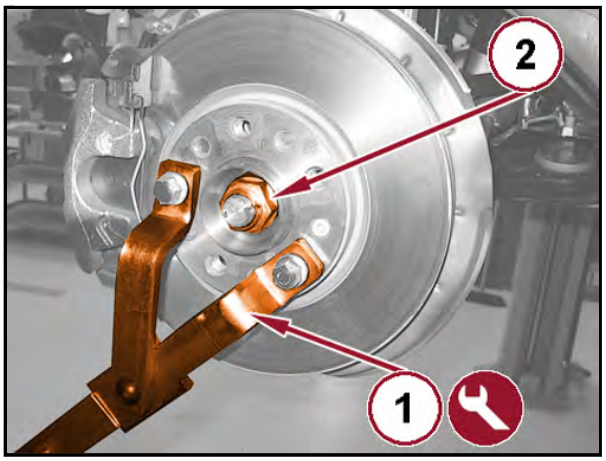
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Using a suitable punch, lift the two staked areas (1) in the hub nut to avoid damaging the halfshaft.



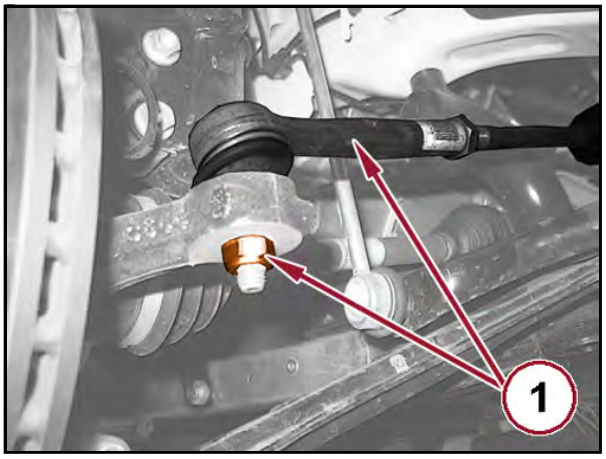
5. Fit the tool 1870815000 (1) to the brake disc.
6. Remove the hub nut (2) from the halfshaft and **DISCARD**.

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PET_AAM_1013-0156

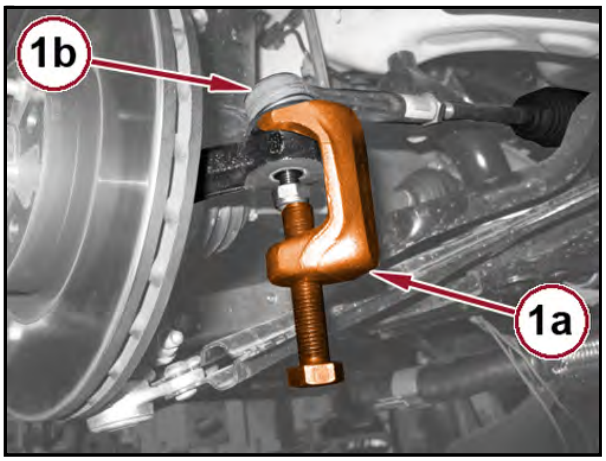
NOTE: **The used hub nut is not reusable.**



7. Remove and **DISCARD** the nut (1) securing the tie rod end to the steering knuckle.



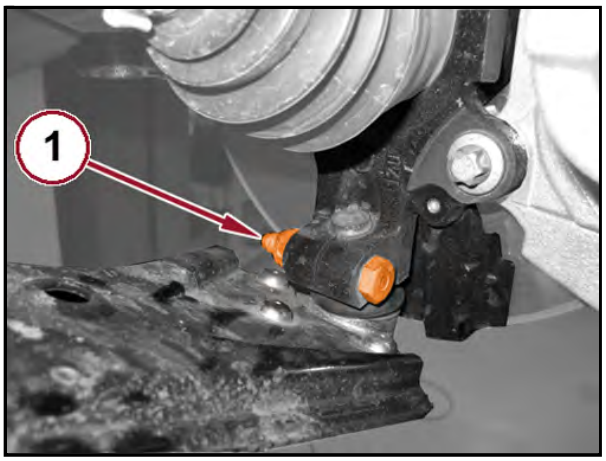
8. Fit the tool 1871000700 (EMEA) or Press, Ball Joint C-4150A (NAFTA) (1a) and disconnect the tie rod (1b) from the steering knuckle.



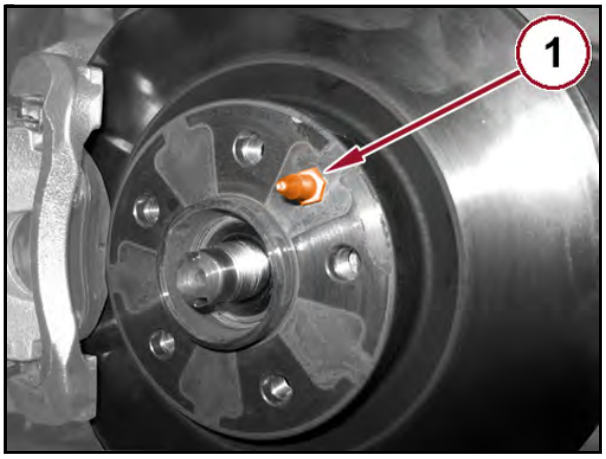
9. Remove the ball joint pinch bolt (1).

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PET_AAM_1013-0157

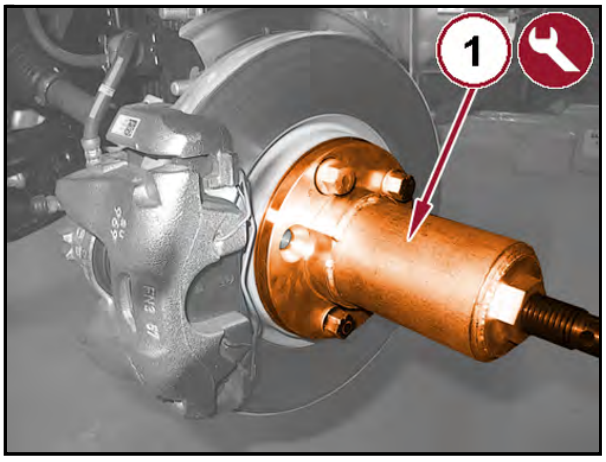
10. Disengage the ball joint from the steering knuckle.



11. Remove the disc brake rotor retaining pin (1).



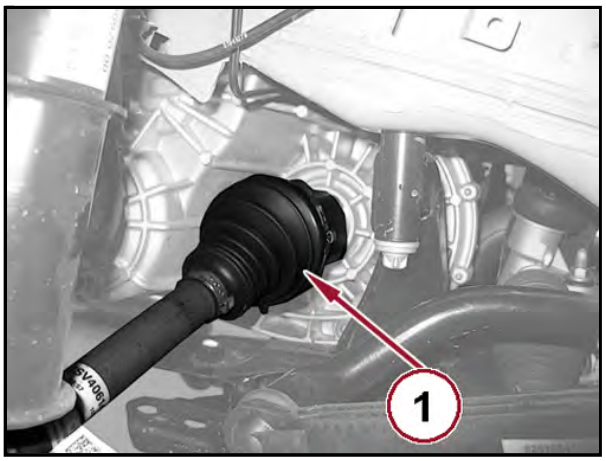
12. Disengage the halfshaft from the wheel hub using tool 2000001600 (1), position the knuckle and rotor assembly aside.



13. Remove the tool, install the disc brake rotor retaining pin and tighten to the proper (Torque Specifications) .

14. Pry the halfshaft (1) from the differential and remove the halfshaft assembly.

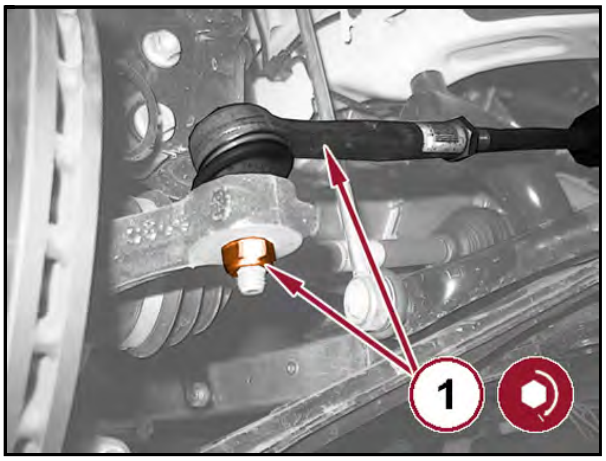
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PET_AAM_1013-0158



INSTALLATION

NOTE: **Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.**

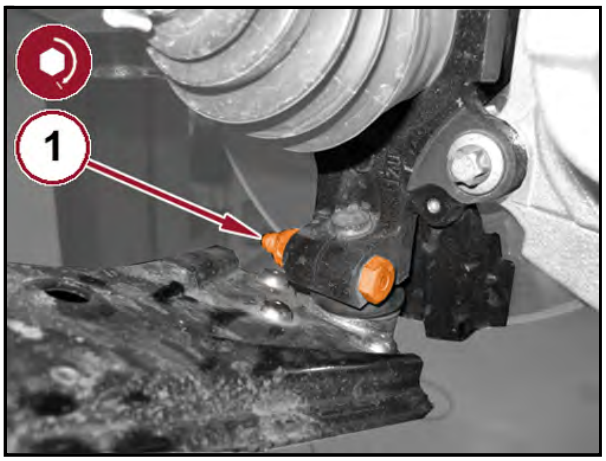
1. Position the halfshaft into the differential and wheel hub.
2. Connect the tie rod end to the steering knuckle and tighten the **NEW** nut (1) to the proper (Torque Specifications) .



3. Position the ball joint stud into the steering knuckle tighten the pinch bolt (1) to the proper (Torque Specifications) .

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PET_AAM_1013-0159

NOTE: **Always install a NEW hub nut. The original hub nut is one time use only and must be discarded when removed.**

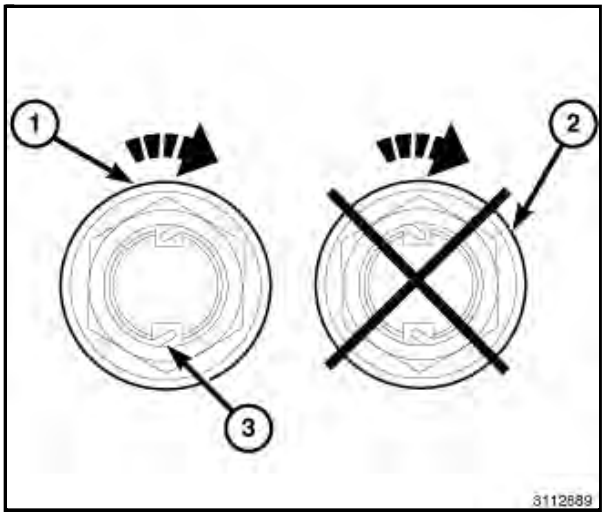


4. Fit the tool 1870815000 and install a **NEW** hub nut, tighten the nut using the following procedure:
    - tighten the nut to 70 N·m (52 Ft Lbs)
    - tighten the nut an additional 63°

NOTE: **Do not use air tools on staking tool while staking hub nut.**

NOTE: **The hub nut must be staked so that it looks similar to Figure 1. Both edges must be split and bent into the shape shown (3). The staking must be opposite of the direction to tighten the nut.**

5. Stake the hub nut as shown.



6. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

7. Install the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

8. Check and correct the transmission fluid level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

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PET_AAM_1013-0160

03 - Differential and Driveline / Half Shaft, Front / Removal and Installation

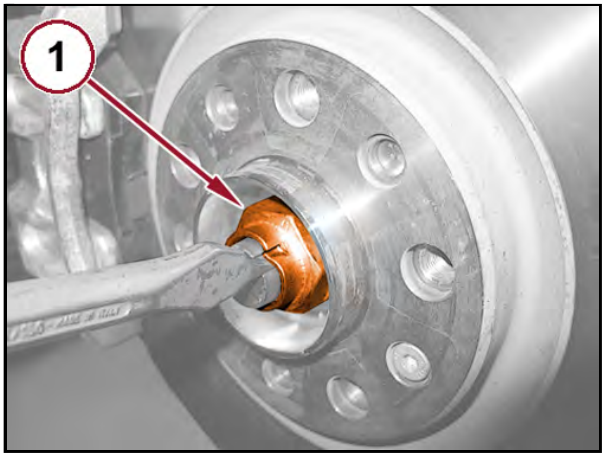
2.0L TURBO DIESEL (170 HP), 2.4L MULTIAIR WITHOUT INTERMEDIATE SHAFT

⊞ **Special Tools:** Click to display a list of tools used in this procedure

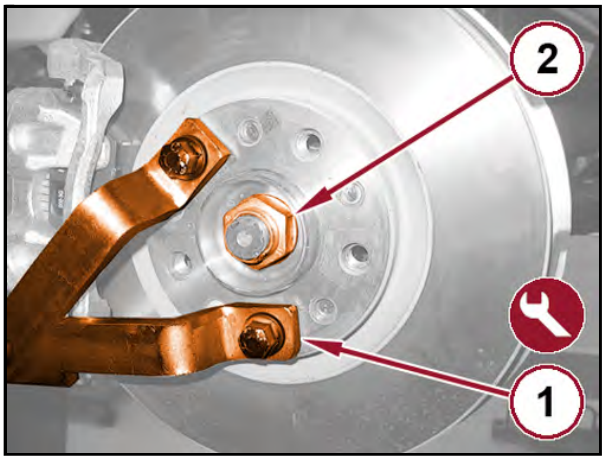
REMOVAL

NOTE: **Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.**

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Using a suitable punch, lift the two staked areas (1) in the hub nut to avoid damaging the halfshaft.

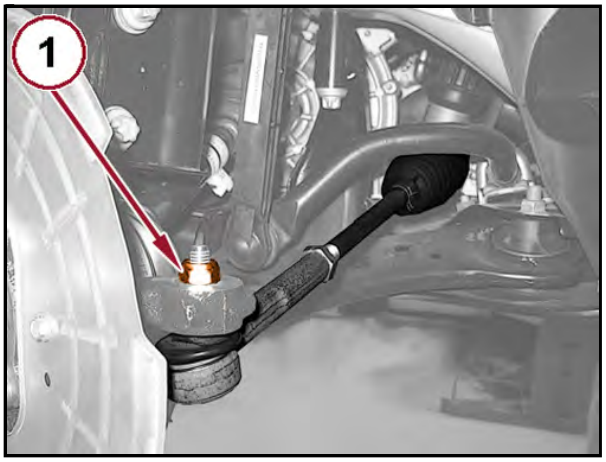


5. Fit the tool 1870815000 (1) to the brake disc.
6. Remove the hub nut (2) from the halfshaft and discard. **The used hub nut is not reusable.**

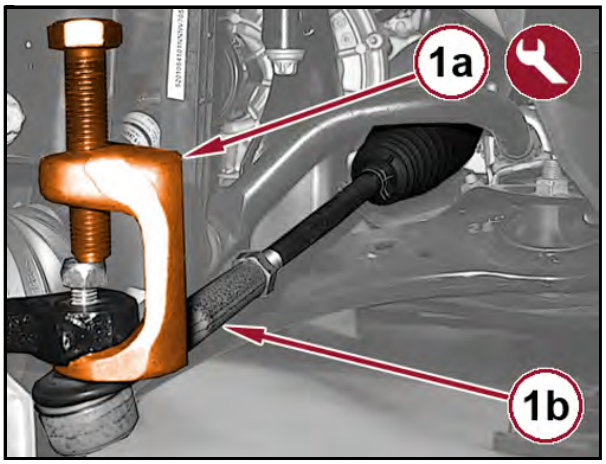


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PET_AAM_1013-0161

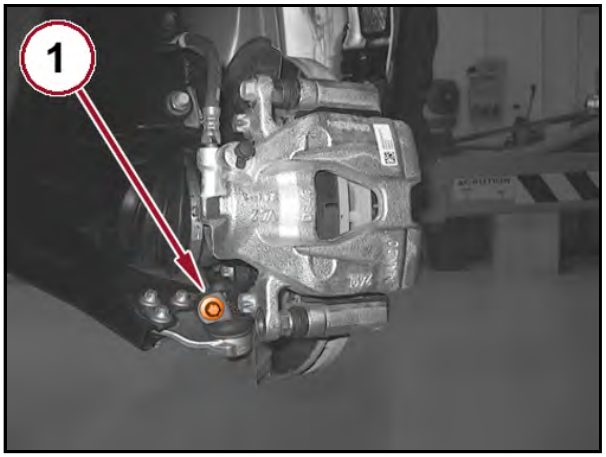
7. Unscrew the nut (1) securing the tie rod end to the steering knuckle.



8. Fit the tool 1871000700 (EMEA) or Press, Ball Joint C-4150A (NAFTA) (1a) and disconnect the tie rod (1b) from the wheel upright.



9. Remove the ball joint pinch bolt (1).

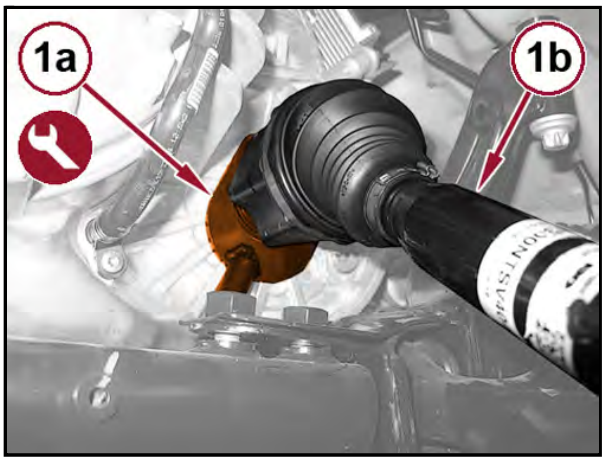


10. Disengage the ball joint from the steering knuckle.

11. Disengage the halfshaft from the wheel hub.

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PET_AAM_1013-0162

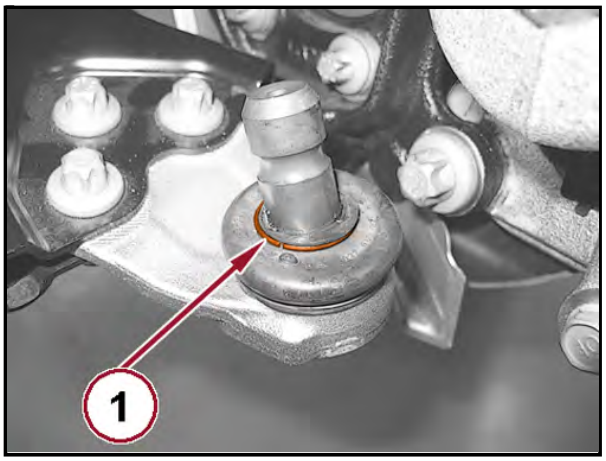
12. With the tool 2000040488 (1a) remove the halfshaft (1b).



INSTALLATION

NOTE: **Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.**

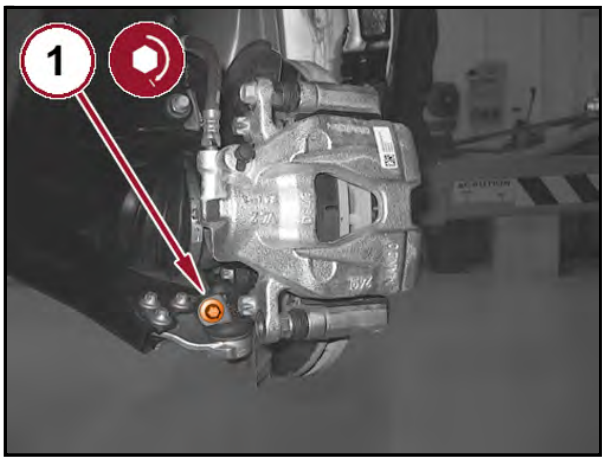
1. Inspect the ball joint boot and the boot tension ring (1) for damage.

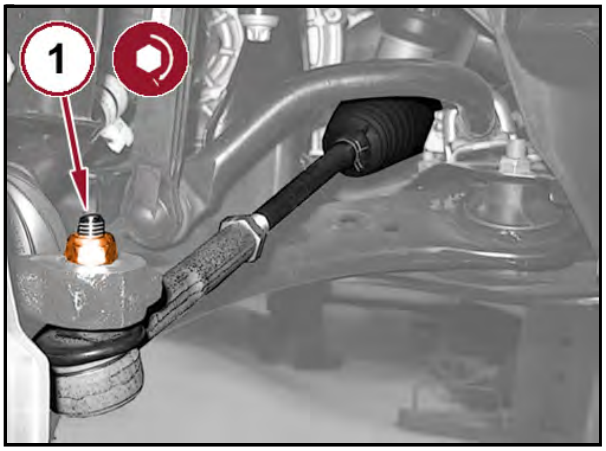


2. Position the half shaftshaft into the differential and wheel hub.

3. Position the ball joint stud into the steering knuckle tighten the **NEW** pinch bolt (1) to the proper (Torque Specifications) .

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4. Connect the tie rod end to the steering knuckle and tighten the **NEW** nut (1) to the proper (Torque Specifications) .

NOTE: **Always install a NEW hub nut. The original hub nut is one time use only and must be discarded when removed.**

5. Fit the tool 1870815000 and install a **NEW** hub nut, tighten the nut using the following procedure:

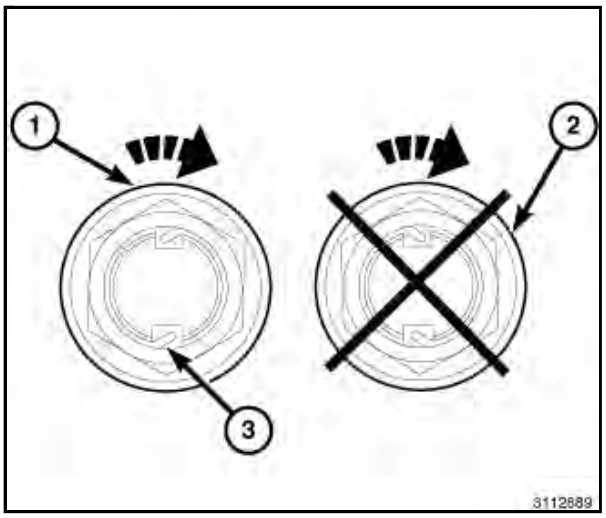
   - tighten the nut to 70 N·m (52 Ft Lbs)
   - tighten the nut an additional 63°

NOTE: **Do not use air tools on staking tool while staking hub nut.**

NOTE: **The hub nut must be staked so that it looks similar to Figure 1. Both edges must be split and bent into the shape shown (3). The staking must be opposite of the direction to tighten the nut.**

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6. Stake the hub nut as shown.



7. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

8. Install the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

9. Check and correct the transmission fluid level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

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PET_AAM_1013-0165

03 - Differential and Driveline / Half Shaft, Front / Removal and Installation

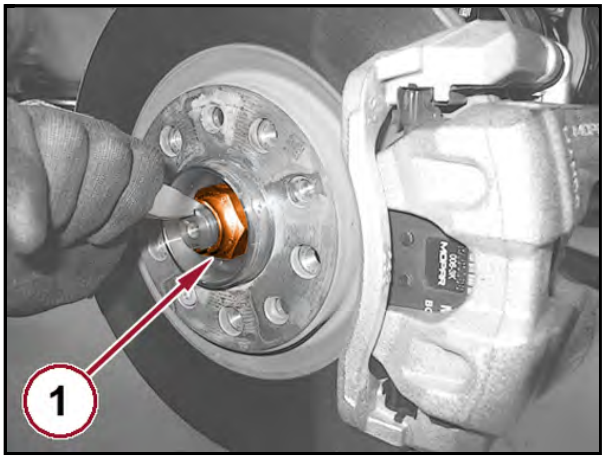
AWD / 4WD RIGHT SIDE, WITHOUT INTERMEDIATE SHAFT

⊞ **Special Tools:** Click to display a list of tools used in this procedure

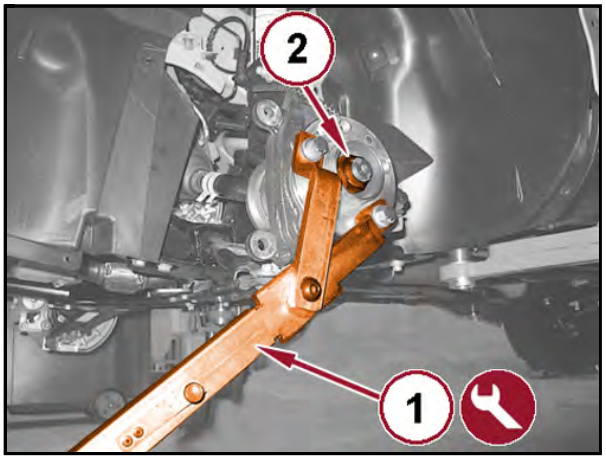
REMOVAL

NOTE: **Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.**

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Using a suitable punch, lift the two staked areas (1) in the hub nut to avoid damaging the halfshaft.

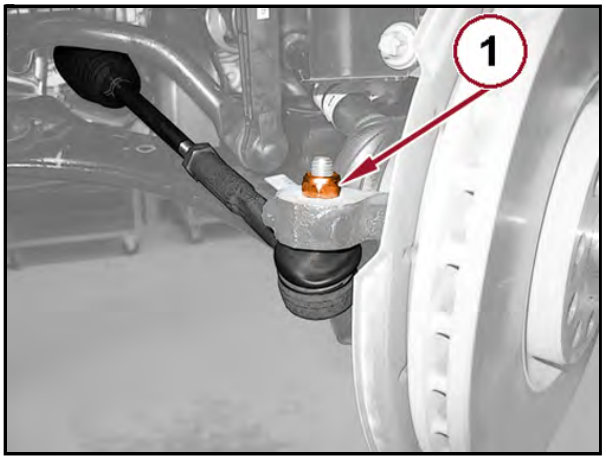


5. Fit the tool 1870815000 (1) to the brake disc.
6. Remove the hub nut (2) from the halfshaft and **DISCARD**. **The used hub nut is not reusable.**

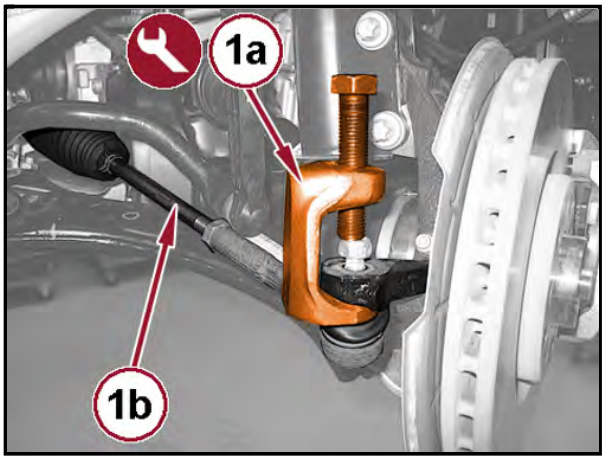


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PET_AAM_1013-0166

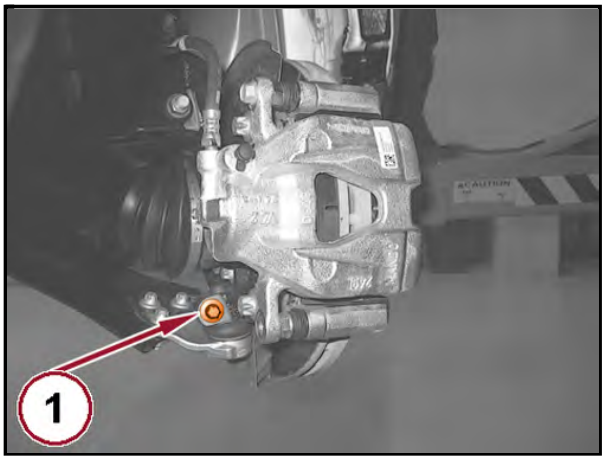
7. Unscrew and **DISCARD** the nut (1) securing the tie rod end to the steering knuckle.



8. Fit the tool 1871000700 (EMEA) or Press, Ball Joint C-4150A (NAFTA) (1a) and disconnect the tie rod (1b) from the wheel upright.



9. Remove the ball joint pinch bolt (1).

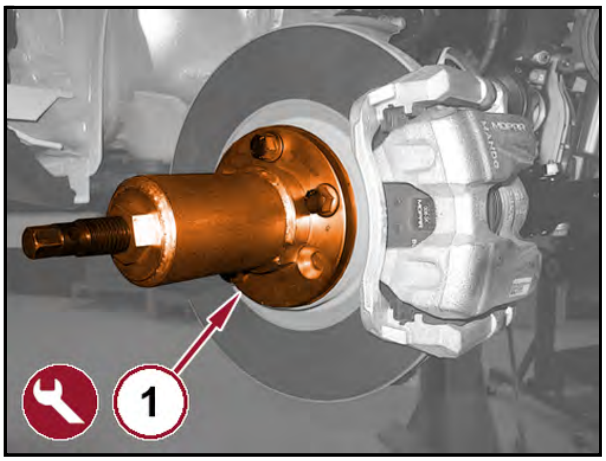


10. Disengage the ball joint from the steering knuckle.

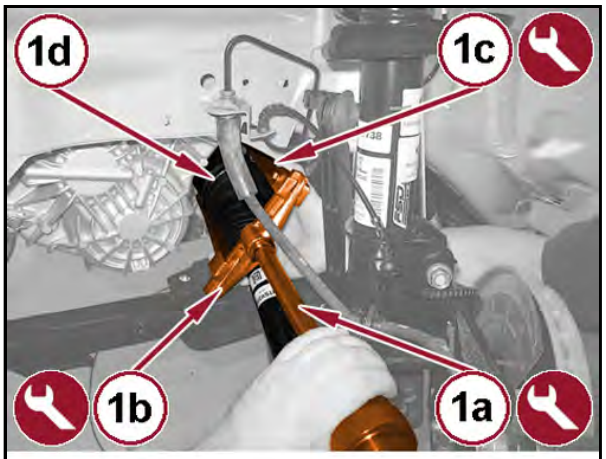
11. If equipped with a 1.4L Turbo, disengage the halfshaft from the wheel hub.

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12. If equipped with a 2.0 Turbo Diesel or 2.4L MultiAir, use tool 2000001600 (1) to disengage the halfshaft from the wheel hub.



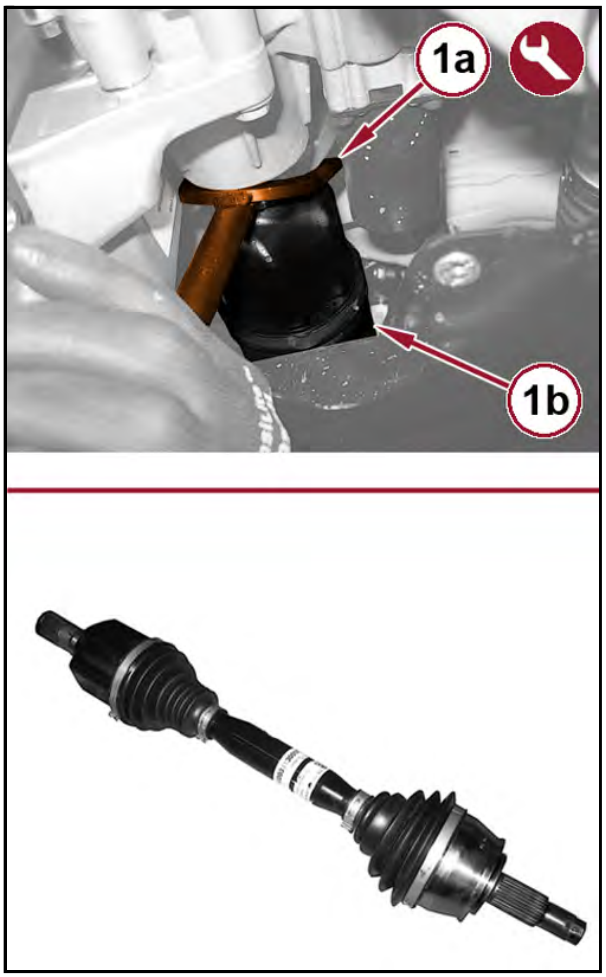
13. If equipped with a 1.4L MultiAir, use tools 1847017001 (1a), 1840005004 (1b) and 99341011 (1c) to remove the halfshaft (1d).





14. If equipped with a 2.0 Turbo Diesel or 2.4L MultiAir, use tool 2000040488 (1a) to disengage the halfshaft (1b) from the Power Transfer Unit (PTU).

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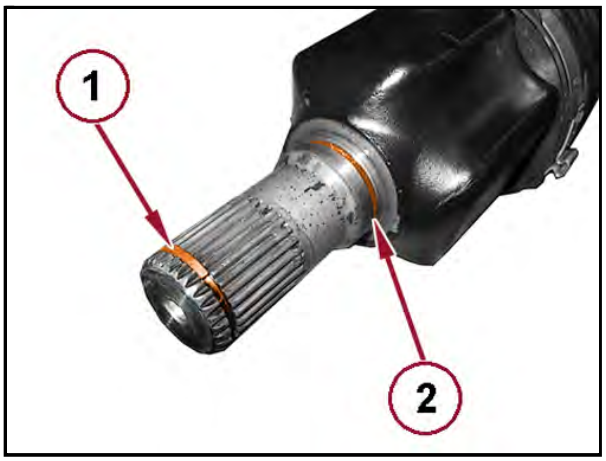
INSTALLATION

NOTE: **Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.**

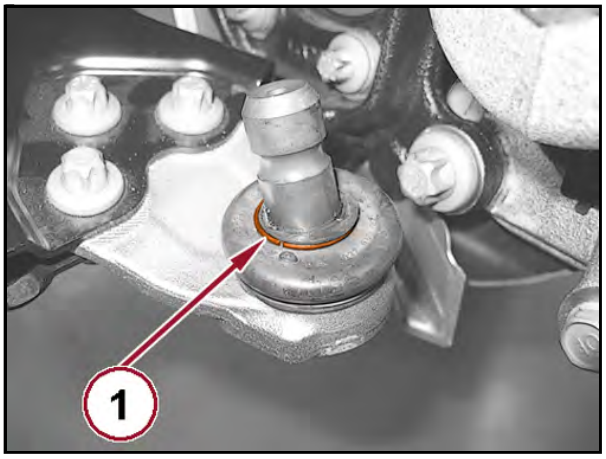
1. Install a **NEW** snap ring (1) on the halfshaft.

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PET_AAM_1013-0169

2. Install a **NEW** O-ring (2) on the halfshaft.

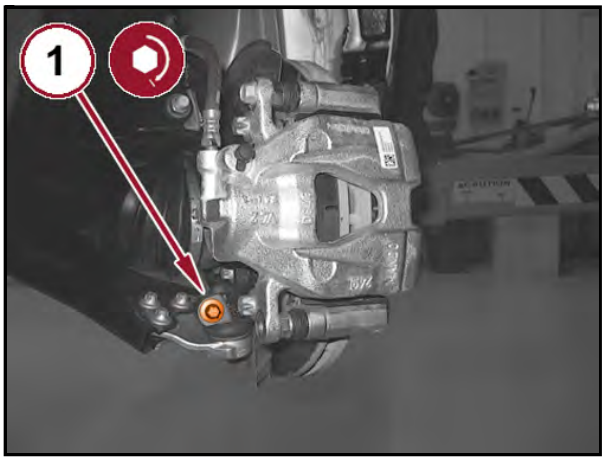


3. Inspect the ball joint boot and the boot tension ring (1) for damage.



4. Position the halfshaft into the Power Transfer Unit (PTU) and wheel hub.

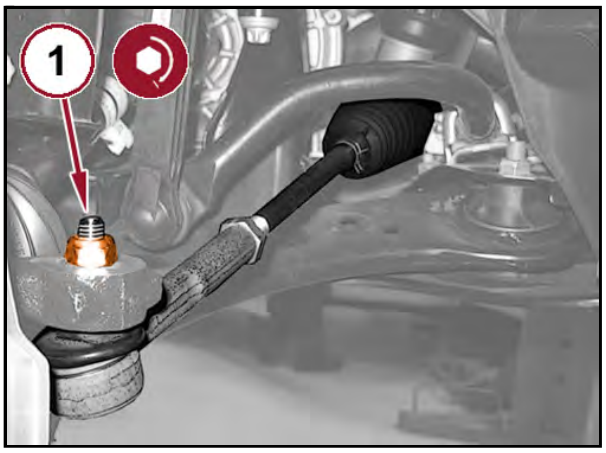
5. Position the ball joint stud into the steering knuckle tighten the pinch bolt (1) to the proper (Torque Specifications) .



6. Connect the tie rod end to the steering knuckle and tighten the **NEW** nut (1) to the proper (Torque Specifications) .

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PET_AAM_1013-0170

NOTE: **Always install a NEW hub nut. The original hub nut is one time use only and must be discarded when removed.**

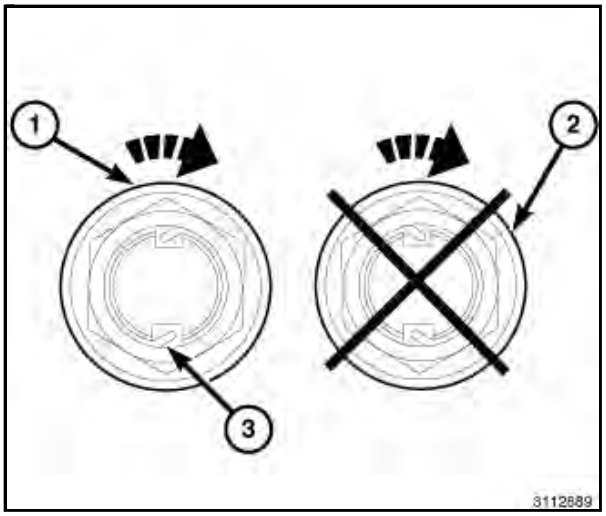


7. Fit the tool 1870815000 and install a **NEW** hub nut, tighten the nut using the following procedure:
   - tighten the nut to 70 N·m (52 Ft Lbs)
   - tighten the nut an additional 63°

NOTE: **Do not use air tools on staking tool while staking hub nut.**

NOTE: **The hub nut must be staked so that it looks similar to Figure 1. Both edges must be split and bent into the shape shown (3). The staking must be opposite of the direction to tighten the nut.**

8. Stake the hub nut as shown.



9. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
10. Install the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
11. Check and correct the PTU fluid level (Refer to 21 - Transmission and Transfer Case/Power Transfer Unit/Standard Procedure) .

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PET_AAM_1013-0171

03 - Differential and Driveline / Half Shaft, Front / Removal and Installation

1.4L TURBO MULTIAIR WITH INTERMEDIATE SHAFT

⊞ **Special Tools:** Click to display a list of tools used in this procedure

REMOVAL

NOTE: Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.

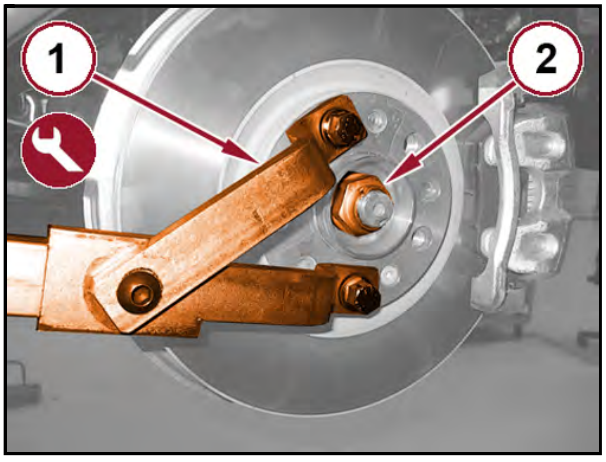
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Using a suitable punch, lift the two staked areas in the hub nut (1) to avoid damaging the halfshaft.



5. Fit the tool 1870815000 (1) to the brake disc.

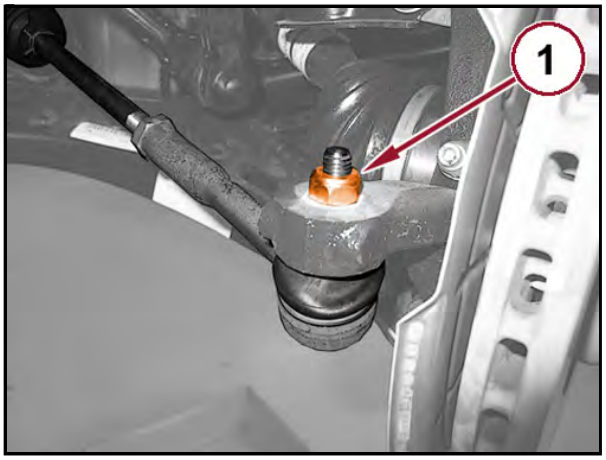
   NOTE: The used hub nut is not reusable.

6. Remove the hub nut (2) from the halfshaft and **DISCARD**.

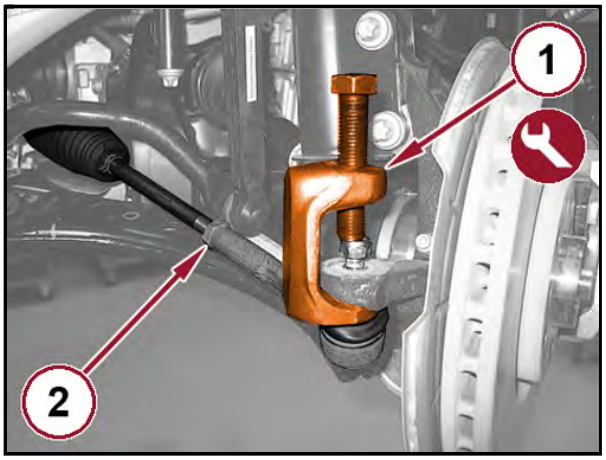


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PET_AAM_1013-0172

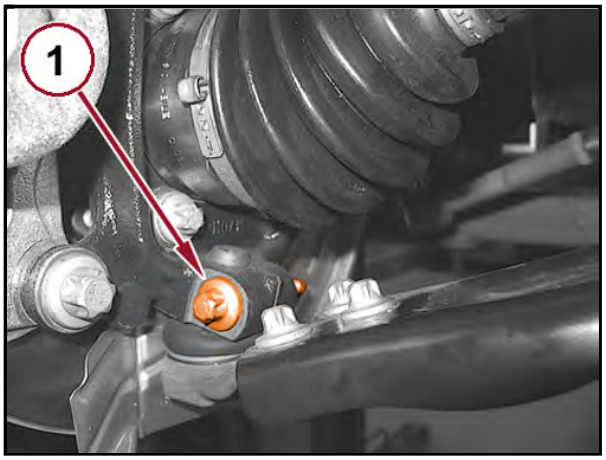
7. Unscrew and **DISCARD** the nut (1) securing the tie rod end to the steering knuckle.



8. Fit the tool 1871000700 (EMEA) or Press, Ball Joint C-4150A (NAFTA) (1a) and disconnect the tie rod (1b) from the steering knuckle.



9. Remove the ball joint pinch bolt (1).



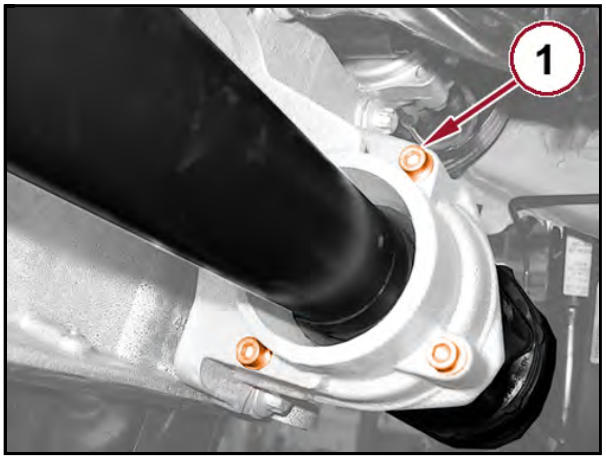
NOTE: **Use care when separating the ball joint stud from the knuckle so the ball joint boot does not get cut.**

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PET_AAM_1013-0173

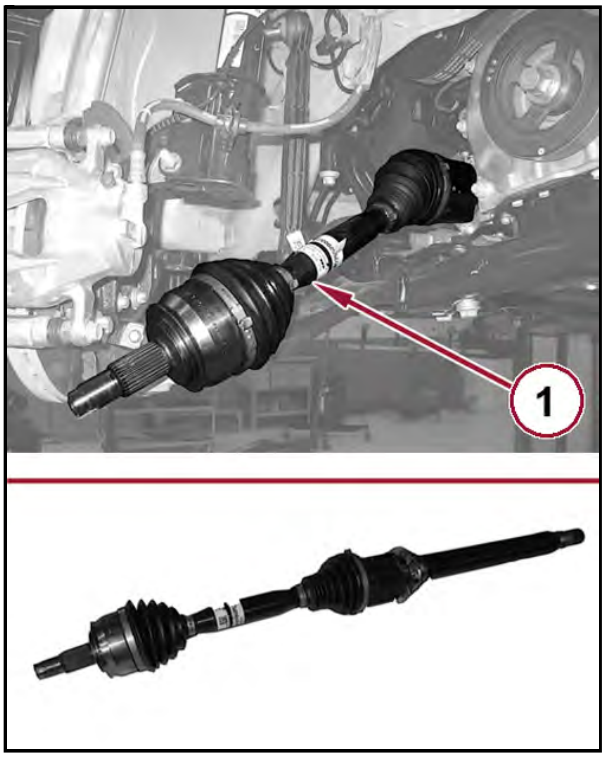
10. Disengage the ball joint from the steering knuckle.

11. Disengage the halfshaft from the wheel hub.

12. Remove bolts (1) mounting the intermediate shaft bearing to the bearing support.



13. Remove the halfshaft (1) with the intermediate shaft from the vehicle.



INSTALLATION

NOTE:

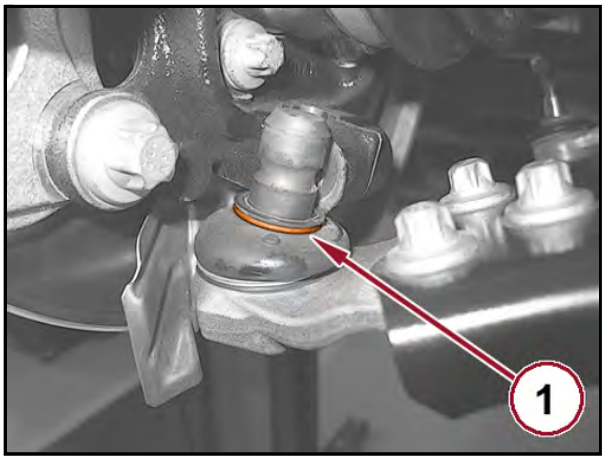
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0174

Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.

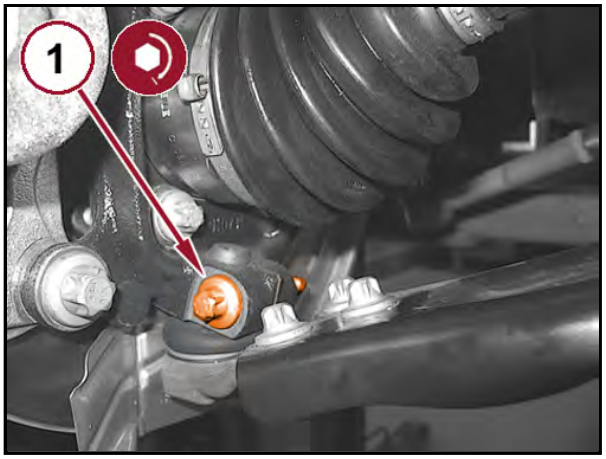
1. Position the halfshaft and intermediate shaft assembly into the differential and wheel hub.

2. Install the intermediate shaft bearing to bearing support bolts and tighten to the proper (Torque Specifications) .

3. Inspect the ball joint boot and the boot tension ring (1) for damage.



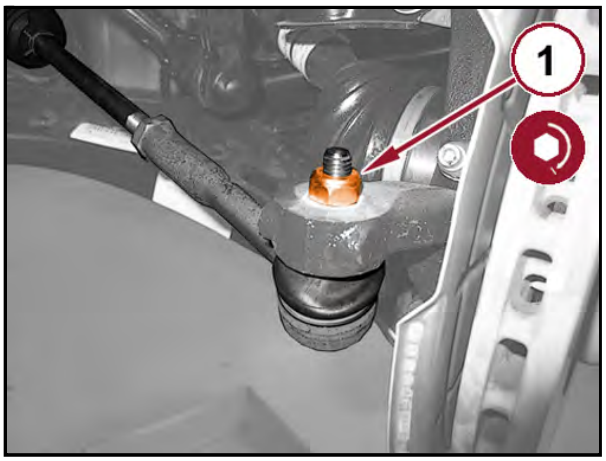
4. Position the ball joint stud into the steering knuckle tighten the pinch bolt (1) to the proper (Torque Specifications) .



5. Connect the tie rod end to the steering knuckle and tighten the **NEW** nut (1) to the proper (Torque Specifications) .

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PET_AAM_1013-0175

NOTE: **Always install a NEW hub nut. The original hub nut is one time use only and must be discarded when removed.**

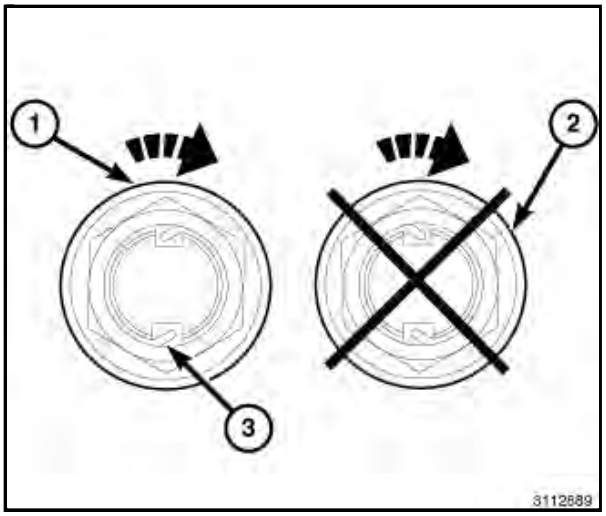


6. Fit the tool 1870815000 and install a **NEW** hub nut, tighten the nut using the following procedure:
    - tighten the nut to 70 N·m (52 Ft Lbs)
    - tighten the nut an additional 63°

NOTE: **Do not use air tools while staking hub nut.**

NOTE: **The hub nut must be staked so that it looks similar to Figure 1. Both edges must be split and bent into the shape shown (3). The staking must be opposite of the direction to tighten the nut.**

7. Stake the hub nut as shown.



8. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
9. Install the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
10. Check and correct the transmission fluid level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

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PET_AAM_1013-0176

03 - Differential and Driveline / Half Shaft, Front / Removal and Installation

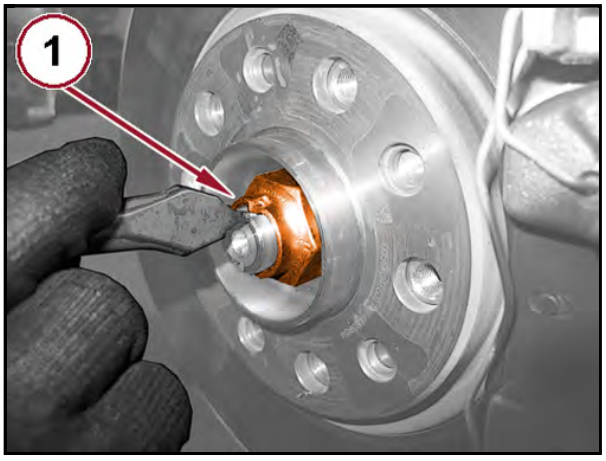
1.6L TURBO DIESEL WITH INTERMEDIATE SHAFT

⊞ **Special Tools:** Click to display a list of tools used in this procedure

REMOVAL

NOTE: Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.

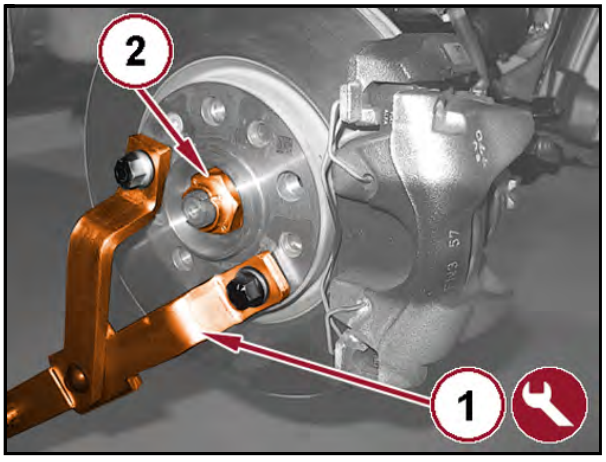
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Using a suitable punch, lift the two staked areas in the hub nut (1) to avoid damaging the halfshaft.



5. Fit the tool 1870815000 (1) to the brake disc.

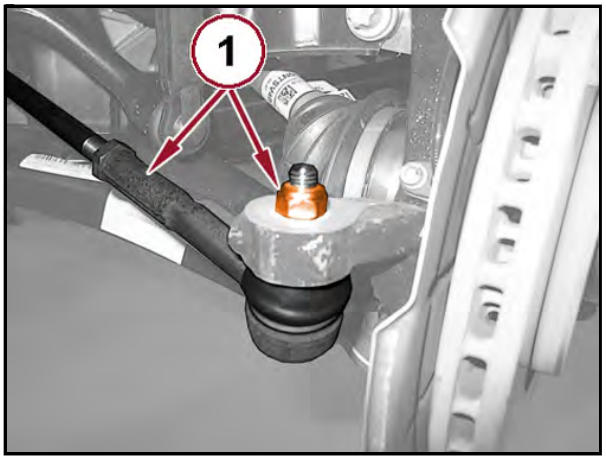
   NOTE: The used hub nut is not reusable.

6. Remove the hub nut (2) from the halfshaft and **DISCARD**.

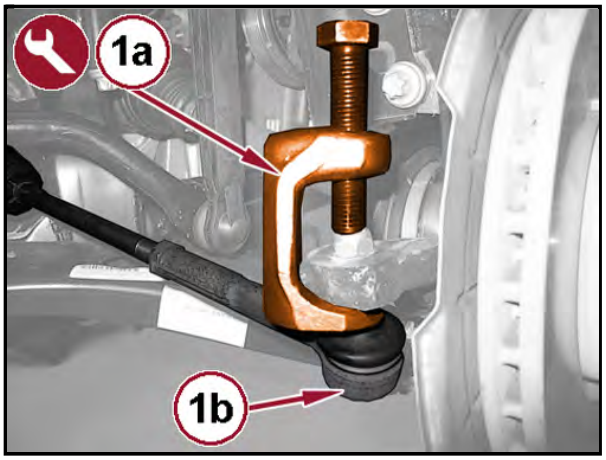


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PET_AAM_1013-0177

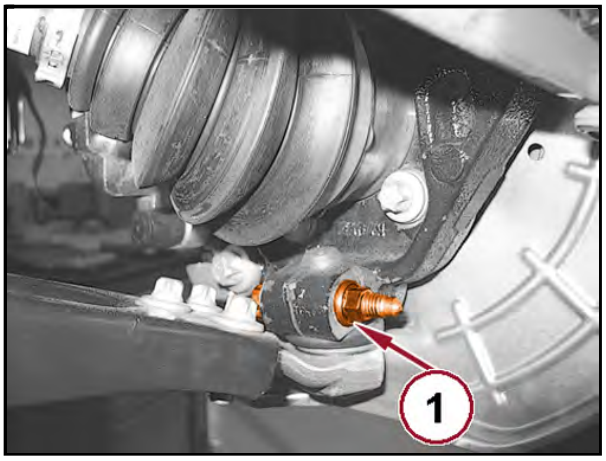
7. Unscrew and **DISCARD** the nut (1) securing the tie rod end to the steering knuckle.



8. Fit the tool 1871000700 (EMEA) or Press, Ball Joint C-4150A (NAFTA) (1a) and disconnect the tie rod (1b) from the steering knuckle.



9. Remove the ball joint pinch bolt (1).

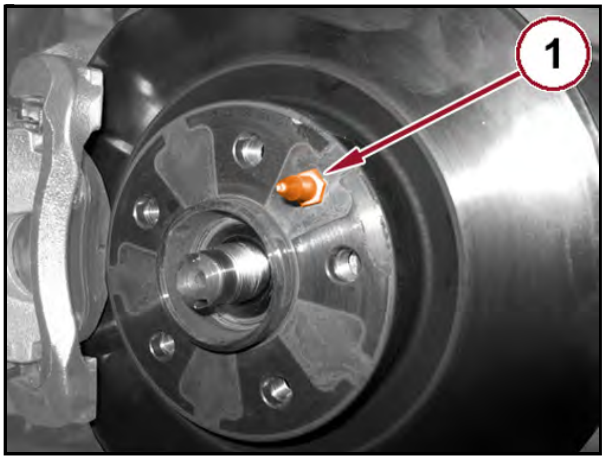


NOTE: **Use care when separating the ball joint stud from the knuckle so the ball joint boot does not get cut.**

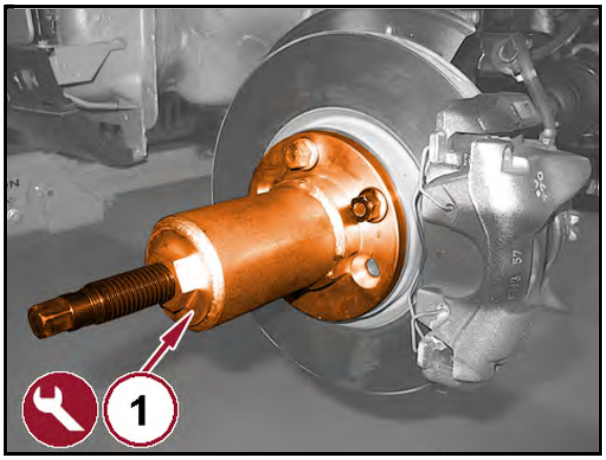
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PET_AAM_1013-0178

10. Disengage the ball joint from the steering knuckle.

11. Remove the disc brake rotor retaining pin (1).

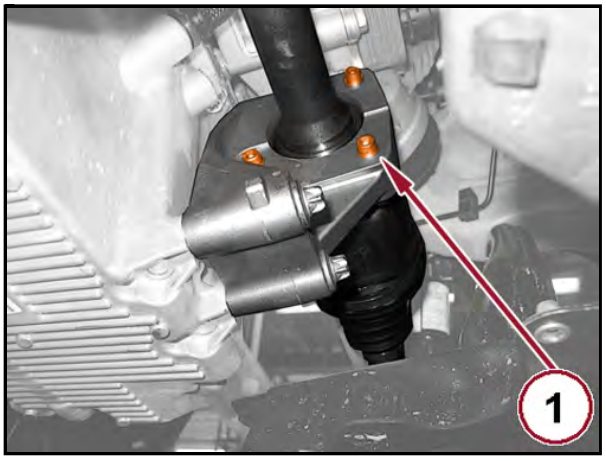


12. Disengage the halfshaft from the wheel hub using tool 2000001600 (1), position the knuckle and rotor assembly aside.



13. Remove the tool, install the disc brake rotor retaining pin and tighten to the proper (Torque Specifications) .

14. Remove bolts (1) mounting the intermediate shaft bearing to the bearing support.



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PET_AAM_1013-0179

15. Remove the halfshaft with the intermediate shaft (1) from the vehicle.



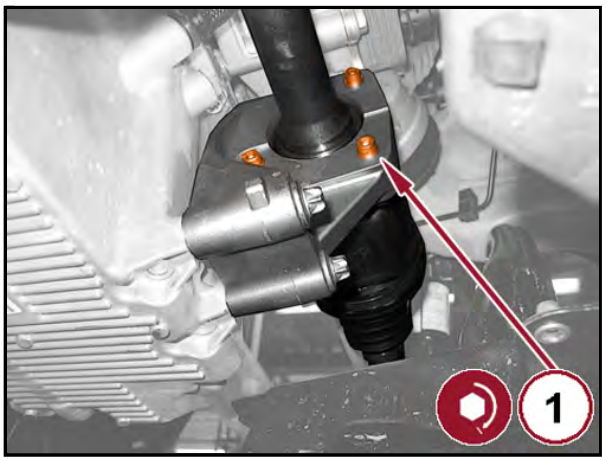
INSTALLATION

NOTE: **Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.**

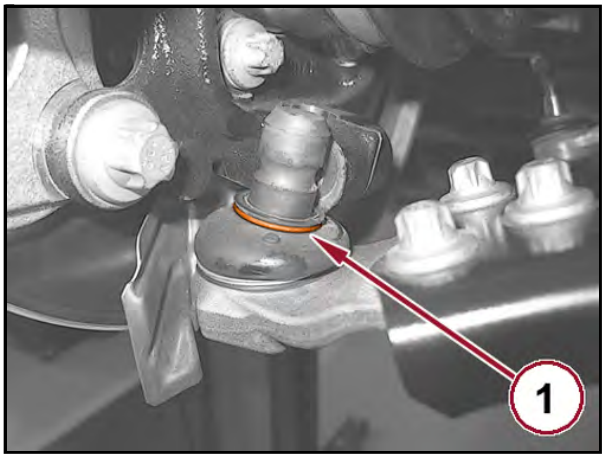
1. Position the halfshaft and intermediate shaft assembly into the differential and wheel hub.

2. Install the intermediate shaft bearing to bearing support bolts (1) and tighten to the proper (Torque Specifications) .

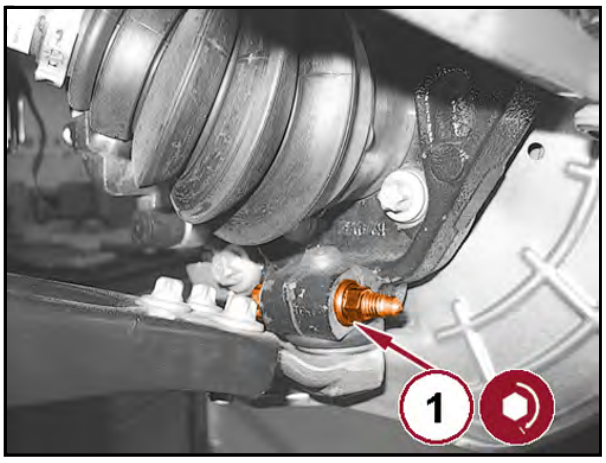
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0180



3. Inspect the ball joint boot and the boot tension ring (1) for damage.

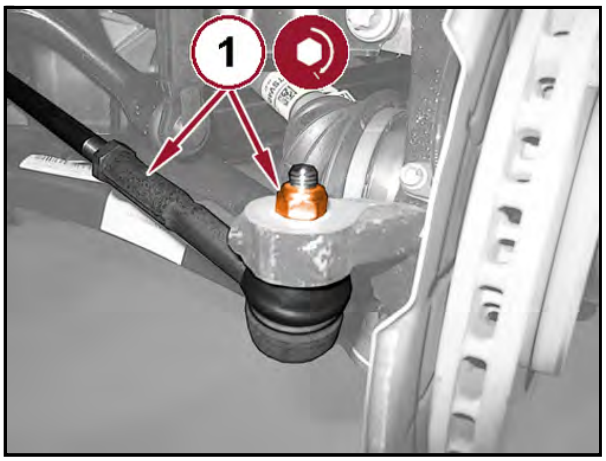


4. Position the ball joint stud into the steering knuckle tighten the **NEW** pinch bolt (1) to the proper (Torque Specifications) .



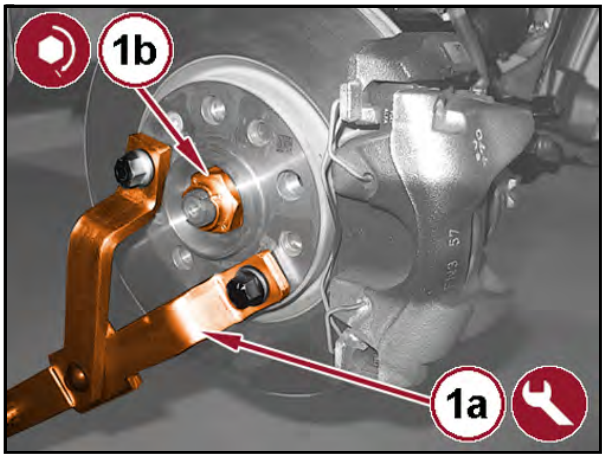
5. Connect the tie rod end to the steering knuckle and tighten the **NEW** nut (1) to the proper (Torque Specifications) .

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PET_AAM_1013-0181



NOTE: **Always install a NEW hub nut. The original hub nut is one time use only and must be discarded when removed.**

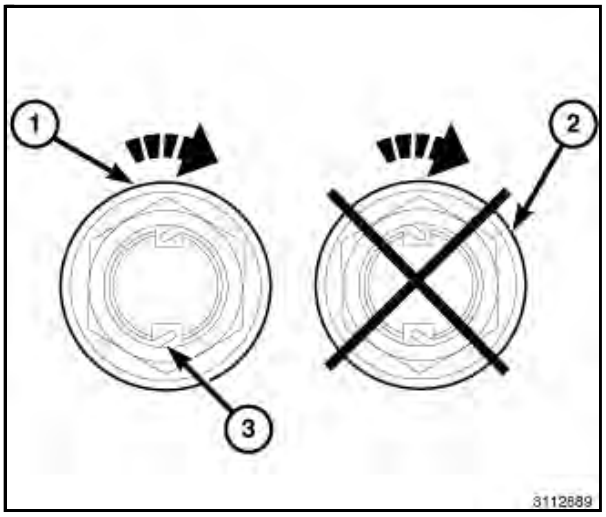
6. Fit the tool 1870815000 (1a) and install a **NEW** hub nut (1b), tighten the nut using the following procedure:
   - tighten the nut to 70 N·m (52 Ft Lbs)
   - tighten the nut an additional 63°



NOTE: **Do not use air tools while staking hub nut.**

NOTE: **The hub nut must be staked so that it looks similar to Figure 1. Both edges must be split and bent into the shape shown (3). The staking must be opposite of the direction to tighten the nut.**

7. Stake the hub nut as shown.



8. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

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9. Install the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

10. Check and correct the transmission fluid level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

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PET_AAM_1013-0183

03 - Differential and Driveline / Half Shaft, Front / Removal and Installation

2.4L MULTIAIR WITH INTERMEDIATE SHAFT

⊞ **Special Tools:** Click to display a list of tools used in this procedure

REMOVAL

NOTE: Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.

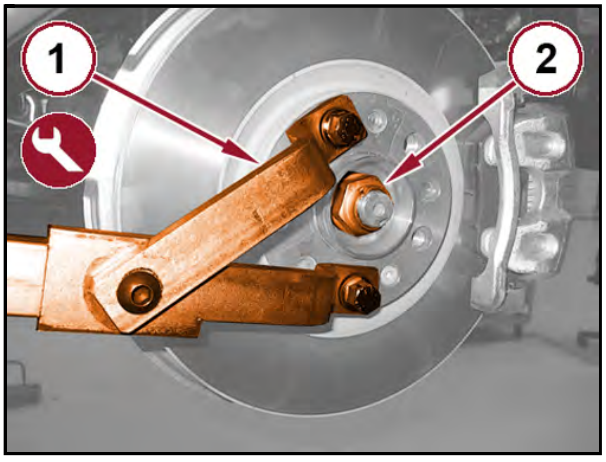
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Using a suitable punch, lift the two staked areas in the hub nut (1) to avoid damaging the halfshaft.



5. Fit the tool 1870815000 (1) to the brake disc.

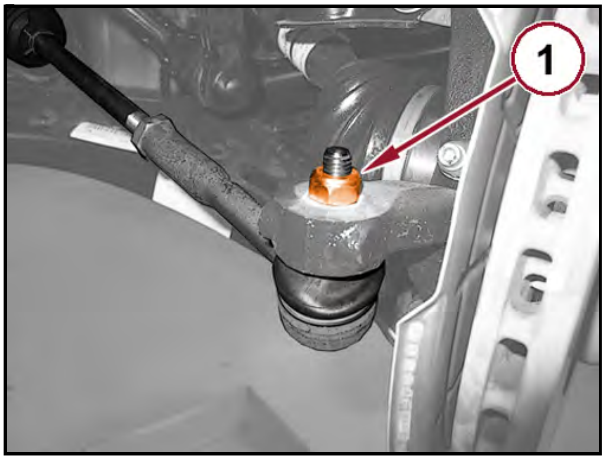
   NOTE: The used hub nut is not reusable.

6. Remove the hub nut (2) from the halfshaft and **DISCARD**.

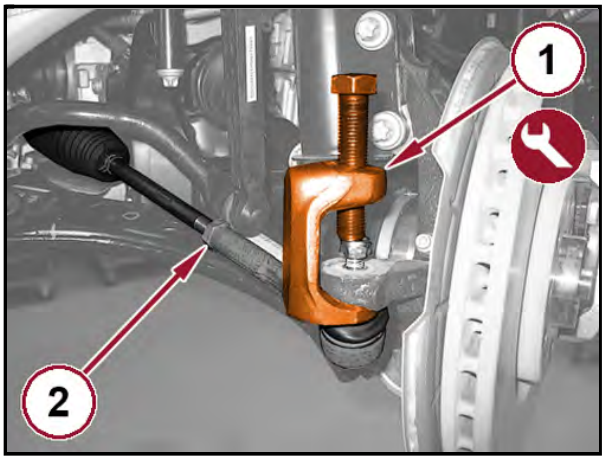


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PET_AAM_1013-0184

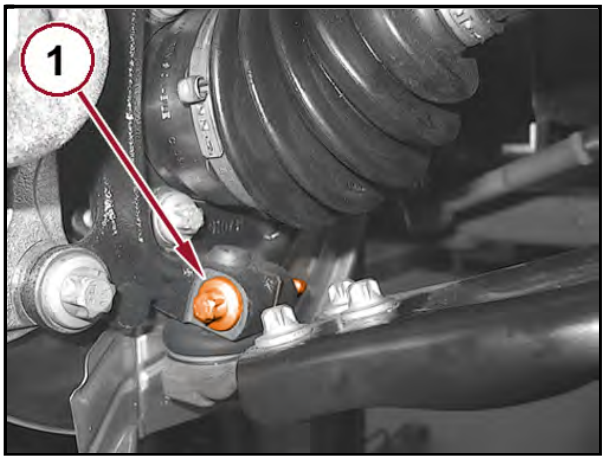
7. Unscrew and **DISCARD** the nut (1) securing the tie rod end to the steering knuckle.



8. Fit the tool 1871000700 (EMEA) or Press, Ball Joint C-4150A (NAFTA) (1) and disconnect the tie rod (2) from the steering knuckle.



9. Remove the ball joint pinch bolt (1).



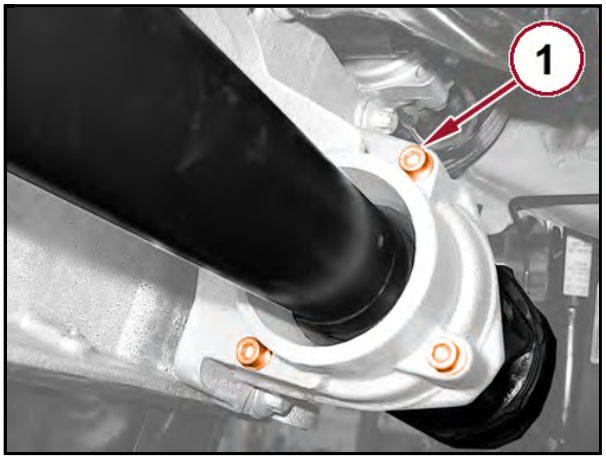
NOTE: **Use care when separating the ball joint stud from the knuckle so the ball joint boot does not get cut.**

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PET_AAM_1013-0185

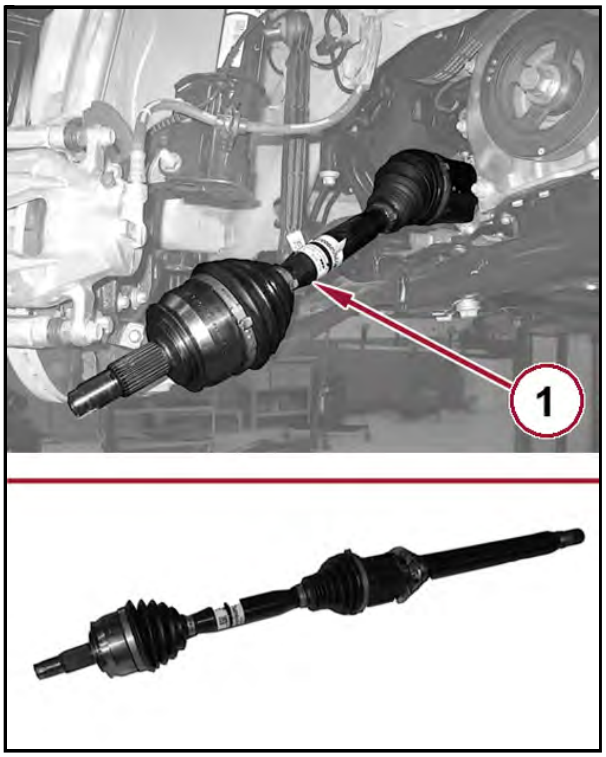
10. Disengage the ball joint from the steering knuckle.

11. Disengage the halfshaft from the wheel hub.

12. Remove bolts (1) mounting the intermediate shaft bearing to the bearing support.



13. Remove the halfshaft with the intermediate shaft from the vehicle.



INSTALLATION

NOTE:

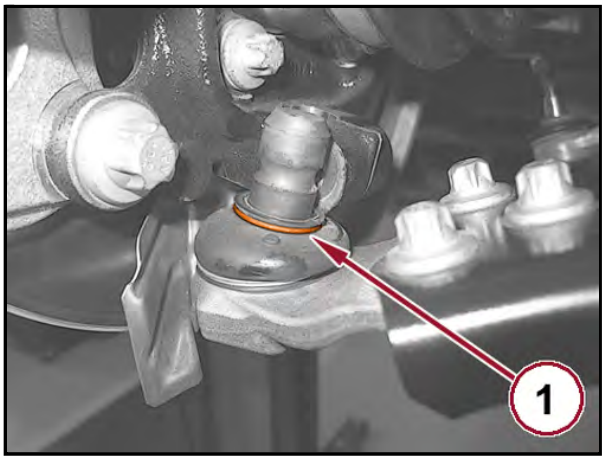
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PET_AAM_1013-0186

Never handle the halfshaft assembly by the inner or outer boots. This can cause damage to the boot, which will allow contaminants to enter the Constant Velocity (CV) joint.

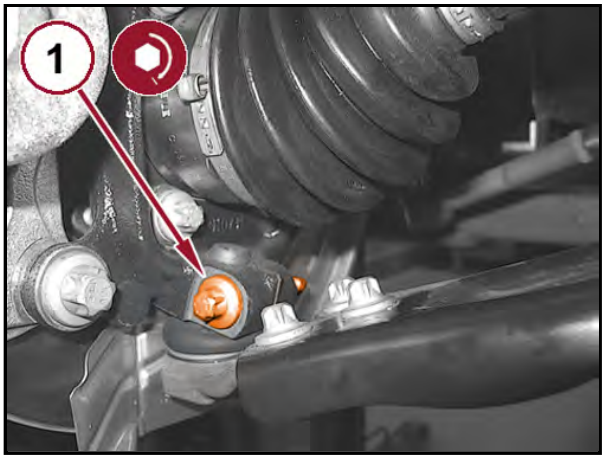
1. Position the halfshaft and intermediate shaft assembly into the differential and wheel hub.

2. Install the intermediate shaft bearing to bearing support bolts and tighten to the proper (Torque Specifications) .

3. Inspect the ball joint boot and the boot tension ring (1) for damage.



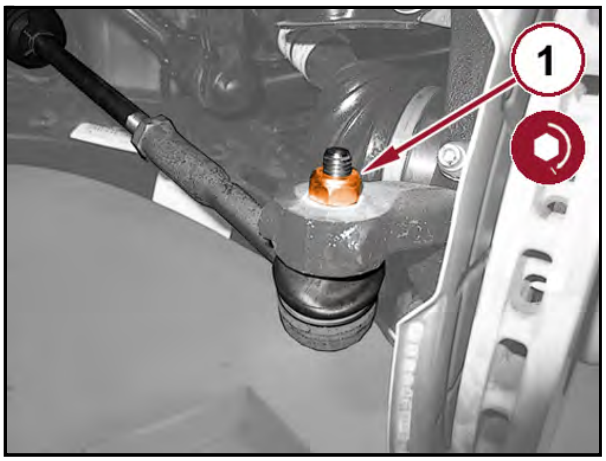
4. Position the ball joint stud into the steering knuckle tighten the pinch bolt (1) to the proper (Torque Specifications) .



5. Connect the tie rod end to the steering knuckle and tighten the **NEW** nut (1) to the proper (Torque Specifications) .

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PET_AAM_1013-0187

NOTE: **Always install a NEW hub nut. The original hub nut is one time use only and must be discarded when removed.**

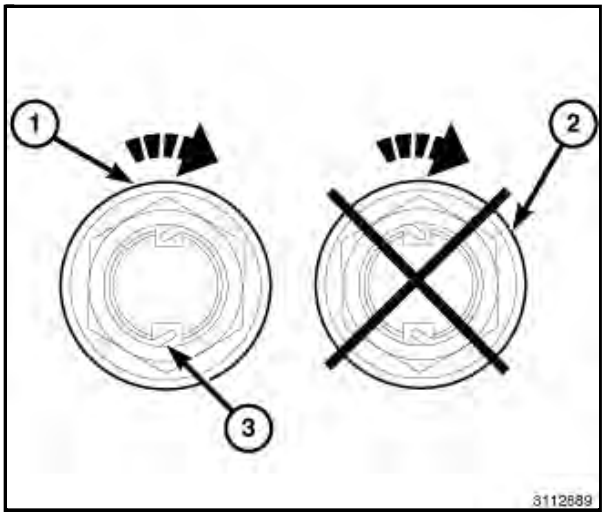


6. Fit the tool 1870815000 and install a **NEW** hub nut, tighten the nut using the following procedure:
    - tighten the nut to 70 N·m (52 Ft Lbs)
    - tighten the nut an additional 60°

NOTE: **Do not use air tools while staking hub nut.**

NOTE: **The hub nut must be staked so that it looks similar to Figure 1. Both edges must be split and bent into the shape shown (3). The staking must be opposite of the direction to tighten the nut.**

7. Stake the hub nut as shown.



8. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
9. Install the tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
10. Check and correct the transmission fluid level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

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PET_AAM_1013-0188

03 - Differential and Driveline / Half Shaft, Rear / Removal and Installation

REMOVAL AND INSTALLATION

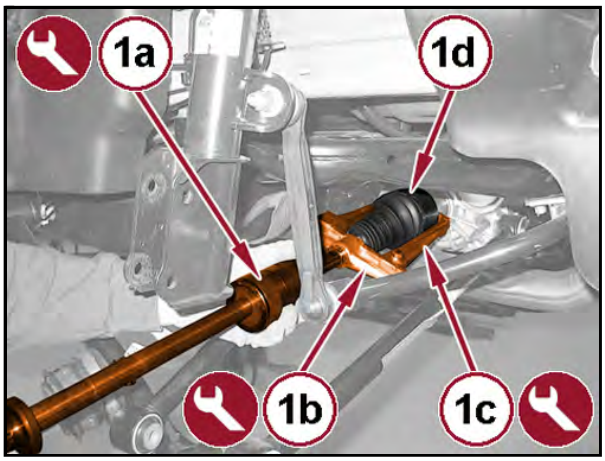
REMOVAL

CAUTION: **Never grasp half shaft assembly by the boots. This may cause the boot to pucker or crease and reduce the service life of the boot.**

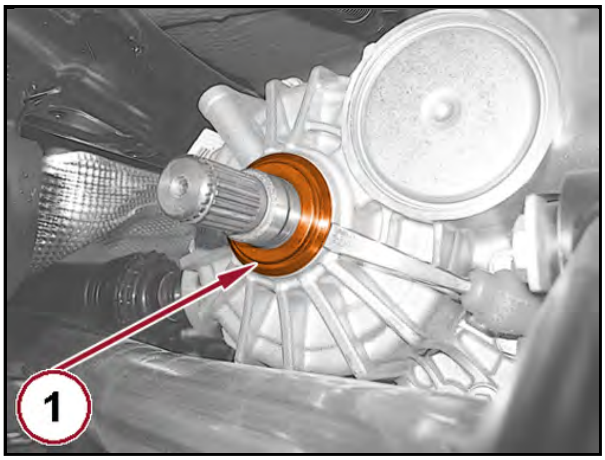
Avoid over angulating or stroking the C/V joints when handling the half shaft.

Half shafts exposed to battery acid, transmission fluid, brake fluid, differential fluid or gasoline may cause the boots to deteriorate. Failure to follow these instructions will result in damage.

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the rear wheel hub and bearing assembly (Refer to 17 - Rear Suspension/HUB AND BEARING/Removal and Installation) .
3. Using the tools 1847017001 (1a), 1840005004 (1b) and 99341011 (1c), remove the halfshaft from the Rear Drive Unit (RDU).

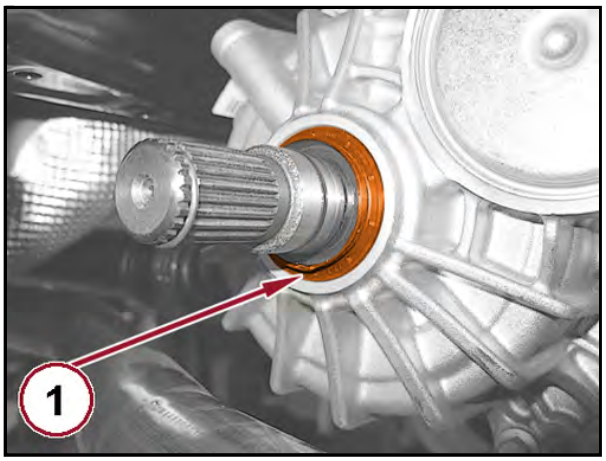


4. If necessary, remove the dust cover (1).



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5. Remove the oil seal (1).



INSTALLATION

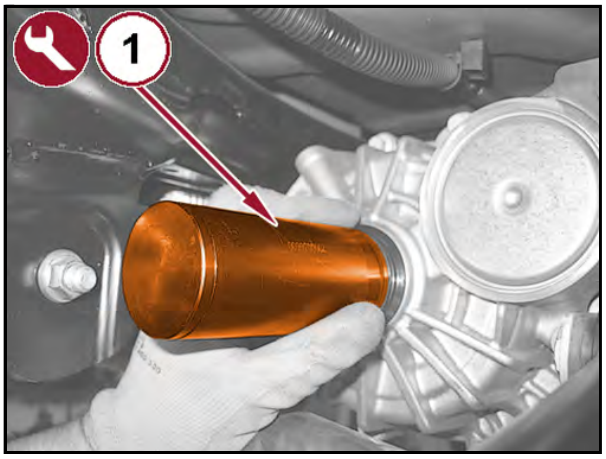
CAUTION: **Never grasp half shaft assembly by the boots. This may cause the boot to pucker or crease and reduce the service life of the boot.**

Avoid over angulating or stroking the C/V joints when handling the half shaft.

Half shafts exposed to battery acid, transmission fluid, brake fluid, differential fluid or gasoline may cause the boots to deteriorate. Failure to follow these instructions will result in damage.

NOTE: **Use care when installing half shaft to axle assembly. The half shaft installation angle should be minimized to avoid damage to the seal upon installation.**

1. If removed, use the tool 2000036600 (1) install a new oil seal.



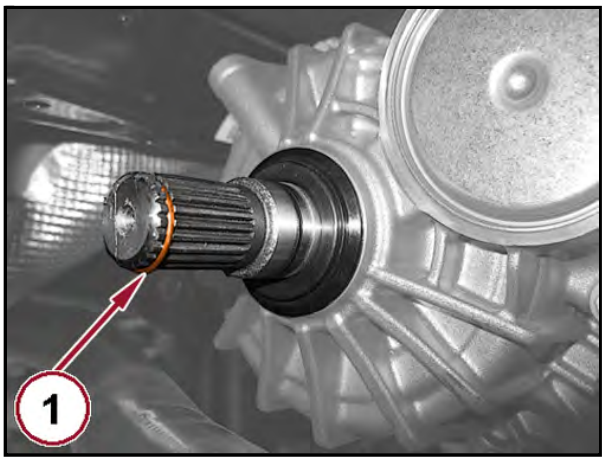
2. Install a **NEW** snap ring on the stub shaft.

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3. Install the halfshaft until the circlip engages in the RDU.

4. Install the rear hub and bearing assembly (Refer to 17 - Rear Suspension/HUB AND BEARING/Removal and Installation) .

5. Check wheel alignment (Refer to 02 - Front Suspension/Wheel Alignment/Standard Procedure) .



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03 - Differential and Driveline / Propeller Shaft / Specifications

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Center Bearing Support Bolts	50	37	—	Do not reuse these fasteners. If removed, a **NEW** fastener must be installed and tightened to specifications.

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03 - Differential and Driveline / Propeller Shaft / Special Tools

SPECIAL TOOLS

Tool (EMEA)	Tool (NAFTA)	Name	FunctionUsage
2000043000	*	Axle Support Fixture	Support Axle
2000043400	*	Adjustable Bracket	Support Axle
2019500030	*	Elastic Ring Spreader	Removing Rear Drive Shaft
*Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

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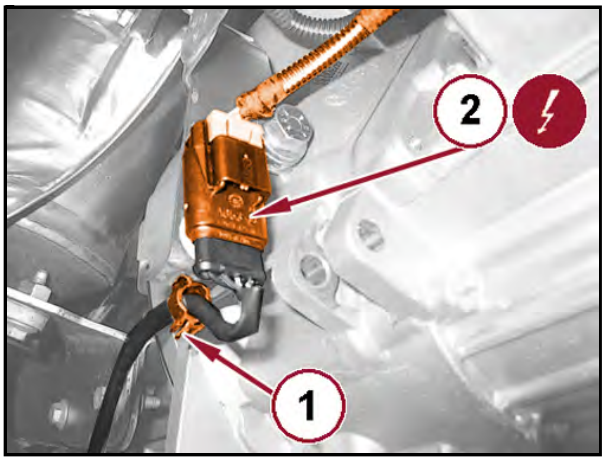
03 - Differential and Driveline / Propeller Shaft / Removal and Installation

1.4 TURBO MULTIAIR

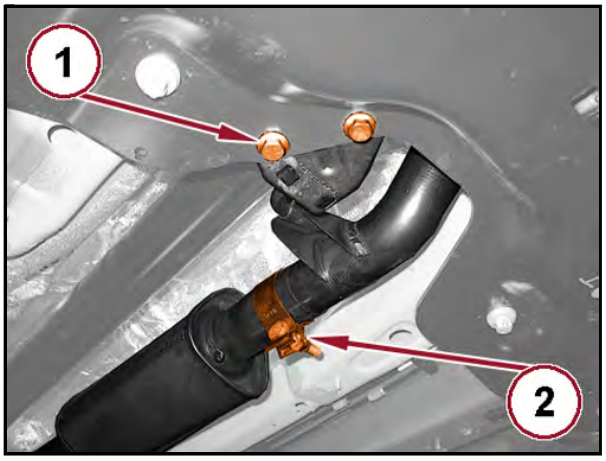
REMOVAL

CAUTION: Propeller shaft removal is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to power transfer unit (PTU) or rear driveline module flanges. A helper is required. If a propshaft section is hung unsupported, damage may occur to the joint, boot, and/or center bearing from over-angulation. This may result in driveline vibrations.

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Disconnect the downstream oxygen sensor wire harness connector (2) and disengage the wiring from the routing clip (1).



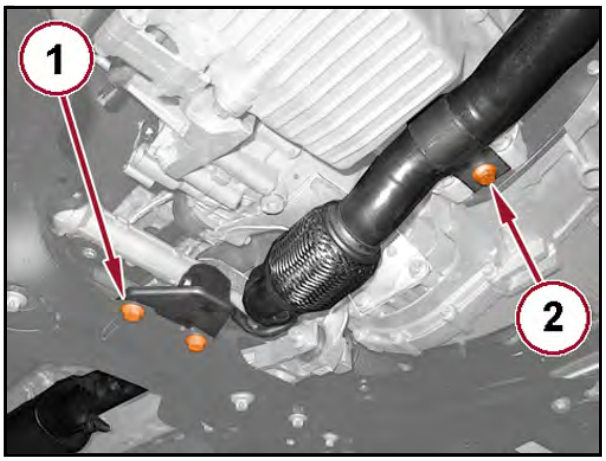
4. Remove the bolts (1) securing the rear exhaust hanger bracket supporting the crossunder pipe at the front crossmember.
5. Loosen the exhaust clamp nut (2) securing the muffler to the crossunder pipe.



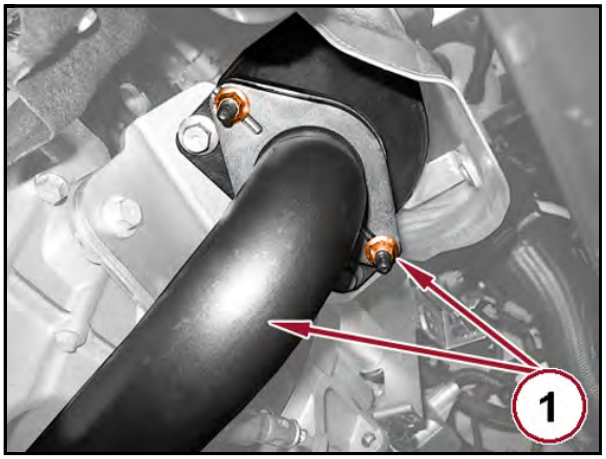
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6. Remove the crossunder pipe front hanger support bracket bolts (1).

7. Remove the crossunder pipe bracket bolt (2) from the engine oil pan.



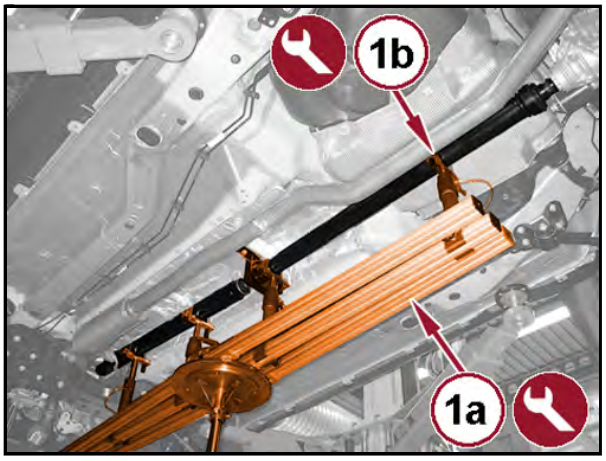
8. Remove the crossunder pipe to catalytic converter flange nuts (1).



9. Remove and discard the exhaust flange gasket.

NOTE: **Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.**

10. Position support tools 2000043000 (1b) and 2000043400 (1a) under the propeller shaft.

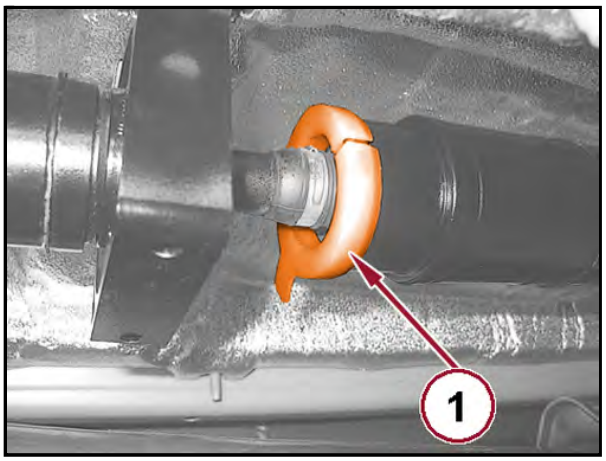


11. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as

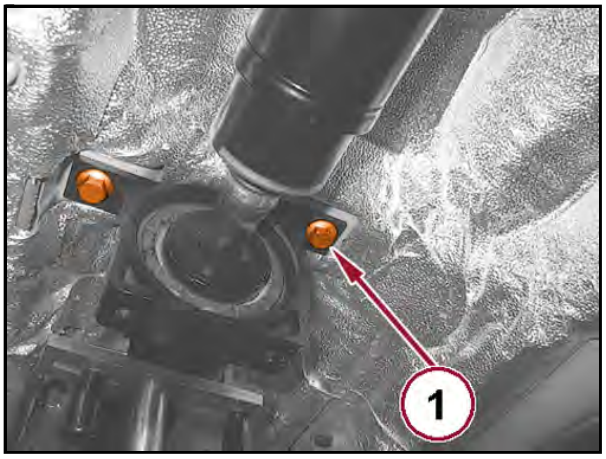
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shown.

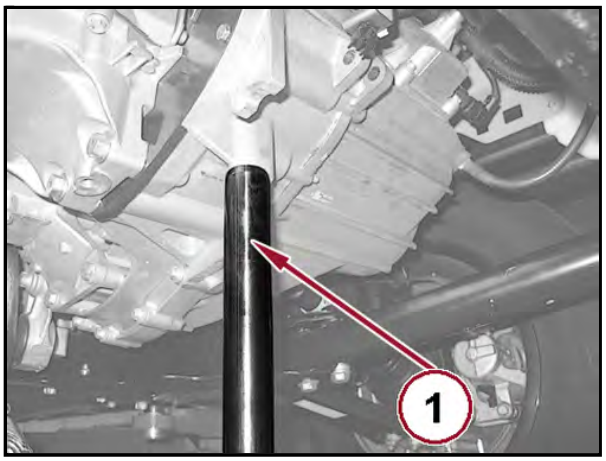
NOTE: **The protective sleeve is provided in the parts package with the dust cover and snap rings for the propeller shaft.**



12. Loosen the propeller shaft center support bolts (1).



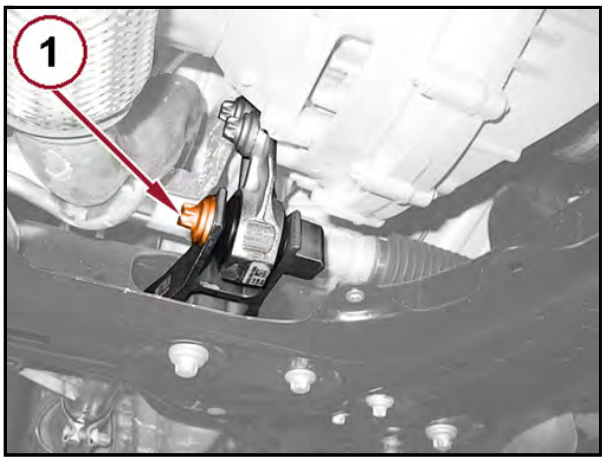
13. Place a suitable jack (1) under the transmission.



14. Remove the rear engine mount through bolt (1).

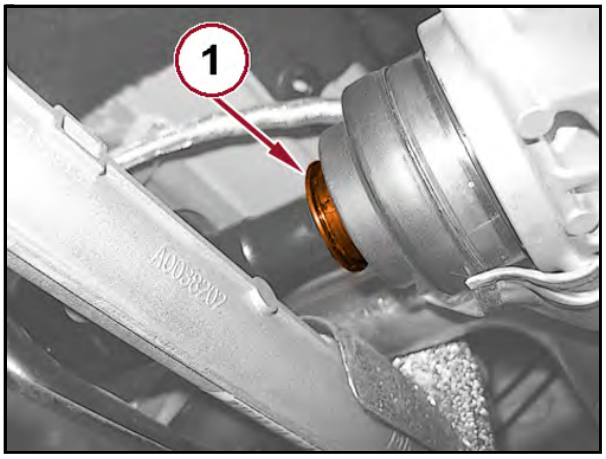
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15. Adjust the jack to carefully shift the powertrain forward.



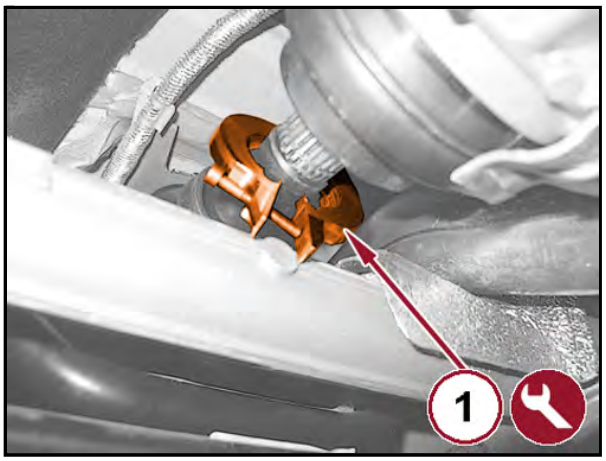
NOTE: **The dust cover must be replaced every time the propeller shaft is removed.**

16. Slide the dust cover (1) at the front of the propeller shaft away from the Power Transfer Unit (PTU) to access the snap ring.



NOTE: **The snap ring must be replaced every time the propeller shaft is removed.**

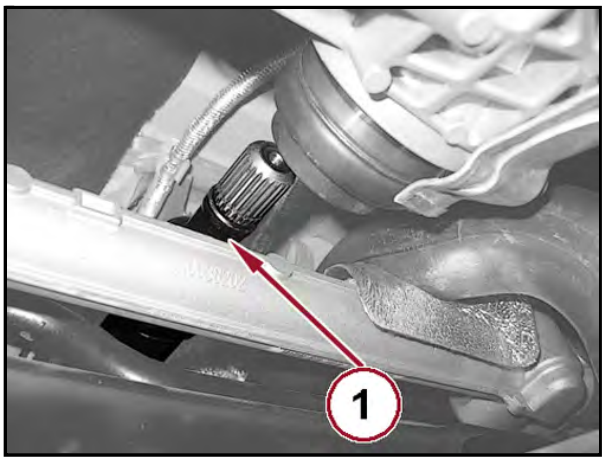
17. Use tool 2019500030 (1) to open propeller shaft snap ring at the PTU.



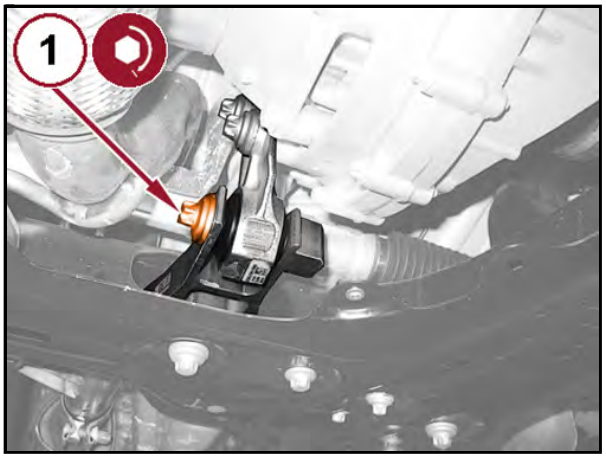
18. Disconnect the propeller shaft (1) from the PTU.

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19. Remove the tool 2019500030.



20. Install the rear engine mount through bolt and torque to the proper (Torque Specifications) .

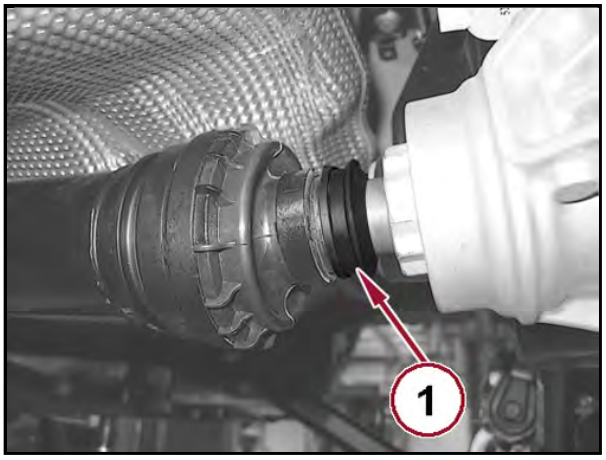


21. Remove the jack from under the transmission.

22. Remove the previously loosened propeller shaft center support bolts.

NOTE: **The dust cover must be replaced every time the propeller shaft is removed.**

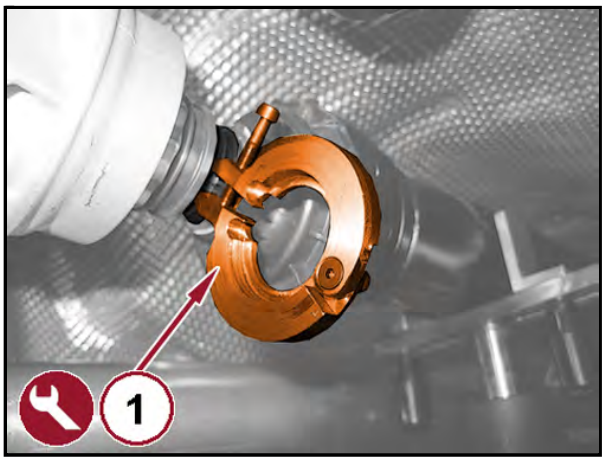
23. Slide the dust cover (1) at the rear of the propeller shaft towards the differential to access the snap ring.



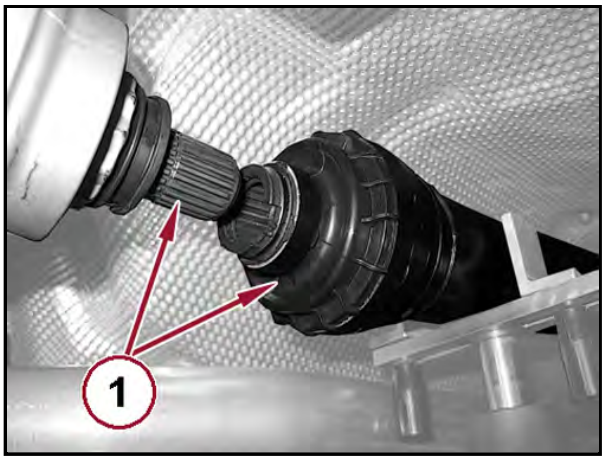
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NOTE: The snap ring must be replaced every time the propeller shaft is removed.

24. Use tool 2019500030 (1) to open propeller shaft snap ring at the Rear Driveline Unit (RDU).

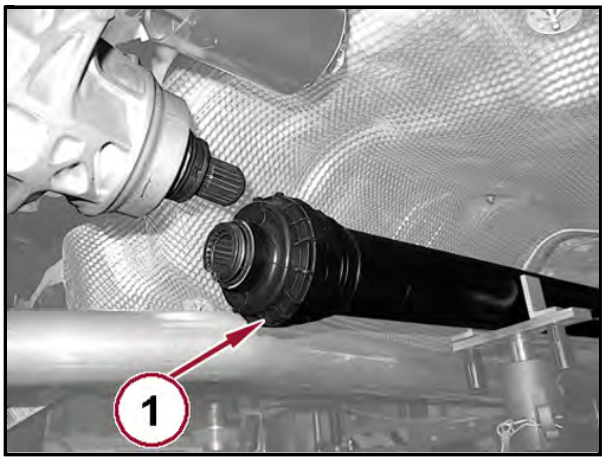


25. Disconnect the propeller shaft from the pinion of the RDU (1).



26. Remove the tool 2019500030.

27. Lower the propeller shaft until the rear joint of the shaft is under the RDU as shown.



NOTE: Pay close attention to avoid excessive articulation between the two halves of the propeller shaft during removal.

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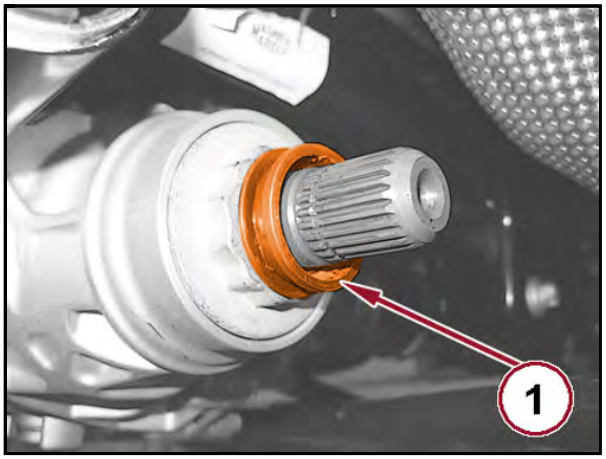
28. Turn the jack to remove the drive shaft, guiding it away from the front suspension crossmember.

INSTALLATION

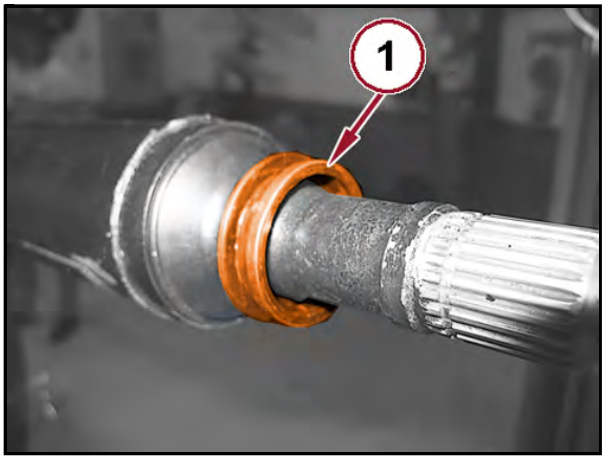
CAUTION: **Propeller shaft removal is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to power transfer unit (PTU) or rear driveline module flanges. A helper is required. If a propshaft section is hung unsupported, damage may occur to the joint, boot, and/or center bearing from over-angulation. This may result in driveline vibrations.**

NOTE: **Lightly apply grease to the splines prior to installation.**

1. Install a **NEW** dust seal (1) on the pinion shaft of the Rear Driveline Unit (RDU).

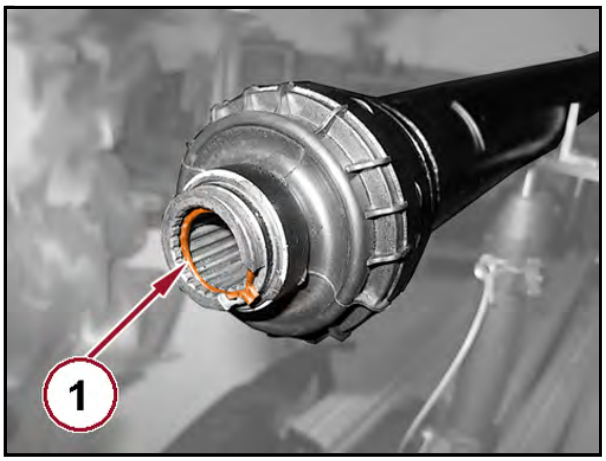


2. Install a **NEW** dust seal (1) on the front shaft of the propeller shaft.

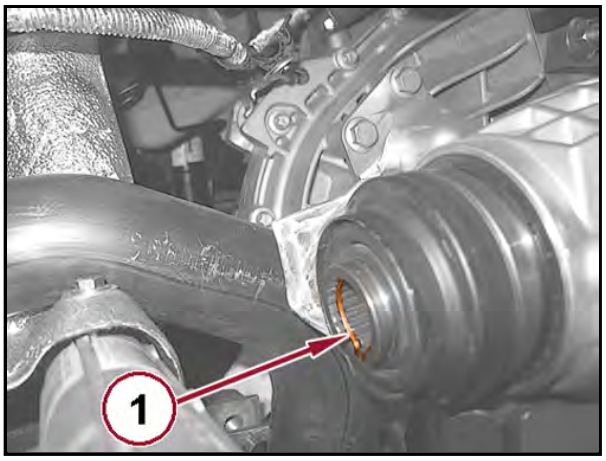


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3. Install a **NEW** snap ring (1) in the drive shaft.



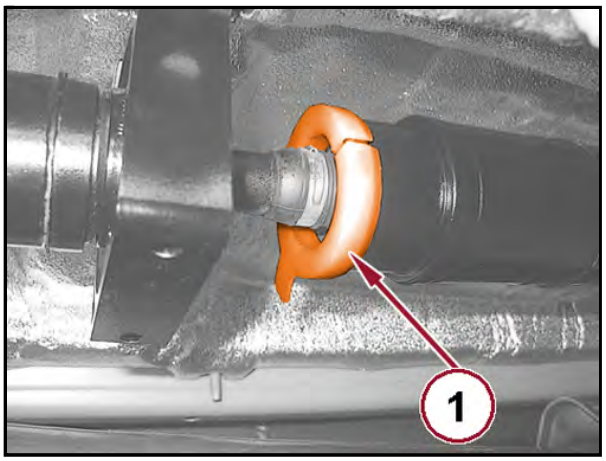
4. Install a **NEW** snap ring (1) in the Power Transfer Unit (PTU).



NOTE: **Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.**

5. Position the propeller shaft on the support tools 2000043000 and 2000043400.

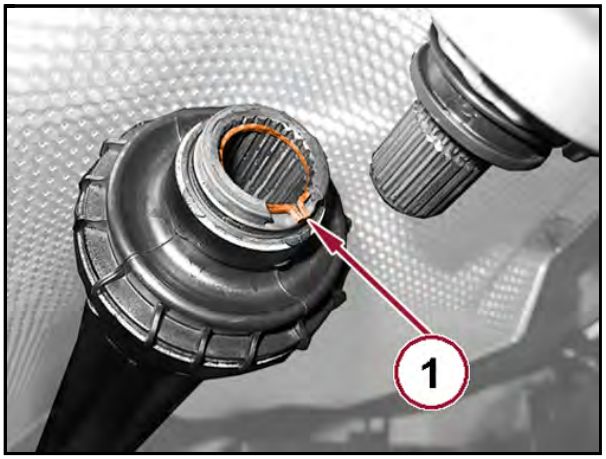
6. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown.



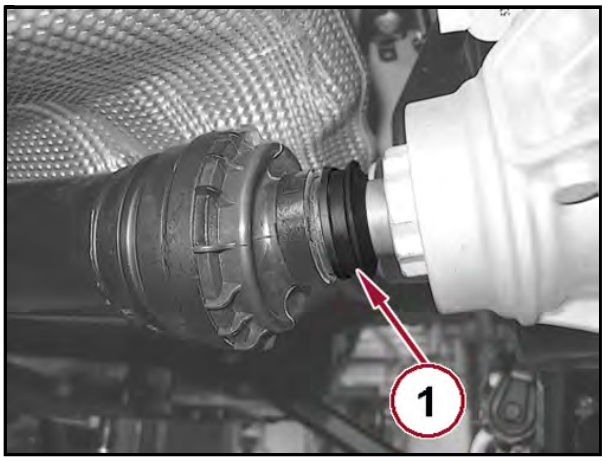
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PET_AAM_1013-0201

7. Raise the propeller shaft into the vehicle positioning the front of the shaft above the front cross member and the steering gear.

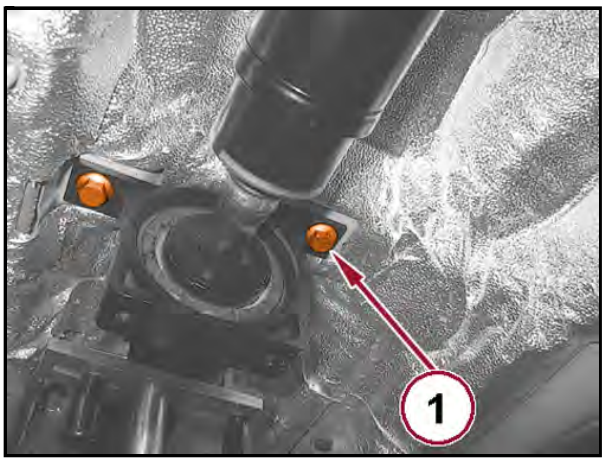
8. Connect the propeller shaft (1) to the pinion of the RDU, verify the snap ring is seated in the groove of the pinion shaft.



9. Position the new dust cover (1) over the joint at the rear of the propeller shaft.



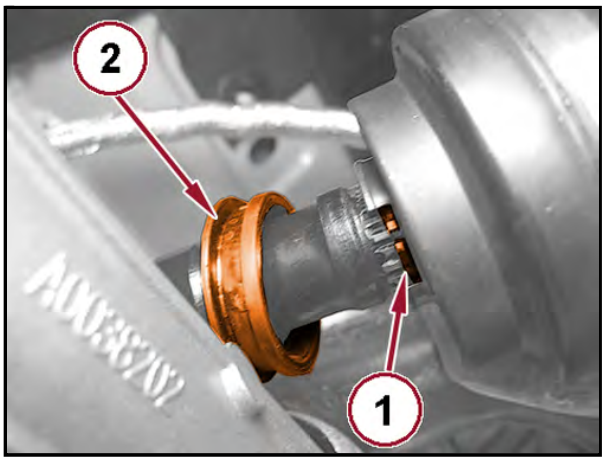
10. Loosely install the **NEW** bolts (1) for the center support bracket.



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11. Connect the propeller shaft (1) to PTU, verify the snap ring is (1) seated in the groove of the propeller shaft.

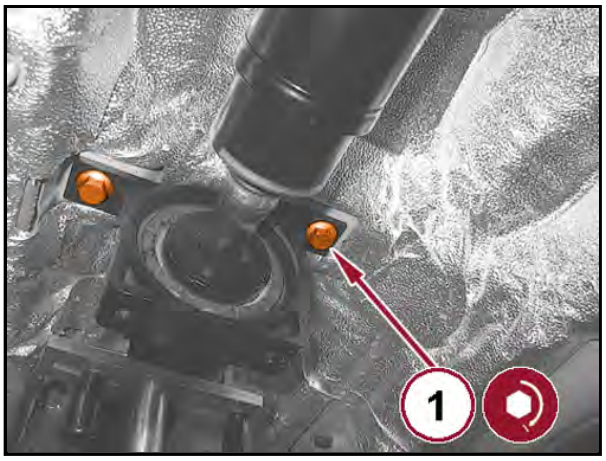
12. Position the new dust cover (2) over the joint at the front of the propeller shaft.



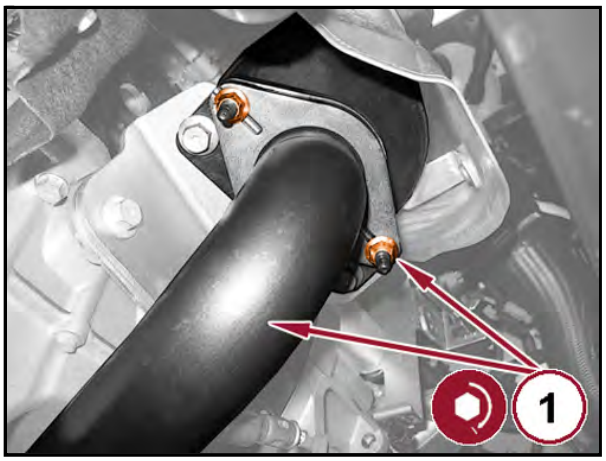
13. Tighten the center support bracket bolts (1) to the proper (Torque Specifications) .

14. Remove the propeller shaft support tools.

15. Remove the tape and the protective sleeve from the propeller shaft.



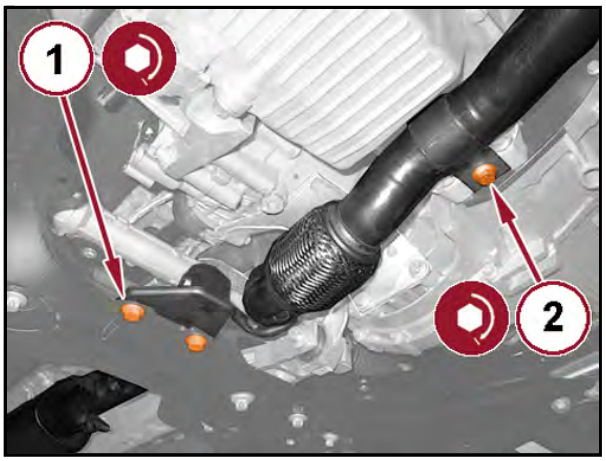
16. Connect the crossunder pipe to the catalytic converter using a **NEW** flange gasket and tighten the **NEW** nuts (1) to the proper (Torque Specifications) .



17. Install the crossunder pipe front hanger support bracket bolts (1) and tighten to the proper (Torque Specifications) .

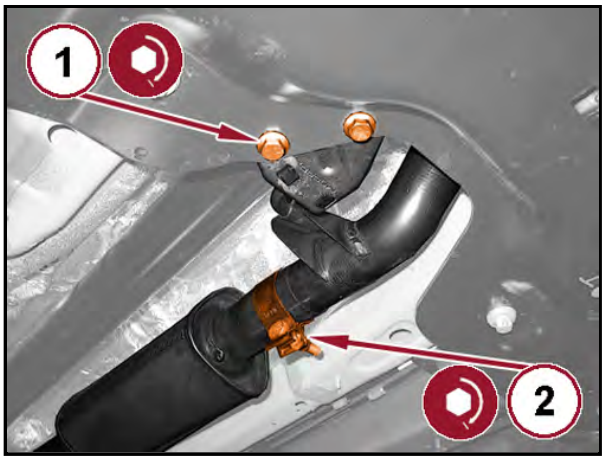
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18. Install the crossunder pipe bracket bolt (2) to the engine oil pan and tighten to the proper (Torque Specifications) .



19. Install the bolts (1) securing the exhaust hanger bracket supporting the crossunder pipe at the front crossmember and tighten to the proper (Torque Specifications) .

20. Tighten the exhaust clamp nut (2) securing the muffler to the crossunder pipe to the proper (Torque Specifications) .



21. Connect the downstream oxygen sensor wire harness connector and disengage the wiring from the routing clip.

22. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

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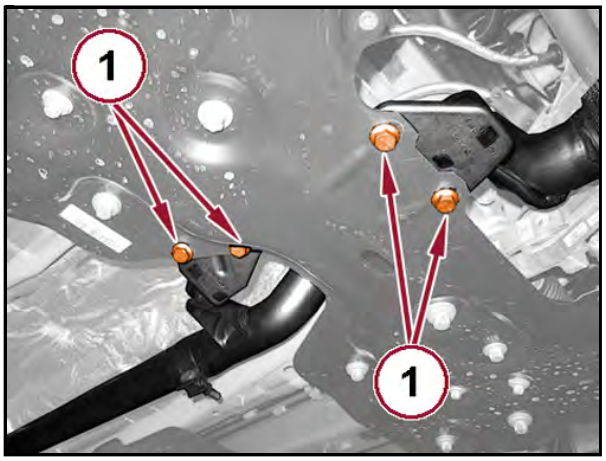
03 - Differential and Driveline / Propeller Shaft / Removal and Installation

2.0 TURBO DIESEL -120 / 140 HP

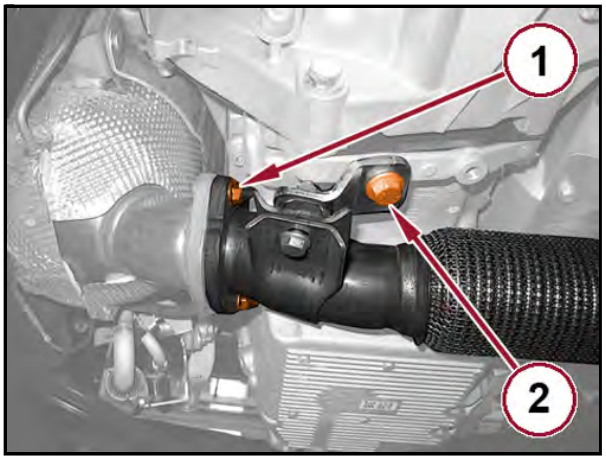
REMOVAL

CAUTION: Propeller shaft removal is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to power transfer unit (PTU) or rear driveline module flanges. A helper is required. If a propshaft section is hung unsupported, damage may occur to the joint, boot, and/or center bearing from over-angulation. This may result in driveline vibrations.

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Remove the crossunder pipe front and rear hanger bolts (1) at the front crossmember.



4. Remove the crossunder pipe to Diesel Particulate Filter (DPF) flange nuts (1).
5. Remove the crossunder pipe bracket bolt (2).

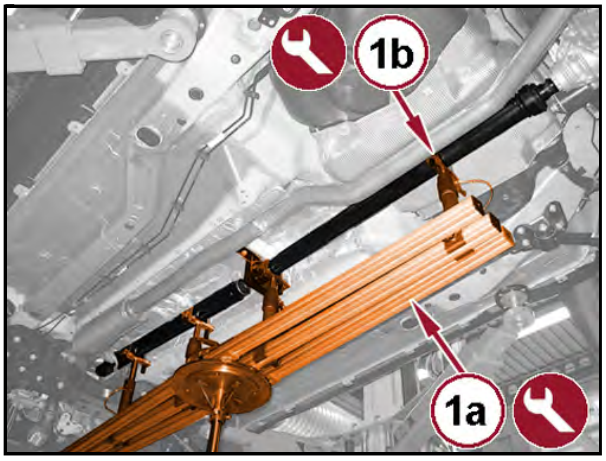


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6. Remove and discard the exhaust flange gasket.

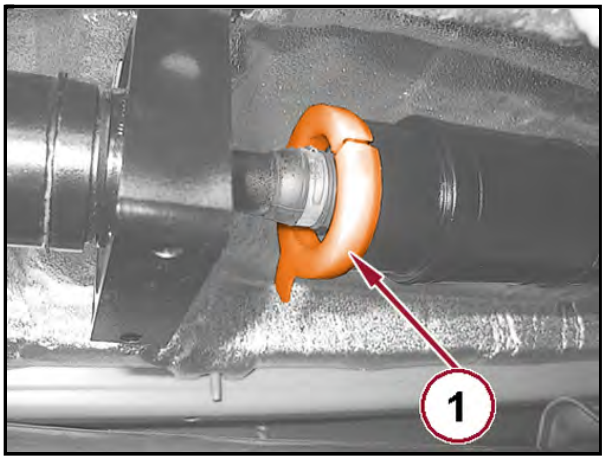
NOTE: **Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.**

7. Position support tools 2000043000 (1b) and 2000043400 (1a) under the propeller shaft.

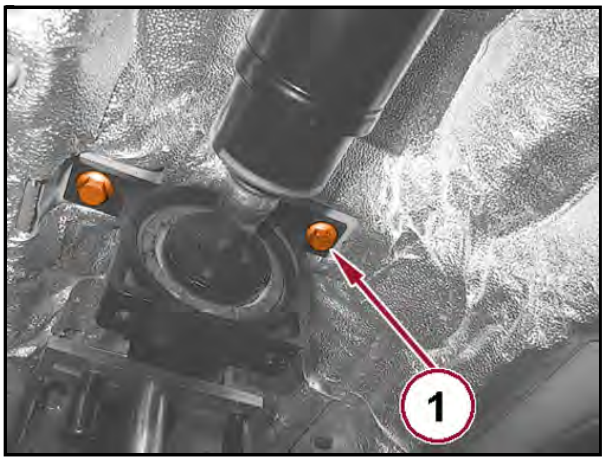


8. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown.

NOTE: **The protective sleeve is provided in the parts package with the dust cover and snap rings for the propeller shaft.**

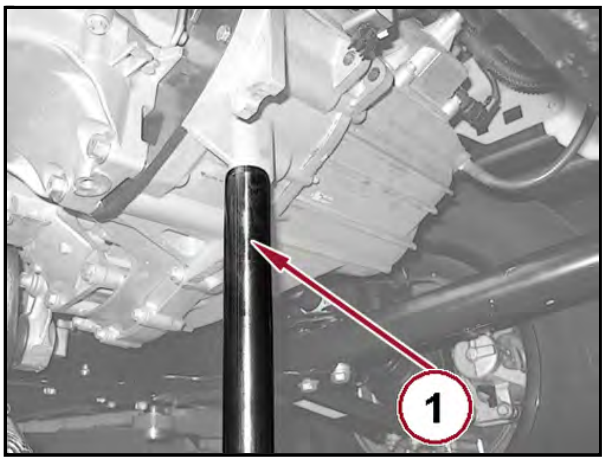


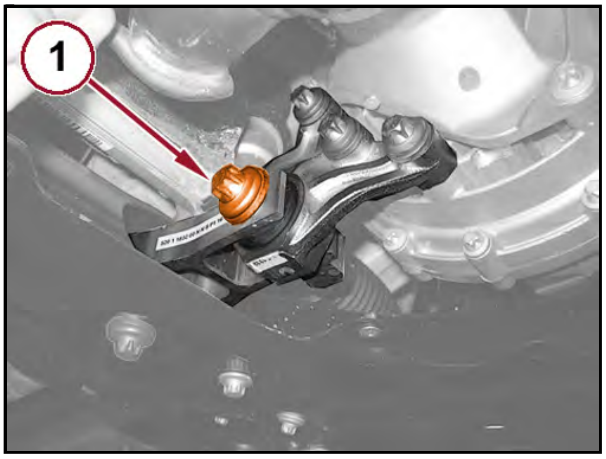
9. Loosen the propeller shaft center support bolts (1).



10. Place a suitable jack (1) under the transmission.

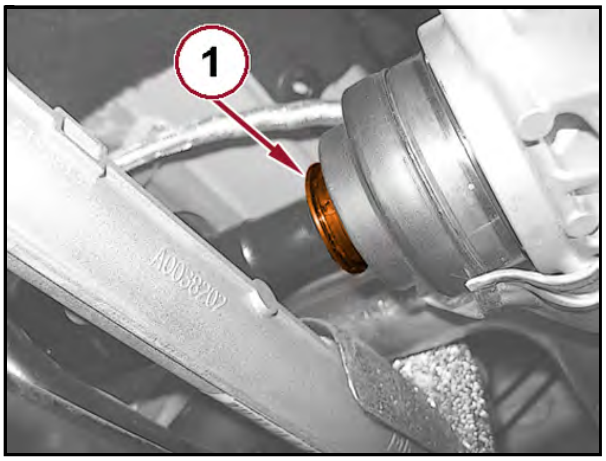
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11. Remove the rear engine mount through bolt (1).

12. Adjust the jack to carefully shift the powertrain forward.



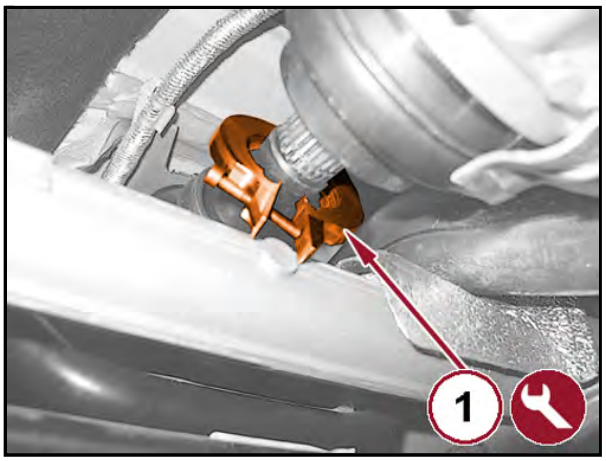
NOTE: **The dust cover must be replaced every time the propeller shaft is removed.**

13. Slide the dust cover (1) at the front of the propeller shaft away from the Power Transfer Unit (PTU) to access the snap ring.

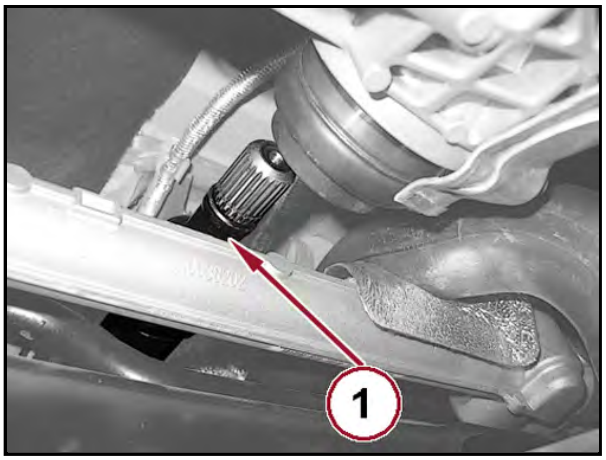
NOTE: **The snap ring must be replaced every time the propeller shaft is removed.**

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14. Use tool 2019500030 (1) to open propeller shaft snap ring at the PTU.

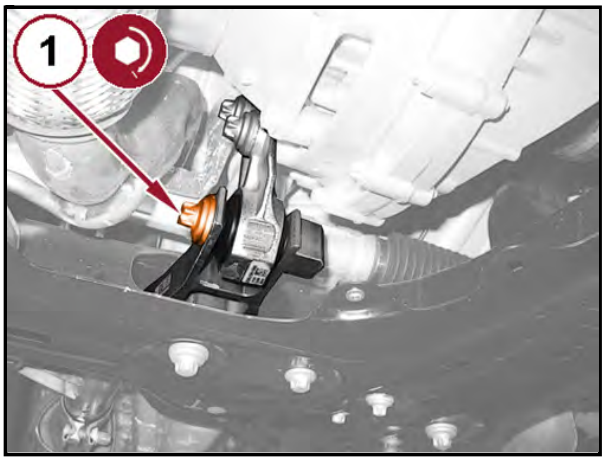


15. Disconnect the propeller shaft (1) from the PTU.



16. Remove the tool 2019500030.

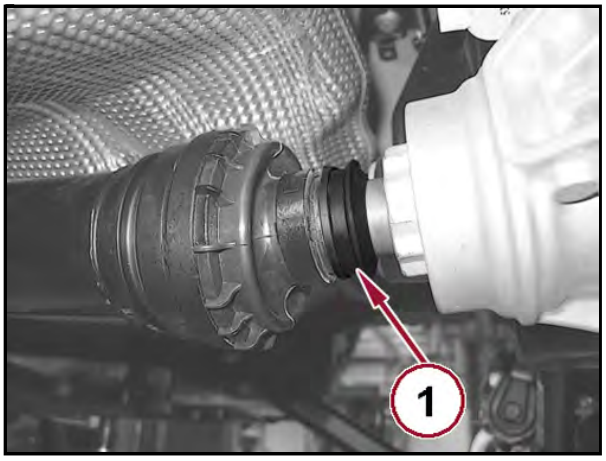
17. Install the rear engine mount through bolt and torque to the proper (Torque Specifications) .



18. Remove the jack from under the transmission.

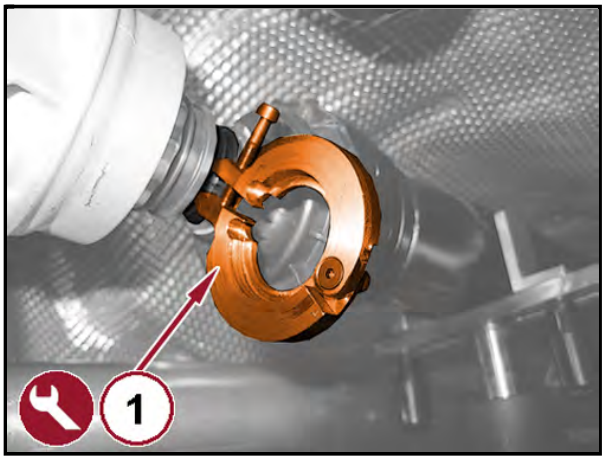
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19. Remove the previously loosened propeller shaft center support bolts.



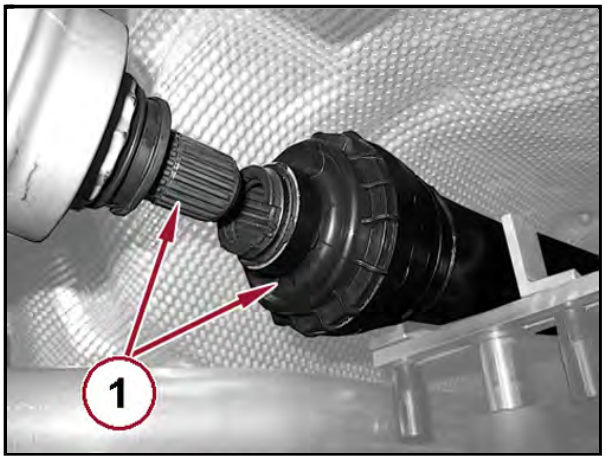
NOTE: **The dust cover must be replaced every time the propeller shaft is removed.**

20. Slide the dust cover (1) at the rear of the propeller shaft towards the differential to access the snap ring.



NOTE: **The snap ring must be replaced every time the propeller shaft is removed.**

21. Use tool 2019500030 (1) to open propeller shaft snap ring at the Rear Driveline Unit (RDU).

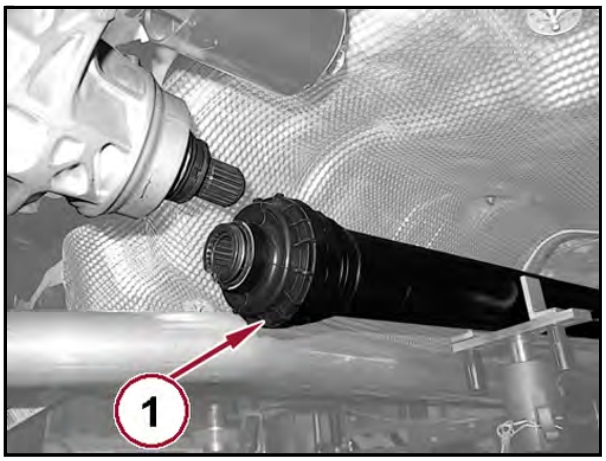


22. Disconnect the propeller shaft from the pinion of the RDU (1).

23. Remove the tool 2019500030.

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24. Lower the propeller shaft until the rear joint of the shaft is under the RDU as shown.



NOTE: **Pay close attention to avoid excessive articulation between the two halves of the propeller shaft during removal.**

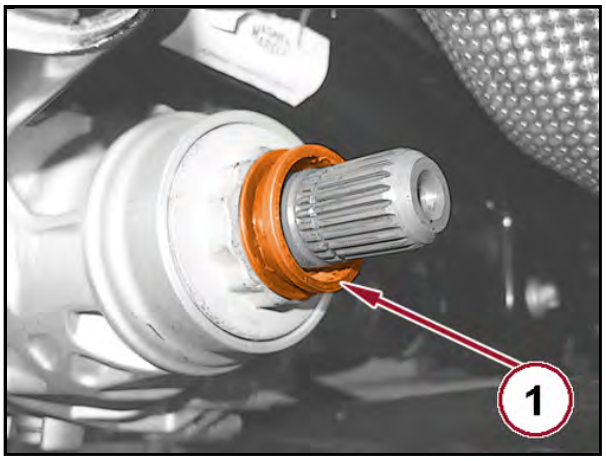
25. Turn the jack to remove the drive shaft, guiding it away from the front suspension crossmember.

INSTALLATION

CAUTION: **Propeller shaft removal is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to power transfer unit (PTU) or rear driveline module flanges. A helper is required. If a propshaft section is hung unsupported, damage may occur to the joint, boot, and/or center bearing from over-angulation. This may result in driveline vibrations.**

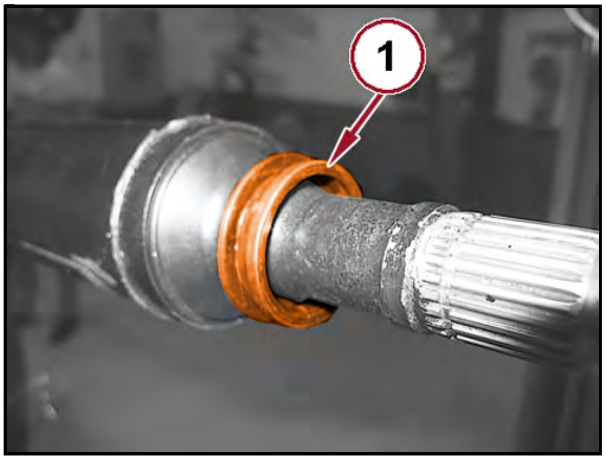
NOTE: **Lightly apply grease to the splines prior to installation.**

1. Install a **NEW** dust seal (1) on the pinion shaft of the Rear Driveline Unit (RDU).

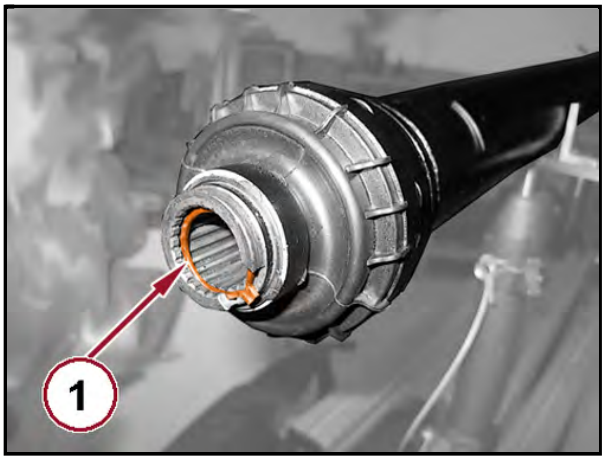


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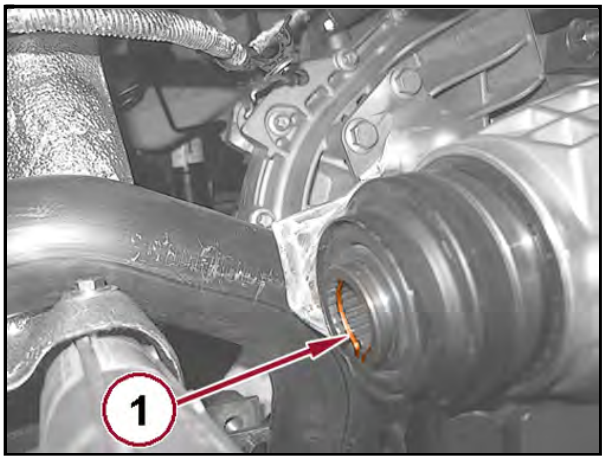
2. Install a **NEW** dust seal (1) on the front shaft of the propeller shaft.



3. Install a **NEW** snap ring (1) in the drive shaft.



4. Install a **NEW** snap ring (1) in the Power Transfer Unit (PTU).

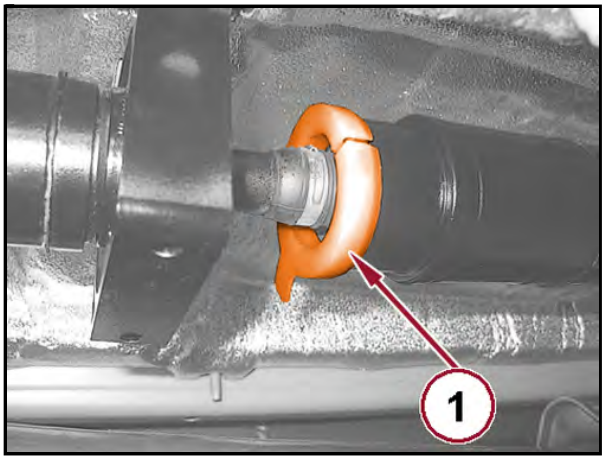


NOTE: **Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.**

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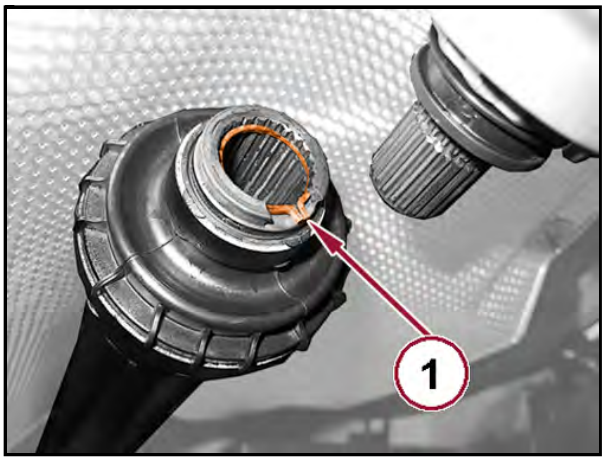
5. Position the propeller shaft on the support tools 2000043000 and 2000043400.

6. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown.

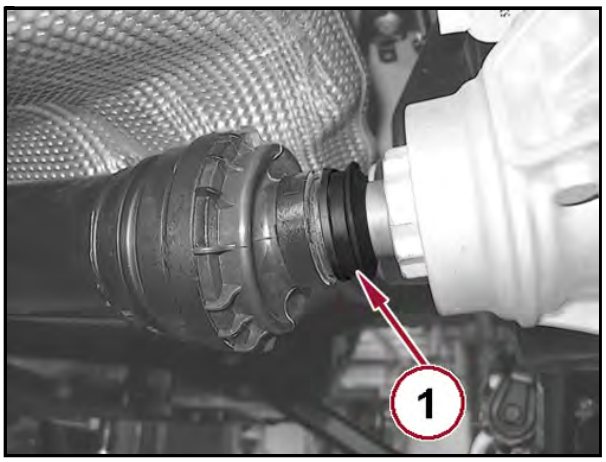


7. Raise the propeller shaft into the vehicle positioning the front of the shaft above the front cross member and the steering gear.

8. Connect the propeller shaft to the pinion of the RDU, verify the snap ring (1) is seated in the groove of the pinion shaft.

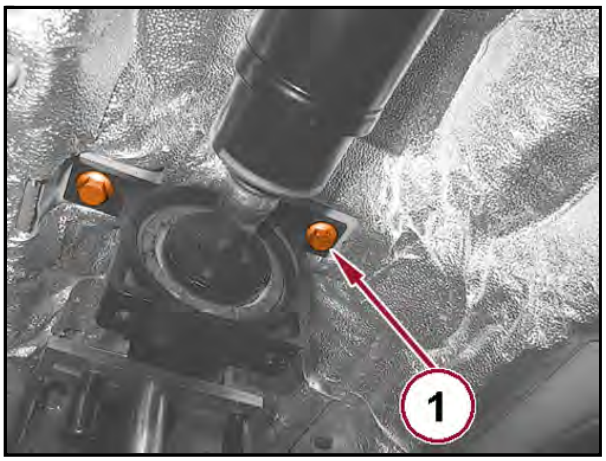


9. Position the new dust cover (1) over the joint at the rear of the propeller shaft.



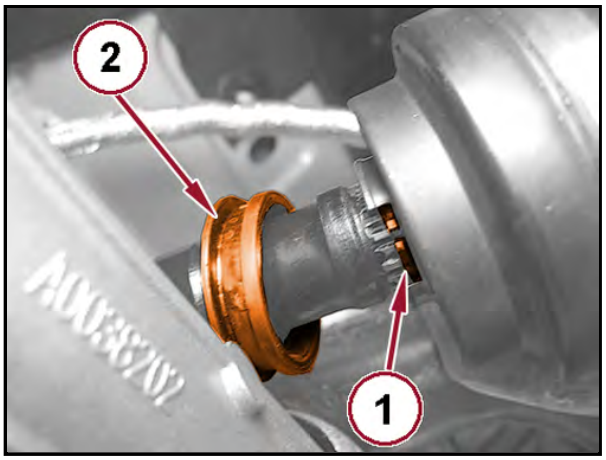
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10. Loosely install the **NEW** bolts (1) for the center support bracket.

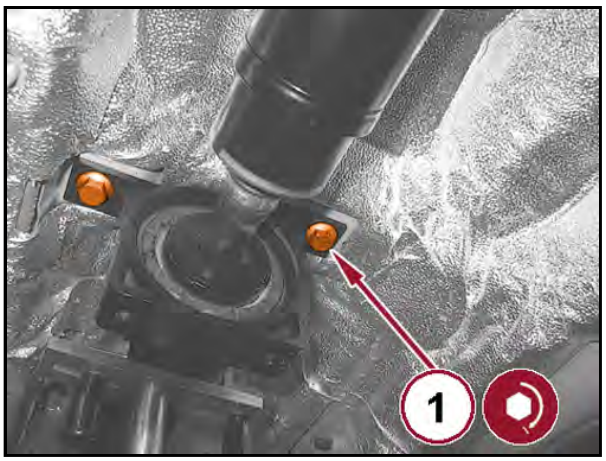


11. Connect the propeller shaft (1) to PTU, verify the snap ring is (1) seated in the groove of the propeller shaft.

12. Position the new dust cover (2) over the joint at the front of the propeller shaft.



13. Tighten the center support bracket bolts (1) to the proper (Torque Specifications) .

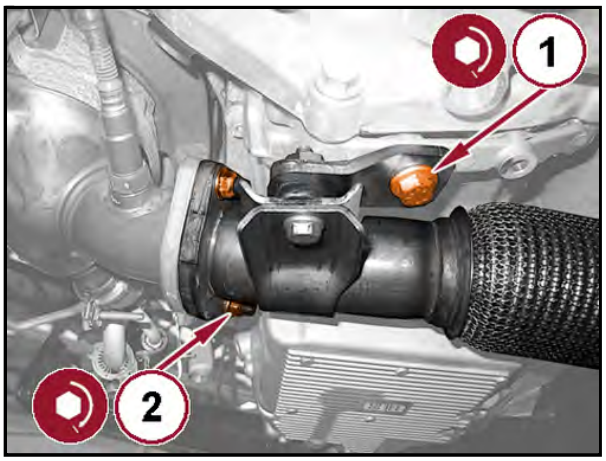


14. Remove the propeller shaft support tools.

15. Remove the tape and the protective sleeve from the propeller shaft.

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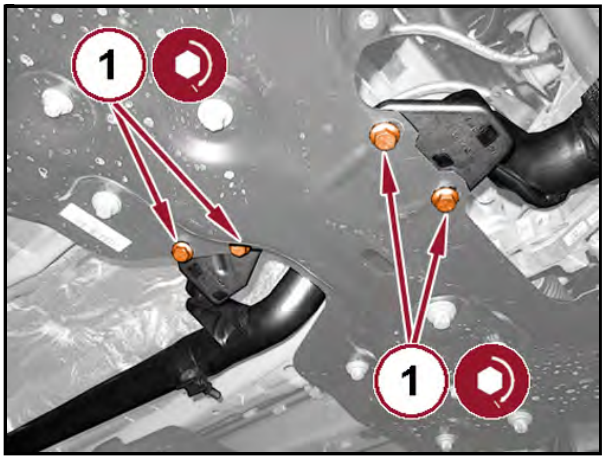
16. Connect the crossunder pipe to the Diesel Particulate Filter (DPF) using a **NEW** flange gasket and tighten the **NEW** nuts (2) to the proper (Torque Specifications) .



17. Install the crossunder pipe front hanger support bracket bolts (1) and tighten to the proper (Torque Specifications) .

18. Install the crossunder pipe bracket bolt (1) and tighten to the proper (Torque Specifications) .

19. Install the front and rear crossunder pipe hanger bolts (1) at the front crossmember and tighten to the proper (Torque Specifications) .



20. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

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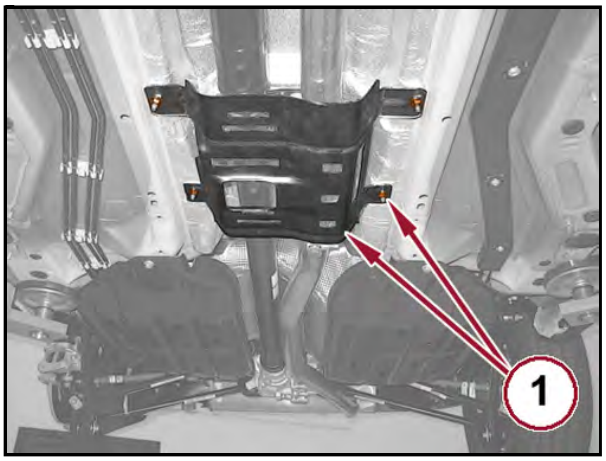
03 - Differential and Driveline / Propeller Shaft / Removal and Installation

2.0 TURBO DIESEL -170 HP

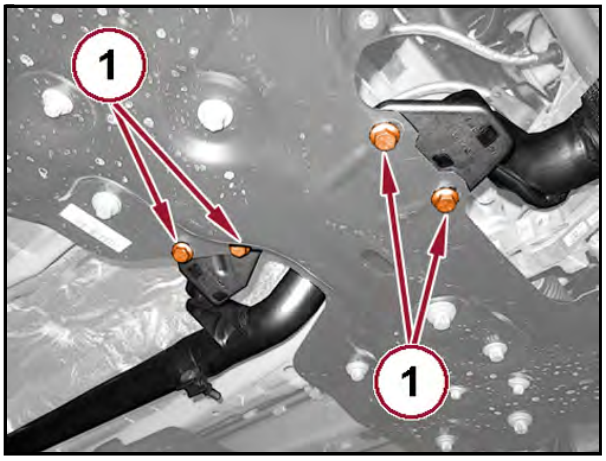
REMOVAL

CAUTION: Propeller shaft removal is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to power transfer unit (PTU) or rear driveline module flanges. A helper is required. If a propshaft section is hung unsupported, damage may occur to the joint, boot, and/or center bearing from over-angulation. This may result in driveline vibrations.

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Remove the nuts and remove the propeller shaft skid plate.



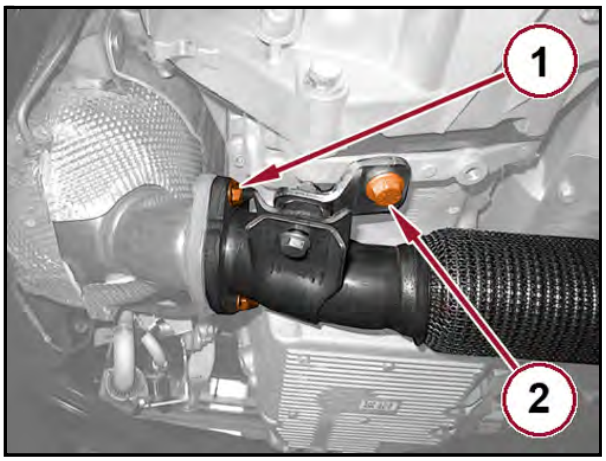
4. Remove the crossunder pipe front and rear hanger bolts (1) at the front crossmember.



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5. Remove the crossunder pipe to Diesel Particulate Filter (DPF) flange nuts (1).

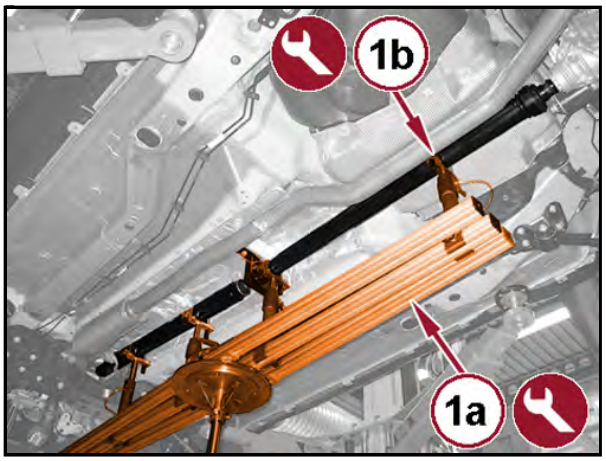
6. Remove the crossunder pipe bracket bolt (2).



7. Remove and discard the exhaust flange gasket.

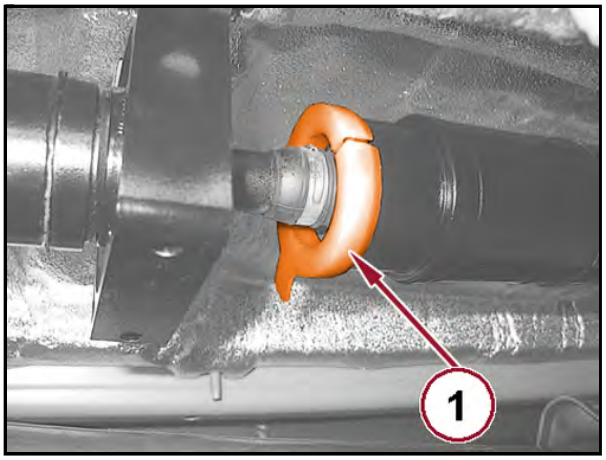
NOTE: **Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.**

8. Position support tools 2000043000 (1b) and 2000043400 (1a) under the propeller shaft.



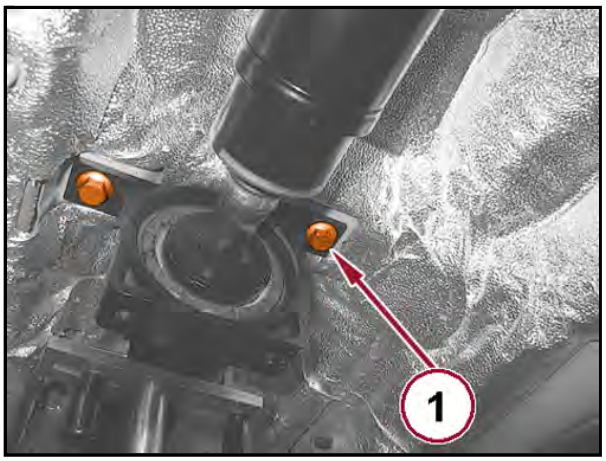
9. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown.

NOTE: **The protective sleeve is provided in the parts package with the dust cover and snap rings for the propeller shaft.**

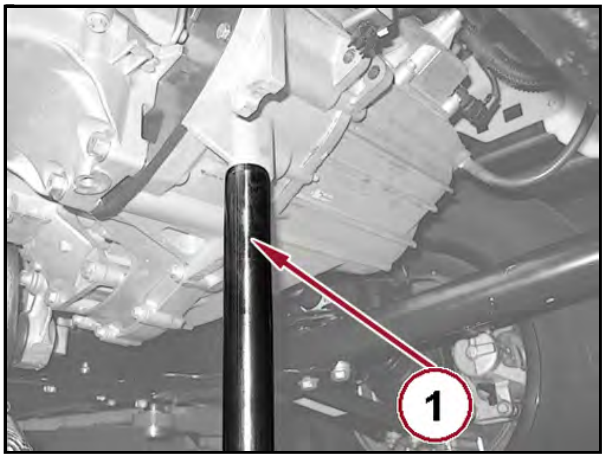


10. Loosen the propeller shaft center support bolts (1).

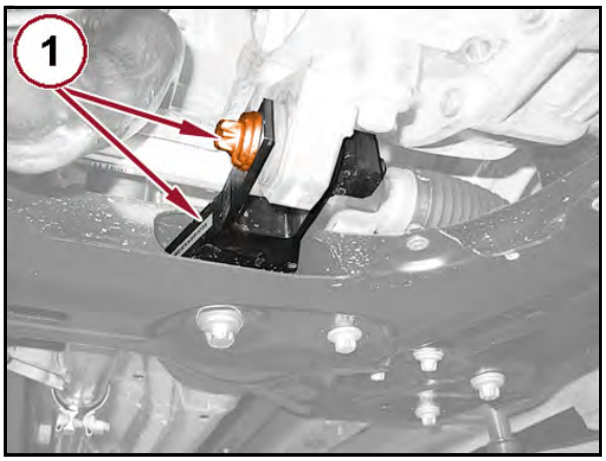
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11. Place a suitable jack (1) under the transmission.



12. Remove the rear engine mount through bolt (1).

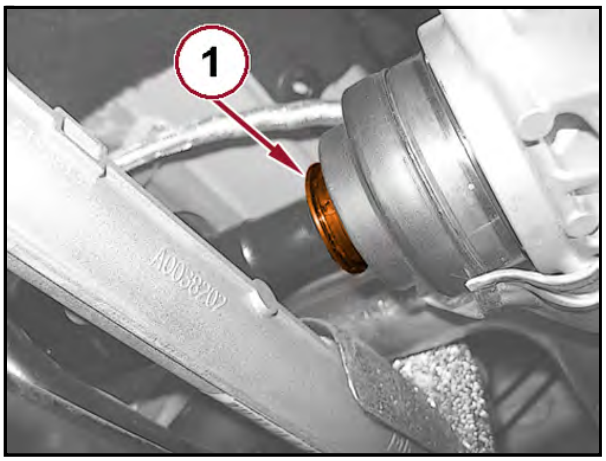


13. Adjust the jack to carefully shift the powertrain forward.

NOTE: **The dust cover must be replaced every time the propeller shaft is removed.**

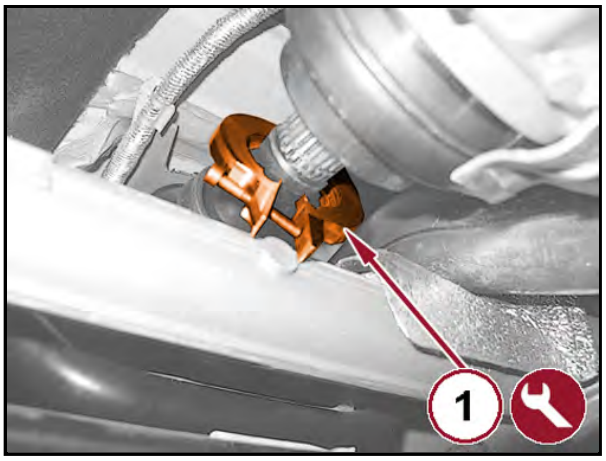
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14. Slide the dust cover (1) at the front of the propeller shaft away from the Power Transfer Unit (PTU) to access the snap ring.

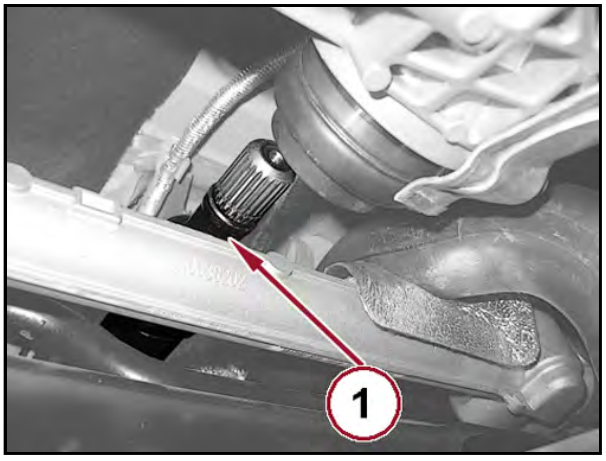


NOTE: **The snap ring must be replaced every time the propeller shaft is removed.**

15. Use tool 2019500030 (1) to open propeller shaft snap ring at the PTU.



16. Disconnect the propeller shaft (1) from the PTU.



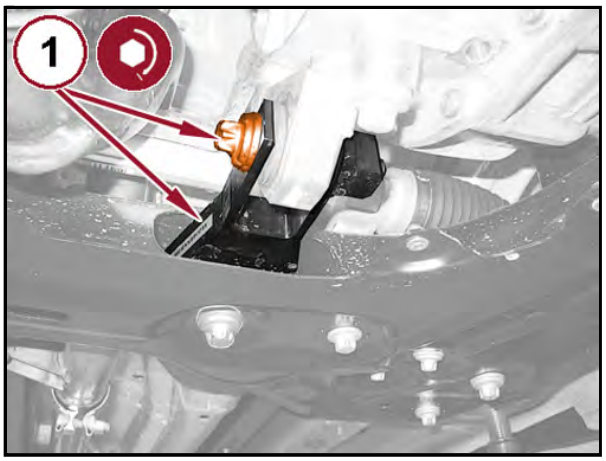
17. Remove the tool 2019500030.

18. Install the rear engine mount through bolt and torque to the proper (Torque Specifications) .

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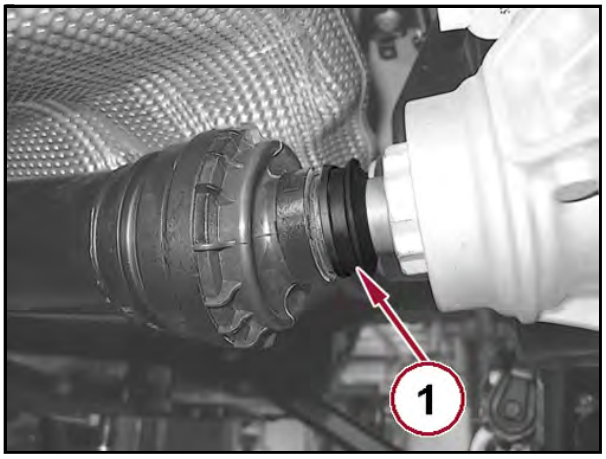
19. Remove the jack from under the transmission.

20. Remove the previously loosened propeller shaft center support bolts.



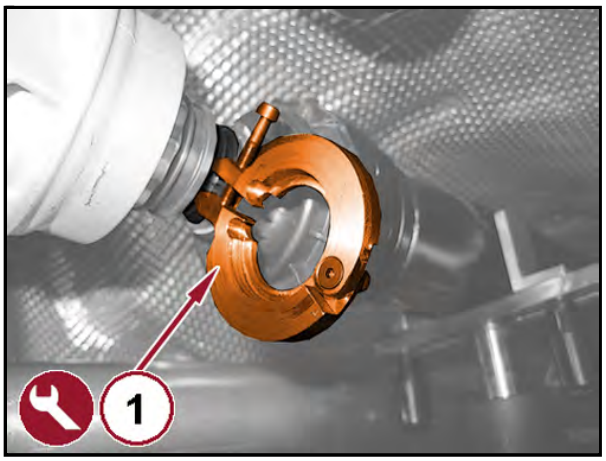
NOTE: **The dust cover must be replaced every time the propeller shaft is removed.**

21. Slide the dust cover (1) at the rear of the propeller shaft towards the differential to access the snap ring.



NOTE: **The snap ring must be replaced every time the propeller shaft is removed.**

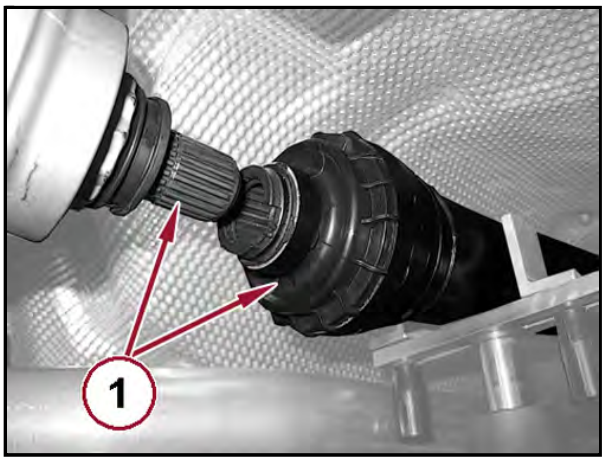
22. Use tool 2019500030 (1) to open propeller shaft snap ring at the Rear Driveline Unit (RDU).



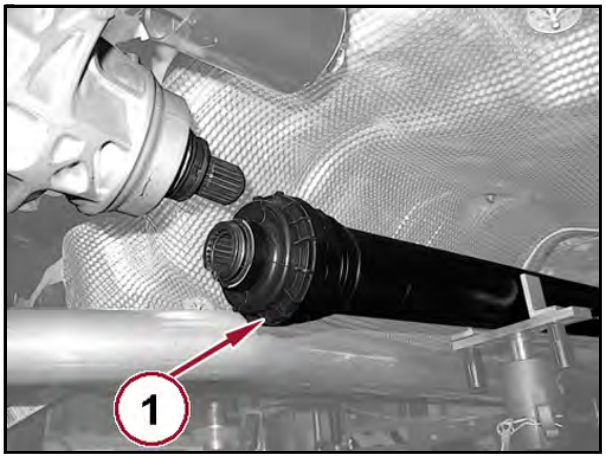
23. Disconnect the propeller shaft from the pinion of the RDU (1).

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24. Remove the tool 2019500030.



25. Lower the propeller shaft until the rear joint of the shaft is under the RDU as shown.



NOTE: **Pay close attention to avoid excessive articulation between the two halves of the propeller shaft during removal.**

26. Turn the jack to remove the drive shaft, guiding it away from the front suspension crossmember.

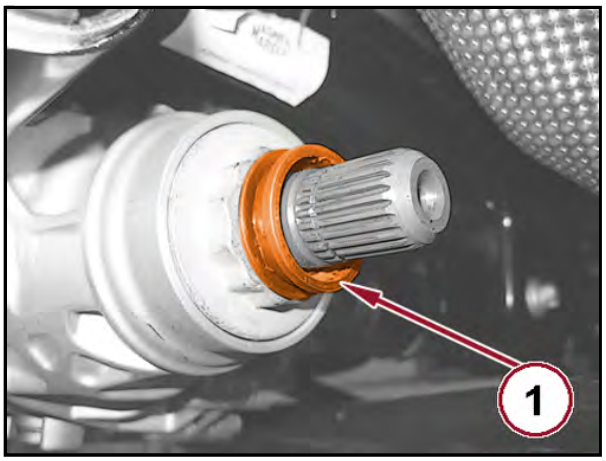
INSTALLATION

CAUTION: **Propeller shaft removal is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to power transfer unit (PTU) or rear driveline module flanges. A helper is required. If a propshaft section is hung unsupported, damage may occur to the joint, boot, and/or center bearing from over-angulation. This may result in driveline vibrations.**

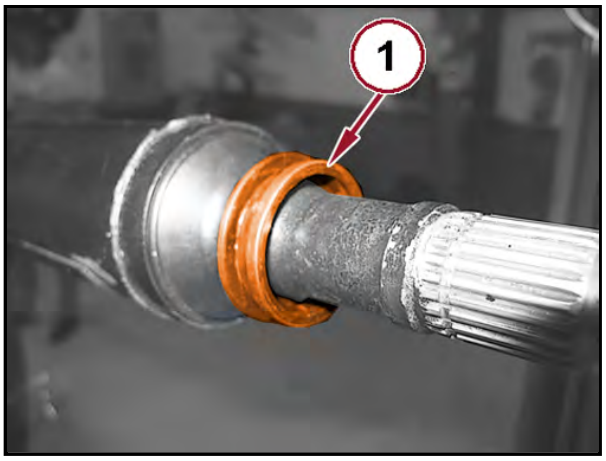
NOTE: **Lightly apply grease to the splines prior to installation.**

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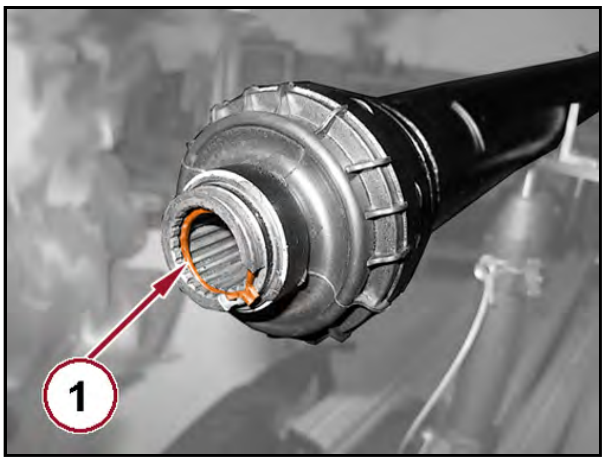
1. Install a **NEW** dust seal (1) on the pinion shaft of the Rear Driveline Unit (RDU).



2. Install a **NEW** dust seal (1) on the front shaft of the propeller shaft.



3. Install a **NEW** snap ring (1) in the drive shaft.

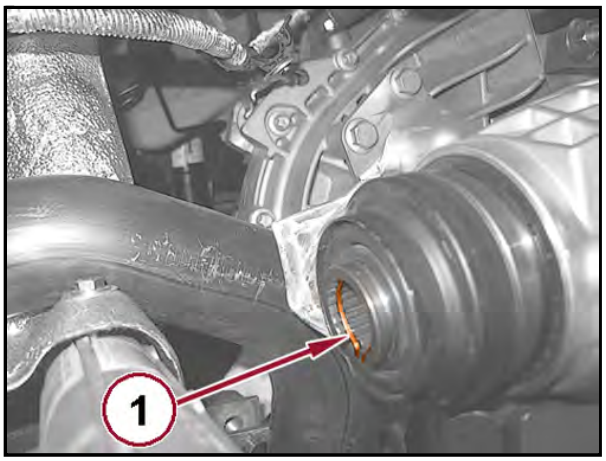


4. Install a **NEW** snap ring (1) in the Power Transfer Unit (PTU).

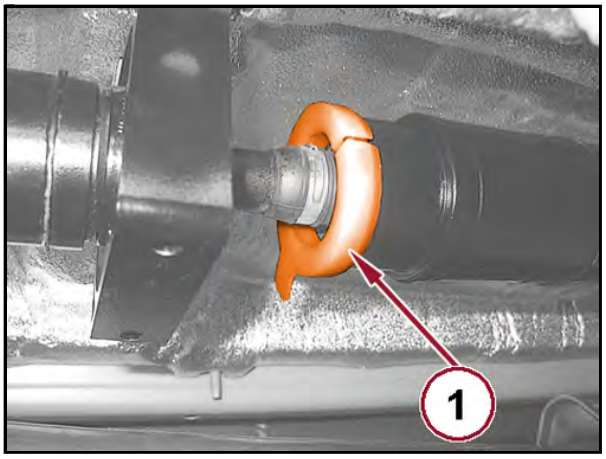
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NOTE: **Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.**

5. Position the propeller shaft on the support tools 2000043000 and 2000043400.

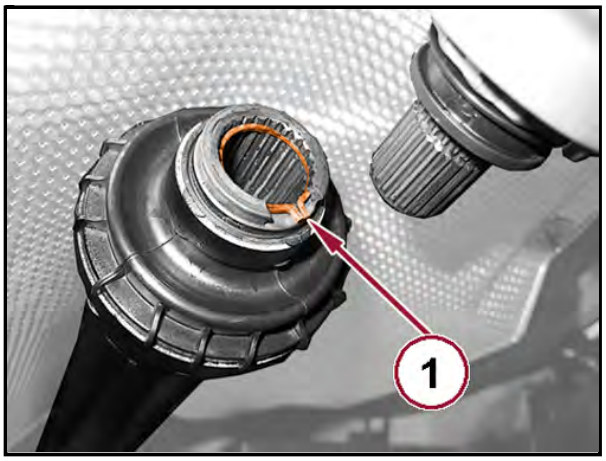


6. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown.



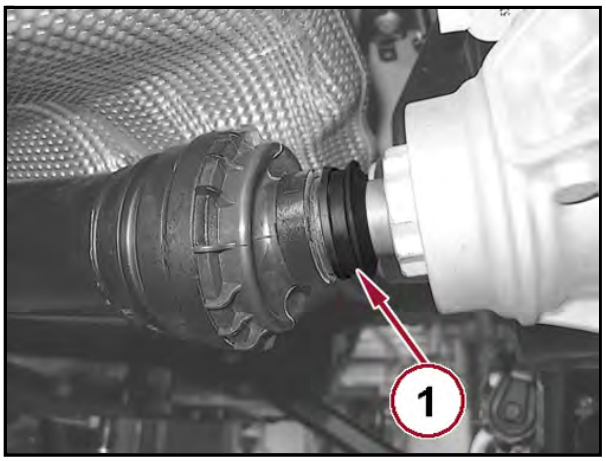
7. Raise the propeller shaft into the vehicle positioning the front of the shaft above the front cross member and the steering gear.

8. Connect the propeller shaft to the pinion of the RDU, verify the snap ring (1) is seated in the groove of the pinion shaft.

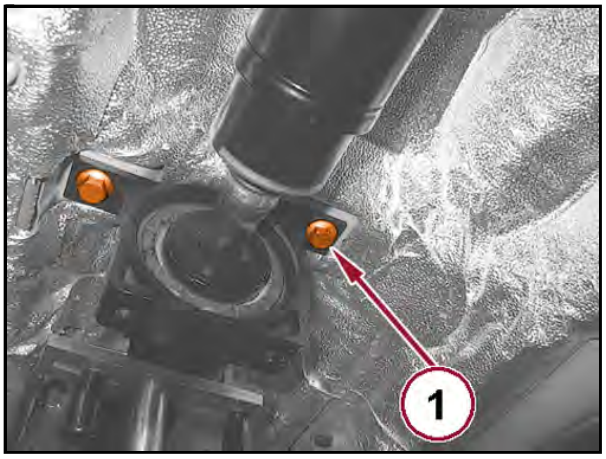


9. Position the new dust cover (1) over the joint at the rear of the propeller shaft.

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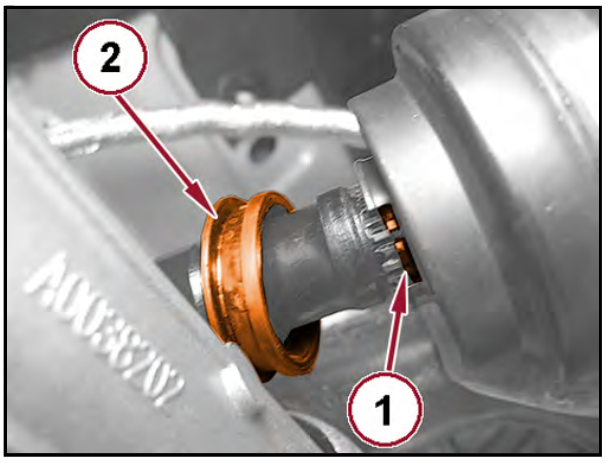


10. Loosely install the **NEW** bolts (1) for the center support bracket.



11. Connect the propeller shaft (1) to PTU, verify the snap ring is (1) seated in the groove of the propeller shaft.

12. Position the new dust cover (2) over the joint at the front of the propeller shaft.

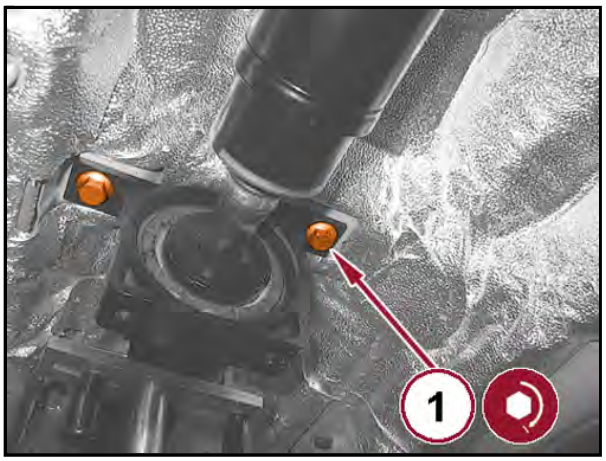


13. Tighten the center support bracket bolts (1) to the proper (Torque Specifications) .

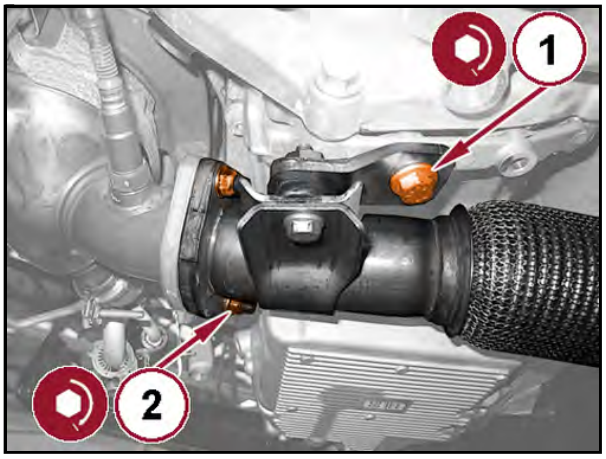
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14. Remove the propeller shaft support tools.

15. Remove the tape and the protective sleeve from the propeller shaft.



16. Connect the crossunder pipe to the Diesel Particulate Filter (DPF) using a **NEW** flange gasket and tighten the **NEW** nuts (2) to the proper (Torque Specifications) .

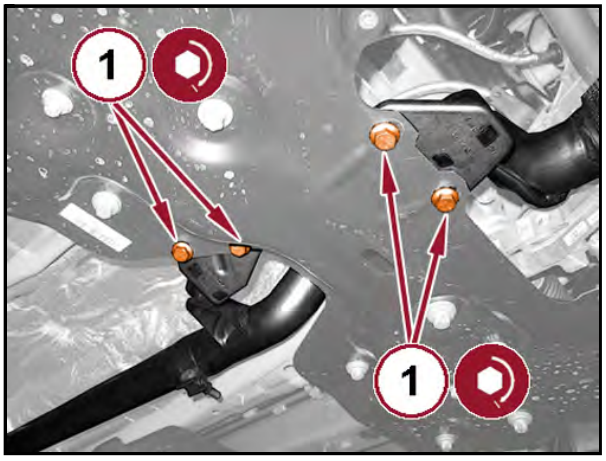


17. Install the crossunder pipe front hanger support bracket bolts (1) and tighten to the proper (Torque Specifications) .

18. Install the crossunder pipe bracket bolt (1) and tighten to the proper (Torque Specifications) .

19. Install the propeller shaft skid plate and tighten the nuts.

20. Install the front and rear crossunder pipe hanger bolts (1) at the front crossmember and tighten to the proper (Torque Specifications) .



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21. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

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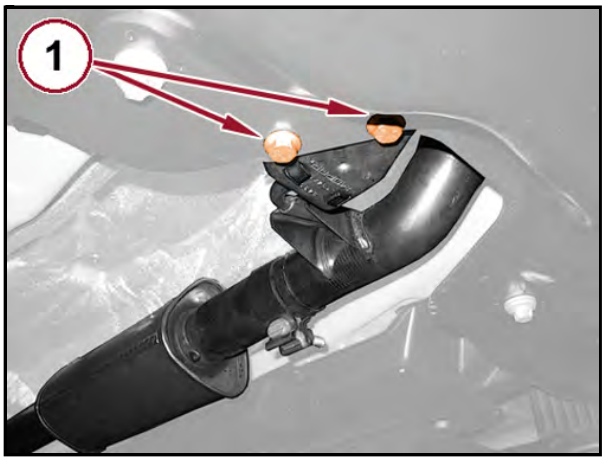
03 - Differential and Driveline / Propeller Shaft / Removal and Installation

2.4 MULTIAIR

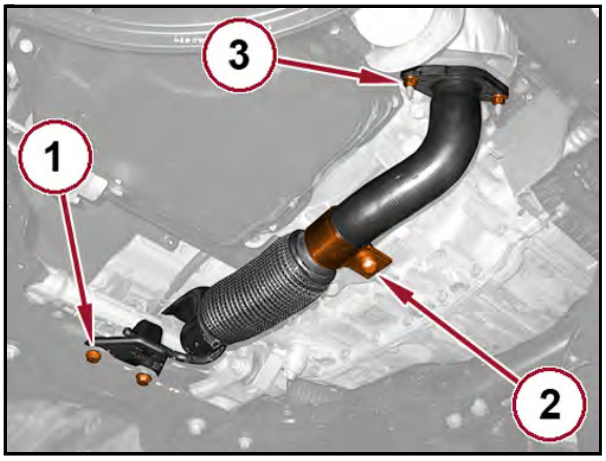
REMOVAL

CAUTION: Propeller shaft removal is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to power transfer unit (PTU) or rear driveline module flanges. A helper is required. If a propshaft section is hung unsupported, damage may occur to the joint, boot, and/or center bearing from over-angulation. This may result in driveline vibrations.

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Remove the bolts (1) securing the rear exhaust hanger bracket supporting the crossunder pipe at the front crossmember.



4. Remove the crossunder pipe front hanger support bracket bolts (1).
5. Remove the crossunder pipe bracket bolt (2).
6. Remove the crossunder pipe to catalytic converter flange nuts (3).

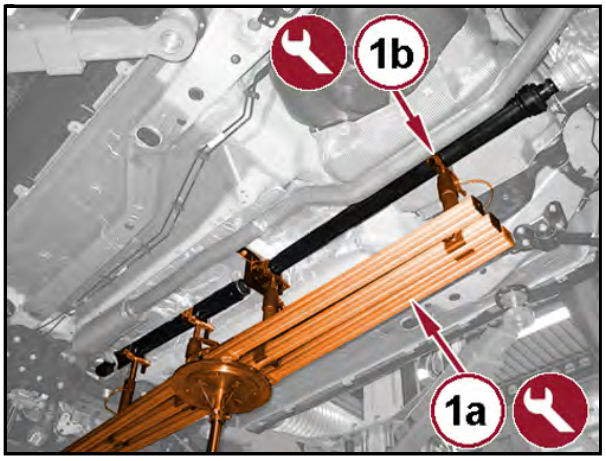


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7. Remove and discard the exhaust flange gasket.

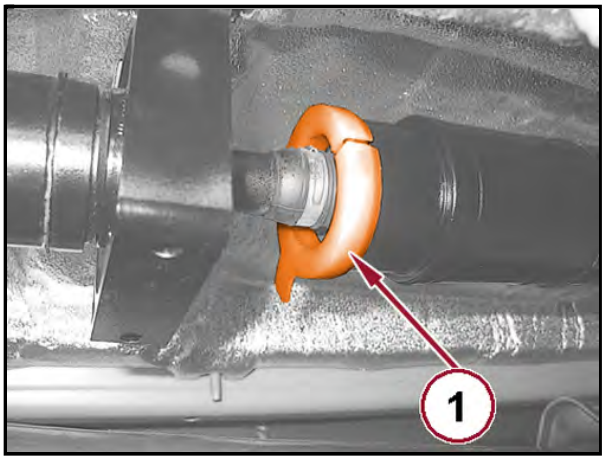
NOTE: **Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.**

8. Position support tools 2000043000 (1b) and 2000043400 (1a) under the propeller shaft.

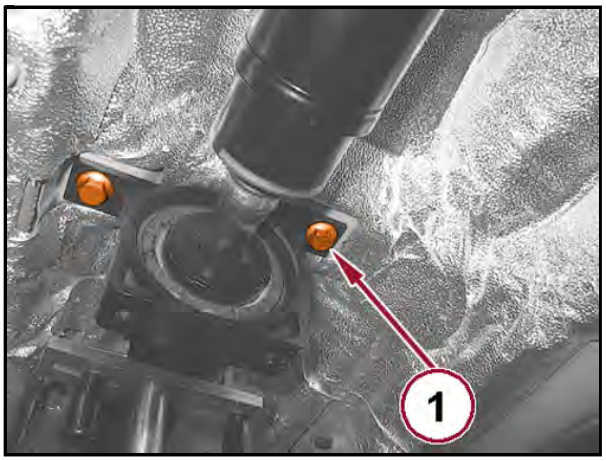


9. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown.

NOTE: **The protective sleeve is provided in the parts package with the dust cover and snap rings for the propeller shaft.**

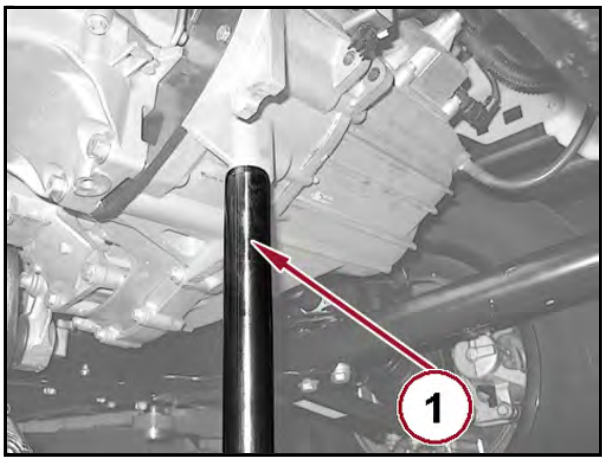


10. Loosen the propeller shaft center support bolts (1).

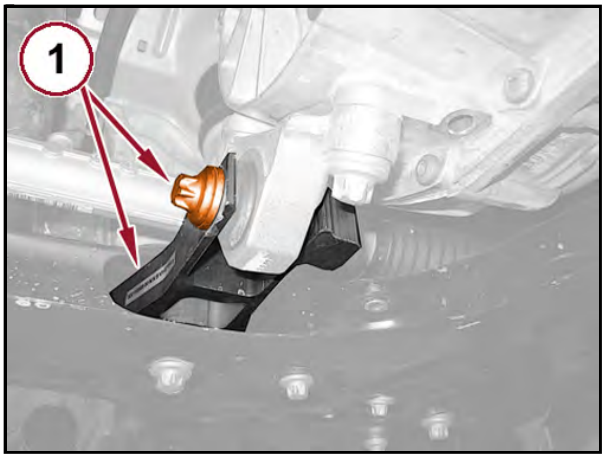


11. Place a suitable jack (1) under the transmission.

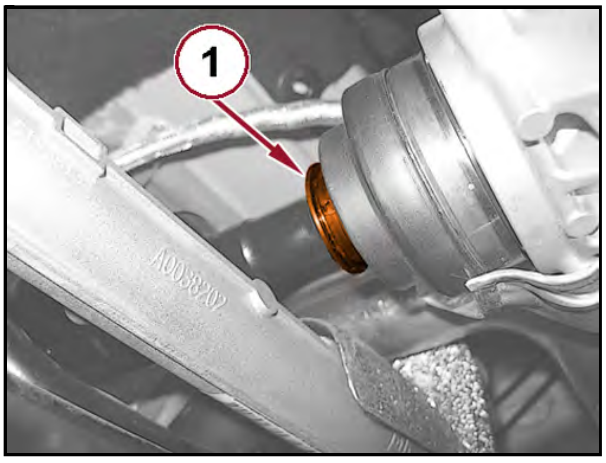
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12. Remove the rear engine mount through bolt (1).



13. Adjust the jack to carefully shift the powertrain forward.



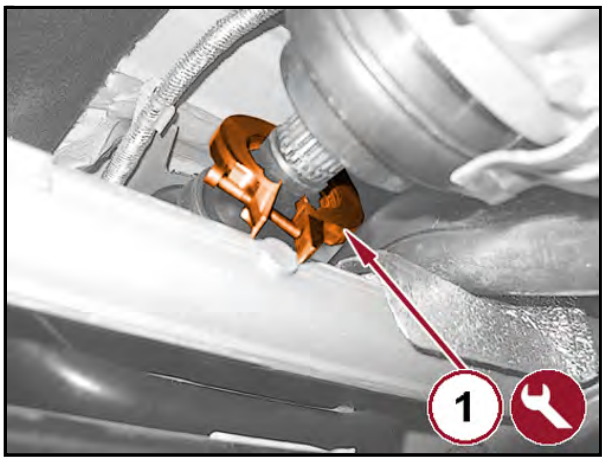
NOTE: **The dust cover must be replaced every time the propeller shaft is removed.**

14. Slide the dust cover (1) at the front of the propeller shaft away from the Power Transfer Unit (PTU) to access the snap ring.

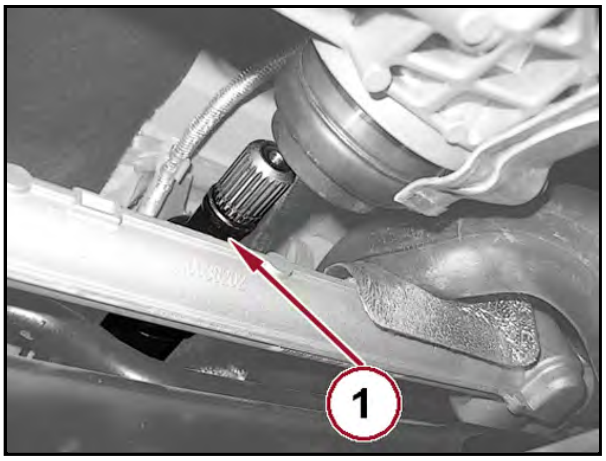
NOTE: **The snap ring must be replaced every time the propeller shaft is removed.**

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15. Use tool 2019500030 (1) to open propeller shaft snap ring at the PTU.

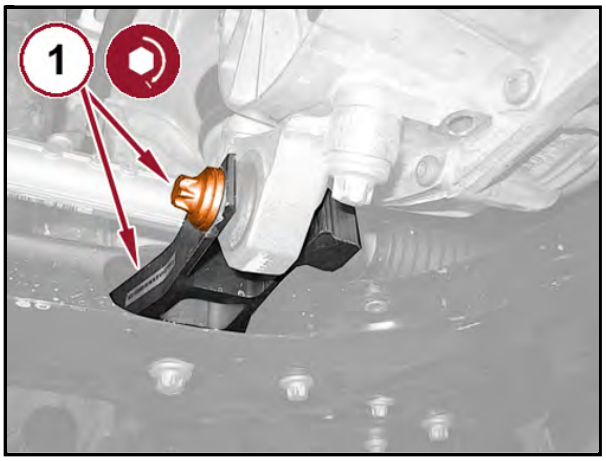


16. Disconnect the propeller shaft (1) from the PTU.



17. Remove the tool 2019500030.

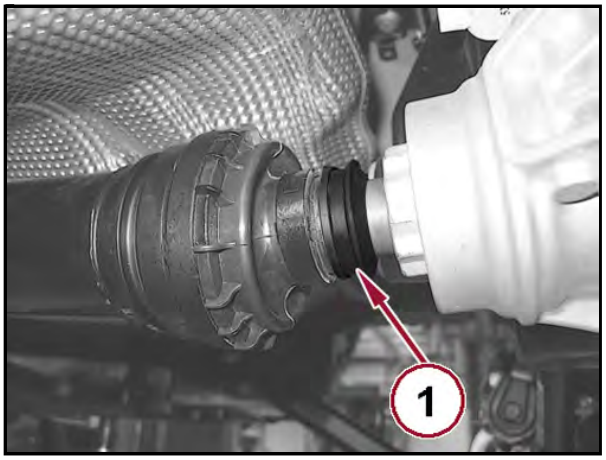
18. Install the rear engine mount through bolt and torque to the proper (Torque Specifications) .



19. Remove the jack from under the transmission.

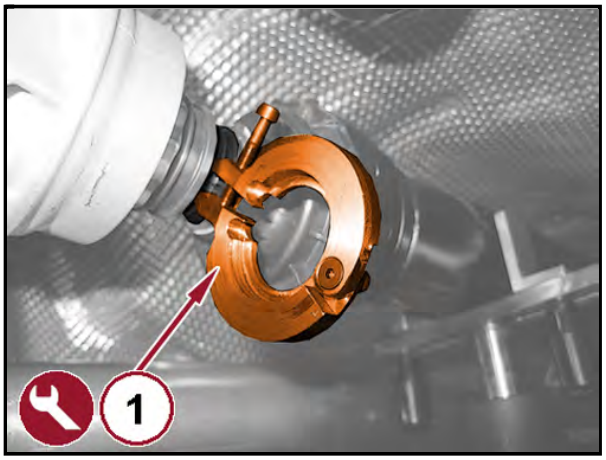
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20. Remove the previously loosened propeller shaft center support bolts.



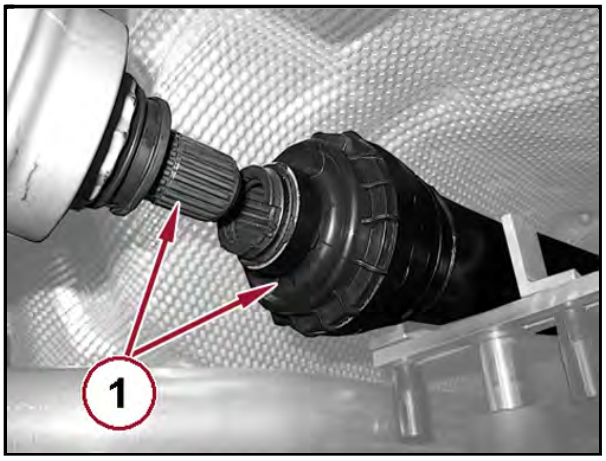
NOTE: **The dust cover must be replaced every time the propeller shaft is removed.**

21. Slide the dust cover (1) at the rear of the propeller shaft towards the differential to access the snap ring.



NOTE: **The snap ring must be replaced every time the propeller shaft is removed.**

22. Use tool 2019500030 (1) to open propeller shaft snap ring at the Rear Driveline Unit (RDU).

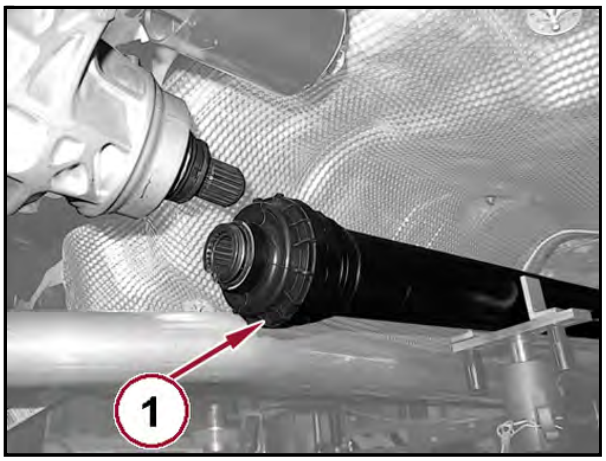


23. Disconnect the propeller shaft from the pinion of the RDU (1).

24. Remove the tool 2019500030.

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25. Lower the propeller shaft (1) until the rear joint of the shaft is under the RDU as shown.



NOTE: **Pay close attention to avoid excessive articulation between the two halves of the propeller shaft during removal.**

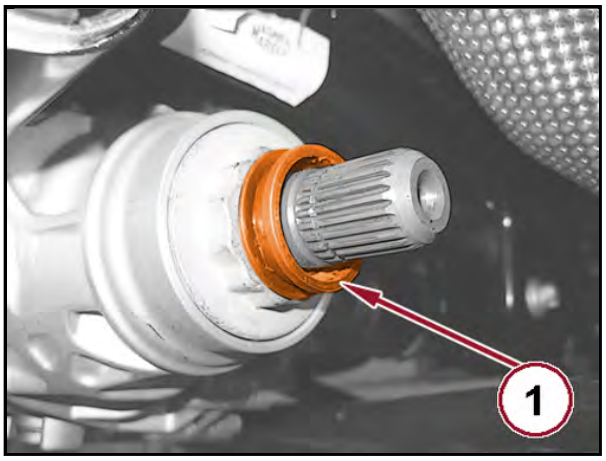
26. Turn the jack to remove the drive shaft, guiding it away from the front suspension crossmember.

INSTALLATION

CAUTION: **Propeller shaft removal is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to power transfer unit (PTU) or rear driveline module flanges. A helper is required. If a propshaft section is hung unsupported, damage may occur to the joint, boot, and/or center bearing from over-angulation. This may result in driveline vibrations.**

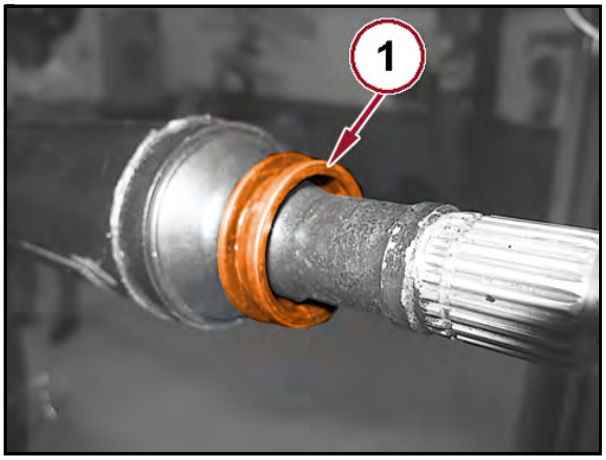
NOTE: **Lightly apply grease to the splines prior to installation.**

1. Install a **NEW** dust seal (1) on the pinion shaft of the Rear Driveline Unit (RDU).

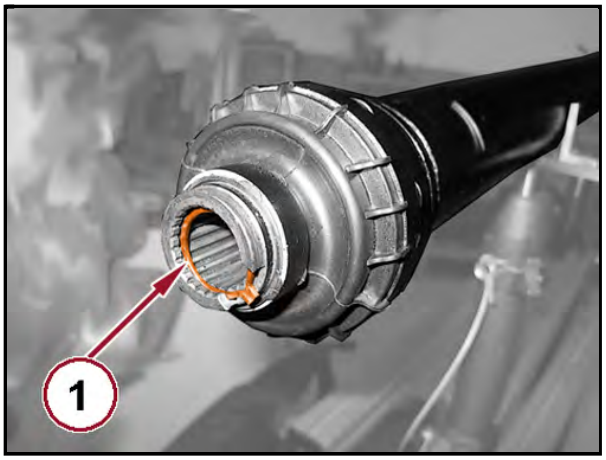


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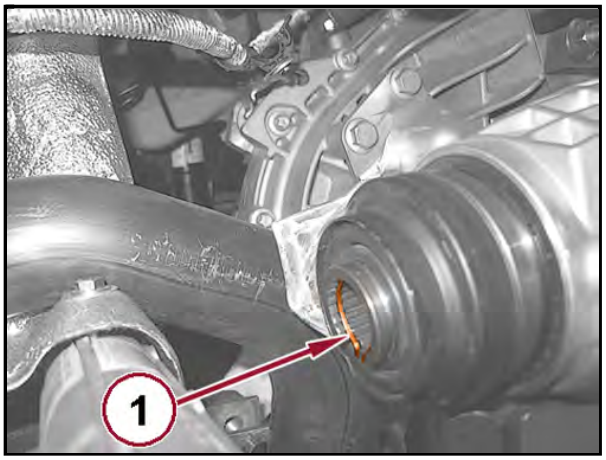
2. Install a **NEW** dust seal (1) on the front shaft of the propeller shaft.



3. Install a **NEW** snap ring (1) in the drive shaft.



4. Install a **NEW** snap ring (1) in the Power Transfer Unit (PTU).

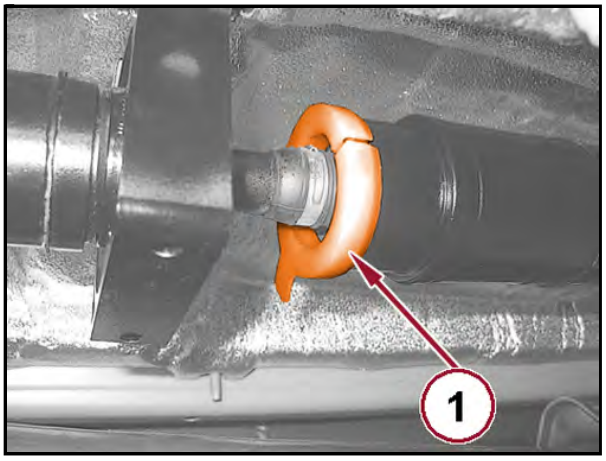


NOTE: **Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.**

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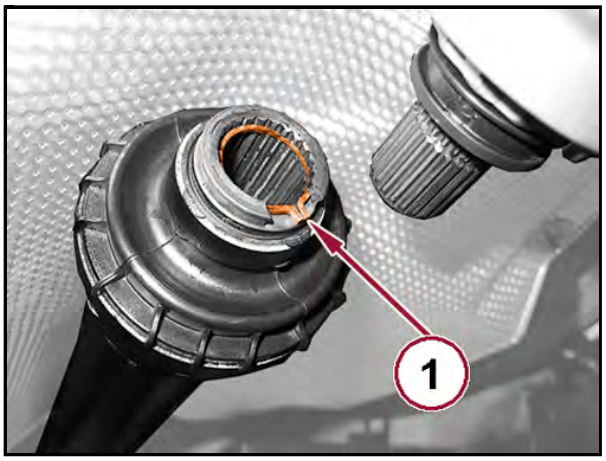
5. Position the propeller shaft on the support tools 2000043000 and 2000043400.

6. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown.

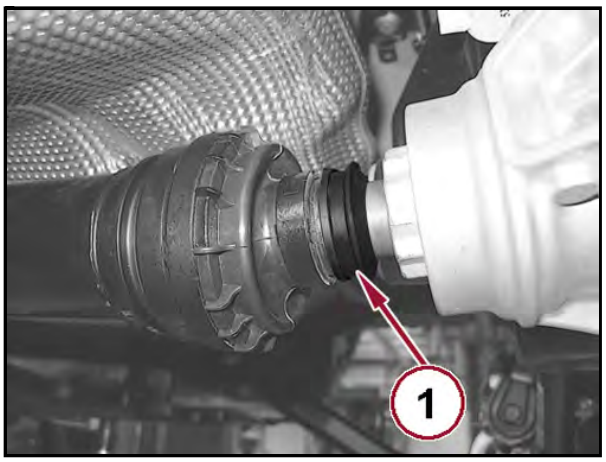


7. Raise the propeller shaft into the vehicle positioning the front of the shaft above the front cross member and the steering gear.

8. Connect the propeller shaft (1) to the pinion of the RDU, verify the snap ring is seated in the groove of the pinion shaft.

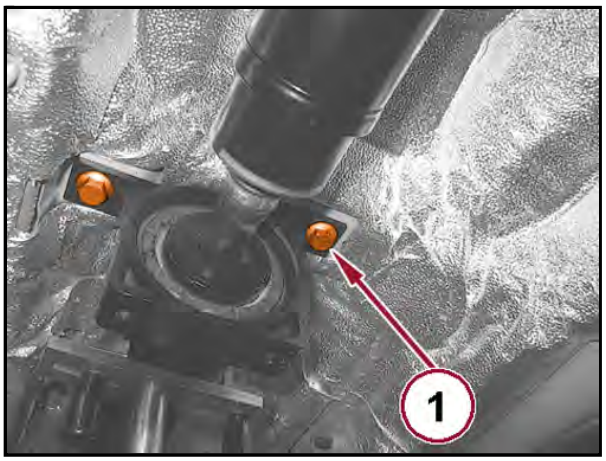


9. Position the new dust cover (1) over the joint at the rear of the propeller shaft.



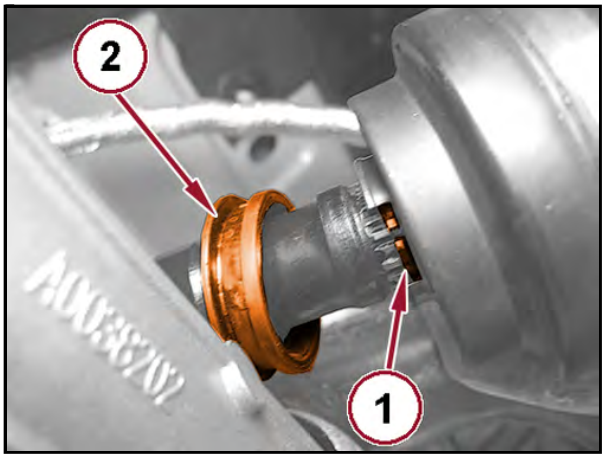
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10. Loosely install the **NEW** bolts (1) for the center support bracket.



11. Connect the propeller shaft (1) to PTU, verify the snap ring is (1) seated in the groove of the propeller shaft.

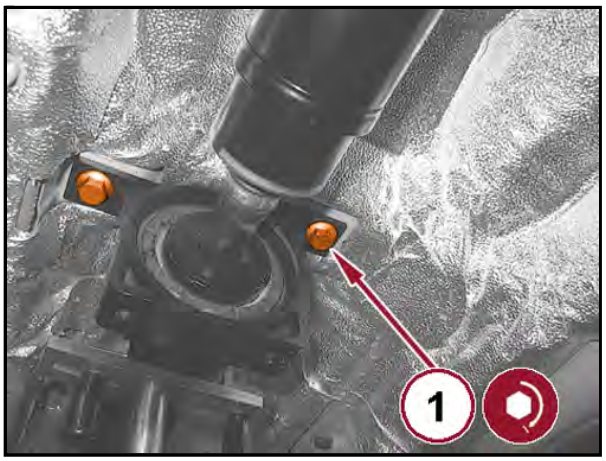
12. Position the new dust cover (2) over the joint at the front of the propeller shaft.



13. Tighten the center support bracket bolts (1) to the proper (Torque Specifications) .

14. Remove the propeller shaft support tools.

15. Remove the tape and the protective sleeve from the propeller shaft.

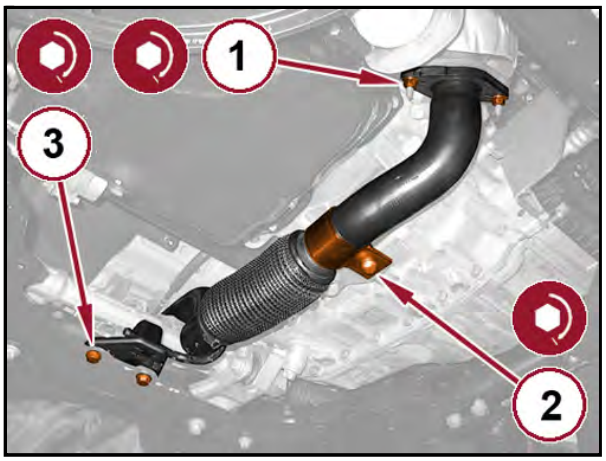


16. Connect the crossunder pipe to the catalytic converter using a **NEW** flange gasket and tighten the **NEW** nuts (1) to the proper (Torque Specifications) .

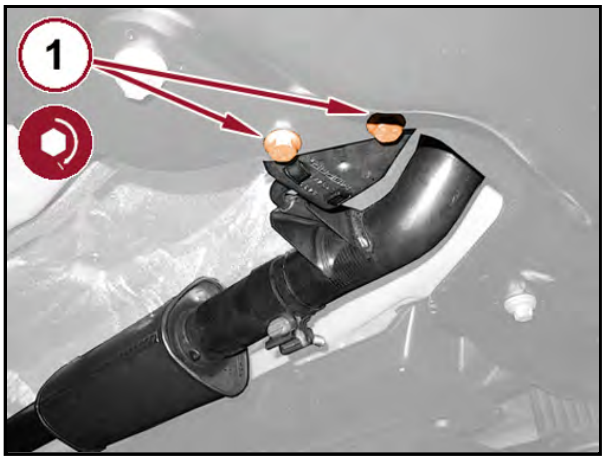
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17. Install the crossunder pipe bracket bolt (2) to the engine and tighten to the proper (Torque Specifications) .

18. Install the crossunder pipe front hanger support bracket bolts (3) and tighten to the proper (Torque Specifications) .



19. Install the bolts (1) securing the rear exhaust hanger bracket supporting the crossunder pipe at the front crossmember and tighten to the proper (Torque Specifications) .



20. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

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03 - Differential and Driveline / Rear Driveline Module / Operation

OPERATION

The primary benefits of All Wheel Drive (AWD) with a Rear Drive Unit (RDU) are:

- Superior straight line acceleration, and cornering on all surfaces.
- Better traction and handling under adverse conditions, resulting in improved hill climbing ability and safer driving.

The AWD system intelligently anticipates/selects front, or AWD in varying torque splits based on conditions, driving style and on a host of "triggers" such as:

- Input to vehicle switches/interfaces such as gear selection; ESC button actuation; wiper settings; and temperature settings
- Environmental influences such as surface grade; vehicle speed; launch characteristics; and relating ESC events
- Dynamic factors including wheel slip; detection of understeer/oversteer; steering angle rate; and acceleration/deceleration rates

Based on all these inputs and more, the system is capable of anticipating, and then delivering infinitely variable amounts of torque combinations between the front and rear driven wheels at launch, all in milliseconds and without driver intervention or feedback.

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03 - Differential and Driveline / Rear Driveline Module / Diagnosis and Testing

REAR DRIVE UNIT (RDU) OPERATION

Driveline module operation requires a relatively straight-forward diagnosis. Refer to the following chart:

CONDITION	POSSIBLE CAUSES	CORRECTION
No All Wheel Drive (AWD) in forward or reverse directions, propeller shaft turning.	1. Check Drivetrain Control Module (DTCM) for DTC's.	1. Review DTCM diagnostic section.
	2. Rear Driveline Unit (RDU) failure.	2. Diagnose and repair or replace as necessary.
No AWD in forward or reverse directions, propeller shaft not turning.	1. Check DTCM for DTC's.	1. Review DTCM diagnostic section.
	2. Power Transfer Unit (PTU) component failure.	2. Diagnose and repair or replace as necessary.
Vibration at all speeds, continuous torque transfer.	1. Mis-matched tires, worn tires on front axle.	1. Replace worn or incorrect (mis-matched) tires with same make and size.

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03 - Differential and Driveline / Rear Driveline Module / Diagnosis and Testing

REAR DRIVE UNIT (RDU) NOISE

Different sources can be the cause of noise that the RDU assembly is suspected of making. Refer to the following causes for noise diagnosis.

REAR DRIVELINE UNIT (RDU) ASSEMBLY NOISE

The most important part of RDU service is properly identifying the cause of failures and noise complaints. The cause of most RDU failures is relatively easy to identify. The cause of RDU noise is more difficult to identify.

If vehicle noise becomes intolerable, every effort should be made to isolate the noise. Many noises that are reported as coming from the RDU may actually originate at other sources. For example:

- Tires
- Road surfaces
- Wheel bearings
- Engine
- Transmission
- Exhaust
- Propeller shaft (vibration)
- Vehicle body (drumming)

RDU noises are normally divided into two categories: gear noise or bearing noise. A thorough and careful inspection should be completed to determine the actual source of the noise before replacing the RDU. Other sources of noise from the rear RDU are the actuator and low fluid level.

The rubber mounting bushings help to dampen-out RDU noise when properly installed. Inspect to confirm that no metal contact exists between the RDU case and the body or suspension cradle. The complete isolation of noise to one area requires expertise and experience. Identifying certain types of vehicle noise baffles even the most capable technicians. Often such practices as:

- Increase tire inflation pressure to eliminate tire noise.
- Listen for noise at varying speeds with different driveline load conditions.
- Swerving the vehicle from left to right to detect wheel bearing noise.

All RDU assemblies produce noise to a certain extent. Slight carrier noise that is noticeable only at certain speeds or isolated situations should be considered normal. Carrier noise tends to peak at a variety of vehicle speeds. The actuator may be audible in certain situations that may be normal. Noise is **NOT ALWAYS** an indication of a problem within the carrier or RDU components.

TIRE NOISE

Tire noise is often mistaken for driveline module noise. Tires that are unbalanced, worn unevenly or are worn in a saw-tooth manner are usually noisy. They often produce a noise that appears to originate in the driveline module.

Tire noise changes with different road surfaces, but driveline module noise does not. Inflate all four tires with approximately 20 psi (138 kPa) more than the recommended inflation pressure (for test purposes only). This will alter noise caused by tires, but will not affect noise caused by the differential. Rear axle noise usually ceases when coasting at speeds less than 30 mph (48 km/h); however, tire noise continues, but at a lower frequency, as the speed is reduced.

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After test has been completed lower tire pressure back to recommended pressure.

GEAR NOISE (DRIVE PINION AND RING GEAR)

Abnormal gear noise is rare and is usually caused by scoring on the ring gear and drive pinion. Scoring is the result of insufficient or incorrect lubricant in the carrier housing.

Abnormal gear noise can be easily recognized. It produces a cycling tone that will be very pronounced within a given speed range. The noise can occur during one or more of the following drive conditions:

- Drive
- Road load
- Float
- Coast

Abnormal gear noise usually tends to peak within a narrow vehicle speed range or ranges. It is usually more pronounced between 30 to 40 mph (48 to 64 km/h) and 50 to 60 mph (80 to 96 km/h). When objectionable gear noise occurs, note the driving conditions and the speed range.

BEARING NOISE (DRIVE PINION AND DIFFERENTIAL)

Defective bearings produce a rough growl that is constant in pitch and varies with the speed of vehicle. Being aware of this will enable a technician to separate bearing noise from gear noise.

Drive pinion bearing noise that results from defective or damaged bearings can usually be identified by its constant, rough sound. Drive pinion front bearing is usually more pronounced during a coast condition. Drive pinion rear bearing noise is more pronounced during a drive condition. The drive pinion bearings are rotating at a higher rate of speed than either the differential side bearings or the axle shaft bearing.

Differential side bearing noise will usually produce a constant, rough sound. The sound is much lower in frequency than the noise caused by drive pinion bearings.

Bearing noise can best be detected by road testing the vehicle on a smooth road (black top). However, it is easy to mistake tire noise for bearing noise. If a doubt exists, the tire treads should be examined for irregularities that often causes a noise that resembles bearing noise.

ENGINE AND TRANSMISSION NOISE

Sometimes noise that appears to be in the driveline module assembly is actually caused by the engine or the transmission. To identify the true source of the noise, note the approximate vehicle speed and/or RPM when the noise is most noticeable. Stop the vehicle next to a flat brick or cement wall (this will help reflect the sound). Place the transmission in **NEUTRAL**. Accelerate the engine slowly up through the engine speed that matches the vehicle speed noted when the noise occurred. If the same noise is produced, it usually indicates that the noise is being caused by the engine or transmission.

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03 - Differential and Driveline / Rear Driveline Module / Specifications

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Rear Drive Unit (RDU) Mounting Bolts	90 + 45°	66 + 45°	-	
Center Bearing Support Bolts	50	37	-	Do not reuse these fasteners. If removed, a **NEW** fastener must be installed and tightened to specifications.

RDM SPECIFICATIONS

DESCRIPTION	SPECIFICATION
DIFFERENTIAL FLUID FILL CAPACITY	0.6 Liters

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03 - Differential and Driveline / Rear Driveline Module / Special Tools

SPECIAL TOOLS

Tool (EMEA)	Tool (NAFTA)	Name	Function
2000043000	*	Axle Support Fixture	Support Axle
2000043400	*	Adjustable Bracket	Support Axle
2019500030	*	Elastic Ring Spreader	Removing Rear Drive Shaft
*Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

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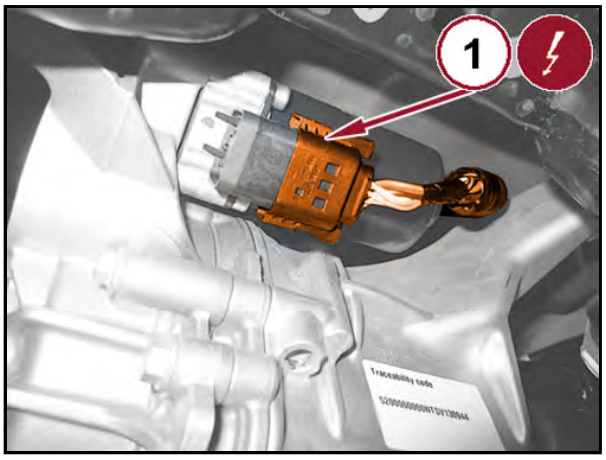
03 - Differential and Driveline / Rear Driveline Module / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

CAUTION: Propeller shaft installation is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to the transmission or rear axle flanges. A helper is required. If a propeller shaft section is hung unsupported, damage may occur to the shaft, coupler, and/or center bearing from over-angulation. This may result in driveline vibrations and/or component failure.

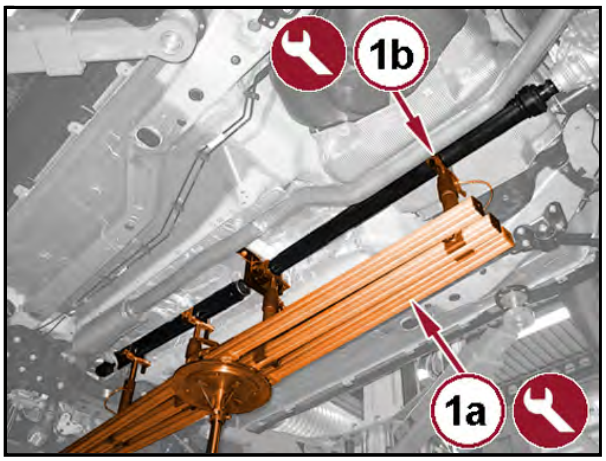
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
2. Remove the muffler (Refer to 11 - Exhaust System/MUFFLER, Exhaust/Removal and Installation) .
3. Remove both rear tires and wheels (Refer to 22 - Tires and Wheels/Removal and Installation) .
4. Remove the rear suspension knuckles with hub and bearings (Refer to 17 - Rear Suspension/KNUCKLE, Rear/Removal and Installation) .
5. Remove both rear halfshafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .
6. Remove the rear stabilizer bar (Refer to 17 - Rear Suspension/STABILIZER BAR, Rear Suspension/Removal and Installation) .
7. Disconnect the electrical connector (1) of the differential actuator.



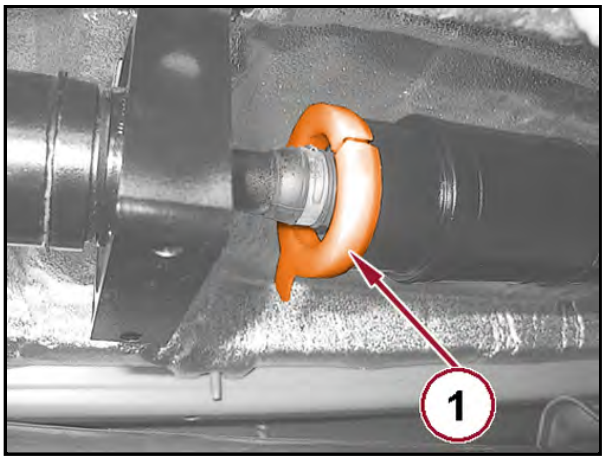
NOTE: Protect the propeller shaft coating with a suitable duct tape to prevent any scratches caused by the propeller shaft support tools.

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8. Position support tools 2000043000 (1b) and 2000043400 (1a) under the propeller shaft.



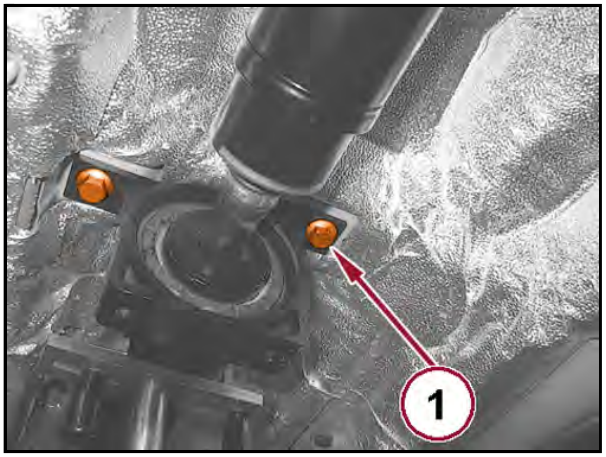
CAUTION: **Do not allow the propeller shaft to hang from the vehicle unsupported. Damage may occur to the joint, boot, and center bearing from over-angulation.**



9. Install the protective sleeve (1) at the center propeller shaft joint to protect the boot as shown.

NOTE: **The protective sleeve is provided in the parts package with the dust cover and snap rings for the propeller shaft.**

10. Remove the propeller shaft center support bolts (1).

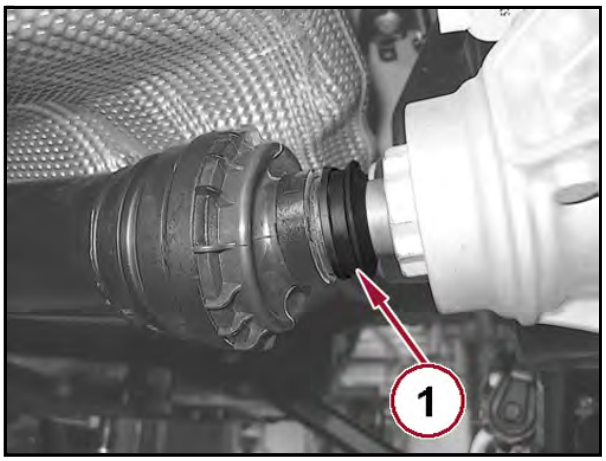


NOTE:

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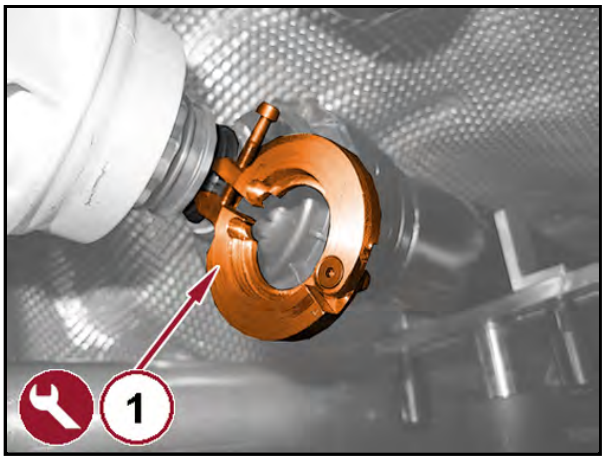
The dust cover must be replaced every time the propeller shaft is removed.

11. Slide the dust cover (1) at the rear of the propeller shaft towards the differential to access the snap ring.

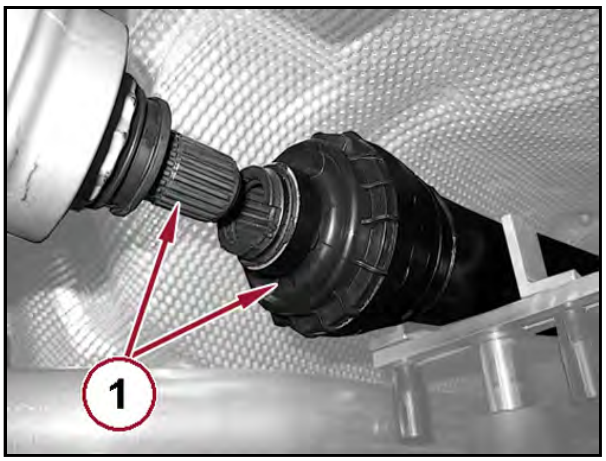


NOTE: The snap ring must be replaced every time the propeller shaft is removed.

12. Use tool 2019500030 (1) to open propeller shaft snap ring at the Rear Driveline Unit (RDU).



13. Disconnect the propeller shaft from the pinion of the RDU (1).

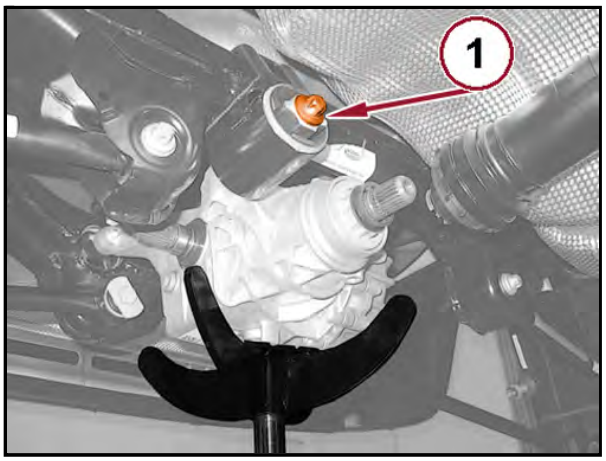


14. Remove the tool 2019500030.

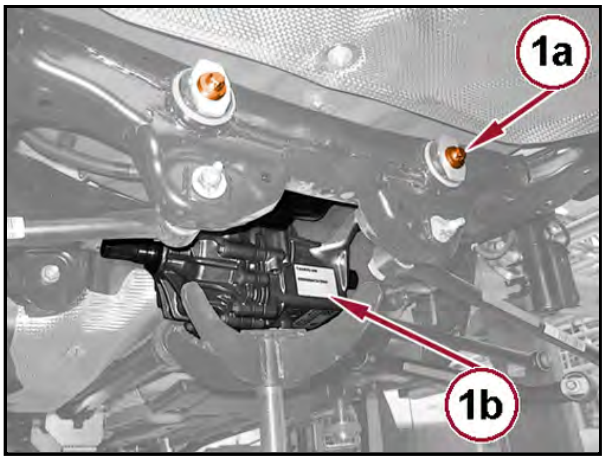
15. Position a suitable hydraulic lift to support the RDU and remove the front RDU mounting bolt

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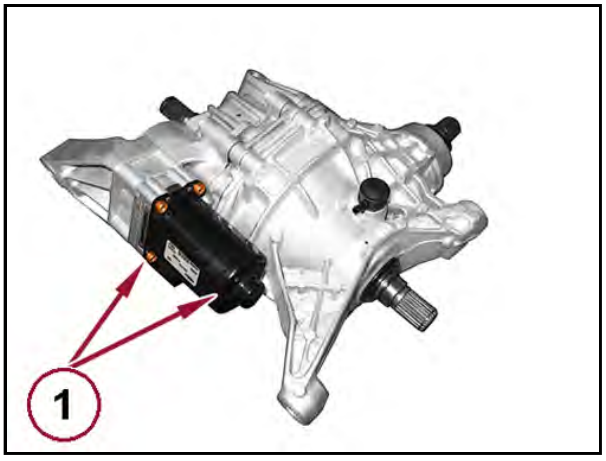
(1).



16. Remove the rear RDU isolator through bolts (1a) and remove the RDU (1b).



17. If necessary, remove the screws and the actuator (1) from the RDU.

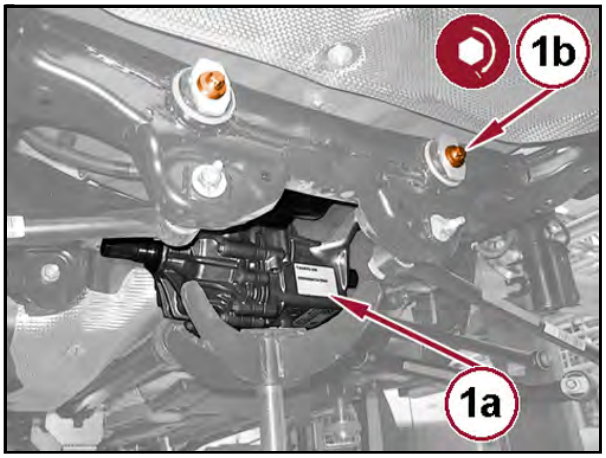


INSTALLATION

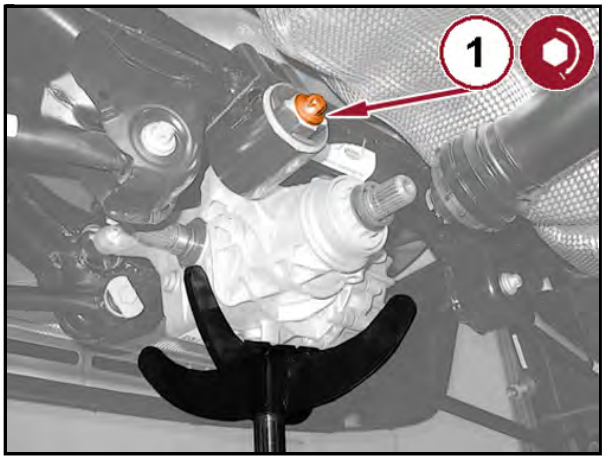
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CAUTION: **Propeller shaft installation is a two-person operation. Never allow propeller shaft to hang from the center bearing, or while only connected to the transmission or rear axle flanges. A helper is required. If a propeller shaft section is hung unsupported, damage may occur to the shaft, coupler, and/or center bearing from over-angulation. This may result in driveline vibrations and/or component failure.**

1. If removed, install the Rear Driveline Unit (RDM) actuator and tighten the screws.
2. Raise the RDU (1a) into position and tighten the through bolts (1b) to the proper (Torque Specifications) .

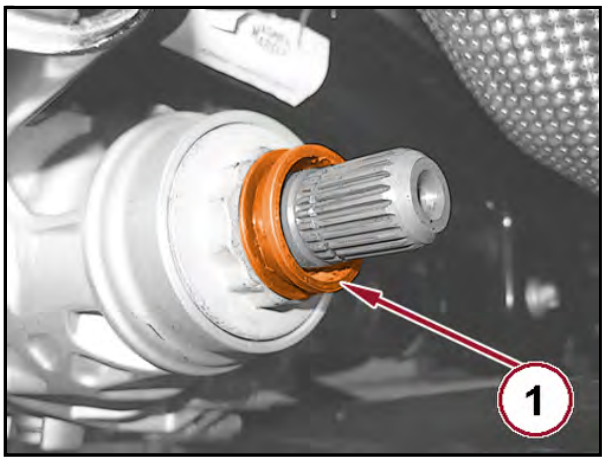


3. Install the front RDU mounting bolt (1) and tighten to the proper (Torque Specifications) .

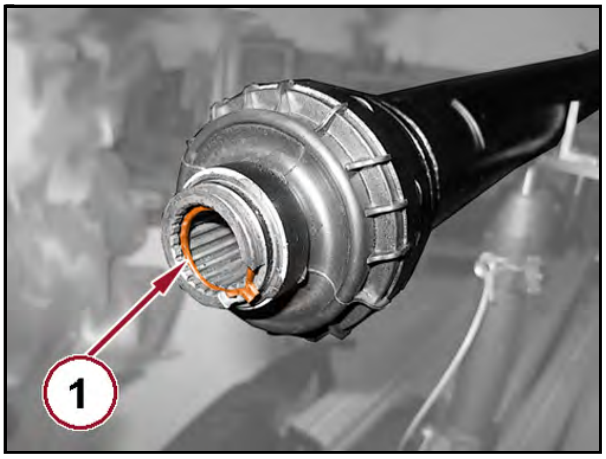


4. Remove the hydraulic lift.
5. Install a new dust seal (1) on the pinion shaft of the RDU.

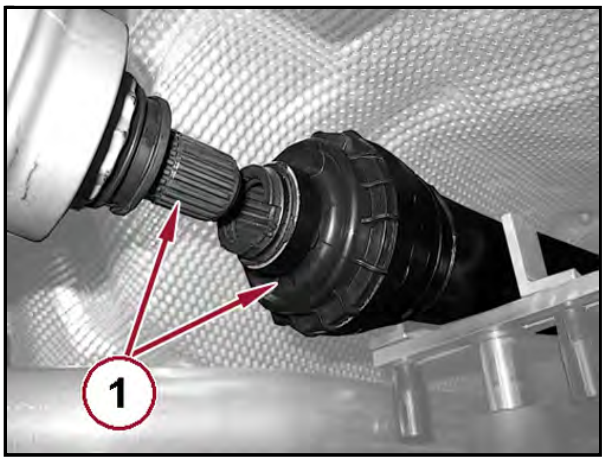
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6. Install a new snap ring (1) in the drive shaft.

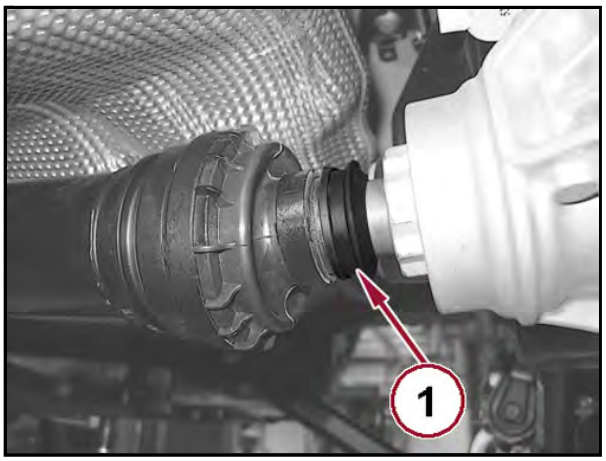


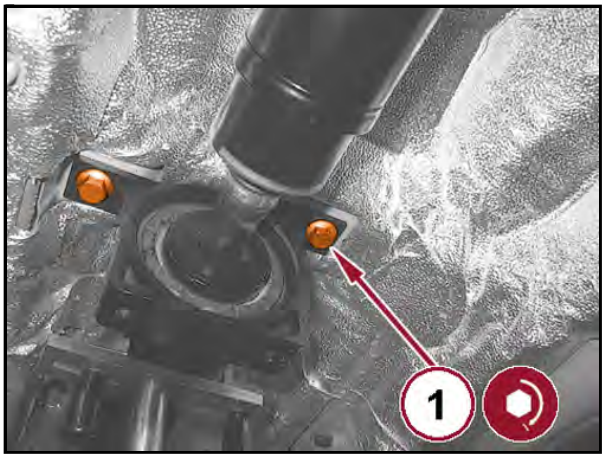
7. Connect the propeller shaft to the pinion of the RDU, verify the snap ring is seated in the groove on the pinion shaft.



8. Position the new dust cover over the joint at the rear of the propeller shaft.

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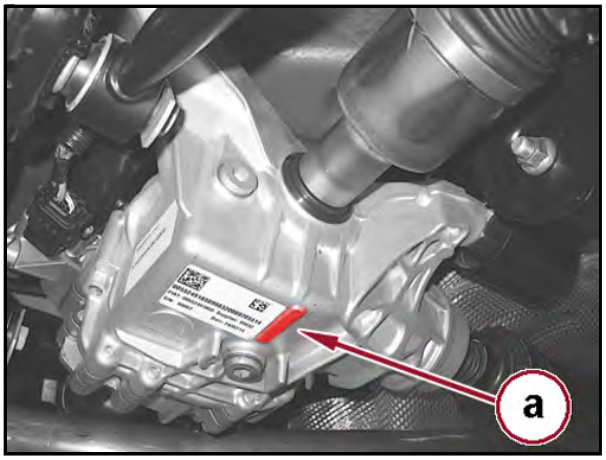
9. Install the propeller shaft center support bolts and tighten to the proper (Torque Specifications) .

10. Remove the propeller shaft support tools.

11. Remove the tape and the protective sleeve from the propeller shaft.

12. Connect the differential actuator wire harness connector.

NOTE: **If replacing the RDU, it is necessary to record the last two characters of the code in the area indicated (a) of the new RDU for performing the self learning procedure.**



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13. When replacing the RDU connect the diagnostic scan tool, enter Miscellaneous Functions of the DriveTrain Control Module (DTCM) and run the self-learning procedure for the RDU.

14. Check and correct the fluid level in the RDU (Refer to 03 - Differential and Driveline/Rear Driveline Module/FLUID, Differential/Standard Procedure) .

15. Install the rear stabilizer bar (Refer to 17 - Rear Suspension/STABILIZER BAR, Rear Suspension/Removal and Installation) .

16. Install the rear halfshafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

17. Install the rear knuckles (Refer to 17 - Rear Suspension/KNUCKLE, Rear/Removal and Installation) .

18. Install the rear tires and wheels (Refer to 22 - Tires and Wheels/Removal and Installation) .

19. Install the muffler (Refer to 11 - Exhaust System/MUFFLER, Exhaust/Removal and Installation) .

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03 - Differential and Driveline / Rear Driveline Module / FLUID, Differential / Standard Procedure

DIFFERENTIAL FLUID LEVEL CHECK

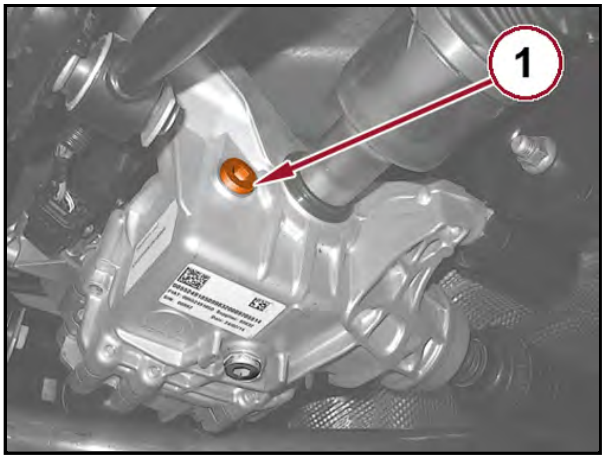
NOTE: The rear differential oil change is not a scheduled maintenance service.

NOTE: The RDM oil must not be drained during normal level checks.

NOTE: Be sure the vehicle is on a level surface, or is hoisted in a level manner, in order to obtain the correct fill level.

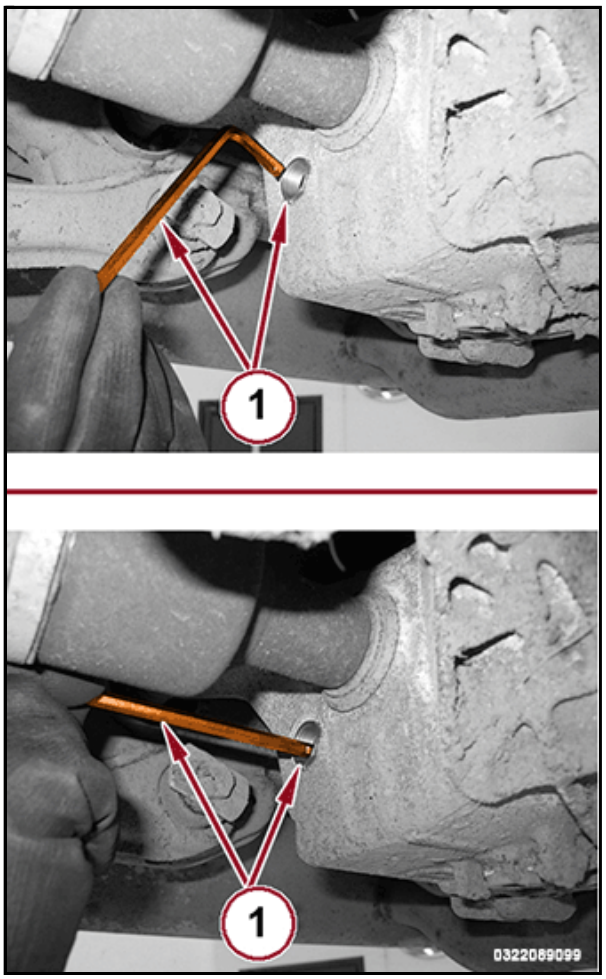
NOTE: If this procedure is not carried out as described exactly, including waiting times, the oil level may vary by more than 3 mm.

1. With the car in SNOW mode, drive at 30 km/h for 5 minutes.
2. Drive back to the workshop, position the vehicle on the hoist, stop the engine and after one hour check the RDM oil level as described below.
3. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting - Standard Procedure) .
4. Remove the rear differential oil filler cap (1).

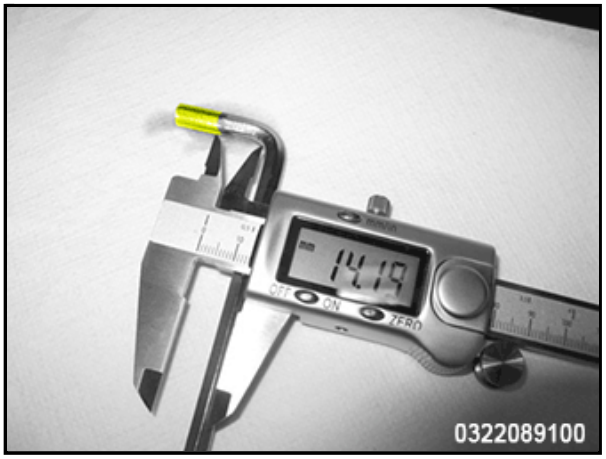


5. Insert a suitable hex wrench (1) in the filler hole to submerge the short branch of the wrench in the oil holding the long branch perfectly horizontal.
6. Very carefully remove the hex wrench (1) from the hole.

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7. With a digital caliper, check that the position shown in the figure is comprised between 13 - 15 mm.



8. If necessary, add the specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .

9. Clean the differential fill plug and install a **NEW** gasket. Install the fill plug and tighten.

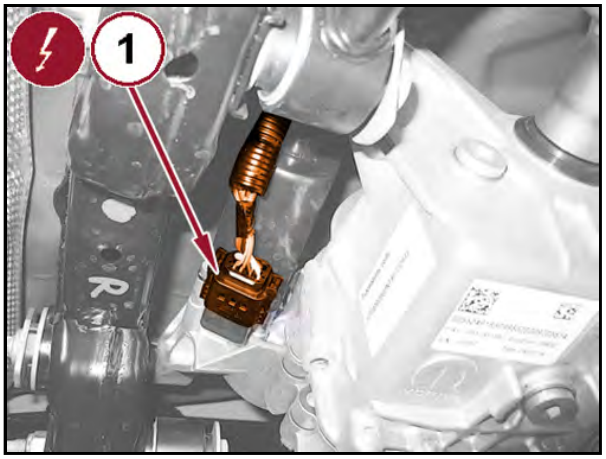
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03 - Differential and Driveline / Rear Driveline Module / ACTUATOR, Axle Shaft / Removal and Installation

REMOVAL AND INSTALLATION

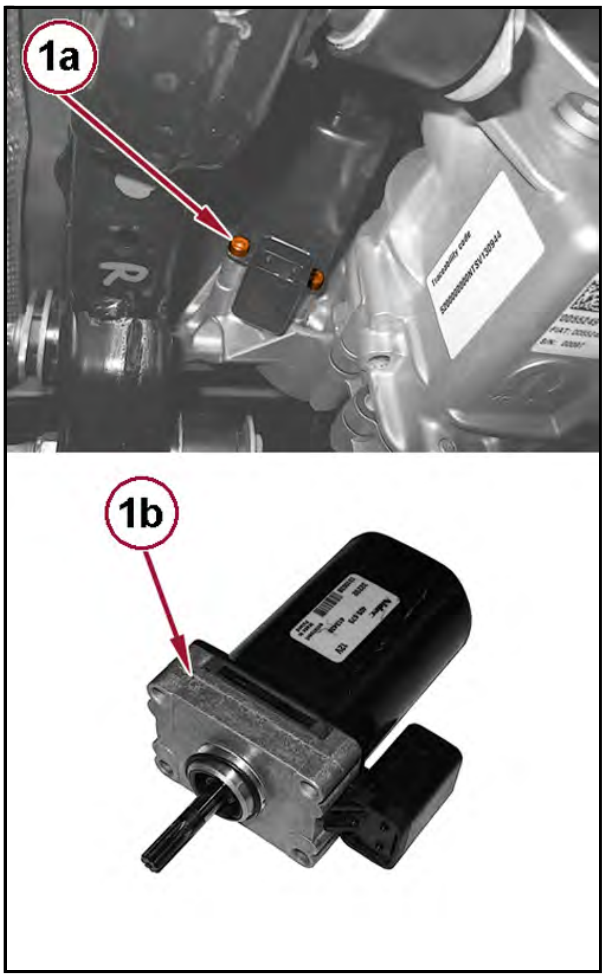
REMOVAL

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Disconnect the wire harness connector (1) at the rear differential actuator.



3. Remove the screws (1a) and remove the rear differential actuator (1b).

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INSTALLATION

1. Install the rear differential actuator and tighten the screws.

2. Connect the wire harness connector at the rear differential actuator.

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Diagnosis and Testing

DIAGNOSIS AND TESTING - AUTOMATIC TRANSMISSION - GENERAL CONDITIONS

CAUTION: Before attempting any repair on an automatic transmission, check for Diagnostic Trouble Codes with the appropriate scan tool.

CAUTION: A unique transmission fluid has been developed for this transmission. This fluid is NOT compatible with ATF+4 or any other current Chrysler transmission fluid. For specifics about this unique fluid see FLUIDS, LUBRICANTS AND GENUINE PARTS .

Transmission malfunctions may be caused by these general conditions:

- poor engine performance.
- improper adjustments.
- hydraulic malfunctions.
- mechanical malfunctions.
- electronic malfunctions.

Diagnosis of these problems should always begin by checking the easily accessible variables: fluid level, fluid condition, and transmission fault codes using the appropriate scan tool. Then perform a road test to determine if the problem has been corrected or if more diagnosis is necessary.

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Diagnosis and Testing

PRELIMINARY DIAGNOSIS

VEHICLE IS DRIVABLE

1. Check for transmission fault codes using the appropriate scan tool.
2. Check fluid level and condition (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .
3. Road test and note how the transmission engages, upshifts, and downshifts.

VEHICLE IS DISABLED

1. Check for transmission fault codes using the appropriate scan tool.
2. Position the vehicle on a hoist with the transmission in neutral (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
3. Check for cracked, leaking cooler lines.
4. Check the fluid level and condition (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .
5. With the transmission in the park position, attempt to rotate half shafts to make sure the transmission output shaft is intact.
6. Check the Transmission Control Module (TCM), wiring, valve body, and solenoids (Utilize fault codes to diagnose if available).

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Diagnosis and Testing

ROAD TEST

Prior to performing a road test, verify that the fluid level, fluid condition, and linkage adjustment is correct.

During the road test, the transmission should be operated in each position to check for slipping and any variation in shifting.

If the vehicle operates properly at highway speeds, but has poor acceleration, the converter stator overrunning clutch may be slipping. If acceleration is normal, but high throttle opening is needed to maintain highway speeds, the converter stator clutch may have seized. Both of these stator defects require replacement of the torque converter and thorough transmission cleaning.

Slipping clutches can be isolated by comparing the “Elements in Use” chart with clutch operation encountered on a road test. This chart identifies which clutches are applied at each position of the selector lever.

A slipping clutch may also set a Diagnostic Trouble Code (DTC) and can be determined by operating the transmission in all selector positions.

948TE 9 Speed Planetary Automatic Transmission with 6 shift elements and 4 planetary gear sets.								
		CLUTCH-A	**CLUTCH-B**	**CLUTCH-C**	**CLUTCH-D**	**CLUTCH-E**	**CLUTCH-F**	**RATIO**
GEAR	**1st**	**X**			**X**		**X**	4.70:1
GEAR	**2nd**	**X**		**X**			**X**	2.84:1
GEAR	**3rd**	**X**	**X**				**X**	1.90:1
GEAR	**4th**	**X**				**X**	**X**	1.38:1
GEAR	**5th**	**X**	**X**			**X**		1.00:1
GEAR	**6th**	**X**		**X**		**X**		0.80:1
GEAR	**7th**	**X**			**X**	**X**		0.69:1
GEAR	**8th**			**X**	**X**	**X**		0.58:1
GEAR	**9th**		**X**		**X**	**X**		0.47:1
GEAR	**N/P**				**X**		**X**	-
GEAR	**R**		**X**		**X**		**X**	3.81:1
Default Gear	**4th Gear**					**X**	**X**	-

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Diagnosis and Testing

EMERGENCY RUNNING FUNCTION - LIMP IN MODE

In the event of a complete transmission electrical failure, loss of power to the Transmission Control Module (TCM), the transmission enters default limp-in mode. When the TCM loses power, all solenoids are de-energized. Maximum pressure locks the transmission in fourth gear, and a Diagnostic Trouble Code (DTC) is stored in memory. If the vehicle is in a forward gear range when the fault occurs, the transmission defaults to fourth gear.

The limp-in function remains active until the DTC is repaired or a stored DTC is erased with an appropriate scan tool.

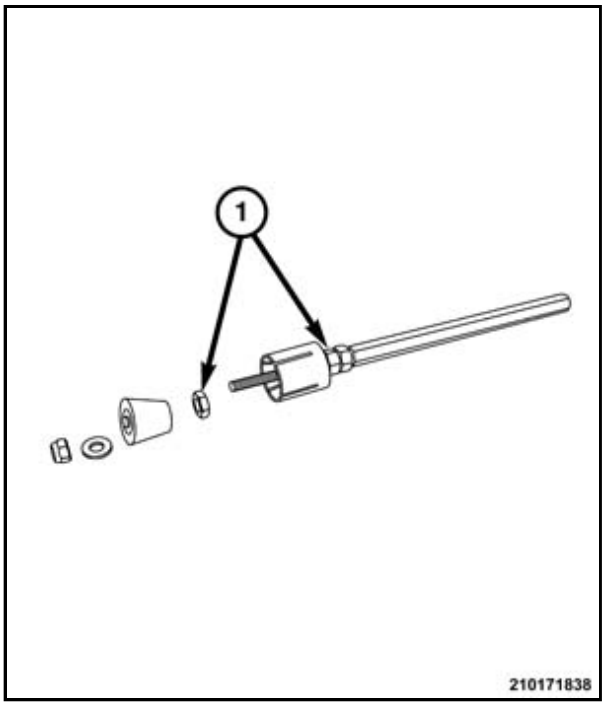
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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Standard Procedures

BEARING TURNING TORQUE MEASUREMENT

⊞ **Special Tools:** Click to display a list of tools used in this procedure
To determine proper select shim thickness for the differential and transfer gear bearings, the turning torque must be measured. If just the differential or transfer gear bearings are being replaced it is not necessary to measure the bearing turning torque. The original factory installed shims will be sufficient to properly preload the bearings when the transmission is assembled. If the differential, transfer gear, or transmission housing castings are replaced the differential and transfer gear bearing turning torque will need to be reestablished.

Verify that the bearings and races are **NEW** and properly installed on/in clean components with the factory installed select shims behind the bearing races. Lightly lubricate the bearings with transmission fluid.



TOOL SETUP

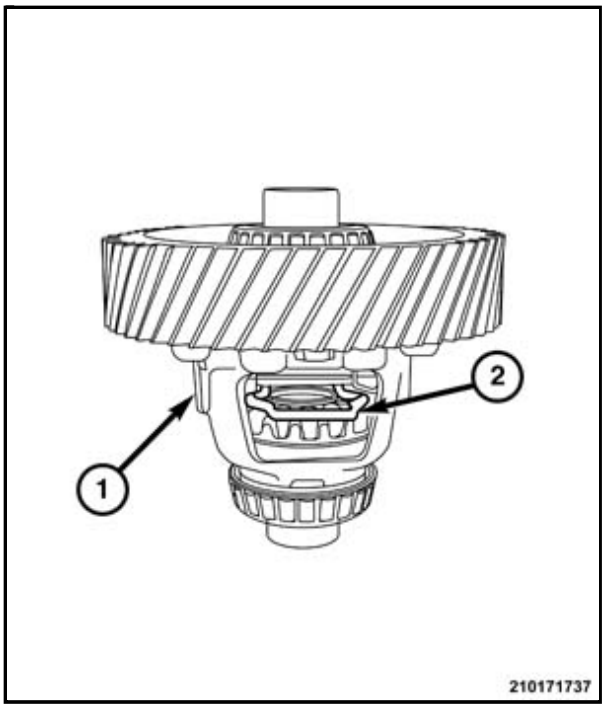
Tool, Differential Bearing Torque C-4995A must be modified to be compatible with the following operation. Two 3/8-24 nuts (1) must be added to keep the center shaft from rotating in the cone and sleeve.

1. Remove the nylok™ nut and expander cone from the center shaft.
2. Remove the sleeve from the center shaft.
3. Install a nut on the center shaft and tighten it against the existing nut. Install the sleeve.
4. Install the 2nd nut inside the sleeve just far enough to install the cone and nut.
5. Install the cone and nut tight enough to keep the center shaft from rotating inside the cone and sleeve.

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MEASUREMENT PROCEDURE

1. Position the differential on a clean work surface.
2. Four Wheel Drive (4WD) transmissions do not use tool 10425, there is no differential. For Front Wheel Drive (FWD) and All Wheel Drive (AWD) transmissions, install the lock tool Tool, Pinion and Side Gear Locking 10425 (2) between the differential (1) pinion gears next to the link pin to prevent the differential from rotating.

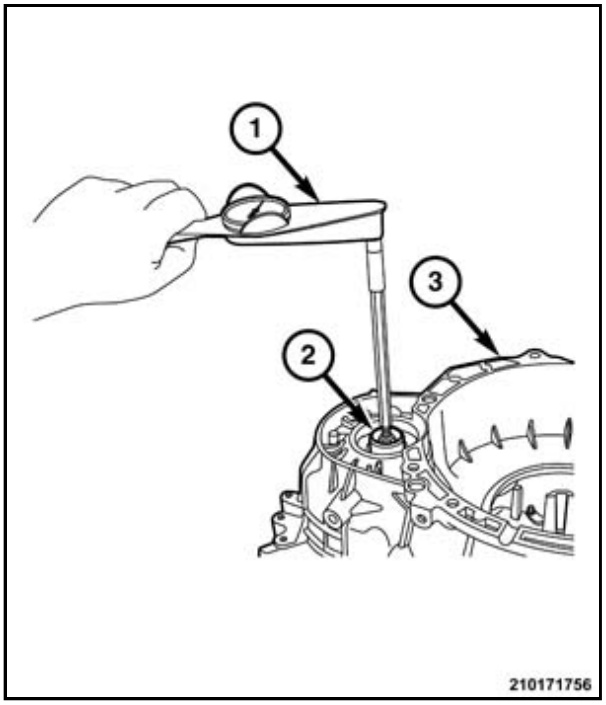


3. Position the transmission and bell housing on a suitable clean work bench.
4. Install new bearing races with the original select shims.
5. Install the differential with new bearings lightly lubricated with transmission fluid in the transmission housing.
6. Install the bell housing.
7. Install the bolts to hold the bell housing to the transmission housing. Tighten bolts to 50% of the specified torque value (Torque Specifications) .
8. Insert modified tool Tool, Differential Bearing Torque C-4995A into the differential until the sleeve (C-4995-1) enters the halfshaft spline in the differential side gear.
9. Tighten the nut until the sleeve expands tightly in the side gear.
10. Tighten the jamb nut to prevent the center shaft from rotating in the sleeve.

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11. Using a suitable wrench, rotate the differential 20 rotations clockwise and 20 rotations counterclockwise.

12. Using a torque wrench (1), measure the turning torque of the differential (2) after the initial break away. It should measure between 1.7 to 2.8 N.m (15 and 25 in lbs).



13. Adjust the turning torque by adding to or subtracting from the thickness of the select shims behind the differential bearing races.

14. After achieving proper differential turning torque, separate the bell housing from the transmission housing.

15. Install the transfer gear with new bearings into the transmission housing.

16. Install the bell housing.

17. Install the bolts to hold the bell housing to the transmission housing. Tighten bolts to 50% of the specified torque value (Torque Specifications) .

NOTE: The turning torque of the differential and the transfer gear will be higher than the differential alone. The ring gear is driving a smaller gear on the transfer shaft.

18. Using a suitable wrench, rotate the differential 20 rotations clockwise and 20 rotations counterclockwise.

19. Using a torque wrench (1), measure the turning torque of the differential (2) after the initial break away. It should measure between 3.4 to 6.8 N.m (35 and 60 in lbs).

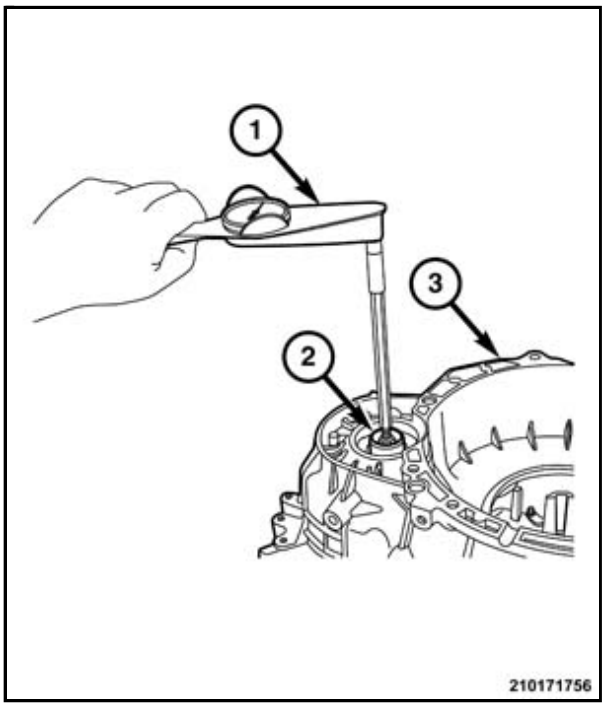
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20. Adjust the turning torque by adding to or subtracting from the thickness of the select shims behind the transfer shaft bearing races.

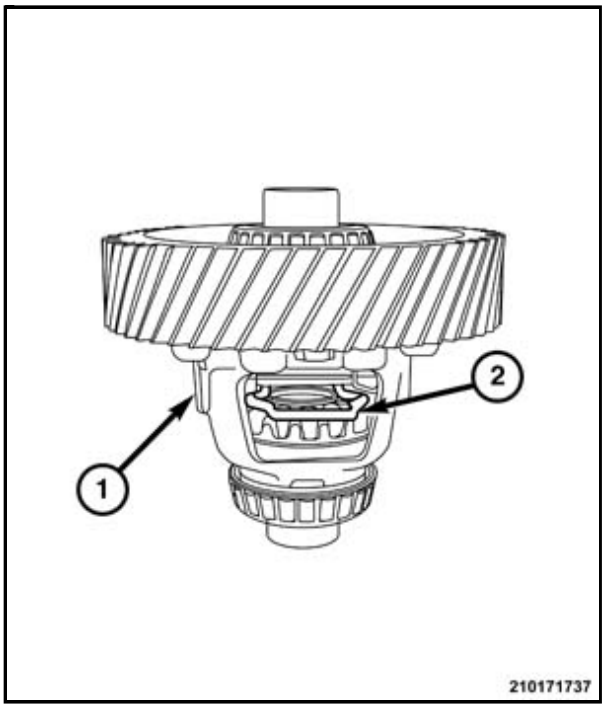
21. Remove tool C-4995 from the differential.

22. Separate the bell housing from the transmission housing.

23. Remove the differential (1) and transfer gear (2).



24. On FWD and AWD transmissions, remove lock tool 10425 (2) from the differential (1).



25. Prepare transmission components for final assembly.

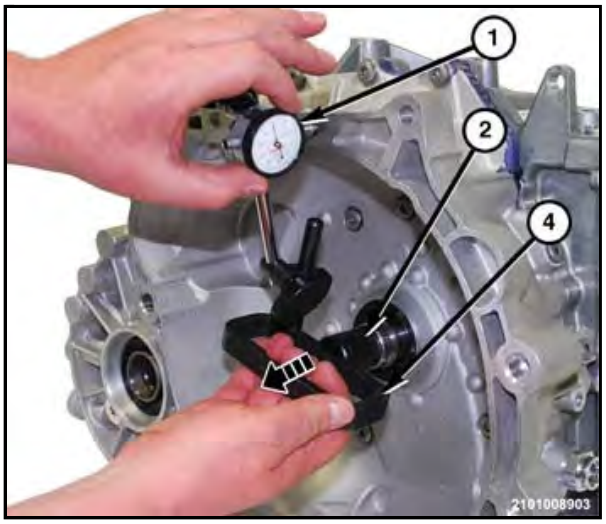
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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Standard Procedures

INPUT SHAFT END PLAY MEASUREMENT

Special Tools: Click to display a list of tools used in this procedure
Before disassembling the 948TE transmission measure the end play of the input shaft. This will aid in the assembly process when selecting a select shim.

1. Place the transmission on a suitable clean work surface.
2. Remove the torque converter.
3. Use tools End Play Socket Set 8266B and Set, Dial Indicator C-3339A attached to the input shaft, to measure the input shaft end play.
4. Attach the dial indicator (1) to the handle 8266-8 (4).
5. Attach the handle (4) to the spline adapter 8266-6 (2).
6. Attach the spline adapter (2) to the input shaft.
7. Position the dial indicator plunger on the bellhousing rim.
8. Pull outward on the handle (4)and zero the dial indicator face (1).



9. Push inward on the handle and read the dial indicator (1).
10. Record the measurement as a reference number for selecting the proper thickness select spacer when assembling the transmission.



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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Specifications

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Transmission Bolts (2.4L MultiAir)	70	52	-	
Flexplate to Torque Converter Bolts	40	30	-	If removed, a **NEW** fastener must be installed and tightened to specifications.

948TE Internal Tightening Specifications

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Bolt - Pan to Case- Oil	10	-	88	
Valve Body to Case Bolts	8	-	71	
Valve Body Bolts	6	-	53	
Speed Sensor to Transmission Case Bolt	5.5	-	49	

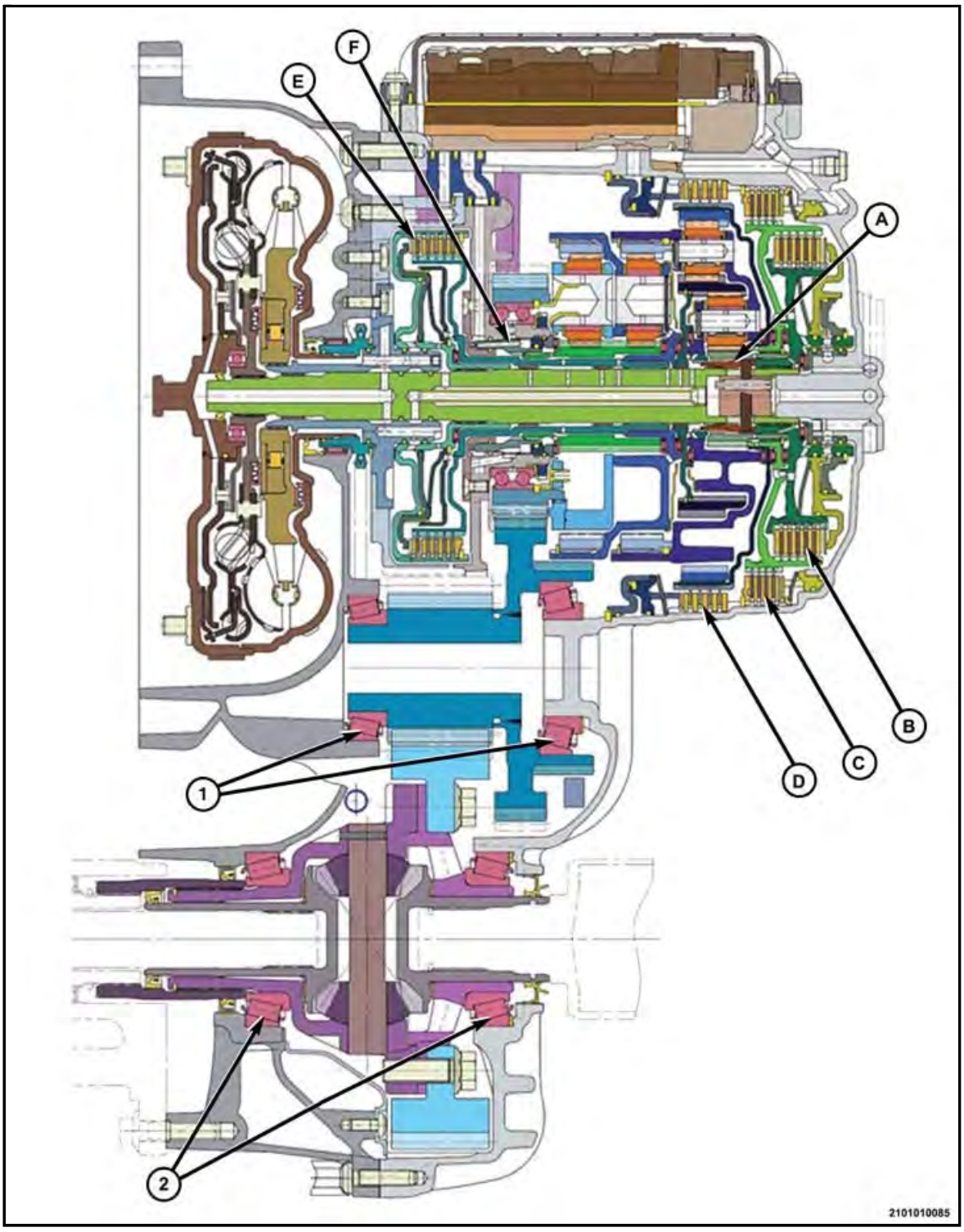
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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Specifications

CLUTCH SPECIFICATIONS

The B, C, D and E clutch clearance must be measured and properly set during the assembly process of the 948TE/9HP48 transmission. The recommended measurement procedures can be found in the Standard Procedures section of this chapter.

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Clutch Composition

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A - Clutch	Dog Clutch
B - Clutch	5 Discs
C - Clutch	4 Discs
D - Clutch	4 Discs
E - Clutch	5 Discs
F - Clutch	Dog Clutch

Clutch Clearance

B-clutch = 1.28 - 1.77 (0.050 - 0.070 in)	C-clutch = 0.76 - 1.15 (0.030 - 0.045 in)
D-clutch = 1.01 - 1.50 (0.040 - 0.059 in)	E-clutch = 1.28 - 1.77 (0.050 - 0.070 in)

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Specifications

TRANSMISSION GEAR RATIOS

Gear ratios for the 948TE/9HP48 automatic transmission are as follows:

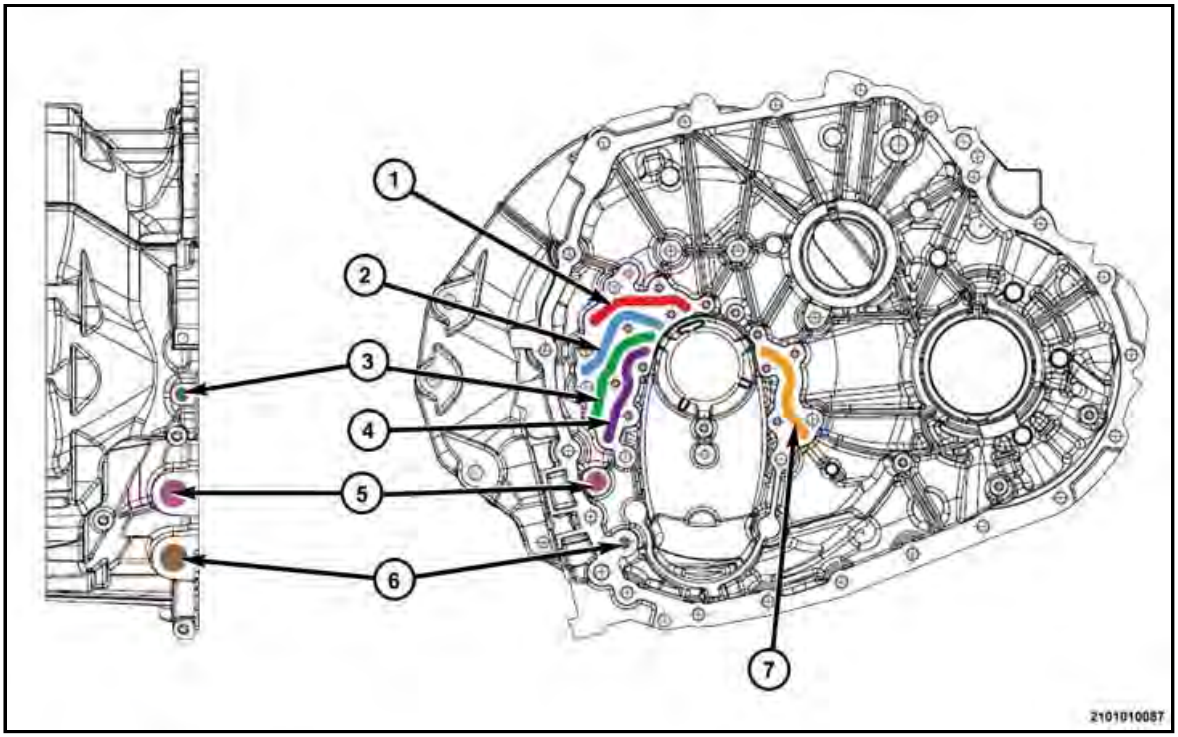
GEAR	RATIO	FINAL DRIVE RATIO (4.334:1) 2.0 TURBO DIESEL 170HP
1ST	4.70:1	20.369:1
2ND	2.842:1	12.317:1
3RD	1.909:1	8.273:1
4TH	1.382:1	5.989:1
5TH	1.00:1	4.334:1
6TH	0.808:1	3.501:1
7TH	0.699:1	3.029:1
8TH	0.58:1	2.513:1
9TH	0.479:1	2.075:1
REVERSE	3.805:1	16.490:1

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Schematics and Diagrams

INTERNAL HYDRAULIC PASSAGES

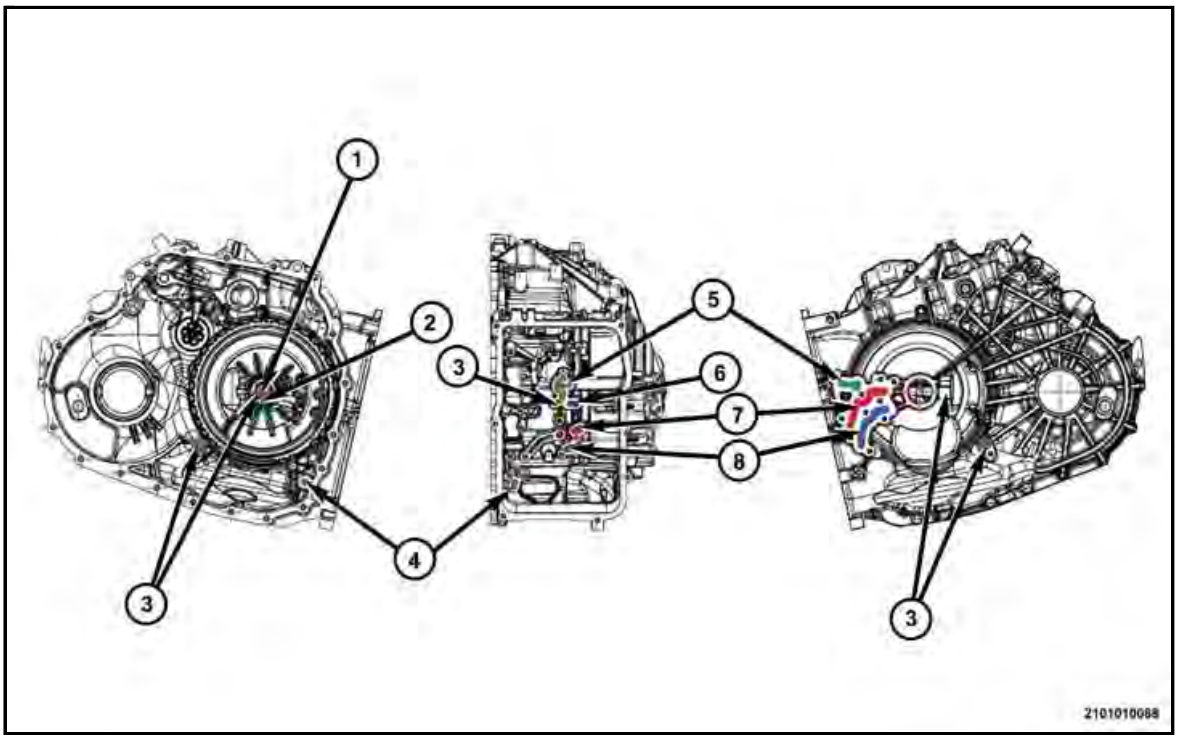
Provided in the following illustrations are the locations of hydraulic passages that will aid in diagnosing leaks and clutch malfunctions.



Hydraulic Ports In Bellhousing

1= Dog Clutch A - OFF	2= Clutch E
3= Torque Converter Open	4= Dog Clutch F - OFF
5= From Cooler	6= To Cooler
7= Dog Clutch F - ON	

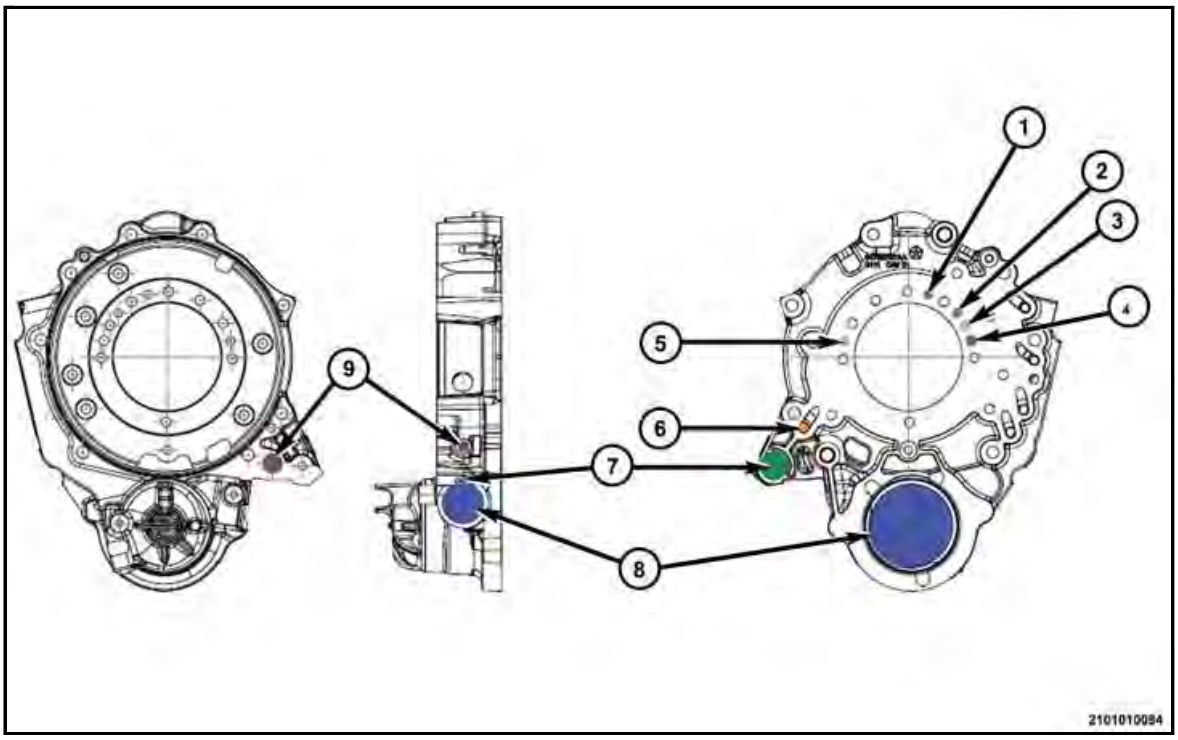
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Hydraulic Ports In Housing

1= Dog Clutch A - ON	2= Clutch B
3= Lubrication	4= To Cooler
5= Clutch C	6= Clutch D
7= Dog Clutch A - ON	8= Clutch B

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Hydraulic Ports In Intermediate Support Plate

1= Dog Clutch A - OFF	2= Clutch E
3= Clutch J	4= Dog Clutch F - OFF
5= Dog Clutch F - ON	6= Front Lubrication
7= Rear Lubrication	8= Pump
9= From Cooler	

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SPECIAL TOOLS

Tool (EMEA)	Tool (NAFTA)	Name	Function
1860898000	*	Anti-torque	Flywheel Retainer
2000040436	8434B	Support Kit	Power Train Support
2000040963	10323A	Dipstick	Checking the automatic transmission oil level 948 TE
*Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

The automatic transmission is removed from the vehicle as an assembly with the engine and separated from the engine outside of the vehicle, (Refer to 09 - Engine/Removal and Installation) .

INSTALLATION

NOTE: If installing a new transmission, remove the shipping cap from the vent.

The automatic transmission is joined to the engine outside of the vehicle and then installed into the vehicle as an assembly with the engine, (Refer to 09 - Engine/Removal and Installation) .

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / Disassembly and Assembly

DISASSEMBLY AND ASSEMBLY

⊞ **Special Tools:** Click to display a list of tools used in this procedure

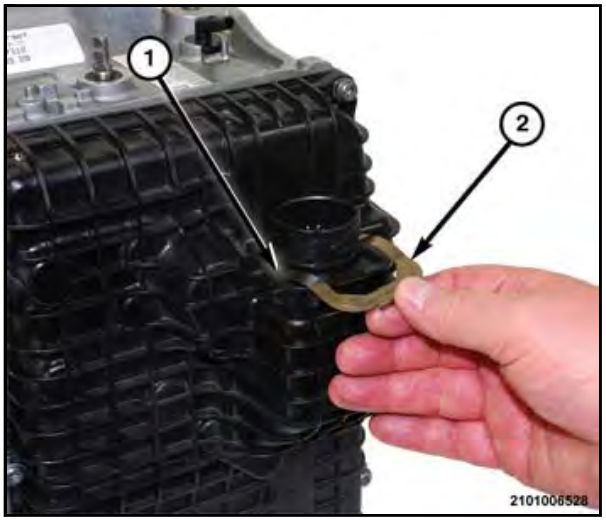
DISASSEMBLY

The 948TE automatic transmission can be overhauled if the vehicle is beyond it's warranty coverage. Verify that the vehicle is no longer covered by warranty before proceeding with this procedure. A clean work area is necessary to assure a properly functioning transmission after the overhaul procedures are completed. Special tools have been developed and are required to disassemble this transmission. Acquire all of the special tools before starting this procedure.

WARNING: Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.

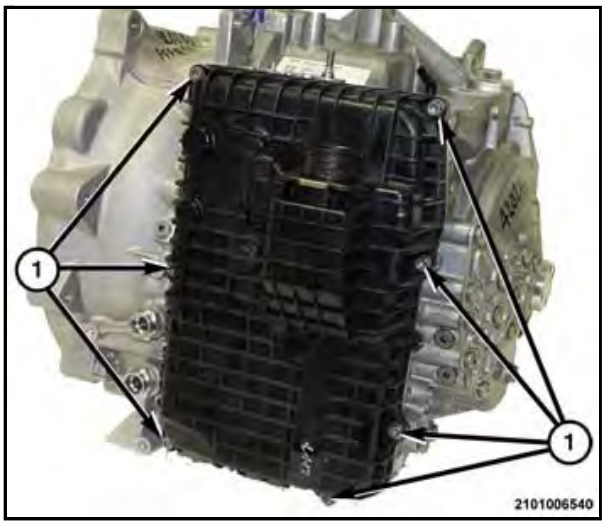
CAUTION: Tag all snap rings, thrust washers, washers, spacers and thrust bearings, etc. during disassembly for quick identification and assembly. Failure to follow these instructions will damage and cause transmission failure.

1. Before disassembling the transmission, remove any oily grime and loose dirt. Place the transmission on a clean work surface with ample fluid drainage or absorbency.
2. Remove the clip (2) holding the transmission solenoid connector (1) in the valve body cover pan.

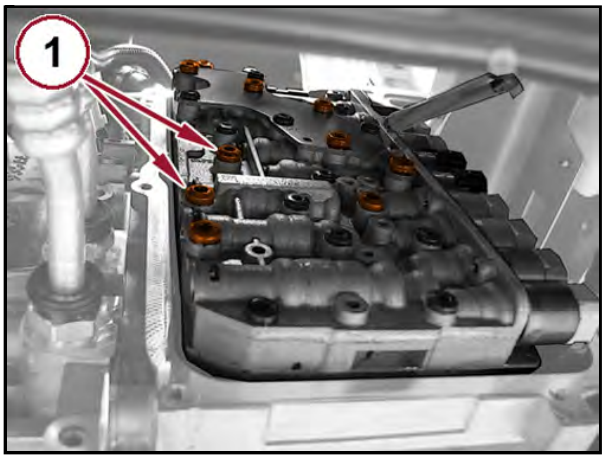


3. Remove the valve body cover pan bolts (1) and the valve body cover pan.

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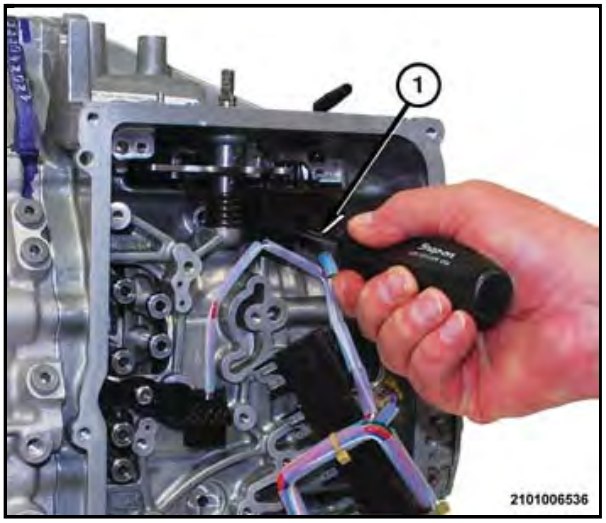


4. Remove the ten bolts (1) holding the valve body to the transmission housing.



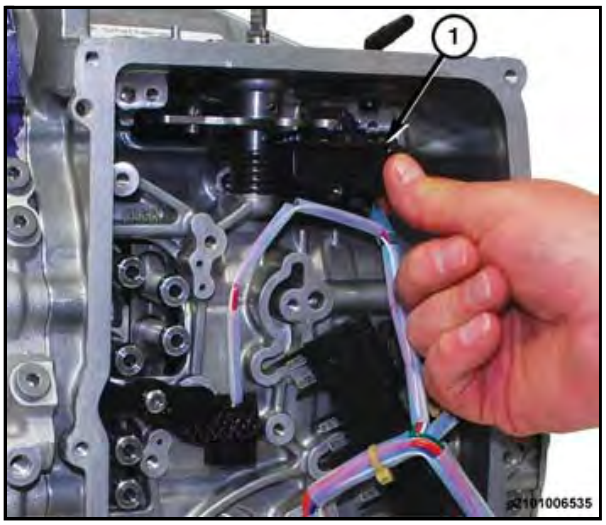
5. Using a suitable prying tool, pry the valve body away from the adapter tubes.

6. Remove the Transmission Range Sensor (TRS) screw (1).

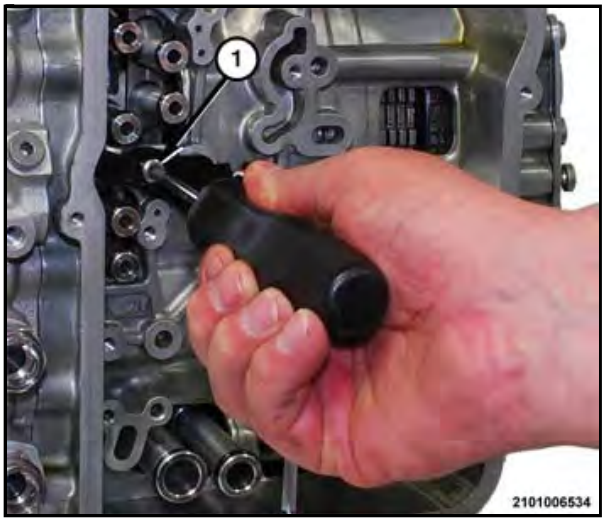


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7. Separate the TRS (1) from the transmission with the wire harness connected.



8. Remove the speed sensor screw (1).



9. Separate the speed sensor (1) from the transmission with the wire harness connected.

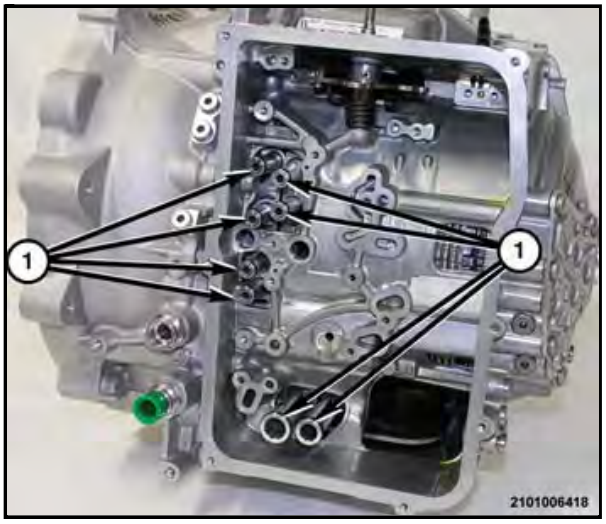


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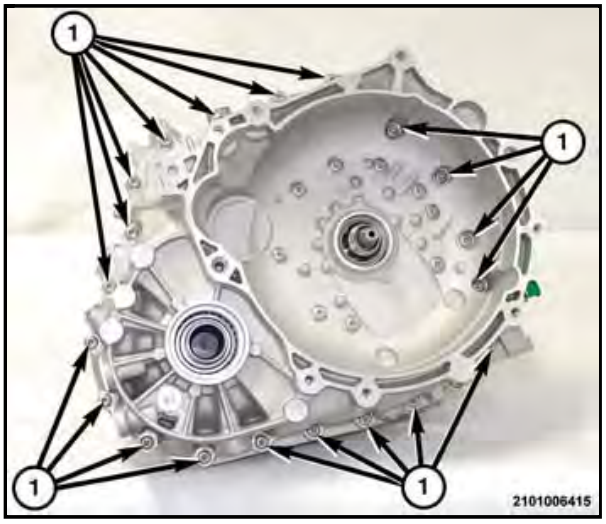
10. Separate the valve body from the transmission.

    NOTE: If the valve body is to be reused without disassembling it, store the valve body in a clean area until it is installed.

11. Using suitable pliers, remove the fluid adapter tubes (1) from the transmission.

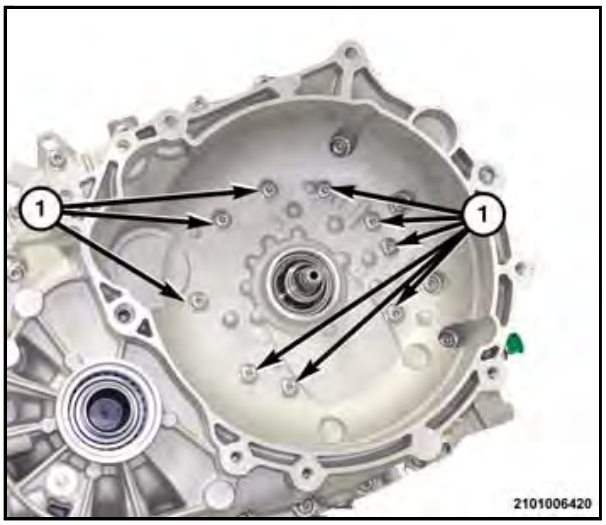


12. From around the perimeter of the transmission, remove the bellhousing bolts (1) holding the bellhousing to the transmission housing.



13. Remove the bellhousing bolts (1) holding the bellhousing to the output gear support.

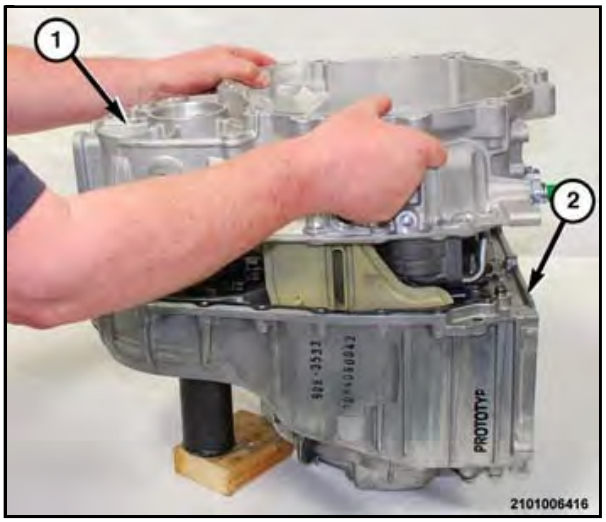
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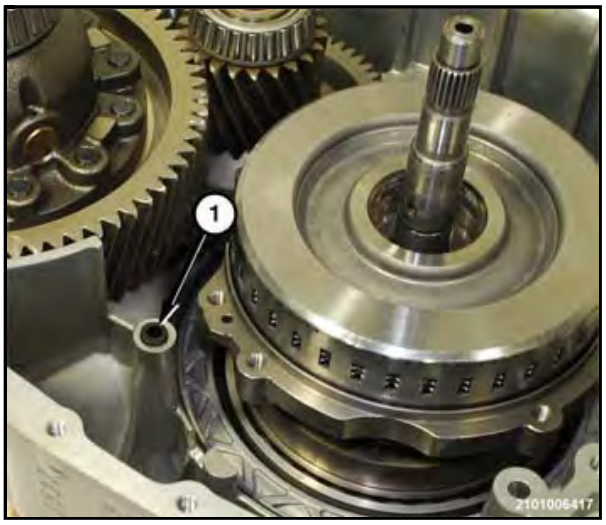
14. Using wooden blocks to stabilize the transmission on the work surface, position the transmission on the bench with the bellhousing facing upward.

15. Using a suitable pry-bar in the pry point locations, pry upward to dislodge the bellhousing from the transmission housing.

16. Lift the bellhousing (1) upward and separate the assembly from the transmission housing (2).

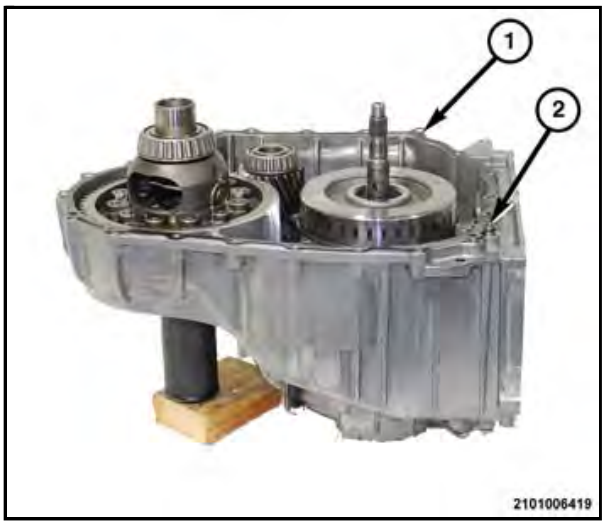


17. Remove the seal (1) from the port in the transmission housing.

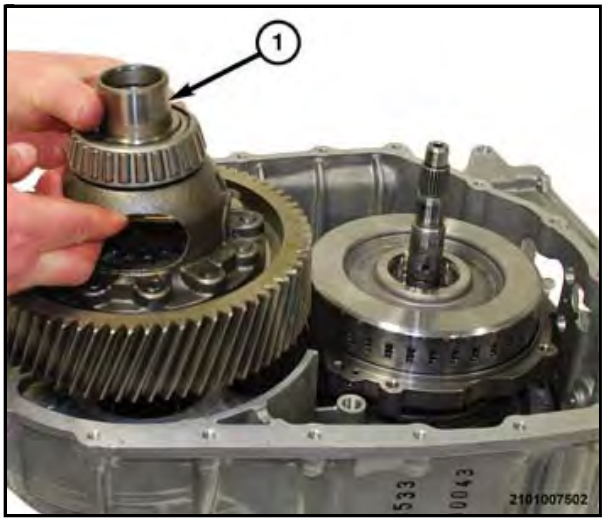


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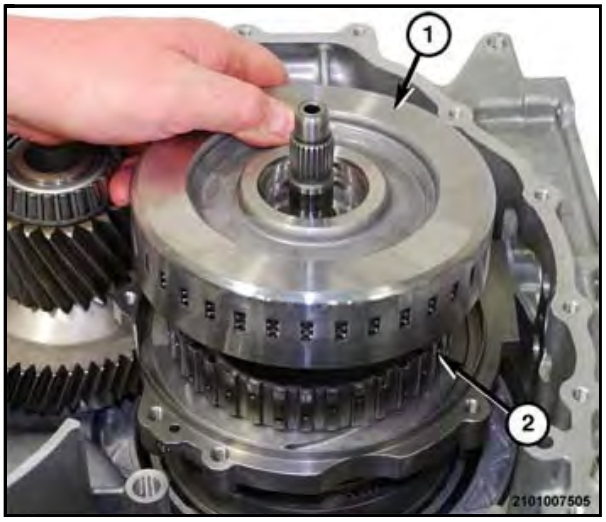
18. Separate the gasket (1) from the sealing surface of the transmission housing (2).



19. Remove the differential assembly (1) from the transmission housing.

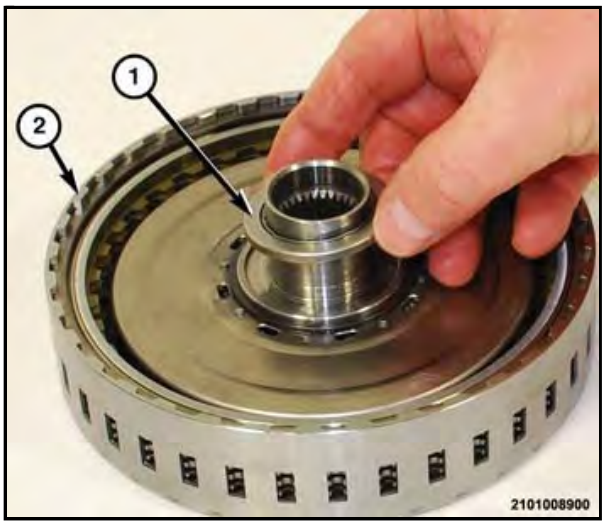


20. Separate the E-clutch drum (1) from the E-clutch asssembly (2).

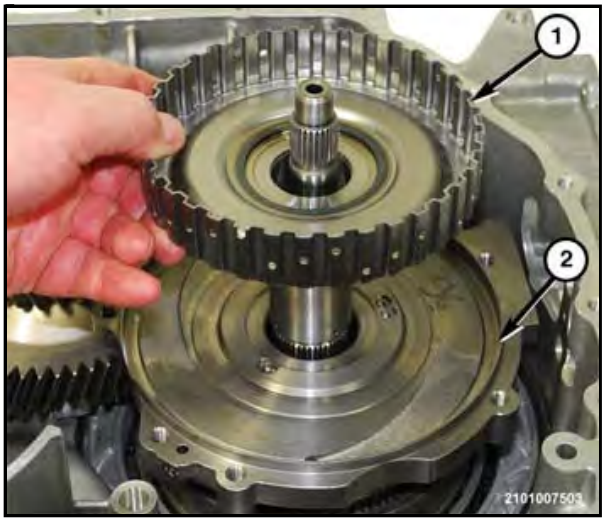


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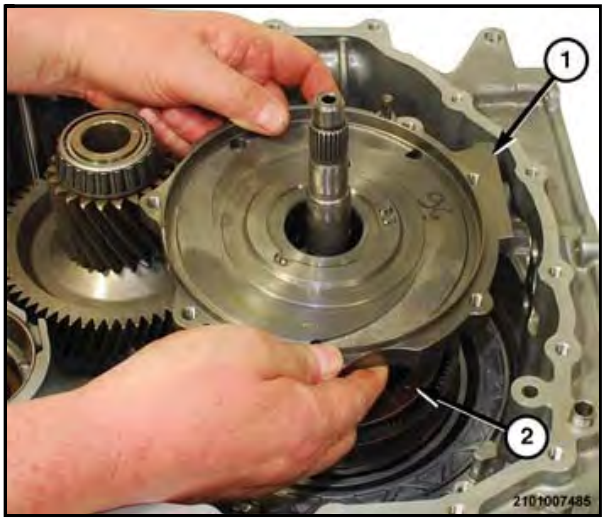
21. Separate the thrust bearing (1) from the E-clutch assembly.



22. Separate the E-clutch hub (1) from the output gear support (2).

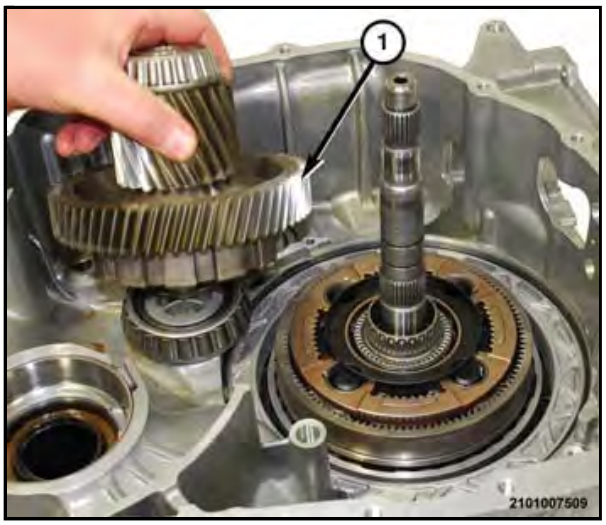


23. Separate the output gear support (1) from the gear 4 planetary pinion carrier (2).

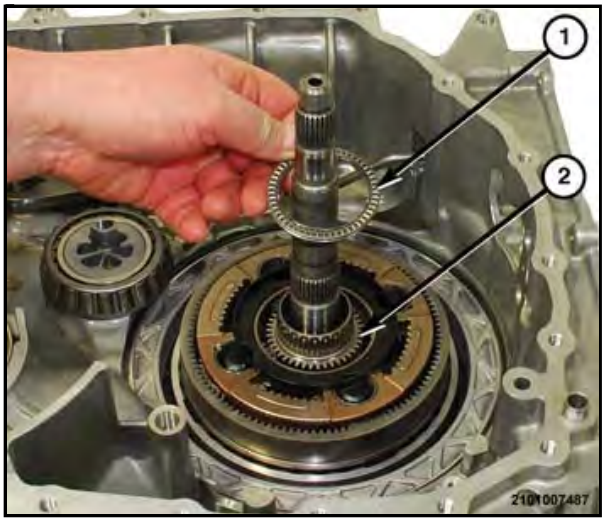


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24. Remove the transfer gear (1) from the transmission housing.



25. Separate the roller type thrust bearing (1) from the sun gear 3 and 4 and Dog Clutch-F (2).

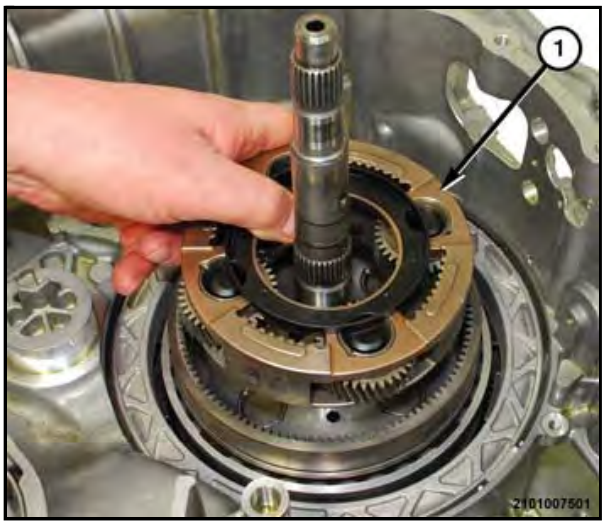


26. Separate the sun gear 3 and 4 and Dog Clutch-F (1) from the gear 4 planetary pinion carrier.



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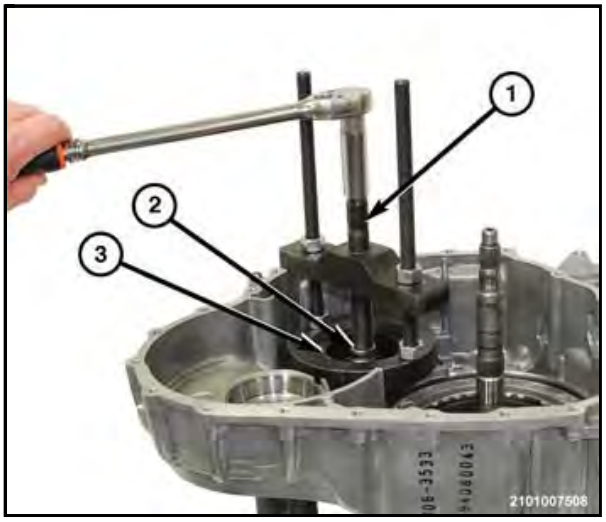
27. Separate the gear 4 planetary pinion carrier (1) from the annulus gear 4.



28. Separate the annulus gear 4 (1) from the annulus gear 3 (2).

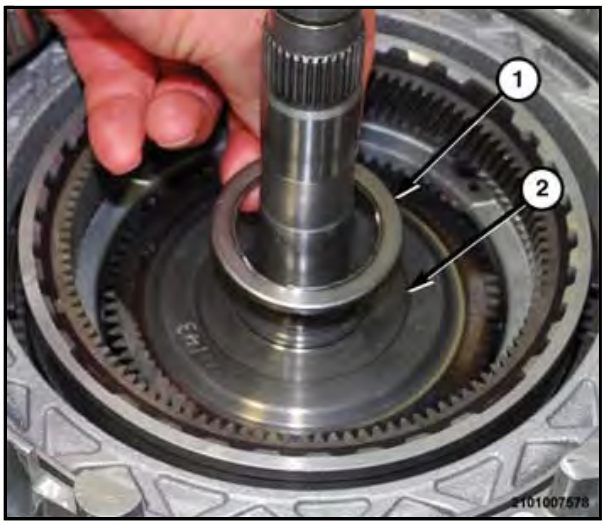


29. Using the Puller, Press C-293-PA (1), Blocks, Adapter 9738 (3) and a suitable socket as a plug (2), remove the transfer gear bearing cone from the transmission housing.



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30. Separate the trust bearing (1) from the annulus gear 1 planetary hub (2).



31. Separate the annulus gear 1 planetary hub (1) from the carrier gear 1 and 2 (2).

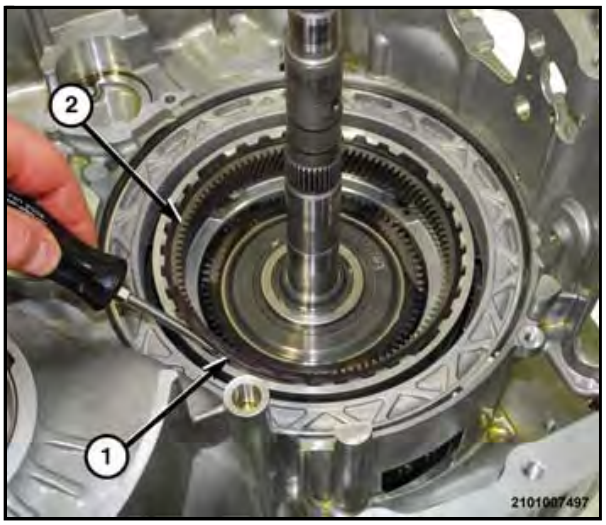


32. Separate the thrust bearing (1) from under the annulus gear 1 planetary hub (2).



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33. Using a suitable screw driver, remove the snap-ring (1) holding the annulus gear 3 (2).



34. Separate the snap-ring (1) from the annulus gear 3 (2).

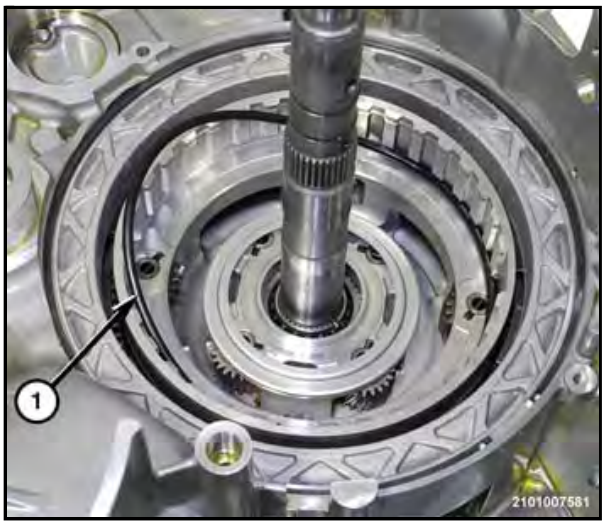


35. Separate the annulus gear 3 (1) from the carrier gear 1 and 2.

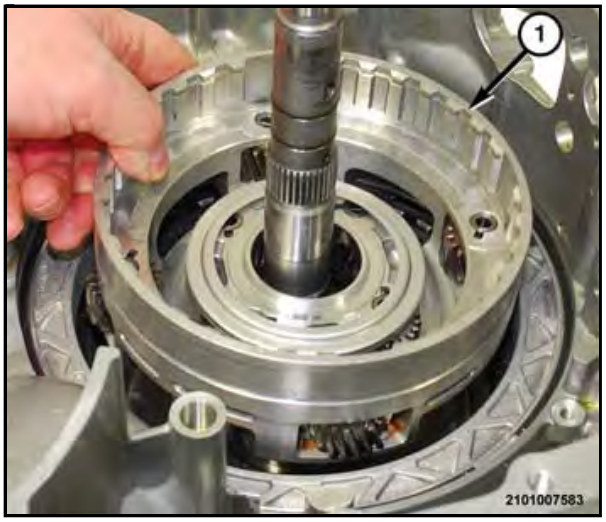


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36. Remove the O-ring seal (1) from the carrier gear 1 and 2.



37. Separate the carrier gear 1 and 2 (1) annulus gear 2, D-clutch hub and input shaft assembly.



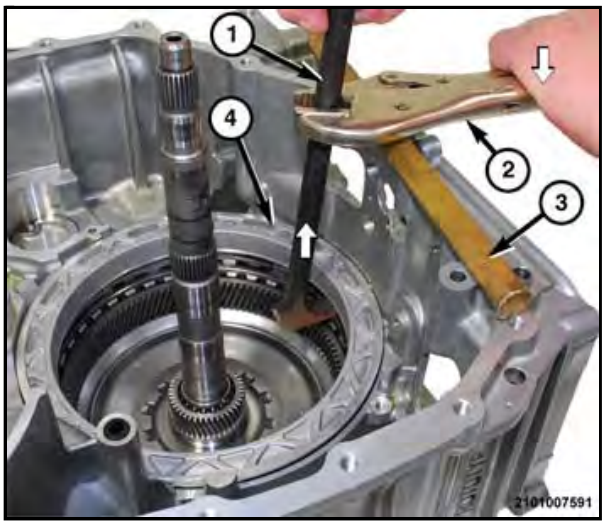
38. Position the transmission housing on a suitable arbor press using wooden blocks for support.

39. Using Pressing Tool 8901A (1) (with pressure scale removed) and Adapter, Pressing Tool 10428 , compress the bellville spring to gain access to the snap ring-ring (3) holding the D-clutch piston retainer (2) into the transmission housing (4).



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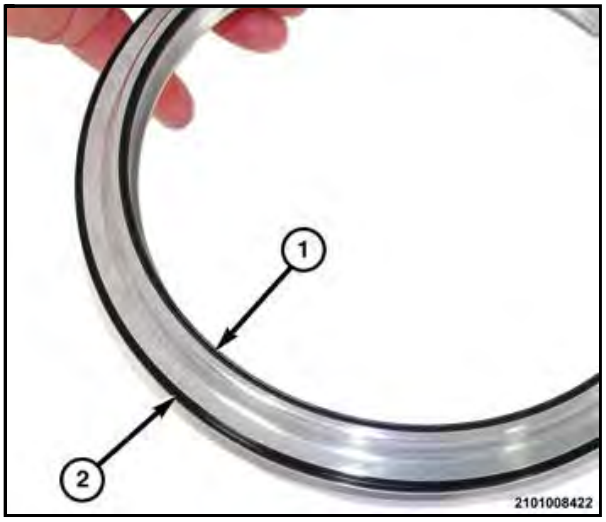
NOTE: The O-ring seal on the D-clutch piston retainer will hang up in the snap-ring groove during removal and will need to be pried out of the transmission housing.



40. Using a suitable pry-bar (1) vise-grip pliers (2) and a brass drift (3) coupled together, pry the D-clutch piston retainer (4) upward and out of the transmission housing.



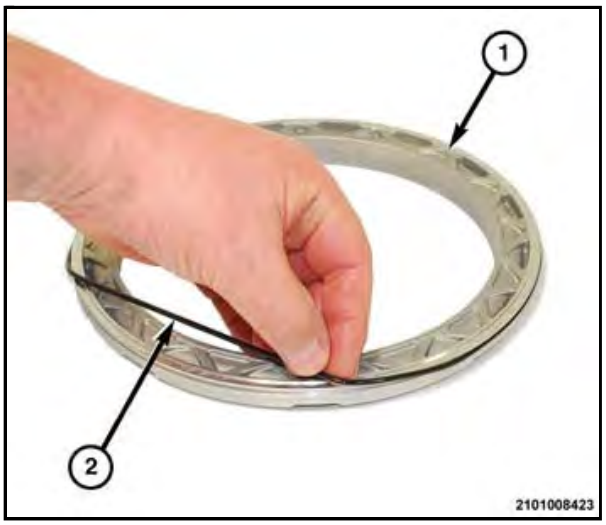
41. Remove the D-clutch piston (2) from the retainer (1).



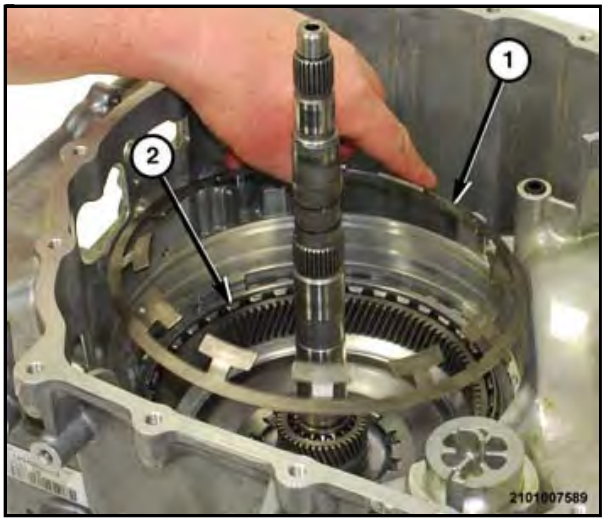
42. Remove the inner (1) and outer (2) lip seals from the D-clutch piston.

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43. Remove the O-ring seal (2) from the D-clutch piston retainer (1).

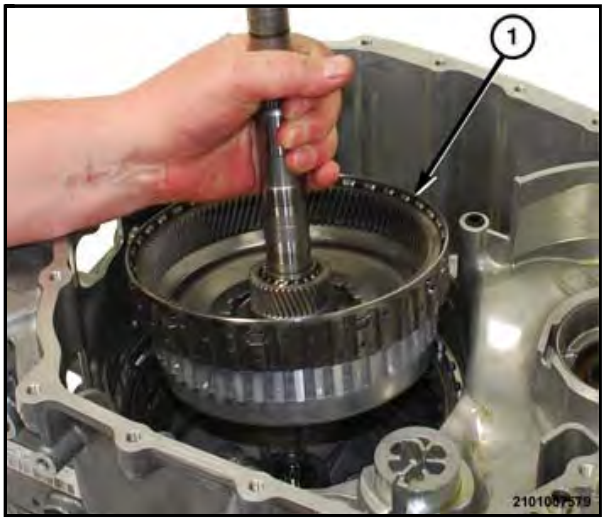


44. Separate the bellville spring (1) from the transmission housing (2).



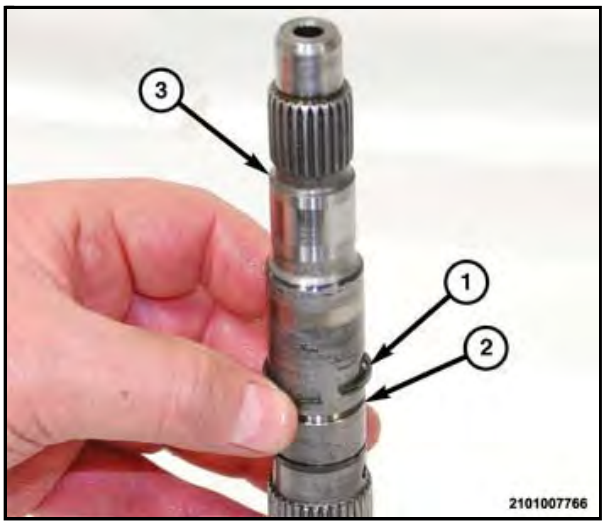
45. Separate the annulus gear 2, D and C-clutch hub and input shaft assembly (1) from the transmission housing.

46. Remove the annulus gear 2, D and C-clutch hub from the input shaft and B-clutch.



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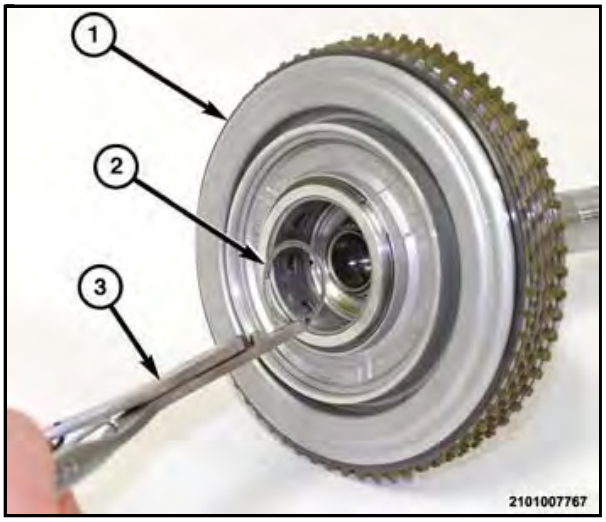
47. Remove the seal-rings (1) from the lands (2) on the input shaft (3).



NOTE: Dog clutch A is permanently attached to the input shaft and cannot be disassembled.

48. Using suitable snap-ring pliers (3), remove the snap-ring (2) holding the input shaft to the B-clutch (1) hub.

49. Separate the input shaft/dog clutch A from the B-clutch (1) hub.

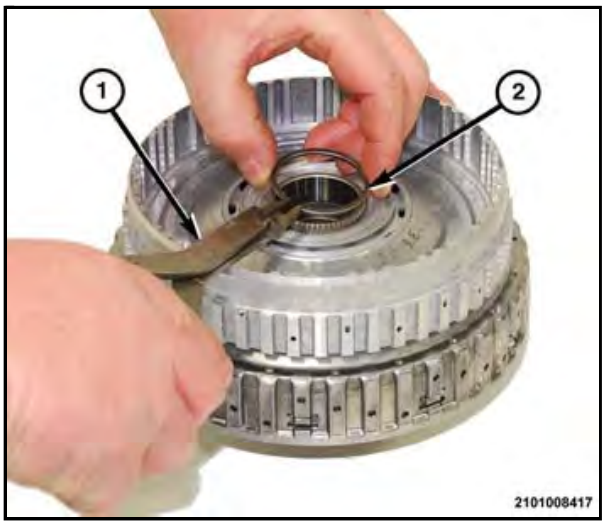


50. Place the annulus gear 2, D and C-clutch hub (1) on tool Plug, Differential End 9611 (2) to hold the sun gear in position.

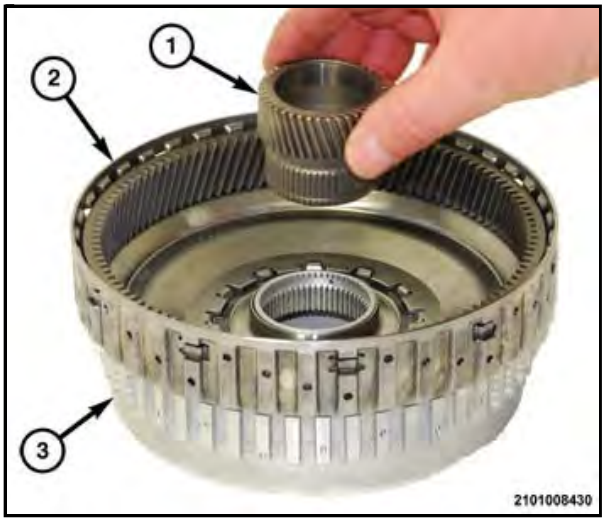


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51. Using a suitable snap-ring pliers (1), remove the snap-ring (2) holding the sun gear 1 to the annulus gear 2, D and C-clutch hub.



52. Turn the annulus gear 2 (2), D and C-clutch hub (3) over and remove sun gear 1 (1).

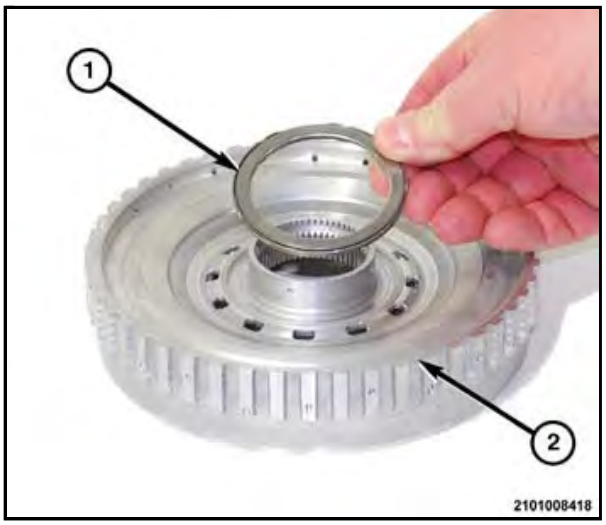


53. Separate the Annulus gear 2, D-clutch hub (1) from the C-clutch hub (2).



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54. Separate the thrust bearing (1) from the C-clutch hub (2).



55. Remove the thrust bearing (1) from the input shaft rear support.

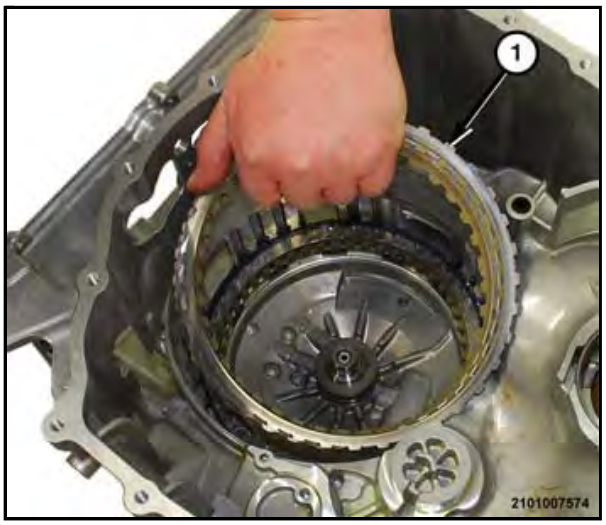


56. Remove the input shaft rear support selective thrust washer (1).

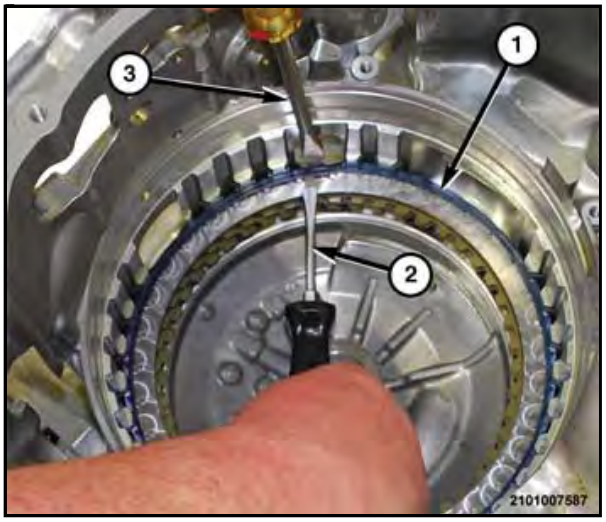


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57. Separate the D-clutch friction discs and steel plates (1) from the transmission housing.



58. Using two suitable screw drivers (2) and (3), lift the snap-ring (1) and pry it inward with the screwdriver (3) and out of from the groove (1) in the transmission housing.

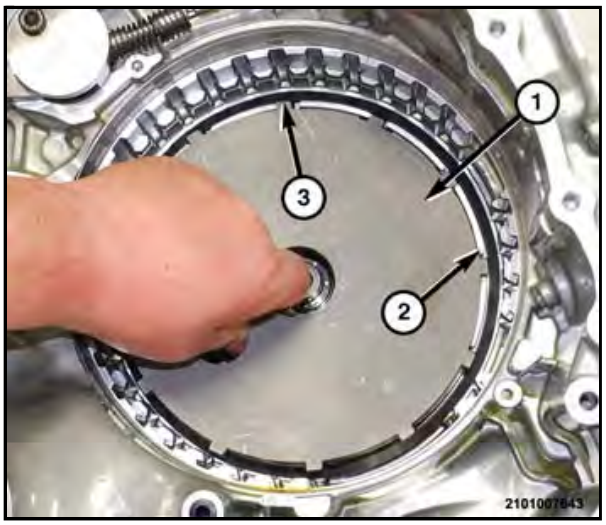


59. Separate the C-clutch friction discs and steel plates (1) from the transmission housing.

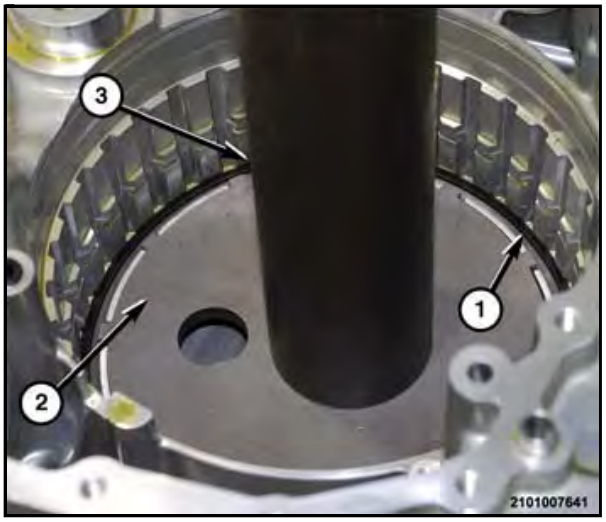


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60. Place the Compressor, Spring 10504 (1) over the C-clutch bellville spring at the bottom of the transmission housing.



61. Place tool Installer, Bearing 8228 (3) over the input shaft support (tool 8901 with 10428 legs can also be used), compress the bellville spring to gain access to the stepped snap-ring (1).



62. Using a suitable screw driver, remove the snap-ring (1) holding the C-clutch bellville spring in the transmission housing.



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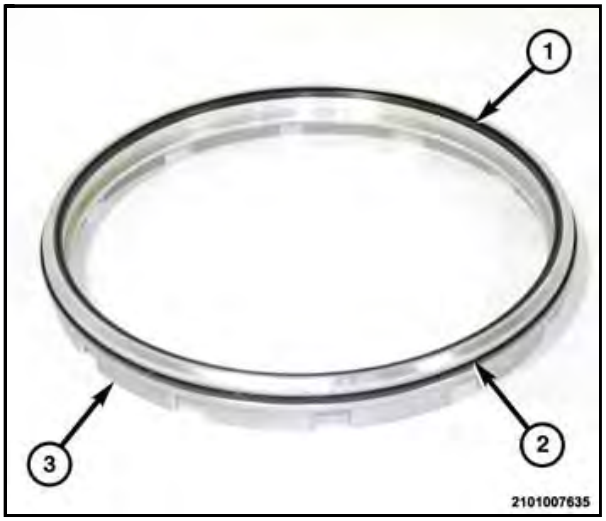
63. Separate the C-clutch bellville spring (1) from the C-clutch piston (2).



64. Using suitable pliers (2), remove the C-clutch piston (1) from the transmission housing.



65. If overhaul is being performed, remove inner (1) and outer (2) seals from the C-clutch piston (3).



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66. Using a suitable hook tool, remove the inner seal-rings (1) from the input shaft support.



67. Using a suitable hook tool, remove the outer seal-rings (1) from the input shaft support.



68. Using a suitable hook tool, remove the split roller bearing (1) from the input shaft support.



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ASSEMBLY

The work area, counter surfaces and tools must be thoroughly cleaned before attempting to assemble the 948TE transmission. All of the sub assemblies should be disassembled, cleaned, and assembled with new sealing components where applicable. The transmission housing should be clean and oil free before beginning this procedure. The B, C, D, and E-clutches should be properly measured and adjusted prior to assembling the transmission. If the transmission was contaminated with metallic material, all of the thrust bearings and roller bearing should be replaced. The bearing in the output gear support assembly is not serviceable. The output gear support assembly should be replaced if metal debris is present.

WARNING: **Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.**

1. Place the transmission housing on a clean work surface with the open interior upward.

2. Place wooden blocks under the transmission to stabilize it for assembly.

3. Install the split roller bearing (1) in position on the input shaft support.



4. Install the outer seal-rings (1) in the lands in the input shaft support.

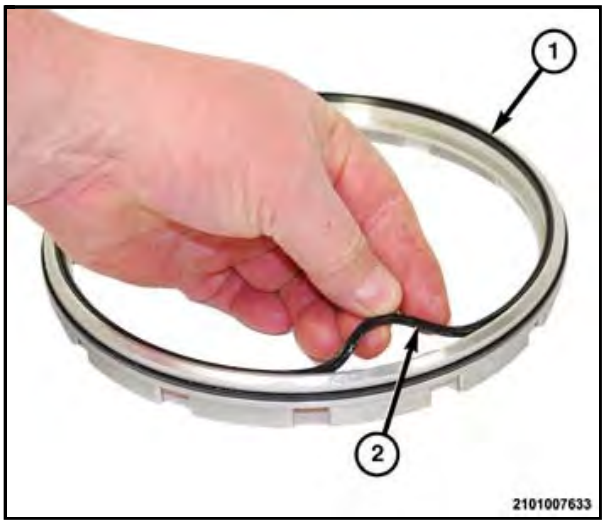
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5. Install the inner seal-rings (1) in the lands in the input shaft support.

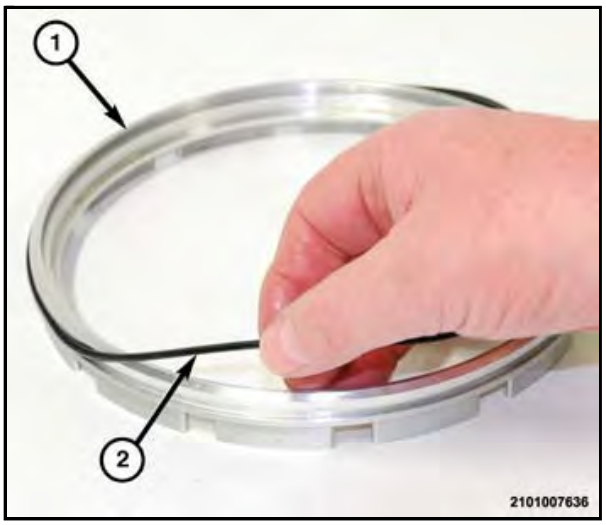


6. Install the inner seal (2) on the C-clutch piston (1).



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7. Install the outer seal (2) on the C-clutch piston (1).



8. Install the C-clutch piston (1) in the transmission housing.



9. If necessary, use a thin feeler gauge (3) to turn the lip on the seal into the retainer (2) as the piston (1) is pushed downward.

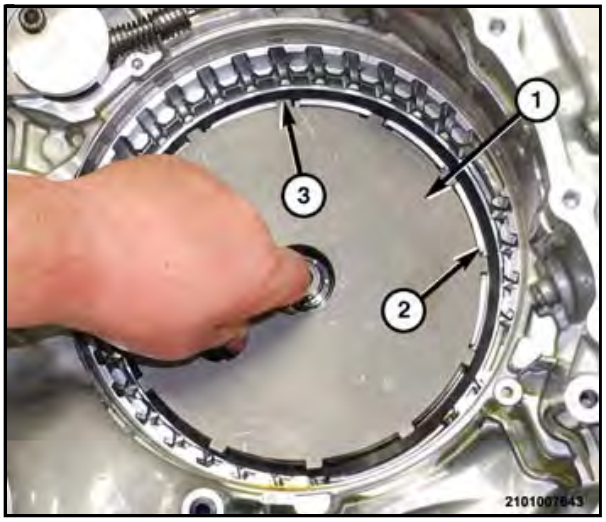


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10. Place the C-clutch bellville spring (1) in position on the C-clutch piston (2).



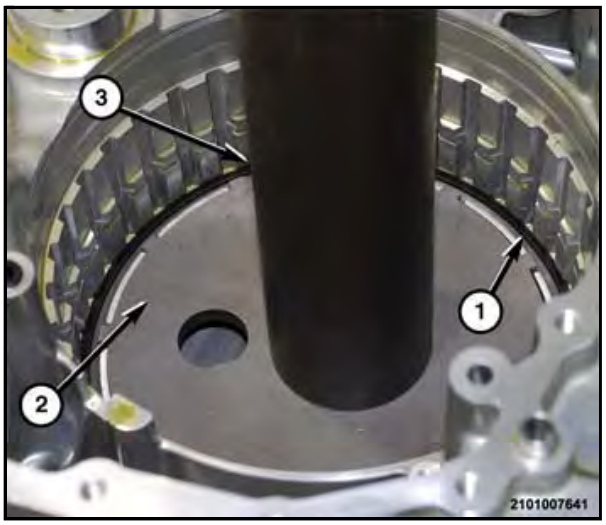
11. Place the Compressor, Spring 10504 (1) over the C-clutch bellville spring (2) at the bottom of the transmission housing (3).



12. Position the transmission housing on a suitable arbor press using wooden blocks for support.

13. Place tool Installer, Bearing 8228 (3) over the input shaft support (tool 8901 with 10428 legs can also be used), compress the bellville spring to gain access to the snap-ring (1) groove.

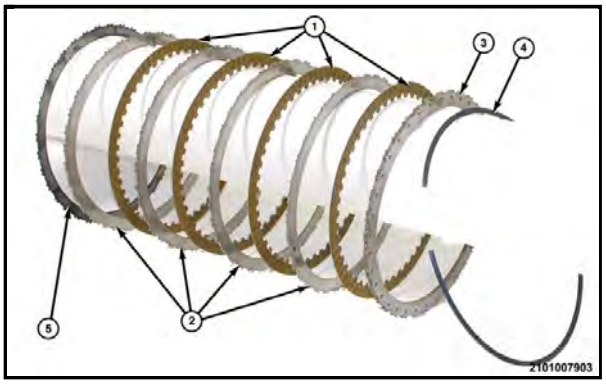
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14. Install the snap-ring (1), stepped side down, to hold the C-clutch bellville spring in the transmission housing.

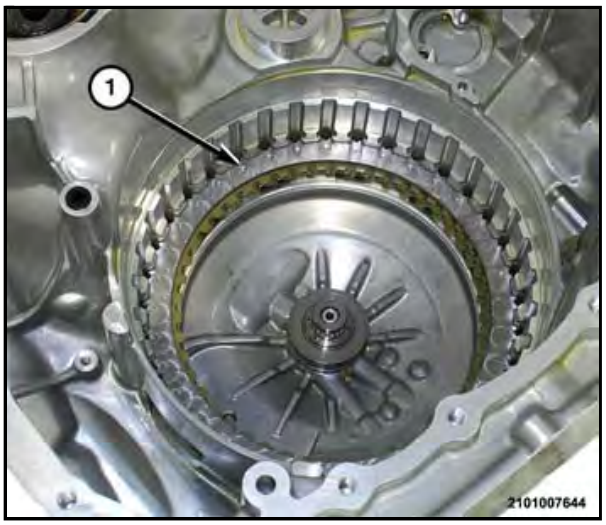
15. Remove the transmission housing from the arbor press and position it on a clean work bench. Position wood blocks under transmission to stabilize it for assembly.



16. Install the C-clutch wave plate (5), one steel plate (2), then install the friction discs (1) alternately separated with steel plates (2) into the transmission housing on top of the C-clutch piston.

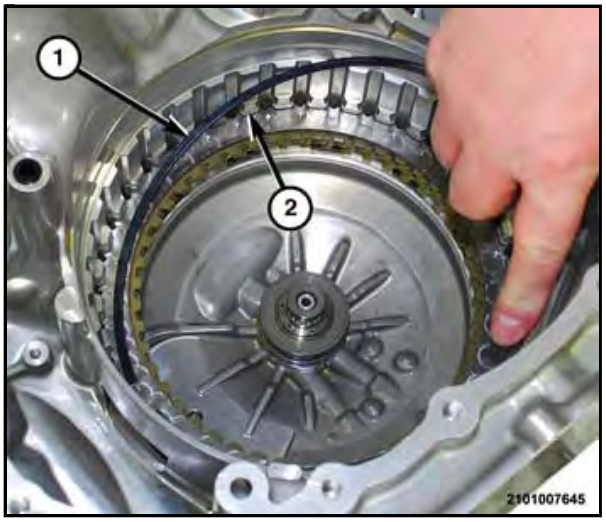
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17. Install the C-clutch selective reaction plate (1) with raised bosses upward on top of the C-clutch disc and plate pack.



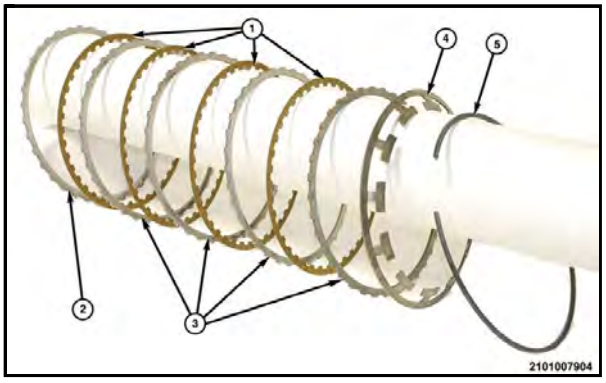
18. Install the snap-ring (1) in the groove (2) in the transmission housing.

    NOTE: Perform C-clutch measurements to verify that the correct selective reaction plate is installed (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/CLUTCH/Adjustments) .



19. Install the correct thickness selective reaction plate (2).

20. Starting with a friction plate (1), alternately install the friction (1) and steel plates (3) in to the case.



    NOTE: Perform D-clutch measurements to verify that the correct selective

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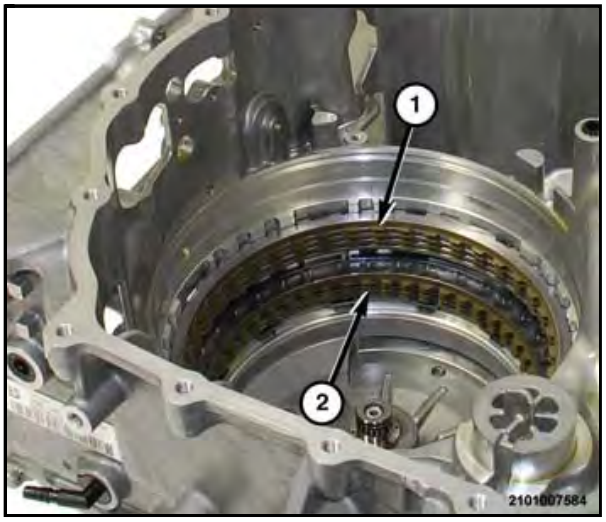
reaction plate (2) is installed (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/CLUTCH/Adjustments) .



21. Install the input shaft rear support selective thrust washer (1).



22. Install the thrust bearing (1) onto the input shaft rear support.

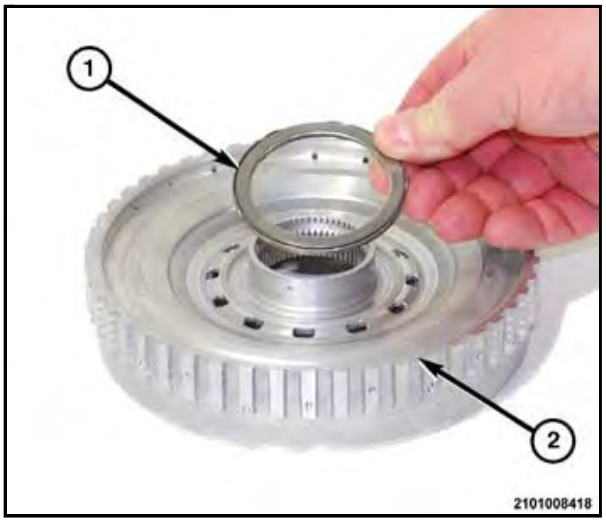


23. Align the teeth of the friction discs for the D- and C-clutches (1, 2) to facilitate the installation of the annulus gear 2, D and C clutch hubs, and input shaft assembly.

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NOTE: **Before final assembly of the annulus gear 2, D and C-clutch hub and input shaft, measure the B-clutch to verify that proper selective reaction plate was installed (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/CLUTCH/Adjustments) .**

24. Place the thrust bearing (1) in position on the C-clutch hub (2).

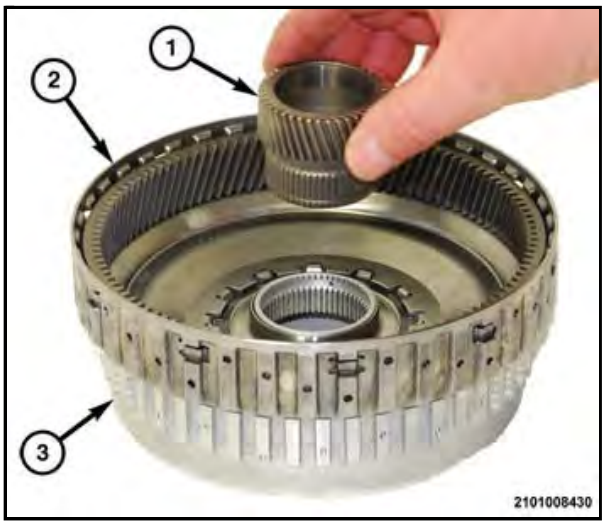


25. Place the Annulus gear 2, D-clutch hub (1) in position on the C-clutch hub (2).



26. Insert the sun gear 1 (1) into annulus gear 2 (2), D and C-clutch hub (3).

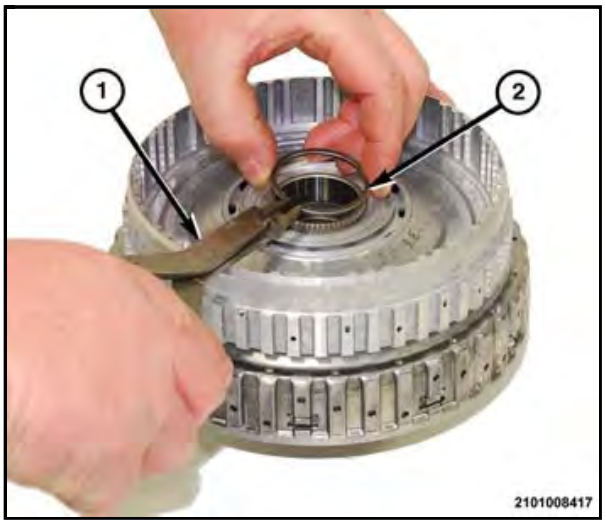
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27. Turn the annulus gear 2, D and C-clutch hub over and place it on tool Plug, Differential End 9611 (2) to hold the sun gear in position.

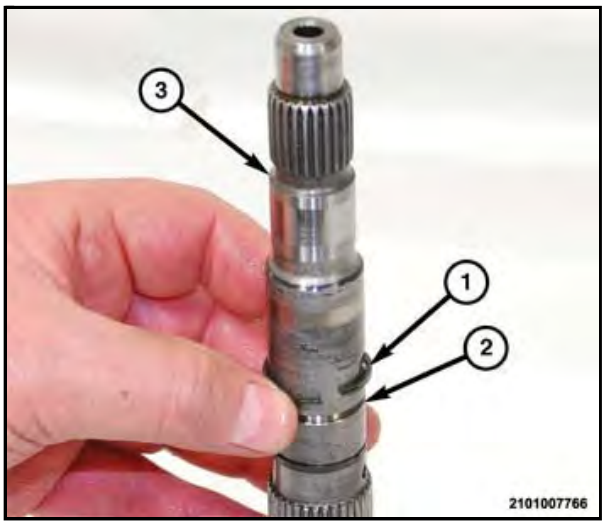


28. Using a suitable snap-ring pliers (1), install the snap-ring (2) to hold the sun gear 1 to the annulus gear 2, D and C-clutch hub.



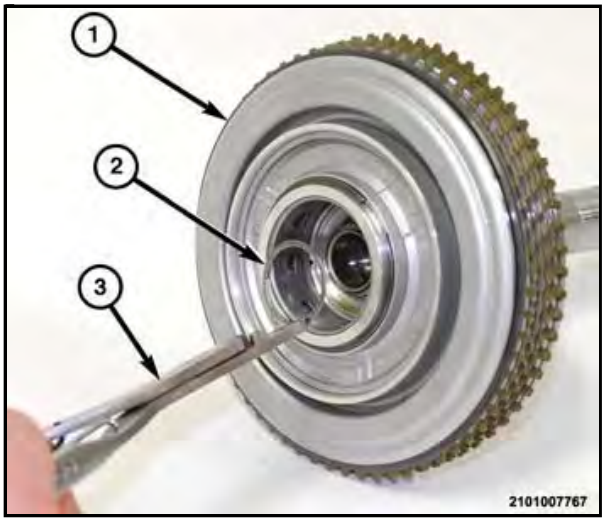
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29. Install NEW seal-rings (1) in the lands (2) on the input shaft (3).

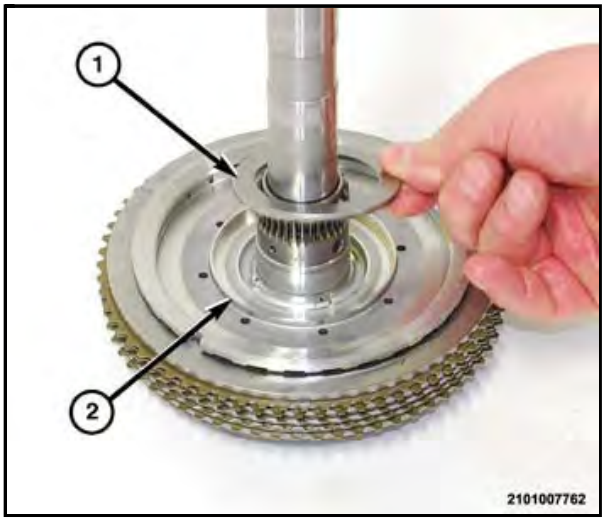


30. Insert the input shaft into the B-clutch (1) hub.

31. Using a suitable snap-ring pliers (3), install the snap-ring (2) to hold the input shaft/dog clutch A to the B-clutch (1) hub.



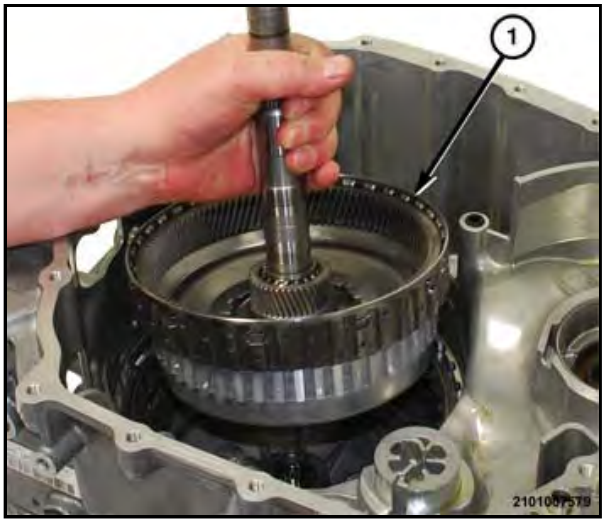
32. Place the thrust bearing (1) on the B-clutch hub (2).



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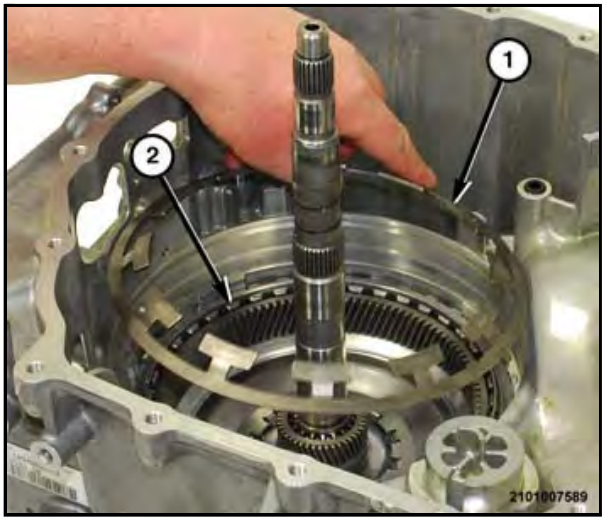
33. Install the annulus gear 2, D and C-clutch hub on the input shaft and B-clutch assembly.

34. While not allowing the input shaft to slip inward, wriggle the annulus gear 2, D and C-clutch hubs and input shaft assembly (1) until they engage the D and C-clutch discs. If the input shaft slips inward, the B-clutch will come out of its retainer impeding proper installation.



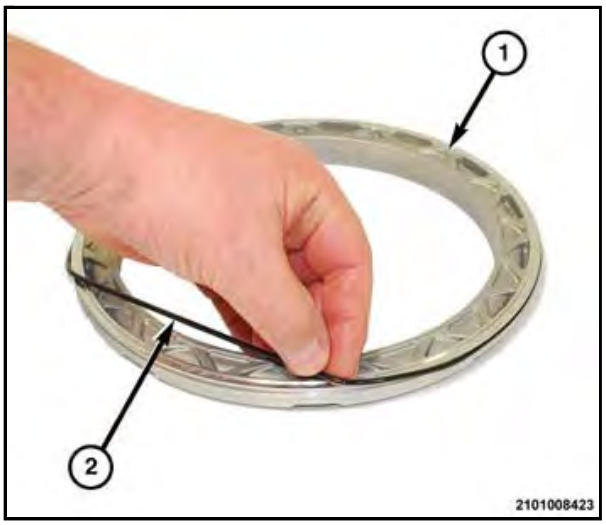
NOTE: A solid audible clunk will be heard if installed correctly.

35. Place the bellville spring (1) in position on the transmission housing (2).

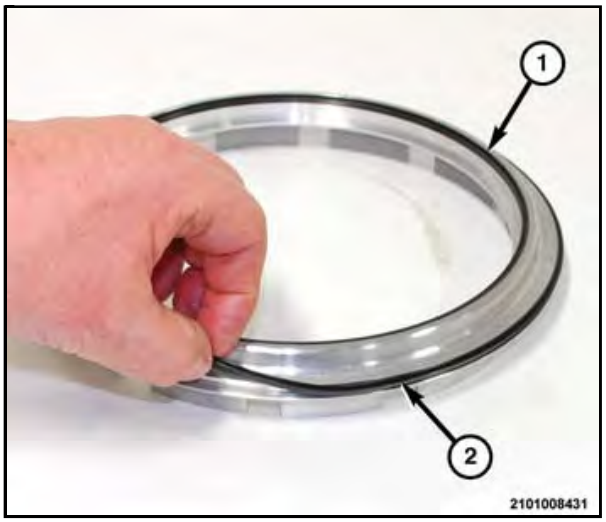


36. Install **NEW** O-ring seal (2) in the D-clutch piston retainer (1).

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37. Install **NEW** outer lip seal (2) in the D-clutch piston (1).



38. Install **NEW** inner lip seal (1) in the D-clutch piston (2).

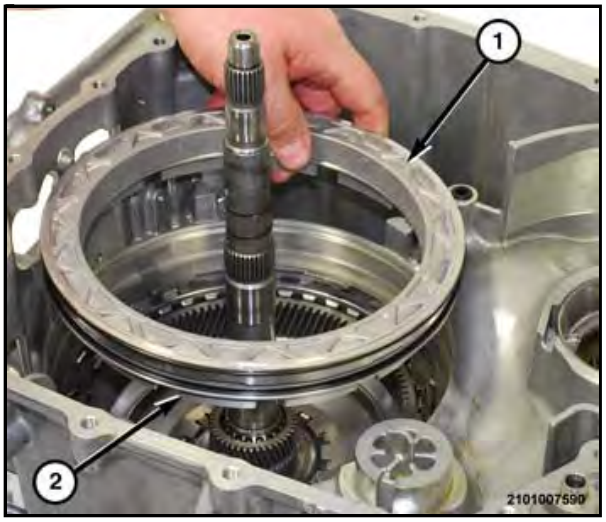


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39. Install the D-clutch piston (2) in the retainer (1).



40. Place the D-clutch piston (2) and retainer (1) assembly in the transmission housing over the D-clutch bellville spring. The fingers on the D-clutch piston (2) rest against the D-clutch selective reaction plate.



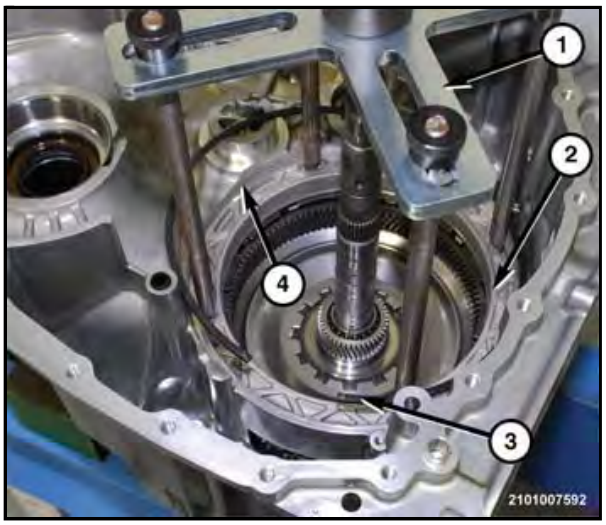
41. Position the transmission housing on a suitable arbor pressure using wooden blocks for support.

42. Using Tool 8901A (with the pressure scale removed) (1) and legs Adapter, Pressing Tool 10428 , compress the bellville spring to gain access to the snap-ring groove (4) in the transmission housing.

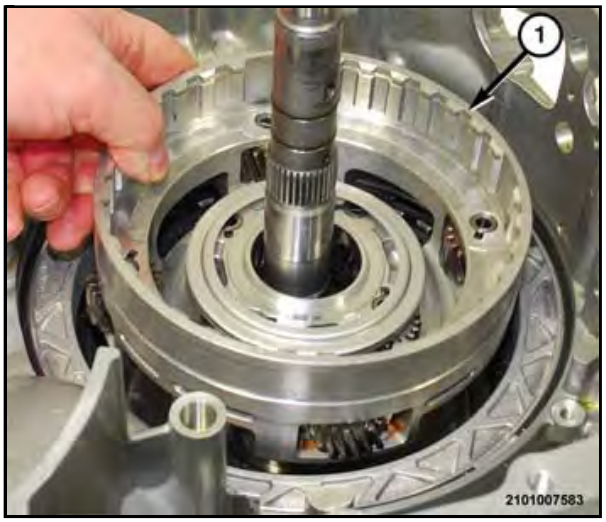
43. Install the snap-ring (3) to hold the D-clutch piston retainer (2) into the transmission housing (4).

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44. Remove the transmission housing from the arbor press and place the transmission housing on the clean work surface. Use wood blocks to stabilize the transmission.



45. Insert the carrier gear 1 and 2 (1) annulus gear 2, D-clutch hub and input shaft assembly onto the annulus gear 2, D and C-clutch hub and input shaft assembly.

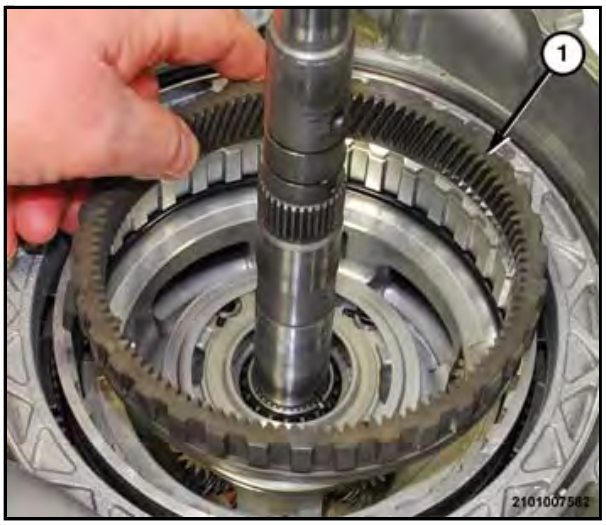


46. Install the **NEW** O-ring seal (1) into the carrier gear 1 and 2.



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47. Install the annulus gear 3 (1) into the carrier gear 1 and 2.



48. Install the snap-ring (1) to hold the annulus gear 3 (2) in the carrier gear 1 and 2.



49. Place the thrust bearing (1) in position under the annulus gear 1 planetary hub (2).

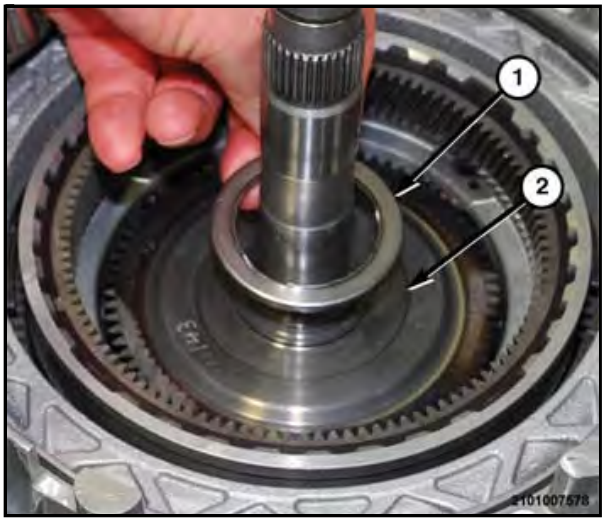


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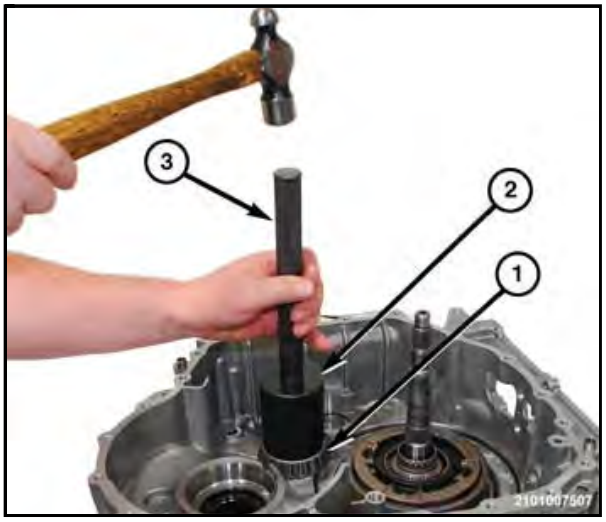
50. Install the annulus gear 1 planetary hub (1) into the carrier gear 1 and 2 (2).



51. Place the trust bearing (1) onto the annulus gear 1 planetary hub (2).

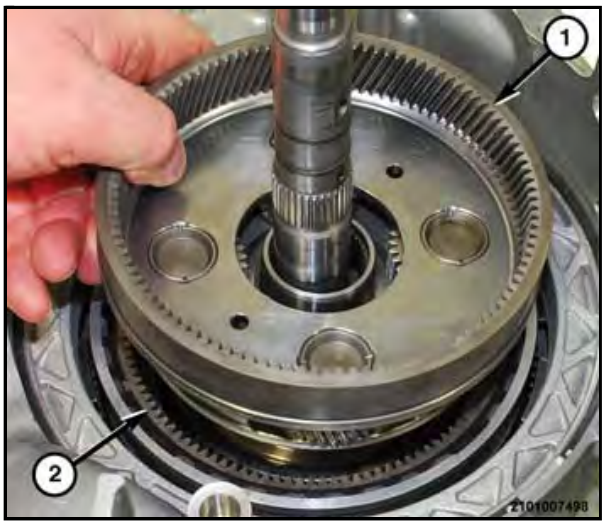


52. Using tool Installer, Seal 6888 (2), and handle Driver Handle, Universal C-4171 (3) install the transfer gear bearing cone (1) onto the transmission housing.

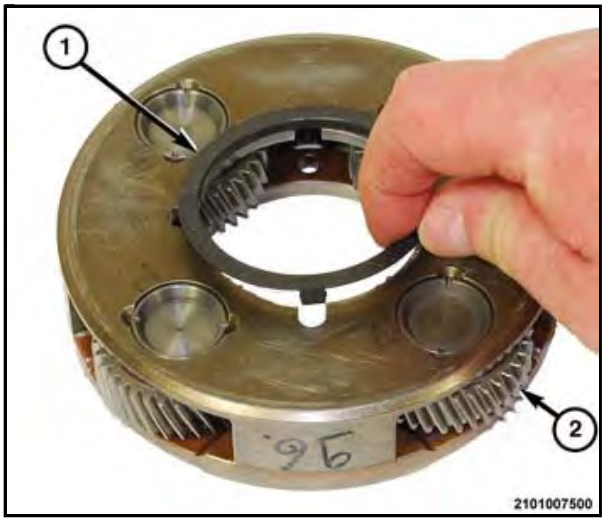


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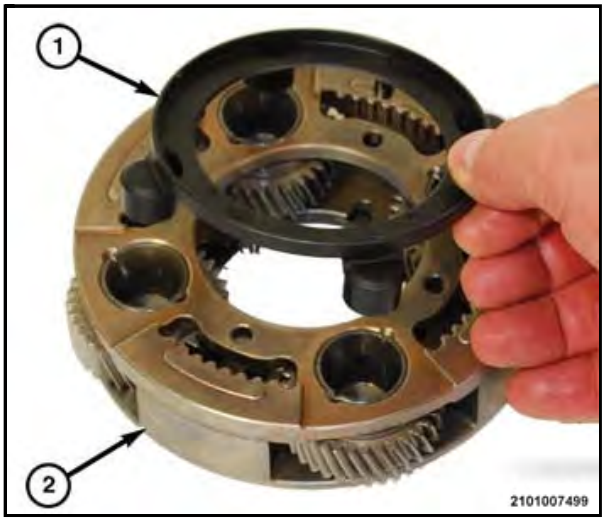
53. Install the annulus gear 4 (1) in the annulus gear 3 (2).



54. Install a **NEW** thrust spacer (1) on the underside of the gear 4 planetary pinion carrier (2).

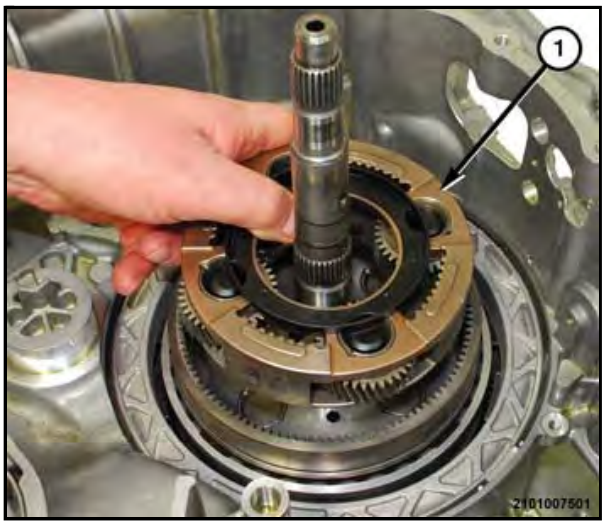


55. Install a **NEW** thrust spacer (1) on the topside of the gear 4 planetary pinion carrier (2).



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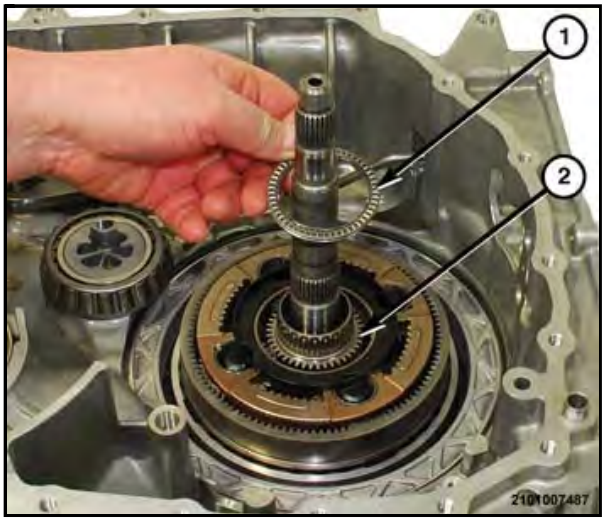
56. Install the gear 4 planetary pinion carrier (1) into the annulus gear 4.



57. Install the sun gear 3 and 4 and Dog Clutch-F (1) in the gear 4 planetary pinion carrier.

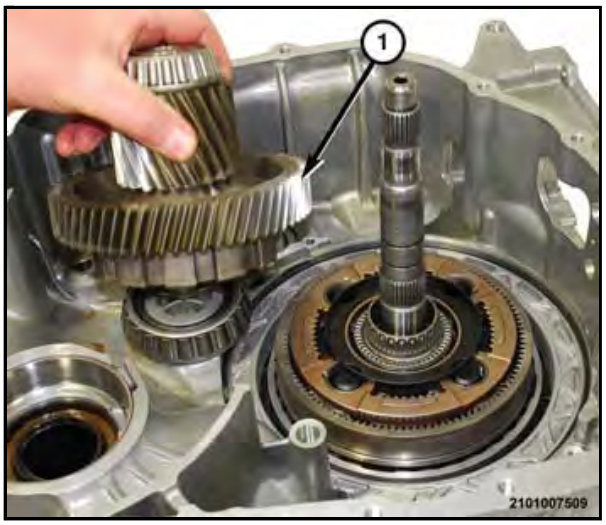


58. Install the roller type thrust bearing (1) onto the sun gear 3 and 4 and Dog Clutch-F (2).



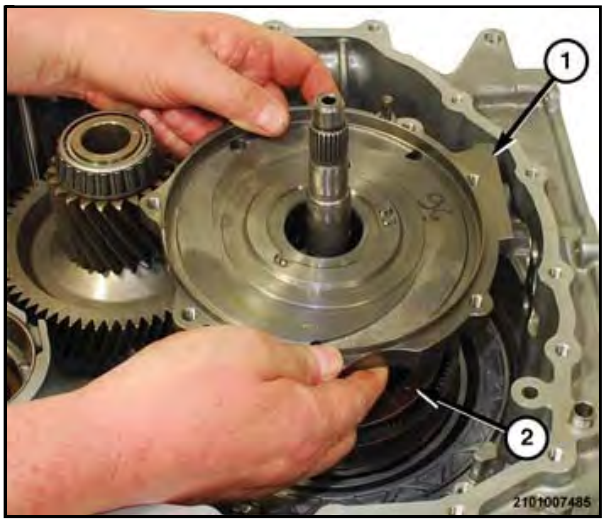
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NOTE: If a new transfer gear (1) or transmission housing are being used, measurements must be performed to determine correct thickness for the bearing preload shims (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) . If the bearings and races are replaced the factory installed preload shims do not require replacement.



59. If necessary, replace the bearings and races on the transfer gear (1).

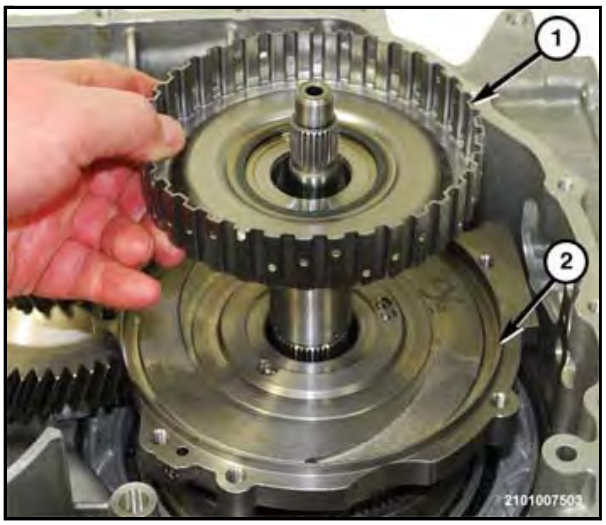
60. Install the transfer gear (1) into the transmission housing.



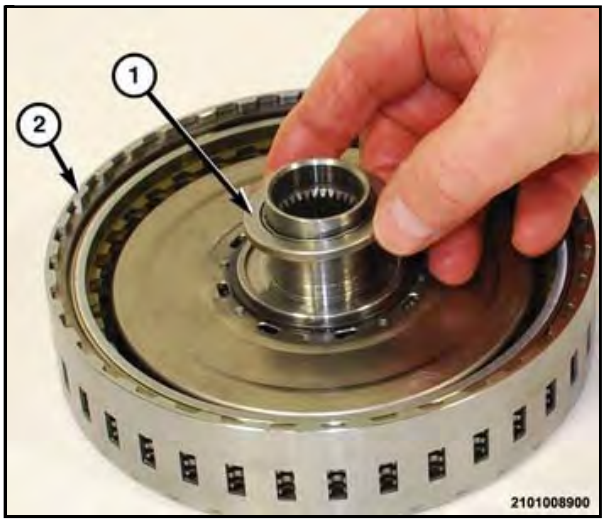
61. Install the output gear support (1) into the gear 4 planetary pinion carrier (2).

62. Install the E-clutch hub and shaft (1) in the output gear support (2).

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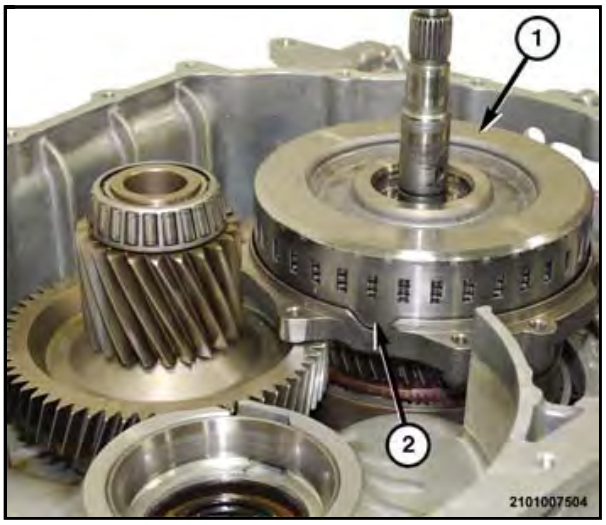
63. Install the thrust bearing (1) on the E-clutch (2) hub.



NOTE: **Before installing the E-clutch, use a suitable screwdriver to align the grooves in the friction discs.**

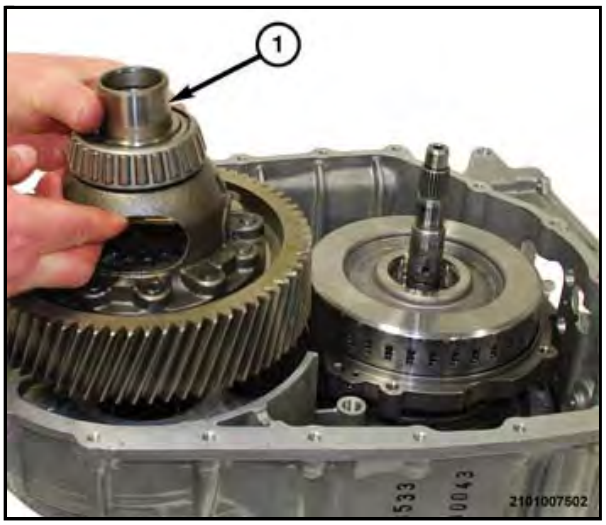
64. Wriggle the E-clutch (1) until all of the friction discs are fully engaged on the E-clutch hub and shaft.

NOTE: **When the E-clutch (1) is fully seated the gap (2) will be very small between the E-clutch retainer and the output gear support.**



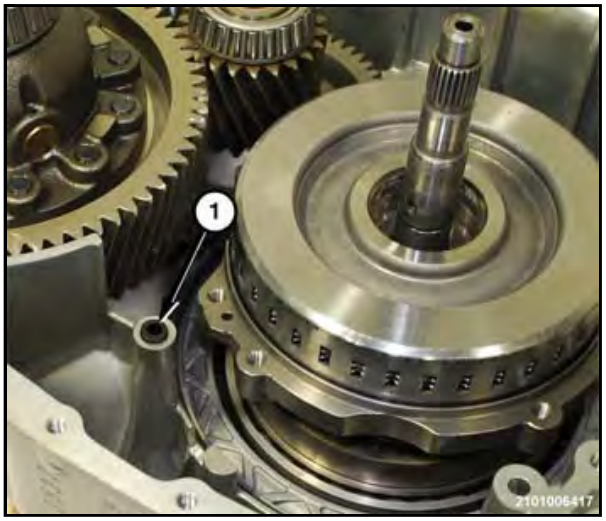
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NOTE: **If a new differential (1) or transmission housing are being used, measurements must be performed to determine correct thickness for the bearing preload shims. If the bearings and races are replaced the factory installed preload shims do not require replacement (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) .**



65. If necessary, replace the bearings and races on the differential (1).

66. Install the differential assembly (1) into the transmission housing.

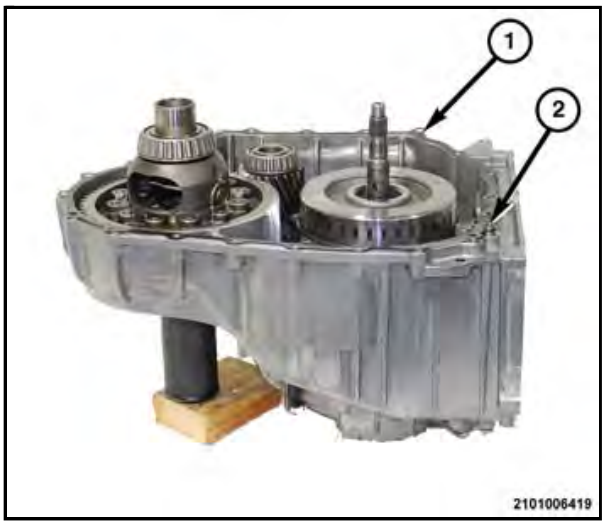


67. Install a **NEW** seal (1) in the port in the transmission housing.

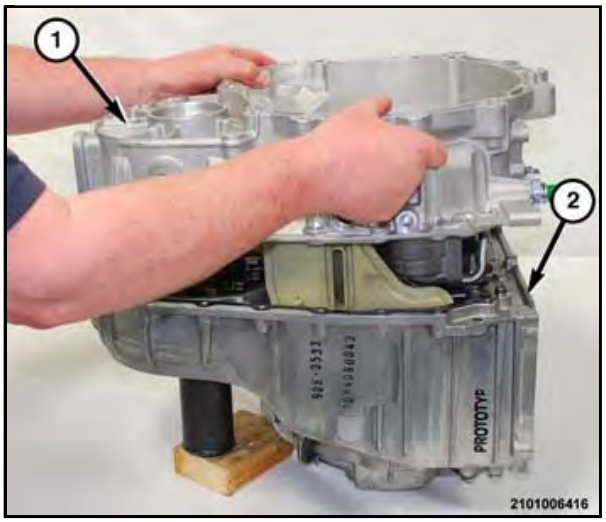
68. Install a **NEW** gasket (1) on the sealing surface of the transmission housing (2).

69. If necessary, replace the output seal and the impeller hub seal.

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70. Guide the bellhousing (1) downward over the input and output shafts and onto the transmission housing (2).

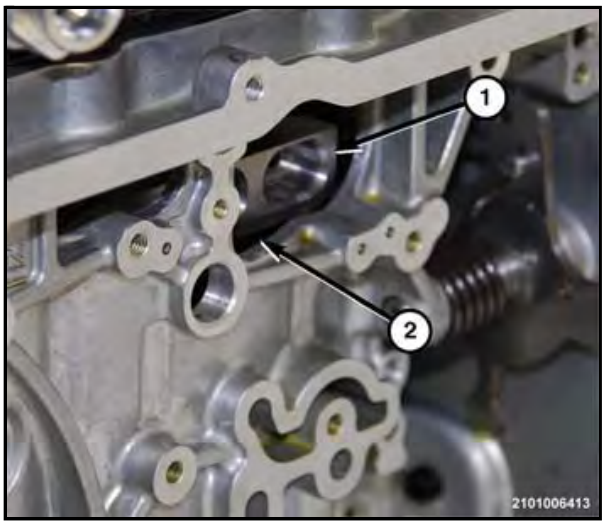


71. Rotate the output gear clockwise to assure guide pin (1) alignment.



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72. Rotate the output gear support (1) through the window (2) behind the valve body until the guide pin engages the receptacle hole in the bellhousing.

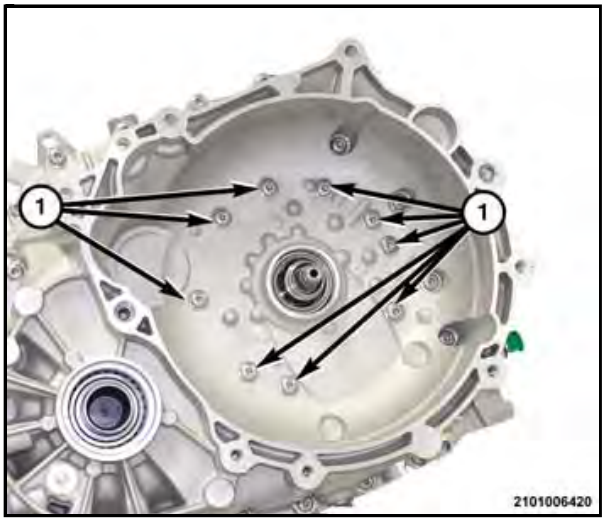


73. Engage the guide pins in the transmission housing into the receptacle holes in the bellhousing to assure proper alignment.

74. Install several bolts to hold the bell housing to the transmission housing. Tighten the bolts hand tight.

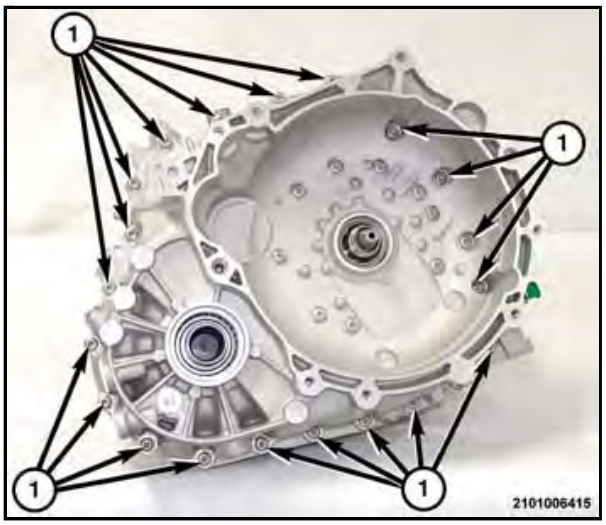
75. Position the transmission on the bench with the bellhousing facing outward.

76. Install the bolts (1) with **NEW** seal washers to hold the bellhousing to the output gear support and tighten to the proper (Torque Specifications) .



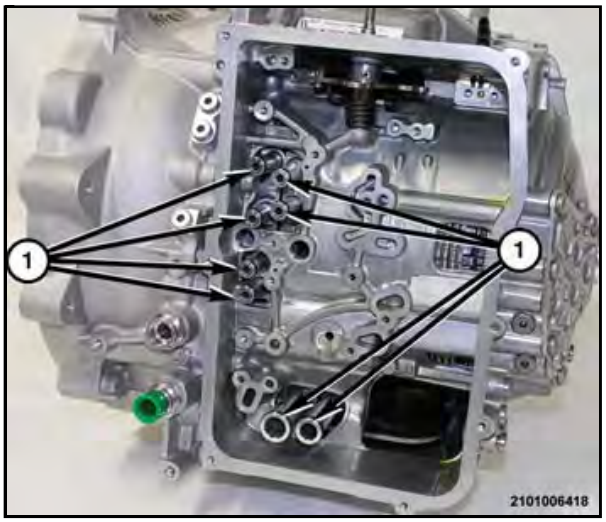
77. Install the bolts (1) to hold the bellhousing to the transmission housing and tighten to the proper (Torque Specifications) .

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78. Install **NEW** O-rings on both ends of the fluid transfer tubes.

79. Install the fluid transfer tubes (1) in the transmission housing.

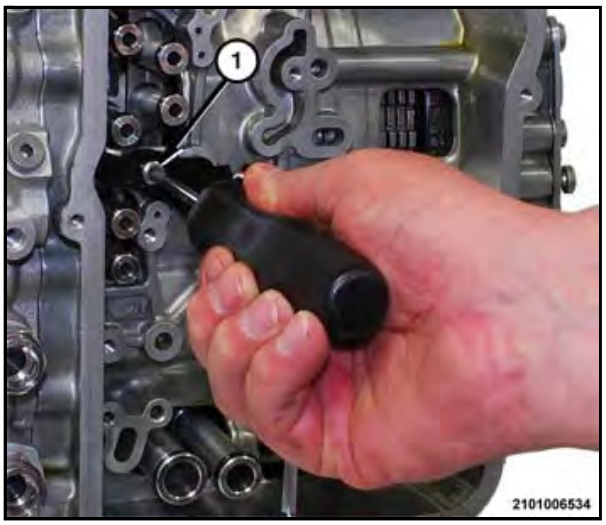


80. Insert the speed sensors (1) into the transmission with the wire harness connected.

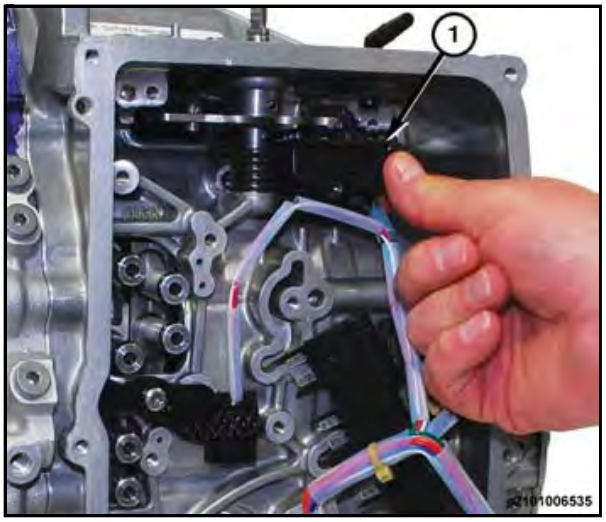


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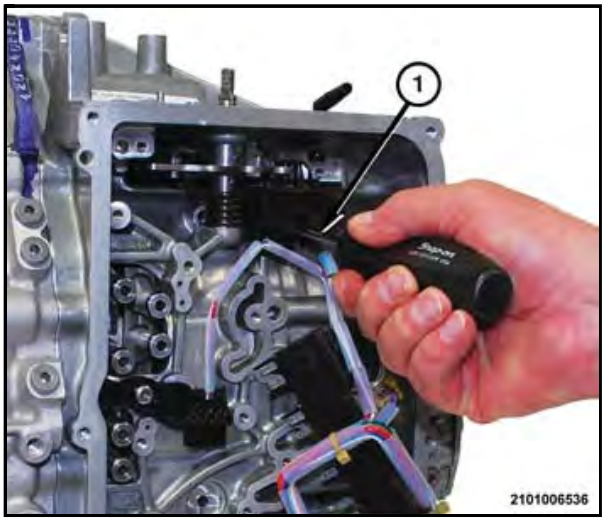
81. Install the speed sensor screw (1) to hold the speed sensors to the transmission housing and tighten to the proper (Torque Specifications) .



82. Place the Transmission Range Sensor (TRS) (1) in position on the transmission with the wire harness connected.

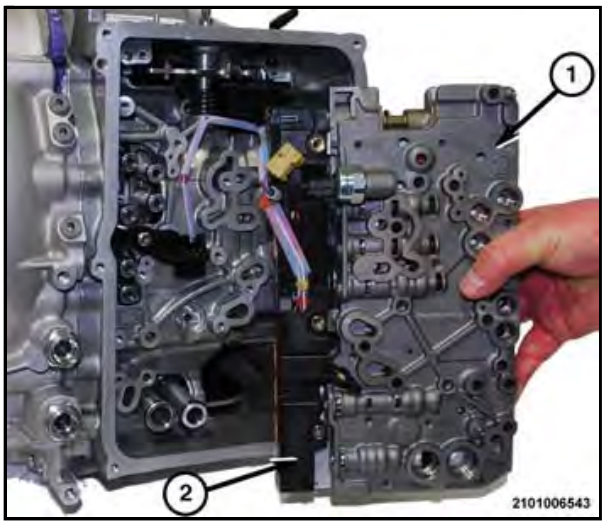


83. Install the TRS screw (1) to hold the TRS to the transmission housing and tighten to the proper (Torque Specifications) .



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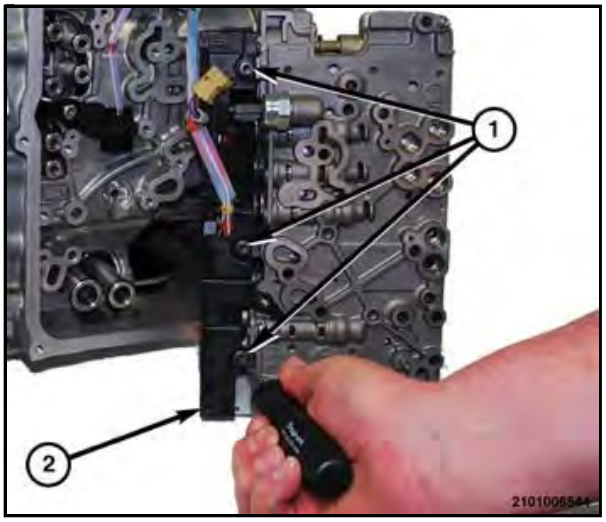
84. Place the valve body (1) in position on the transmission.



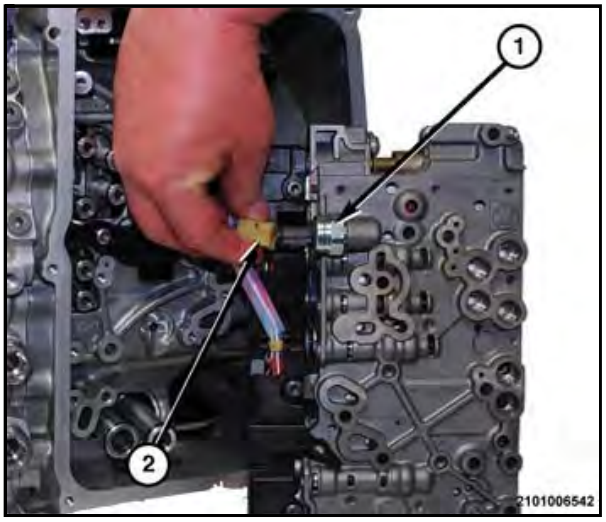
85. Place the transmission solenoid wire harness connector (2) in position on the solenoids.

86. Press the transmission solenoid wire harness connector (2) inward to engage the terminals on the solenoids.

87. Install the screws (1) to hold the valve body wire harness connector (2) to the valve body and solenoids and tighten to the proper (Torque Specifications) .

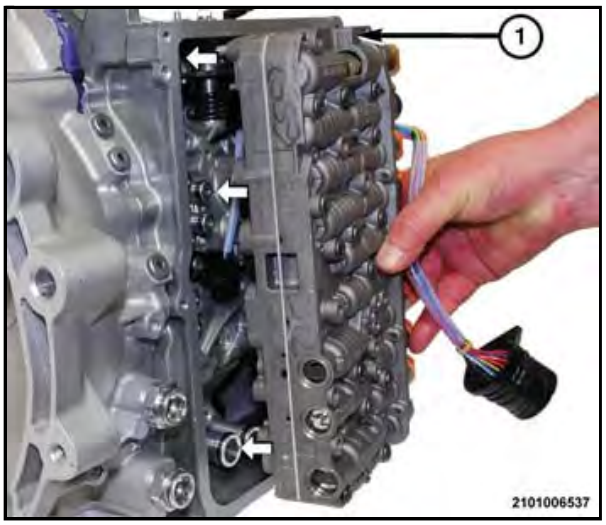


88. Connect the wire harness connector (2) to the fluid pressure sensor (1).

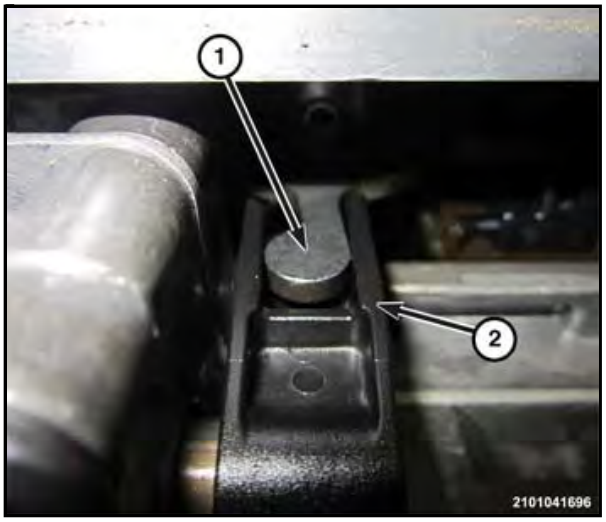


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89. Turn the valve body (1) over and align with the fluid transfer tubes.



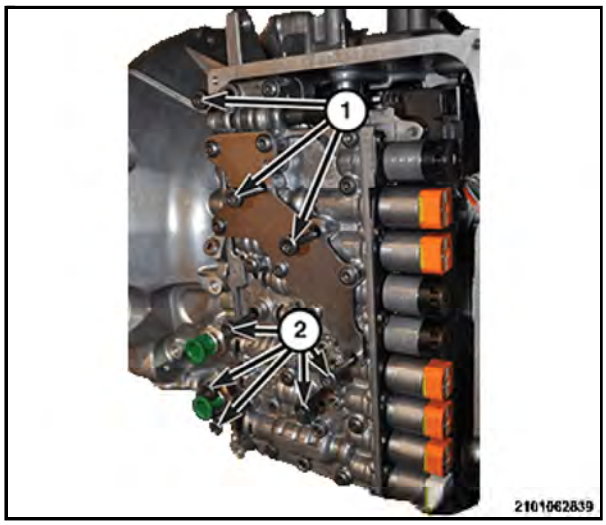
90. Guide the manual lever cam (1) into the slot on the manual valve (2).



91. Firmly press the valve body inward until the O-rings on the fluid transfer adapters engage into receptacle holes on the valve body.

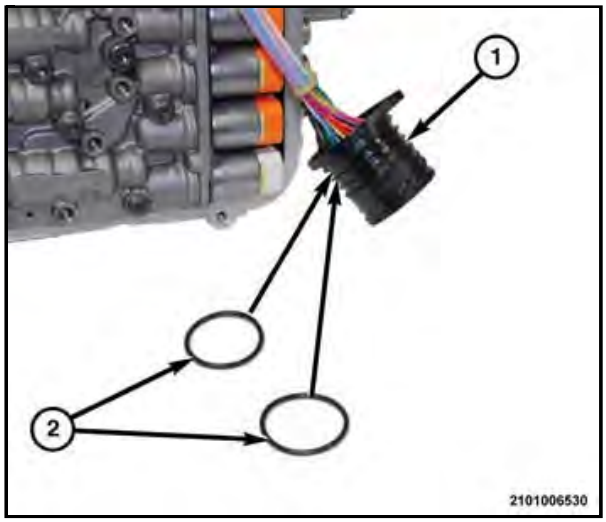
92. Install the 3 three upper valve body bolts (1) and five lower valve body bolts (2) to the transmission housing and tighten to the proper (Torque Specifications) .

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NOTE: A light coating of assembly lube can be applied to the O-ring seals (2) of the valve body wire harness connector to ease installation.

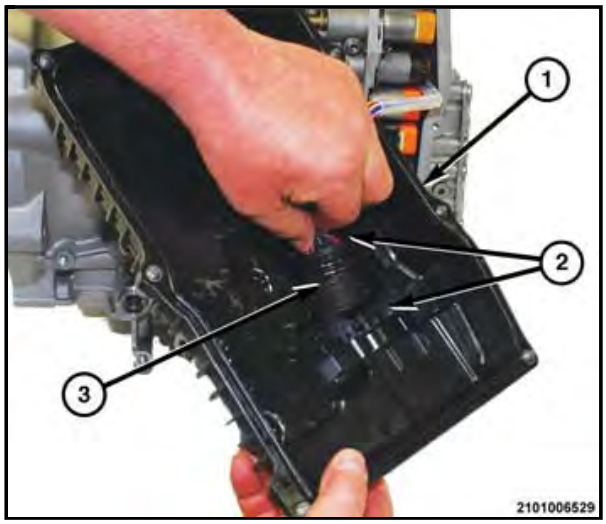
93. Install **NEW** O-ring seals (2) on the valve body wire harness connector (1).



94. Place the valve body cover pan (1) in position on the transmission.

NOTE: Be certain that the flat side (2) on the valve body wire harness connector (3) is aligned with the flat spot on the valve body cover pan (1).

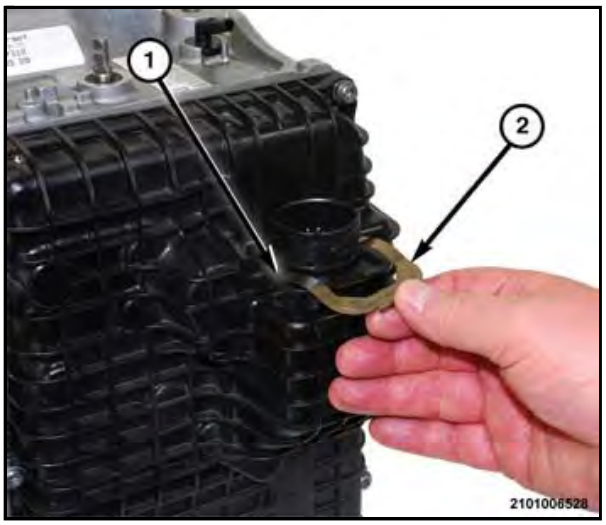
95. Insert the valve body wire harness connector (3) into the opening on the inside of valve body cover pan (1).



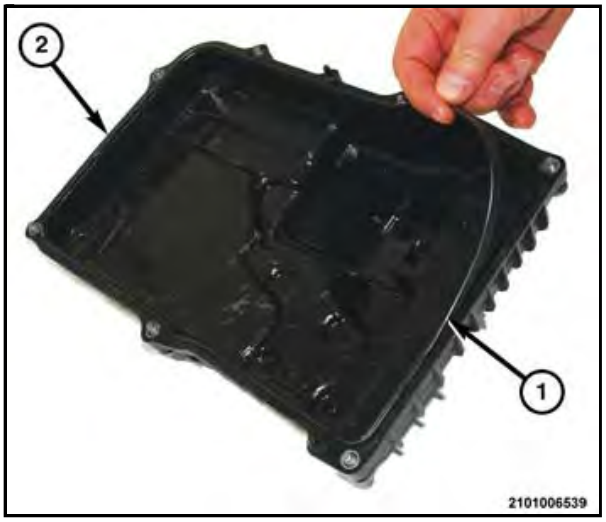
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96. Press the transmission solenoid connector inward until the retainer clip groove (1) is exposed on the outside of the valve body cover pan.

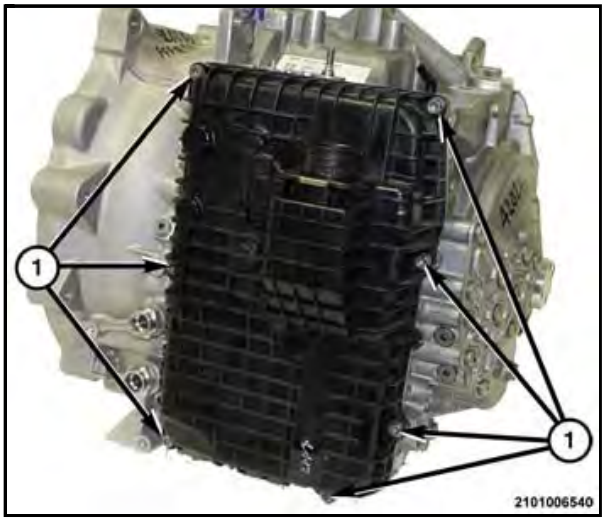
97. Install the clip (2) to hold the transmission solenoid connector in the valve body cover pan.



98. Install a **NEW** gasket seal (1) in the groove around the sealing surface of the valve body cover pan (2).



99. Install the valve body cover pan and valve body cover pan bolts (1) to hold the valve body cover pan to the transmission housing and tighten to the proper (Torque Specifications) .



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PET_AAM_1013-0323

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / BEARINGS, Differential / Removal and Installation

REMOVAL AND INSTALLATION

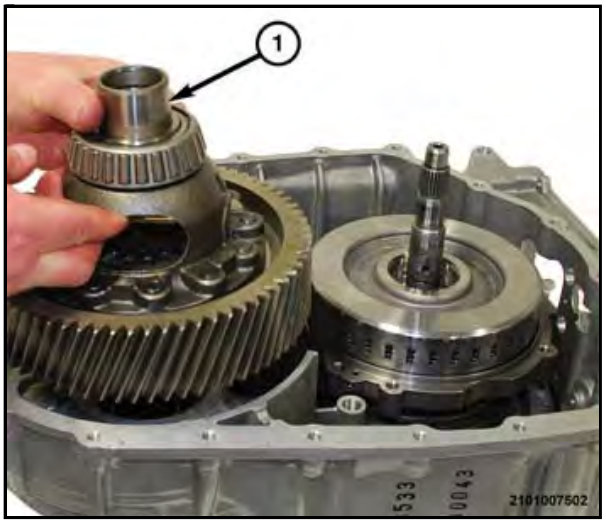
⊞ **Special Tools:** Click to display a list of tools used in this procedure

DIFFERENTIAL BEARING REMOVAL

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

2. Remove the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

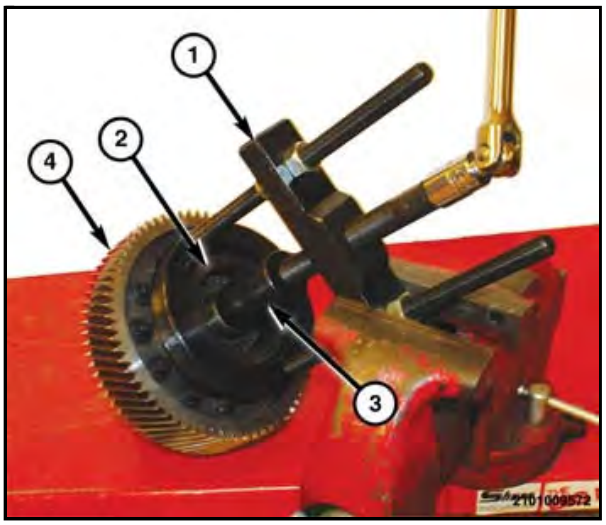
3. Remove the differential assembly (1) from the transmission.

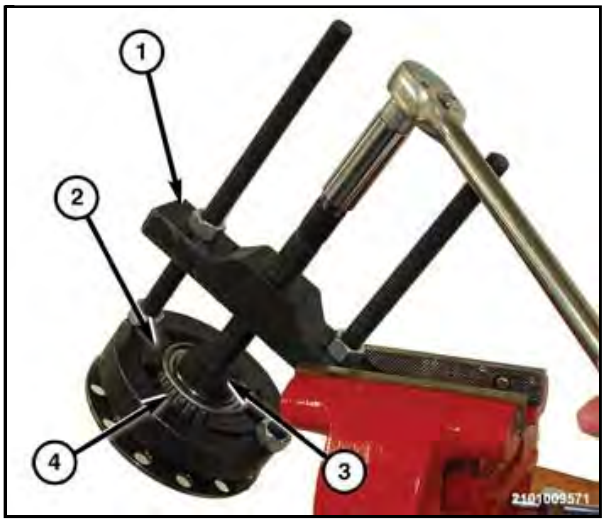


4. Clean the differential assembly with solvent and blow it dry with regulated 344 kPa (50 psi) shop air.

5. **If the differential is assembled** remove the bearings using tools Blocks, Adapter 9738 (2) , and Insert, Crankshaft 8513A (3), along with Puller, Press C-293-PA (1).

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6. **If the differential is disassembled** remove the bearings using tools Block Set, Puller C-293-37 (2) , and Press Plug 9678 (3), along with Puller, Press C-293-PA (1).

DIFFERENTIAL BEARING INSTALLATION

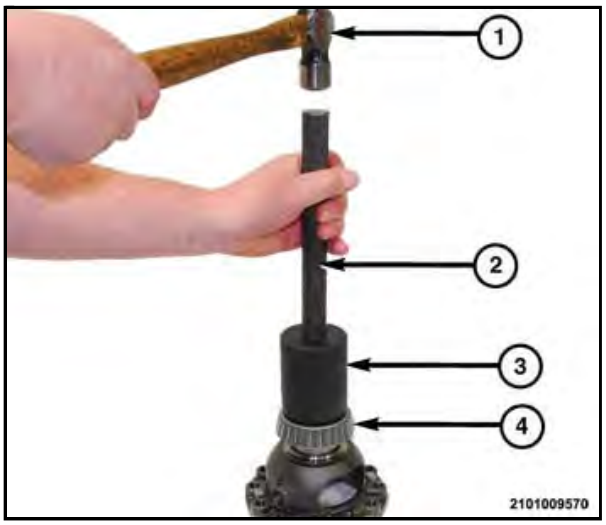
If only the bearing is being replaced the bearing preload does not require selecting a new select shim. If the transmission housing, bellhousing or differential is replaced, the proper thickness select shim will have to be determined (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) .

1. Clean the differential with solvent and blow it dry with regulated 344 kPa (50 psi) shop air.

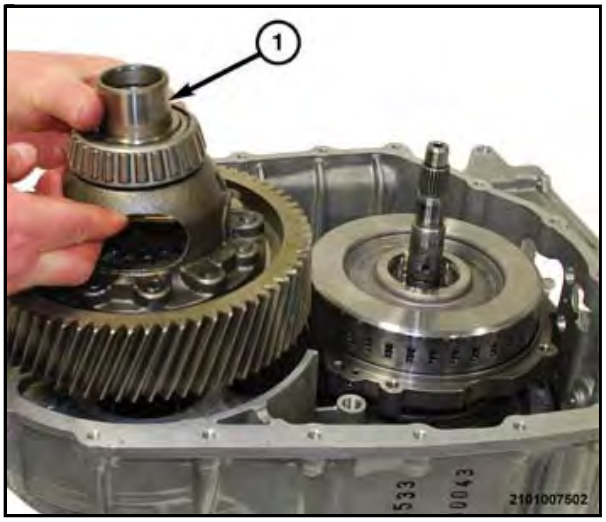
2. Using a suitable hammer (1), Installer, Seal 6888 (3) and Driver Handle, Universal C-4171 , install the side bearings.

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3. If necessary, assemble the differential assembly (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/DIFFERENTIAL AND RING GEAR/Disassembly and Assembly) .



4. Install the differential assembly (1) into the transmission housing.



5. Install the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

6. Install the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

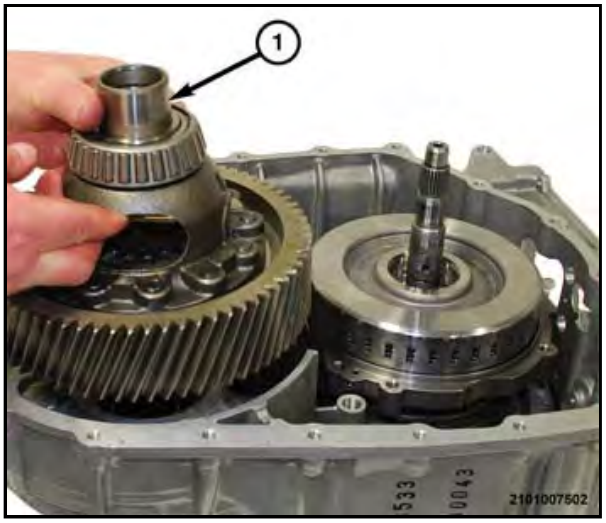
DIFFERENTIAL BEARING RACE REMOVAL

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

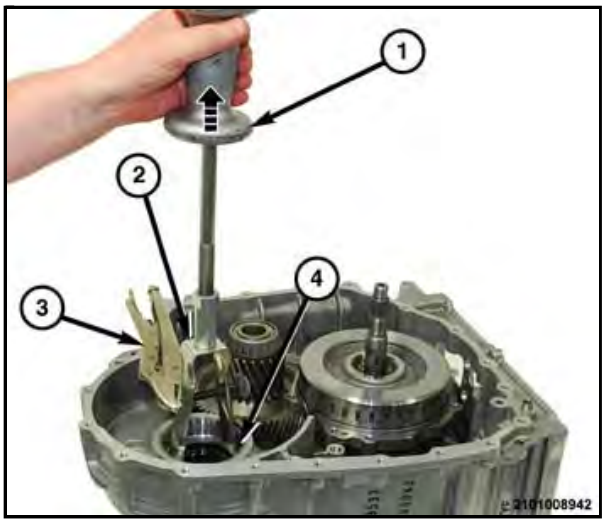
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2. Remove the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

3. Remove the differential assembly (1) from the transmission.



4. Using tool Remover, Bearing Cup 9664 (2), Slide Hammer, Universal C-637 (1) and suitable vise-grip pliers (3) to hold the expansion screw in position, remove the bearing race (4) from the transmission housing.



DIFFERENTIAL BEARING RACE INSTALLATION

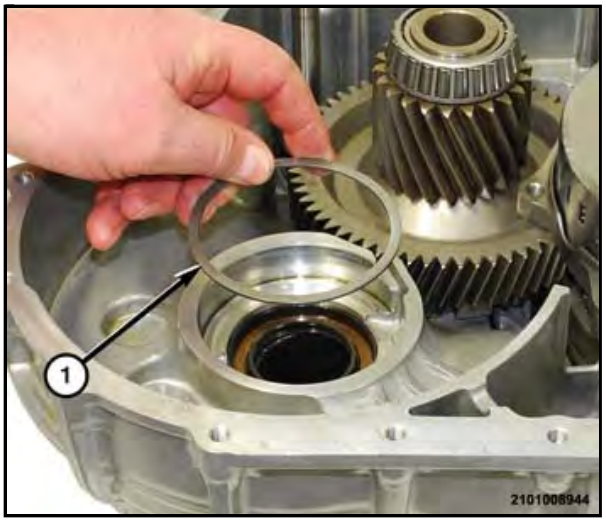
If only the bearing is being replaced the bearing preload does not require selecting a new select shim. If the transmission housing, bellhousing or differential is replaced, the proper thickness select shim will have to be determined (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) .

1. Wipe the bearing bores clean with a clean lint free cloth.

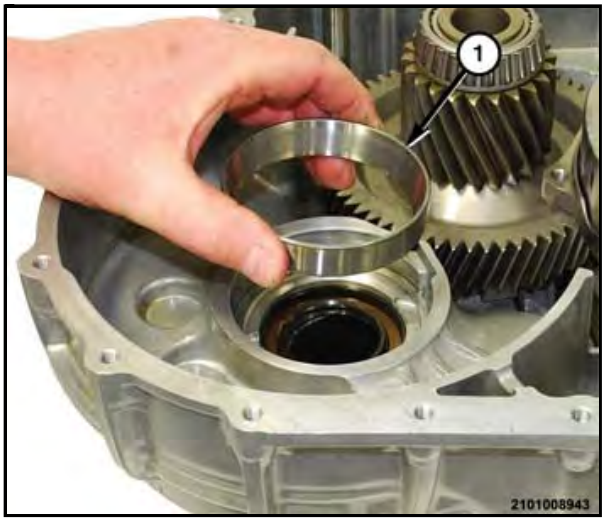
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2. Inspect the bearing bores for damage or cracks in the casting.

3. Install the original select shim (1) in the bearing bore of the transmission housing.

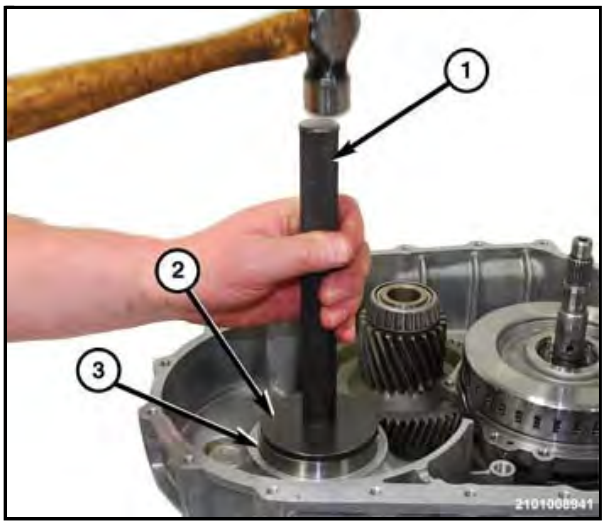


4. Place the **NEW** bearing race (1) in the bearing bore of the transmission housing.

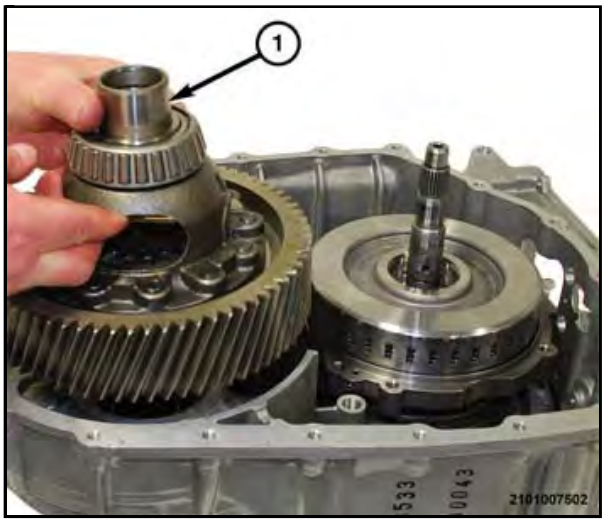


5. Using tool Installer, Bearing C-4310 (2) and Driver Handle, Universal C-4171 (1) install the bearing race in the transmission housing.

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6. Install the differential assembly (1) in the transmission housing.



7. Place the **NEW** bearing race in the bearing bore of the bellhousing.

8. Using tool Installer, Bearing C-4310 and Driver Handle, Universal C-4171 install the bearing race in the transmission bellhousing.

9. Install the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

10. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / BEARINGS, Transfer Gear / Removal and Installation

TRANSFER GEAR INNER BEARING

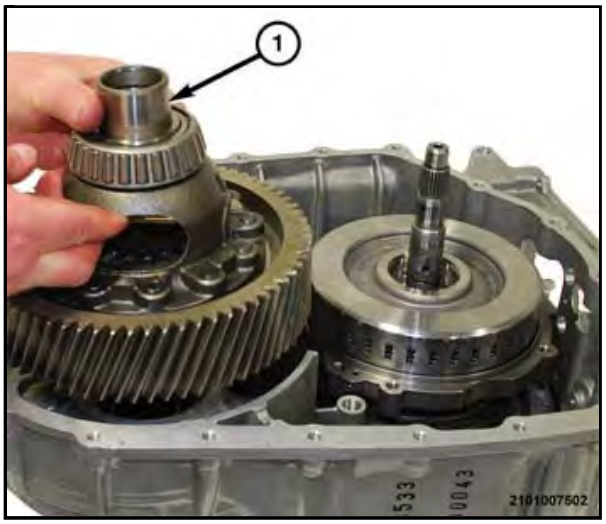
⊞ **Special Tools:** Click to display a list of tools used in this procedure

TRANSFER GEAR INNER BEARING REMOVAL

WARNING: Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.

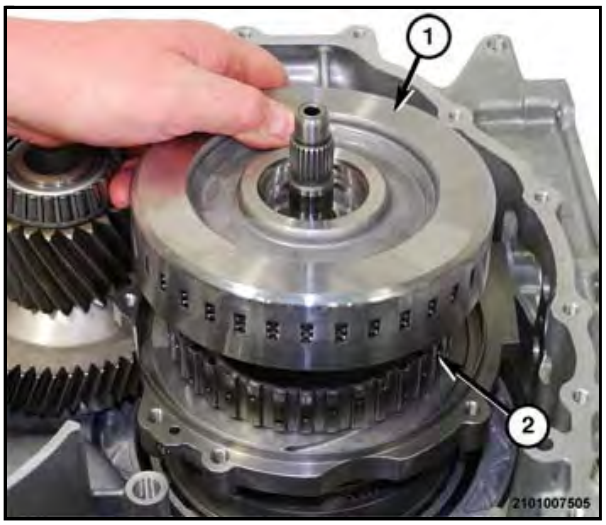
Before disassembling the transmission, remove oily grime and loose dirt. Place the transmission on a clean work surface with ample fluid drainage or absorbency.

1. Remove the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal).
2. Remove the differential assembly (1) from the transmission housing.

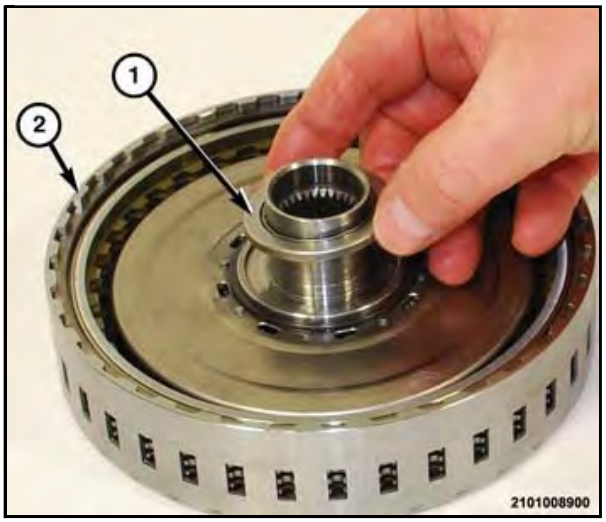


3. Separate the E-clutch drum (1) from the E-clutch hub (2).

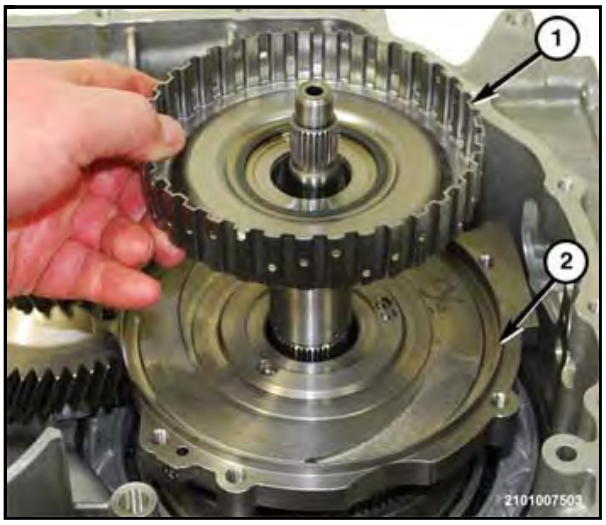
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4. Separate the thrust bearing (1) from the E-clutch (2) hub.

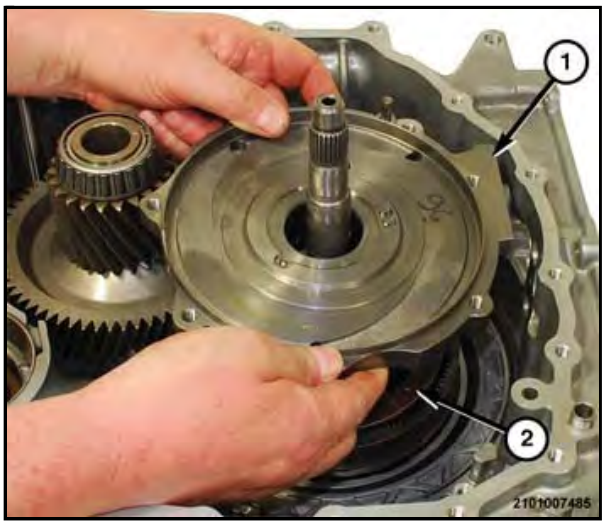


5. Separate the E-clutch hub (1) from the output gear support (2).

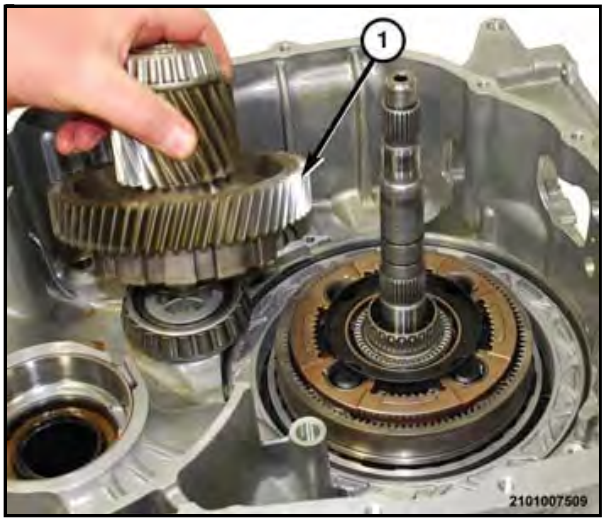


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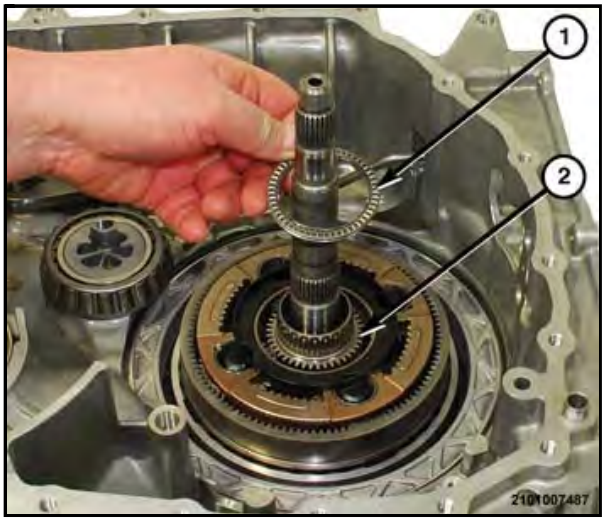
6. Separate the output gear support (1) from the gear 4 planetary pinion carrier (2).



7. Remove the transfer gear (1) from the transmission housing.

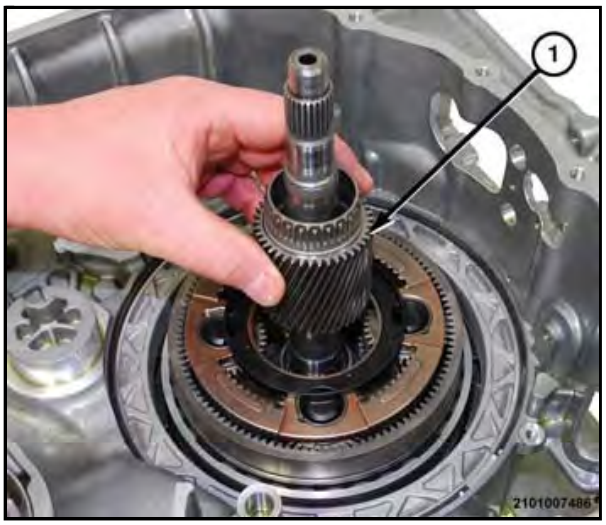


8. Separate the roller type thrust bearing (1) from the sun gear 3 and 4 and Dog Clutch-F (2).

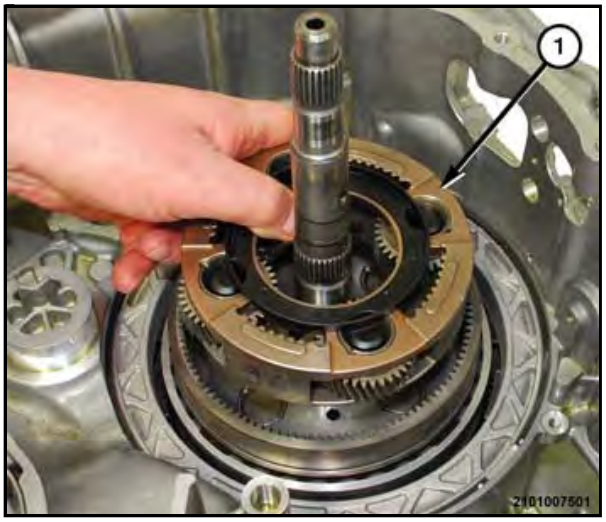


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9. Separate the sun gear 3 and 4 and Dog Clutch-F (1) from the gear 4 planetary pinion carrier.



10. Separate the gear 4 planetary pinion carrier (1) from the annulus gear 4.

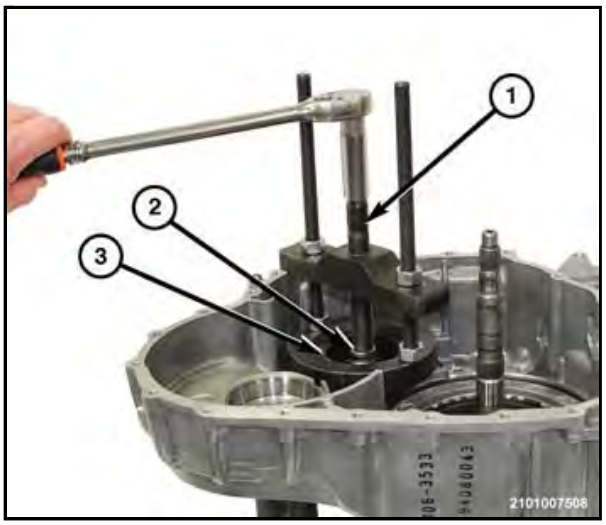


11. Separate the annulus gear 4 (1) from the annulus gear 3 (2).



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12. Using the Puller, Press C-293-PA (1), Adapter Blocks Blocks, Adapter 9738 (3) and a suitable socket as a plug (2), remove the transfer gear bearing cone from the transmission housing.

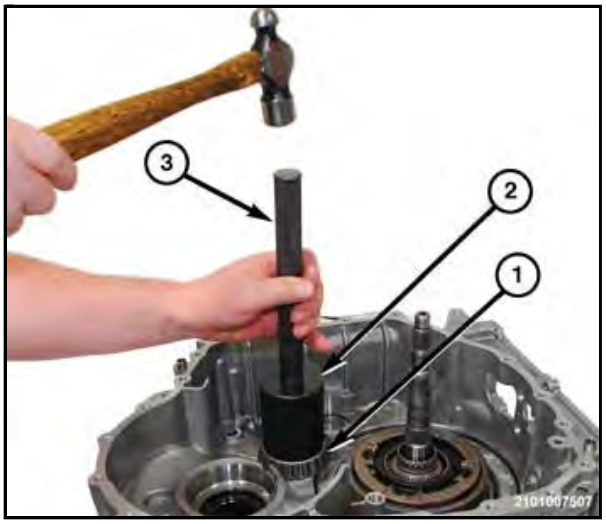


TRANSFER GEAR INNER BEARING INSTALLATION

The work area, counter surfaces and tools must be thoroughly cleaned before attempting to assemble the 948TE transmission. All of the sub assemblies should be disassembled, cleaned, and assembled with new sealing components where applicable. The transmission housing should be clean and oil free before beginning this procedure. If the transmission was contaminated with metallic material, all of the thrust bearings and roller bearings should be replaced. The bearing in the output gear support assembly is not serviceable. The output gear support assembly should be replaced if metal debris is present.

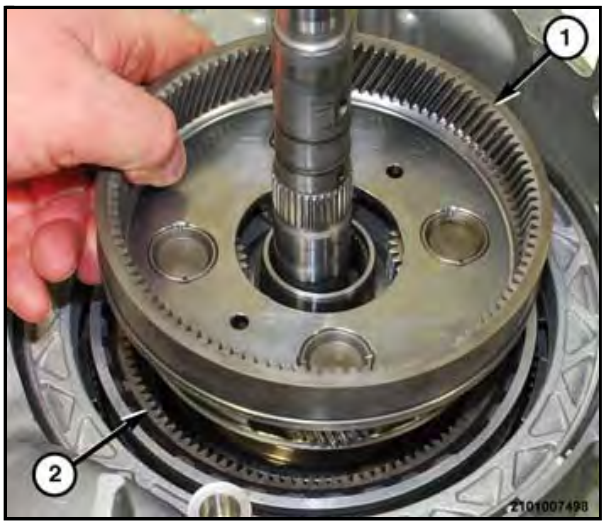
WARNING: Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.

1. Using tool Installer, Seal 6888 (2), and handle Driver Handle, Universal C-4171 (3) install the transfer gear bearing cone (1) onto the transmission housing.

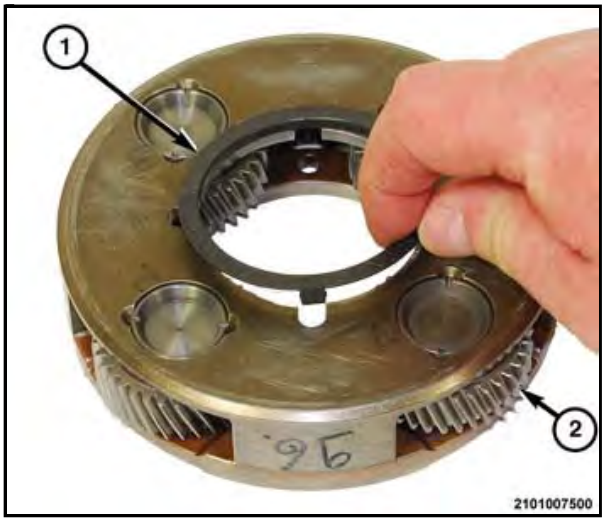


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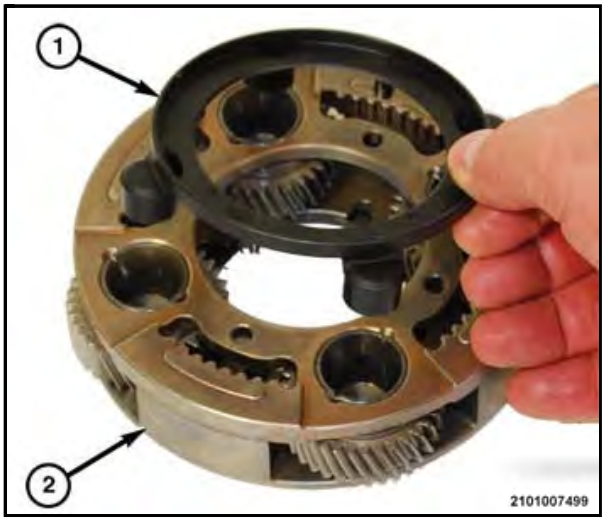
2. Install the annulus gear 4 (1) in the annulus gear 3 (2).



3. Install a **NEW** thrust spacer (1) on the underside of the gear 4 planetary pinion carrier (2).

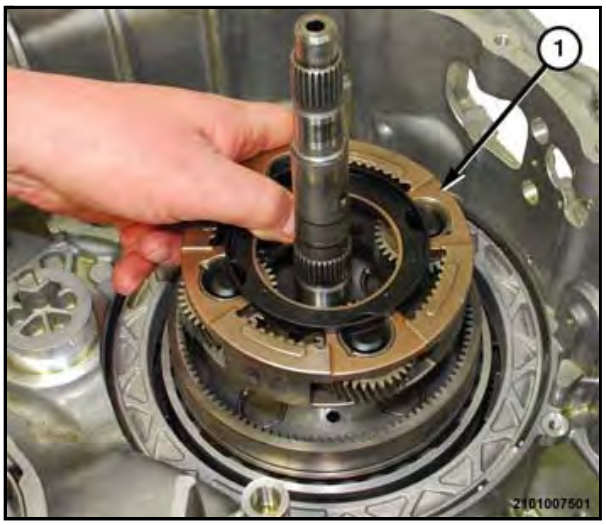


4. Install a **NEW** thrust spacer (1) on the topside of the gear 4 planetary pinion carrier (2).



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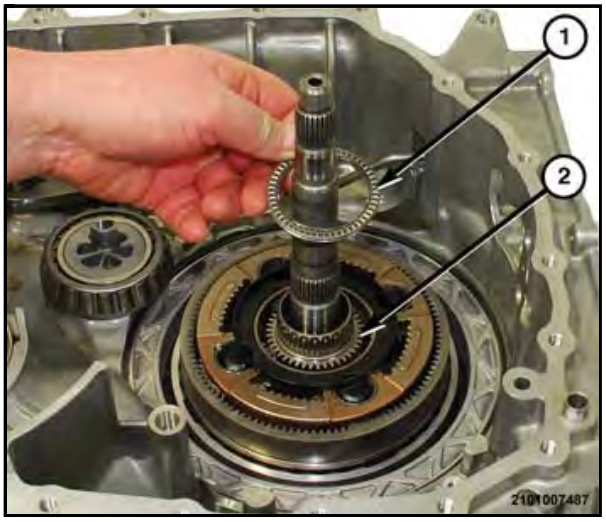
5. Install the gear 4 planetary pinion carrier (1) into the annulus gear 4.



6. Install the sun gear 3 and 4 and Dog Clutch-F (1) in the gear 4 planetary pinion carrier.

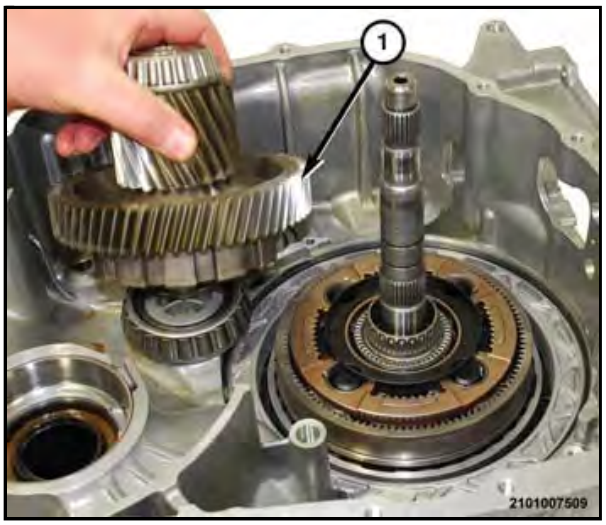


7. Install the roller type thrust bearing (1) onto the sun gear 3 and 4 and Dog Clutch-F (2).

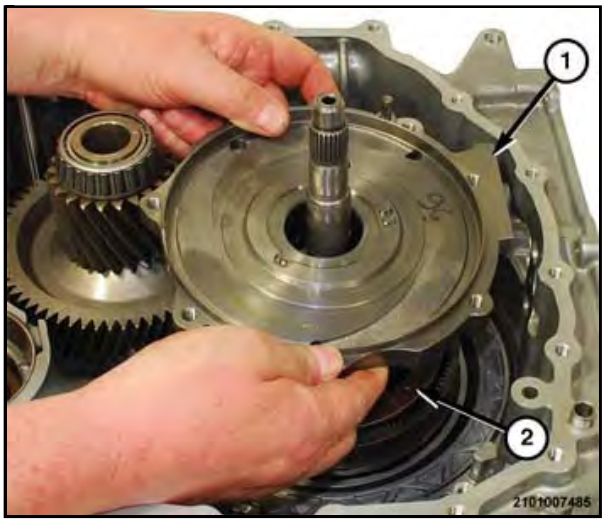


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PET_AAM_1013-0336

NOTE: If a new transfer gear (1) or transmission housing are being used, measurements must be preformed to determine correct thickness for the bearing preload shims (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) . If the bearings and races are replaced the factory installed preload shims do not require replacement.

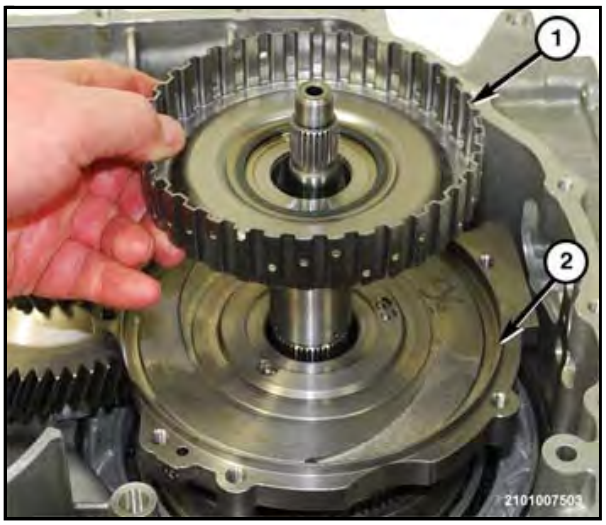


8. If necessary, replace the bearings and races on the transfer gear (1).
9. Install the transfer gear (1) into the transmission housing.

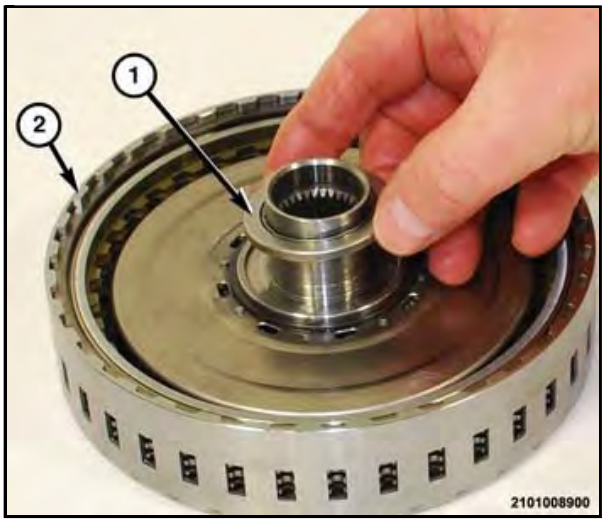


10. Install the output gear support (1) into the gear 4 planetary pinion carrier (2).
11. Install the E-clutch hub and shaft (1) in the output gear support (2).

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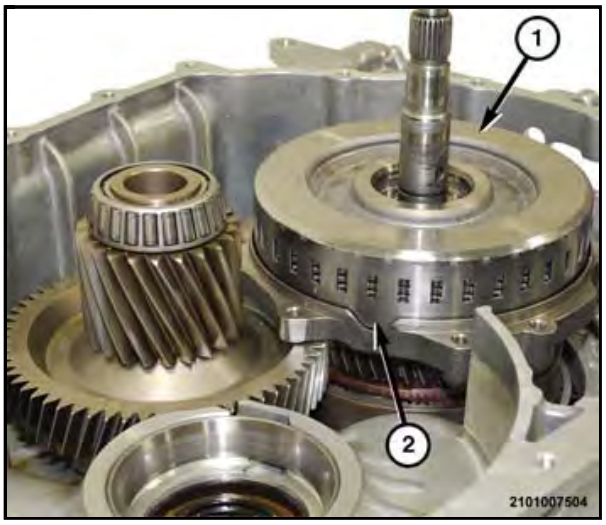
12. Install the thrust bearing (1) on the E-clutch (2) hub.



NOTE: **Before installing the E-clutch, use a suitable screwdriver to align the grooves in the friction discs.**

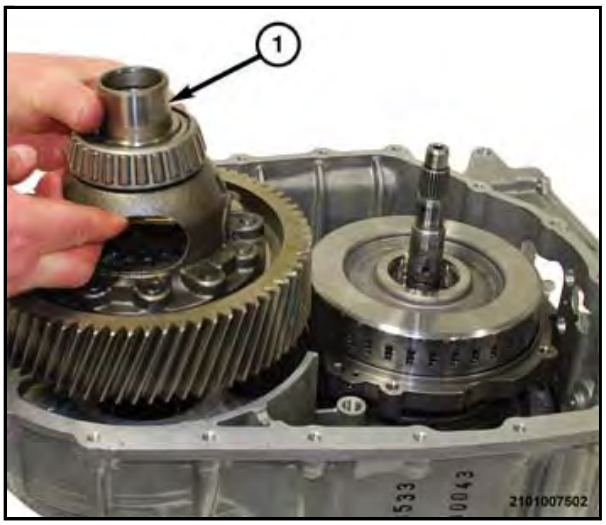
13. Wriggle the E-clutch (1) until all of the friction discs are fully engaged on the E-clutch hub and shaft.

NOTE: **When the E-clutch (1) is fully seated the gap (2) will be very small between the E-clutch retainer and the output gear support.**



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NOTE: **If a new differential (1) or transmission housing are being used, measurements must be preformed to determine correct thickness for the bearing preload shims. If the bearings and races are replaced the factory installed preload shims do not require replacement (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) .**



14. If necessary, replace the bearings and races on the differential (1).
15. Install the differential assembly (1) into the transmission housing.
16. Install the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .
17. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .
18. Road test the vehicle to verify the repair.

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PET_AAM_1013-0339

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / BEARINGS, Transfer Gear / Removal and Installation

TRANSFER GEAR INNER BEARING RACE

⊞ **Special Tools:** Click to display a list of tools used in this procedure

TRANSFER GEAR INNER BEARING RACE REMOVAL

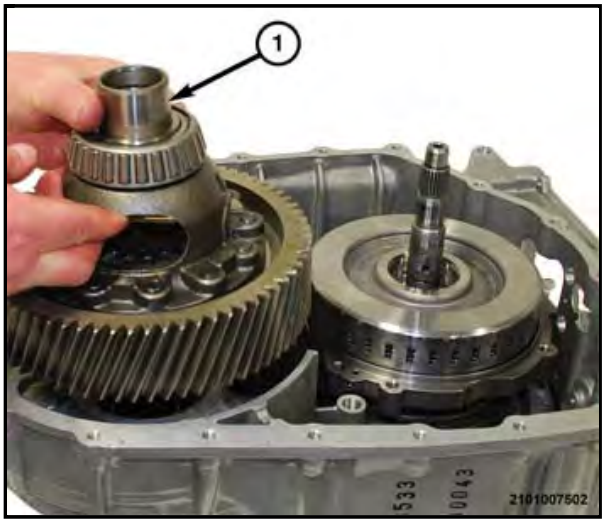
WARNING: Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.

Before disassembling the transmission, remove oily grime and loose dirt. Place the transmission on a clean work surface with ample fluid drainage or absorbency.

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

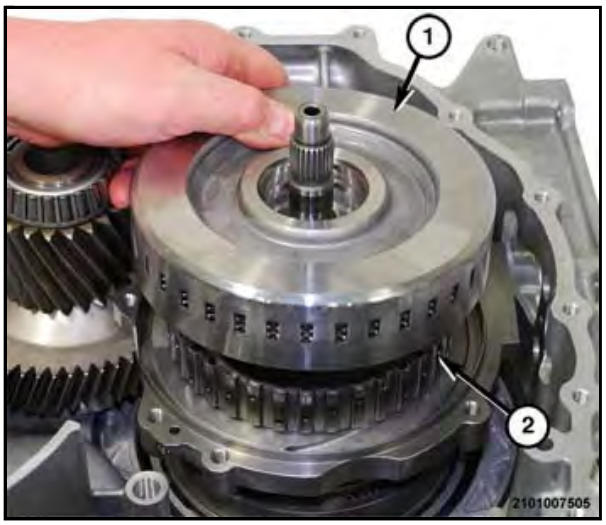
2. Remove the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

3. Remove the differential assembly (1) from the transmission housing.

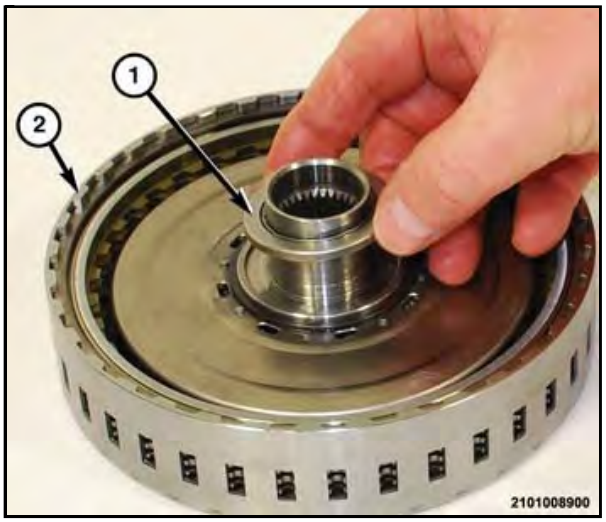


4. Separate the E-clutch drum (1) from the E-clutch hub (2).

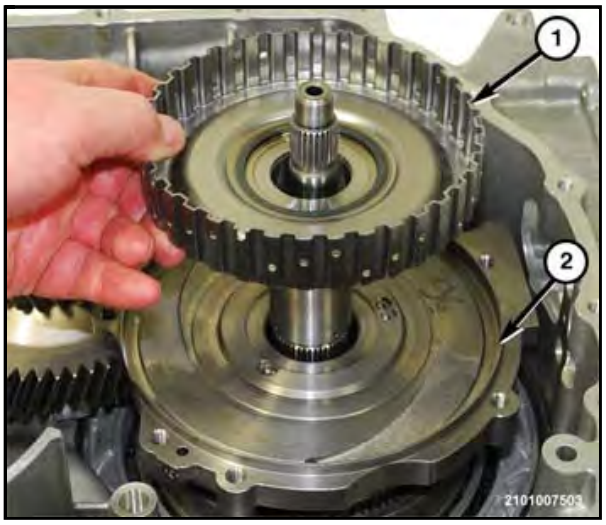
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5. Separate the thrust bearing (1) from the E-clutch (2) hub.

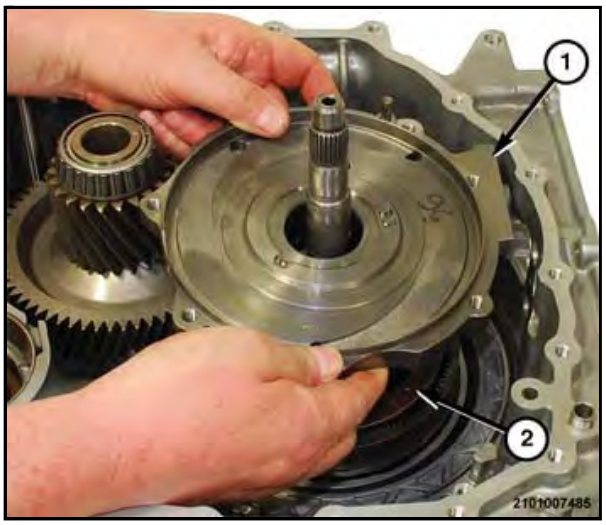


6. Separate the E-clutch hub (1) from the output gear support (2).

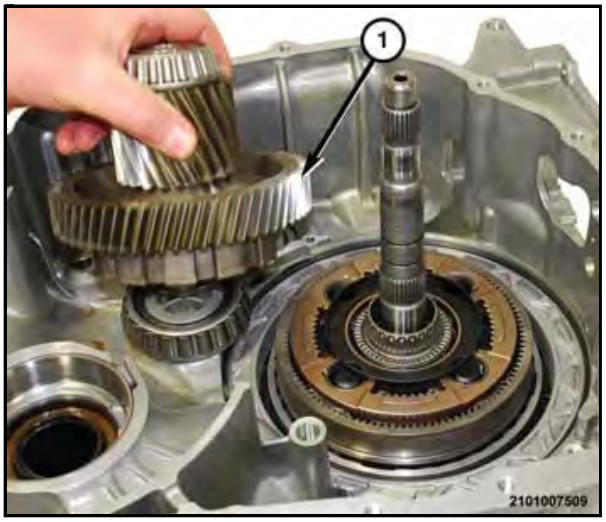


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PET_AAM_1013-0341

7. Separate the output gear support (1) from the gear 4 planetary pinion carrier (2).



8. Remove the transfer gear (1) from the transmission housing.



9. Clean the transfer gear with solvent and blow it dry with regulated 344 kPa (50 psi) shop air.

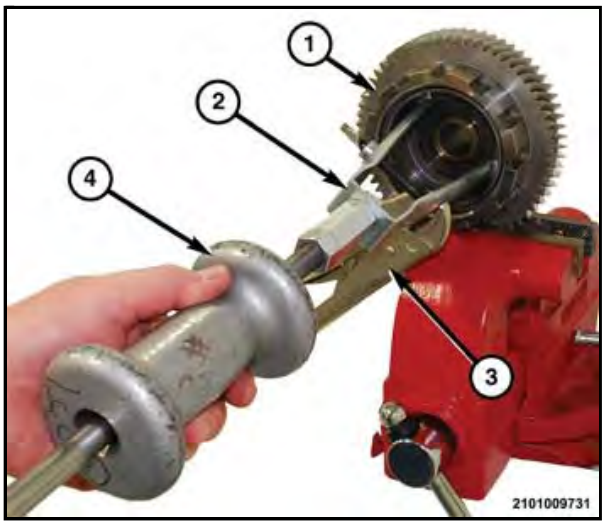
10. Clamp the transfer gear (1) in a suitable bench vise with protective jaws.

    NOTE: It may be necessary to clamp vise grips (3) on the seal remover (2) to keep the expander screw in place.

11. Using tool Slide Hammer, Universal C-637 (4) and Remover, Seal 7794-A (2) with the jaws expanded out under the inner edge on the bearing race.

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PET_AAM_1013-0342

12. Knock outward with the slide hammer (4) until the bearing race comes out of the transfer gear (1).



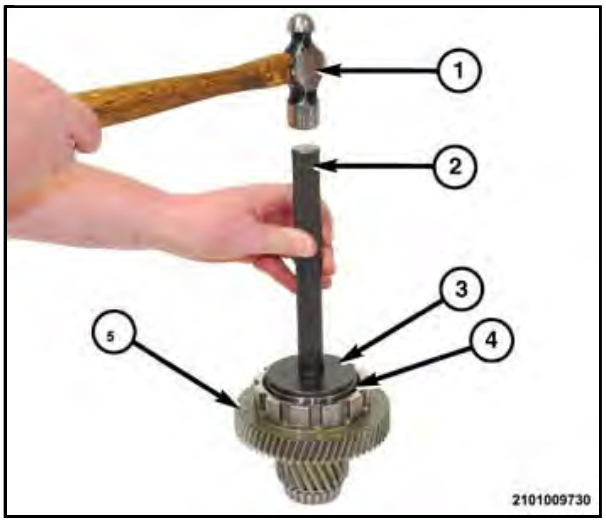
TRANSFER GEAR INNER BEARING RACE INSTALLATION

1. Using a clean lint free cloth, wipe the transfer gear bore clean. Inspect the bore for burrs or other damage. Use crocus cloth the dress down burrs.

2. Place the transfer gear on the stable, clean work surface.

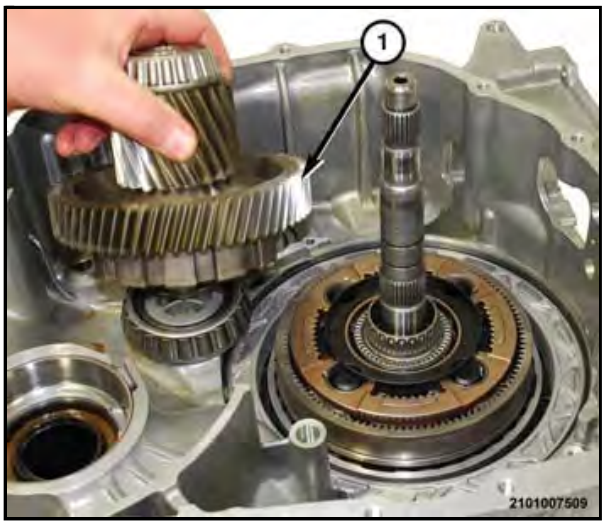
3. Place the **NEW** bearing race (4) in the transfer gear bore.

4. Using a suitable hammer (1) and tool Installer, Bearing Cup 9588 (3) with Driver Handle, Universal C-4171 (2), drive the bearing race into the transfer gear until it is fully seated against the bottom surface.

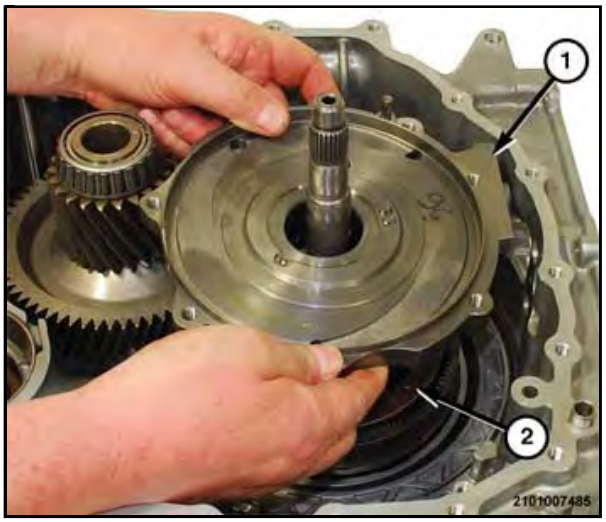


5. Install the transfer gear (1) into the transmission housing.

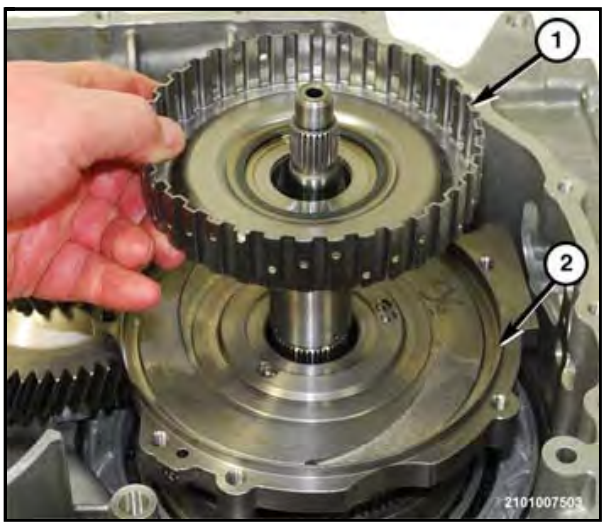
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0343



6. Install the output gear support (1) into the gear 4 planetary pinion carrier (2).

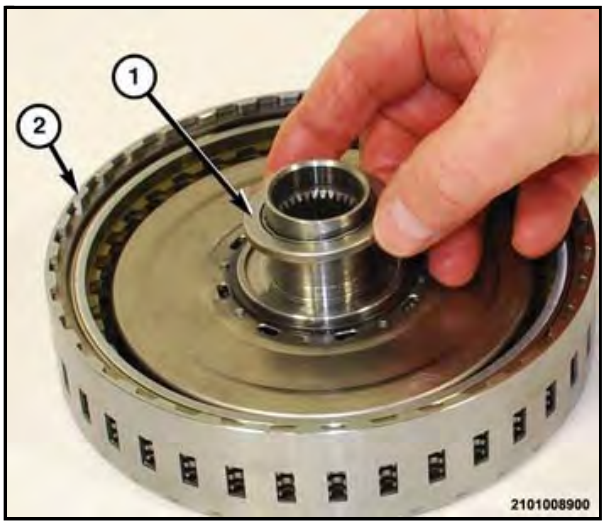


7. Install the E-clutch hub and shaft (1) in the output gear support (2).



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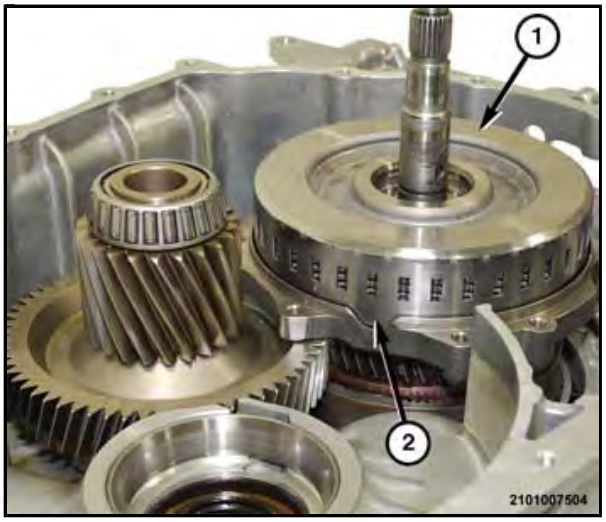
8. Install the thrust bearing (1) on the E-clutch (2) hub.



NOTE: **Before installing the E-clutch, use a suitable screwdriver to align the grooves in the friction discs.**

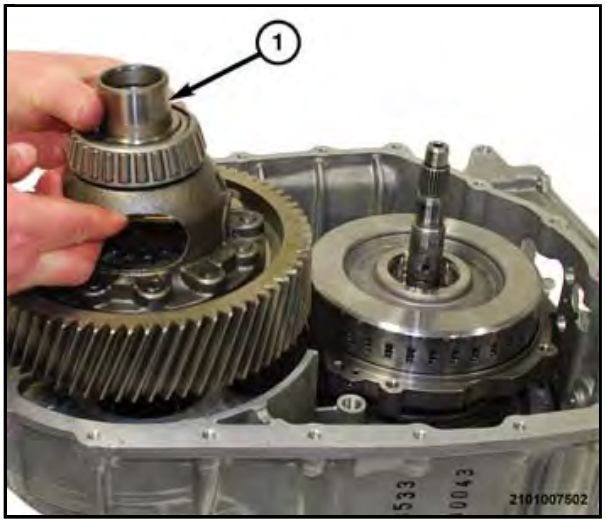
9. Wriggle the E-clutch (1) until all of the friction discs are fully engaged on the E-clutch hub and shaft.

NOTE: **When the E-clutch (1) is fully seated the gap (2) will be very small between the E-clutch retainer and the output gear support.**



NOTE: **If a new differential (1) or transmission housing are being used, measurements must be preformed to determine correct thickness for the bearing preload shims. If the bearings and races are replaced the factory installed preload shims do not require replacement (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) .**

10. If necessary, replace the bearings and races on the differential (1).



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11. Install the differential assembly (1) into the transmission housing.

12. Install the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

13. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

14. Road test the vehicle to verify the repair.

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PET_AAM_1013-0346

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / BEARINGS, Transfer Gear / Removal and Installation

TRANSFER GEAR OUTER BEARING

⊞ **Special Tools:** Click to display a list of tools used in this procedure

TRANSFER GEAR OUTER BEARING REMOVAL

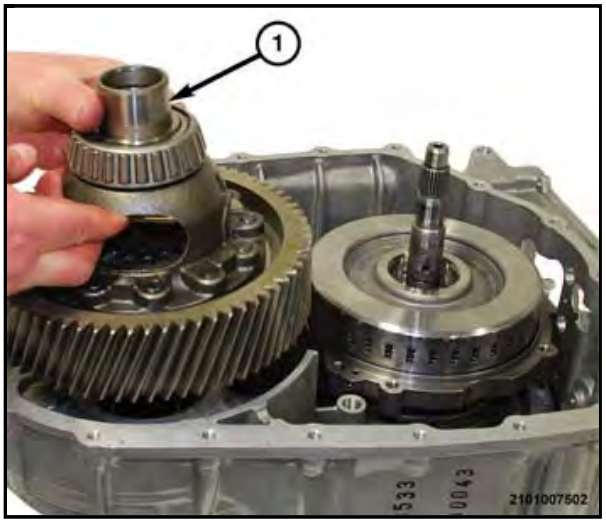
WARNING: Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.

Before disassembling the transmission, remove oily grime and loose dirt. Place the transmission on a clean work surface with ample fluid drainage or absorbency.

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

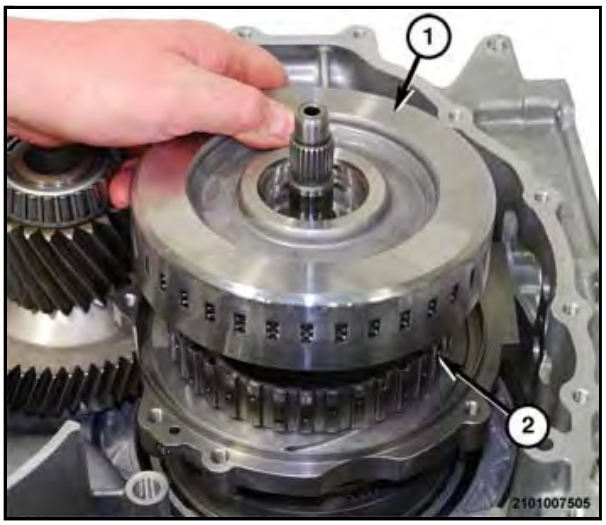
2. Remove the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

3. Remove the differential assembly (1) from the transmission housing.

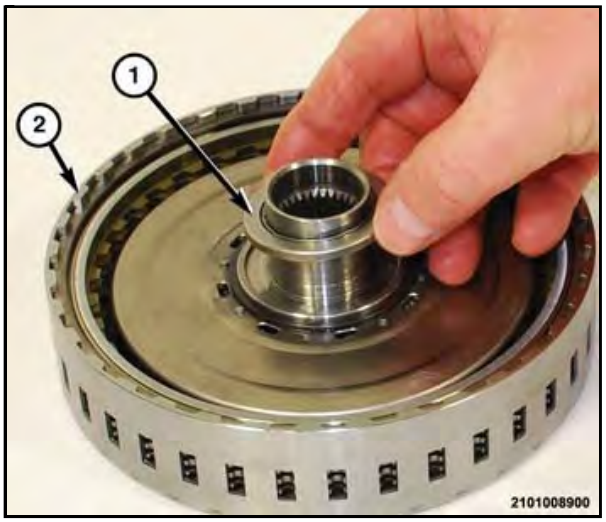


4. Separate the E-clutch drum (1) from the E-clutch hub (2).

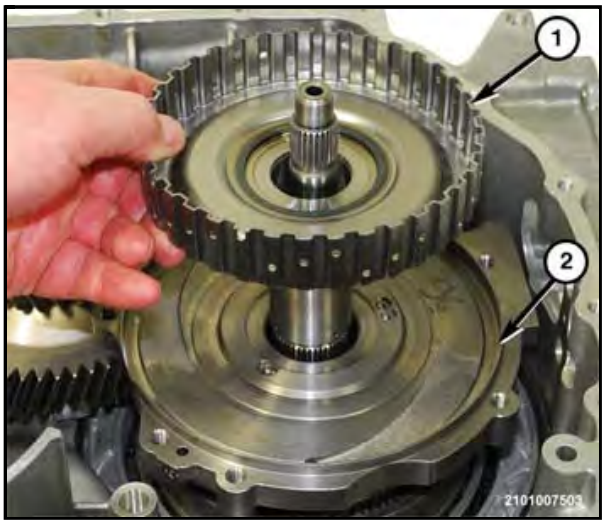
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PET_AAM_1013-0347



5. Separate the thrust bearing (1) from the E-clutch (2) hub.

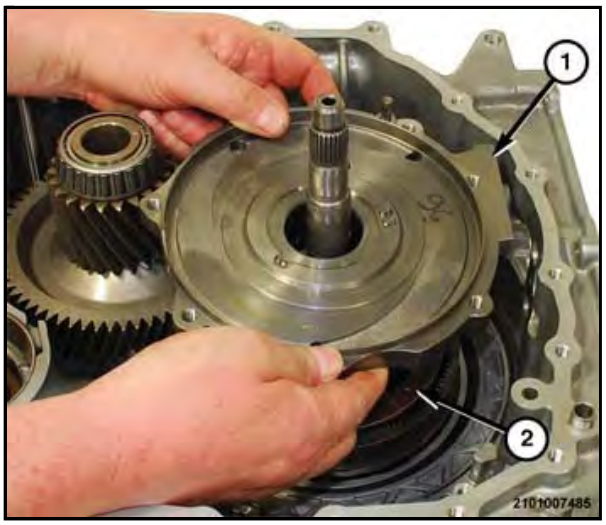


6. Separate the E-clutch hub (1) from the output gear support (2).

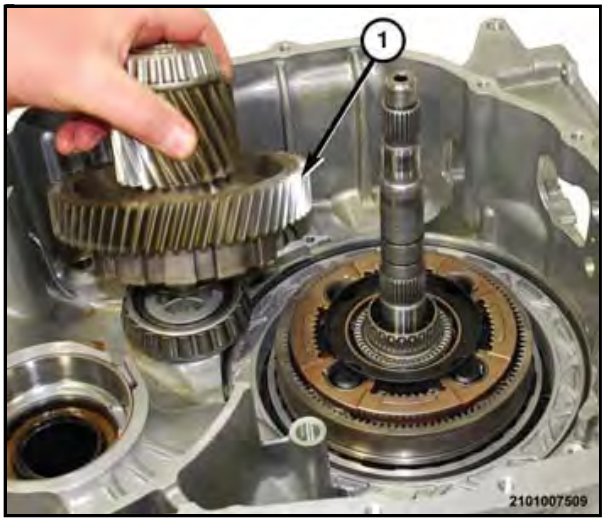


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PET_AAM_1013-0348

7. Separate the output gear support (1) from the gear 4 planetary pinion carrier (2).



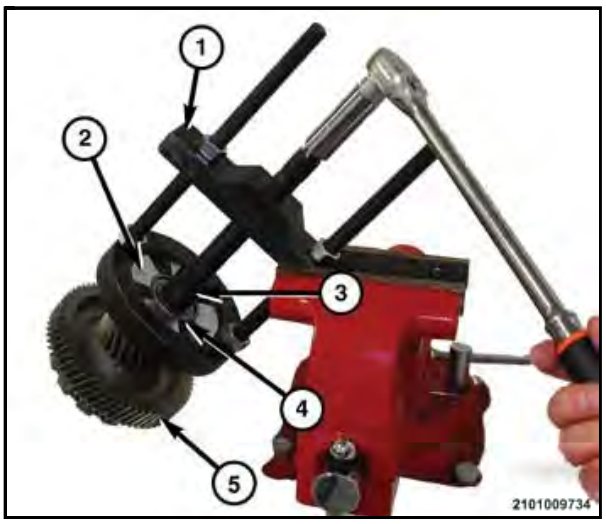
8. Remove the transfer gear (1) from the transmission housing.



9. Clamp tool Puller, Press C-293-PA (1) in a suitable vise with the ram bolt head facing upward.

10. Using tool Block Set, Puller C-293-40 (2) with the transfer gear bearing inserted under the puller press and the blocks engaged evenly spaced around the bearing, insert tool Insert, Crankshaft 8513A (3) between the press ram and the transfer gear (5) and hand tighten the press (1) ram down to the insert.

11. While holding the transfer gear (5), use a suitable wrench to tighten the press (1) ram until the bearing (4) comes off the transfer gear.

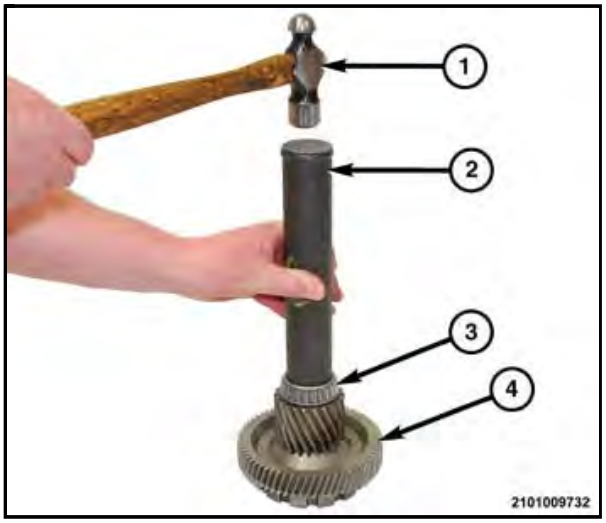


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PET_AAM_1013-0349

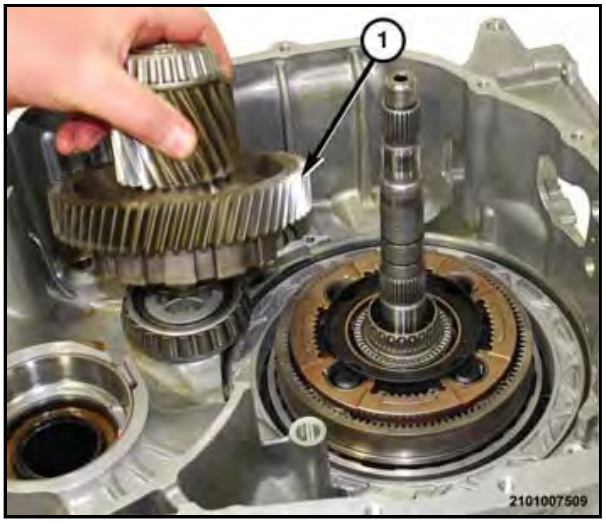
TRANSFER GEAR OUTER BEARING INSTALLATION

NOTE: Clean the transfer gear with suitable solvent and blow it dry with 344 kPa (50psi) regulated shop air.

1. Place the transfer gear on a stable, clean work surface.
2. Place the **NEW** transfer gear bearing (3) on the transfer gear (4).
3. Using a suitable hammer (1) and tool Installer, Bearing/Seal 6052 (2), drive the transfer gear bearing (3) onto the transfer gear (4).

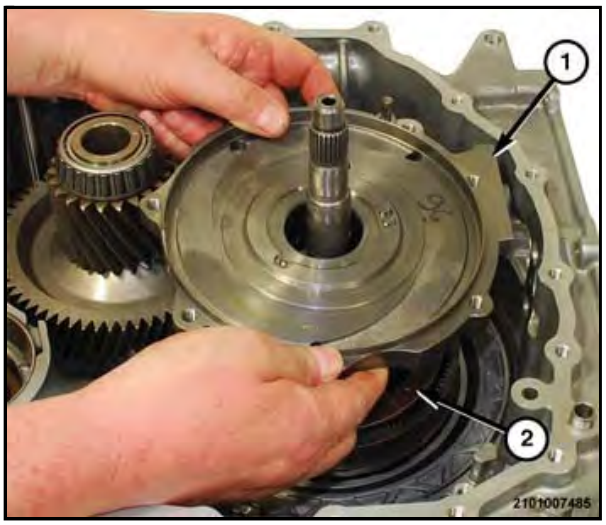


4. Install the transfer gear (1) into the transmission housing.

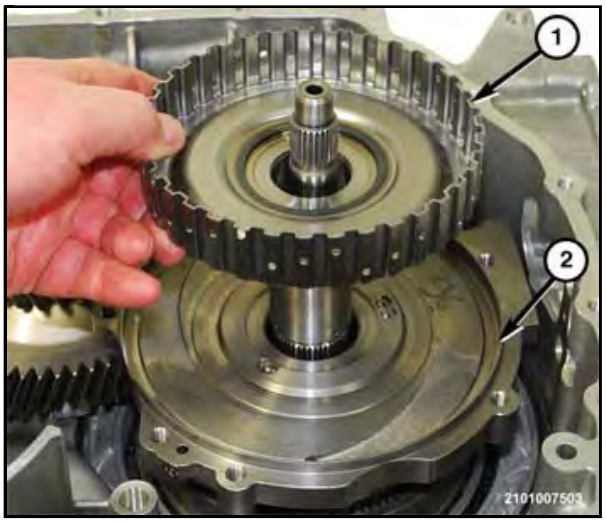


5. Install the output gear support (1) into the gear 4 planetary pinion carrier (2).

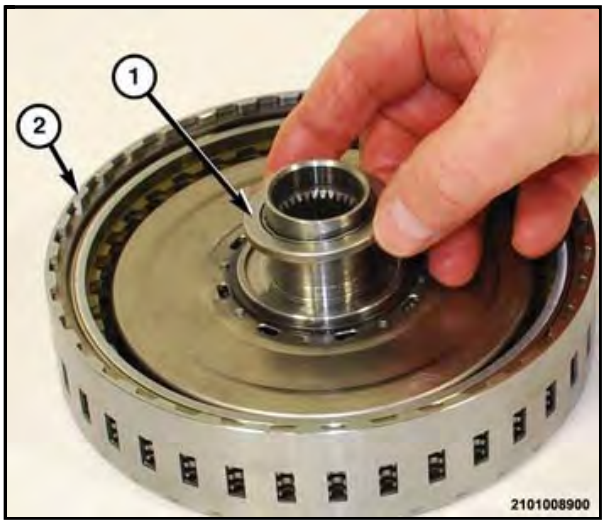
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PET_AAM_1013-0350



6. Install the E-clutch hub and shaft (1) in the output gear support (2).

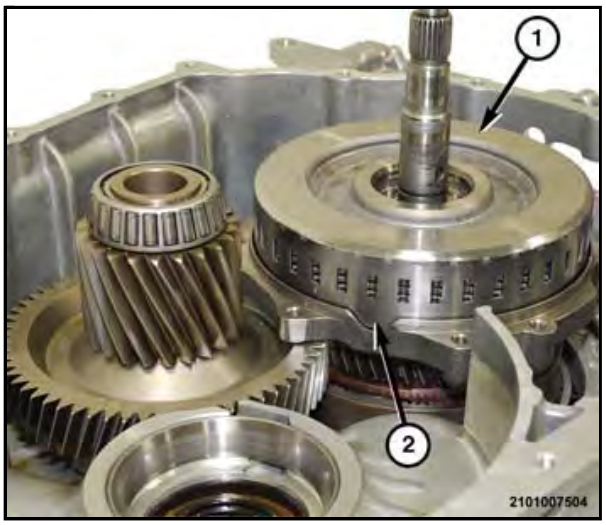


7. Install the thrust bearing (1) on the E-clutch (2) hub.



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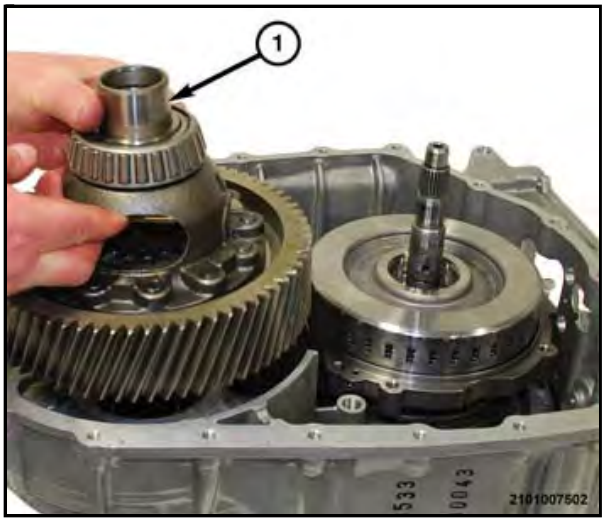
NOTE: Before installing the E-clutch, use a suitable screwdriver to align the grooves in the friction discs.



8. Wriggle the E-clutch (1) until all of the friction discs are fully engaged on the E-clutch hub and shaft.

NOTE: When the E-clutch (1) is fully seated the gap (2) will be very small between the E-clutch retainer and the output gear support.

NOTE: If a new differential (1) or transmission housing are being used, measurements must be preformed to determine correct thickness for the bearing preload shims. If the bearings and races are replaced the factory installed preload shims do not require replacement (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) .



9. If necessary, replace the bearings and races on the differential (1).

10. Install the differential assembly (1) into the transmission housing.

11. Install the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

12. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

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PET_AAM_1013-0352

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / BEARINGS, Transfer Gear / Removal and Installation

TRANSFER GEAR OUTER BEARING RACE

⊞ **Special Tools:** Click to display a list of tools used in this procedure

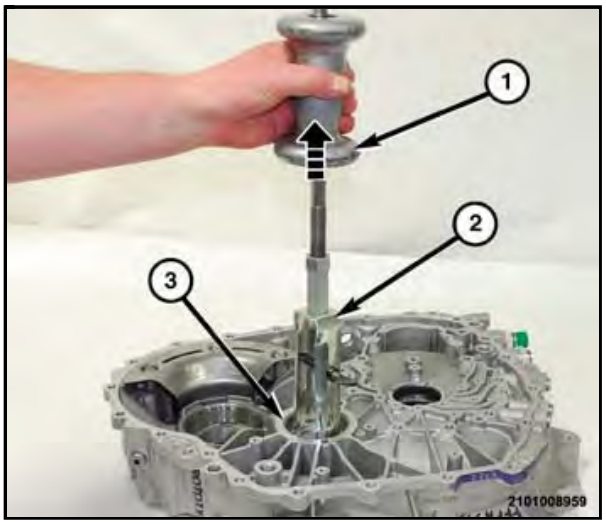
TRANSFER GEAR OUTER BEARING RACE REMOVAL

1. Remove the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

2. Remove the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

3. Position the bellhousing on a stable, clean work surface.

4. Using tool Slide Hammer, Universal C-637 (1) and Remover, Bearing Cup 9664 (2) with the tool fingers inserted in the channels behind the transfer gear outer bearing race (3), remove the transfer gear outer bearing race (3) from the bellhousing bore.



TRANSFER GEAR OUTER BEARING RACE INSTALLATION

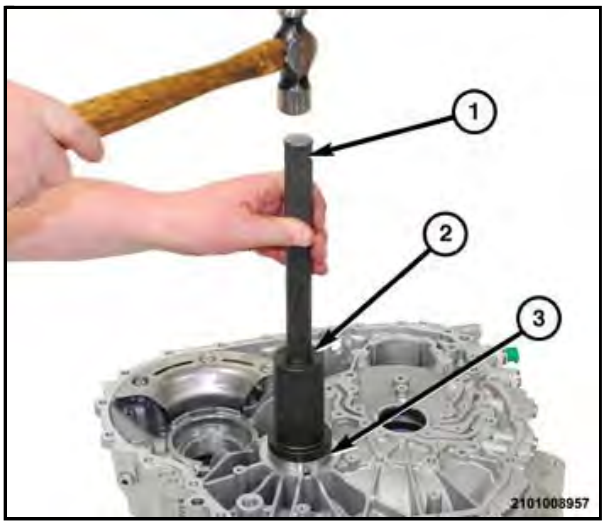
Clean the bearing bore with a lint free cloth and inspect for damage to the bellhousing casting. If the bellhousing is damaged the transmission will require replacement.

1. Place the **NEW** transfer gear outer bearing race in position in the bellhousing bore.

2. Using and suitable hammer and tool Installer, Bearing Cup 10036 (1) with Driver Handle, Universal C-4171 (2) , drive the transfer gear

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outer bearing race (3) into the bellhousing bore until it seats down to the bottom stop.



3. Install the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

4. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

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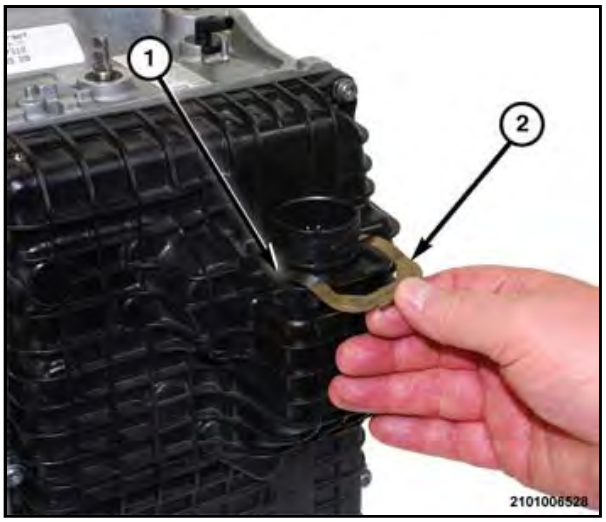
21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / BELLHOUSING / Removal and Installation

REMOVAL AND INSTALLATION

BELLHOUSING REMOVAL

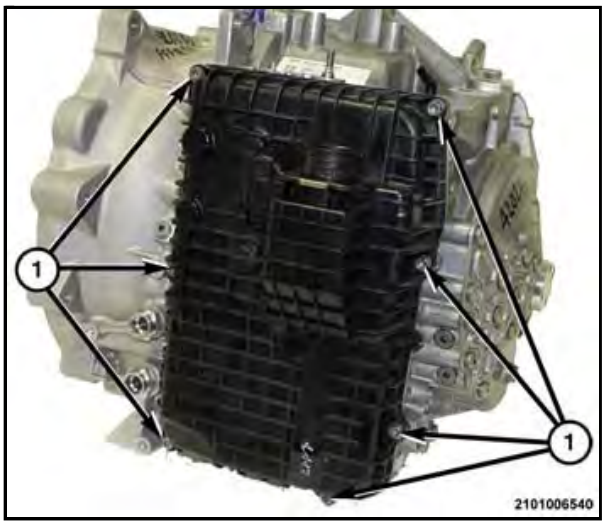
Before disassembling the transmission, remove any oily grime and loose dirt. Place the transmission on a clean work surface with ample fluid drainage or absorbency.

1. Place the transmission on a suitable, clean work surface.
2. Remove the torque converter.
3. Measure the input shaft end-play (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) .
4. Remove the clip (2) holding the transmission solenoid connector (1) in the valve body cover pan.

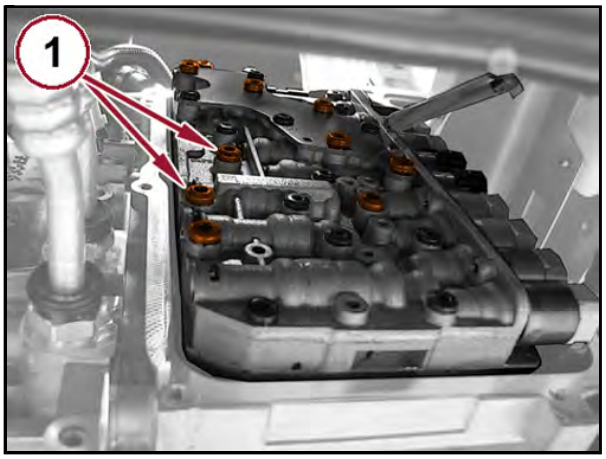


5. Remove the valve body cover pan bolts (1) and the valve body cover pan.

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PET_AAM_1013-0355

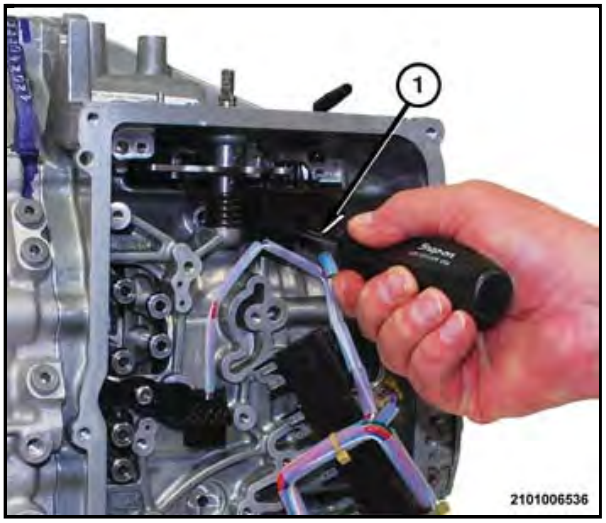


6. Remove the ten bolts (1) holding the valve body to the transmission housing.



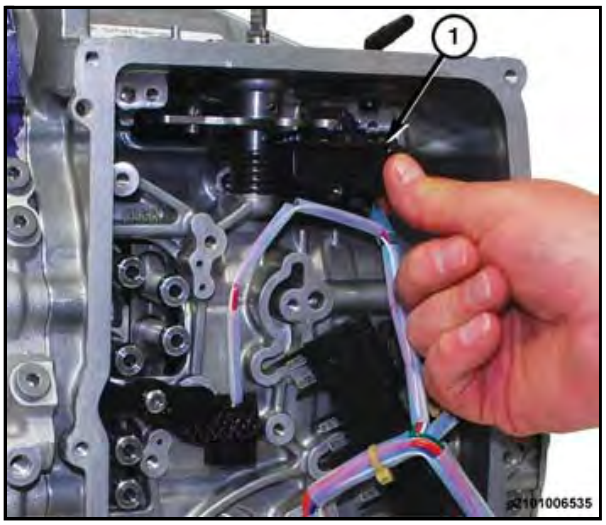
7. Using a suitable prying tool, pry the valve body away from the adapter tubes.

8. Remove the Transmission Range Sensor (TRS) screw (1).

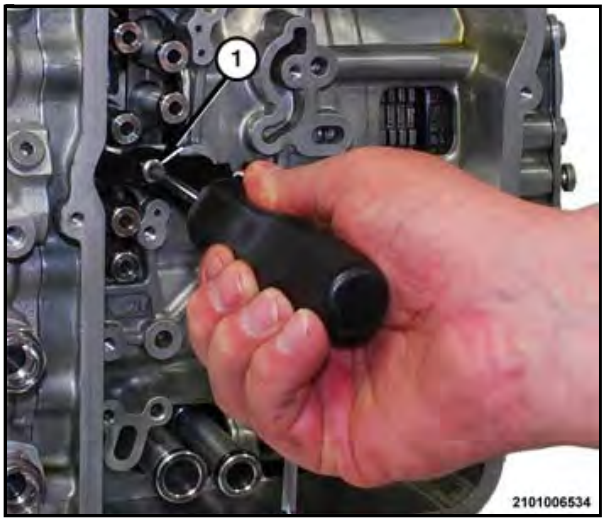


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9. Separate the TRS (1) from the transmission with the wire harness connected.



10. Remove the speed sensor screw (1).



11. Separate the speed sensor (1) from the transmission with the wire harness connected.

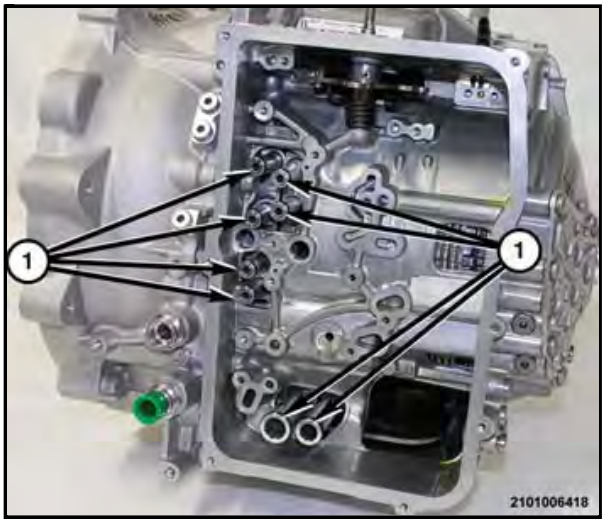


American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0357

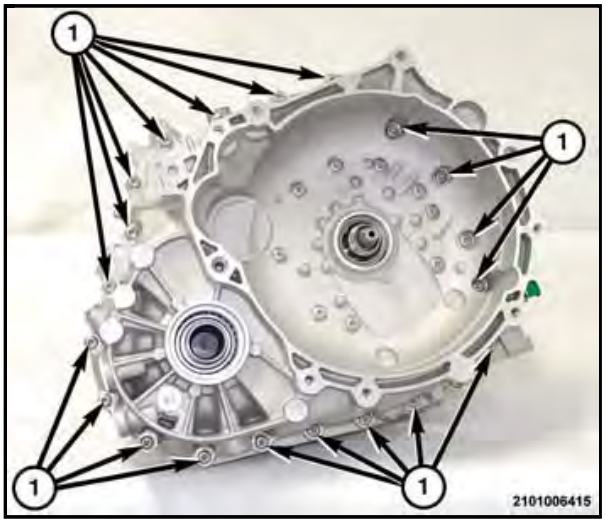
12. Separate the valve body from the transmission.

    NOTE: If the valve body is to be reused without disassembling it, store the valve body in a clean area until it is installed.

13. Using suitable pliers, remove the fluid adapter tubes (1) from the transmission.



14. From around the perimeter of the transmission, remove the bellhousing bolts (1) holding the bellhousing to the transmission housing.

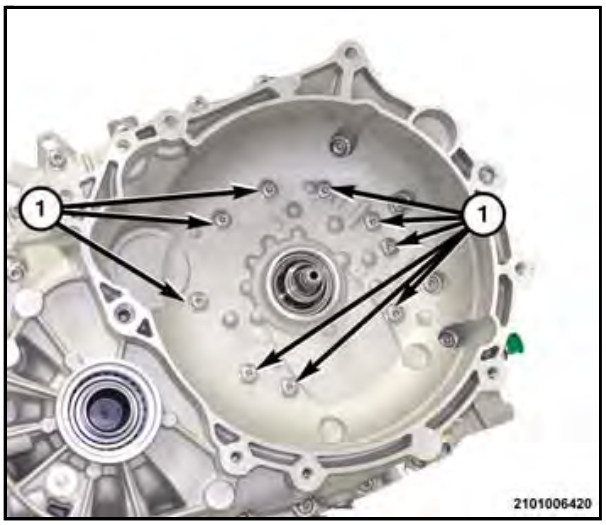


15. Remove the bellhousing bolts (1) holding the bellhousing to the output gear support.

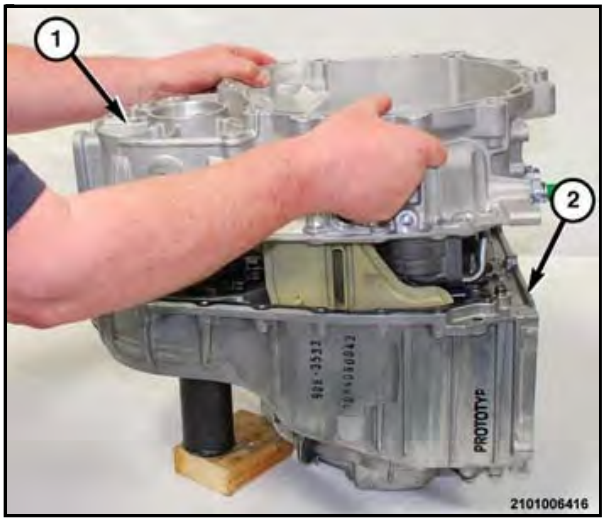
16. Using wooden blocks to stabilize the transmission on the work surface, position the transmission on the bench with the bellhousing facing upward.

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17. Using a suitable pry-bar in the pry point locations, pry upward to dislodge the bellhousing from the transmission housing.



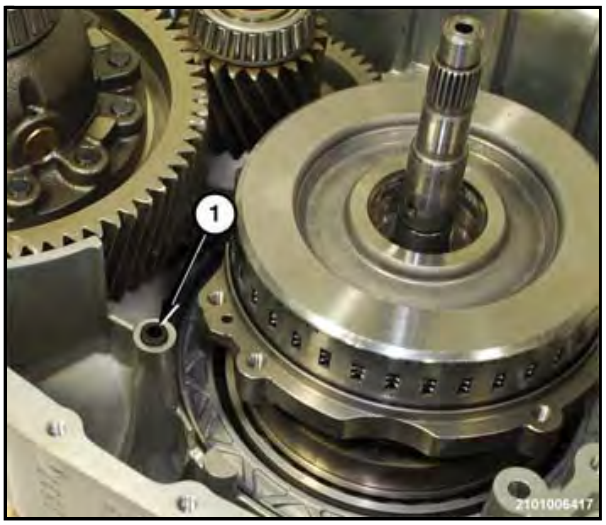
18. Lift the bellhousing (1) upward and separate the assembly from the transmission housing (2).



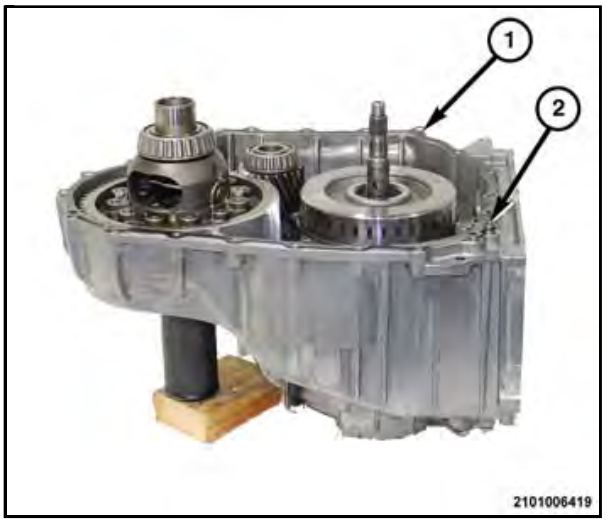
BELLHOUSING INSTALLATION

1. Install a **NEW** seal (1) in the port in the transmission housing.

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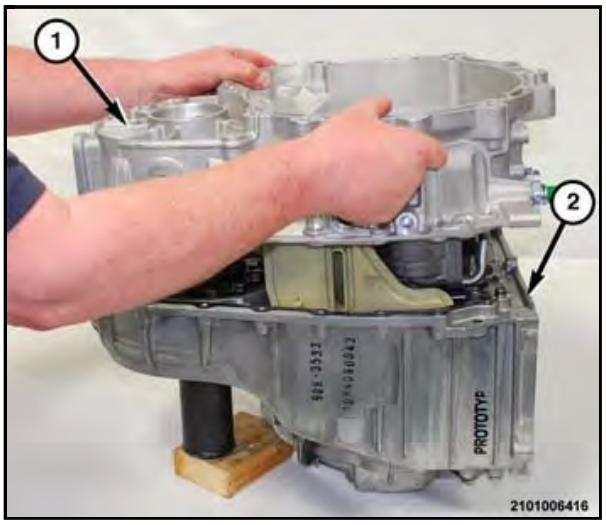


2. Install a **NEW** gasket (1) on the sealing surface of the transmission housing (2).



3. If necessary, replace the output seal and the impeller hub seal.

4. Guide the bellhousing (1) downward over the input and output shafts and onto the transmission housing (2).

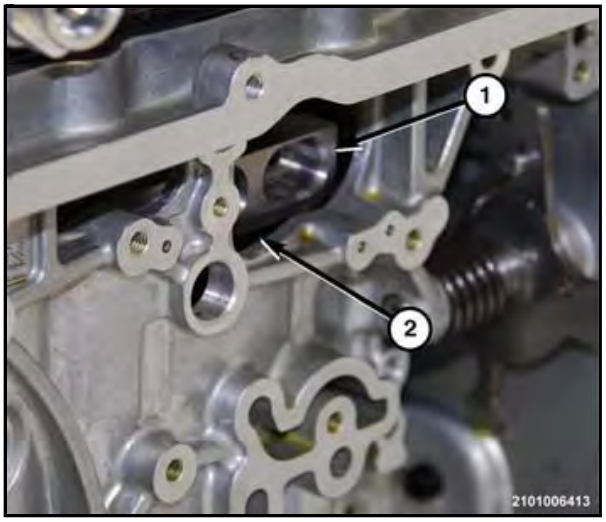


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5. Rotate the output gear clockwise to assure guide pin (1) alignment.



6. Rotate the output gear support (1) through the window (2) behind the valve body until the guide pin engages the receptacle hole in the bellhousing.



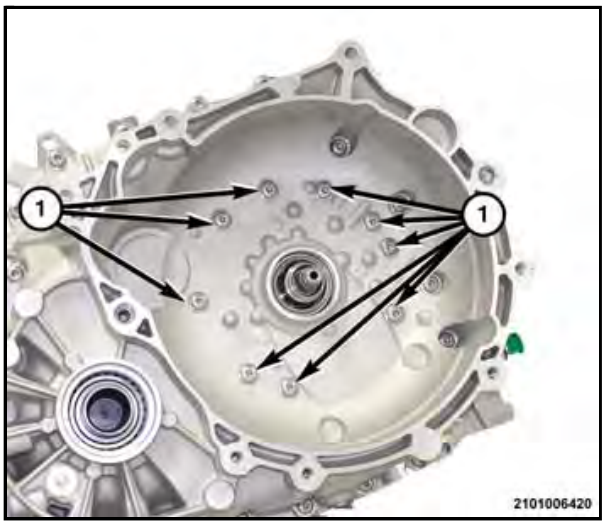
7. Engage the guide pins in the transmission housing into the receptacle holes in the bellhousing to assure proper alignment.

8. Install several bolts to hold the bell housing to the transmission housing. Tighten the bolts hand tight.

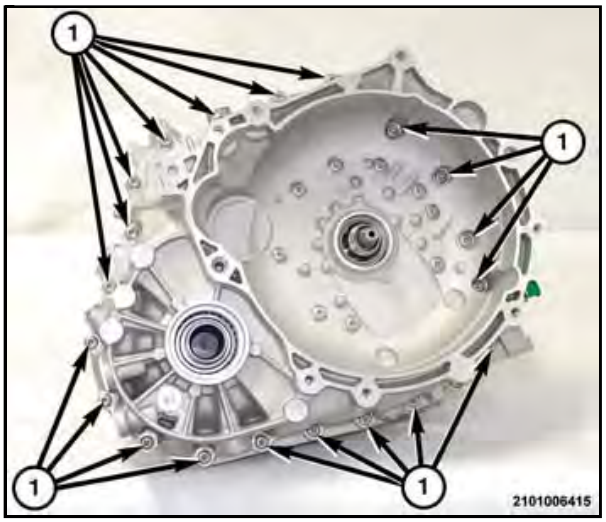
9. Position the transmission on the bench with the bellhousing facing outward.

10. Install the bolts (1) with **NEW** seal washers to hold the bellhousing to the output gear support and tighten to the proper (Torque Specifications) .

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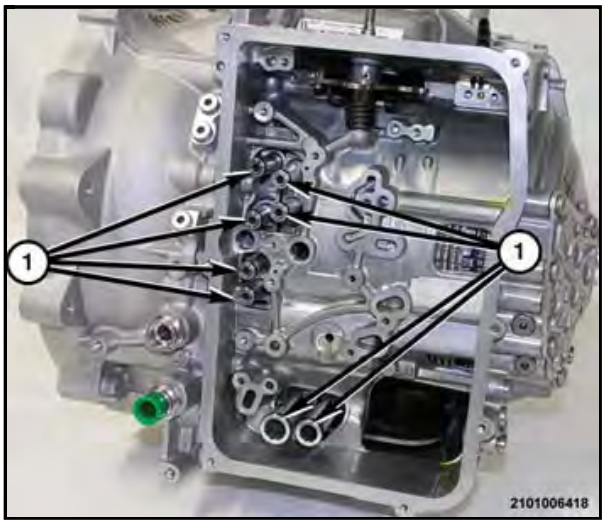


11. Install the bolts (1) to hold the bellhousing to the transmission housing and tighten to the proper (Torque Specifications) .



12. Install **NEW** O-rings on both ends of the fluid transfer tubes.

13. Install the fluid adapter tubes (1) in the transmission housing.



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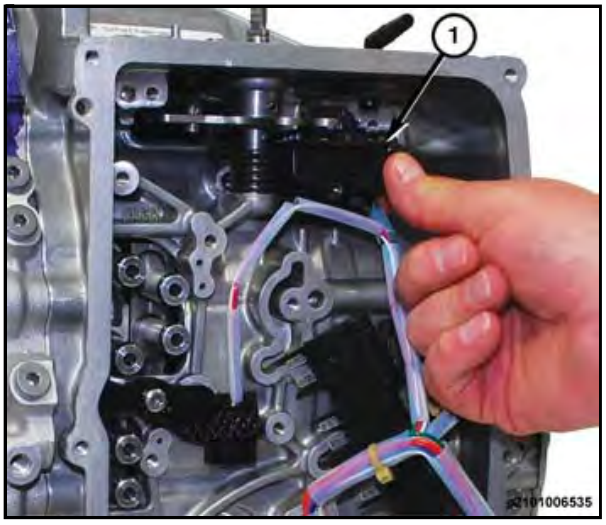
14. Place the valve body with the internal harness near the transmission.

15. Insert the speed sensors (1) into the transmission with the wire harness connected.

16. Install the speed sensor screw (1) to hold the speed sensors to the transmission housing and tighten to the proper (Torque Specifications) .



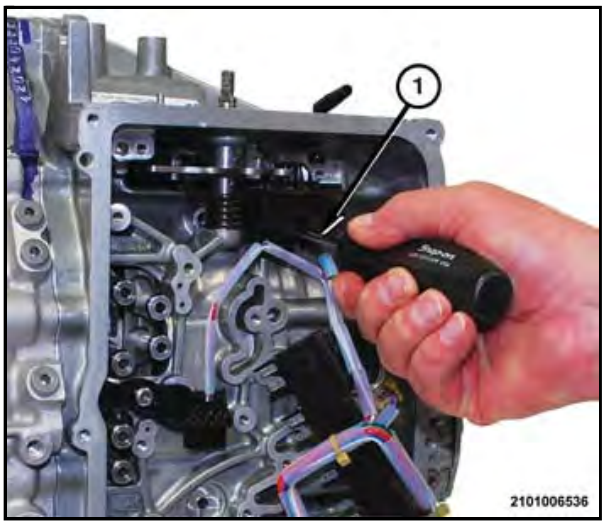
17. Place the Transmission Range Sensor (TRS) (1) in position on the transmission with the wire harness connected.



18. Install the TRS screw (1) to hold the TRS to the transmission housing and tighten to the proper (Torque Specifications) .

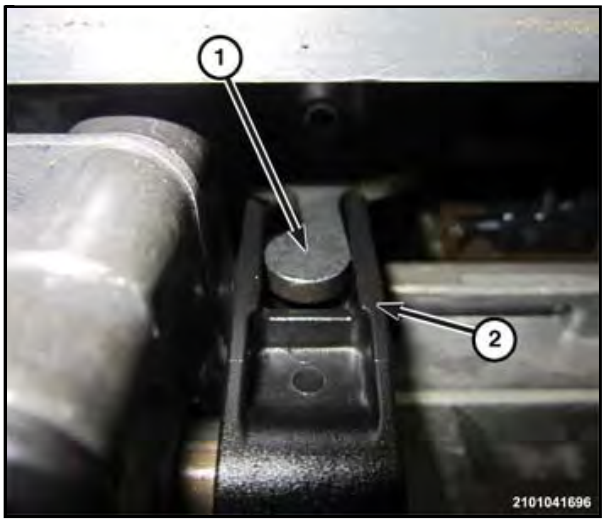
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PET_AAM_1013-0363

19. Align the valve body with the fluid transfer tubes.

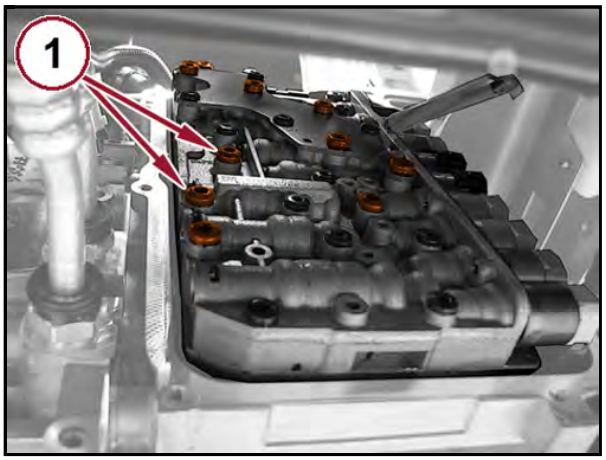


20. Guide the manual lever cam (1) into the slot (2) on the manual valve.

21. Firmly press the valve body (1) inward until the O-rings on the fluid transfer adapters engage into receptacle holes on the valve body.



22. Install the valve body bolts (1) to hold the valve body to the transmission housing and tighten to the proper (Torque Specifications) .

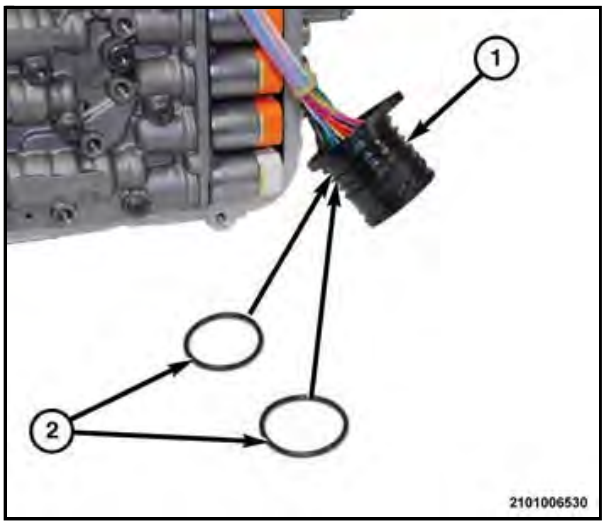


NOTE:

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A light coating of assembly lube can be applied to the O-ring seals (2) of the transmission solenoid connector to ease installation.

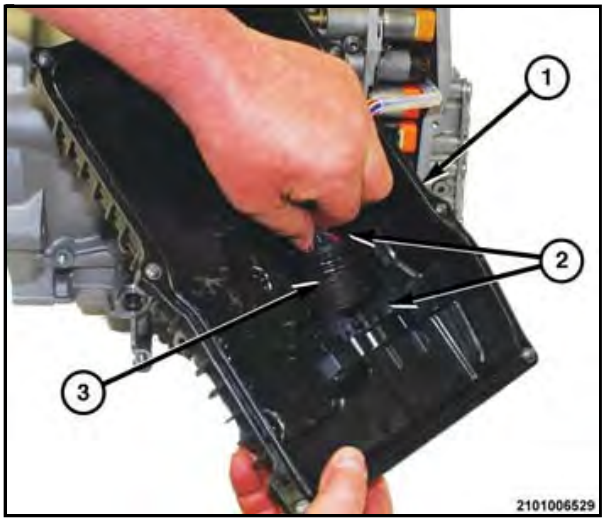
23. Install **NEW** O-ring seals (2) on the transmission solenoid connector (1).



24. Place the valve body cover pan (1) in position on the transmission.

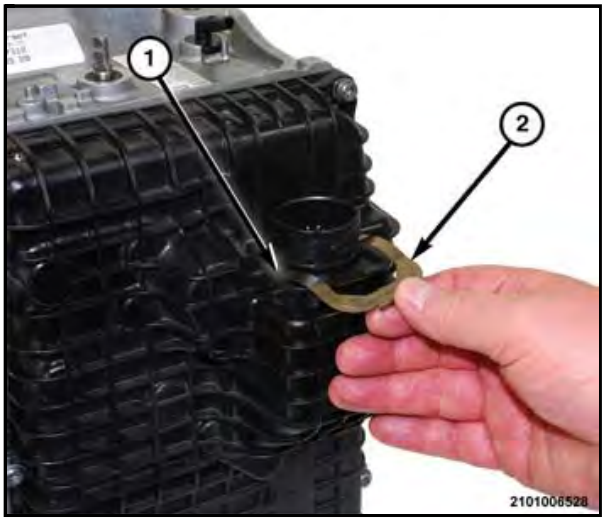
NOTE: Be certain that the flat side (2) on the transmission solenoid connector (3) is aligned with the flat spot on the valve body cover pan (1).

25. Insert the transmission solenoid connector (3) into the opening on the inside of valve body cover pan (1).



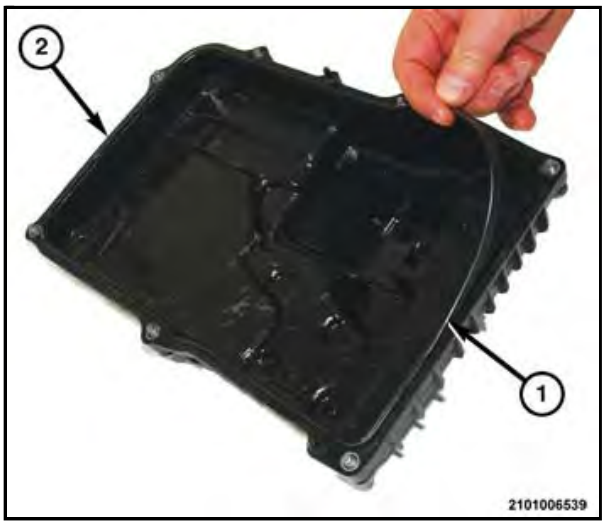
26. Press the transmission solenoid connector inward until the retainer clip groove (1) is exposed on the outside of the valve body cover pan.

27. Install the clip (2) to hold the transmission solenoid connector in the valve body cover pan.

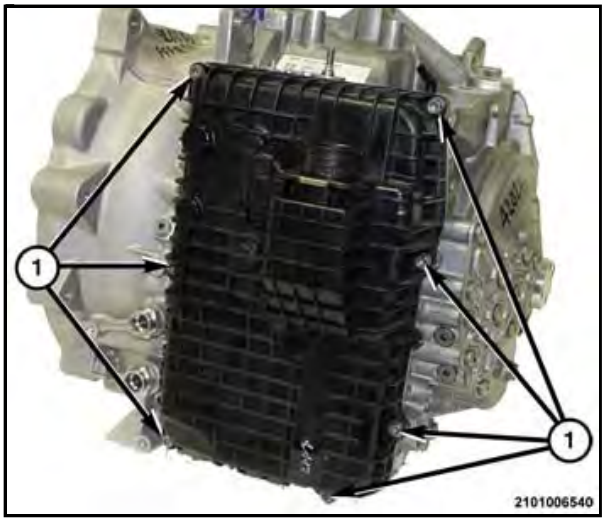


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28. Install a **NEW** gasket seal (1) in the groove around the sealing surface of the valve body cover pan (2).



29. Install the valve body cover pan and valve body cover pan bolts (1) to hold the valve body cover pan to the transmission housing and tighten to the proper (Torque Specifications) .



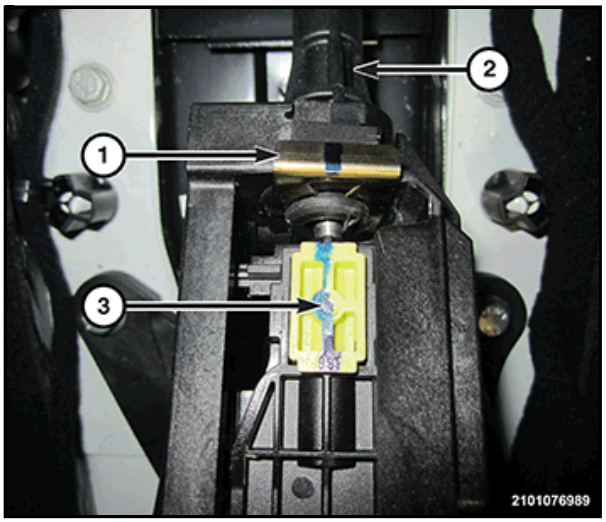
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0366

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / CABLE, Shift / Adjustments

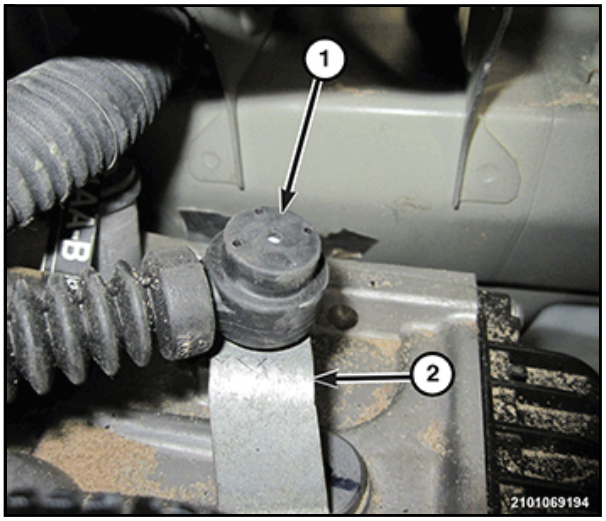
ADJUSTMENTS

ADJUSTMENT

1. Place the gearshift lever in Park (P) and remove ignition key.
2. Remove the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .
3. Release the shift cable adjustment lock (3) using a suitable tool to lift it upward.



4. Pull the manual lever (2) fully forward to the park detent position.

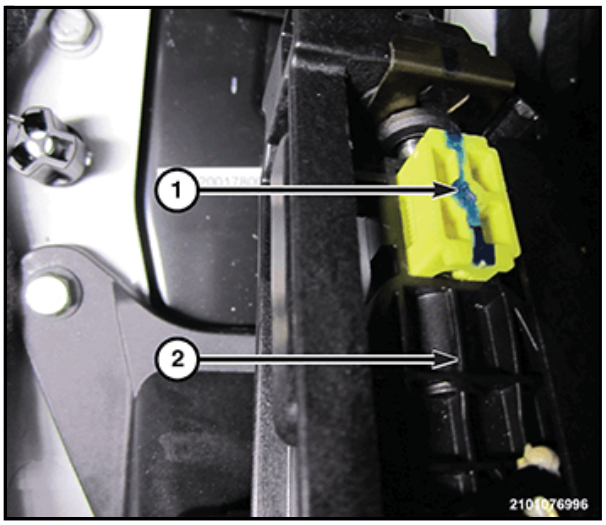


5. Lock the adjustment by pushing the locking tab (1) down onto the shift cable.

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6. Verify the gear shift cable adjustment.

7. Install the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .



VERIFICATION

1. Place gearshift lever in Park (P).

2. Attempt to move vehicle by rocking back and forth on level ground. If vehicle does not move, attempt to start engine. If engine starts, the park position is correct.

3. Depress and hold the brake pedal.

4. Turn key to on/run and place gearshift lever in Neutral (N).

5. Attempt to start engine. If engine starts in both Neutral (N) or Park (P), gearshift cable is adjusted properly. No adjustment is required.

6. If engine does not start in either Park (P) or Neutral (N), perform adjustment procedure.

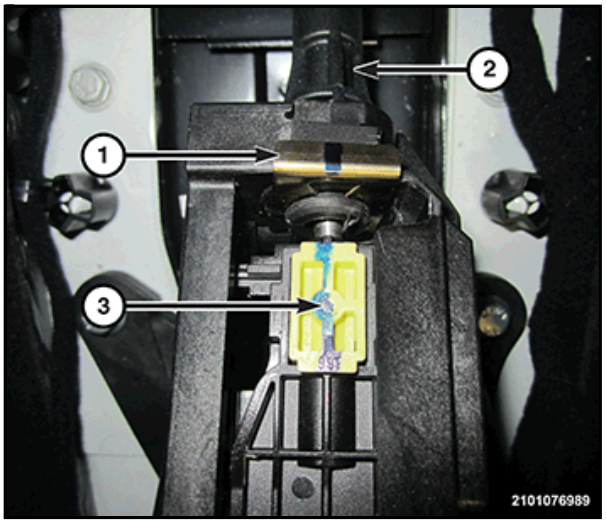
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PET_AAM_1013-0368

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / CABLE, Shift / Removal and Installation

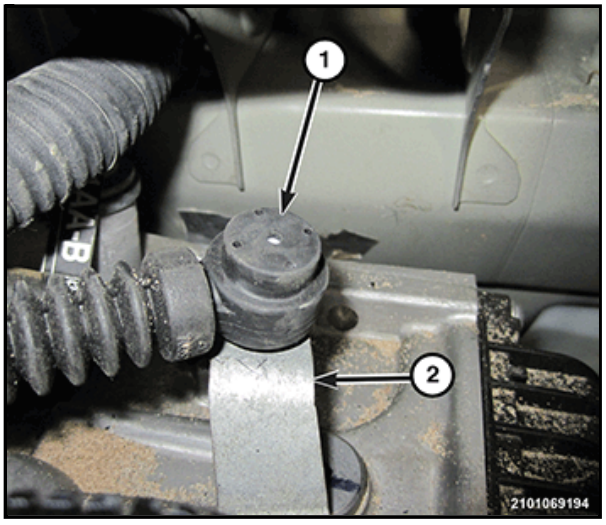
REMOVAL AND INSTALLATION

REMOVAL

1. Set the parking brake.
2. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
3. Remove the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .
4. Using a suitable tool, release the shifter cable adjuster lock (3) at the shifter by prying it upward.
5. Remove the shifter cable retainer (1).
6. Pull the shifter cable (2) out of the shifter housing.

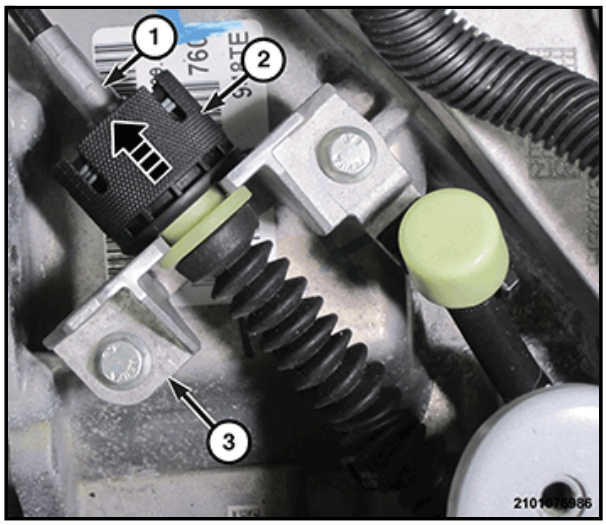


7. Remove the shifter cable (1) from the manual lever (2).



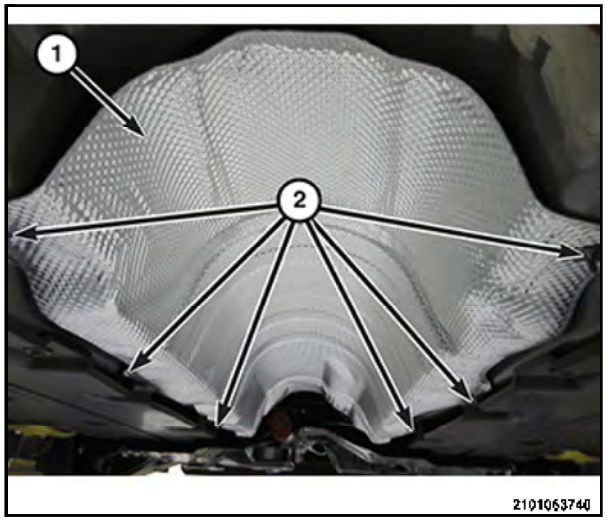
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8. Pull back on and hold the locking collar (2), then lift the shifter cable (1) out of the shifter cable bracket (3).



9. Raise and support the vehicle on a hoist (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .

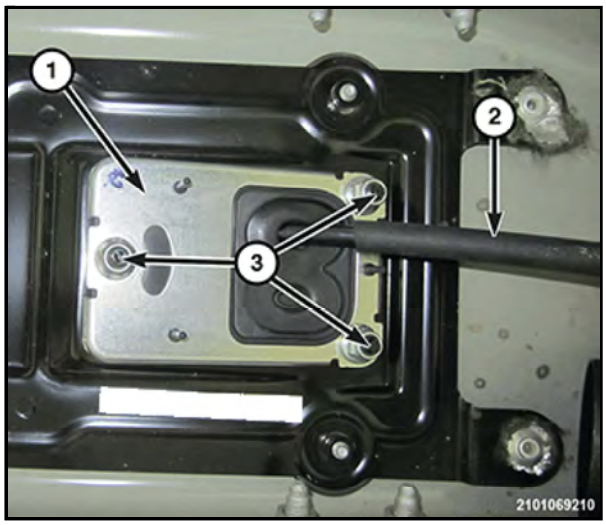
10. Remove the exhaust heat shield (1) nuts (2) and lower heat shield to gain access to the shifter cable and grommet.



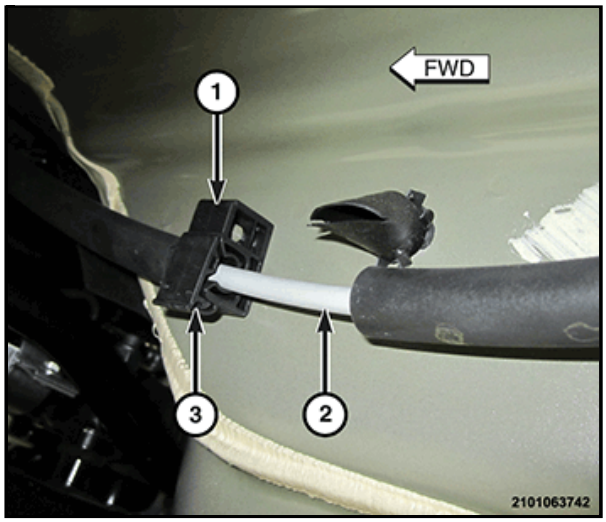
NOTE: **Shown with exhaust removed for clarity.**

11. Remove the nuts (3) for the shifter cable grommet and plate assembly (1).

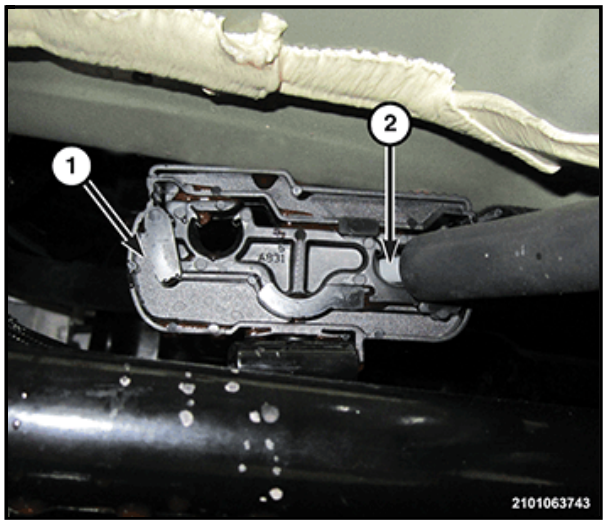
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12. Detach the shifter cable (2) from the clip (1) attached to the exhaust tunnel.

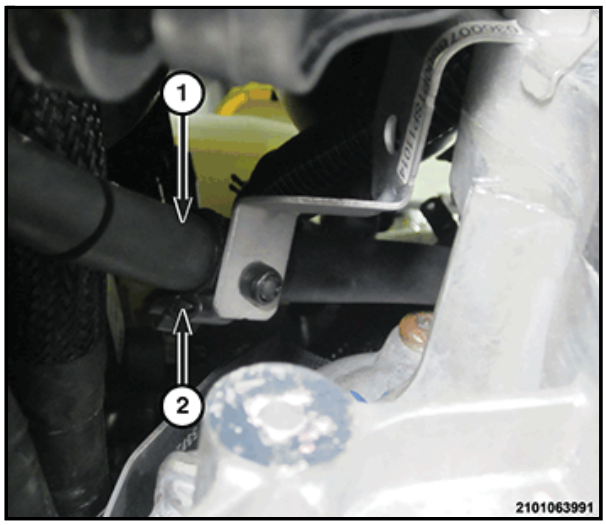


13. Detach the shifter cable (2) from the clip (1) near the stabilizer bar.

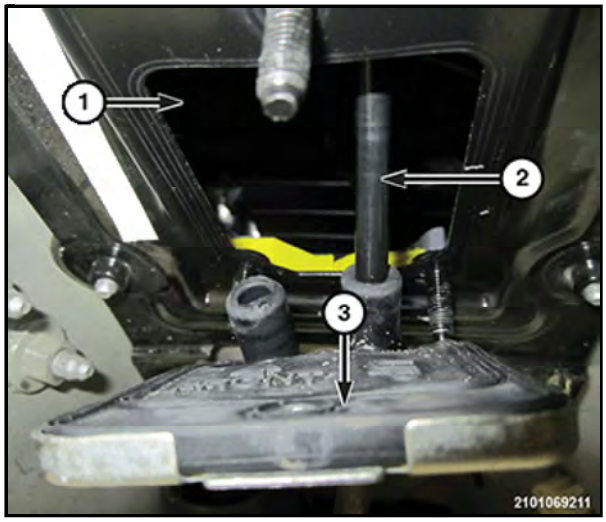


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14. Detach the shifter cable (2) from the clip (1) above the starter.



15. Pull the shifter cable (2) and plate assembly (3) through the opening in the floor pan (1).



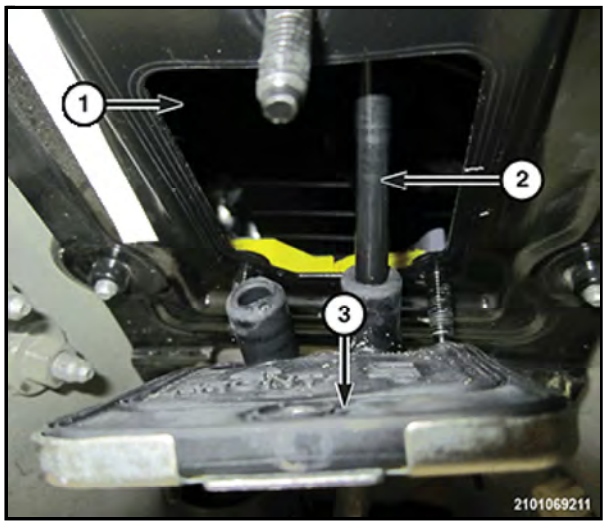
16. Remove the shifter cable from the vehicle.

INSTALLATION

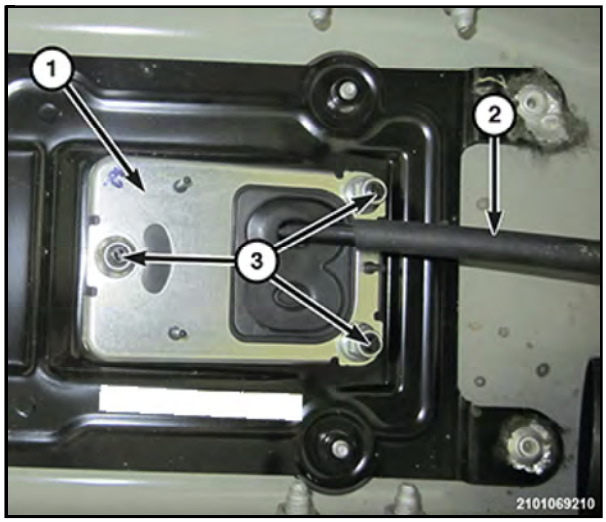
NOTE: Shown with exhaust removed for clarity.

1. Push the shifter cable (2) up through the opening in the floor pan (1).

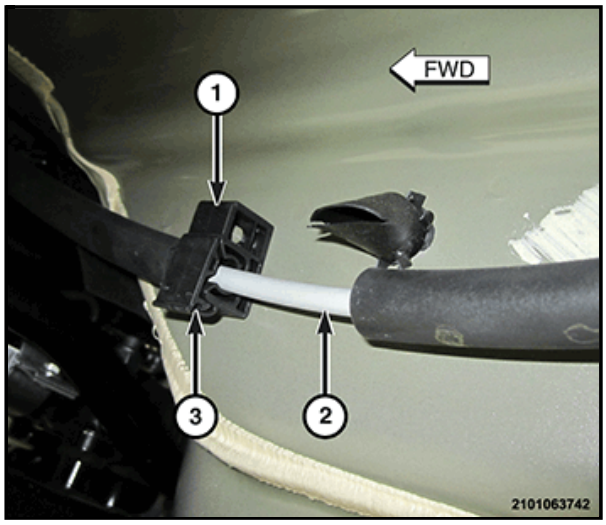
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PET_AAM_1013-0372



2. Install grommet and plate assembly nuts (3). Torque to the proper (Torque Specifications) .

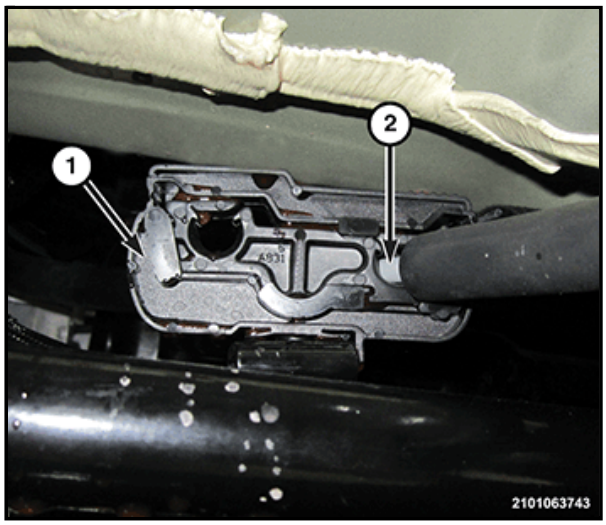


3. Attach the shifter cable (2) to the clip (1) in the exhaust tunnel.

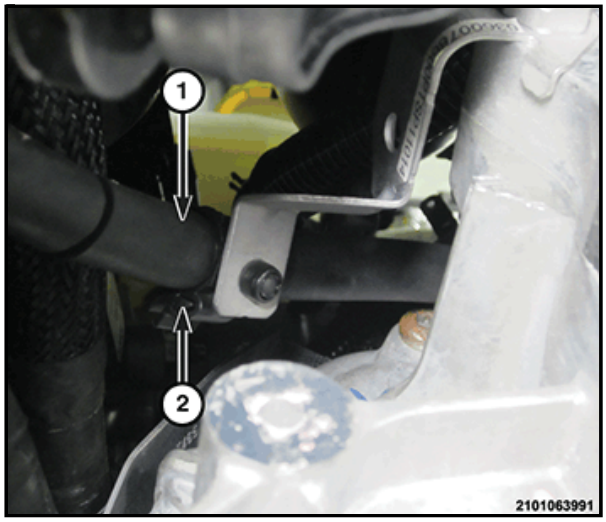


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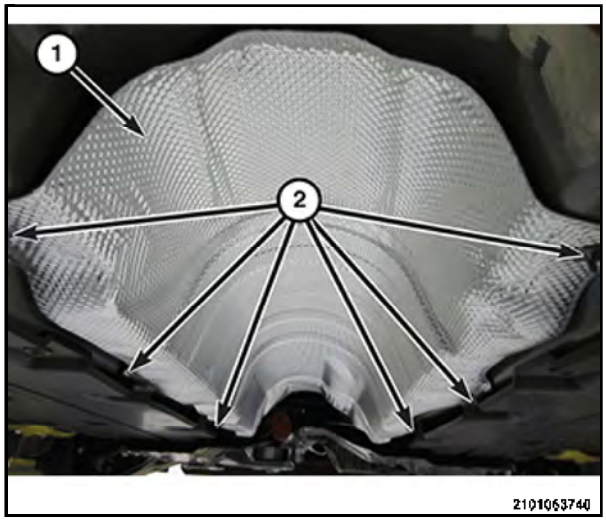
4. Attach the shifter cable (2) to the routing clip (1) near the stabilizer bar.



5. Attach the shifter cable (1) to the routing clip (2) above the starter.



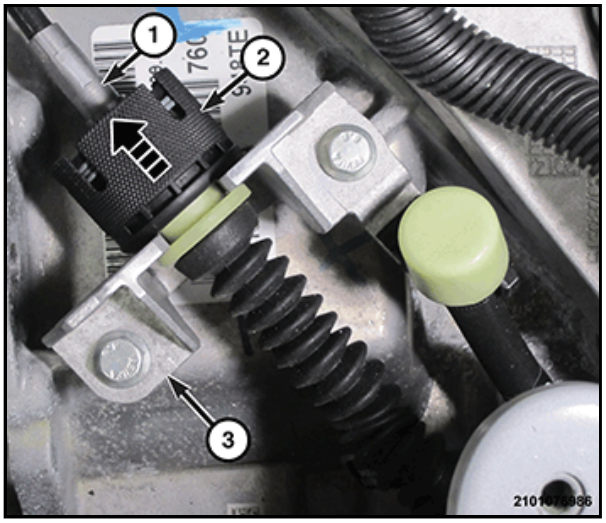
6. Position the heat shield (1) in place and install the heat shield nuts (2).



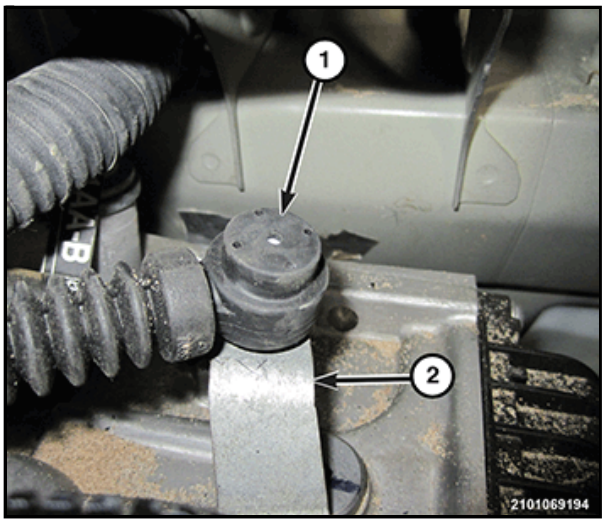
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PET_AAM_1013-0374

7. Lower the vehicle.

8. Attach the shifter cable (1) in the shifter cable bracket (3) on the transmission.



9. Attach the shifter cable end (1) to the manual lever (2).



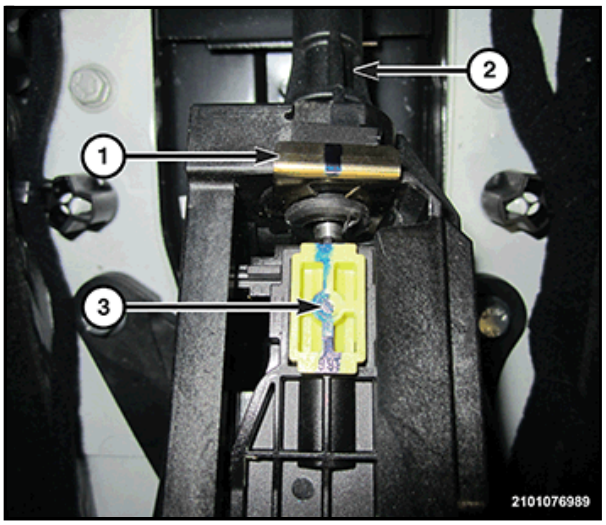
NOTE: **Make sure the transmission is in Park by rotating the manual lever to its forward most position.**

10. Insert the gear shift cable (2) into the gear shift housing.

11. Install the gear shift cable retainer (1).

NOTE: **Make sure the gear shift lever is in the Park position.**

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12. Push the gear shift cable adjuster lock (3) down.
13. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.
14. Verify the gear shift cable adjustment (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/CABLE, Shift/Adjustments) .
15. Install the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .

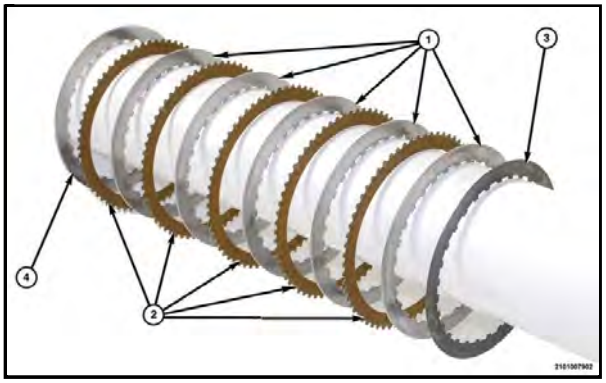
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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / CLUTCH, B / Adjustments

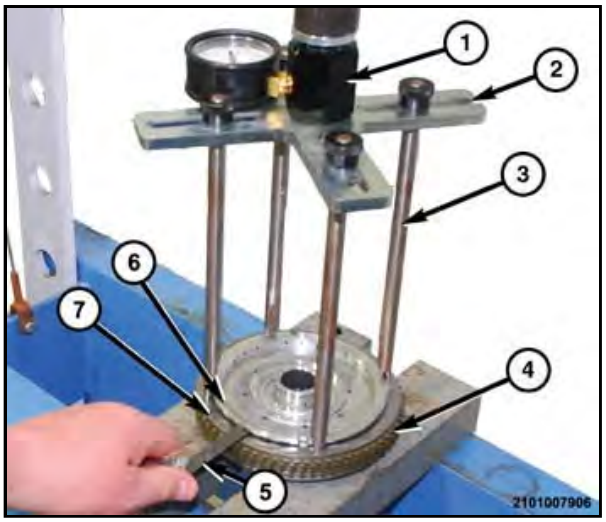
B-CLUTCH MEASUREMENT

⊞ **Special Tools:** Click to display a list of tools used in this procedure
After the B-clutch is cleaned and assembled the end play must be measured to verify that the correct select reaction plate has been installed.

1. Position the B-clutch on a arbor press with the reaction plate (4) facing upward.



2. Using tool Gauge, Force 10429 (1), Pressing Tool 8901A (2) (with pressure scale removed) and legs Adapter, Pressing Tool 10428 (3), compress the B-clutch (4) to collapse wave plate to 3.2 kg/cm² (45 PSI) (1).
3. Using a suitable feeler gauge (5), measure the gap between the B-clutch piston (6) and the reaction plate (7) (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Specifications) .
4. If the measurement is not within specification, replace the reaction plate (7) with the correct plate.



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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / CLUTCH, B / Disassembly and Assembly

DISASSEMBLY AND ASSEMBLY

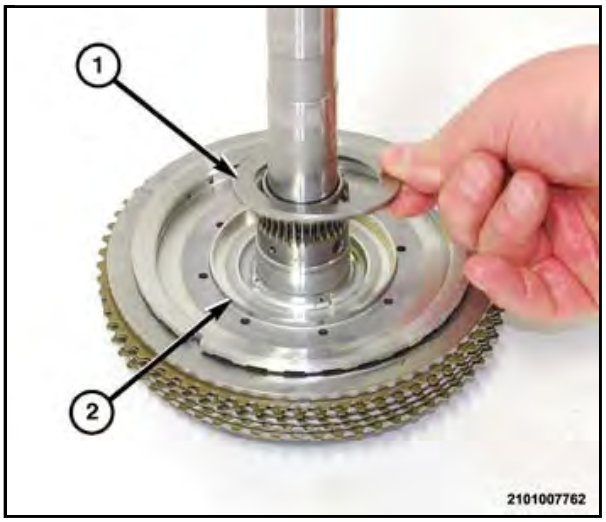
⊞ **Special Tools:** Click to display a list of tools used in this procedure

B-CLUTCH DISASSEMBLY

WARNING: Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.

NOTE: Clean the B-clutch components with suitable solvent and blow them dry with regulated 344 kPa (50 psi) shop air. Position all of the B-clutch components on a clean work surface in preparation for assembly.

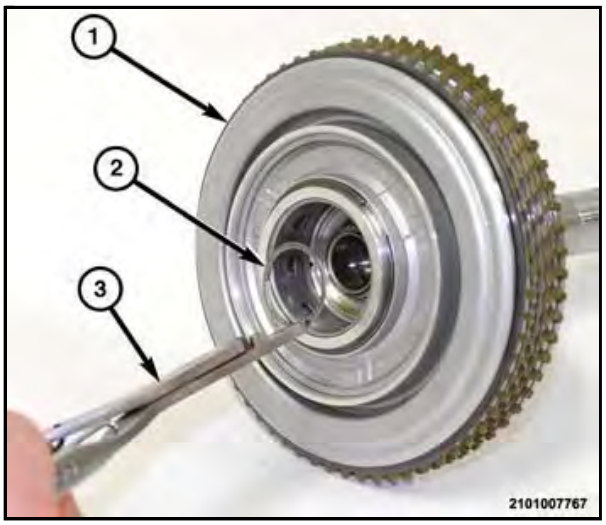
1. Remove the thrust bearing (1) from the B-clutch hub (2).



2. Remove the snap-ring (2) holding the B-clutch hub (1) to the input shaft/Dog clutch A assembly.

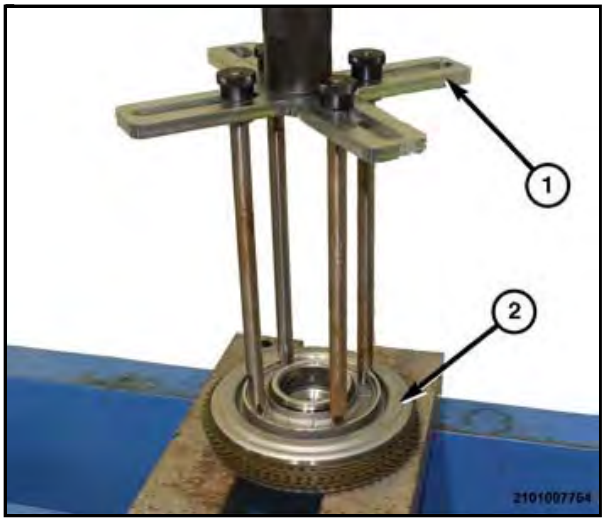
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3. Remove the input shaft from the B-clutch (1).



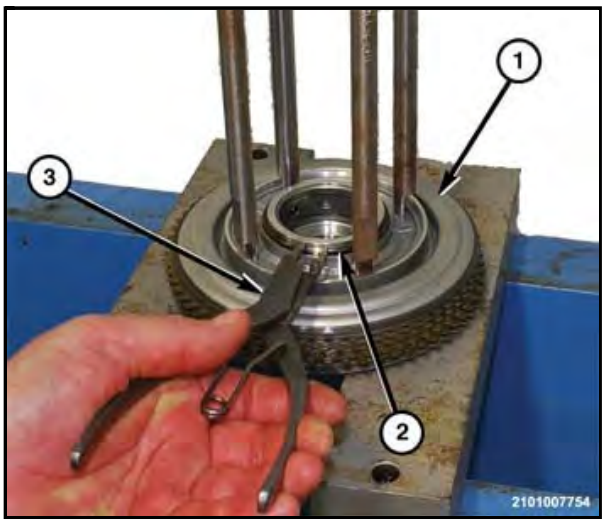
4. Place the B-clutch (2) with piston up on a suitable arbor press.

5. Using tool 8901A (with pressure scale removed) (1) and legs Adapter, Pressing Tool 10428 , compress the B-clutch (2) piston to gain access to the snap-ring.



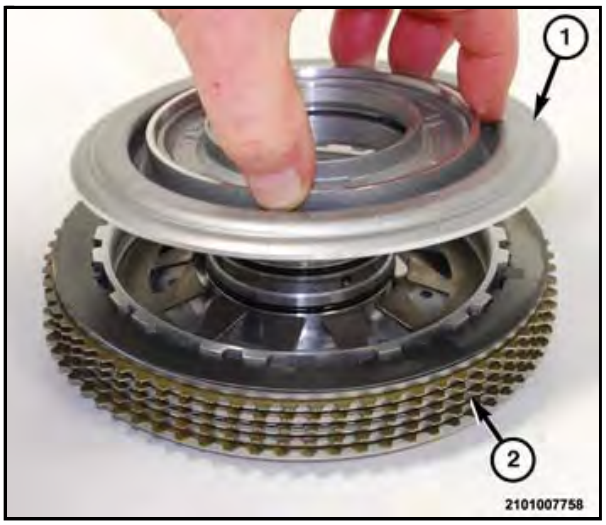
6. Using suitable snap-ring pliers (3), remove the snap-ring (2) holding the B-clutch piston in the B-clutch (1) hub.

7. Remove the B-clutch (1) from the arbor press.

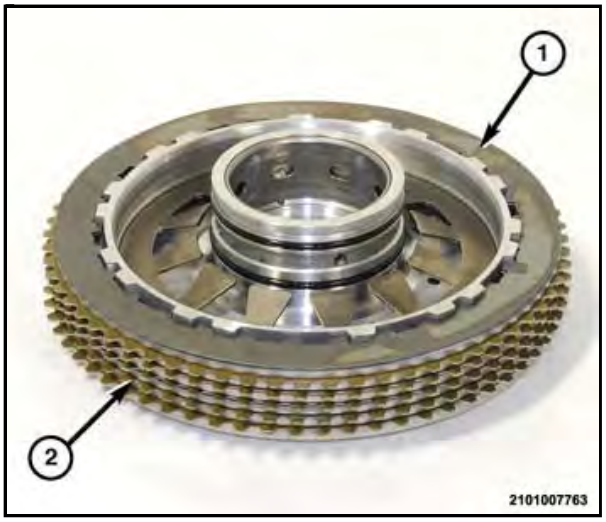


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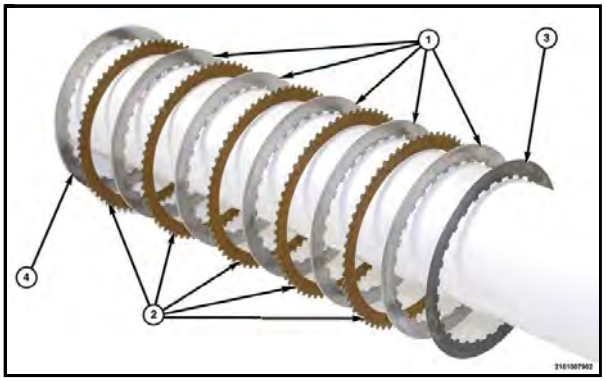
8. Remove the B-clutch piston (1) from the B-clutch (2).



9. Remove the B-clutch friction discs and steel plates (2) From the B-clutch hub (1).

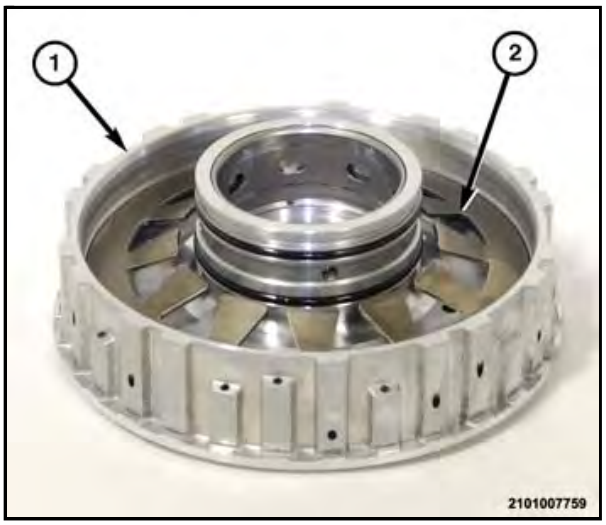


10. Separate the friction discs (2) from the steel plates (1).



11. Remove the belleville spring (2) from the B-clutch hub (1).

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12. Using a suitable hook tool (3) remove the two O-ring seals (2) from the B-clutch hub (1).

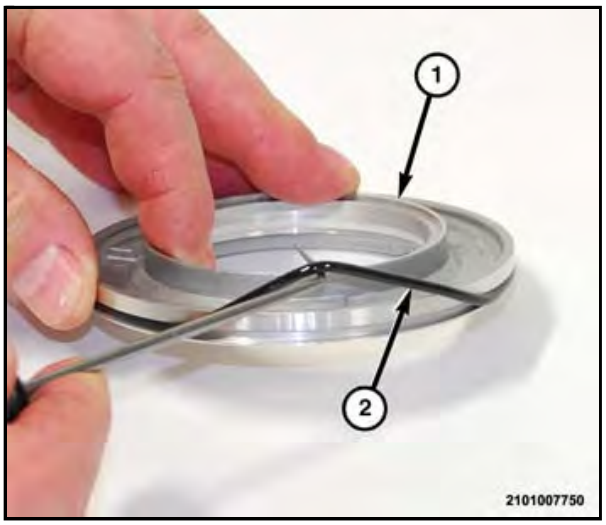


13. Remove the shim support (1) from the B-clutch piston (2).



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14. Using a suitable hook tool, remove the O-ring (2) from the shim support (1).



15. Using a suitable hook tool, remove the O-ring seal (2) from the B-clutch piston (1).



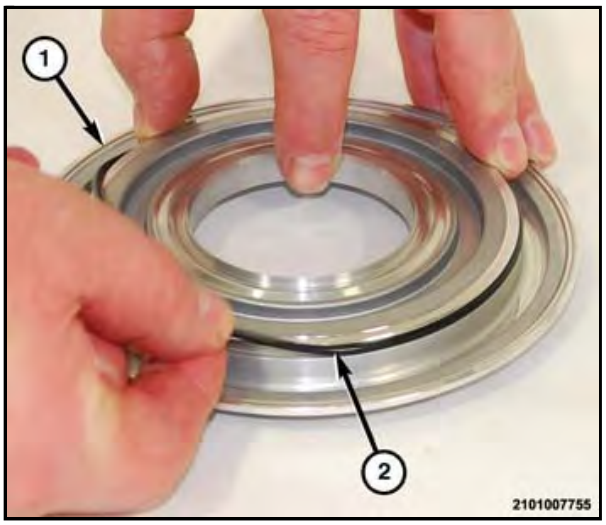
B-CLUTCH ASSEMBLY

WARNING: **Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.**

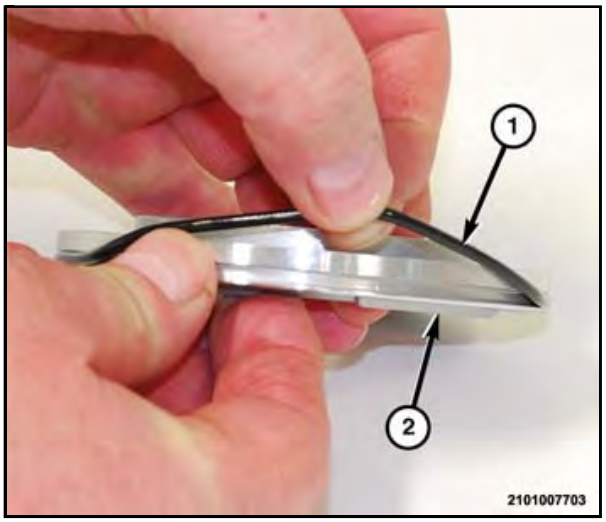
Clean the B-clutch components with suitable solvent and blow them dry with regulated 344 kPa (50 psi) shop air. Position all of the B-clutch components on a clean work surface in preparation for assembly.

1. Install the O-ring seal (2) on the B-clutch piston (1).

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2. Install the O-ring seal (1) on the B-clutch shim support (2).

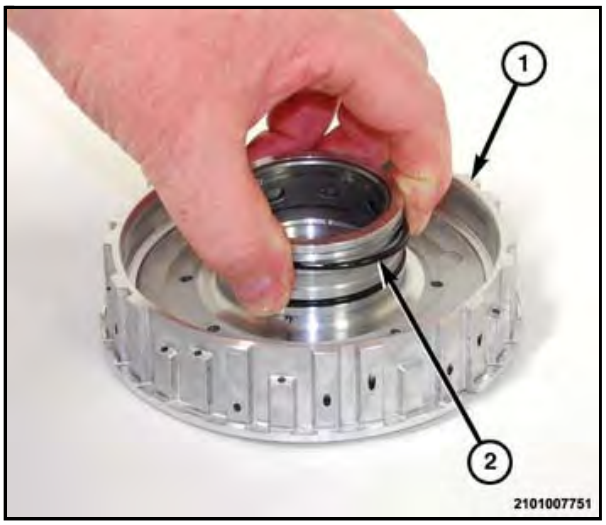


3. Install the shim support (1) in the B-clutch piston (2).

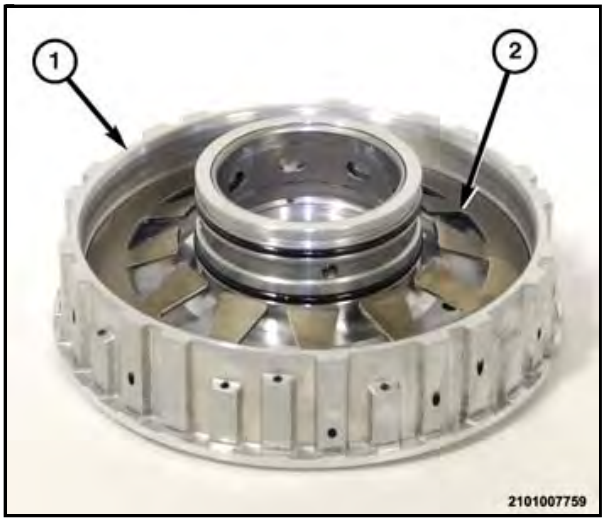


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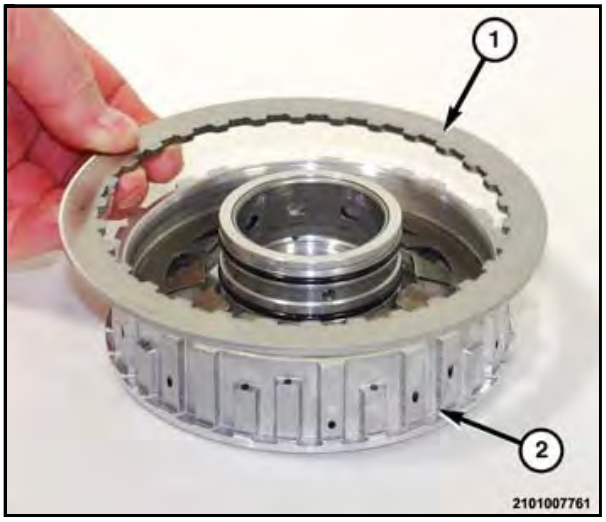
4. Install New O-ring seals (2) in the B-clutch hub (1).



5. Install the belleville spring (2) in the B-clutch hub (1).

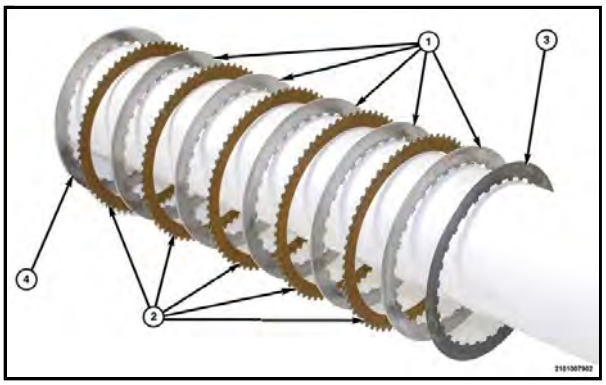


6. Install the reaction plate (1) on the B-clutch hub (2).

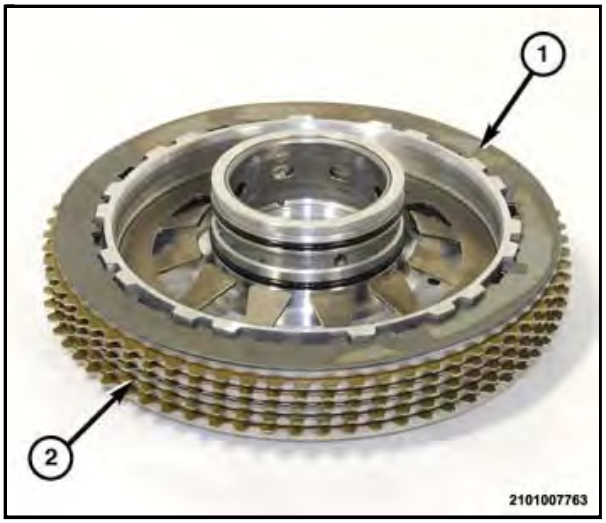


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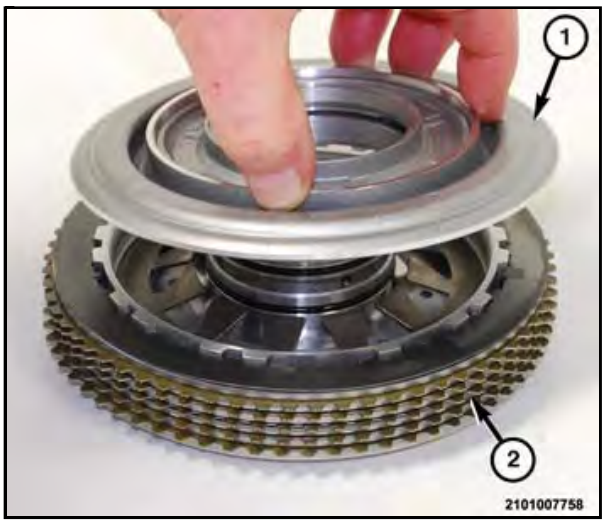
7. In alternating sequence, Install the B-clutch friction plates (2) and steel plates (1) On the B-clutch hub.



8. Install the wave spring plate (1) on the B-clutch hub.



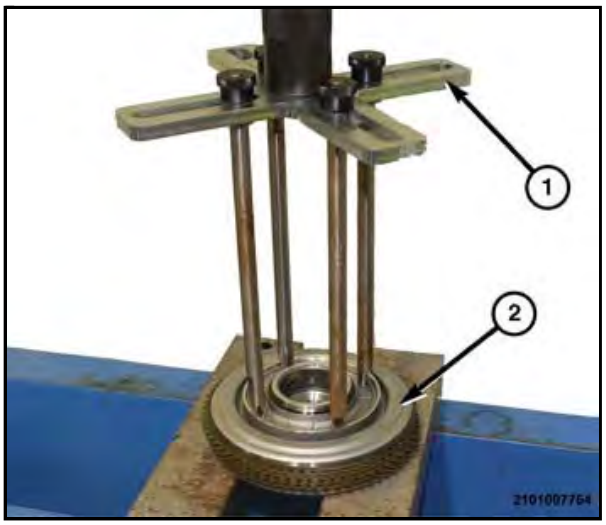
9. Install the piston (1) on the B-clutch (2).



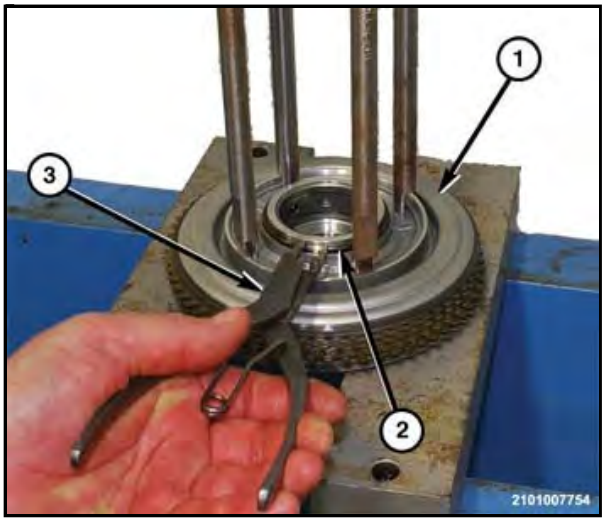
10. Using tool 8901A (with pressure scale removed) (1) and legs Adapter, Pressing Tool 10428 , compress the B-clutch (2) piston to

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gain access to the snap-ring.



11. Using suitable snap-ring pliers (3), install the snap-ring (2) in the B-clutch (1) hub.

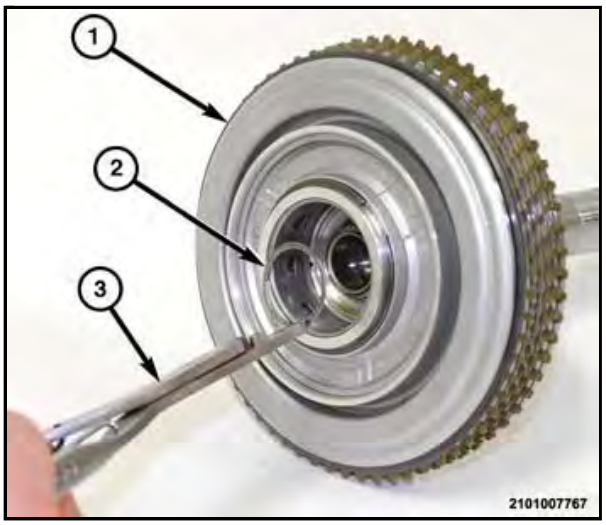


NOTE: **Before installing the input shaft/dog A-clutch, measure the B-clutch to determine if the proper select reaction plate was installed (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/CLUTCH/Adjustments) .**

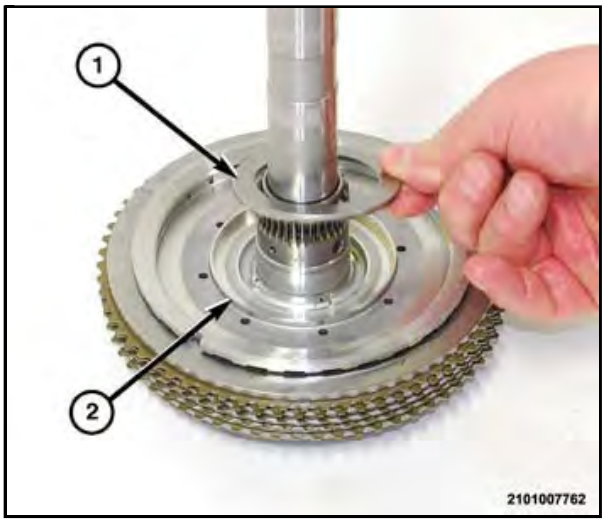
12. Insert the input shaft/dog A-clutch assembly into the B-clutch assembly (1).

13. Using suitable snap-ring pliers (3), install the snap-ring (2) to hold the input shaft in the B-clutch assembly (1).

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14. Install the thrust bearing (1) on the B-clutch hub (2).



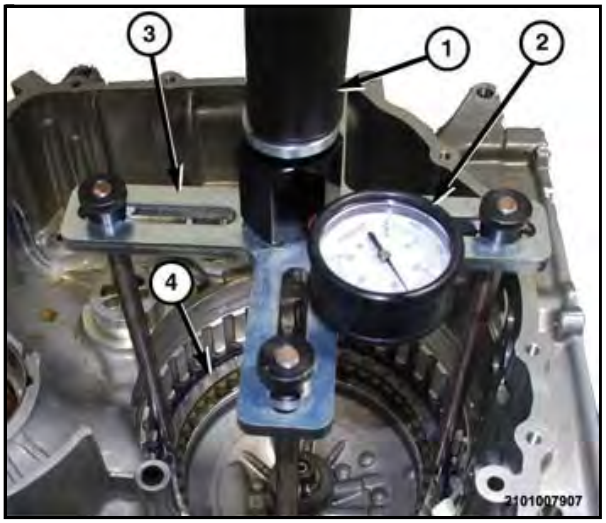
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0387

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / CLUTCH, C / Adjustments

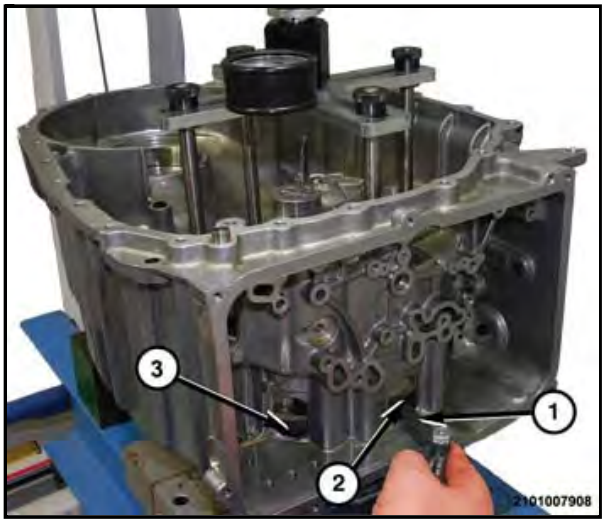
C-CLUTCH MEASUREMENT

⊞ **Special Tools:** Click to display a list of tools used in this procedure
After the C-clutch is cleaned and assembled the end play must be measured to verify that the correct select reaction plate has been installed.

1. Position the transaxle housing on a suitable arbor press.
2. Using tool Gauge, Force 10429 (2), 8901A (with pressure scale removed) (3), and legs Adapter, Pressing Tool 10428 , compress the C-clutch (4) with 3.2 kg/cm² (45 PSI).

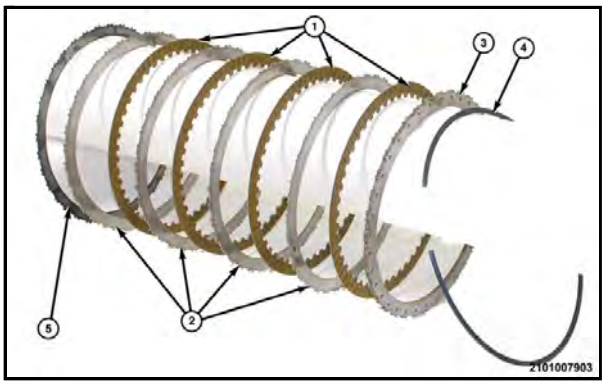


3. Using a suitable feeler gauge (1), measure the gap (2) between the C-clutch snap-ring and the C-clutch select reaction plate (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Specifications) .



4. If measurement does not match the specifications, replace the C-clutch select reaction plate (3).

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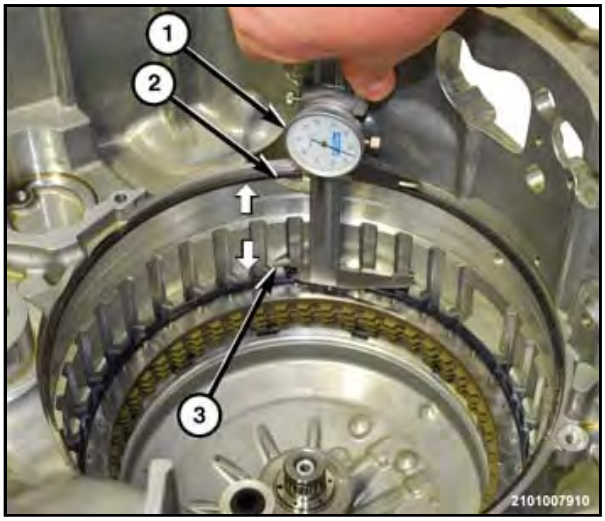
21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / CLUTCH, D / Adjustments

D-CLUTCH MEASUREMENT

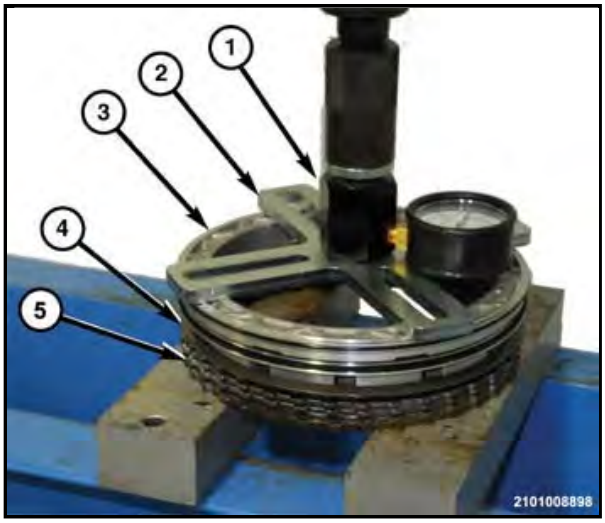
⊞ **Special Tools:** Click to display a list of tools used in this procedure

NOTE: After the D-clutch is cleaned and assembled the endplay must be measured to verify that the correct D-clutch select reaction plate has been installed.

1. Install the D-clutch snap-ring (2) in the groove in the transaxle housing.
2. Using a suitable caliper (1), measure the distance from the bottom of the D-clutch snap-ring (2) to the D-clutch shoulder (3) in the transaxle housing. Record this number.



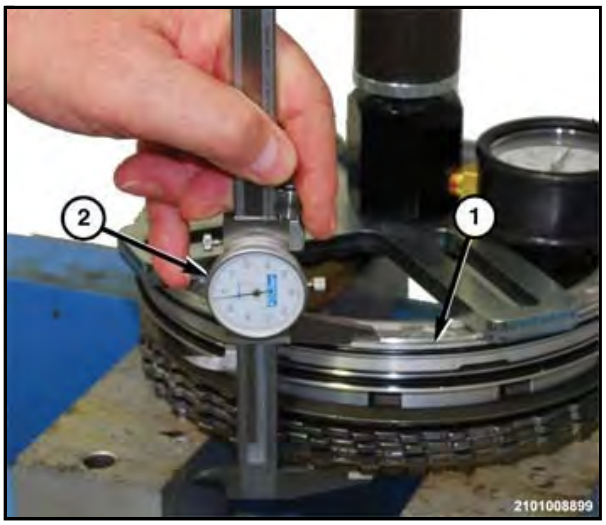
3. Place the D-clutch piston retainer/piston assembly (3), belleville spring (4), and clutch stack (5) on a suitable arbor press.
4. Using tool Gauge, Force 10429 (1) and 8901A (2) (with pressure scale and legs removed), compress the D-clutch assembly to 3.2 kg/cm² (45 PSI).



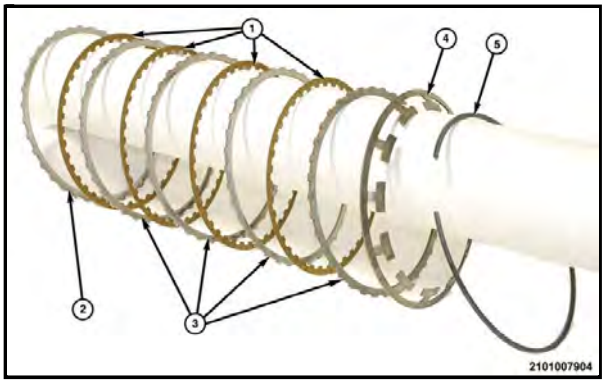
5. Using a suitable caliper (2), measure the thickness from the snap-ring step (1) in the D-clutch piston retainer to the underside of the D-clutch reaction plate. Record this number.

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6. Subtract the recorded value of step 5 from the recorded value of step 2. The difference is the amount of endplay in the D-clutch (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Specifications) .



7. If the remainder from step 6 does not match the specifications, replace the D-clutch select reaction plate (2).



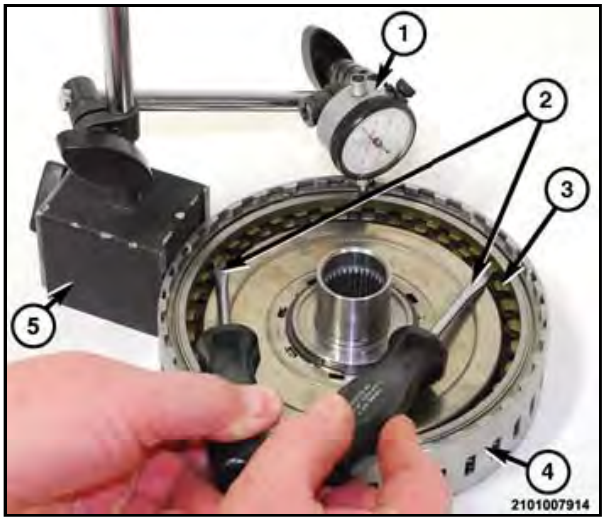
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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / CLUTCH, E / Adjustments

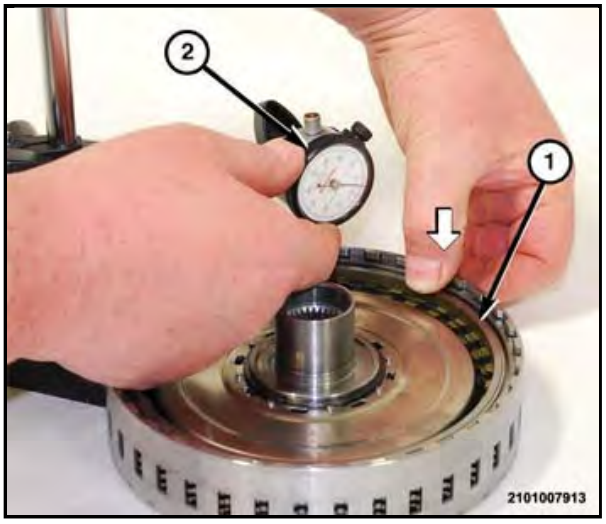
E-CLUTCH MEASUREMENT

After the E-clutch is cleaned and assembled the end play must be measured to verify that the correct select snap-ring has been installed.

1. Use a dial indicator (1) and a magnetic base (5) attached to the E-clutch retainer (4) with the stylist tip resting on the reaction plate.

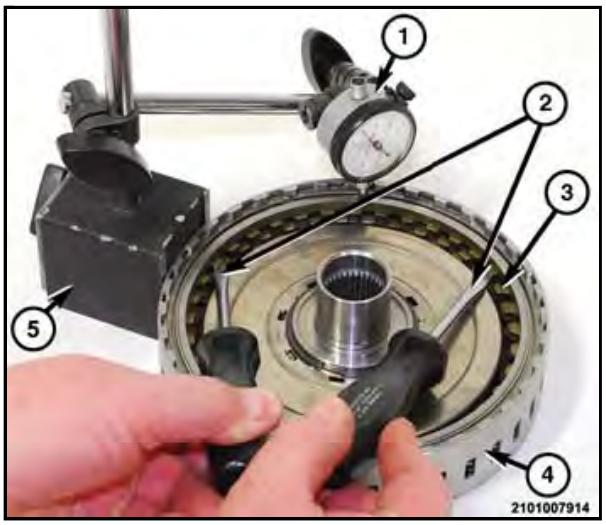


2. Press downward on the reaction plate (1) and zero the dial indicator face (2).

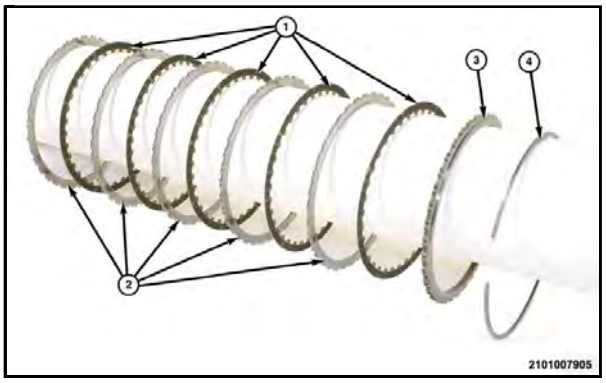


3. Using two suitable screw drivers (2), gently pry the upper friction disc (3) upward while reading the dial indicator (1).

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4. The reading should be within specification (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Specifications) . If not, install a thicker or thinner E-clutch select snap-ring (4).



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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / CLUTCH, E / Disassembly and Assembly

DISASSEMBLY AND ASSEMBLY

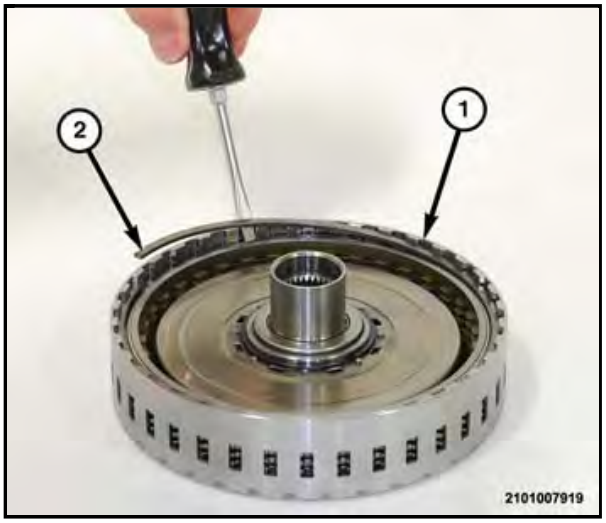
⊞ **Special Tools:** Click to display a list of tools used in this procedure

E-CLUTCH DISASSEMBLY

WARNING: Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.

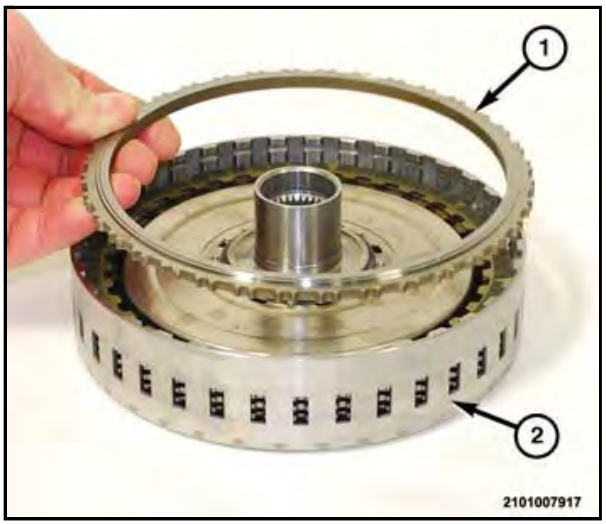
NOTE: Clean the E-clutch components with suitable solvent and blow them dry with regulated 344 kPa (50 psi) shop air. The seals are integral to the piston.

1. Using a suitable screw driver, remove the snap-ring (2) holding the E-clutch reaction plate in the E-clutch retainer (1).

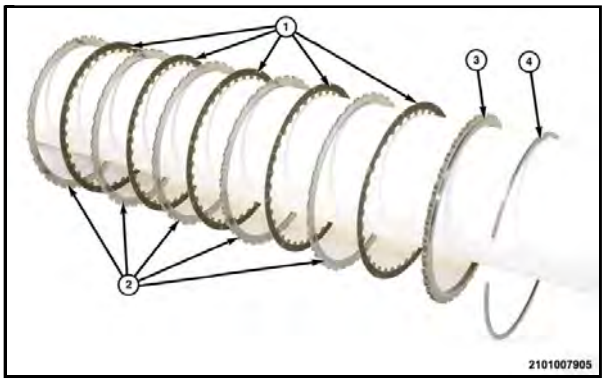


2. Remove the reaction plate (1) from the E-clutch retainer (2).

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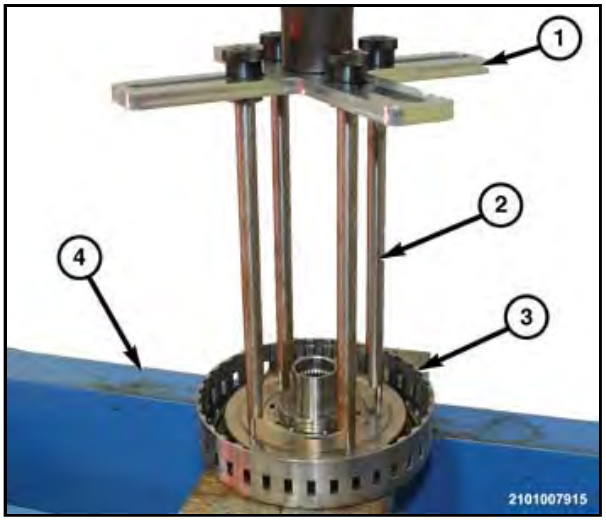


3. Remove the E-clutch friction plates (1) and steel plates (2) from the E-clutch retainer.



4. Place the E-clutch retainer (3) on a suitable arbor press (4).

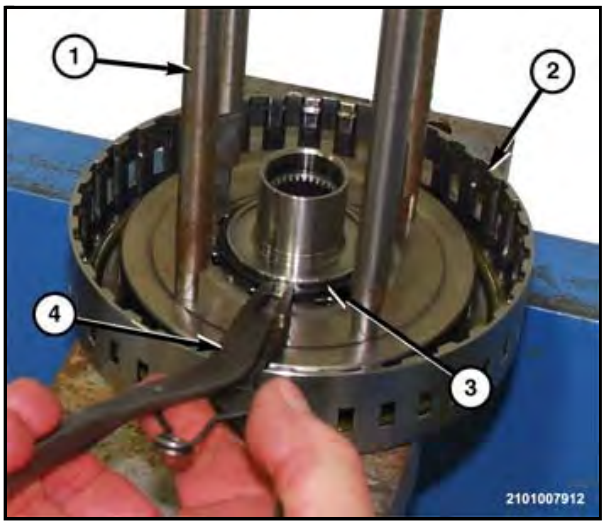
5. Using tool 8901A (with pressure scale removed) (1) and legs Adapter, Pressing Tool 10428 (2), compress the E-clutch spring retainer to gain access to the snap-ring.



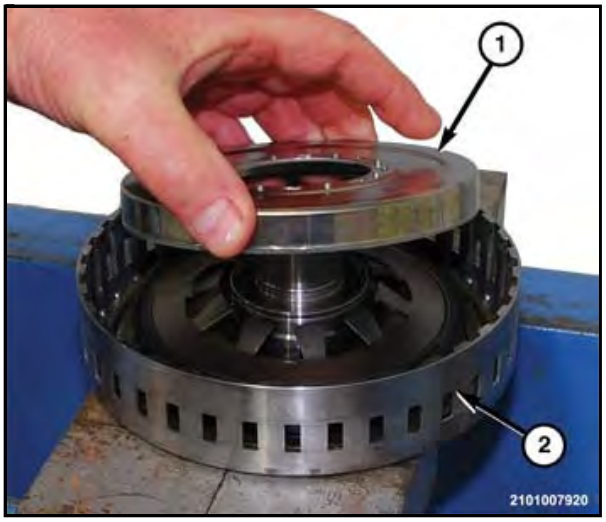
6. Using suitable snap-ring pliers (4), remove the snap-ring (3) holding the spring retainer to the E-clutch retainer (2).

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PET_AAM_1013-0395

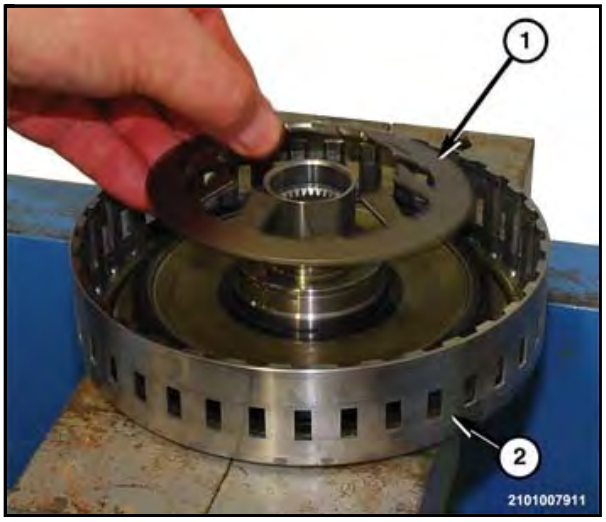
7. Remove the tools 8904 and 10428 (1) from the E-clutch retainer.



8. Remove the E-clutch spring retainer (1) from the E-clutch retainer (2).

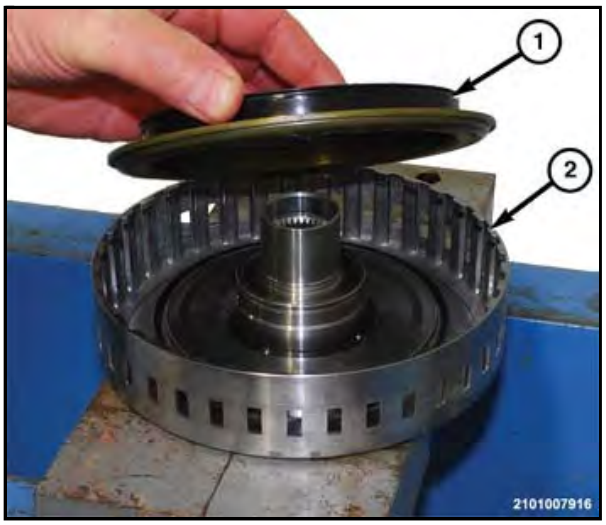


9. Remove the belleville spring (1) from the E-clutch retainer (1).



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10. Remove the piston (1) from the E-clutch retainer (2).

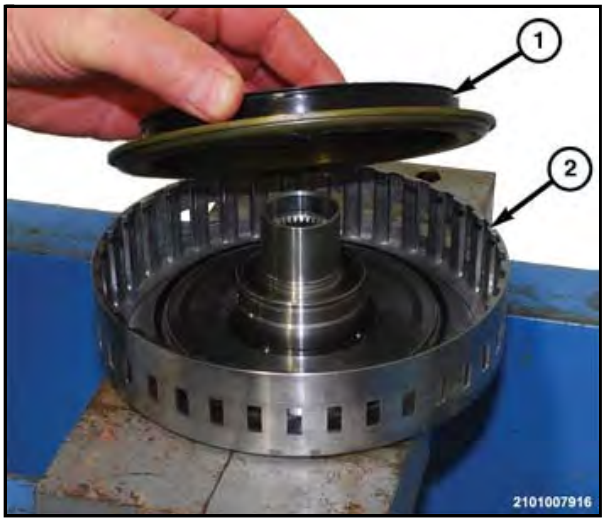


E-CLUTCH ASSEMBLY

WARNING: **Always wear safety glasses when cleaning, disassembling and assembling the transmission/transaxle. Contents of the transmission/transaxle can become projectiles (e.g., springs, snap-rings, as well as metal and other debris). Failure to wear safety glasses may result in severe personal injury.**

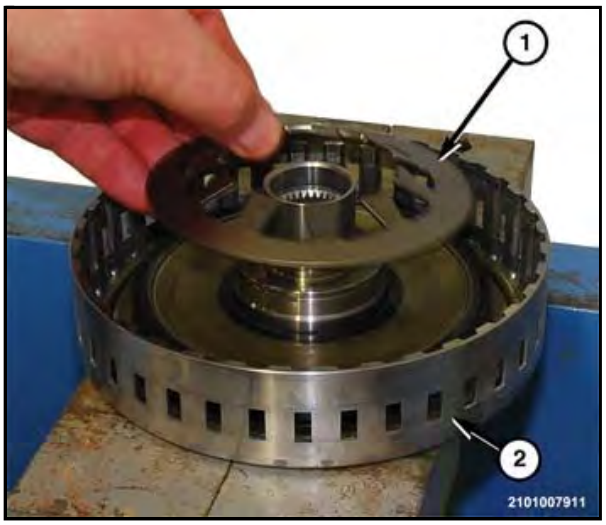
NOTE: **Clean the E-clutch components with suitable solvent and blow them dry with regulated 344 kPa (50 psi) shop air. Position all of the E-clutch components on a clean work surface in preparation for assembly. If the seals are damaged in any way clutch piston, retainer and belleville spring retainer will require replacement.**

1. Install the piston (1) into the E-clutch retainer (2).

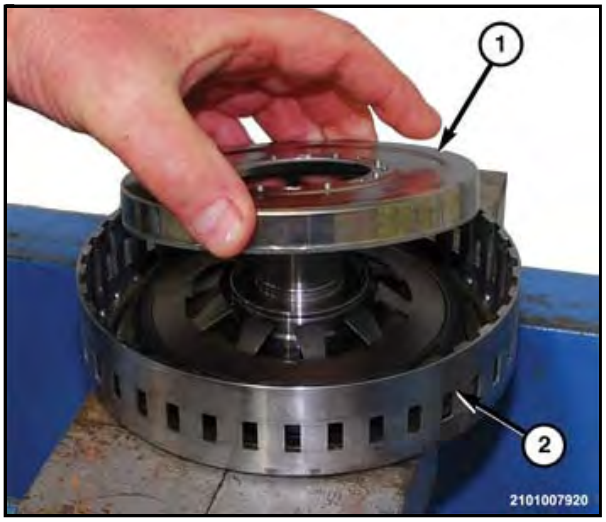


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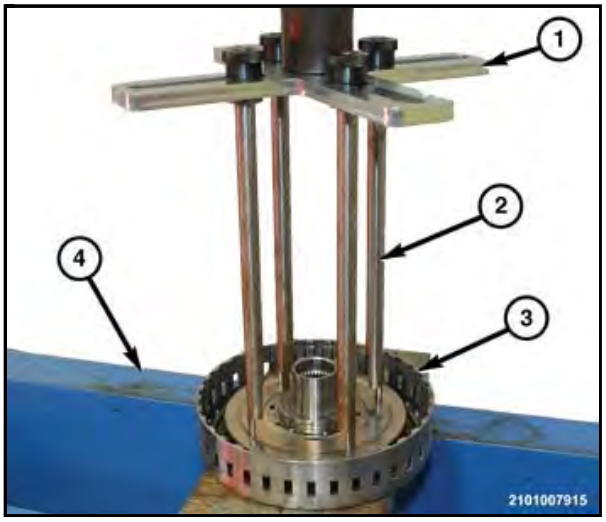
2. Install the belleville spring (1) into the E-clutch retainer (1).



3. Install the E-clutch spring retainer (1) into the E-clutch retainer (2).

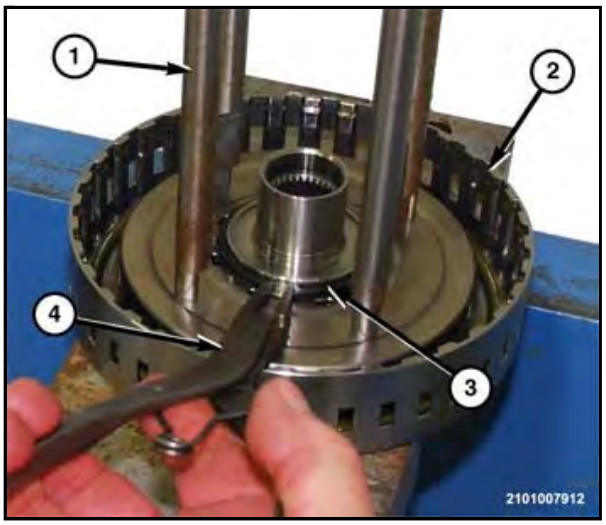


4. Using tool 8901A (with pressure scale removed) (1) and legs Adapter, Pressing Tool 10428 (2), compress the E-clutch spring retainer to until snap-ring groove is exposed.



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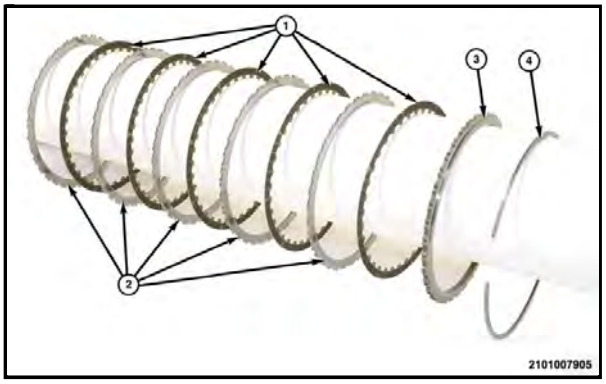
5. Using suitable snap-ring pliers (4), install the snap-ring (3) holding the E-clutch spring retainer to the E-clutch retainer (2).



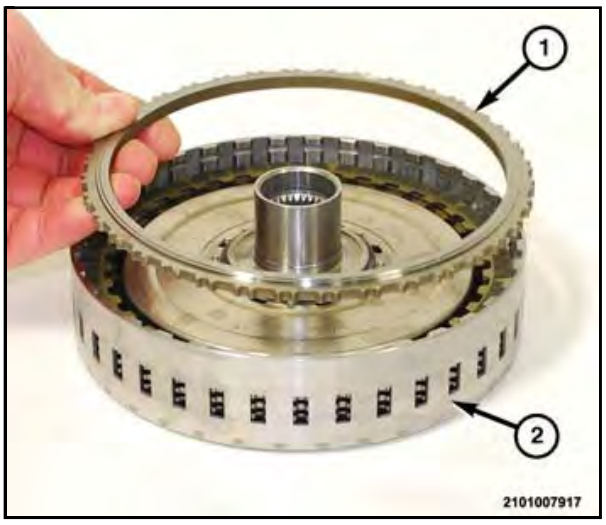
6. Remove the tools 8904 and 10428 (1) from the E-clutch retainer (2).

7. Place the E-clutch retainer (2) on a suitable clean work surface.

8. In alternating sequence, Install the E-clutch friction plates (1) and steel plates (2) into the E-clutch retainer.



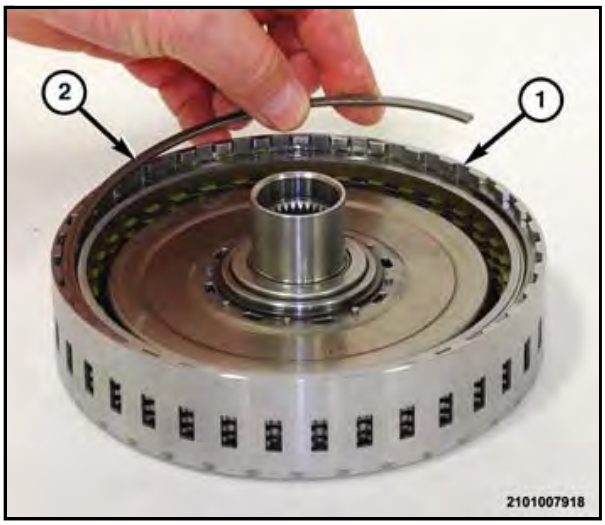
9. With stepped side up, install the reaction plate (1) into the E-clutch retainer (2).



10. Install the snap-ring (2) to hold the E-clutch reaction plate in the E-clutch retainer (1).

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11. Measure the E-clutch end play (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/CLUTCH/Adjustments) .



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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / DIFFERENTIAL AND RING GEAR / Disassembly and Assembly

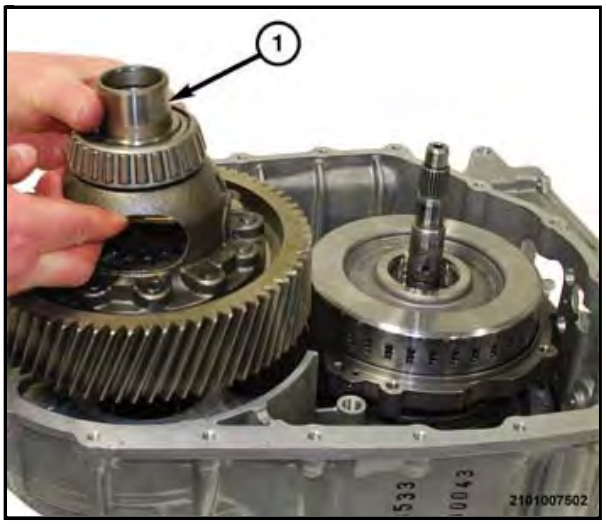
DISASSEMBLY AND ASSEMBLY

⊞ **Special Tools:** Click to display a list of tools used in this procedure

DIFFERENTIAL DISASSEMBLY

NOTE: The differential unit can be placed on tool Installer, Seal 6888 as a stable holding fixture.

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .
2. Place the transmission on a suitable clean work surface.
3. Remove the bellhousing from the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .
4. Separate the differential unit (1) from the transmission.



5. Remove the bolts (2) holding the ring gear (1) to the differential housing.

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6. Separate the ring gear (1) from the differential unit (2).

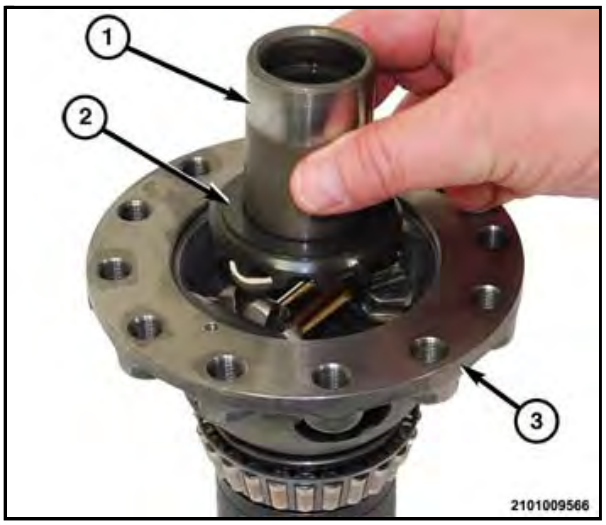


7. Separate the two halves (1) of the differential housing (2) to gain access to the pinion shaft.

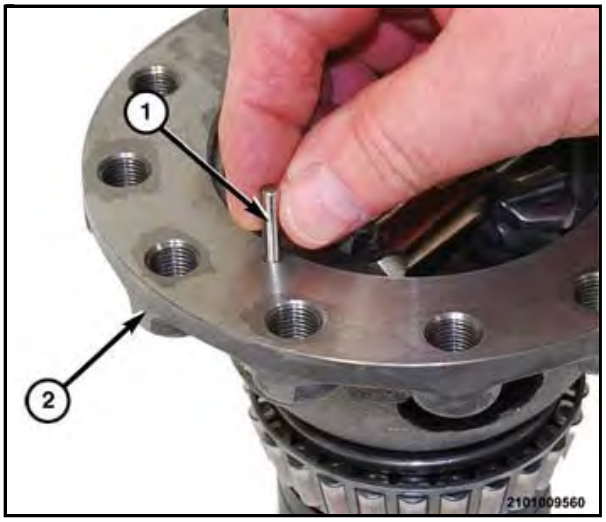


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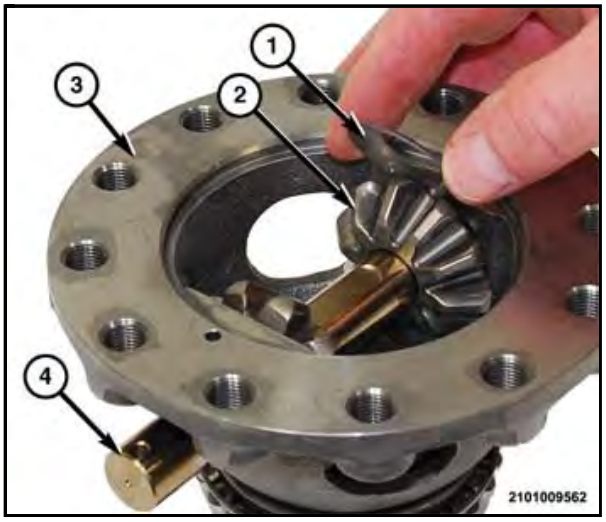
8. Remove the differential side gear (1) and thrust washer (2) from the differential housing (3).



9. Using a suitable pencil magnet, remove the lock-pin (1) holding the pinion shaft in the differential housing (2).

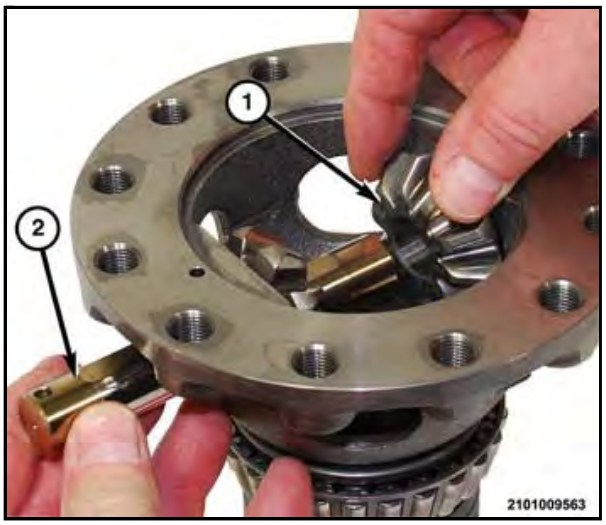


10. Slide the pinion shaft (4) outward and remove the conical thrust washer (1) from behind the pinion gear (2).

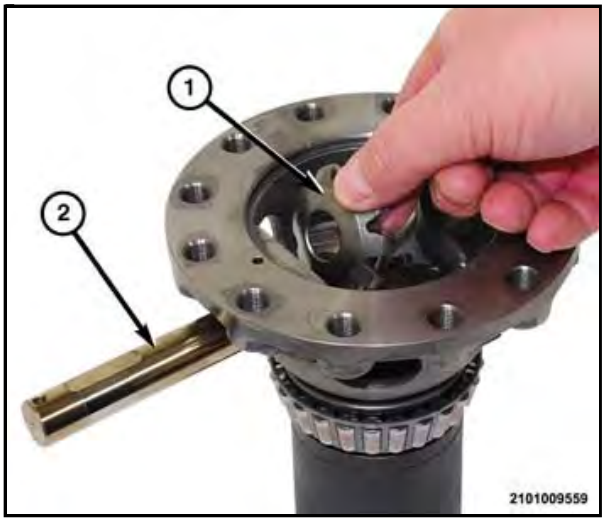


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11. Slide the pinion shaft (2) outward and remove the pinion gear 1 (1).

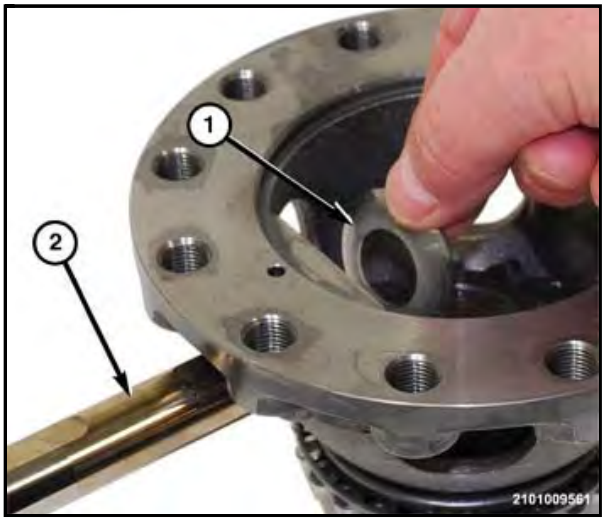


12. Slide the pinion shaft (2) outward and remove the pinion gear 2 (1).



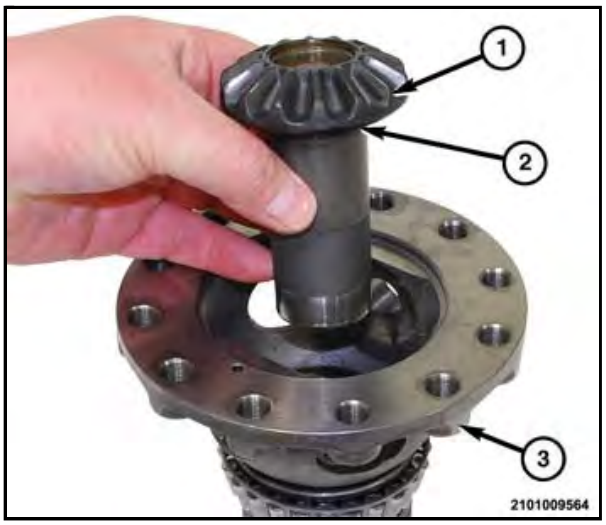
13. Slide the pinion shaft (2) outward and remove the conical thrust washer (1) from behind the pinion gear 2.

14. Remove the pinion shaft (2) from the differential housing.



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15. Remove the differential side gear (1) and thrust washer (2) from the differential housing (3).

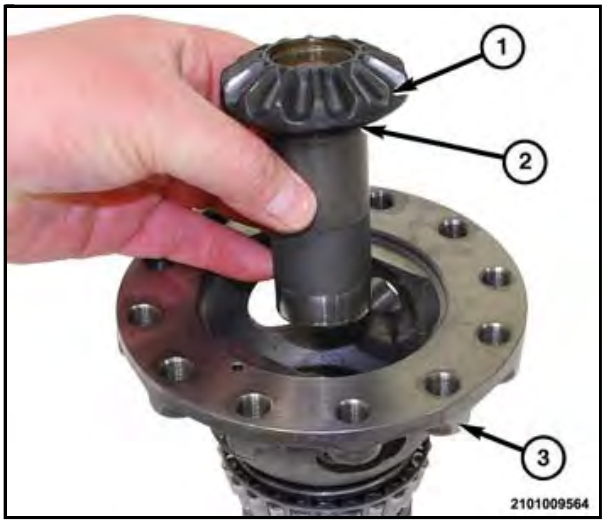


DIFFERENTIAL ASSEMBLY

The differential unit can be placed on tool Installer, Seal 6888 as a stable holding fixture.

1. Clean the differential components with suitable solvent and blow then dry with 344 kPa (50 psi) shop air. Inspect the differential components for excess wear or damage. Replace the differential if damage is apparent.

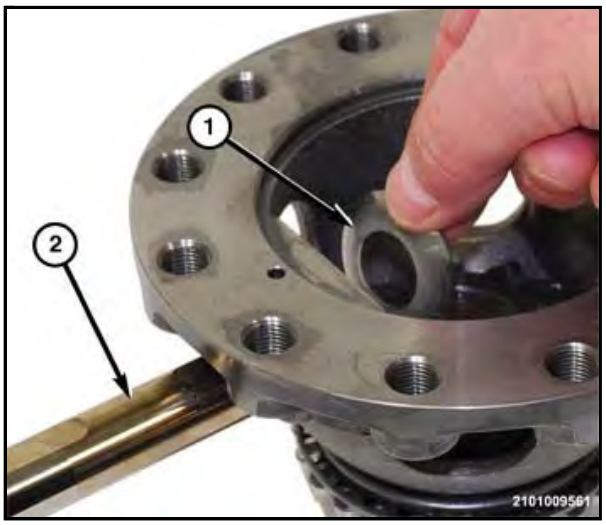
2. Install the differential side gear (1) and thrust washer (2) into the differential housing (3).



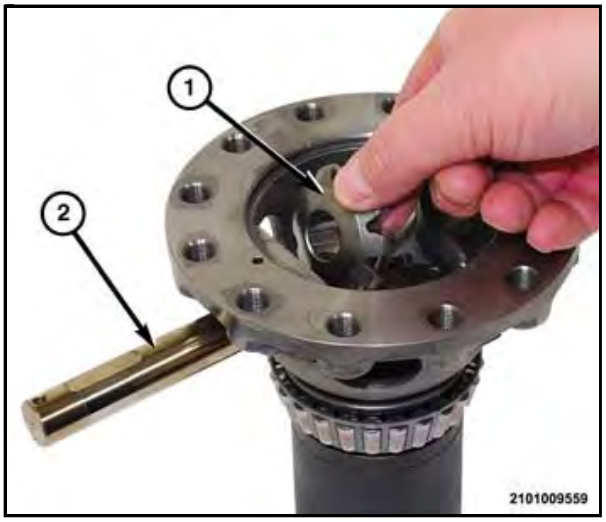
3. Install the pinion shaft (2) in the differential housing.

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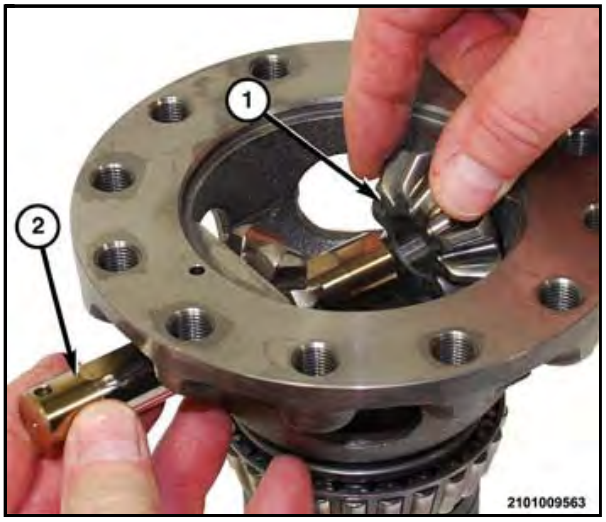
4. Slide the pinion shaft (2) inward and install the conical thrust washer (1).



5. Slide the pinion shaft (2) inward and install the pinion gear (1).

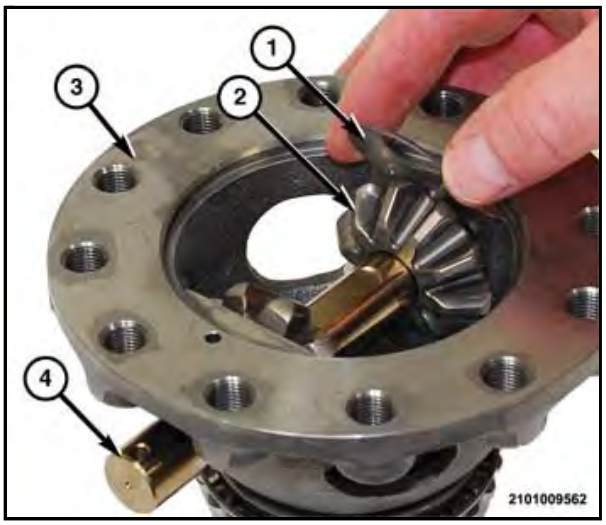


6. Slide the pinion shaft (2) inward and install the pinion gear (1).

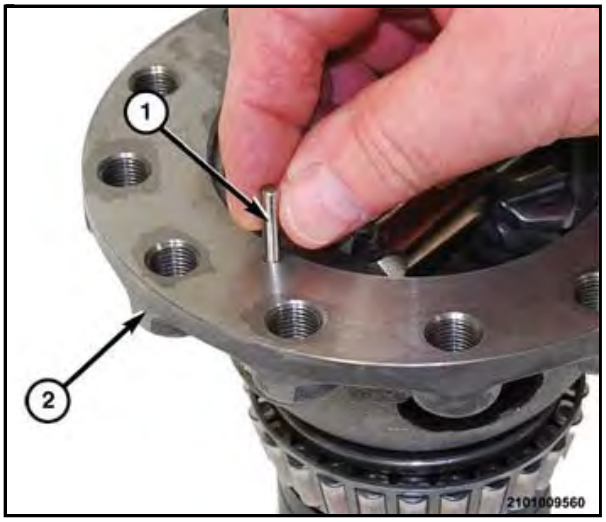


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PET_AAM_1013-0406

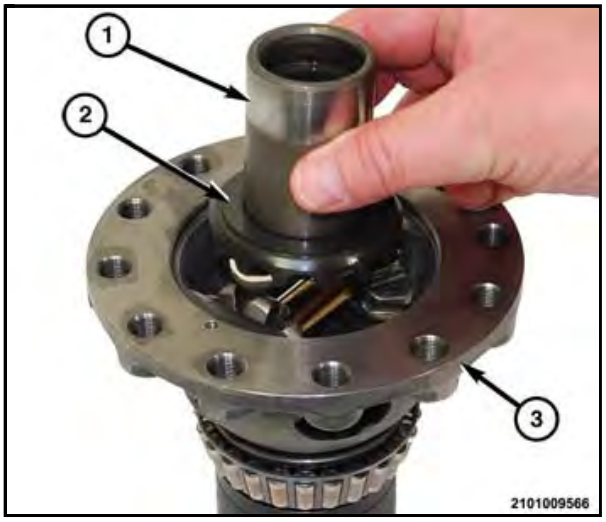
7. Slide the pinion shaft (4) inward and install the conical thrust washer (1) behind the pinion gear (2).



8. Align the hole in the pinion shaft with the hole in the differential housing (2) and install the lock-pin (1) to hold the pinion shaft in the differential housing.



9. Install the differential side gear (1) and thrust washer (2) into the differential housing (3).



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10. Place the upper half (1) housing on the lower differential housing (2).



11. Place the ring gear (1) in position on the differential housing (2).

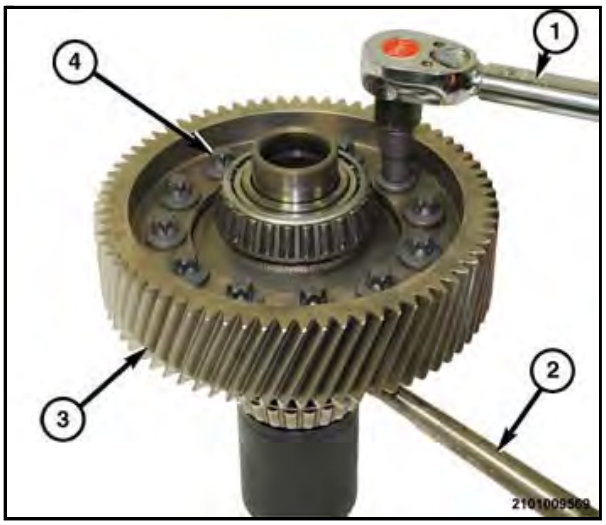


12. Install the bolts (2) to hold the ring gear (1) to the differential housing.

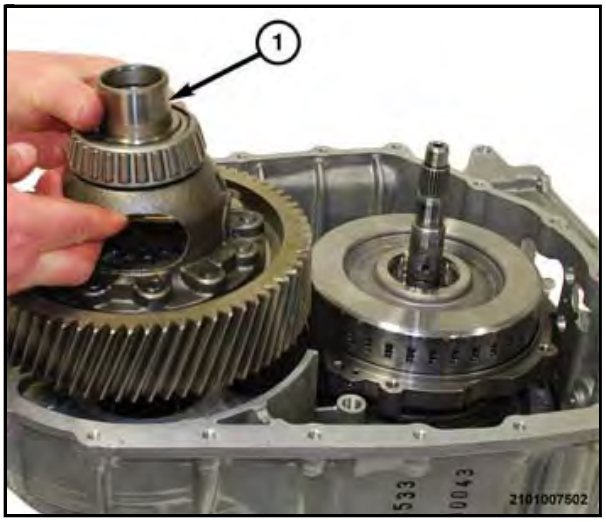


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13. Tighten the ring gear bolts to the proper (Torque Specifications) .



14. Place the differential housing (1) in position in the transmission.



15. Install the bellhousing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

16. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / FLUID and FILTER / Standard Procedure

FLUID LEVEL CHECK

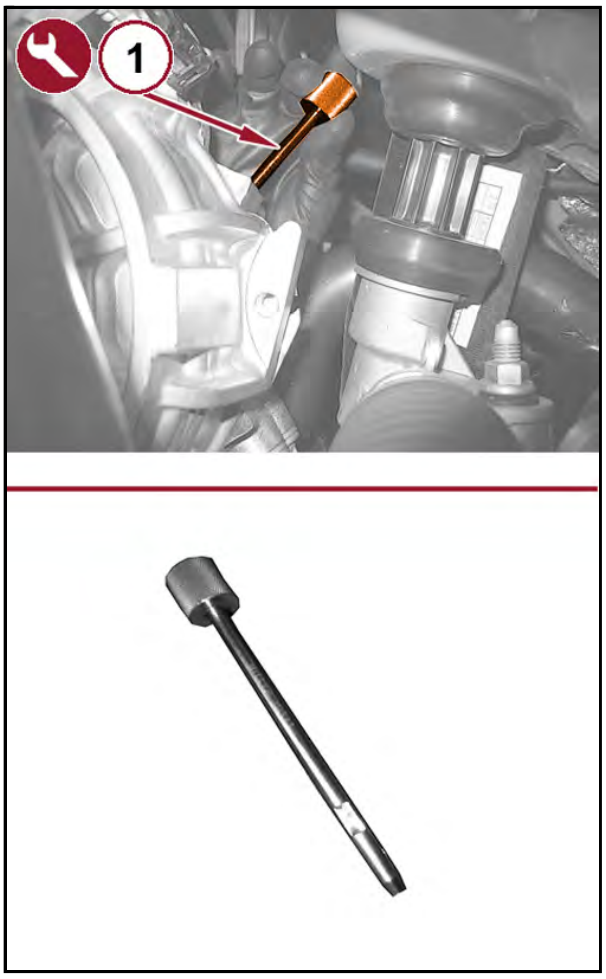
⊞ **Special Tools:** Click to display a list of tools used in this procedure

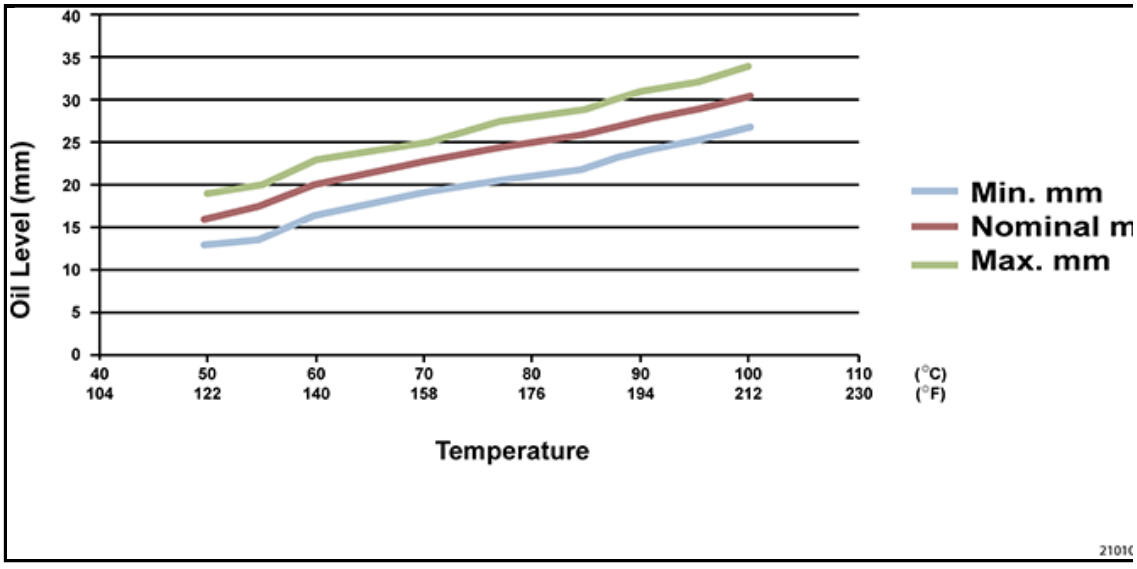
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the left front tire and wheel assembly. (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Connect a scan tool to the Diagnostic Connector.
5. With the scan tool, view the Data Display and read the Transmission Fluid Temperature.
6. Start the engine and allow it to run at idle with the transmission in Park.
7. Verify that the fluid temperature is above 50 °C.

   NOTE: **Vehicle must be level for accurate transmission fluid level readings.**

8. Turn the steering wheel to the full left position.
9. Remove the plug from the fluid level check port.
10. Insert tool 2000040963 (EMEA) or Dipstick 10323A (NAFTA) (1) into the fluid level check port and allow the handle of the tool to rest on the flat surface of the transmission housing around the check port.
11. Remove the 2000040963 (EMEA) or Dipstick 10323A (NAFTA) (1) from the check port , keeping the handle above the tip so the level reading remains accurate.

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12. If necessary, adjust the fluid level using the proper automatic transmission fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .

13. Install the plug into the fluid level check port and tighten.

14. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

15. Install the left front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / FLUID and FILTER / Standard Procedure

FLUID AND FILTER SERVICE

The 948TE/9HP48 automatic transmission is a sealed for life design and does not require periodic service. The only time the transmission fluid needs to be checked is when abnormal shifts frequently occur or evidence of a transmission fluid leak is present. The fluid filter is mounted internally and requires that the transmission be removed from the vehicle and disassembled to replace the filter. The fluid filter has a plastic body filled with polyester filter fleece.

NOTE: **The fluid used in this automatic transmission is not compatible with other types of transmission fluid, use only Shell® L12108 Automatic Transmission Fluid or Mopar® equivalent after repairs have been completed. Refer to Star Parts for the part number.** Use of improper fluid will cause premature failure, poor shift quality and possible leaks.

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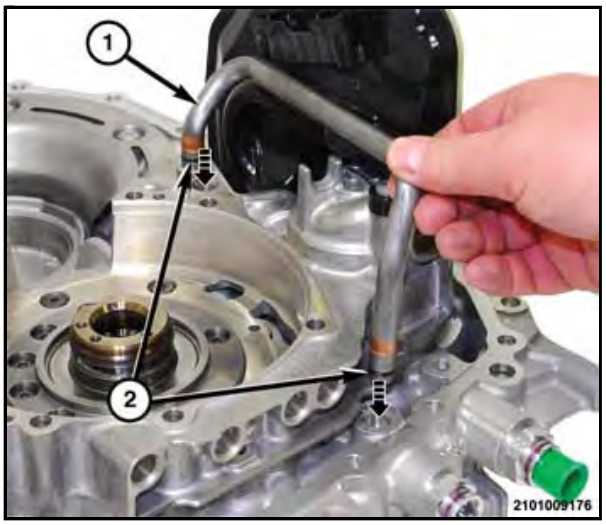
21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / FLUID and FILTER / Removal and Installation

REMOVAL AND INSTALLATION

TRANSMISSION FLUID FILTER REMOVAL

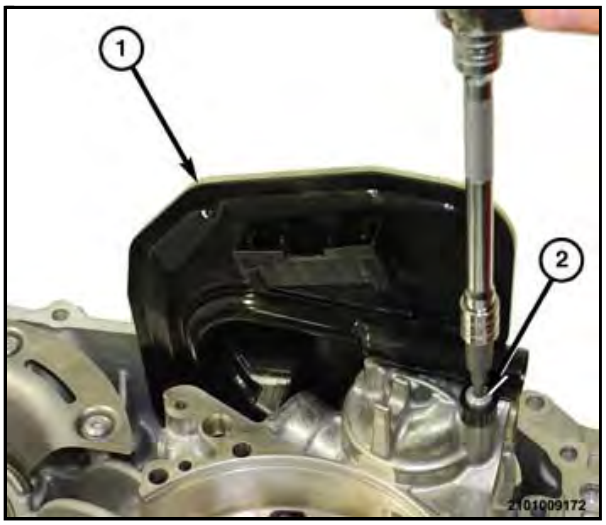
NOTE: The fluid filter does not require periodic replacement. It should only be replaced in conjunction with a major failure that caused excessive fluid contamination or during an overhaul.

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .
2. Drain the fluid from the transmission.
3. Remove the bellhousing from the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .
4. Remove the fluid tube (1) from the intermediate support plate and bellhousing.

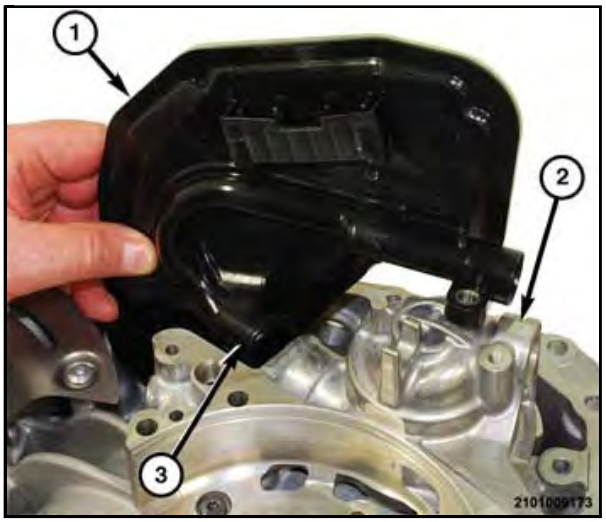


5. Remove the bolt (2) holding the fluid filter (1) to the intermediate support plate.

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6. Separate the fluid filter (1) from the intermediate support plate (2).



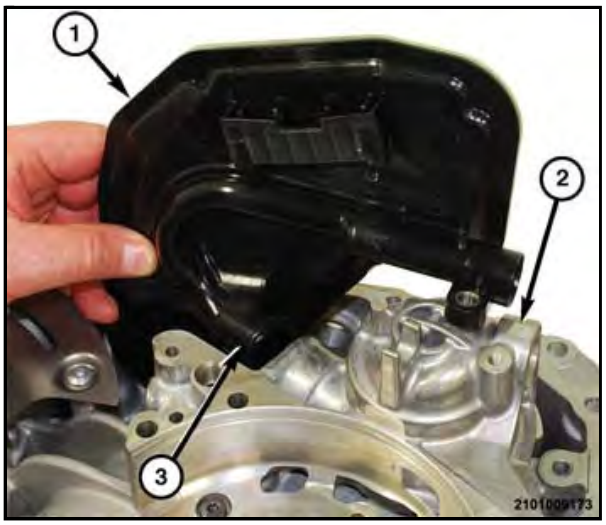
TRANSMISSION FLUID FILTER INSTALLATION

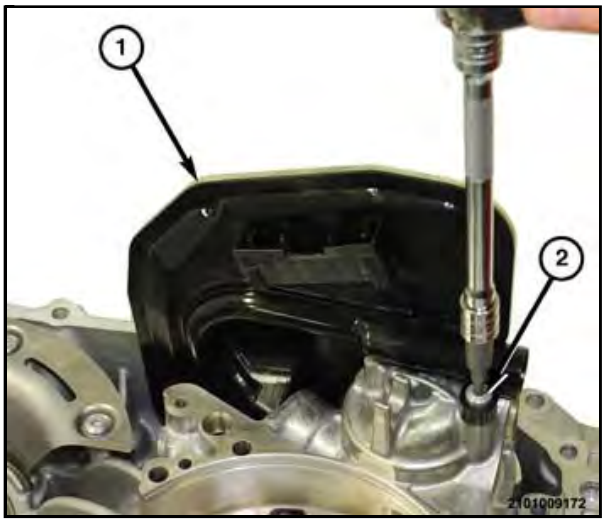
1. Clean the intermediate support plate in preparation for the **NEW** fluid filter.

2. Verify that the O-ring (3) is in good condition. Replace the O-ring (3) if damage is present.

3. Insert the oil filter neck (3) into the oil pump orifice and align the bolt hole with the bore in the intermediate support plate (2).

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4. Install the bolt (2) to hold the fluid filter (1) to the intermediate support plate and tighten to the proper (Torque Specifications) .

5. Install the bellhousing on the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

6. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

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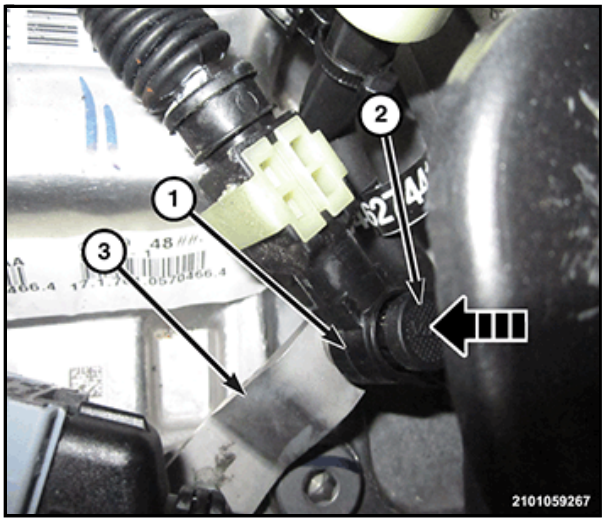
21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / MANUAL LEVER AND PARK ROD / Removal and Installation

REMOVAL AND INSTALLATION

PARK DETENT AND MANUAL SHAFT REMOVAL

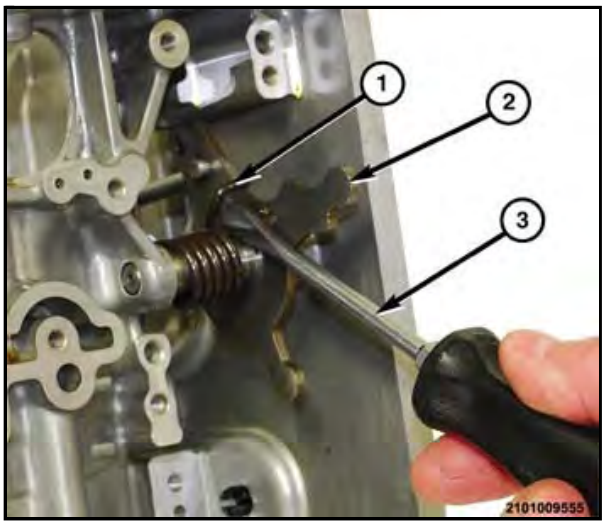
The transmission does not require removal to complete the following procedure.

1. Remove the valve body from the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/VALVE BODY/Removal and Installation) .
2. Pull upward on the cable end (1) while pushing down on release button (2) to remove the shifter cable from the manual lever (3).

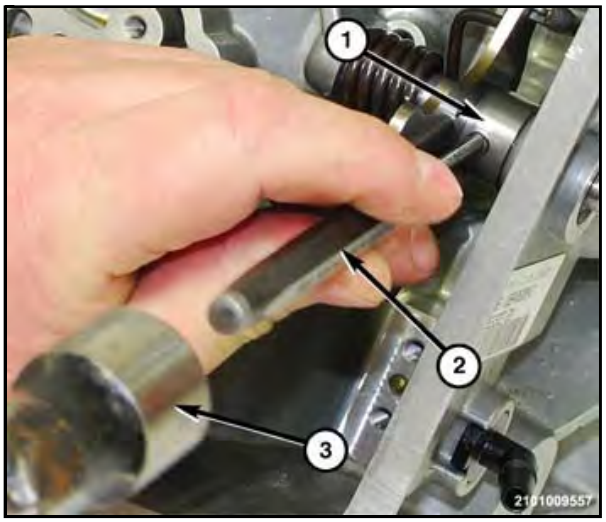


3. Remove the nut holding the manual shift lever to the manual shaft.
4. Pry the manual shift lever upward and off the manual shaft.
5. Using a suitable screw driver (3), pry the spring (1) to the inside and off of the detent (2).

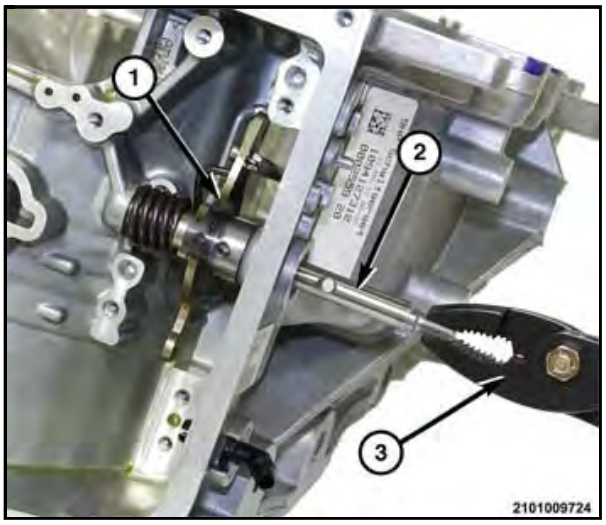
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0417



6. Using a suitable hammer (3) and pin-punch (2), drive the roll-pin out of the detent hub (1).

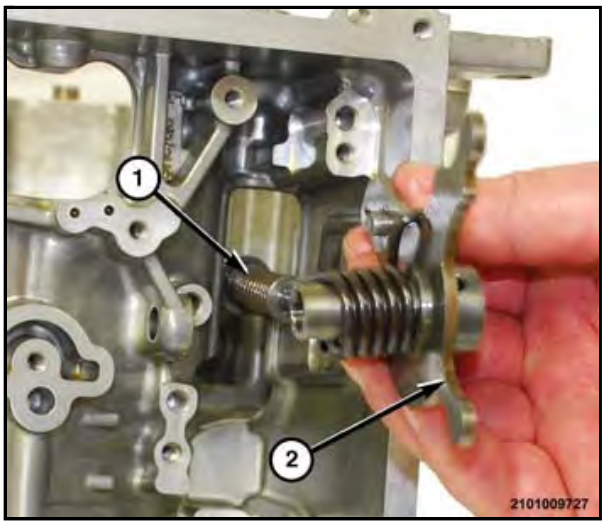


7. Using suitable pliers (3), pull the manual shaft (2) out of the detent hub (1) and transmission housing.



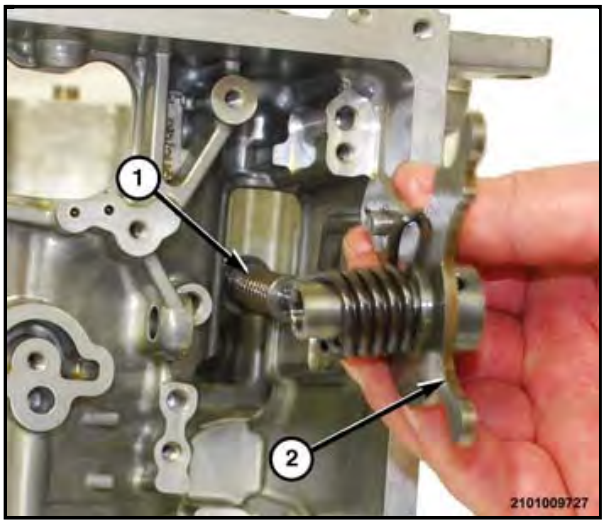
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0418

8. Remove the detent hub (2) and park rod (1) from the transmission.



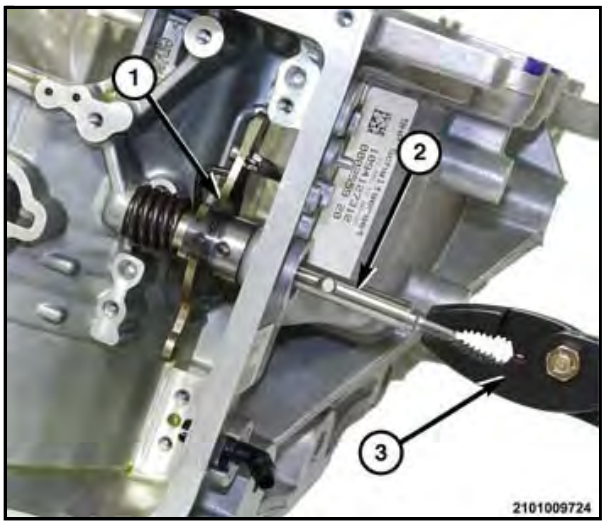
PARK DETENT AND MANUAL SHAFT INSTALLATION

1. Insert the and park rod (1) into the park rod guide and the detent hub (2) into the transmission.

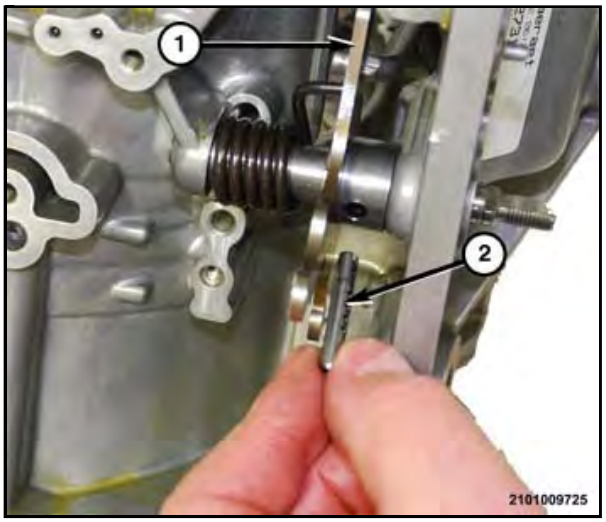


2. Insert the manual shaft (2) into the detent hub (1) and transmission housing and align the holes in the detent hub and the manual shaft.

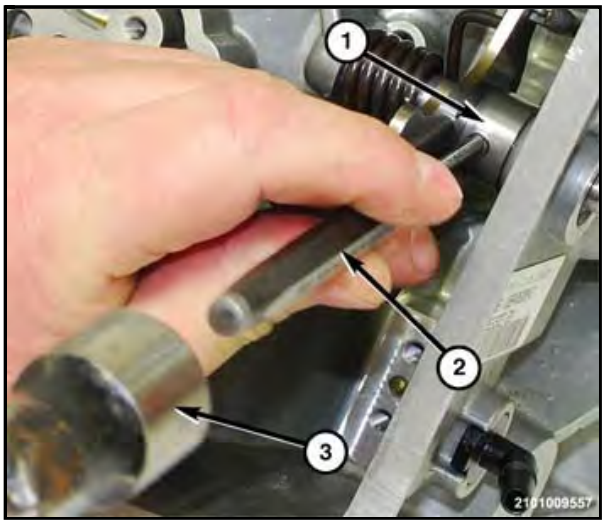
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0419



3. Insert the tapered end of the roll-pin (2) into the hole in the detent hub (1).

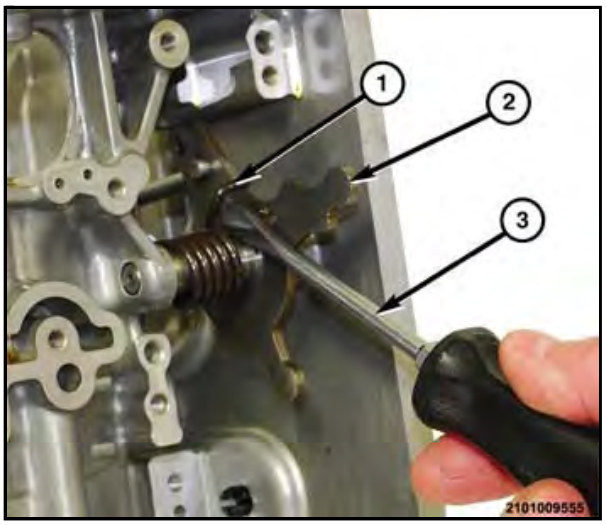


4. Using a suitable hammer (3) and pin-punch (2), drive the roll-pin into of the detent hub (1) until the head is flush.



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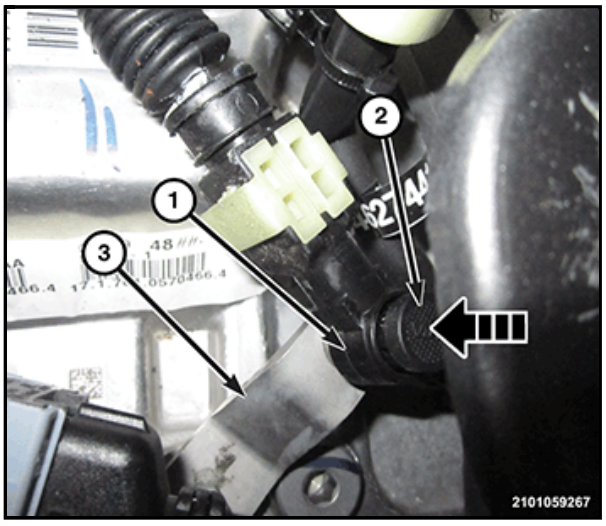
5. Using a suitable screw driver (3), pry the spring (1) over the top of the detent hub (2).



6. Place the manual lever in position on the manual shift lever.

7. Install the nut to hold the manual shift lever to the manual shaft to the manual shaft and tighten to the proper (Torque Specifications) .

8. Hold the release button down (3) down while attaching the shifter cable end (1) to the manual lever (3).



9. Install the valve body into the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/VALVE BODY/Removal and Installation) .

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / NEEDLE BEARING, Oil Pump Sprocket / Removal and Installation

REMOVAL AND INSTALLATION

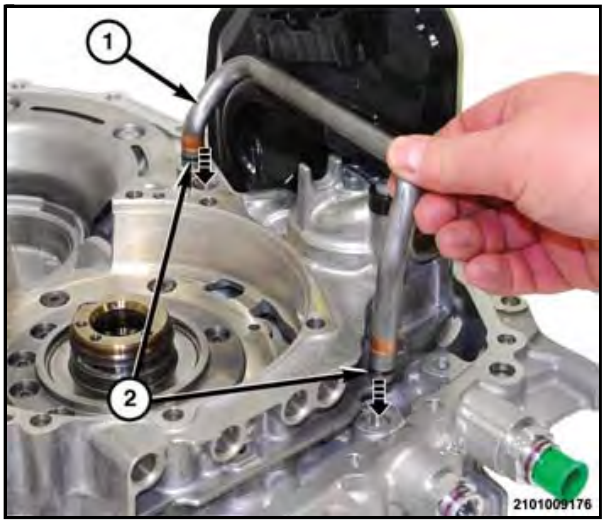
⊞ **Special Tools:** Click to display a list of tools used in this procedure

OIL PUMP SPROCKET NEEDLE BEARING REMOVAL

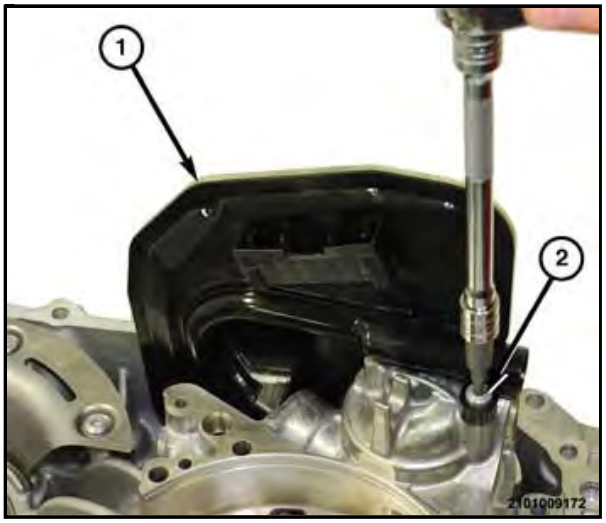
1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

2. Remove the bellhousing from the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

3. Remove the fluid tube (1) from the bellhousing and discard the fluid tube O-rings (2).

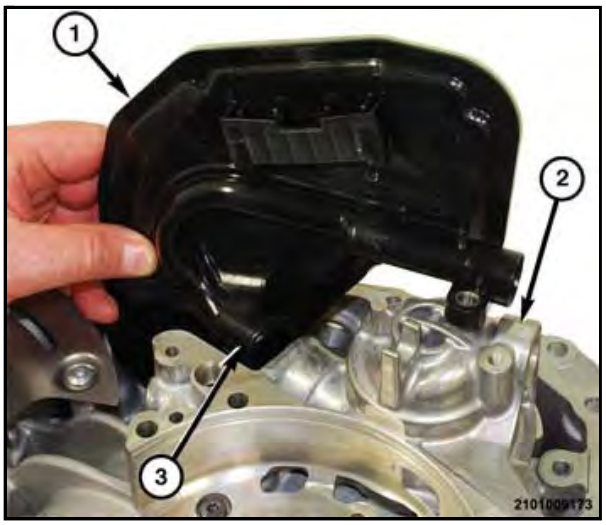


4. Remove the bolt (2) holding the oil filter (1) to the bellhousing.

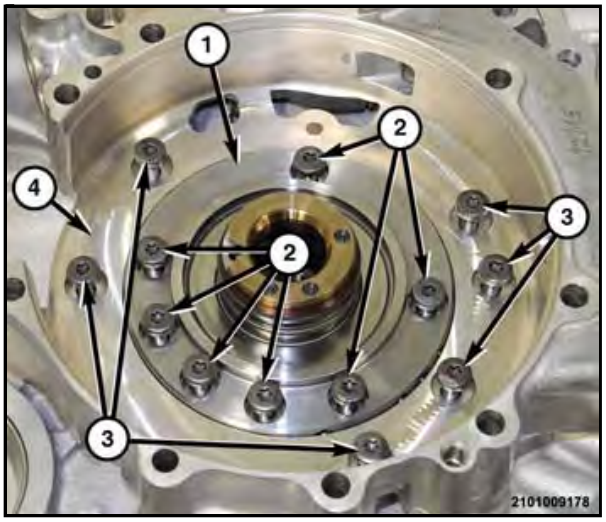


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PET_AAM_1013-0422

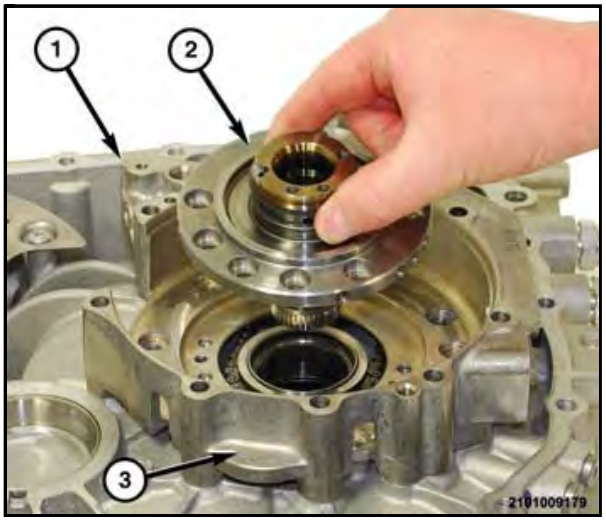
5. Separate the oil filter (1) from the bellhousing (2).



6. Remove the bolts (2) holding the reaction shaft (1) to the intermediate support plate (4).

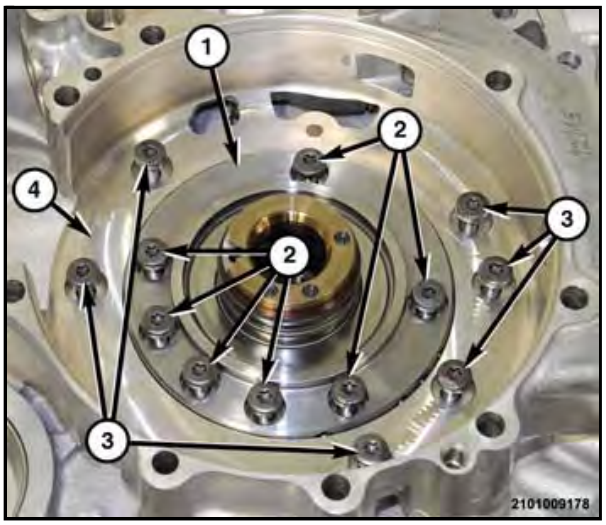


7. Separate the reaction shaft (2) from the intermediate support plate (1).

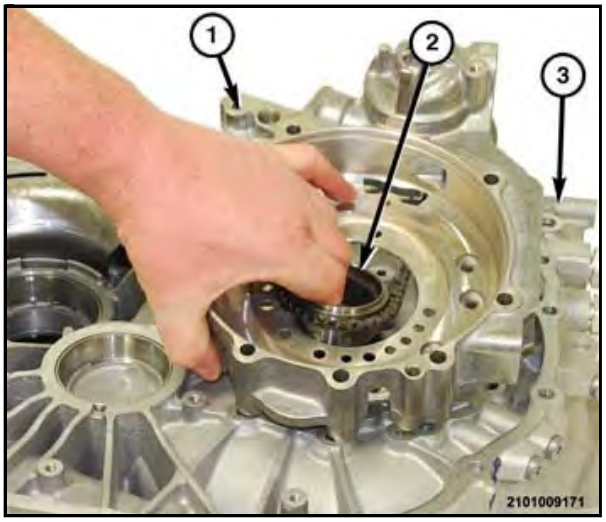


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PET_AAM_1013-0423

8. Remove the bolts (3) holding the intermediate support plate and oil pump (4) to the bellhousing.



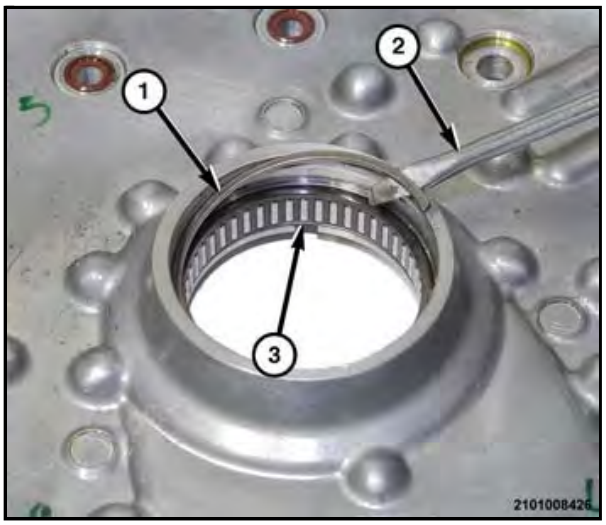
9. Separate the intermediate support plate and oil pump (1) from the bellhousing (3).

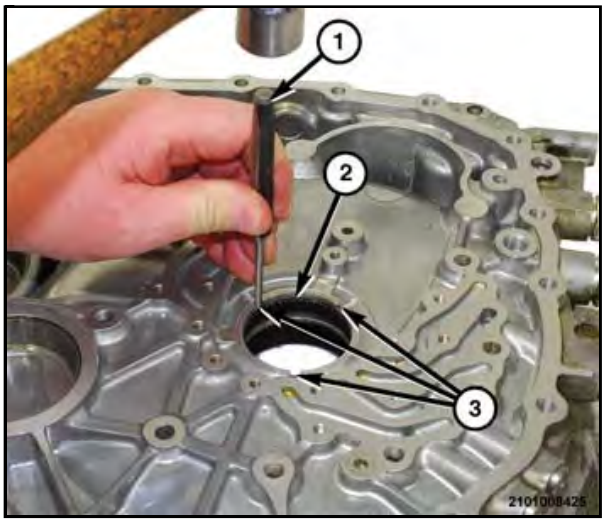


10. Using a suitable screw driver, remove the input shaft seal from the bellhousing.

11. Using a suitable screw driver (2), remove the snap-ring (1) holding the oil pump sprocket needle bearing (3) in the bellhousing.

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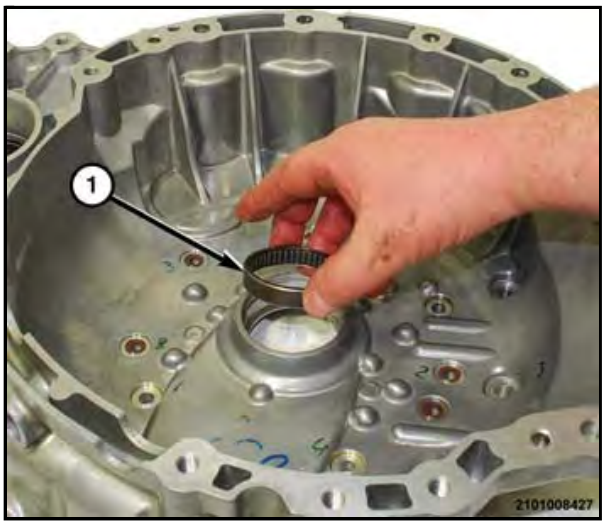
12. Using a suitable punch tool (1), remove the oil pump sprocket needle bearing (2) by tapping outward while alternating between the three notches (3) in the bellhousing bore flange.

OIL PUMP SPROCKET NEEDLE BEARING INSTALLATION

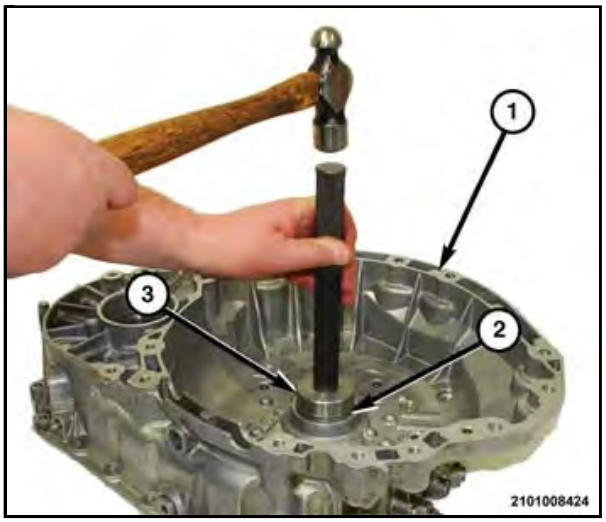
1. Clean the oil pump sprocket needle bearing and input shaft seal bore.

2. Place the oil pump sprocket needle bearing (1) in position into the bore in the center of the bellhousing.

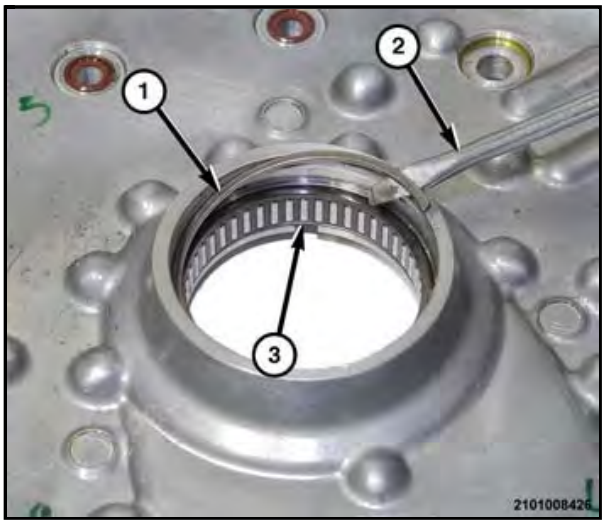
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PET_AAM_1013-0425



3. Using tool Installer, Bearing 10503 (3) and Driver Handle, Universal C-4171 , install the oil pump sprocket needle bearing (2) in the bellhousing (1) bore until the bearing is seated against the flange.



4. Install the snap-ring (1) to hold the oil pump sprocket needle bearing (3) in the bellhousing.



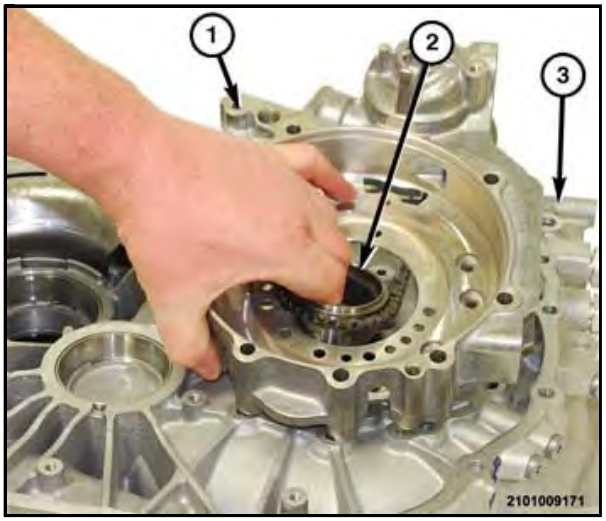
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0426

5. Apply assembly lube on the lip of the **NEW** seal.

6. Place the seal on tool Installer, Seal 9677 (2), with the tension spring away from the tool, and insert the seal into the bore in the bellhousing and using a suitable hammer, drive the seal into the bore in the center of the bellhousing until the tool seats against the bellhousing.

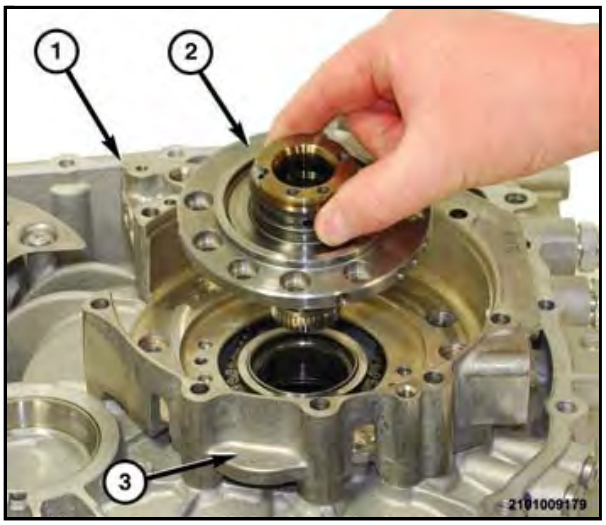


7. Place the intermediate support plate and oil pump (1) in position on the bellhousing (3) while guiding the oil pump sprocket (2) into oil pump sprocket needle bearing.

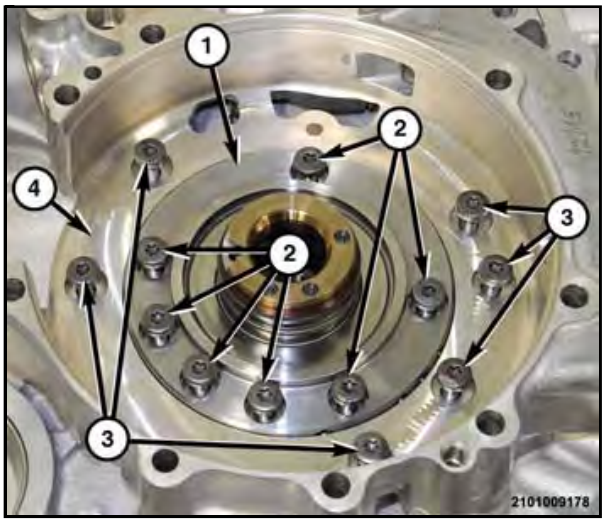


8. Place the reaction shaft (2) in position on the intermediate support plate (1).

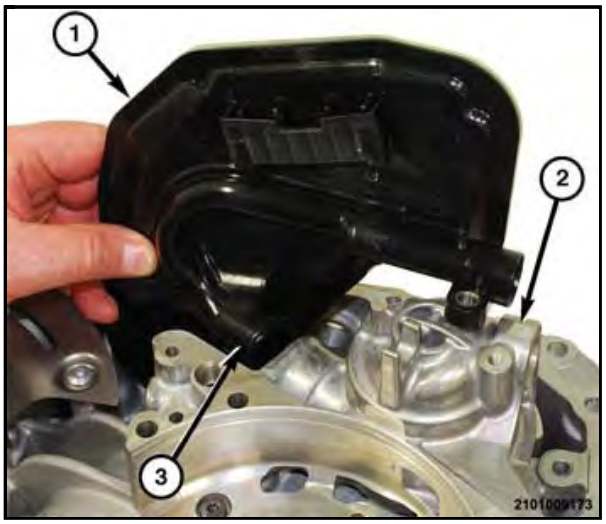
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PET_AAM_1013-0427



9. Install the bolts (2) to hold the reaction shaft (1) to the intermediate support plate (4) and tighten to the proper (Torque Specifications) .

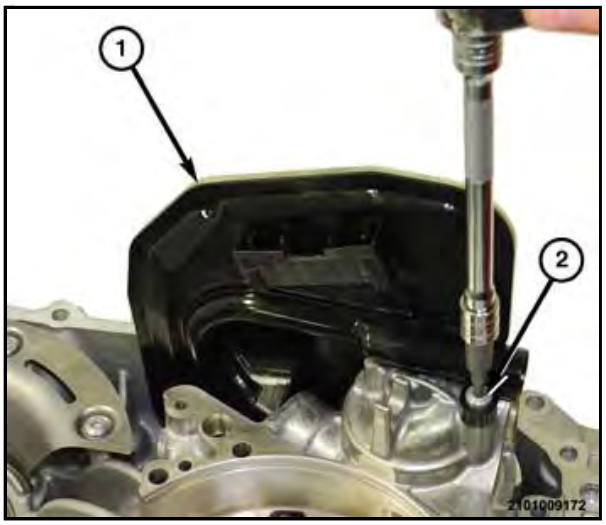


10. Place the fluid filter (1) in position on the bellhousing (2) and insert feed tube into the oil pump.

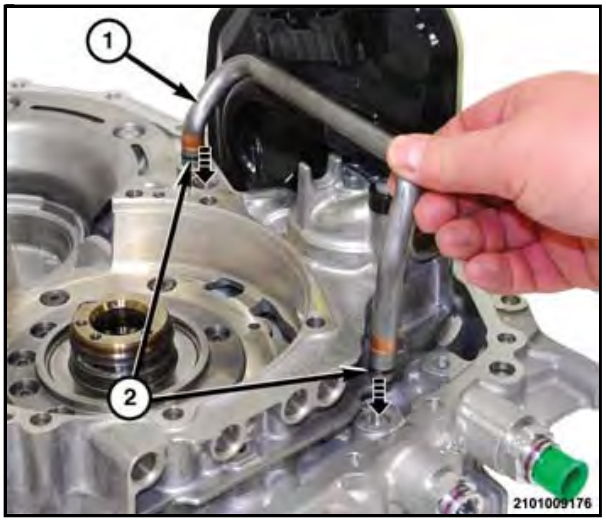


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PET_AAM_1013-0428

11. Install the bolt (2) to hold the fluid filter (1) to the bellhousing and tighten to the proper (Torque Specifications) .



12. Install **NEW** O-rings (2) on the fluid tube and install the fluid tube (1) in the bellhousing.



13. Install the bellhousing on the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

14. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

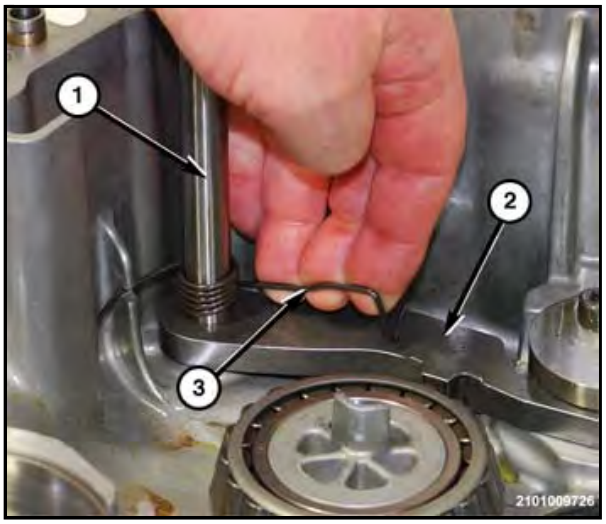
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0429

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / PARKING SPRAG AND GUIDE / Removal and Installation

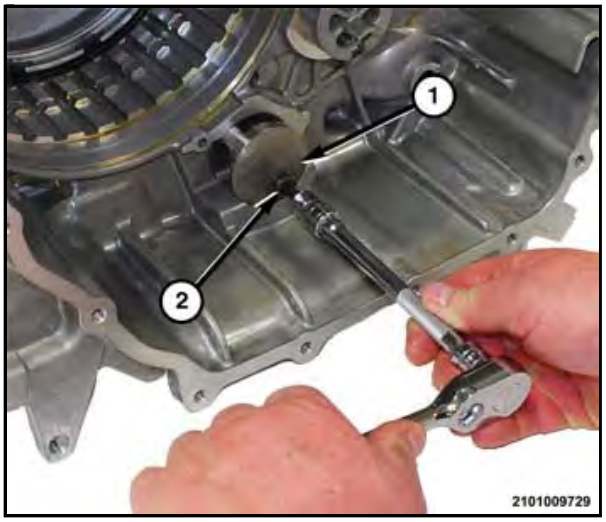
REMOVAL AND INSTALLATION

PARK ROD GUIDE AND PAWL REMOVAL

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .
2. Position the transmission on the clean, stable work surface.
3. Remove the bellhousing from the transmission housing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .
4. Compress and release the park pawl (2) return spring (3).
5. Pull the reaction pin (1) from the park pawl (2).
6. Separate the park pawl (2) from the park rod guide.



7. Remove the park rod guide bolt (2) and the park rod guide (1).

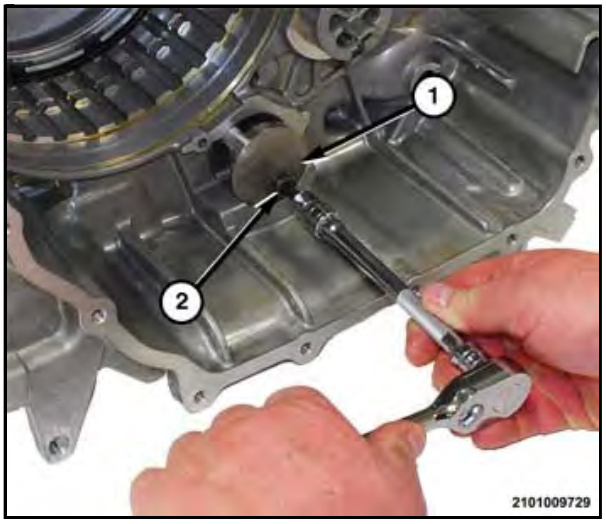


American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0430

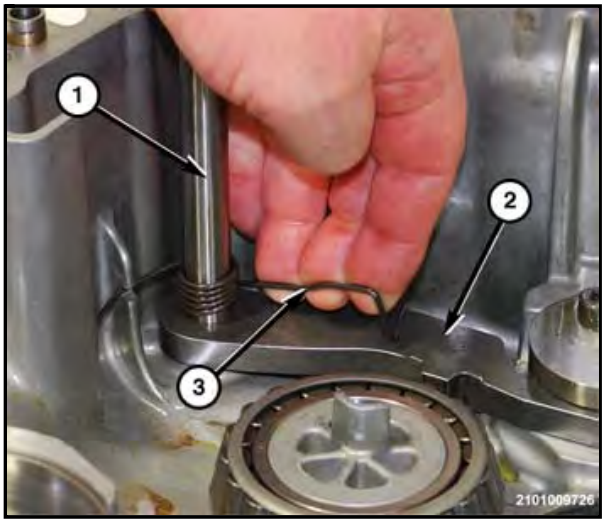
PARK ROD GUIDE AND PAWL INSTALLATION

NOTE: If the park pawl is damaged the transfer gear may also be damaged. Replace the transfer gear if damage if present. If the transfer gear is replaced the proper thickness bearing preload select shim will have to be established.

1. Install the park rod guide (1) and the park rod guide bolt (2) in the transmission housing and tighten to the proper (Torque Specifications) .



2. Install the park pawl (2) in position in park rod guide.
3. Insert the reaction pin (1) through the park pawl (2) and into the transmission housing.
4. Slide the park pawl return spring (3) over the reaction pin (1) and insert the tail of the spring into the notch in the transmission housing.
5. Wind the park pawl return spring (3) counterclockwise and hook the bent end of the spring over the park pawl (2).



6. Install the bellhousing into the transmission housing (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

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7. Install the transmission into the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / PUMP, Fluid / Removal and Installation

REMOVAL AND INSTALLATION

⊞ **Special Tools:** Click to display a list of tools used in this procedure

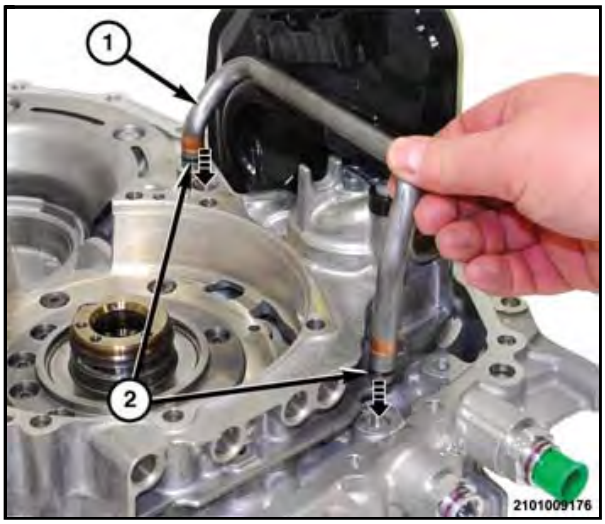
OIL PUMP REMOVAL

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

2. Position the transmission on the clean, stable work surface.

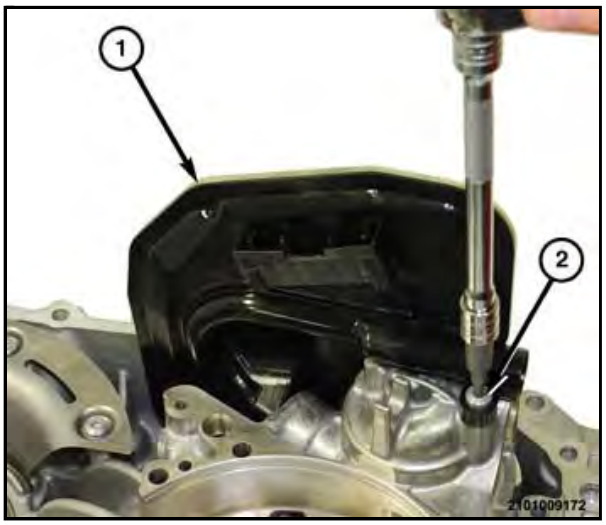
3. Remove the bellhousing from the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

4. Remove the fluid tube (1) from the intermediate support plate and bellhousing.

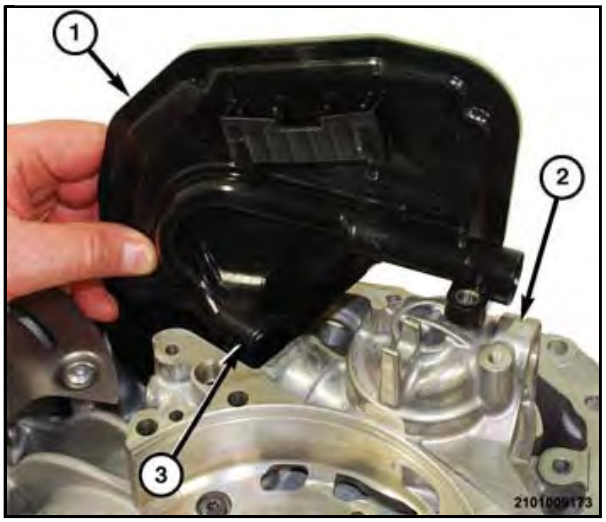


5. Remove the bolt (2) holding the fluid filter (1) to the intermediate support plate.

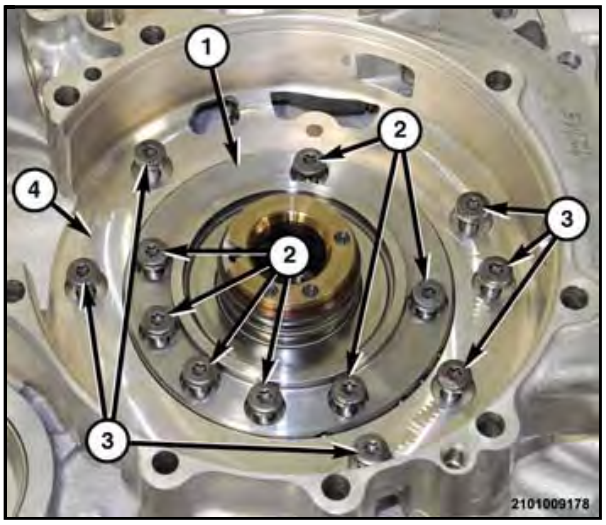
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6. Separate the fluid filter (1) from the intermediate support plate (2).

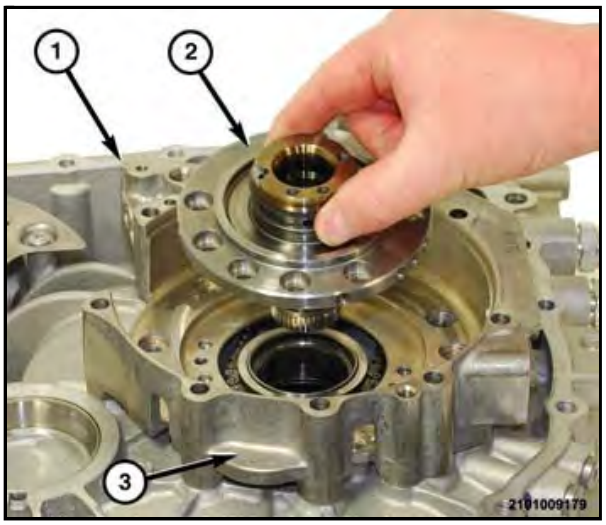


7. Remove the reaction shaft bolts (2) holding the reaction shaft (1) to the intermediate support plate (4).

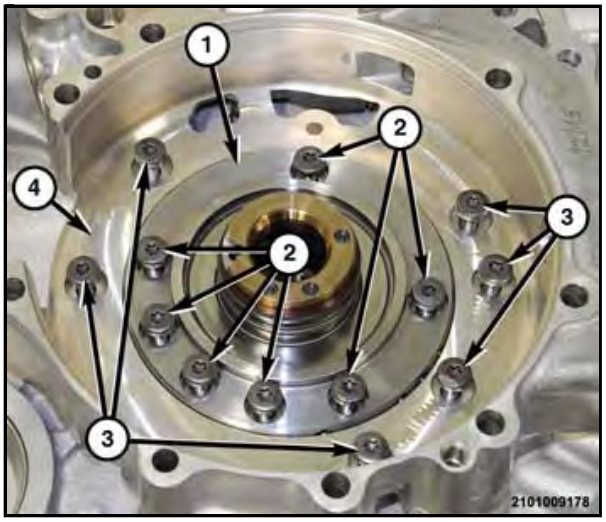


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8. Separate the reaction shaft (2) from the intermediate support plate (1).

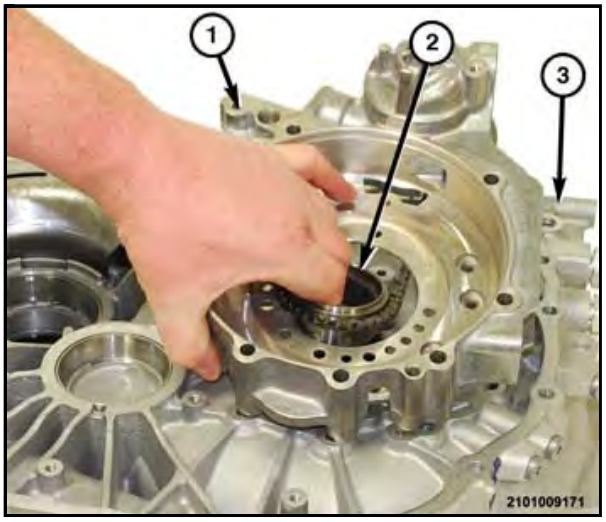


9. Remove the bolts (3) holding the intermediate support plate and oil pump (1) to the bellhousing.



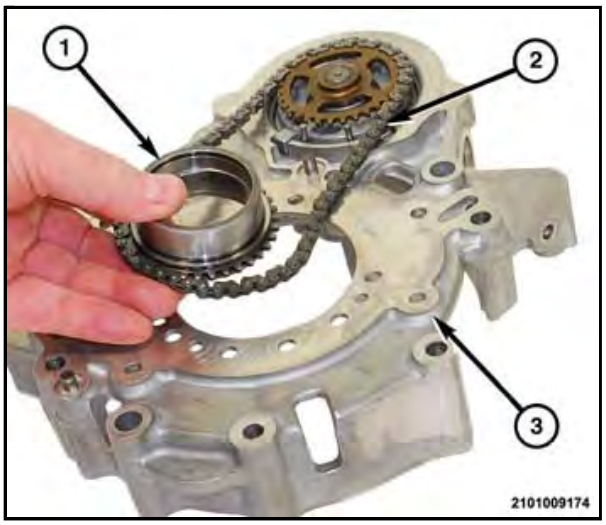
10. Separate the intermediate support plate and oil pump (1) from the bellhousing (3).

11. Turn the intermediate support plate and oil pump (1) outside up on the work surface.

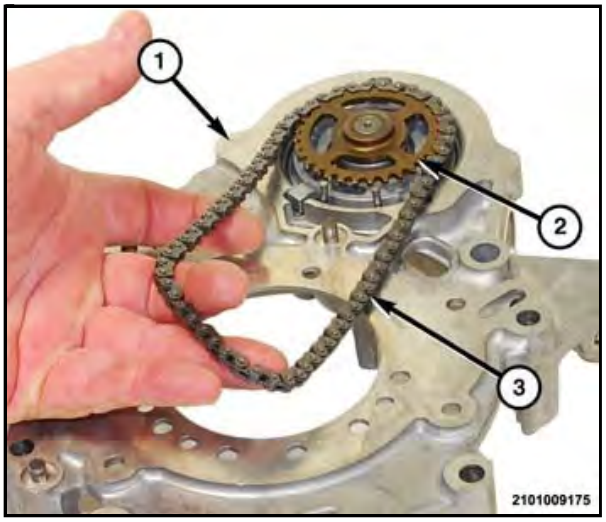


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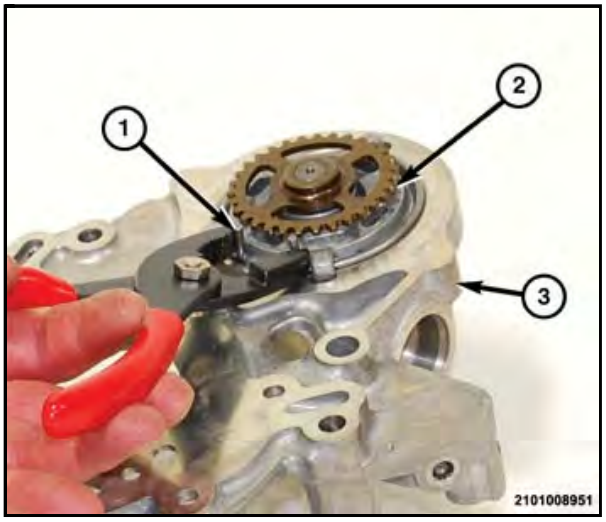
12. Separate the oil pump drive sprocket (1) from the drive chain (2).



13. Separate the oil pump drive chain (3) from the oil pump driven sprocket (2).

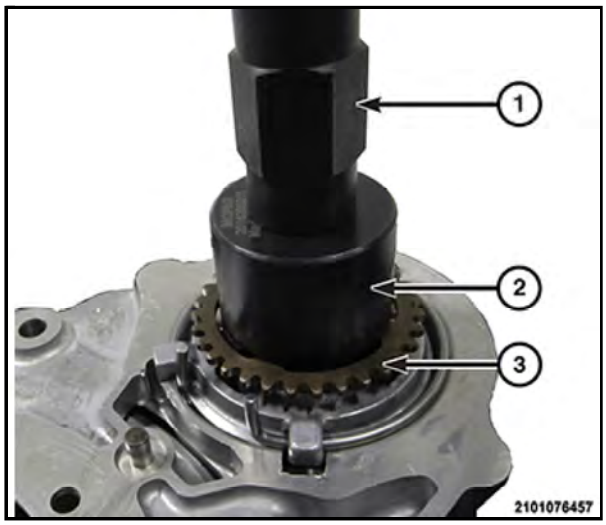


14. Using suitable pliers (1), compress the snap-ring holding the oil pump (2) into the intermediate support plate (3).



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15. While holding compression on the snap-ring, use Remover-Installer, 948 TE Transmission Pump 2016200211 (2) and Slide Hammer, Universal C-637 (1) to remove the oil pump (3) out of the bore in the intermediate support plate.

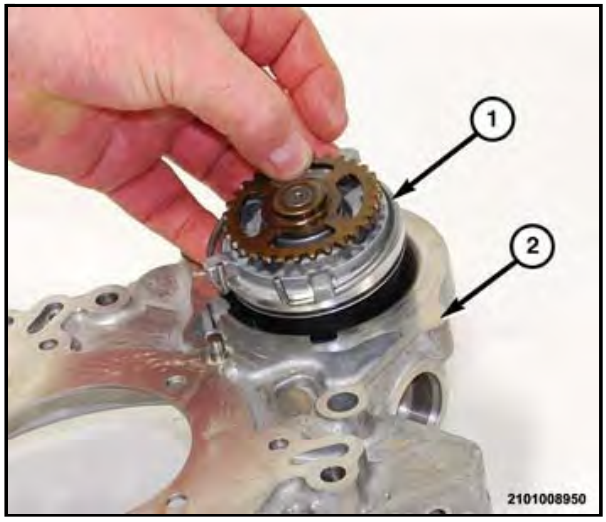


OIL PUMP INSTALLATION

1. Clean the intermediate support plate and oil pump with suitable solvent and blow them dry with regulated 344 kPa (50 psi) shop air.

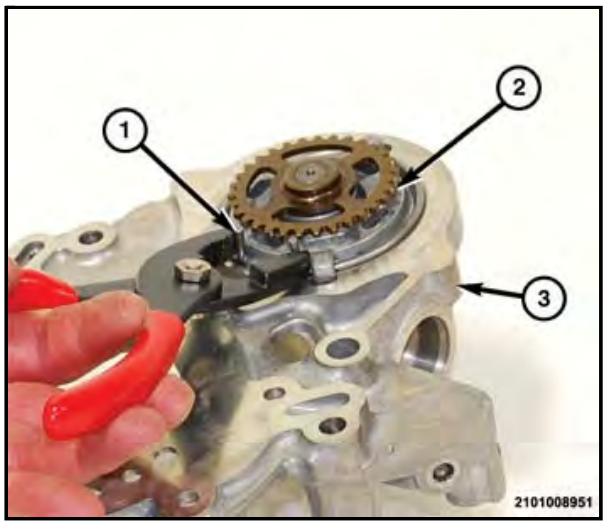
2. Inspect the intermediate support plate and oil pump for apparent damage or ware. If the intermediate support plate is damaged, the transmission will require replacement. If the oil pump is damaged, replace the oil pump.

3. Insert the oil pump (1) into the intermediate support plate (2). Align the tabs on the pump with the notches on the intermediate support plate.

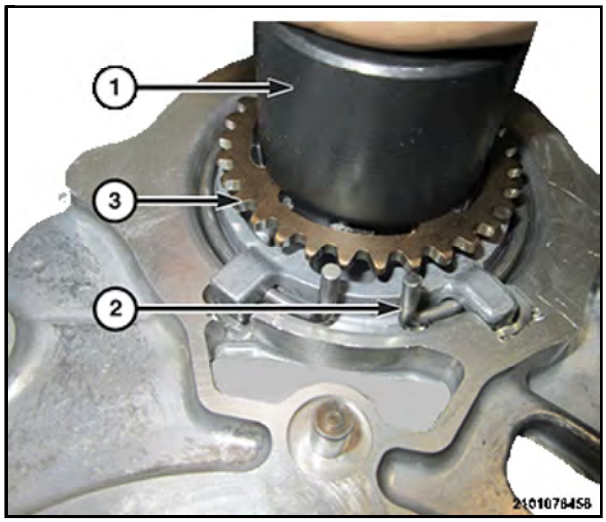


4. Using a suitable pliers (1), compress the snap-ring to hold the oil pump (2) into the intermediate support plate (3).

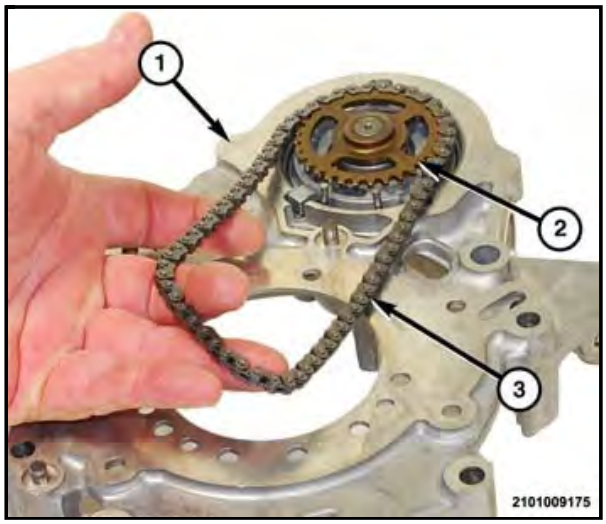
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5. While holding compression on the snap-ring (2), use Remover-Installer, 948 TE Transmission Pump 2016200211 (1) with a C-clamp to compress the spring on the bottom of the oil pump just enough to seat the snap-ring (2).



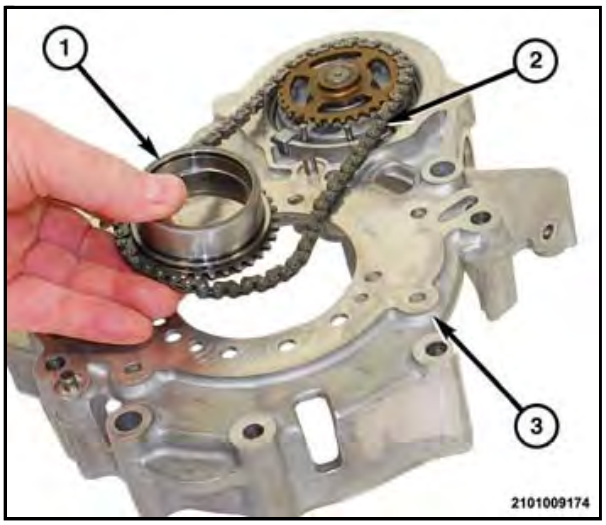
6. Install the oil pump drive chain (3) onto the oil pump driven sprocket (2).



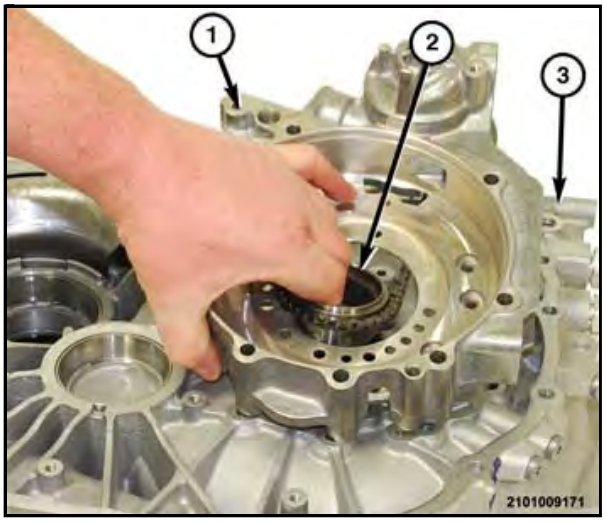
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7. Install the oil pump drive sprocket (1) onto the drive chain (2).

8. While holding the chain on the drive sprocket, turn the intermediate support plate and oil pump (1) inside up on the work surface.



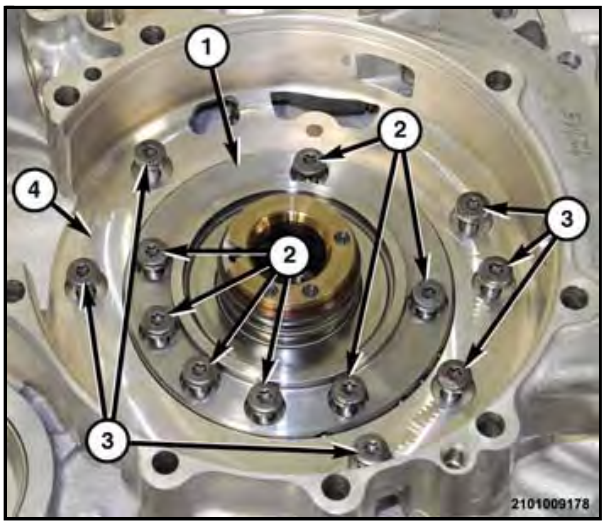
9. Place the intermediate support plate and oil pump (1) in position on the bellhousing (3).



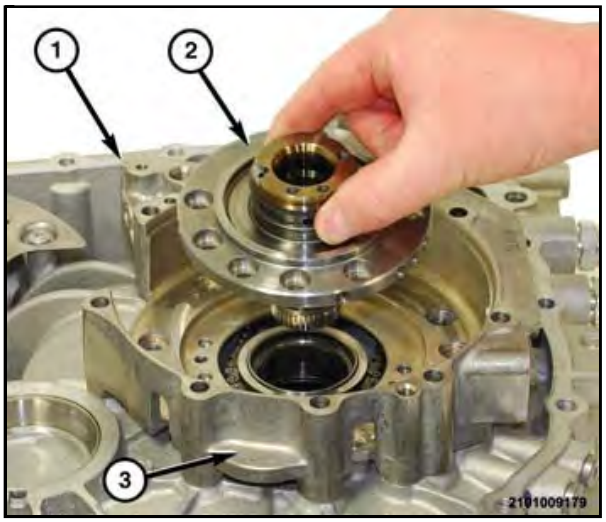
10. Insert the oil pump drive sprocket into the oil pump sprocket needle bearing.

11. Install the bolts (3) to hold the intermediate support plate and oil pump (1) to the bellhousing and tighten to the proper (Torque Specifications) .

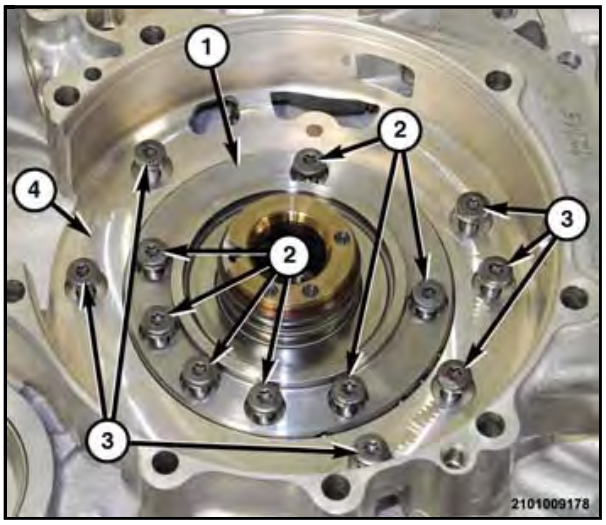
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12. Place the reaction shaft (2) into the intermediate support plate (1).

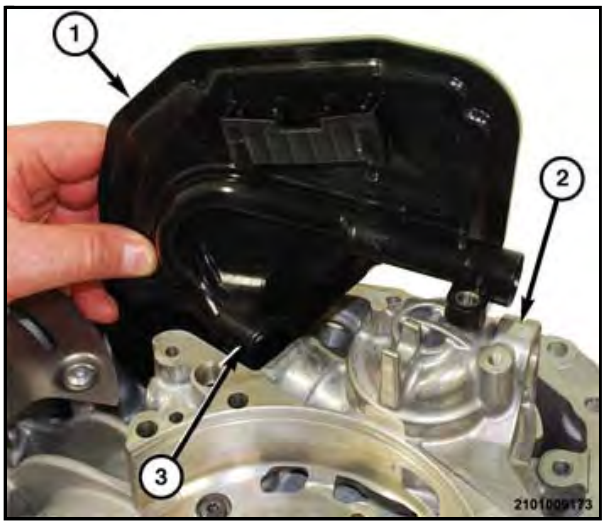


13. Install the bolts (2) to hold the reaction shaft (1) to the intermediate support plate (4) and tighten to the proper (Torque Specifications) .

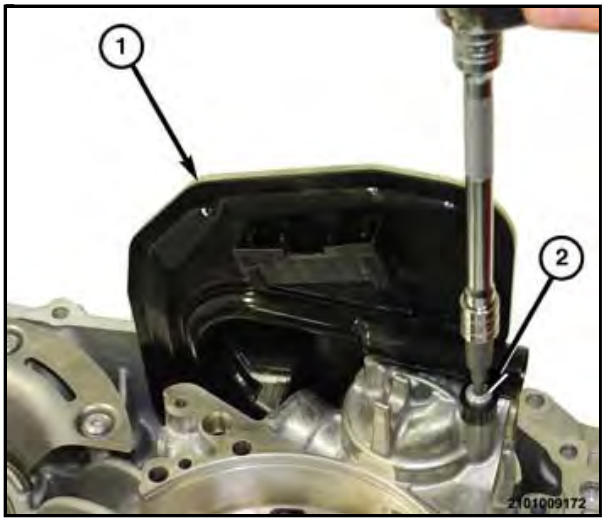


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14. Insert the oil filter neck (3) into the oil pump orifice and align the bolt hole with the bore in the intermediate support plate (2).

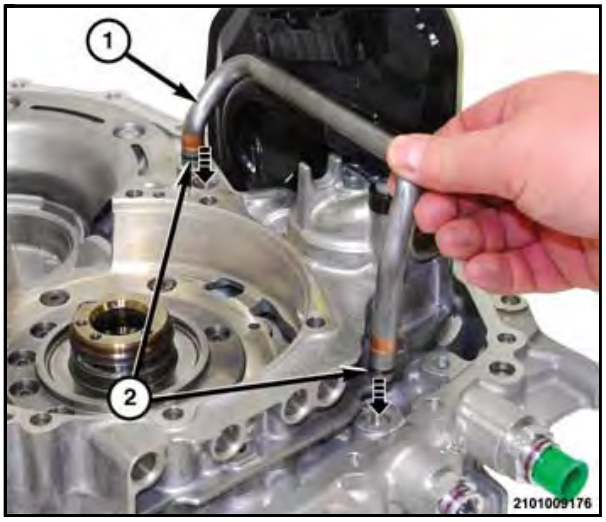


15. Install the bolt (2) to hold the oil filter (1) to the intermediate support plate and tighten to the proper (Torque Specifications) .



16. Replace the O-ring seals (2) on the fluid tube (1).

17. Install the fluid tube (1) into the bellhousing and intermediate support plate.



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18. Install the bellhousing on the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

19. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

20. Road test the vehicle to verify the repair.

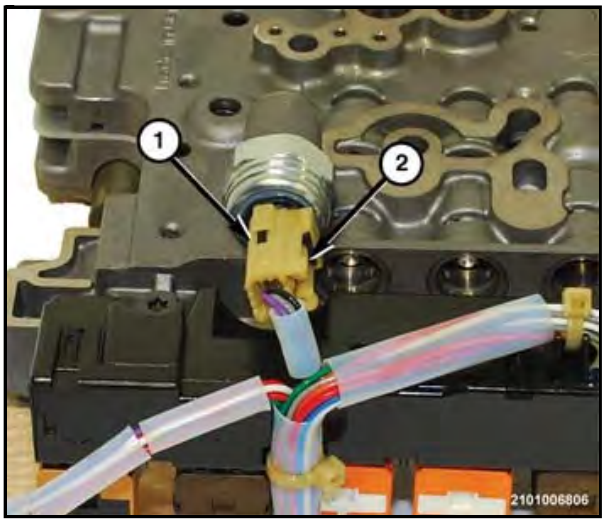
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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SENSOR, Fluid Pressure / Removal and Installation

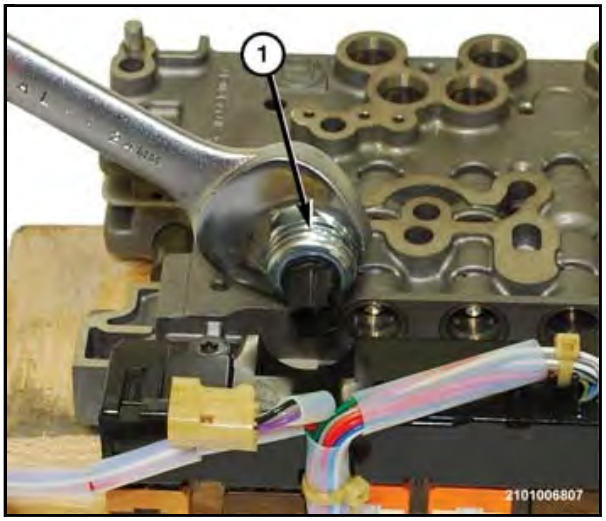
REMOVAL AND INSTALLATION

FLUID PRESSURE SENSOR REMOVAL

1. Remove the valve body (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/VALVE BODY/Removal and Installation) .

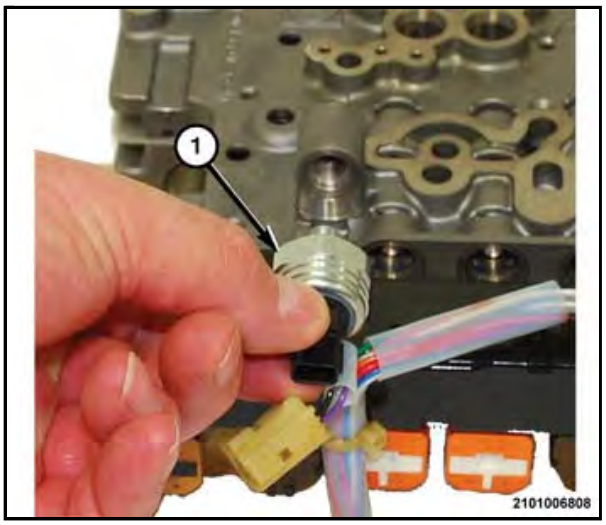


2. Release the lock (2) on the fluid pressure sensor wire harness connector (1).
3. Pull the wire harness connector (1) from the fluid pressure sensor.



4. Using a suitable wrench, loosen the fluid pressure sensor (1).
5. Remove the fluid pressure sensor (1) from the valve body.

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FLUID PRESSURE SENSOR INSTALLATION

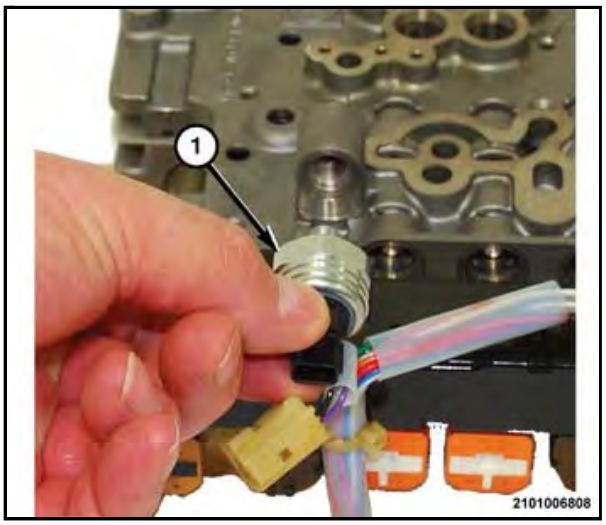
1. Remove and discard the old O-ring from the fluid pressure sensor if the old fluid pressure sensor is reused.

2. Install a **NEW** O-ring (2) on the fluid pressure sensor (1).

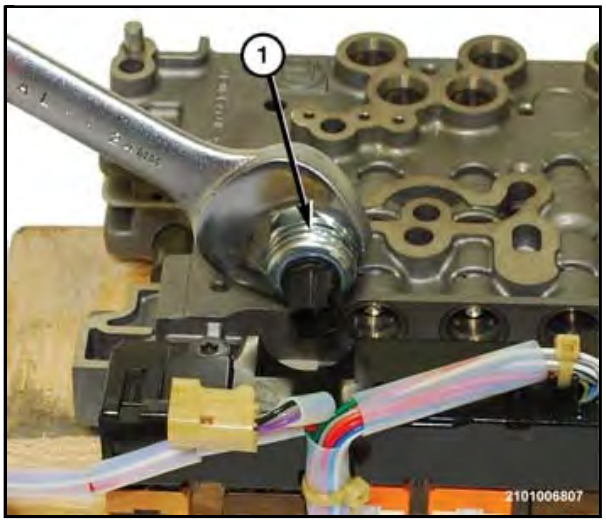


3. Thread the fluid pressure sensor (1) into the valve body.

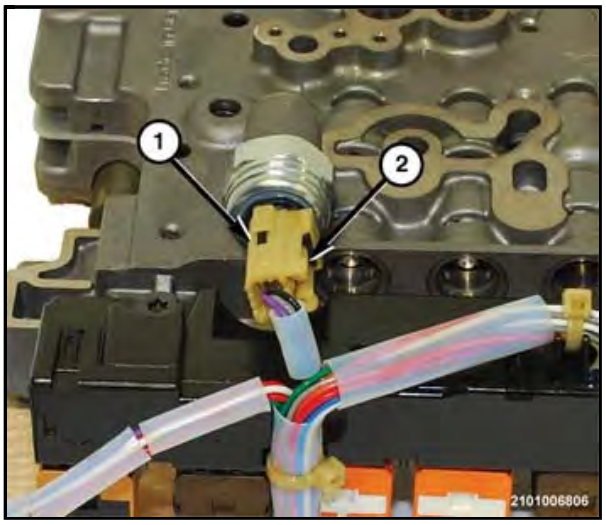
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4. Using a suitable wrench, tighten the fluid pressure sensor (1).



5. Connect the fluid pressure sensor wire harness connector (1) and make sure the wire harness connector lock (2), locks.



6. Install the valve body (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/VALVE BODY/Removal and Installation) .

7. Road test the vehicle to verify the repair.

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SEAL, Axle / Removal and Installation

REMOVAL AND INSTALLATION - FWD BOTH SIDES - AWD AND 4WD LEFT SIDE

⊞ **Special Tools:** Click to display a list of tools used in this procedure

FWD BOTH SIDES – 4WD / AWD LEFT SIDE

1. Remove the halfshaft from the vehicle (Refer to 03 - Differential and Driveline/Half Shaft/Removal).

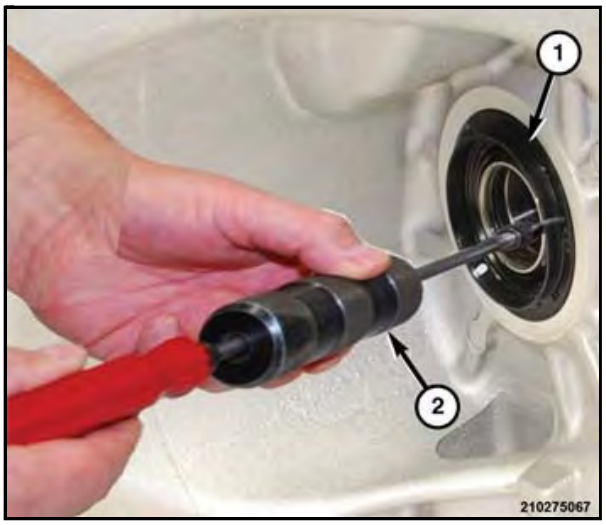
NOTE: Keep the punch tool in the center of the seal to avoid damage to the transmission housing.

2. Using a suitable punch tool (1) and hammer, punch a hole in the metal armature inside the seal (2).



3. Thread the sheet metal screw of the dent puller (2) into the seal (1).

4. Tap outward on the slide hammer (2) until the seal (1) comes out of the seal bore.

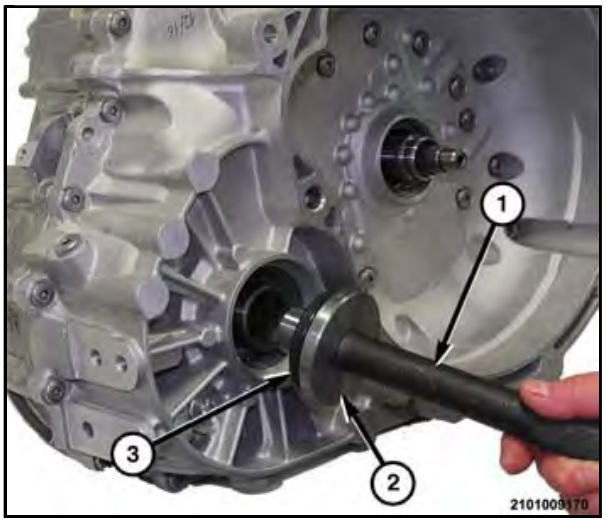


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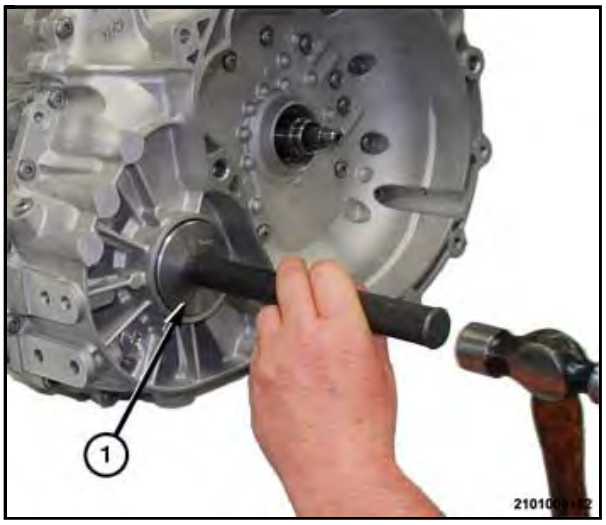
INSTALLATION

NOTE: Clean the seal bore in the transmission housing with a clean lint-free cloth.

1. Apply assembly lube on the lip of the NEW seal to avoid damage after installation.
2. Using tool Installer, Oil Seal 10506 10506 (2) and Driver Handle, Universal C-4171 (1) with the seal (3) positioned on the installer, insert the seal in the transmission bore around the output shaft.



3. Using a suitable hammer, drive the seal into the transmission until it is seated.



4. Install the Left Hand (LH) halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Installation).
5. Verify that the transmission fluid is at the proper level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

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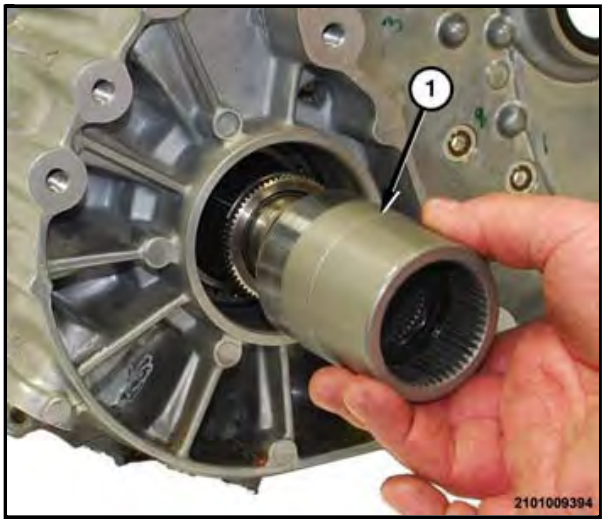
21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SEAL, Axle / Removal and Installation

REMOVAL AND INSTALLATION - AWD AND 4WD RIGHT SIDE

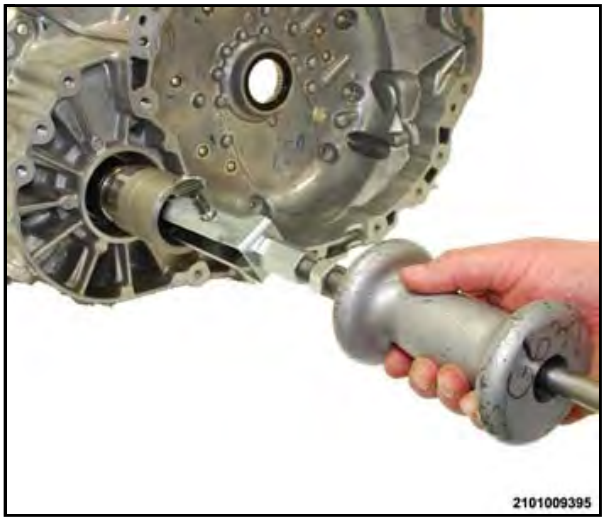
⊞ **Special Tools:** Click to display a list of tools used in this procedure

REMOVAL

NOTE: The 948TE/9HP48 automatic transmission configured for All Wheel Drive (AWD) utilizes an adapter sleeve (1) to couple the Power Transfer Unit (PTU) to the differential. Lip seals are used to seal the inner and outer surfaces of the adapter sleeve.



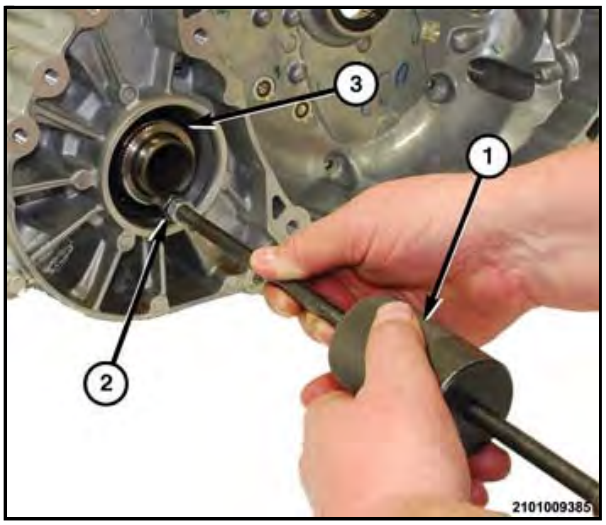
1. Remove the PTU from the vehicle (Refer to 21 - Transmission and Transfer Case/Power Transfer Unit/Removal and Installation) .



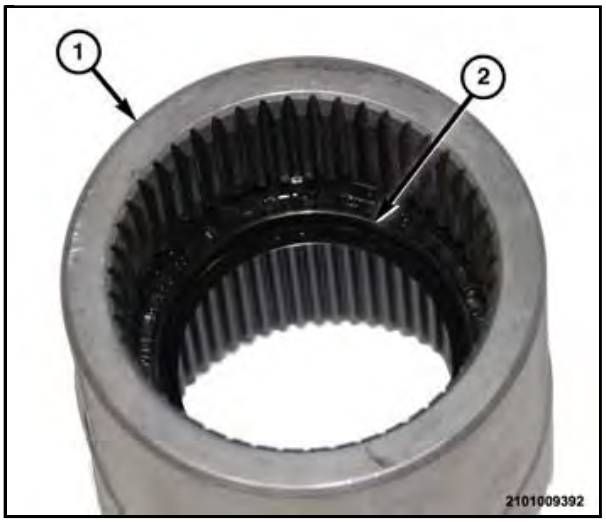
2. Using tool Remover, Seal 7794-A and Slide Hammer, Universal C-637 , Remove the adapter sleeve from the transmission.

3. Using tool Remover, Seal 9667 (2) and Slide Hammers C-3752 (1), remove the seal (3) from the transmission.

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4. Position the adapter sleeve (1) on the work surface with the seal (2) tension spring side down.

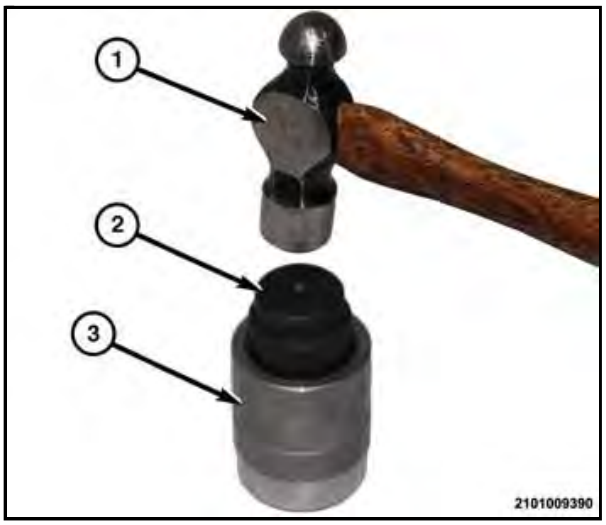


5. Insert tool Adapter Plug 9676 (1) into PTU side of the adapter sleeve (2).



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PET_AAM_1013-0449

6. Using a suitable hammer (1), drive the seal from the inside of the adapter sleeve (3).



INSTALLATION

NOTE: Clean the adapter sleeve with suitable solvent and blow it dry with regulated 344 kPa (50 psi) shop air.

1. Apply assembly lube on the inner seal lip to avoid damaging the seal during installation.
2. Place the adapter sleeve (2) on a suitable work surface with the transmission side up.
3. Insert the **NEW** lip seal (1) into the adapter sleeve (2) with the tension spring up.



4. Using tool Installer, Oil Slinger 8840 (2) and a hammer (1), install the seal in the adapter sleeve (3).

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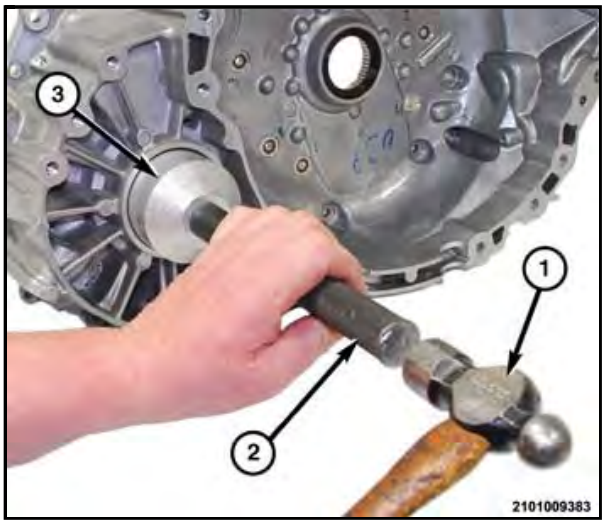


5. Apply assembly lube on the outer seal (1) lip to avoid damaging the seal during installation.

6. Insert the NEW lip seal (1) into the transmission (2).

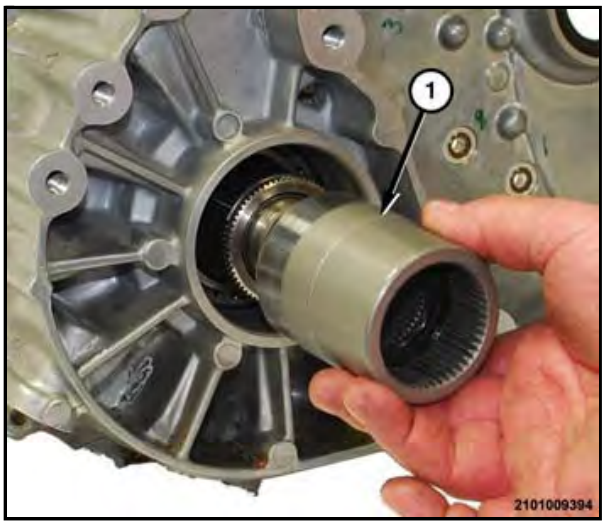


7. Using tool Installer, Seal C-3972-A (3), Driver Handle, Universal C-4171 (2), and a hammer (1), Install the outer lip seal in the transmission.



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8. Install the adapter sleeve (1) in the transmission.



9. Install the Power Transfer Unit (PTU) into the vehicle (Refer to 21 - Transmission and Transfer Case/Power Transfer Unit/Removal and Installation) .

10. Verify that the transmission fluid level is at the proper level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

11. Road test the vehicle to verify the repair.

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SEAL, Input Shaft / Removal and Installation

REMOVAL AND INSTALLATION

⊞ **Special Tools:** Click to display a list of tools used in this procedure

REMOVAL

1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .
2. Drain the fluid from the transmission.
3. Remove the torque converter from the transmission.
4. Using a suitable punch tool and hammer, punch a hole in the center of the metal armature of the seal.
5. Using a suitable dent puller (2) threaded into the hole in the seal , remove the seal (1) from the bore in the center of the bellhousing.



INSTALLATION

1. Clean the seal bore in the center of the bellhousing.
2. Apply assembly lube on the lip of the **NEW** seal.
3. Place the seal on tool Installer, Seal 9677 (2), with the tension spring away from the tool, and insert the seal into the bore in the bellhousing.

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4. Using a suitable hammer, drive the seal into the bore in the center of the bellhousing until the tool (2) seats against the bellhousing (1).



5. Install the torque converter.

6. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

7. Fill the transmission to the proper level with the specified fluid (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Standard Procedures) .

8. Road test the vehicle to verify the repair.

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SENSORS, Speed / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

The input and output speed sensors are serviced as an assembly. The speed sensors can be replaced with the transmission in the vehicle.

1. Remove the valve body (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/VALVE BODY/Removal and Installation) .
2. Remove the screw (1) holding the speed sensor assembly to the transmission housing.



3. Separate the speed sensor assembly (1) from the transmission.



4. Release the lock on the wire harness connector.

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5. Separate the wire harness connector from the speed sensor assembly.

INSTALLATION

The input and output speed sensors are serviced as an assembly.

1. Insert the wire harness connector into the speed sensor assembly.

2. Engage the lock on the wire harness connector.

3. Insert the speed sensor assembly (1) into the transmission housing.



4. Install the screw (1) to hold the speed sensor assembly to the transmission housing.



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5. Install the valve body (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/VALVE BODY/Removal and Installation) .

6. Road test the vehicle to verify repair.

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SHAFT, Reaction / Removal and Installation

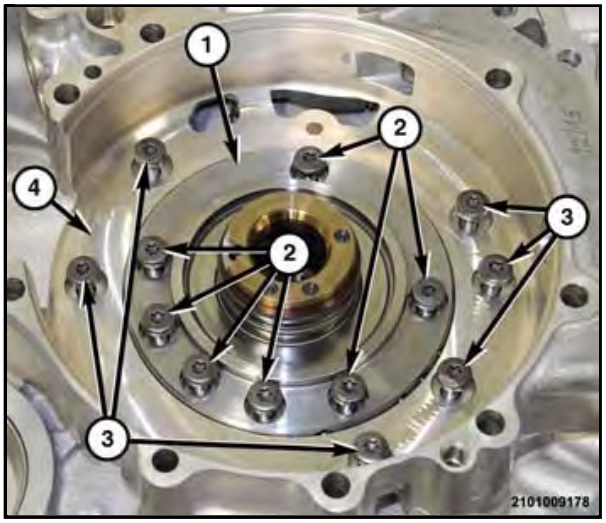
REMOVAL AND INSTALLATION

REMOVAL

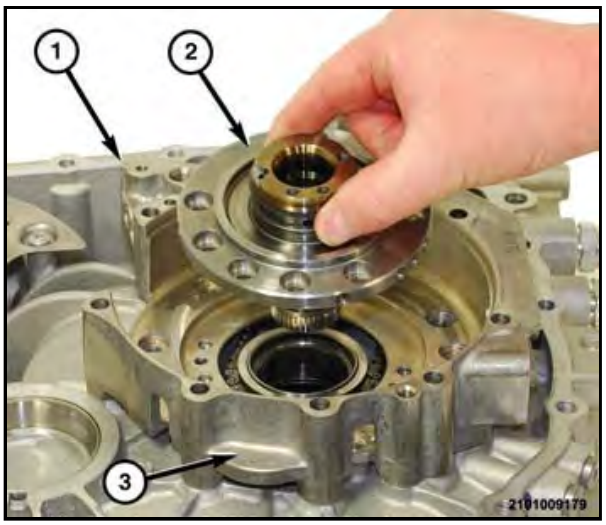
1. Remove the transmission from the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

2. Remove the bellhousing from the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

3. Remove the bolts (2) holding the reaction shaft (1) to the intermediate support plate (4).

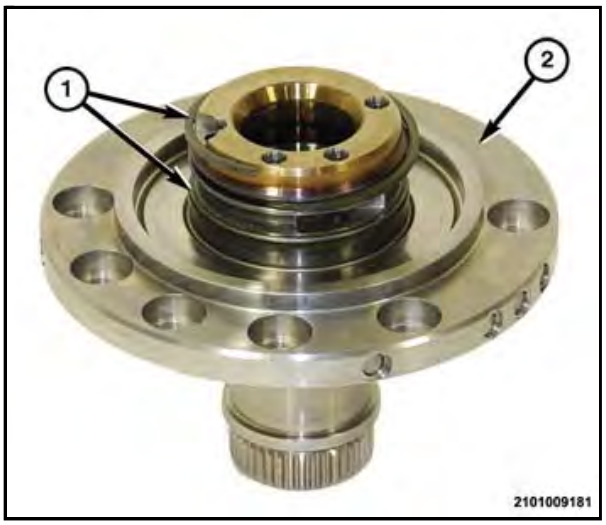


4. Separate the reaction shaft (2) from the intermediate support plate (1).

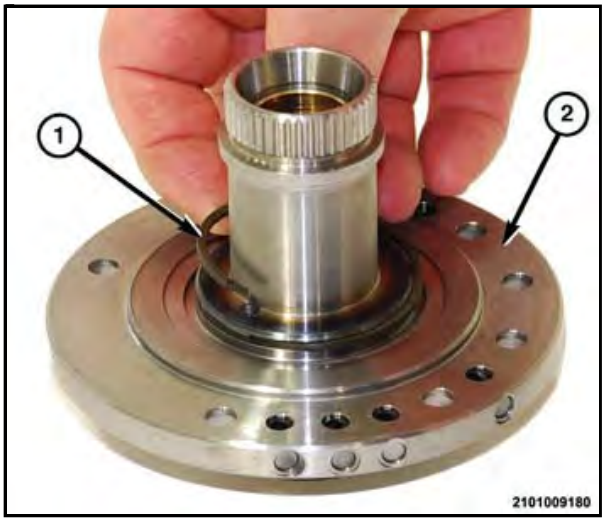


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5. Remove the seal rings (1) from the ring lands in the inner reaction shaft hub (2).



6. Remove the seal ring (1) from the ring land in the outer reaction shaft hub (2).



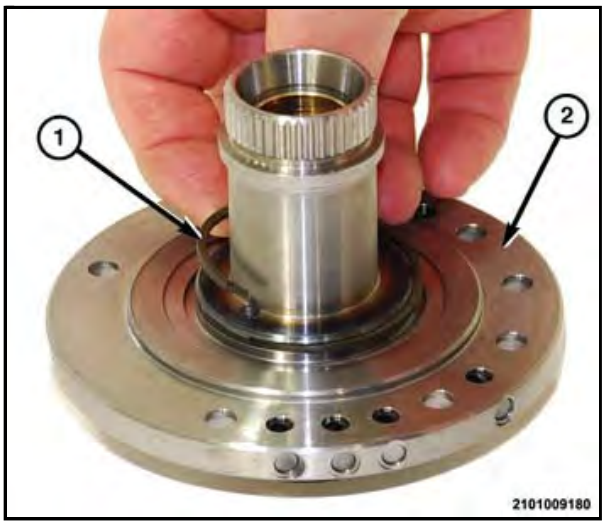
INSTALLATION

1. Clean the reaction shaft with suitable solvent and blow it dry using regulated 344 kPa (50 psi) shop air.

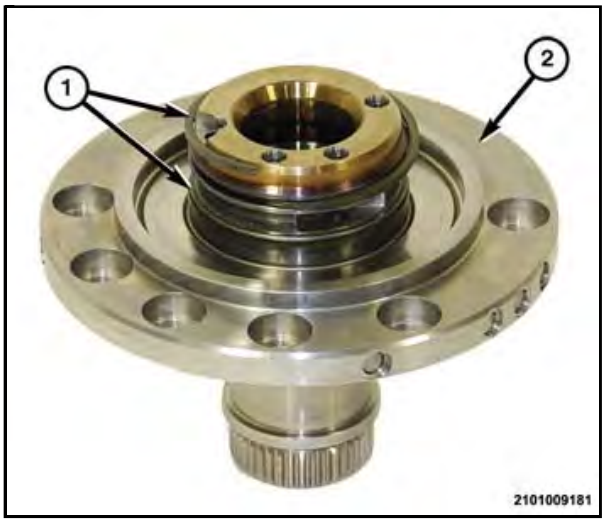
2. Inspect the reaction shaft for excess damage or wear. Replace the reaction shaft if damage is present.

3. Install a **NEW** seal ring (1) in the land of the outer reaction shaft hub (2).

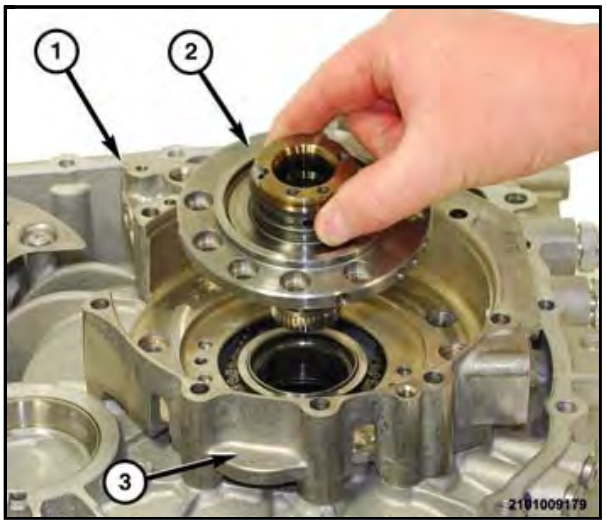
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PET_AAM_1013-0459



4. Install **NEW** seal rings (1) in the lands of the inner reaction shaft hub (2).

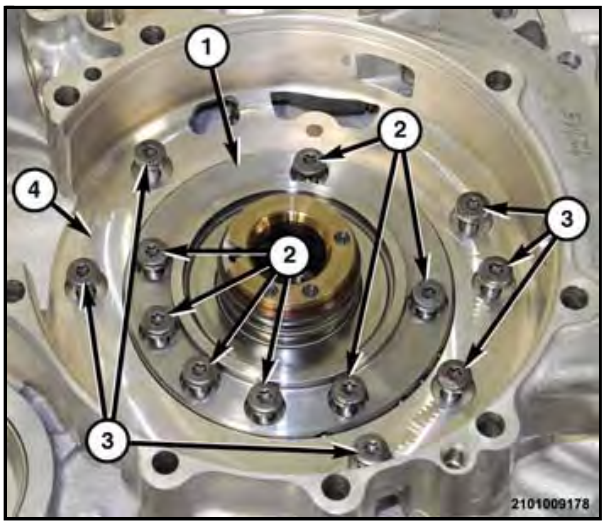


5. Place the reaction shaft (2) into the intermediate support plate (1).



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6. Install the bolts (2) to hold the reaction shaft (1) to the intermediate support plate (4) and tighten to the proper (Torque Specifications) .



7. Install the bellhousing on the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/BELLHOUSING/Removal and Installation) .

8. Install the transmission in the vehicle (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/Removal and Installation) .

9. Fill the transmission to the proper level (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

10. Road test the vehicle to verify the repair.

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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SHIFTER, Floor Console / Removal and Installation

SHIFTER BEZEL

REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Using a suitable tool to release the clips (1a) and lift the bezel with the boot (1b).
3. Release the clips (2a) and the retainers (2b) and lift the boot (2c).



4. Disconnect the wire harness connector (1) from the shifter bezel (2).
5. Remove the shifter bezel (2) from the vehicle.

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INSTALLATION

1. Position the shifter bezel in the vehicle.
2. Connect the wiring harness connector to the shifter bezel.
3. Install the shifter boot to the shifter bezel.
4. Install the shifter bezel to the console.
5. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

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PET_AAM_1013-0463

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SHIFTER, Floor Console / Removal and Installation

SHIFTER KNOB

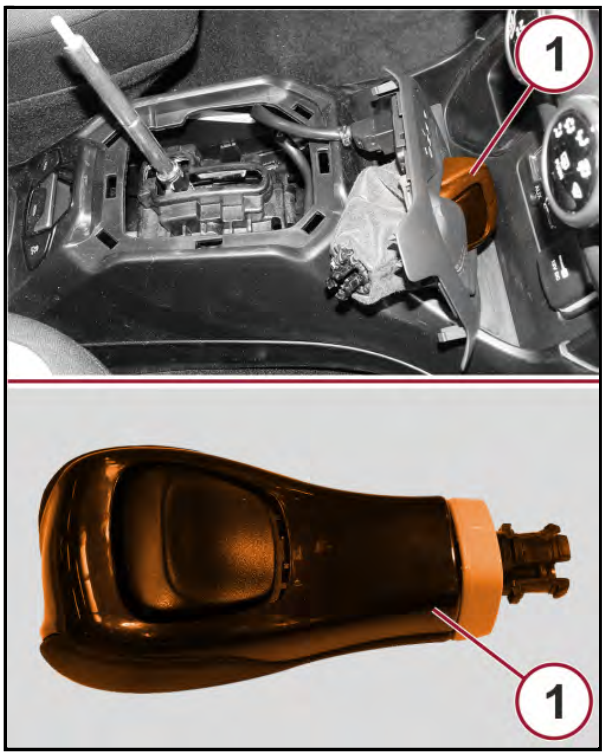
REMOVAL

1. Using a suitable tool to release the clips (1a) and lift the bezel with the boot (1b).
2. Using a suitable tool to remove the retaining clip (2).



3. Remove the knob (1) separating it from the shifter boot.

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INSTALLATION

1. Insert the knob in the shifter boot.
2. Install the knob on the gear shift lever and secure it with a new retaining clip.
3. Install the shifter bezel engaging the clips in their retainers.

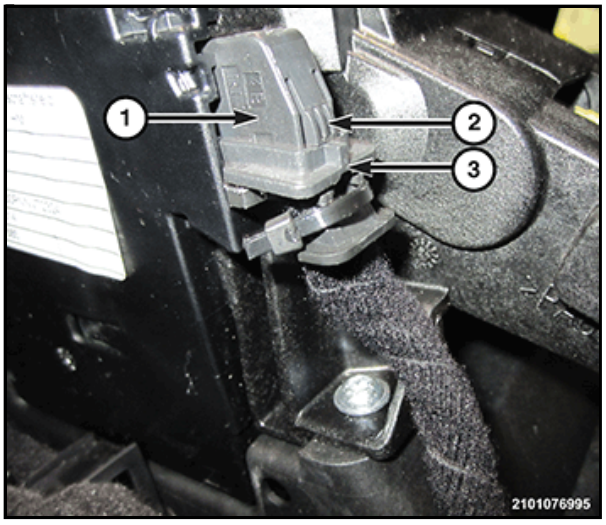
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21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / SHIFTER, Floor Console / Removal and Installation

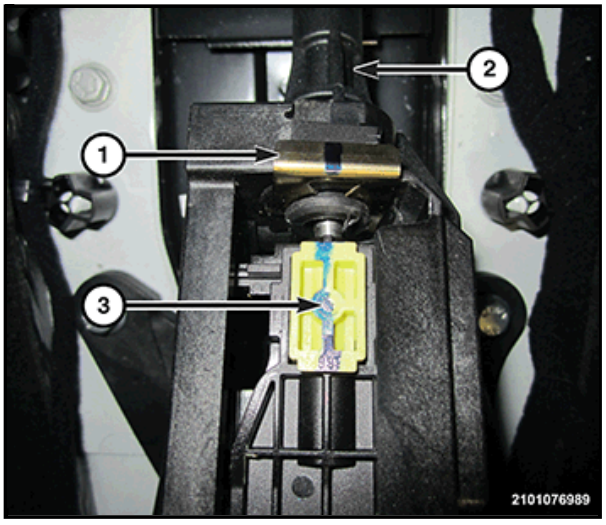
GEAR SHIFTER

REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Remove the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .
3. Make sure the shifter is in the Park position.
4. Release the wire harness connector (1) from the shifter assembly by pressing the release tab (2) while opening the bail (3).



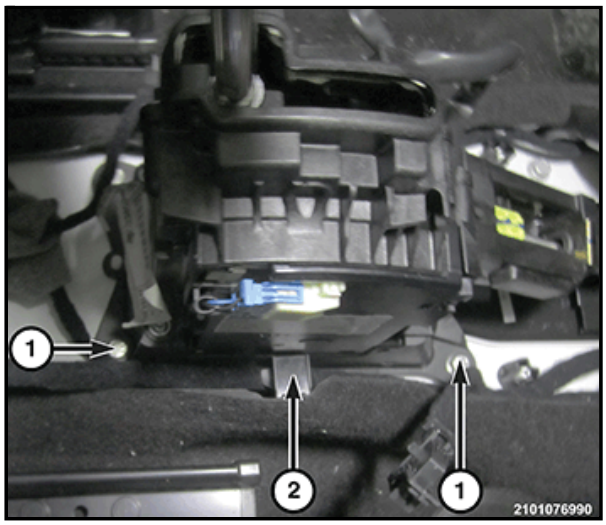
5. Release the shifter cable adjuster lock (3) by prying upward with a suitable tool.
6. Remove the shifter cable retaining clip (1).
7. Separate the shifter cable (2) out of the shifter.



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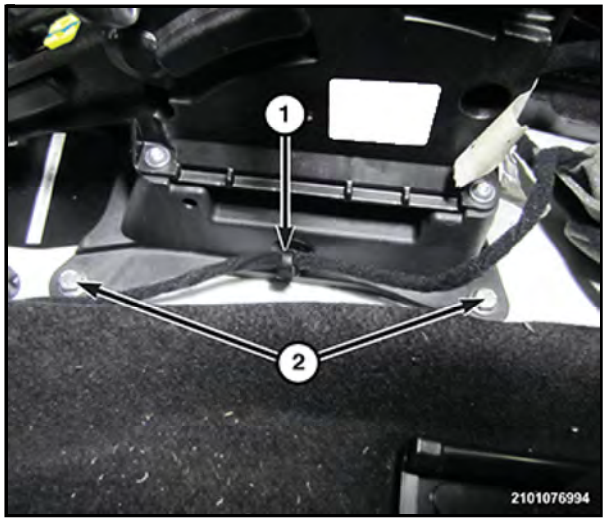
8. Release the wire harness from right side retainer (2).

9. Remove the right side shifter mounting bolts (1).



10. Detach the wire harness retaining clip (1) from the shifter.

11. Remove the left side shifter mounting bolts (2).



12. Remove the shifter from the vehicle.

INSTALLATION

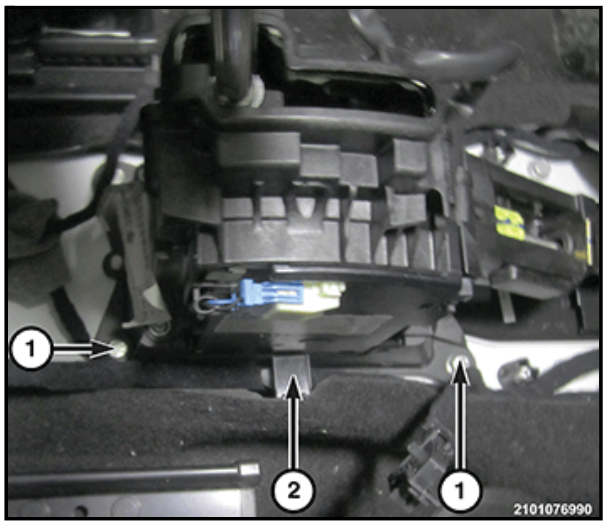
1. Make sure the transmission is in the park position.

2. Position the shifter in the vehicle and hand start the bolts.

3. Tighten the right side shifter mounting bolts to the proper (Torque Specifications) .

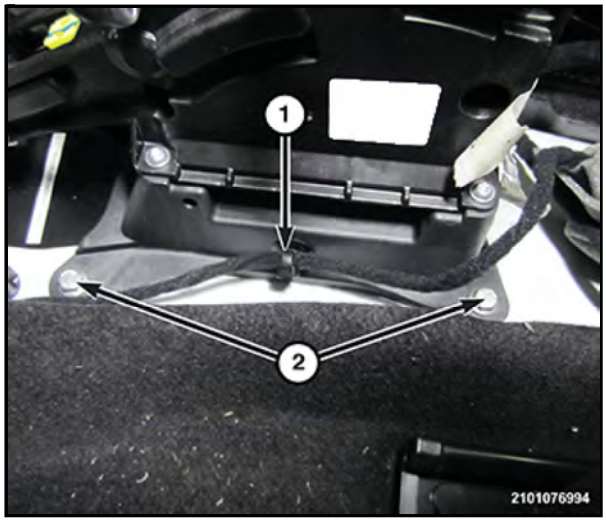
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4. Secure the wiring harness to the right side harness retainer (2).



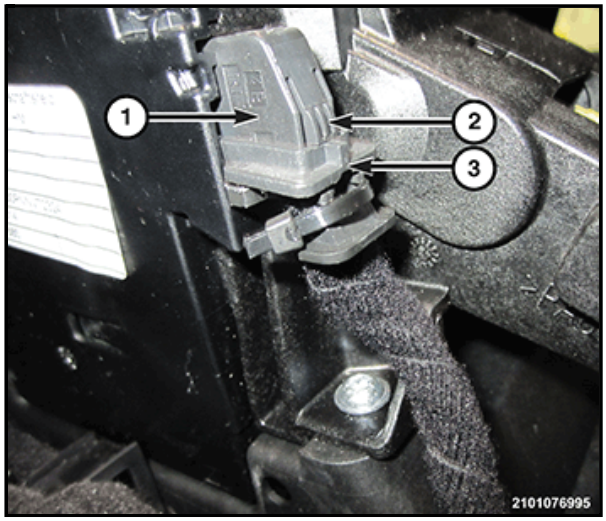
5. Tighten the left side shifter mounting bolts (2) to the proper (Torque Specifications) .

6. Connect the wire harness retainer (1) to the shifter assembly.



7. Connect the shifter wire harness connector (1).

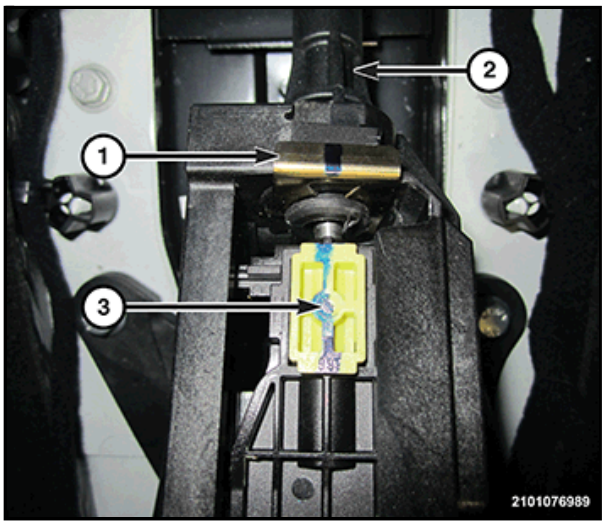
8. Position the shifter cable into the shifter housing.



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9. Install the shifter cable retainer (1).

10. With the shifter in the Park position, push the shifter cable adjuster lock (3) down so that it is flush to the shifter housing as shown.



11. Verify shifter operation, and if necessary, adjust the shifter cable (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/CABLE, Shift/Adjustments) .

12. Install the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .

13. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

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PET_AAM_1013-0469

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / TUBE, Oil / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

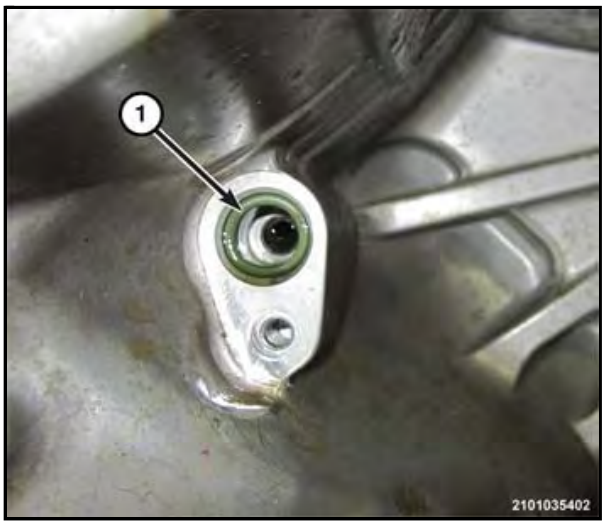
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the left front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the oil supply tube bolts (1 and 3).
4. Remove the oil supply tube (2) from the transmission.



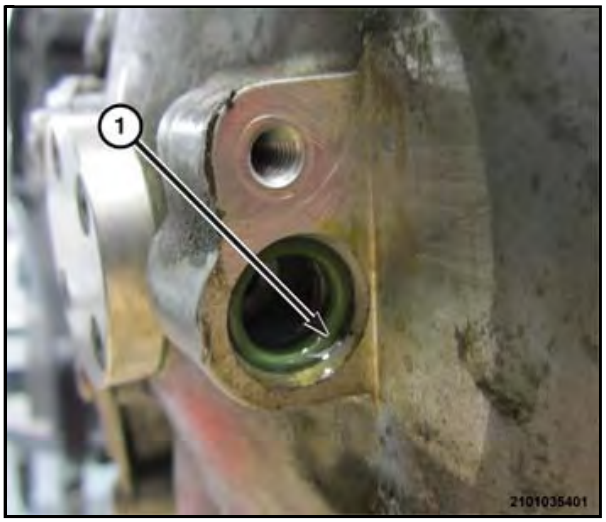
INSTALLATION

1. Replace the O-ring seal (1) near the differential end for the oil supply tube.

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2. Replace the O-ring seal (1) near the end of the transmission for the oil supply tube.



3. Install the oil supply tube (2) onto transmission.

4. Install the oil supply tube bolts (1 and 3) and tighten to the proper (Torque Specifications) .



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5. Install the left front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

6. Fill the transmission to the proper level with the correct fluid (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/9HP48 FLUID and FILTER/Standard Procedure) .

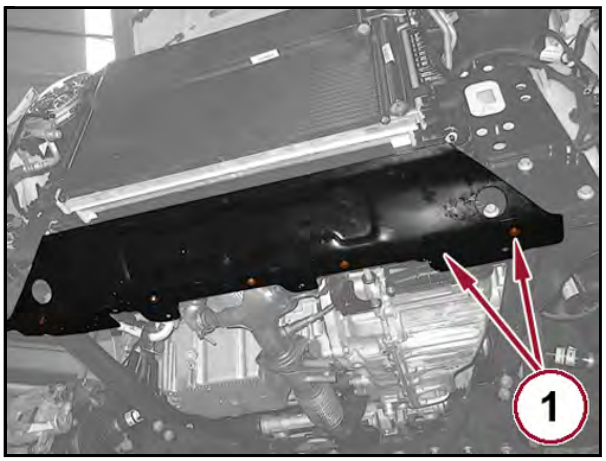
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PET_AAM_1013-0472

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / VALVE BODY / Removal and Installation

2.0 TURBO DIESEL -170 HP

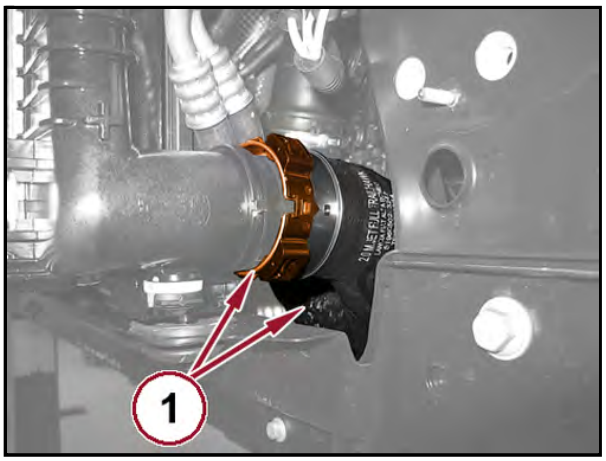
REMOVAL

1. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
2. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
3. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
4. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
5. Remove the front fascia (Refer to 13 - Frame and Bumpers/Bumpers/FASCIA, Front/Removal and Installation) .
6. Remove the screws (1) and remove the lower core support reinforcement beam.

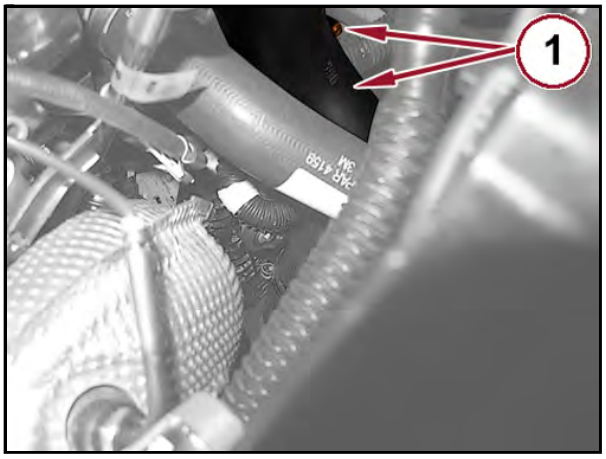


7. Disconnect the charge air cooler outlet hose (1) from the charge air cooler.

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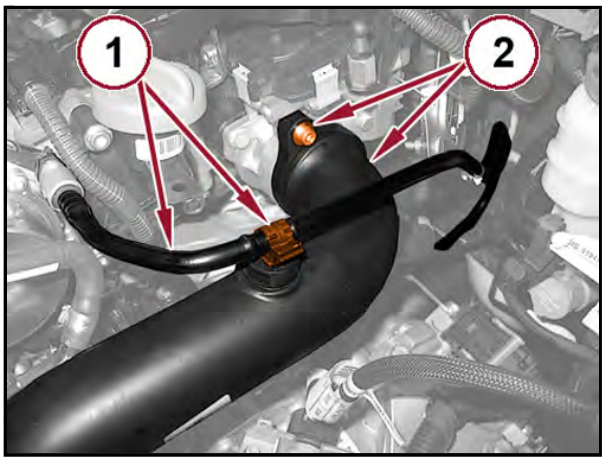


8. Remove the bolt securing the charge air cooler intermediate tube to the throttle body (1).



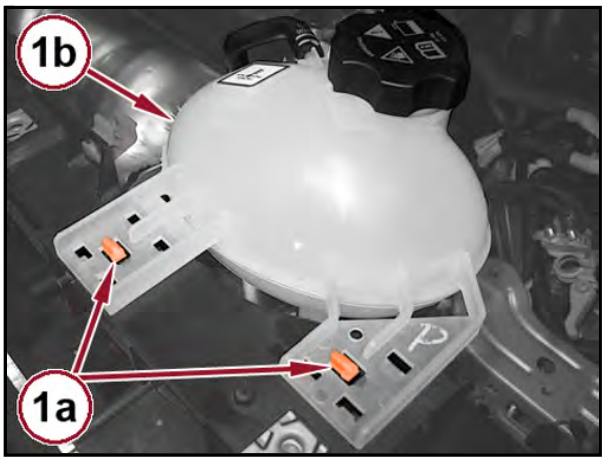
9. Release the power brake booster vacuum hose from the retaining clip (1).

10. Remove the charge air cooler tube to throttle body bolts (2) and remove the tube.



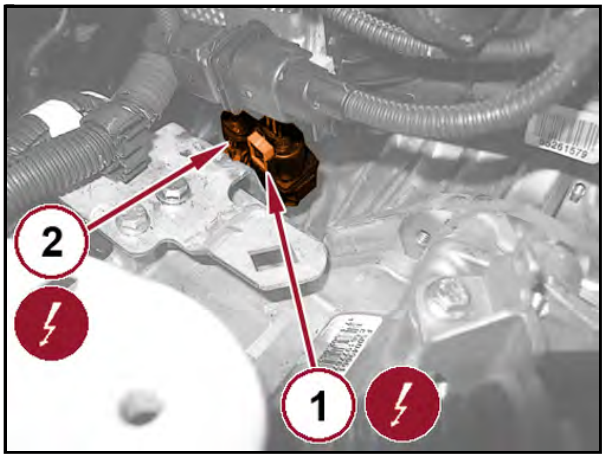
11. Press the release tabs (1a) to detach the coolant reservoir (1b) and position the reservoir aside.

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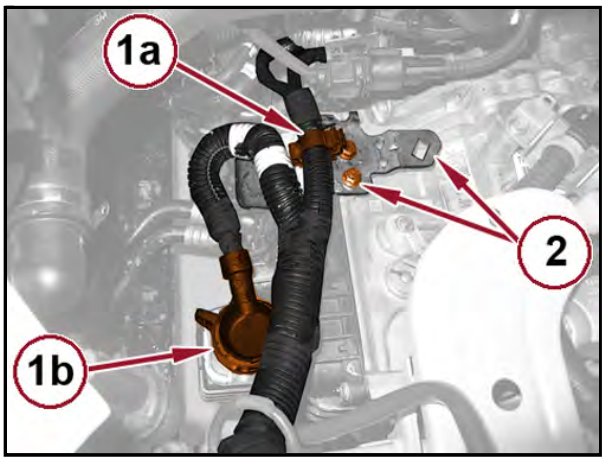
12. Disconnect the downstream oxygen sensor wire harness connector (1).

13. Disconnect the Diesel Particulate Filter (DPF) downstream temperature sensor wire harness connector (2).



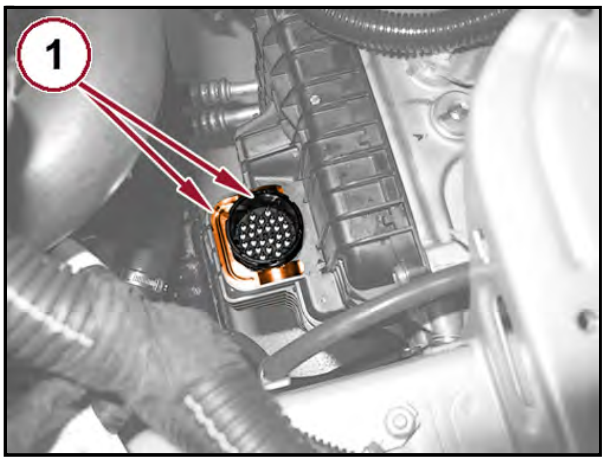
14. Open the wire harness retainer (1a), rotate the lock lever (1b) counterclockwise and disconnect the wire harness connector from the socket on the transmission oil pan.

15. Remove the wire harness retainer (2).



16. Remove the transmission wire harness retaining clip and push the connector into the valve body cover (1).

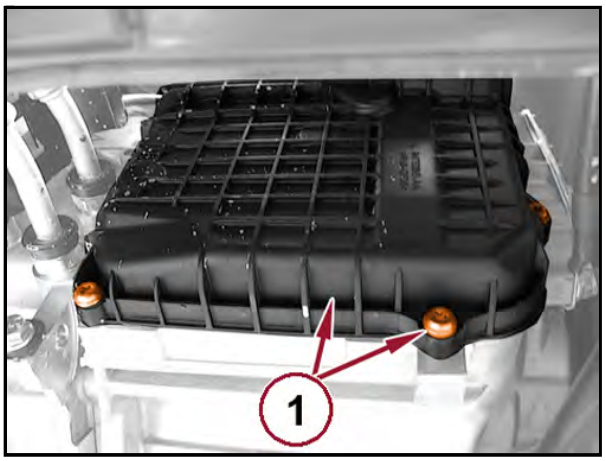
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17. Remove the accessible upper bolts (1) from the valve body cover.

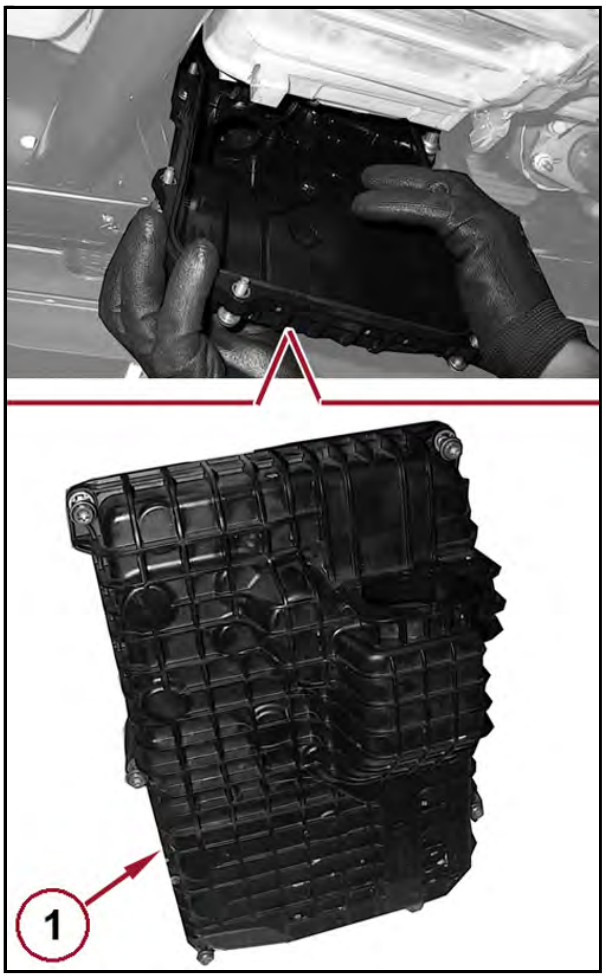


18. Remove the remaining lower valve body cover bolts.

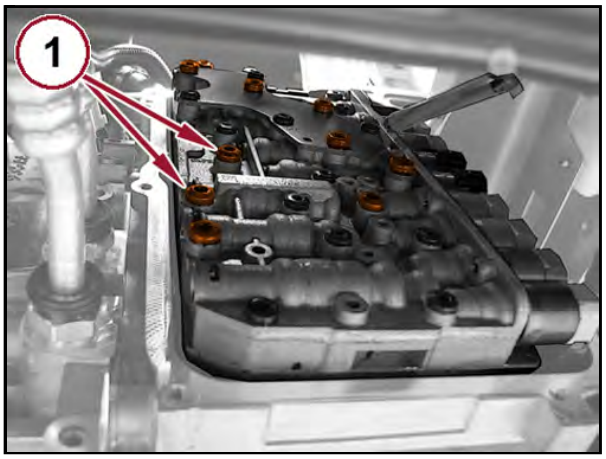


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19. Remove the valve body cover (1).



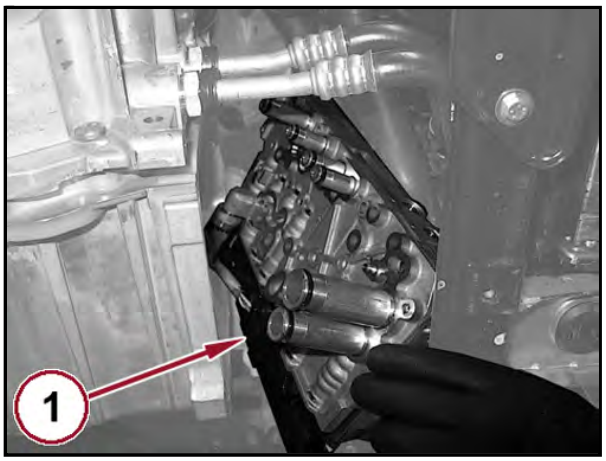
20. Remove the ten valve body to case bolts (1).



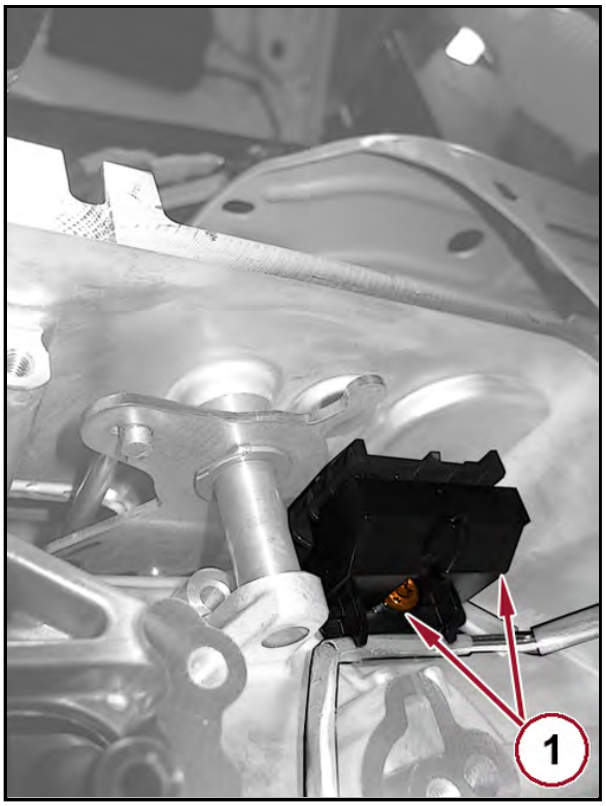
NOTE: **The fluid transfer tubes may come out with the valve body.**

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21. Using a suitable prying tool, separate the valve body (1) from the transmission.

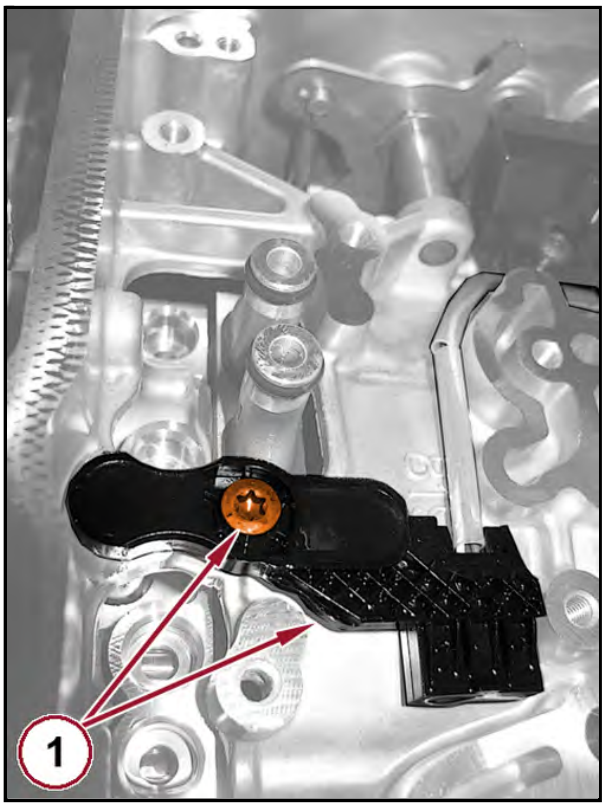


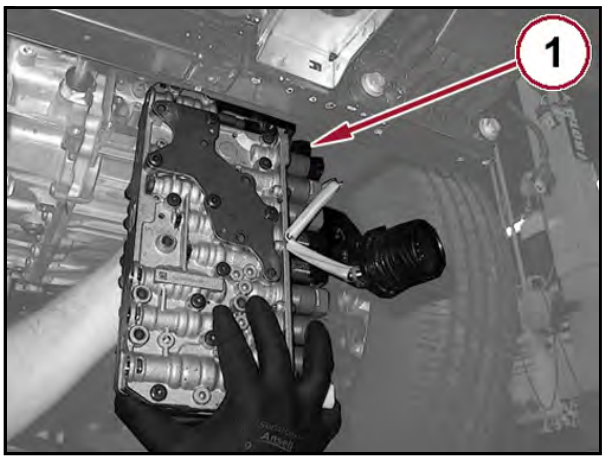
22. Remove the Transmission Range Sensor (TRS) mounting screw (1).



23. Remove the transmission speed sensor screw and pull the speed sensors from the case (1).

American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0478





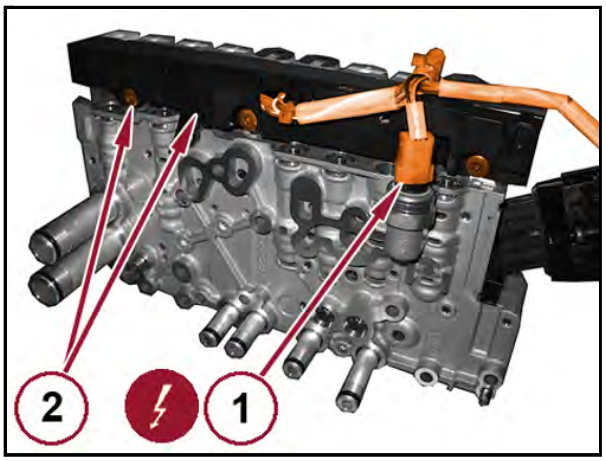
24. Remove the valve body with the wire harness (1) from the vehicle.

    NOTE: **If the valve body is to be reused without disassembling it, store the valve body in a clean area until it is installed.**

25. If necessary, disconnect the wiring harness from the transmission fluid pressure transducer (1).

26. To remove internal transmission harness, remove the screws from the solenoid connectors and lift the harness (2) from the valve body.

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PET_AAM_1013-0479

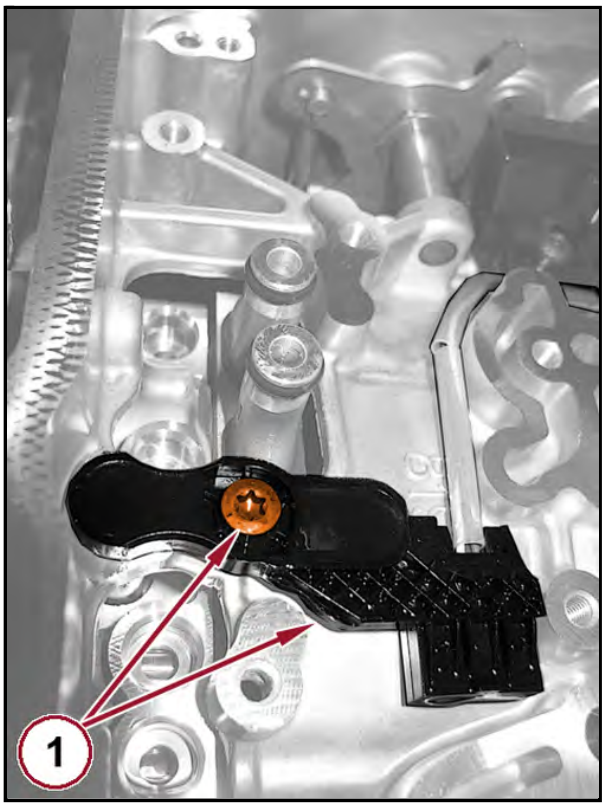


INSTALLATION

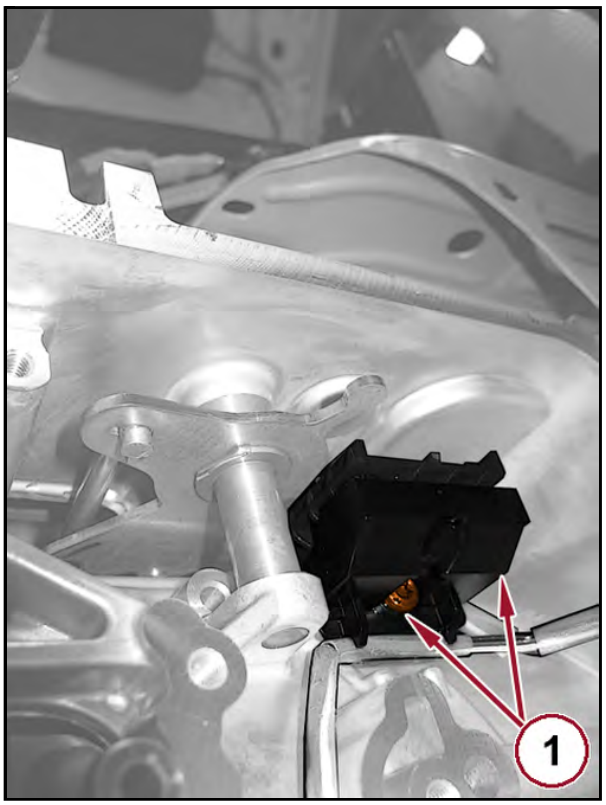
NOTE: Before installing the valve body, replace the O-ring seals on the fluid transfer tubes. Apply a light coating of assembly lube on the O-rings to ease valve body installation.

1. If removed, position the internal transmission wire harness into position on the valve body.
2. Tighten the solenoid wire harness connector screws to the proper (Torque Specifications) .
3. Connect the wire harness connector to the transmission fluid pressure transducer.
4. Clean the mating surfaces between the valve body and the transmission housing with a clean lint-free cloth.
5. install the transmission speed sensors and tighten the screw (1) to the proper (Torque Specifications) .

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6. Install the Transmission Range Sensor (TRS) and tighten the screw to the proper (Torque Specifications) .



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7. Align the valve body with the fluid transfer tubes manual lever with the manual valve.

8. Install the ten bolts to hold the valve body to the transmission housing and tighten to the proper (Torque Specifications) .

   NOTE: A light coating of assembly lube can be applied to the O-ring seals (2) to ease installation.

9. Insert the transmission wire harness connector into the valve body cover with the flat side (2) of the socket on the left and install the retaining clip.

10. Place the valve body cover in position and install the bolts to hold the valve body cover to the transmission housing and tighten to the proper (Torque Specifications) .

11. Engage the transmission wire connector into the socket on the valve body cover.

12. Install the wire harness retainer bracket to the transmission and tighten the screws.

13. Position the wire harness in the routing clip.

14. Connect the transmission wire harness connector and rotate the lock lever clockwise.

15. Connect the wire harness connector to the downstream oxygen sensor.

16. Connect the wire harness connector to the downstream Diesel particulate Filter (DPF) exhaust gas temperature sensor.

17. Snap the engine coolant reservoir into position.

18. Install the charge air cooler tube in position and tighten the bolts at the throttle body.

19. Attach the vacuum hose to the routing clip on the charge air cooler tube.

20. Connect the charge air cooler tube to the charge air cooler.

21. Install the lower core support reinforcement beam and tighten the bolts.

22. Install the front fascia (Refer to 13 - Frame and Bumpers/Bumpers/FASCIA, Front/Removal and Installation) .

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23. Install the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .

24. Fill the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

25. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

26. Install the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .

27. Perform the Valve Body Solenoid Learn procedure if the valve body and/or the TCM was replaced during a repair.

28. Perform Transmission Verification Test-948TE (Refer to 28 - DTC-Based Diagnostics/MODULE, Transmission Control (TCM) /Standard Procedure) .

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PET_AAM_1013-0483

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / VALVE BODY / Removal and Installation

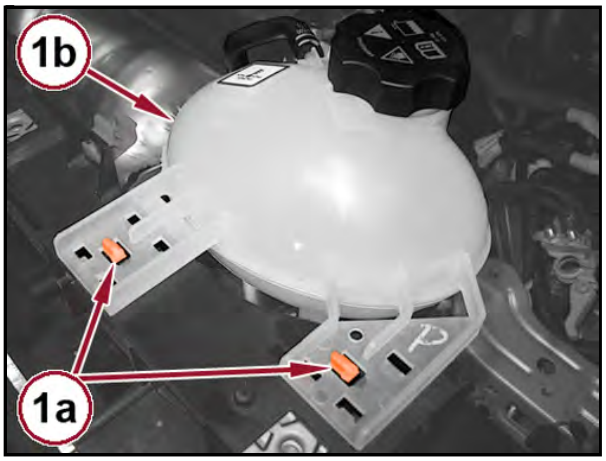
GASOLINE ENGINE

REMOVAL

1. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
2. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
3. Place the transmission in Neutral and raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
4. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
5. Remove the front fascia (Refer to 13 - Frame and Bumpers/Bumpers/FASCIA, Front/Removal and Installation) .

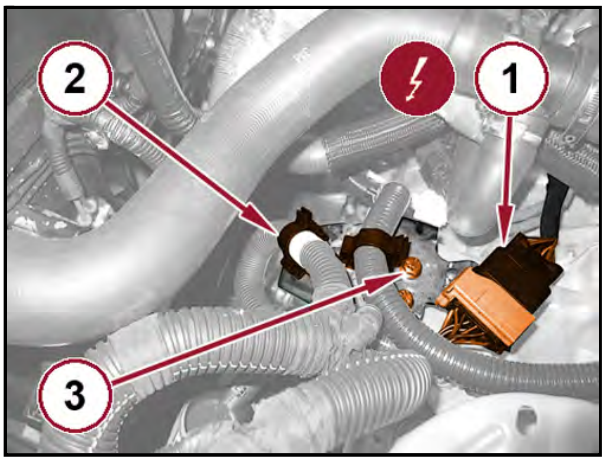
   NOTE: It is not necessary to disconnect the coolant hoses from the coolant reservoir.

6. Press the release tabs (1a) to detach the coolant reservoir (1b) and position the reservoir aside.

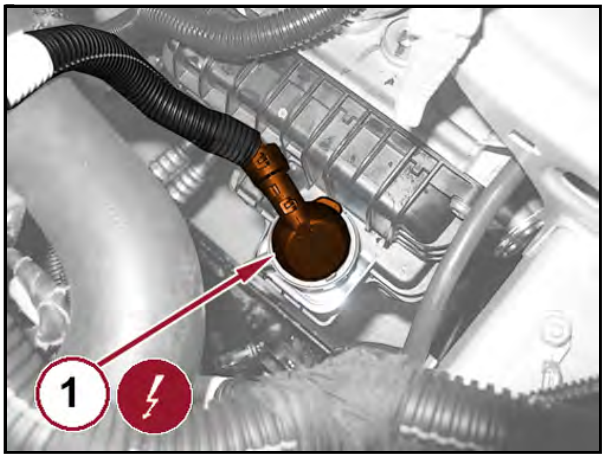


7. Disconnect the wire harness connector (1).
8. Release the wire harness from the routing clips (2).
9. Remove the wire harness retainer bolts (3) and remove the bracket.

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PET_AAM_1013-0484

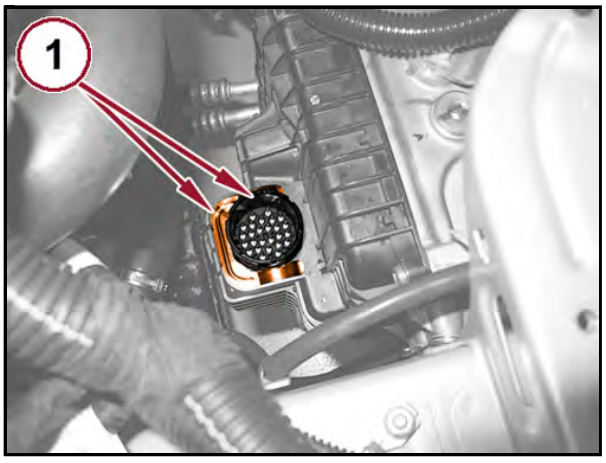


10. Rotate the lock lever (1) counterclockwise and disconnect the wire harness connector from the socket on the transmission oil pan.



11.

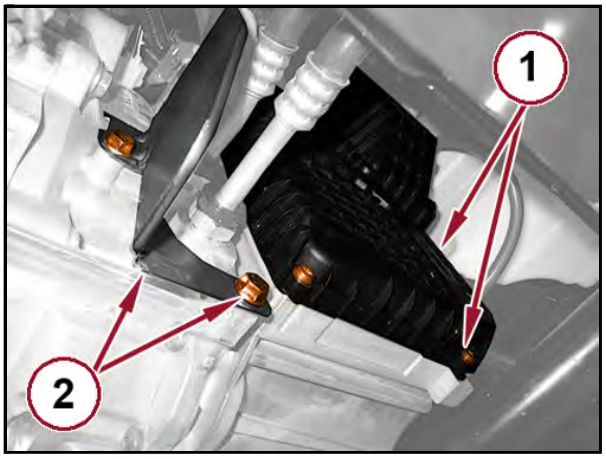
12. Remove the transmission wire harness retaining clip and push the connector into the valve body cover (1).



13. Remove the accessible upper bolts (1) from the valve body cover.

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PET_AAM_1013-0485



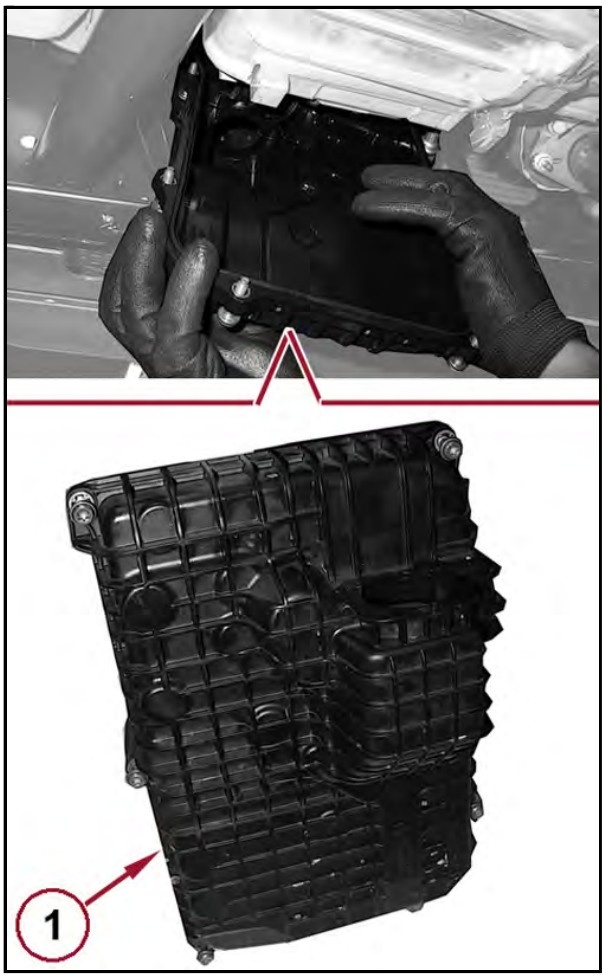


14. Remove the bolts and the transmission oil cooler line shield.

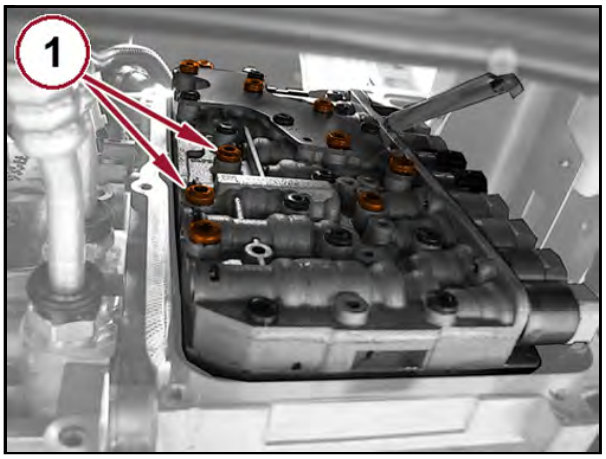
15. Remove the remaining lower valve body cover bolts (1).

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PET_AAM_1013-0486

16. Remove the valve body cover (1).



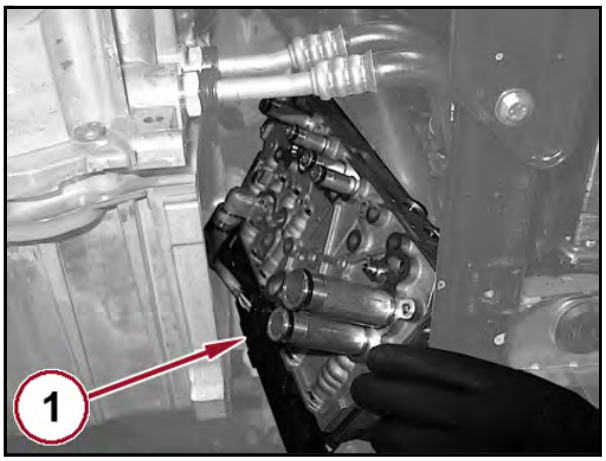
17. Remove the ten valve body to case bolts (1).



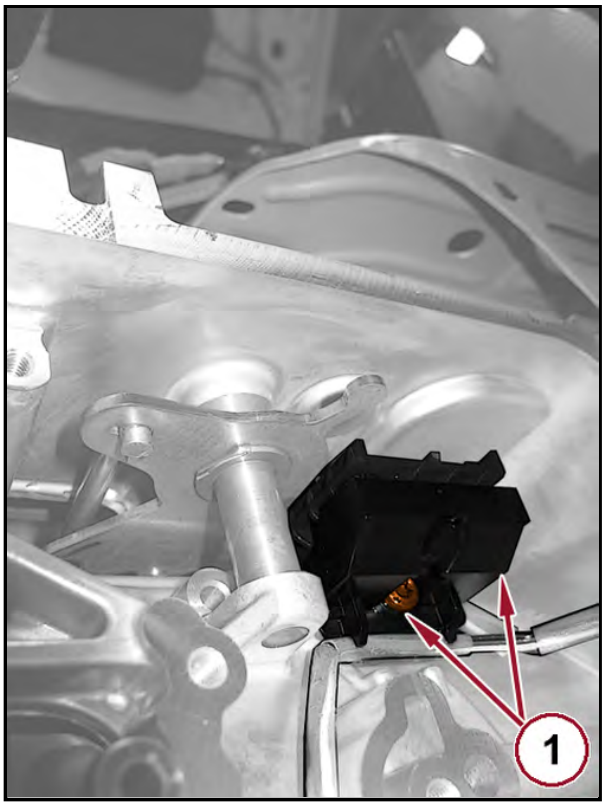
NOTE: **The fluid transfer tubes may come out with the valve body.**

American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0487

18. Using a suitable prying tool, separate the valve body (1) from the transmission.

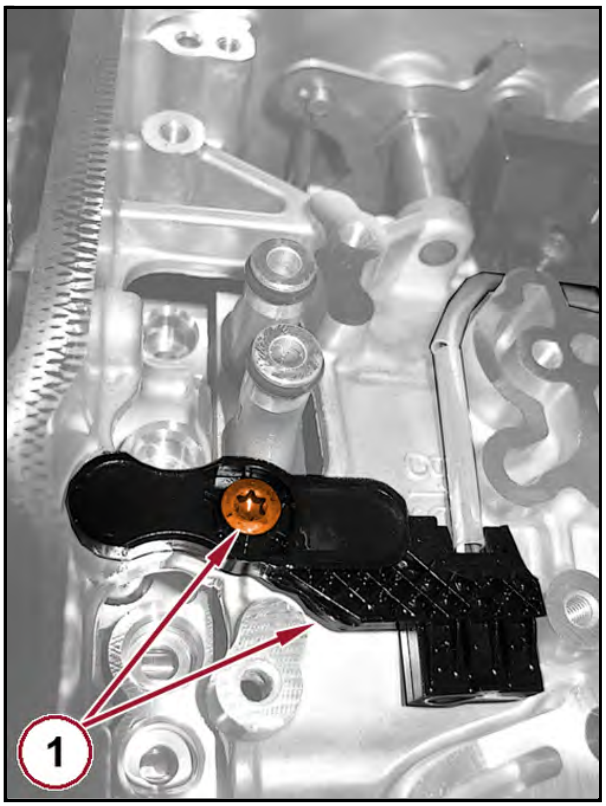


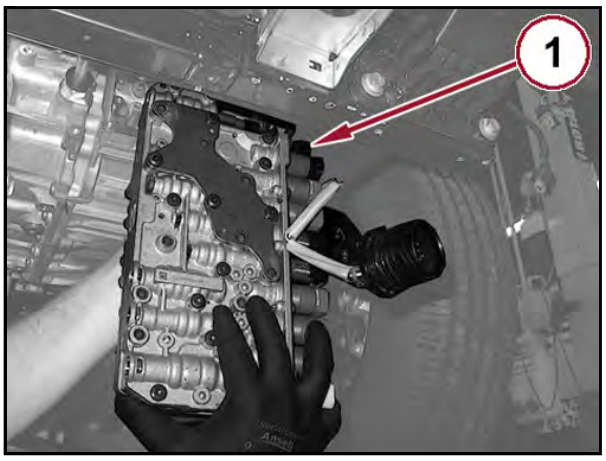
19. Remove the Transmission Range Sensor (TRS) mounting screw (1).



20. Remove the transmission speed sensor screw and pull the speed sensors from the case (1).

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PET_AAM_1013-0488





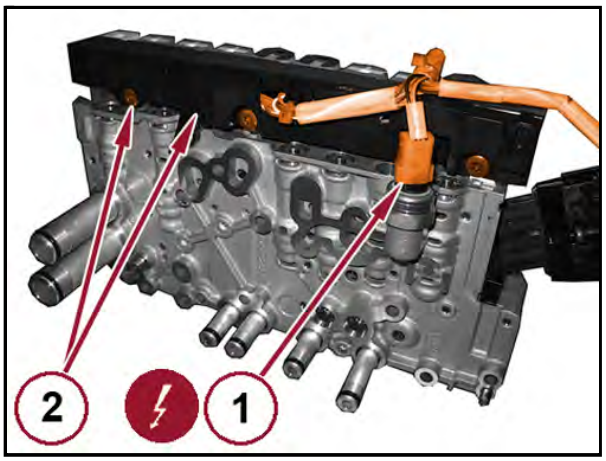
21. Remove the valve body with the wire harness (1) from the vehicle.

    NOTE: **If the valve body is to be reused without disassembling it, store the valve body in a clean area until it is installed.**

22. If necessary, disconnect the wiring harness from the transmission fluid pressure transducer (1).

23. To remove internal transmission harness, remove the screws from the solenoid connectors and lift the harness (2) from the valve body.

American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0489

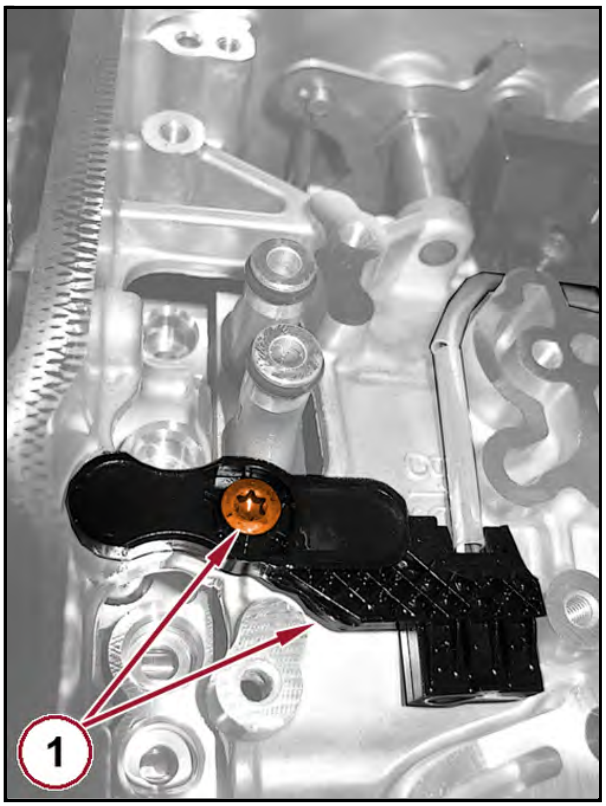


INSTALLATION

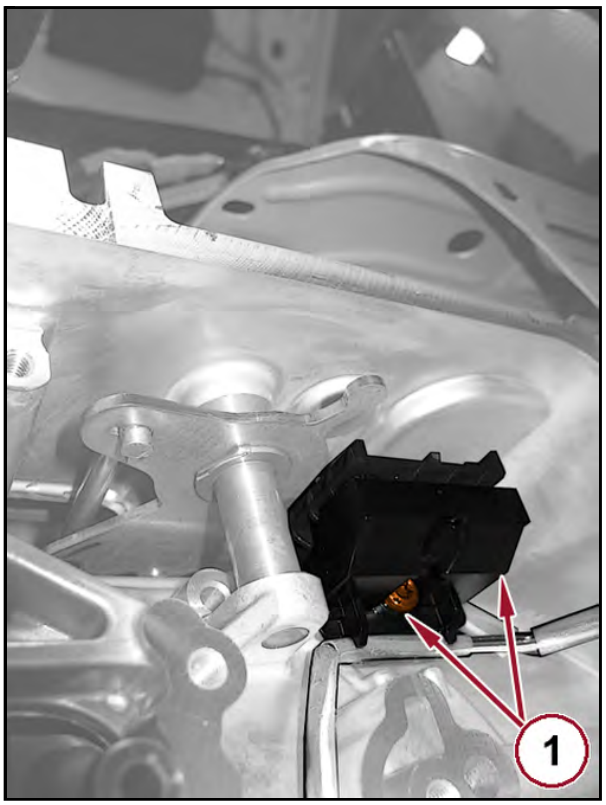
NOTE: Before installing the valve body, replace the O-ring seals on the fluid transfer tubes. Apply a light coating of assembly lube on the O-rings to ease valve body installation.

1. If removed, position the internal transmission wire harness into position on the valve body.
2. Tighten the solenoid wire harness connector screws to the proper (Torque Specifications) .
3. Connect the wire harness connector to the transmission fluid pressure transducer.
4. Clean the mating surfaces between the valve body and the transmission housing with a clean lint-free cloth.
5. install the transmission speed sensors and tighten the screw (1) to the proper (Torque Specifications) .

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PET_AAM_1013-0490



6. Install the Transmission Range Sensor (TRS) and tighten the screw to the proper (Torque Specifications) .



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PET_AAM_1013-0491

7. Align the valve body with the fluid transfer tubes manual lever with the manual valve.

8. Install the ten bolts to hold the valve body to the transmission housing and tighten to the proper (Torque Specifications) .

9. Insert the transmission wire harness connector into the valve body cover with the flat side (2) of the socket on the left and install the retaining clip.

10. Place the valve body cover in position and install the bolts to hold the valve body cover to the transmission housing and tighten to the proper (Torque Specifications) .

11. Install the wire harness retainer bracket to the transmission and tighten the screws.

12. Position the wire harness in the routing clip.

13. Connect the transmission wire harness connector and rotate the lock lever clockwise.

14. Connect the wire harness connector near the retainer bracket.

15. Snap the engine coolant reservoir into position.

16. Install the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .

17. Fill the transmission (Refer to 21 - Transmission and Transfer Case/Automatic - 948TE/FLUID and FILTER/Standard Procedure) .

18. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

19. Install the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .

20. Perform the Valve Body Solenoid Learn procedure if the valve body and/or the TCM was replaced during a repair.

21. Perform Transmission Verification Test-948TE (Refer to 28 - DTC-Based Diagnostics/MODULE, Transmission Control (TCM) /Standard Procedure).

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PET_AAM_1013-0492

21 - Transmission and Transfer Case / Automatic - 948TE/9HP48 / VALVE BODY / Disassembly and Assembly

DISASSEMBLY AND ASSEMBLY

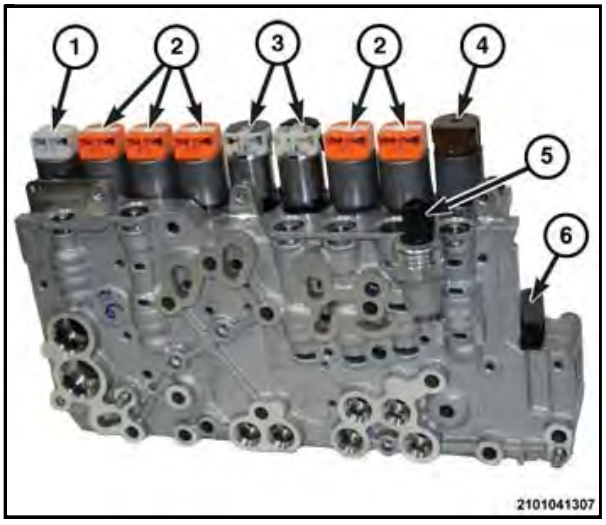
DISASSEMBLY

Remove the valve body from the transmission and place the valve body on a clean oil absorbent work surface. Position wood blocks at each end of the valve body to provide a stable work fixture.

1. Remove the solenoids (1 - 4) from the valve body.

   NOTE: Each type solenoid has a unique color end cover.

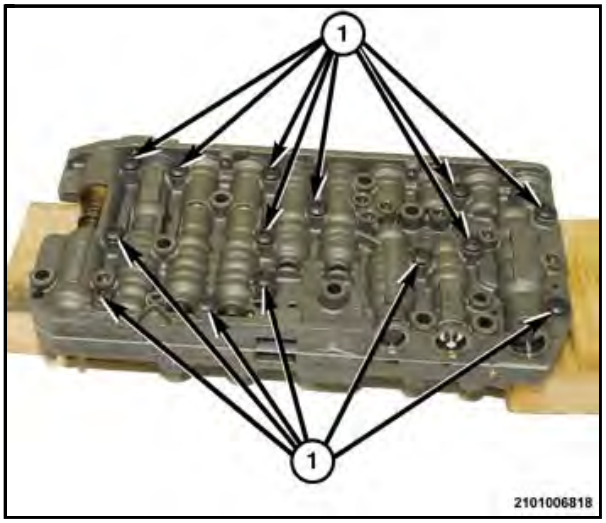
   - 1 = System Pressure Regulator Solenoid
   - 2 = Pressure Regulator Solenoids
   - 3 = Dog Clutch Solenoids



2. Remove the pressure sensor from the valve body.

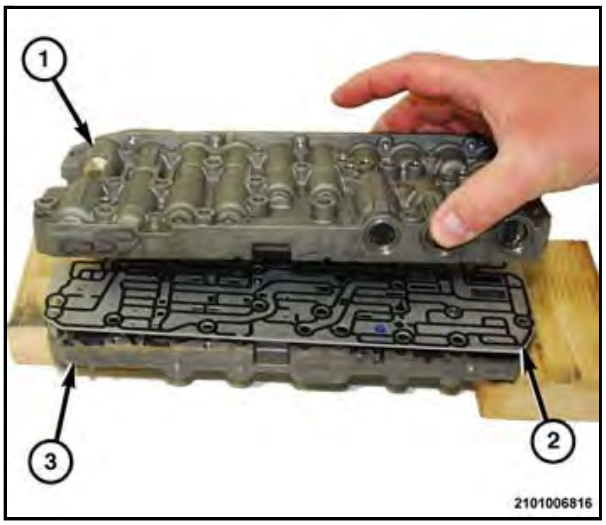
3. Position the valve body on the wooden blocks with outer side up.

4. Remove the screws (1) holding the valve body halves together.

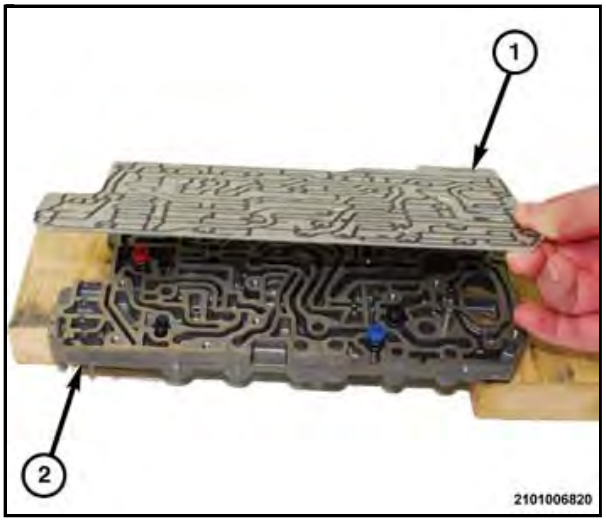


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PET_AAM_1013-0493

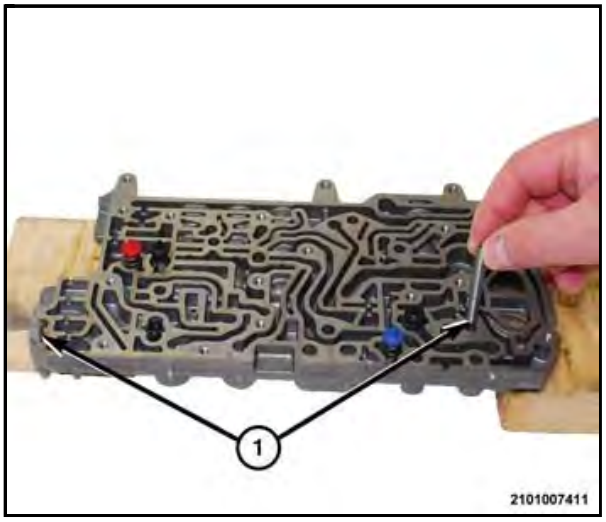
5. Separate the outer valve body (1) from the separator plate (2).



6. Lift the separator plate (1) upward and off of the inner valve body (2).



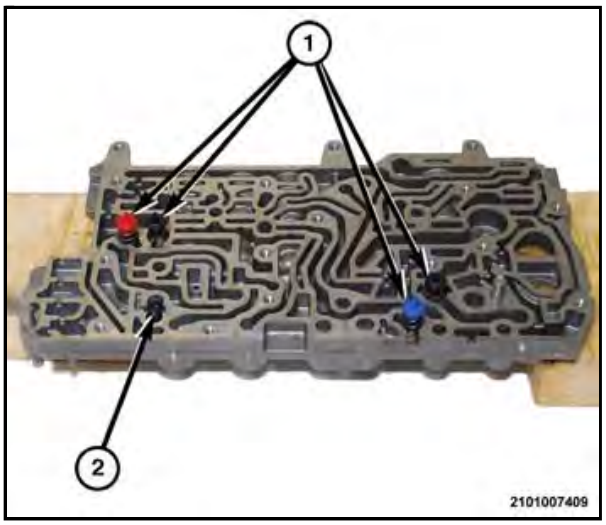
7. Remove the guide pins (1) from the inner valve body.



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8. Remove the color coded check valves (1) from the inner valve body.

9. Remove the toggling, connected check-balls (2) from the inner valve body.



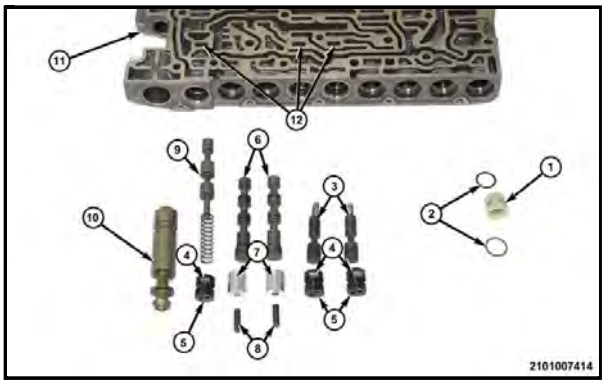
10. Position the outer valve body on the work surface inside up to gain access to the valve retaining spring clips.

NOTE: DO NOT damage the filter screen during removal.

11. Using a suitable prying tool, remove the filter screen (1) from the bore in the outer valve body (11).

12. Remove the bullets (8), sleeves (7), and pressure regulator valves (6) from the bores in the outer valve body (11).

13. Remove the parking lock valve (10) from the bore in the outer valve body (11).



14. Using a suitable prying tool, remove the spring clips (12) holding the lubrication valve plugs in the bores in the outer valve body (11).

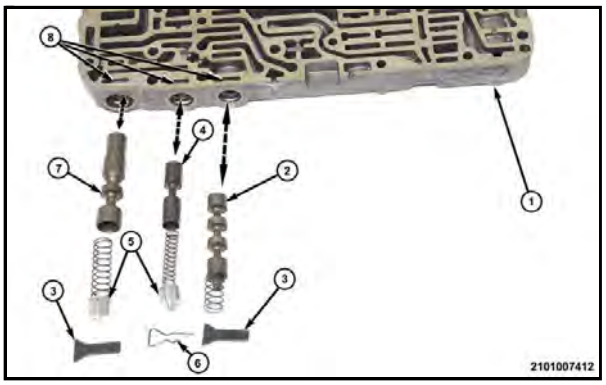
15. Remove the plugs (5), lubrication valves and springs (3) from the bores in the outer valve body (11).

16. Using a suitable prying tool, remove the spring clip (12) holding the MV park lock valve plug in the bore in the outer valve body (11).

17. Remove the spring and MV park lock valve (9) from the bore in the outer valve body (11) .

18. Rotate the outer valve (11) body to gain access to the pressure and lubrication valves.

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19. The support plates (3) and spring clip (6) are located in pockets (8) in the outer valve body (1).

20. Remove the support plate (3) holding the spring and converter pressure valve (2) in the bore in the outer valve body (1).

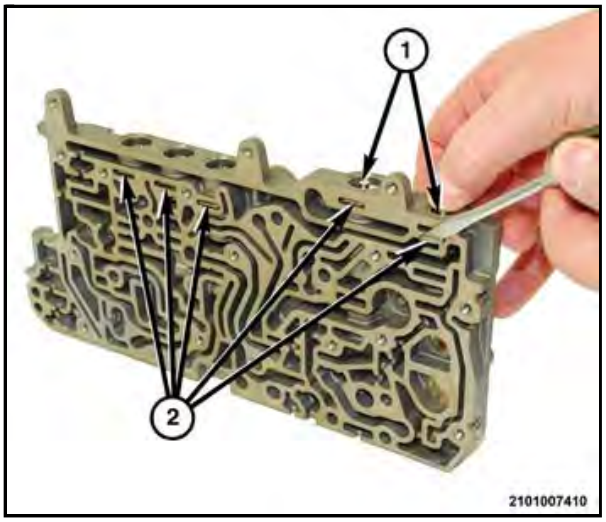
21. Remove the spring and converter pressure valve (2) from the bore in the outer valve body (1).

22. Remove the support plate (3) holding the plug (5), spring and system pressure valve (7) in the bore in the outer valve body (1).

23. Remove the plug (5), spring and system pressure valve (7) from the bore in the outer valve body (1).

24. Remove the spring clip (6) holding the plug (5), spring and lubrication valve (4) in the bore in the outer valve body (1).

25. Remove the plug (5), spring and lubrication valve (4) from the bore in the outer valve body (1).



26. Place the inner valve body on the clean work surface with the valves bores facing up.

    NOTE: The spring clips holding (2) the plugs (1) in the inner valve are located in pockets (2) on the separator plate side of the inner valve body.

27. Press each of the valve plugs (1) downward and remove the spring clips (2) holding the valves in the bores in the inner valve body.

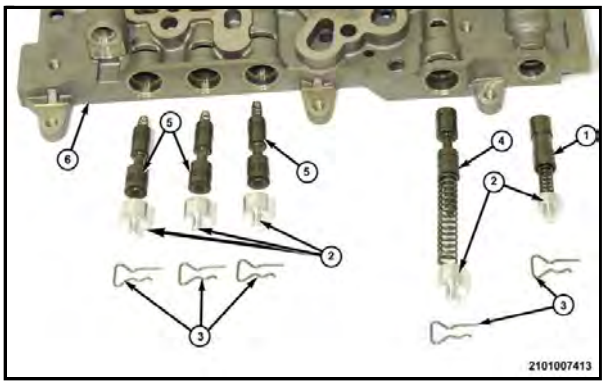
28. Remove the plug (2), spring and boost valve (1) from the bore in the inner valve body (6).

29. Remove the plug (2), spring and solenoid limit valve (4) from the bore in the inner valve body (6).

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30. Remove the plugs (2), springs and PCV valves (5) from the bores in the inner valve body (6).

31. Perform the cleaning and inspection procedures.



VALVE BODY CLEANING AND INSPECTION

Clean the valve body components with a suitable clean solvent. The valve body components can be blown dry with compressed regulated 344 kPa (50 psi) shop air.

Inspect the valve components and bores for excessive scoring, porosity, warping or other damage that may cause the valves to bind or leak excessively. If damage is evident the complete valve body must be replaced.

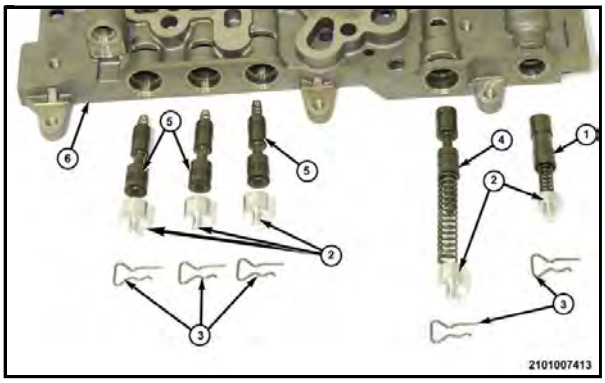
ASSEMBLY

Before assembling the valve body, thoroughly clean all of the components with a suitable solvent and blow them dry with 344 kPa (50 psi) **regulated** shop air. Clean the work surface and lay out a clean lint free cloth to avoid contaminating the clean valve body components. Lay the valve components out on the cloth in the order they will be installed in the valve body. The cloth will hold the valve components in place and keep them from rolling out of position. A light lubricating oil can be applied the each component as the valve body is assembled.

1. Install the springs, Pressure Control Valve (PCV) valves, and (5) plugs (2), from the bores in the inner valve body (6).

2. Install the solenoid limit valve (4), spring, and plug (2) into the bore in the inner valve body (6).

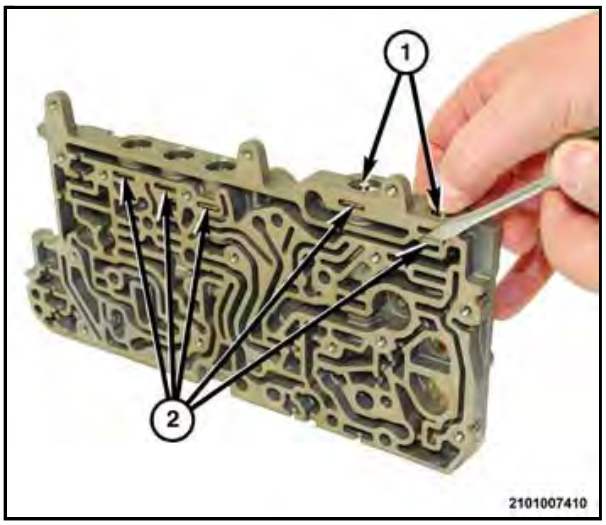
3. Install the boost valve (1), spring, and plug (2) into the bore in the inner valve body (6).

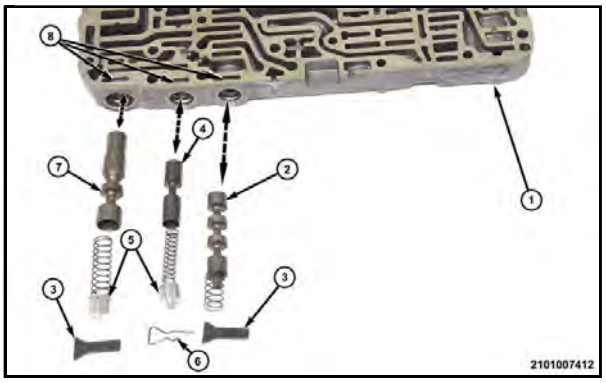


4. Turn the inner valve body so the plugs (1) are facing upward.

5. While pressing downward on the plugs (1), install the spring clips (2) to hold the plugs in the inner valve body.

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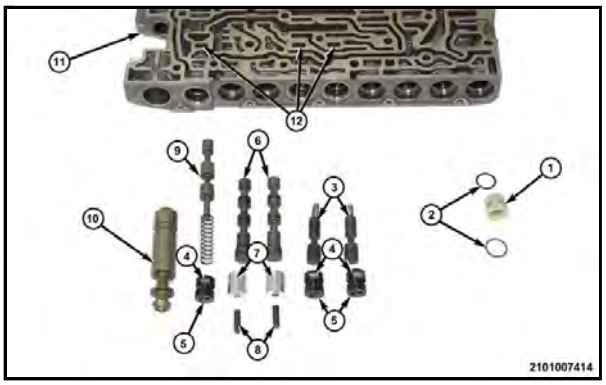
6. The support plates (3) and spring clip (6) go into pockets (8) in the outer valve body (1).
7. Install the lubrication valve (4), spring, and plug (5) into the bore in the outer valve body (1).
8. Install the spring clip (6) to hold the plug (5), spring and lubrication valve (4) in the bore in the outer valve body (1).
9. Install the system pressure valve (7), spring, and plug (5) in the bore in the outer valve body (1).
10. Install the support plate (3) to hold the plug (5), spring and system pressure valve (7) into the bore in the outer valve body (1).
11. Install the converter pressure valve (2) and spring into the bore in the outer valve body (1).
12. Install the support plate (3) to hold the spring and converter pressure valve (2) in the bore in the outer valve body (1).
13. Position the outer valve body (11) on the work surface inside up to gain access to the valve retaining spring clips (12).
14. Install the MV park lock valve (9), spring, and plug into the bore in the outer valve body (11).

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15. While pressing down on the plug to align the slot, install the spring clip (13) to hold the MV park lock valve and plug in the bore in the outer valve body (11).

16. Install the lubrication valves, springs (3), a plugs (5), into the bores in the outer valve body (11).

17. While pressing down on the plug to align the slot, install the spring clips (13) to hold the lubrication valve plugs in the bores in the outer valve body (11).



18. Install the parking lock valve (10) into the bore in the outer valve body (11).

19. Install the pressure regulator valves (6), sleeves (7), and bullets (8) into the bores in the outer valve body (11).

20. Install NEW O-rings (2) on the filter screen (1).

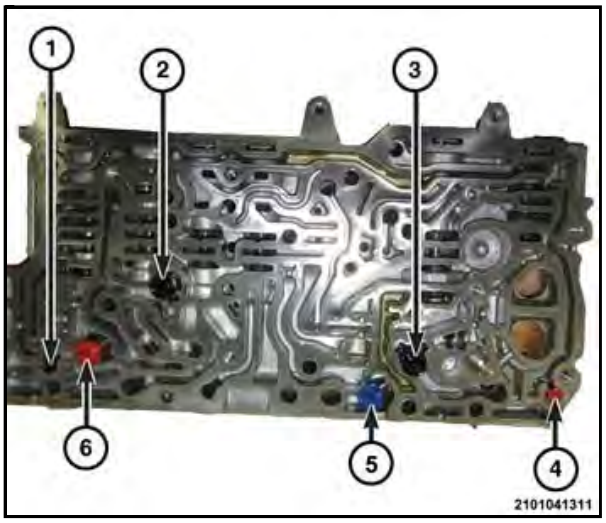
21. Install the filter screen (1) into the bore in the outer valve body (11).

22. Place the inner valve body on the work surface resting on wood blocks to elevate the center for clearance underneath.

23. Install the check-ball (1) into the inner valve body.

24. Install the black color coded check valves (2, 3) into the inner valve body as shown.

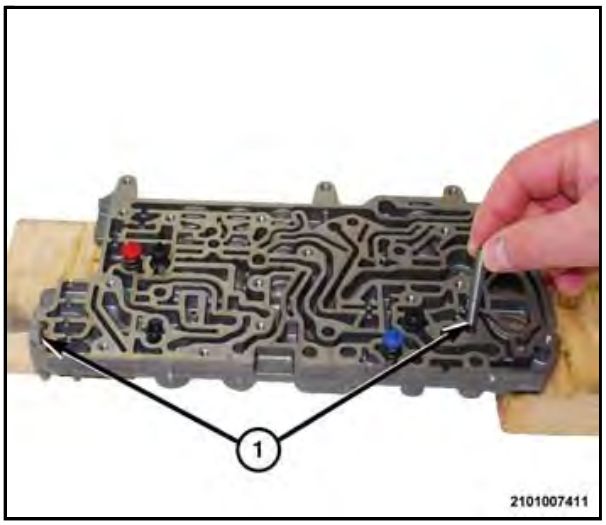
25. Install the red color coded check valves (4, 6) into the valve body as shown.



26. Install the blue color coded check valves (5) into the valve body as shown.

27. With the smaller diameter end downward, install the guide pins (1) into the inner valve body.

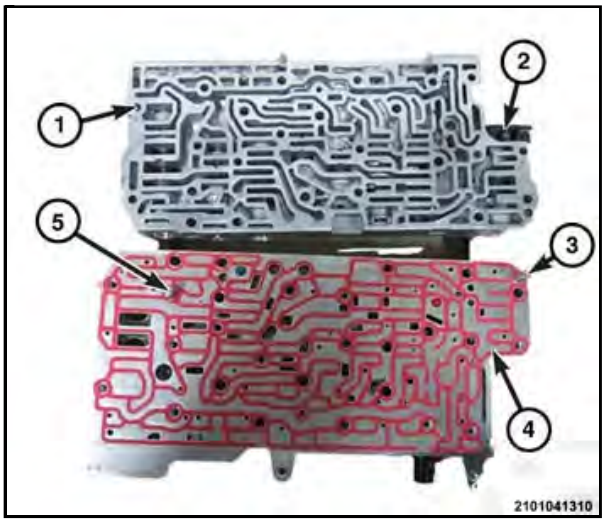
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PET_AAM_1013-0499



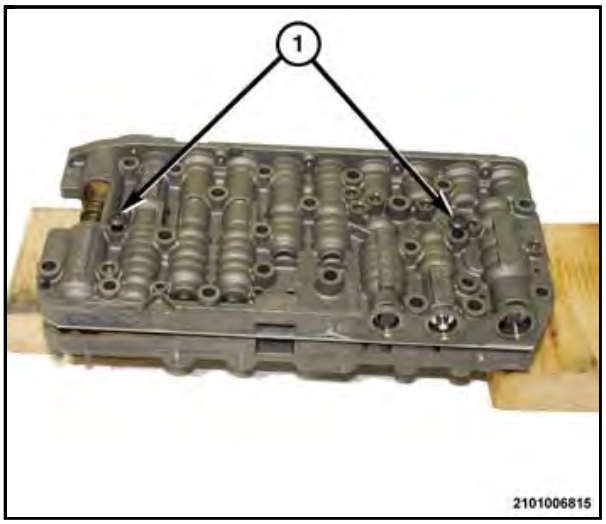
28. Place the separator plate (4) in position on of the inner valve body over the guide pins (3, 5).

29. Install the manual valve (2).

30. Place the outer valve body (1) in position on the separator plate (4).

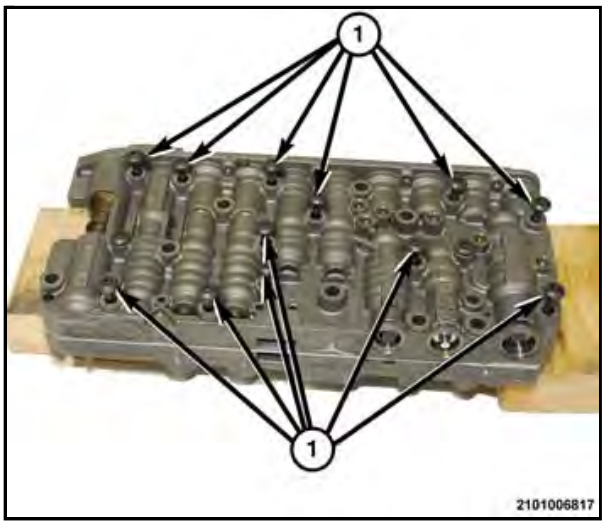


31. Install two screws (1) to hold the outer valve body to the inner valve body and separator plate. Tighten the screws snug with a suitable torx-drive screw driver.



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32. Install the remaining screws (1) to hold the inner valve body to the outer valve body.

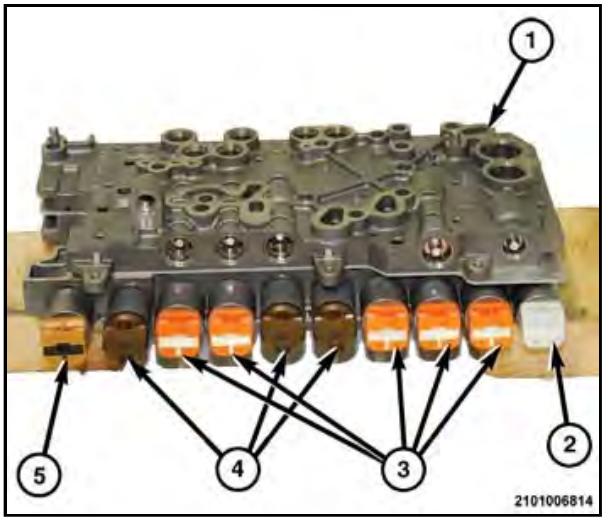


33. Install the pressure sensor in the valve body.

34. Install the solenoids (2 - 5) in the valve body (1).

NOTE: Each type solenoid has a unique color end cover.

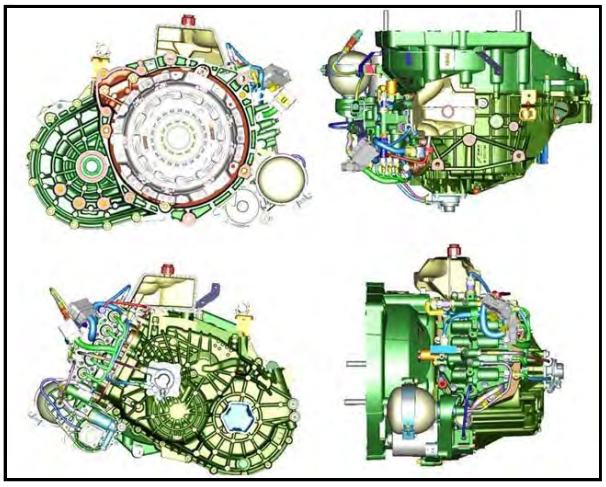
- 2 = System Pressure Regulator Solenoid
- 3 = Pressure Regulator Solenoids
- 4 = Dog Clutch Solenoids
- 5 = Parking Lock Solenoid



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21 - Transmission and Transfer Case / Automatic - C635 DDCT / Description and Operation

Description and Operation



The Fiat Powertrain Technologies Dual Disc Clutch Transmission (DDCT) is a three-shaft transmission capable of transmitting a maximum torque of 350 Nm. It uses innovative technology that allows driving comfort to be combined with an automatic transmission, with lower running costs than for manual transmissiones.

The DDCT transmission is made by combining two aluminium alloy half-casings. It can be installed in front wheel drive, transverse engine layout arrangements. The DDCT has a typical three-shaft layout for additional compactness. A uniqueness is that the main shaft actually consists of two mutually coaxial shafts. Two dry clutches operated by two separate hydraulic slave cylinders are used to transmit torque to the main shaft:

- A traditional one located under the transmission casing (traditional) to manage the even gear clutch
- The second one located on the transmission casing to manage the odd gear clutch

Gears are engaged and the clutches are managed by a valve body, controlled by a dedicated Transmission Control Module (TCM). The valve body is positioned directly on the transmission casing.

The specific features are:

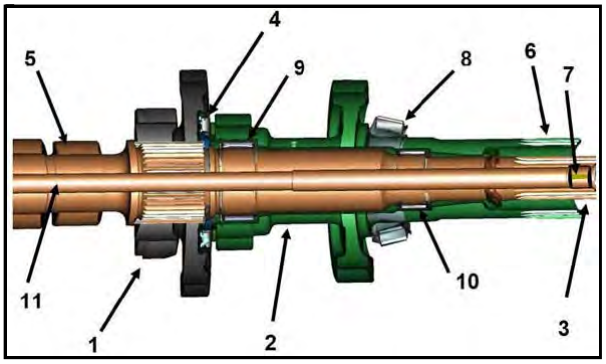
- 6 synchronized gears
- Max. torque that can be transmitted: 350 N·m (258 lb.ft.)
- Three shafts, one input (main) shaft plus two output shafts (upper and lower)
- Main shaft comprising two coaxial shafts
- Dual dry clutch
- Dual hydraulic actuator for the clutches.
- Fixed idler mechanical transmission
- Synchronized reverse
- Free wheel for reverse engagement
- Helical tooth gears (straight tooth reverse gear)
- Integrated differential in the transmission casing;
- Mechanical "Parking" function
- Designed for coupling to specific flywheel
- Transmission housing split in two aluminium half casings
- Valve body for clutch and gear shift control
- Dedicated TCM

DDCT operating principles - Mechanical part

FPT engineers have designed solutions to allow continuous motion transmission using the C633 manual transmission. First, the main shaft of the DDCT consists of two mutually coaxial shafts, called outer main shaft and inner main shaft. The junction area houses an axial bearing allowing reciprocal rotation. Both shafts are made of steel. The inner main shaft has a grooved profile for splining 3rd and 5th speed drive gears, while the outer main shaft is made in one piece.

Section view:

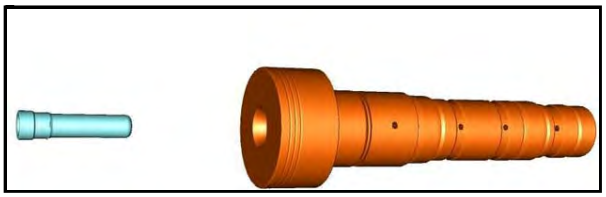
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PET_AAM_1013-0502



1	3rd speed drive gear
2	Outer main shaft (coupled to clutch K2 – even gears)
3	Inner shaft odd gear clutch grooved profile
4	Axial bearing
5	Inner main shaft (coupled to clutch K1 – odd gears)
6	Outer main shaft even gear clutch grooved profile
7	Clutch rod bushing
8	Outer main shaft bearing
9	Roller cage
10	Inner main shaft roller cage
11	Inner main shaft hole for introducing odd gear clutch rod

The need for two main shafts derives from the fact that two pairs of gears must be meshed to allow continuous motion transmission. Therefore, two clutches are needed to obtain this without causing mechanical damage, one for odd gears (called K1) and one for even gears (called K2). While travelling, one of the two clutches is closed to transmit motion from only one pair of gears and the other clutch is open to prevent transmission using the other gear pair. During both upshifting and downshifting, both clutches work together, so that one opens while the other closes and vice versa.

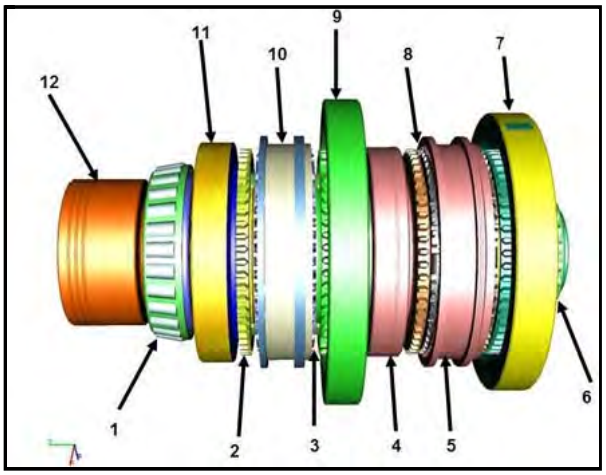
Upper output shaft



1	Plastic plug
2	Upper output shaft

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PET_AAM_1013-0503

The upper output shaft is made entirely of steel; it is hollow so that oil can flow to machined openings to lubricate driven gear roller bearings. A plastic plug is positioned so that the oil in the shaft can only flow out through the specific openings for lubricating the roller bearings on the shaft inner side. The DDCT upper output shaft is the same as that of the manual transmission. The difference concerns the position of the gears on the shaft itself. The gears interface with the shaft by means of steel bushings.

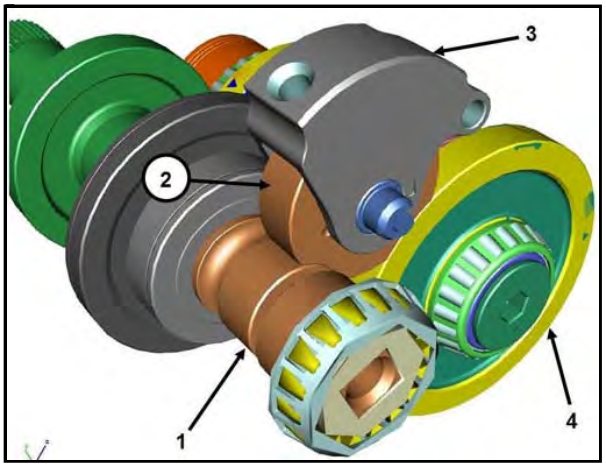


1	Upper output shaft inner bearing
2	4th speed gear toothed ring
3	2nd speed synchronizer ring
4	5th speed gear
5	5th speed and reverse sliding sleeve
6	Upper output shaft outer bearing
7	Reverse driven gear
8	5th speed synchronizer ring
9	2nd speed driven gear
10	2nd and 4th speed sliding sleeve
11	4th speed driven gear
12	Motion transfer gear from shaft to differential

Reverse

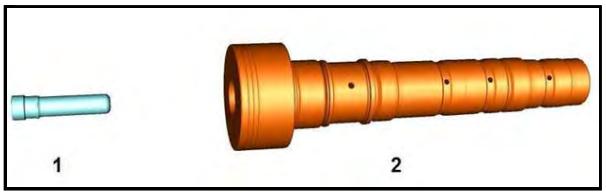
Motion is reversed in the DDCT by using a straight tooth idler gear installed in the transmission.

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1	Inner main shaft
2	Idler wheel
3	Idler wheel support
4	Reverse driven gear

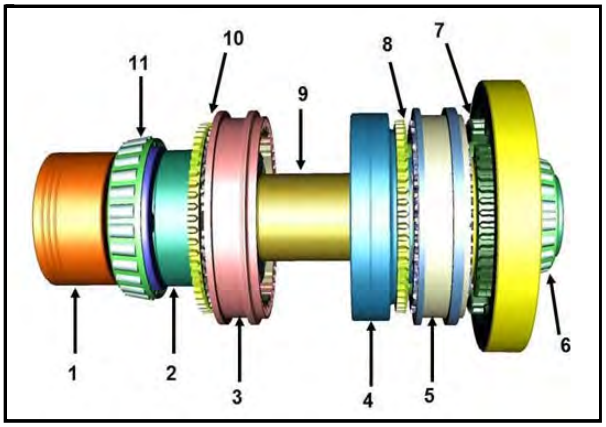
Lower output shaft



1	Plastic plug
2	Lower output shaft

The lower output shaft made entirely of steel; it is hollow so that oil can flow to the machined openings to lubricate driven gear roller bearings. A plastic plug is positioned so that the oil in the shaft can only flow out through the specific openings for lubricating the roller bearings on the shaft inner side. The DDCT upper output shaft is the same as that of the manual transmission. The difference concerns the position of the gears on the shaft itself. The gears interface with the shaft by means of steel bushings.

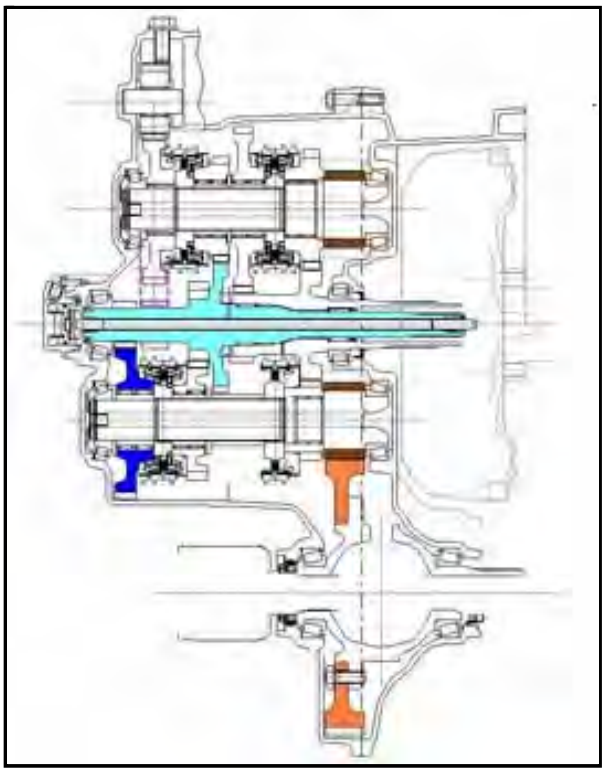
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PET_AAM_1013-0505

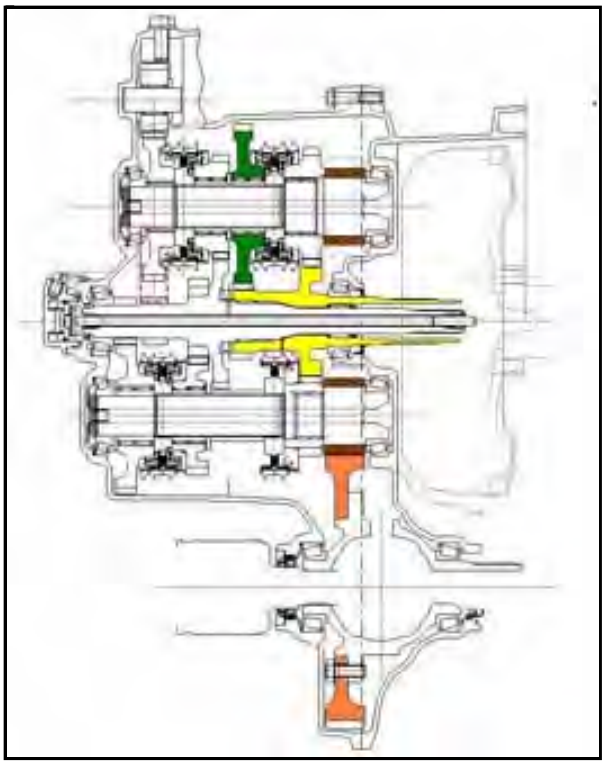


1	Motion transfer gear from shaft to differential
2	6th speed driven gear
3	6th speed sliding sleeve
4	3rd speed driven gear
5	3rd and 1st speed sliding sleeve
6	Lower output shaft outer bearing
7	1st speed toothed ring
8	3rd speed synchronizer ring
9	6th speed spacer
10	6th speed toothed ring
11	Lower output shaft inner bearing

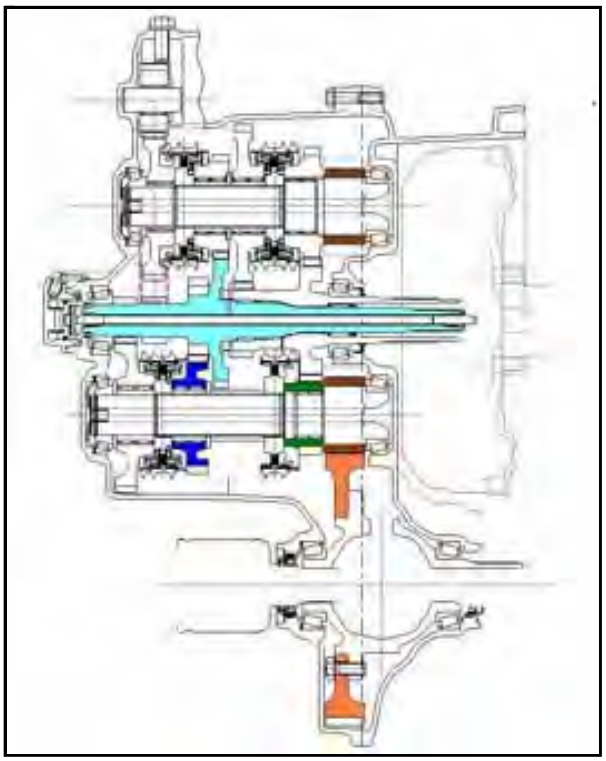
Power flow

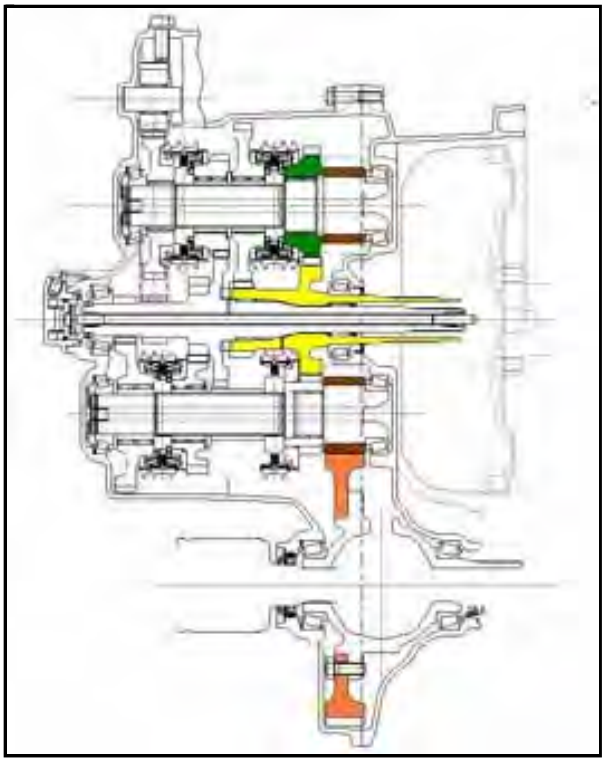
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PET_AAM_1013-0506



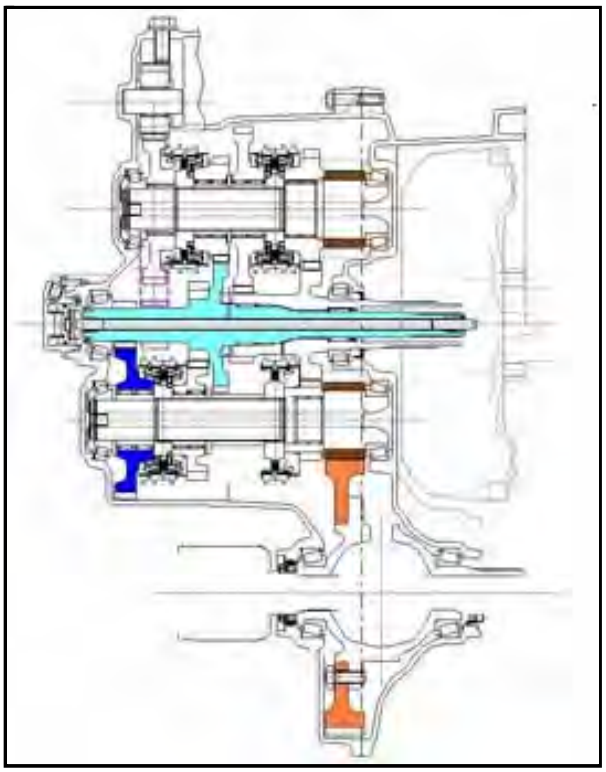


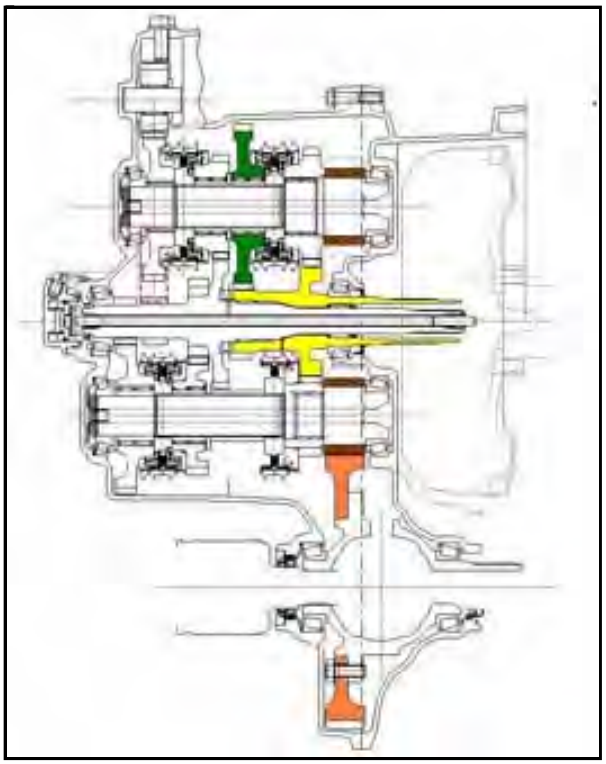
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PET_AAM_1013-0508

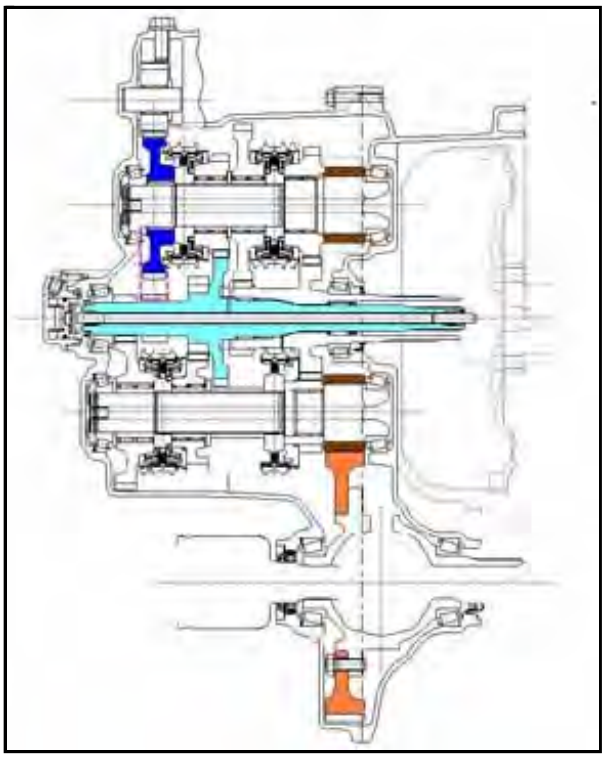




The gear output of the DDCT is shown in the figures above.

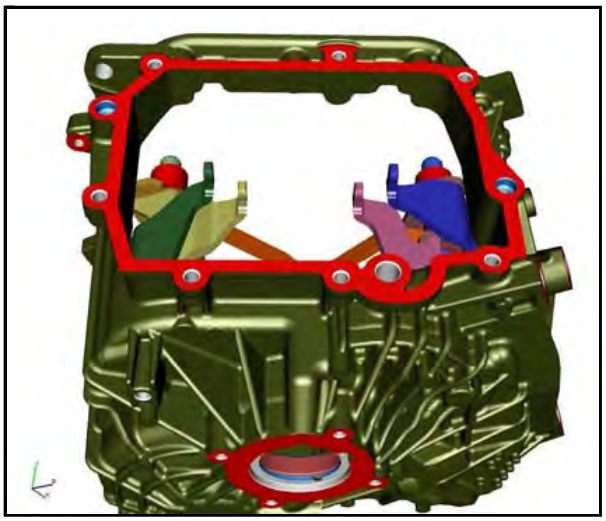
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Odd gears are shown in blue. Even gears are shown in green. The inner main shaft is light blue and the outer main shaft is yellow.



Gear engagement rods

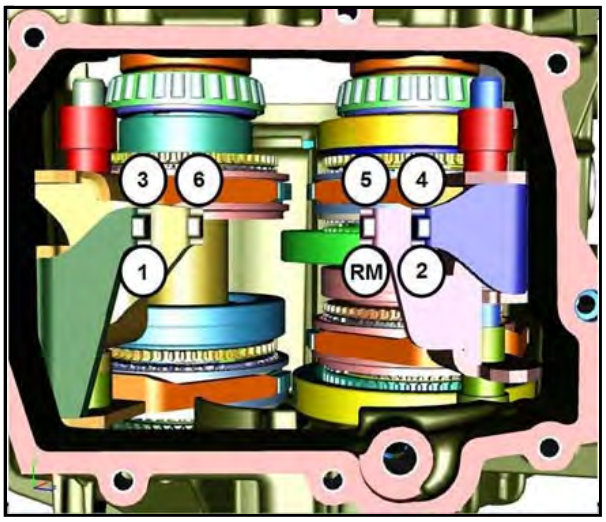
The valve body uses four rods ending in four forks, which are engaged in the sliding sleeves for engaging the gears.



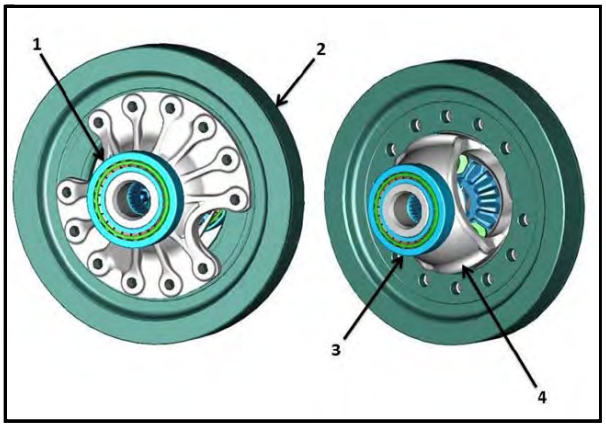
The rods are positioned in pairs. One pair engages the gear on the upper output shaft, the other pair those on the lower output shaft. The rods are anchored to the transmission casing by means of two hollow steel shafts, which also allow sliding to move the sliding sleeve. The rods are shown below in gear engagement order:

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Differential



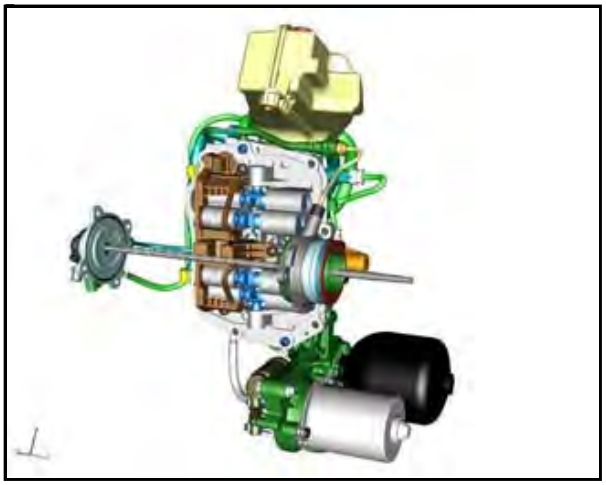
The DDCT is equipped with an open differential. The crown is joined to the body of the differential by means of 12 screws.

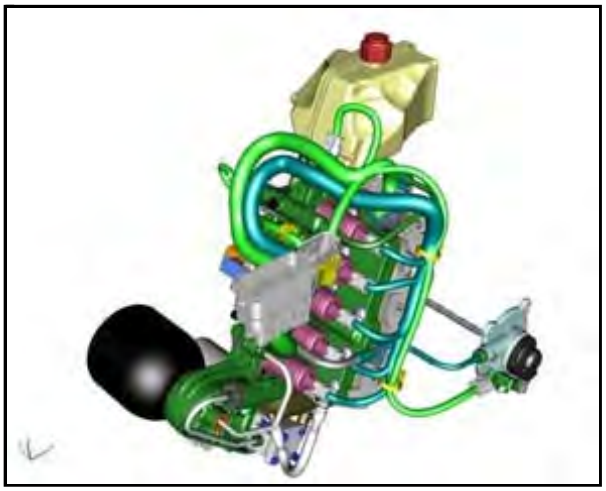


1	Tapered bearing, left side
2	Toothed gear
3	Differential gear casing
4	Tapered bearing, right side

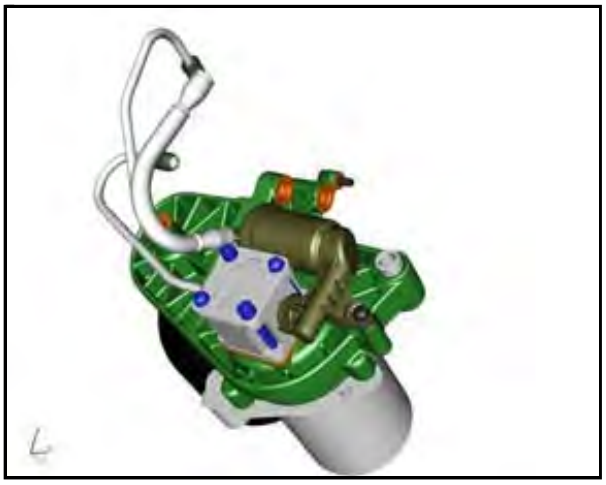
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Valve body kit components



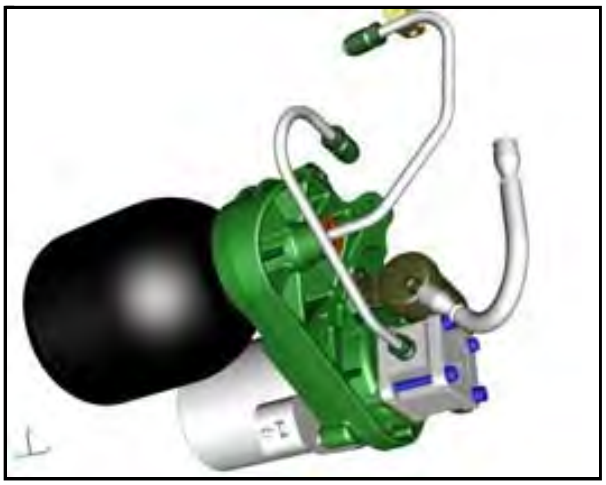


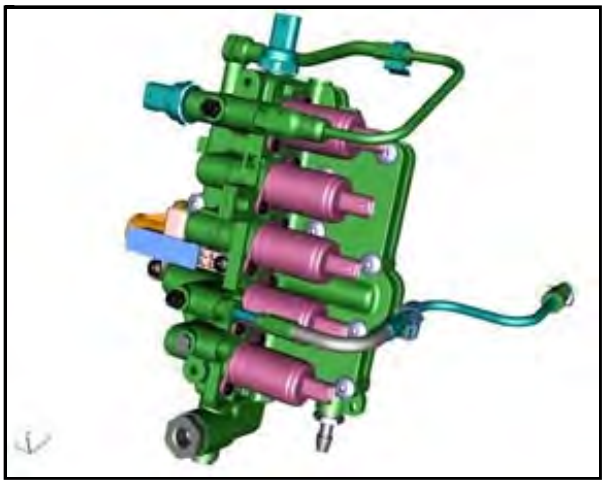
The electro-hydraulic kit is positioned directly on the manual transmission casing. It consists of several parts: the reservoir, the hydraulic power unit, the slave cylinders and the actuator unit (CAM). The unit is called **Complete Actuation System** hence the acronym **CAS.**

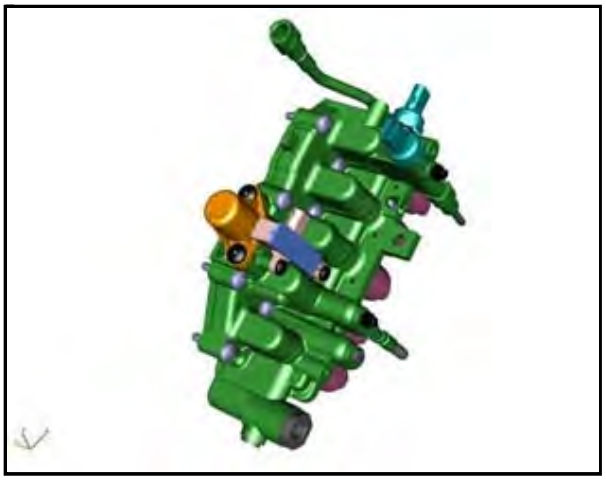


- The hydraulic power unit with electric pump and accumulator;

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PET_AAM_1013-0512







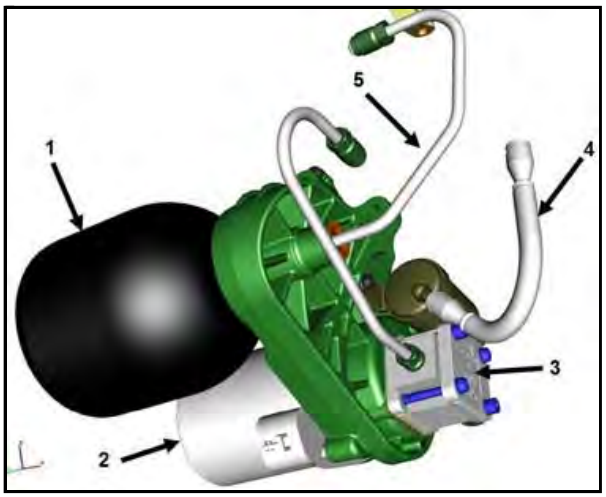
- The solenoid valve actuating unit, which transforms hydraulic energy into mechanical energy by interfacing engagement pistons and control rods. This unit is called Complete Actuation Module (CAM).

Power unit

The power unit supplies hydraulic energy for actuating both gear engagement/selection and clutch slave cylinders. The unit includes an electric pump, high pressure pipes connecting to the solenoid valve unit

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PET_AAM_1013-0513

and a low-pressure, pre-shaped rubber flexible hose, which connects the valve unit to the pump.



1	Accumulator, precharged with nitrogen
2	Motor
3	Oil pump
4	Low pressure oil line
5	High pressure oil line

The system works with line pressure at ambient temperature in the range from 44 to 55 bar. The engagement/release pressure thresholds are appropriately reduced at lower temperatures by effect of the lower accumulator precharging to prevent the electric pump from overworking (because the oil is more viscous). At higher temperatures, the engagement/release pressures are appropriately increased to take into account the precharge increase in the accumulator. For example, the system works between 39 and 43 bar at -30°C and between 50 and 58 bar at 120°C in normal conditions. In recovery condition, the system may reach a maximum operating pressure of 70 ± 5 bar.

The electric pump is activated when the pressure drops below 44 bar and is deactivated when the pressure of the circuit reaches 55 bar.

Technical specifications:

- Line pressure at ambient temperature: between 44 and 55 bar
- Operating temperature: between -30°C and +120°C
- Starting possible with a temperature al low as -30°C
- Pump flow is > 1.35 l/min
- Accumulator volume is 480 cm3, precharged at 30 bar at 20°C

Complete Actuation Module

The solenoid valve actuating unit, which transforms hydraulic energy into mechanical energy by interfacing engagement pistons and control rods. This unit is called Complete Actuation Module (CAM).

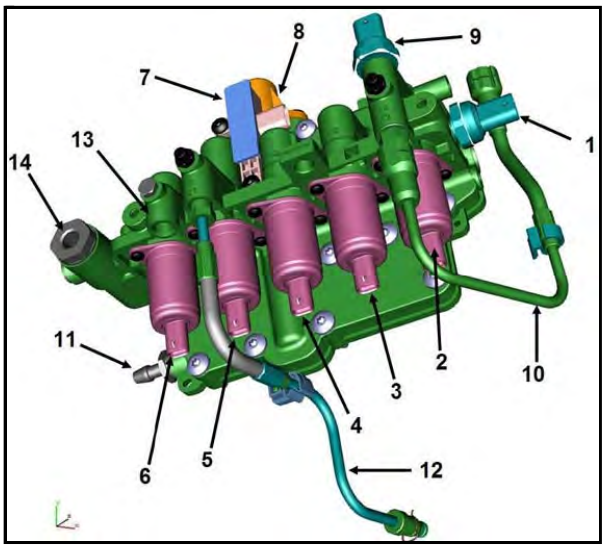
The module consists of four pressure proportional solenoid valves (PPV), a capacity proportional solenoid valve (QPV) for slave cylinder K1, a control

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pressure sensor for slave cylinder K2, a line pressure sensor, magneto-resistive sensors for controlling movements of the shifter and gear engagement pistons and transmission input rpm sensors.

The functions of this module are:

- to control and manage clutch position.
- to control and manage gear selection and engagement.



The Complete Actuation Module consists of:

1	Electro-hydraulic kit line pressure sensor
2	Proportional pressure solenoid valve PPV K2 (even gear clutch control)
3	Proportional pressure solenoid valve PPV-S (shifter)
4	Proportional pressure solenoid valve PPV2 (1st - 6th - 4th - 5th gear engagement)
5	Proportional capacity solenoid valve QPV K1 (odd gear clutch control)
6	Proportional pressure solenoid valve PPV1 (3rd - (7th) - 2nd - reverse gear engagement)
7	Shifter selector position sensor
8	Shifter selector axis
9	K2 slave cylinder pressure sensor
10	K2 slave cylinder oil output
11	Low-pressure oil output towards the hydraulic power unit
12	K1 slave cylinder oil output
13	Connection to pressure accumulator.
14	High-pressure oil inlet from hydraulic power unit.

Limp home

Limp home is low-performance mode used in presence of a system failure. Only 1st, 2nd and 3rd gear and reverse can be engaged in this mode which can be used for some faults only. System performance in limp home conditions is obviously worse than normal (gear shifts are slower). Engine limp home can be requested in some cases. This mode limits engine rpm.

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Special automatic maps may be activated in some recovery conditions (automatic even gear strategy and automatic odd gear strategy). The objective is to be able to drive the vehicle while cutting out the faulty transmission component.

Retry

The retry strategy attempts to engage a gear which, having been previously requested, was not engaged because of a problem. After recognizing that gear engagement is impossible, the system attempts to engage the gear again (starting from neutral). It tries twice more if the second attempt fails. Neutral is engaged if all attempts fail.

The distinction explained below is needed to understand how the system works after the third failed engagement attempt:

- **Powershift**: the gear shifting operation has not been completed and therefore the previous gear is still engaged and the corresponding clutch is still transmitting torque. The driver is unaware of problem because traction is maintained. Another set of three attempts can be made, if a new gear shift is required. If this behavior is systematic, after a given series of consecutive events, the transmission component for the gear affected by the failure is cut out and appropriate recovery strategies are implemented (automatic even or odd gear strategy).

Automatic gear shift (auto mode)

The DDCT is equipped with an automatic operating mode, very similar to that of a conventional automatic transmission. The gear to be engaged is selected using a (double) map which correlates the power required by the driver and the car speed. A double map is needed because two AUTOMATIC control modes named Normal & Dynamic can be selected by pressing a button in the dashboard. If the accelerator pedal is released in Dynamic mode, the system does not shift up to maintain engine brake function. In Normal mode, instead, the gear is shifted up (if allowed) when the accelerator is released to benefit in terms of consumption. The gear shift mode is identical to that of semi-automatic operation using the steering wheel levers but transmission and engine actuator control parameters dedicated to each mode are used. Automatic mode is selected with a button, which is positioned in an unstable manner in a specific position. It is turned off in the same way.

N.B.: the system switches to AUTOMATIC if the steering wheel levers are faulty.

Request to put the transmission in neutral

This request takes priority over all the other requests and is possible using the levers only. As mentioned, the brake pedal must be pressed when the engine is off.

This neutral request is always accepted with the vehicle in motion.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / Specifications

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Hydraulic Accumulator	11	—	97	
Hydraulic Accumulator Clamp	7	—	97	
Hydraulic Accumulator Support Bracket Bolts	10	—	89	
Hydraulic fluid Filter Screws	6	=	62	
Hydraulic Fluid Reservoir Screws	10	—	89	
Hydraulic Tube Flare Nuts	18	—	159	
Left Engine Mount to Adapter Bracket Bolts	40 + 45°	40 + 45°	—	
Left Engine Mount Adapter Bracket to Transmission Bolts	40 + 45°	40 + 45°	—	
Left Engine Mount to Frame Bolts	112	83	—	
Parking Sprag Assembly Bolts	60	44	—	
Plug, Drain	41	30	—	
Transmission Adaptor Plate Bolt and Nut (M12)	91	67	—	
Transmission Adaptor Plate Bolts (M10)	46	34	—	
Transmission to Engine Bolts	60	44	—	
Transmission Hydraulic Power Unit Bolts	20	15	—	
Transmission Hydraulic Power Unit Motor Bolts	10	—	89	
Transmission Hydraulic Power Unit Pump Bolts	10	—	89	
Transmission Pan Bolts	10	—	89	
Valve Body Bolts	Refer to Valve Body Installation)			

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / Removal and Installation

REMOVAL AND INSTALLATION

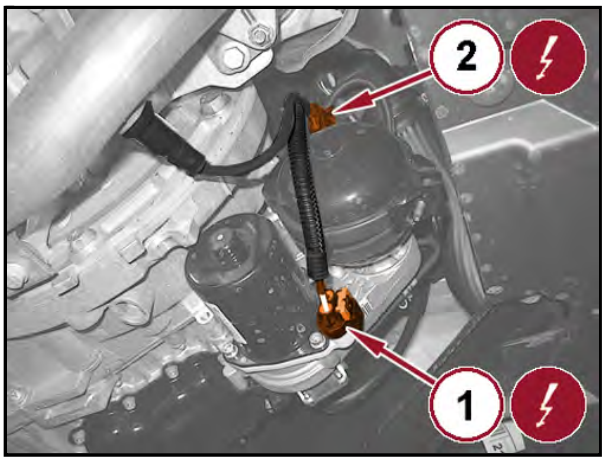
REMOVAL

CAUTION: The Dual Mass Flywheel (DMF) must be reset any time the engine and transaxle are separated or damage will result on the first engine crank. Always check a new flywheel to verify it is set up properly or damage may result.

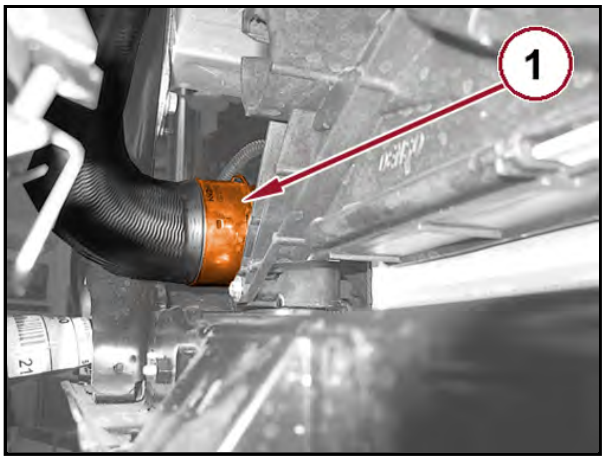
1. Position the vehicle on the lift.
2. Position the gear shift lever in "Park".
3. Remove both front tire and wheel assemblies (Refer to 22 - Tires and Wheels/Removal and Installation) .
4. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
5. Remove the left and right front wheelhouse splash shields (Refer to 23 - Body/Exterior/SHIELD, Splash/Removal and Installation) .
6. Remove the front fascia (Refer to 13 - Frame and Bumpers/Bumpers/FASCIA, Front/Removal and Installation) .
7. Remove the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .
8. Drain the transmission fluid (Refer to 21 - Transmission and Transfer Case/Automatic - C635 DDCT/FLUID/Standard Procedure) .
9. Remove the halfshafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .
10. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
11. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
12. Disconnect the clutch transmission electric pump wire harness connector (1) and release the transmission wiring.

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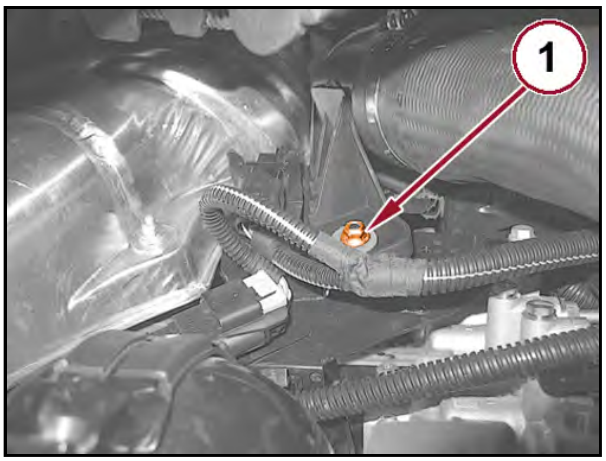
13. Disconnect the pre-catalytic converter oxygen sensor wire harness connector (2).



14. Disconnect the charge air cooler outlet tube (1) at the charge air cooler.



15. Remove the charge air cooler outlet tube nut (1) at the wiring harness bracket.

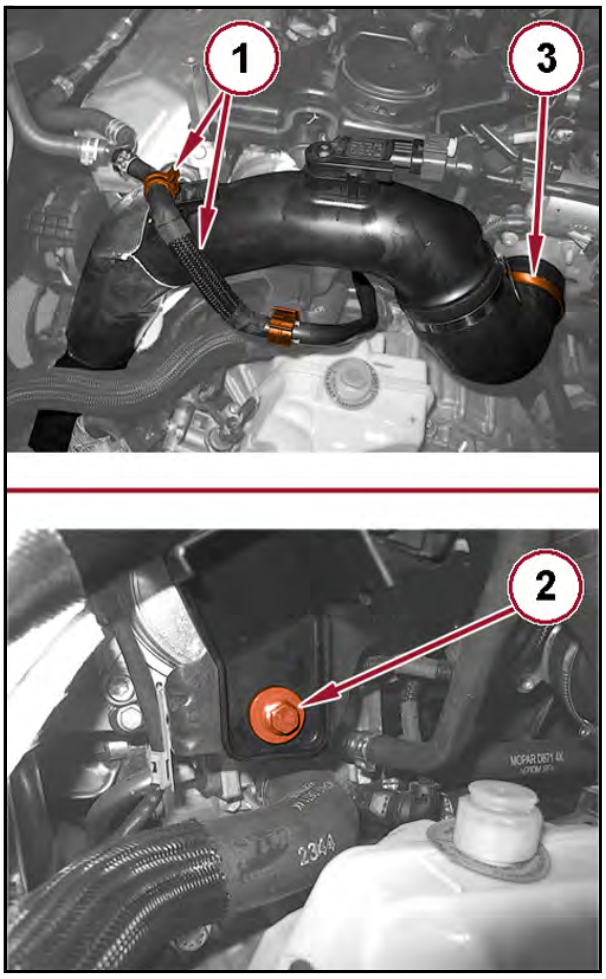


16. Open the clips and release the coolant hose (1) from the charge air cooler outlet tube.

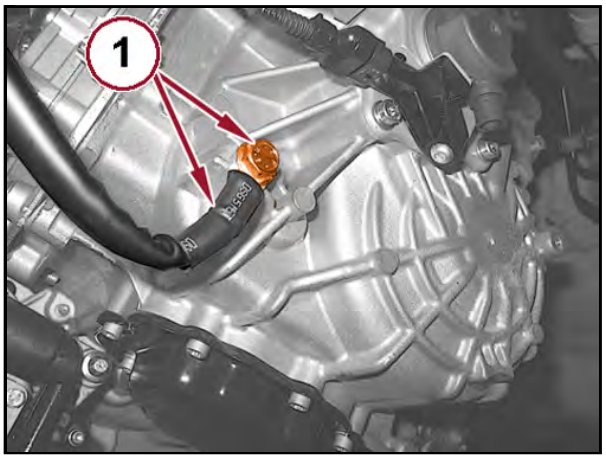
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17. Remove the charge air cooler outlet tube bolt (2) from the wiring holding bracket.

18. Loosen the clamp (3) and remove the charge air cooler outlet tube.



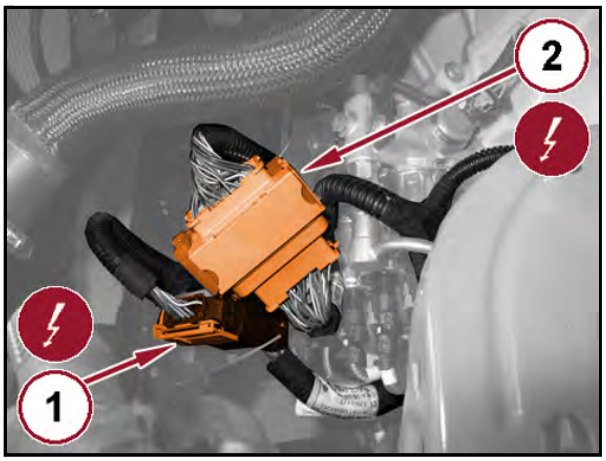
19. Remove the bolt and disconnect the ground cable (1).



20. Disconnect the solenoid valve wire harness connector (1) for the gear selection/engagement control activation unit.

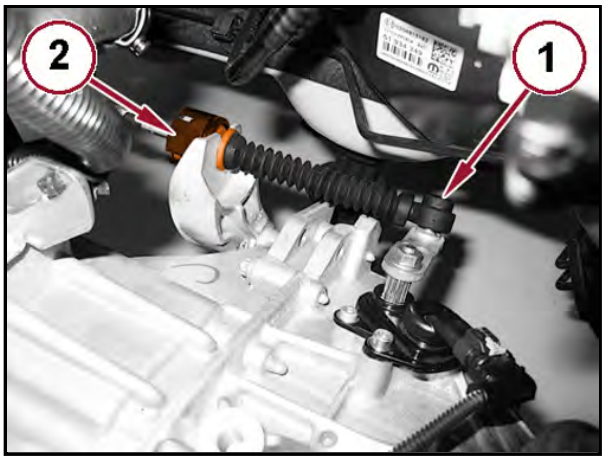
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21. Disconnect the sensor connector (2) from the gear engagement/release control activation unit.



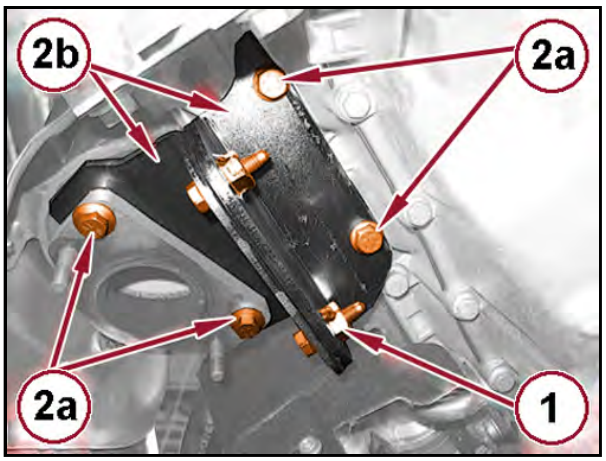
22. Disconnect the "Park" engagement cable from the control lever (1).

23. Move back the sliding clip (2) and release the "Park" engagement cable from the bracket.



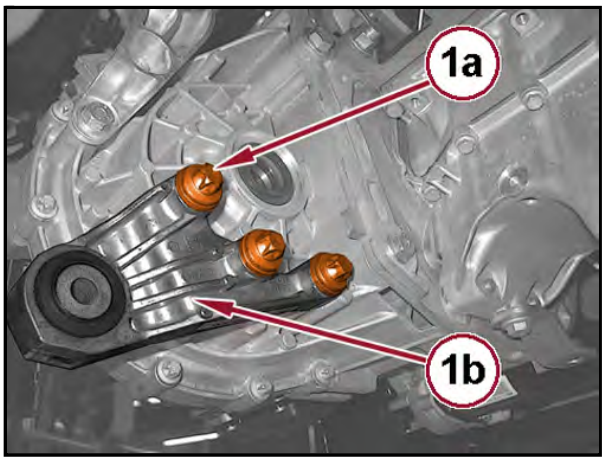
24. Loosen the catalytic converter mounting bracket bolts (1).

25. Remove the bolts (2a), then remove the catalytic converter mounting brackets (2b).

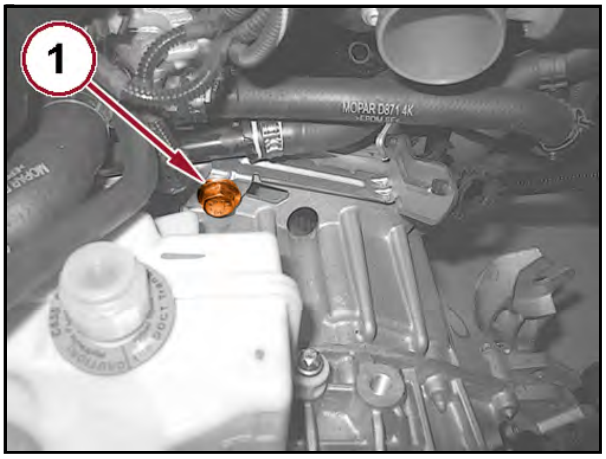


26. Remove the bolts (1a), then remove the lower reaction rod bracket (1b).

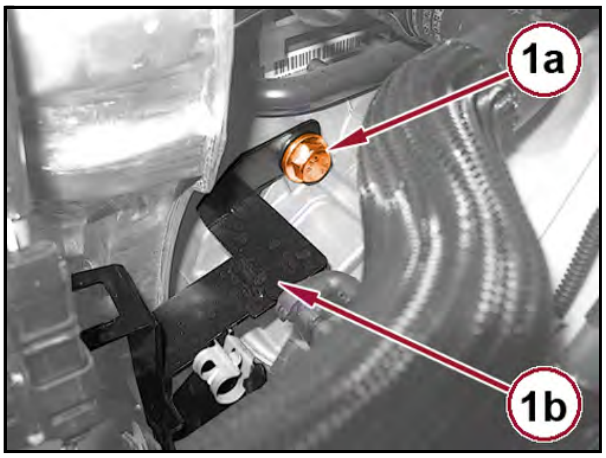
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27. Remove the upper transmission to engine bolt (1), intake side.



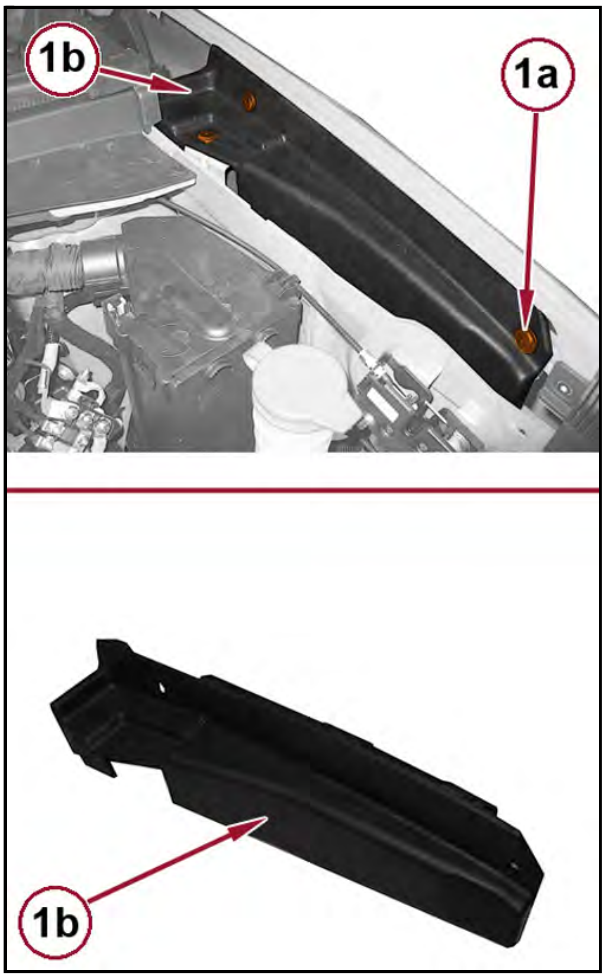
28. Remove the upper transmission to engine bolt (1a), exhaust side, position aside the wiring-routing bracket (1b).



29. Release the buttons (1a) and remove the soundproofing block (1b), left side.

30. Proceed in the same way to remove the soundproofing block, right side.

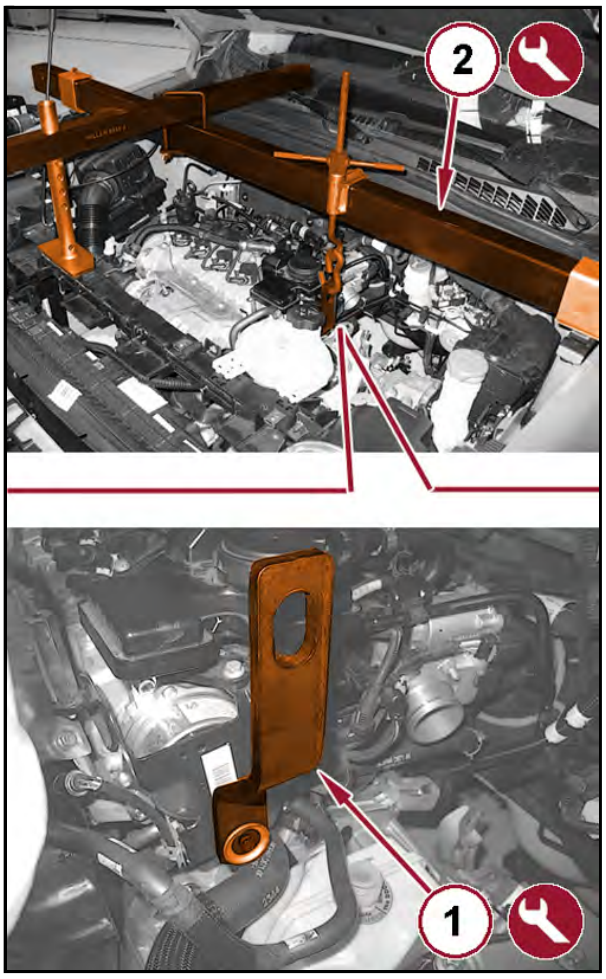
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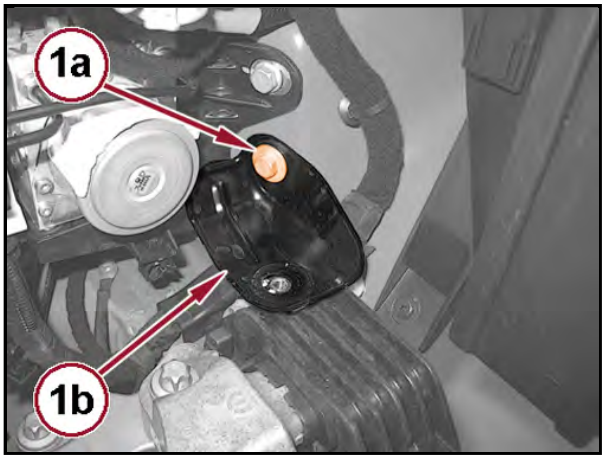
31. Mount the engine support bracket (1) from the 2000040436 engine support kit the as shown in the figure.

32. Position the 2000040436, engine support tools (2).

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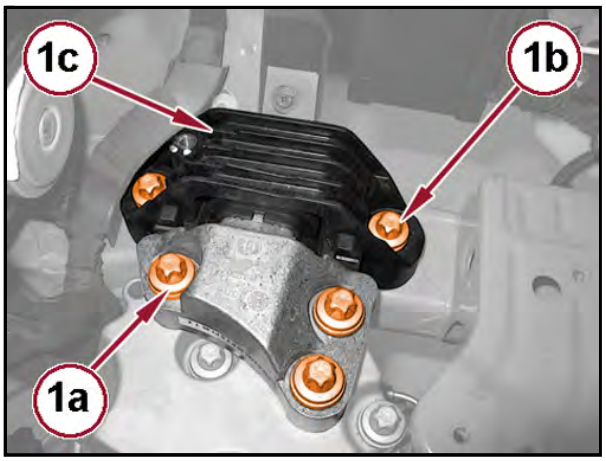


33. Remove the bolt (1a), then remove the heat shield (1b).

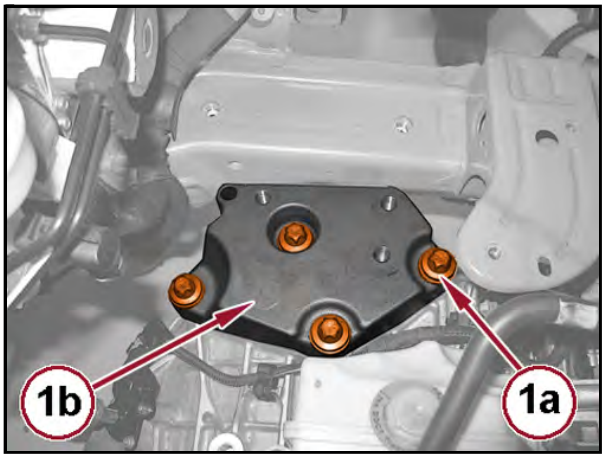


34. Remove the bolts (1a) and (1b), then remove the left engine mount (1c).

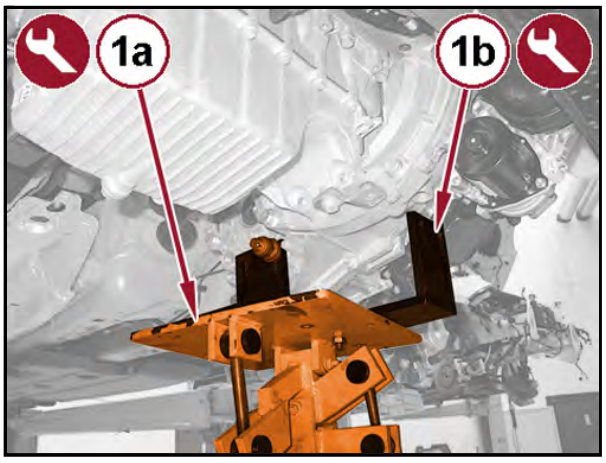
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35. Remove the bolts (1a), then remove the left engine mount adapter (1b) from the transmission.

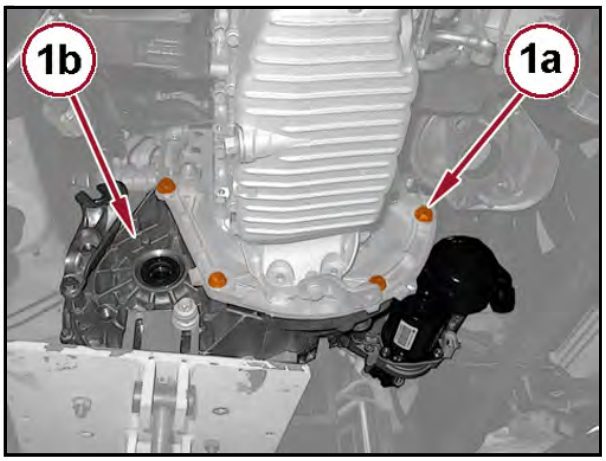


36. Support the transmission using the 1870835001 jack (1a) and the 1870847000 brackets (1b), as shown.



37. Remove the bolts (1a), then remove the transmission (1b).

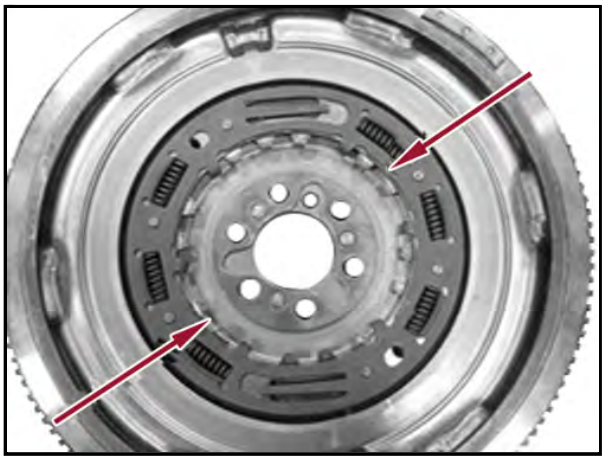
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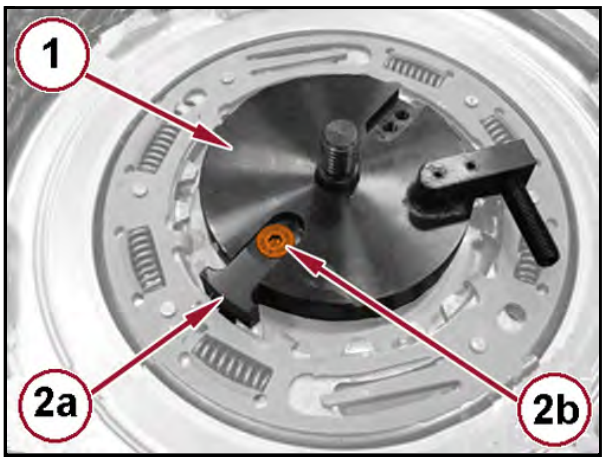
INSTALLATION

CAUTION: **The Dual Mass Flywheel (DMF) must be reset any time the engine and transaxle are separated or damage will result on the first engine crank. Always check a new flywheel to verify it is set up properly or damage may result.**

1. Perform the preliminary flywheel spring reset procedure using tool 2000042100.
2. The references shown in the figure are the locking points for the arms of the tool mounting plate.

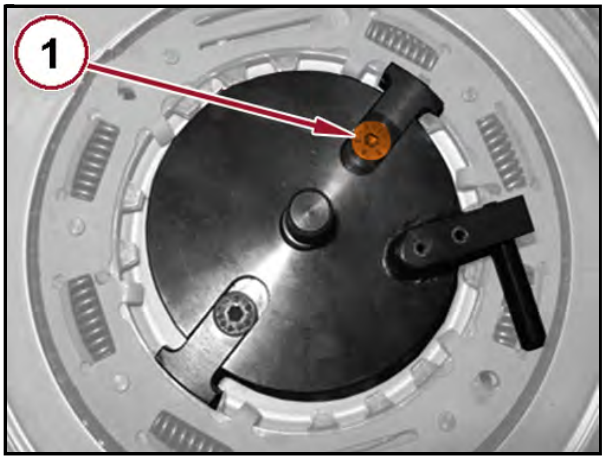


3. Place the mounting plate (1) of the tool 2000042100 in the points shown in the previous figure.
4. Fit the arm (2a) and tighten the screw (2b) using the inner threaded hole.



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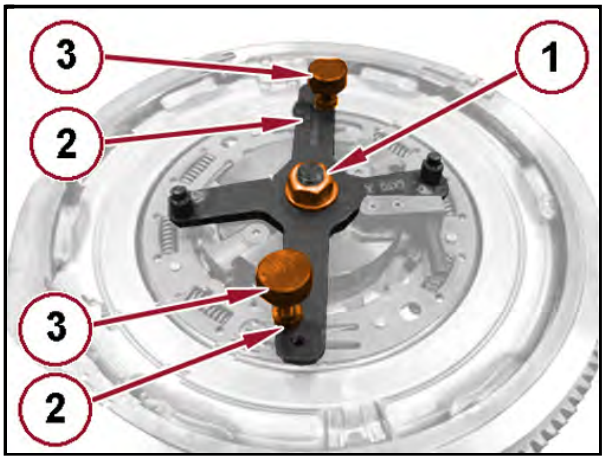
5. Proceed in the same way to fit the second arm (1).



6. Position the tool cross journal with wording "SIDE A" (1) facing upwards.

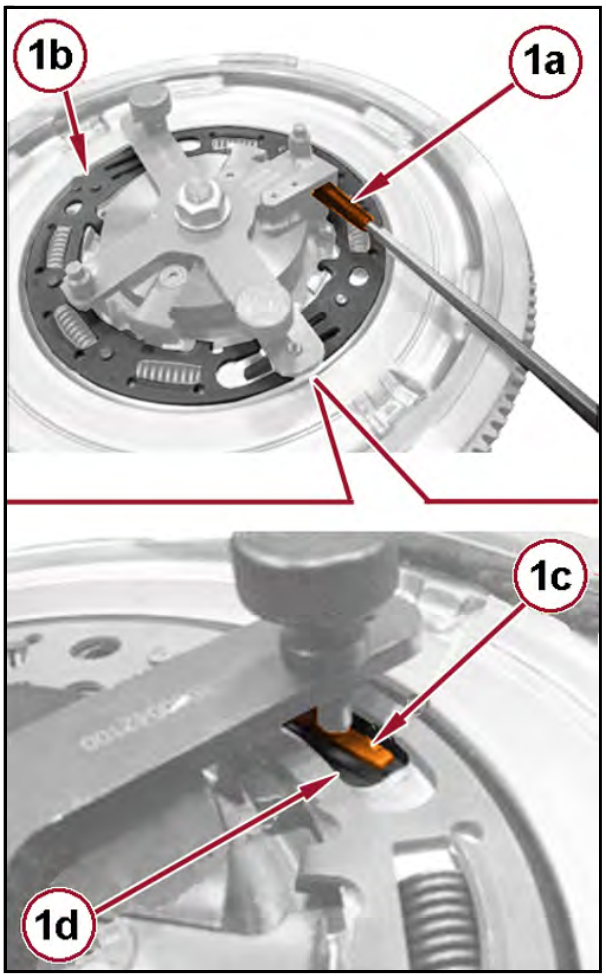


7. Hand tighten the cross journal nut (1).
8. Position the spacers (2) next to the cross journal inner threaded holes.
9. Hand start the pins (3).

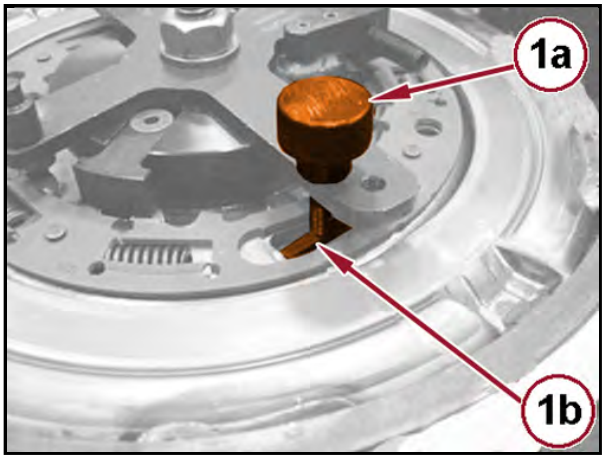


10. Turn the thrust pin (1a) to rotate the spring containment chamber (1b) until the tab (1c) is completely next to the slot (1d).

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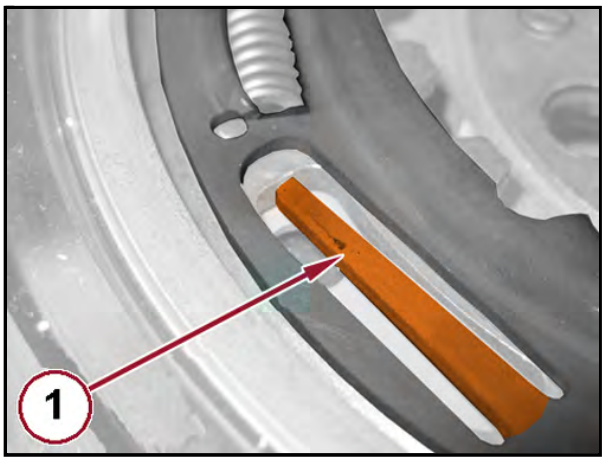
11. Completely tighten the pins (1a) to lower the tabs (1b) until the fixed part of the flywheel is attached.



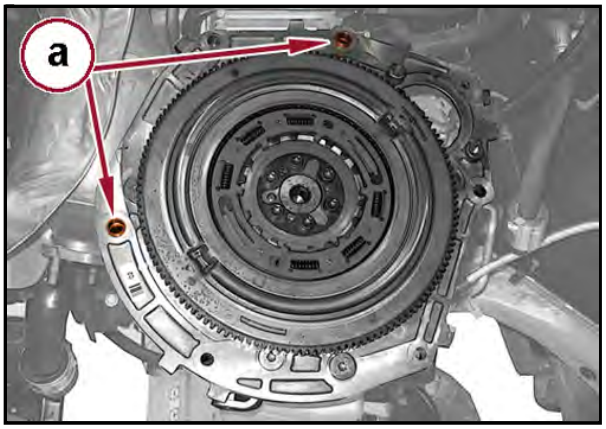
12. The final position of the two tabs (1) for maintaining pre-load is the one shown.

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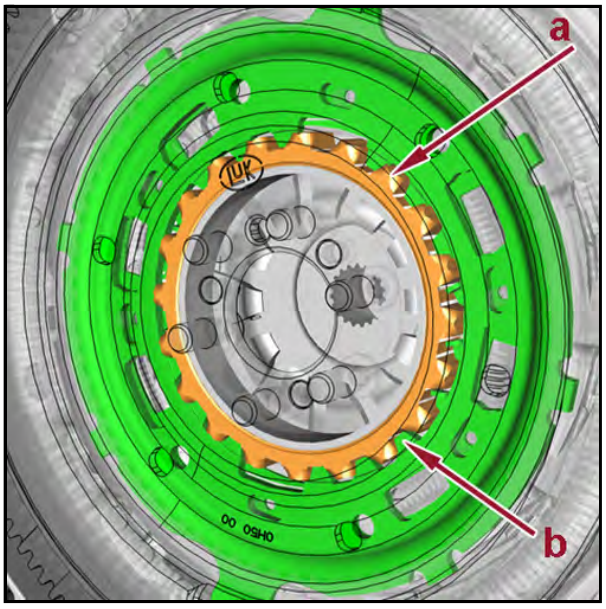
13. Remove the flywheel pre-loading tool 2000042100.



14. Check that the locating dowels (a) are intact before installing the transmission.

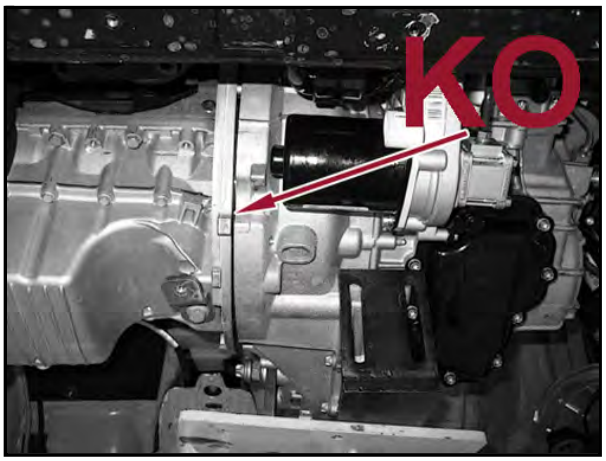


15. Place the transmission in place matching the crown (a) for the clutch mechanism with the engine flywheel teeth (b).



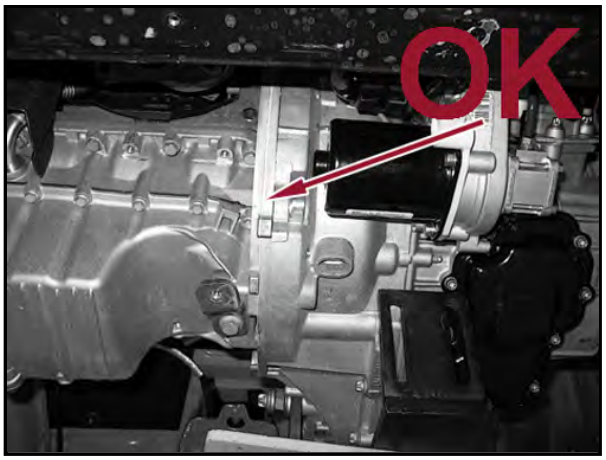
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16. If there is a gap between the engine and transmission as shown in the figure, do not tighten the bolts.



17. Rotate the engine flywheel, to align the clutch with the flywheel.

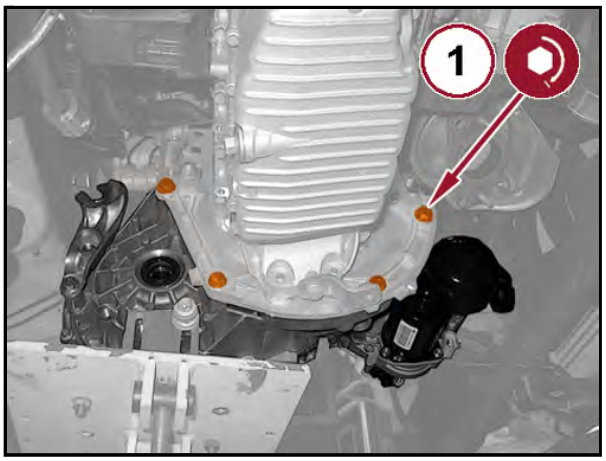
18. Only install the transmission bolts when the engine and transmission are fully mated.



19.

NOTE: **Check for correct clutch to flywheel alignment with the diagnostic scan tool before starting the engine after the transmission is installed.**

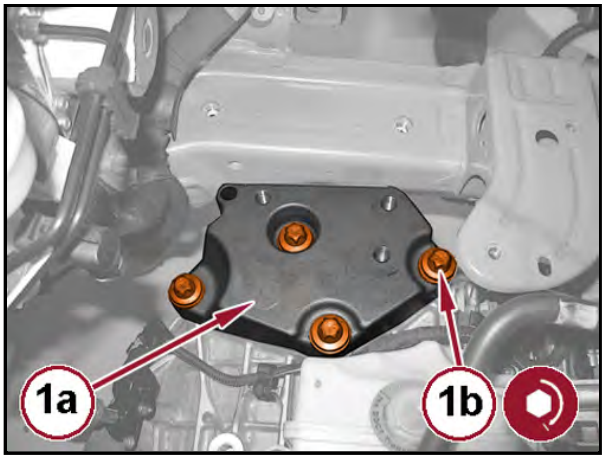
20. Tighten the lower transmission to engine bolts (1) to the proper (Torque Specifications) .



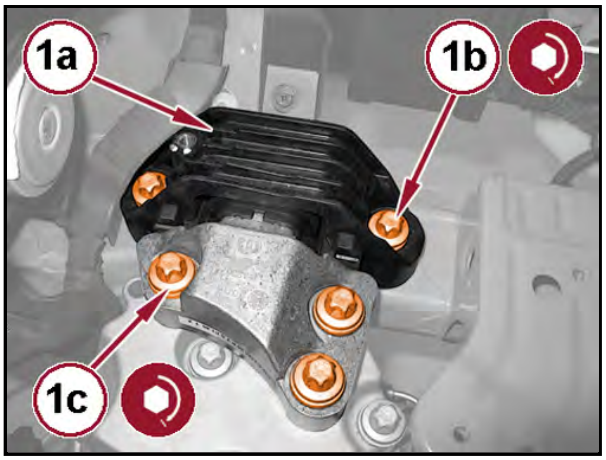
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21. Remove the transmission jack.

22. Install the left engine mount adapter (1a) on the transmission and tighten the screws (1b) to the proper (Torque Specifications) .



23. Install the left side engine mount (1a) and tighten the bolts (1b) and (1c) to the proper (Torque Specifications) .



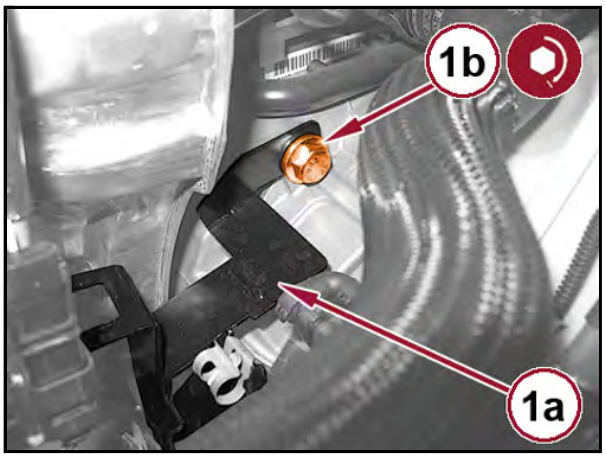
24. Install the heat shield and securely tighten the bolt.

25. Remove the powertrain support tools 2000040436.

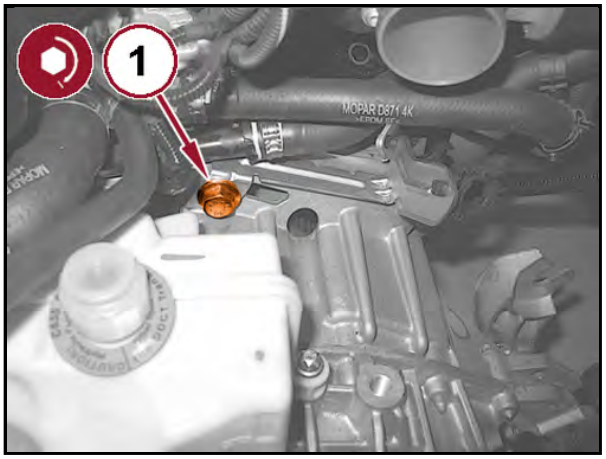
26. Install the soundproofing blocks.

27. Position the wiring-routing bracket (1a) in position and tighten the transmission to engine upper bolt (1b) to the proper (Torque Specifications) .

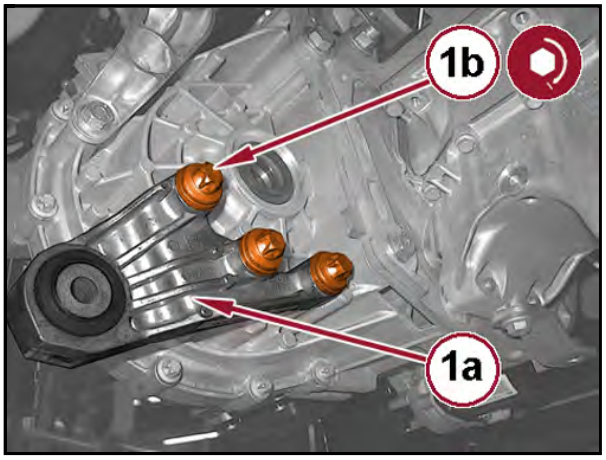
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28. Tighten the upper transmission to engine bolt to the proper (Torque Specifications) .



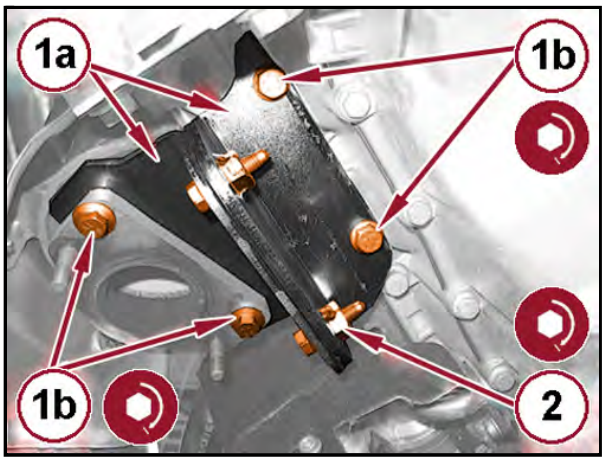
29. Install the lower reaction rod bracket (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



30. Install the pre-catalytic converter mounting brackets (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .

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31. Tighten the catalytic converter mounting bracket bolts (2) to the proper (Torque Specifications) .



32. Check that the gear lever is in "Park".
33. Move back the "Park" engagement cable terminal sliding clip and fit it in the bracket manually, until fully connected.
34. Release the sliding clip and make sure that the cable is secure in the bracket.
35. Connect the "Parking" engagement cable to the lever on the transmission.
36. Connect the sensor wire harness connector for the gear selection/engagement control activation unit.
37. Connect the solenoid valve wire harness connector for the gear selection/engagement control activation unit.
38. Connect the ground cable and tighten the screw.
39. Position the charge air cooler outlet tube in the vehicle and tighten the clamp at the throttle body.
40. Tighten the charge air cooler outlet tube screw and nut to the wire harness routing bracket.
41. Position the coolant hose and engage the retaining clips.
42. Connect the charge air cooler outlet tube to charge air cooler.
43. Connect the oxygen sensor wire harness connector on the pre-catalytic converter.
44. Connect the dual clutch electric pump wire harness connector and engage the transmission wiring.

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45. Install the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .

46. Install the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .

47. Install the halfshafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .

48. Fill the transmission fluid (Refer to 21 - Transmission and Transfer Case/Automatic - C635 DDCT/FLUID/Standard Procedure) .

49. Install the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

50. Install the front fascia (Refer to 13 - Frame and Bumpers/Bumpers/FASCIA, Front/Removal and Installation) .

51. Install the left and right front wheelhouse splash shields (Refer to 23 - Body/Exterior/SHIELD, Splash/Removal and Installation) .

52. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

53. Install both front tire and wheel assemblies (Refer to 22 - Tires and Wheels/Removal and Installation) .

54. Align the front end (Refer to 02 - Front Suspension/Wheel Alignment/Specifications) .

    NOTE: Before starting the engine after the transmission is installed, check the correct engine/transmission mating with the diagnosis scan tool according to the procedure below.

55. **CHECK THE ENGINE/transmission MATCHING WITH THE DIAGNOSIS EQUIPMENT**

    - Connect the diagnosis equipment to the transmission control unit.
    - Turn the key "ON".
    - Check that there is no error "P2949 - ODD GEAR CLUTCH UNEXPECTED OPENING".
    - Check that the readings from signals for "ODD CLUTCH POSITION" and "EVEN CLOSING CLUTCH POSITION" correspond; the correct value to be measured is 10 +/- 1 mm.
    - If an even clutch position value lower than 7.8 mm is found, the clutch unit and flywheel splines are incorrectly installed. In this case, the "twin clutch unit" is damaged and must be replaced.
    - In addition, check the integrity of the six tabs locking the engine flywheel armature. If even only one tab is broken, replace the engine flywheel.

56. Remove the car from the lift.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / Special Tools

SPECIAL TOOLS

Tool (EMEA)	Tool (NAFTA)	Name	Function
1870835001	*	Hydraulic Jack	Transmission Removal and Installation
1870847000	*	Brackets	Transmission Removal and Installation
2000036100	*	Installer	Odd gear Clutch Actuator Rod Seal Installer
2000036200	*	Installer	Input Shaft Seal Installer
2000040436	8534B	Support Kit	Power Train Support
2000042100	10310	Dual Mass Flywheel Reset Tool	Flywheel Reset Tool
*Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

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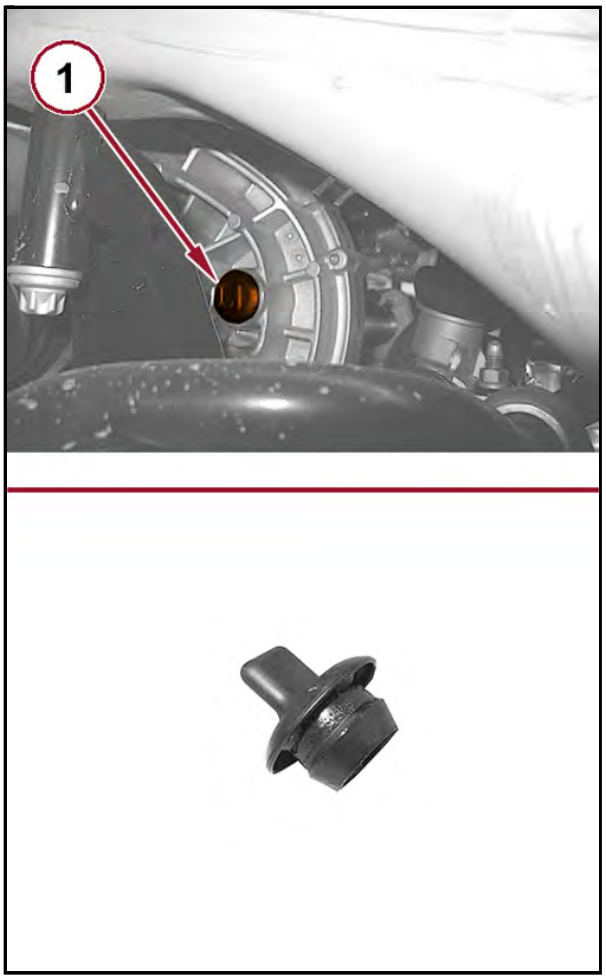
21 - Transmission and Transfer Case / Automatic - C635 DDCT / FLUID / Standard Procedure

DRAINING AND FILLING

NOTE: Changing the manual gearbox oil is not a scheduled maintenance operation and is only carried out during overhaul operations involving removing/refitting of internal components. Therefore, in all other removing/refitting operations, the manual gearbox oil must be reused.

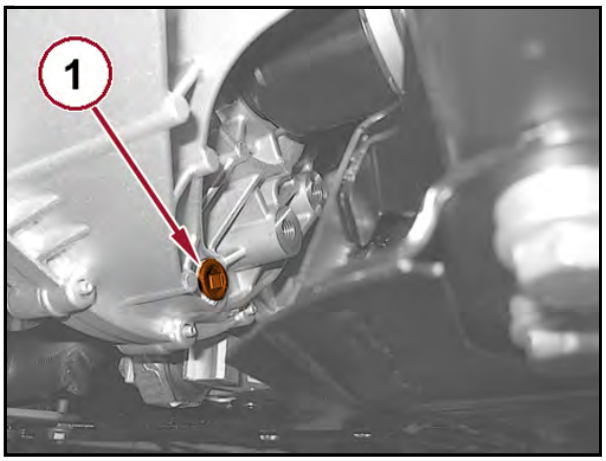
NOTE: The collection of manual gearbox oil and its storage before use must be made in a clean container, with a protection cover.Possible foreign bodies in the container or in the storage area can compromise the reuse of the manual gearbox oil.

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Remove the gearbox casing filler plug (1).



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NOTE: **Do not let the fluid disperse into the environment as uncontrolled dispersion of this product causes pollution.**



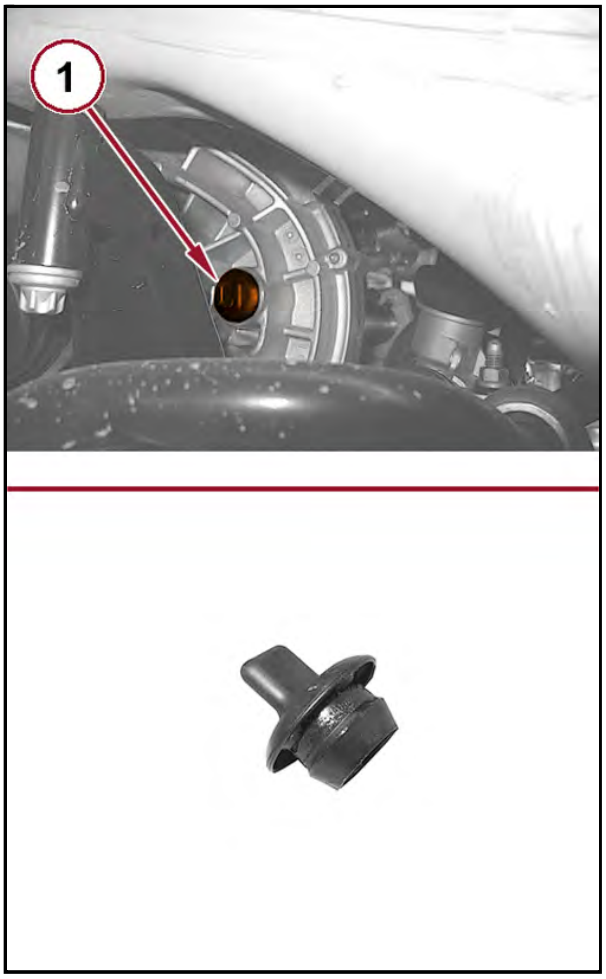
4. Unscrew the gearbox oil drain plug (1) and drain the oil into a suitable container.
5. Clean and install the drain plug (1) , tighten it to the proper (Torque Specifications) .
6. Fill the transmission to the bottom of the fill plug opening with the specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .
7. Clean the filler plug and install.
8. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
9. Remove the support and lower the vehicle.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / FLUID / Standard Procedure

TRANSMISSION FLUID LEVEL CHECK

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the gearbox casing filler plug (1) and check that the fluid level reaches the bottom of the fill plug opening.
3. If necessary, add fluid to the bottom of the fill plug opening with the specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .
4. Clean the filler plug (1) and install.



5. Remove the support and lower the vehicle.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / FLUID / Standard Procedure

HYDRAULIC SYSTEM FILTER

REMOVAL

1. Position the vehicle on the lift.

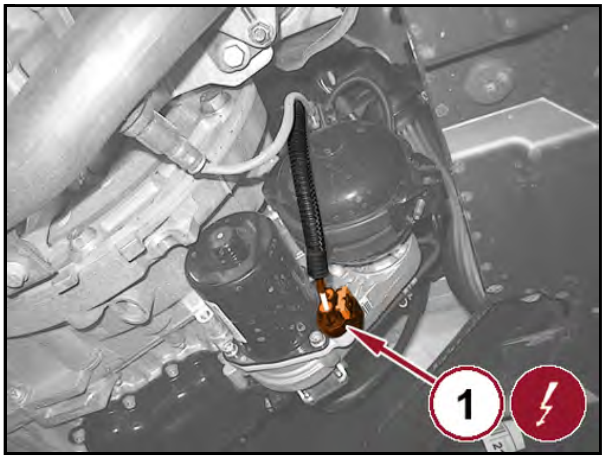
2. Connect the diagnostic scan tool and perform the "accumulator depressurization" procedure.

   NOTE: After replacing/refitting the filter, connect the diagnostic scan tool and bleed the clutch.

3. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

4. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

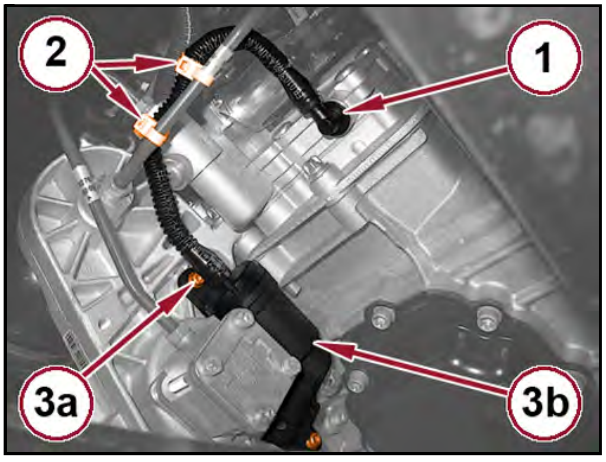
5. Disconnect the electric pump wire harness connector (1).



6. Disconnect the hose from solenoid valve unit to filter, solenoid valve unit side (1).

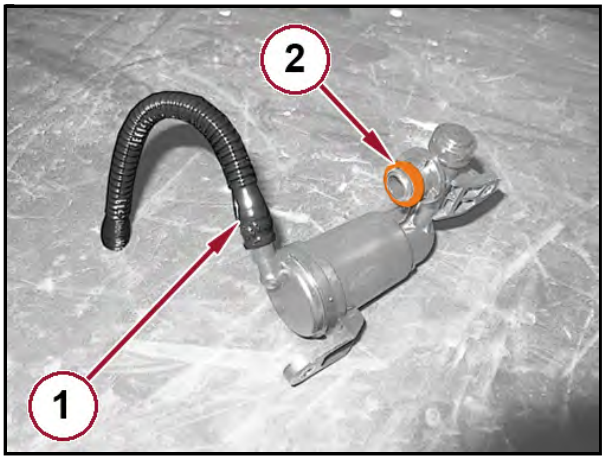
7. Using a suitable tool, remove the hose retaining tie straps (2).

8. Undo the screws (3a) and remove the filter (3b) complete with hose.



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9. Disconnect the hose (1) from the filter.
10. Remove the O-ring (2) from the filter connector.



INSTALLATION

1. Install a **NEW** hose on the filter.
2. Position the filter with the **NEW** O-ring in place and tighten the screws to the proper (Torque Specifications) .
3. Connect the hose from the filter to the solenoid valve. Install new tie straps.
4. Fill the fluid the reservoir with specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .
5. Connect the electric pump wire harness connector.
6. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
7. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.
8. After replacing/refitting the filter, connect the diagnostic scan tool and bleed the clutch.
9. Remove the car from the lift.

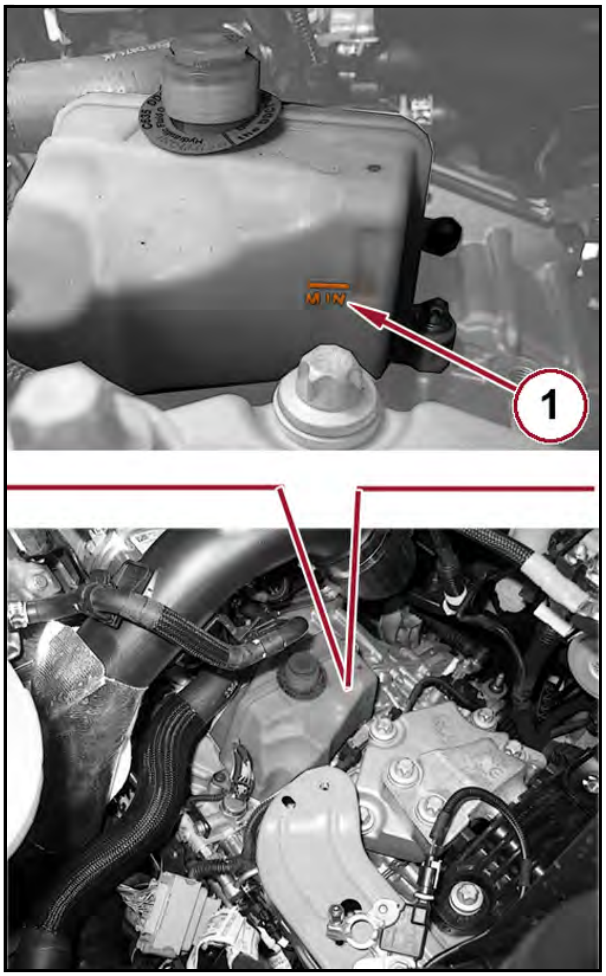
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21 - Transmission and Transfer Case / Automatic - C635 DDCT / FLUID / Standard Procedure

HYDRAULIC FLUID LEVEL CHECK AND FILLING

NOTE: The dual clutch transmission control hydraulic circuit oil level should be checked with the vehicle on a flat surface, the engine switched off and cold.

1. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
2. Pressurize the dual clutch transmission hydraulic circuit by opening the drivers door to activate the electric pump.
3. Check that the level at or above the MIN reference mark on the reservoir.
4. If the level is below the MIN mark, remove the cap and add the recommended fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) until it reaches the MAX mark.



NOTE: **The dual clutch transmission oil consumption is very limited. If the level is below the MIN. mark, make sure that there are no leaks from the entire circuit.**

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / RESERVOIR, Hydraulic Circuit / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

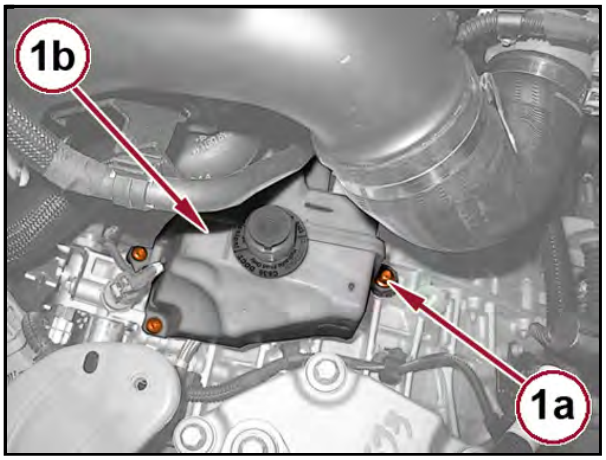
1. Connect the diagnosis scan tool and perform the "accumulator depressurization" procedure.

   NOTE: After replacing/refitting the reservoir, connect the diagnosis scan tool and bleed the clutch.

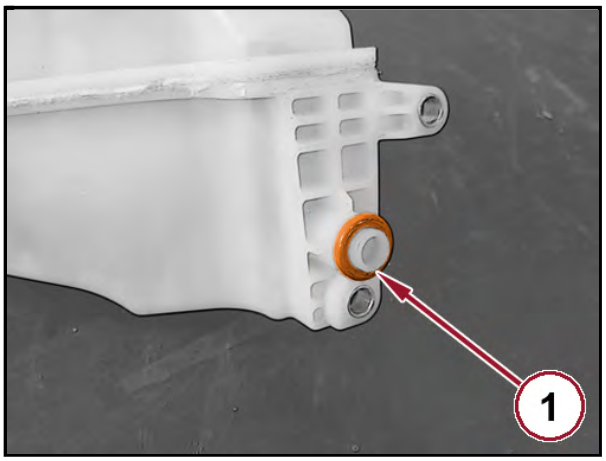
2. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .

3. Remove the reservoir cap and siphon the oil using a suitable tool.

4. Remove the screws (1a) and remove the reservoir (1b).



5. Remove the O-ring (1) from the reservoir connector.



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INSTALLATION

1. Place the reservoir in position, with the **NEW** O-ring and tighten the screws to the proper (Torque Specifications) .

2. Install the battery tray (Refer to 08 - Electrical/Battery System/BATTERY/Removal and Installation) .

3. Fill the hydraulic circuit with the specified oil (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .

4. Using the diagnostic scan tool, bleed the hydraulic circuit.

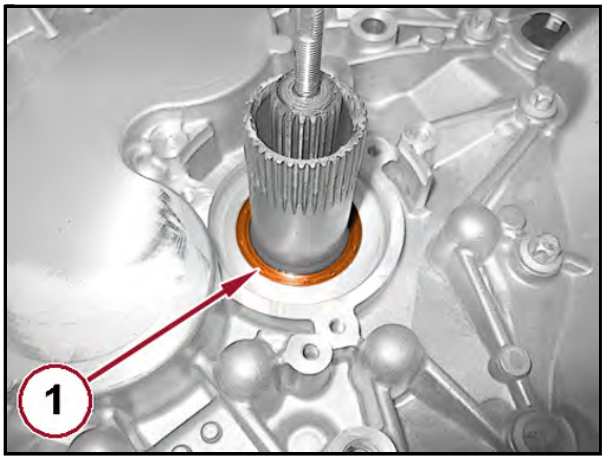
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21 - Transmission and Transfer Case / Automatic - C635 DDCT / SEAL, Input Shaft / Removal and Installation

REMOVAL AND INSTALLATION

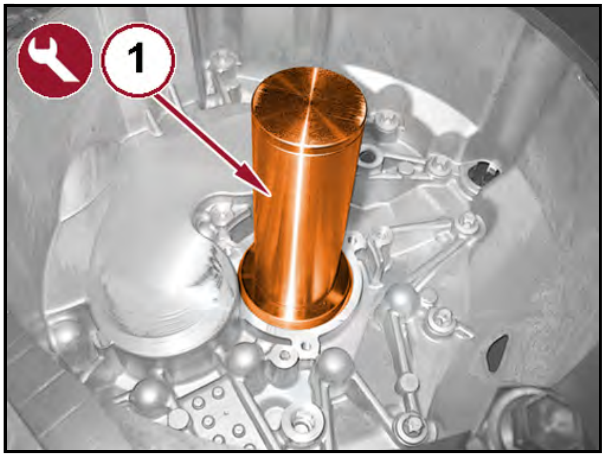
REMOVAL

1. Remove the clutch discs (Refer to 06 - Clutch/DISC, Clutch/Removal and Installation) .
2. Remove the odd gear slave cylinder (Refer to 06 - Clutch/DISC, Clutch/Removal and Installation) .
3. Using a suitable tool, carefully remove the input shaft oil seal (1) from the transmission without damaging the seal bore or input shaft.



INSTALLATION

1.
2. Using the tool 2000036200 (1), install a new seal ring for the outside main shaft on the gearbox/transmission casing.
3. Install the odd gear slave cylinder (Refer to 06 - Clutch/CYLINDER, Clutch Slave/Removal and Installation) .
4. Install the clutch discs (Refer to 06 - Clutch/DISC, Clutch/Removal and Installation) .



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21 - Transmission and Transfer Case / Automatic - C635 DDCT / SHIFTER, Floor Console / Removal and Installation

SHIFTER BEZEL

REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Using a suitable tool to release the clips (1a) and lift the bezel with the boot (1b).
3. Release the clips (2a) and the retainers (2b) and lift the boot (2c).



4. Disconnect the wire harness connector (1) from the shifter bezel (2).
5. Remove the shifter bezel (2) from the vehicle.

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INSTALLATION

1. Position the shifter bezel in the vehicle.
2. Connect the wiring harness connector to the shifter bezel.
3. Install the shifter boot to the shifter bezel.
4. Install the shifter bezel to the console.
5. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / SHIFTER, Floor Console / Removal and Installation

SHIFTER KNOB

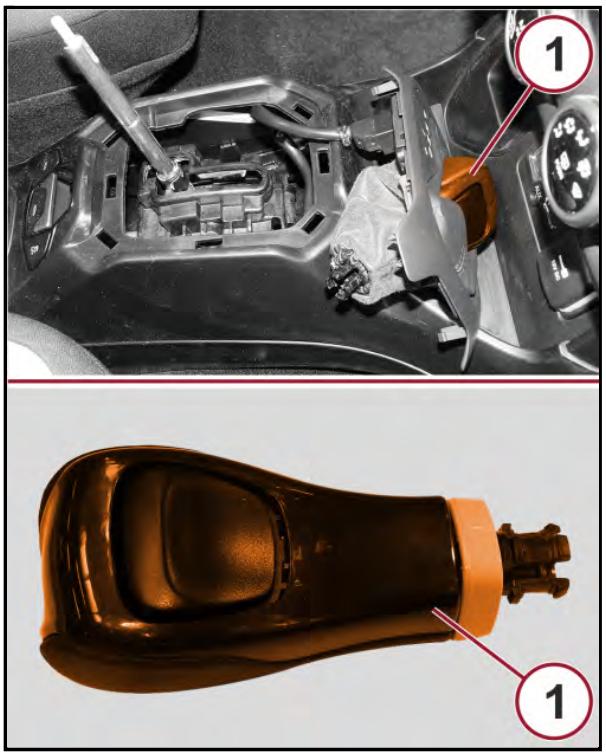
REMOVAL

1. Using a suitable tool to release the clips (1a) and lift the bezel with the boot (1b).
2. Using a suitable tool to remove the retaining clip (2).



3. Remove the knob (1) separating it from the shifter boot.

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INSTALLATION

1. Insert the knob in the shifter boot.
2. Install the knob on the gear shift lever and secure it with a new retaining clip.
3. Install the shifter bezel engaging the clips in their retainers.

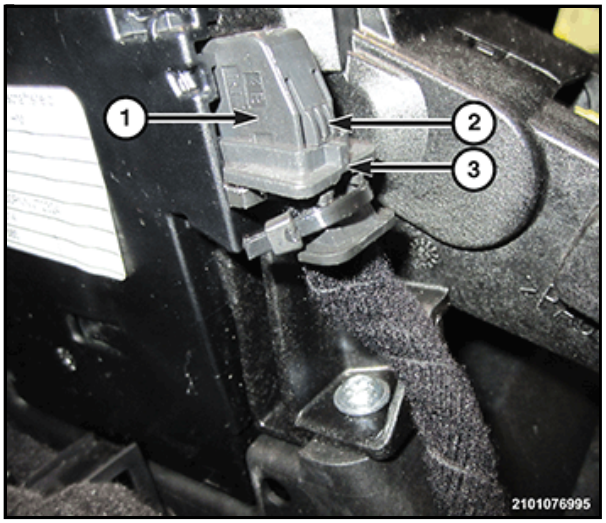
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21 - Transmission and Transfer Case / Automatic - C635 DDCT / SHIFTER, Floor Console / Removal and Installation

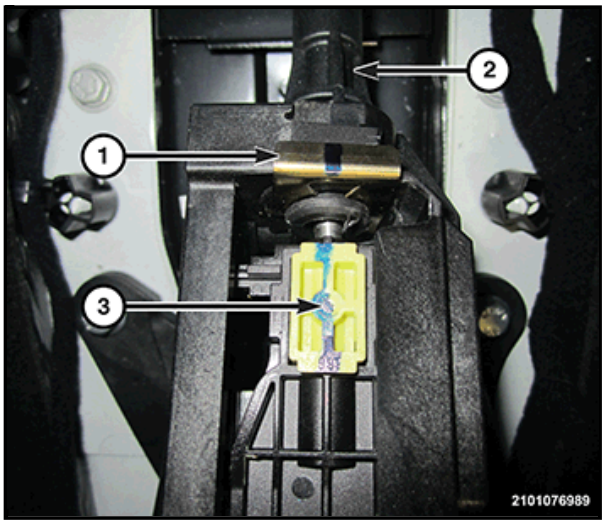
GEAR SHIFTER

REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Remove the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .
3. Make sure the shifter is in the Park position.
4. Release the wire harness connector (1) from the shifter assembly by pressing the release tab (2) while opening the bail (3).



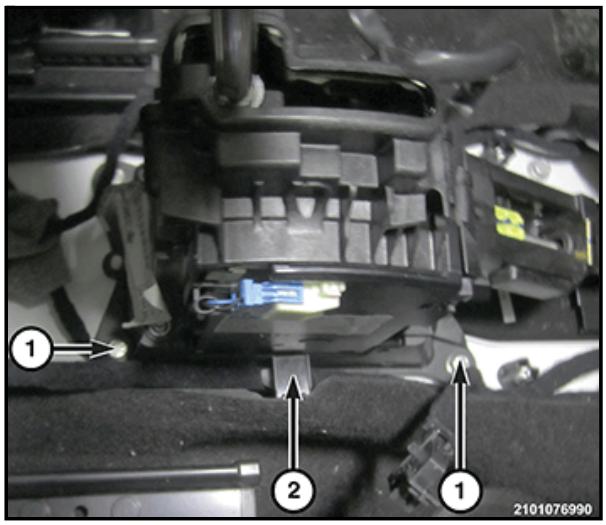
5. Release the park engagement cable adjuster lock (3) by prying upward with a suitable tool.
6. Remove the park engagement cable retaining clip (1).
7. Separate the park engagement cable (2) out of the shifter.



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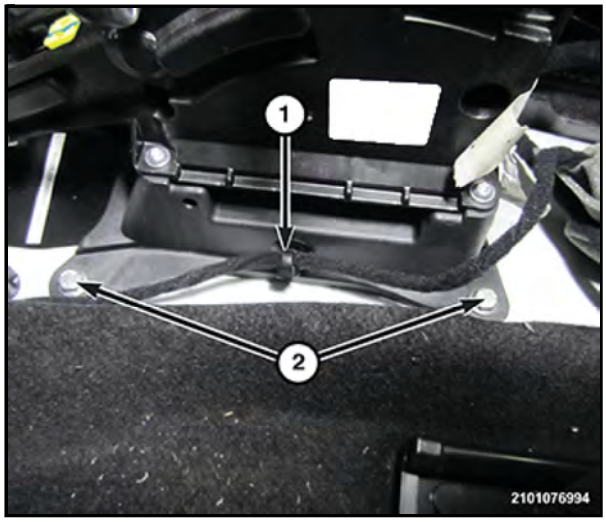
8. Release the wire harness from right side retainer (2).

9. Remove the right side shifter mounting bolts (1).



10. Detach the wire harness retaining clip (1) from the shifter.

11. Remove the left side shifter mounting bolts (2).



12. Remove the shifter from the vehicle.

INSTALLATION

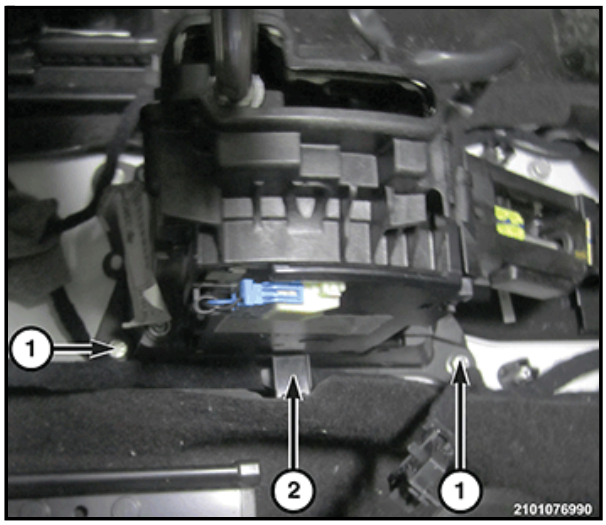
1. Make sure the transmission is in the park position.

2. Position the shifter in the vehicle and hand start the bolts.

3. Tighten the right side shifter mounting bolts (1).

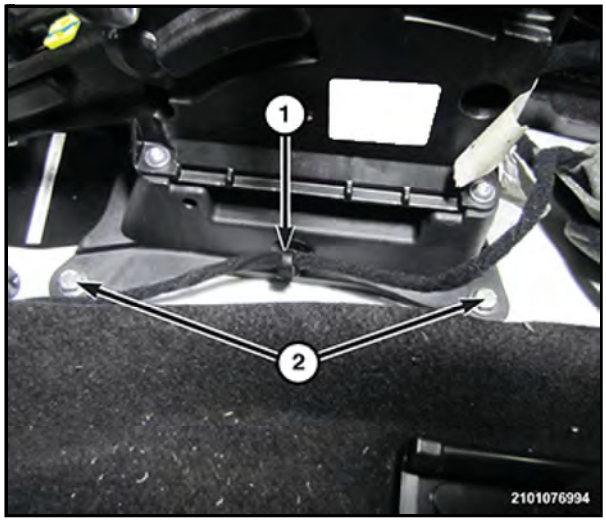
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4. Secure the wiring harness to the right side harness retainer (2).



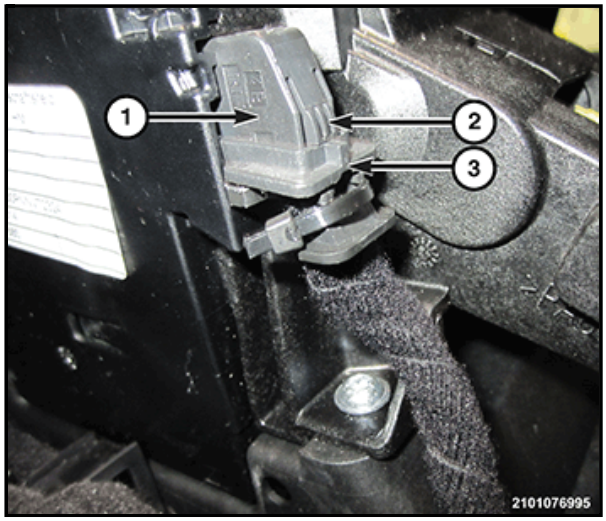
5. Tighten the left side shifter mounting bolts (2).

6. Connect the wire harness retainer (1) to the shifter assembly.



7. Connect the shifter wire harness connector (1).

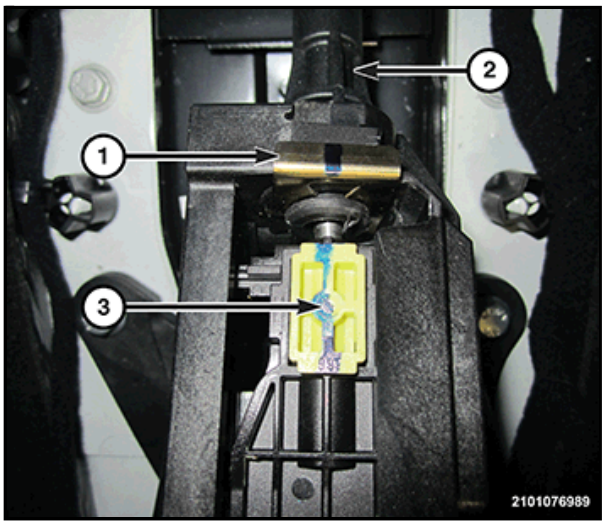
8. Position the park engagement cable into the shifter housing.



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9. Install the park engagement cable retainer (1).

10. With the shifter in the Park position, push the park engagement cable adjuster lock (3) down so that it is flush to the shifter housing as shown.



11. Verify shifter operation, and if necessary, adjust the shifter cable.

12. Install the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .

13. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / UNIT, Smart Drive / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

NOTE: If the pump current adjustment control unit is replaced, connect the diagnosis equipment and carry out the "Data Set Deletion" procedure.

NOTE: In the event of simultaneous replacement of the electronic control unit (TCU) and of the electric pump current adjustment control unit, the "data set deletion" procedure must be performed after the "historical data" rewriting procedure.

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

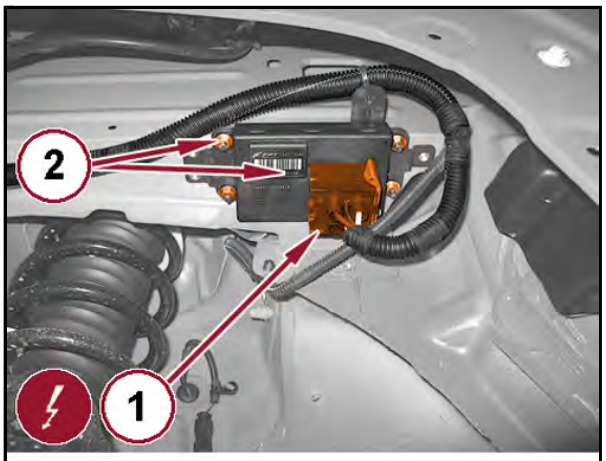
2. Remove the left front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

3. Remove the left front wheel well splash shield (Refer to 23 - Body/Exterior/SHIELD, Splash/Removal and Installation) .

4. Disconnect the wire harness connector (1) for the pump current adjustment control unit.

5. Remove the nuts and remove the pump current adjustment control unit (2).

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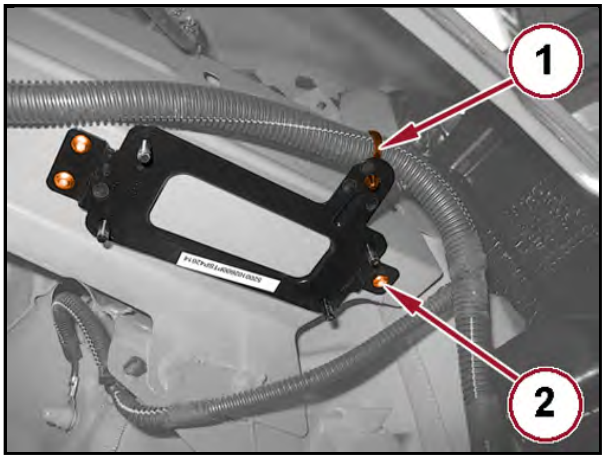




6. If necessary, disconnect the wiring harness retaining clip (1).

7. If necessary, using a suitable tool remove the rivets (2) fixing the pump current adjustment control unit bracket.

8. Remove the pump current adjustment control unit bracket.



INSTALLATION

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1. If removed, place the pump current adjustment control unit bracket in position and install it using new rivets.

2. If removed, install the wiring harness in the retaining clip.

3. Install the pump current adjustment control unit in position and tighten the nuts.

4. Connect the wire harness connector for the pump current adjustment control unit.

5. Install the left front wheel well splash shield (Refer to 23 - Body/Exterior/SHIELD, Splash/Removal and Installation) .

6. Install the left front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

7. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

8. If the pump current adjustment control unit is replaced, connect the diagnosis equipment and carry out the "Data Set Deletion" procedure.

9. In the event of simultaneous replacement of the electronic control unit (TCU) and of the electric pump current adjustment control unit, the "data set deletion" procedure must be performed after the "historical data" rewriting procedure.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / UNIT, Transmission Hydraulic Power / Removal and Installation

POWER UNIT

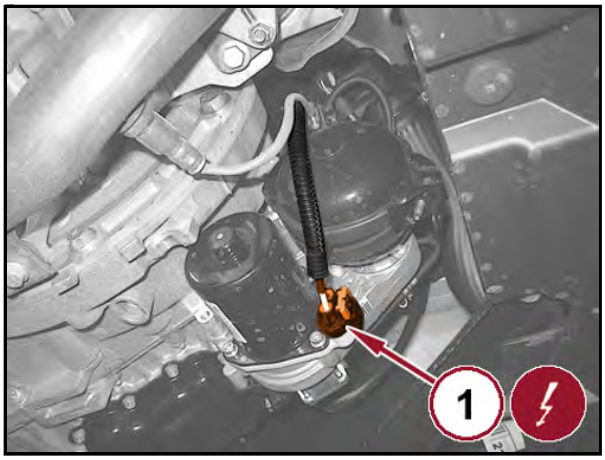
REMOVAL

NOTE: **If the power unit is replaced, connect the diagnostic scan tool and perform the "data set deletion" procedure.**

In case of simultaneous replacement of the transmission Control Module (TCM) and the power unit, the "data set deletion" must be performed AFTER the "historical data" rewriting procedure.

After replacing or reinstalling the power unit, connect the diagnostic scan tool and bleed the clutch.

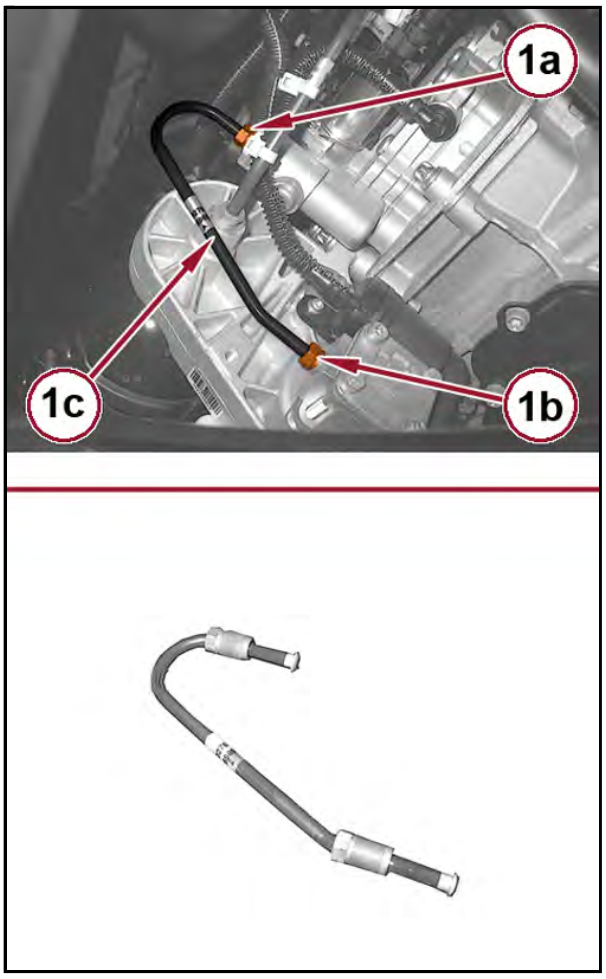
1. Position the vehicle on the lift.
2. Connect the diagnostic scan tool and perform the "accumulator depressurization" procedure.
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Disconnect the wire harness connector (1) for the electric pump.



5.
6. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
7. Unscrew the flare nuts (1a and 1b) , then remove the tube (1c) from the electric pump to

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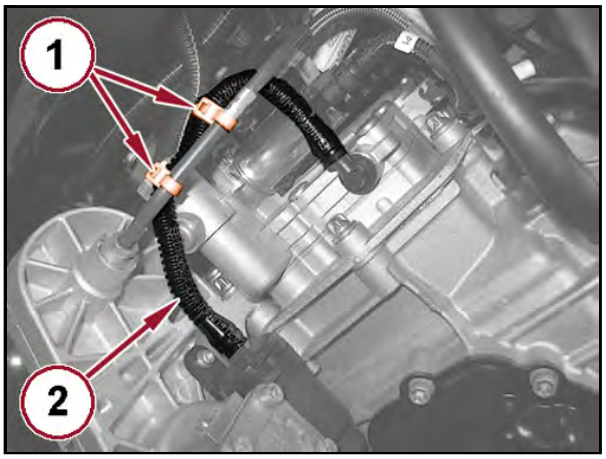
the valve body.



8. Using a suitable tool, remove the filter to valve body hose retaining bands (1).

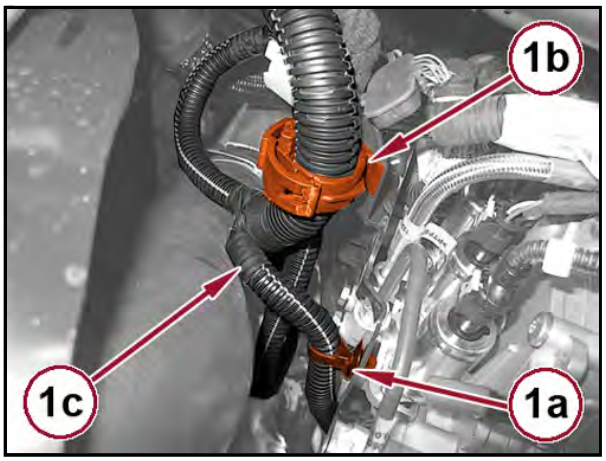
   NOTE: This hose (2) must be replaced at every removal.

9. Remove the filter to valve body hose (2) complete with gaskets.

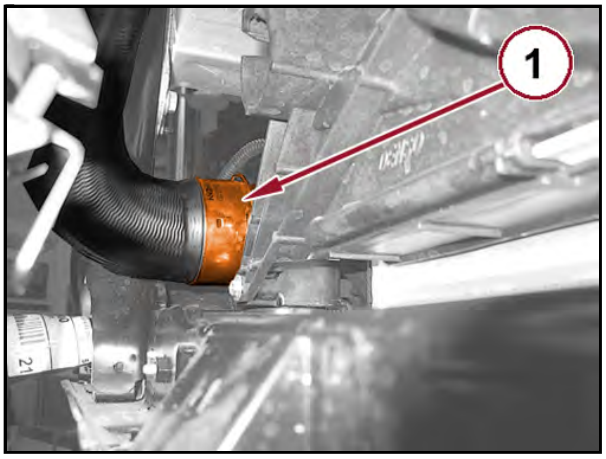


10. Disconnect the clip (1a), open the clip (1b) and release the wiring (1c) from the wire harness routing bracket.

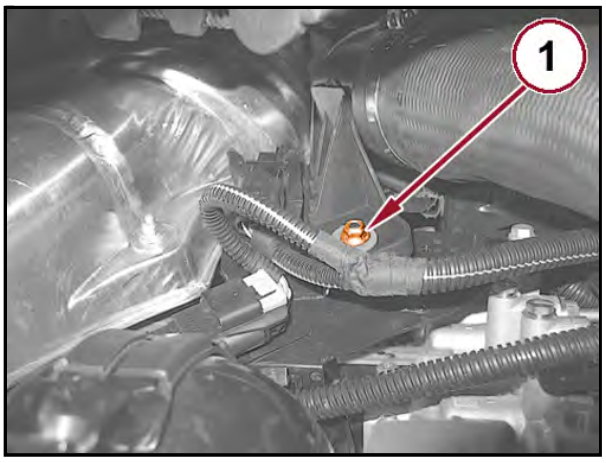
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11. Disconnect the quick coupling (1) for the charge air cooler outlet hose at the charge air cooler.



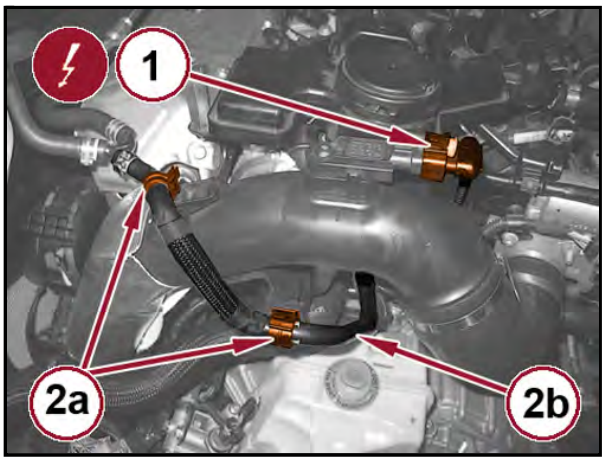
12. Remove the charge air cooler outlet hose nut (1) at the wire harness routing bracket.



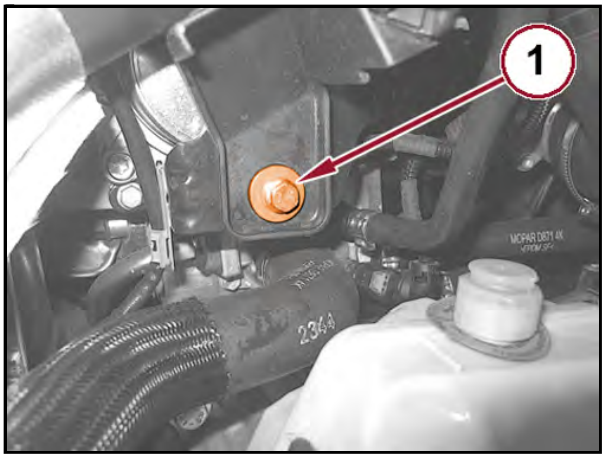
13. Disconnect the pressure relief sensor wire harness connector (1).

14. Open the clips (2a) and release the coolant hose (2b).

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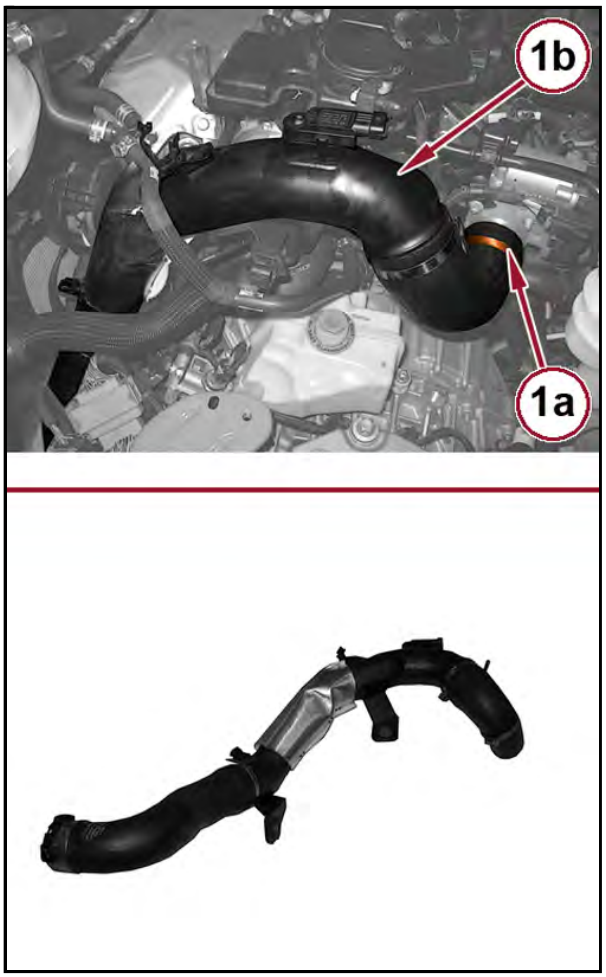


15. Remove the charge air cooler outlet hose bolt (1) at the wire harness routing bracket.

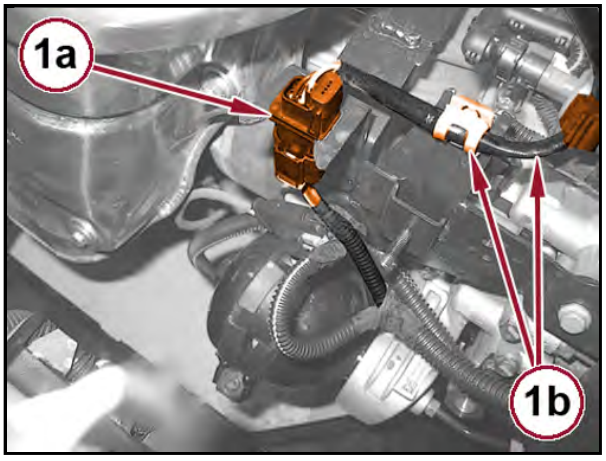


16. Loosen the clamp (1a) and remove the charge air cooler outlet hose (1b).

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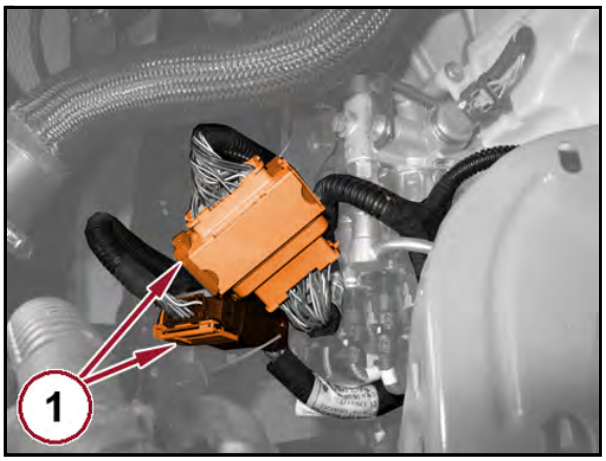


17. Disconnect the wire harness connector (1a) and the routing clip (1b) from the wire harness routing bracket.

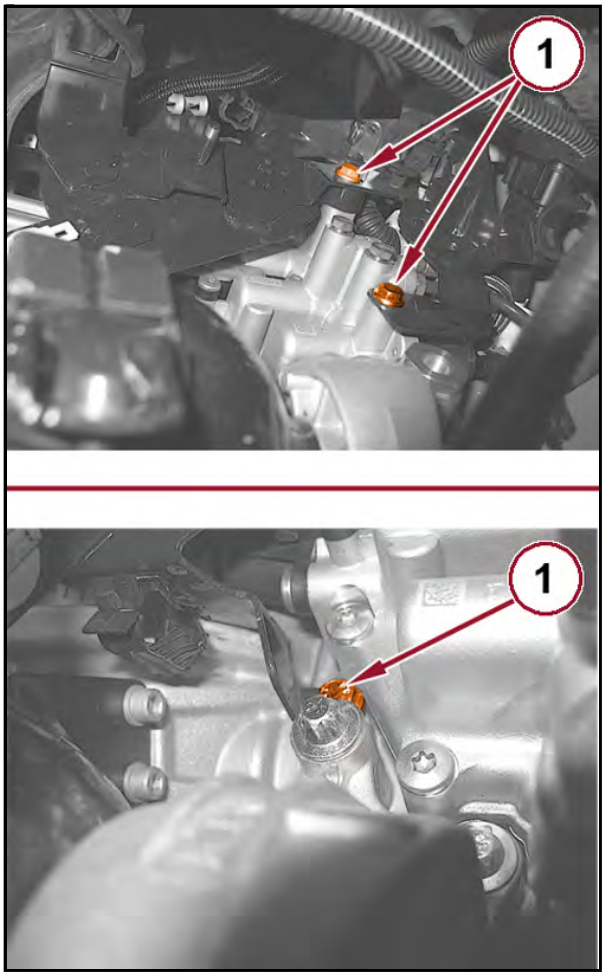


18. Disconnect the solenoid valve and the sensor wire harness connectors (1) from the wire harness routing bracket.

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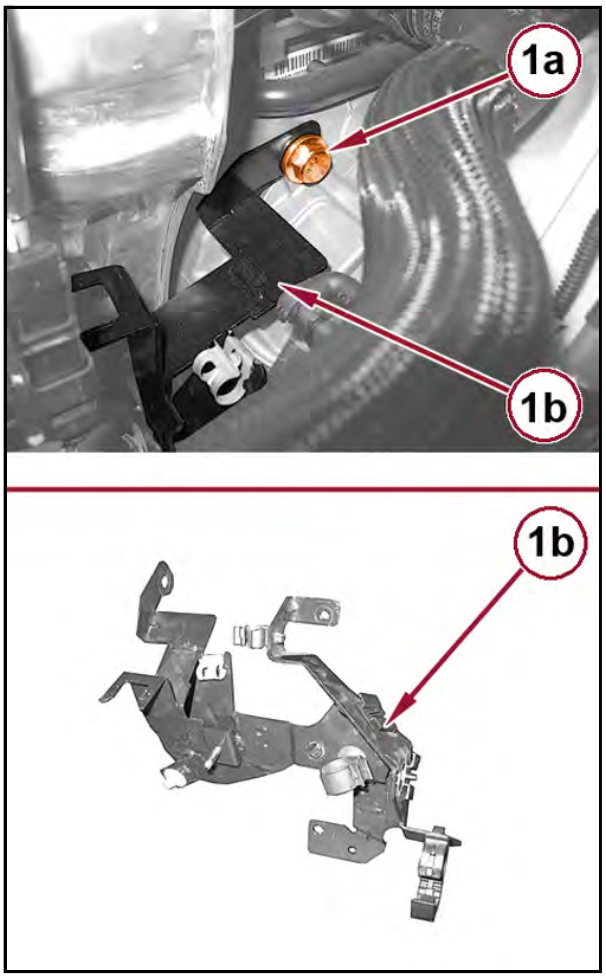


19. Remove the lower bolts (1) from the wire harness routing bracket.

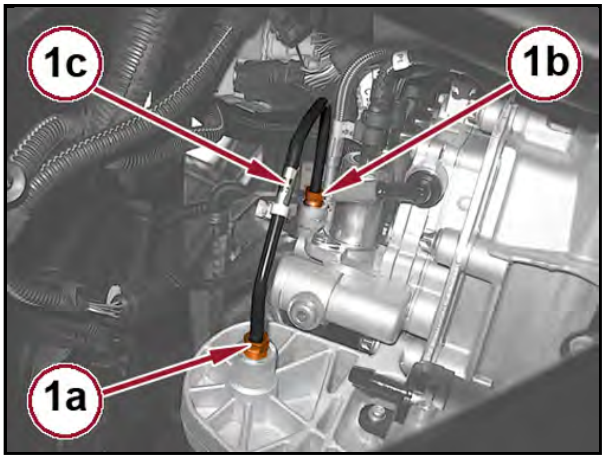


20. Remove the transmission to engine bolt (1a) and remove the wire harness routing bracket (1b).

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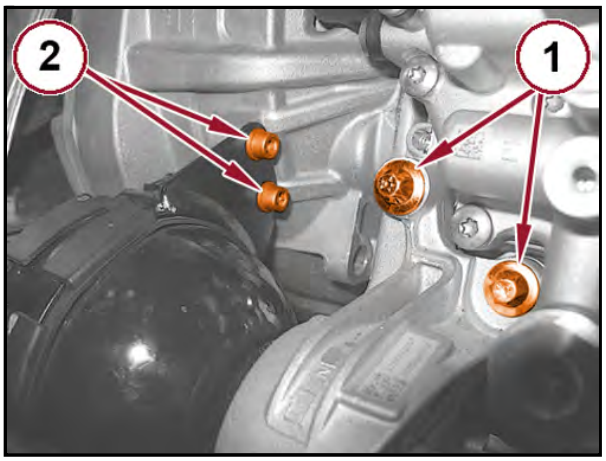
21. Unscrew the flare nuts (1a and 1b), then remove the pressure accumulator to valve body tube (1c).



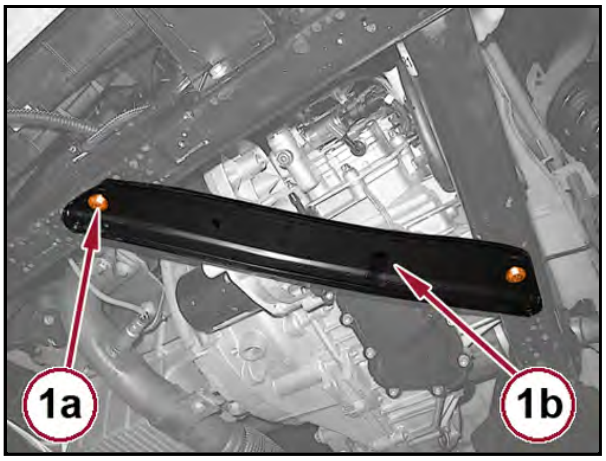
22. Remove the upper bolts (1) fixing the power unit to the gearbox.

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23. Remove the accumulator support bracket bolts (2).

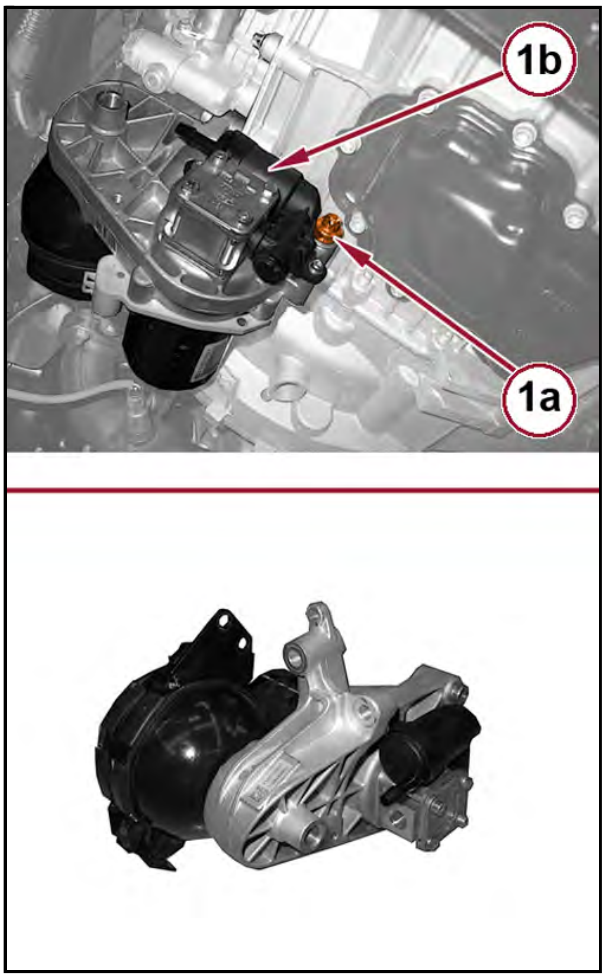


24. Remove the bolts (1a) and remove the left bracket from third load line to front end (1b).



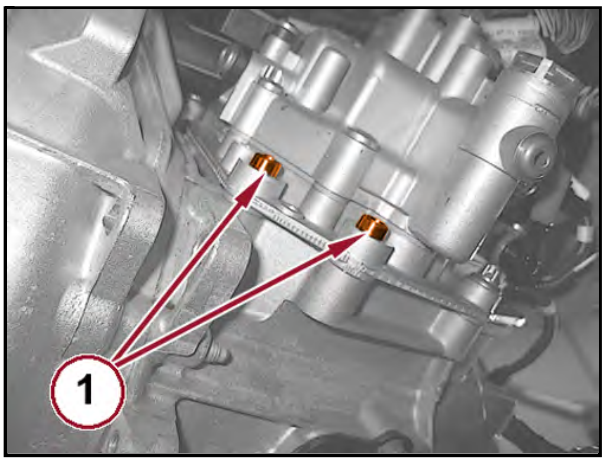
25. Remove the lower bolt (1a) and remove the power unit (1b).

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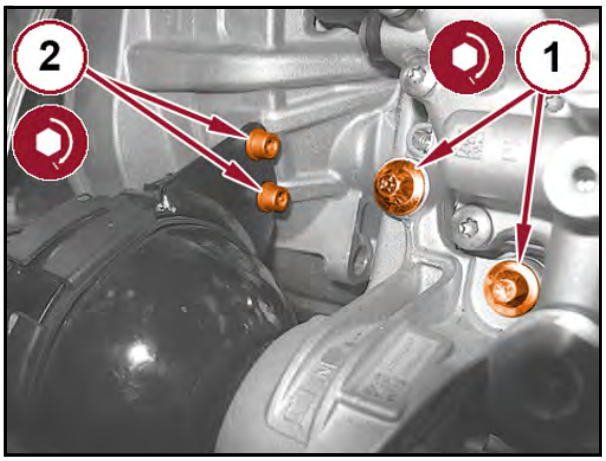
INSTALLATION

1. Check the condition of the locating dowels.



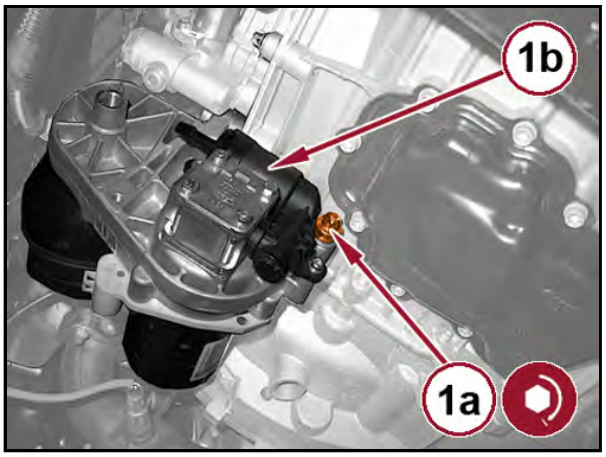
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2. Place the power unit back in position, engage the locating dowels and tighten the hydraulic power unit pump upper bolts (1) to the proper (Torque Specifications) .



3. Tighten the accumulator support bracket bolts (2) to the proper (Torque Specifications) .

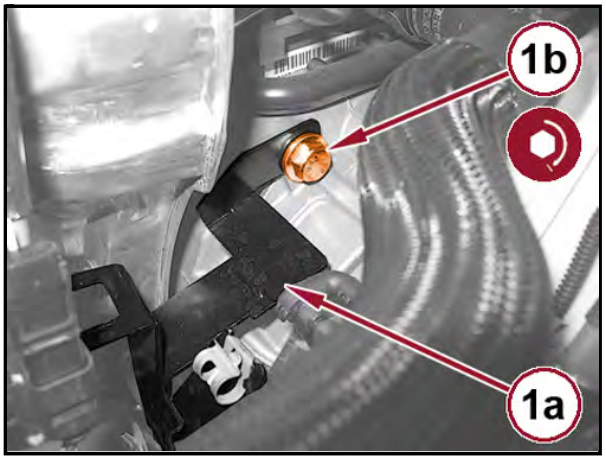
4. Tighten the power unit (1b) lower bolt (1a) fixing the to the gearbox to the proper (Torque Specifications) .



5. Place the left bracket from third load line to front end in position and tighten the bolts to the proper (Torque Specifications) .

6. Install the tube from pressure accumulator to valve body unit and tighten the connectors.

7. Place the wire harness routing bracket (1a) in position and tighten the transmission to engine bolt (1b) to the proper (Torque Specifications) .



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8. Tighten the wire harness routing bracket lower bolts.

9. Connect the solenoid valve wiring and sensors harness wire connectors to the wire harness routing bracket.

10. Install the and tighten the clamp at the throttle body.

11. Tighten the charge air cooler outlet hose bolt and the nut to the wire harness routing bracket.

12. Position the coolant hose in position and engage the respective retaining clips.

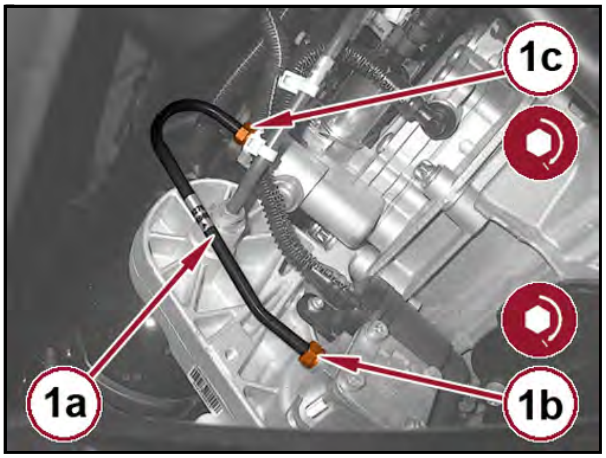
13. Connect the wire harness connector for the excess pressure sensor.

14. Connect the charge air cooler outlet hose at the charge air cooler.

15. Connect the solenoid valve and sensor wiring in the respective retaining clips.

16. Install the **NEW** filter to valve body hose complete with seals and engage it with the retaining clips.

17. Install the electric pump to valve body (1a) tube in position and tighten the flare nuts (1b), (1c) to the proper (Torque Specifications) .



18. Fill the oil reservoir with the specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .

19. Install the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .

20. Connect the electric pump wire harness connector.

21. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

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22. Remove the car from the lift.

23. If the power unit is replaced, connect the diagnosis scan tool and perform the "data set deletion" procedure.

24. In case of simultaneous replacement of the Transmission Control Module (TCM) and of the power unit, the "data set deletion" must be performed **AFTER** the "historical data" rewriting procedure.

25. After replacing or reinstalling the power unit, connect the diagnosis scan tool and bleed the clutch.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / UNIT, Transmission Hydraulic Power / Removal and Installation

MOTOR

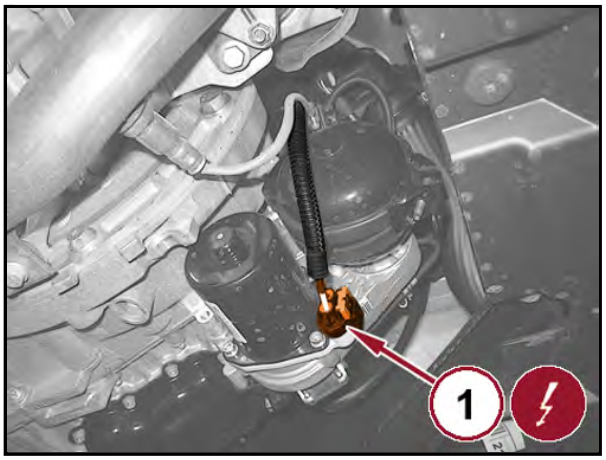
REMOVAL

1. Position the vehicle on the lift

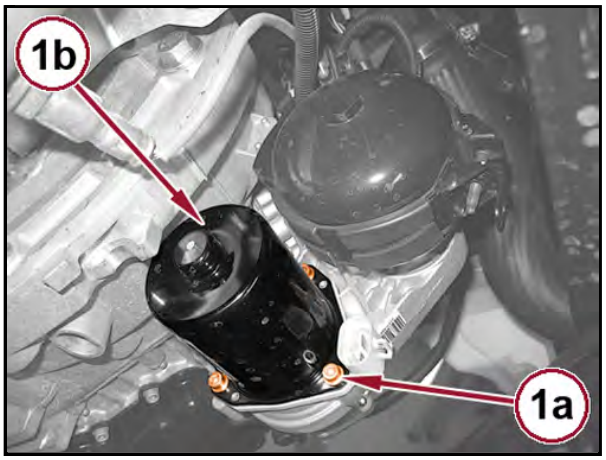
2. If the electric pump motor is replaced, connect the diagnostic scan tool and perform the "DATA SET deletion" procedure.If the Transmission Control Module (TCM) is replaced at the same time, the "DATA SET deletion" must be performed after the "HISTORICAL DATA rewriting" procedure.

3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

4. Disconnect the electric pump motor wire harness connector (1).

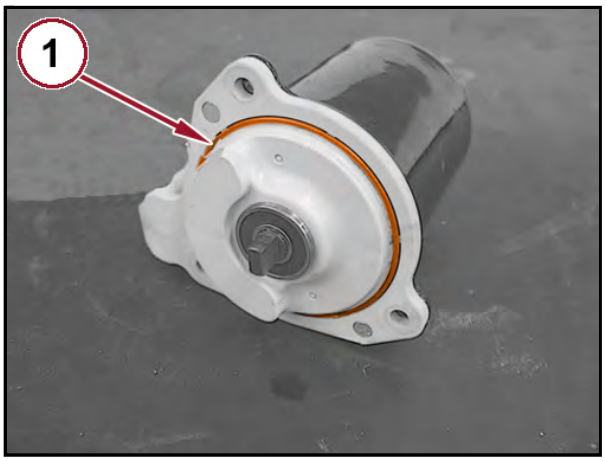


5. Undo the bolts (1a) and remove the electric pump motor (1b).

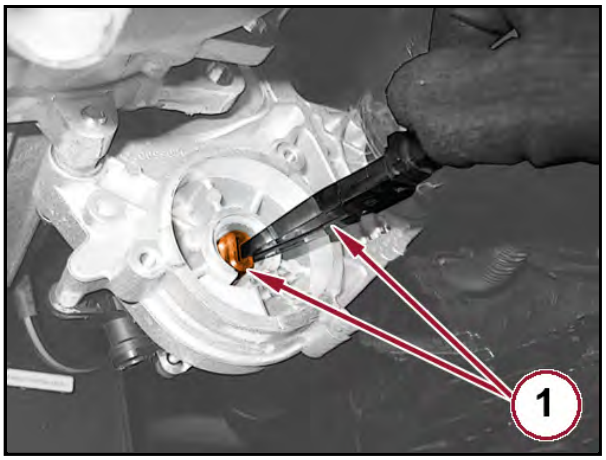


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6. Remove the O-ring (1) from the flange of the electric pump motor.



7. If required, remove the joint (1) from the electric pump.



INSTALLATION

1. If removed, install the electric pump joint.
2. Place the pump motor in position with a **NEW** O-ring and tighten the bolts to the proper (Torque Specifications) .
3. Connect the electric pump motor wire harness connector.
4. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
5. If the electric pump motor is replaced, connect the diagnostic scan tool and perform the "DATA SET deletion" procedure.If the Transmission Control Module (TCM) is replaced at the same time, the "DATA SET deletion" must be performed after the "HISTORICAL DATA rewriting" procedure.

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6. Remove the car from the lift.

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21 - Transmission and Transfer Case / Automatic - C635 DDCT / UNIT, Transmission Hydraulic Power / Removal and Installation

ACCUMULATOR

REMOVAL

1. Install the accumulator with a **NEW** O-ring to the proper (Torque Specifications) .
2. Tighten the accumulator band screw to the proper (Torque Specifications) .
3. Fill the fluid reservoir with the specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .
4. Connect the electric pump motor wire harness connector.
5. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
6. If the accumulator is replaced, connect the diagnostic scan tool and carry out the "Data set deletion" procedure.
7. In case of simultaneous replacement of the Transmission Control Module (TCM) and the accumulator, the "data set deletion" must be performed after the "historical data" rewriting procedure.
8. After replacing the accumulator, connect the diagnostic scan tool and bleed the clutch.
9. Remove the car from the lift.

INSTALLATION

1. Tighten the accumulator complete with a **NEW** O-ring to the proper (Torque Specifications) .
2. Tighten the accumulator clamp screw to the proper (Torque Specifications) .
3. Fill the oil reservoir with the specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .
4. Connect the electric pump wire harness connector.

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5. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

6. If the accumulator was replaced, connect the diagnostic scan tool and perform the "Data set deletion" procedure.

7. In case of simultaneous replacement of the Transmission Control Module (TCM) and the accumulator, the "data set deletion" must be performed after the "historical data" rewriting procedure.

8. Remove the car from the lift.

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PET_AAM_1013-0572

21 - Transmission and Transfer Case / Manual, C510 / Description

DESCRIPTION C510 MANUAL

This five speed is a constant-mesh manual transmission. All gear ranges, except reverse, are synchronized. The transmission case is aluminum with a steel end-plate cover. It is housed in a die-cast aluminum case featuring a two-piece, middle split design.

The C510 transmission internal components can be serviced only by separating the gear case from the clutch housing.

GEAR RATIOS

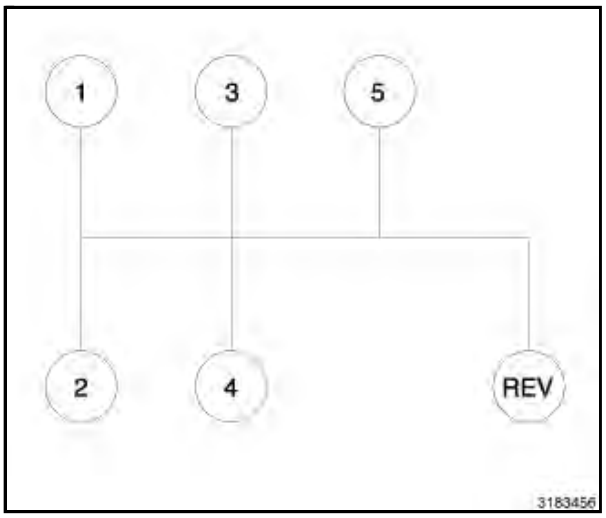
GEAR	Ratio
1st	3.909
2nd	2.158
3rd	1.345
4th	.974
5th	0.766
REVERSE	3.818
FINAL DRIVE RATIO	3.733
CLUTCH RELEASE SYSTEM	HYDRAULIC

The differential is a conventional arrangement of gears that is supported by roller bearings. The final output gear turns the ring gear and differential assembly, thereby turning the drive axle shafts.

GEARSHIFT PATTERN

1. The C514 transaxle shift pattern is a modified H–pattern. Overdrive fifth and reverse gears are outboard of the first through fourth gear positions.

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21 - Transmission and Transfer Case / Manual, C510 / Diagnosis and Testing

COMMON PROBLEM CAUSES

The majority of transmission malfunctions are a result of:

- Insufficient lubrication
- Incorrect lubricant
- Mis-assembled or damaged internal components
- Improper operation

NOISY OPERATION

Transmission noise is most often a result of worn or damaged components. Chipped, broken gear or synchronizer teeth, and brinnelled, spalled bearings all cause noise.

Abnormal wear and damage to the internal components is frequently the end result of insufficient lubricant.

LOW LUBRICANT LEVEL

Insufficient transmission lubricant is usually the result of leaks, or inaccurate fluid level check or refill method. **Vehicle must be level to accurately check fluid level.** Leakage is evident by the presence of oil around the leak point. If leakage is not evident, the condition is probably the result of an underfill.

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21 - Transmission and Transfer Case / Manual, C510 / Specifications

SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Drain Plug	46	34	-	
Engine to Transmission Bolt	60	44	-	
Fifth Gear Shift Fork to Rail Bolt	17	13	-	
Fill Plug	25	18	-	
First and Second Gear Shift Fork to Rail Bolt	17	13	-	
Gear Selector/Engagement Lever Bolts	24	18	-	
Input and Output Shaft Nuts	112	83	-	Do not reuse these fasteners. If removed, a **NEW** fastener must be installed and tightened to specifications.
Input and Output Shaft Rear Bearing Retaining Plate	24	18	-	
Left Axle Seal Flange Bolts	20 + 45°	15 + 45°	-	
Left Engine Mount Bracket to Transmission Bolts	67	49	-	
Left Engine Mount Support Bracket Bolts	35	26	-	
Rear Engine Mount Bracket to Front Suspension Cradle Bolts	90 + 45°	66 + 45°	-	
Rear Engine Mount Bracket to Isolator	90 + 45°	66 + 45°	-	
Rear Engine Mount Isolator to Transmission Bolts	40 + 45°	30 + 45°	-	
rear Transmission Cover Bolts	24	18	-	
Reverse Idler Shaft Bolt	33	24	-	
Reverse Shift Fork Bolts	9.8	-	87	
Ring Gear Bolts	85	63	-	
	17	13	-	

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DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Third and Fourth Gear Shift Fork to Rail bolt				
Transmission Case Bolts	24	18	-	
Transmission to Engine Bolts	60	44	-	
Upper Dust Cover to Transmission Bolts	60	44	-	

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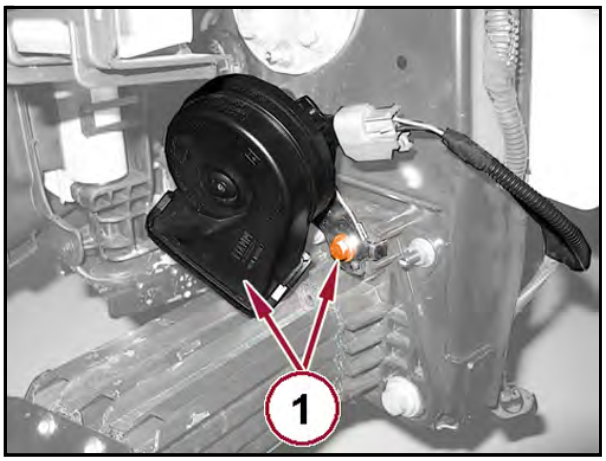
21 - Transmission and Transfer Case / Manual, C510 / Removal and Installation

REMOVAL AND INSTALLATION

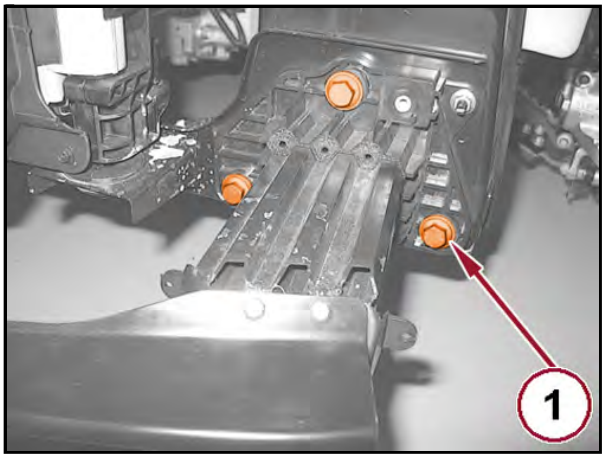
REMOVAL

1. Place the car on a lift.
2. Remove the front tire and wheel assemblies (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Remove the front inner wheelhouse splash shields (Refer to 23 - Body/Exterior/SHIELD, Splash/Removal and Installation) .
5. Remove the front fascia (Refer to 13 - Frame and Bumpers/Bumpers/FASCIA, Front/Removal and Installation) .
6. Remove the starter motor (Refer to 08 - Electrical/Starting/STARTER/Removal and Installation) .
7. Drain the transmission oil (Refer to 21 - Transmission and Transfer Case/Manual/FLUID/Standard Procedure) .
8. Remove the exhaust manifold (Refer to 09 - Engine/Manifolds/MANIFOLD, Exhaust/Removal and Installation) .
9. Remove the front half shafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .
10. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
11. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
12. Remove the bolt and position the horn (1) aside.

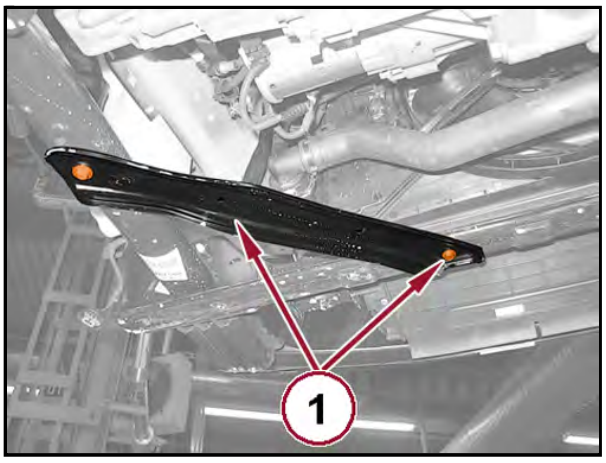
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13. Remove the bolts (1) for the left lower load beam.

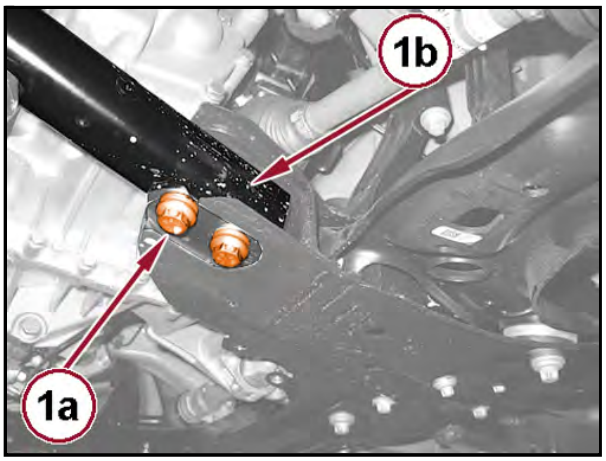


14. Remove the bolts and remove the front end reinforcement (1).

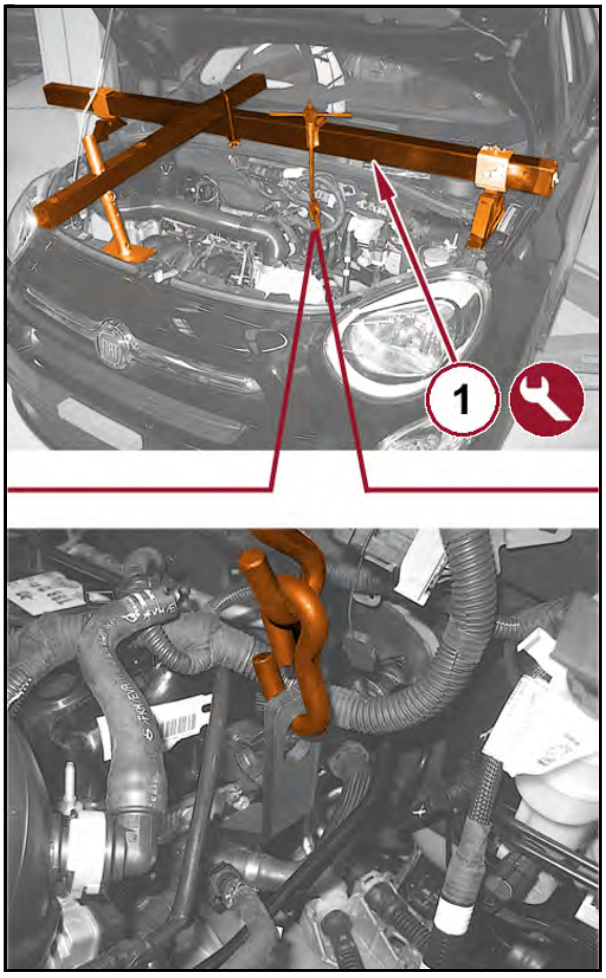


15. Remove the bolts (1a) and remove the left lower load beam (1b).

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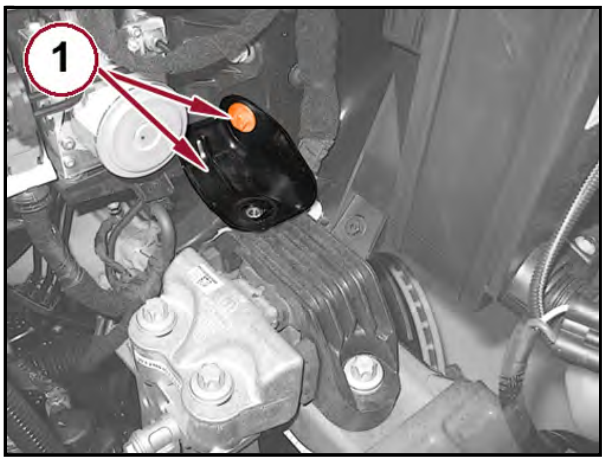


16. Position the powertrain support tools 2000040436 (1).

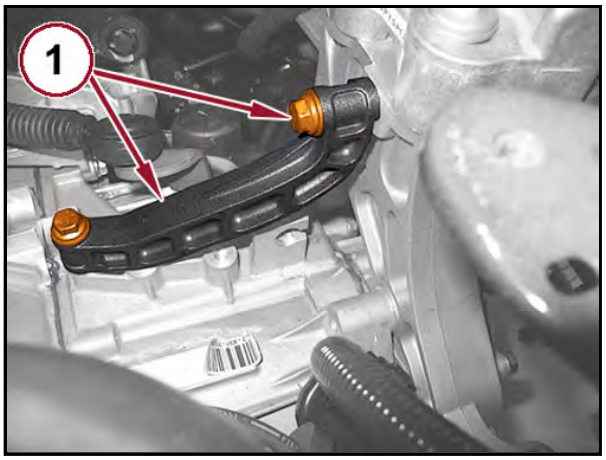


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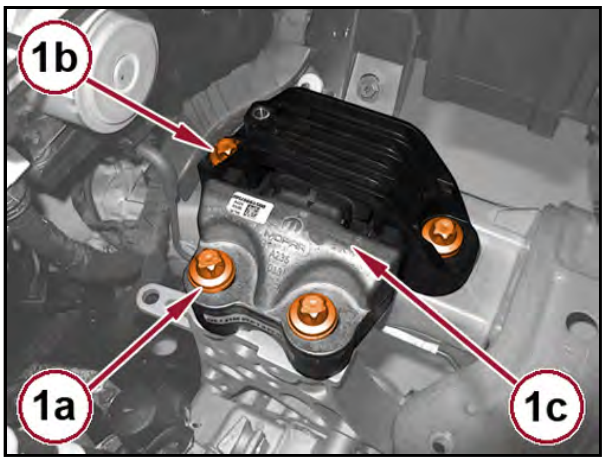
17. Remove the bolt and remove heat shield (1).



18. Remove the bolts and remove the left engine mount reinforcement bracket (1).

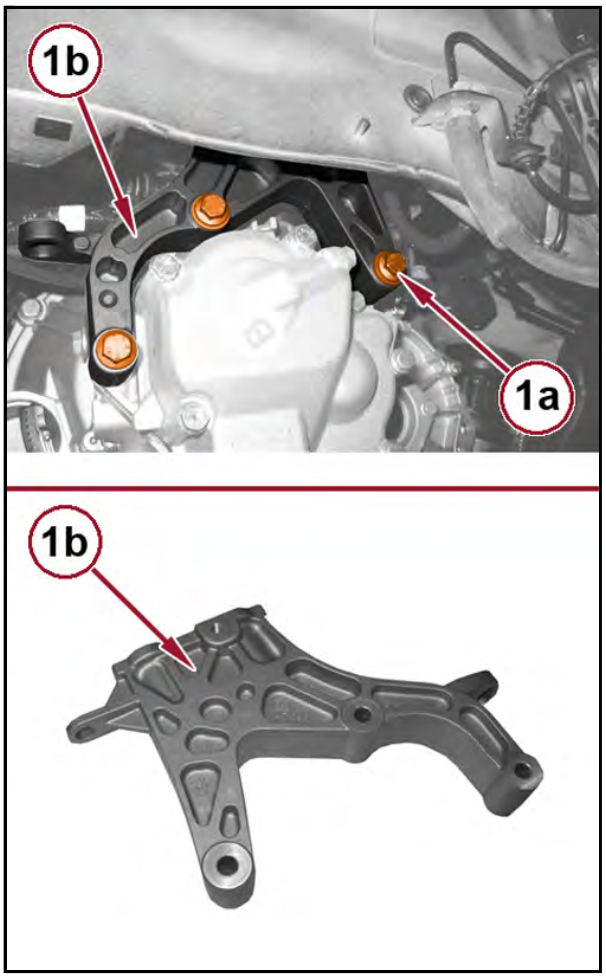


19. Remove the bolts (1a and 1b) and remove the left side engine mount (1c).



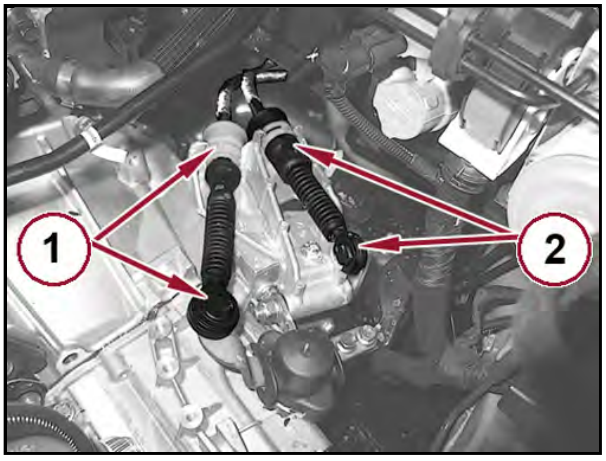
20. Remove the bolts (1a) and remove the left engine mount bracket (1b).

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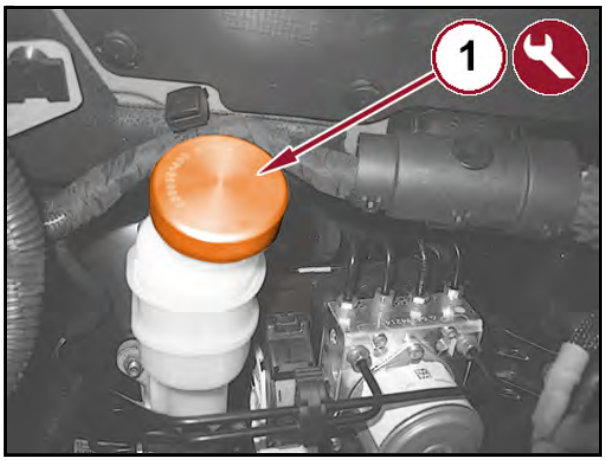
21. Detach the gear engagement cable (1) from the transmission and position aside.

22. Detach the gear selection cable (2) from the transmission and position aside.



23. Install the 2000001400 brake/clutch fluid reservoir cap (1).

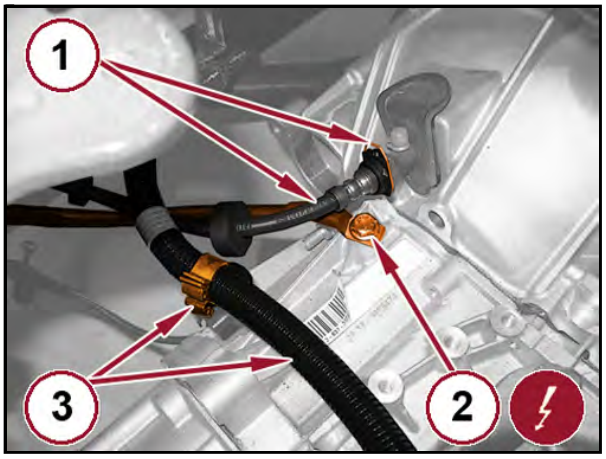
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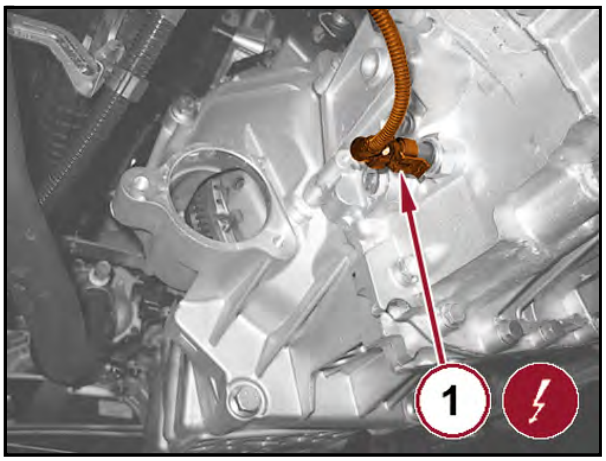
24. Lift the clip and disconnect the hose (1) for the clutch slave cylinder.

25. Remove the bolt and disconnect the battery earth lead (2).

26. Open the clip and release the starter wiring (3).

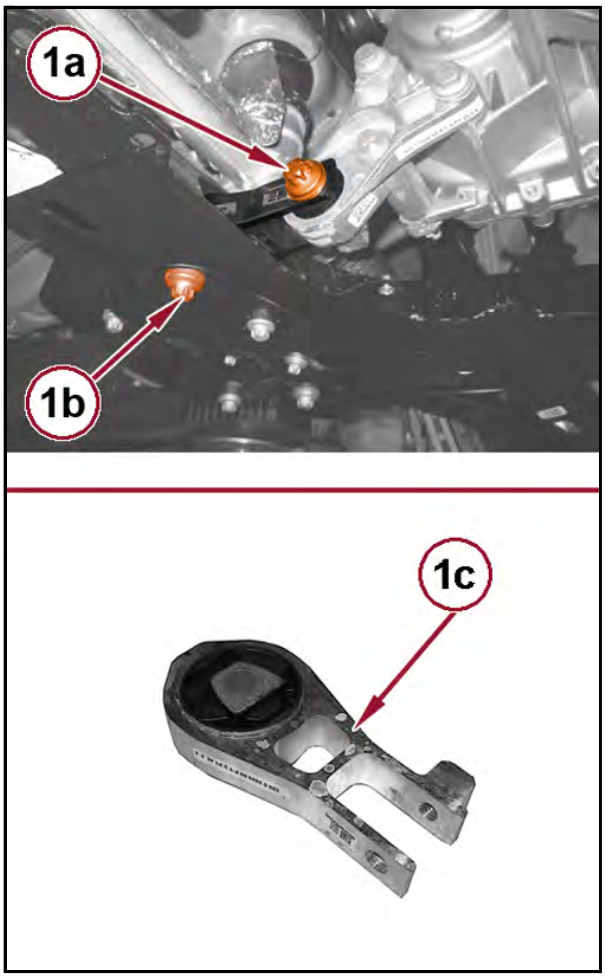


27. Disconnect the back up lamp switch wire harness connector (1).

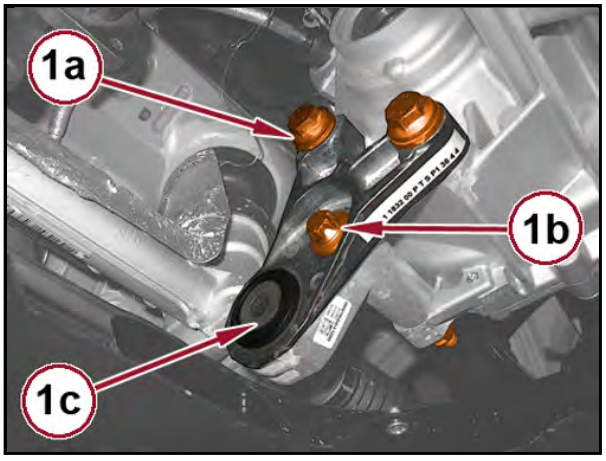


28. Remove the bolts (1a) and (1b), then remove the reaction rod (1c).

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29. Remove the bolts (1a), the bolt (1b) and remove the bracket for the reaction rod (1c).

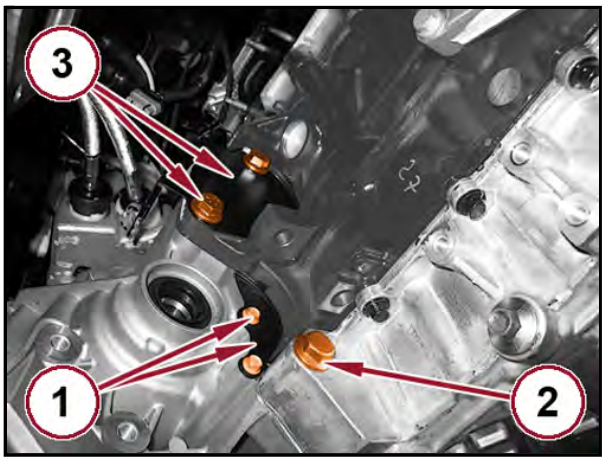


30. Remove the lower dust cover (1).

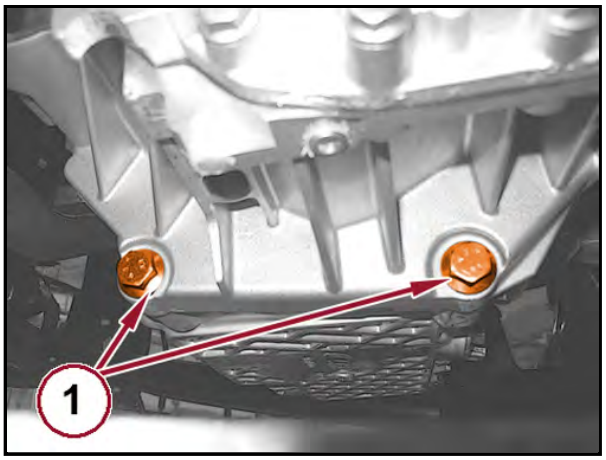
31. Remove the engine oil pan to transmission bolt (2).

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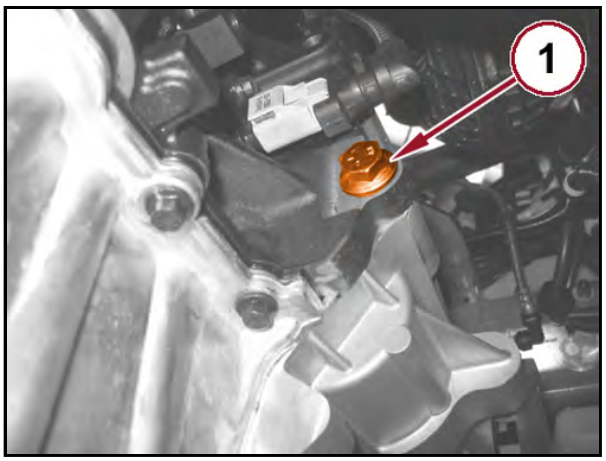
32. Remove the upper dust cover (3).



33. Remove the transmission to engine oil pan bolts (1).

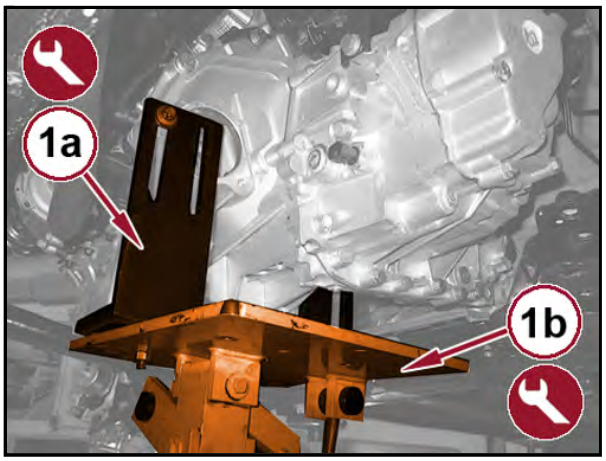


34. Remove the lower front engine to transmission bolt (1).

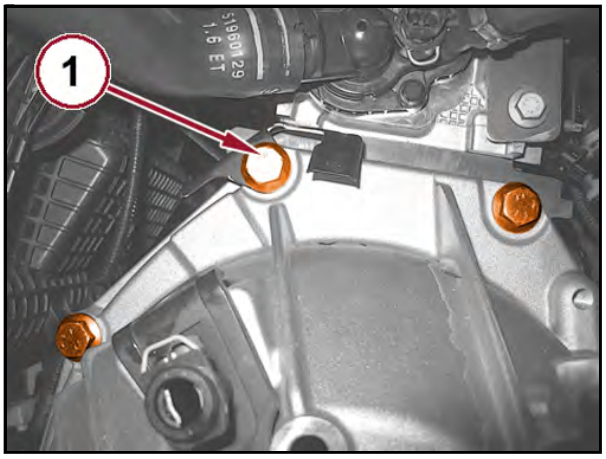


35. Support the transmission with the brackets 1870847000 (1a) and the jack 1870835001 (1b).

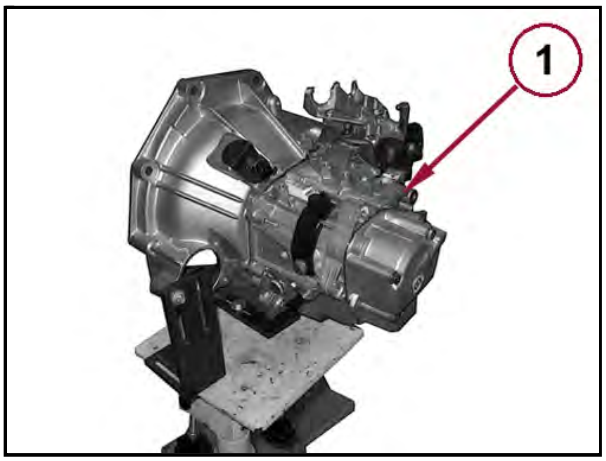
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36. Remove the upper transmission to engine bolts (1).



37. Remove the transmission (1) from the vehicle.

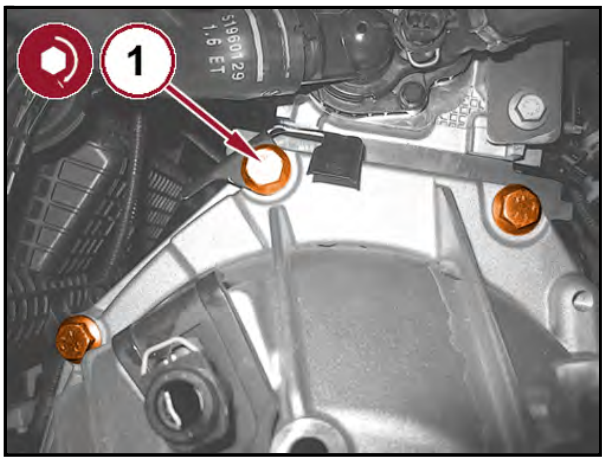


INSTALLATION

1. Install the transmission using the 1870835001 jack and the 1870847000 brackets.

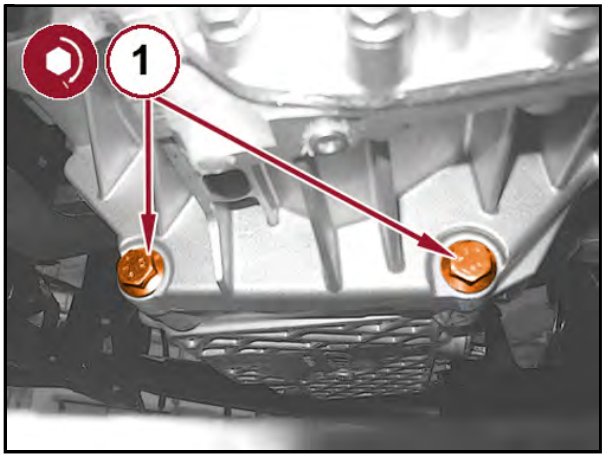
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2. Tighten the upper transmission to engine bolts to the proper (Torque Specifications) .

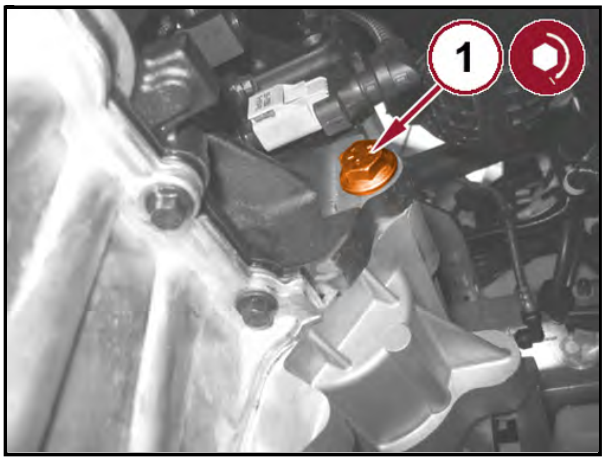


3. Remove the transmission jack and adapters.

4. Install the lower transmission to engine oil pan bolts (1) and tighten to the proper (Torque Specifications) .



5. Install the front lower engine to transmission bolt (1) and tighten to the proper (Torque Specifications) .

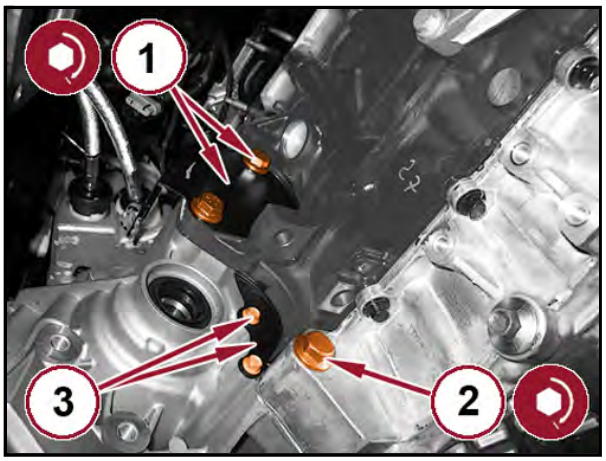


6. Install the upper dust cover and tighten the bolts (1) to the proper (Torque Specifications) .

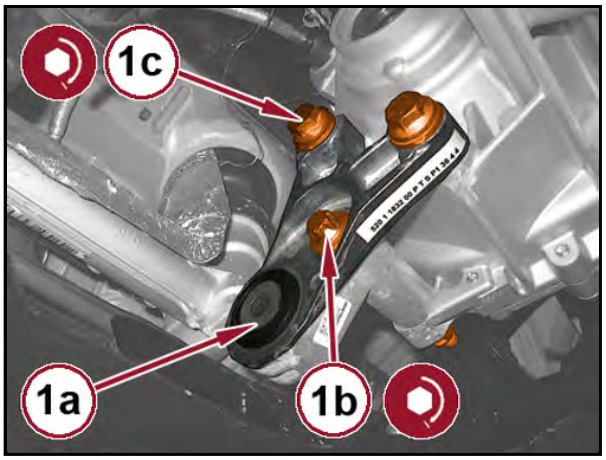
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7. Install the transmission to oil pan bolt (2) and tighten to the proper (Torque Specifications) .

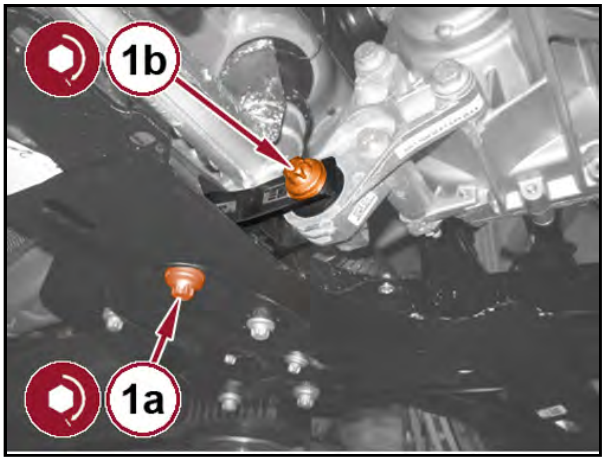
8. Install the upper dust cover and tighten the bolts (3).



9. Install the rear engine mount isolator (1a) and tighten the bolt (1b) and the bolts (1c) to the proper (Torque Specifications) .



10. Install the rear engine mount bracket bolts (1a) and (1b) to the proper (Torque Specifications) .



11. Connect back up lamp switch wire harness connector.

12. Engage the starter wiring with the retaining clip.

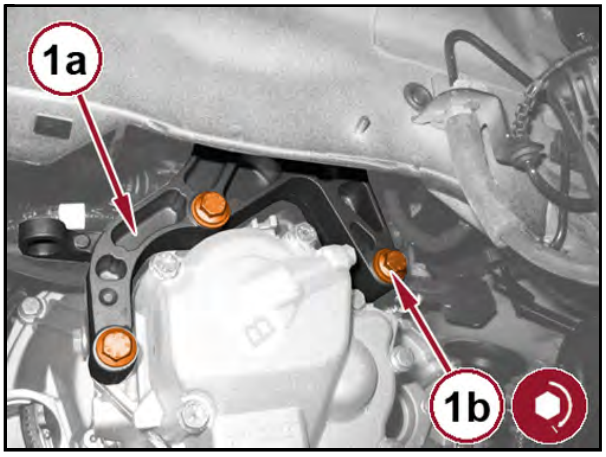
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13. Connect the battery ground wire and tighten the bolt.

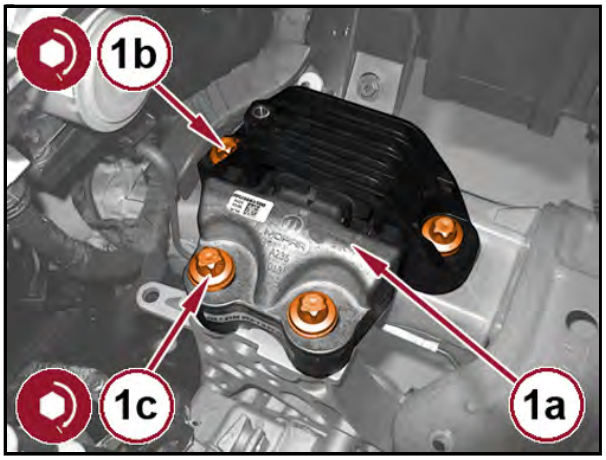
14. Connect the slave cylinder hose and engage the retaining clip.

15. Attach the gear selection and engagement cables to the transmission.

16. Install the left engine mount bracket (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



17. Install the left side engine mount isolator (1a) and tighten the bolts (1b) and (1c) to the proper (Torque Specifications) .

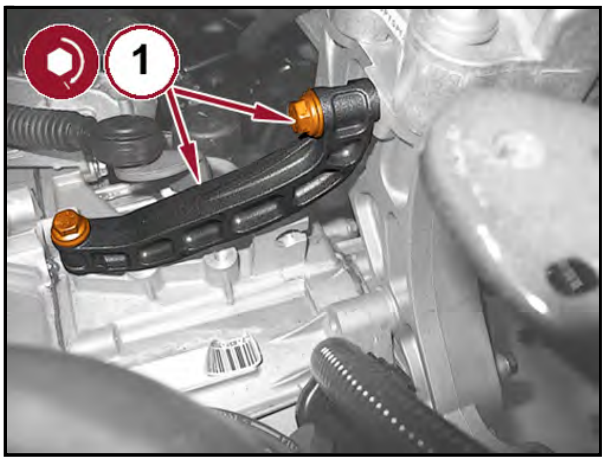


18. Install the left engine mount reinforcement bracket (1) and tighten the bolts to the proper (Torque Specifications) .

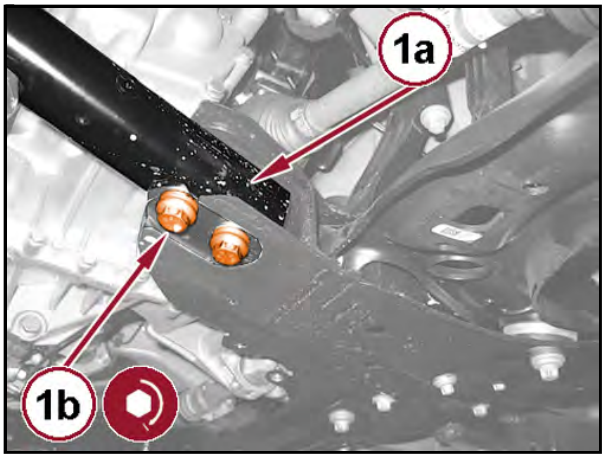
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19. Install the heat shield in its housing and tighten the screw.

20. Remove the 2000040436 powertrain support tools.

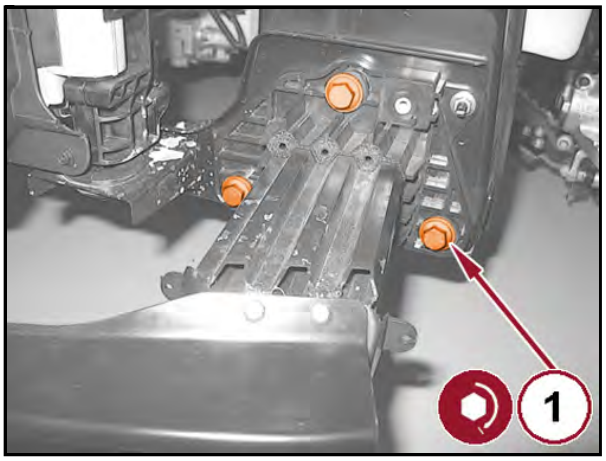


21. Position the left lower load beam (1a) in position and tighten the bolts (1b) to the proper (Torque Specifications) .



22. Install the front end reinforcement and tighten the bolts.

23. Install the left lower load beam to the front end bolts (1) and tighten to the proper (Torque Specifications) .



24. Install the horn in its housing and tighten the bolt.

25. Install the battery support tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .

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26. Install the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .

27. Install the front half shafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .

28. Install the exhaust manifold (Refer to 09 - Engine/Manifolds/MANIFOLD, Exhaust/Removal and Installation) .

29. Fill the transmssion with the specified oil (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .

30. Bleed the hydraulic clutch (Refer to 06 - Clutch/Standard Procedure) .

31. Install the starter motor (Refer to 08 - Electrical/Starting/STARTER/Removal and Installation) .

32. Install the front fascia (Refer to 13 - Frame and Bumpers/Bumpers/FASCIA, Front/Removal and Installation) .

33. Install the front wheelhouse inner splash shields (Refer to 23 - Body/Exterior/SHIELD, Splash/Removal and Installation) .

34. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

35. Install the front tire and wheel assemblies (Refer to 22 - Tires and Wheels/Removal and Installation) .

36. Remove the car from the lift.

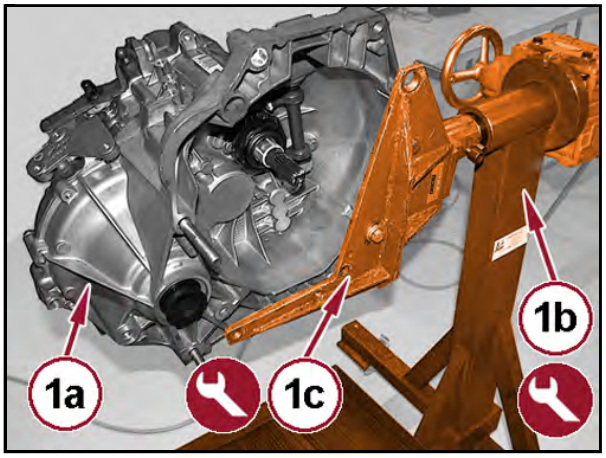
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21 - Transmission and Transfer Case / Manual, C510 / Disassembly and Assembly

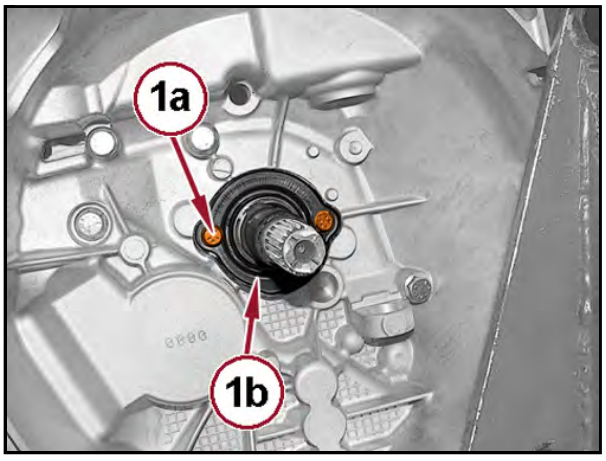
DISASSEMBLY AND ASSEMBLY

DISASSEMBLY

NOTE: During removal and installation of gears using the press, the gear to plate bearing surface must be as large as possible. Place an aluminium sheet of suitable thickness between the gear and the plate to prevent damage to the gear teeth.

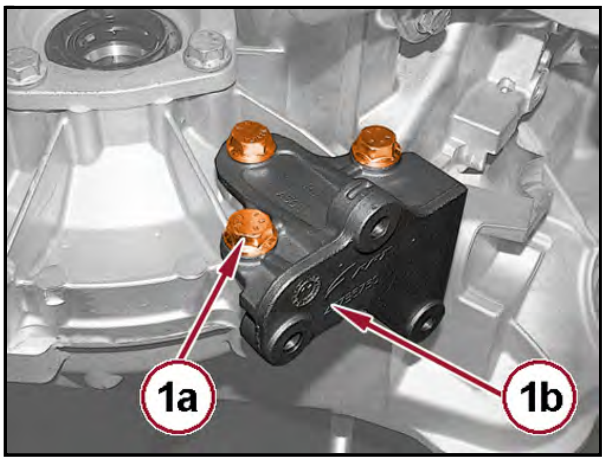


1. Position the transmission (1a) on the overhaul stand 1871000000 (1b) using the adapter 1871001014 (1c).
2. Use tools 1840005001 (1a), 1847017001 (1b) and 1840005303 to remove the left inner tripod housing (1d).
3. Remove the outer clutch thrust control linkage retaining ring.
4. Remove the outer clutch thrust control linkage.

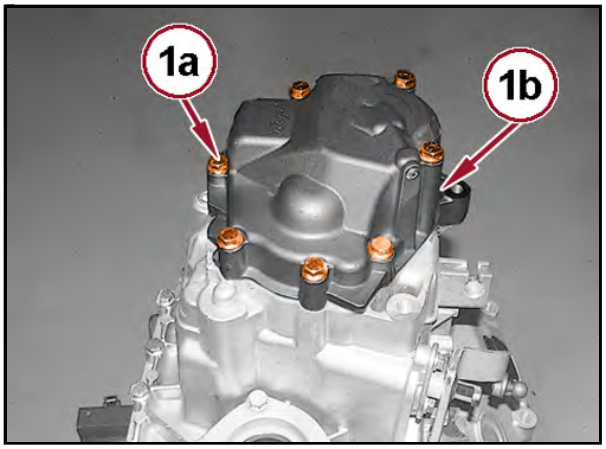


5. Remove the bolts (1a) and remove the transmission input shaft seal (1b) from the bellhousing.
6. Remove the bolts (1a) and remove the gear shift cable reaction bracket (1b).

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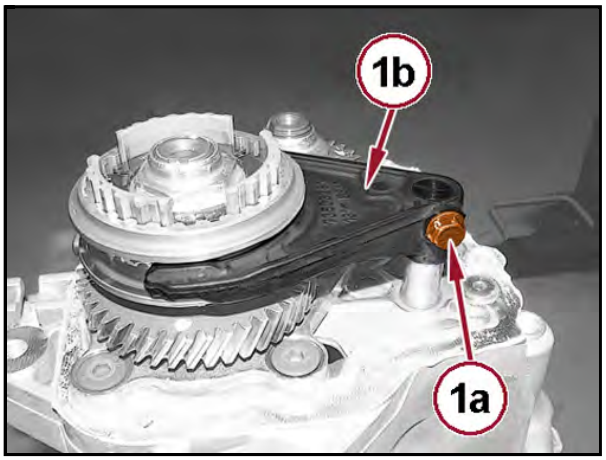
7. Remove the bolts (1a) and remove the transmission rear cover (1b).



8. Engage any gear using the gear selection and engagement lever.

9. Remove the bolt (1a) from the 5th gear shift fork (1b).

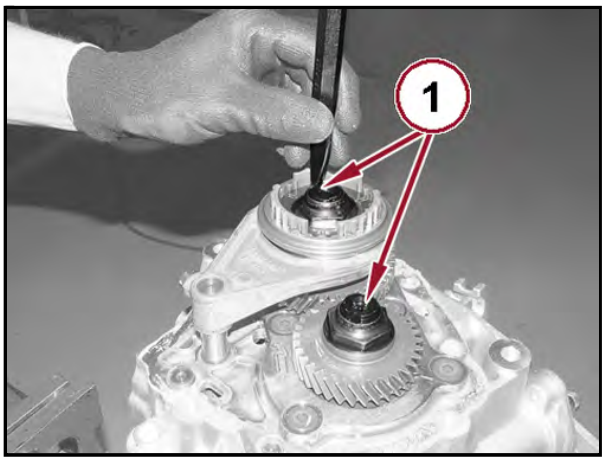
10. Engage the 5th gear by pushing the fork (1b) down.



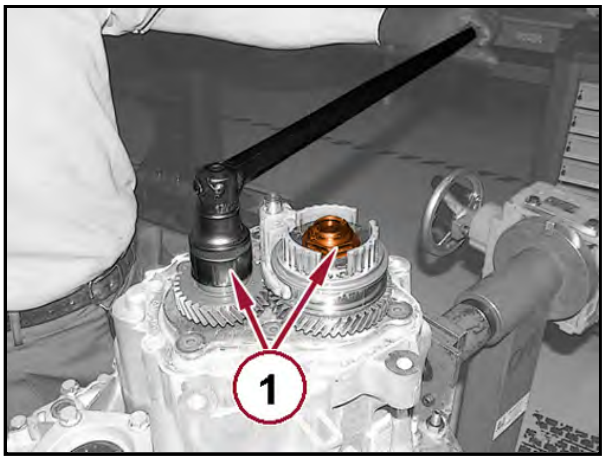
NOTE: **If two gears are engaged simultaneously the gear shafts will lock.**

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11. Use a suitable drift to straighten the staking on the input and output shaft nuts (1).



12. Remove the input and output shaft nuts (1).



13. Remove the 5th gear shift fork with the 5th gear synchronizer sleeve (1).

14. Remove the retaining washer (2) for the synchronizer detents.

15. Remove the synchronizer detents (3).

16. Remove the 5th gear synchronizer hub (4).

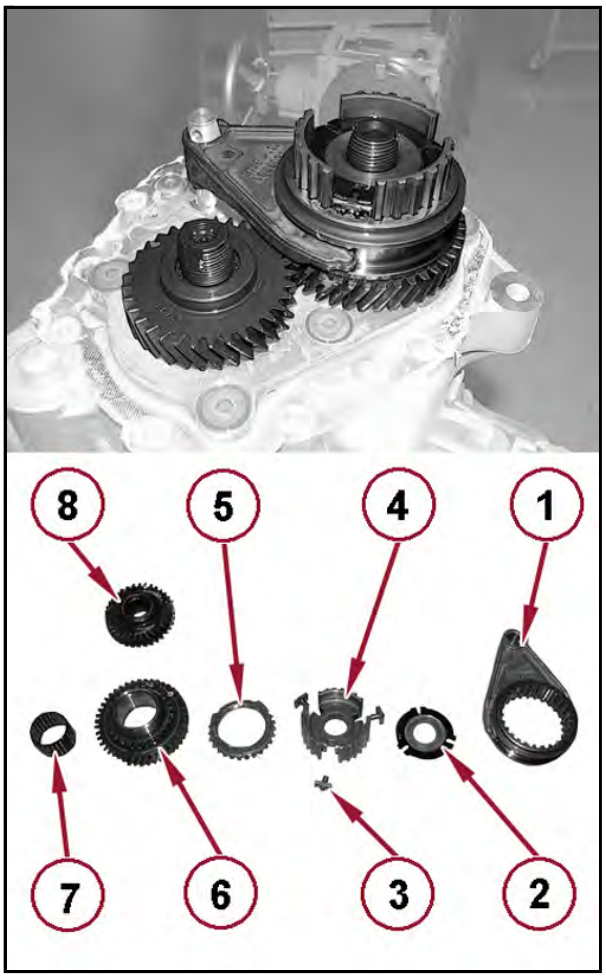
17. Remove the 5th gear synchronizer ring (5).

18. Remove the 5th gear drive gear (6).

19. Remove the 5th gear drive gear needle bearing (7).

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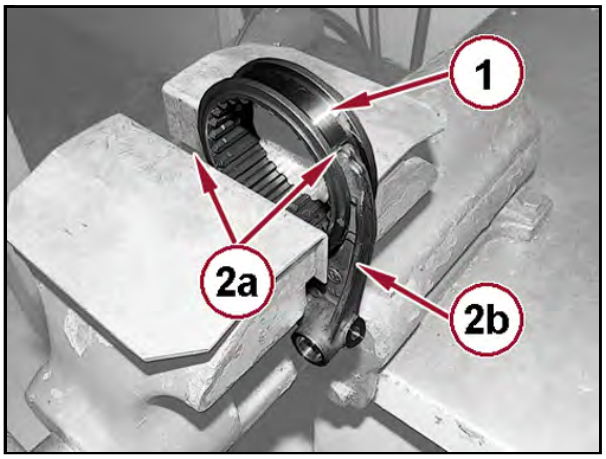
20. Remove the 5th gear driven gear (8).



NOTE: **Do not nick the tapered part of the sleeve and the ends of the fork with the drift.**

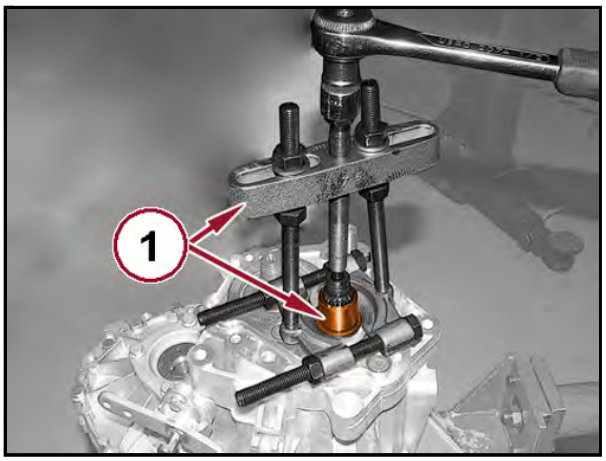
21. Position the 5th gear synchronizer sleeve (1) in a vice with protective, non marring jaw covers.

22. Using a brass punch, alternatively tap on the two ends (2a) of the fork (2b) to separate it from the 5th gear synchronizer sleeve.

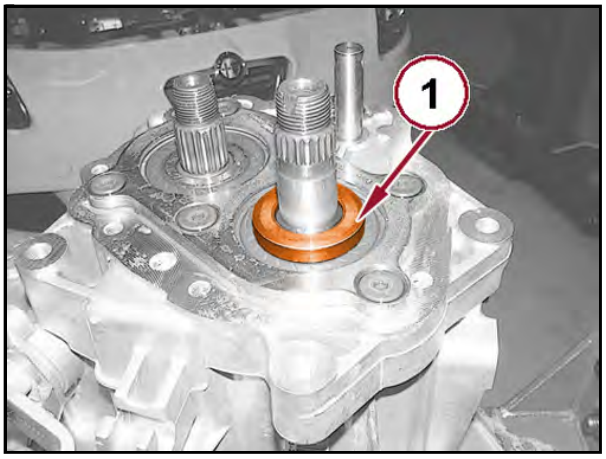


23. Using a suitable puller, remove the 5th gear drive gear bushing (1).

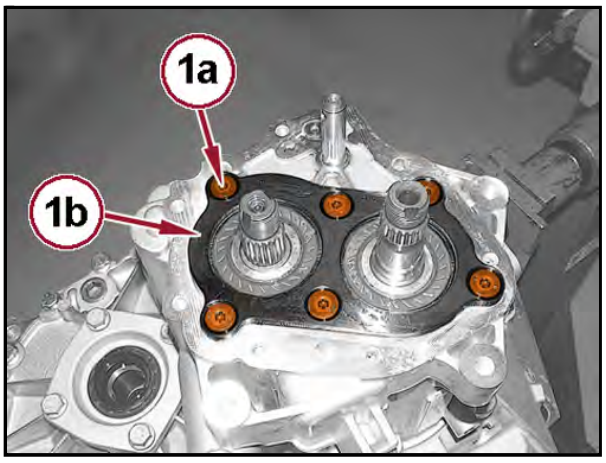
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24. Remove the spacer (1).

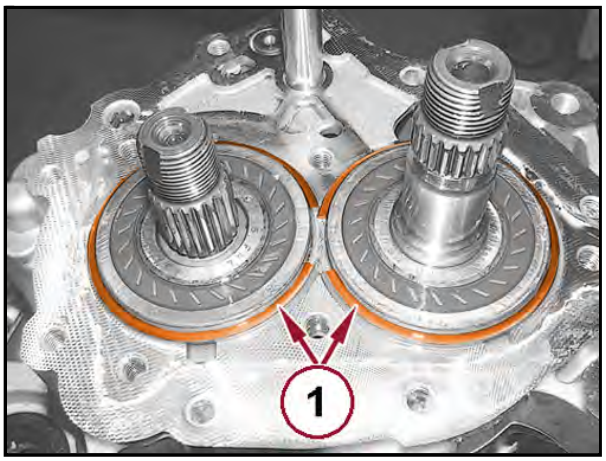


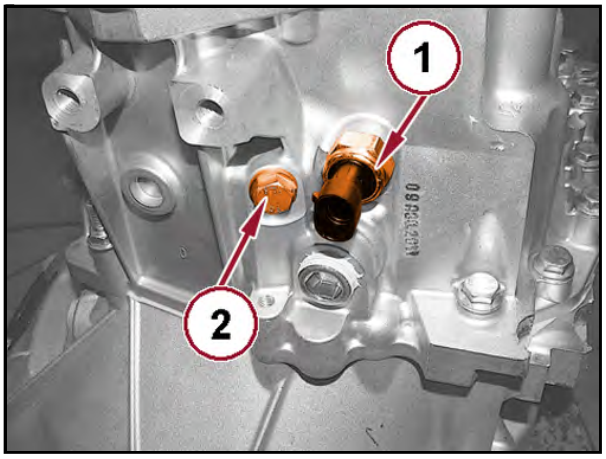
25. Remove the bolts (1a) and remove the input and output shaft rear bearing retaining plate (1b).



26. Reposition the input and output shaft rear bearing snap rings so their openings are at the front and remove them (1).

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27. Remove the backup lamp switch (1).

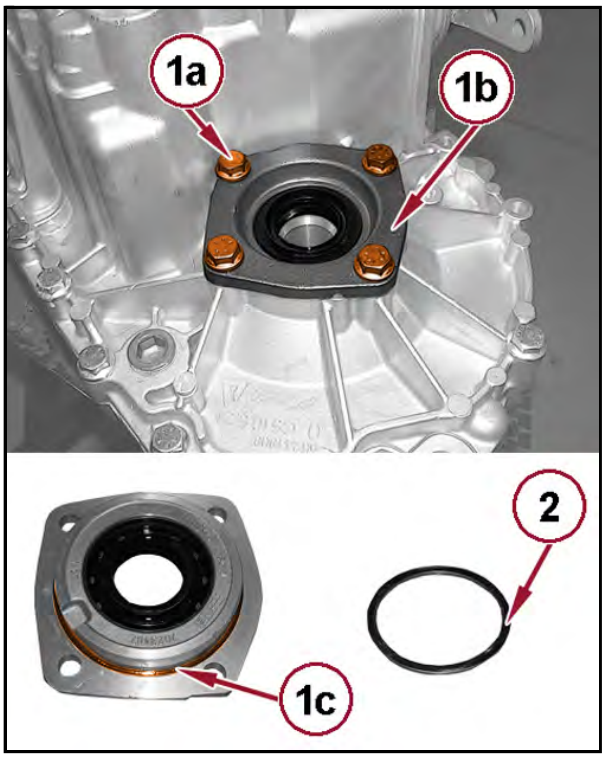
28. Remove the reverse idler gear shaft bolt (2).

29. Remove the bolts (1a) and remove and **DISCARD** the left half shaft seal (1b) with O-ring (1c).

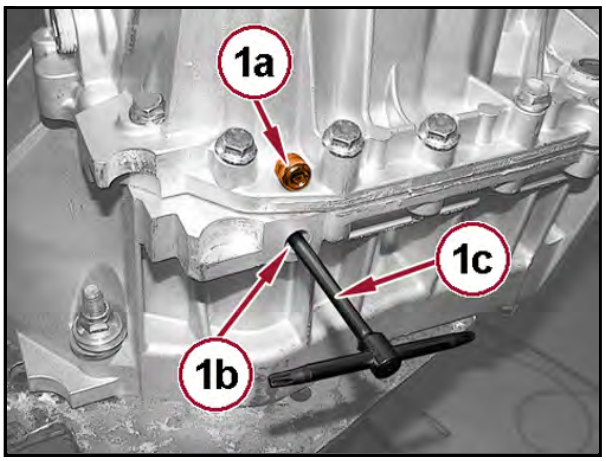
30. Remove the differential bearing preload thrust washer (2).

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31. Operate the gear selector and engagement lever and put the transmission in neutral.

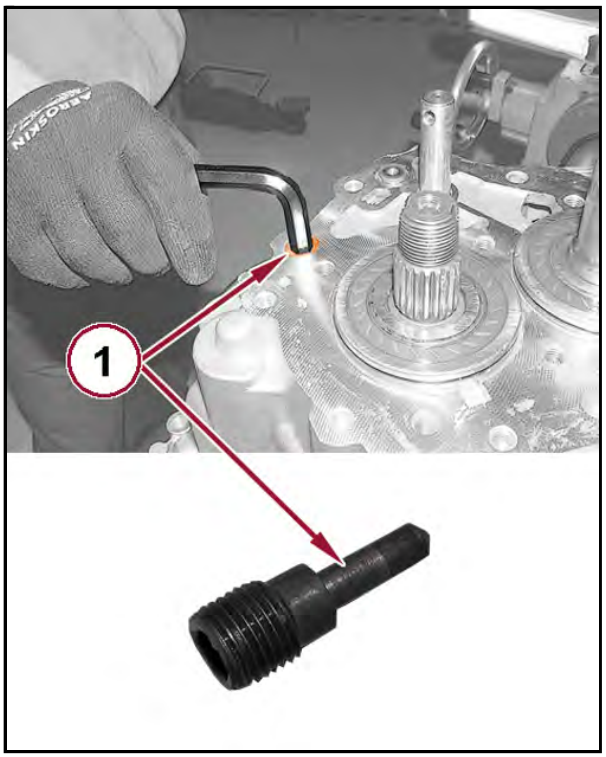


32. Remove the plug (1a) and insert a suitable pin (1c) in the hole (1b) until the gear shift rails are locked in neutral.

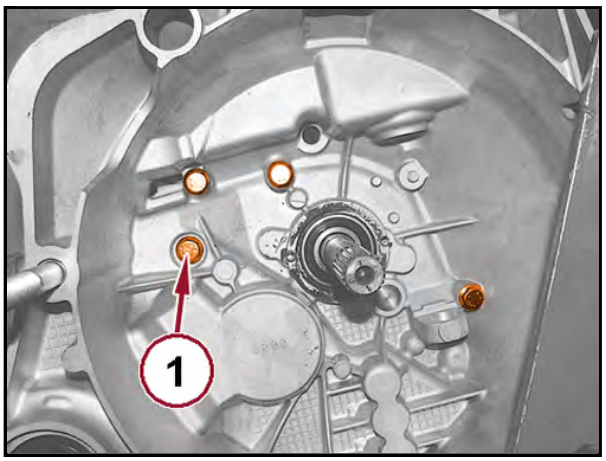


33. Unscrew the gear selector lever inner support locking pin (1).

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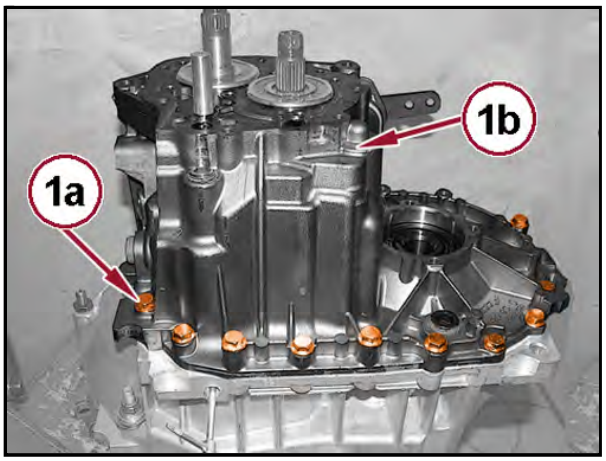


34. Remove the inner bellhousing bolts (1).

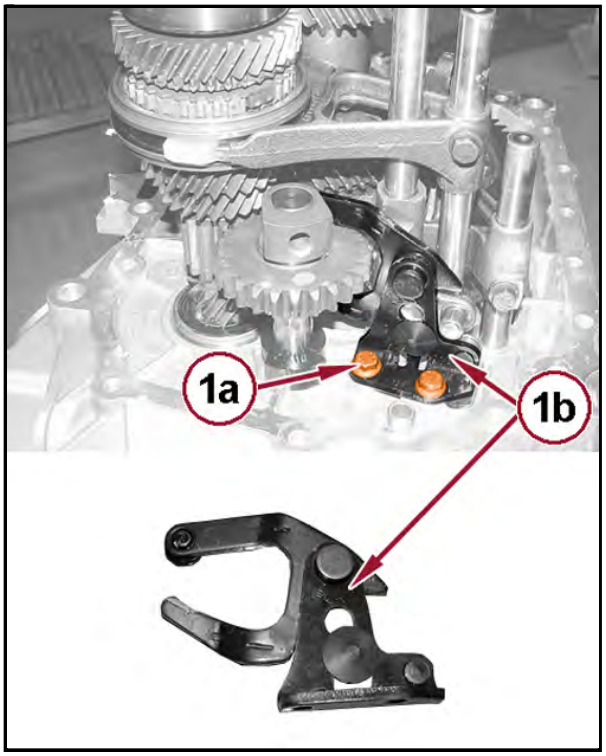


35. Remove the bolts (1a) and separate the transmission case (1b) from the bellhousing.

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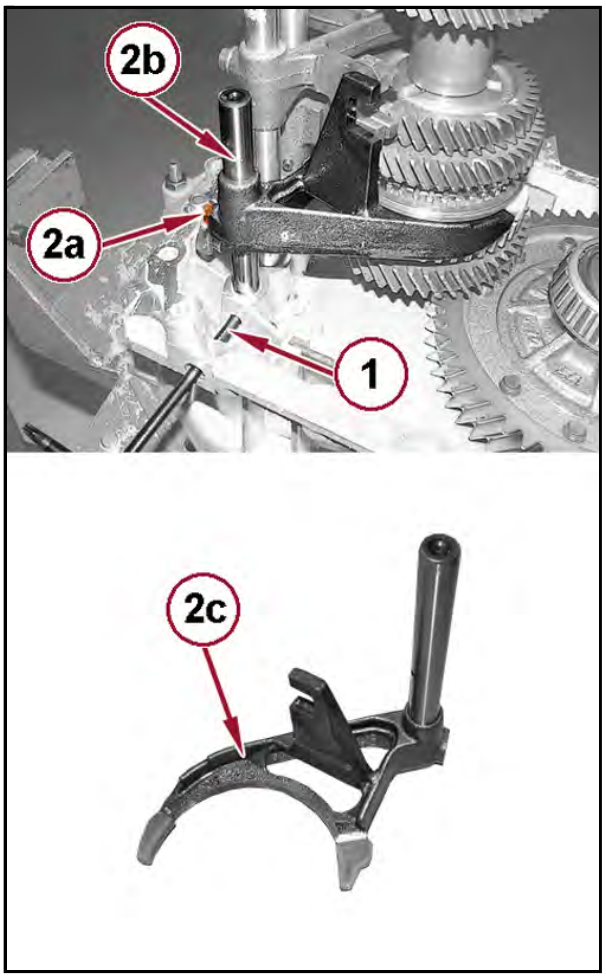
36. Remove the bolts (1a) and remove the reverse engagement lever (1b).



37. Remove the pin (1) used for locking the gear shift rails.

38. Remove the screw (2a), remove the rail (2b) and 1st and 2nd gear shift fork (2c).

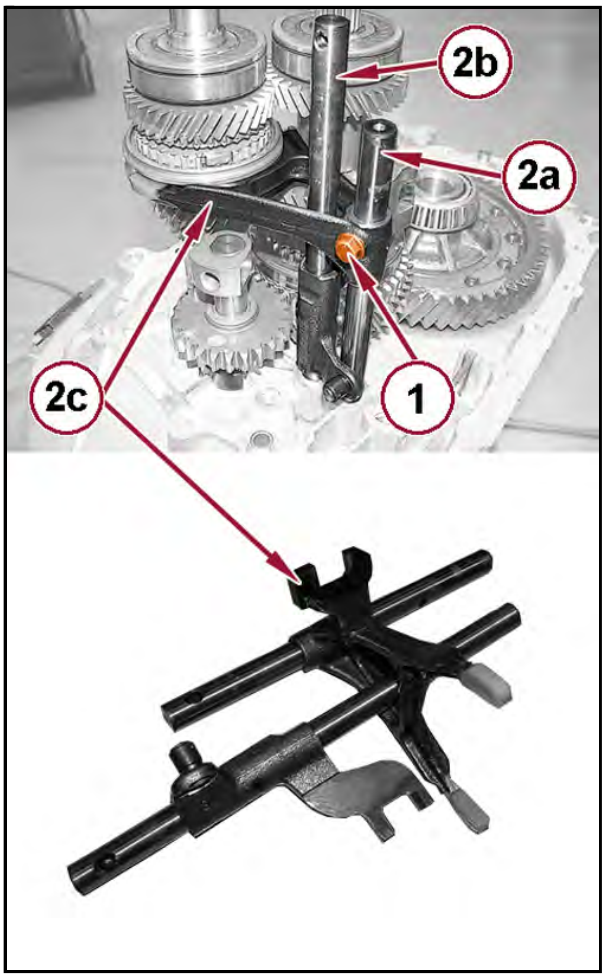
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PET_AAM_1013-0600



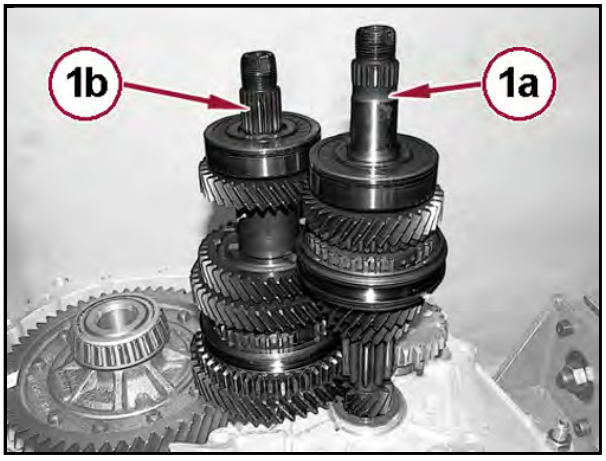
39. Remove the bolt (1) from 3rd and 4th gear shift fork.

40. Remove the 3rd and 4th gear shift rail (2a) and the 5th and reverse gear shift rail (2b) simultaneously with the 3rd and 4th gear fork (2c).

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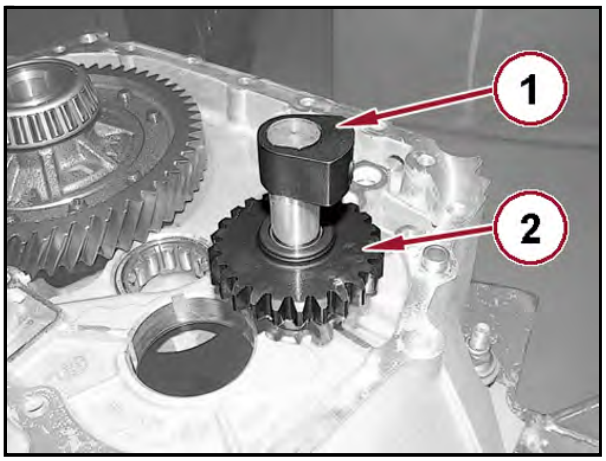
41. Remove the input shaft (1a) and the output shaft (1b) assemblies simultaneously.



42. Remove the reverse idler gear shaft support screw (1).

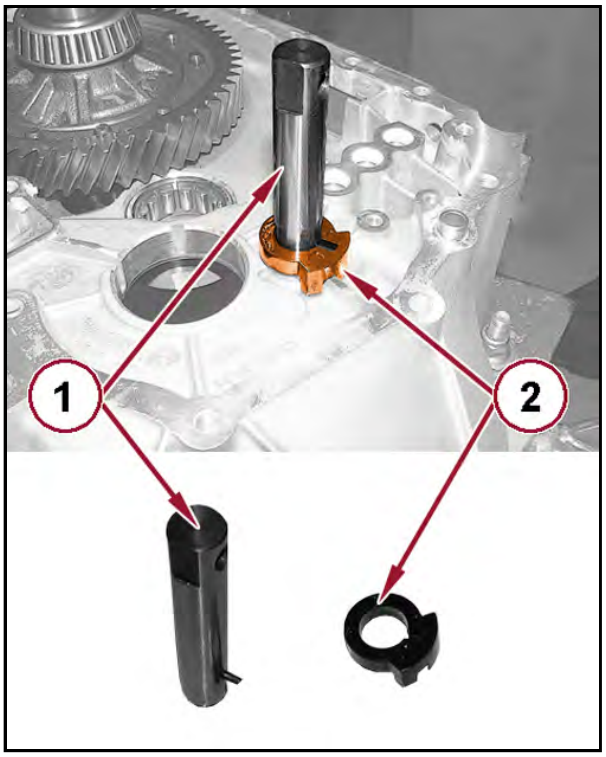
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43. Remove the reverse idler gear (2).



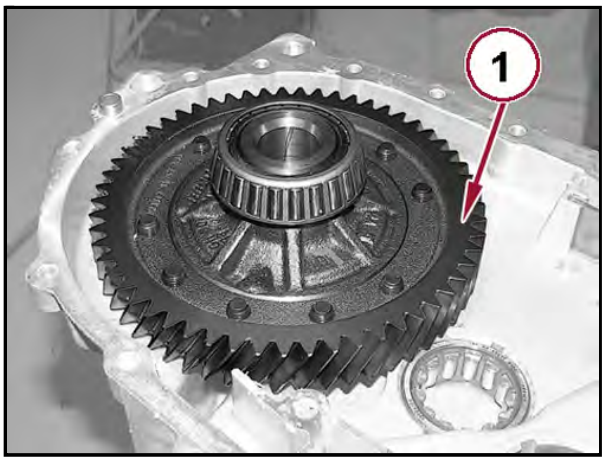
44. Remove the reverse idler gear shaft complete with centering pin (1).

45. Remove the reverse idler gear shaft locating bushing (2).

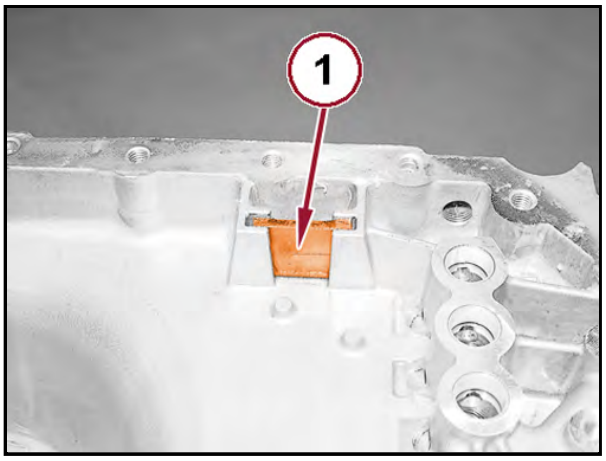


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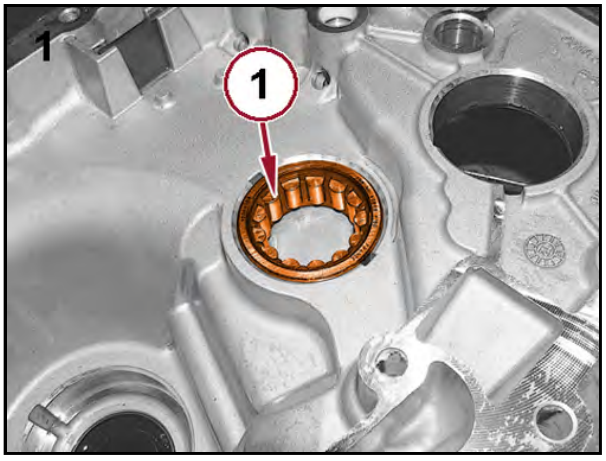
46. Remove the differential assembly (1).



47. Remove the magnet (1).

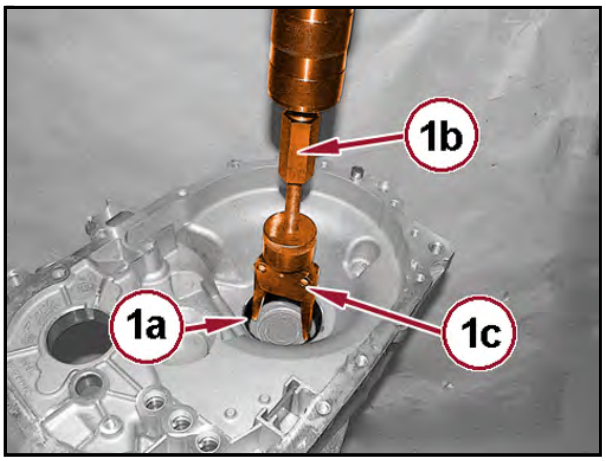


48. Remove the output shaft front bearing (1).



49. Remove the outer race (1a) for the right side differential bearing from the bellhousing, using tools 1847017001 (1b) and 1870655000 (1c).

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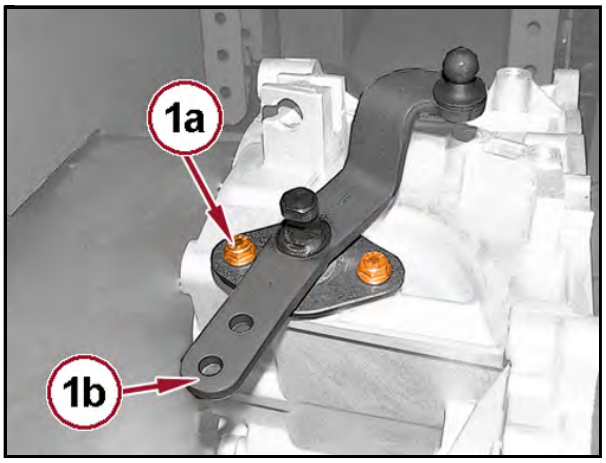


50. Remove the right side half shaft seal (1).



51. Position the transmission case in a vice equipped with protective, non marring jaw covers.

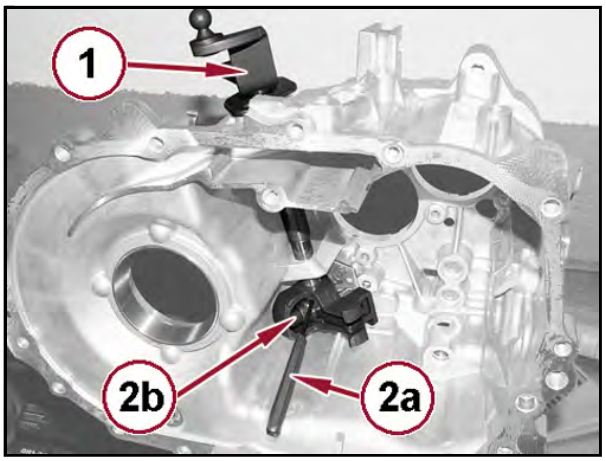
52. Remove the bolts (1a) for the gear selector and engagement lever (1b).



53. Turn the gear selector and engagement lever (1) to access the dog retaining pin.

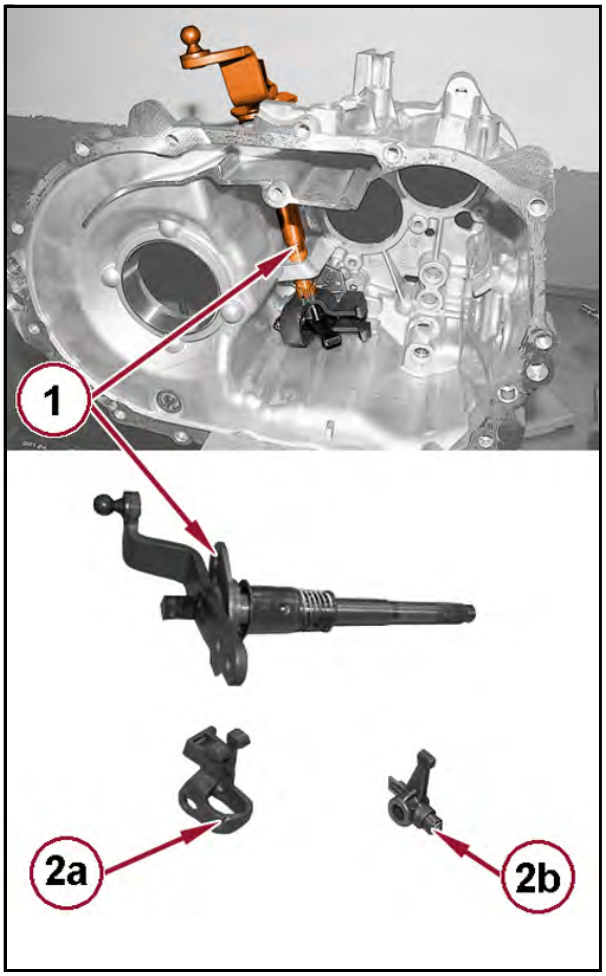
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54. Keep the gear selector and engagement lever pressed while using a suitable punch (2a) to remove the dog retaining pin (2b).



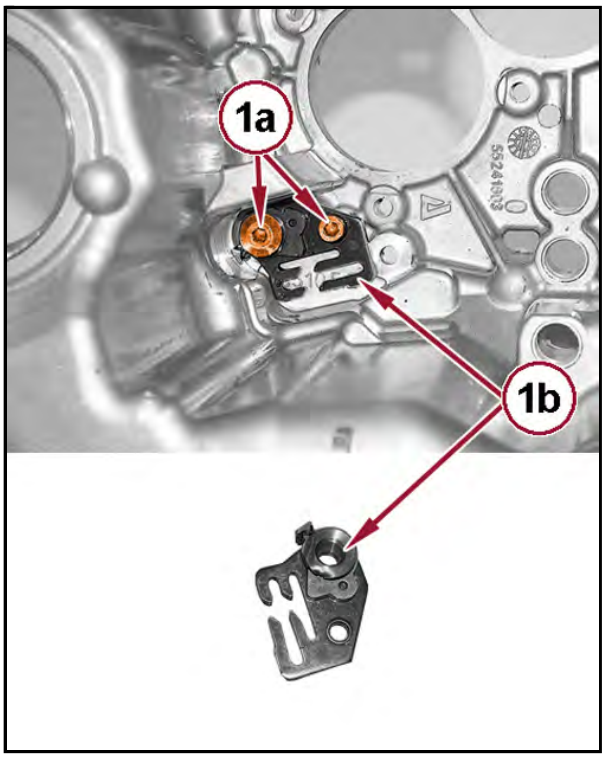
55. Remove the gear selector and engagement lever (1).

56. Remove the gear selector and engagement rod inner mounting bracket (2a) and the dog (2b).

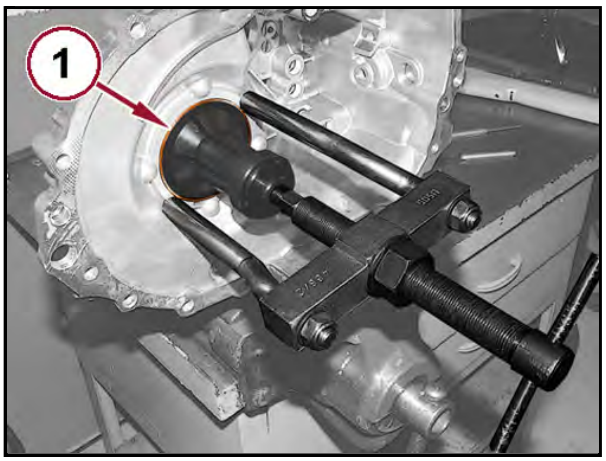


57. Remove the bolts (1a) and remove the gear control drive plate (1b).

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58. Using a suitable tool, remove the left side differential bearing outer race from the transmission case.

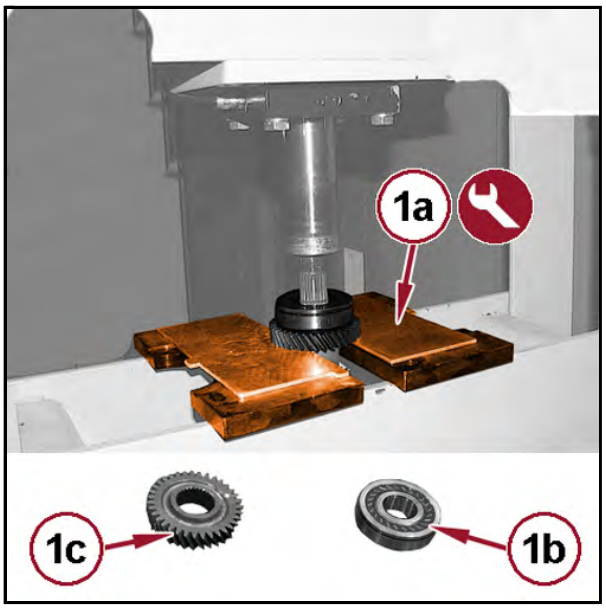


OUTPUT SHAFT DISASSEMBLY

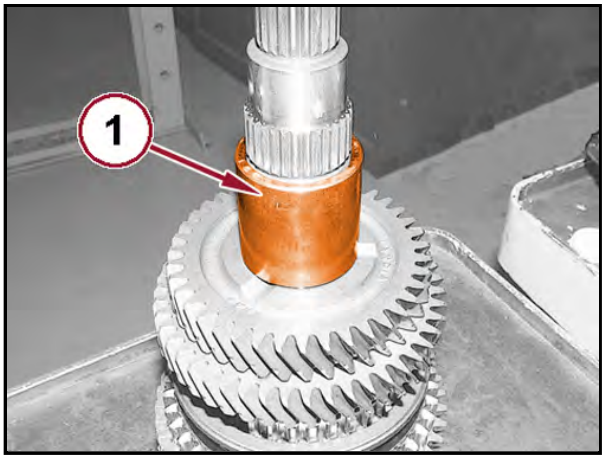
1. With a hydraulic press using the tool 2000005000 (1a), remove the rear bearing (1b)

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and the 4th gear driven gear (1c).

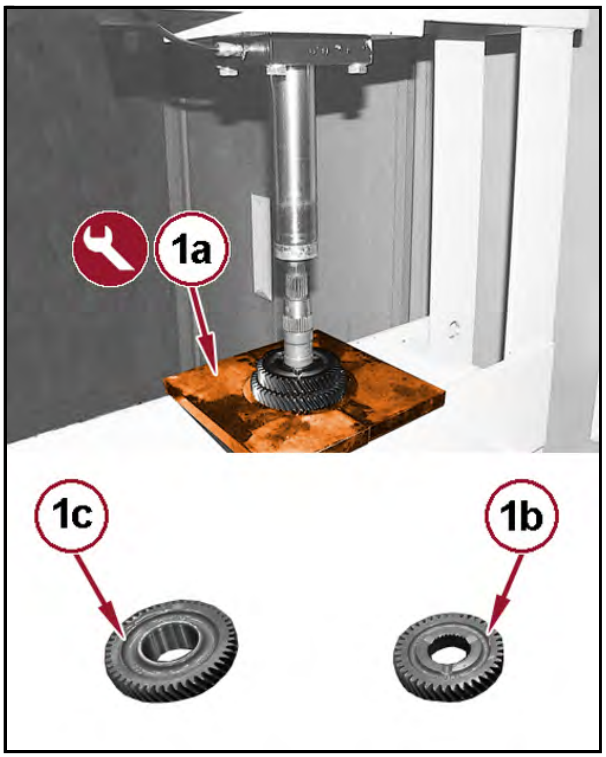


2. Remove the spacer (1) between 3rd and 4th gear.



3. With a hydraulic press using the tool 2000005000 (1a), remove the 3rd gear driven gear (1b) and the 2nd gear driven gear (1c).

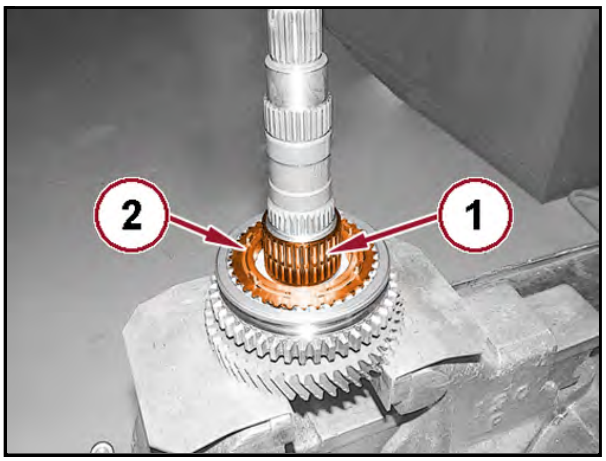
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4. Position the output shaft in a vice with protective, non marring jaw covers.

5. Remove the 2nd gear driven gear needle bearing (1).

6. Remove the 2nd gear synchronizer ring (2).

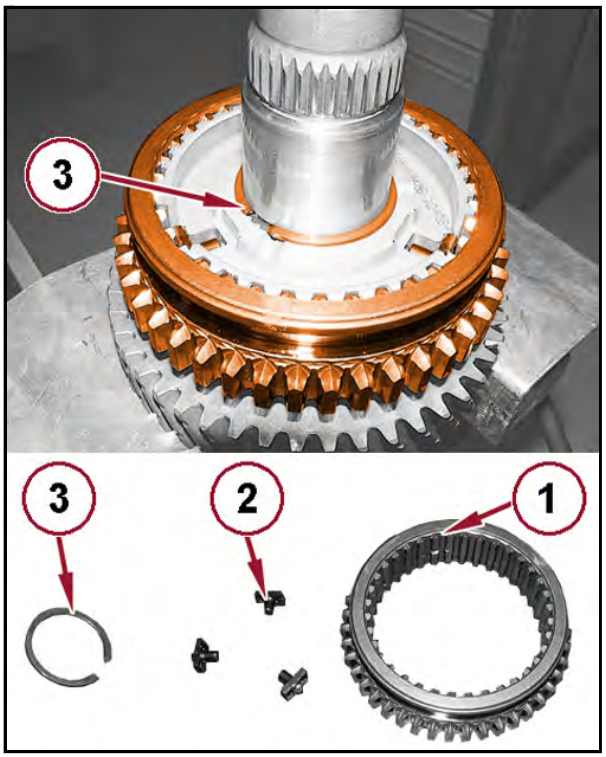


7. Remove the 1st-2nd and reverse synchronizer sleeve (1).

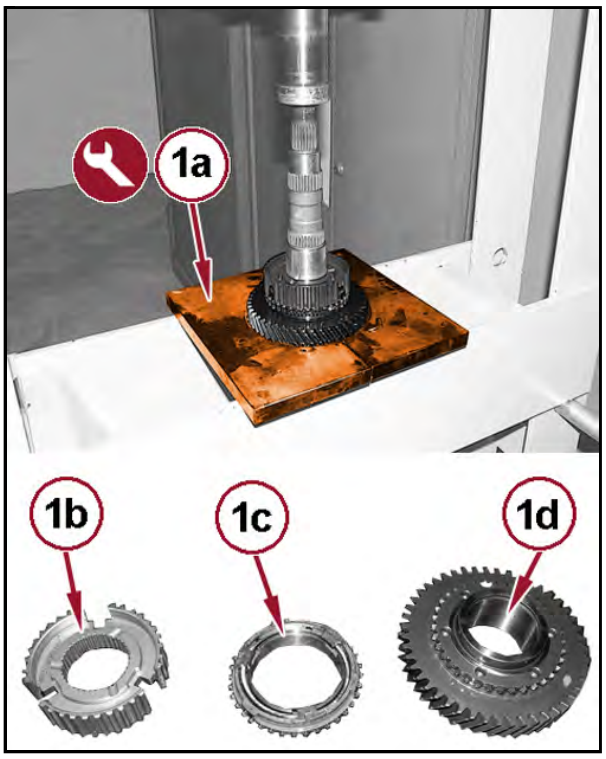
8. Remove the synchronizer detents (2).

9. Remove and **DISCARD** the 1st-2nd and reverse synchronizer hub snap ring (3).

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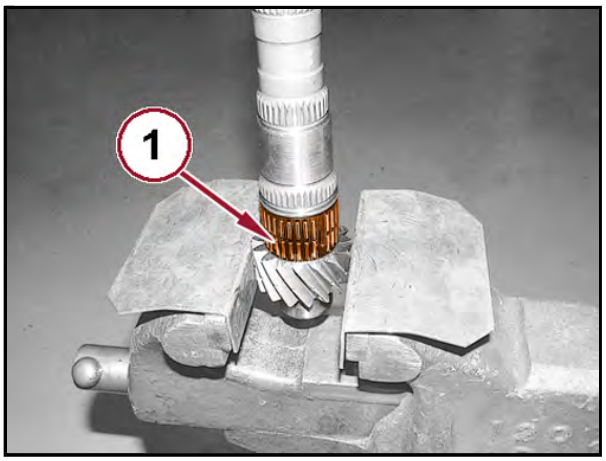
10. With a hydraulic press, use tool 2000005000 (1a) to remove the 1st-2nd and reverse synchronizer hub (1b), the 1st gear synchronizer ring (1c) and the 1st gear driven gear (1d).



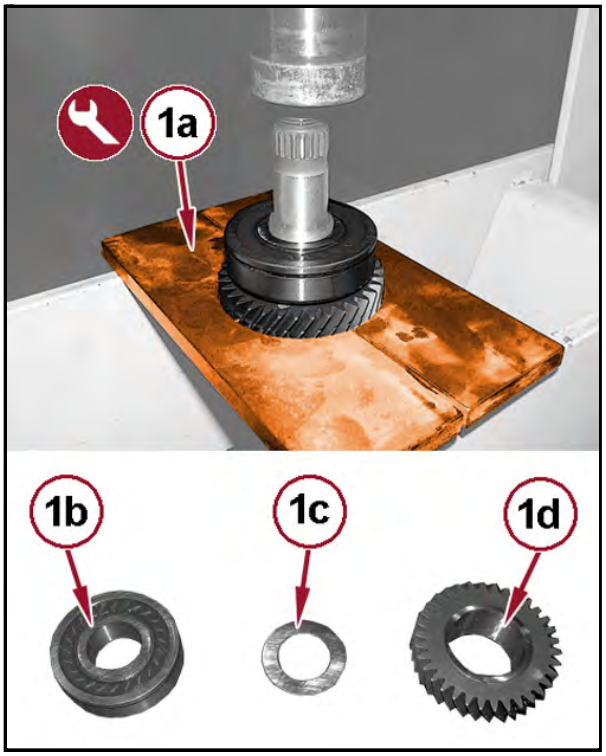
11. Remove the needle bearing (1) for the 1st gear driven gear.

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12. The output shaft front bearing inner race cannot be serviced; if worn or damaged, replace the output shaft.



13. Position the input shaft in a suitable hydraulic press using the tool 1870899400 (1a), remove the rear bearing (1b), the spacer (1c) and the 4th gear drive gear (1d).

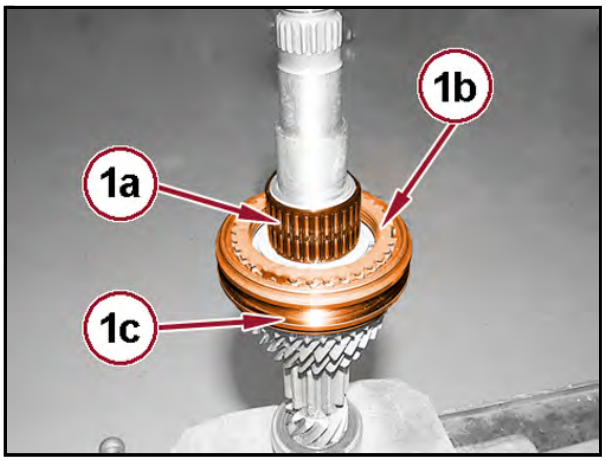


INPUT SHAFT DISASSEMBLY

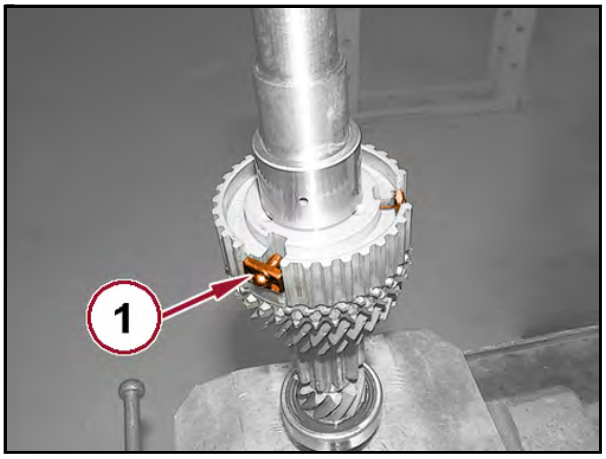
1. Position the input shaft in a vice with protective, non marring jaw covers.

2. Remove the 4th gear drive gear needle bearing (1a), the 4th gear synchronizer ring (1b) and the 3rd and 4th gear synchronizer sleeve (1c).

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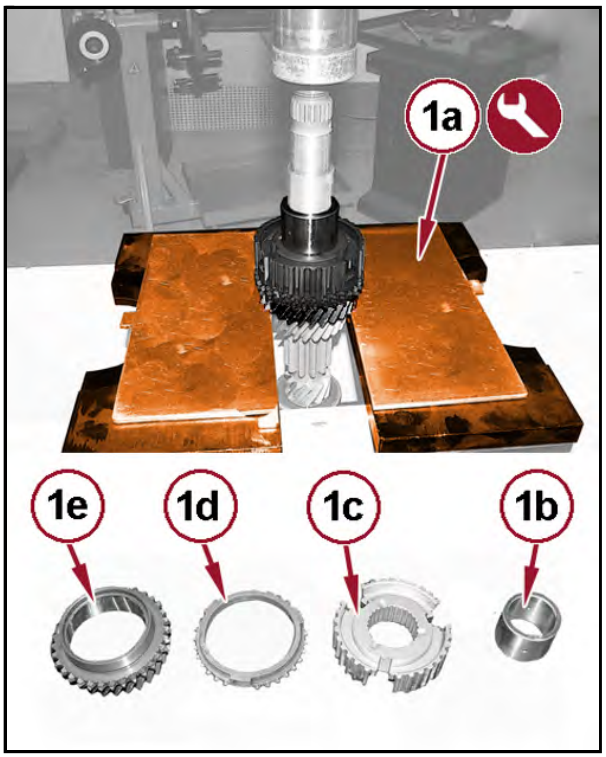


3. Remove the synchronizer detents (1).

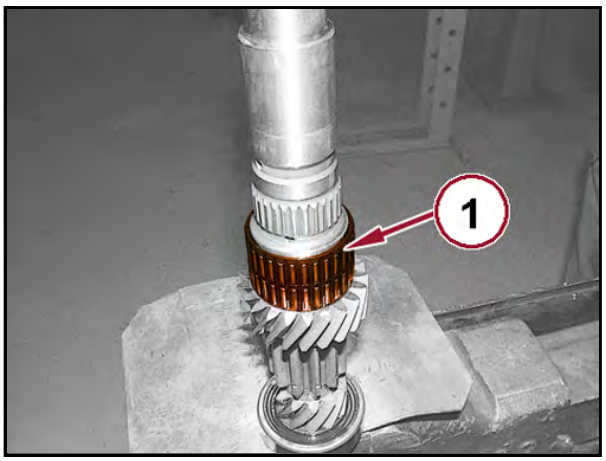


4. With a hydraulic press, use the tool 2000005000 (1a) to remove the 4th gear drive gear bushing (1b), the 3rd and 4th gear synchronizer hub (1c), the 3rd gear synchronizer ring (1d) and the 3rd speed drive gear (1e).

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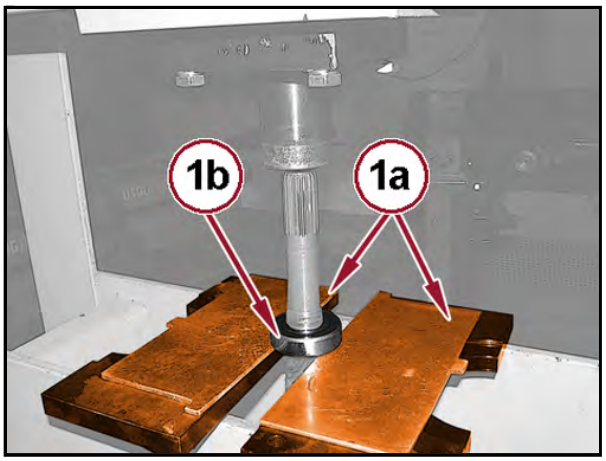


5. Remove the 3rd speed drive gear needle bearing (1).



6. With a hydraulic press using the tool 2000005000 (1a), remove the input shaft front bearing (1b).

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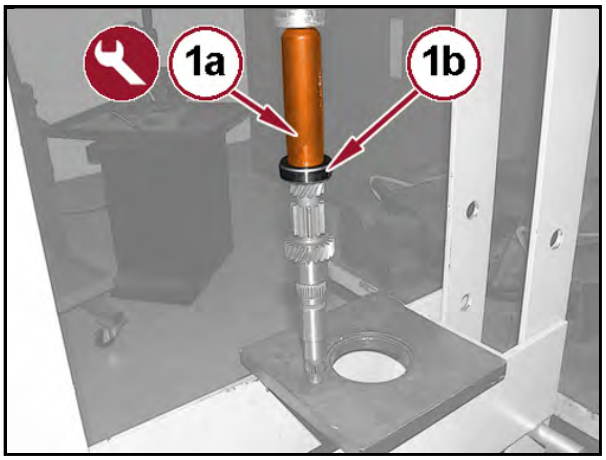


ASSEMBLY

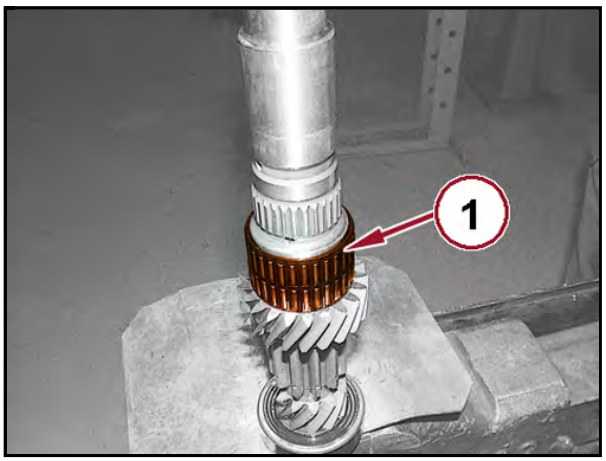
Thoroughly clean and inspect all parts. Replace any component that has excess wear or is damaged as necessary.

INPUT SHAFT ASSEMBLY

1. Using a hydraulic press and the tool 1870659000 (1a), install the input shaft front bearing (1b).



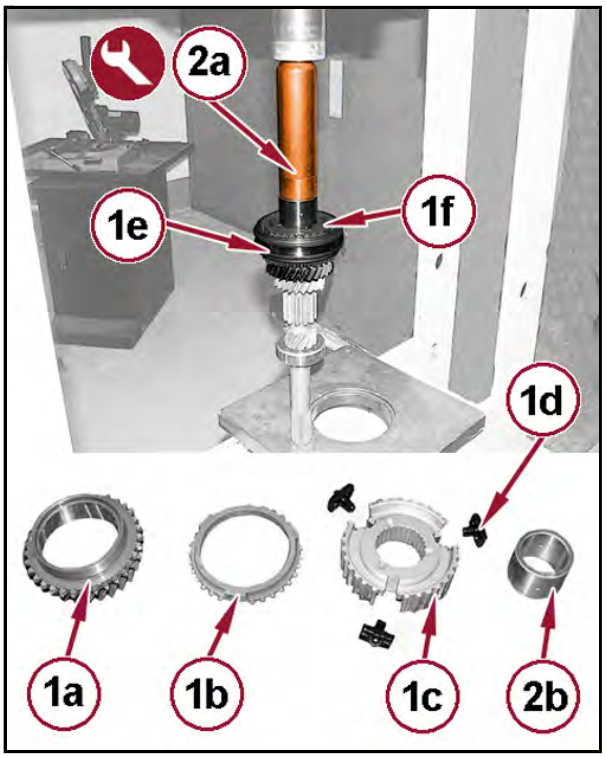
2. Install the 3rd speed drive gear needle bearing (1).



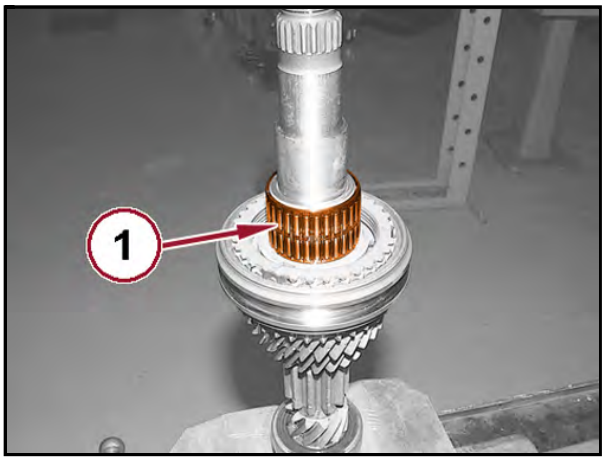
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PET_AAM_1013-0614

3. Install the 3rd speed drive gear (1a), the 3rd gear synchronizer ring (1b), the 3rd and 4th gear synchronizer hub (1c), the synchronizer detents (1d), the 3rd and 4th synchronizer sleeve (1e) and the 4th speed synchronizer ring (1f).

4. Using a hydraulic press and the tool 1870659000 (2a), install the bushing for the 4th speed drive gear (2b).



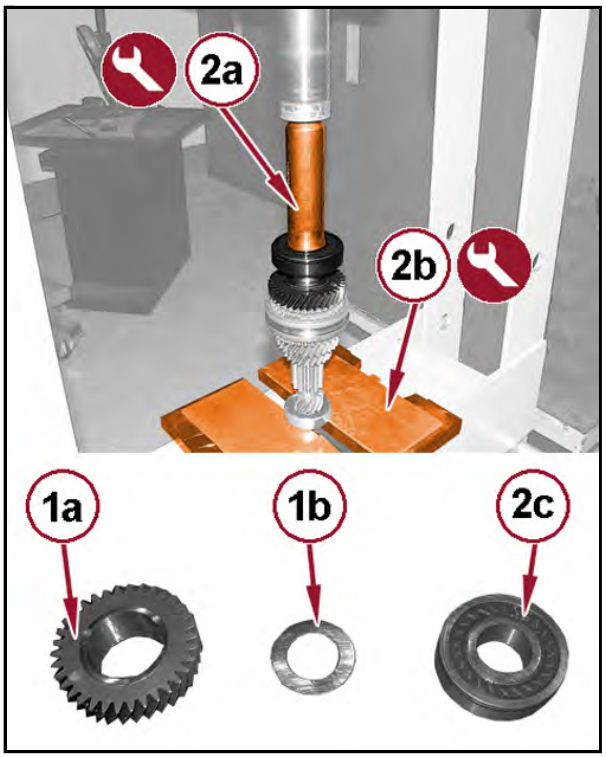
5. Install the 4th speed drive gear needle bearing (1).

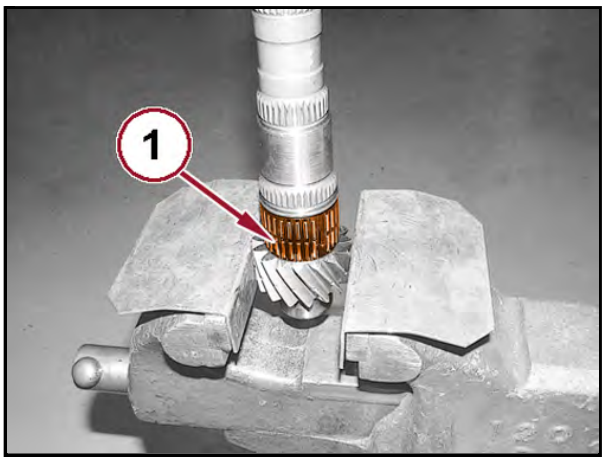


6. Install the 4th speed drive gear (1a) and the shim (1b).

7. Using a hydraulic press and the tools 1870659000 (2a) and 2000005000 (2b) install the rear bearing (2c).

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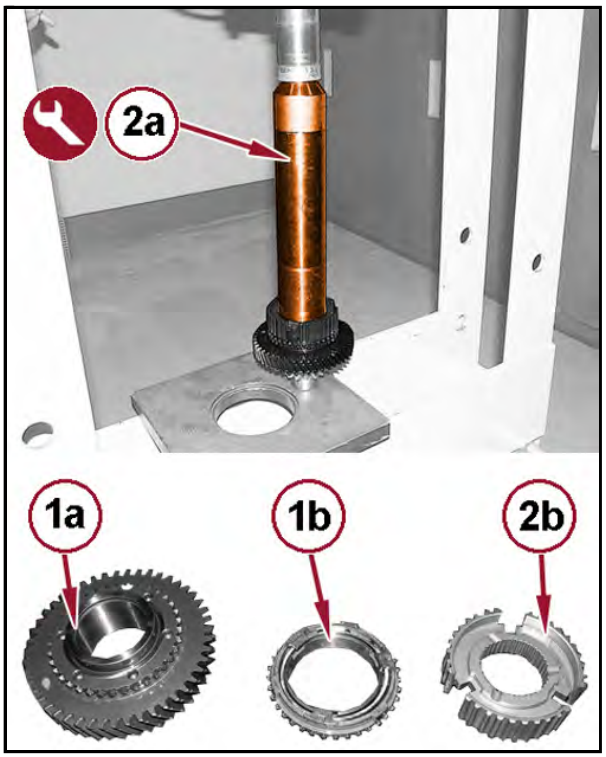
OUTPUT SHAFT ASSEMBLY

1. Install the 1st speed driven gear needle bearing (1).

2. Install the 1st speed driven gear (1a) and 1st gear synchronizer ring (1b).

3. Using a hydraulic press and the tool 1870658000 (2a), install the 1st-2nd and reverse synchronizer hub (2b).

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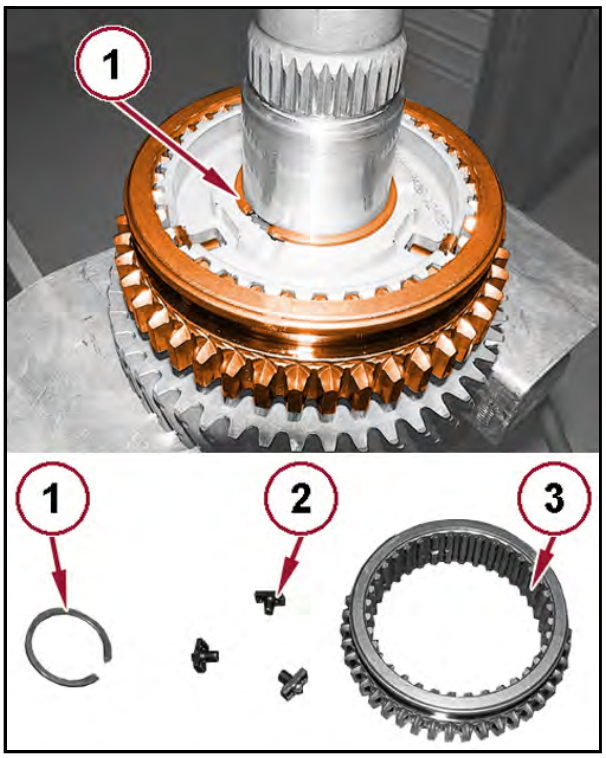


4. Position the output shaft in a vice with protective, non marring jaw covers.

5. Install a **NEW** 1st-2nd and reverse synchronizer hub snap ring (1).

6. Install the synchronizer detents (2) in the 1st-2nd and reverse synchronizer hub.

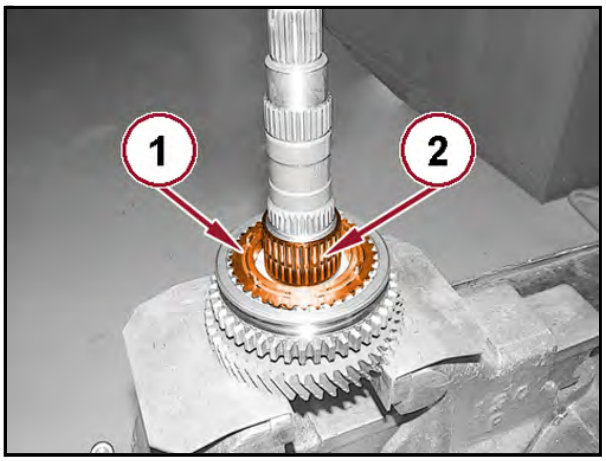
7. Install the 1st-2nd and reverse synchronizer sleeve (3).



8. Install the 2nd gear synchronizer rings (1).

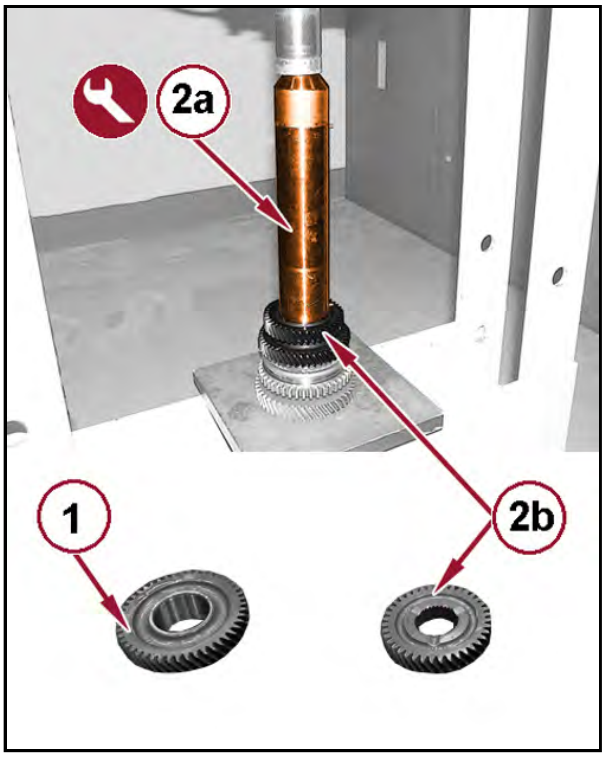
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9. Install the 2nd speed driven gear needle bearing (2).



10. Install the 2nd speed driven gear (1).

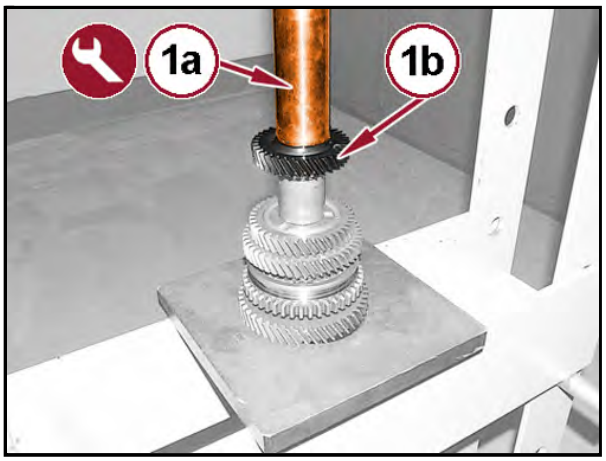
11. Using a hydraulic press and the tool 1870658000 (2a), install the 3rd speed driven gear (2b).



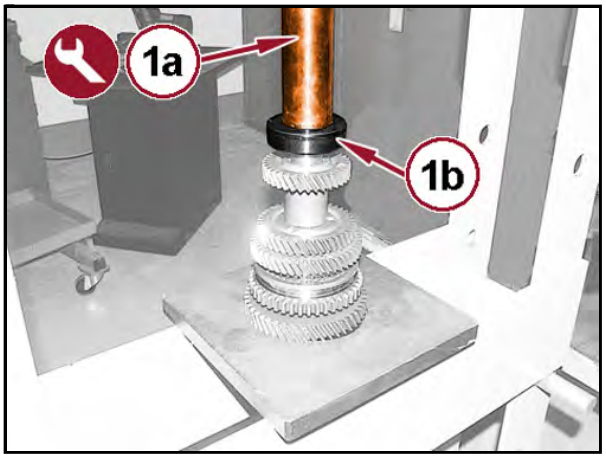
12. Install the spacer between the 3rd and 4th gear.

13. Using a hydraulic press and the tool 1870465000 (1a), install the 4th speed driven gear (1b).

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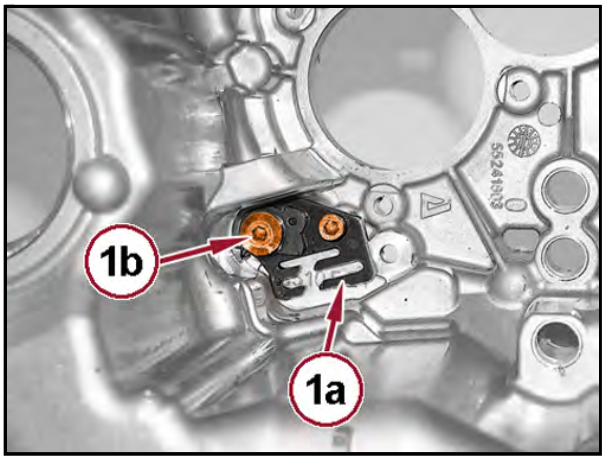
14. Using a hydraulic press and the tool 1870465000 (1a), install the rear bearing (1b).



TRANSMISSION ASSEMBLY

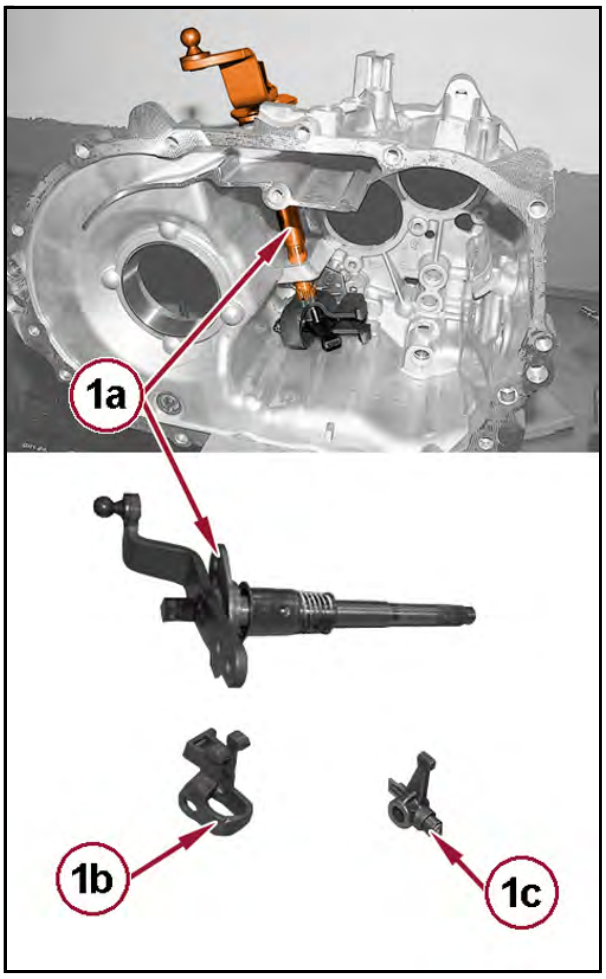
1. Position the transmission case in a vice with protective, non marring jaw covers.

2. Place the gear control drive plate (1a) and tighten the bolts (1b).

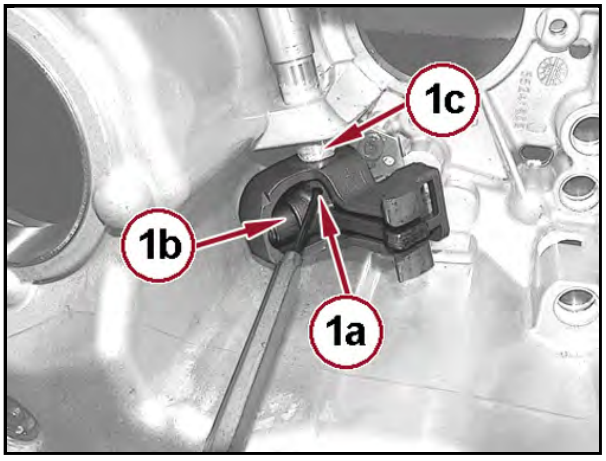


3. Place the gear selector and engagement lever (1a) in its housing along with the gear selector and engagement rod inner mounting bracket (1b) and the dog (1c).

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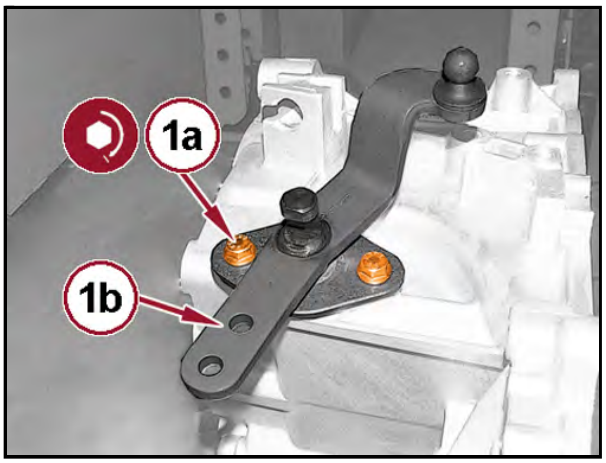


4. Using a suitable punch, install the **NEW** pin (1a) securing the dog (1b) to the gear selector and engagement lever (1c).

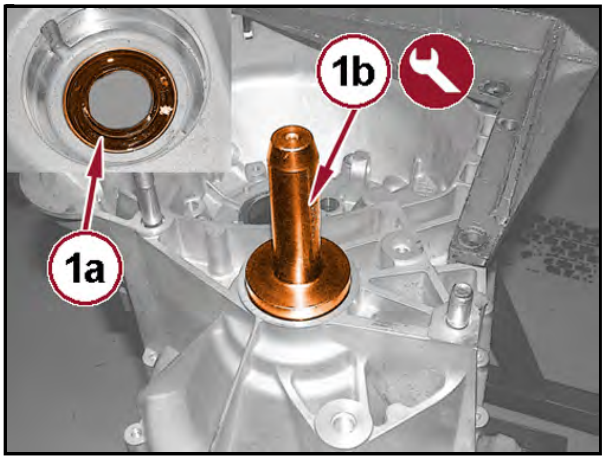


5. Tighten the gear selector and engagement lever (1b) fixing screws (1a) to the proper (Torque Specifications) .

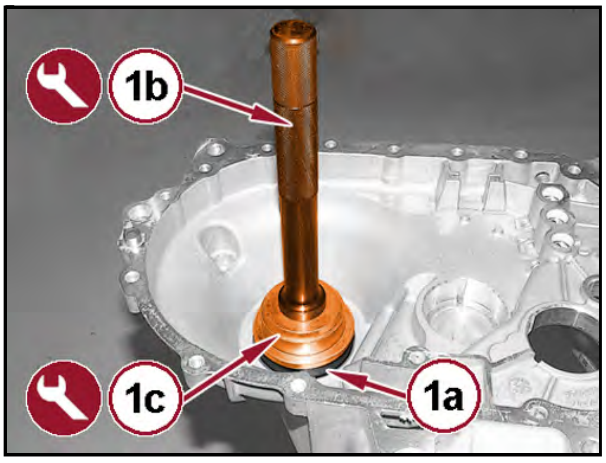
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6. Install a **NEW** right side half shaft seal (1a) using the tool 1875016000 (1b).

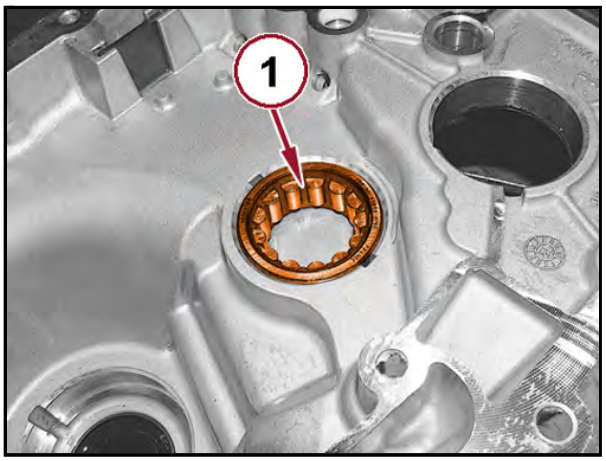


7. Install the outer race (1a) for the right side differential bearing using tools 1870898400 (1b) and 1874541000 (1c).

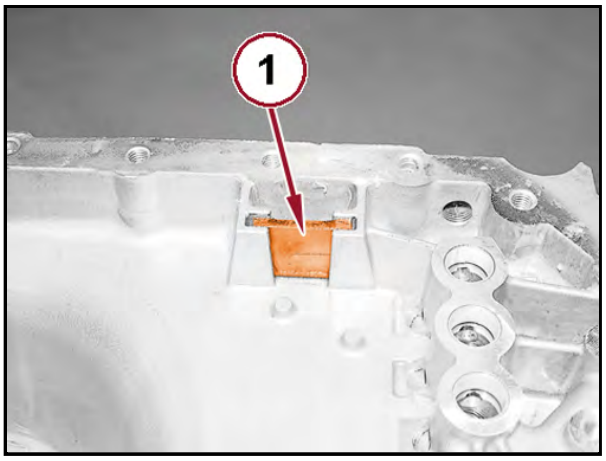


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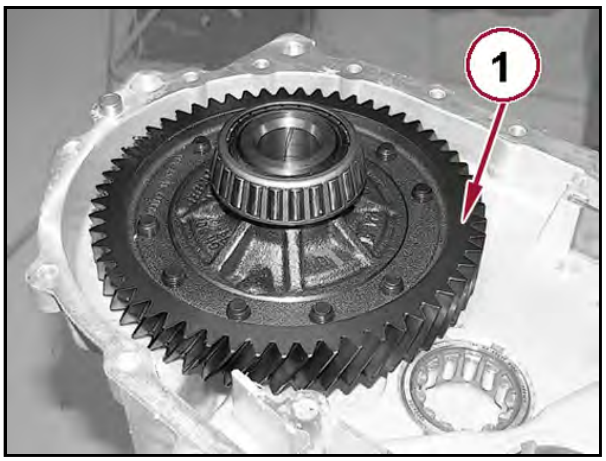
8. Install the output shaft front bearing (1).



9. Install the magnet (1) in the case.



10. Install the differential assembly (1) in the bellhousing.

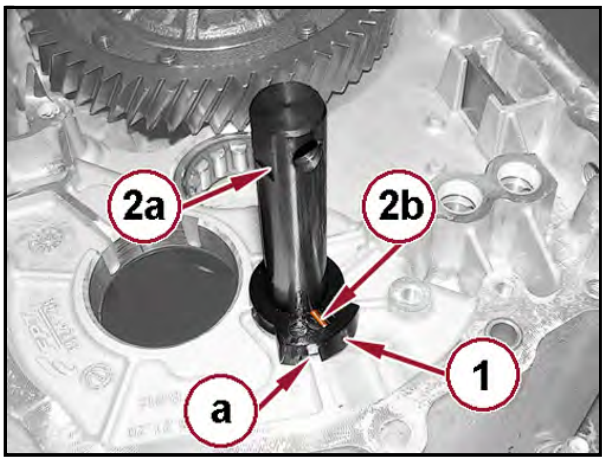


Install the bushing for the reverse idler gear shaft.

11. Install the reverse idler gear bushing (1) with indexing notch (a) over the rib in the bellhousing as shown.

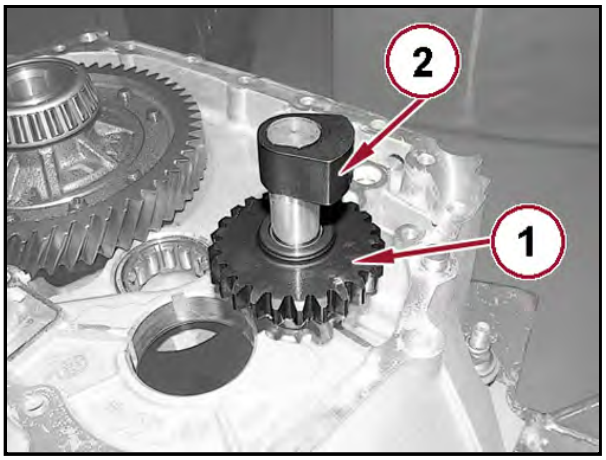
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12. Install the reverse idler gear shaft (2a), placing the pin (2b) in the groove in the bushing (1).

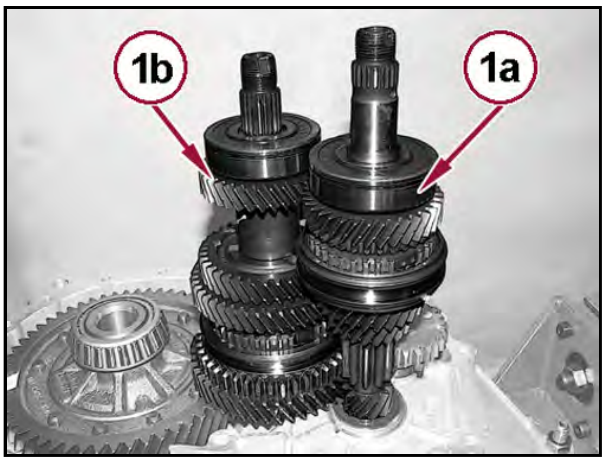


13. Install the reverse idler gear (1) with the gear engagement teeth facing downward.

14. Install the reverse idler gear shaft support (2).



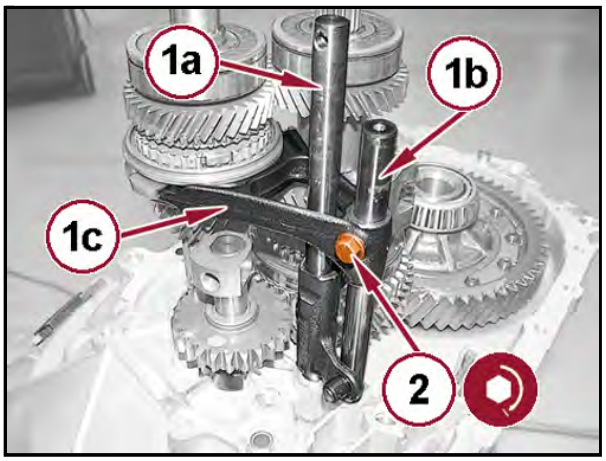
15. Install the input shaft (1a) and the output shaft (1b) assemblies simultaneously.



16. Install the 5th and reverse gear shift rail (1a) and the 3rd and 4th gear shift rail (1b) with shift fork (1c) simultaneously.

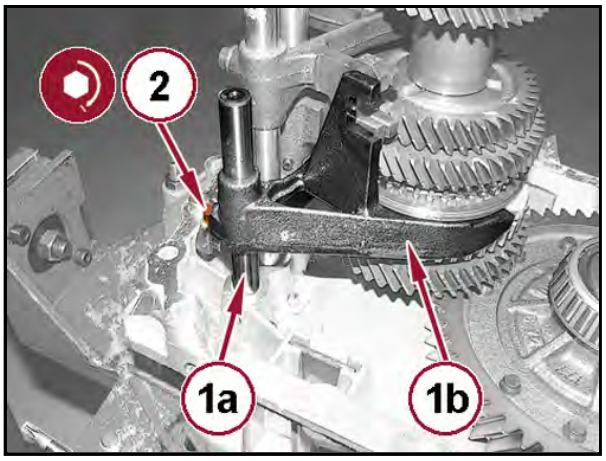
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17. Tighten the 3rd and 4th gear shift fork bolt (2) to the proper (Torque Specifications) .

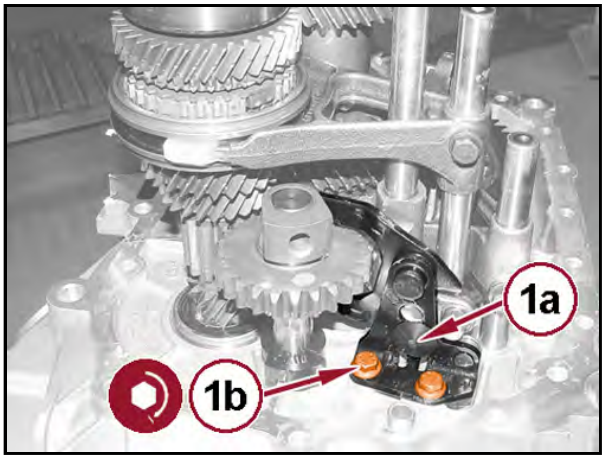


18. Install the 1st and 2nd gear shift rail (1a) with shift fork (1b).

19. Tighten the 1st and 2nd gear fork bolt to the proper (Torque Specifications) .



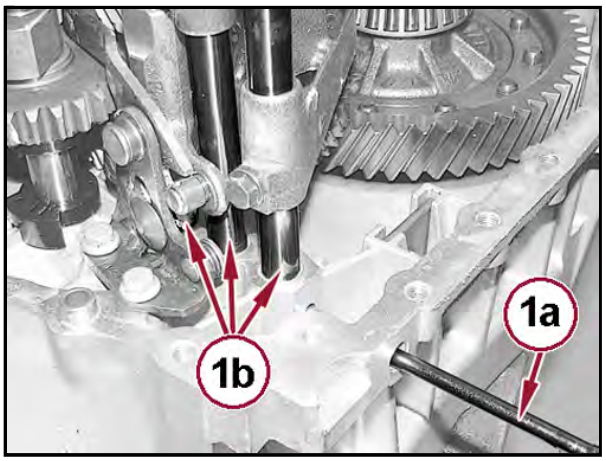
20. Install the reverse shift fork (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



21. Position all the gear shift forks in neutral and install a suitable locking pin (1a) through the bellhousing and shift rails (1b).

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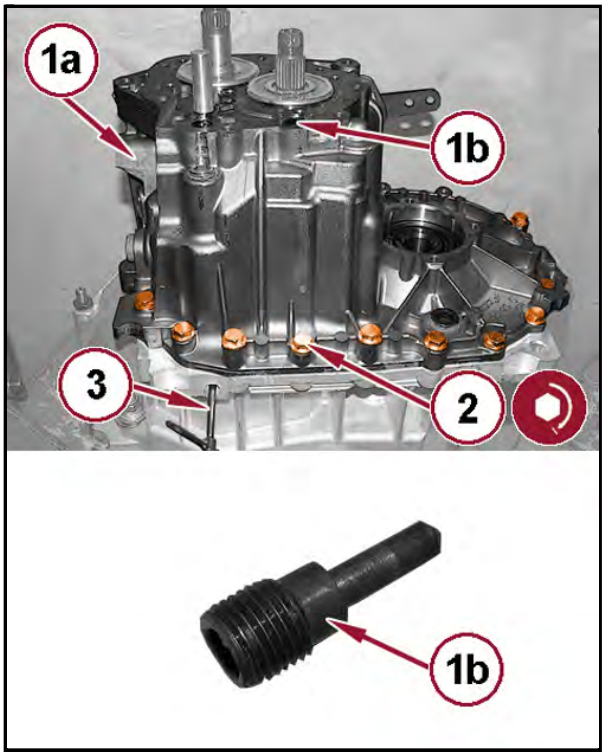
22. Apply sealant to the mating surface of the bellhousing and the transmission case.



23. Install the transmission case (1a) to the bellhousing and tighten the gear selector and engagement lever inner support locking pin (1b).

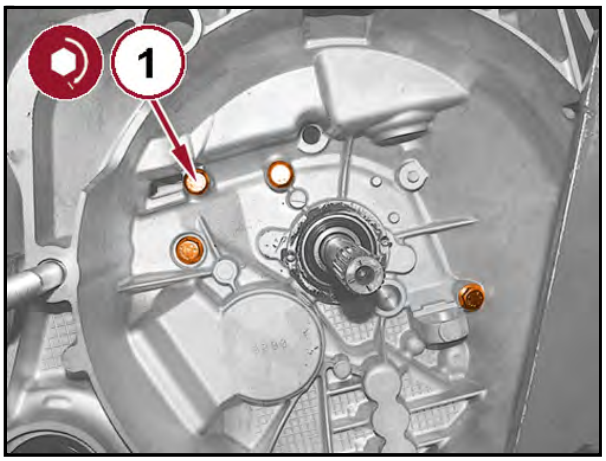
24. Tighten the outer transmission case bolts (2) to the proper (Torque Specifications) .

25. Remove the shift rail locking pin (3) and install and tighten the plug.

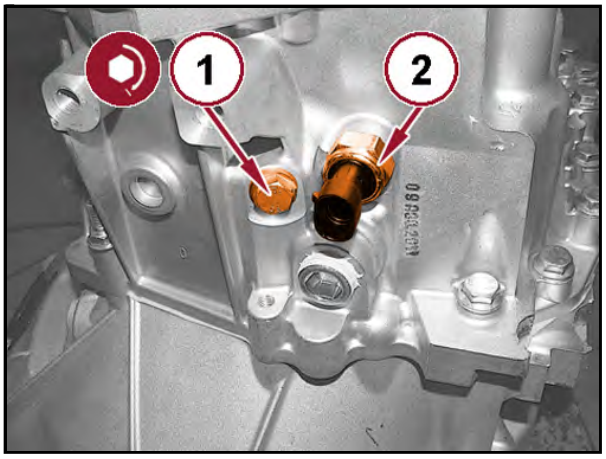


26. Tighten the inner transmission case bolts (2) to the proper (Torque Specifications) .

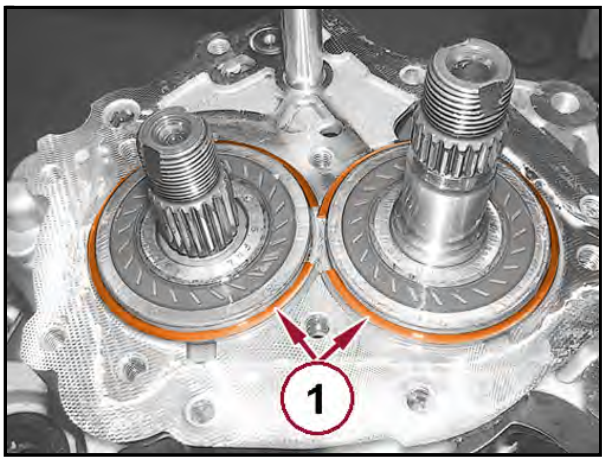
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27. Tighten the reverse idler shaft bolt (1) to the proper (Torque Specifications) .



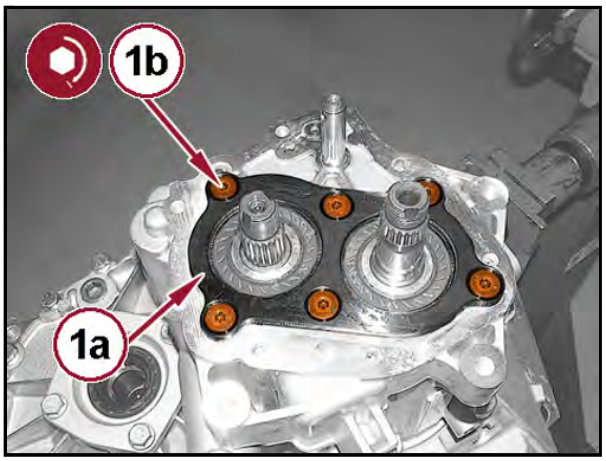
28. Install the backup lamp switch (2).



29. Install the input and output shaft rear bearing snap rings (1). After installation, orient the gaps as shown.

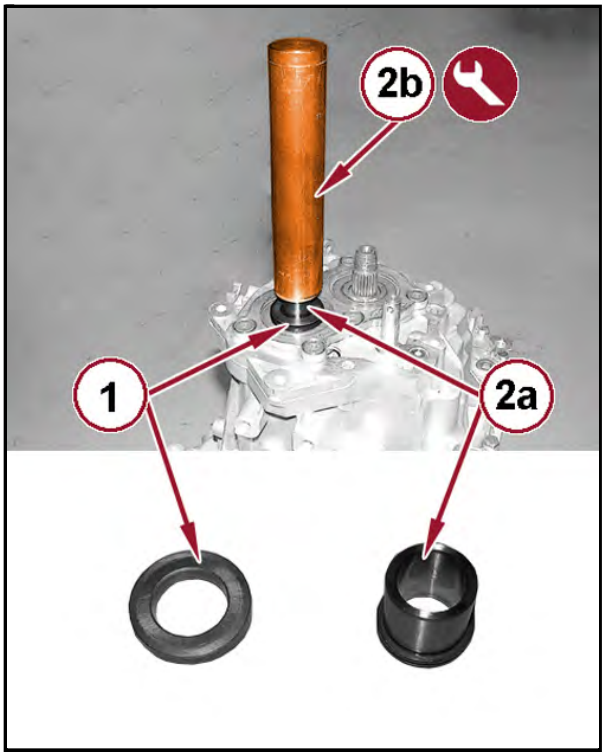
30. Install input and output shaft rear bearing retaining plate (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .

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31. Install the spacer (1).

32. Install the 5th speed drive gear bushing (2a) using the tool 1871004500 (2b).

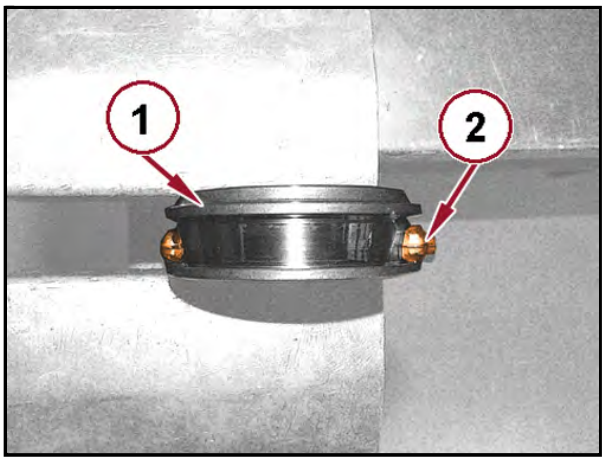


33. Position the 5th gear synchronizer sleeve (1) in a vice with protective, non marring jaws.

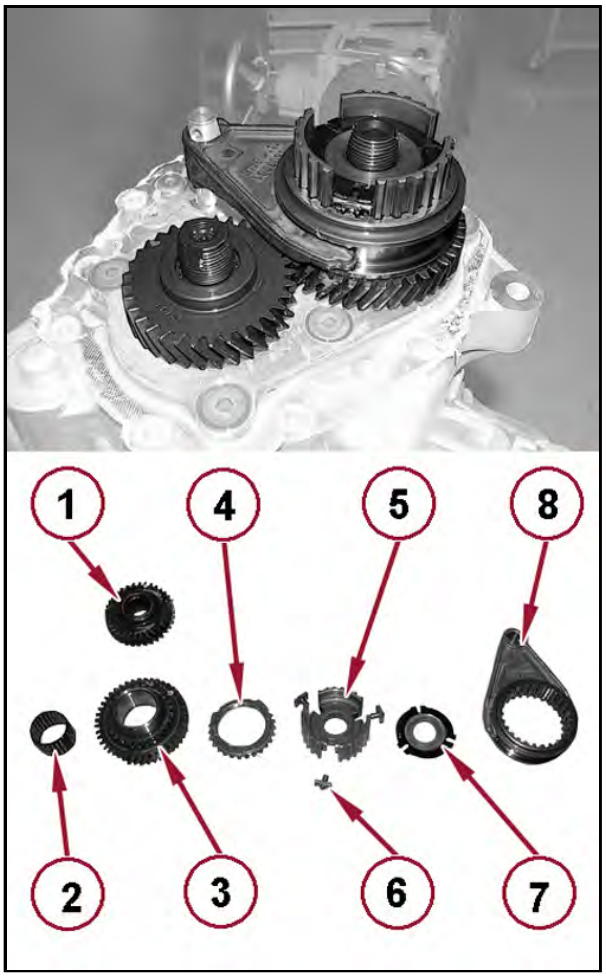
34. Position the 5th gear shift fork (2) so that the tapered part is facing the same direction as the taper of the sleeve (1). Press the fork onto the sleeve by hand.

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35. Check that the sleeve (1) can rotate freely inside of the fork (2).



36. Install the 5th speed driven gear (1).
37. Install the 5th speed drive gear needle bearing (2).
38. Install the 5th speed drive gear (3).
39. Install the 5th gear synchronizer ring (4).
40. Install the 5th gear synchronizer hub (5).
41. Install the detents (6).
42. Install the detent retainer (7).
43. Install the 5th speed synchronizer sleeve complete with shift fork (8).

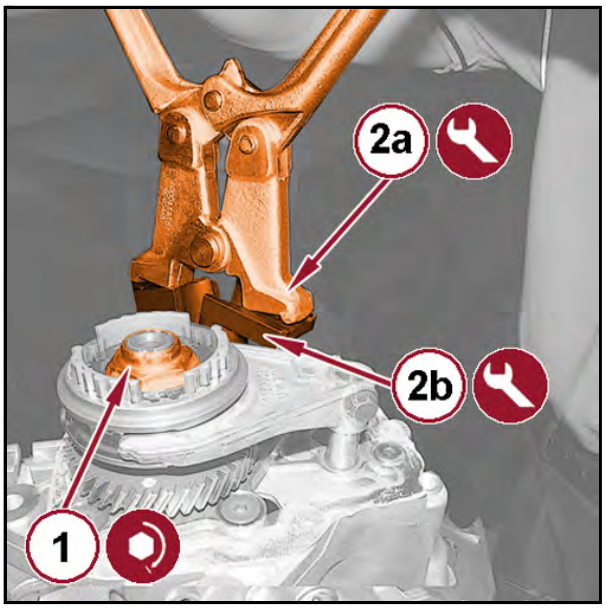


44. Engage any gear using the gear selection and engagement lever.
45. Engage 5th gear by pressing the shift fork down.

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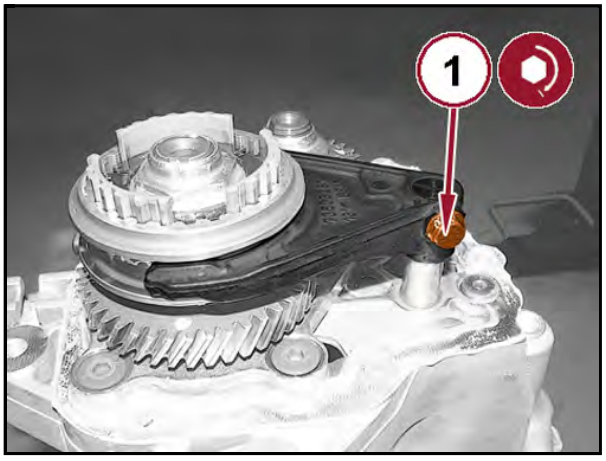
46. Install **NEW** nuts (1) on the input and output shafts and tighten the to the proper (Torque Specifications) .

47. Stake the input and output shaft nuts using the tools 1874140001 (2a) and 1874140005 (2b).



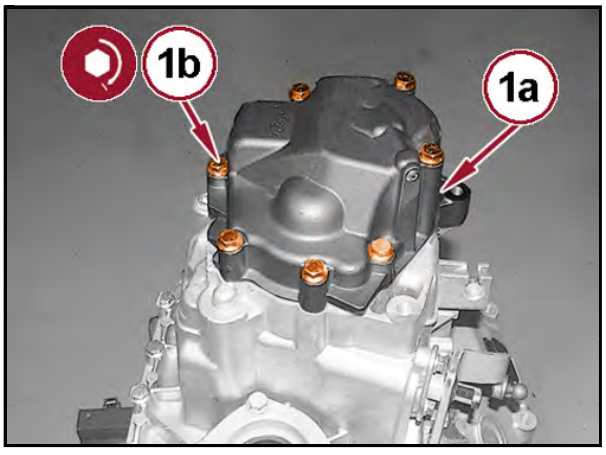
48. Place the 5th gear shift fork in neutral.

49. Install the 5th gear shift fork bolt to the proper (Torque Specifications) .



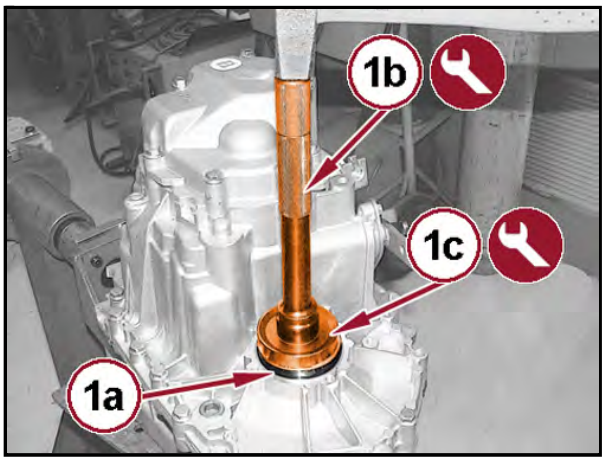
50. Apply sealant to the rear cover mating surface.

51. Install the rear cover (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .

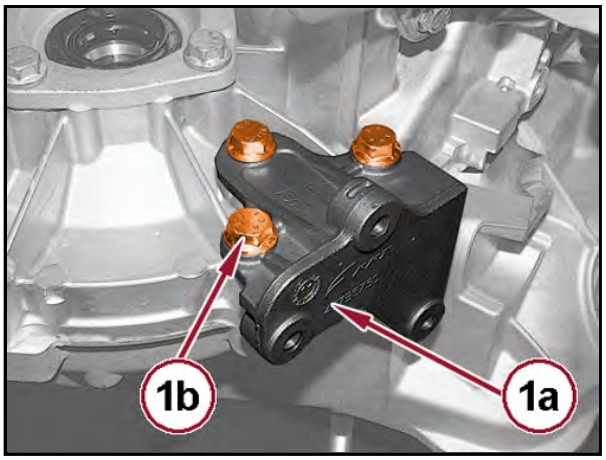


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52. Install the left differential bearing outer race (1a) using tools 1870898400 (1b) and 1875055000 (1c).

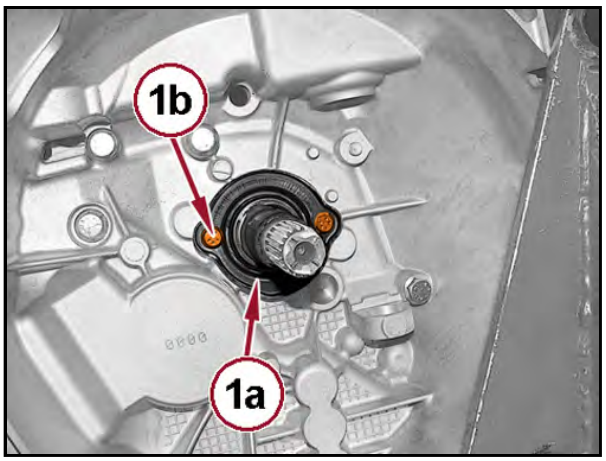


53. Install the gear engagement and selection cable reaction bracket (1a) and tighten the bolts (1b).



54. Apply sealant to the mating surface of the transmission input shaft gasket flange.

55. Install the transmission input shaft gasket (1a) and tighten the bolts (1b).

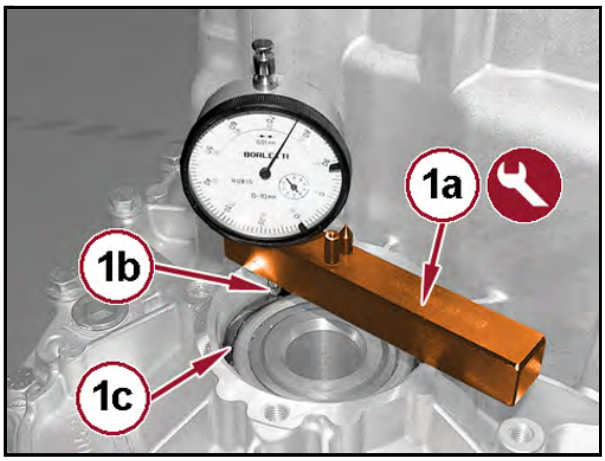


56. Install the outer lever of the clutch thrust bearing control and the snap ring.

57. Position the tool 1895655000 (1a) complete with dial indicator across the differential seal cover support surface, then bring the plunger

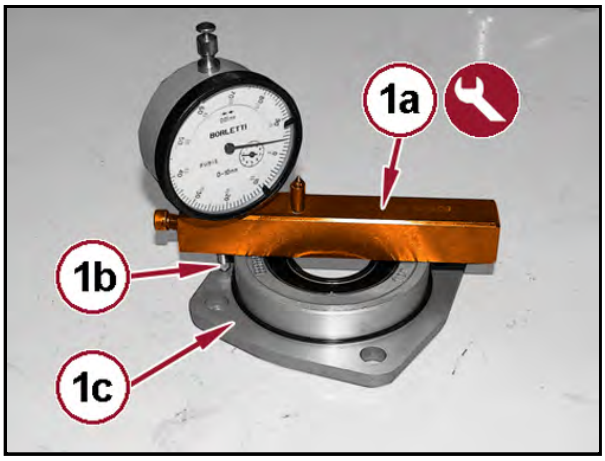
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(1b) into contact with the taper roller bearing outer race (1c). Zero the dial indicator with a preload of 1 mm (.0394 in.).



58. Position the tool 1895655000 (1a) complete with dial indicator across the left axle seal, bringing the plunger (1b) in contact with the surface (1c) and measure the difference.

    NOTE: 08 mm (.003 in.) corresponds to the desired preload of the differential bearings.



59. Calculate the size of the differential bearing preload select thrust washer by adding 0.08 mm (.003 in.) to the difference measured.

60. Install a select thrust washer (1) having the same size or the next largest size to the one calculated for the differential bearing preload in the housing.

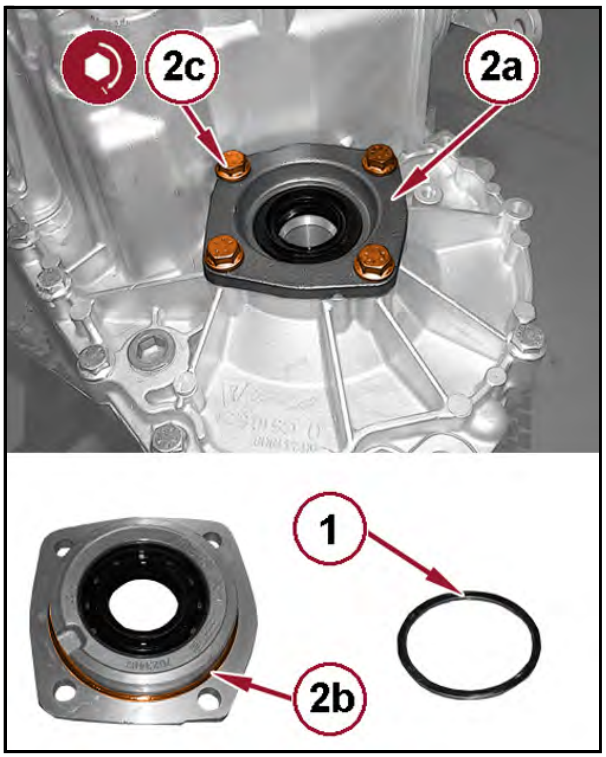
    NOTE: The left axle seal must always be replaced if removed.

61. Install a **NEW** left axle seal (2a) and the gasket (2b), then tighten the bolts (2c) to the proper (Torque Specifications) .

62. Install the differential inner tripod housing.

63. Remove the transmission from the support stand.

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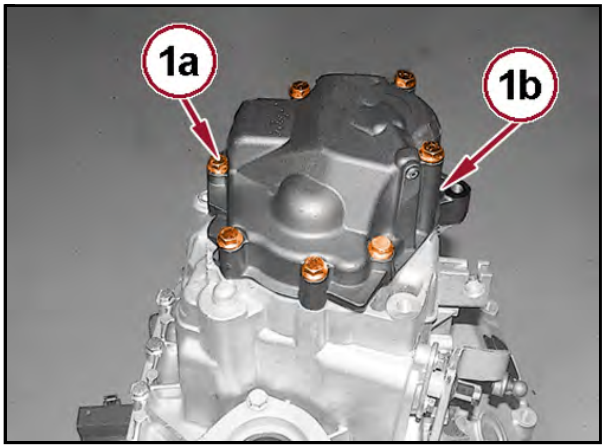


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PET_AAM_1013-0632

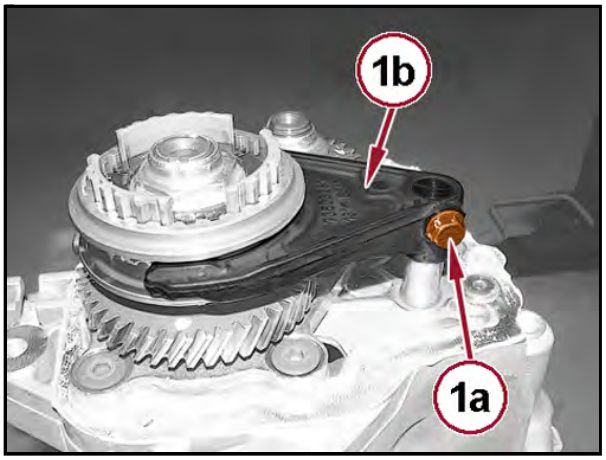
FIFTH GEAR DISASSEMBLY AND ASSEMBLY

DISASSEMBLY

1. Remove the bolts (1a) and remove the transmission rear cover (1b).



2. Engage any gear using the gear selection and engagement lever.
3. Remove the bolt (1a) from the 5th gear shift fork (1b).
4. Engage the 5th gear by pushing the fork (1b) down.

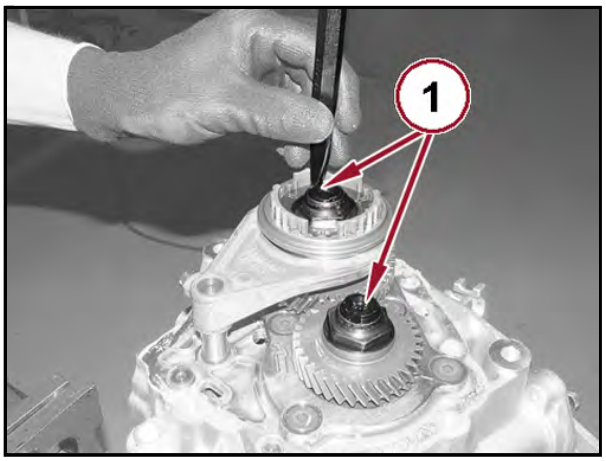


NOTE: **If two gears are engaged simultaneously the gear shafts will lock.**

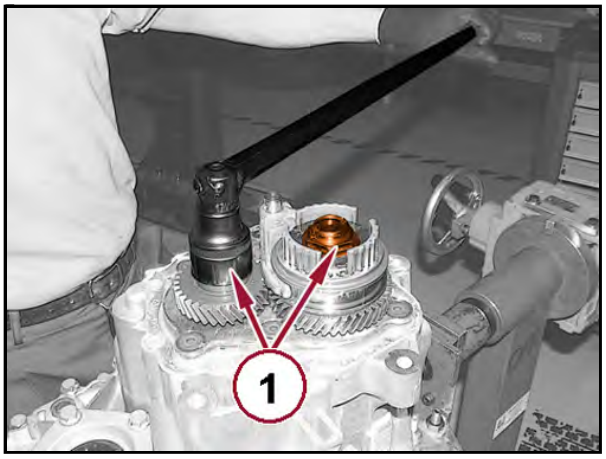
5. Use a suitable drift to straighten the staking on the input and output shaft nuts, then loosen the nuts (1).

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6. Place 5th gear in the neutral position by lifting up on the shift fork. This will prevent the detents from falling free.



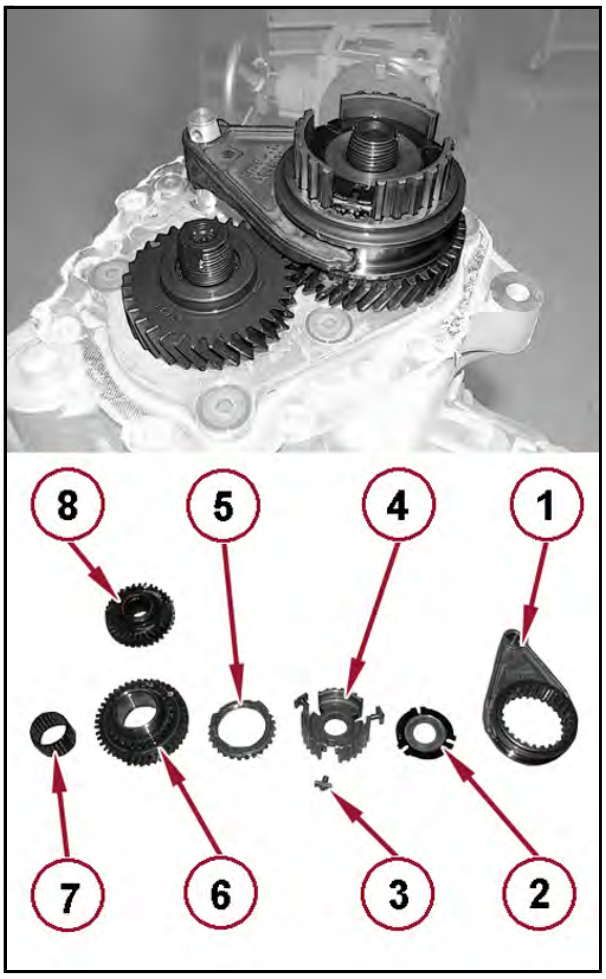
7. Remove the input and output shaft nuts (1).



8. Remove the 5th gear shift fork with the 5th gear synchronizer sleeve (1).
9. Remove the retaining washer (2) for the synchronizer detents.
10. Remove the synchronizer detents (3).
11. Remove the 5th gear synchronizer hub (4).
12. Remove the 5th gear synchronizer ring (5).
13. Remove the 5th gear drive gear (6).
14. Remove the 5th gear drive gear needle bearing (7).

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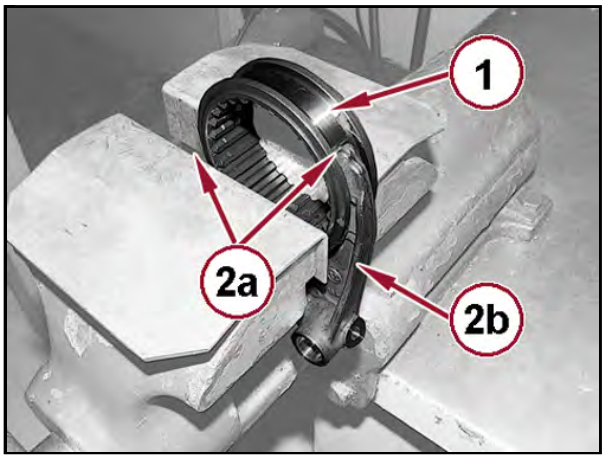
15. Remove the 5th gear driven gear (8).



NOTE: **Do not nick the tapered part of the sleeve and the ends of the fork with the drift.**

16. Position the 5th gear synchronizer sleeve (1) in a vice with protective, non marring jaw covers.

17. Using a brass punch, alternatively tap on the two ends (2a) of the fork (2b) to separate it from the 5th gear synchronizer sleeve.

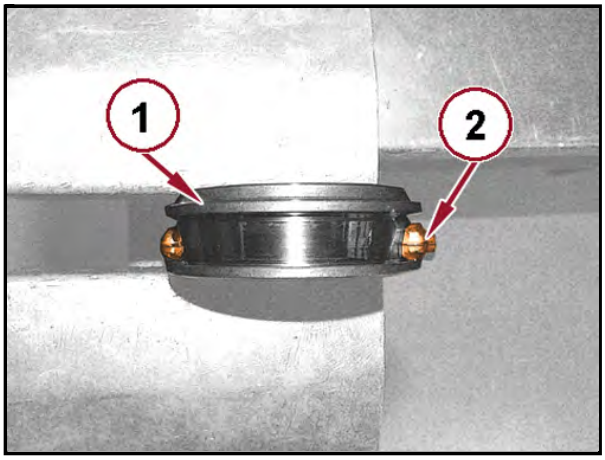


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ASSEMBLY

Thoroughly clean and inspect all parts. Replace any component that has excess wear or is damaged as necessary.

1. Position the 5th gear synchronizer sleeve (1) in a vice with protective, non marring jaws.
2. Position the 5th gear shift fork (2) so that the tapered part is facing the same direction as the taper of the sleeve (1). Press the fork onto the sleeve by hand.

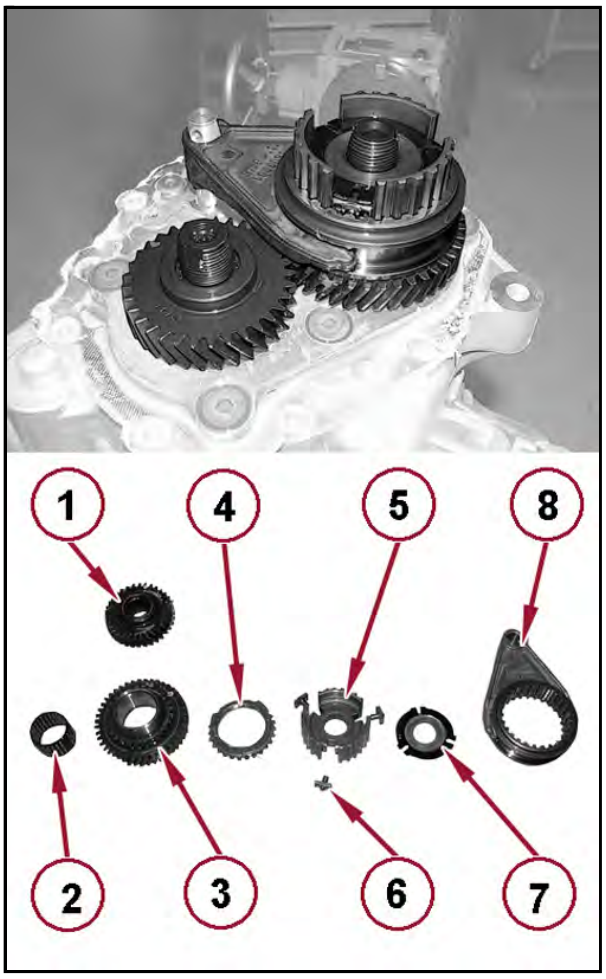


3. Check that the sleeve (1) can rotate freely inside of the fork (2).
4. Install the 5th speed driven gear (1).
5. Install the 5th speed drive gear needle bearing (2).
6. Install the 5th speed drive gear (3).
7. Install the 5th gear synchronizer ring (4).
8. Install the 5th gear synchronizer hub (5).
9. Install the detents (6).
10. Install the detent retainer (7).
11. Install the 5th speed synchronizer sleeve complete with shift fork (8).

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PET_AAM_1013-0636

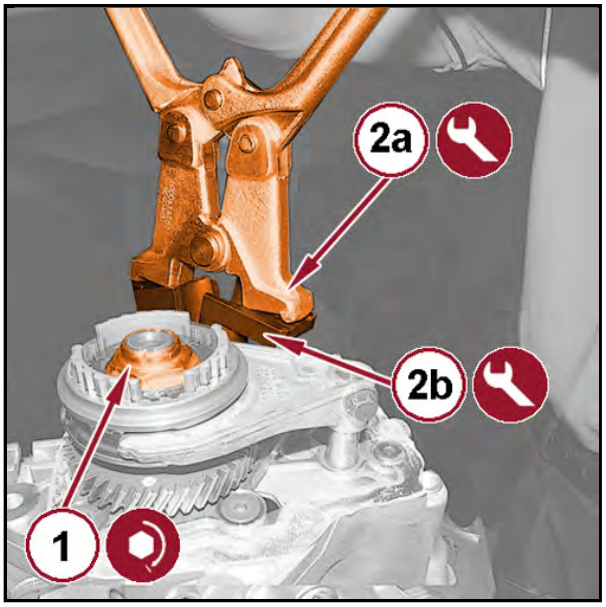
12. Engage any gear using the gear selection and engagement lever.

13. Engage 5th gear by pressing the shift fork down.



14. Install **NEW** nuts (1) on the input and output shafts and tighten the to the proper (Torque Specifications) .

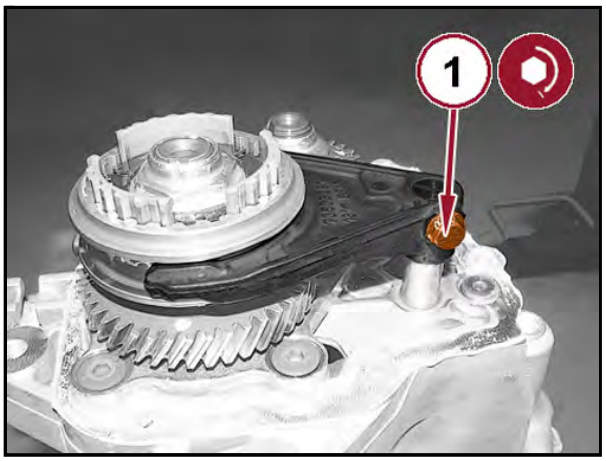
15. Stake the input and output shaft nuts using the tools 1874140001 (2a) and 1874140005 (2b).



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PET_AAM_1013-0637

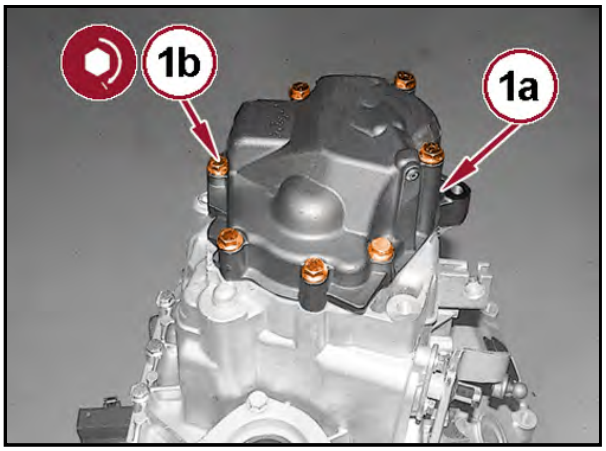
16. Place the 5th gear shift fork in neutral.

17. Install the 5th gear shift fork bolt to the proper (Torque Specifications) .



18. Apply sealant to the rear cover mating surface.

19. Install the rear cover (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



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21 - Transmission and Transfer Case / Manual, C510 / Special Tools

SPECIAL TOOLS

Tool (EMEA)	Tool (NAFTA)	Name	Function
1840005001	*	Puller Bridge	Transmission Disssembly
1840005303	*	Puller Jaws	Transmission Disssembly
1845028000	*	Thrust Button	Differential Bearing Removal
1847017001	*	Slide Hammer	Transmission Disassembly
1870465000	*	Installer	Transmission Assembly
1870655000	*	Puller	Transmission Disassembly
1870658000	*	Installer	Differential Bearing Installation
1870659000	*	Installer	Transmission Assembly
1870835001	*	Hydraulic Jack	Transmission Removal and Installation
1870847000	*	Brackets	Transmission Removal and Installation
1870898400	*	Handle	Transmission Disassembly and Assembly
1870899400	*	Support Plates	Transmission Disassembly and Assembly
1871000000	*	Stand	Transmission Disassembly and Assembly
1871004500	*	Installer	Fifth Gear Bushing Installation
1871001014	*	Adapter	Transmission Disassembly and Assembly
1874140001	*	Handle	Staking the Input and Output Shaft Nuts
1874140005	*	Adapter, Staking	Staking the Input and Output Shaft Nuts
1874541000	*	Installer	Right Differential Bearing Race Installation
1875016000	*	Installer	Right Axle Seal Installation
1875055000	*	Installer	Left Differential Bearing Race Installation
1895655000	*	Support	Differential Bearing Preload Shim Selection
2000001400	*	Cap	Fluid Reservoir
2000040436	8534B	Support Kit	Power Train Support
2000005000	*	Support Plates	Transmission Disassembly and Assembly

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Tool (EMEA)	Tool (NAFTA)	Name	Function
*Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

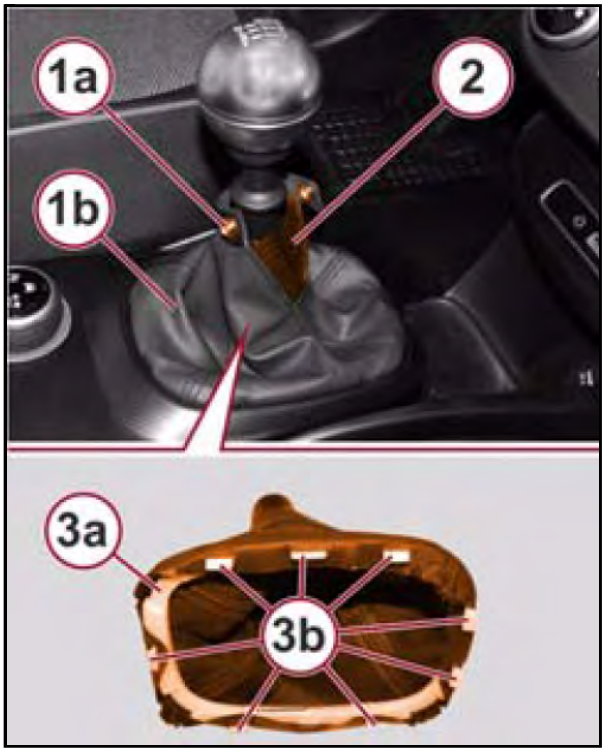
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0640

21 - Transmission and Transfer Case / Manual, C510 / BOOT, Gearshift / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

1. Open the button (1a) for the gearshift boot (1b).
2. Separate the Velcro fabric at the seam (2).
3. Using tool 1878077000, pry up the base of the boot (3a), releasing the lower retainers (3b).



4. Remove the gearshift boot.

INSTALLATION

1. Check that the gearshift boot is not damaged.
2. Position the boot over the gearshift lever and engage the lower retainers to the console.
3. Close the gearshift boot seam using the Velcro fabric.
4. Close the button.

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PET_AAM_1013-0641

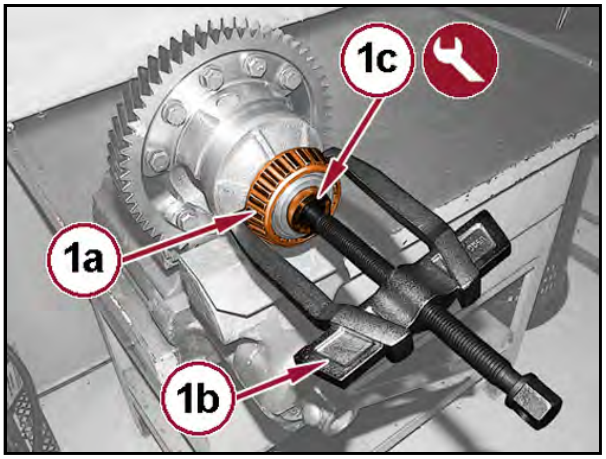
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0642

21 - Transmission and Transfer Case / Manual, C510 / DIFFERENTIAL, Transaxle / Disassembly and Assembly

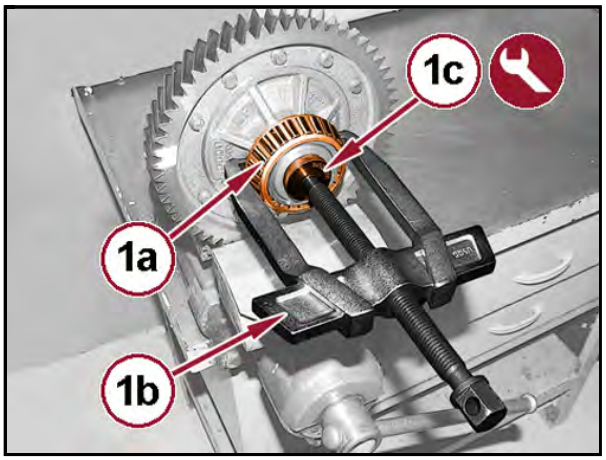
DISASSEMBLY AND ASSEMBLY

DISASSEMBLY

1. Place the complete differential in a vice equipped with protective, non-marring jaw covers.
2. Remove the bearing (1a) from the differential case using a suitable puller (1b) and the tool 1845028000 (1c).

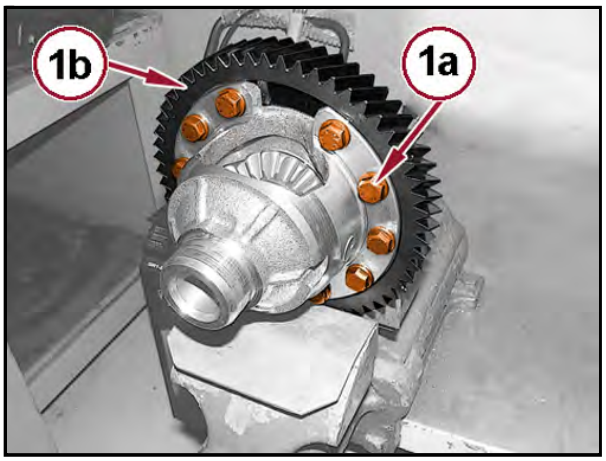


3. Remove the bearing (1a) from the differential case using a suitable puller (1b) and the tool 1845028000 (1c).

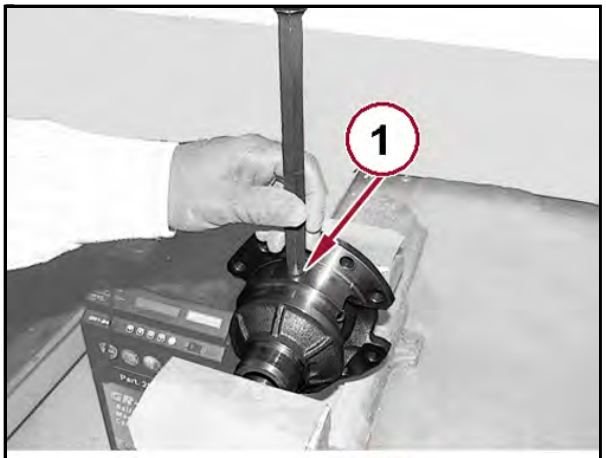


4. Mark the position of the ring gear in relation to the differential casing.
5. Remove the bolts (1a) and remove the ring gear (1b).

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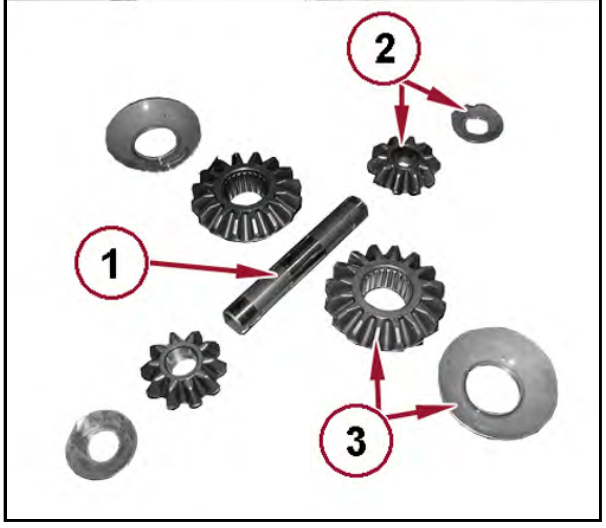


6. Remove the satellite carrier pin using a suitable drift (1). The roll pin will be sheared during this operation.



7. Remove the satellite gears and shims (2).

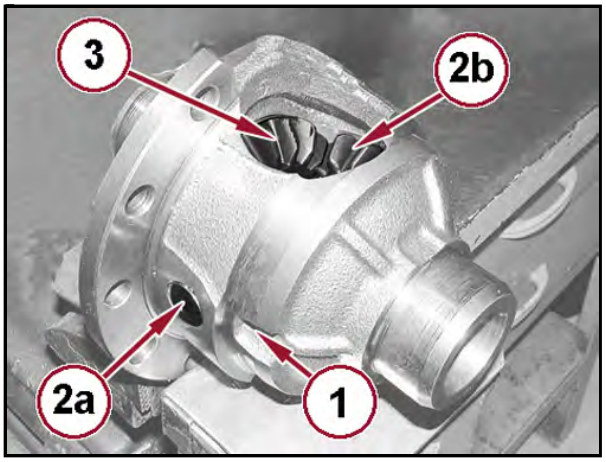
8. Remove the planet gears and shims (3).



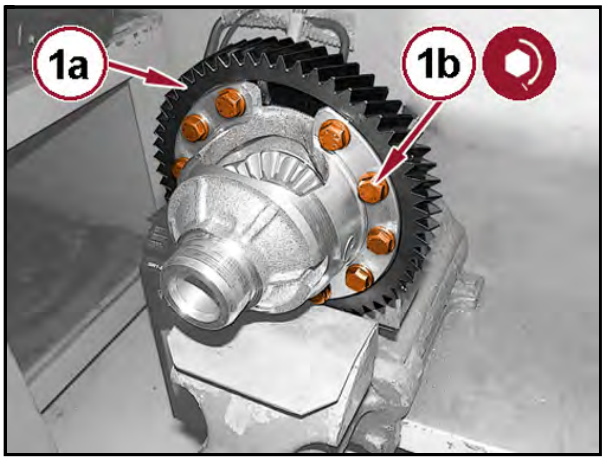
ASSEMBLY

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PET_AAM_1013-0644

1. Clean and inspect the satellite and planet gears are intact and show no signs of seizing.
2. Use a suitable punch to break through the wall of the differential casing at the point shown (1) in the figure.
3. Remove the pieces of the old roll pin from the satellite carrier pin (2) and from the differential casing.
4. Fit the planet gears (3) and shims.
5. Install the satellite carrier pin (2a) in the differential casing with the satellite gears (2b) and shims.

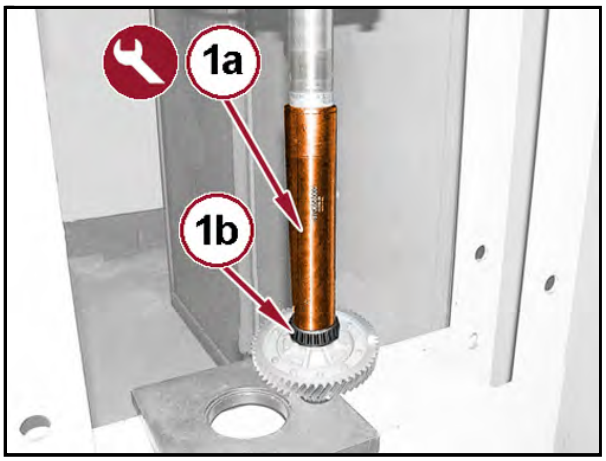


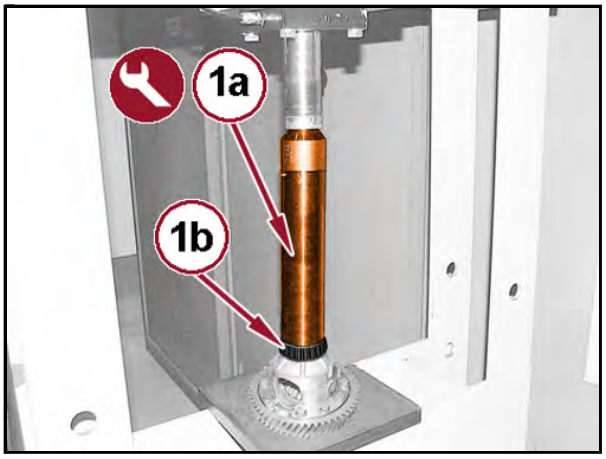
6. Install a **NEW** satellite carrier shaft roll pin using a suitable drift.
7. After installting the roll pin, stake the differential case to prevent it from coming out.
8. Check that the planet and satellite gears rotate without backlash and with slight resistance.
9. Install the ring gear (1a) aligning the marks made during disassembly, tighten the bolts (1b) to the proper (Torque Specifications) .



10. Using a suitable hydraulic press and the tool 1870658000 (1a), install the bearing (1b) on the differential case.

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11. Using a suitable hydraulic press and the tool 1870658000 (1a), install the bearing (1b) on the differential case.

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PET_AAM_1013-0646

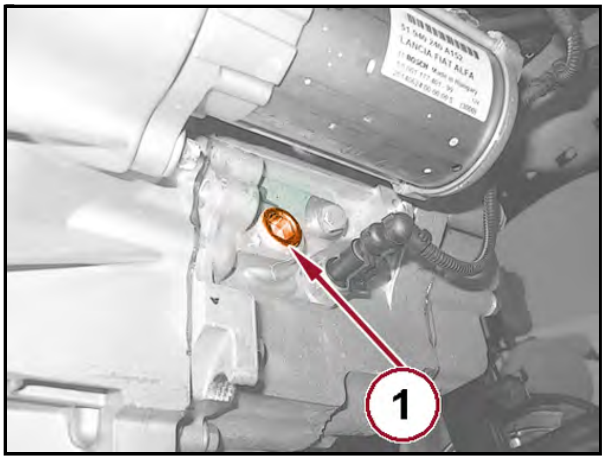
21 - Transmission and Transfer Case / Manual, C510 / FLUID / Standard Procedure

FLUID DRAIN AND FILL

NOTE: Changing the manual transmission oil is not a scheduled maintenance operation and is only carried out during overhaul operations involving the replacement of internal components. Therefore, in all other procedures, the manual transmission oil must be reused.

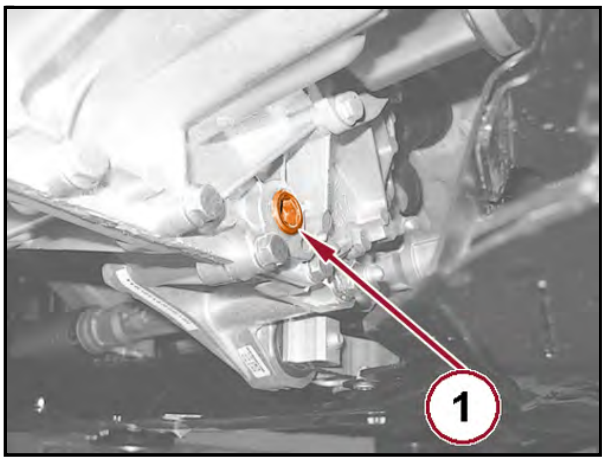
CAUTION: Possible foreign bodies in the container or in the storage area can compromise the reutilization of the manual gearbox oil

1. Place the vehicle on a lift.
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Remove the transmission filler plug (1).



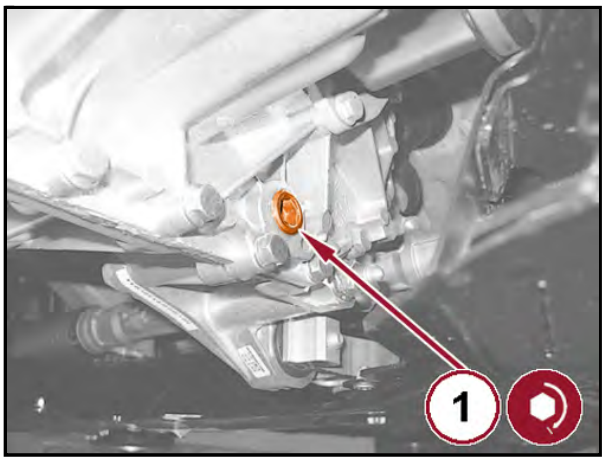
NOTE: Dispose of the fluid in an approved manner.

4. Remove the drain plug (1) from the transmission and drain the fluid into a suitable container.

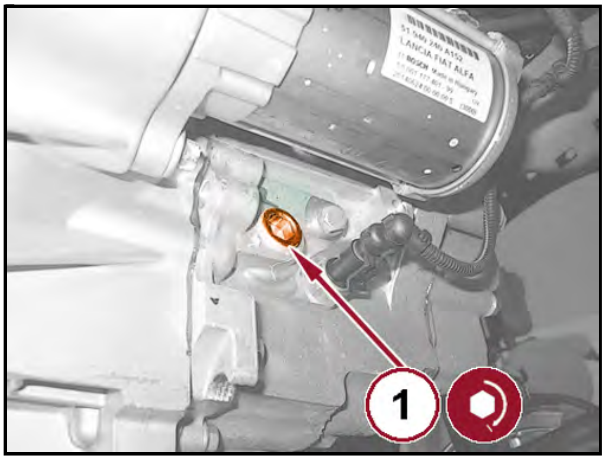


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5. Clean the drain plug (1) and tighten it to the proper (Torque Specifications) .



6. Refill the transmission with the specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .



7. Check that the oil level just touches the lower edge of the filler opening.

8. Clean the drain plug, refit and tighten it to the proper (Torque Specifications) .

9. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

10. Remove the vehicle from the lift.

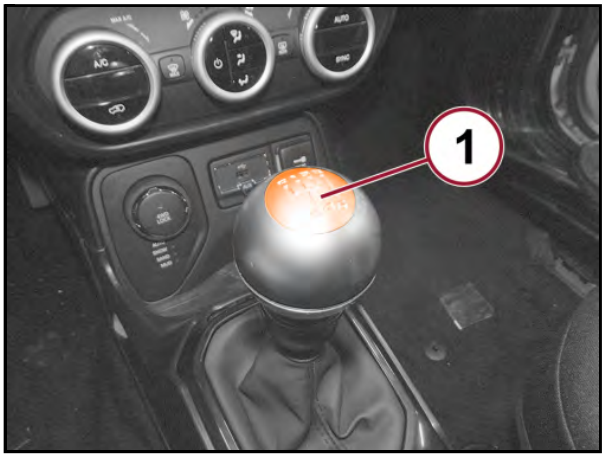
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PET_AAM_1013-0648

21 - Transmission and Transfer Case / Manual, C510 / KNOB, Gearshift / Removal and Installation

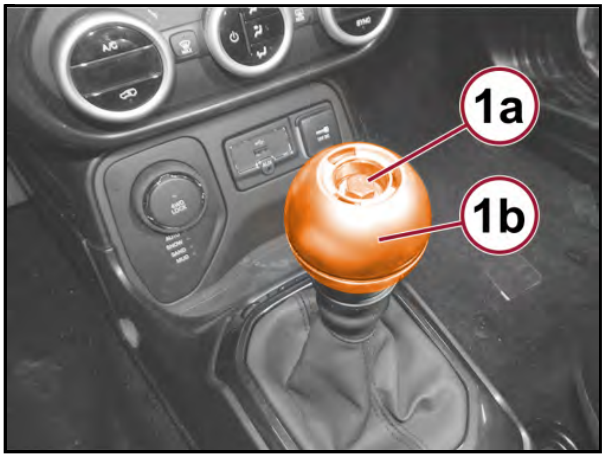
REMOVAL AND INSTALLATION

REMOVAL

1. Pry off the flange (1) at the top of the shifter knob.



2. Remove the bolt (1a) and remove the shifter knob (1b).



INSTALLATION

1. Place the shifter knob on the shifter lever lever tighten the screw.

2. Insert the flange in the top of the shifter knob.

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PET_AAM_1013-0649

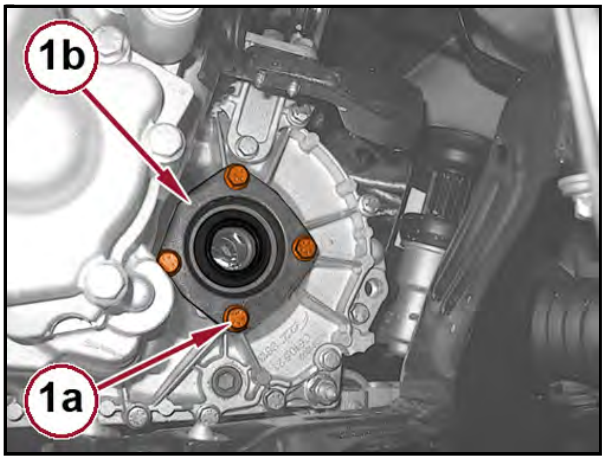
21 - Transmission and Transfer Case / Manual, C510 / SEAL, Axle Drive Shaft / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

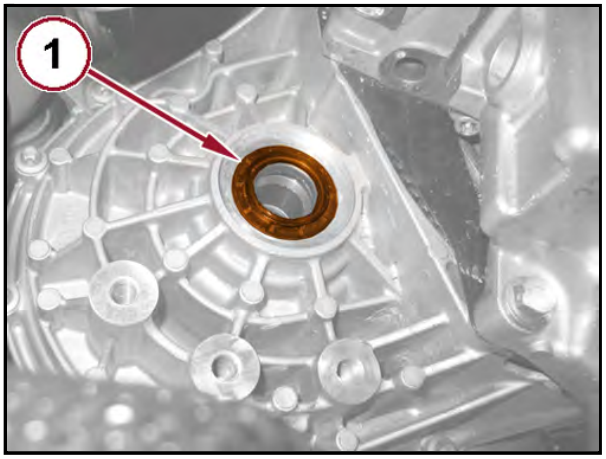
LEFT SIDE

1. Remove the left half shaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .
2. Remove the bolts (1a) and remove the left seal flange (1b).



RIGHT SIDE

1. Remove the right half shaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .
2. Carefully pry out the seal (1) using a suitable tool without damaging the seal bore.

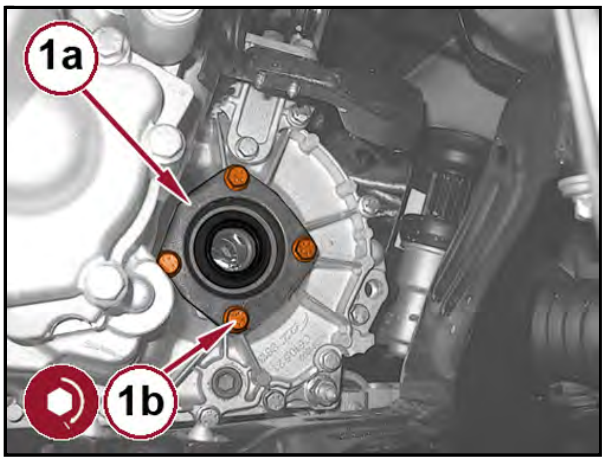


INSTALLATION

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LEFT SIDE

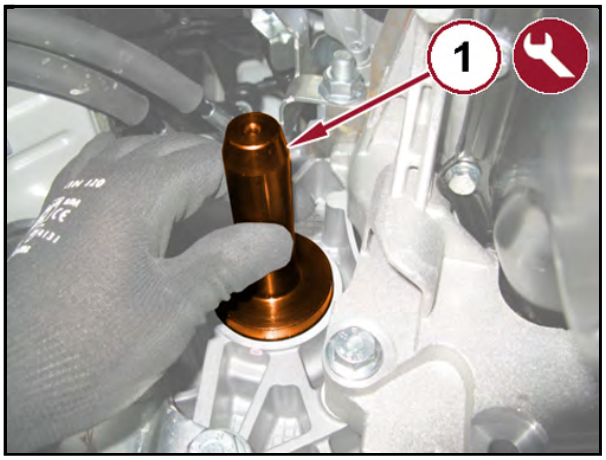
1. Install the left flange (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



2. Install the left half shaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .

RIGHT SIDE

1. Lubricate the **NEW** axle shaft oil seal with transmission fluid.
2. Using the installer 1875016000 (1) install the seal into the differential housing.



3. Install the right half shaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .

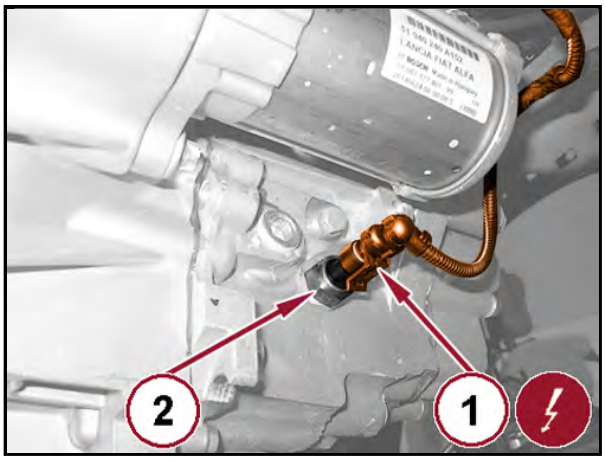
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0651

21 - Transmission and Transfer Case / Manual, C510 / SWITCH, Backup Lamp / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

1. Place the car on a lift.
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Disconnect the backup lamp switch wire harness connector (1).
4. Remove the backup lamp switch (2).



INSTALLATION

1. Install the backup lamp switch and tighten securely..
2. Connect the backup lamp switch wire harness connector.
3. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
4. Remove the car from the lift.

American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0652

21 - Transmission and Transfer Case / Manual, C635 / Description

DESCRIPTION

The C635 6-speed transmission is a constant-mesh transaxle that is synchronized in all gear ranges.

The C635 transmission is a three-shaft design to reduce overall length of the unit for easier packaging in the vehicle. The extra shaft is an output shaft. Gears 2, 4, 5 and Reverse are on one output shaft , gears 1, 3 and 6 and are on the second shaft. Each output shaft has a different final drive ratio, which is also different from most transaxles. All ratios are synchronized.

The four-plane shift mechanism is cable operated and incorporates a pull-up ring on the shift lever that must be lifted to engage reverse. This prevents unintentional selection of reverse when attempting to select 1st gear. Rubber isolation of the shift system at the transmission minimizes noise carried along the cables to the passenger compartment

GEAR RATIOS 1.4L Engine

GEAR	RATIO	OVERALL FINAL DRIVE RATIO
1ST	4.154	18.435
2ND	2.118	9.399
3RD	1.361	6.040
4TH	0.978	4.340
5TH	0.756	3.355
6TH	0.622	2.760
REVERSE	4.00	17.752
Final Drive Ratio (FDR)	4.438	

GEAR RATIOS 1.6L Multijet 16V and 2.0L Multijet 16V

GEAR	RATIO	OVERALL FINAL DRIVE RATIO
1ST	4.154	15.922
2ND	2.118	8.118
3RD	1.361	5.216
4TH	0.978	3.748
5TH	0.756	2.897
6TH	0.622	2.384

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GEAR	RATIO	OVERALL FINAL DRIVE RATIO
REVERSE	4.00	15.332
Final Drive Ratio (FDR)	3.833	

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21 - Transmission and Transfer Case / Manual, C635 / Diagnosis and Testing

COMMON PROBLEM CAUSES

PRE-DIAGNOSTIC INSPECTION:

- Verify that the transaxle fluid level is at the proper cold fill level.
- Inspect the exterior of the transaxle for evidence of fluid leaks.
- Inspect the exterior of the transaxle for mechanical issues, such as improper shift cable routing or loose mounting bolts.

NOTE: If a fluid with anti-friction additive is used in a C-635 transaxle the synchronizers will fail, requiring synchronizer replacement.

DIFFICULT SHIFTING

DIFFICULT SHIFTER OPERATION

1. The engagement of the gears is difficult in every condition.

CHECK SHIFTER CABLE HARDWARE	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the routing of the shifter cables and the attachment to the transmission and the shifter.	Continue to Step 2	Cables not properly fitted.	Restore the proper attachment of the control cables (Refer to 21 - Transmission and Transfer Case/Manual/CABLE, Gearshift Control/Removal and Installation) .

2.

CHECK SHIFTER CABLES	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the shifter cables for worn spherical ends or bushings.	Continue to Step 3	Spherical ends worn or damaged.	Replace the shifter cables (Refer to 21 - Transmission and Transfer Case/Manual/CABLE, Gearshift Control/Removal and Installation) .

3.

CHECK THE SHIFT LEVER	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the ball joint of the gear lever: must not be worn out.	End diagnosis	Spherical end worn out.	Replace the shifter (Refer to 21 - Transmission and Transfer Case/Manual/MECHANISM, Gearshift/Removal and Installation) .

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SHIFTING INTO GEAR DIFFICULT

1. The insertion of the gears is sometimes difficult also you hear a noise in the transition area (changing scratch)

PRELIMINARY CHECKS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check for proper clutch disengagement: with the engine running depress the clutch pedal and engage a gear.	Continue to Step 2	Gear clash when shifting	Diagnose clutch (Refer to 06 - Clutch/Diagnosis and Testing) .

2.

CHECK GEAR SELECTION	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Verify the integrity of the springs and the bearing for the gearbox.	Continue to Step 3	Damaged springs or bearings	Replace damaged components.

3.

CHECK SYNCHRONIZER RINGS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Inspect the synchronizers. In particular, check the synchronizer rings: must not show signs of wear on the inner surfaces.	Continue to Step 4	worn rings	Replace synchronizers.

4.

CHECK GEARS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Inspect the gears. In particular, check the front teeth of the gears: must not have nicks or excessive wear.	Continue to Step 5	worn gears	Replace the gears concerned.

5.

CHECK HUBS AND SLIDING SLEEVES	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Inspect the sliding sleeves and hubs. In particular, check the hubs and sliding sleeves: - Must have no nicks, wear or excessive play - Must move freely.	End diagnosis	worn sleeves or hubs	Replace worn sleeves or hubs.

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LOW SENSITIVITY OF ENGAGEMENT SPEED

1. The insertion of the gears is not precise. There is an excessive play in the gear selection and an abnormal return of the lever in neutral

CHECK GEAR SELECTION	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Verify the integrity of the springs and the bearing for the gearbox.	Continue to Step 2	Damaged springs or bearings	Replace damaged components.

2.

CHECK SHIFTER CABLES	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the shifter cables for worn spherical ends or bushings.	Continue to Step 3	Spherical ends worn or damaged.	Replace the shifter cables (Refer to 21 - Transmission and Transfer Case/Manual/CABLE, Gearshift Control/Removal and Installation) .

3.

CHECK THE SHIFT LEVER	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the ball joint of the gear lever: must not be worn out.	End diagnosis	Spherical end worn out.	Replace the shifter (Refer to 21 - Transmission and Transfer Case/Manual/MECHANISM, Gearshift/Removal and Installation) .

NOISY OPERATION

Transaxle noise is most often a result of :

- Worn or damaged internal components.
- Chipped, broken gear or synchronizer teeth, and brinnelled, spalled bearings.
- Insufficient lubricant.
- Aftermarket additives can damage synchronizers.

NOISE WHEN LAUNCHING

1. While operating the vehicle, a noise that varies in intensity with engine speed is heard when releasing the clutch after a shift.

CHECK DIFFERENTIAL	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Inspect the differential gears	Continue to Step 2	worn or damaged differential components	Repair or replace components as necessary.

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CHECK DIFFERENTIAL	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
In particular: should not be worn or damaged. must not have an excessive clearance Ring gear bolts must not be loose.			

2.

CHECK DIFFERENTIAL HOUSING	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check for wear of the planet pinion gear shaft or the bore of the differential housing (Refer to 21 - Transmission and Transfer Case/Manual/DIFFERENTIAL, Transaxle/Disassembly and Assembly) .	end diagnosis	worn differential housing	Replace the differential housing (Refer to 21 - Transmission and Transfer Case/Manual/DIFFERENTIAL, Transaxle/Disassembly and Assembly) .

NOISE IN NEUTRAL

1. With the vehicle stationary, transmission in neutral, engine running, there is a noise at high frequency and low intensity in the transmission area.

PRELIMINARY CHECKS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
1. Visually check if the noise is accompanied by an oil leak from the gearbox / differential. 2. Depress the clutch pedal and see if the noise increases. 3. Check the oil level in the gearbox / differential.	Continue to Step 2	1. Detected oil leak from the gearbox 2. Clutch depressed the noise disappears or diminishes greatly: internal transmission noise. 3. Oil level too low.	1. Proceed as indicated See table X15 LOSSES OIL CHANGE / DIFFERENTIAL 2. Proceed as indicated See table S015 NOISE 'RUNNING 3. Correct the transmission oil level and perform a road test (Refer to 21 - Transmission and Transfer Case/Manual, /FLUID/Standard Procedure) If the fault persists, go to Step 2.

2.

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CHECK CLUTCH DISC SPLINES	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check for the presence of excess lubricant in the splines of the clutch disc and transmission input shaft.	Continue to Step 3	1. Worn or damaged input shaft splines. 2. Worn or damaged splines in the clutch disc.	1. Replace the transmission input shaft. 2. Properly lubricate the bushings clutch disc splines. If necessary, replace the clutch disc (Refer to 06 - Clutch/DISC, Clutch/Removal and Installation) .

3.

CHECK CLUTCH DISC	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Inspect: wear of the clutch disc; contamination (oil or grease) of the clutch disc; deformation of the clutch disc; damage to the diaphragm spring pressure plate.	End diagnosis	1. Worn or damaged clutch disc or pressure plate. 2. Presence of oil or grease.	1. Replace the clutch disc (Refer to 06 - Clutch/DISC, Clutch/Removal and Installation) . 2. Also, replace the transmission input shaft seal.

NOISE IN A SPECIFIC GEAR

1. While driving, a noise is heard in a specific gear from the transmission area. The noise abates when shifted to a different gear.

CHECK THE SYNCHRONIZERS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Remove and Disassemble transmission to inspect the appropriate synchronizer(s).	Continue to Step 2	worn or damaged synchronizer components	Replace worn components as necessary.

2.

CHECK THE GEARS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Remove and Disassemble transmission to inspect the appropriate gear(s)	Continue to Step 3	1. Worn or damaged gears	1. Replace the gears as necessary.

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CHECK THE GEARS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION

3.

CHECK THE DIFFERENTIAL	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Inspect the differential gears. In particular: should not be worn or damaged. must not have an excessive clearance.	End diagnosis	Worn or damaged differential components.	Repair or replace as necessary.

NOISE WHILE TURNING

1. While cornering, a noise is heard from the transmission area.

PRELIMINARY CHECKS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
1. Steer to the right or to the left and see if the noise increases. 2. Steer to the bottom and then release the steering wheel: make sure that the noise intensity increases or not with the steering angle.	Continue to Step 2	1. Noise level varies only by steering to the right or left. 2. Noise ceases straightline. 3. Noise level varies greatly with the steering angle. 4. Noise remains constant with the steering angle.	1. Proceed as indicated See table S015 NOISE 'IN TERMS OF TRAVEL 2. Proceed as indicated See table S015 NOISE 'IN TERMS OF TRAVEL Continue to Step 3 Continue to Step 2

2.

CHECK DIFFERENTIAL	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the differential, in particular its bearings	Continue to Step 3	1. bearings damaged 2. Gears worn or damaged.	1. Replace bearings 2. Repair or replace the differential case as necessary (Refer to 21 - Transmission and Transfer Case/Manual/DIFFERENTIAL, Transaxle/Disassembly and Assembly) .

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3.

CHECK CV JOINTS	EVERYTHING OK	PROBLEMS ENCOUNTERED	RESOLUTION
Check the CV joints transmission.	End diagnosis	damaged joint	Replace the joint.

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21 - Transmission and Transfer Case / Manual, C635 / Specifications

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
Differential Ring Gear-to-Carrier Bolts	100	74	—	Do not reuse these fasteners. If removed, a **NEW** fastener must be installed and tightened to specifications.
Gear Shaft Rear Bearing Retention Bolt	110	81	—	
Input Shaft Rear Bearing Retention Bolt	56	41	—	
Race Plate Bolts (M8)	26	19	—	
Race Plate Bolts (M12)	80	59	—	
Reverse Idler Gear Bolt	10	—	89	
Shift Cable Bracket-to-case Bolts	20	15	—	
Shift Lever Assembly-to-Case Bolts	20	15	—	
Shifter Assembly to Floor Bolts	10	—	89	
Shifter Cable to Floor Pan Nuts	10	—	89	Do not reuse these fasteners. If removed, a **NEW** fastener must be installed and tightened to specifications.
Support, Inner Box Differential	35 + 50°	26 + 50°	—	
Transmission Case-to-Bell Housing Bolts	26	19	—	
Transmission Drain/Fill Plug	41	30	—	
Transmission-to-Engine Bolts	60	44	—	
Transmission-to-Engine Oil Pan Bolts	40	30	—	
Transaxle to Engine Stud Nut,	60	44	—	

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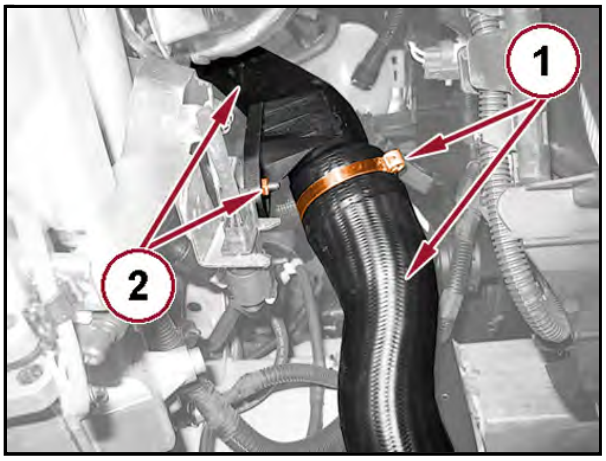
21 - Transmission and Transfer Case / Manual, C635 / Removal and Installation

1.4 TURBO MULTIAIR

⊞ **Special Tools:** Click to display a list of tools used in this procedure

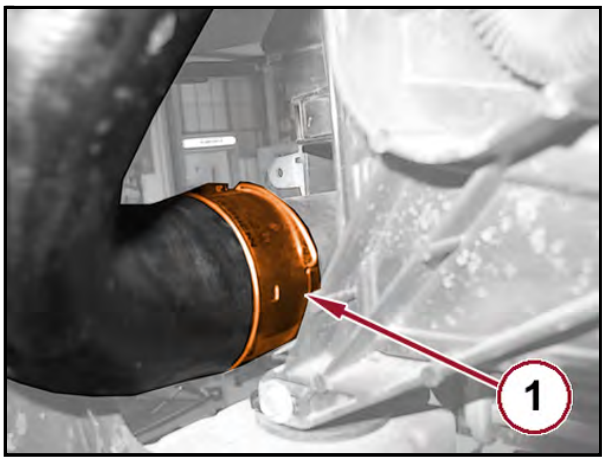
1.4 L

1. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
2. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
3. Drain the transmission oil (Refer to 21 - Transmission and Transfer Case//FLUID/Standard Procedure) .
4. Remove the half shafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .
5. Remove the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .
6. If equipped, remove the power Transfer Unit (PTU) (Refer to 21 - Transmission and Transfer Case/Power Transfer Unit/Removal and Installation) .
7. Loosen the clamp and disconnect the air supply hose on heat exchanger tube (1).
8. Remove the retaining nut rigid (2) pipe air delivery.

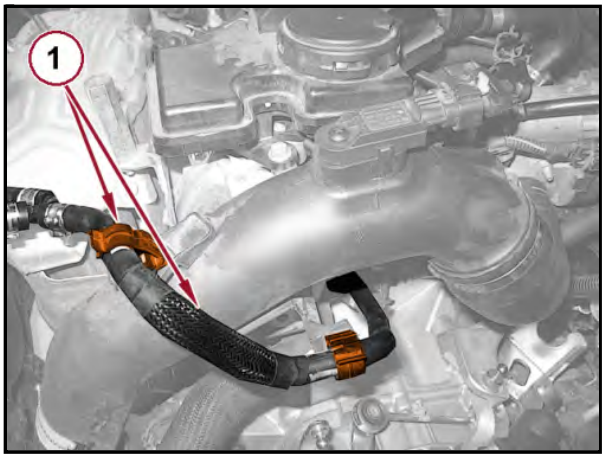


9. Disconnect the Charge Air Cooler (CAC) outlet hose quick coupling sleeve at the CAC.

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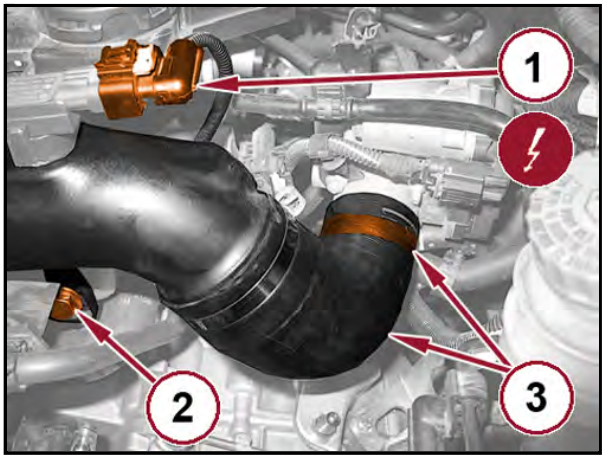
10. Disengage the turbo coolant supply hose from the retainers (1).



11. Disconnect the air temperature and pressure sensor wire harness connector (1).

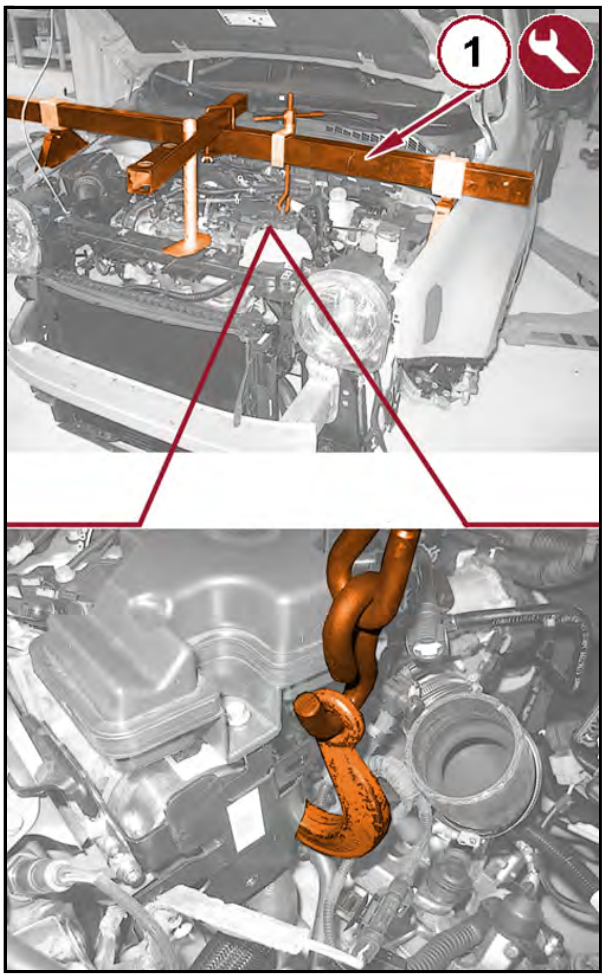
12. Remove the CAC hose retaining bolt (2).

13. Loosen the hose clamp and remove the CAC outlet hose (3) from the vehicle.

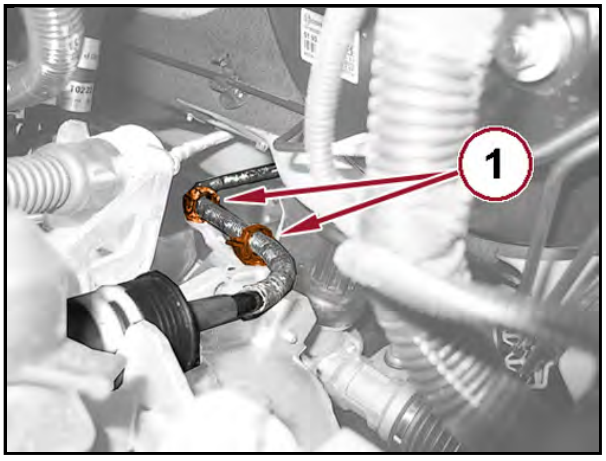


14. Use tool 2000040436 (EMEA) or Fixture, Driveline Support 8534B (NAFTA) (1) to support the drivetrain as shown.

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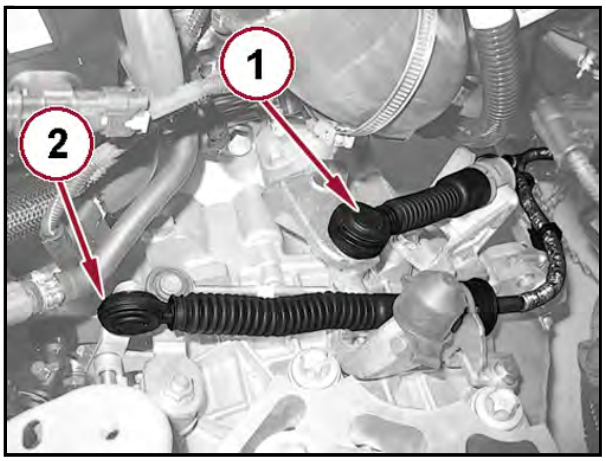
15. Open the shifter cable retaining clips (1) on the transmission.



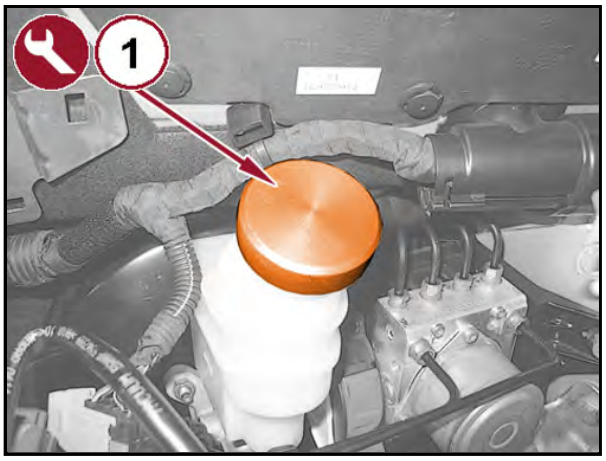
16. Disengage the gear engagement cable end from the lever (1).

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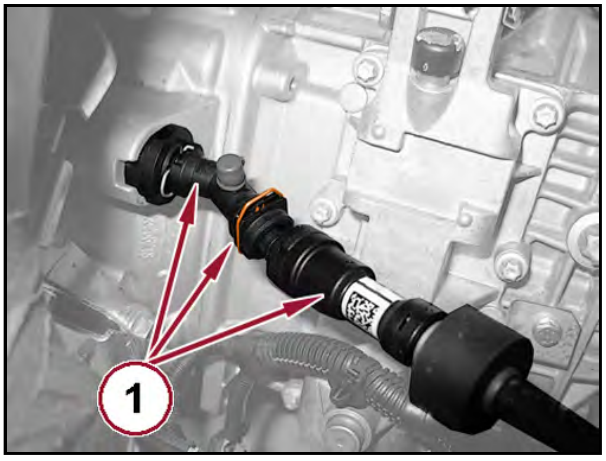
17. Disengage the gear selector cable end from the lever (2).



18. Install tool 2000001400 (1) to the master cylinder reservoir.

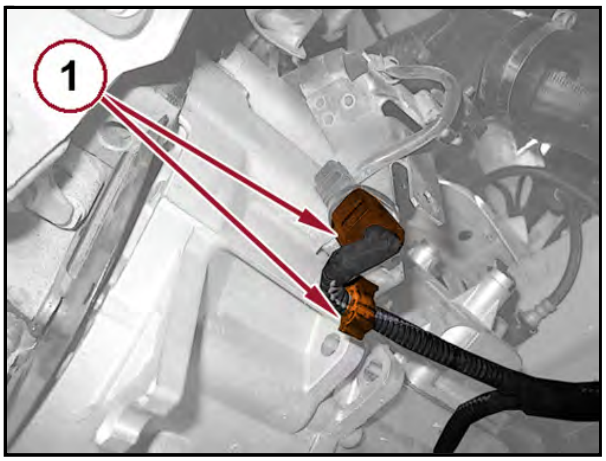


19. Lift the clip and disconnect the vibration damper (1).



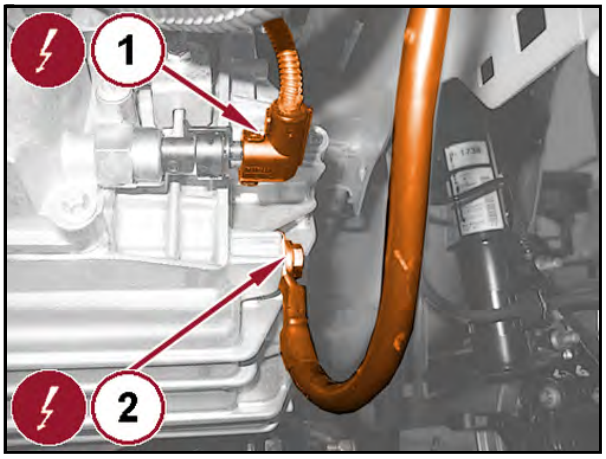
20. Open the clip harness retaining clip (1) and disconnect the upstream oxygen sensor wire harness connector (1).

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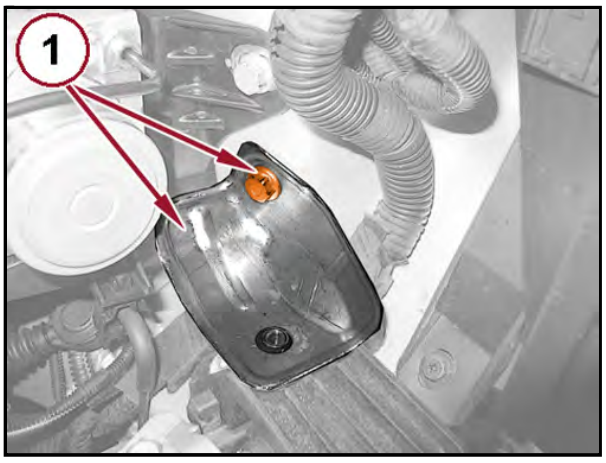


21. Disconnect the reverse light switch wire harness connector (1).

22. Remove the ground cable bolt (2) and position cable aside.

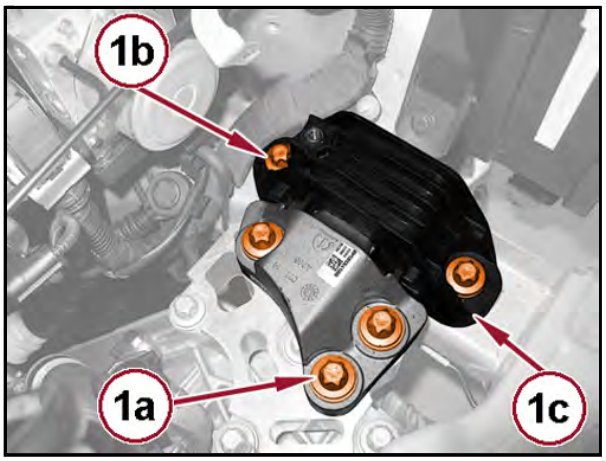


23. Remove the bolt and the heat shield (1).

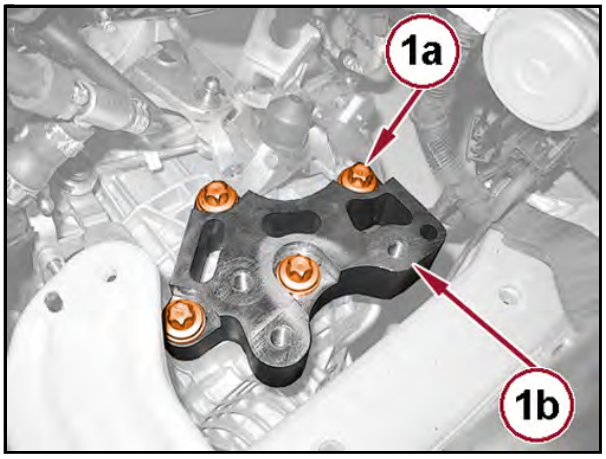


24. Remove the screws (1a), (1b) and remove the left engine mount (1c).

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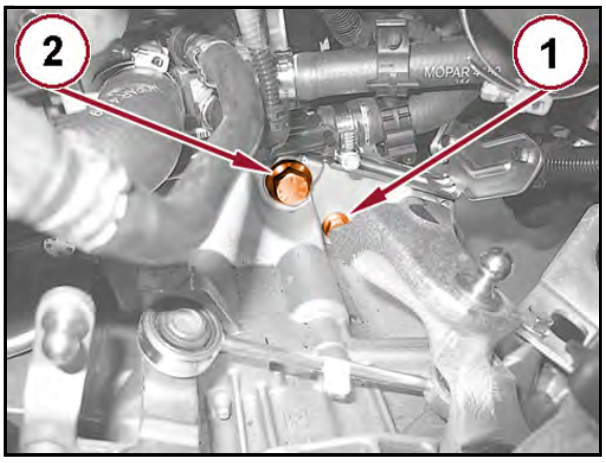


25. Remove the screws (1a) and remove the left engine mount adapter (1b).



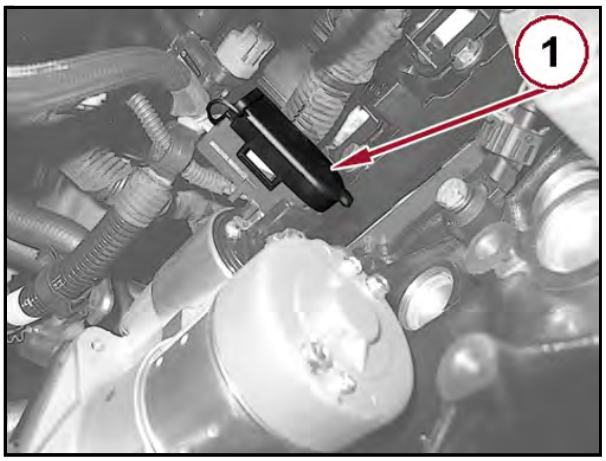
26. Remove the upper bolt (1) fastening starter.

27. Remove the upper right transmission to engine bolt (2).



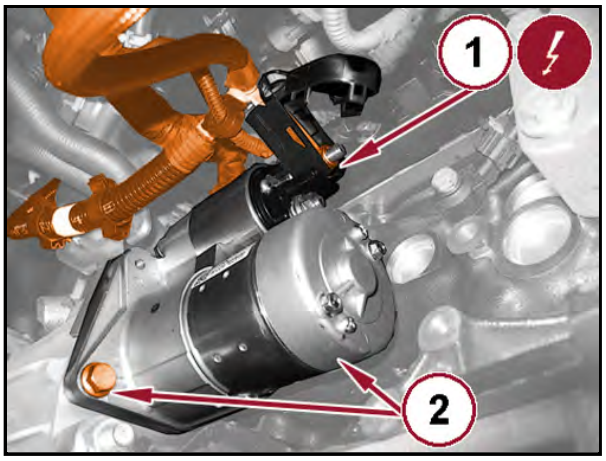
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28. Open the starter wire connector cover (1).

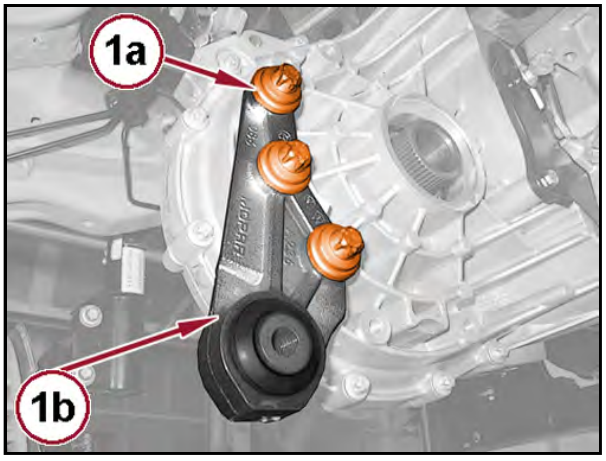


29. Remove the nut (1) and disconnect the starter wiring.

30. Remove the lower starter bolt and remove the starter (2).

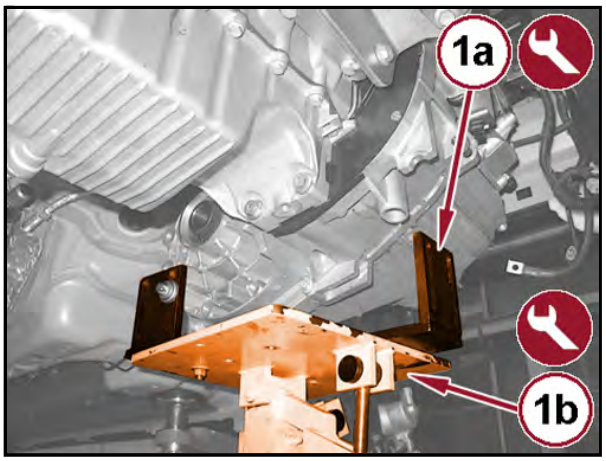


31. Remove the bolts (1a) and remove the rear engine mount (1b).



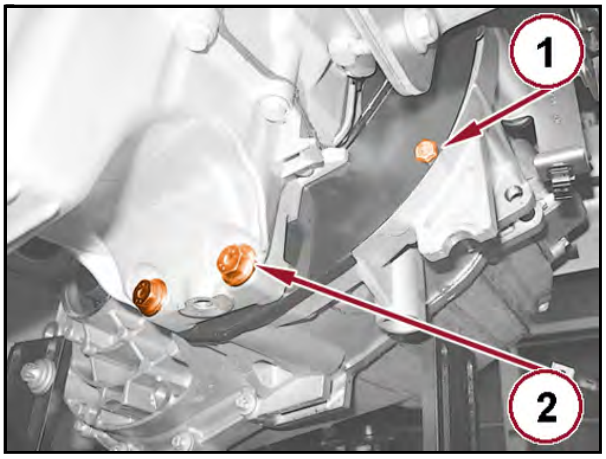
32. Assemble the tools 1870847000 (1a) and 1870835001 (1b) (EMEA) or a suitable transmission jack (NAFTA) and properly support the transmission.

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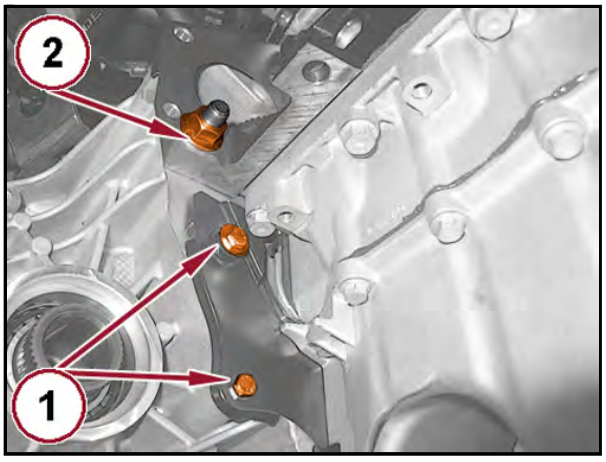
33. Remove the dust cover bolt (1).

34. Remove the two engine oil pan to transmission bolts (2).



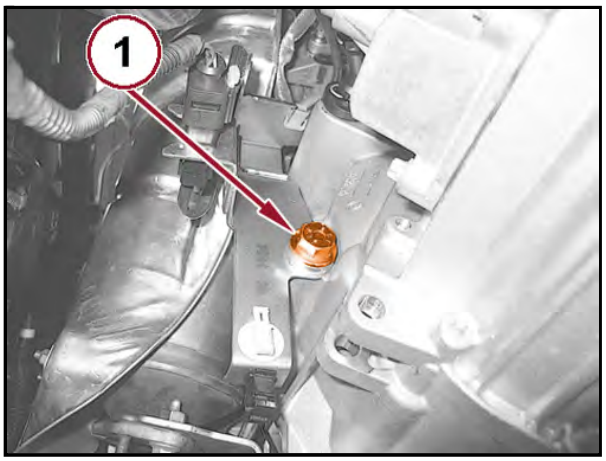
35. Remove the two dust shield bolts (1).

36. Unscrew the transmission to engine fastening nut (2).



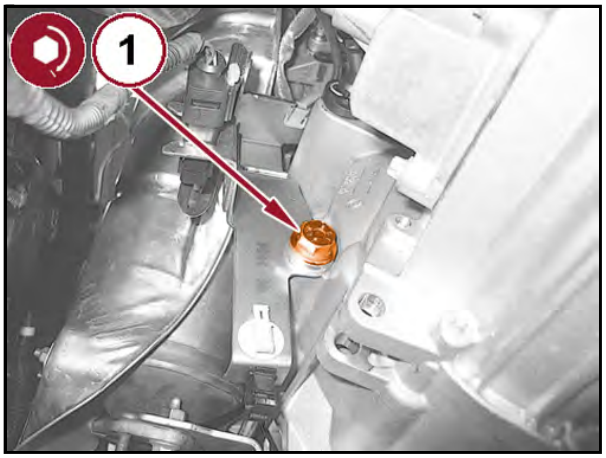
37. Remove the bolt (1), position the bracket aside and remove the transmission from the vehicle.

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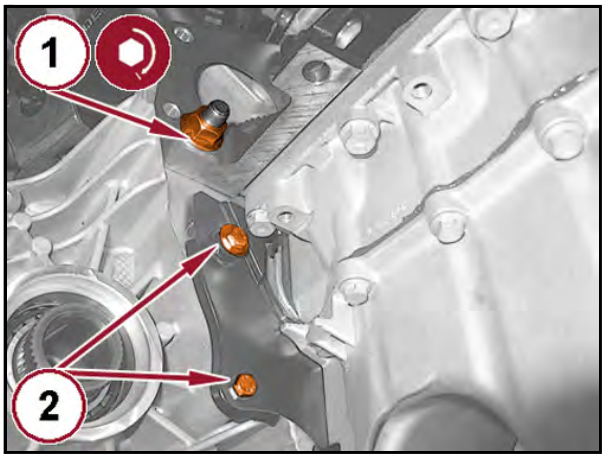


1.4 L

1. Place the transaxle in position under the vehicle using tools 1870847000 and 1870835001 (EMEA) or a suitable transmission jack (NAFTA).
2. Position the bracket and tighten the bolt to the proper (Torque Specifications) .



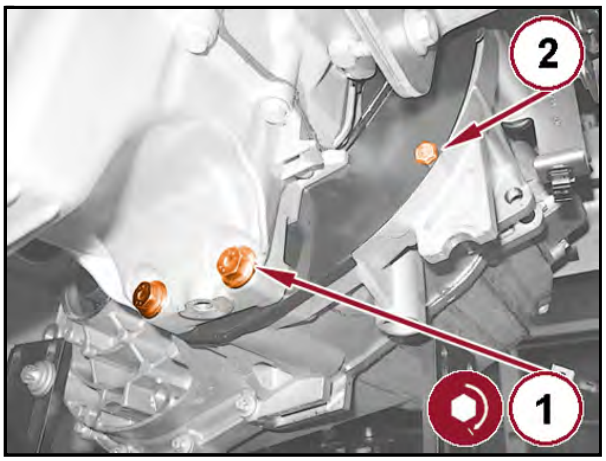
3. Install the nut (1) to attach the transmission to the engine and tighten the bolt to the proper (Torque Specifications) .
4. Tighten the two dust cover bolts (2).



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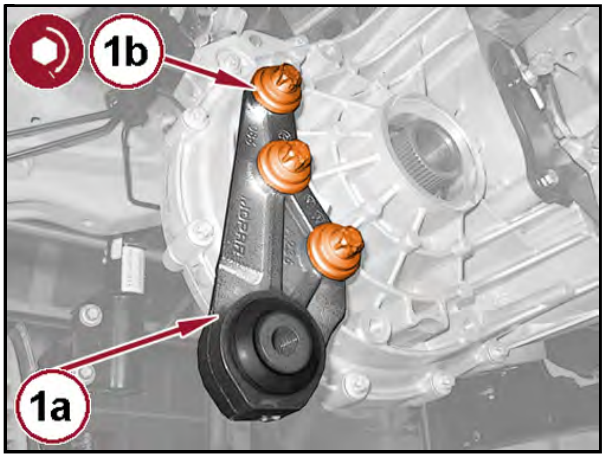
5. Install the two engine oil pan to transmission bolts (1) and tighten to the proper (Torque Specifications) .

6. Install and tighten the dust cover bolt (2).



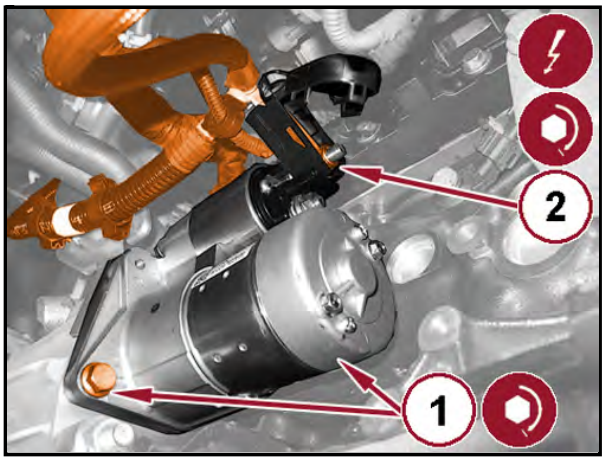
7. Remove the transmission jack.

8. Install the engine mount (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



9. Put the starter into place and tighten the lower bolt (1) to the proper (Torque Specifications) .

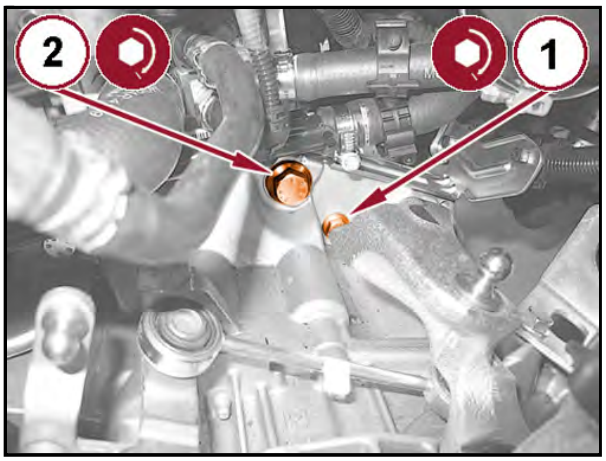
10. Connect the starter wiring, tighten the nut (2) to the proper (Torque Specifications) and close the connector cover.



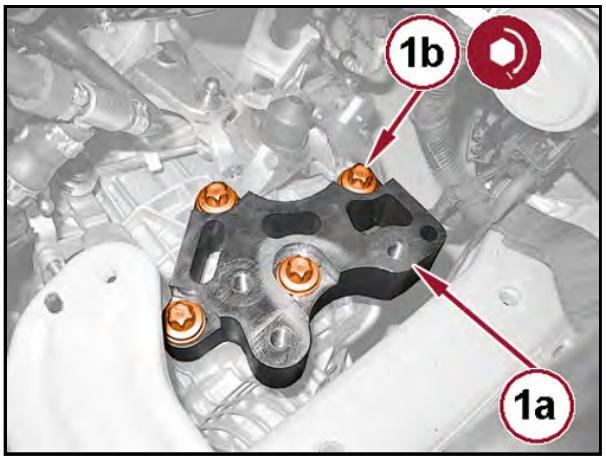
11. Install the upper starter bolt (1) and tighten to the proper (Torque Specifications) .

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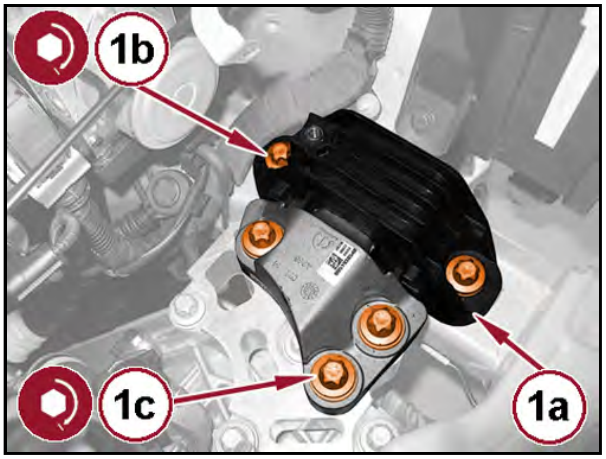
12. Install the upper right transmission to engine bolt (2) and tighten to the proper (Torque Specifications) .



13. Put into place the left engine mount adapter (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



14. Position the left engine mount (1a) into position and tighten the bolts (1b) and (1c) to the proper (Torque Specifications) .



15. Install the heat shield and tighten the bolt.

16. Attach the battery ground cable to the transmission and tighten the screw.

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17. Connect the reverse light switch wire harness connector.
18. Connect the upstream oxygen sensor and close the wire harness retaining clips.
19. Connect the vibration damper to the clutch master cylinder hose and engage the clip.
20. Engage the gear selector cable to the transmission lever.
21. Engage the gear engagement cable to the transmission lever.
22. Close the shifter cable retaining clips.
23. Remove the drive train support tool 2000040436 (EMEA) or Fixture, Driveline Support 8534B (NAFTA).
24. Install the Charge Air Cooler (CAC) outlet hose to the throttle body and tighten its clamp.
25. Install and tighten the CAC hose retaining bolt.
26. Connect the air temperature and pressure sensor wire harness connector.
27. Engage the turbo coolant supply hose the retaining clips.
28. Connect CAC outlet hose quick coupling sleeve at the CAC.
29. Tighten the nut securing the rigid air delivery pipe.
30. Connect air supply hose on the heat exchanger tube and tighten the clamp.
31. Install the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
32. Install the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
33. If equipped, install the Power Transfer Unit (PTU) (Refer to 21 - Transmission and Transfer Case/Power Transfer Unit/Removal and Installation) .
34. Install the half shafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .
35. Fill the transaxle with correct fluid to the proper level (Refer to 21 - Transmission and Transfer Case/Manual/FLUID - Standard Procedure) .

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36. Install the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

37. Bleed the air from the clutch (Refer to 06 - Clutch/Standard Procedure).

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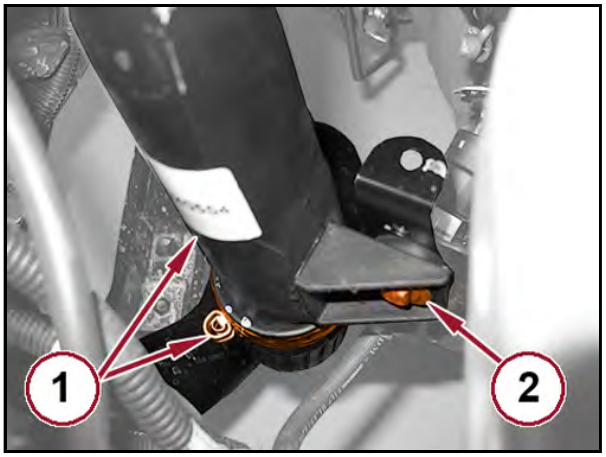
21 - Transmission and Transfer Case / Manual, C635 / Removal and Installation

1.6L TURBO DIESEL

⊞ **Special Tools:** Click to display a list of tools used in this procedure

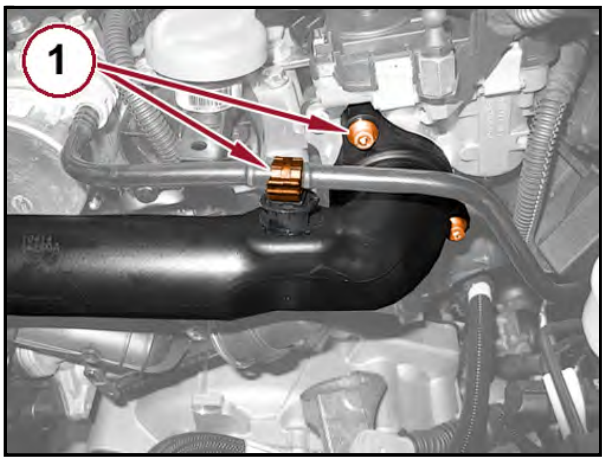
1.6 TURBO DIESEL

1. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
2. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
3. Drain the transmission oil (Refer to 21 - Transmission and Transfer Case//FLUID/Standard Procedure) .
4. Remove the half shafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .
5. Remove the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .
6. Loosen the clamp and disconnect the Charge Air Cooler (CAC) hose from the tube leading to the throttle body (1).
7. Remove the nut (2) securing the CAC tube to the throttle body.

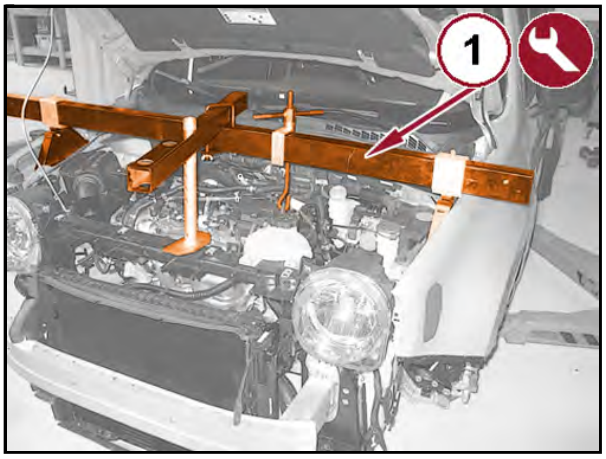


8. Open the clip, remove the nuts and remove the CAC tube at the throttle body.

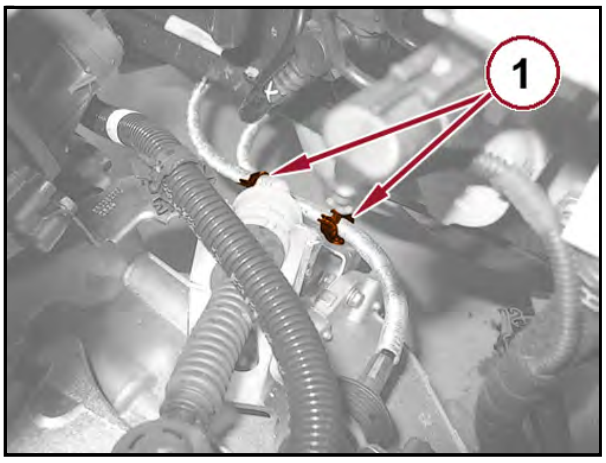
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9. Use tool 2000040436 (EMEA) or Fixture, Driveline Support 8534B (NAFTA) (1) to support the drivetrain as shown.



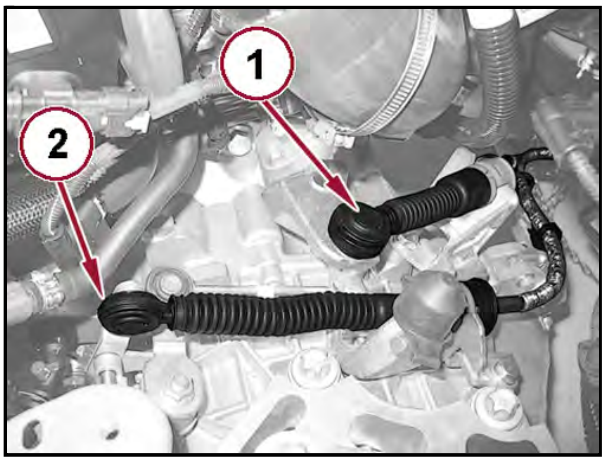
10. Open the shifter cable retaining clips (1) on the transmission.



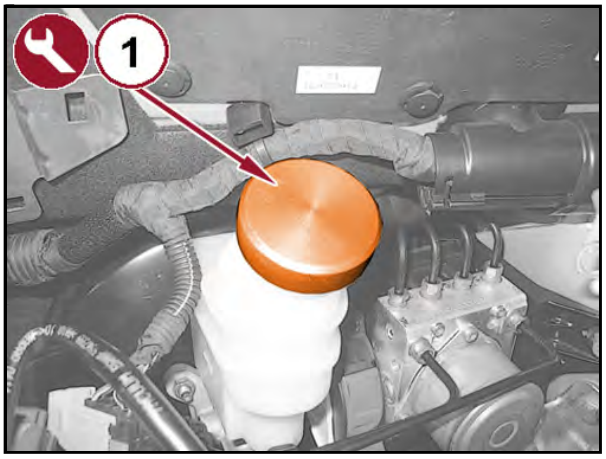
11. Disengage the gear engagement cable end from the lever (1).

12. Disengage the gear selector cable end from the lever (2).

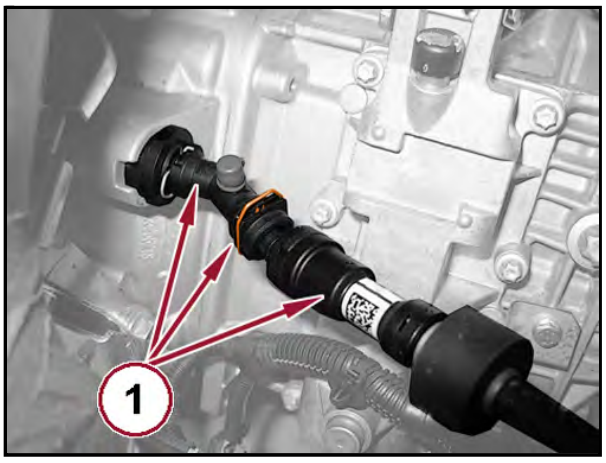
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13. Install tool 2000001400 (1) to the master cylinder reservoir.



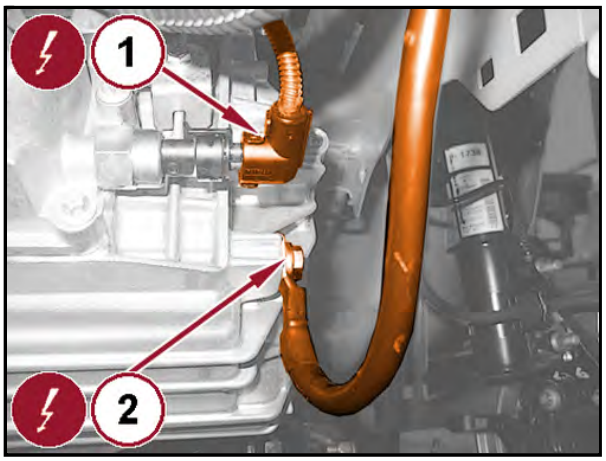
14. Lift the clip and disconnect the vibration damper (1).



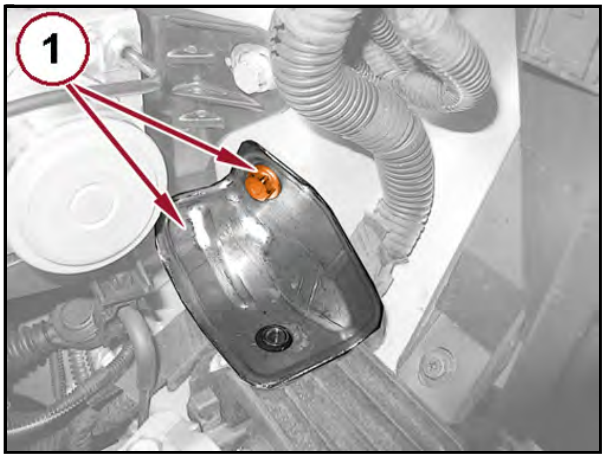
15. Disconnect the reverse light switch wire harness connector (1).

16. Remove the ground cable bolt (2) and position cable aside.

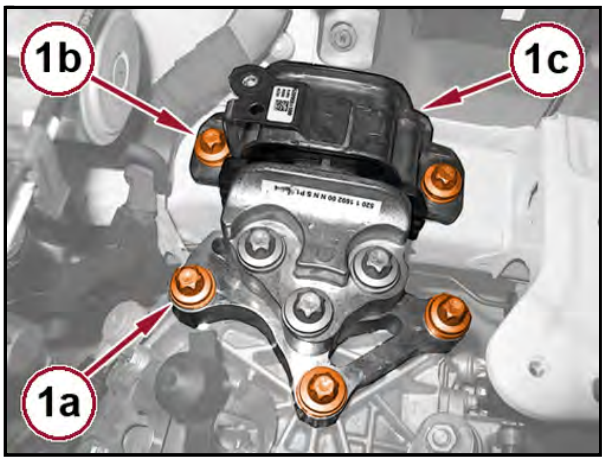
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17. Remove the bolt and the heat shield (1).

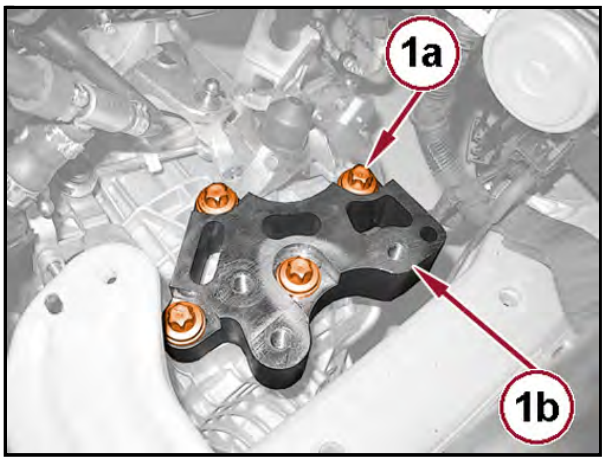


18. Remove the bolts (1a), (1b) and remove the left engine mount (1c).

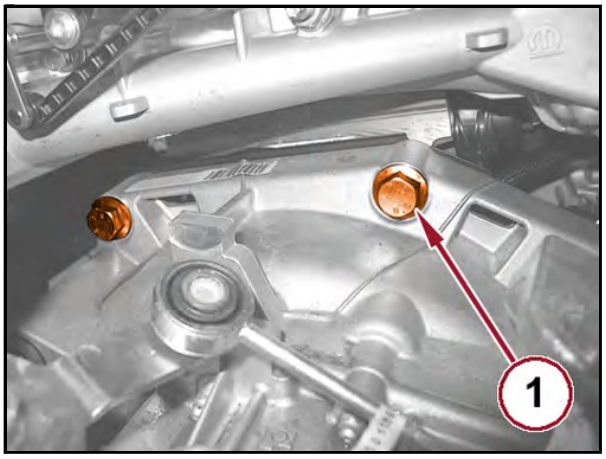


19. Remove the screws (1a) and remove the left engine mount adapter (1b).

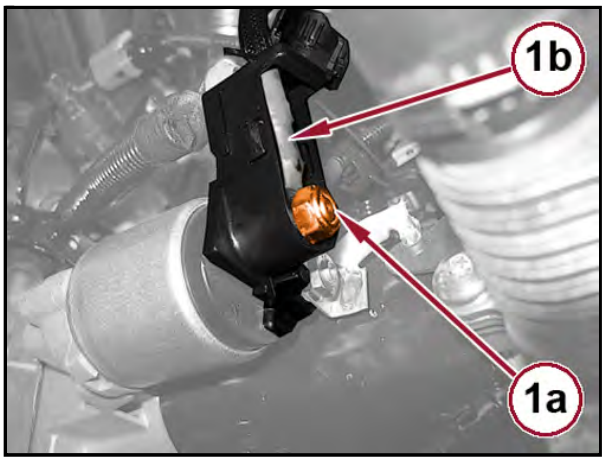
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20. Remove the upper transmission to engine bolts (1).

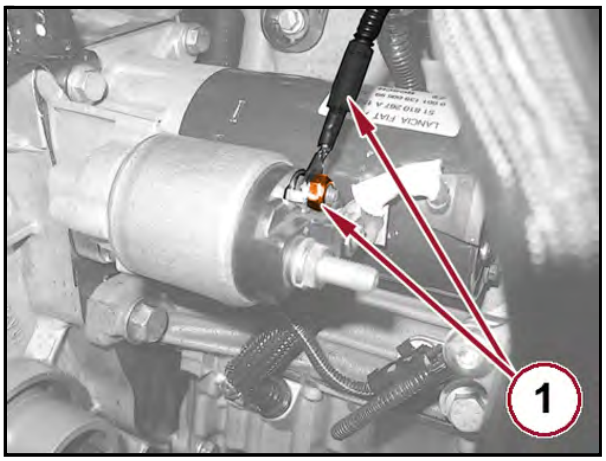


21. Open the starter wire connector cover, remove the nut (1a) and disconnect the cable at the starter (1b).

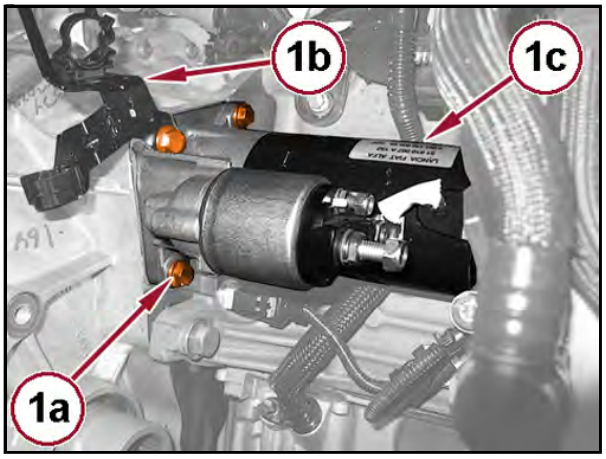


22. Remove the nut and disconnect the starter wiring (1).

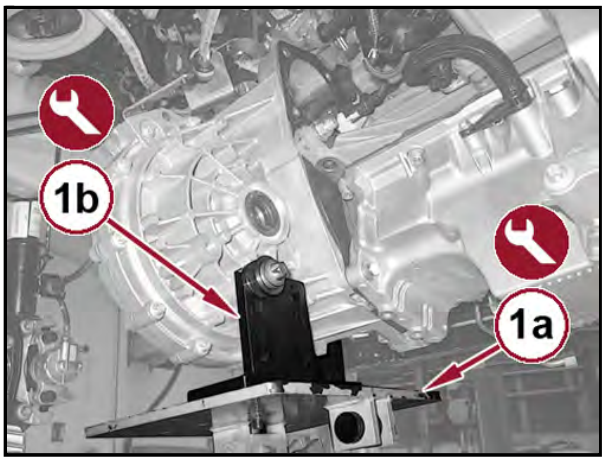
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PET_AAM_1013-0680



23. Remove the starter bolts (1a) and the bracket (1b), then remove the starter (1c).



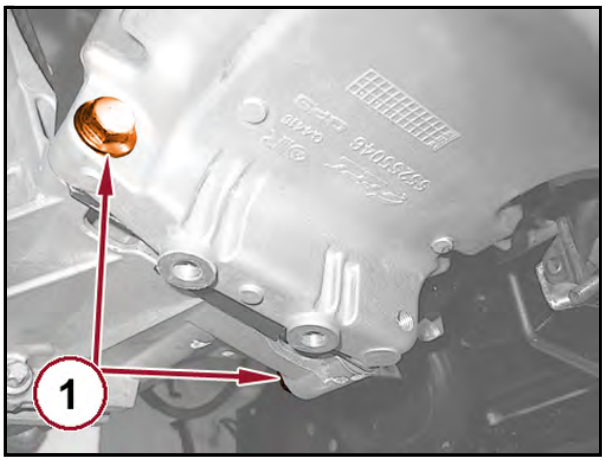
24. Assemble the tools 1870835001 (1a) and 1870847000 (1b) (EMEA) or a suitable transmission jack (NAFTA) to properly support the transmission.



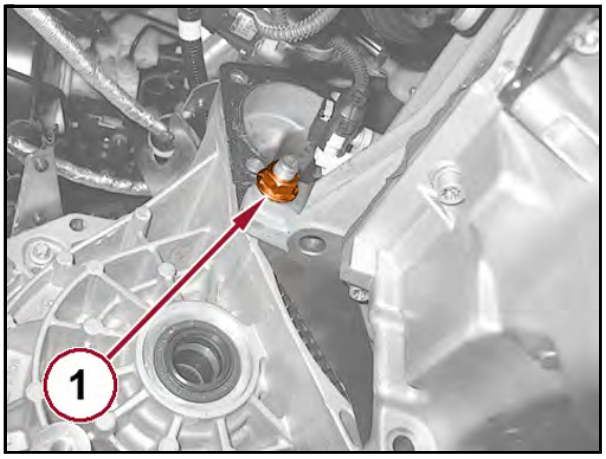
25. Loosen the dust cover bolt.

26. Remove the two engine oil pan to transmission bolts (1).

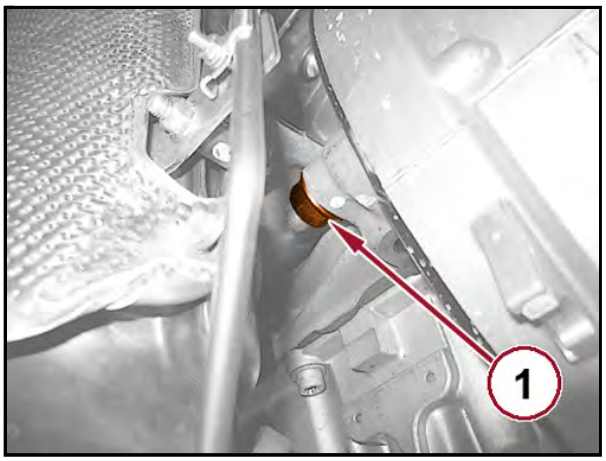
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PET_AAM_1013-0681



27. Unscrew the transmission to engine fastening nut (1).



28. Unscrew the nut (1) and remove the gearbox from the engine.

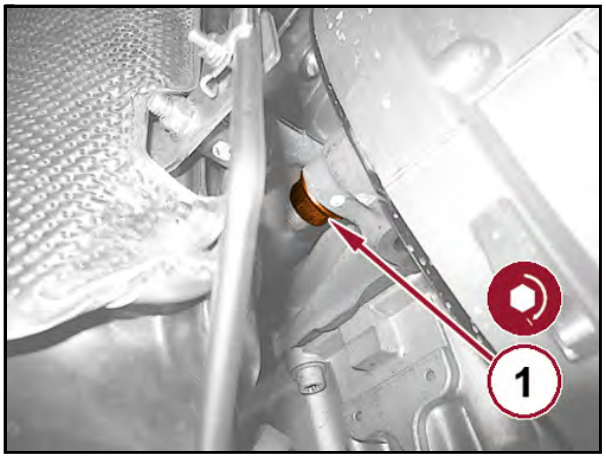


1.6 TURBO DIESEL

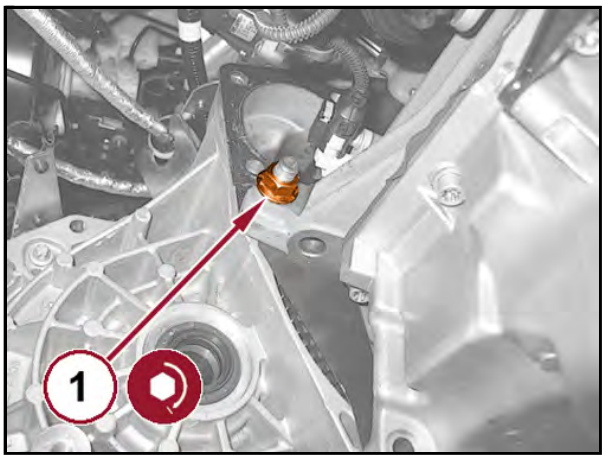
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PET_AAM_1013-0682

1. Place the transaxle in position under the vehicle using tools 1870847000 and 1870835001 (EMEA) or a suitable transmission jack (NAFTA).

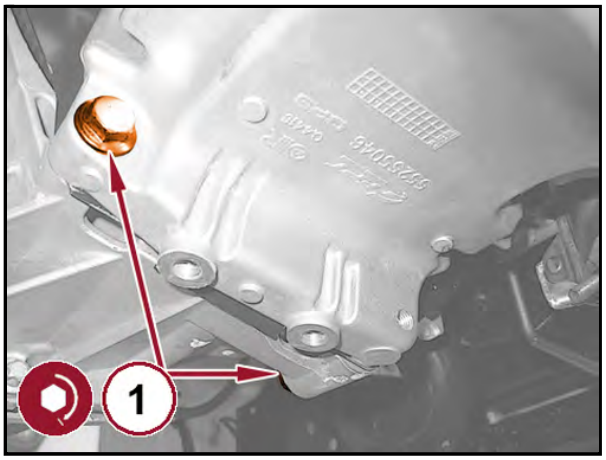
2. Tighten the nut (1) to the proper (Torque Specifications) .



3. Install the nut (1) to attach the transmission to the engine and tighten the bolt to the proper (Torque Specifications) .



4. Install the two engine oil pan to transmission bolts (1) and tighten to the proper (Torque Specifications) .



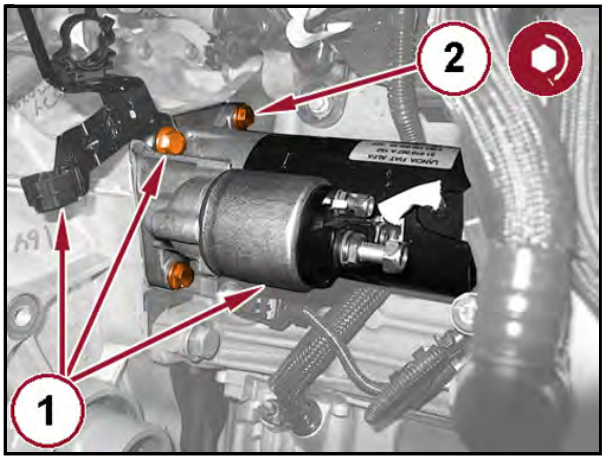
5. Tighten the dust cover bolt.

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6. Remove the transmission jack.

7. Position the starter with **NEW** gasket and bracket in position, hold in place with top starter bolt (1).

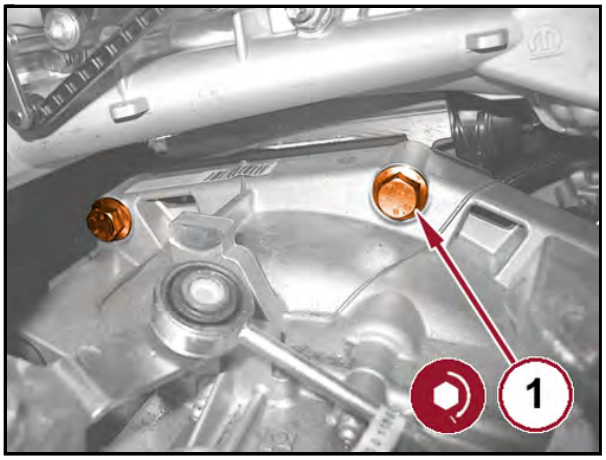
8. Install and tighten the starter motor mounting bolts (2) to the proper (Torque Specifications) .



9. Connect the starter wire to the stud and tighten the nut.

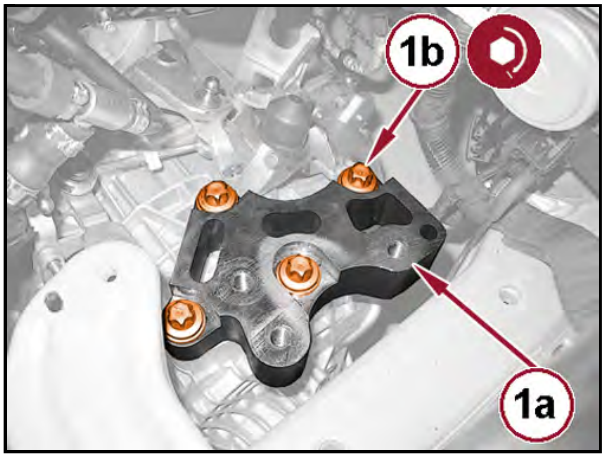
10. Connect the starter cable, tighten the nut and close the connector cover.

11. Install the upper transmission to engine bolts (1) and tighten to the proper (Torque Specifications) .



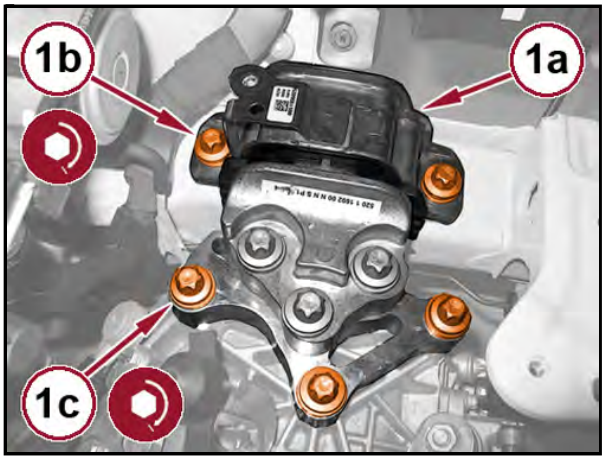
12. Put into place the support bracket for the Diesel Particulate Filter (DPF) and tighten the screws.

13. Put into place the left engine mount adapter (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



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14. Position the left engine mount (1a) into position and tighten the bolts (1b) and (1c) to the proper (Torque Specifications) .



15. Install the heat shield and tighten the bolt.
16. Attach the battery ground cable to the transmission and tighten the screw.
17. Connect the reverse light switch wire harness connector.
18. Connect the vibration damper to the clutch master cylinder hose and engage the clip.
19. Engage the gear selector cable to the transmission lever.
20. Engage the gear engagement cable to the transmission lever.
21. Close the shifter cable retaining clips.
22. Remove the drive train support tool 2000040436 (EMEA) or Fixture, Driveline Support 8534B (NAFTA).
23. Install the Charge Air Cooler (CAC) tube to the throttle body, complete with seal, engage the retaining clip and tighten the screws.
24. Install and tighten the CAC tube to throttle body bolt.
25. Connect the CAC hose to the tube and tighten the clamp.
26. Install the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
27. Install the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .

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28. Install the half shafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

29. Fill the transaxle with correct fluid to the proper level (Refer to 21 - Transmission and Transfer Case/Manual/FLUID - Standard Procedure) .

30. Install the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

31. Bleed the air from the clutch (Refer to 06 - Clutch/Standard Procedure).

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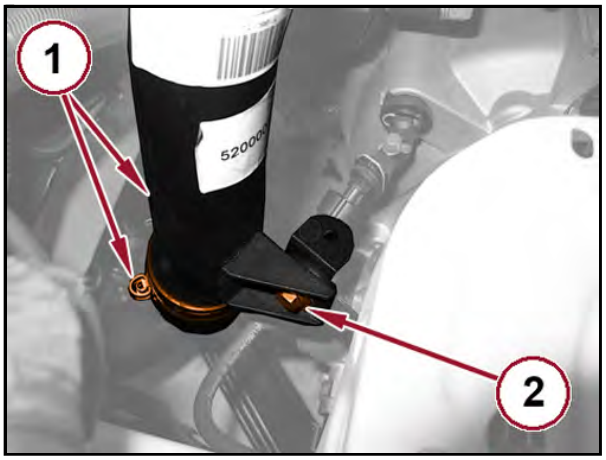
21 - Transmission and Transfer Case / Manual, C635 / Removal and Installation

2.0 TURBO DIESEL - AWD / 4WD

⊞ **Special Tools:** Click to display a list of tools used in this procedure

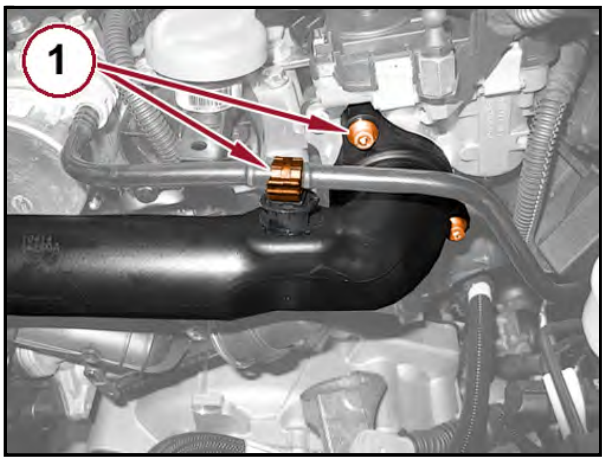
2.0 TURBO DIESEL

1. Remove the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .
2. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
3. Drain the transmission oil (Refer to 21 - Transmission and Transfer Case//FLUID/Standard Procedure) .
4. Remove the half shafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .
5. Remove the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .
6. Remove the power Transfer Unit (PTU) (Refer to 21 - Transmission and Transfer Case/Power Transfer Unit/Removal and Installation) .
7. Remove the Diesel Particulate Filter (DPF) (Refer to 11 - Exhaust System/FILTER, Diesel Particulate/Removal and Installation) .
8. Loosen the clamp and disconnect the Charge Air Cooler (CAC) hose from the tube leading to the throttle body (1).
9. Remove the nut (2) securing the CAC tube to the throttle body.

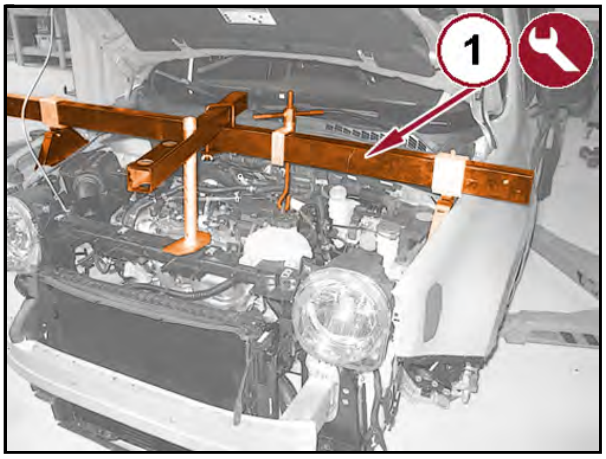


10. Open the clip, remove the nuts and remove the CAC tube at the throttle body.

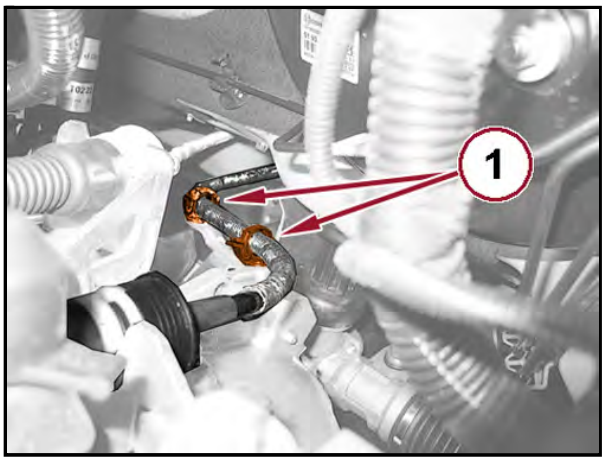
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11. Use tool 2000040436 (EMEA) or Fixture, Driveline Support 8534B (NAFTA) (1) to support the drivetrain as shown.



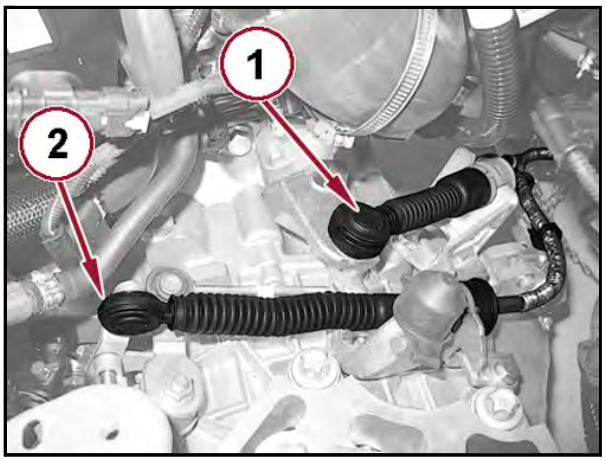
12. Open the shifter cable retaining clips (1) on the transmission.



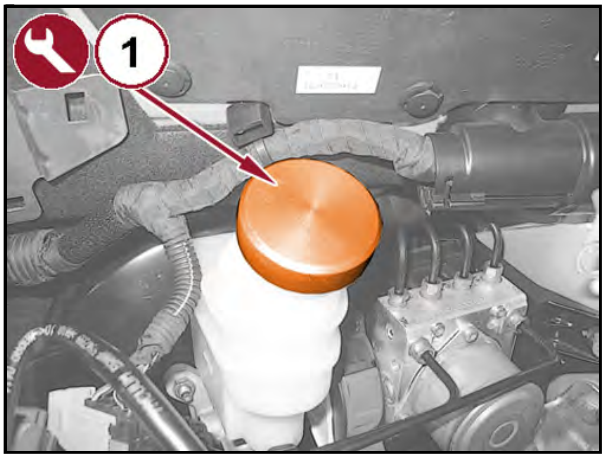
13. Disengage the gear engagement cable end from the lever (1).

14. Disengage the gear selector cable end from the lever (2).

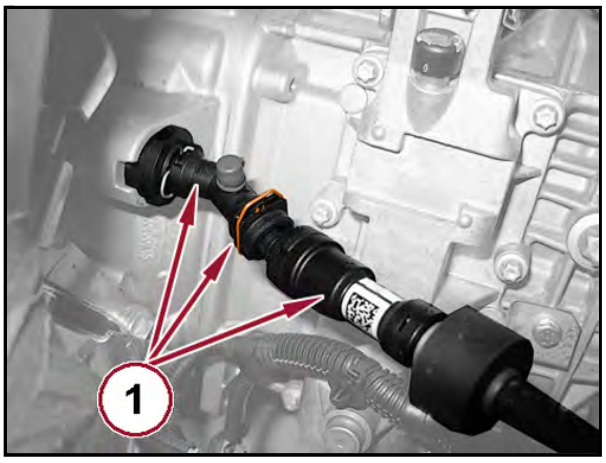
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15. Install tool 2000001400 (1) to the master cylinder reservoir.



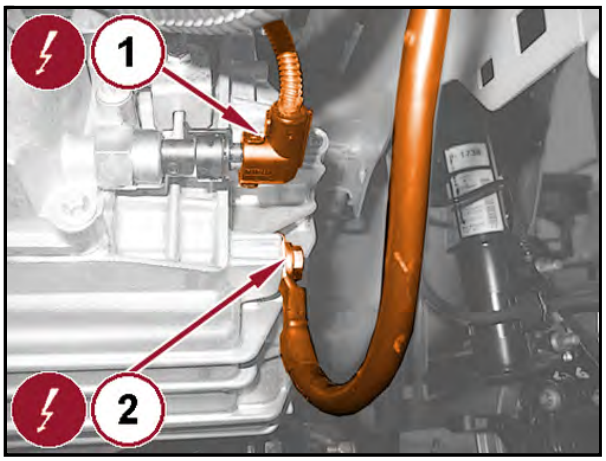
16. Lift the clip and disconnect the vibration damper (1).



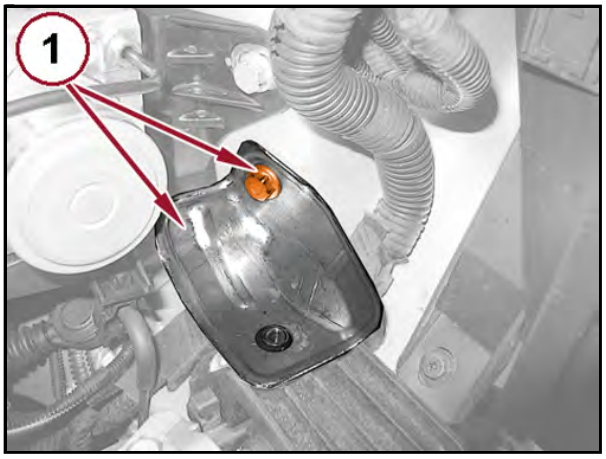
17. Disconnect the reverse light switch wire harness connector (1).

18. Remove the ground cable bolt (2) and position cable aside.

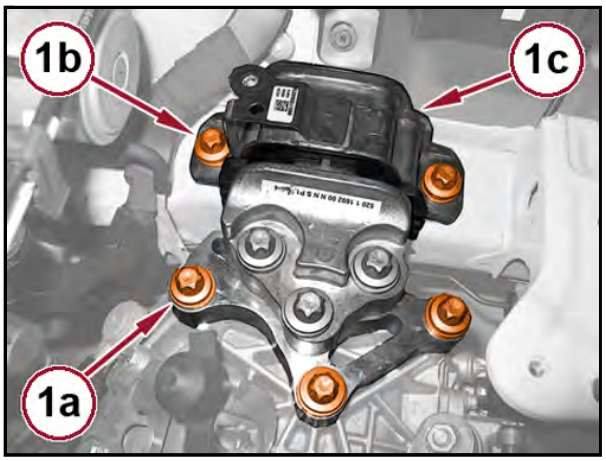
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19. Remove the bolt and the heat shield (1).

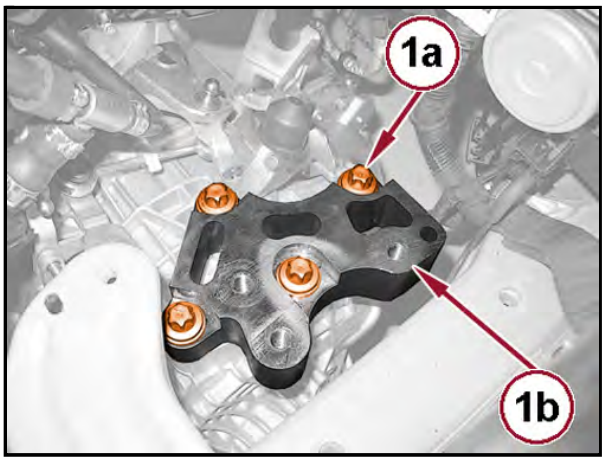


20. Remove the bolts (1a), (1b) and remove the left engine mount (1c).

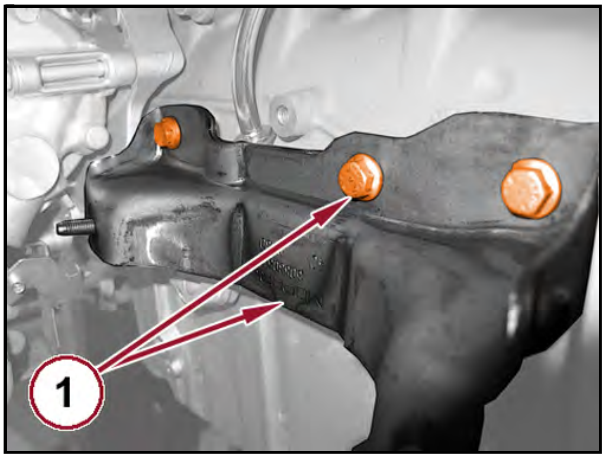


21. Remove the screws (1a) and remove the left engine mount adapter (1b).

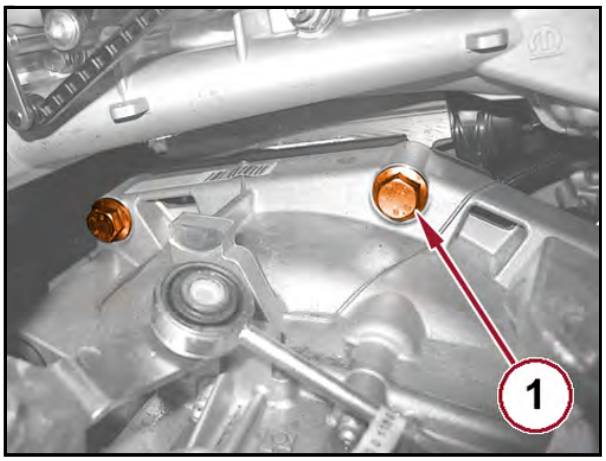
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22. Remove the screws and remove the DPF support bracket (1).

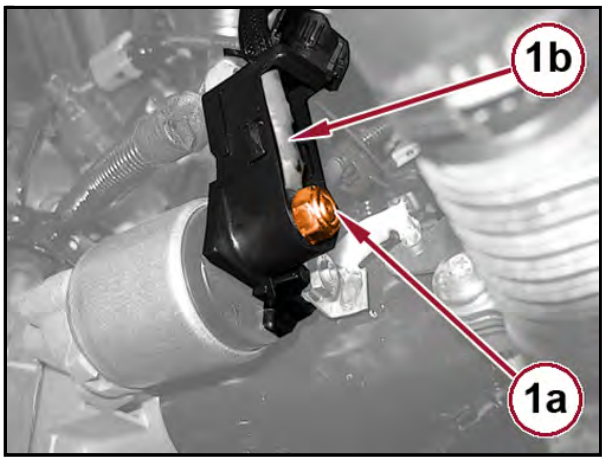


23. Remove the upper transmission to engine bolts (1).

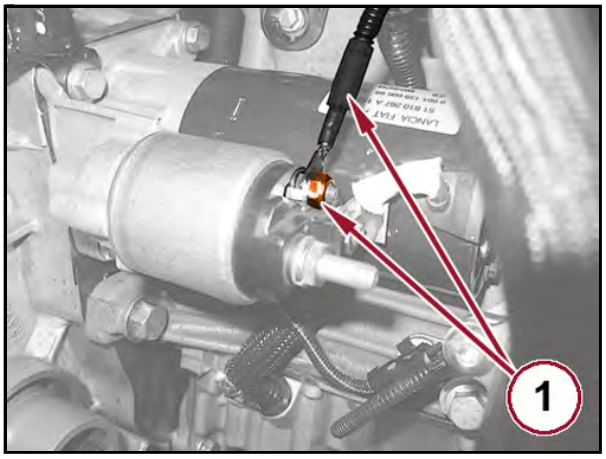


24. Open the starter wire connector cover, remove the nut (1a) and disconnect the cable at the starter (1b).

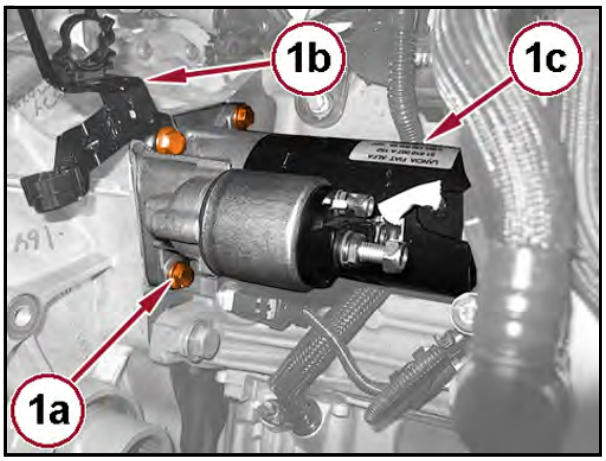
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25. Remove the nut and disconnect the starter wiring (1).



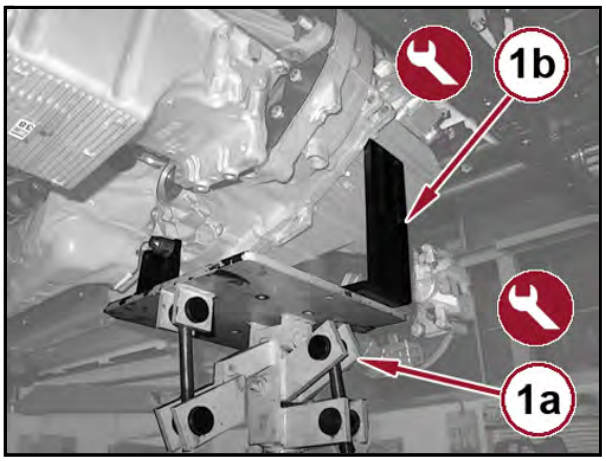
26. Remove the starter bolts (1a) and the bracket (1b), then remove the starter (1c).



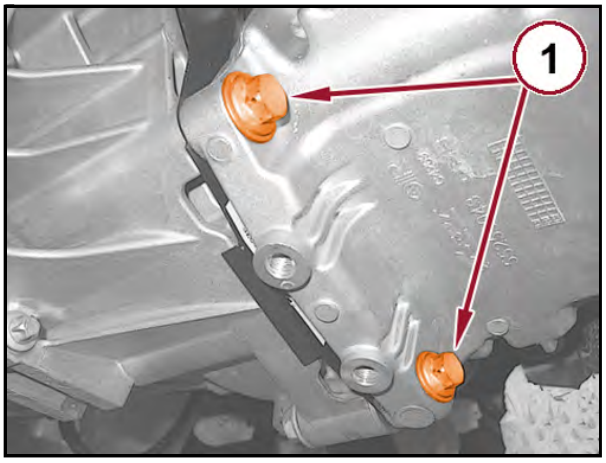
27. Assemble the tools 1870847000 (1a) and 1870835001 (1b) (EMEA) or a suitable transmission jack (NAFTA) to properly support the transmission.

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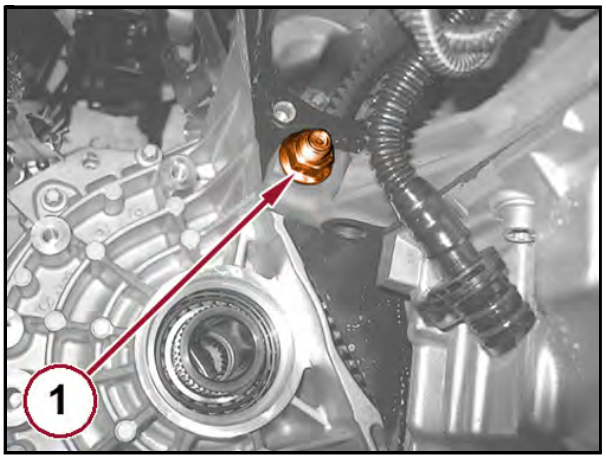
28. Loosen the dust cover bolt.



29. Remove the two engine oil pan to transmission bolts (1).

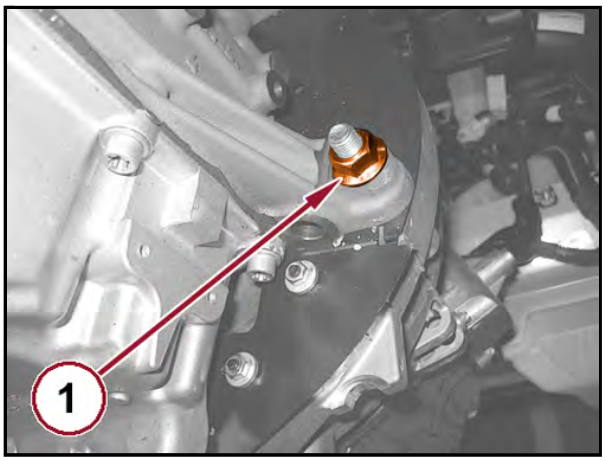


30. Remove the transmission to engine fastening nut (1).



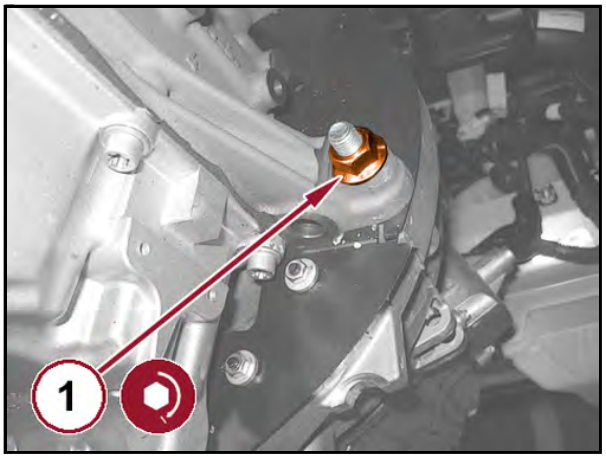
31. Remove the nut (1) and remove the gearbox from the engine.

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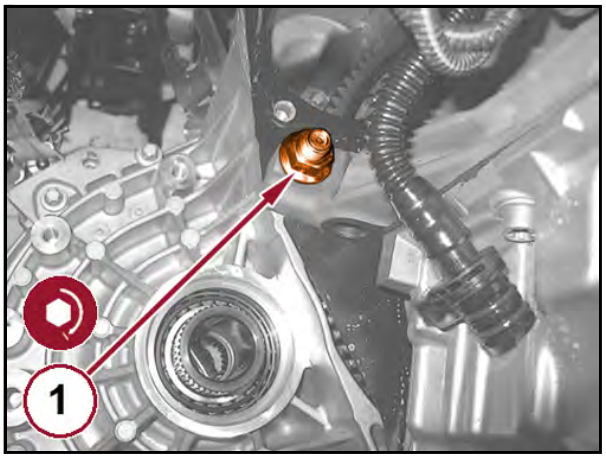


1.6 TURBO DIESEL

1. Place the transaxle in position under the vehicle using tools 1870847000 and 1870835001 (EMEA) or a suitable transmission jack (NAFTA).
2. Tighten the nut (1) to the proper (Torque Specifications) .

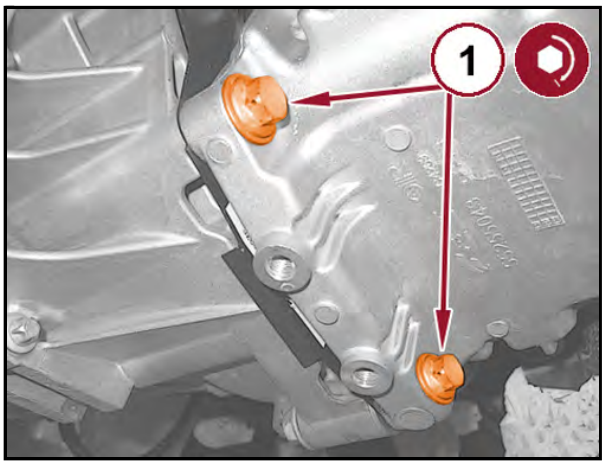


3. Install the nut (1) to attach the transmission to the engine and tighten the bolt to the proper (Torque Specifications) .



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4. Install the two engine oil pan to transmission bolts (1) and tighten to the proper (Torque Specifications) .

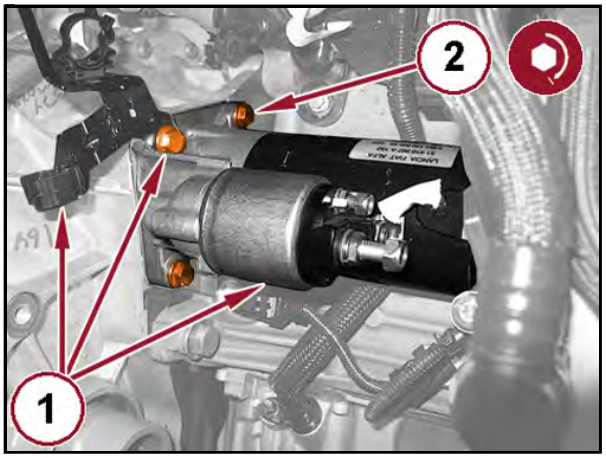


5. Tighten the dust cover bolt.

6. Remove the transmission jack.

7. Position the starter with **NEW** gasket and bracket in position, hold in place with top starter bolt (1).

8. Install and tighten the starter motor mounting bolts (2) to the proper (Torque Specifications) .



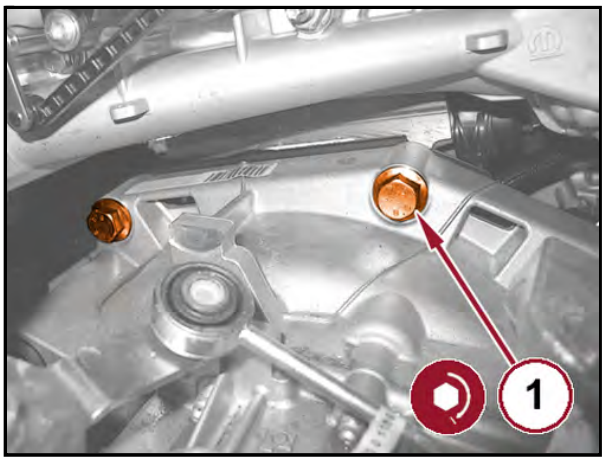
9. Connect the starter wire to the stud and tighten the nut.

10. Connect the starter cable, tighten the nut and close the connector cover.

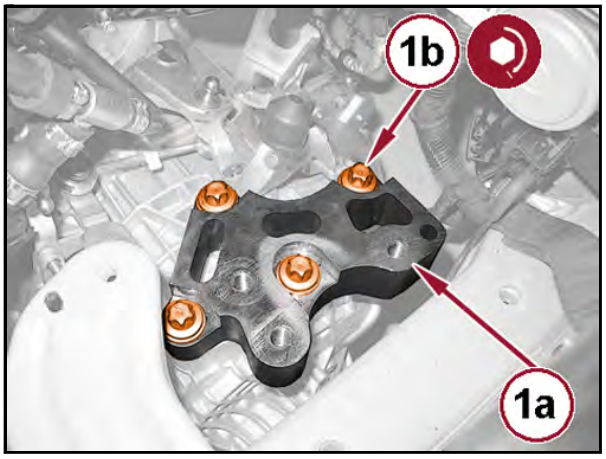
11. Install the upper transmission to engine bolts (1) and tighten to the proper (Torque Specifications) .

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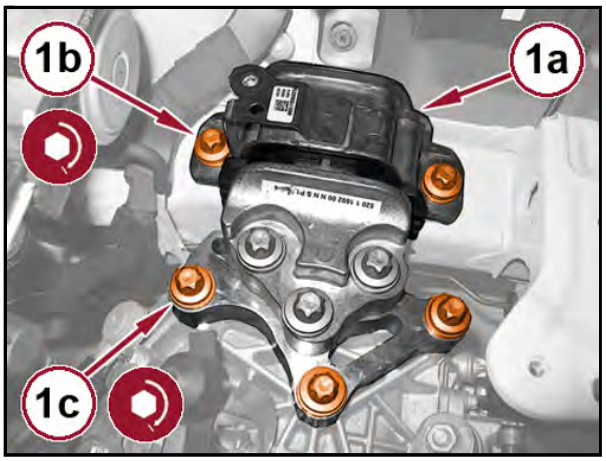
12. Put into place the support bracket for the Diesel Particulate Filter (DPF) and tighten the screws.



13. Put into place the left engine mount adapter (1a) and tighten the bolts (1b) to the proper (Torque Specifications) .



14. Position the left engine mount (1a) into position and tighten the bolts (1b) and (1c) to the proper (Torque Specifications) .



15. Install the heat shield and tighten the bolt.

16. Attach the battery ground cable to the transmission and tighten the screw.

17. Connect the reverse light switch wire harness connector.

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18. Connect the vibration damper to the clutch master cylinder hose and engage the clip.

19. Engage the gear selector cable to the transmission lever.

20. Engage the gear engagement cable to the transmission lever.

21. Close the shifter cable retaining clips.

22. Remove the drive train support tool 2000040436 (EMEA) or Fixture, Driveline Support 8534B (NAFTA).

23. Install the Charge Air Cooler (CAC) tube to the throttle body, complete with seal, engage the retaining clip and tighten the screws.

24. Install and tighten the CAC tube to throttle body bolt.

25. Connect the CAC hose to the tube and tighten the clamp.

26. Install the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .

27. Install the engine cover (Refer to 09 - Engine/COVER, Engine/Removal and Installation) .

28. Install the Power Transfer Unit (PTU) (Refer to 21 - Transmission and Transfer Case/Power Transfer Unit/Removal and Installation) .

29. Install the half shafts (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

30. Fill the transaxle with correct fluid to the proper level (Refer to 21 - Transmission and Transfer Case/Manual/FLUID - Standard Procedure) .

31. Install the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

32. Bleed the air from the clutch (Refer to 06 - Clutch/Standard Procedure).

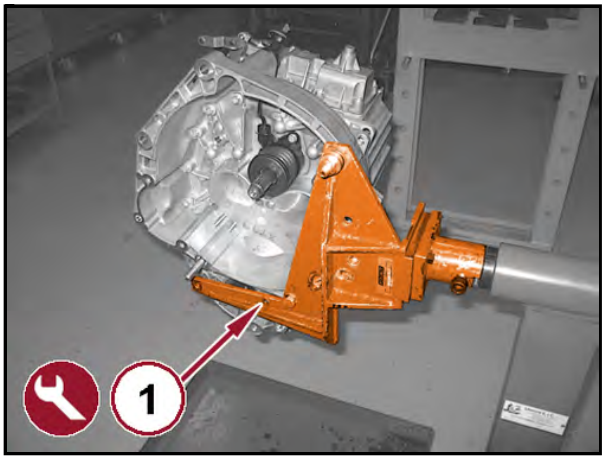
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21 - Transmission and Transfer Case / Manual, C635 / Disassembly and Assembly

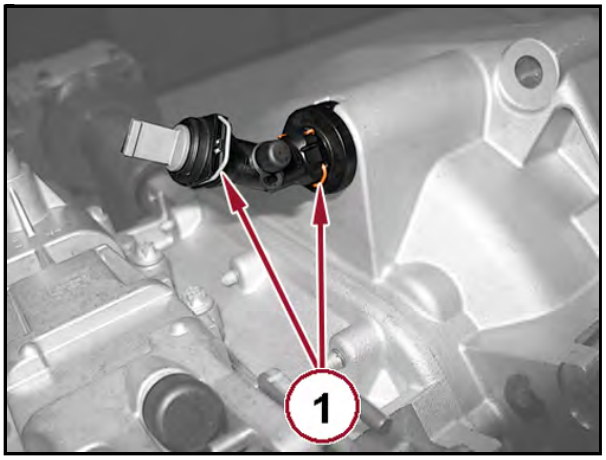
DISASSEMBLY AND ASSEMBLY

⊞ **Special Tools:** Click to display a list of tools used in this procedure

DISASSEMBLY



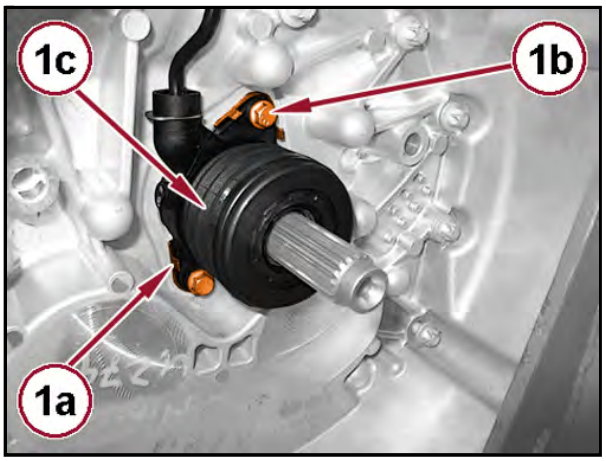
1. Install the gearbox on the stand with the holding tool (1).



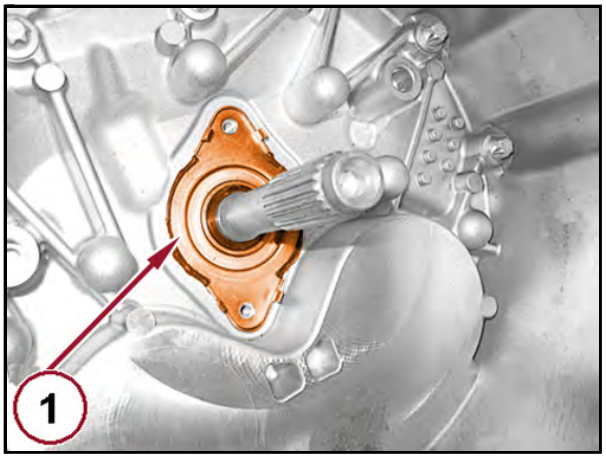
2. Lift the spring (1), disconnect and remove the clutch tube union.

3. Open the retaining tabs (1a), unscrew the screws (1b) and remove the clutch slave cylinder (1c).

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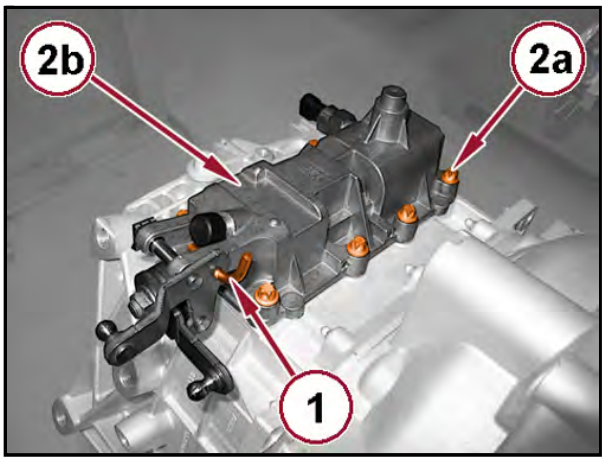


4. Remove the main shaft oil seal plate (1).



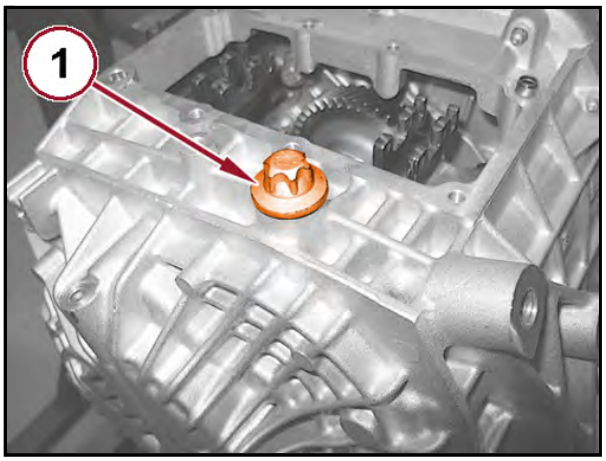
5. Place the locking pin (1) in place to lock the selection switch/gear engagement.

6. Remove the screws (2a) and remove the gear selector assembly (2b).

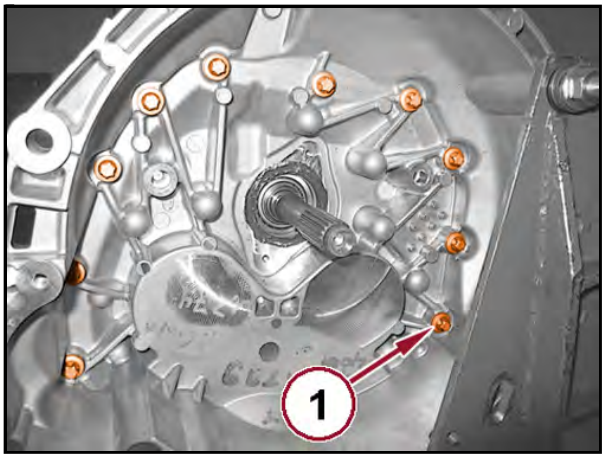


7. Remove the reverse idler gear assembly retaining bolt (1).

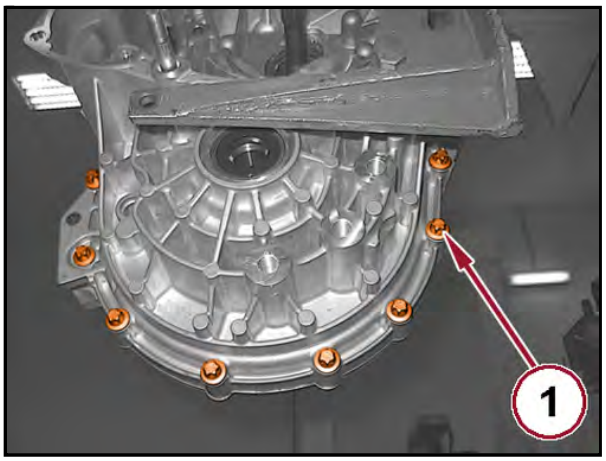
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8. Remove the screws (1) securing internal gearbox.

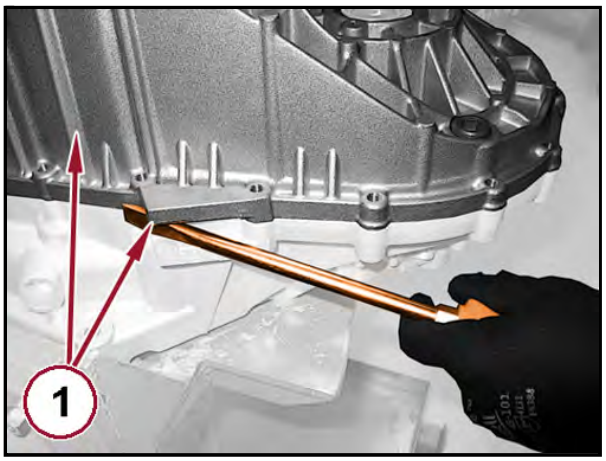


9. Remove the outer clutch housing screws (1).

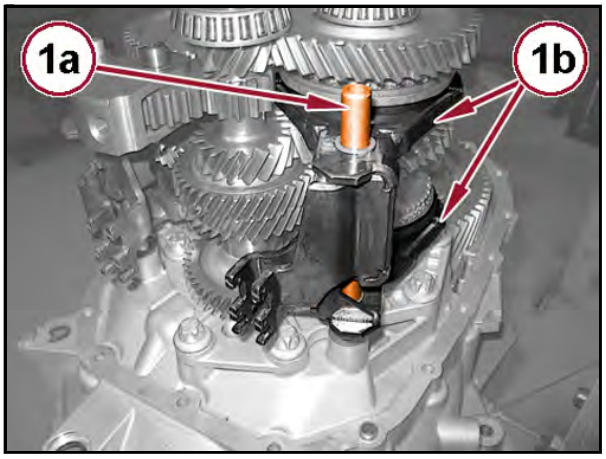


10. Separate the case halves by carefully prying on the case side half (1) and the clutch housing side half.

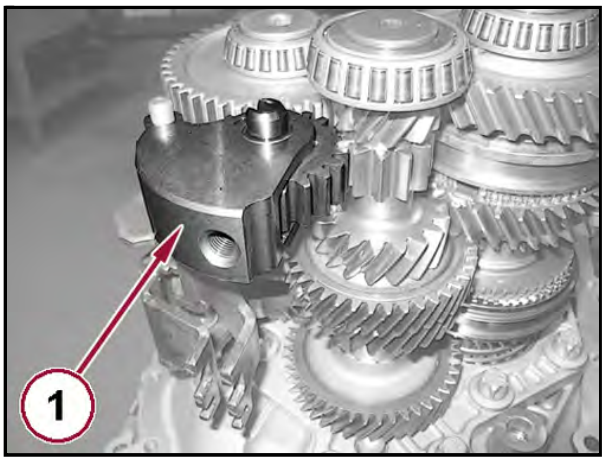
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11. Remove the rod (1a) and remove the 1-2-5-6 gear shifter fork assembly (1b).

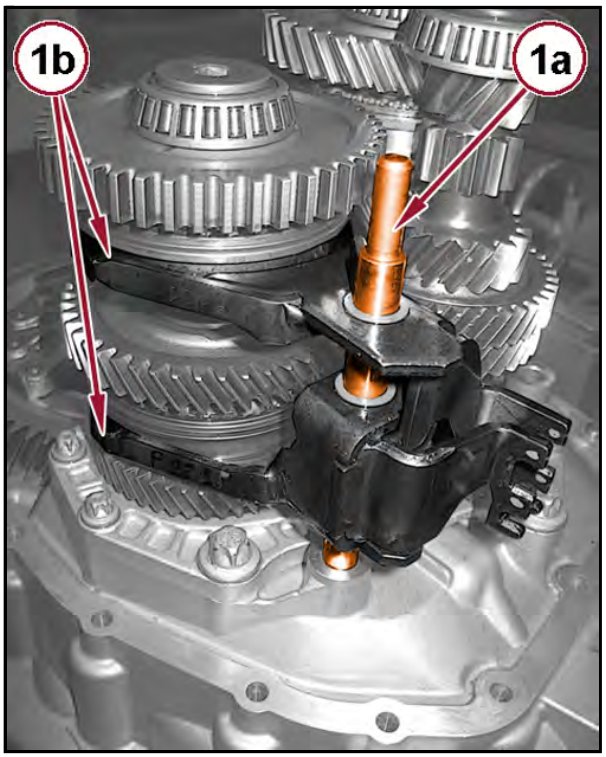


12. Remove the reverse idler gear assembly (1).



13. Remove the rod (1a) and remove the 3-4 reverse gear shifter fork assembly (1b).

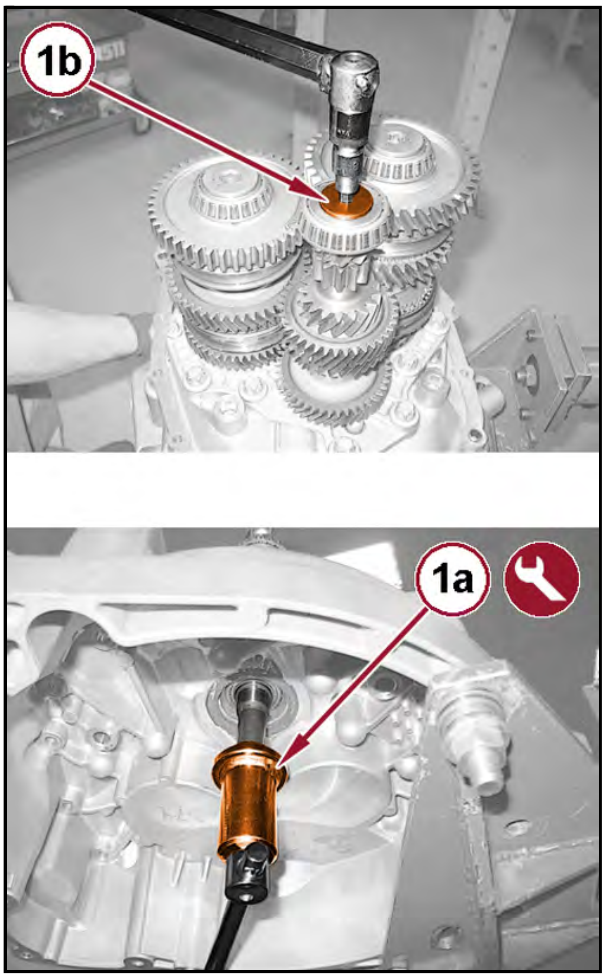
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14. Place tool 1870853000 and unscrew the nut (1b) securing rear bearing shaft.

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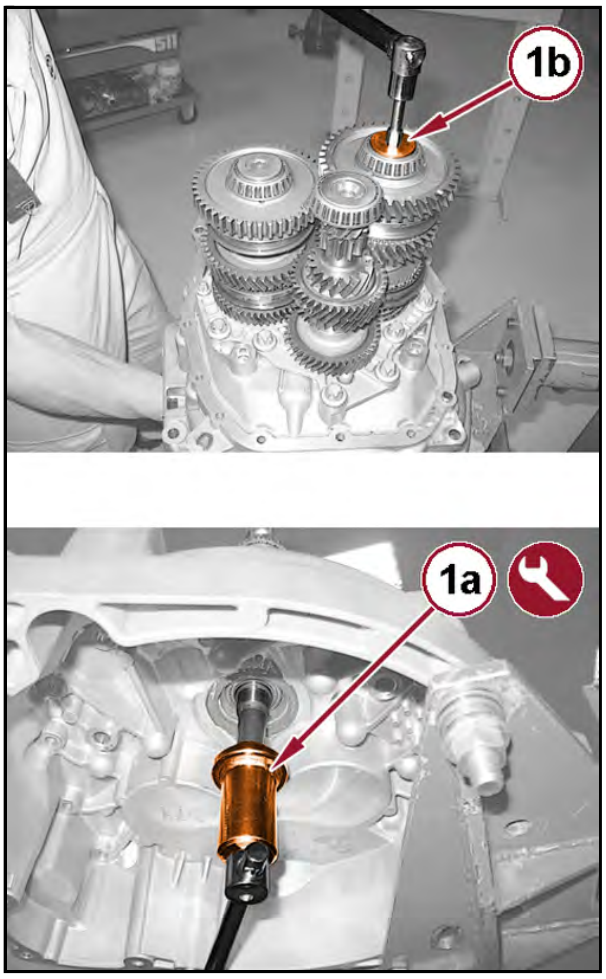
15. Engage 1st and 6th gear.



16. Place tool 1870853000 (1a) and unscrew the ring left hand (1b) securing rear bearing shaft bottom.

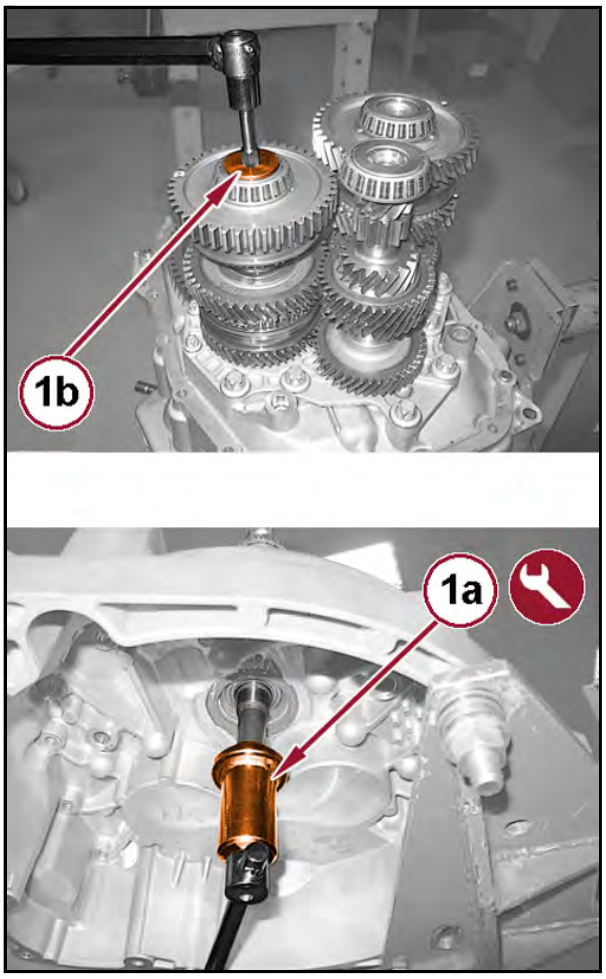
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17. Engage 4th gear and reverse gear.



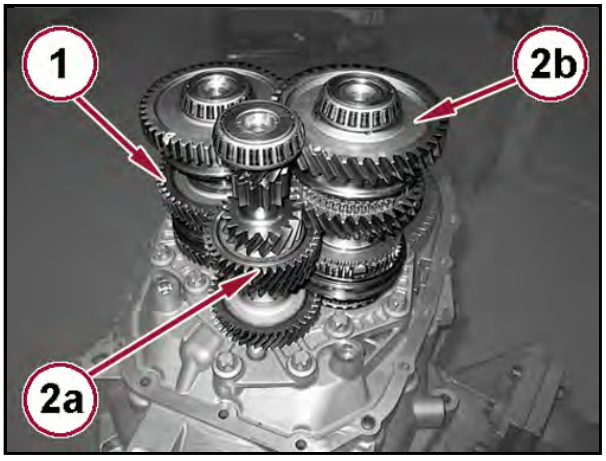
18. Place tool 1870853000 (1a) and unscrew the nut clockwise (1b) securing the rear bearing.

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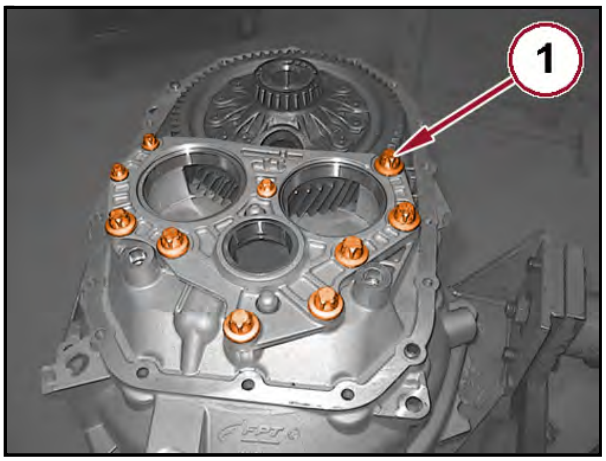
19. Remove the upper shaft.

20. Remove the mainshaft (2a) together with the secondary shaft (2b).

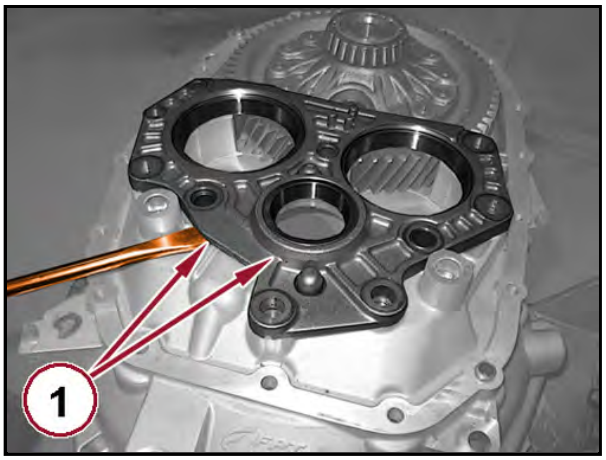


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PET_AAM_1013-0705

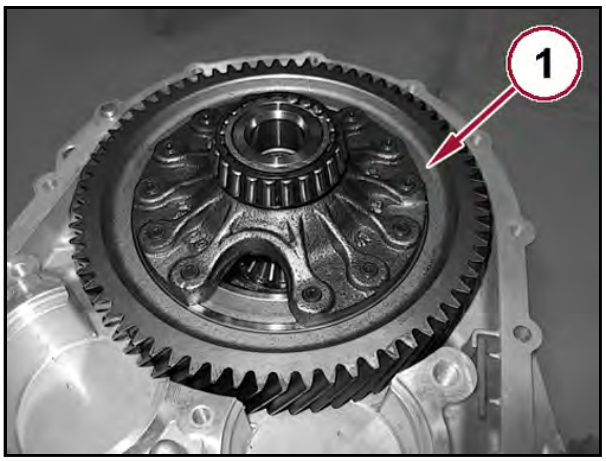
21. Remove the bearing race plate screws.



22. Remove the bearing race plate.

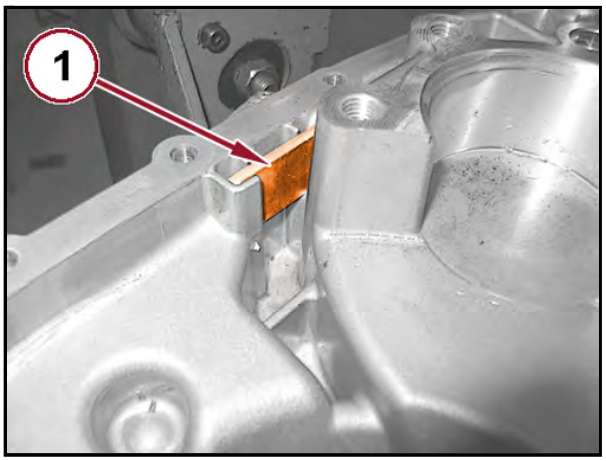


23. Remove the differential housing complete.

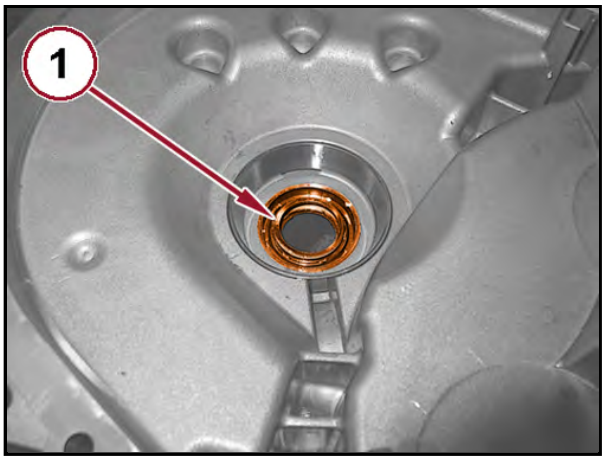


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24. Remove the magnet.

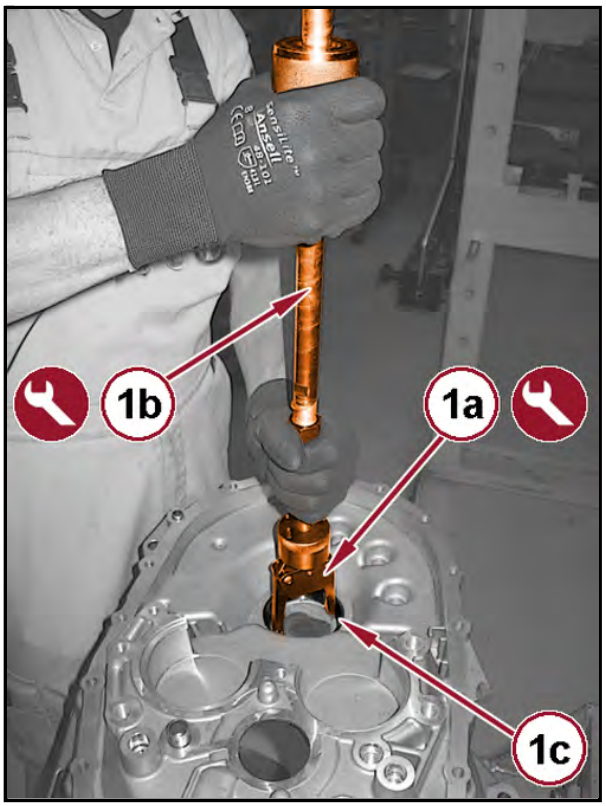


25. Remove the oil seal of the drive shaft right differential.

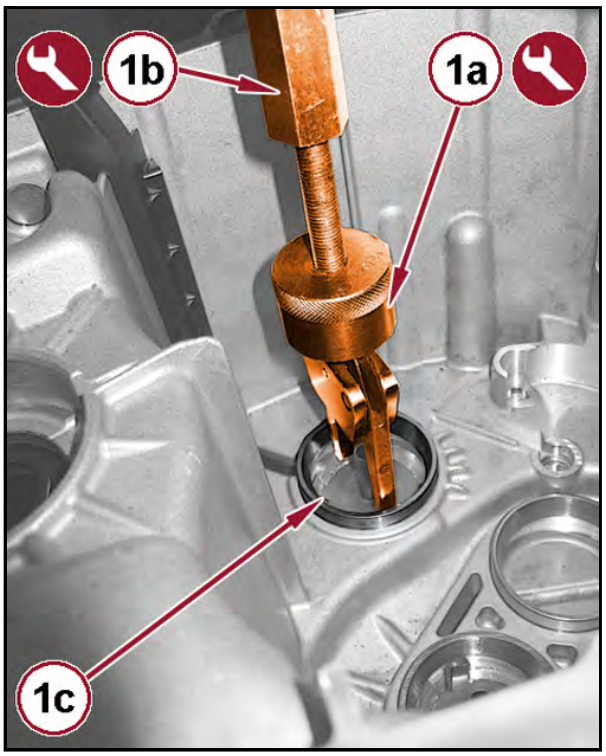


26. With the tools 1870655000 (1a) and 1840206001 (1b), remove the outer race (1c) of the right bearing differential housing.

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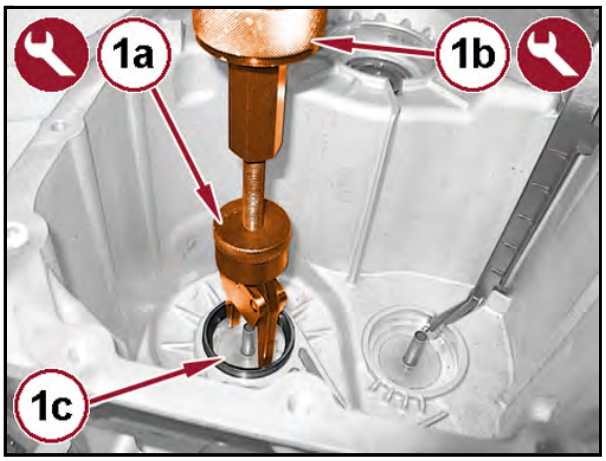


27. With the tools 1870655000 (1a) and 1847017001 (1b), remove the outer race (1c) and the shim ring rear bearing shaft top.

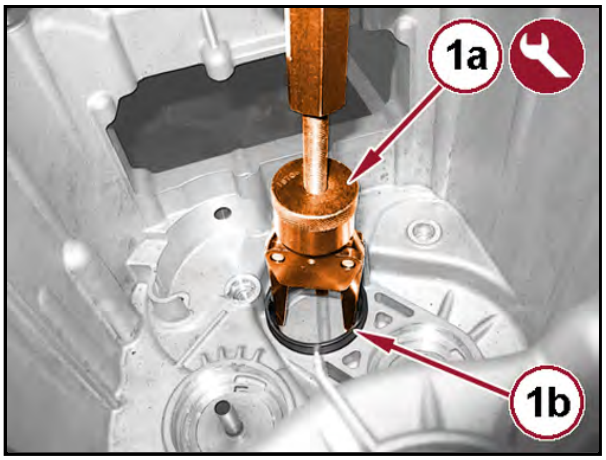


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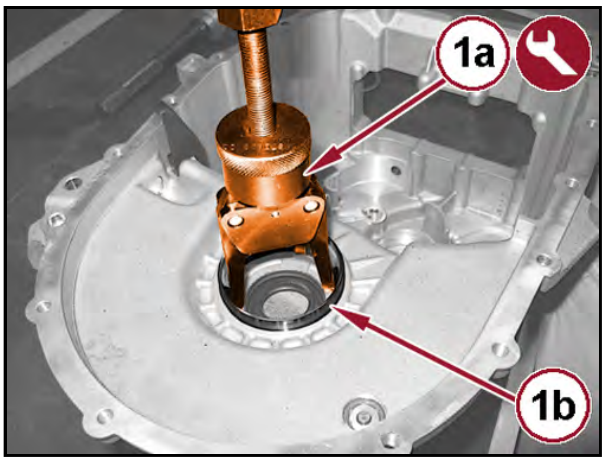
28. With the tools 1870655000 (1a) and 1847017001 (1b), remove the outer race (1c) and the shim ring rear bearing shaft bottom.



29. With tools 1870655000 (1a), remove the outer race (1b) and the shim ring rear bearing shaft.

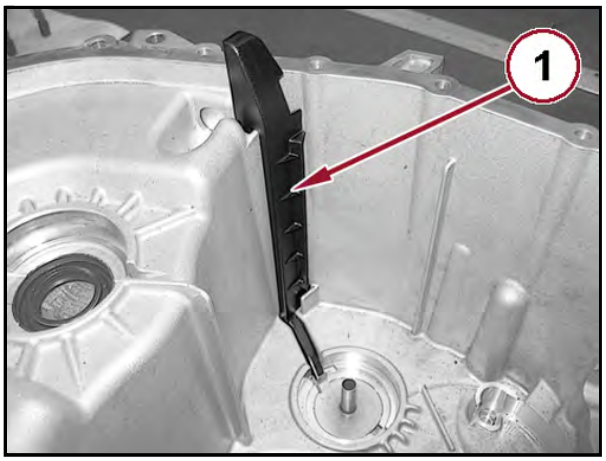


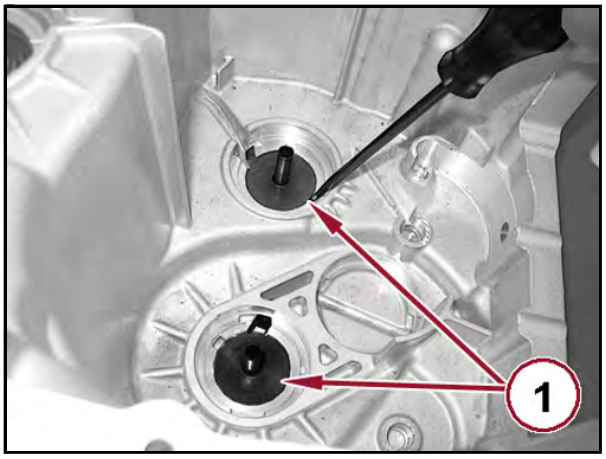
30. With the tools 1870655000 (1a), remove the outer race (1b) and the shim ring bearing left differential housing.



31. Remove the lubricating duct (1) by pulling upward.

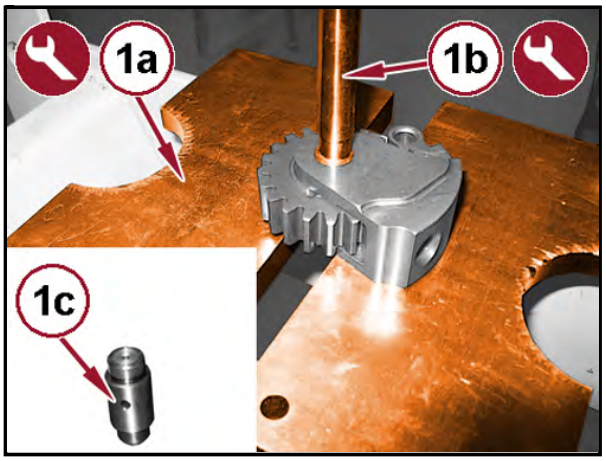
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32. Remove the shaft oil ducts (1) from the case using a screwdriver or the equivalent.

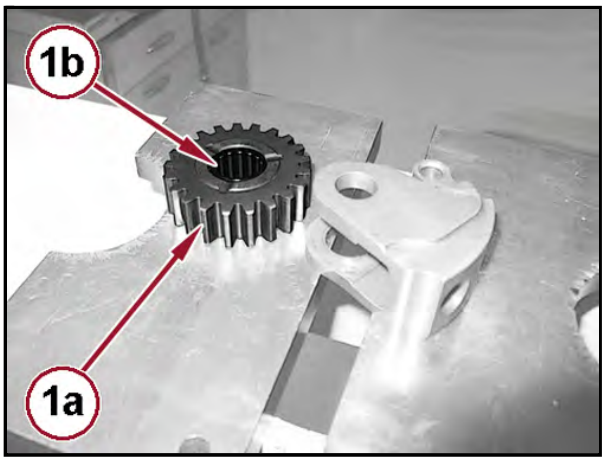
33. Remove the left shaft seal differential from gearbox.



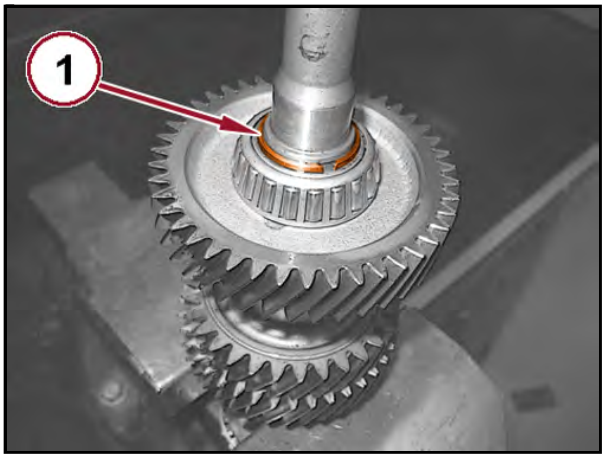
34. At the hydraulic press, with tools 1860837000 (1a) and 2000028700 (1b), remove the pin (1c) securing reverse gear support.

35. Disengage the reverse gear (1a) complete with needle bearing (1b).

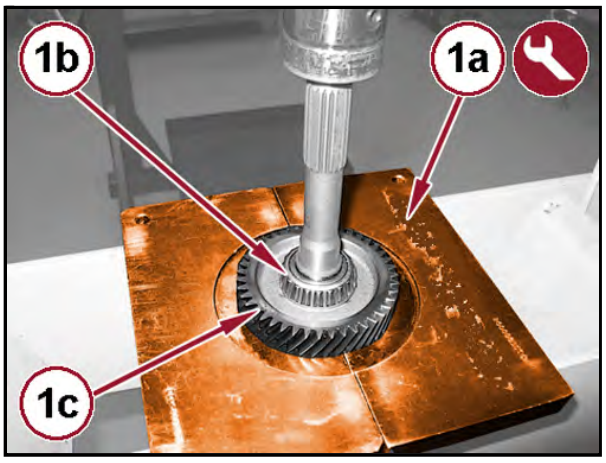
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36. Place the mainshaft in a vice equipped with protective, non-marring jaw covers and remove the bearing snap ring.

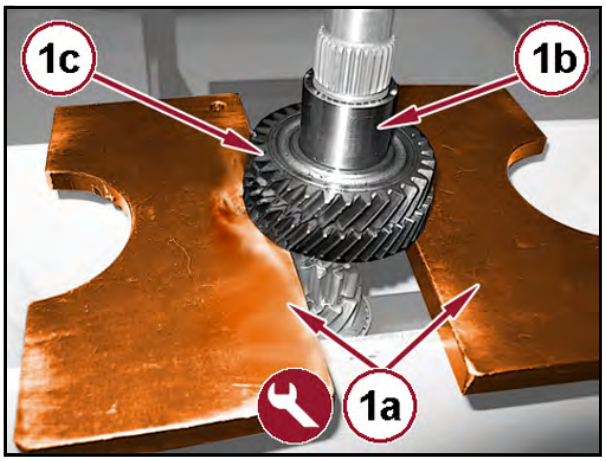


37. At the hydraulic press, with the tool 2000005000 (1a), remove the front bearing (1b) and the forth-sixth gear (1c).

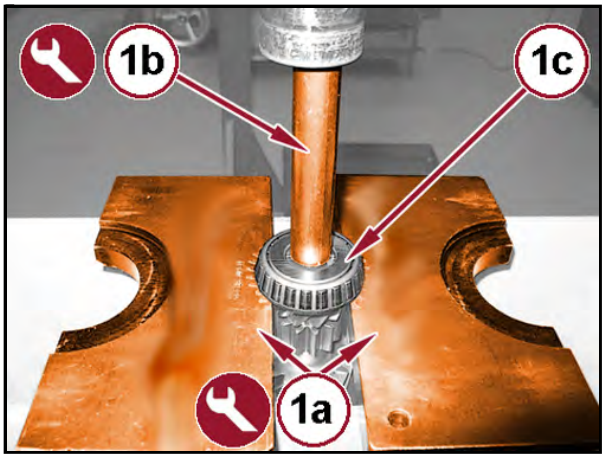


38. At the hydraulic press, with the tool 1860837000 (1a), remove the spacer (1b) and the third-fifth gears (1c).

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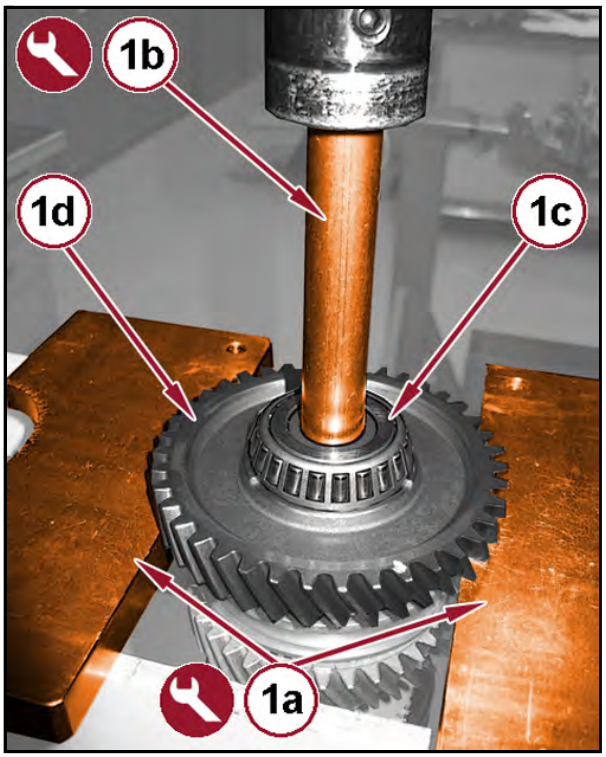


39. At the hydraulic press, with tools 1860837000 (1a) and 2000004700 (1b), remove the rear bearing (1c).

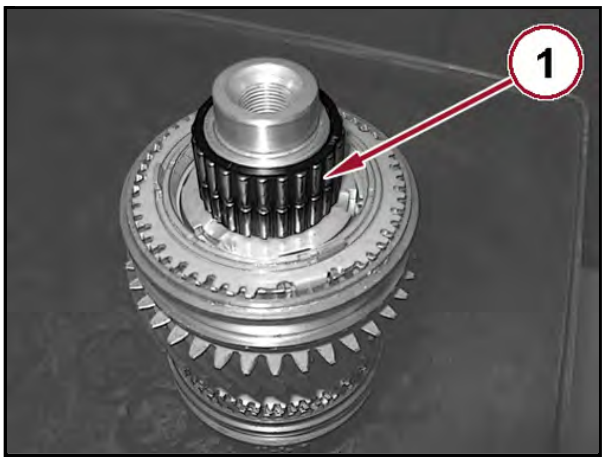


40. At the hydraulic press, with tools 1860837000 (1a) and 2000004700 (1b), remove the rear bearing (1c) and the 1st speed gear (1d).

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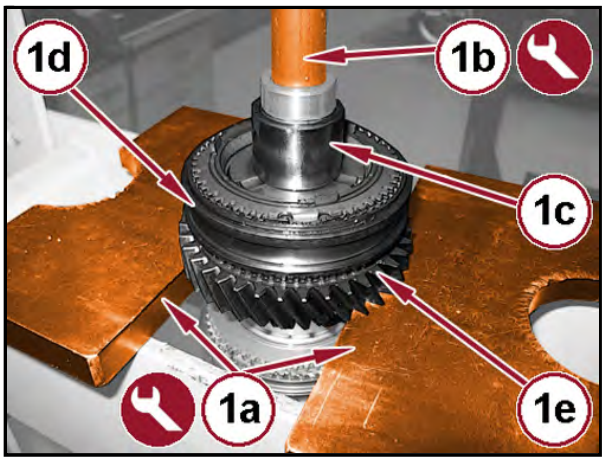


41. Remove the needle bearing.

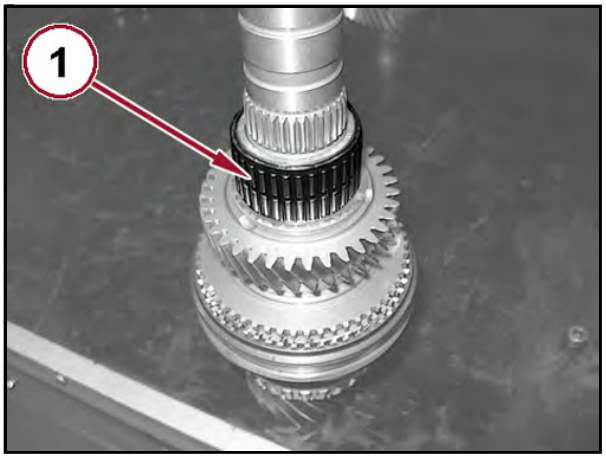


42. At the hydraulic press, with tools 1860837000 (1a) and 2000004700 (1b), remove the spacer (1c), the synchronizer (1d) and the 2nd speed gear (1st).

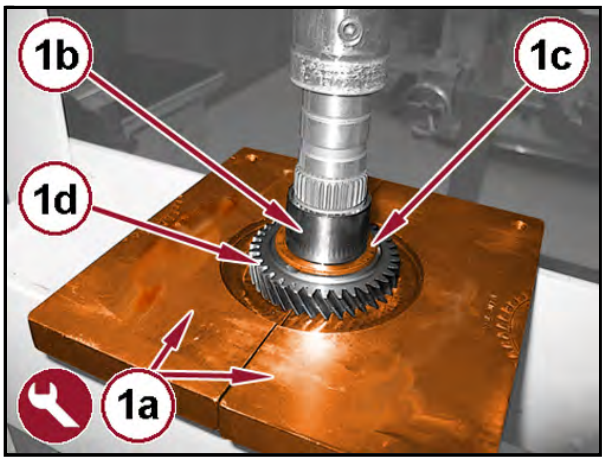
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43. Remove the needle bearing.

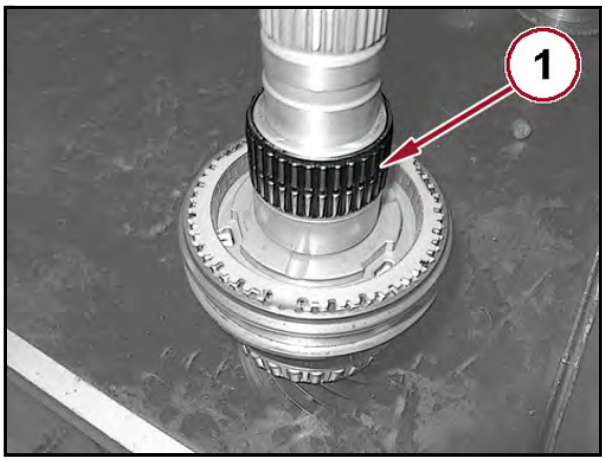


44. In the hydraulic press, with the tool 1860837000 (1a), remove the spacer (1b), the shim ring (1c) and the 5th speed gear (1d).

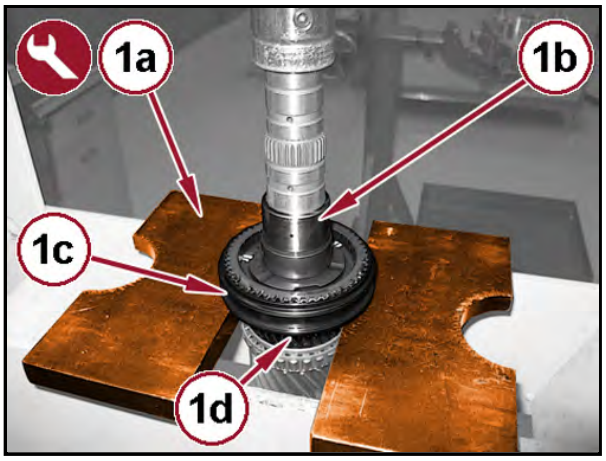


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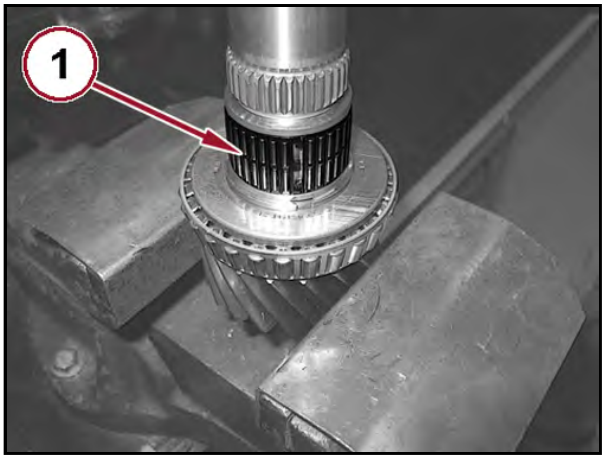
45. Remove the needle bearing.



46. In the hydraulic press, with the tool 1860837000 (1a), remove the spacer (1b), the synchronizer (1c) and the 6th speed gear (1d).

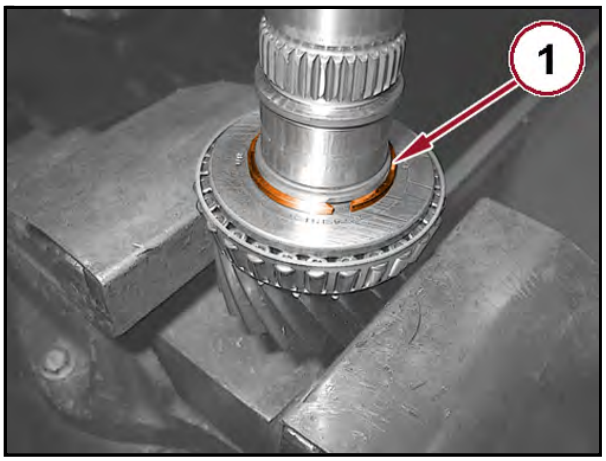


47. Place the shaft in a vice equipped with protective, non-marring jaw covers and remove the needle bearing.

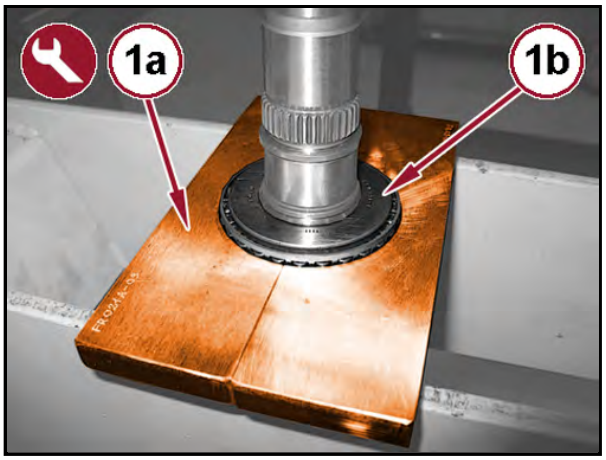


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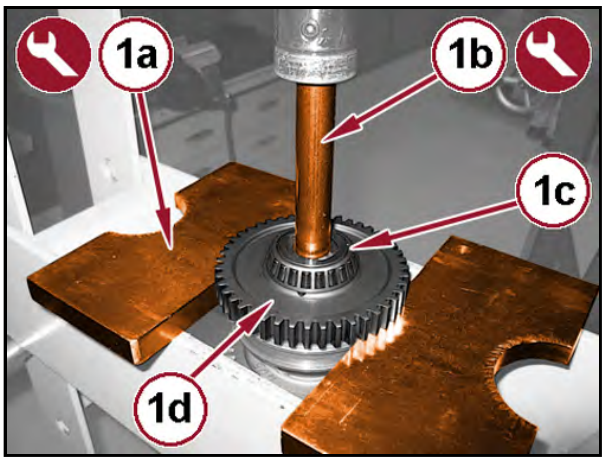
48. Remove the bearing snap ring.



49. At the hydraulic press, with the tool 2000035508 (1a), remove the front bearing (1b).

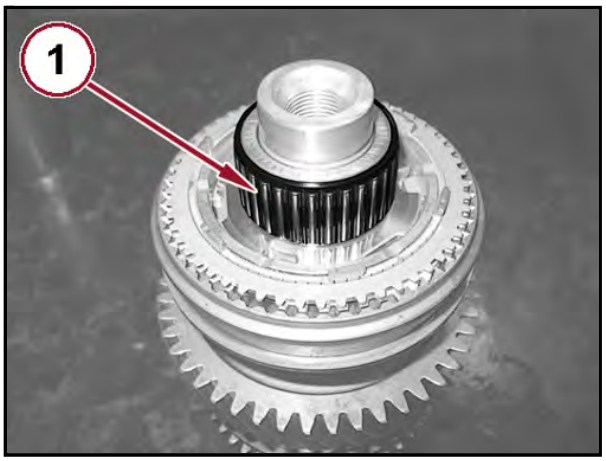


50. At the hydraulic press, with tools 1860837000 (1a) and 2000004700 (1b), remove the rear bearing (1c) and the reverse gear (1d).

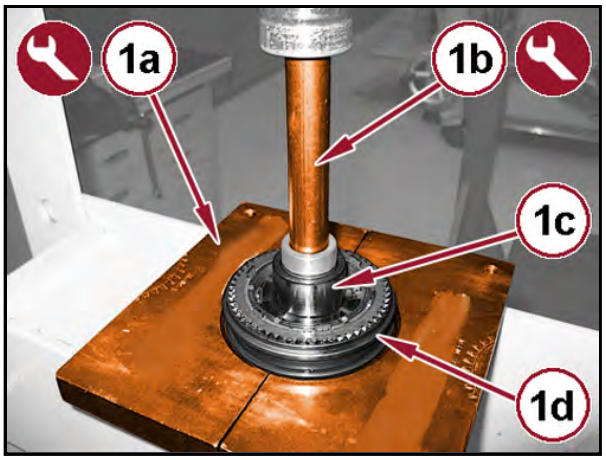


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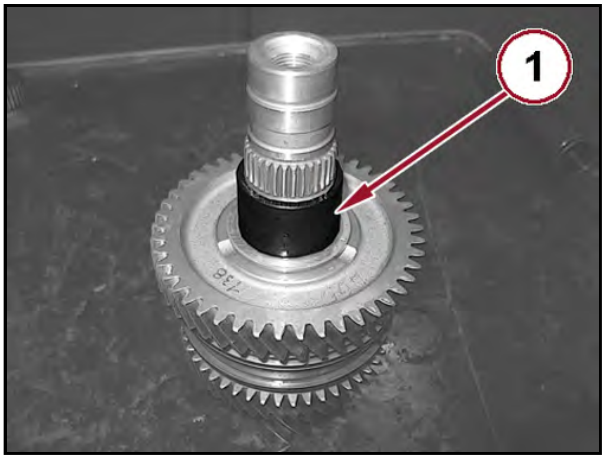
51. Remove the needle bearing.



52. At the hydraulic press, with tools 1860837000 (1a) and 2000004700 (1b), remove the spacer (1c) and the synchronizer assembly (1d).

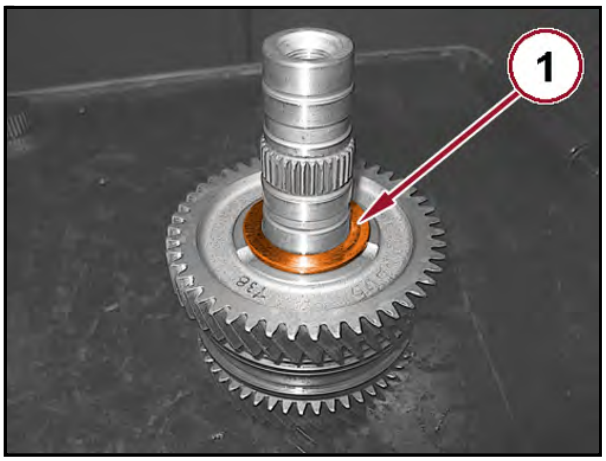


53. Remove the spacer.

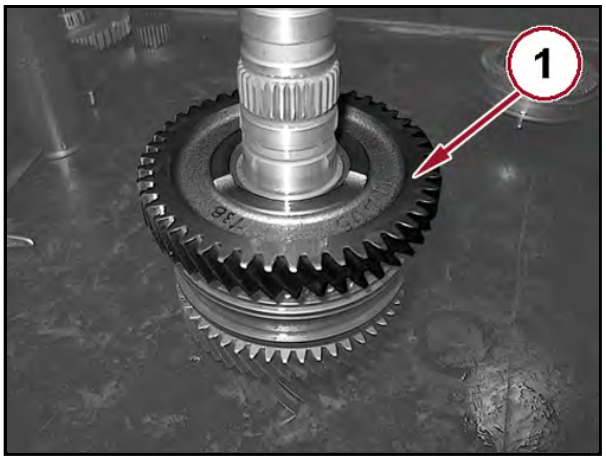


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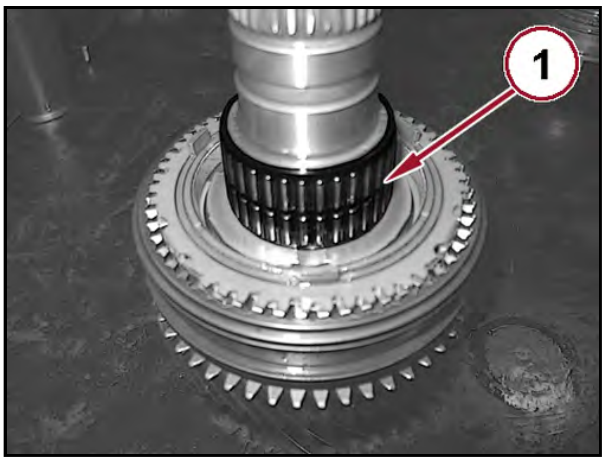
54. Remove the shim ring.



55. Remove the 3rd speed gear.

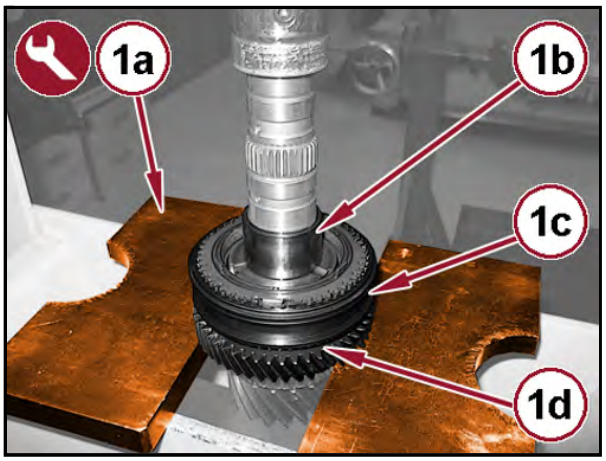


56. Remove the needle bearing.

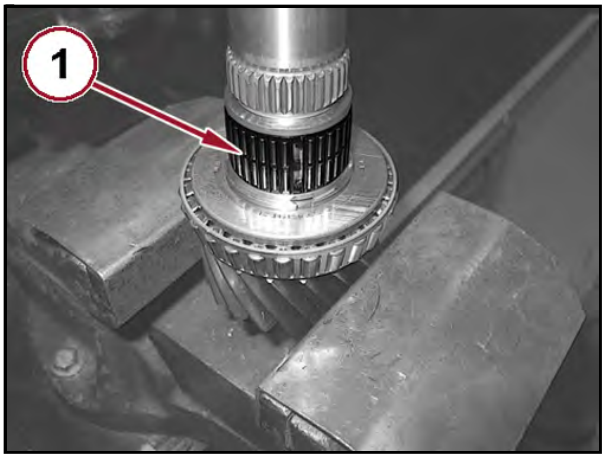


57. In the hydraulic press, with the tool 1860837000 (1a), remove the spacer (1b), the synchronizer (1c) and the 4th speed gear (1d).

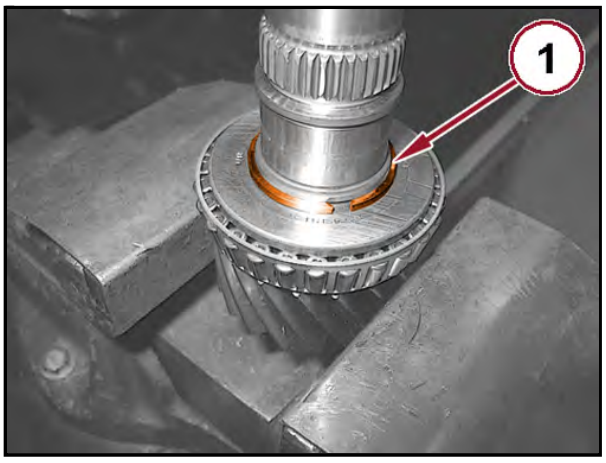
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58. Place the upper shaft in a vice equipped with protective, non-marring jaw covers and remove the needle bearing.

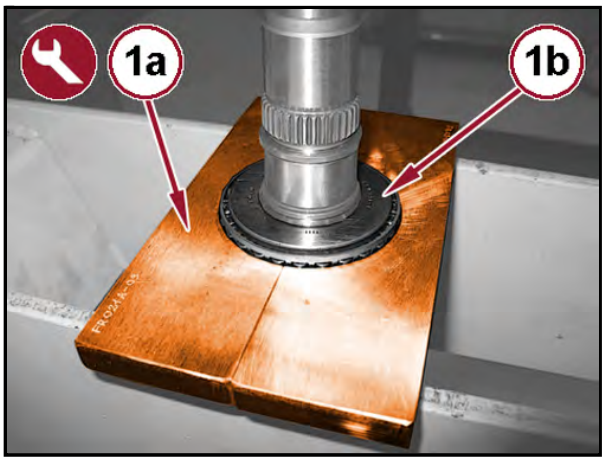


59. Remove the bearing snap ring.

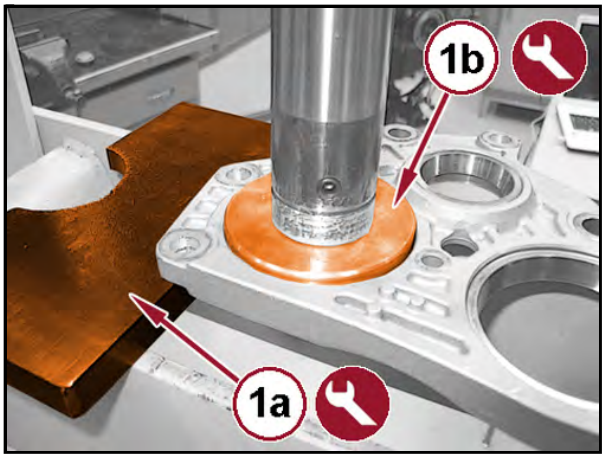


60. At the hydraulic press, with the tool 2000035508 (1a), remove the front bearing (1b).

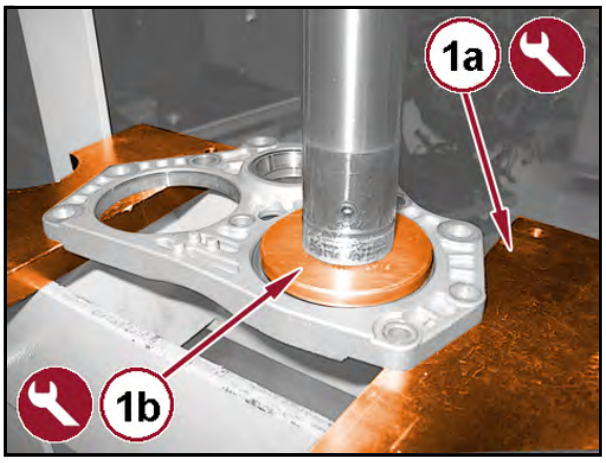
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61. At the hydraulic press, with tools 1860837000 (1a) and 1870434000 (1b), remove the bottom front outer bearing race.

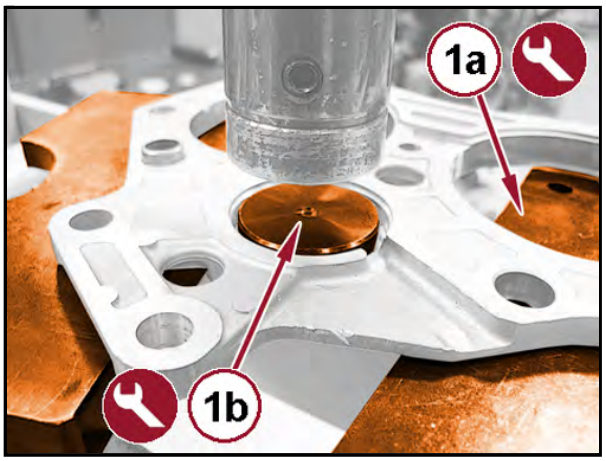


62. At the hydraulic press, with tools 1860837000 (1a) and 1870434000 (1b), remove the top front outer bearing race.



63. At the hydraulic press, with tools 1860837000 (1a) and 1870434000 (1b), remove the front bearing outer race.

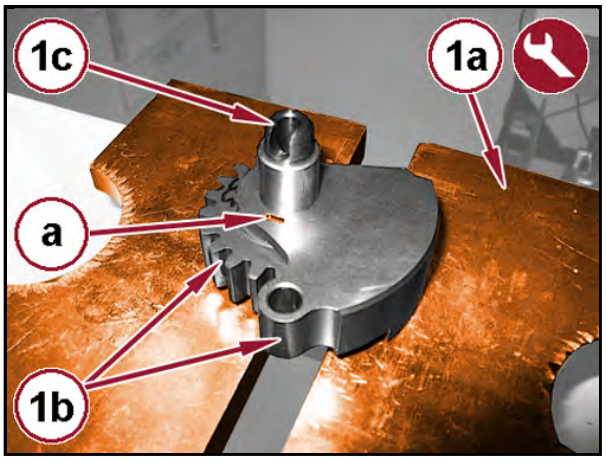
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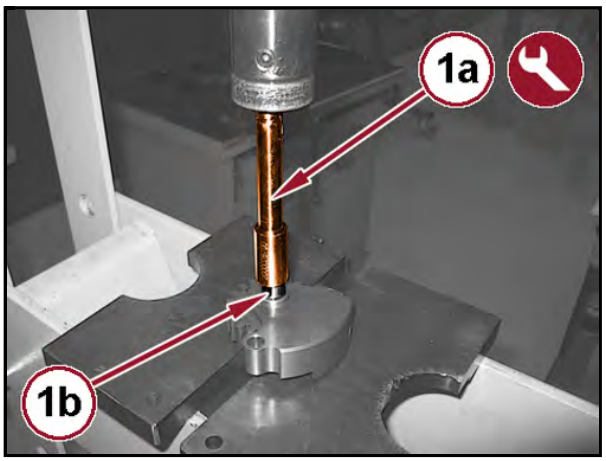
ASSEMBLY

NOTE: The cut out of the fastening pin (1c) must be directed at the notch "a" as shown in FIG.

1. Using a hydraulic press, with the tool 1860837000 (1a), install the support (1b) complete with reverse idler gear, needle bearing and pin (1c).

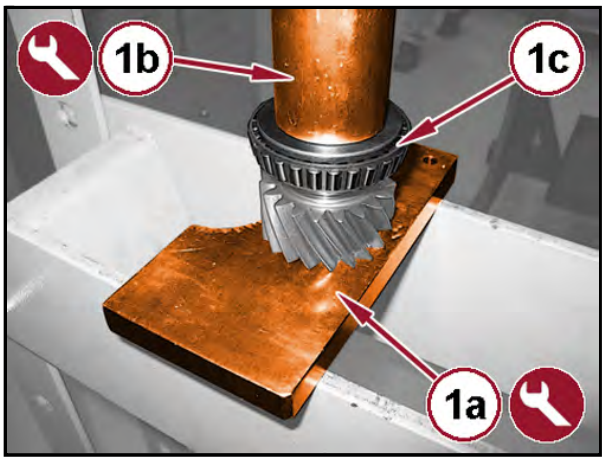


2. In the hydraulic press, with the tool 2000028700 (1a), permanently mount the pin (1b) of the reverse gear to the support.

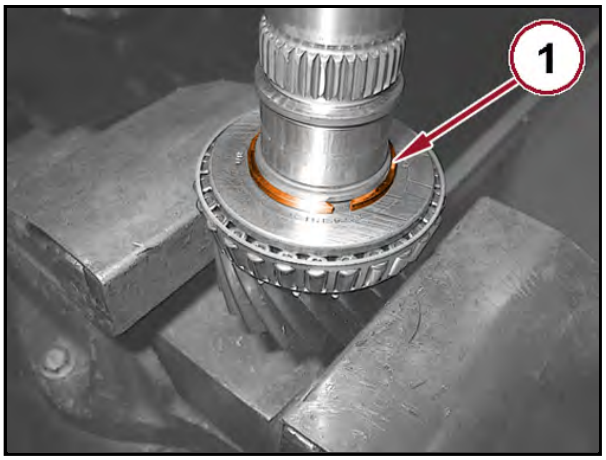


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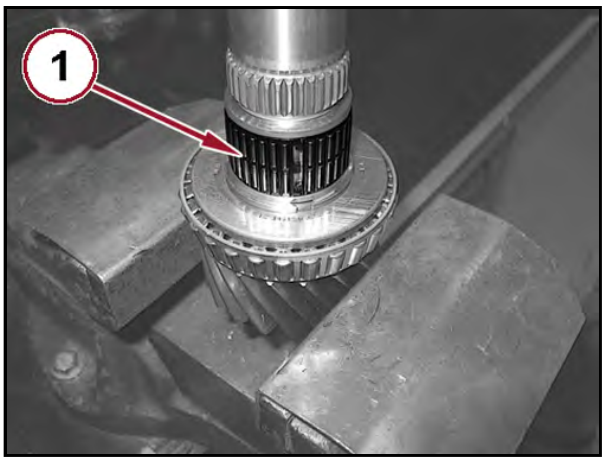
3. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the front bearing (1c).



4. Place the upper shaft in a vice equipped with protective, non-marring jaw covers and install the bearing snap ring.

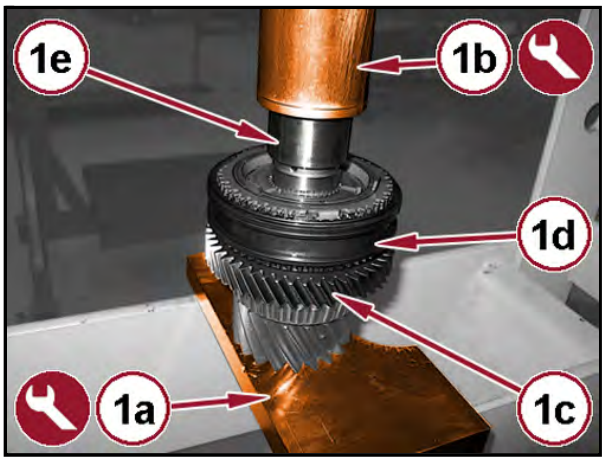


5. Install the needle bearing.

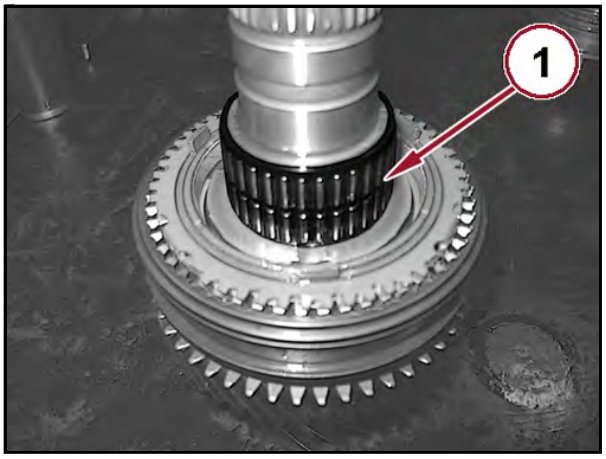


6. In the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the 4th speed gear (1c), the synchronizer (1d) and spacer (1e).

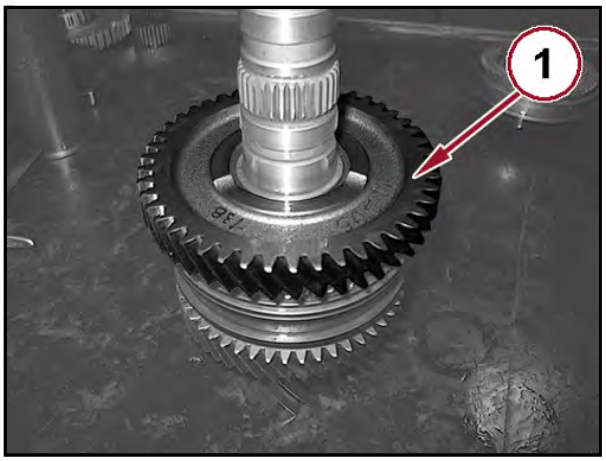
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7. Mount the needle bearing.

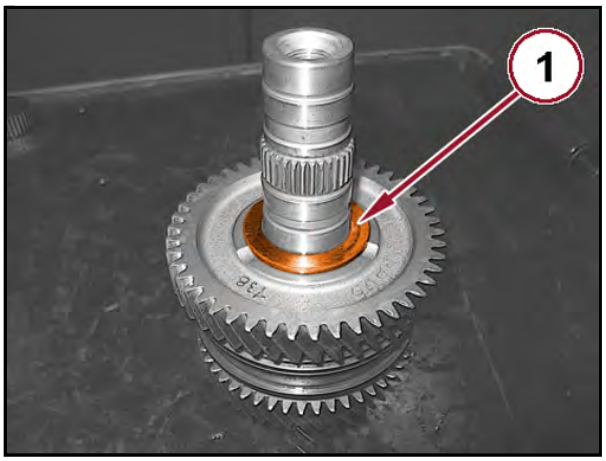


8. Mount the 3rd speed gear.

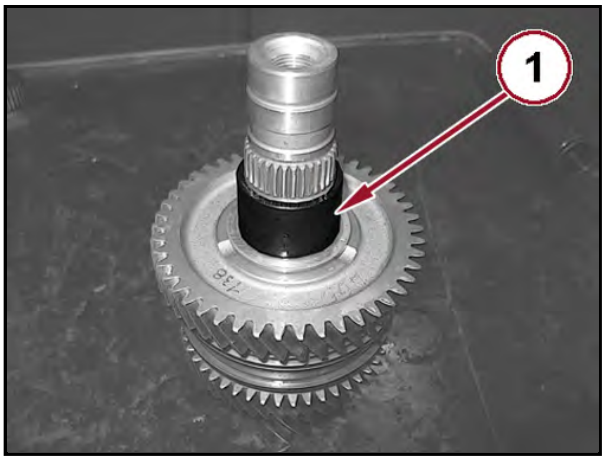


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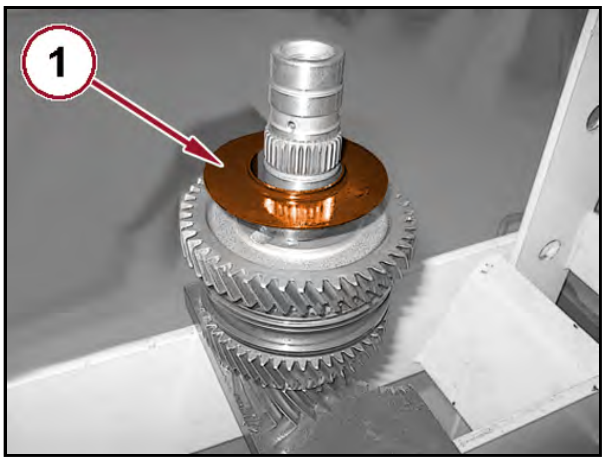
9. Install the shim ring.



10. Install the spacer.

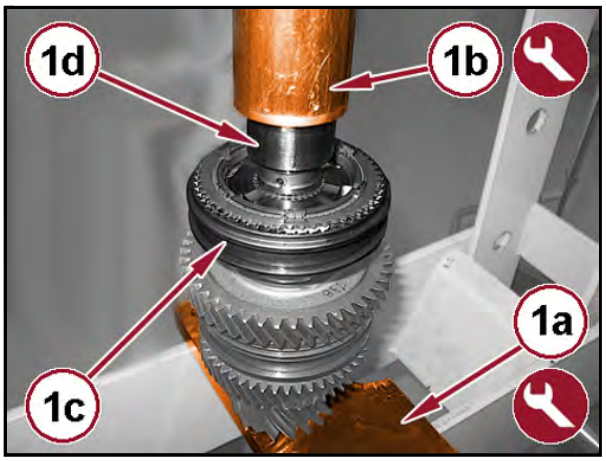


11. Install bushing retaining pieces of the synchronizer.

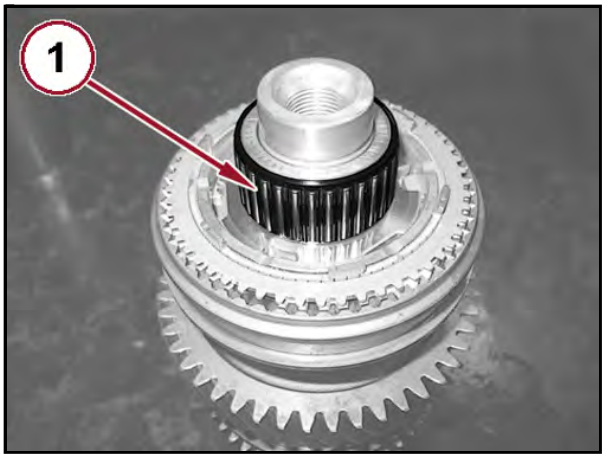


12. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the synchronizer assembly (1c) and spacer (1d).

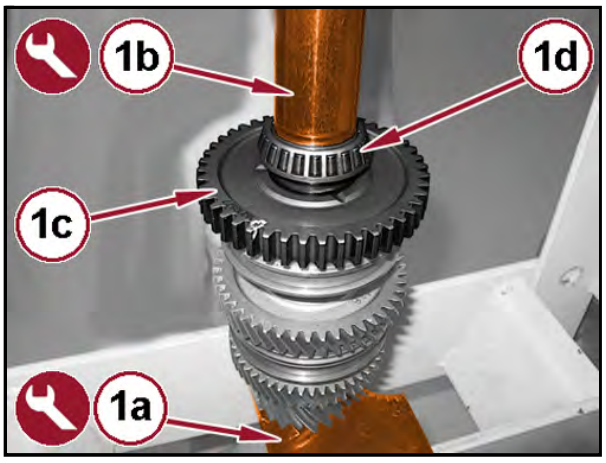
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13. Install the needle bearing.

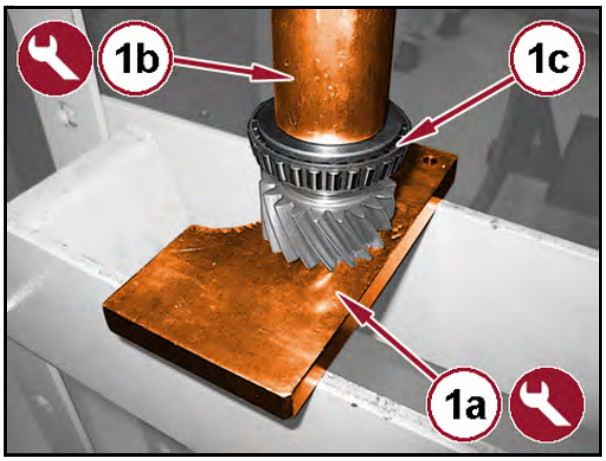


14. At the hydraulic press, with tools 1860837000 (1a) and 1870152000 (1b), mount the reverse gear (1c) and the rear bearing (1d).

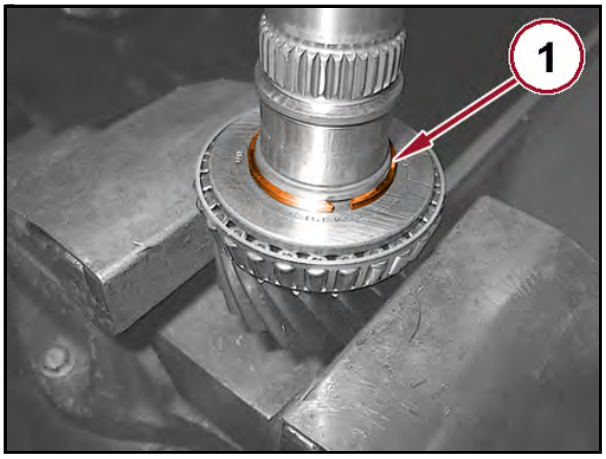


15. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the front bearing (1c).

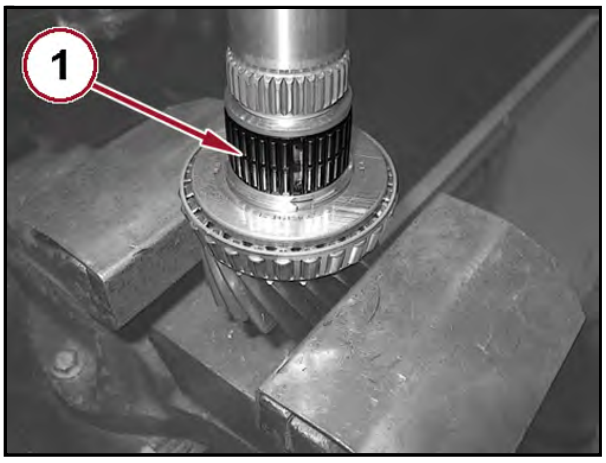
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16. Place the shaft in a vice equipped with protective, non-marring jaw covers and install the bearing snap ring (1).

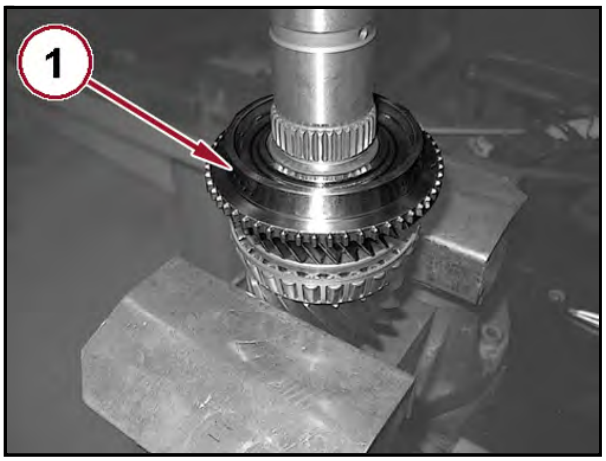


17. Install the needle bearing (1).

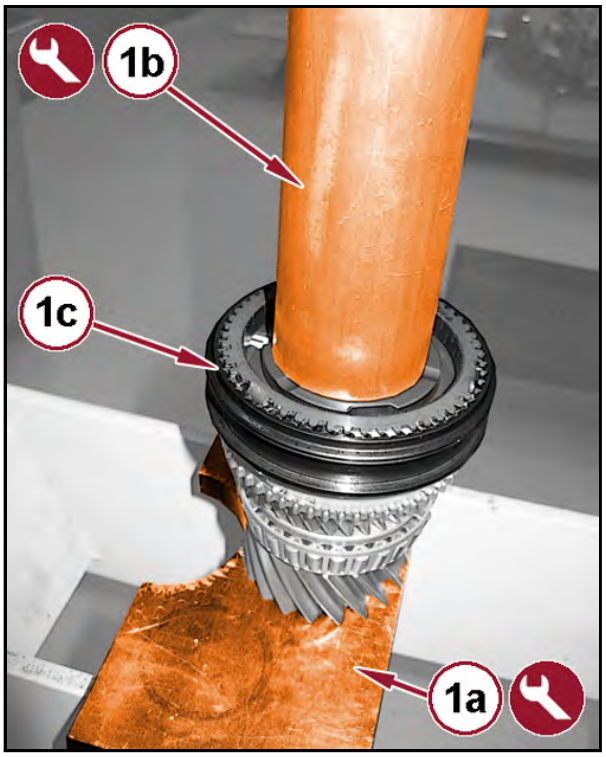


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18. Mount the 6th speed gear (1).

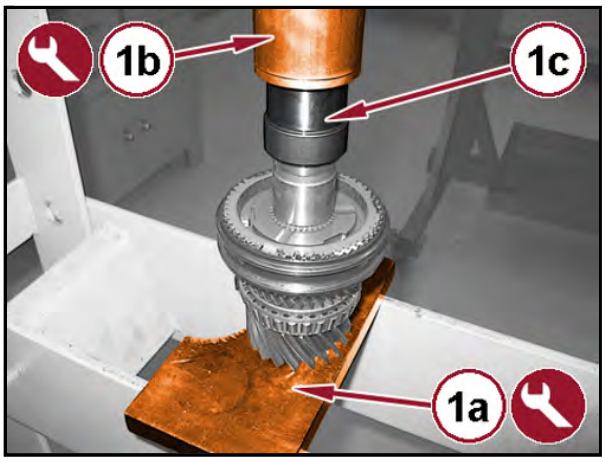


19. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), install the synchronizer (1c).

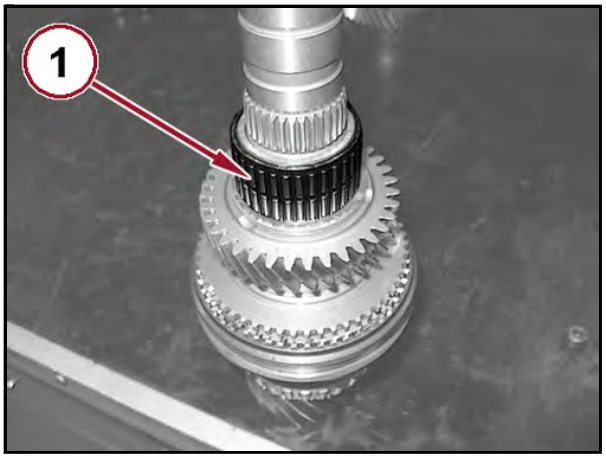


20. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), fit the spacer (1c) between the gear 5th/6th speed gear.

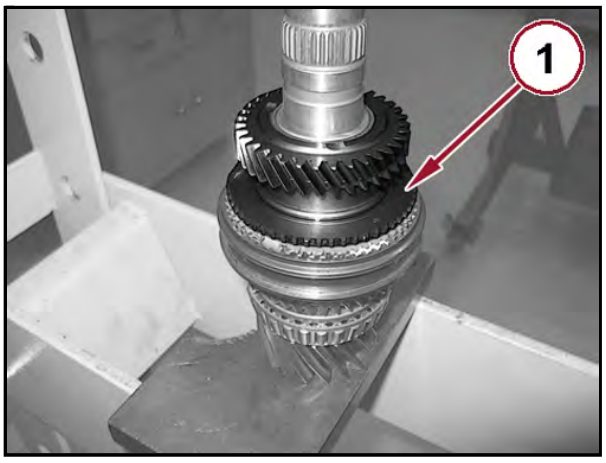
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21. Install the needle bearing.

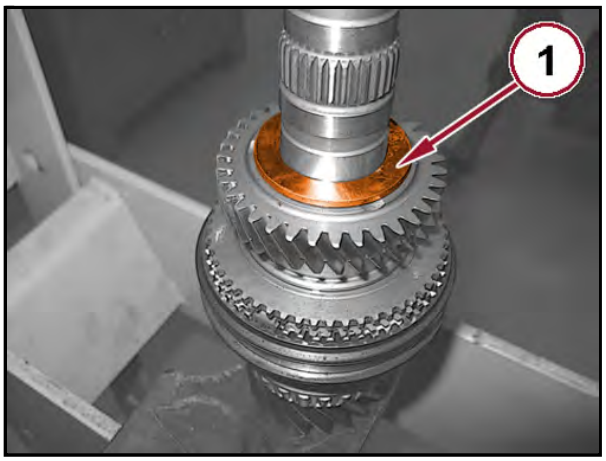


22. Mount the 5th gear speed.

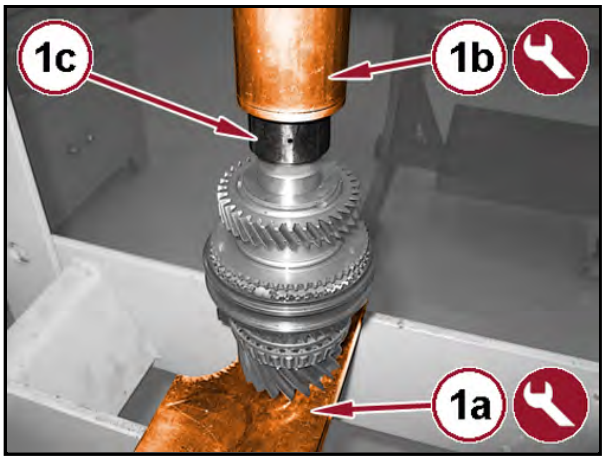


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23. Install the shim ring.

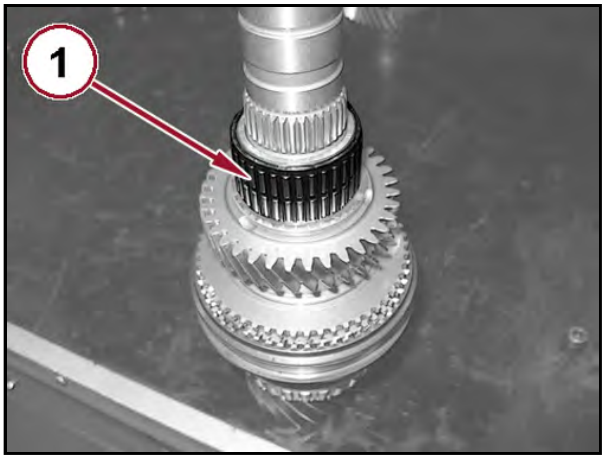


24. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), fit the spacer (1c).



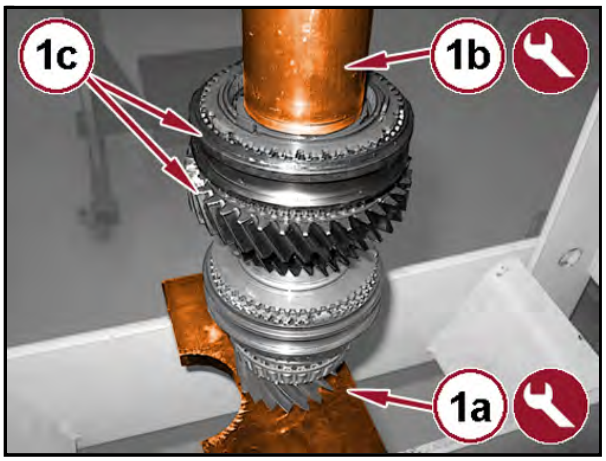
25. Install the needle bearing.

NOTE: Check that the 2nd speed gear rotates freely.

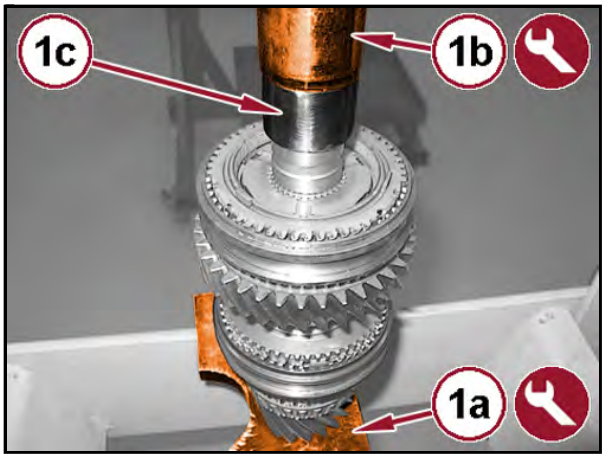


26. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the synchronizer the 2nd speed gear assembly (1c).

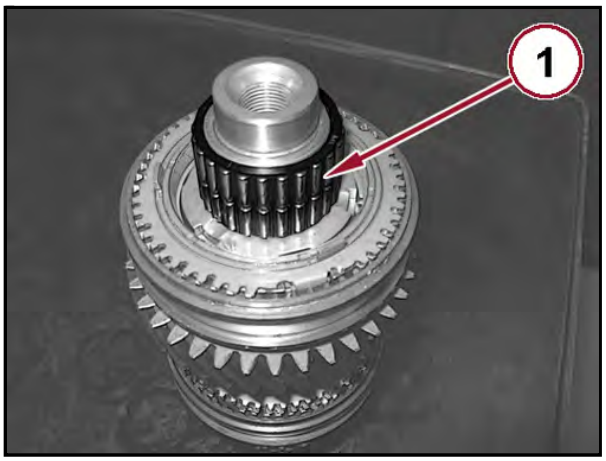
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27. At the hydraulic press, with tools 1860837000 (1a) and 1870152000 (1b), fit the spacer (1c) between the gear 2nd/1st speed gear.

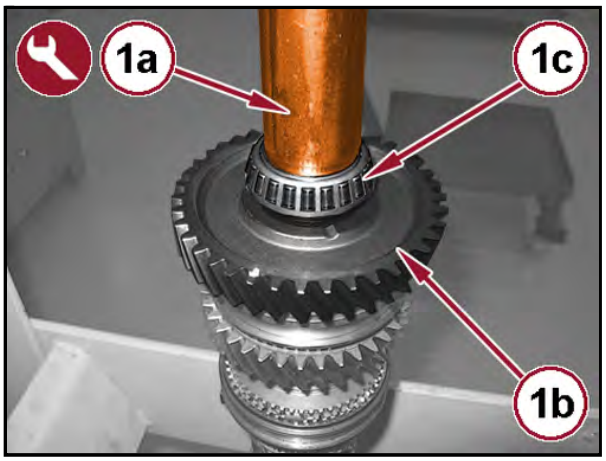


28. Install the needle bearing.

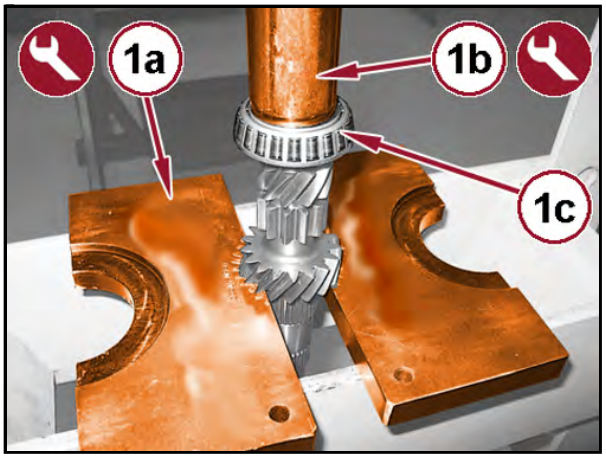


29. At the hydraulic press, with tools 1860837000 (1a) and 1870152000, mount the 1st speed gear (1b) and the rear bearing (1c).

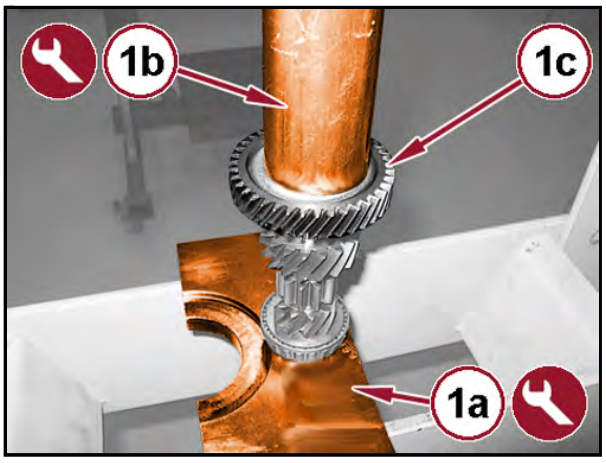
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30. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the rear bearing (1c).

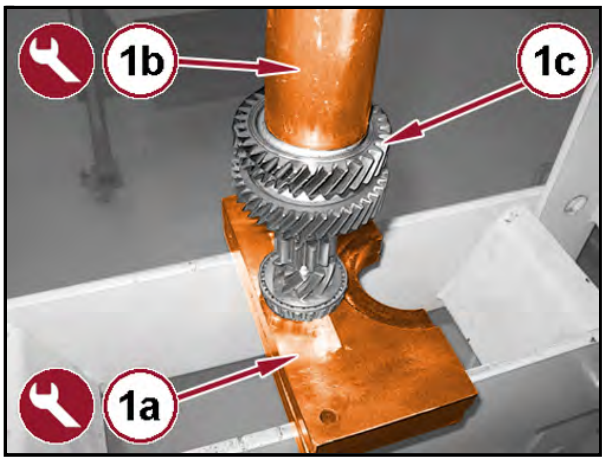


31. Before mounting, to bring the 5th gear speed to a temperature of about 150° C using a suitable tool. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the 5th gear speed (1c).

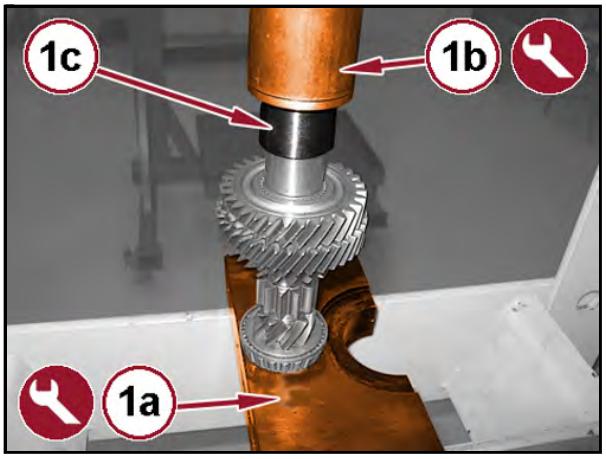


32. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the 3rd gear speed (1c).

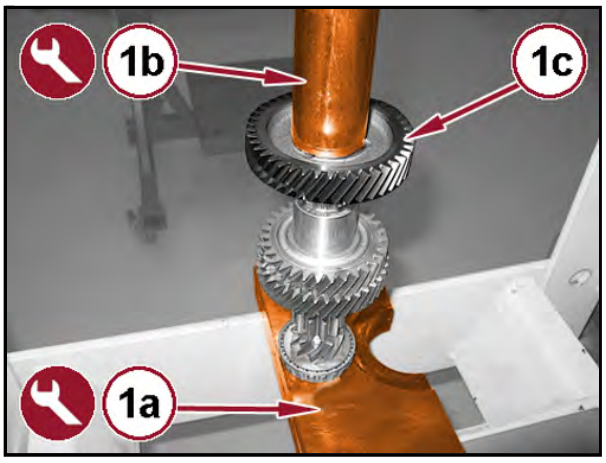
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33. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), fit the spacer (1c).

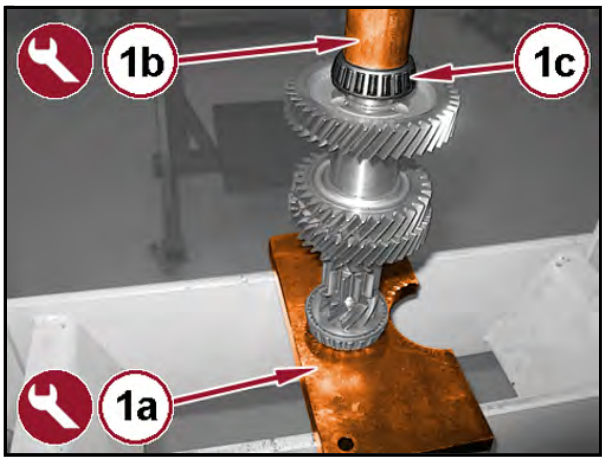


34. At the hydraulic press, with tools 1860837000 (1a) and 1870658000 (EMEA) or Installer, Bearing C-3095-A (NAFTA) (1b), mount the 4th and 6th gear speed (1c).

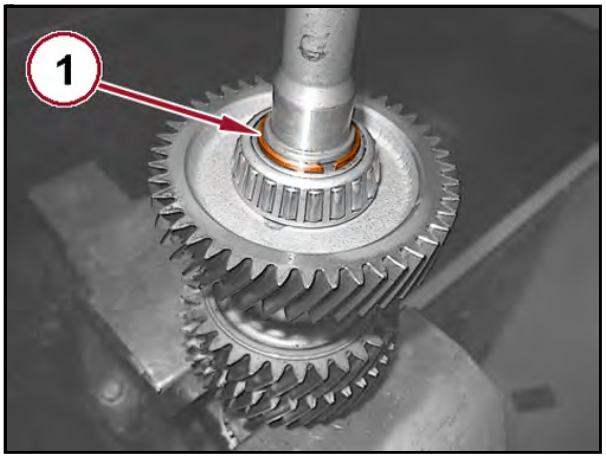


35. At the hydraulic press, with tools 1860837000 (1a) and 1860945000 (1b), mount the front bearing (1c).

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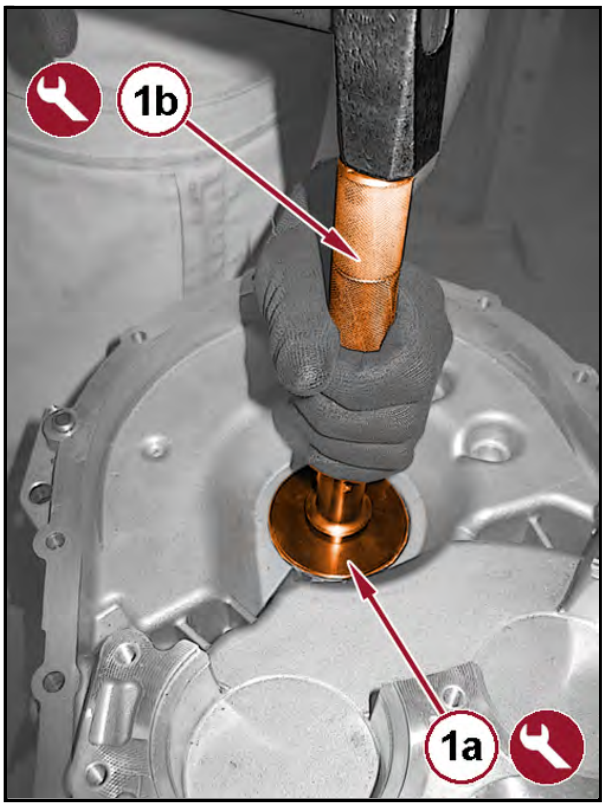


36. Place the main shaft in a vice equipped with protective, non-marring jaw covers and install the bearing snap ring.

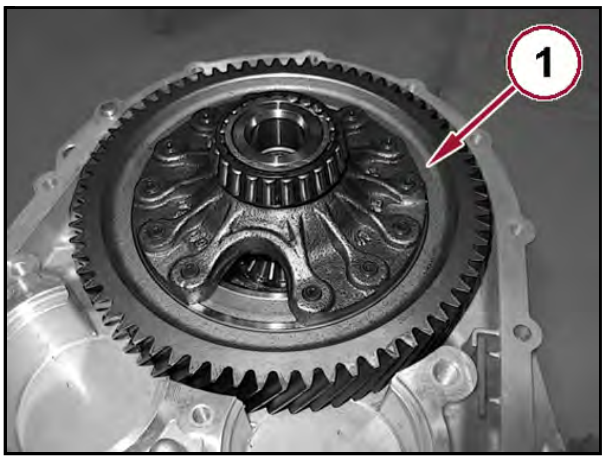


37. With the tools 1870843000 (EMEA) or Installer, Differential Bearing Cup 10305 (NAFTA) (1a) and 1870898400 (EMEA) or Driver Handle, Universal C-4171 (NAFTA) (1b), install the right outer differential bearing race.

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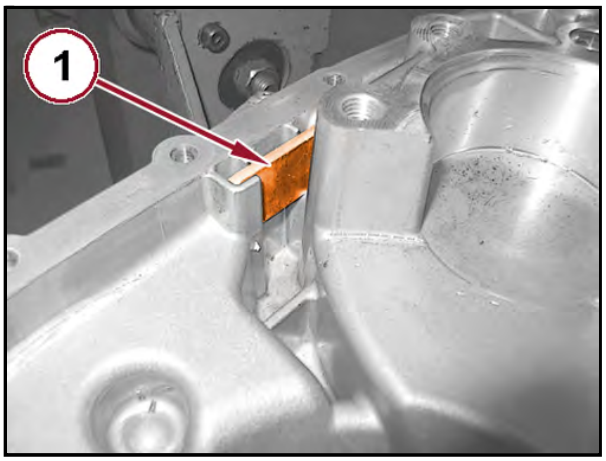


38. Put into place the differential housing complete.

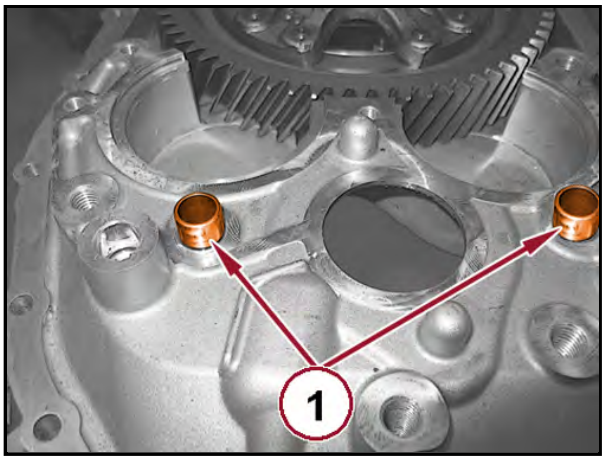


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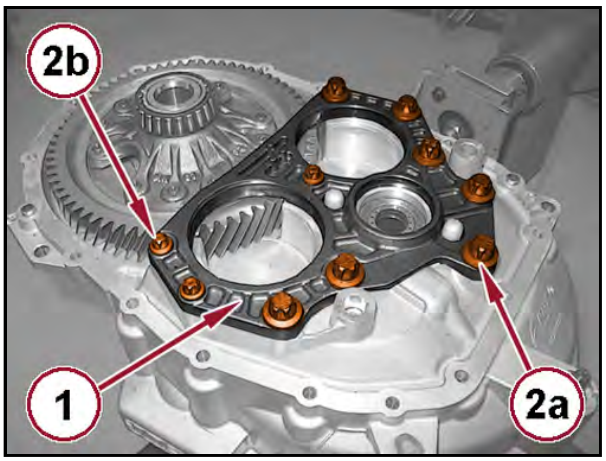
39. Put into place the magnet.



40. Check the installation of the plate shaft centering bushings.



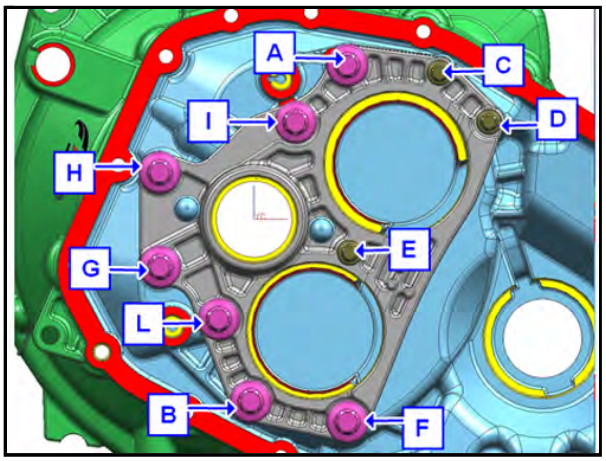
41. Put into place the plate shaft support for the primary and secondary shafts engaging the centering bushings.



42. Proceed to tighten the screws (2a) and (2b) using the steps outlined below.

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a. STEP 1 - Tighten the pair of M12 screws to 20 Nm, shown in the figure, in the sequence: I - L - F - H - A.

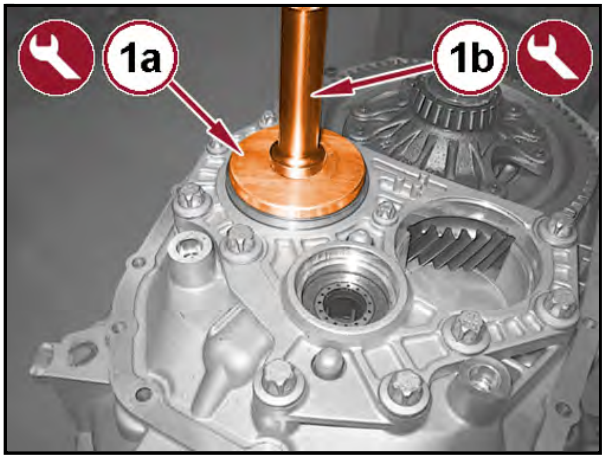


b. STEP 2 - Tighten to torque the M8 screws shown in the figure, in the sequence: C - E - D.

c. STEP 3 - Tighten to torque the M12 screws shown in the figure, in the sequence: B - G.

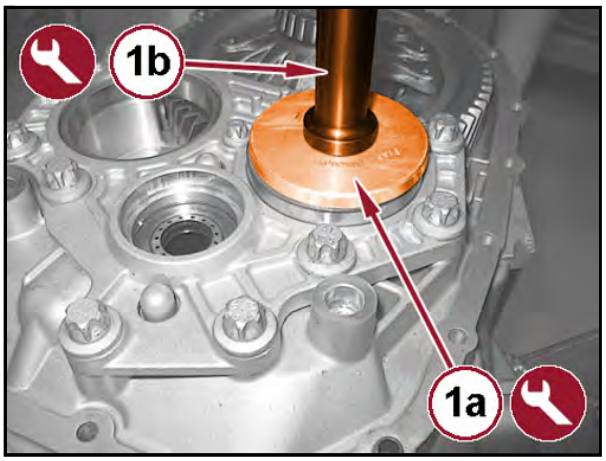
d. STEP 4 - Tighten to torque the M12 screws shown in the figure, in the sequence: I - L - F - H - A.

43. With the tools 1870434000 (1a) and 1870898400 (1b), install the top front bearing outer race.

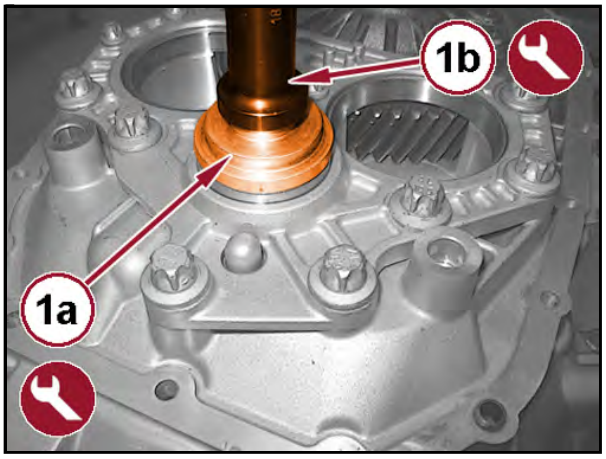


44. With the tools 1870434000 (1a) and 1870898400 (1b), install the bottom front bearing outer race.

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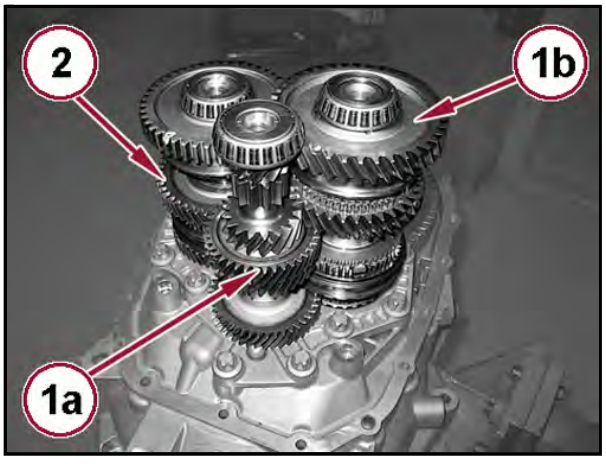


45. With the tools 1870426000 (1a) and 1870898400 (1b), install the front bearing outer race.



46. Put in its seat the primary shaft (1a) along with the lower secondary (1b).

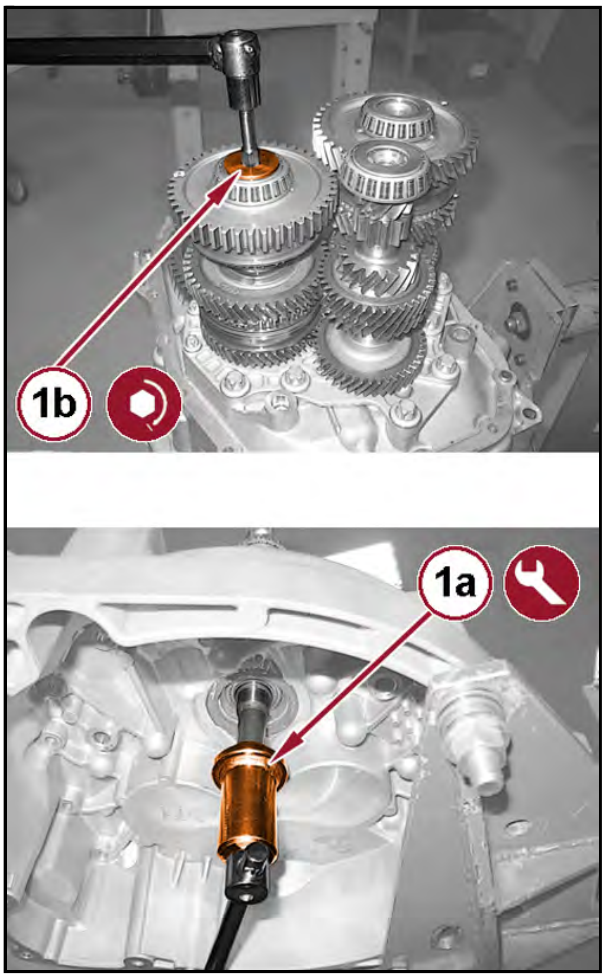
47. Put into place the upper shaft (2).



48. Engage the 4th gear speed and reverse gear.

49. Place the tool 1870853000 (1a) and tighten to torque the nut clockwise (1b) securing rear bearing shaft top.

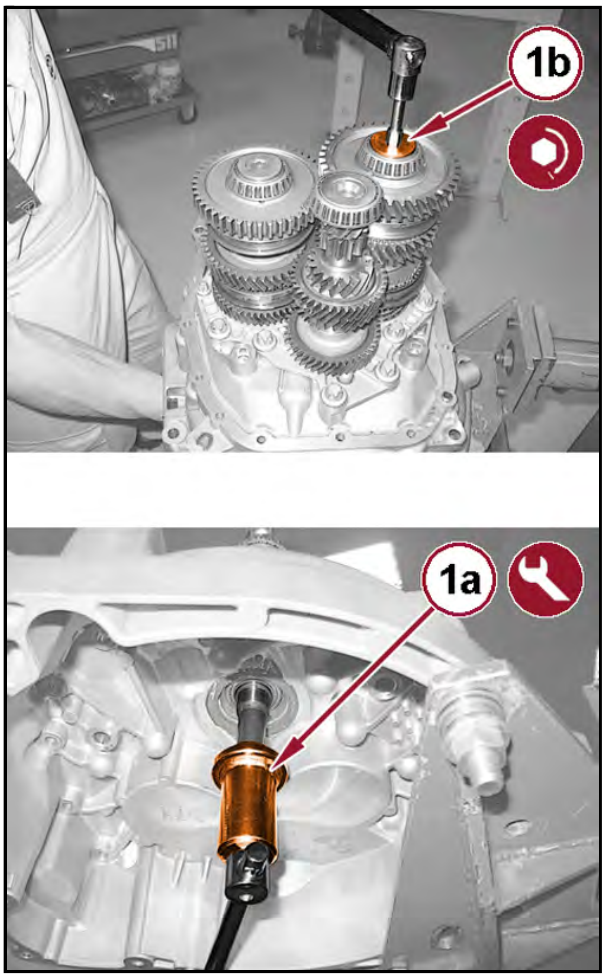
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50. Engage the 1st and the 6th gear speed.

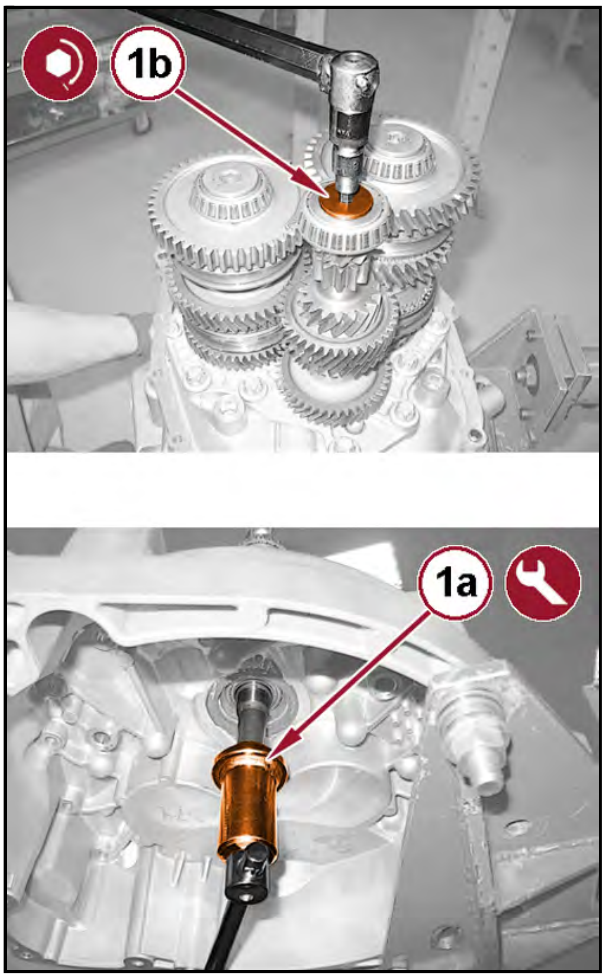
51. Place the tool 1870853000 (1a) and tighten to torque the nut clockwise (1b) securing rear bearing shaft bottom.

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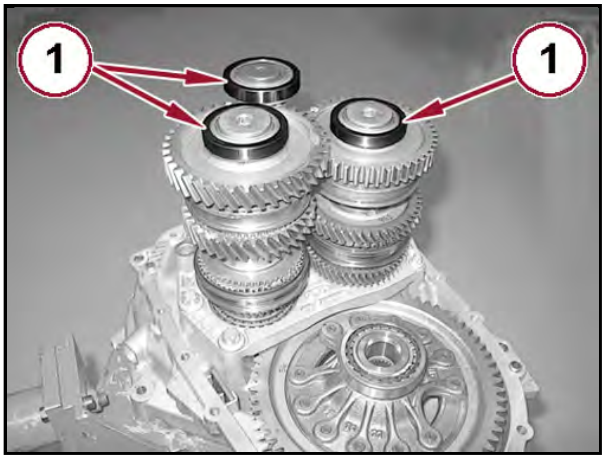


52. Place the tool 1870853000 (1a) and tighten to torque the nut (1b) securing rear bearing shaft.

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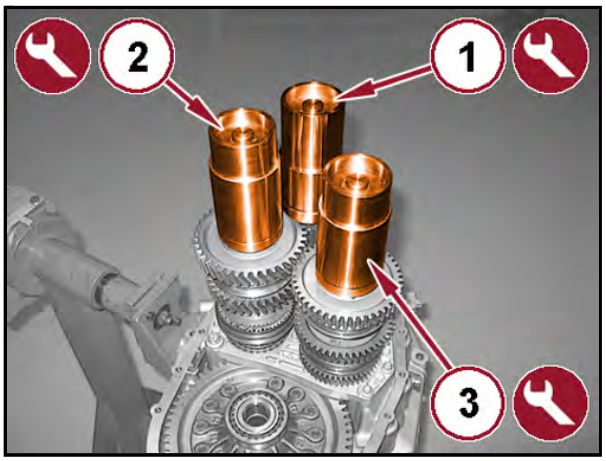


53. Place the rear main shaft and secondary shafts bearing outer races.

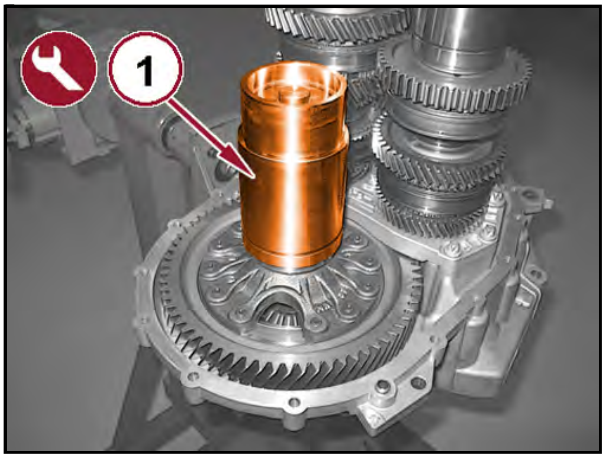


54. Place the tools 2000035504 (1), 2000035506 (2) and 2000035505 (3) on the shafts.

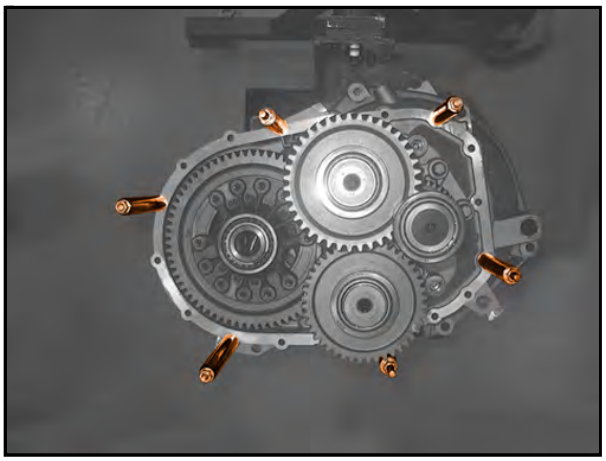
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NOTE: **Make sure the six spacers are positioned according to the picture below.**



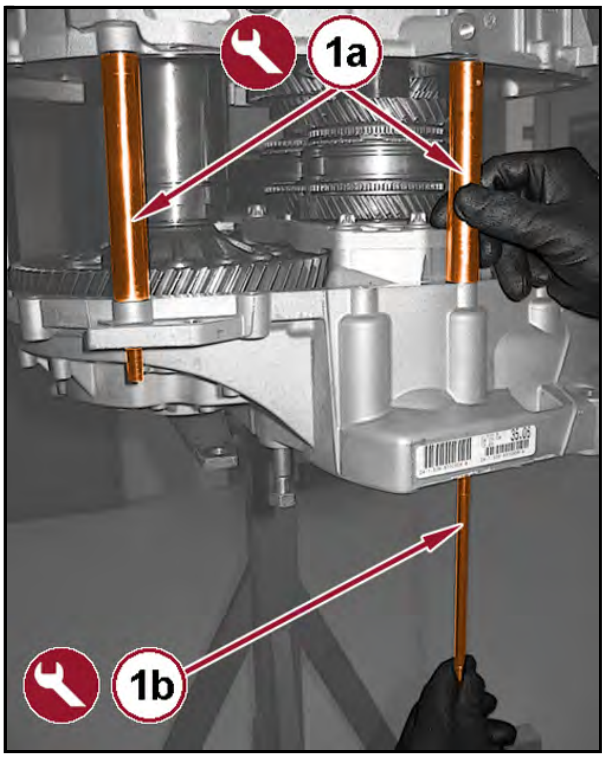
55. Place the tool 2000035507 (1) on the differential.



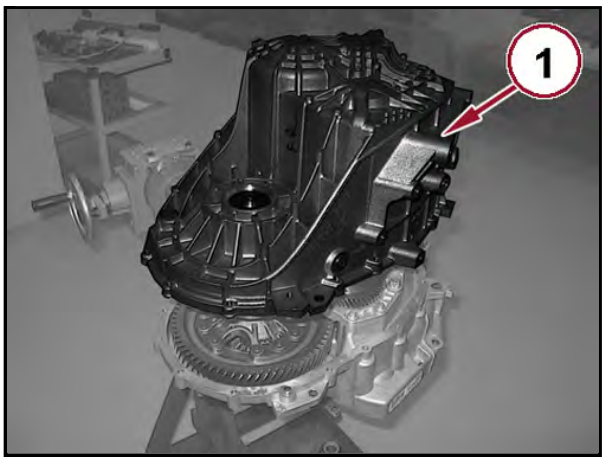
56. Place the tools 2000035501 and 2000035502.

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57. Place the spacers 2000035502 (1a) and tighten the bolts 2000035502 (1b).

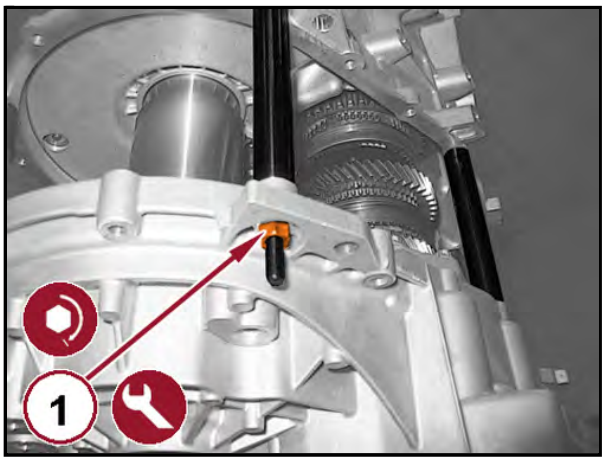


58. Install the case (1).

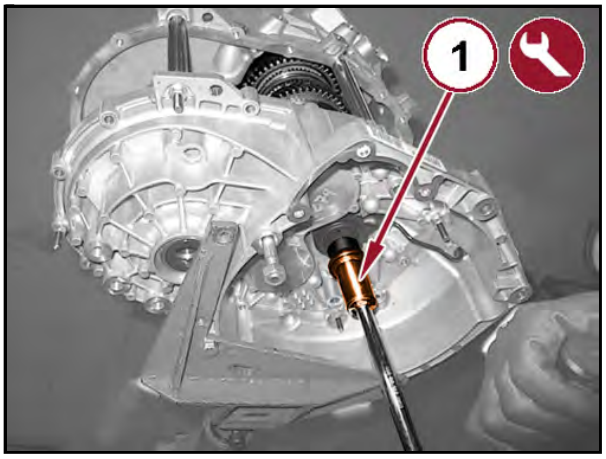


59. Place the spacers 2000035503 (1a) and tighten the bolts to the transmission clutch housing.

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60. Check that gauges rotate without jamming.



61. Insert the washers and tighten the nuts securing the spacers to the pair of 15 Nm.

62. Proceed to the tightening of the nuts starting from those that are in correspondence of the centering bushings bell exchange.

63. Visually check that they are "closed pack" the following components: bell-exchange spacers-clutch bell.

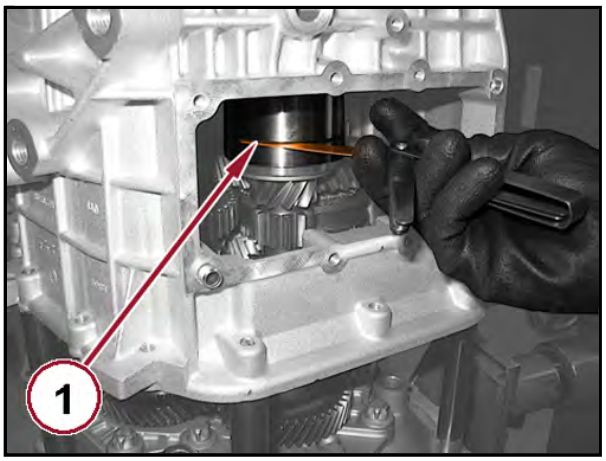
64. Engage the 6th gear speed and with the tool, turn the primary shaft 41 times (corresponding to 15 turns of the differential).

65. Measure with feeler gauge light which remains between the two cylinders of the caliber of abutment of the primary shaft.

66. Determine the thickness of the new shim ring for the primary shaft, by subtracting the maximum allowable play of 0.011 mm to reading previously carried out using a feeler

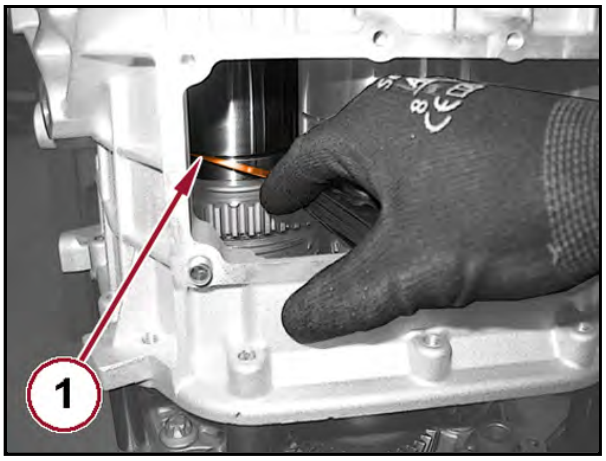
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gauge.



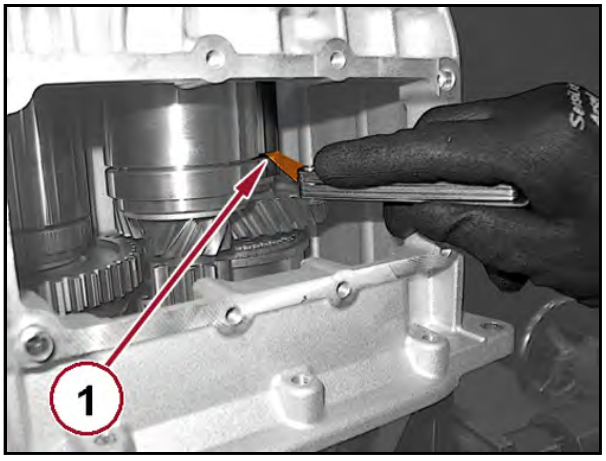
67. Measure with feeler gauge light which remains between the two cylinders of the caliber of the upper abutment of the secondary shaft.

68. Determine the thickness of the new shim ring for the upper secondary shaft, by adding the maximum preload admitted 0.141 mm to reading previously carried out using a feeler gauge.



69. Measure with feeler gauge light which remains between the two cylinders of the caliber of the lower abutment of the secondary shaft.

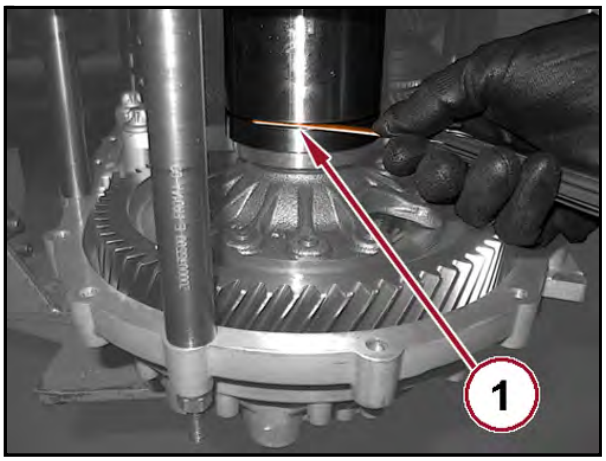
70. Determine the thickness of the new shim ring for lower secondary shaft, by adding the maximum preload admitted 0.133 mm to reading previously carried out using a feeler gauge.



71. Measure with feeler gauge light which remains between the two cylinders of the caliber of abutment of the differential.

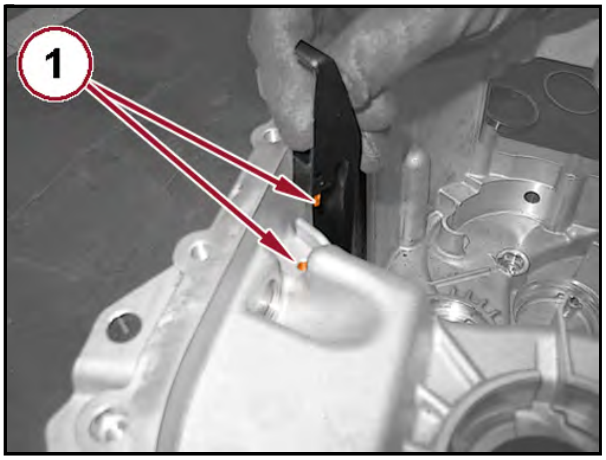
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72. Determine the thickness of the new shim ring to the differential, the maximum permitted by summing the game of 0.040 mm to reading previously carried out using a feeler gauge.

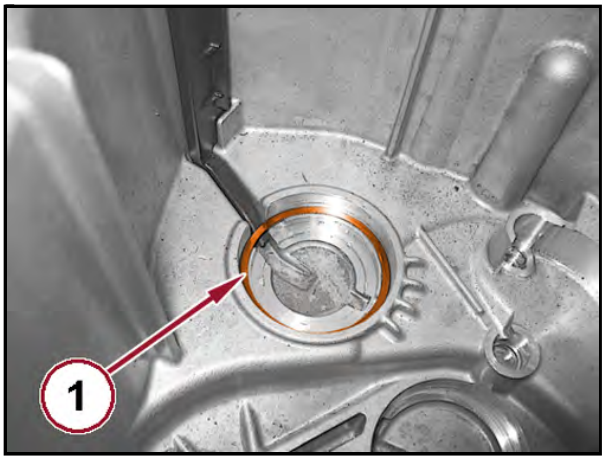


73. Remove the case and all the equipment used for determining the thickness of the new wearing rings.

74. Put into place the lubricating duct, engaging the centering pin in the hole shown.

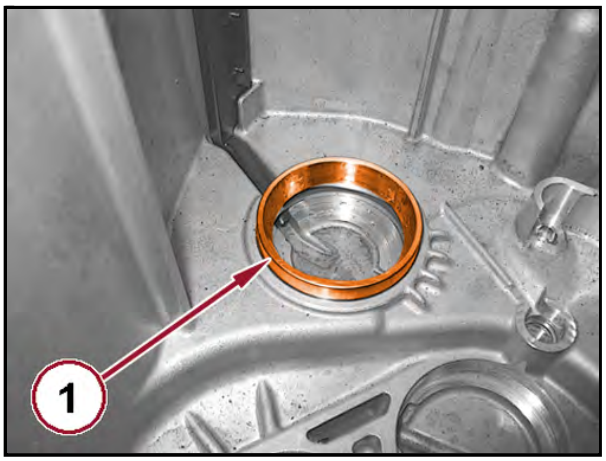


75. Put into place a new shim.



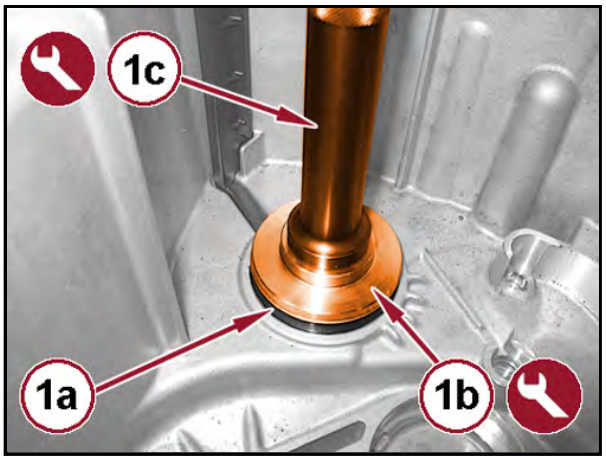
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76. Put into place the top rear bearing outer race.



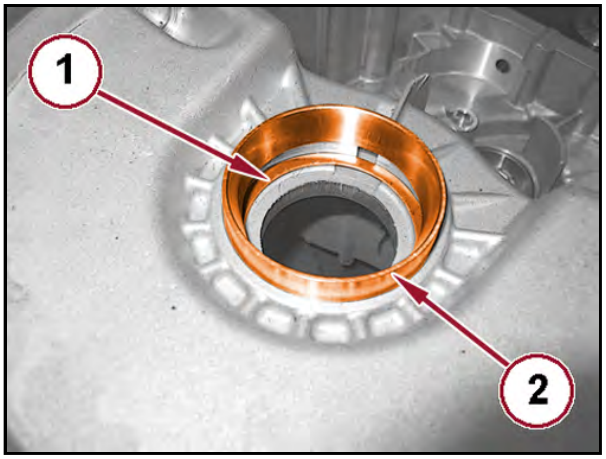
77. Install the top rear bearing outer race shaft (first), using the tools 1870381000 (1b) and 1870898400 (1c).

78. Do the same with the assembly of new bearing shims and their outer races.



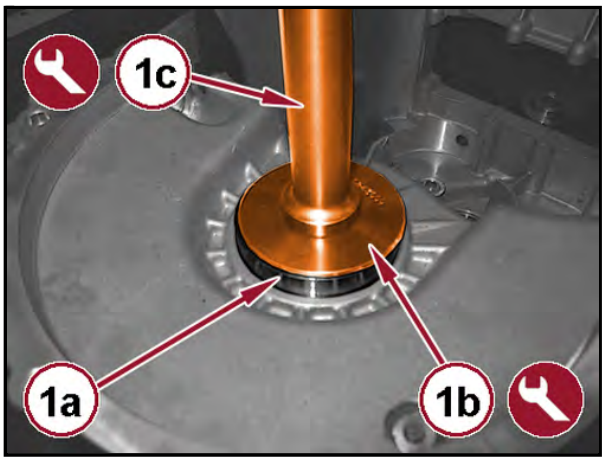
79. Put into place a new shim ring of differential.

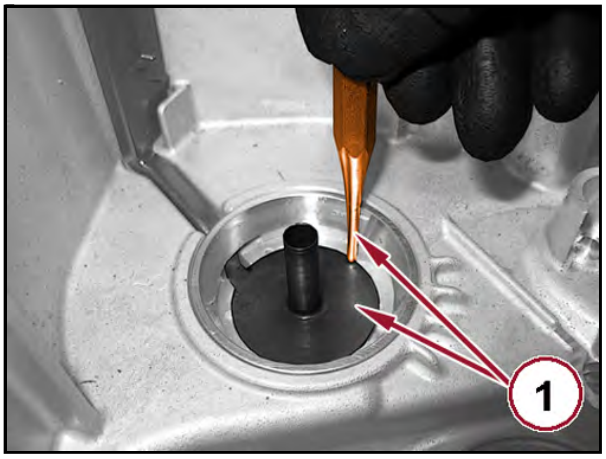
80. Put into place the left bearing outer race differential.



81. Install the outer race left bearing differential (1a), using the tools 1870843000 (EMEA) or Installer, Differential Bearing Cup 10305 (NAFTA) (1b) and 1870898400 (1c).

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82. Put into place and with a suitable punch, the shaft oil ducts.

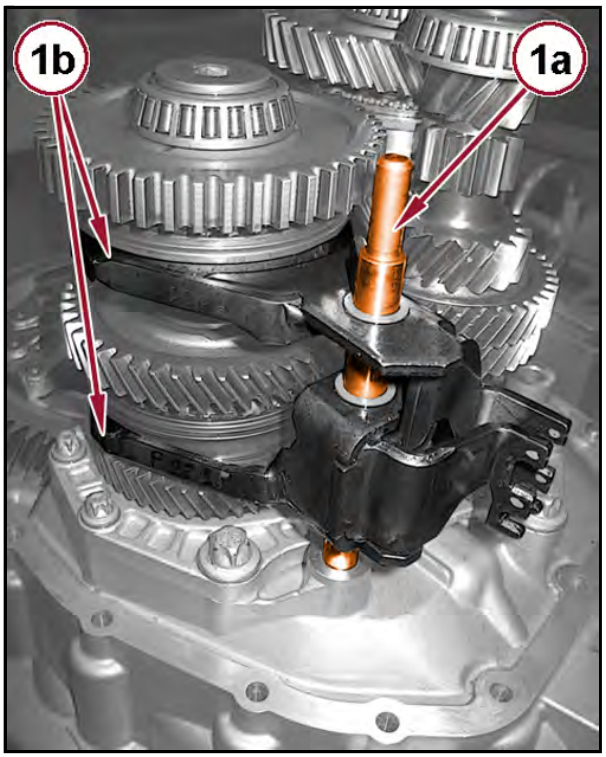
83. If reusing the gearbox, check and repair burrs existing in the seat.

84. Do the same for the mounting of the oil ducts of the lubrication secondary shaft.

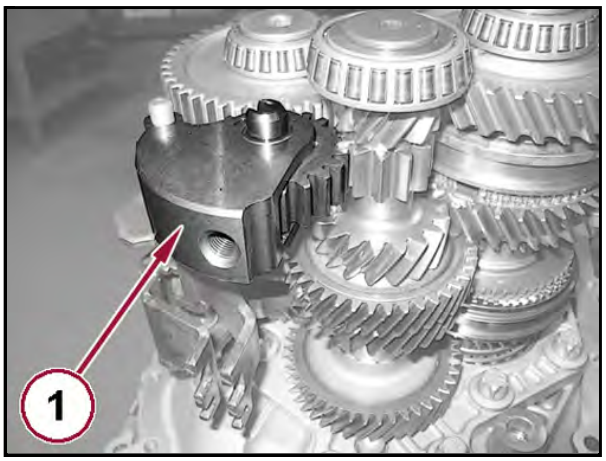
85. Mount the rod (1a) on the clutch housing complete with forks engage 3rd and 4th gear speed and reverse gear (1b) of the secondary

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shaft.

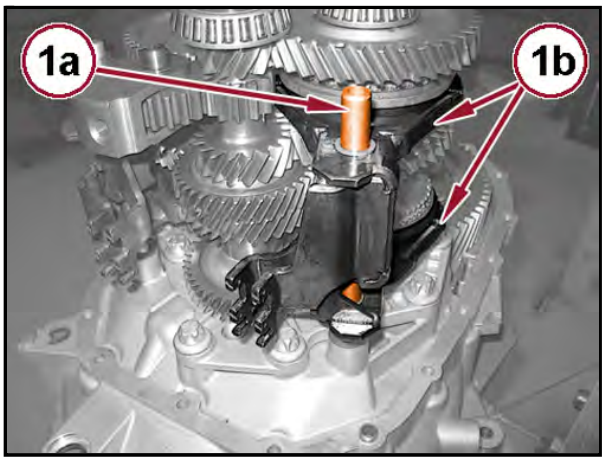


86. Put into place the reverse gear support.



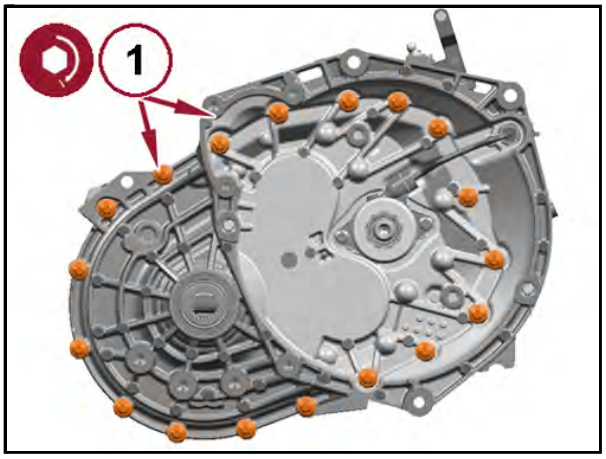
87. Mount the rod (1a) on the clutch housing complete with forks engage 1st, 2nd and 5th, 6th gear speed (1b) of the secondary lower shaft.

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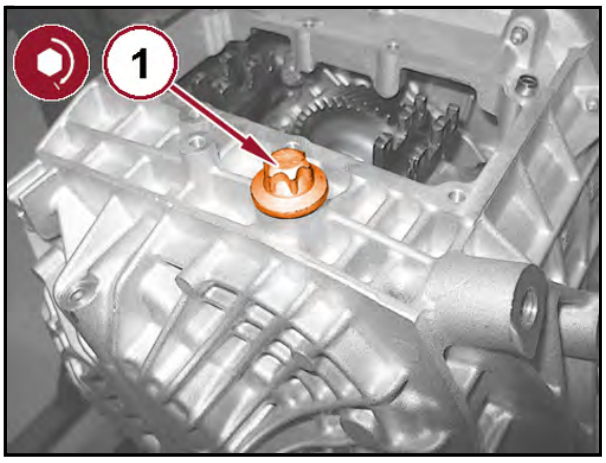
88. Apply a bead of silicone sealant to the mating surface of the gearbox-clutch housing.

89. Put into place the gearbox, engage the centering bushings and tighten the screws shown in the figure to the specified torque.



90. The tightening of the screws 18 fixing the gear box must be made with a criss-cross sequence.

91. Tighten to torque the new reverse gear support screw.



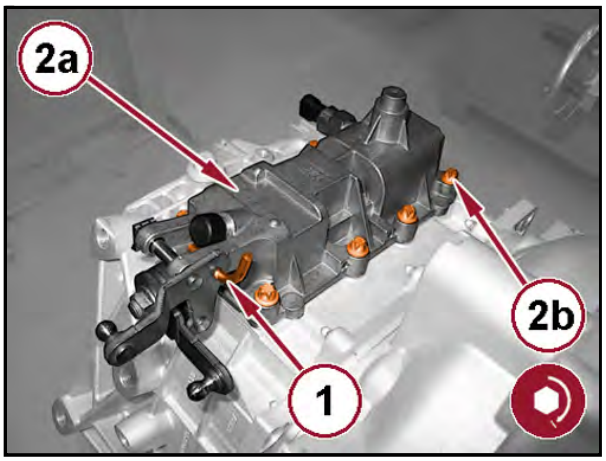
92. Check that the locking pin is inserted into the gear-selector as shown.

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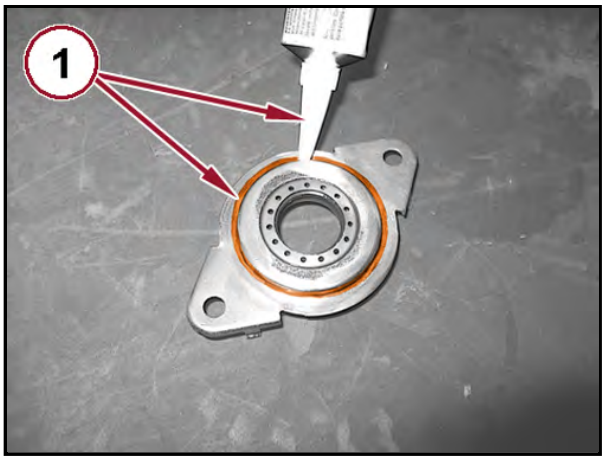
93. - Apply a bead of sealant to the mating surfaces box clutch-group selection / gear engagement.

94. Check that the noses of the auctions selection / gear-are in place "neutral".

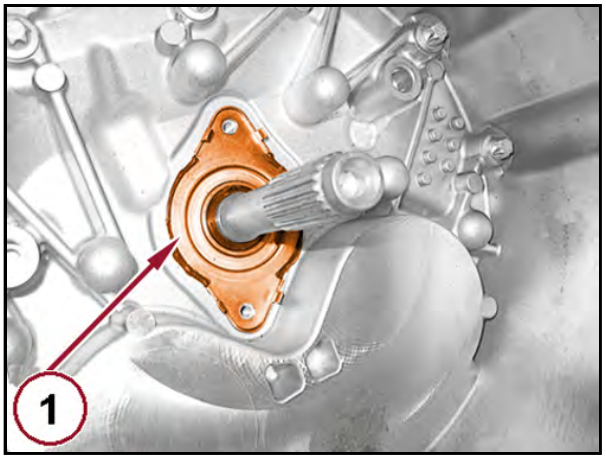
95. Put into place the group selection / coupling gears (2a) on the centering bushings, then tighten the screws (2b) to the specified torque.



96. Apply silicone sealant (1) on the support shaft sealing ring, as shown in FIG.

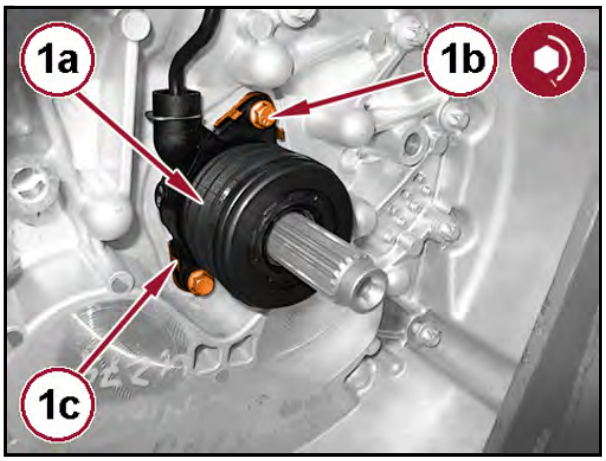


97. Put in its seat support shaft sealing ring (1), as shown in FIG.

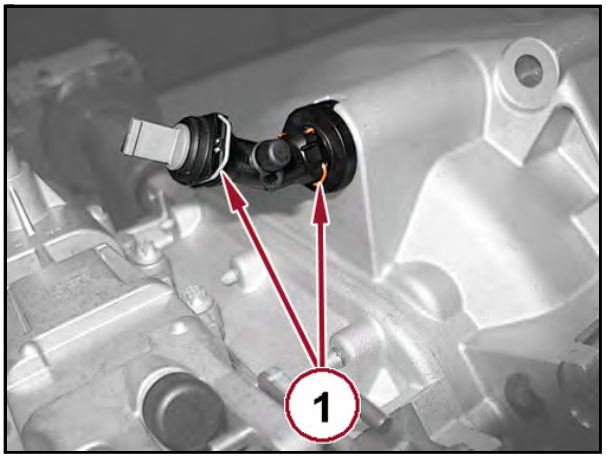


98. Put into place the clutch slave cylinder (1a) and tighten the screws (1b) to the specified torque and engage the retaining tabs (1c).

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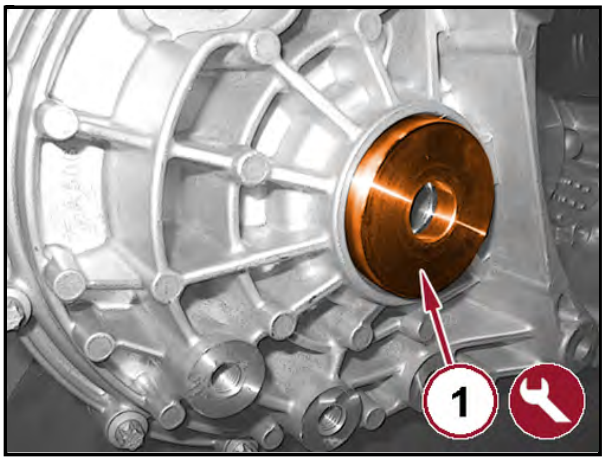


99. Using a new centering bushing rigid tube actuator coaxial clutch, put into place a clutch tube union and engage the retaining clip.



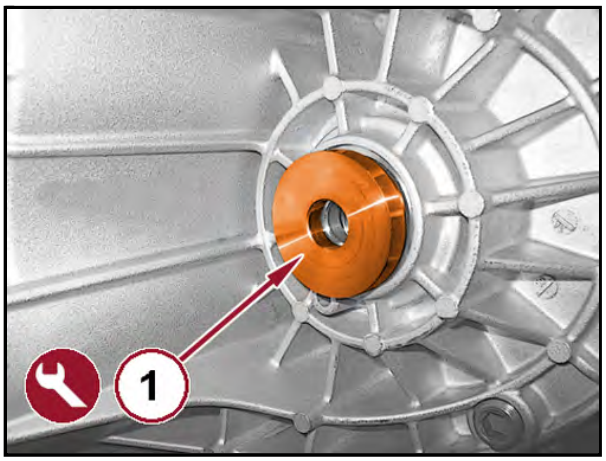
100. Remove the clamps, remove the change from the tool support and place it on a suitable bench.

101. Install a new shaft seal ring right differential with the tool 2000035511.



102. Install a new shaft seal ring left differential with the tool 2000035510.

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21 - Transmission and Transfer Case / Manual, C635 / Cleaning

CLEANING

Clean the gears, bearings, shafts, synchronizers, thrust washers, oil feeder, shift mechanism, gear case, and bellhousing. Do not use solvent to clean sealed bearings. Dry all parts except the bearings with compressed air. Allow the bearings to either air dry or wipe them dry with clean shop towels.

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21 - Transmission and Transfer Case / Manual, C635 / Special Tools

SPECIAL TOOLS

Tool (EMEA)	Tool (NAFTA)	Name	Function
1840206001	*	Slide Hammer	-
1845028000	*	Plug	Differential Bearing Removal
1860837000	*	Support Plate	Use with Hydraulic press
1860945000	*	Installer	Input Shaft Bearings, 1st and 2nd Synchronizer hub, 4th Gear Bushing
1847017001	*	Slide Hammer	Bearing Removal
1870152000	*	Installer Installation spacers / bearings	Differential Bearing Removal
1870381000	*	Installer Rear Cover Bearings	Install Outer Rear Bearing Races
1870426000	*	Installer	Install Input Shaft bearing Outer Race
1870434000	*	Puller / Installer	Removing / Installing Countershaft Outer Bearing Races
1870655000	*	Puller / Installer	Removing Bearing Race
1870658000	C-3095-A	Puller / Installer	Installing Bearings and Hubs, Input and Countershafts
1870710000	*	Puller / Installer	Removing the Input Shaft Outer Bearing Race
1870835001	*	Hydraulic Jack	Transmission Removal and Installation
1870843000	10305	Installer	Outer Bearing Race Installation
1870847000	*	Brackets	Transmission Removal and Installation
1870853000	*	Lever	Rotating Input Shaft
1870898400	C-4171	Handle	Outer Bearing Race Installation
1871001014	*	Support	Mount Transmission to Work Stand
2000004700	*	Installer	Bearing Installation
2000005000	*	Plate	Use with Hydraulic Press

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Tool (EMEA)	Tool (NAFTA)	Name	Function
2000028700	*	Puller / Installer	Removal and Installation Reverse Gear Shaft
2000035501	*	Spacers	Select Shim Selection
2000035502	*	Threaded Pins	Select Shim Selection
2000035503	*	Nuts / Washers	Select Shim Selection
2000035504	*	Gauge	Input Shaft Select Shim Selection
2000035505	*	Gauge	Countershaft Upper Select Shim Selection
2000035506	*	Gauge	Countershaft Lower Select Shim Selection
2000035507	*	Guage	Differential Select Shim Selection
2000035508	*	Plates	Removal of countershaft Upper and Lower Bearings
2000035510	*	Installer	Left Differential Seal Installer
2000035511	*	Installer	Right Differential Seal Installer
2000040436	8534B	Support Kit	Power Train Support
2000001400	*	Cap	Prevent Loss of Hydraulic Fluid
*Tool not available for NAFTA. Use a commercially available tool or contact Mopar Essential Tools to order the custom EMEA tool.			

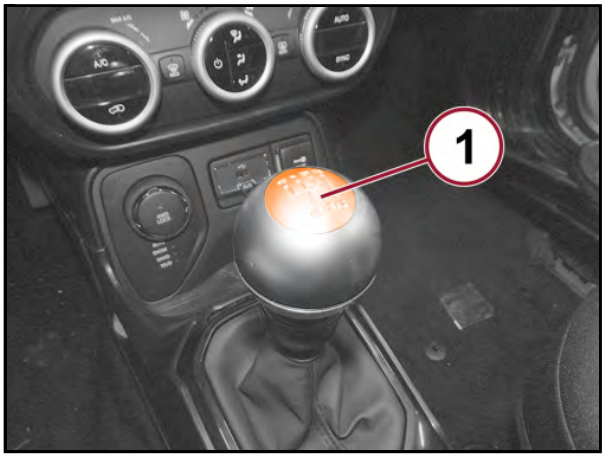
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21 - Transmission and Transfer Case / Manual, C635 / KNOB, Gearshift / Removal and Installation

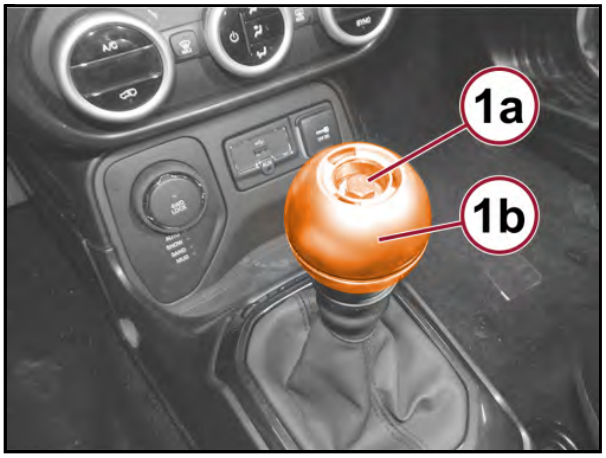
REMOVAL AND INSTALLATION

REMOVAL

1. Pry off the flange (1) at the top of the shifter knob.



2. Remove the bolt (1a) and remove the shifter knob (1b).



INSTALLATION

1. Place the shifter knob on the shifter lever lever tighten the screw.

2. Insert the flange in the top of the shifter knob.

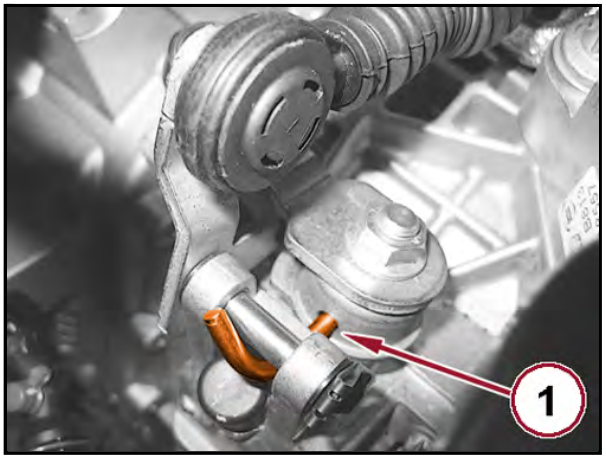
American Axle v. Neapco - IPR2025-00091
PET_AAM_1013-0756

21 - Transmission and Transfer Case / Manual, C635 / CABLE, Gearshift Control / Removal and Installation

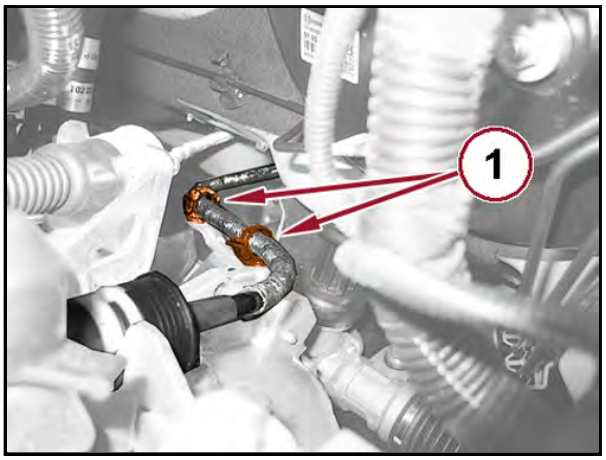
REMOVAL AND INSTALLATION

REMOVAL

1. Remove the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. If equipped, remove the propeller shaft (Refer to 03 - Differential and Driveline/Propeller Shaft/Removal and Installation) .
4. Place the transmission in "Neutral" and insert an appropriate locking device (1).



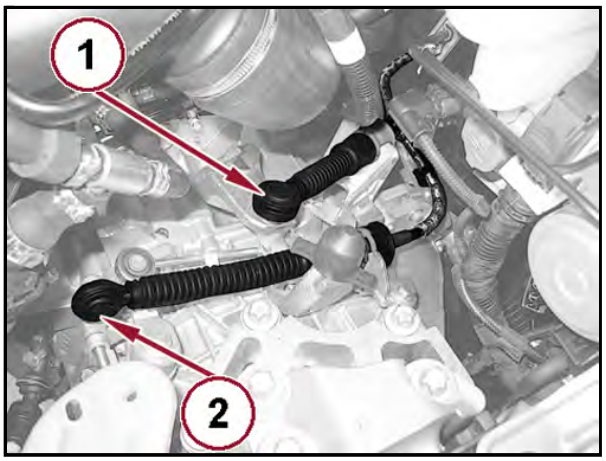
5. Open the clips (1) and release the gear selection cable.



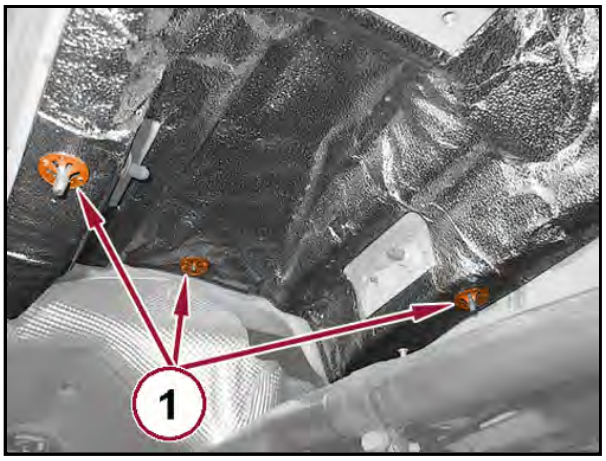
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6. Disconnect the cable end (1), retract the bushing and position aside the gear engagement cable.

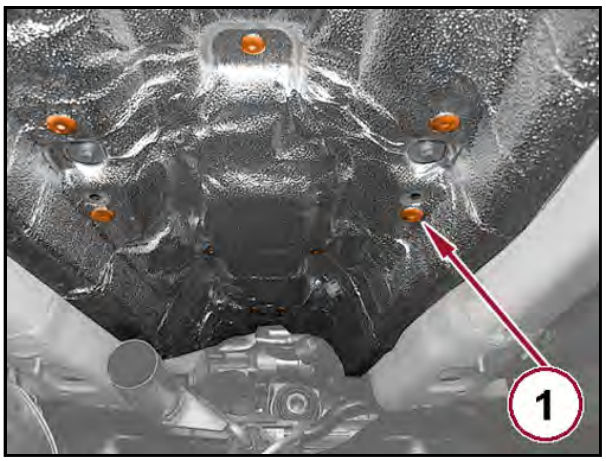
7. Disconnect the cable end (2), retract the bushing and position aside the gear selection cable.



8. Unscrew the clips (1) attaching the exhaust silencer heat shield to the floor pan.



9. Using a suitable tool, to remove the rivets (1) securing the exhaust heat shield to the floor pan.

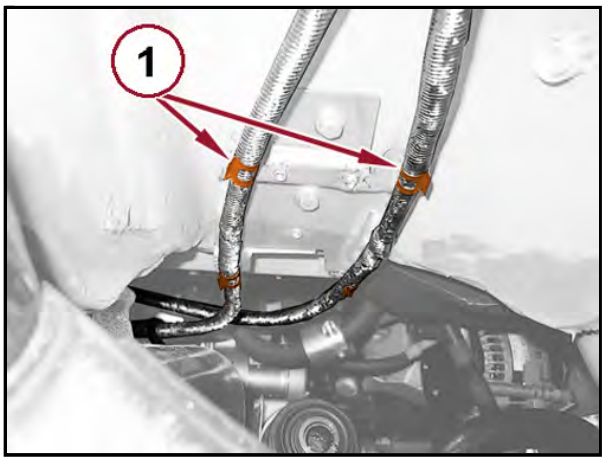


10. Unhook and remove the exhaust silencer heat shield.

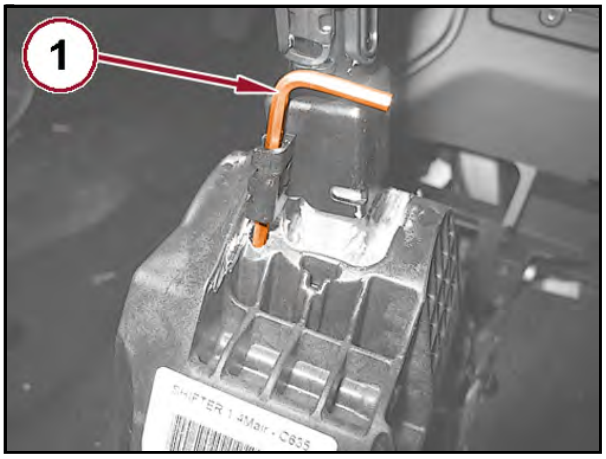
11. Disengage the selection and gear cables from the retaining clips (1).

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12. Remove the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .



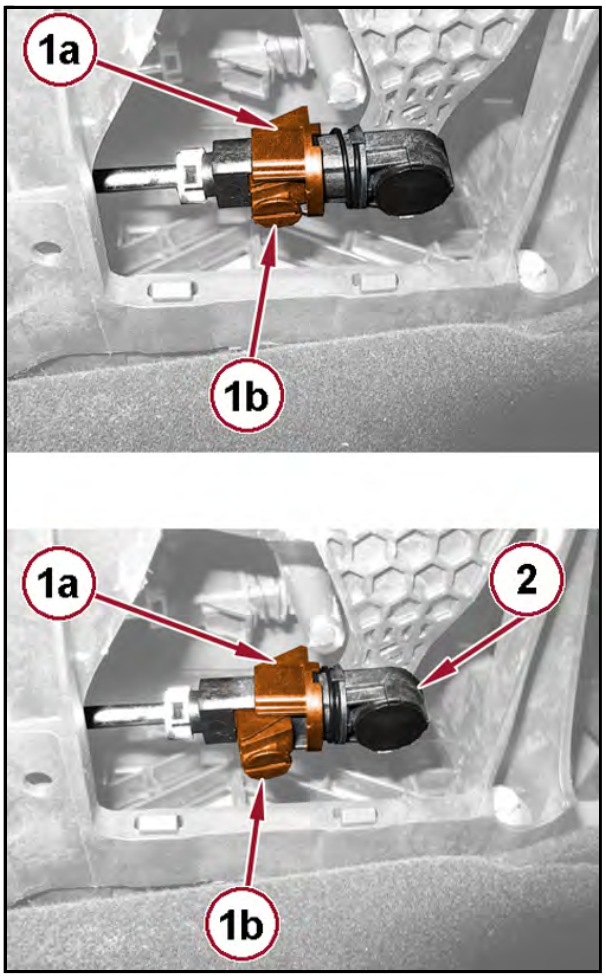
13. Insert a suitable locking pin (1) into the shifter as shown.



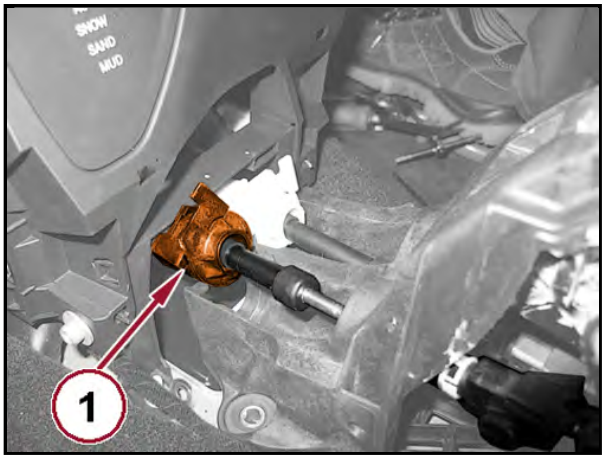
14. Slide the cursor (1a) to compress the spring and arm the "quick adjuster" device of the gear selection cable while simultaneously raising the button (1b).

15. Disconnect the end of the cable (2) from the shifter.

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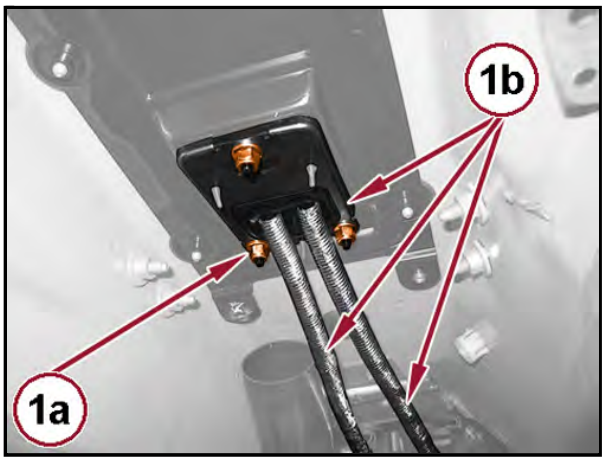
16. Disconnect the "quick-fit" device (1) of the cable from the shifter.



17. Do the same to disconnect the cable from the gear shift supporting gear lever.

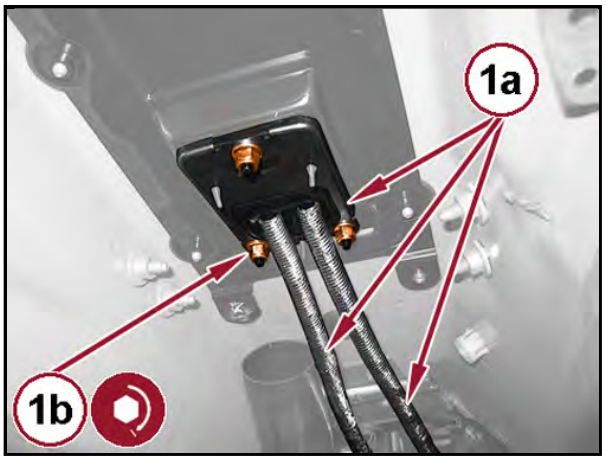
18. Remove the nuts (1a) and remove the gear shift cables complete with support bracket (1b) from the vehicle.

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INSTALLATION

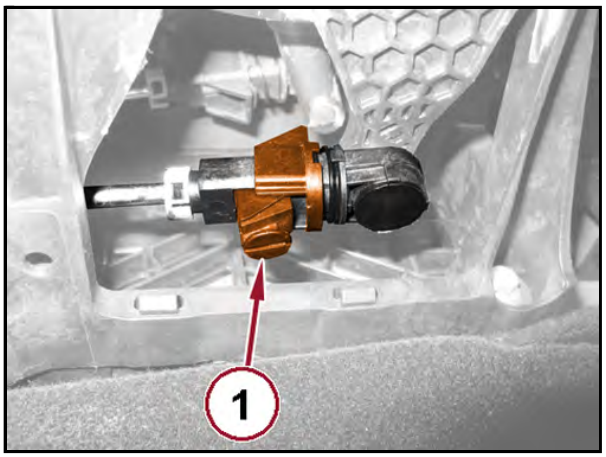
1. Position the shifter cables complete with bracket (1a) and tighten the **NEW** nuts (1b) to the proper (Torque Specifications) .



2. Side the cursor on the selection cable and insert it into the bracket on the transmission, release the cursor and ensure the cable is properly secured to bracket.
3. Do the same to attach the gear shift cable.
4. Connect the ends of the shifter cables to the transmission levers.
5. Connect the shifter cables to the shifter using the "quick-fit" devices.
6. Engage the ends of the cables to the control lever of the shifter.
7. Firmly press the lock button (1) of the "quick adjuster" device at the shifter end of the selector cable.

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8. Do the same for the lock button "quick adjuster" device for the shift cable.
9. Remove the pin locking device at the transmission.
10. Remove the locking pin at the shifter.
11. Make a test insertion of all gears and return to its position of "neutral".



12. Install the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .
13. Install the exhaust heat shield and tighten the clips.
14. Use a suitable tool to install the rivets securing the exhaust heat shield to the body.
15. If equipped, install the propeller shaft (Refer to 03 - Differential and Driveline/Propeller Shaft/Removal and Installation) .
16. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
17. Install the battery tray (Refer to 08 - Electrical/Battery System/TRAY, Battery/Removal and Installation) .

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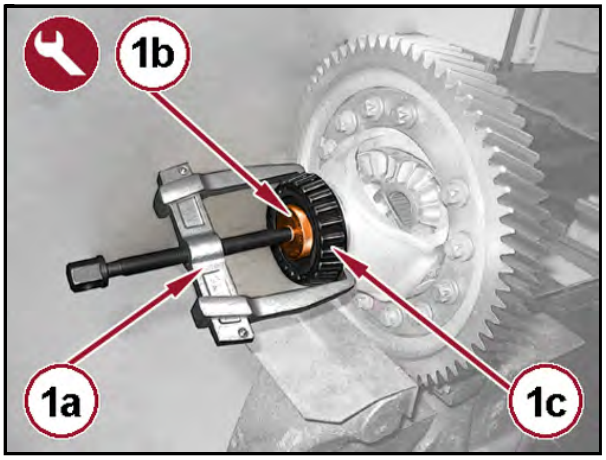
21 - Transmission and Transfer Case / Manual, C635 / DIFFERENTIAL, Transaxle / Disassembly and Assembly

DISASSEMBLY AND ASSEMBLY

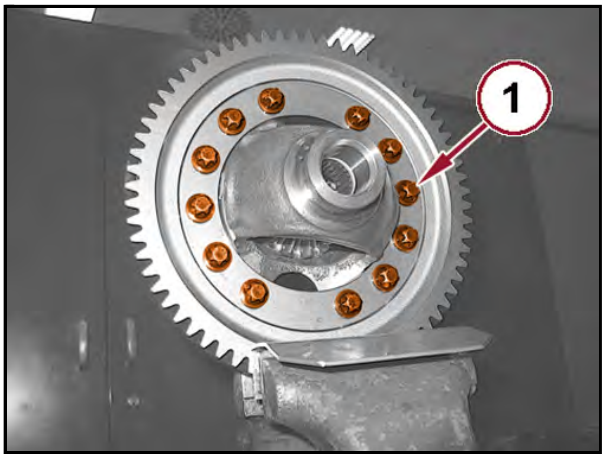
DISASSEMBLY

NOTE: Left side shown, right side similar.

1. With the tools (1a) and 1845028000 (1b), remove the left and right side differential bearings (1c).



2. Place the complete differential in a vice equipped with protective, non-marring jaw covers.
3. Remove the ring gear bolts (1).



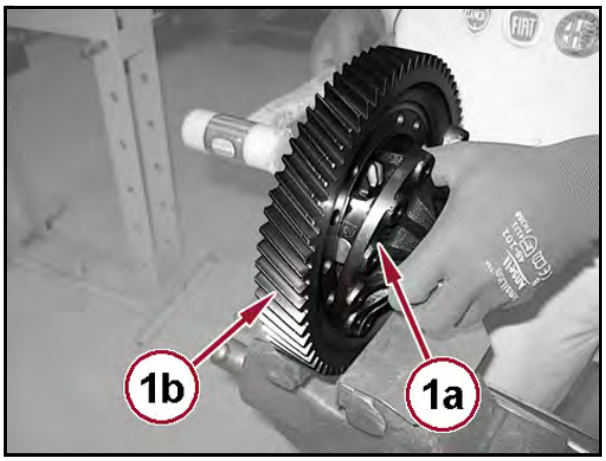
4. Using a soft faced hammer, remove the differential housing (1a) from the ring gear (1b).

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ASSEMBLY

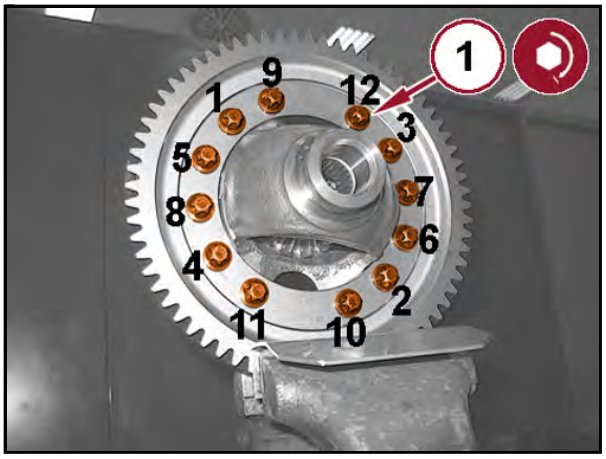
1. Place the ring gear into a vice equipped with protective, non-marring jaw covers.

2. Position the differential housing into the ring gear.



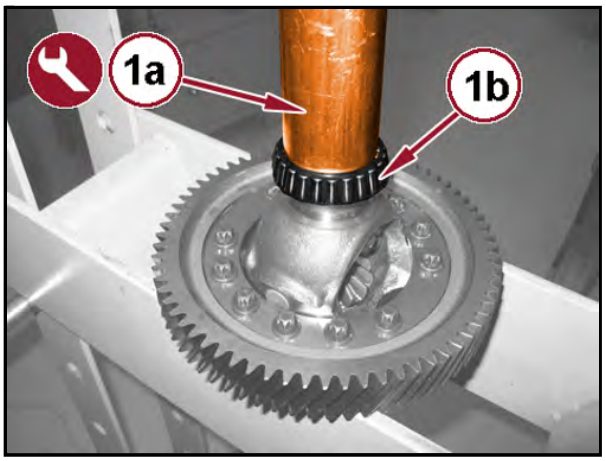
3. Install **NEW** ring gear bolts (1) and tighten to 35 N·m in the sequence shown.

4. Tighten the ring gear bolts an additional 50° using the sequence shown.



NOTE: **Right side shown, left side similar.**

5. Install **NEW** left and right side differential bearings (1b) using a suitable press and tool 1870658000 (1a).



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21 - Transmission and Transfer Case / Manual, C635 / FLUID / Standard Procedure

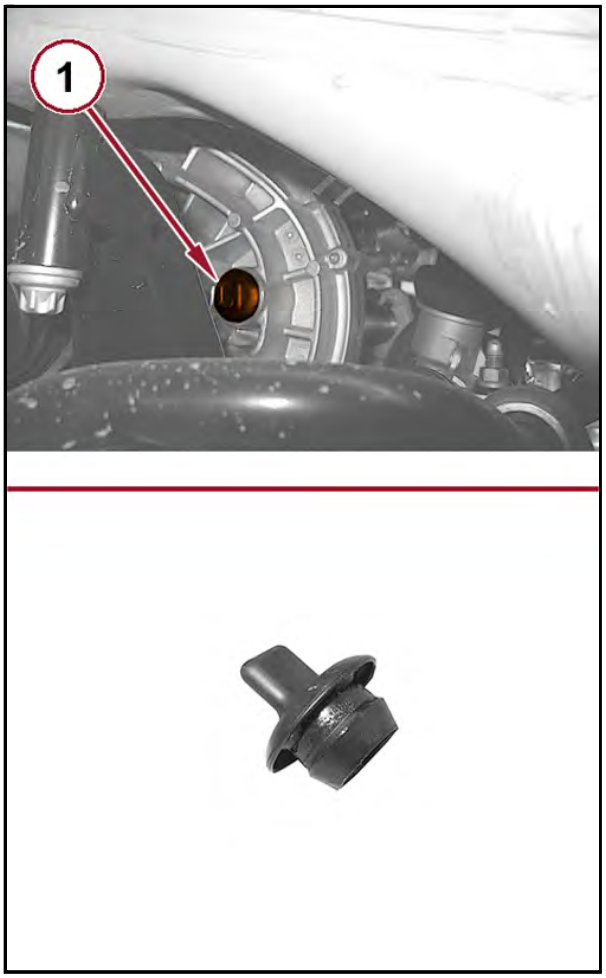
FLUID DRAIN AND FILL

The transmission does not require scheduled maintenance and should be performed only as a result of revision operations for control / replacement of internal components. Therefore in all other operations of removal and installation, gearbox oil is to be reused.

CAUTION: Possible foreign bodies in the container or in the storage area can compromise the reutilization of the manual gearbox oil

The transmission oil collection and its storage before re-use should be made with a clean container with a protective cover.

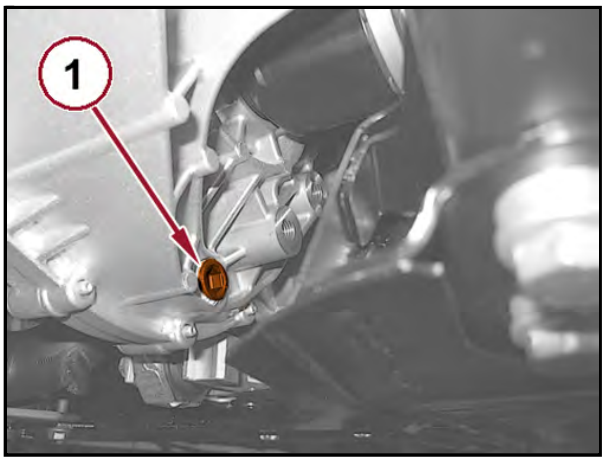
1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Remove the transmission fill plug (1).



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NOTE: Do not spill any oil because the indiscriminate dispersal of the product contributes to pollution.

4. Remove transmission drain plug (1) to allow the oil to into a suitable drain pan.



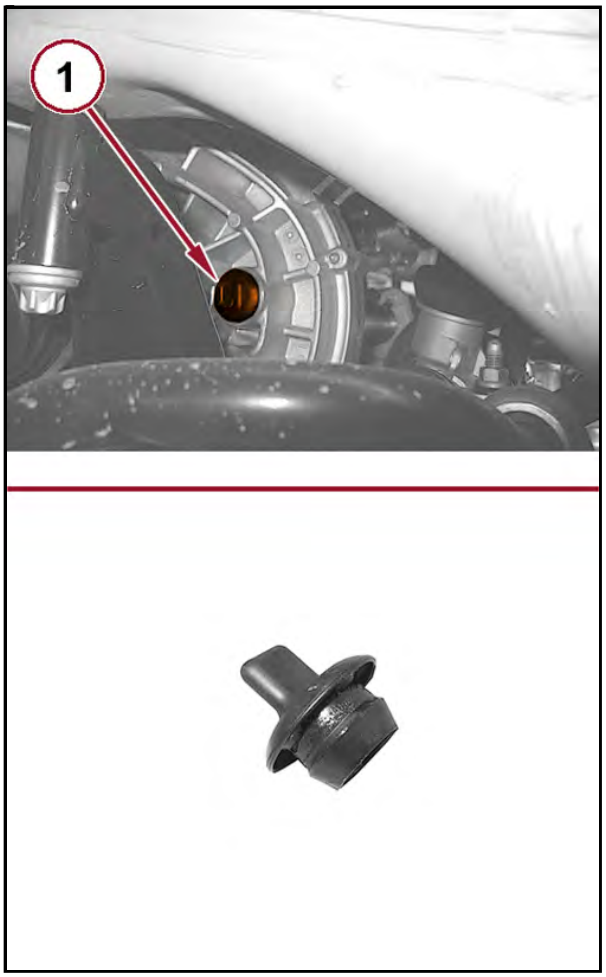
5. Clean, then install the drain plug and tighten to the proper (Torque Specifications) .
6. Check that the oil level is just below the bottom edge of the fill hole.
7. Clean the filler cap and install it in the transmission.
8. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

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21 - Transmission and Transfer Case / Manual, C635 / FLUID / Standard Procedure

FLUID LEVEL INSPECTION

1. Raise and support the vehicle. (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Remove the transmission fill plug (1) and check that the oil level is just below the bottom edge of the fill hole.



4. If oil level is low, add the recommended oil (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .
5. Clean the filler cap and install it in the transmission.
6. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

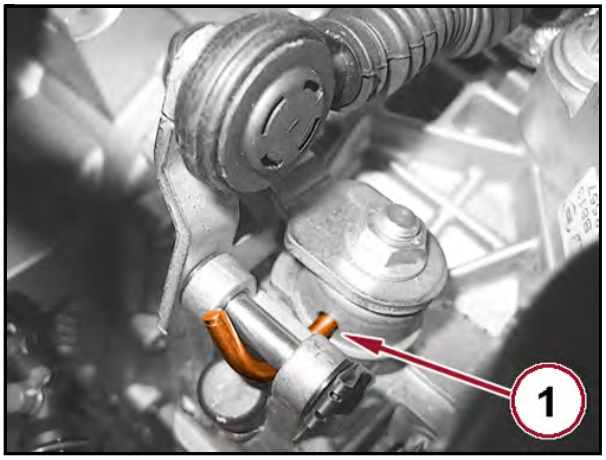
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PET_AAM_1013-0767

21 - Transmission and Transfer Case / Manual, C635 / MECHANISM, Gearshift / Removal and Installation

REMOVAL AND INSTALLATION

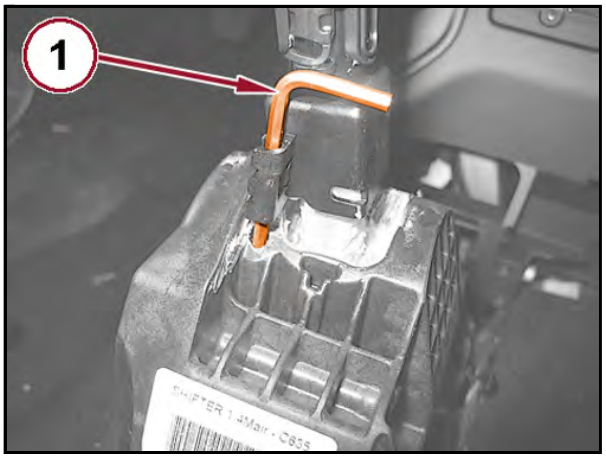
Removal

1. Place the vehicle in "Neutral" and insert an appropriate locking device (1) in the transmission as shown.



2. Remove the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .

3. Insert a suitable locking pin (1) in the shifter, as shown.

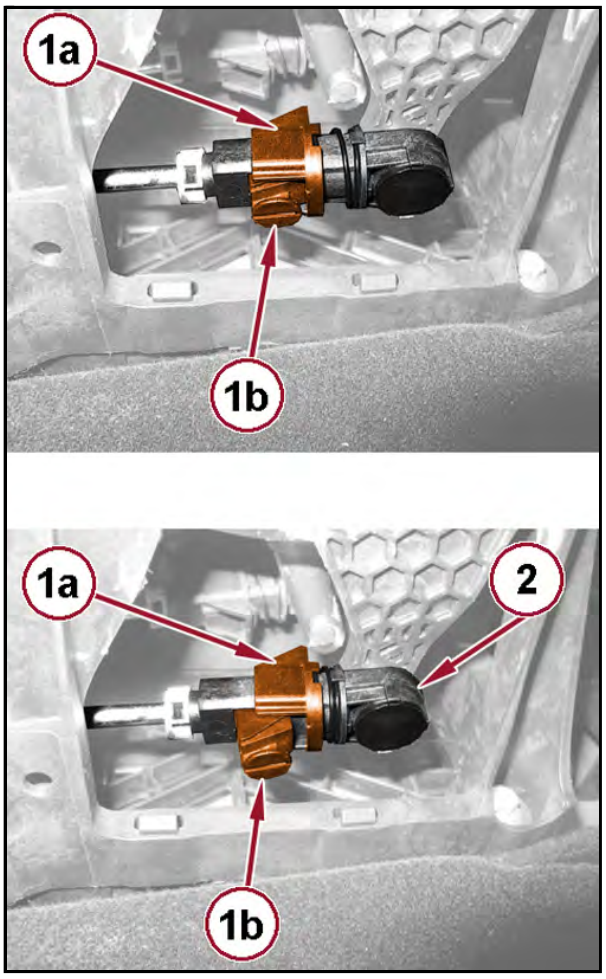


4. Slide the cursor (1a) to compress the spring and arm the "quick adjuster" device of the gear selection cable while simultaneously raising the button (1b).

5. Disconnect the end of the cable (2) from the shifter.

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6. Do the same for the other cable.

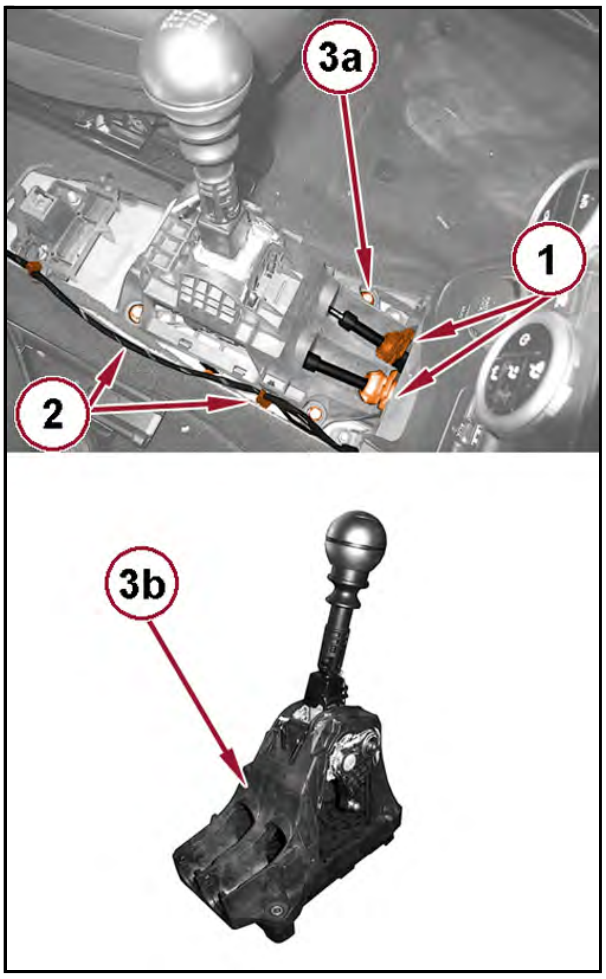


7. Disconnect the "quick-fit" device (1) of the cable from the shifter.

8. Disengage the wire harness retaining clips (2) on the right and left of the support gear lever.

9. 3. Unscrew the screws (3a) and remove the shifter (3b).

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Installation

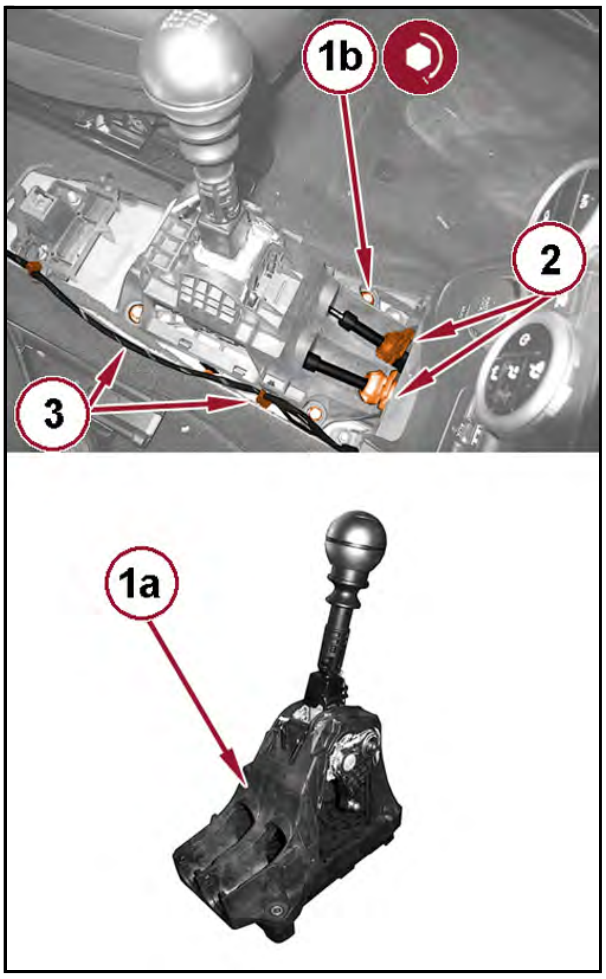
1. Install the shifter (1a) terminals of the cables and gear-selection. Put into place the support gear lever and tighten the screws (1b) to the specified torque.

2. Engage the shifter cables "quick-fit" devices (2) to the shifter.

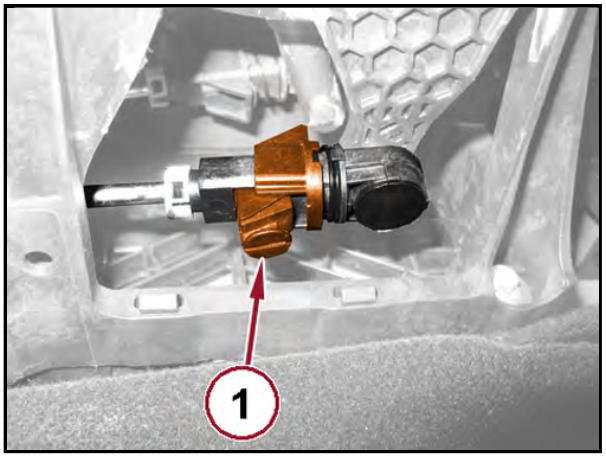
3. Engage the wire harness retaining clips (3) wiring on the right and left of the shifter.

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4. Connect the ends of the shifter cables to the respective control levers.



5. Firmly press the lock button (1) of the selector cable "quick adjuster" device (1).



6. Do the same for the gear engagement cable "quick adjuster" device.

7. Remove the locking pin device from the transmission.

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8. Remove the locking pin from the shifter.

9. Make a test insertion of all gears and return to its position of "neutral".

10. Install the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .

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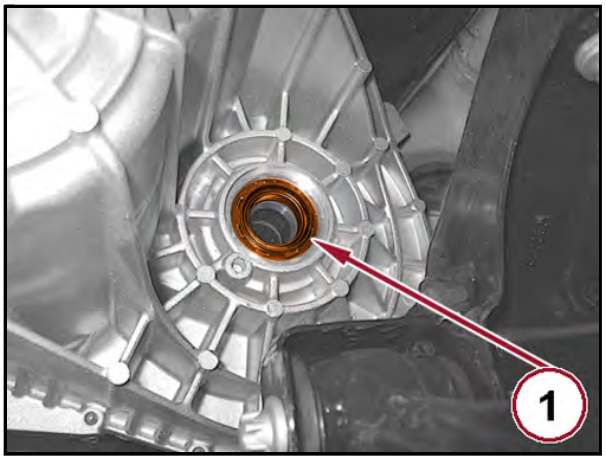
21 - Transmission and Transfer Case / Manual, C635 / SEAL, Axle Drive Shaft / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

LEFT SIDE

1. Remove the left half shaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .

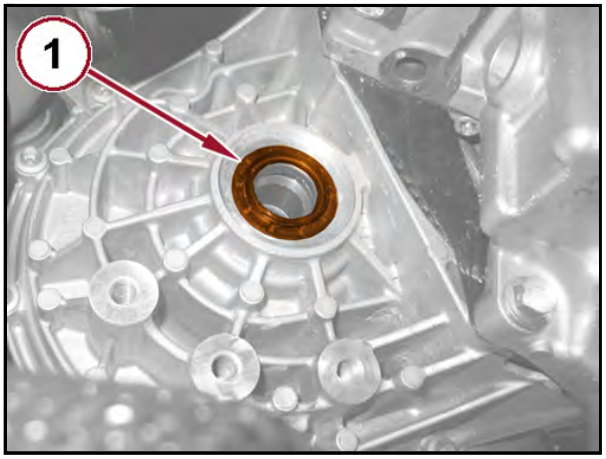


NOTE: Be careful to not damage the seal bore during removal.

2. Carefully pry out the seal (1).

RIGHT SIDE

1. Remove the right half shaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .



NOTE: Be careful to not damage the seal bore during removal.

2. Carefully pry out the seal (1).

INSTALLATION

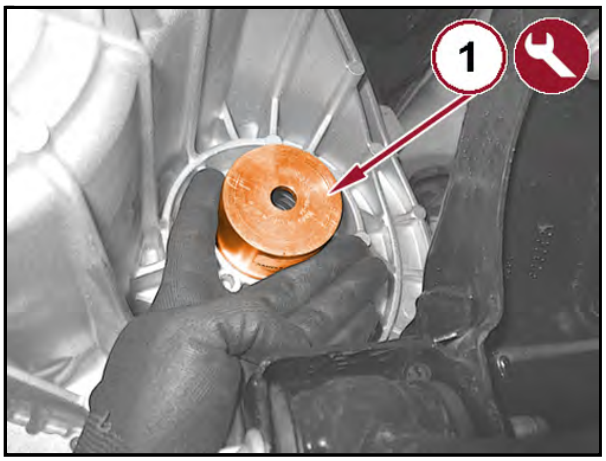
LEFT SIDE

1. Moisten the **NEW** seal with differential gear oil.

2. Using tool 2000035510, install the new seal into the differential.

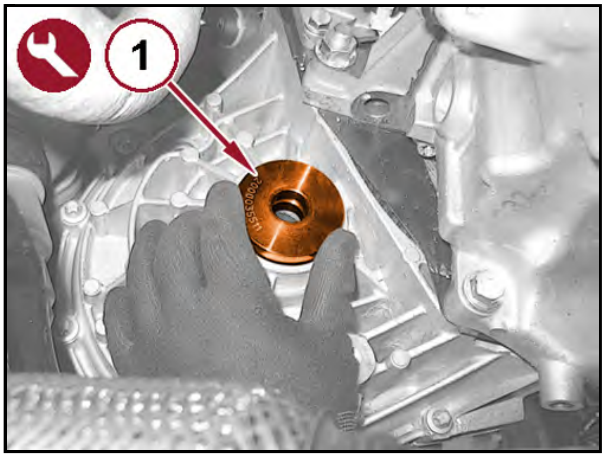
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3. Install the left half shaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .



RIGHT SIDE

1. Moisten the **NEW** seal with differential gear oil.
2. Using tool 2000035510, install the new seal into the differential.



3. Install the left half shaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal and Installation) .

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21 - Transmission and Transfer Case / Manual, C635 / SEAL, Input Shaft / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

If necessary to replace the input shaft oil seal and flange assembly refer to (Refer to 06 - Clutch/CYLINDER, Clutch Slave/Removal and Installation) .

INSTALLATION

To install a new input shaft oil seal and flange assembly refer to (Refer to 06 - Clutch/CYLINDER, Clutch Slave/Removal and Installation) .

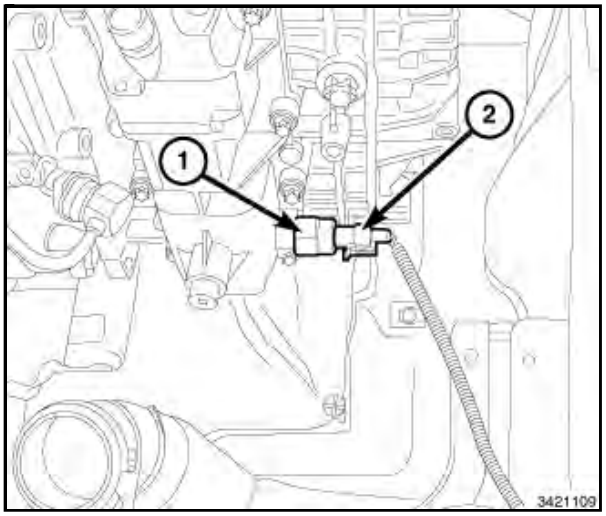
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21 - Transmission and Transfer Case / Manual, C635 / SWITCH, Backup Lamp / Removal and Installation

REMOVAL AND INSTALLATION

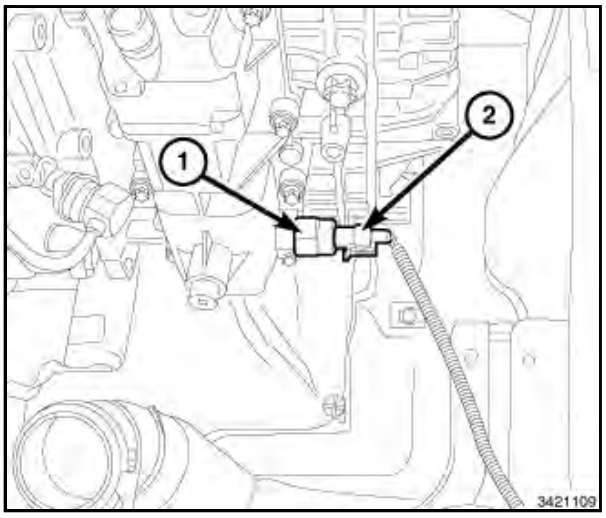
REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.
2. Remove the air cleaner body (Refer to 09 - Engine/Air Intake System/BODY, Air Cleaner/Removal and Installation) .
3. Disconnect the backup lamp switch wire harness connector (2).
4. Remove the backup lamp switch (1).



INSTALLATION

1. Install the backup lamp switch (1) and tighten to the proper (Torque Specifications) .
2. Connect the backup lamp switch wire harness connector (2).
3. Install the air cleaner body (Refer to 09 - Engine/Air Intake System/BODY, Air Cleaner/Removal and Installation) .
4. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.



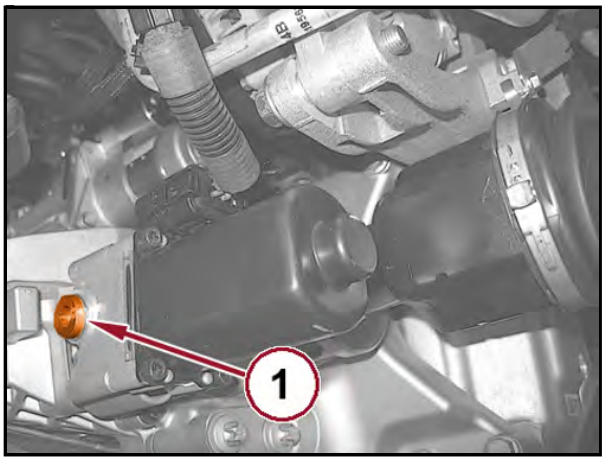
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PET_AAM_1013-0776

21 - Transmission and Transfer Case / Power Transfer Unit / Standard Procedure

POWER TRANSFER UNIT (PTU) FLUID FILL

The PTU oil is not a scheduled maintenance service.

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .
3. Remove the right front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
4. Remove the PTU oil filler cap and check the oil level is just below the bottom edge of the fill hole.



5. If necessary fill the PTU to the bottom of the fill plug hole using the specified fluid (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .
6. Clean and tighten the PTU fill plug.
7. Install the right front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
8. Install the belly pan (Refer to 13 - Frame and Bumpers/Under Body Protection/BELLY PAN/Removal and Installation) .

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PET_AAM_1013-0777

21 - Transmission and Transfer Case / Power Transfer Unit / Specifications

SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.	COMMENT
PTU-to-Transmission Bolts	55	41	-	
PTU Bracket-to-Engine Bolts	55	41	-	
Bracket-to-PTU Bolt	55	41	-	

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21 - Transmission and Transfer Case / Power Transfer Unit / Removal and Installation

1.4 TURBO MULTIAIR

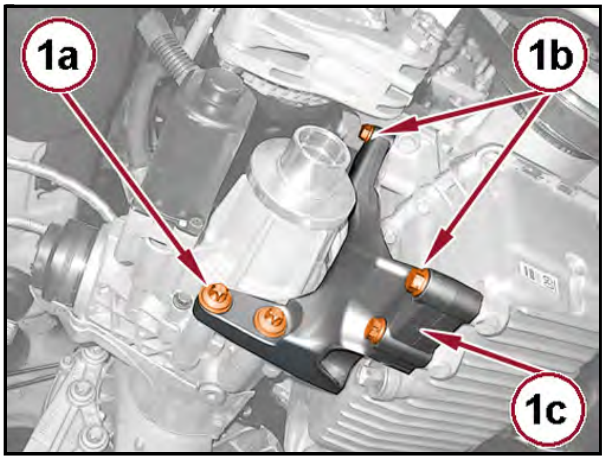
REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

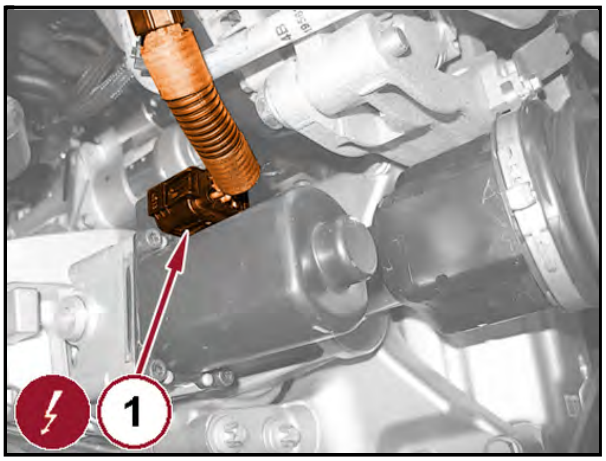
2. Remove the right front halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

3. Remove the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

4. Remove the bolts (1a), (1b) and remove the Power transfer Unit (PTU) support bracket (1c).

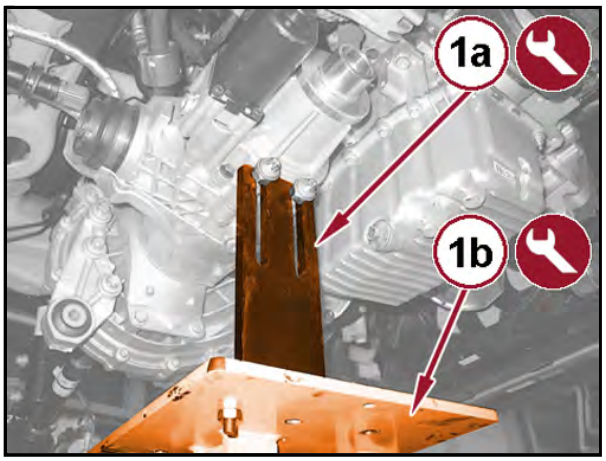


5. Disconnect the wire harness connector (1) of the PTU actuator.

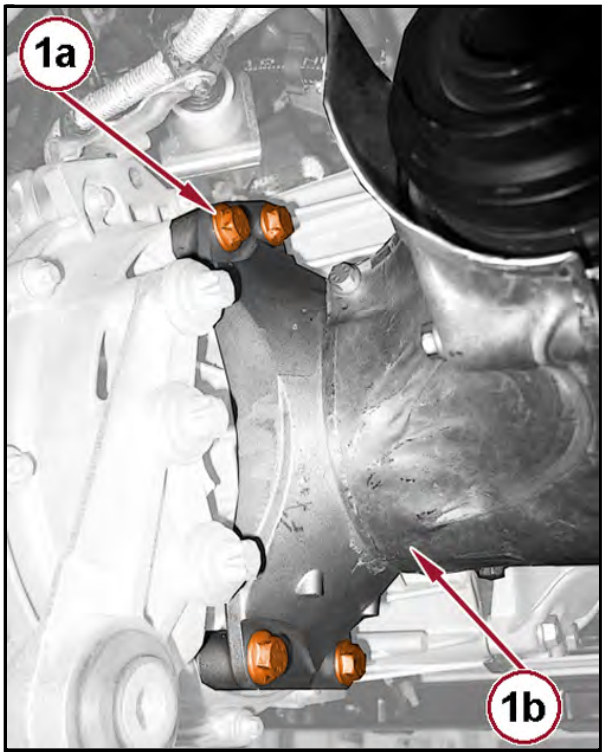


6. Support the PTU using tools 1870847000 (1a) and 1870835001 (1b).

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PET_AAM_1013-0779

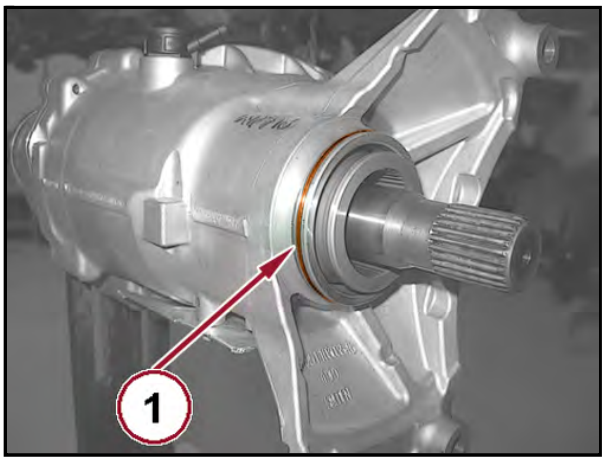


7. Remove the bolts (1a) and remove the PTU (1b) from the vehicle.

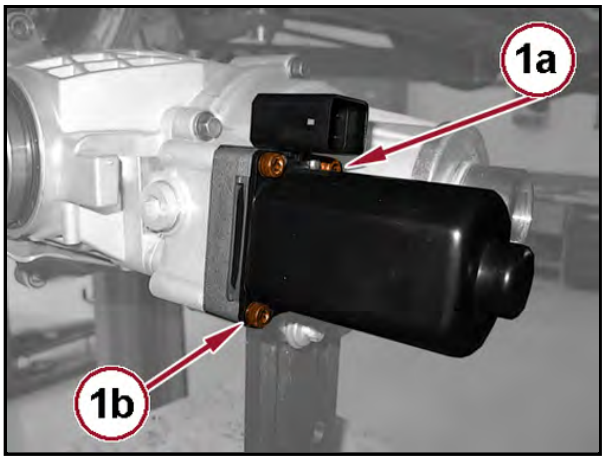


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PET_AAM_1013-0780

8. Remove and discard the O-ring (1).



9. If necessary, remove the bolts (1a) and remove the PTU actuator (1b).



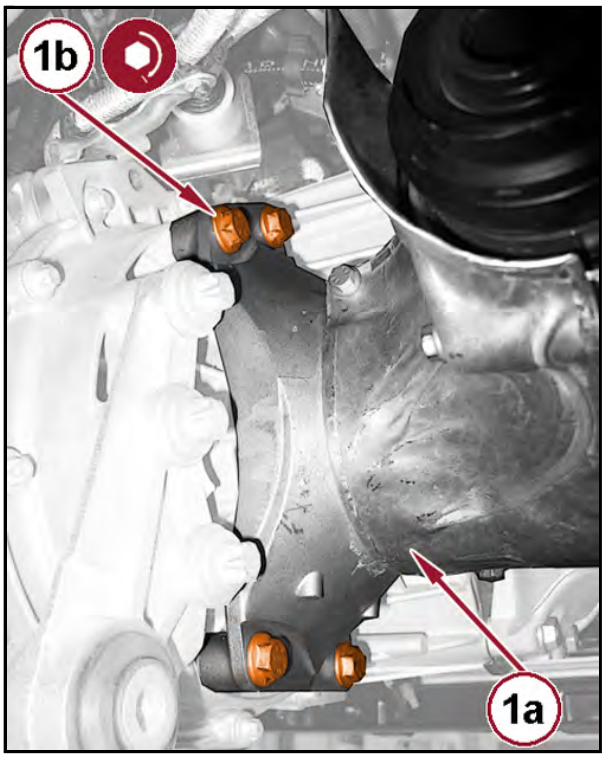
INSTALLATION

1. If removed, install the Power Transfer Unit (PTU) actuator and tighten the bolts.

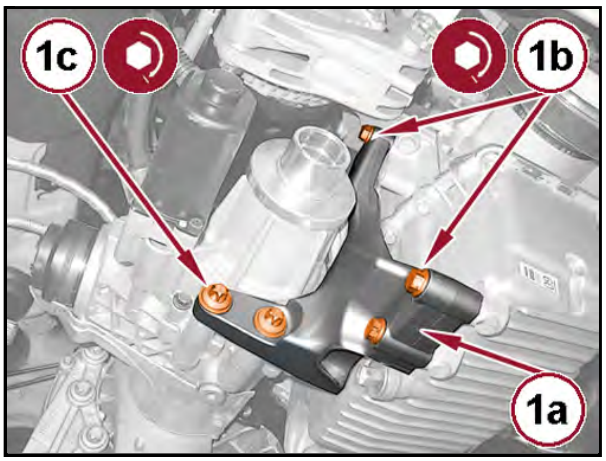
2. With the tools 1870847000 and 1870835001 install the PTU (1a) complete with a **NEW** O-ring and tighten the bolts (1b) to the proper (Torque Specifications) .

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3. Remove the PTU support tools.



4. Install the PTU support bracket (1a) the tighten the bolts (1b) and (1c) to the proper (Torque Specifications) .



5. Connect the wire harness connector to the PTU actuator.

6. Install the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

7. Install the right front halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

8. Verify that the PTU and transmission are filled to the specified fluid level (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .

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9. Lower the vehicle.

10. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

11. When installing a **NEW** (PTU), connect the diagnostic scan tool, enter "miscellaneous functions" of the DriveTrain Control Module (DTCM) and run the self-learning procedure for the PTU.

12. Road test the vehicle to verify the repair.

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PET_AAM_1013-0783

21 - Transmission and Transfer Case / Power Transfer Unit / Removal and Installation

2.0 TURBO DIESEL -120/140 HP

REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

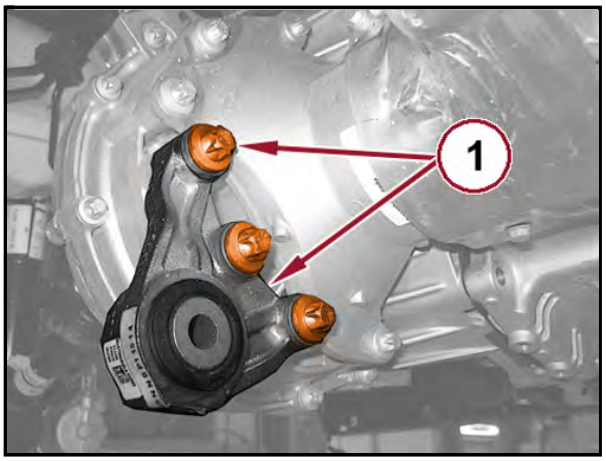
2. Remove the right front halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

3. Remove the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

4. Place a suitable hydraulic lift under the rear exhaust muffler, remove the bolts and remove the exhaust.



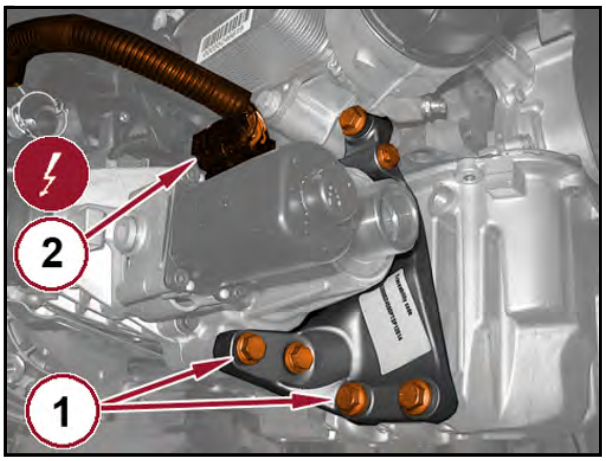
5. Remove the bolts and remove the isolator for the rear engine mount (1).



6. Remove the bolts and remove the Power transfer Unit (PTU) support bracket (1).

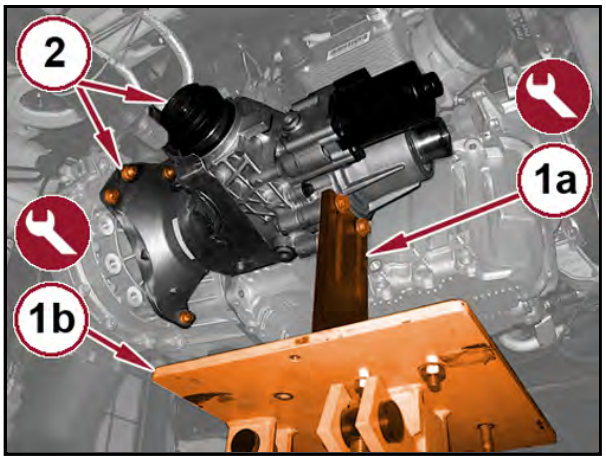
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PET_AAM_1013-0784

7. Disconnect the wire harness connector (2) of the PTU actuator.

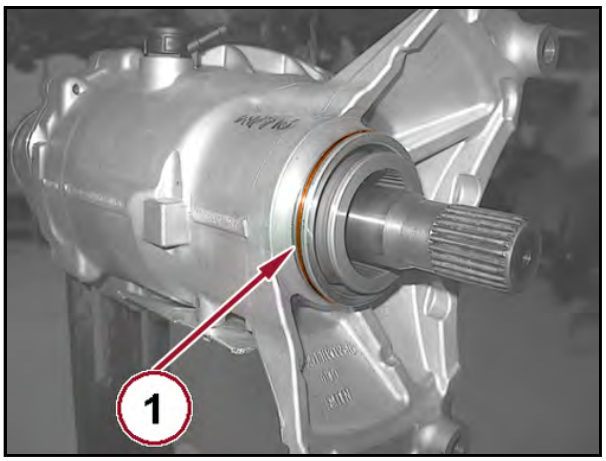


8. Support the PTU using tools 1870847000 (1a) and 1870835001 (1b).

9. Remove the bolts and remove the PTU (2) from the vehicle.

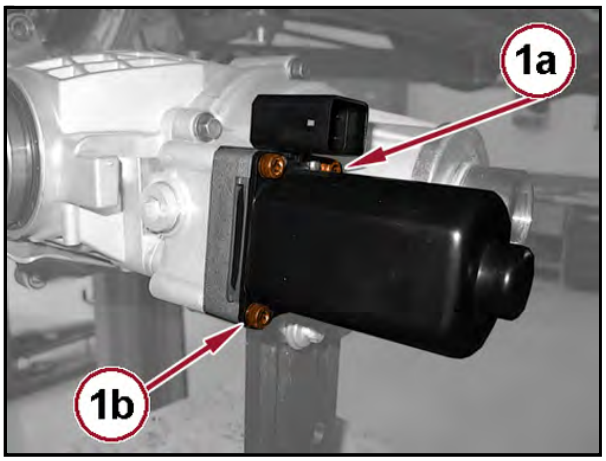


10. Remove and discard the O-ring (1).



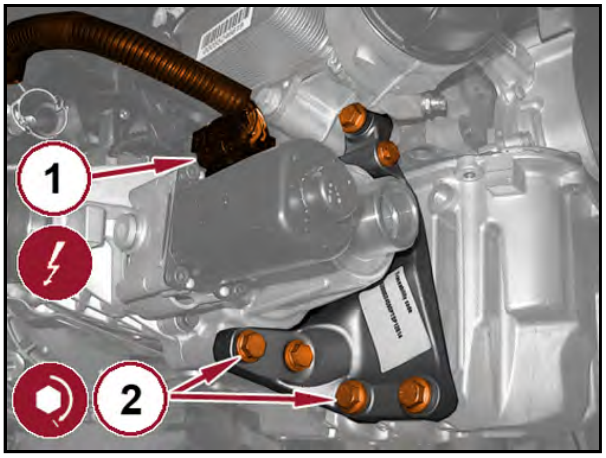
11. If necessary, remove the bolts (1a) and remove the PTU actuator (1b).

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PET_AAM_1013-0785



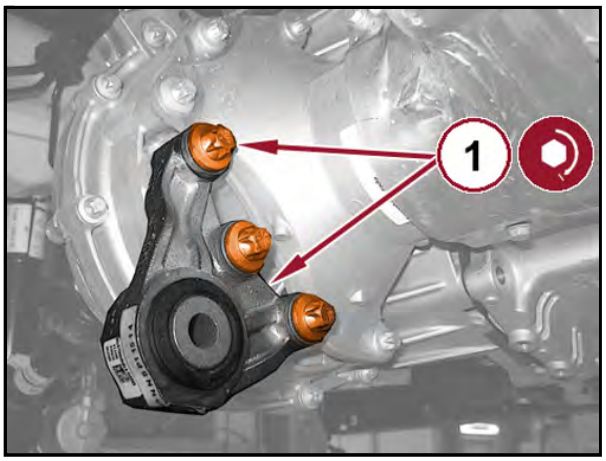
INSTALLATION

1. If removed, install the Power Transfer Unit (PTU) actuator and tighten the bolts.
2. With the tools 1870847000 and 1870835001 install the PTU (1a) complete with a **NEW** O-ring and tighten the bolts (1b) to the proper (Torque Specifications) .
3. Remove the PTU support tools.
4. Connect the wire harness connector (1) to the PTU actuator.
5. Install the PTU support bracket and tighten the bolts and (2) to the proper (Torque Specifications) .



6. Install the rear engine mount isolator and tighten the bolts to the proper (Torque Specifications) .
7. Install the exhaust and tighten the bolts.
8. Install the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

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PET_AAM_1013-0786



9. Install the right front halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .
10. Verify that the PTU and transmission are filled to the specified fluid level (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .
11. Lower the vehicle.
12. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.
13. When installing a **NEW** (PTU), connect the diagnostic scan tool, enter "miscellaneous functions" of the DriveTrain Control Module (DTCM) and run the self-learning procedure for the PTU.
14. Road test the vehicle to verify the repair.

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21 - Transmission and Transfer Case / Power Transfer Unit / Removal and Installation

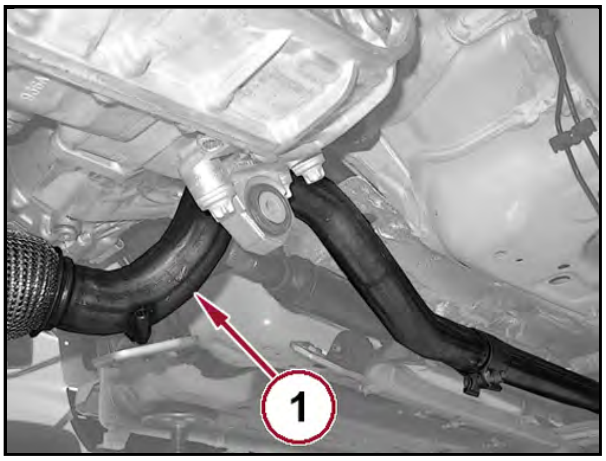
2.0 TURBO DIESEL -170 HP

REMOVAL

1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

2. Remove the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

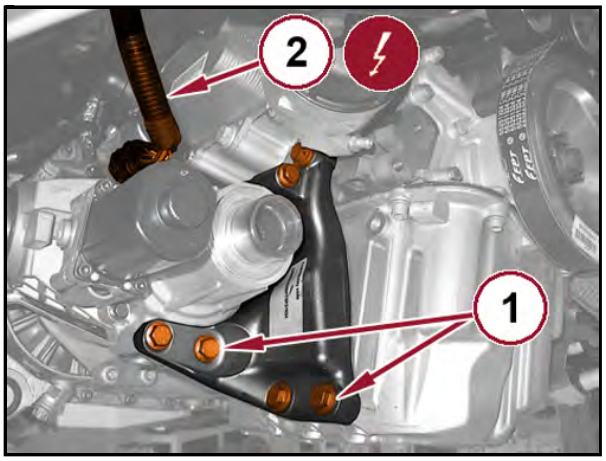
3. Remove the crossunder pipe (1).



4. Remove the right front halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

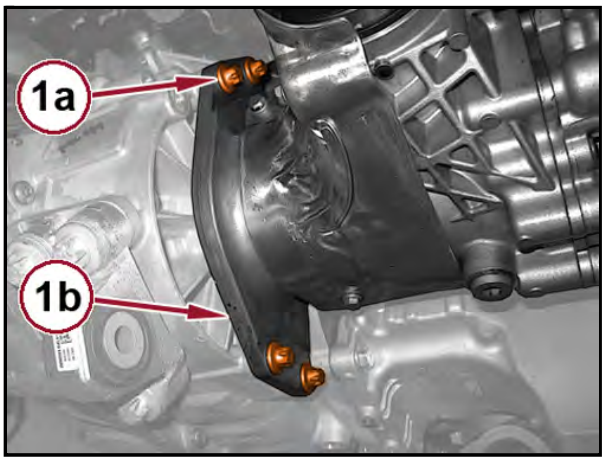
5. Remove the Power transfer Unit (PTU) support bracket bolts (1).

6. Disconnect the wire harness connector (2) of the PTU actuator.

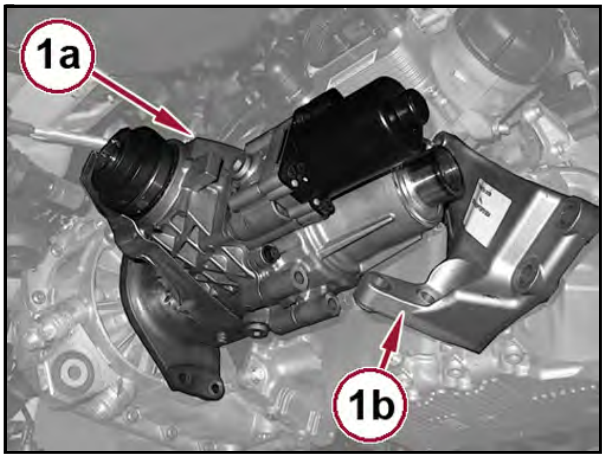


7. Remove the bolts (1a) securing the PTU (1b) to the transmission.

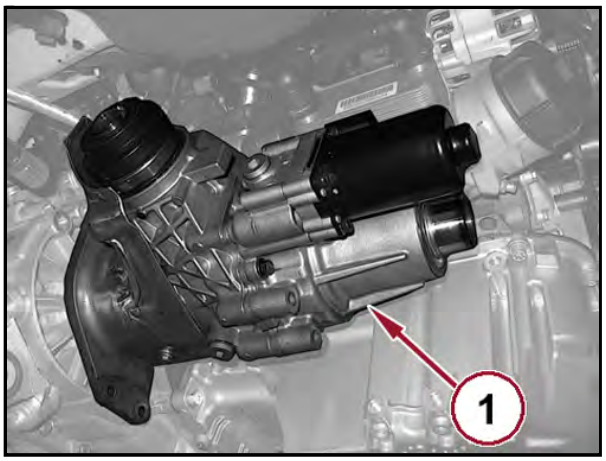
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8. Separate the PTU (1a) from the transmission far enough to remove the support bracket (1b).

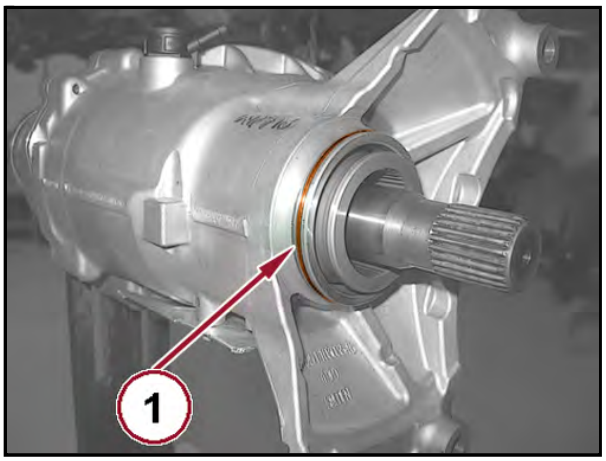


9. Remove the PTU (1) from the vehicle.

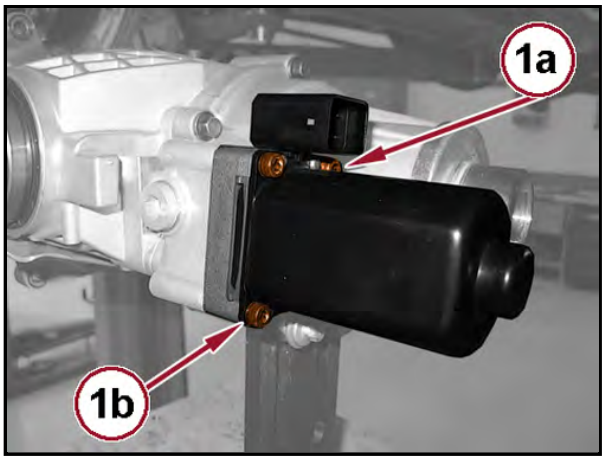


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10. Remove and discard the O-ring (1).



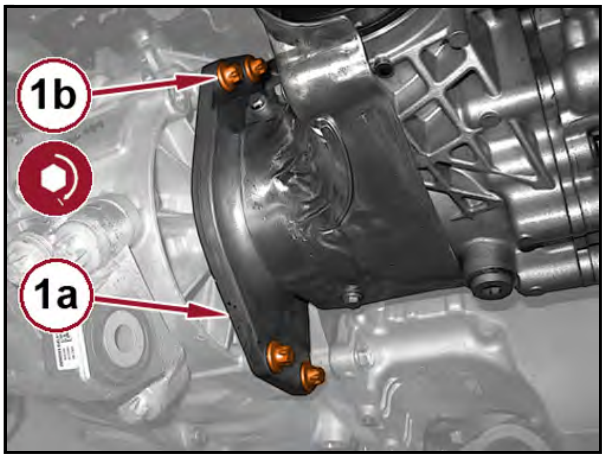
11. If necessary, remove the bolts (1a) and remove the PTU actuator (1b).



INSTALLATION

1. If removed, install the Power Transfer Unit (PTU) actuator and tighten the bolts.

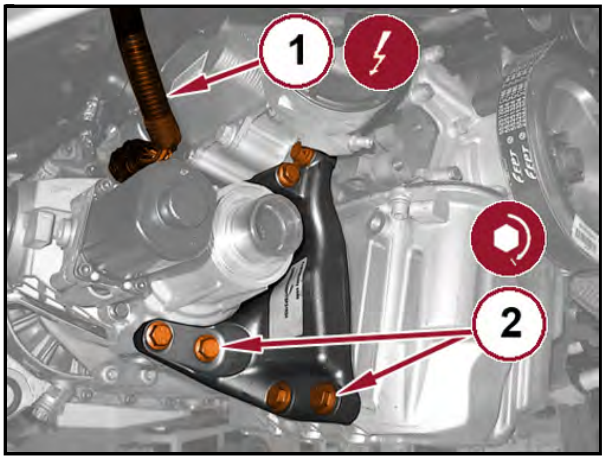
2. Install the PTU (1a) complete with a **NEW** O-ring and the support bracket in position, tighten the PTU mounting bolts (1b) to the proper (Torque Specifications) .



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3. Connect the wire harness connector (1) to the PTU actuator.

4. Install the PTU support bracket bolts and (2) to the proper (Torque Specifications) .



5. Install the crossunder pipe and tighten the bolts.

6. Install the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

7. Install the right front halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

8. Verify that the PTU and transmission are filled to the specified fluid level (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .

9. Lower the vehicle.

10. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

11. When installing a **NEW** (PTU), connect the diagnostic scan tool, enter "miscellaneous functions" of the DriveTrain Control Module (DTCM) and run the self-learning procedure for the PTU.

12. Road test the vehicle to verify the repair.

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21 - Transmission and Transfer Case / Power Transfer Unit / Removal and Installation

2.4L MULTIAIR

REMOVAL

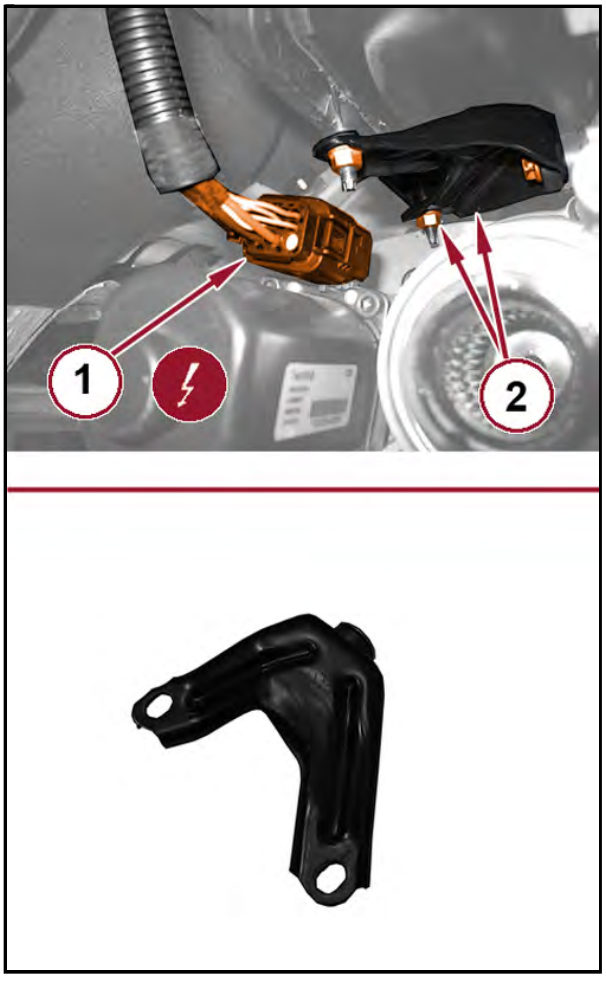
1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

2. Remove the right front halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

3. Remove the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

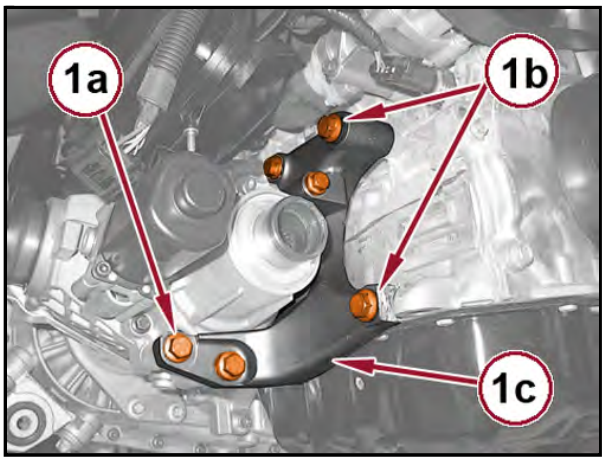
4. Disconnect the wire harness connector (1) of the PTU actuator.

5. Remove the intake manifold support bracket nuts and the bracket (2).

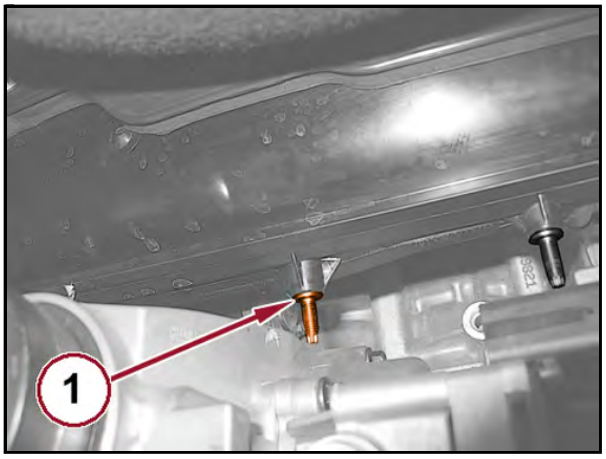


6. Remove the bolts (1a), (1b) and remove the Power transfer Unit (PTU) support bracket (1c).

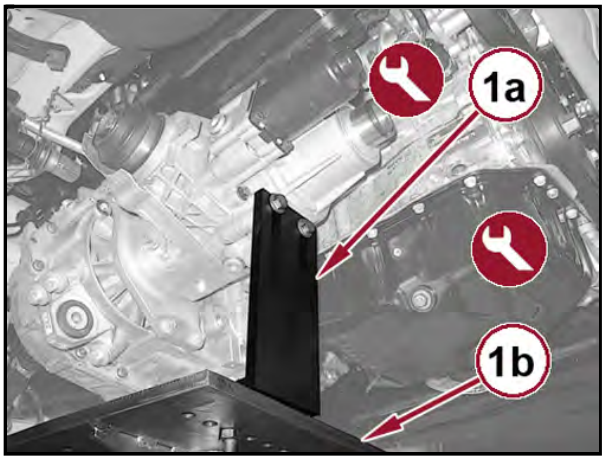
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7. Remove the intake manifold bracket stud (1) shown from the intake manifold.

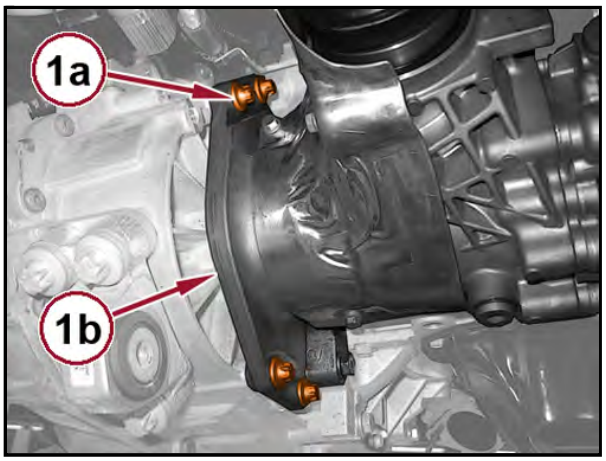


8. Support the PTU using tools 1870847000 (1a) and 1870835001 (1b) as shown.

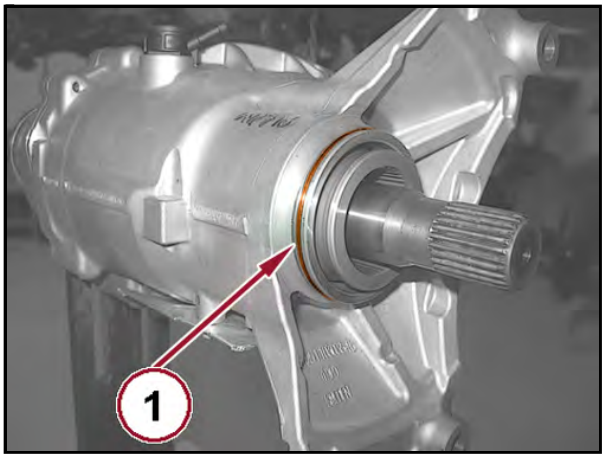


9. Remove the bolts (1a) and remove the PTU (1b) from the vehicle.

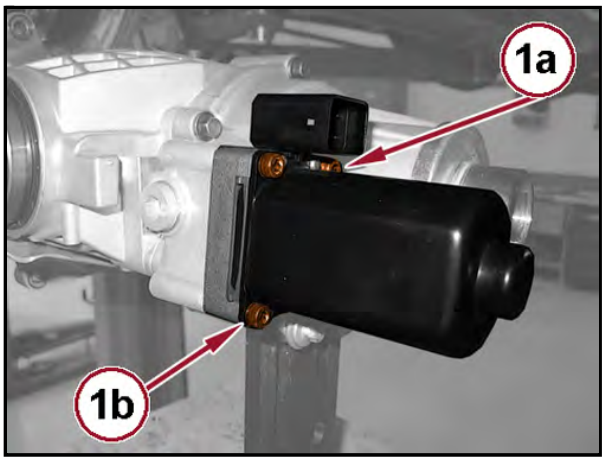
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PET_AAM_1013-0793



10. Remove and discard the O-ring.



11. If required, remove the bolts (1a) and remove the PTU actuator (1b).

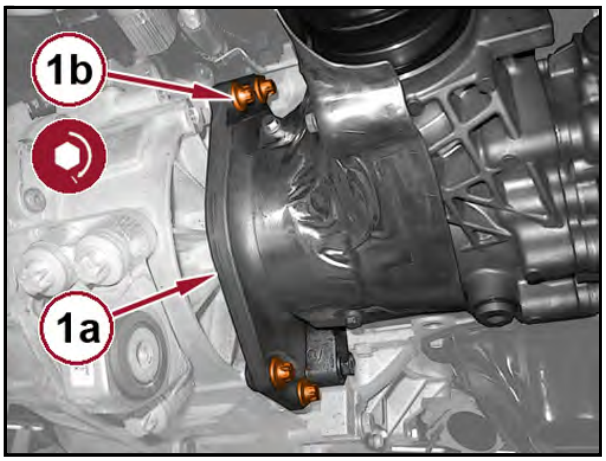


INSTALLATION

1. If removed, install the Power Transfer Unit (PTU) actuator and tighten the bolts.

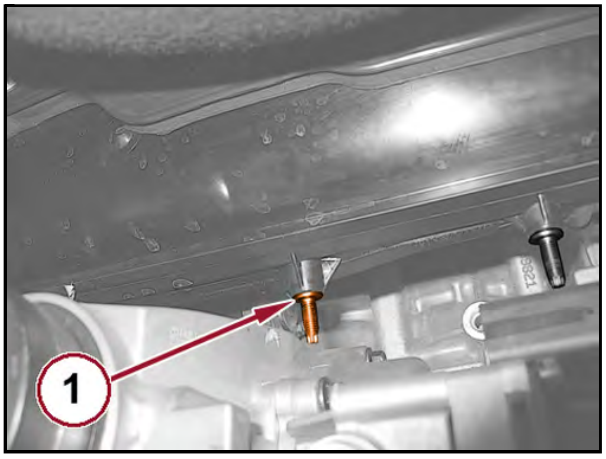
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PET_AAM_1013-0794

2. With the tools 1870847000 and 1870835001 install the PTU (1a) complete with a **NEW** O-ring and tighten the bolts (1b) to the proper (Torque Specifications) .

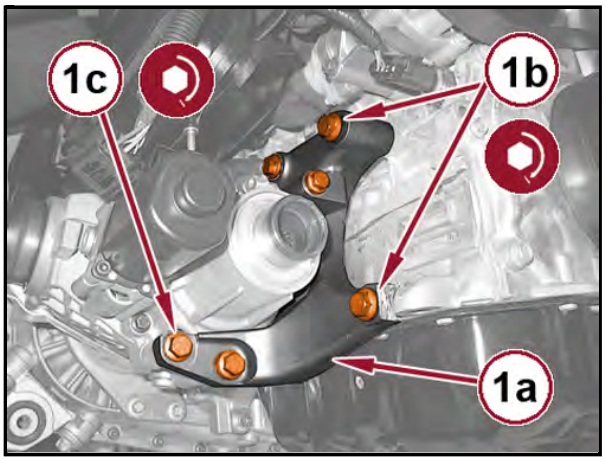


3. Remove the PTU support tools.

4. Install the intake manifold support bracket stud (1) into the intake manifold.



5. Install the PTU support bracket (1a) the tighten the bolts (1b) and (1c) to the proper (Torque Specifications) .



6. Install the intake manifold support bracket and tighten the nuts.

7. Connect the wire harness connector to the PTU actuator.

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8. Install the front suspension crossmember (Refer to 13 - Frame and Bumpers/Frame/CROSSMEMBER, Front Suspension/Removal and Installation) .

9. Install the right front halfshaft (Refer to 03 - Differential and Driveline/Half Shaft/Removal) .

10. Verify that the PTU and transmission are filled to the specified fluid level (Refer to 04 - Vehicle Quick Reference/Capacities and Recommended Fluids/Specifications) .

11. Lower the vehicle.

12. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

13. When installing a **NEW** (PTU), connect the diagnostic scan tool, enter "miscellaneous functions" of the DriveTrain Control Module (DTCM) and run the self-learning procedure for the PTU.

14. Road test the vehicle to verify the repair.

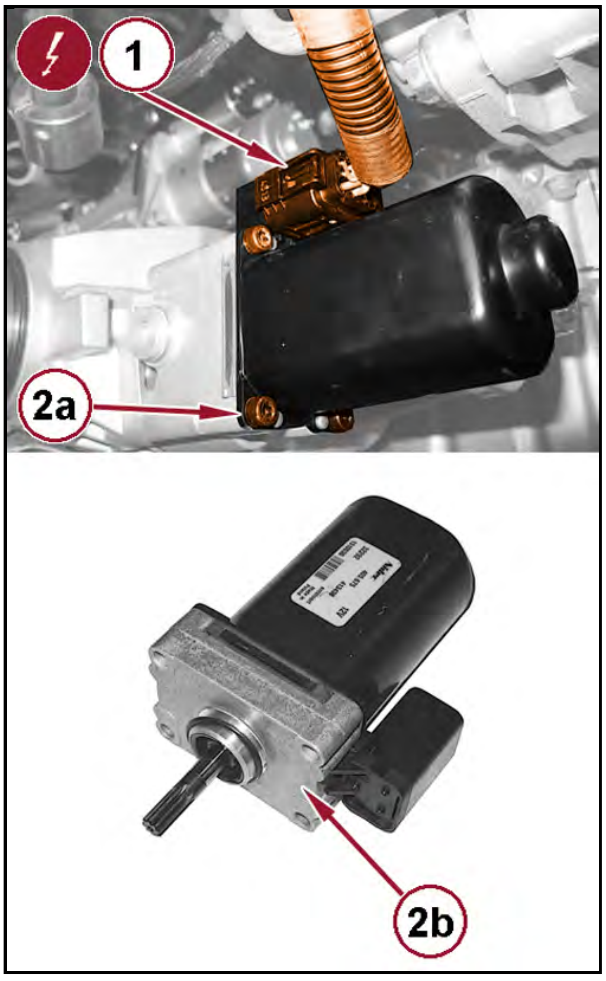
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PET_AAM_1013-0796

21 - Transmission and Transfer Case / Power Transfer Unit / ACTUATOR, Shift / Removal and Installation

REMOVAL AND INSTALLATION

SHIFT ACTUATOR REMOVAL

1. Raise and support the vehicle (Refer to 04 - Vehicle Quick Reference/Hoisting/Standard Procedure) .
2. Remove the right front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .
3. Disconnect the wire harness connector (1) at the actuator .
4. Remove the actuator mounting bolts (2a) and separate the actuator from the Power transfer Unit (PTU).



SHIFT ACTUATOR INSTALLATION

1. Position the actuator on the Power Transfer Unit and tighten the bolts.

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2. Connect the wire harness connector at the actuator.

3. Install the right front tire and wheel assembly (Refer to 22 - Tires and Wheels/Removal and Installation) .

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PET_AAM_1013-0798

21 - Transmission and Transfer Case / Power Transfer Unit / SWITCH, Transfer Case / Removal and Installation

REMOVAL AND INSTALLATION

REMOVAL

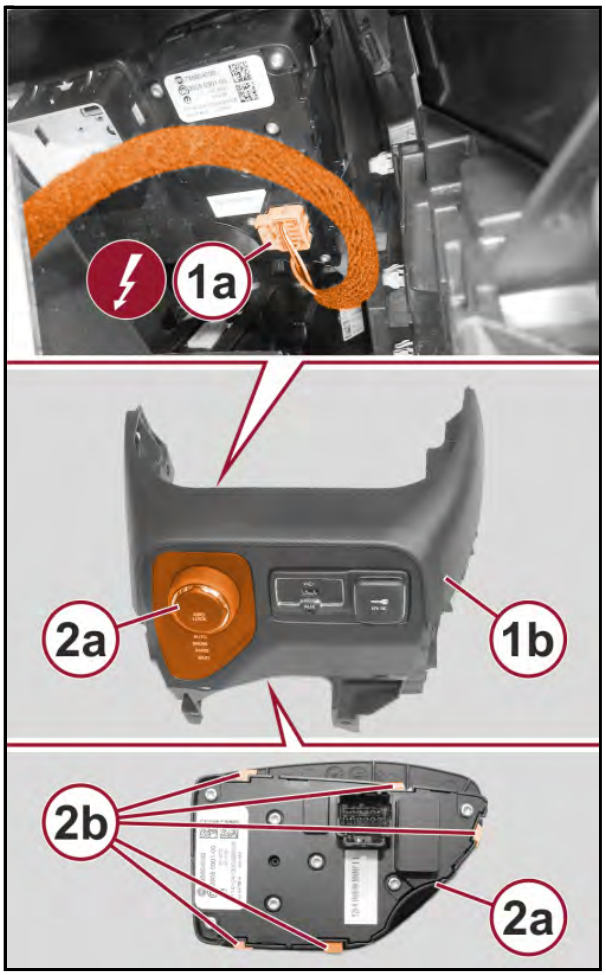
1. Disconnect and isolate the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), disconnect the IBS connector first before disconnecting the negative battery cable.

2. Remove the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .

3. Remove the media hub (Refer to 08 - Electrical/8A - Audio and Video/MEDIA HUB/Removal and Installation) .

4. Disconnect the Power Transfer Unit (PTU) switch wire harness connector (a) and remove the media hub (1b) from the vehicle.

5. Using a suitable trim stick, remove the PTU switch (2a) from the media hub The switch is held in the media hub by retaining clips (2b).



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INSTALLATION

1. Inspect the Power Transfer Unit (PTU) switch for damage.
2. Install the PTU switch into the media hub, verifying the retaining clips are properly seated.
3. Connect the PTU switch wire harness connector.
4. Install the media hub (Refer to 08 - Electrical/8A - Audio and Video/MEDIA HUB/Removal and Installation) .
5. Install the floor console (Refer to 23 - Body/Interior/CONSOLE, Floor/Removal and Installation) .
6. Connect the negative battery cable. If equipped with an Intelligent Battery Sensor (IBS), connect the IBS connector to the negative battery cable.

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