

The Worldwide Leader in Concrete Paving Technology

Commander III New Generation Trimmer/Paver Operator/Service Manual G21 Controls

GOMACO EXHIBIT 1005

GOMACO CORPORATION

A Division of

GODBERSEN-SMITH CONSTRUCTION COMPANY

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GOMACO reserves the right to make changes in its products without incurring any obligation to incorporate such improvements in any products previously sold or in service.

GOMACO CORPORATION

Gary L. Godbersen

G. L. Godbersen
PRESIDENT & CEO



New Generation Commander III Trimmer/Paver Operator and Service Manual G21 Controls

MACHINE SERIAL NUMBER: _____

ENGINE SERIAL NUMBER: _____

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TO THE CUSTOMER

Your new GOMACO Commander III was carefully designed and manufactured to give years of dependable service. To keep it running efficiently, read the instructions in this manual thoroughly. It contains detailed descriptions and instructions for the efficient operation and maintenance of your Commander III. Each section is clearly identified so you can easily find the information that you need. Read the Table of Contents to learn where each section is located. All instructions are recommended procedures only.

Throughout this manual you will come across **"Caution"**, **"Warning"** or **"Danger"** statements which will be carried out in bold type and preceded by one of the following symbols. Be certain to carefully read the message that follows to avoid the possibility of personal injury or machine damage.

⚠ DANGER! ⚠

A "Danger"statement is of utmost importance and signals severe injury or high probability of death to the user if proper precautions are not taken.

⚠ WARNING! ⚠

A "Warning" statement is customarily used to indicate a potential hazard which could result in serious personal injury.

⚠ CAUTION! ⚠

A "Caution" statement usually indicates a hazard that could result in minor injury, or damage to equipment.

You will also come across "**Notice**" statements which will be carried out in bold type. A "Notice" statement usually indicates a precaution or procedure to take to prevent personnal injury, property damage or an unsatisfactory finished product.

Right hand and left hand sides are determined by facing the direction the Commander III Trimmer/ Slipform Paver will travel during paving operations. The control console faces forward direction of travel and the engine is on the right side of the machine frame.

Record your Commander III Trimmer/Slipform Paver serial numbers in the appropriate spaces provided on the title page. Your GOMACO dealer needs this information to give you prompt, efficient service when you order parts. It pays to rely on an authorized GOMACO Distributor for your service needs. For the location of the Distributor nearest you, contact GOMACO.

NOTE: It is GOMACO's policy to constantly strive to improve GOMACO products. The information, specifications, and illustrations in this publication are based on the information in effect at the time of approval for printing and publishing. GOMACO therefore reserves the right to make changes in design and improvements whenever it is believed the efficiency of the machine will be improved without incurring any obligation to incorporate such improvements in any machine which has been shipped or is in service. It is recommended that users contact an authorized GOMACO Distributor for the latest revisions.

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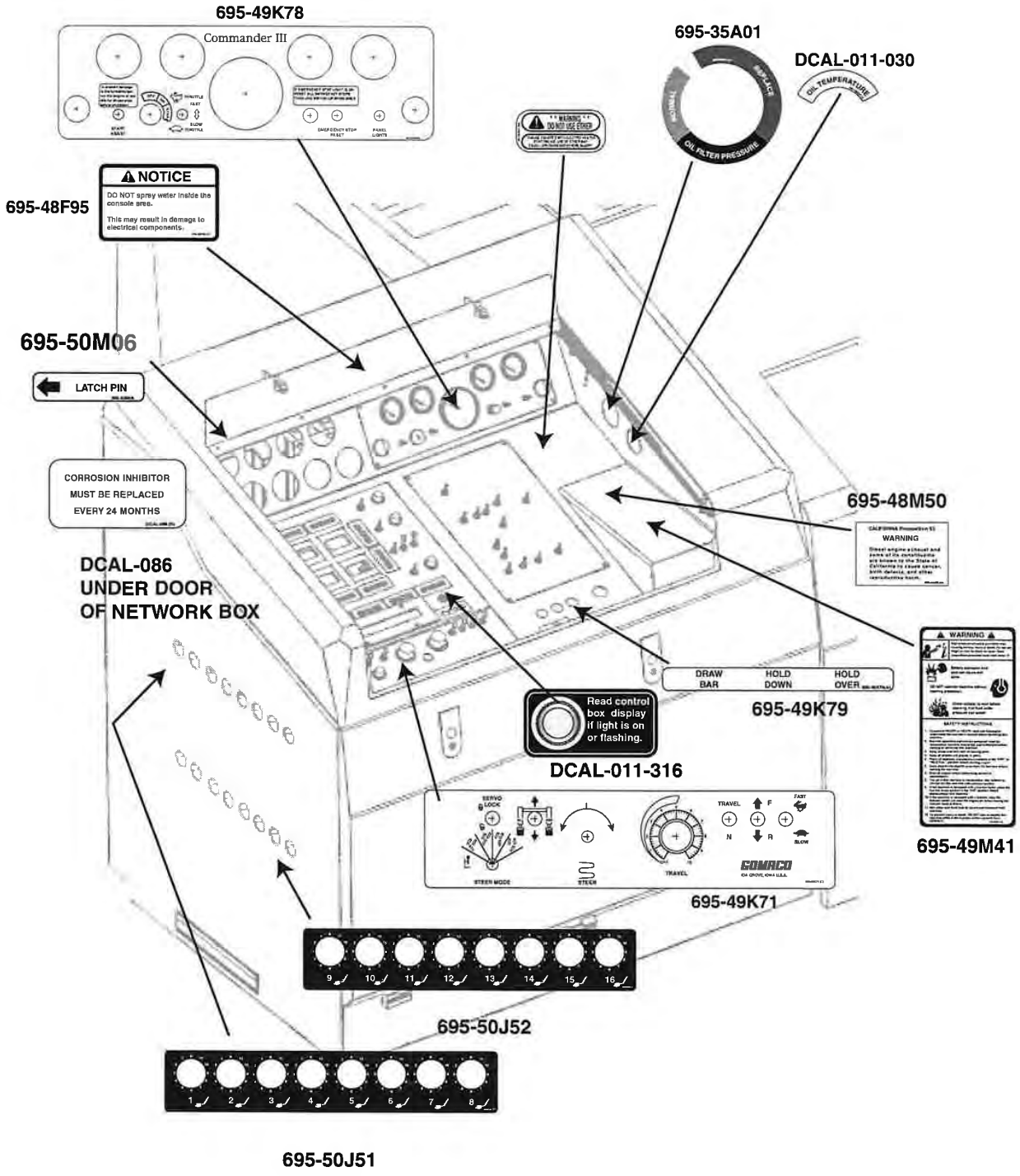
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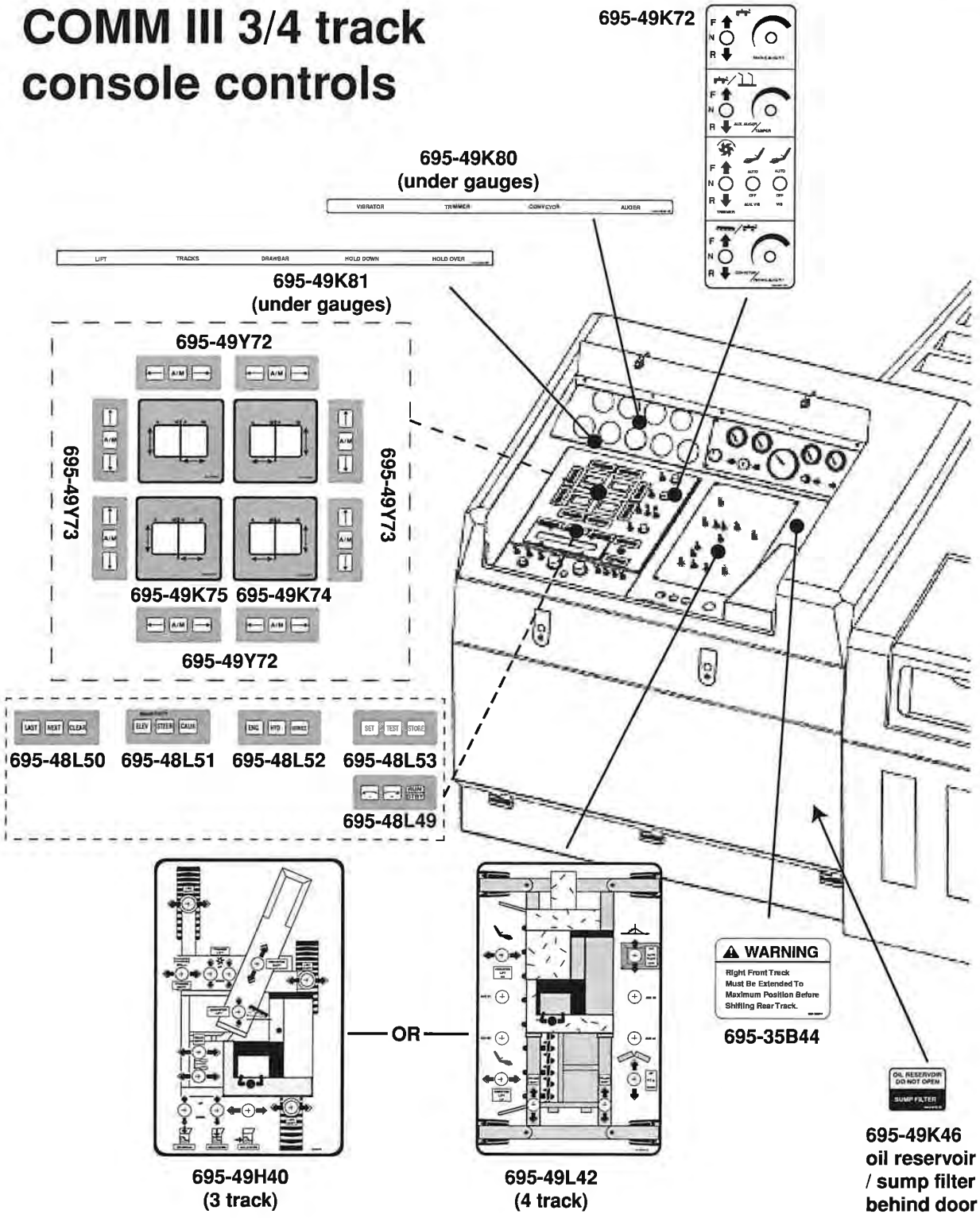
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Decal Placement



COMM III 3/4 track console controls





On remote



695-35D35

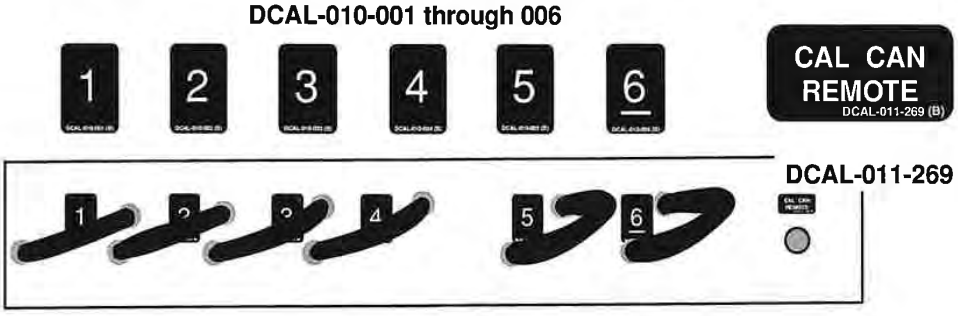
Left side of shroud on remote holder.



695-50A73

On left frame

DCAL-010-001 through 006

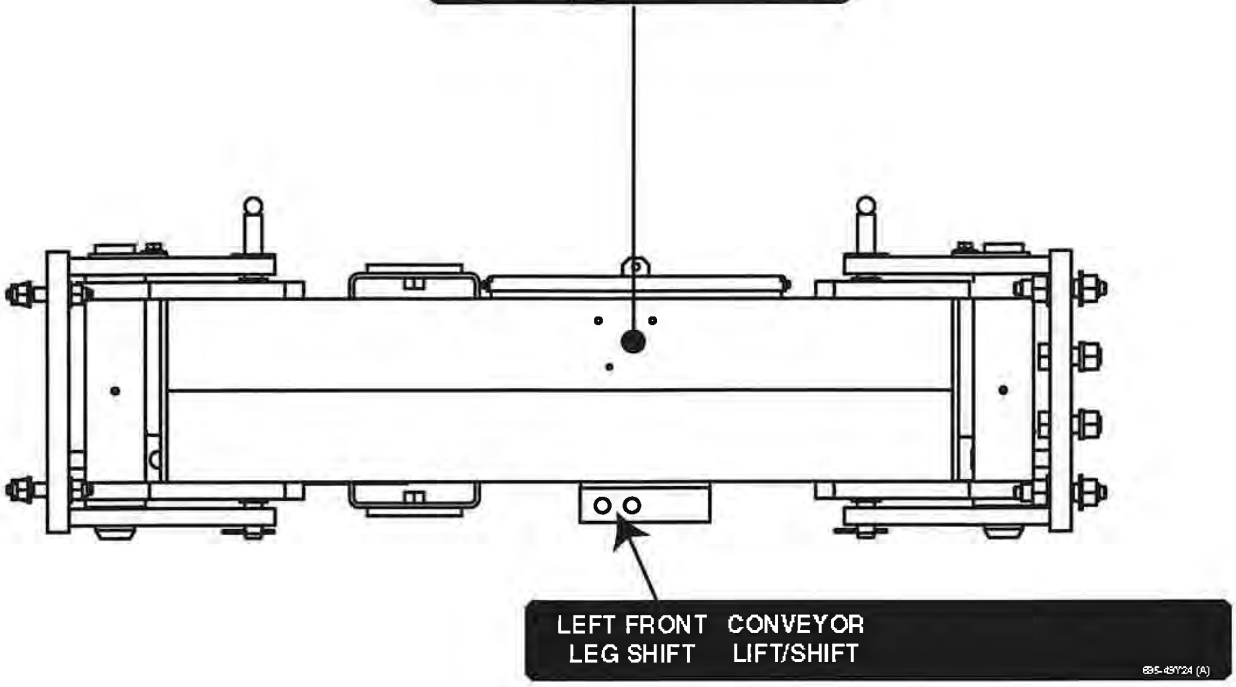


DCAL-011-269

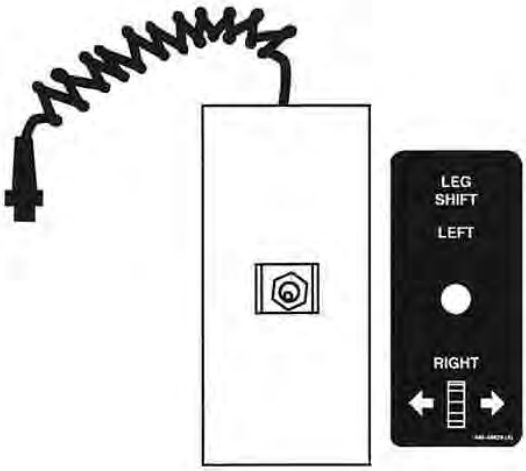
Left frame hose connections. Numbers 1 through 6 DCAL-010-001 through DCAL-010-006. Cal Can remote bulkhead connection. On frame DCAL-011-269. On remote use 695-35D35 Left/Right and 695-50A73 Cal Can on remote holder on shroud to the right of vibrator variables.



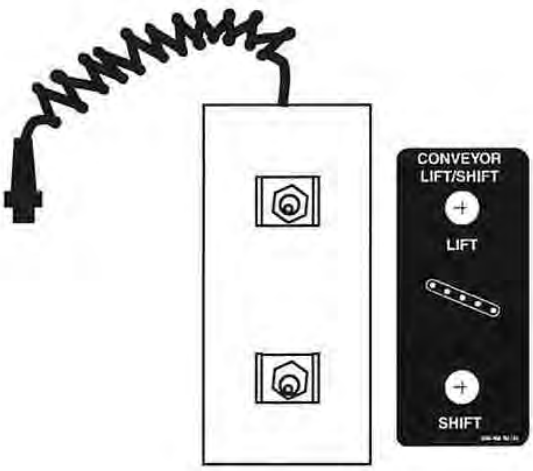
695-47T55
(on left side of left front leg pivot)



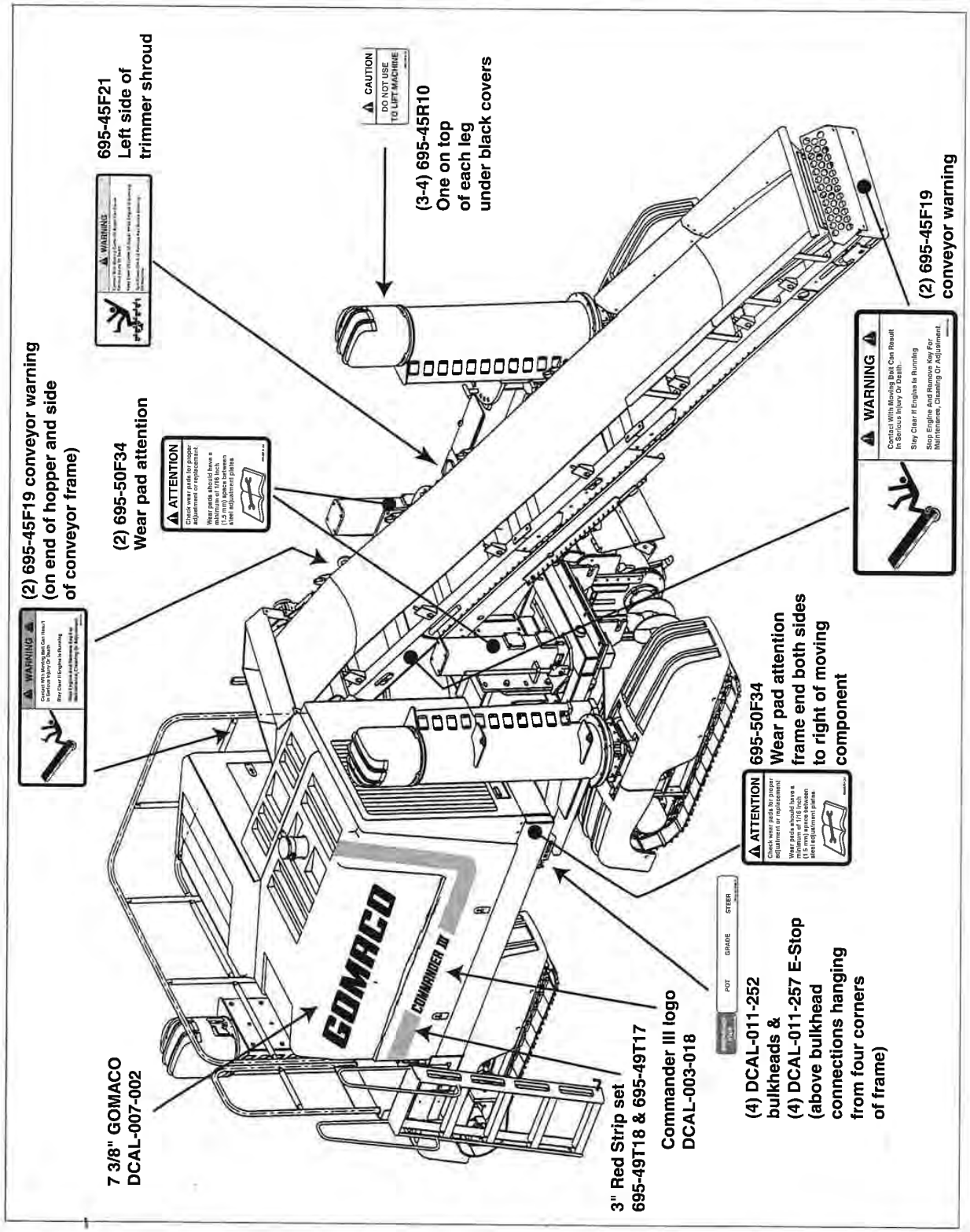
695-49Y24 Left front leg shift and conveyor lift/shift bulkheads



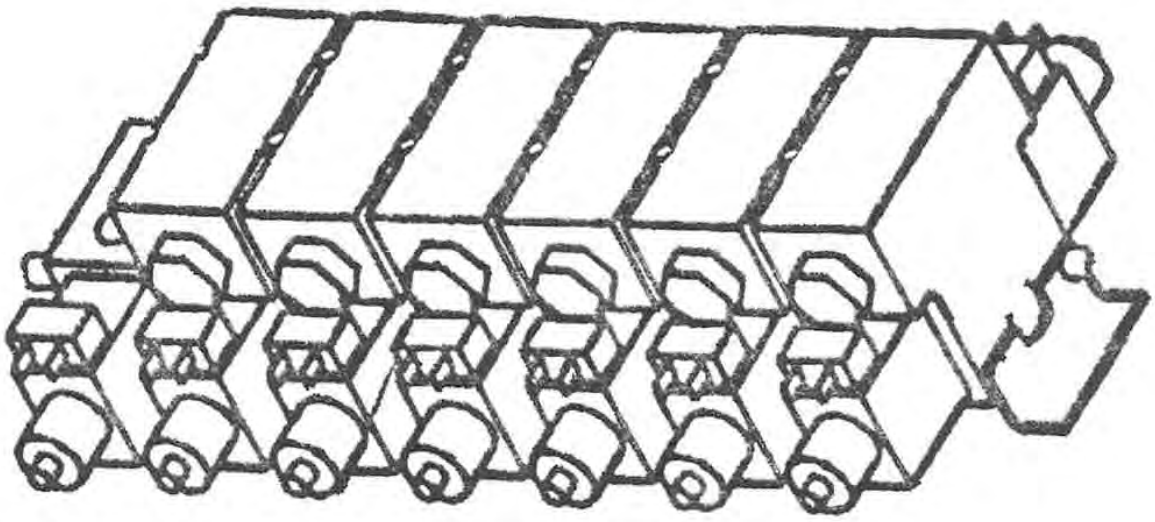
695-49K20 Leg shift
(on LF leg shift remote control)



695-49L30 conveyor lift/shift
(on remote control)


(2) 695-45F19 conveyor warning (on end of hopper and side of conveyor frame)
695-45F21 Left side of trimmer shroud
(2) 695-50F34 Wear pad attention
(3-4) 695-45R10 One on top of each leg under black covers
(2) 695-45F19 conveyor warning
7 3/8" GOMACO DCAL-007-002
3" Red Strip set 695-49T18 & 695-49T17
Commander III logo DCAL-003-018
(4) DCAL-011-252 bulkheads & (4) DCAL-011-257 E-Stop (above bulkhead connections hanging from four corners of frame)
695-50F34 Wear pad attention frame end both sides to right of moving component
WARNING
ATTENTION
CAUTION
DO NOT USE TO LIFT MACHINE
GOMACO
COMMANDER III
POT
GRADE
STEER

COMM III 3 track Rt side



POWER WASHER	CONVEYOR LIFT / PTA	RIGHT FRONT LEG SHIFT	TRIMMER LIFT LEFT / VIBRATOR POSITION LEFT	TRIMMER LIFT RIGHT / VIBRATOR POSITION RIGHT	TRIMMER SHIFT / FRAME EXTEND FRONT	CONVEYOR SLIDE / FRAME EXTEND REAR

695-50F32
Solenoid inner label

AUTO FLOAT	DRAW BAR	HOLD DOWN	FRONT LEG PIVOT	REAR LEG SHIFT	MOLD SHIFT REAR	MOLD SHIFT FRONT

695-50F33
Solenoid outer label

Place under indiividual solenoid circuits on frame piece aligning with correct circuit

Commander III inside and outside solenoid label decals

14 Track hose clamp decals:

(14 hose clamp assemblies 1 decal per clamp assembly)



DCAL-011-054
CONVEYOR
DCAL-011-058
HOLD DOWN
DCAL-011-059
TRIMMER
DCAL-011-080
AUGER
695-35C57
TRACKS
695-49W30
CONVEYOR LIFT
695-49W31
DRAW BAR
695-49W39
PIVOT LEG
695-49W40
POWER WASH
695-49W42
REAR LEG SHIFT
695-49W50
TRIMMER LIFT LEFT
695-49W51
TRIMMER LIFT RIGHT
695-49W52
TRIMMER SHIFT
695-49Y22
CONVEYOR SLIDE

Commander III 4 track hose clamp assemblies

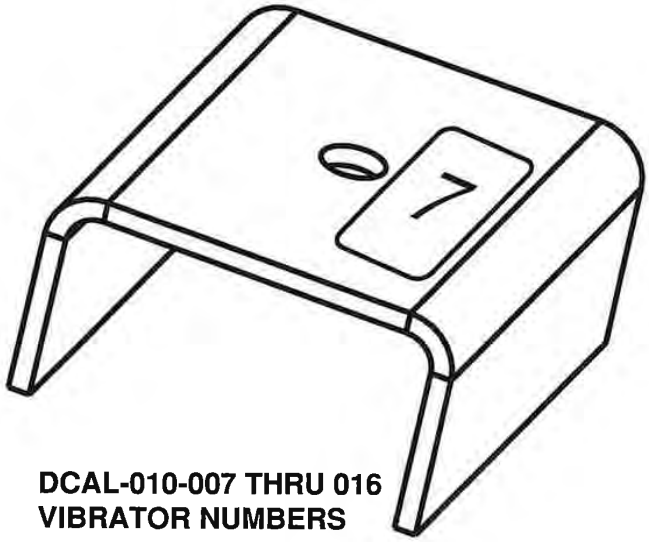
4 Track hose clamp decals: (20 hose clamp assemblies 1 decal per clamp assembly, except where noted)



Additional hose clamp assemblies for 4 track

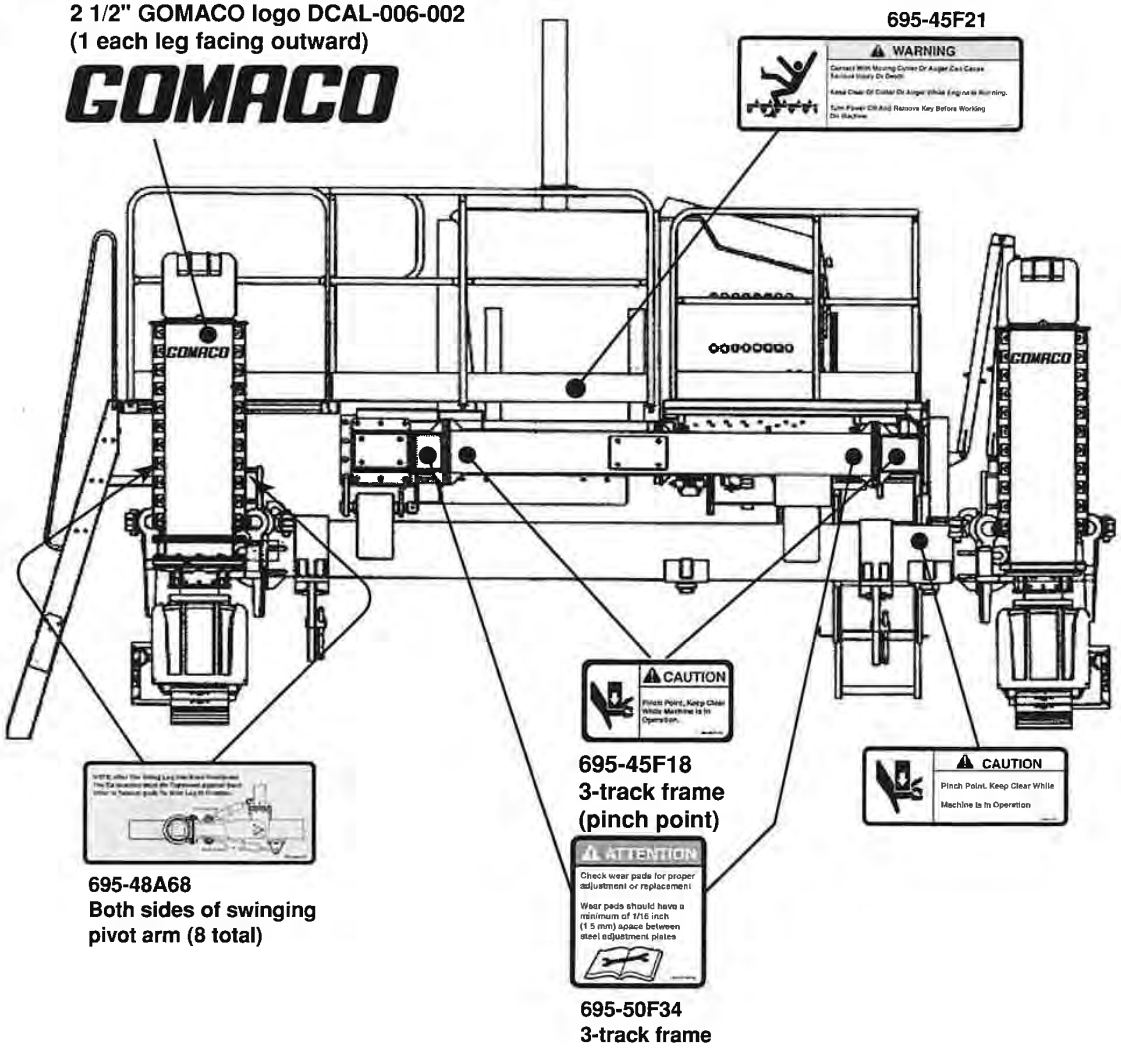
DCAL-011-453 qty 4, 1 each track track tension
DCAL-011-055 qty 4, 1 each track Track
695-50D07 qty 4, 1 each track Two speed / Case drain
695-49W44
Right front lift
695-49W45
Right front steer
695-49W46
Right rear lift
695-49W47
Right rear steer
695-49W36
Left rear lift
695-49W37
Left rear steer
695-49W34
Left front lift
695-49W35
Left front steer

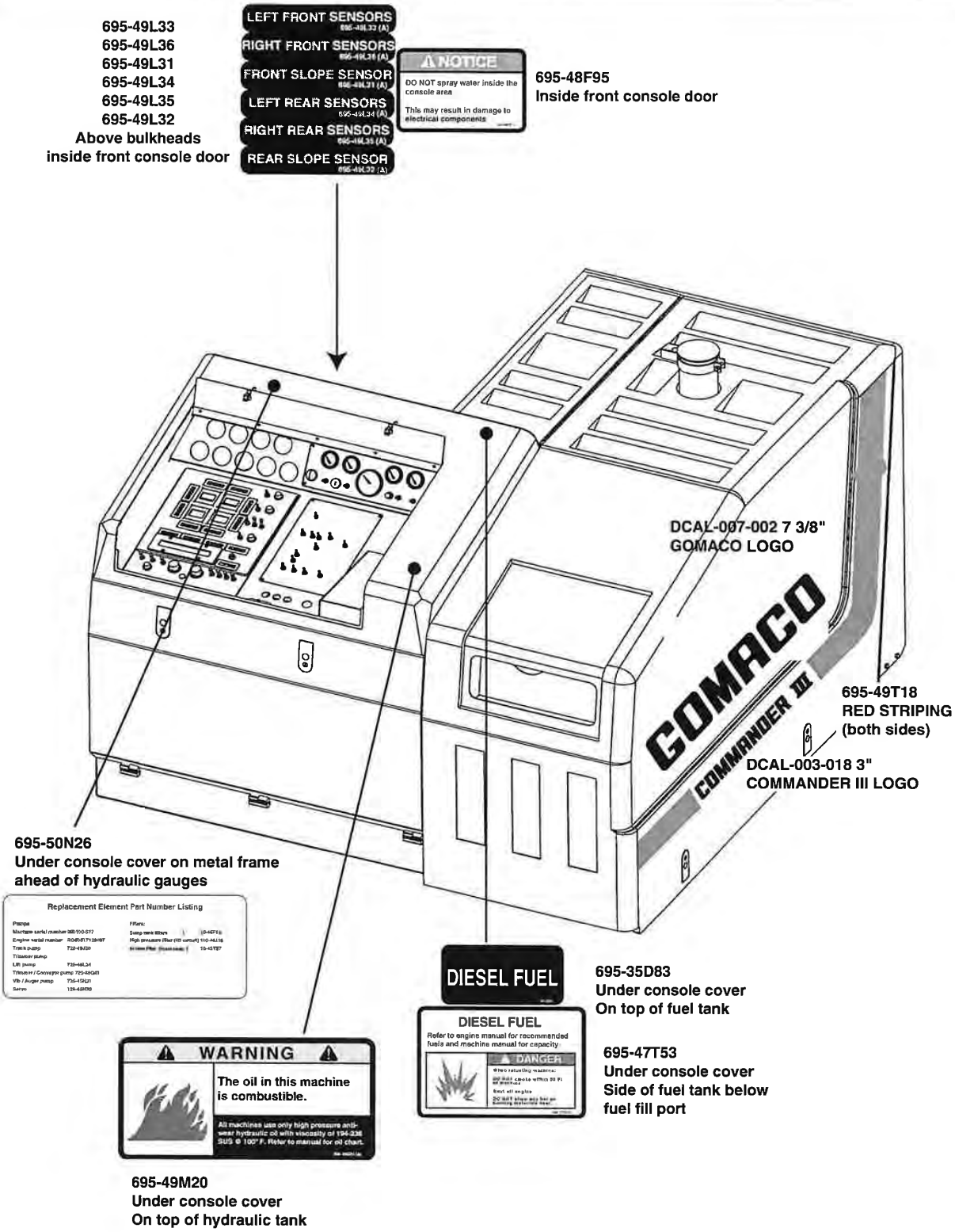
Vibrator hose clamp decals: (8 hose clamp assemblies 1 decal per clamp assembly)



DCAL-010-007 THRU 016 VIBRATOR NUMBERS

COMM III 4 track front (frame and leg)




LEFT FRONT SENSORS
RIGHT FRONT SENSORS
FRONT SLOPE SENSOR
LEFT REAR SENSORS
RIGHT REAR SENSORS
REAR SLOPE SENSOR
NOTICE
DO NOT spray water inside the console area
This may result in damage to electrical components
695-49L33
695-49L36
695-49L31
695-49L34
695-49L35
695-49L32
Above bulkheads inside front console door
695-48F95
Inside front console door
DCAL-007-002 7 3/8"
GOMACO LOGO
695-49T18
RED STRIPING
(both sides)
DCAL-003-018 3"
COMMANDER III LOGO
695-50N26
Under console cover on metal frame
ahead of hydraulic gauges
Replacement Element Part Number Listing
DIESEL FUEL
695-35D83
Under console cover
On top of fuel tank
DIESEL FUEL
Refer to engine manual for recommended fuels and machine manual for capacity
DANGER
695-47T53
Under console cover
Side of fuel tank below
fuel fill port
WARNING
The oil in this machine is combustible.
All machines use only high pressure anti-wear hydraulic oil with viscosity of 194-236 SUS @ 100° F. Refer to manual for oil chart.
695-49M20
Under console cover
On top of hydraulic tank

GENERAL SAFETY STATEMENTS

1. The C-III should only be operated by responsible persons who have thoroughly read the operators manual and have been properly instructed to do so. Do not allow unnecessary persons on the machine.
2. Be certain all shields and guards are kept in place.
3. Be certain that the trimmerhead or auger is free of debris before engaging the control valve.
4. Keep hands, feet and clothing free of moving parts. Do not wear loose fitting clothing or jewelry that can catch on controls or other parts of the machine.
5. Use steps and hand rail to mount and dismount from the C-III.
6. Be certain that the engine is shut off before performing service or maintenance on the C-III.
7. Place the tractive brake in the "on" position before loading or unloading the machine or while traveling down steep enbankments.
8. Stop the trimmer wheel or auger rotation and shut the engine off before removing debris.
9. Be certain that all hydraulic control valves and electrical controls are in the "off" position before starting the engine.
10. Wear a hard hat, protective glasses and other protective equipment as required by job conditions.
11. Report all needed repairs.

SAFETY SECTION

The safety section lists basic safety precautions. In addition, this section identifies the text and locations of warning labels used on the machine.

Read and understand the basic precautions listed in the safety section before operating or performing lubrication, maintenance and repair on this equipment.

WARNING: DO NOT OPERATE THIS EQUIPMENT UNTIL YOU HAVE READ AND THOROUGHLY UNDERSTOOD THE OPERATORS MANUAL. FAILURE TO FOLLOW THIS PROCEDURE MAY RESULT IN INJURY OR DEATH.

DANGER: DO NOT ALTER OR MODIFY THIS PRODUCT WITHOUT THE EXPRESS WRITTEN CONSENT OF THE MANUFACTURER. UNAUTHORIZED MODIFICATION MAY RESULT IN SERIOUS INJURY OR DEATH.

WARNING SIGNS AND DECALS

There are several specific safety signs or decals on your machine. Please take the time to familiarize yourself with the safety signs.

Make sure that you can read all safety signs. Clean or replace these if you cannot read the words or see the pictures. When cleaning the labels use a cloth, water and soap. Do not use solvents, gasoline, etc., to clean safety signs. The use of solvents, gasoline, etc., could loosen the sign's adhesive and cause the sign to fall off.

You must replace a label if it is damaged, missing or cannot be read. If a label is on a part that is replaced, make sure a new label is installed on the replaced part. Contact your GOMACO dealer for new labels.

HIGH PRESSURE WATER

High pressure water can cause personal injury. When using high pressure water for cleaning, wear a protective face shield, protective clothing and protective shoes. Wear eye protection at all times when cleaning the machine. Pressurized water could cause debris and/or water to be blown and result in personal injury. Do not aim the nozzle at any part of the body.

FLUID LEAKS

Always use a board or cardboard when checking for a leak. Escaping fluid under pressure, even a pin-hole size leak, can penetrate body tissue, causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated by a doctor familiar with this type of injury immediately.

Do not bend or strike high pressure lines. Do not install bent or damaged lines, tubes or hoses.

Repair any loose or damaged fuel and oil lines, tubes and hoses. Leaks can cause fires.

Inspect all lines, tubes and hoses carefully. Do not use your bare hands to check for leaks. Tighten all connections securely.

Check for the following:

-End fittings damaged or leaking.

-Outer covering chafed or cut and wire reinforcing exposed.

-Outer covering ballooning locally.

-Evidence of kinking or crushing of the flexible part of the hose.

-End fittings displaced.

BURN PREVENTION

Do not touch any part of an operating engine. Allow the engine to cool before any repairs are performed on the engine.

Do not touch any hydraulic tank, valve or hose when at operating temperature. Allow the hydraulic oil to cool before performing any service on the hydraulic circuits.

Relieve all pressure in oil, fuel or cooling systems before any lines, fittings or related items are disconnected or removed.

COOLANT

At operating temperature, the engine coolant is hot and under pressure. The radiator and all lines to the engine contain hot coolant. When pressure is relieved rapidly, this hot coolant can turn into steam.

Any contact with hot coolant or steam can cause severe burns.

Check the coolant level only after the engine has been stopped and the filler cap is cool enough to remove with your bare hand.

Remove the cooling system filler cap slowly to relieve pressure.

Cooling system additive contains alkali. To prevent personal injury, avoid contact with the skin and eyes and do not drink.

Allow cooling system components to cool before draining.

BATTERIES

Battery electrolyte contains acid and can cause injury. Avoid contact with the skin and eyes.

Wash hands after touching batteries and connectors. Use of gloves is recommended.

Batteries give off flammable fumes which can explode.

Do not smoke when observing the battery electrolyte levels.

Always wear protective glasses when working with batteries.

FIRE OR EXPLOSION PREVENTION

All fuels, most lubricants and some coolant mixtures are flammable.

Diesel fuel is flammable. Gasoline is flammable. The mixture of diesel and gasoline fumes are extremely explosive.

Do not smoke in areas where batteries are charged, or where flammable materials are stored.

Keep all fuels and lubricants stored in properly marked containers and away from all unauthorized persons.

Store all oily rags or other flammable material in a protective container, in a safe place.

Do not weld or flame cut the frame, pipes or tubes that contain flammable fluids without prior authorization and instruction from GOMACO or a GOMACO authorized dealer. Do not weld on the machine with the battery connected. Disconnect the battery negative (-) ground cable to prevent damage to the electrical system and /or explosion.

Remove all flammable materials such as fuel, oil and other debris before they accumulate on the engine or other components of the machine.

Do not expose the engine or hydraulic components to flames if at all possible.

Have a fire extinguisher available and know how to use it. Inspect and have it serviced as recommended on the instruction plate.

When starting from an external source, always connect the positive (+) jumper cable to the POSITIVE (+) terminal of the battery of the engine to be started.

To prevent potential sparks from igniting combustible gases produced by some batteries, attach the negative (-) boost ground cable last, to the starter NEGATIVE (-) terminal (if equipped) or to the engine block.

Clean and tighten all electrical connections. Check daily for loose or frayed electrical wires. Have all loose or frayed electrical wires tightened, repaired or replaced before operating the machine.

CRUSHING OR CUTTING PREVENTION

Support equipment and attachments properly when working beneath them.

Never attempt adjustments while the engine is running unless otherwise specified in this manual.

Stay clear of all rotating and moving parts. Guards should be in place whenever maintenance is not being performed.

Wear protective glasses when striking objects to avoid injury to your eyes.

Chips or other debris can fly off objects when struck. Make sure no one can be injured by flying debris before striking any object.

MOUNTING AND DISMOUNTING

Do not jump off the machine. Always use steps and handholds when mounting and dismounting.

Clean steps, handholds and areas of the machine you will be working on or around.

PREPARING TO START THE MACHINE

Be sure that all protective guards and covers are installed if the machine must be started to make adjustments or checks. To help prevent an accident caused by parts in rotation, work carefully around them.

Inspect the machine for potential hazards.

Make sure no one is working on, or close to the machine before starting or moving it.

Commander III Spare Parts

Engine Oil Filter

Cat	210-48N41
Cummins	210-49B89
John Deere	210-50A89

Engine Primary Fuel Filter

Cat	210-48N42
Cummins	210-49T55
John Deere	210-50A90

Engine Secondary Fuel Filter

Cummins	210-47J05
John Deere	210-50A91

Engine

Air Filter Primary	210-49H81
Air Filter Secondary	210-49H82
Air Compressor Filter Element – Cummins	210-45A35
Main Hydraulic Filter Element	110-10C51
High Pressure Filter Element	110-45Q53
Sump Filter Element	110-46F19
Sump Filter Access Cover Gasket	GT60-396
Access Cover Bolt Rubber Seal Washer	420-30A96

Network Controller System

Grade/Steering Sensor	500-46D83
Slope Sensor	500-46Y35
S2X	500-49J69
Main Control Panel Module	500-48T15
Switch Membrane	530-48L59
Deviation Meter Assembly	500-49Y70
Sensor Coil Cord (20 ft.)	520-48D40
Servo Valve (5 gpm)	125-45N30
Servo Valve Mounting O-Rings (4 Required)	160-10Y37
Grade Sensor Wand (Complete)	500-15A77
Sensor Wand Tube	500-15A80
Thumb Screw Grade Wand	500-10P87
Thumb Screw O-Ring Grade Wand	500-10P88
Steering Sensor Wand Assembly	500-15A69
Thumb Screw Steering Wand	500-10F69
0-3000 psi Pressure Gauge	700-35A46
Ignition Switch Key	210-48W43
Console Cover Key	730-49K60
Vibrator Bent	GT11-046

Relief Cartridges

E-Stop Relief Cartridge	125-49R80
Vibrator Valve Stem N/O	125-49A17
Vibrator Relief Cartridge	125-45Q88
Vibrator Variable Relief Cartridge	125-45Q87

Solenoid Valve

Stack Valve Single w/PO Checks	125-46G66
Stack Valve Single w/o PO Checks End Bank	125-49J39

Apitech Valve

Solenoid Pulsar	125-48H64
Cartridge Valve Pilot 200 psi	125-49G75

Electrical

8 Amp Circuit Breaker	525-10S43
10 Amp Circuit Breaker	525-10S44
20 Amp Circuit Breaker	525-10S45
Power Relay 200 amp 12v	500-47B35
Coil Cord Smart Cylinders	WH01-0046

Quick Coupler O-Rings

3/8 in	160-10J99
1/2 in	160-10K03
3/4 in	160-10K01

Conveyor Discharge Chute (5 ft)	900117-133

Trimmer Teeth (Carbide Tip)	730-45J82

Chapter II Control and Gauges

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03 Hydraulic Controls and Gauges **2-3**
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Chapter II Control and Gauges

01 Content of Chapter

This chapter gives a description of all engine, hydraulic and electrical controls used on the Commander III. The basic operating procedures for the Commander III are also covered. Read this chapter thoroughly to identify yourself with all controls and operations. **Pay particular attention to all safety statements.**

NOTICE



WARNING!
DO NOT OPERATE THIS EQUIPMENT UNTIL YOU HAVE READ AND THOROUGHLY UNDERSTAND THE OPERATORS MANUAL. FAILURE TO FOLLOW THIS PROCEDURE MAY RESULT IN INJURY OR DEATH.

DANGER!
DO NOT ALTER OR MODIFY THIS PRODUCT WITHOUT THE EXPRESS WRITTEN CONSENT OF THE MANUFACTURER.
UNAUTHORIZED MODIFICATION MAY RESULT IN SERIOUS INJURY OR DEATH.

DCAL-058

02 Engine Controls and Gauges



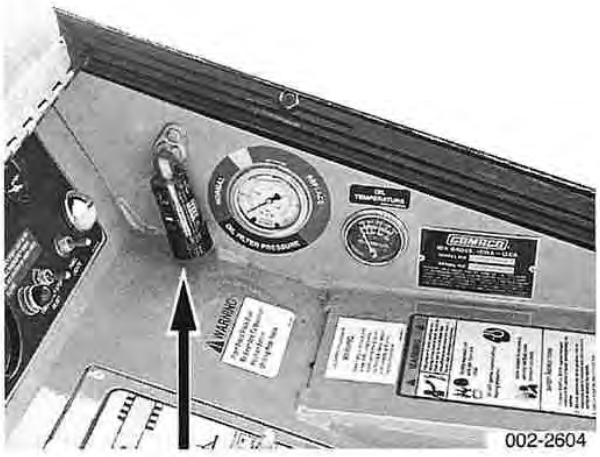
Engine Pre-Heater Light

DANGER!

DO NOT USE ETHER. INTAKE MANIFOLD FLAME HEATER STARTING AID HAS OPEN FLAME. ETHER MAY CAUSE EXPLOSION AND SEVERE INJURY.

Note: The engine pre-heater is only available on machines equipped with the Cummins 6BTA 197 HP engine.

Engine Pre-Heater Light: Indicates when the engine pre-heater is operating. To initiate the preheat cycle time, turn the ignition switch to the "on" position. The light should be illuminated if preheating is required. When the light stops illuminating, the engine may be cranked to start. If after 10 seconds, the engine does not start, initiate the preheat cycle again to reduce battery drainage.



Air filter restriction indicator

Air Filter Restriction Indicator: Monitors the amount of engine air intake restriction. As the air intake restriction increases, the line will move higher on the indicator. When the engine is stopped, the line will lock in place. When the line shows in the service indicator window, the air filter requires replacement. Push in on the button in the bottom and release it to reset the indicator.



Engine controls and gauges

WARNING!

DIESEL FUEL IS FLAMMABLE. WHEN REFUELING THE MACHINE, STOP THE ENGINE. DO NOT SMOKE WITHIN 50 FT. (15 M) OF THE MACHINE. DO NOT ALLOW ANY HOT OR BURNING MATERIALS NEAR THE FUEL FILL LOCATION. SEVERE BURNS MAY OCCUR IF THE FUEL WERE TO IGNITE.

Fuel Gauge: Monitors the amount of diesel fuel in the reservoir. "F" indicates a full reservoir. Refill the reservoir when the gauge indicates "E": or slightly above. The fuel tank capacity is 55 gallons (208 liters).

Engine Oil Pressure: Indicates engine oil pressure. Normal operating pressure is 65 psi (4.5 bar) at 2250 RPM for Cummins engines. Refer to the appropriate engine operators manual for additional instructions.

Tachometer and Hour Meter: Electrically operated and registers engine rpm and hours of operation. Driven by the alternator. Normal operating speed is 2250 rpm (maximum).

Engine Water Temperature: Indicates operating temperature of the engine coolant. Normal operating temperature is approximately 190-200° F (88-93.4° C.) for Cummins engines, depending on ambient air temperature. If the temperature rises above 220° F. (104.4° C.) locate the cause and correct.

Voltage Meter: Indicates voltage in the electrical circuits. Normal indication is a 13-14 volt charge at 2250 rpm.

⚠ CAUTION! ⚠

CONTINUOUS EXPOSURE TO ENGINE AND MACHINE NOISE CAN CAUSE HEARING INJURY. DO NOT OPERATE THE MACHINE WITHOUT ADEQUATE HEARING PROTECTION.

Start Assist Switch: The Cummins engine is equipped with an automatic stop system that will stop the engine if the oil pressure drops below a set amount. The start assist switch is used to override the automatic engine stop system while cranking the engine. Depress the switch while cranking the engine and continue to hold it in the bypass position after the engine starts. Release the switch when the engine oil pressure has increased sufficiently.

Ignition Switch: "On/off/start" positions. "Off" position shuts off the electrical power to the electronic controls and stops the engine. "On" position supplies electrical power to the electronic controls and the engine fuel solenoid to open it. "Start" position is used for starting the engine. After the engine starts, allow the switch to return to the "on" position. Turning the ignition switch to the "off" position will stop the engine.

> **Note:** The start assist switch must be depressed when starting the engine.

Engine Throttle Switch: Controls the engine speed. Depressing the switch in the "up" position will cause the engine rpm to increase. Depressing the switch in the "down" position will cause the engine rpm to decrease. Releasing the spring loaded switch will lock the throttle in any given position. Normal operating engine speed is 2250 rpm (maximum throttle).

Panel Light Switch: Used to operate the lights on the control panel. The "up" position will illuminate the panel lights and the "down" position will turn the lights off.



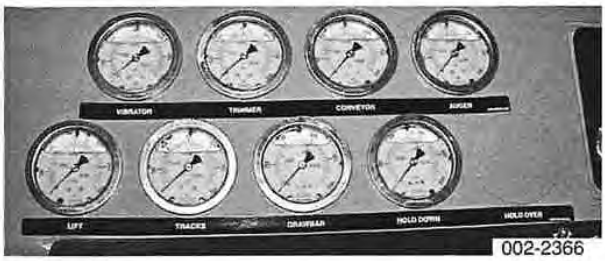
Master disconnect switch

⚠ CAUTION! ⚠

WHEN SERVICING THE ELECTRICAL SYSTEM OR WELDING ON THE MACHINE, ALWAYS DISCONNECT THE GROUND STRAP FROM THE BATTERY(S) TO PREVENT DAMAGE TO THE MACHINE ELECTRICAL SYSTEMS.

Master Disconnect Switch: The master disconnect switch is used to disconnect the ground side of the electrical system from the negative post of the battery. With the switch in the "off" position, ground to all electrical circuits is disconnected and the circuits will not operate. When the switch is turned to the "on" position, a ground is provided to the electrical circuits, allowing them to operate. The switch must be in the "on" position during normal operation.

03 Hydraulic Controls and Gauges



Hydraulic gauges

Vibrator Pressure Gauge: Monitors the amount of pressure required to operate the vibrator circuit. Amount of pressure required will depend on the number of vibrators being operated and their speed. Normal operating pressure range is 500 to 1500 psi (34 to 103.4 bar). Relief pressure setting for the vibrator system is 1850 psi (127 bar).

Trimmerhead Pressure Gauge: Monitors pressure required to drive the trimmer wheel. Normal operating pressure range is 500 to 2100 psi (34 to 144 bar). Pressure will vary depending on depth of cut, width of cut, grade density and forward travel speed. Relief pressure setting for the trimmer system is 2450 psi (169 bar).

When the machine is equipped with the auxiliary vibrator manifold, the trimmer hydraulic system is used to operate the auxiliary vibrators. The trimmerhead pressure gauge will monitor the normal operating pressure range from 500 to 1500 psi (34 to 103.4 bar). Relief pressure setting for the auxiliary vibrator system is 1850 psi (127 bar).

Conveyor Pressure Gauge: Monitors the amount of pressure required to operate the charging conveyor. Amount of pressure required will depend on the amount of concrete on the conveyor. Normal operating pressure range is 500 to 2000 psi (34 to 138 bar). Relief pressure setting for the conveyor system is 2500 psi (172 bar).

> **Note:** When the machine is equipped with a paving form, the conveyor pressure gauge is used to monitor dual paving augers in the slipform mold that are controlled separately.

Auger Pressure Gauge: Monitors the amount of pressure required to operate the auger. Amount of pressure required will depend on the amount of concrete in the auger. Normal operating pressure range is 500 to 1800 psi (34 to 124 bar). Relief pressure setting for the auger system is 2300 psi (158 bar).

> **Note:** When the machine is equipped with a paving form, the auger pressure gauge is used to monitor a tamper bar in the slipform mold.

Lift Pressure Gauge: Monitors the amount of hydraulic pressure available for machine elevation and steering control. Normal lift pressure is 2000 psi (138 bar).

> **Note:** If the lift pressure drops below 1000 PSI (69 bar), the machine control may become slow.

Track Pressure Gauge: Monitors the amount of pressure required to operate the track drive system in forward or reverse. Normal operating pressure range is 500 to 2300 psi (48 to 158 bar). Relief pressure setting for the tractive system is 2800 psi (193 bar).

Drawbar Pressure Gauge: Monitors the amount of pressure applied to the hydraulic cylinder holding the front of the slipform mold down in contact with the concrete. The regulated pressure range is 0 to 600 psi (0 to 41 bar).

Form Hold-down Pressure Gauge: Monitors the amount of pressure applied to the hydraulic cylinder holding the rear of the slipform mold down in contact with the concrete. The regulated pressure range is 0 to 600 psi (0 to 41 bar).

Form Hold-Over Pressure Gauge (Option): Monitors the amount of pressure applied to the hydraulic cylinder holding the rear of the slipform mold over in contact with an existing concrete surface for scab on placement. The regulated pressure range is 0 to 600 psi (0 to 41 bar).



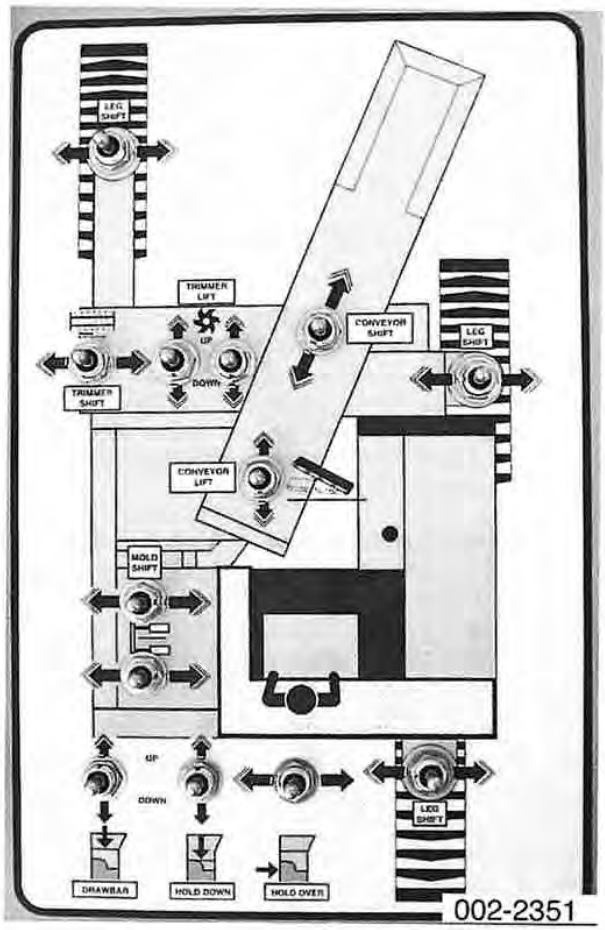
Filter and oil temperature gauges

Hydraulic Filter Pressure Gauge: Monitors the amount of pressure required to force the hydraulic oil through the main hydraulic filter. Normal operating pressure is below 25 psi (1.72 bar). During cold weather start-up, the filter pressure may exceed 25 psi (1.72 bar). The filter must be changed when the gauge registers in the replace area with the hydraulic fluid at operating temperature.

Hydraulic Oil Temperature Gauge: Monitors the hydraulic oil temperature. Normal operating temperature is 140° to 180° F (60° to 82° C) depending on the ambient temperature. If the hydraulic oil temperature rises above 195° F. (90.5° C), locate the cause of the overheating. Overheating can be caused by excessive load on all systems on a warm day, air flow through the oil cooler(s) restricted and/or by a system that is constantly exceeding relief pressure. The overheating can be corrected by reducing the load on all systems on a warm day, cleaning the oil cooler(s) fins, and/or by reducing the load on the various systems to maintain pressure below relief setting.

Note: Excessive oil temperature may cause serious damage to components.

04 Control Switches



Three track control switches

The three track control panel module contains all switches that are required to operate the machine for curb and gutter and sidewalk operations. The three track control panel module may be replaced with the four track control panel module when the machine is assembled for four track operations. To exchange the panels, disconnect the cable bulkheads and remove the four nuts and lock washers from the rear of the panel. Insert the appropriate panel and attach the appropriate bulkhead cables. Tighten the nuts and lock washers securely.

Left Front Leg Pivot Switch: Controls the lateral movement of the left front leg from straight ahead to 21 inches to the left and 12 inches to the right. The left front leg can be positioned anywhere in this area. Moving the switch to the "left" position will move it to the left and moving the switch to the "right" position will cause it to move right.

Trimmerhead Shift Switch: Controls the lateral positioning of the trimmerhead up to 36 inches (91 cm) to the left side of the machine. The trimmerhead can be positioned anywhere in this area. Moving the switch to the "left" position will cause the trimmerhead to shift left and moving the switch to the "right" position will cause it to shift right.

Trimmerhead Lift Switches (Left and Right): Controls the vertical movement of the trimmerhead up to 18 inches (45 cm). The trimmerhead can be positioned anywhere in this area. Moving the switches to the "up" position will cause the trimmerhead to raise and moving the switches to the "down" position will cause it to lower. The cylinder mount may be manually lowered an additional 6 inches (15 cm) if necessary.

Conveyor Shift Switch: Controls the longitudinal movement of the conveyor assembly to allow the conveyor easier access to the slipform mold hopper in any of its positions up to 36 inches (91 cm). Moving the switch to the "up" position, will cause the conveyor frame to shift up towards the slipform mold and will cause it to shift down when moved to the "down" position. Remove the retaining pin in the conveyor shift frame while shifting the frame and replace it when finished to maintain the new position.

Right Front Leg Shift Switch: Controls the lateral movement of the right front leg from flush with the side of the machine to 36 inches (91 cm) to the right. The right front leg can be positioned anywhere in this area. Moving the switch to the "left" position will move it left and moving the switch to the "right" position will cause it to move right. The leg will maintain its lateral position when the switch is allowed to return to center.

Conveyor Lift Switch: Controls the vertical movement of the receiving hopper end of the conveyor to allow easier concrete discharge from supply trucks. "Up" will raise the receiving end of the conveyor and "down" will lower it. The conveyor will maintain its vertical position when the valve is allowed to return to center. Be certain to remove the pin from the two piece tube under the conveyor mount. The pin can be placed through the inner tube to limit the downward travel of the conveyor.

Mold Shift Switches (Front and Rear): Controls the lateral positioning of the slipform mold up to 36 inches (91 cm) to the left side of the machine. The slipform mold can be positioned anywhere in this area. Moving the switches to the "left" position will cause the slipform mold to shift left and moving the switches to the "right" position will cause it to shift right.

Drawbar Hold Down Switch: Controls the hydraulic cylinder used to hold the front of the slipform mold down in firm contact with the concrete. Moving the switch to the "up" position will cause the slipform mold to raise and moving the switch to the "down" position will cause it to lower. Center position will stop the slipform mold in a given position, but will not necessarily hold it in that position. The switch is used in conjunction with the drawbar hold-down pressure control valve and must be operated in the "down" position during pouring operations. Up to 18 inches (45 cm) of cylinder stroke is available with an additional 6 inches (15 cm) of manual adjustment on the mounting flange.

Hold Down Switch: Controls the hydraulic cylinder used to hold the rear of the slipform mold down in firm contact with the concrete. Moving the switch to the "up" position will cause the slipform mold to raise and moving the switch to the "down" position will cause it to lower. Center position will stop the form in a given position, but will not necessarily hold it in that position. The valve is used in conjunction with the hold-down pressure control valve and must be operated in the "down" position during pouring operations.

Hold Over Switch: Controls the hydraulic cylinder used to hold the rear of the slipform mold against the existing roadway when pouring against it (scab on). Placing the switch in the "left" position will pull the slipform away from the existing roadway and "right" will push the slipform against the roadway. The center position will stop the form in a given place, but will not necessarily hold it there. The switch is used in conjunction with the hold over pressure control valve and must be operated in the "down" position during pouring operations.

> **Note:** The hold over control system is an optional system.

Rear Leg Shift Switch: Controls the lateral repositioning of the rear leg assembly from centered at the rear of the machine to 24 inches (60 cm) to the left. Moving the switch to the "left" position, will cause the leg to shift to the left and will cause it to shift right when moved to the "right" position. The leg will maintain its lateral position when the switch is allowed to return to center.



Left front leg pivot remote

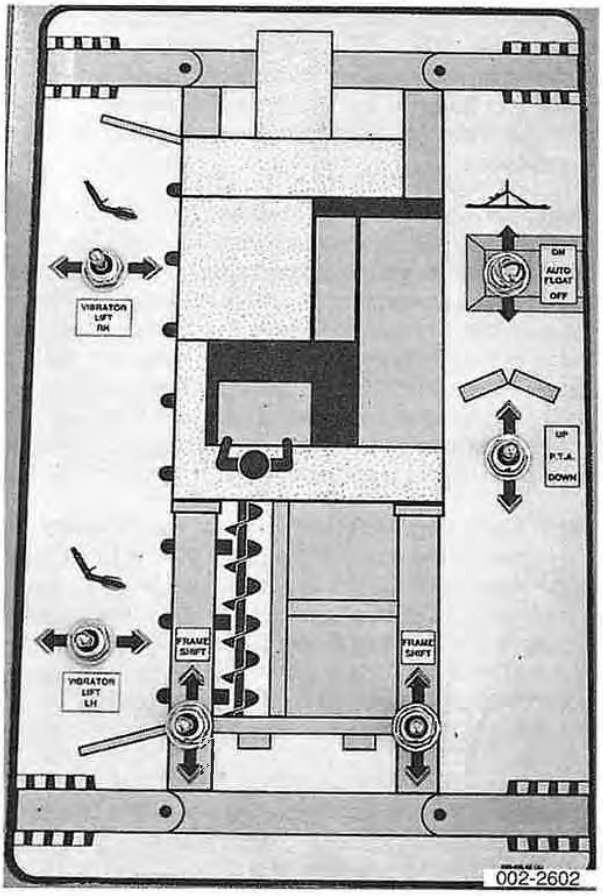
Remote Left Front Leg Pivot Switch: Controls the lateral movement of the left front leg from straight ahead to 21 inches to the left and 12 inches to the right. The left front leg can be positioned anywhere in this area. Moving the switch to the "left" position will move it to the left and moving the switch to the "right" position will cause it to move right.



Conveyor shift and lift remote

Remote Conveyor Shift Switch: Controls the longitudinal movement of the conveyor assembly to allow the conveyor easier access to the slipform mold hopper in any of its positions up to 36 inches (91 cm). Moving the switch to the "up" position, will cause the conveyor frame to shift up towards the slipform mold and will cause it to shift down when moved to the "down" position. Remove the retaining pin in the conveyor shift frame while shifting the frame and replace it when finished to maintain the new position.

Remote Conveyor Lift Switch: Controls the vertical movement of the receiving hopper end of the conveyor to allow easier concrete discharge from supply trucks. "Up" will raise the receiving end of the conveyor and "down" will lower it. The conveyor will maintain its vertical position when the valve is allowed to return to center. Be certain to remove the pin from the two piece tube under the conveyor mount. The pin can be placed through the inner tube to limit the downward travel of the conveyor.



Four track control switches

The four track control panel replaces the three track control panel when the machine is assembled for four track operations. To exchange the panels, disconnect the cable bulkheads and remove the four nuts and lock washers from the rear of the panel. Insert the appropriate panel and attach the appropriate bulkhead cables. Tighten the nuts and lock washers securely.

Vibrator Position Switches: Used to control the up and down positioning of the vibrators. Moving the switch in the "up" direction will raise the vibrators to clear expansion material or headers. Moving the

switch in the "down" direction will lower the vibrators into the concrete.

Auto Float® Off/On Switch: Used to keep the optional Auto Float® from running when moving the machine about the job. When the switch is in the "on" position, the starting and stopping of the Auto Float® is controlled by the position of the travel variable speed control knob and/or the neutral/travel switch. When the speed control is in the "off" position, or the neutral/travel switch is placed in the "neutral" position, the Auto Float® will stop. The Auto Float® will begin operation when the speed control is rotated in the increase direction and the neutral/travel switch is placed in the "travel" position. When the switch is in the "off" position, the Auto Float® will not run when the speed control is rotated in the increase direction. The switch must be in the "on" position during pouring operations.

> **Note:** The Auto Float® will only operate when the machine is traveling in the forward direction.

Powered Transition Adjuster (PTA) Switch: Used to adjust the crown in the slipform mold during pouring operations. "Up" position increases the amount of crown and "down" position decreases the amount of crown.

Frame Extend Switches: Used to hydraulically extend the left main frame up to 6 feet (1.83 M) on the left side. Moving the extend switches to the "out" position will extend the frame and moving the switches to the "in" position will retract the frame. Both switches should be operated simultaneously to extend or retract the frame evenly. The outside frame clamps must be loosened before extending or retracting the frame.

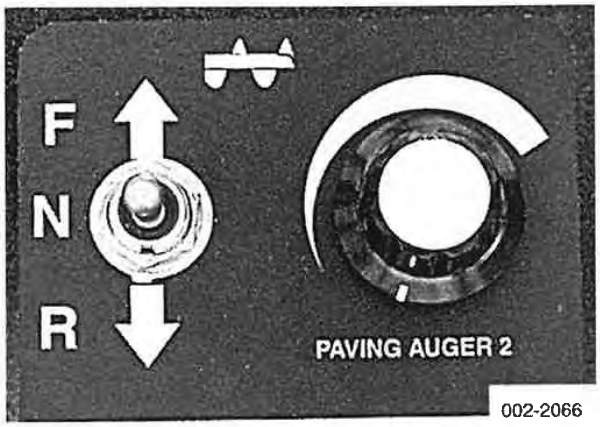


Slipform mold pressure controls

Drawbar Hold Down Pressure Control Valve: Used to adjust the amount of pressure holding the front of the slipform mold down on the concrete. Adjustable from 30 to 600 psi (2.1 to 41.4 bar) by turning the control knob clockwise to increase pressure and counterclockwise to decrease pressure.

Hold Down Pressure Control Valve: Used to adjust the amount of pressure holding the rear of the slipform mold down on the concrete. Adjustable from 30 to 600 psi (2.1 to 41.4 bar) by turning the control knob clockwise to increase pressure and counterclockwise to decrease pressure.

Holdover Pressure Control Valve (optional): Used to adjust the amount of pressure holding the rear of the slipform mold against the existing roadway. Adjustable from 30 to 600 psi (2.1 to 41.4 bar) by turning the control knob clockwise to increase pressure and counterclockwise to decrease pressure.



Number 2 paving auger controls

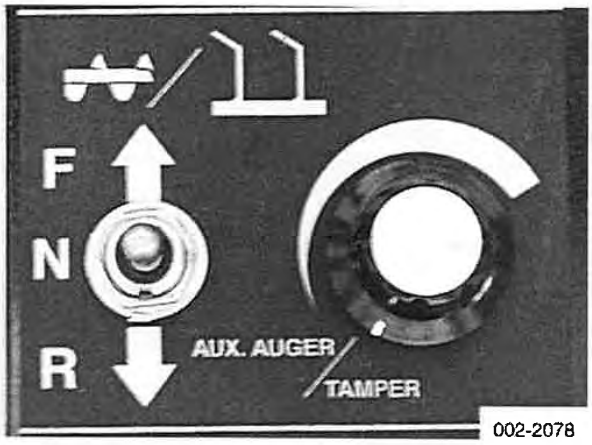
Paving Auger Forward/Neutral/Reverse Switch: Controls the rotation direction of the number 2 paving auger when operating the machine in four track mode. "F" position will cause the auger to rotate to the right and "R" position will rotate the auger to the left. "N" position will stop the operation of the auger.

> **Note:** The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.

Paving Auger Variable Speed Knob: Used to control the speed of the paving auger in either forward or reverse directions of rotation. The control knob can also be used to start and stop the auger. With the control knob in the "off" position (all the way counterclockwise) the auger will not move. Turning the knob in the increase direction (clockwise) will start the auger rotating in the desired direction or will increase the rotation speed if the auger is already rotating. Turning the knob in the decrease direction

(counterclockwise) will reduce the rotation speed, or will stop the auger if turned far enough.

Note: The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.



Auxiliary auger or tamper bar controls

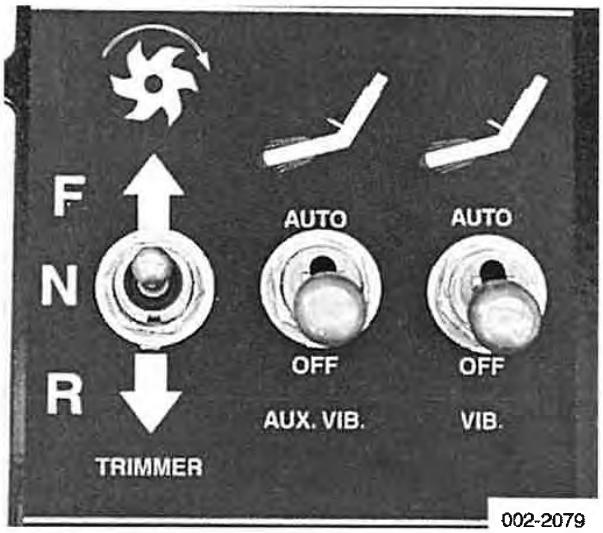
Auxiliary Auger/Tamper Forward/Neutral/Reverse Switch: Controls the rotation direction of the auxiliary auger (sidewalk or golf cart path slipform molds) when operating the machine in three track mode. Controls the rotation of the drive motor for the tamper bar in a paving form when in four track mode. "F" position will cause the auger to rotate to the right and "R" position will rotate the auger to the left. "N" position will stop the operation of the auger. The tamper bar should only be operated in the "F" position to prevent the eccentric bolt from unscrewing itself during operation.

Note: The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.

Auxiliary Auger/Tamper Variable Speed Knob: Used to control the speed of the slipform mold auger in either forward or reverse directions of rotation. The control knob can also be used to start and stop the auger. With the control knob in the "off" position (all the way counterclockwise) the auger will not move. Turning the knob in the increase direction (clockwise) will start the auger rotating in the desired direction or will increase the rotation speed if the auger is already rotating. Turning the knob in the decrease direction (counterclockwise) will reduce the rotation speed, or will stop the auger if turned far enough. The forward/ neutral/reverse switch must be in forward or reverse to turn the auger.

The tamper bar speed is also controlled using this knob when a paving form is mounted under the machine frame in four track mode. The forward/ neutral/reverse switch must be in the "F" position for proper rotation of the tamper bar drive motor during operation.

Note: The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.



Trimmer and vibrator control switches

Trimmer Forward/Neutral/Reverse Switch: Controls the operation and rotation direction of the trimmer wheel. "F" position will cause the trimmer to rotate to undercut the sub base material. "R" position will rotate the trimmer in the reverse rotation to release any obstacles that may be caught in the trimmer wheel. "N" position will stop the operation of the trimmer wheel.

Note: The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.

Vibrator Off/Auto Switches: Used to keep all of the vibrators on the corresponding bank from running when moving the machine about the job. When the switch is in the "auto" position, the starting and stopping of all the vibrators connected to the corresponding bank is controlled by the position of the travel variable speed control knob and/or the neutral/ travel switch. When the speed control is in the "off" position, or the neutral/travel switch is placed in the "neutral" position, the vibrators will stop. The vibrators will begin operation when the speed control is rotated in the increase direction and the neutral/travel switch is

placed in the "travel" position. When the off/auto switch is in the "off" position, the vibrators connected to the corresponding bank will not run when the speed control is rotated in the increase direction. The switch must be in the "auto" position during pouring operations. The vibrators will only operate when the machine is traveling in the forward direction.



Conveyor or paving auger controls

Conveyor/Paving Auger Forward/Neutral/Reverse Switch: Controls the rotation direction of the conveyor when operating the machine in three track mode. Controls the rotation of the auger in a paving form when in four track mode. "F" position will cause the conveyor to rotate to charge the hopper with concrete and "R" position will rotate the conveyor in reverse to allow removal of obstacles that may be caught in the conveyor. "N" position will stop the operation of the conveyor.

When operating the auger, "F" position will cause the auger to rotate to the right and "R" position will rotate the auger to the left. "N" position will stop the operation of the auger.

> **Note:** The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.

Conveyor/Paving Auger Variable Speed Knob: Used to control the speed of the conveyor in either forward or reverse directions of rotation. The control knob can also be used to start and stop the auger. With the control knob in the "off" position (all the way counterclockwise) the conveyor or auger will not move. Turning the knob in the increase direction (clockwise) will start the conveyor or auger rotating in the desired direction or will increase the rotation speed if the conveyor or auger is already rotating. Turning the knob in the decrease direction (counterclockwise) will reduce the rotation speed, or will stop the conveyor or auger if turned far enough. The forward/neutral/reverse switch must be in forward or reverse to turn the conveyor or auger.

> **Note:** The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.



Travel controls

Travel Variable Control Knob: Controls the operating travel speed in either forward or reverse from 0 to 45 feet per minute (0 to 13.7 m/min.) in low speed travel and 0 to 100 feet per minute (0 to 30 m/min.) in high speed travel. When the control knob is moved in the "decrease" direction to the "off" position, the track drive system is stopped. As the control knob is rotated in the "increase" (clockwise) direction the machine will begin to travel. Travel speed will increase as the control knob is rotated clockwise.

The travel variable control knob is also used to start and stop machine travel and the operation of the vibrator circuits. When the control knob is moved away from the "off" position (released from the detent area of the knob), all vibrator circuits will resume operation immediately. The tracks will not begin turning until the knob reaches the number 1 on the label for the knob. When the knob is moved to the "off" position (counterclockwise), the vibrators will stop simultaneously.

> **Note:** The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.

Travel/Neutral Switch: Used to control the vibrator and travel circuits. When the switch is placed in the "neutral" position, the vibrator and track circuits will not operate. When the switch is placed in the "travel" position, the vibrator and travel circuits will operate normally. The travel variable speed knob must be rotated clockwise to cause the machine to move and the vibrator variable controls must be turned counterclockwise for operation.

Note: The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.

Forward/Reverse (F/R) Switch: Used to control the direction of machine travel. When the switch is placed in the "forward" position, the tracks will rotate forward for pouring and trimming operations. When the switch is placed in the "reverse" position, the tracks will rotate in reverse for moving the machine to the start of pouring and trimming operations. All vibrators will not operate when the forward/reverse switch is in the "reverse" position.

Note: The network main screen must be in run (R) mode to allow operation of the hydraulic control systems.

Two Speed Travel Switch: Used to control the hydraulic oil flow through the track drive motors when paving or transporting the machine around the job site. When the switch is placed in the "slow" position, the oil is routed through the track drive motors for low speed high torque travel. When the switch is placed in the "high" position, the oil is routed through the track drive motors for high speed low torque travel. The switch must be in the "slow" speed position for paving operations.

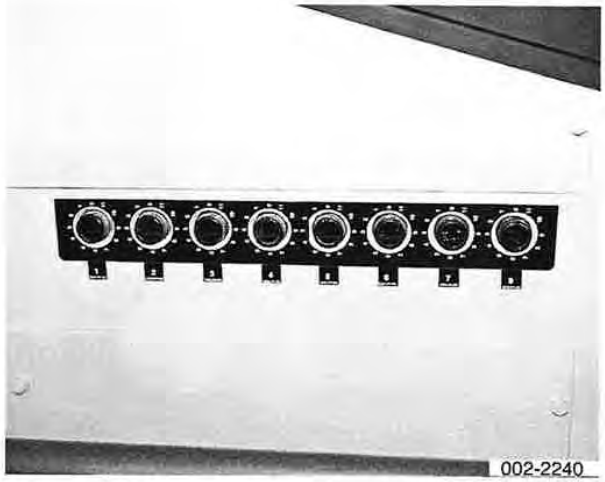


002-2067

Servo lock switch and warning light

Servo Lock Switch: Used to lock all elevation and steering systems in a given position. When the switch is in the "on" position, a solenoid valve is energized to the closed position, blocking the flow of oil to the servo valves. When the switch is in the "off" position, the solenoid valve is de-energized to the open position, allowing oil flow into the servo valves. The servo lock switch must be in the "off" position during pouring operations.

Servo Lock Warning Light: Indicates when the servo lock switch is in the "on" position when the light is illuminated. To resume pouring operations, place the servo lock switch in the "off" position. The warning light should not be illuminated during pouring operations.


002-2240

Vibrator variables

Vibrator Variable Control Valves: Used to individually control the vibration output of each hydraulic powered concrete vibrator in the slipform mold. Controls vibrator output from 0 to 10,500 vibrations per minute. Rotating each control knob counterclockwise increases vibration and clockwise decreases the vibration in the corresponding vibrator. Turning the knob all the way clockwise stops the vibrator attached to that circuit.


002-2054

Servo manual override levers

Manual Override Control Levers: Used for troubleshooting the steering and elevation systems to determine if the problem is electrical or hydraulic. By moving the manual control lever on the top of the servo valve, the system controlled by that valve should respond as follows.

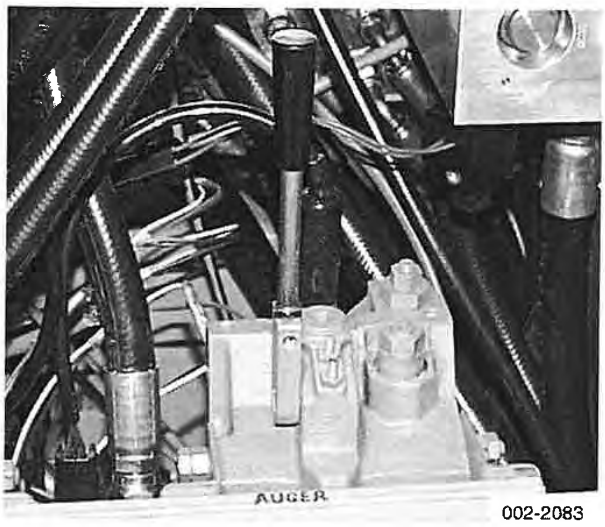
1. **Left Front, Right Front and Rear Steer:** By moving the manual control lever forward, the steering cylinder of the corresponding track should extend and should retract when the lever is moved to the rear.

2. **Left Front, Right Front and Rear Elevation:** By moving the manual control lever forward, the corresponding leg should raise and should lower when the lever is moved to the rear.

3. **Left Rear Elevation (4-track only):** By moving the manual control lever forward, the corresponding leg should raise and should lower when the lever is moved to the rear.

4. **Left Rear Steer (4-track only):** By moving the manual control lever forward, the steering cylinder of the corresponding track should extend and should retract when the lever is moved to the rear.

Note: The control system should be in the "standby" mode when checking the operation of the override levers. The servo lock switch must be in the "off" position.



Manual override lever

Proportional control valve manual override levers: Used for troubleshooting the auxiliary auger/tamper, conveyor/paving auger, paving auger, trimmer and track systems to determine if the problem is electrical or hydraulic. By moving the manual control lever on each valve, the system controlled by that valve should respond as follows:

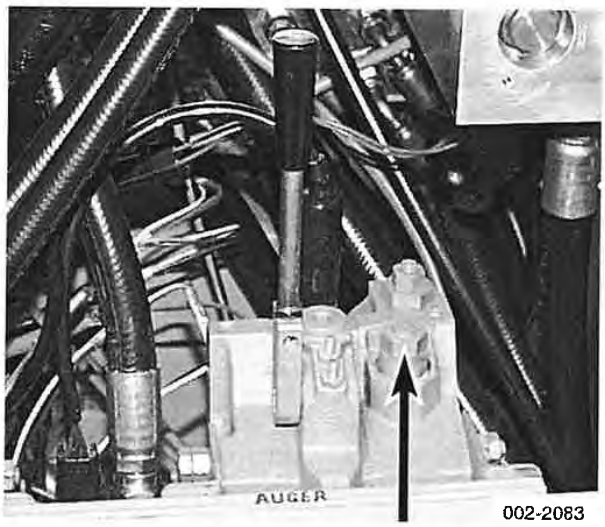
1. **Trimmer:** By moving the manual override control lever down, the trimmerwheel should under cut the grade and should turn backwards, when the lever is moved up.

2. **Track:** By moving the manual override control lever towards the operator, the tracks should move forward and should move in reverse when the lever is moved away from the operator.

3. **Auxiliary Auger/ Tamper:** By moving the manual override control lever towards the operator, the trimmerwheel should under cut the grade and should turn backwards, when the lever is moved away from the operator.

4. **Conveyor/Paving Auger:** By moving the manual override control lever towards the operator, the conveyor should charge the slipform mold hopper and should turn backwards when the lever is moved away from the operator.

5. **Paving Auger 2:** By moving the manual override control lever towards the operator, the auger should move concrete to the center of the paving form and should move concrete to the outside of the paving form when the lever is moved away from the operator.



Pressure relief

Pressure Relief Valves: Used to individually control the maximum pressure settings of the trimmer, track, auxiliary auger/tamper, conveyor/paving auger 1 and paving auger 2 control systems. If any of the systems should stall, the pressure relief valve for that system will open, bypassing hydraulic fluid back to the pressure tank. If one of the valves should open, it will in no way affect the operation of the other valves. The valve cartridges are interchangeable with any of the

other valves for troubleshooting. Refer to the maintenance chapter for proper adjustment procedures and pressure settings.



Emergency stop button

⚠ WARNING! ⚠

A DEFECTIVE EMERGENCY STOP SYSTEM MAY CAUSE SEVERE INJURY OR DEATH. DO NOT OPERATE THE MACHINE WITH AN INOPERATIVE EMERGENCY STOP SYSTEM. CHECK THE EMERGENCY STOP SYSTEM FOR PROPER WORKING ORDER BEFORE BEGINNING PAVING OPERATIONS.

Emergency Stop Button: Used to stop all functions on the machine. Emergency stop buttons are located on the control console and on each of the lift legs on the machine frame. The buttons must be pulled or rotated to the out position to operate the machine. If any button is depressed, the machine travel, the conveyor/auger, paving auger, the auxiliary auger/ tamper, the vibrators and the trimmer wheel will stop. The emergency stop reset light will illuminate to indicate that the machine will not operate and the main panel display will indicate that all control knobs and forward/neutral reverse switches must be turned off or in neutral.

Notice: The buttons on all emergency stops must be out to operate the machine. The operation of each emergency stop button must be checked every day before beginning operation. Make certain that all emergency stop buttons are out and that the check E-stop light has been reset and is out. Depress an emergency stop button out. If the check E-stop light does not illuminate after depressing any certain emergency stop button, check the system for faults and correct before operating the machine. Repeat the check with the remaining emergency stop buttons.



Emergency stop light and switch

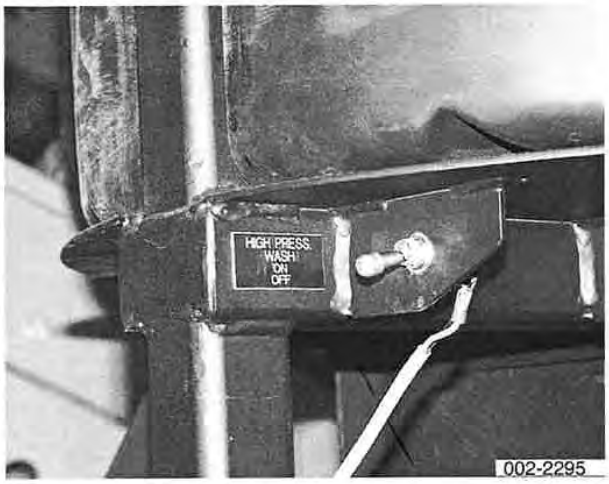
Emergency Stop Indicator Light: Used to indicate when the emergency stop relay must be reset or when an emergency stop button has been depressed. When it is illuminated, the emergency stop reset switch must be depressed to energize the emergency stop relay. When the relay has been energized, the light will go out.

> **Note:** The emergency stop indicator light will be illuminated after initial start up of the engine as well as whenever an emergency stop button has been depressed.

⚠ WARNING! ⚠

BE CERTAIN THAT ALL CONTROLS ARE IN THE OFF POSITION BEFORE ACTIVATING THE RELAY. TO PREVENT SERIOUS INJURY, OR DEATH, BE CERTAIN THAT ALL PERSONS ARE CLEAR OF THE TRIMMER/AUGER, CONVEYORS AND TRACKS BEFORE ACTIVATING THE RELAY.

Emergency Stop Reset Switch: Used to reset the emergency stop relay when one of the emergency stop buttons has been depressed. The reset switch must be depressed whenever the emergency stop reset indicator light is illuminated. The emergency stop button must be reset to the out position prior to depressing the emergency stop reset switch. Place all hydraulic controls in the "off" or "neutral" position before resetting the emergency stop circuit.



High pressure wash switch

⚠ WARNING! ⚠

DO NOT OPERATE THE TRIMMER, TRACKS, AUGER OR CONVEYOR WHILE CLEANING THE MACHINE. SERIOUS INJURY OR DEATH CAN OCCUR IF PERSONNEL ARE CAUGHT IN MOVING PARTS.

Used to control the starting and stopping of the high pressure wash system. When the switch is placed in the "on" position, a solenoid valve is opened to supply a regulated amount of oil to the drive motor on the power washer pump. When the switch is placed in the "off" position, the solenoid valve stops the oil flow to the power washer.

Notice: The power washer should only be used when the paver is stopped and the servo lock switch has been placed in the "on" position.



Sideplate control valves

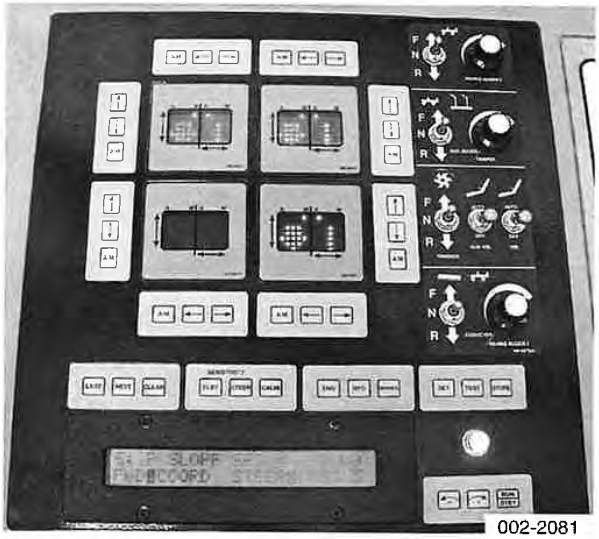
Sideplate Control Valves (Optional): Used to raise or lower hydraulic sideplates on barrier or paving slipform molds. The "up" position raises the individual cylinder attached to that control valve and "down" will lower it. The center position will stop the sideplate in a given position, but will not necessarily hold it in that position. The valve is used in conjunction with the pressure reducing-relieving valve and should be operated in the detent "down" position during pouring operations. The pressure reducing-relieving valve is adjusted with a small amount of down pressure (300-600 psi, 20-41 bar) to maintain contact with the grade.

Optional split hydraulic sideplates require 4 control valves, two for the front half of the sideplate and two for the rear half of the sideplate.

Additional control valves may be added as options for control of hydraulic edge slump adjustment as well as gull wing sideplates on paving slipform molds. Gull wing sideplate controls are only used at the beginning and ending of a pour to allow better positioning of the machine when starting from existing concrete slabs. The control valve will swing the gull wing sideplate in or out. During a pour the sideplates must be locked tightly to the side of the slipform mold. The hydraulic edge slump control valve raises or lowers the edge slump adjustment to compensate for varying concrete slump conditions. The gull wing and edge slump control valves should be operated in the center position when not in use. Each valve is used in conjunction with a pressure reducing-relieving valve. The pressure reducing-relieving valve may be adjusted between 0-1600 psi (0-110 bar).

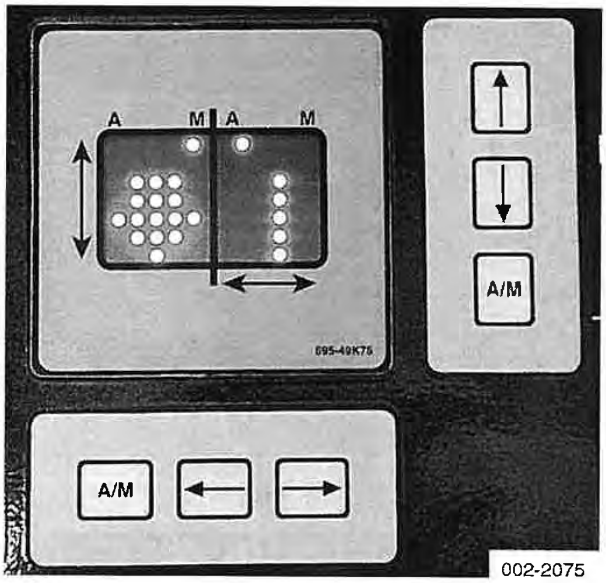
05 Network Control System

Faceplate Controls and Gauges


002-2081

Network control panel

The network control system is designed to be used in the 3-track mode, 4-track paver mode or the 4-track barrier mode. Selection of the proper mode is accomplished through the use of the various switches on the panel. The elevation control systems are the same for all three modes. Changes are made in the steering systems for the appropriate mode. The control panel is designed to provide access to all functions required for normal paving operations. Additional functions are accessed with the switches that are located above the main screen. The panel consists of four individual leg modules, a main screen, the smart steer panel, an all jog switch and a warning light.



Individual leg module

Each leg module consists of deviation indicators and various switches used to control a single elevation loop and a single steering loop. The module consists of two deviation indicators that are used to display steering and elevation sensor positions relative to the signal from the slope setpoint, or the steering feedback pot. The deviation indicators are also used to show sensitivity settings and automatic/manual status. An LED position indicator is used to show steering error and elevation error. A centered signal from the steering or elevation sensor is indicated by a straight line of LED indicator lights. As a sensor signal error occurs, an arrow will indicate the amount of signal error. As the arrow increases in size, it corresponds to the amount of signal error that the sensor is outputting.

When viewing the displays for each of the legs, they will correspond to the appropriate locations when facing the forward direction of travel depending upon the machine setup. For example, the three track operation of the machine will indicate that the top left display is for the left front leg. When the machine is converted to 4-track paving operations, the top left display will indicate the sensor deviation for the right front leg.

Automatic (A) or manual (M) control modes are indicated by LED lights in the upper left hand and upper right hand corners of the display. If the elevation control loop and the steering control loop are in manual, the LED light below the manual (M) will be illuminated on each individual indicator. The LED light below the automatic (A) will be illuminated when both controls loops are in automatic mode. If one control

loop is in the automatic mode and the other is in the manual mode, the manual (M) and the automatic (A) LED lights will be illuminated on the corresponding displays.

A set of three switches positioned vertically along the side of the deviation indicator are used for control of elevation. The automatic/manual (A/M) switch will set the elevation loop for manual operation through the use of the jog switches, or automatic operation through the use of the corresponding sensor. The jog switches are used to manually change the elevation of the leg when the control loop is in the manual mode. The jog switches will override the sensor signals when the control loop is in the automatic mode. The jog switches are functional with the main screen in either run or standby. The switches are also used to increase or decrease sensitivity when required.

A set of three switches positioned horizontally along the bottom of the deviation indicator are used for control of steering. The automatic/manual (A/M) switch will set the steering loop for manual operation through the use of the jog switches, or automatic operation through the use of the corresponding sensor. The jog switches are used to manually steer the track when the control loop is in the manual mode. The jog switches will override the sensor signals when the control loop is in the automatic mode. The jog switches are functional with the main screen in either run or standby. The switches are also used to increase or decrease sensitivity when required.



Main screen

The main screen is located near the bottom of the main control panel. The main screen is capable of displaying letters (alpha), numbers (numeric) and some special symbols in two lines of up to 24 characters each. The display is used for general system information, as well as various calibration, service and testing information. Backlighting of the display panel is provided for low light and night viewing.

The slope setpoint switches are used to change the cross slope of the machine frame. The front and rear slope systems are changed simultaneously using one switch. If slope control is on the right side, depressing the switch with the arrow pointing to the left, will cause the right side of the machine to raise. The right side of the machine will lower if the switch with the arrow pointing to the right is depressed. If slope control is on the left side of the machine, the left side will lower when the switch with the arrow pointing to the left is depressed, and will raise when the switch with the arrow pointing to the right is depressed. By depressing and releasing either switch, the slope command will change in 0.05% increments. By depressing and holding the switch, the slope command will slowly change in 0.05% increments for approximately two counts and then rapidly change in 0.5% increments until the switch is released. A small wedge symbol will appear when the slope is changed either direction from 0.0%. If the machine frame is commanded to tilt to the left, the wedge symbol will appear, tilted to the left. If the machine frame is commanded to tilt to the right, the wedge symbol will appear, tilted to the right.

The run/standby switch is used to place all control systems in the run mode, or in the standby mode. The mode of the system is shown in the upper left corner of the display by an "S" for standby, or by an "R" for run. To change the mode, depress and release the switch. In the standby mode, all automatic signals to the servo valves are turned off. In the run position, the manual/ automatic selection made at the individual control loops will control the corresponding servo valve.

Warning Light: The warning light will provide a visible signal if a problem should occur in the control system. If the main screen is in the "standby" mode, the light will flash. If there is a problem in one or more of the individual control loops with the main screen in the run (R) mode and the individual loop in the automatic (A) mode, the light will remain illuminated. If there is no problem in the system with all functions in the automatic mode, the light will go out.

> **Note:** If the alarm system has been set to the "horn & lamp" mode, the warning horn will sound any time that the light illuminates. Refer to the section covering calibration for instructions on how to set the alarm mode.



All jog switch

All Jog Switch: The all jog switch is used to simultaneously raise or lower all legs. When using the all jog switch, the main screen can be in run (R) or standby (S), and the individual elevation control loops can be in manual (M), or automatic (A). The all jog switch will override the automatic functions. If the main screen is in the standby (S) mode, or the individual elevation loops are in the manual (M) mode, when the all jog switch is released, the legs will hold at the current position. If the main screen is in the run (R) mode when the jog switch is released, the control of the elevation loops that are in the automatic (A) mode will return to the sensors. If the loop in automatic (A) is being controlled by a slope sensor, the corresponding leg will follow the sensor in the normal manner. If the loop in automatic (A) is being controlled by a elevation sensor, the leg will follow the sensor in the normal manner, unless the sensor has reached the off line limit.

Smart steer controls: The smart steer panel contains a five position steer mode select switch and a steering control knob for manually steering the tracks. When using the smart steer system, the main screen must be in the run (R) mode and the individual steering control loops must be in the automatic (A) mode.

3/4-track steering: The five position steer select switch is used to select the stringline steer mode or one of four manual steering modes. The automatic mode is selected when steering is to be controlled by the steering sensors or by the control loop jog switches. "STRING STEER" will be displayed on the main screen. The manual steer knob is disabled.

When the steer select switch is in the "coordinated steer" position, the steering control knob will control the turning of the tracks. "COORD STEER" will be displayed on the main screen. When the knob is in the center position, the tracks will be straight ahead. If the knob is turned left or right from the center position, the leading tracks will turn in the corresponding direction and the trailing track(s) will turn in the opposite direction to give minimum turning radius.

When the steer select switch is in the "crab steer" position, the steering control knob will control the turning of the tracks. "CRAB STEER" will be displayed on the main screen. When the knob is in the center position, the tracks will be straight ahead. If the knob is turned left or right from the center position, all tracks will turn in the corresponding direction, to walk the machine to the side.

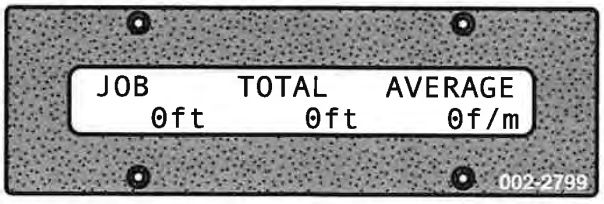
When the steer select switch is in the "front steer only" position, the steering control knob will control the turning of the front tracks and the rear track(s) will be locked straight ahead. "FRONT STEER" will be displayed on the main screen. When the knob is in the center position, the front tracks will be straight ahead. If the knob is turned left or right from the center position, the front tracks will turn in the corresponding direction and the rear track(s) will remain straight ahead.

When the steer select switch is in the "rear steer only" position, the steering control knob will control the turning of the rear track(s) and the front tracks will be locked straight ahead. "REAR STEER" will be displayed on the main screen. When the knob is in the center position, the rear track(s) will be straight ahead. If the knob is turned left or right from the center position, the rear track(s) will turn in the corresponding direction and the front tracks will remain straight ahead.

The manual steer knob is used to turn the tracks in any of the four manual modes. When the indicator on the knob is centered the tracks will be straight ahead. As the knob is turned either direction from center, the tracks will turn accordingly. The more the knob is turned, the more the tracks will turn. The manual steer knob has no affect on the steering when the steer select switch is in the "stringline steer" position.

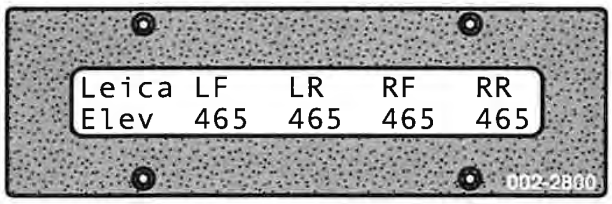


Last/Next/Clear Switches: The last and next switches are used to advance or recall the various displays on the main screen. The clear switch is used to clear the data stored in the various functions when they are displayed. The clear switch will have no effect on certain functions when they are displayed (such as slope setting, sensitivity setting, etc.).



Last/Next/Clear switches

The Job, Total, and Average distance displays are currently unavailable for use.



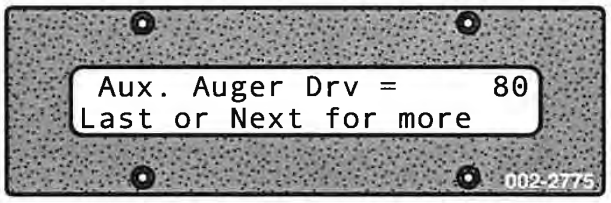
Leica elevation command display

Depressing the NEXT switch will display the Leica drive signals for each of the elevation control cylinders. The Leica display monitors the percentage of drive that the network controller is receiving from the Leica control system. The drive signal may be monitored at any time the network controller is in the "run" mode. The Leica Stringless Control System is optional and must be installed and operating before the default codes shown in the previous photo will deviate.



Leica steer command display

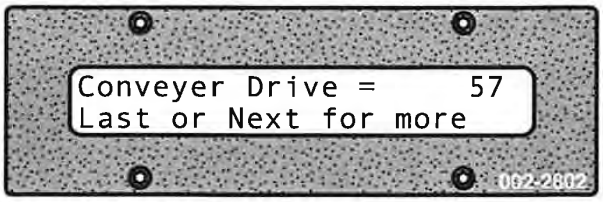
Depressing the NEXT switch will display the Leica drive signals for each of the steering control cylinders. The Leica display monitors the percentage of drive that the network controller is receiving from the Leica control system. The drive signal may be monitored at any time the network controller is in the "run" mode. The Leica Stringless Control System is optional and must be installed and operating before the default codes shown in the previous photo will deviate.



Auxiliary auger drive command display

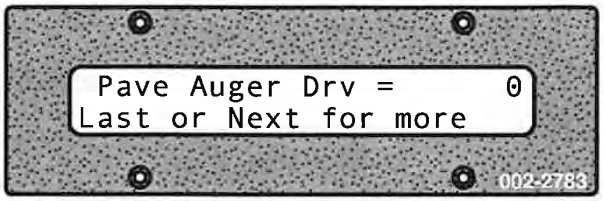
Depressing the NEXT switch will display the auxiliary auger drive. The auxiliary auger display indicates the percentage of drive that the network controller is sending to the proportional control valve. The drive signal may be monitored at any time during the operation of the machine. The signal can range from 0 to 80 percent and can only be monitored when the network controller is in the "run" mode.

Note: The calibrate mode for the auxiliary auger must be "on" before the drive command will indicate a value during operation.



Conveyor drive display

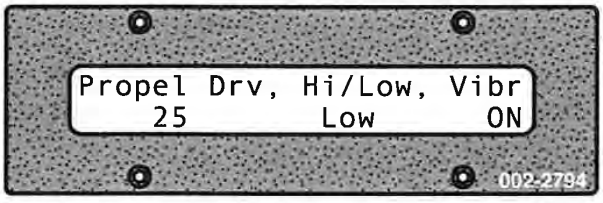
Depressing the NEXT switch will display the conveyor drive. The conveyor display indicates the percentage of drive that the network controller is sending to the proportional control valve. The drive signal may be monitored at any time the network controller is in the "run" mode and can range from 0 to 80 percent.



Pave auger drive display

Depressing the NEXT switch will display the pave auger drive. The pave auger display indicates the percentage of drive that the network controller is sending to the proportional control valve. The drive signal may be monitored at any time the network controller is in the "run" mode and can range from 0 to 80 percent.

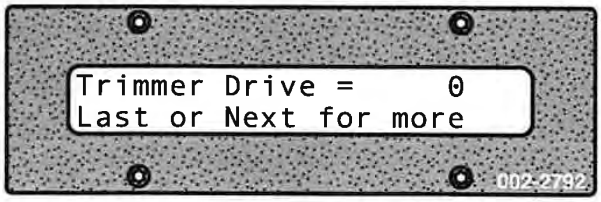
Note: The calibrate mode for the auxiliary auger must be "on" and the optional valve must be installed before the drive command will indicate a value during operation.



Travel drive command display

Depressing the NEXT switch will display the propel drive. The propel display indicates the percentage of drive that the network controller is sending to the proportional control valve. The drive signal may be monitored at any time the network controller is in the "run" mode and can range from 0 to 80 percent.

The position of the Hi/Low switch is also displayed since it affects the automatic control of the vibrators. The vibrator on/off control is also displayed since it is operated using either the travel variable control knob or the travel/neutral switch.



Trimmer drive display

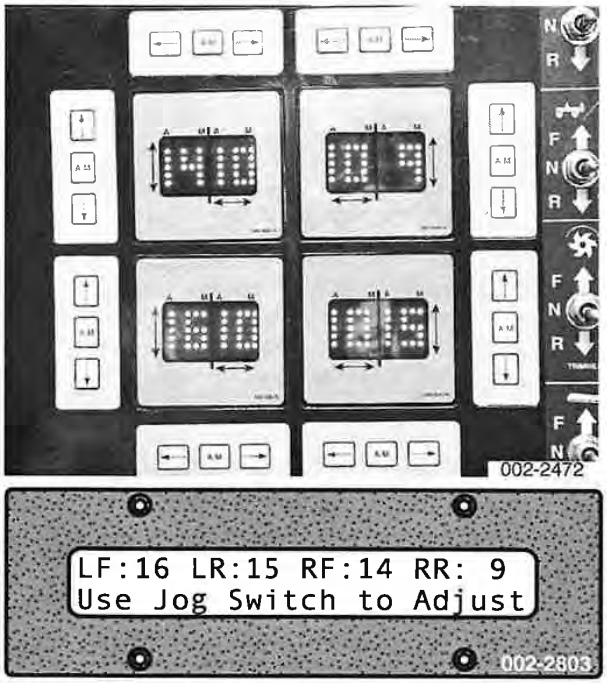
Depressing the NEXT switch will display the trimmer drive. The trimmer display indicates the percentage of drive that the network controller is sending to the proportional control valve. The drive signal may be monitored at any time the network controller is in the "run" mode and can read either 0 or 100 percent.



Sensitivity switches

Sensitivity Switches: The sensitivity switches are used to activate the sensitivity setting modes. Depressing and releasing the ELEV switch will cause the setting for each individual elevation loop to be displayed on the corresponding display. Individual elevation control loop sensitivities can be increased by depressing the up switch, or decreased by depressing the down switch. For each depression of either switch, the sensitivity will change one setting. To exit the elevation sensitivity mode, depress and release the ELEV switch.

Depressing and releasing the STEER switch will cause the setting for each individual steering loop to be displayed on the corresponding display. Individual steering control loop sensitivities can be increased by depressing the right switch, or decreased by depressing the left switch. For each depression of either switch, the sensitivity will change one setting. To exit the steering sensitivity mode, depress and release the STEER switch.



Sensitivity displays

Depress and release the ELEV sensitivity switch on the control panel. The sensitivity settings of all elevation control loops will appear on the individual displays. Individual elevation control loop sensitivities can be increased by depressing the up jog switch, or decreased by depressing the down jog switch. For each depression of either switch, the sensitivity will change one setting. The minimum number displayed will be "1" while the maximum number displayed is "19".

Depressing and releasing the STEER sensitivity switch at the bottom of the control module, the sensitivity settings of all steering control loops will appear on the control loop displays. Individual steering control loop sensitivities can be increased by depressing the right switch, or decreased by depressing the left switch. For each depression of either switch, the sensitivity will change one setting. The minimum number displayed will be "0" while the maximum number displayed is "19".



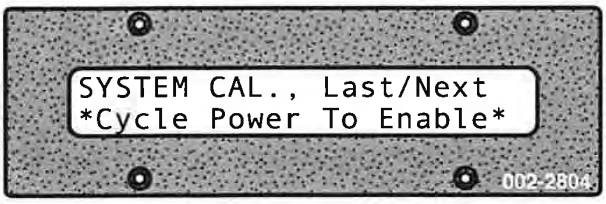
Calibrate switch

Calibrate Switch: The CALIB switch will bring up machine specific configuration displays on the main screen. When in the calibration mode, the LAST and NEXT switches will scroll through the available

calibration displays. The + and - slope switches are used to change the various settings. The various displays that can be accessed, and changed, when in calibration are elevation mode, alarm mode, units, machine type, rear wand select, elevation wand, all jog valve drive voltage settings, steer wand, forward and rear steer authority, auxiliary auger and paving auger control. To exit the calibration mode, depress and release the CALIB switch.

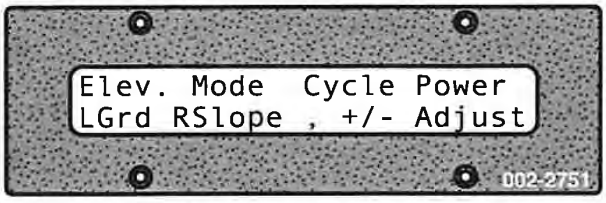
Note: The system power must be turned off and restarted before any calibrate changes will be enabled.

Calibrate Displays



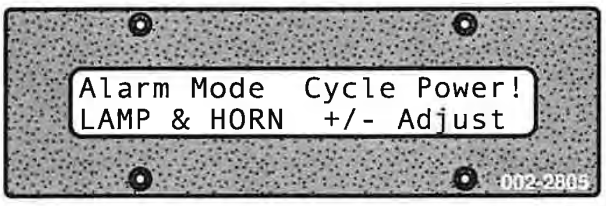
System calibration display

The calibrate mode is used to select various settings needed during setup and operation of the machine. By depressing and releasing the CALIB switch at the bottom of the control panel, the main screen will indicate that the calibration mode has been entered. Depressing the LAST or NEXT switches will scroll through the individual calibrate settings. The operator must cycle the power before any changes are enabled.



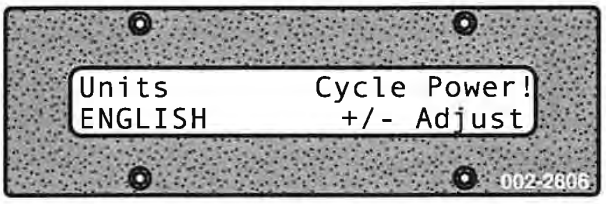
Elevation display

Depressing and releasing the NEXT switch will select the elevation mode on the main screen. The elevation mode is used to designate the type of sensor control the machine will be using for a particular job situation. The upper line will display "press +/- to adjust" while the lower line will display "ELEV MODE" and the current setting. Depress and release the +/- switches to scroll through the elevation mode settings available (left elevation/right slope, right elevation/left slope, dual elevation/right steer, left steer/dual elevation, Leica). The operator must cycle the power before any changes are enabled.



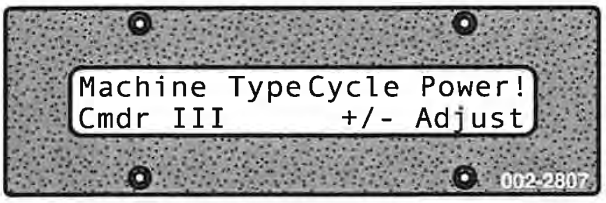
Alarm display

The lamp is the only alarm system available on the machine for troubleshooting purposes. An audible alarm is not currently available.



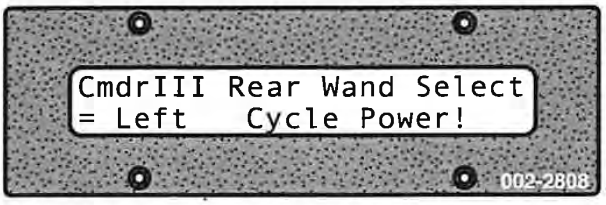
English/metric display

The Units mode is not currently available for use.



Machine type display

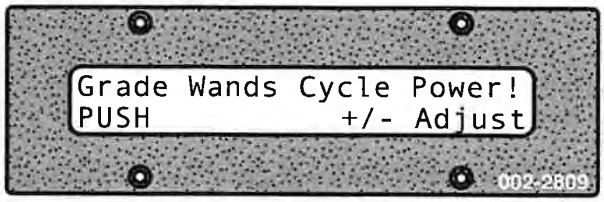
Depressing and releasing the NEXT switch will bring up the machine type mode on the main screen. Machine type designates the type of programming the controller will use in the different setup configurations. The upper line will display "press +/- to adjust" while the lower line will display the current setting. Depressing the +/- switches will scroll through the machine type settings available (Commander III, Barrier, 4 Trk Paver, Stagger). The operator must cycle the power before any changes are enabled.



Rear wand select display

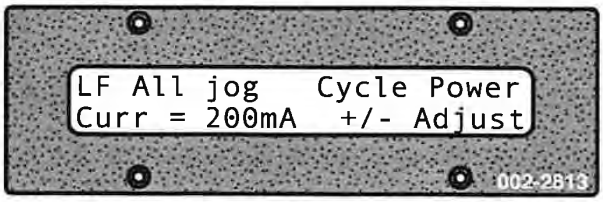
Depressing and releasing the NEXT switch will bring up the rear wand select on the main screen. Rear wand select determines which sensor bulkheads are going to be used for the steering and elevation control on the rear leg. The rear steer, rear elevation and rear

feedback potentiometer must be connected to the appropriate bulkhead as selected in the calibrate mode. Depressing the +/- switches will scroll through the rear wand selections available (Left, Right). The operator must cycle the power before any changes are enabled.



Elevation wand display

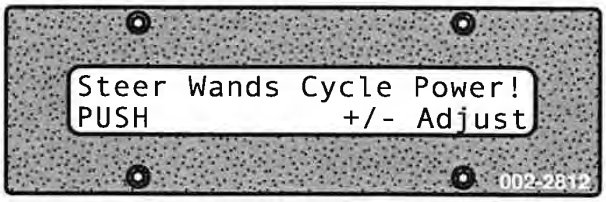
Depressing and releasing the NEXT switch will select the elevation sensor phasing on the main screen. Elevation sensor phasing allows attachment of the elevation sensor wands for pushing or pulling the wands along the stringline. All elevation sensors must face the same direction. The upper line will display "Elevation Wands" and "Cycle Power" while the lower line will display "Push or Pull" and "+/- Adjust". Depressing the +/- switches will scroll through the elevation wand settings available (Push, Pull). The operator must cycle the power before any changes are enabled.



All jog display

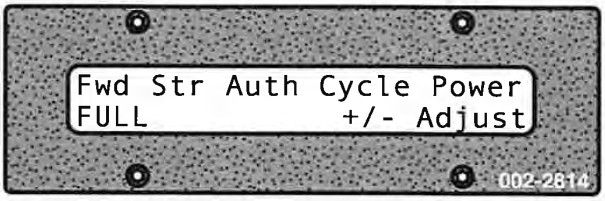
Depressing and releasing the NEXT switch will bring up each of the all jog voltage modes on the main screen. The all jog voltage values to each elevation control loop can be changed to raise all legs at the same speed regardless of weight distribution. The upper line will display "All Jog" with the control loop position (LF, RF, LR, RR) and "Cycle Power" while the lower line will display the voltage setting and "+/- Adjust". Depressing the +/- switches will increase or decrease the voltage setting. Setting range is 0 to 250 ma (milliampere) for each of the control loops. To adjust, select the desired leg by scrolling through the displays. Adjust the setting up or down as desired and check the operation with the all jog switch. If the up or down speed is not correct, readjust and recheck. Normal range is from 150 to 250 ma. The operator must cycle the power before any changes are enabled.

Note: The all jog voltage setting has no affect on the automatic control output signals.

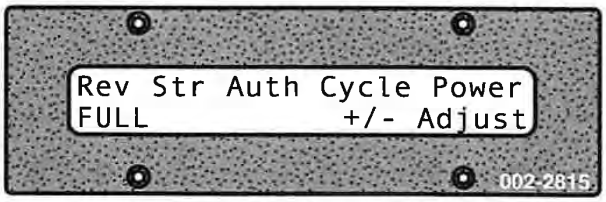


Steer wand display

Depressing and releasing the NEXT switch will select the steer sensor phasing on the main screen. Steer sensor phasing allows attachment of the steer sensor wands for leading or trailing the wands along the stringline. Both sensors must face the same direction. The upper line will display "Steer Wands" and "Cycle Power" while the lower line will display "Push or Pull" and "+/- Adjust". Depressing the +/- switches will scroll through the steer wand settings available (Push, Pull). The operator must cycle the power before any changes are enabled.

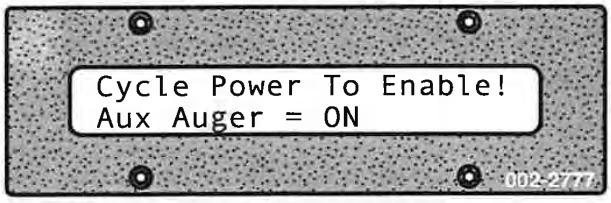


Steer authority display



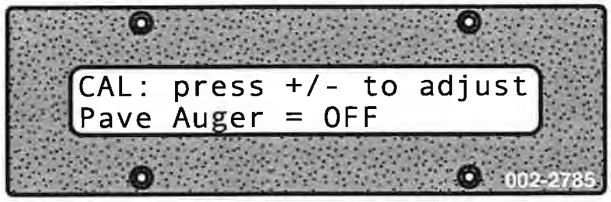
Steer authority display

Depressing and releasing the NEXT switch will bring up the steer authority mode on the main screen. Steer authority is used to reduce the servo valve drive signal when the machine is traveled in the forward or reverse direction. When the setting is at half, the valve drive signal is decreased by 50%. The upper line will display "(Forward or Reverse) Steer Authority " and "Cycle Power" while the lower line will display "Full or Half" and "+/- Adjust". Depressing the +/- switches will scroll through the steer authority settings available (Full, Half). The operator must cycle the power before any changes are enabled.



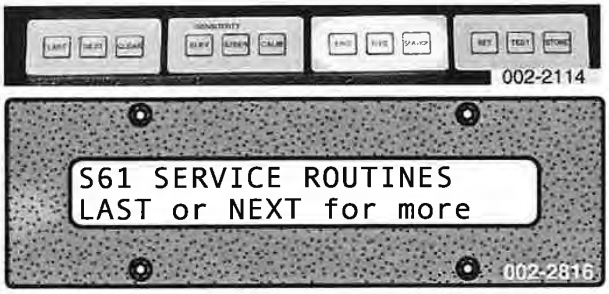
Auxiliary auger Off/On display

Depressing and releasing the NEXT switch will bring up the auxiliary auger mode on the main screen. If the golf cart path or sidewalk slipform mold is not equipped with an auger, the auxiliary auger mode may be turned "off". The auxiliary auger mode should be "on" when an auger exists in the slipform mold or during 4-track paving operations. The operator must cycle the power before any changes are enabled.



Pave auger Off/On display

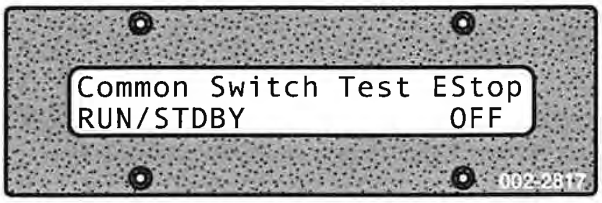
Depressing and releasing the NEXT switch will bring up the pave auger mode on the main screen. If the machine is not equipped with the pave auger control valve, the pave auger mode should be "off". A fault display will be indicated if the pave auger mode is "on" and the valve does not exist on the machine. The pave auger mode should be "on" when the valve is installed and will be used during paving operations. The operator must cycle the power before any changes are enabled.



Engine, hydraulic and service switches

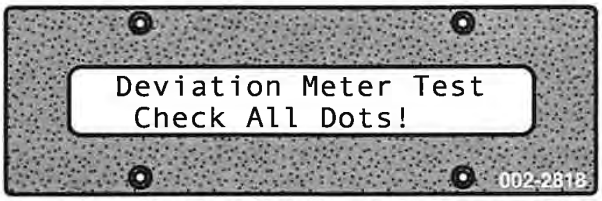
Engine, Hydraulic and Service Switches: The ENG and HYD switches are currently inactive. The SERVICE switch will bring up test mode displays on the main screen. When in the service mode, the LAST and NEXT switches will scroll through the available service displays. To exit the service mode, depress and release the SERVICE switch.

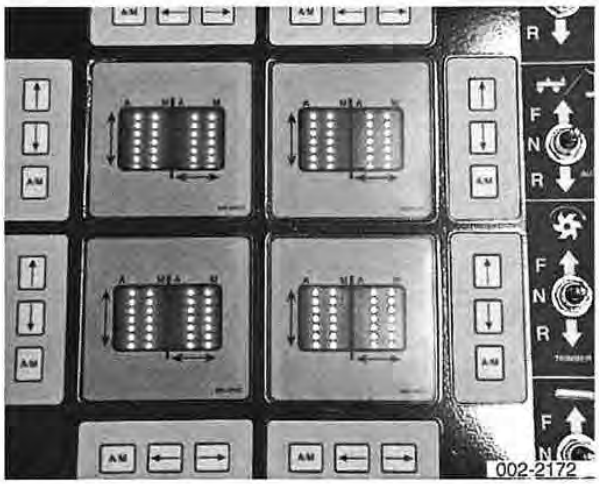
Service Displays



Common switch test

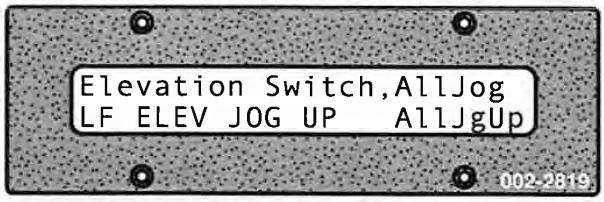
This display will indicate the function of the various display switches located directly above the main screen, including the run/standby and slope setpoint switches. Depress the appropriate switch and the display will indicate which switch was depressed. If a switch is depressed and the function of that switch is not indicated on the lower line of the display, the switch or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.





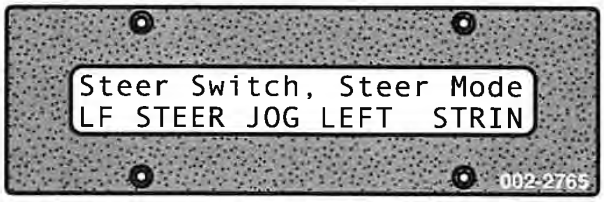
Deviation meter test

This test will alternate the LED lights on the individual meters to indicate if any of the lights are defective. If any of the LED lights fail to illuminate, the display is defective and may require replacement. Refer to the troubleshooting chapter for more information.



Elevation switch test

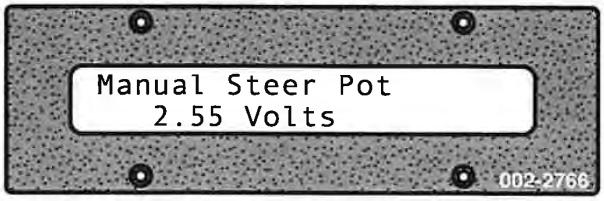
This display will indicate the function of an individual elevation jog switch, elevation A/M switch or all jog switch. Depress the appropriate switch and the display will indicate which switch was depressed. If an elevation switch is depressed and the function of that switch is not indicated on the display, the switch or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.



Steer switch test

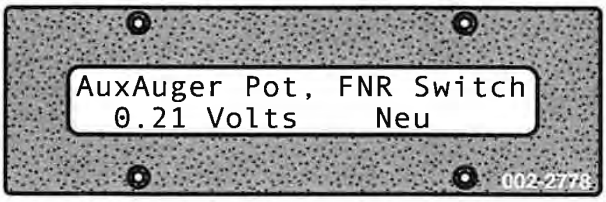
This display will indicate the function of an individual steer jog switch or steer A/M switch. Depress the appropriate switch and the display will indicate which switch was depressed. If a steer switch is depressed and the function of that switch is not indicated on the display, the switch or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.

The display also indicates the function of the manual steer select switch (steer mode). Rotate the control knob and the display will indicate the corresponding position of the switch on the lower line of the display. If the corresponding position is not indicated, the switch or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.



Manual steer pot test

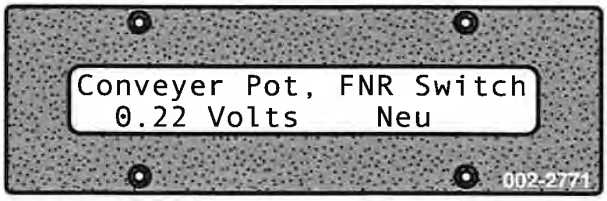
This display will indicate the function of the manual steer control knob. Rotate the manual steer knob and the display will indicate the voltage output of the knob from 0.21 to 4.80 Volts. If an increase or decrease in voltage is not indicated on the display as the knob is rotated, the control knob or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.



Auxiliary auger pot test

This display will indicate the function of the auxiliary auger control knob. Rotate the auxiliary auger knob and the display will indicate the voltage output of the knob from 0.21 to 5.00 Volts. If an increase or decrease in voltage is not indicated on the display as the knob is rotated, the control knob or the wiring connection may be defective.

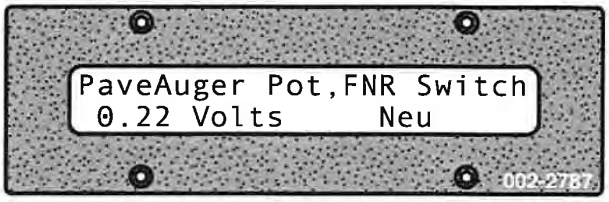
The forward/neutral/reverse (FNR) switch function is also indicated on the display. If the corresponding position of the switch is not indicated on the second line, the switch or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.



Conveyor pot test

This display will indicate the function of the conveyor control knob. Rotate the conveyor knob and the display will indicate the voltage output of the knob from 0.21 to 5.00 Volts. If an increase or decrease in voltage is not indicated on the display as the knob is rotated, the control knob or the wiring connection may be defective.

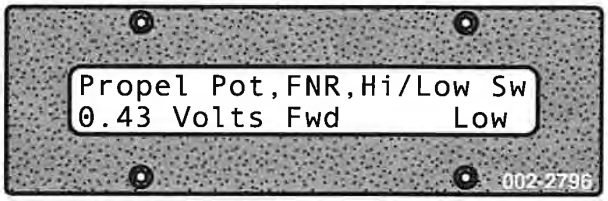
The forward/neutral/reverse (FNR) switch function is also indicated on the display. If the corresponding position of the switch is not indicated on the second line, the switch or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.



Pave auger pot test

This display will indicate the function of the pave auger control knob. Rotate the pave auger knob and the display will indicate the voltage output of the knob from 0.21 to 5.00 Volts. If an increase or decrease in voltage is not indicated on the display as the knob is rotated, the control knob or the wiring connection may be defective.

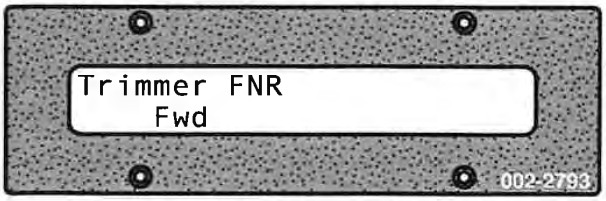
The forward/neutral/reverse (FNR) switch function is also indicated on the display. If the corresponding position of the switch is not indicated on the second line, the switch or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.



Travel pot test

This display will indicate the function of the variable travel control knob. Rotate the variable travel knob and the display will indicate the voltage output of the knob from 0.21 to 5.00 Volts. If an increase or decrease in voltage is not indicated on the display as the knob is rotated, the control knob or the wiring connection may be defective.

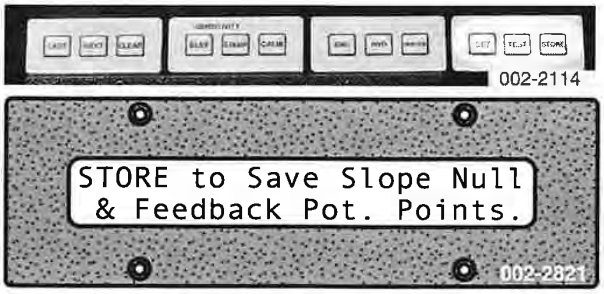
The forward/neutral/reverse (FNR) switch and the Hi/Low switch function are also indicated on the display. If the corresponding position of the switch is not indicated on the second line, the switch or the wiring connection may be defective. Refer to the troubleshooting chapter for more information.



Trimmer switch test

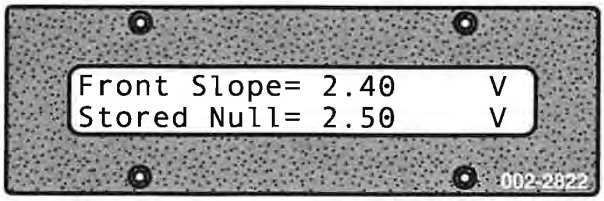
The trimmer forward/neutral/reverse (FNR) switch function is indicated on the display. If the corresponding position of the switch is not indicated on the second line, the switch or the wiring connection may be defective.

Set and Store Switches



Set and store switches

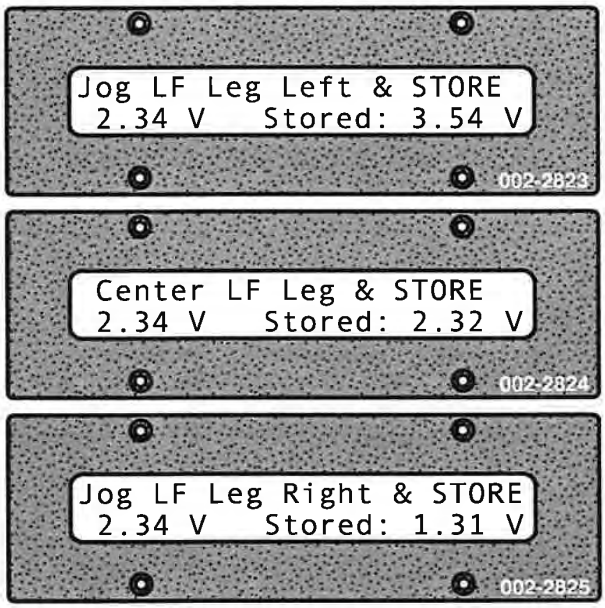
The SET switch will bring up adjust reference displays on the main screen. It is used to change the null position of the steering feedback pots and the slope sensor(s). When in the set mode, the LAST and NEXT switches may be depressed to display the null position of the appropriate feedback pot or slope sensor on the display panel. By depressing the STORE switch, a new null value will be assigned. To exit the set mode, depress and release the SET switch.



Front slope sensor calibration

Centering the Slope Sensor: Prior to storing a new null point, level the 3-track machine frame from side to side or level the 4-track machine frame on all four sides. When the machine frame is level, turn off the engine. Turn the ignition key to the "on" position to operate the network controller. Depress and release the SET switch. The main screen will indicate "STORE to Save Slope Null & Feedback Pot. Points". Depress the LAST or NEXT switch until the appropriate slope sensor is indicated on the main screen. The main screen will indicate which sensor is ready for adjustment and the voltage value that the network controller is receiving from the sensor. The lower line will indicate the stored null voltage of the sensor.

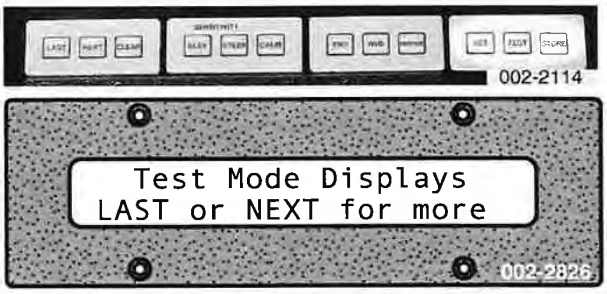
Adjust the machine frame in a level position as previously described. If the top line of the display does not read between 2.40 and 2.60 Volts, loosen the appropriate slope sensor and rotate it until the top line voltage reads between 2.40 and 2.60 Volts. Tighten the mounting screws securely. Depress the STORE switch to store the new null point. Depress the NEXT switch and repeat the procedure for the other slope sensor (if applicable). Refer to the Maintenance chapter for more information.



Steering feedback calibration

Calibrating the Steering Cylinders: Three adjustments are required for each steering cylinder: left turn limit, center and right turn limit. Begin by starting the engine and depress and release the SET switch. The main screen will indicate "STORE to Save Slope Null & Feedback Pot. Points". To select a steering control loop, depress the LAST or NEXT switch until the appropriate sensor signal is indicated on the main screen (Photo 002-2529). Turn the track as far to the left as required to prevent the track from contacting obstacles on the jobsite. Depress the STORE switch and depress the NEXT switch (Photo 002-2528). Turn the track to the straight ahead position and measure for correct adjustment (Refer to the maintenance chapter for measurement information). When it is adjusted parallel to the machine frame or stringline depress the STORE switch and depress the NEXT switch (Photo 002-2527). Turn the track as far to the right as required to prevent the track from contacting obstacles on the jobsite. Depress the STORE switch. Continue to depress the NEXT switch to repeat the procedure for the other tracks (if necessary). Refer to the Maintenance chapter for more information.

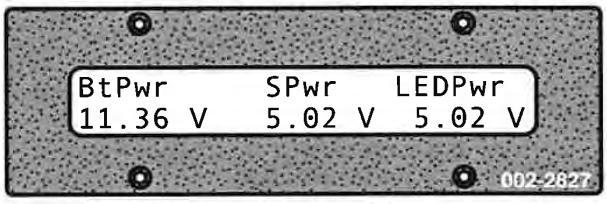
Note: The left and right limits prevent the network controller from stroking the cylinder completely and causing the track to contact an obstacle. When radius work is required, make certain that the left and right limit settings do not prevent the track from turning enough to complete the radius.



Test switch

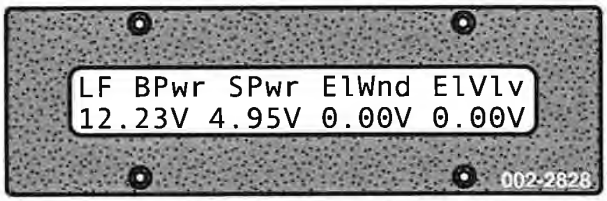
The TEST switch will bring up test mode displays on the main screen. When in the test mode, the LAST and NEXT switches will scroll through the available test displays. To exit the test mode, depress and release the TEST switch.

Test Displays



Test mode display 1

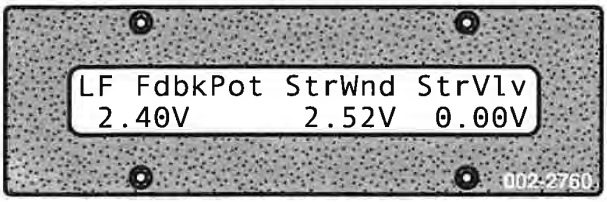
Depressing the NEXT switch will display the voltage power supplies to the main control panel. The voltages from left to right on the display are battery power, sensor power and LED light power supplies. Refer to the following voltage range table for the appropriate indication for normal operation.



Test mode display 2

Depressing the NEXT switch will display the appropriate leg (LF (left front)), the corresponding S2X

controller power supply (BPwr), the sensor power supply (SPwr), the elevation sensor signal (ElWnd) and the elevation servo valve signal (ElVlv). Depressing the NEXT switch will scroll to the corresponding display for each of the legs on the machine. Refer to the following voltage range table for the appropriate indication for normal operation.



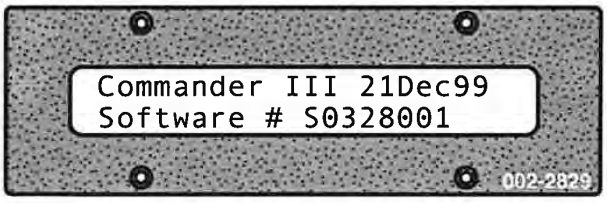
Test mode display 3

Depressing the NEXT switch will display the appropriate leg (LF), the corresponding feedback potentiometer signal (FdbkPot), the steer sensor signal (StrWnd) and the steer servo valve signal (StrVlv). Depressing the NEXT switch will scroll to the corresponding display for each of the legs on the machine. Refer to the following voltage range table for the appropriate indication for normal operation.

The following table shows the low and high voltage signals that the controller normally operates in. Any signal above or below the normal ranges is an indication of a faulty circuit and should be repaired or replaced as necessary.

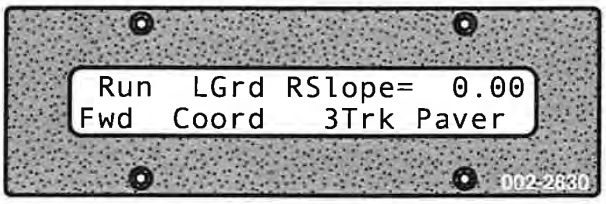
Circuit	Voltage Range
Power supply	9.0 to 16.0
Sensor supply	4.75 to 5.25
Sensor output	1.2 to 3.8
Slope sensor output	0.75 to 4.25
Feedback Pot	1.0 to 4.0
Elevation Valve	0.0 to +/-4.10
Steer Valve	0.0 to +/-4.10

System Operation



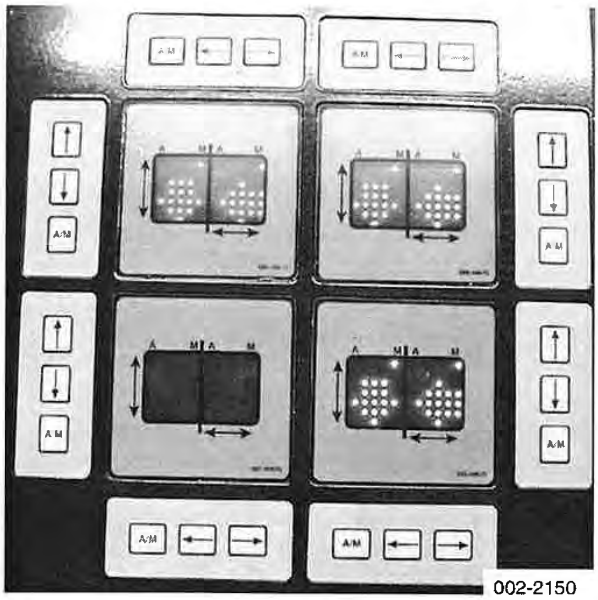
Machine model display

When the ignition switch is first turned on, the main screen will show the power-up screen for approximately five seconds. The machine model and setup configuration will be displayed on the upper line with the revision date. The program identification number (software number) will be displayed on the lower line. During this time the system is self checking the programming for faults. If a fault exists in the programming, the display panel will indicate that a fault is present.



Normal operating display

After the program checks are completed, the display panel will change to the normal operating display. The letters "Stdby" or "Run" on the left end of the upper line will indicate if the main screen is in the standby (Stdby) mode, or the run (Run) mode (the system will be in standby (Stdby) on start-up). The next part of the display, on the upper line, indicates which side of the machine is being controlled by the elevation/slope or dual elevation system. If the slope sensors are used the slope setting percentage will be indicated at the end of the upper line. If the slope setting is adjusted either direction from "0.00%", a (-) negative symbol will appear indicating the direction of the slope is rejecting the water in the curb and gutter. If the system is set for "dual elevation" operation, the display will show "dual elevation" and the slope percentage will not be displayed. The first display in the lower line will indicate the machine direction of travel. The second part of the lower line will indicate how the machine steering is to be controlled. The last part of the lower line will indicate the machine type configuration.



Control loop in manual mode

Manual operation: With no sensors connected, any leg on the machine can be raised or lowered with the main screen in the standby (S) or run (R) mode, or with the control loops in the manual (M) or automatic (A) mode. To raise or lower the leg, depress and hold the up, or down switch on the appropriate control loop. When the machine is at the desired height, release the switch.

To manually raise or lower any leg on the machine with the sensors connected, the main screen must be in the standby (S) mode, or the control loop must be in the manual (M) mode (if the main screen is in the run (R) mode).

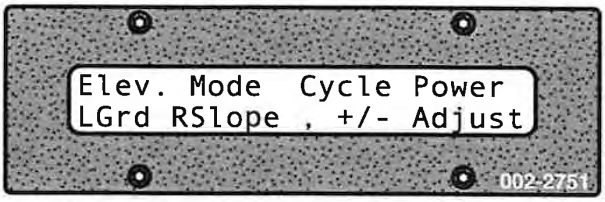
> **Note:** To hold the machine frame level, it is recommended to place the main screen in the run (R) mode, and the slope control loop(s) in the automatic (A) mode. Adjust the slope setpoint to "0.00%". This will cause the frame to automatically remain level while moving the machine around. It may be necessary to decrease the sensitivity if the machine becomes unstable.

All leg elevations on the machine can be controlled through the use of the all jog switch. By moving the all jog switch in the "up" direction, all leg elevations will raise and will lower when the switch is moved in the "down" direction. If the weight distribution on each leg varies, it may be necessary to calibrate the all jog current values to allow each leg to raise the machine frame equally. Refer to the calibrate display section for adjustment procedures.



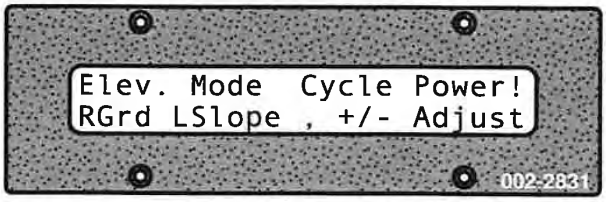
Smart steer in manual mode

To manually steer the machine using the steering knob (with or without the sensors connected), the main screen must be in the "run" mode and the steer mode select switch in one of the four manual positions. Turn the manual steer knob either direction as necessary to turn the tracks. The more the knob is turned, the more the tracks will turn. To individually steer any track, place the main screen in the "standby" mode, then depress and hold the left, or right switch on the appropriate control loop. The forward/reverse steer switch has no affect on the manual steering operation, except to reverse the steering displays (for track position reference).



Left elevation, right slope display

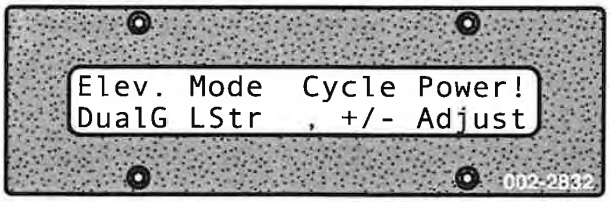
Automatic Operation: For automatic operation, the sensors must be mounted and connected to the machine. The machine can be operated with a stringline guide on the left side, the right side, or both sides. The control system recognizes how the machine is to be operated through the elevation/slope designation set in the calibrate mode. If left elevation/ right slope is designated, the control system will assign elevation control to the leg(s) on the left side of the machine frame and slope control to the right leg(s).



Right elevation, left slope display

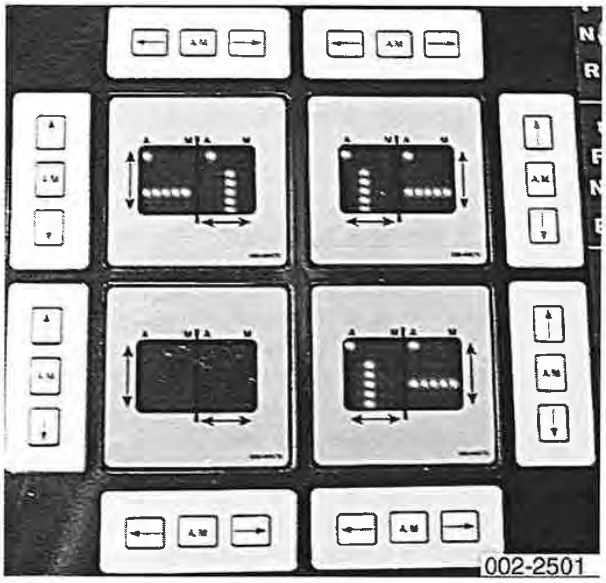
If right elevation/left slope is designated, the control system will assign elevation control to the leg(s) on the

right side of the machine frame and slope control to the left leg(s).



Left steer/dual elevation display

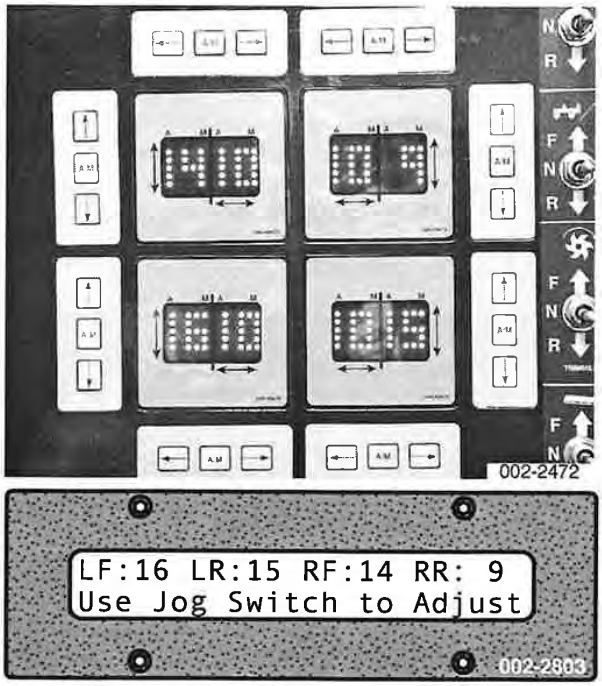
If dual elevation is designated, the control system will assign elevation control to the legs on both sides of the machine frame. One dual elevation display will indicate arrows pointing to the left for left steer and one display will indicate arrows pointing to the right for right steer.



Automatic mode with slope

To set the control system for automatic control, the machine should be set to the stringline guide, following the instructions in the setup chapter. Check that the main screen is in the standby (S) mode. Place each control loop in the automatic (A) mode by depressing each of the A/M switches. Place the steering selector switch in the stringline steer position. Place the forward/reverse switch in the position corresponding to the direction of travel. Depress the run/standby switch to place the main screen in the "run" mode (indicated by "Run" in the display). All control loops should drive to the "null" (center) position as indicated by the control loop display indicators. If a elevation sensor wand is in the full up or down position, when the system is placed in the run (R) mode, it may cause an "off line" condition and shut down the loop. To correct, move the appropriate sensor wand slightly back towards center. The system will recognize this as a normal operating range, placing the control loop back in the automatic mode and will now react to the sensor wand position.

The slope command will return to the last value that it was set at, even if the system has been shut down and restarted. The slope setpoint switches are used to change the cross slope of the machine frame. The slope control loop(s) are changed simultaneously using one switch. By depressing and releasing either switch, the slope command will change in 0.05% increments. By depressing and holding the switch, the slope command will slowly change in 0.05% increments for two counts, and then rapidly change in 0.5% increments until the switch is released.



Sensitivities on control loop

Sensitivity settings can be checked by depressing and releasing either the elevation or steer sensitivity switches under the service panel. The settings will be shown on the individual control loops by the number of indicators displayed. Minimum sensitivity is with "0" showing and maximum is with 19 showing. The sensitivity can be set at any place in between. Individual control loop sensitivities can be increased by depressing the up switch, or decreased by depressing the down switch for elevation or depressing the left and right switch for steer. For each depression of either switch, the sensitivity will change one setting.

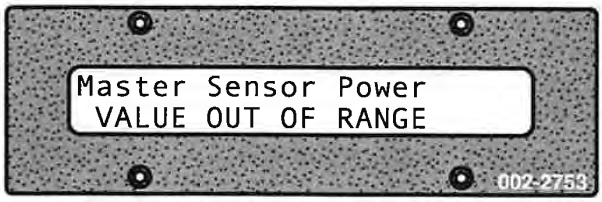
Initial setting for the sensitivity on the elevation, slope and steering control loops is typically with ten to fifteen indicators showing. For optimum performance, it may be necessary to increase or decrease the sensitivity. Sensitivity settings can be made in the standby or run mode. For final setup instructions, refer to the setup chapter.

System Diagnostics

The network controller is capable of self and system diagnostics. It will detect the following:

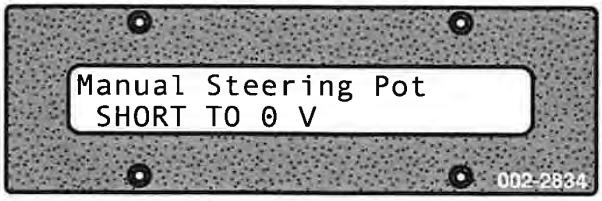
1. Low battery voltage
2. Incorrect sensor signals
3. Shorts in wiring
4. Lost stringline
5. Location of faults
6. Program faults
7. Valve drive faults

The main screen will indicate the type of failure and the current voltage reading for the failed circuit. If more than one fault exists, the main screen will alternate between faults, giving an overall view of the problem. The following is a listing of the various fault messages. Refer to the troubleshooting chapter for more diagnostic information.



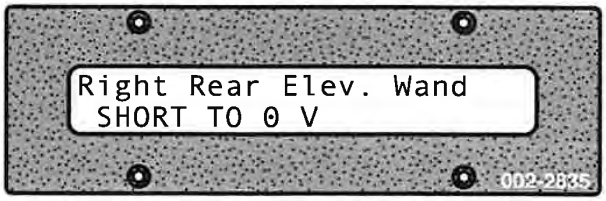
Master sensor power failure

MASTER SENSOR POWER VALUE OUT OF RANGE—This message refers to a problem with voltage being provided to the manual steer knobs on the control panel. If sensor voltage drops below 4.75 volts or increases above 5.25 volts the main screen will alternate the message "Master Sensor Power – VALUE OUT OF RANGE" with the normal operating display. The machine can be operated with the manual override controls only.



Control knob output voltage failure

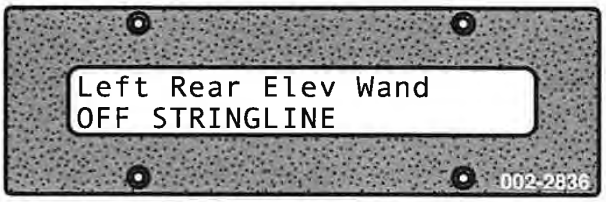
POT SHORT TO 0 V—If the output voltage signal from a control panel knob drops below 0.21 volts or increases above 5.0 volts the main screen will indicate which control knob output voltage is faulty. The message "SHORT TO 0 V" will alternate with the normal operating display.



Short to 0.0 Volts

SHORT TO 0.0 VOLTS—If the output voltage signal from a sensor, or a feedback pot, drops below 1.2 volts or increases above 3.8 volts the main screen will indicate the location and type of sensor or feedback pot. The message "SHORT TO 0 V" will alternate with the normal operating display. The output voltage drive to the corresponding servo valve will shut down, holding the appropriate cylinder in position. The appropriate control loop must be in the automatic (A) mode and the main screen must be in the run (R) mode prior to reading a fault of this type. To check, swap the sensor (or feedback pot) with one known to be good. If the problem is corrected, the sensor (or feedback pot) is at fault and must be replaced. If the problem is not corrected by swapping the sensor (or feedback pot), swap the cord between the sensor (or feedback pot) and the bulkhead plug. If the problem is not corrected by swapping the cord, disconnect the cable between the bulkhead plugs and the S2X, at the S2X controller. Swap the cable to one of the other S2X controllers. If the problem transfers with the cable, the cable is at fault and must be replaced. If the problem remains with the S2X controller, the S2X controller is at fault and must be replaced.

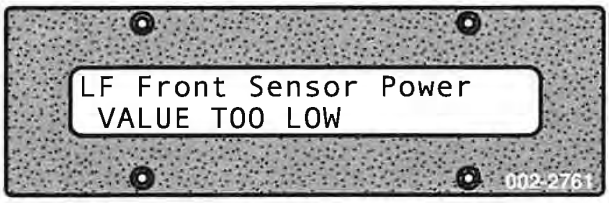
> **Note:** The working voltage range for the slope sensor is 0.75 to 4.75 volts.



Off stringline

OFF STRINGLINE—If the output voltage signal from a sensor drops below 1.5 volts or increases above 3.5 volts the main screen will indicate the location and the type of the sensor. The message on the top line of the

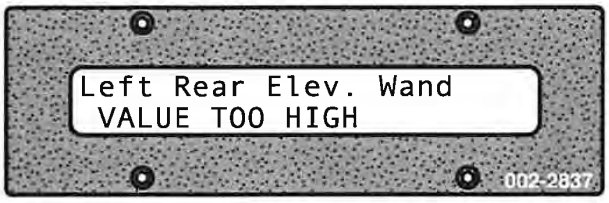
display will indicate the location of the sensor and the bottom line indicates the message OFF STRINGLINE. The message will alternate with the normal operating display. The output voltage drive to the corresponding servo valve will shut down, holding the appropriate cylinder in position. The appropriate control loop must be in the automatic (A) mode and the main screen must be in the run (R) mode prior to reading a fault of this type. To correct this problem, place the sensor wand(s) back on the stringline guide.



Sensor power failure

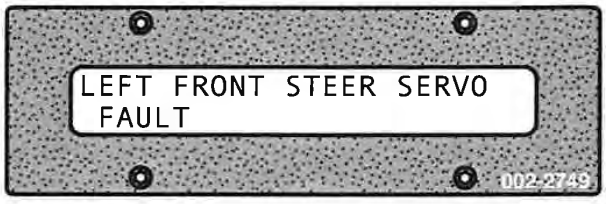
VALUE TOO LOW—This message refers to a failure of the power supplied to the sensors by the individual S2X controllers. If sensor voltage drops below 4.75 volts or increases above 5.25 volts the main screen will indicate the location of the failure. The message "Sensor Power – VALUE TOO LOW" will alternate with the normal operating display. The output voltage drive to the corresponding servo valve will shut down, holding the appropriate cylinder in position.

> **Note:** If the sensor power supply from an individual S2X controller has failed, all sensors controlled by the S2X controller will be affected.



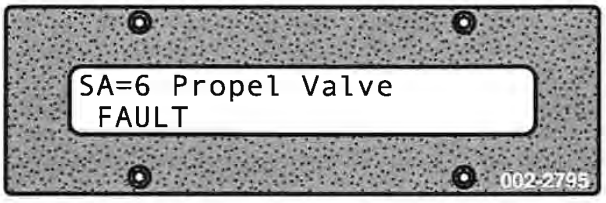
Sensor signal short to power

VALUE TOO HIGH—This message refers to a direct short between the power supplied to the sensors and the sensor signal returning to the S2X controller. If sensor signal voltage increases above 3.8 volts the main screen will indicate the location of the failure. The message "VALUE TOO HIGH" will alternate with the normal operating display. The output voltage drive to the corresponding servo valve will shut down, holding the appropriate cylinder in position.



Servo fault

SERVO FAULT—If a short or open electrical circuit occurs in the wiring or the valve, the main screen will indicate the location and the type of the servo valve. The message SERVO FAULT will alternate with the normal operating display. To check, disconnect the polarized plug from the suspect servo valve. Connect the plug from the S2X controller to a servo valve known to be good. If the fault message clears, the suspect valve is defective and must be replaced. If the fault message remains, the servo valve is good and the problem is in the wiring or the S2X controller.



Travel valve fault

VALVE FAULT— If a short or open occurs in the wiring or the control valve, the main screen will indicate the S2X address (SA–6) and the appropriate control valve. The FAULT message will alternate with the normal operating display. To check, disconnect the polarized plug from the suspect control valve. Connect the plug to a control valve known to be good. If the fault clears, the suspect valve is defective and must be replaced. If the fault message remains, the control valve is good and the problem is in the wiring or the S2X controller.



DC2 controller not responding

NO RESPONSE—If an S2X controller failure occurs, the main screen will indicate the location of the S2X. The message NO RESPONSE will alternate with the normal operating display. This message occurs when a S2X controller is not communicating with the main

control panel. A power failure or a defective S2X controller may be the cause.

06 Moving the Machine

Before starting the engine, all oil and coolant levels should be checked. The machine should be greased as specified in the maintenance chapter. Position all hydraulic control knobs and FNR switches in the "neutral" or "off" position and place the servo lock switch in the "on" position.

To start the engine, turn the throttle open (counterclockwise) three or four turns. Be certain the travel variable control knob is in the "off" position. Depress the start assist switch and turn the ignition key to the "start" position. Crank the engine until it starts. Release the key and allow it to return to the "on" position. Release the start assist switch after the engine oil pressure has increased sufficiently to override the engine oil pressure shut down circuit. After the engine starts, do not increase speed above 1000 rpm for one minute to allow engine oil pressure to increase, especially on turbocharged engines. Depress the emergency stop reset switch to set the emergency stop system for operation. When the light above the reset switch is no longer illuminated, the machine is ready for operation. If the light continues to illuminate, check that all of the emergency stop buttons are pulled out

NOTICE: DO NOT OPERATE STARTER LONGER THAN 30 SECONDS AT A TIME OR DAMAGE MAY RESULT. ALLOW STARTER TO COOL FOR 2 TO 3 MINUTES BETWEEN STARTING ATTEMPTS

Note: The travel variable control knob must be rotated to the off position before the engine will crank. When the engine starts, the ignition switch must remain in the "on" position for the electronic controls to function

⚠ CAUTION! ⚠

CONTINUOUS EXPOSURE TO ENGINE AND MACHINE NOISE CAN CAUSE HEARING INJURY. DO NOT OPERATE THE MACHINE WITHOUT ADEQUATE HEARING PROTECTION

Increase engine speed to 1500 rpm and allow the engine to "warm up" for 10 to 15 minutes before activating any function.

After the engine has been started, select the CALIB switch. It will be necessary to check the appropriate parameters that the machine is to operate under and change them if necessary. Select the appropriate elevation mode, alarm mode, sensor phasing, steer authority and machine type. Once the selections have been made, they are stored by the controller and are recalled after each shut down.

Note: If a change to the calibrate mode was necessary, the network control system must be restarted before the new parameter in the calibrate mode will take affect.

⚠ WARNING! ⚠

DO NOT RAISE THE RIGHT SIDE OF THE MACHINE HIGHER THAN THE LEFT WHEN THE LEGS ARE IN THE TRANSPORT MODE. WHEN IN THE TRANSPORT MODE, IT IS POSSIBLE TO TIP THE MACHINE OVER IF THE RIGHT SIDE IS RAISED CONSIDERABLY HIGHER THAN THE LEFT.

To move the machine, or to load or unload it, increase engine speed to 2250 rpm (maximum). Place the servo lock switch in the "off" position. Using the all jog switch, raise the machine high enough to clear obstacles.

Note: To hold the machine frame level, it is recommended to place the servo lock switch in the "off" position. Place the slope control loop in the automatic (A) mode and the main screen in the run (R) mode. Adjust the slope setpoint to "0.0%" of slope by depressing the +/- switches in the desired direction. By doing this, the machine frame will automatically remain level, from side to side, while moving the machine. It may be necessary to adjust the sensitivity if the machine reacts erratically.

⚠ WARNING! ⚠

THE TRACK BRAKE SWITCH MUST BE "ON" ANY TIME THE MACHINE IS LOADED OR UNLOADED OR MOVING UP OR DOWN STEEP EMBANKMENTS. THE REAR TRACK (WHEN IN 3-TRACK MODE) MUST BE KEPT AS FAR TO THE LEFT AS POSSIBLE TO PROVIDE THE MOST STABILITY DURING LOADING OR UNLOADING. THE MACHINE SHOULD ALSO BE DISASSEMBLED TO THE NORMAL TRANSPORT WIDTH WHETHER IN 3-TRACK OR 4-TRACK CONFIGURATIONS.



002-2067

Select a manual steer mode

Place the manual steer selector in one of the manual steer positions and the main screen in the run (R) mode. Steer the tracks to the desired direction by rotating the manual steer knob. Make certain the tracks are correctly positioned before moving the machine.

Note: It will be necessary to place the servo lock switch in the "off" position to steer the tracks.



002-2349

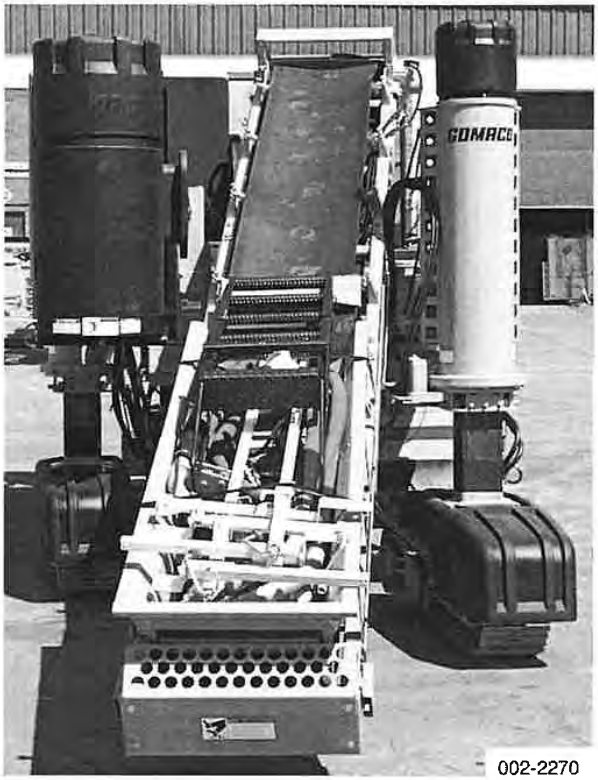
Controls set to move the machine

⚠ WARNING! ⚠

BE CERTAIN THAT THE AREA IN FRONT OF, AND BEHIND THE MACHINE IS CLEAR BEFORE MOVING THE MACHINE. MOVE THE MACHINE SLOWLY WHEN LOADING OR UNLOADING IT. USE CAUTION WHEN TRAVELING DOWN EMBANKMENTS TO AVOID TIP-OVER. BE CERTAIN THAT THE AREA AROUND THE MACHINE IS CLEAR BEFORE TURNING

Place the forward/reverse direction control switch to either "forward" or "reverse" for the desired direction of machine travel. The fast/slow switch must be placed in the "slow" position for loading or unloading the machine. For faster movement around the jobsite after the machine has been unloaded, the fast/slow switch may be placed in the "fast" position. Place the travel/neutral switch in the "travel" position. To start the machine in motion, slowly rotate the travel variable control knob in the "increase" direction. The more the control knob is moved in the "increase" direction, the faster the machine will travel.

Note: When changing the forward/reverse switch or the fast/slow switch positions, it will be necessary to stop the machine travel before the change will take affect.



002-2270

Shipped components

Banded to the conveyor is the ladder for boarding the machine, 2 sensor arm assemblies, 4 sensor arm braces, the rubber discharge chute for the conveyor and miscellaneous other parts. Cut the bands and lay all parts off to one side for installation later.



Install boarding ladder

Install the boarding ladder on the right rear corner of the machine by sliding the hook plate down into the mounting bracket. Tighten the retainer bolt securely. Extend the ladder to the desired length by pulling the spring loaded pins out and sliding the inner section up or down as necessary. Make certain the spring loaded pins have secured the ladder prior to use.

Remove the sensors, steering wands, elevation wands and miscellaneous other parts from the tool box on the left front leg extension. Lay them off to the side out of the way, until needed.

CHAPTER III CURB, GUTTER & SIDEWALK SETUP

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Vibrator Installation 3-2
Driveway Cutter Installation 3-2
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CHAPTER III CURB, GUTTER & SIDEWALK SETUP

01 Content of Chapter

This chapter covers instructions for the preparation of the machine, trimmerhead and the various slipform molds used for standard types of pouring. Also covered are instructions for mounting the attachments to the machine and pouring operations. At the end of the chapter are instructions for cleaning the machine at the end of the pour. Some procedures pertain to machines that are being assembled for the first time, while others pertain to machines that may have been in service for some time. All adjustments are recommended procedures only. **Pay particular attention to all safety statements!**



DCAL-058

02 Curb and Gutter Form Preparation

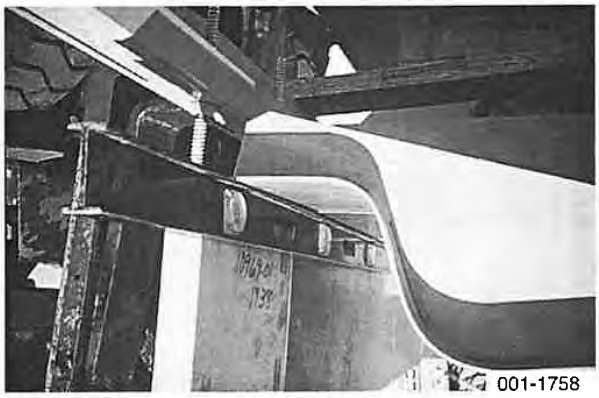
Stainless Trowel Adjustment



Adjust stainless section

Adjust the stainless trowel section of the slipform mold so the leading edge is approximately 1/8 in. (3 mm) above the rear edge of the main pan. Make the adjustment at both sides of the mold. Tighten the adjustment nuts securely.

Place a 4 ft. (1.2 m) straight edge from the rear of the stainless trowel section, up into the main form. Adjust the rear of the stainless until there is an 1/8 in. (3 mm) gap between the rear edge of the main form and the straight edge. Tighten the adjustment nuts securely.



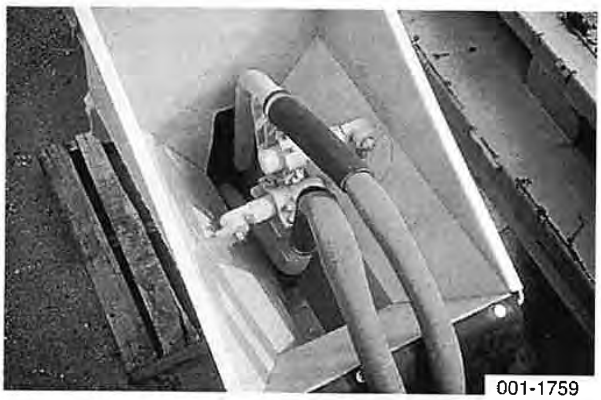
Straight edge in top of curb

Place the straight edge in the top of the curb profile. Adjust the rear of the curb profile stainless until there is 1/8 in. (3 mm) gap between the rear edge of the main form and the straight edge. Tighten the adjustment nuts securely. Check the sides of the curb profile to be certain that the leading edge of the stainless is not protruding inside the dimensions of the main form. If so, slightly bend the leading edge of stainless trowel as necessary.

Adjusting the stainless trowel section in this manner assures that as concrete slips from the main form, the leading edge of the stainless will not catch and tear the surface. It also assures that the rear of the stainless will push down slightly on the concrete to give it a troweled surface.

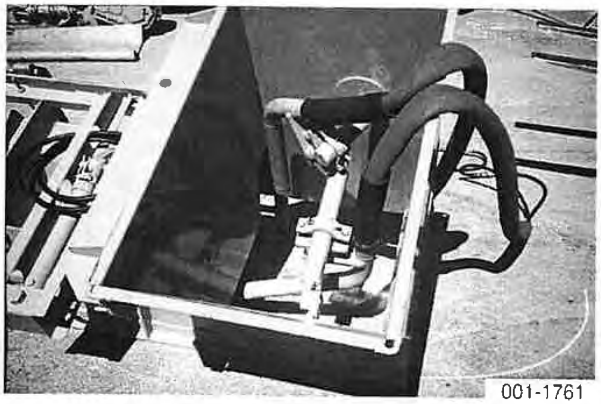
Note: When adjusting the stainless trowel section on curb and gutter forms, it is normally easier to roll the form over on its top.

Vibrator Installation



Install vibrators in barrier curb

Vibrator placement in a barrier type curb (no gutter section) is with the lower vibrator in an underslung (horizontal) position, centered in the curb. The tip should be 6 in. (150 mm) above the bottom of the form. The top vibrator should be in an overslung (vertical) position, centered in the curb opening and tipped back slightly. The tip should be 6 to 8 in. (150 to 200 mm) below the top of the opening. Tighten the vibrator attaching bolts and setscrews securely. Tighten the adjustable vibrator mount assemblies securely in position.



Install vibrators in curb & gutter form

When installing vibrators in a standard curb and gutter form, place one vibrator in the overslung (vertical) position, centered in front of the curb opening. The tip should be tilted back slightly and 6 to 8 in. (150 to 200 mm) below the top of the opening. The gutter vibrator should be underslung (horizontal) approximately 4 to 6 in. (100 to 150 mm) from the outer edge of the gutter with the tip centered in the concrete thickness. Tighten the vibrator attaching bolts and setscrews securely. Tighten the adjustable vibrator mount assemblies securely in position.

To install vibrators in a drive-over type or a valley type curb and gutter form, position both vibrators in the underslung (horizontal) position, approximately 4 to 6 in. (100 to 150 mm) in from each edge. The tip should be centered in the concrete thickness. Tighten the vibrator attaching bolts and setscrews securely. Tighten the adjustable vibrator mount assemblies securely in position.

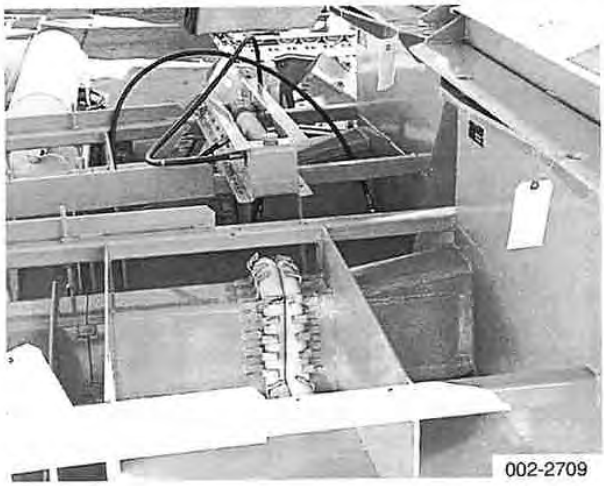
> **Note:** It may be necessary to position the vibrators to one side of the recommended position to allow steel bars to be fed into any of the forms previously described. On forms of 3 ft. (0.91 m) wide or over, it may be necessary to add an additional vibrator in the center of the form.

Driveway Cutter Installation



Install driveway cutter

There are two types of driveway cutter assemblies available from GOMACO. The guillotine cutter blade, when inserted, simply strikes the concrete curb off at the depth of the blade. Concrete finishing is required throughout the driveway area with the guillotine cutter blade.



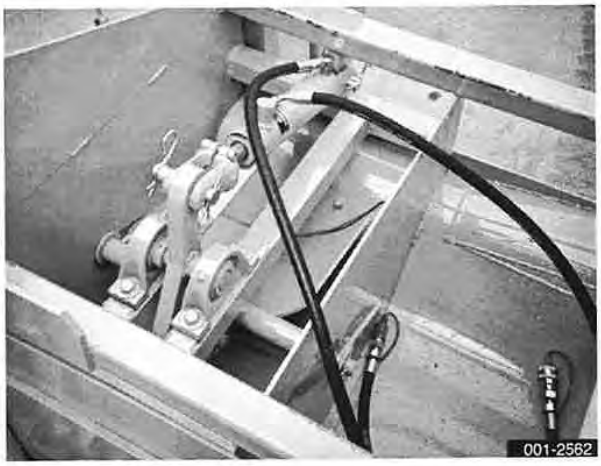
Installation of the guillotine driveway cutter

Set the driveway cutter assembly in place on the square tubes at the top of the form. Insert the mounting bolts and tighten securely. Extend the cylinder to the maximum, making certain the blade enters the slot in the top of the gutter profile. Check the gum rubber hose seals on each side of the blade to be certain they are snug to prevent grout from leaking out.

> **Note:** If a slot has not been cut in top of curb profile, order GOMACO brochure number H-0476-02 for complete installation instructions.

Look under the slipform mold and note the angle of the bottom edge of the blade. It may be necessary to cut the bottom of the blade to get the desired angle.

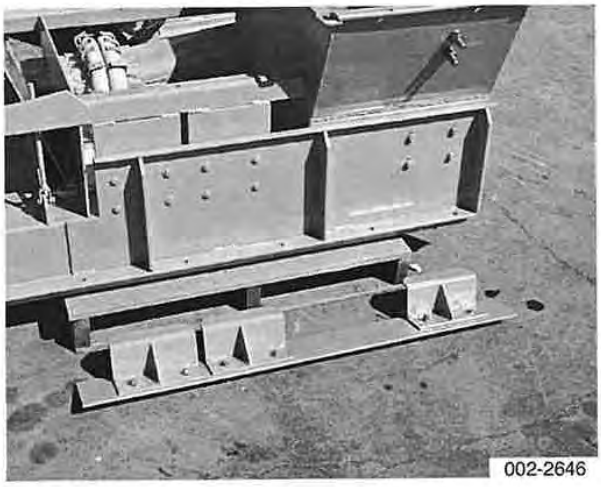
> **Note:** If blade angle is to be changed, do not remove an excess of material. Remove material in small amounts and check performance after each such removal.



California Style driveway cutter

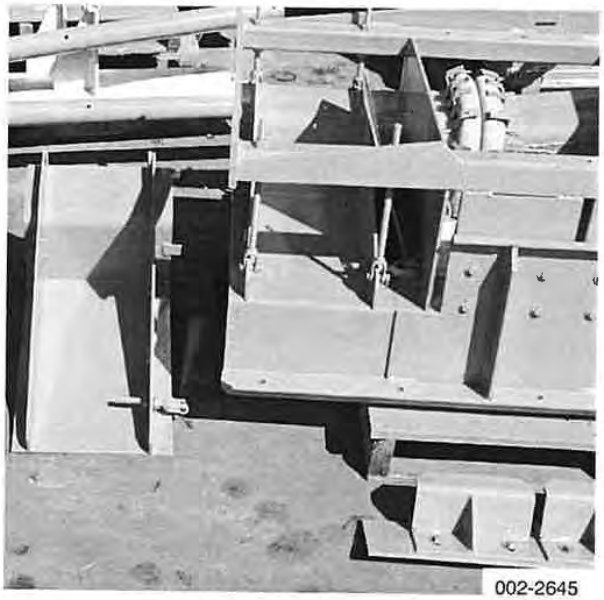
The California style driveway cutter is a depressor type. Depending upon concrete mix design, this blade will partially finish the driveway opening in the curb. This style of driveway cutter must be built to specification for each individual curb and gutter profile. The California style driveway cutter is not interchangeable between different profiles.

Scab-On Sideplate Preparation



Install sideplate

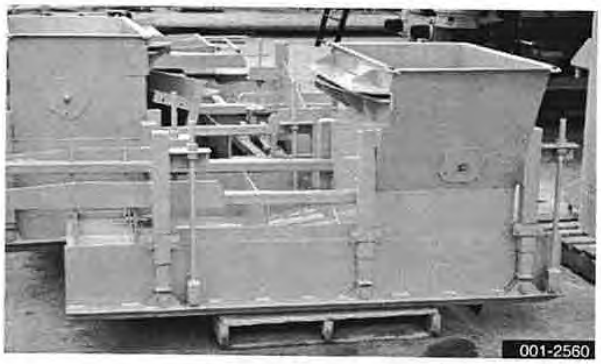
On forms that are designed to be used for pouring against the edge of the existing roadway (scab-on), a removable sideplate is available. The sideplate may be installed so that the form may be used for pouring free standing curb and gutter. Bolt the sideplate to the side of the form and tighten the attaching bolts securely. When the form is used for scab on operations, the plate is removed and the guide plates are installed in its place.



Change stainless trowel section

The stainless trowel section must be changed to match the type of pour. Loosen the adjustment nuts on the four stainless adjustment bolts. Remove the cotter keys and pins from the adjustment bolt clevis and remove the stainless section. Insert the proper stainless section into place and install the pins and cotter keys. Adjust the stainless trowel as previously described.

Manual Sideplate Adjustments



Adjustable sideplates

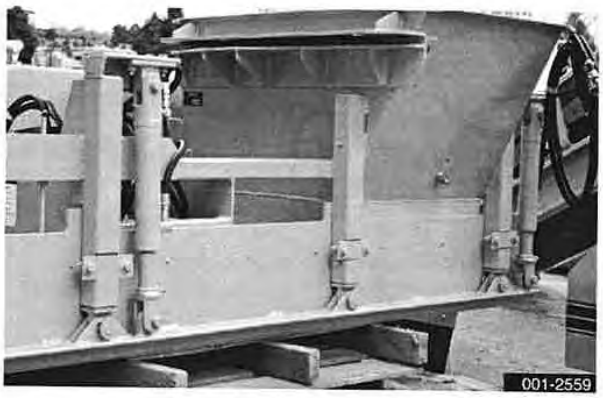
On forms equipped with adjustable sideplates, it will be necessary to adjust the sideplates for the proper height. Raise the form off the ground. Measure from the bottom of the sideplate to the top of the curb form just ahead of the stainless section. This measurement should be 1/2 inch more than the actual height of the curb to allow for slump. Raise or lower the sideplate as necessary with the adjustment bolt and tighten securely. It may be necessary to loosen each of the clamp plates on the sideplate guide tubes.

Measure from the bottom of the sideplate to the top of the gutter face just ahead of the stainless section. This measurement should be 1/4 inch more than the actual height of the gutter to allow for slump. Raise or lower the sideplate as necessary with the adjustment bolt and tighten securely. It may be necessary to loosen each of the clamp plates on the sideplate guide tubes.

Measure from the top of the sideplate to the bottom of the angle iron on the side of the form, in line with the rear adjustment bolt. Measure from the top of the sideplate to the bottom of the angle iron on the side of the form, in line with the front adjustment bolt. Adjust the front of the sideplate until the measurement is the same as the rear. Adjust the front of the sideplate in the same manner on both sides of the form.

> **Note**: Sideplate measurements may vary depending on the height of the curb, concrete mix designs and concrete slump.

Hydraulic Sideplate Adjustments



Hydraulic adjusted sideplates

An optional pressure compensated sideplate assembly can be installed on the form. Hydraulic pressure is used to hold the sideplates down in firm contact with the grade. Hang the control box on the top of the guard rail on the left side of the machine.

Connect the pressure and return hoses from the control valve to the quick couplers hanging down under the right side of the control console. Route the hoses from the sideplate cylinders over the top of the slipform mold to the control box on the left guard rail. Connect the hoses from the cylinder to the respective hoses in the control box. Be certain to place the protective covers over/in the quick couplers when they

are disconnected to keep dirt from entering the hydraulic system.

During pouring operations, place the control valve handles in the "down" position and adjust the pressure holding the front and rear of each sideplate on the grade to approximately 300 psi (21 bar). To adjust the pressure, loosen the jam nut on the adjusting screw and turn the screw in to increase pressure, or out to decrease pressure. Before raising the slipform mold, place the control valves in the center (neutral) position. Move the valve handles to the "up" position to raise the sideplates.

Note: It may be necessary to operate the two front sideplate cylinders in the "neutral" position if running on soft subbase to prevent the sideplate from digging into the subbase material.

03 Sidewalk Form Preparation

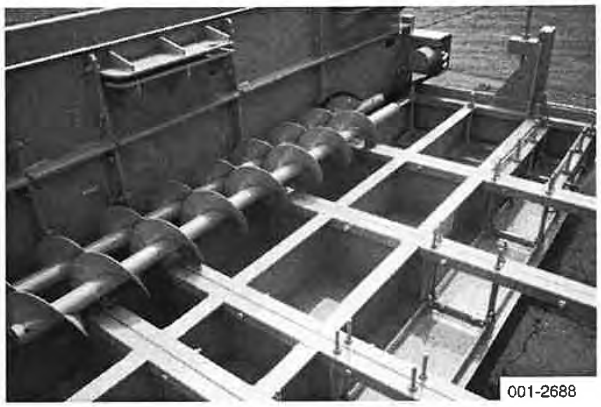
Changing Sectional Form Widths



Sectional Form

When changing the width of the sectional sidewalk mold, it should be removed from the machine. Place adequate support blocking under the form on each side of the joint where the form is to be split.

Note: If a section is to be removed, place blocking to each side of, but not under the section.



Remove Bolts Between Sections

Remove the bolts from the adjoining ends of the stainless trowel section. Remove the bolts from the back of the form and the hopper where it is to be split. Remove the bolts from either end of the hopper auger. If an insert section is to be removed, remove the bolts at each side of the section and lift the section clear. Remove the auger and install the appropriate section in its place. Push the sections together and insert the bolts previously removed. If a section is to be added, use a suitable lifting device and lift one side of the form away from the other section enough to insert the section of desired width. Insert the bolts through each end of the added section. Do not tighten bolts at this point.

Note: If the width of the sidewalk exceeds 6 feet (1.83 m), an auger must be installed in the form hopper.



Straighten Bottom of Form

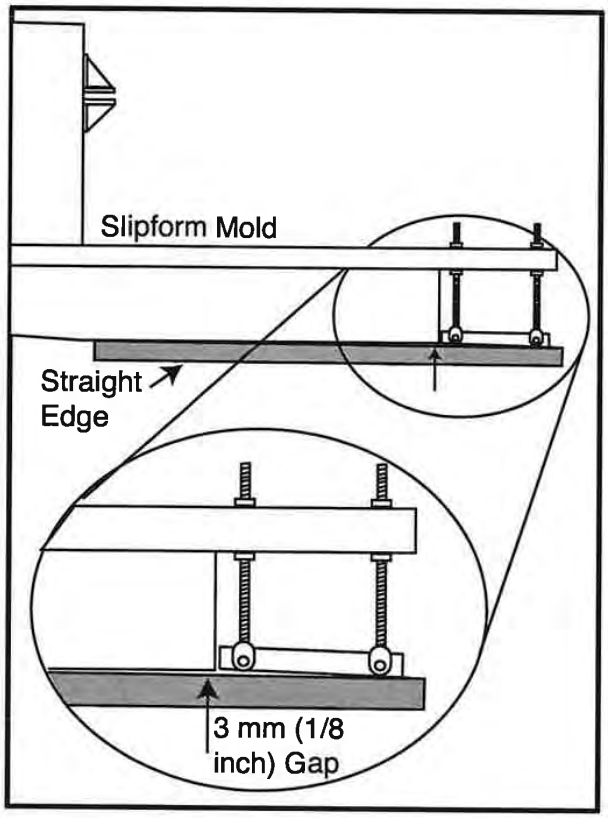
Using a suitable lift device, align the bottom edge of the form where the section(s) adjoin. Place a straight edge across the front and the rear of the main form to check for flatness. If the profile needs adjusting, it may be necessary to shim the insert sections of the main form. Tighten all bolts securely.

Stainless Trowel Adjustment



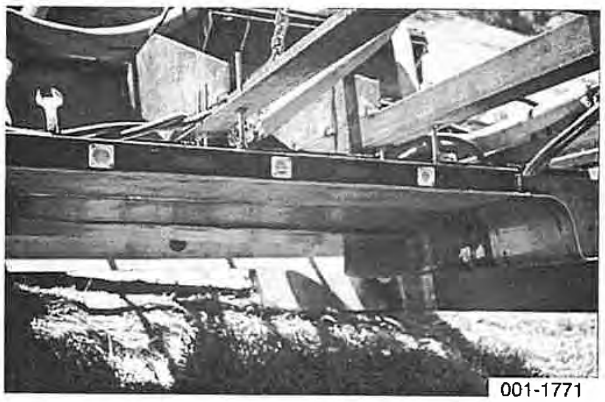
Adjust sidewalk stainless

Adjust the stainless trowel section of the slipform mold so the leading edge is approximately 1/8 in. (3 mm) above the rear edge of the main pan. Make the adjustment at both edges and at each center adjustment location. Tighten the adjustment nuts securely.



Adjust rear edge of stainless

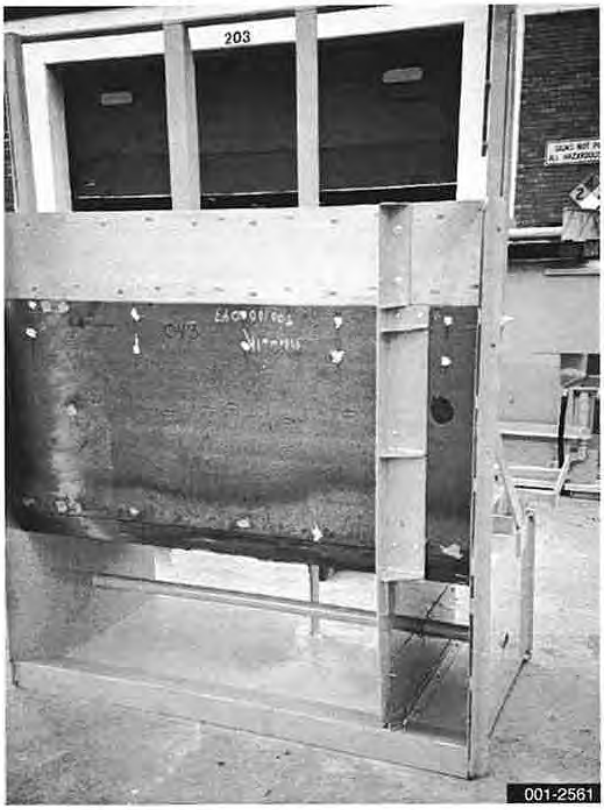
Place a 4 ft. (1.2 m) straight edge from the rear of the stainless trowel section, up into the main form. Adjust the rear of the stainless, at each adjustment location, until there is 1/8 in. (3 mm) gap between the rear edge of the main form and the straight edge. Tighten the adjustment nuts securely.



Adjust stainless for flatness

Place a straight edge across the rear edge of the stainless trowel to check for flatness. If the profile needs adjusting, it may be necessary to adjust the center rear of the main form also.

Blockout Installation



Install sidewalk blockout

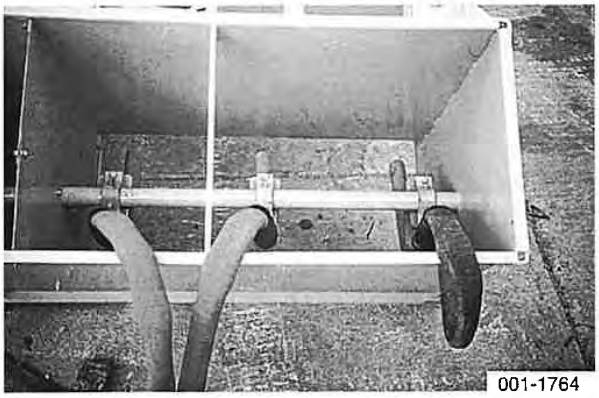
If the width of the sidewalk form must be made smaller, it will be necessary to install an optional blockout assembly. Tilt the form up until it is resting on the front of the hopper. Hold the bottom portion of the blockout in place and secure it with the bolts, nuts and lock washers provided. If holes are not provided in the main form, it will be necessary to drill holes. Secure the blockout in the desired location and mark the holes. Drill 3/8 in. (10 mm) holes at each marked location and then install blockout.

Bolt the edger into place on the stainless trowel section. Place a straight edge along the side of the blockout and adjust the front of the edger so it is 1/8 in. (3 mm) outside the rear of the blockout. Adjust the rear of the edger in, or out, so there is 1/8 in. (3 mm) gap between the rear edge of the blockout and the straight edge. Tighten the attaching bolts securely.

> **Note:** If holes are not in stainless trowel section, position edger in proper location and mark holes. Drill a 3/8 in. (10 mm) hole at each of the marked locations and attach the edger.

Install the rear half of the false end into the slipform hopper and secure in to the rear of the hopper. Install the front half and secure it to the front of the hopper. Fasten the two halves together in the center. Attach both halves to the bottom of the blockout and tighten all mounting bolts securely. If holes are not present in the hopper, mark and drill 3/8 in. (10 mm) holes.

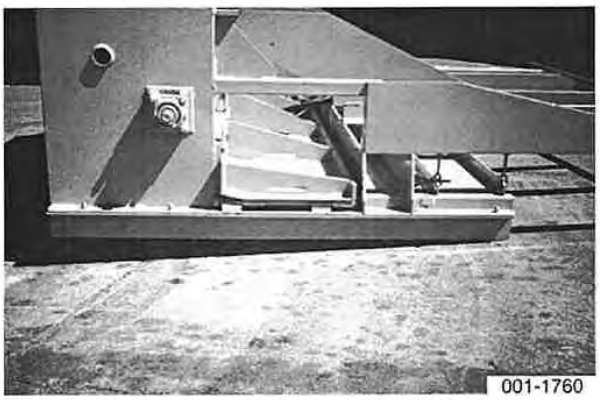
Vibrator Installation



Install vibrators in sidewalk form

The vibrators are installed 4 to 6 in. (100 to 150 mm) in from each edge in the underslung (horizontal) position. The top of the vibrator tip should be even with the bottom of the form pan. On 3 to 5 ft. (0.9 to 1.5 m) wide forms, a third vibrator should be positioned in the center of the form. On forms wider than 5 ft. (1.5 m), additional vibrators should be installed for an 18 inch (0.5 m) optimum spacing between vibrators.

Installing Depth Extensions



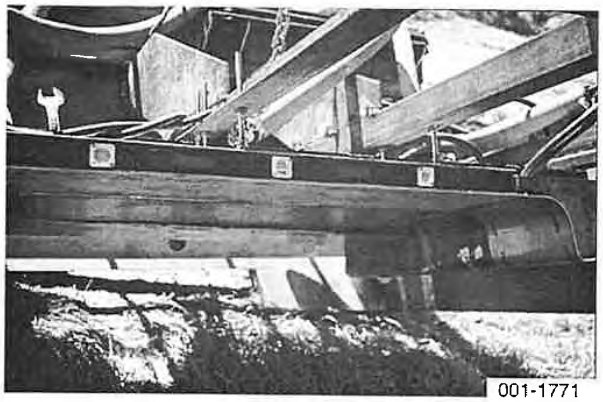
Install depth extensions

If the thickness of the sidewalk must be increased, bolt on extensions are available for the bottom of the form sides. Bolt the extensions into place and tighten securely. If no holes are provided in the bottom angles of the form, clamp the extensions in place and mark

the location of the holes. Drill the holes, using a 3/8 in. (13 mm) drill bit. Fasten the extensions in place and tighten the mounting bolts securely.

04 Monolithic Form Preparation

Stainless Trowel Adjustment



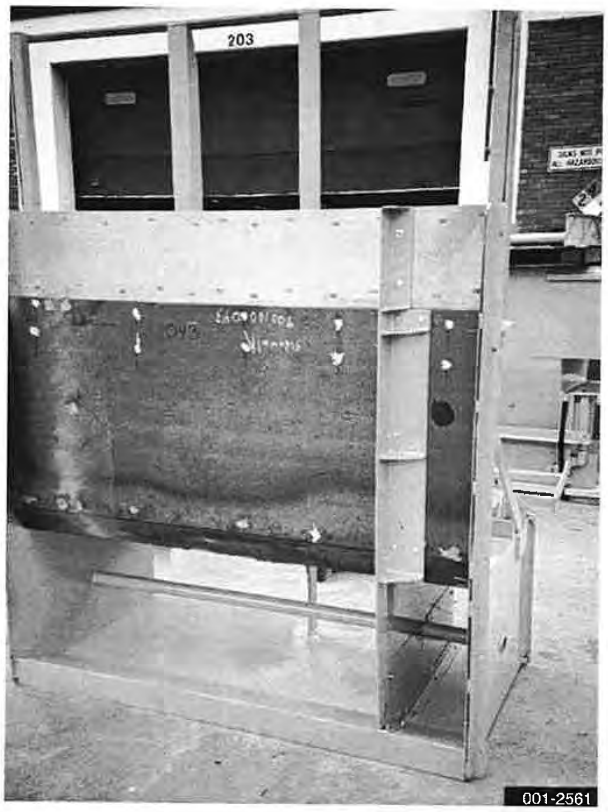
Adjust stainless trowel section

Adjust the stainless trowel section of the slipform mold so the leading edge is approximately 1/8 in. (3 mm) above the rear edge of the main pan. Make the adjustment at both edges and at each center adjustment location. Tighten the adjustment nuts securely.

Place a 4 ft. (1.2 m) straight edge from the rear of the stainless trowel section, up into the main form. Adjust the rear of the stainless, at each adjustment location, until there is 1/8 in. (3 mm) gap between the edge of the main form and the straight edge. Tighten the adjustment nuts securely.

Place a straight edge across the rear edge of the sidewalk portion of the stainless trowel to check for flatness. Adjust the center rear of the main form if the profile requires adjustment.

Blockout Installation



Sidewalk form with blockout installed

If the width of either the sidewalk or gutter portion of the slipform mold must be made smaller, it will be necessary to install a blockout assembly. Tilt the form up until it is resting on the front of the hopper. Hold the bottom portion of the blockout in place and secure it with the bolts, nuts and lock washers provided. Tighten the bolts securely. If the holes are not provided in the main form, it will be necessary to drill holes. Secure the blockout in the desired location and mark the holes. Drill 3/8 in. (10 mm) holes at each marked location and then install the blockout.

If the blockout is being installed on the sidewalk side, bolt the edger into place on the stainless trowel section. Place a straight edge along the side of the blockout and adjust the front of the edger so it is 1/8 in. (3 mm) outside the rear edge of the blockout. Adjust the rear of the edger in, or out, so there is a 1/8 in. (3 mm) gap between the rear edge of the blockout and the straight edge. Tighten the attaching bolts securely.

Note: If the holes are not in the stainless trowel section, position the edger in the proper location and mark the holes. Drill a 3/8 in. (10 mm) hole at each of the marked locations and attach the edger.

If the blockout is being installed on the gutter side, it may be necessary to change the stainless section. Loosen the adjustment nuts on the stainless adjustment bolts. Remove the cotter keys and pins from the adjustment bolt clevis and remove the stainless section. Insert the proper stainless section into place and install the pins and cotter keys. Adjust the stainless trowel as previously described.

Install the front and rear halves of the blockout into the slipform hopper. Fasten the two halves together in the center. Attach both halves to the bottom portion of the blockout and tighten all bolts securely.

Note: It may be necessary to cut a 3 in. (76 mm) section of flighting from the auger shaft, where it goes through the false end.

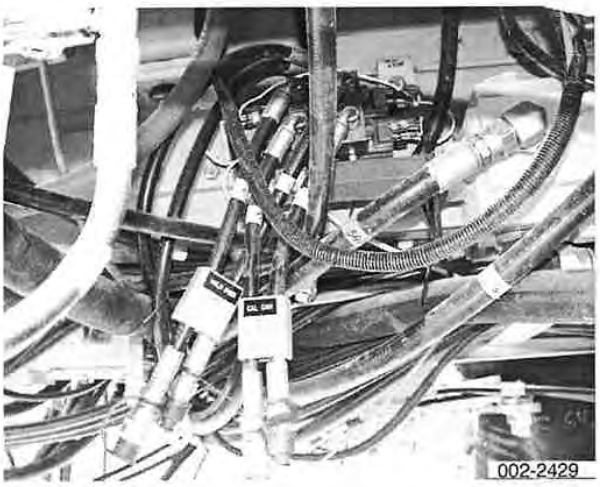
Vibrator Installation



Install vibrators in monolithic form

Install a vibrator 4 to 6 in. (100 to 150 mm) in from the edge of the sidewalk portion of the form in the underslung (horizontal) position. The top of the vibrator tip should be even with the bottom of the form pan. Install a vibrator in the gutter portion of the form in the underslung (horizontal) position with the tip centered in the concrete. The vibrator should be 4 to 6 in. (100 to 150 mm) in from the edge. Place a vibrator in the underslung (horizontal) position in the curb area with the tip centered in the concrete. Any additional vibrators should be installed for an 18 inch (0.5 m) optimum spacing between vibrators.

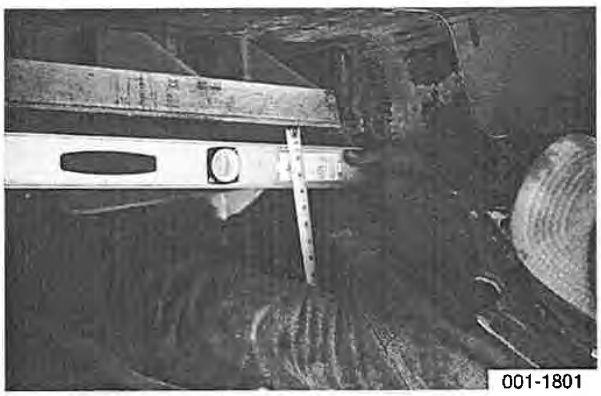
Driveway Depressor Hydraulic Connection



Hold over connection

Connection of the hydraulic cylinder to the machine for operation may be accomplished in two different ways. The rear shift switch may be used to operate the driveway depressor. Disconnect the rear leg shift cylinder hoses and connect them to the driveway depressor cylinder hoses. The optional hold over control circuit may also be used if it is installed on the machine. Connect the driveway depressor cylinder hoses to the hold over solenoid valve quick couplers.

Driveway Depressor Adjustment



Adjust driveway depressor down

Adjust the upper set of limiting stops on the driveway depressor (if so equipped) so it will leave the required amount of reveal in the gutter area when depressed. Adjust the rear edge of the depressor so it is 1/8 in. (3 mm) lower than the front edge. Lock the adjusting nuts in place with the jam nuts.

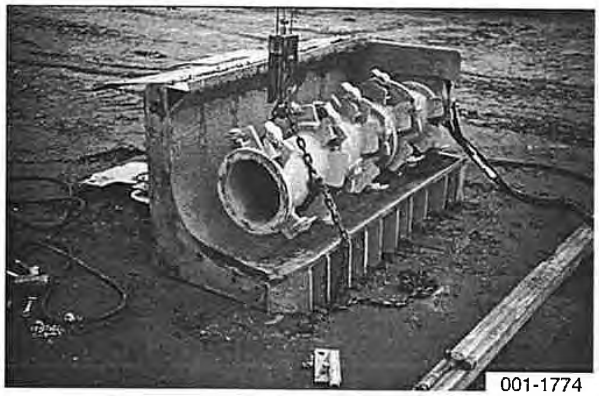


Adjust driveway depressor up

Adjust the lower set of limiting stops to limit how far the depressor can be retracted. The rear edge of the depressor should be even with the leading edge of the main pan when it is completely retracted. The front edge of the depressor should be 1/8 to 1/4 in. (3 to 6 mm) higher than the rear. Lock the adjusting nuts in place with the jam nuts.

05 Trimmerhead Preparation

Width Adjustment

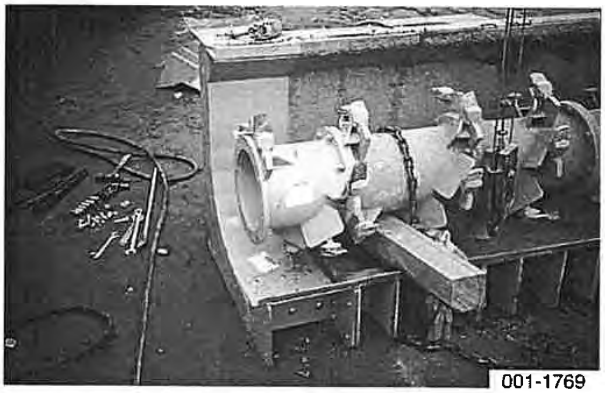


Remove end plate from trimmerhead

The width of the trimmerhead is adjustable by the installation or removal of bolt in sections. Standard inserts are available in 18 in. (460 mm) and 24 in. (610 mm) widths (optional widths are available; consult GOMACO). Minimum trimming width is 24 in. (610 mm) and the maximum width should not exceed 10 ft. (3.04 m). It is recommended that the trimmer width be at least 6 in. (150 mm) wider than the pouring width. To change the width of the trimmerhead, it must be removed from the machine. Lay the trimmerhead over on its' back. Remove the eight cap screws securing the flanged idler shaft to the end of the trimmer wheel. Remove the eleven bolts securing the end plate to the trimmer shroud and remove the end plate and shaft assembly. Use blocking between the trimmer shroud and the wheel to support the end of the wheel.

If the trimmerhead is to be shortened, locate the joint that will shorten the trimmer to the desired length. Remove the eight bolts from the trimmer wheel flange and the fifteen bolts from the shroud. Lift the section(s) away. For minimum trimming width, the 24 in. (610 mm) drive section is the only section necessary.

> **Note**: The drive section wheel is 21 7/8 inches (556 mm) in length. Do not interchange it with a 24 inch (610 mm) long insert wheel.

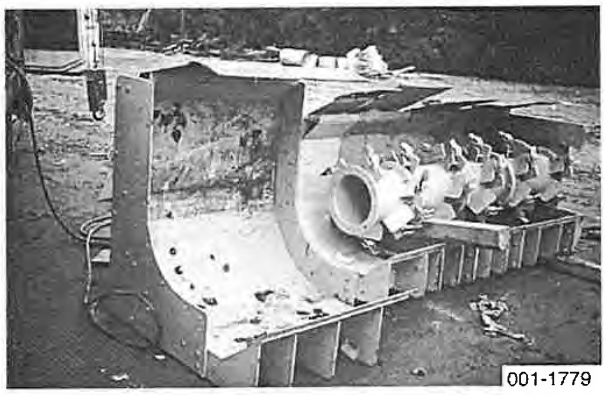


Install insert and end sections

If the width of the trimmer is to be changed, determine which section(s) will be necessary. Position the insert shroud(s) next to the main trimmer and attach with fifteen bolts and tighten securely. With the tooth mounts forming a continuous spiral, connect the trimmer wheel insert(s) to the main trimmer wheel and tighten the bolts securely.

Reattach the end plate to the trimmer shroud. Reattach the idler shaft to the end of the trimmer wheel and tighten the all bolts securely. Set the trimmer upright. Refer to the Maintenance chapter for instructions on adjusting wheel height.

Installing Profile Sections



Install profile shroud sections

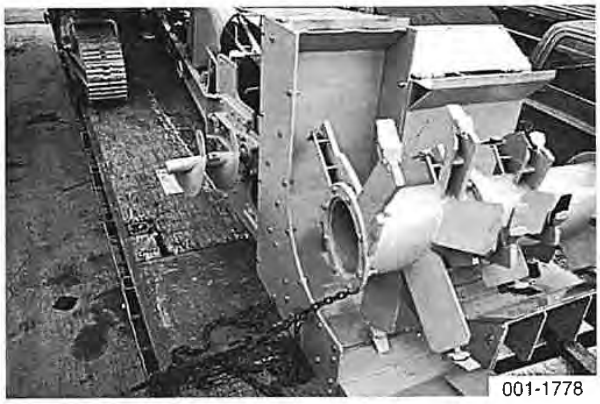
Profile sections are available for up to 10 in. (250 mm) of grade difference. The blade portion of the shrouds are stamped with a number to aid in the assembly order. Refer to the engineering drawing shipped with the shroud sections, or with the profile blades for the numbers of the sections and their order of assembly. When changing from one profile to another, it may be necessary to only change the profile blades. Simply unbolt and remove the blade section from the shroud and insert the proper section in its place. The blade numbers are stamped on the flange where the sections are bolted together. Assemble the proper shroud and blade sections. Tighten all bolts securely. Lay the profile shrouds over on their back.

The shrouds of the profile sections are of a larger dimension than the main trimmer shrouds. It will be necessary to install a step plate to each end of the profile shroud sections. Tighten attaching bolts securely.

⚠ WARNING! ⚠

WHEN LIFTING A SECTION IN OR OUT OF THE TRIMMERHEAD, DO NOT GET UNDER THE LIFTING DEVICE, OR THE SECTION. DO NOT PLACE FINGERS IN HOLES TO CHECK FOR ALIGNMENT. SEVERE INJURY, OR AMPUTATION, COULD OCCUR IF THE SECTION WERE TO FALL.

Remove the idler shaft end from the main trimmerhead assembly. Install any straight grade sections as necessary, following the previous instructions. Attach a lifting device to the main trimmerhead section and raise section to match the profile shroud. Align holes in the end of the main trimmer shroud with the holes in the step plate. Install and tighten the bolts. Place the blocking under the smaller shroud to hold it up.



Install profile wheel sections

Refer to the engineering drawing shipped with the sections for the numbers of the proper wheel sections and their order. The wheel numbers are stamped on the mounting flanges. Assemble the proper profile wheel sections and lift wheel assembly into place. Be certain that the tooth mounts form a continuous spiral. When attaching the profile wheels to the main wheel, insert the 3/4 in. (19 mm) spacer in between the flanges. Insert and tighten the bolts.

Lift the end plate assembly into place and attach it to the step plate. Tighten the mounting bolts securely. Align the holes in the end trimmer wheel flange and the flange of the idler shaft. Insert and tighten the bolts.

06 Positioning the Legs

Vertical Positioning



Legs in normal position

The vertical positioning of the track mounts will be determined by the difference in elevation, between the subgrade on which each track runs and the concrete

subgrade. The positioning is also affected by the slope of the machine frame in relation to the slope of the grade the machine is operating on and by the type of profile. It is recommended to adjust the track mounts so that the leg is extended approximately 12 in. (300 mm) during normal pouring operations. The track mounts are adjustable in 4 in. (100 mm) increments. All three track mounts should be placed in the same vertical position, provided the tracks are all operating on subgrade that is parallel to and at approximately the same elevation as the concrete subgrade. Also, the machine frame cross slope should be at the same slope as the grade the machine is operating on.

Normally the track mounts are all placed in position number one when pouring curb and gutter or sidewalk requiring a straight grade profile and placed in position number two when trimming and pouring monolithic profile.



Legs set for different slopes

If the cross slope of the machine frame is different than the slope of the grade the machine is operating on, it may be necessary to adjust one or more of the legs vertically. Adjust the leg(s) to position two or three as necessary to keep the hydraulic grade control cylinders extended approximately 12 in. (300 mm) during normal pouring operations.



Tracks on different grade elevations

If the left front track is running on the same grade elevation as the concrete subgrade, but the right front and rear tracks are running on grade that is lower than the concrete subgrade, it may be necessary to adjust the right and rear track mounts vertically to keep the hydraulic grade control cylinders extended approximately 12 in. (300 mm) during normal pouring operations.

If the left front track is running on the same grade elevation as the concrete subgrade, but the right front and rear tracks are running on grade that is higher than the concrete subgrade, it may be necessary to adjust the left front track mount vertically. It may also be necessary to vertically adjust the trimmerhead mounts (see section 08) and the slipform mold, to keep the hydraulic grade control cylinders extended approximately 12 in. (300 mm) during normal pouring operations.



Adjust position of left front leg

When adjusting the vertical position of the track mounts, the right front track must be extended to the maximum out position and the rear track must be as close to the center of the machine as possible. Using the appropriate elevation jog switches, raise the

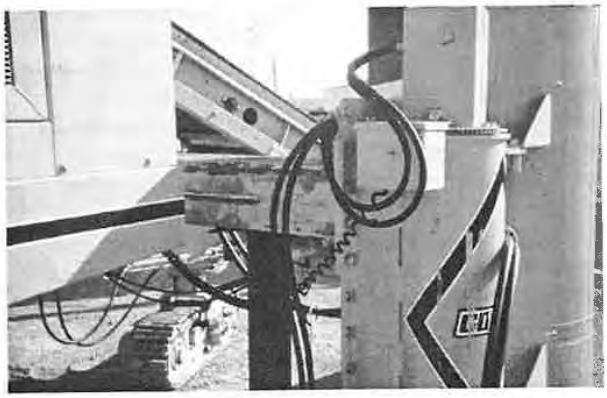
machine frame approximately 6 in. (150 mm) higher than the amount of vertical leg adjustment that will be made.

⚠ WARNING! ⚠

WHEN ADJUSTING THE POSITION OF THE LEG, DO NOT GET UNDER THE MACHINE, OR THE LEG. DO NOT PLACE FINGERS IN HOLES TO CHECK FOR ALIGNMENT. SEVERE INJURY, OR AMPUTATION, COULD OCCUR IF THE LEG WERE TO MOVE OR FALL.

Place adequate blocking or a support under the left front leg extension or support it with a lifting device. Using the jog switch for the left front grade, lower the machine frame onto the support system until all weight is removed from the track. Place a safety chain around the upper leg tube and the frame mount to stabilize it before removing the eight mounting bolts. Using the jog switch, lower the track guide tube until the proper holes in the guide tube align with the holes in the frame mount. Replace the bolts and tighten securely. Lift machine high enough to remove support system.

Notice: It is advised that at least three persons perform the repositioning operation. One to operate the machine and jog switches, one to stabilize the track mount and another to remove and replace the attaching bolts.



Adjust position of right front leg

Make certain that the water tank is empty before adjusting the position of the right leg. It is advised to place a chain around the outer guide tube and the top of the frame mount to aid in stabilizing the track mount. Place adequate blocking or a support under the right leg extension tube or support it with a lifting device. Using the jog switch for the right front grade, lower the machine frame onto the support system until all weight is removed from the track. Remove the eight mounting bolts. Using the jog switch, lower the track guide tube until the proper holes in the guide tube align with the holes in the frame mount. Replace the bolts and tighten securely. Lift the machine high enough to remove the support system.



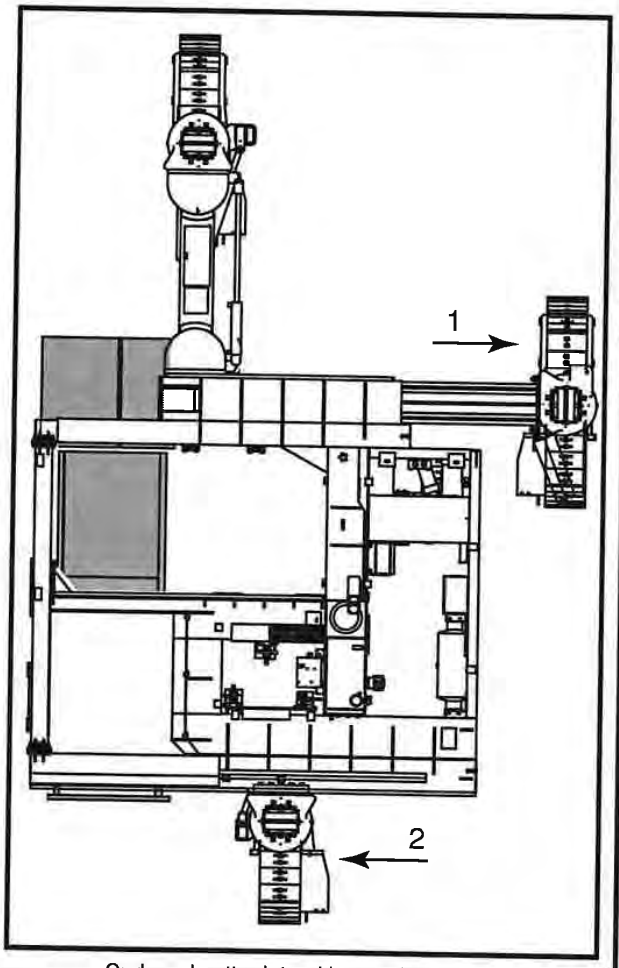
Adjust position of rear leg

⚠ WARNING! ⚠

WHEN ADJUSTING THE POSITION OF THE LEG, DO NOT GET UNDER THE MACHINE, OR THE LEG. DO NOT PLACE FINGERS IN HOLES TO CHECK FOR ALIGNMENT. SEVERE INJURY, OR AMPUTATION, COULD OCCUR IF THE LEG WERE TO MOVE OR FALL.

Place adequate blocking or a support under the rear of the machine frame, or support it with a lifting device. Do not place blocking under rear track positioning cylinder or under hydraulic tank drain plugs. Using the jog switch for the rear grade, lower the machine frame onto the support system until all weight is removed from the track. Place a safety chain around the upper leg tube and the frame mount to stabilize it before removing the eight mounting bolts. Using the jog switch, lower the track guide tube until the proper holes in the guide tube align with the holes in the frame mount. Replace the cap screws and tighten securely. Be certain that the lock washers are in place on the cap screws. Lift the machine high enough to remove the support system.

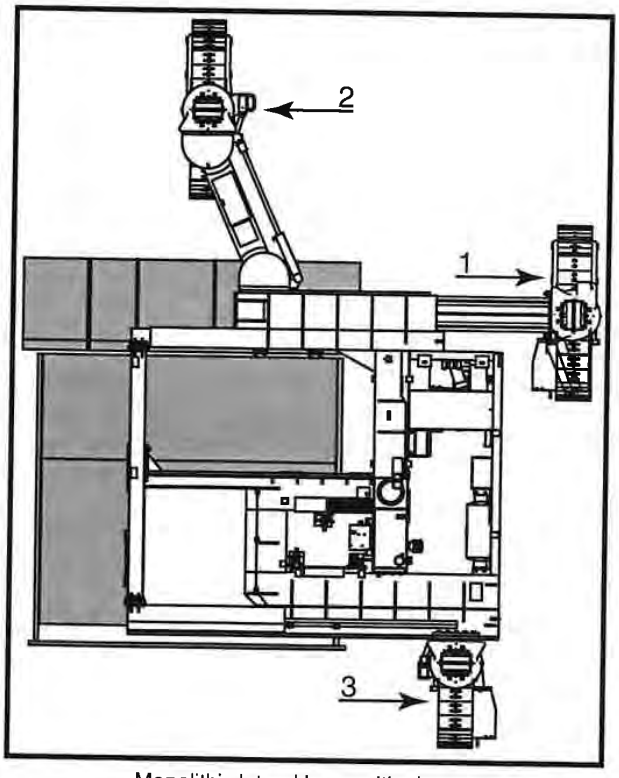
Curb and Gutter Lateral Leg Positioning



Curb and gutter lateral leg positioning

For best machine stability and control, the previous drawing indicates the right front leg and rear leg positions with the slipform mold extended fully to the left side of the machine frame. The right front leg (1) should be extended to the maximum amount of cylinder stroke. The rear leg (2) should be adjusted to the right as necessary to allow 6 to 12 inches (15 to 30 cm) of clearance between the track and the slipform mold. Refer to the following information for more detailed adjustment procedures.

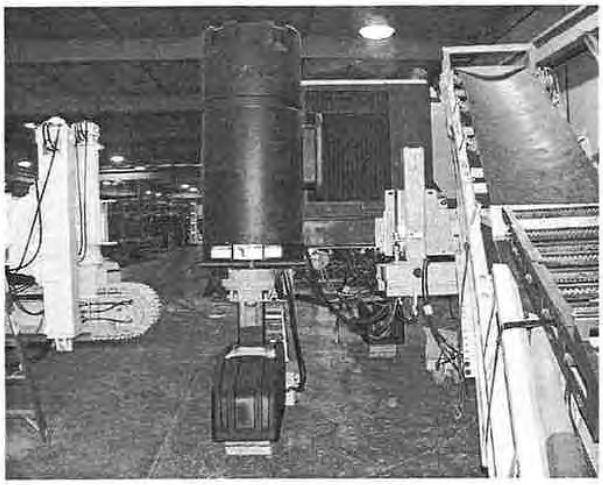
Monolithic or Sidewalk Lateral Leg Positioning



Monolithic lateral leg positioning

When a monolithic trimmerhead and slipform mold is attached, each of the three legs should be adjusted as indicated in the previous drawing. Adjust each of the three legs prior to attaching the trimmerhead or slipform mold to the machine in the order as shown in the drawing. The right front leg (1) should be extended to the maximum amount of cylinder stroke. The left front leg (2) should be adjusted to the maximum left position. The rear leg (3) should be adjusted to the right as necessary to allow 6 to 12 inches (15 to 30 cm) of clearance between the track and the slipform mold. Refer to the following information for more detailed adjustment procedures.

Lateral Positioning Procedures



Extend right front leg

⚠ WARNING! ⚠

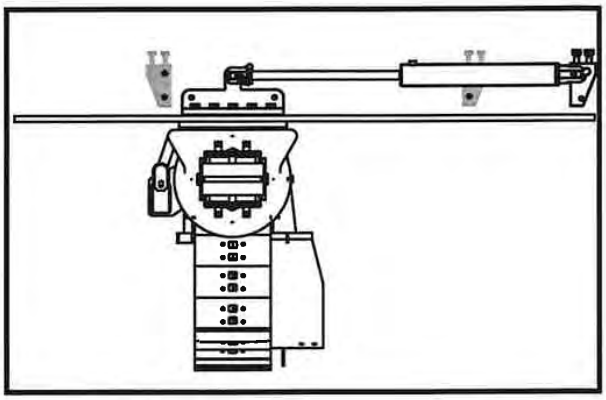
FOR STABILITY, THE RIGHT FRONT TRACK MUST BE EXTENDED TO THE MAXIMUM OUT POSITION BEFORE SHIFTING THE REAR TRACK.

The right front leg assembly should be extended to the maximum out position for most paving operations. To extend the leg, start the machine traveling in either forward or reverse. Move the front extend control switch to the "out" position until the leg assembly has extended the maximum 3 ft. (0.9 m) distance.

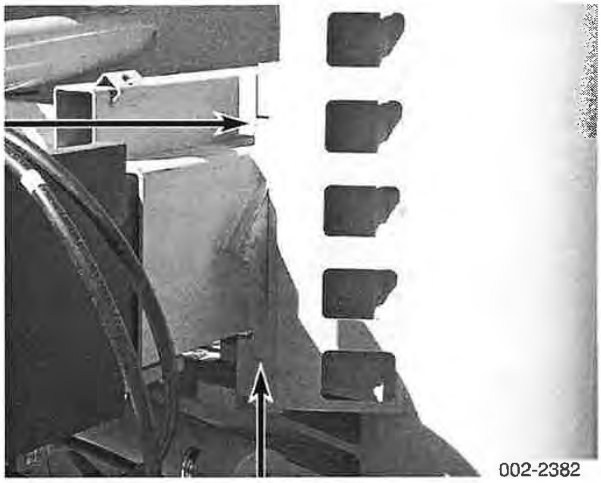


Check wear pads for proper adjustment

Make certain that the wear pads in the bottom of the outer guide tube are properly tensioned after extending the right front leg. Refer to the Maintenance chapter for adjustment procedures.



Rear shift cylinder position for limited left extension



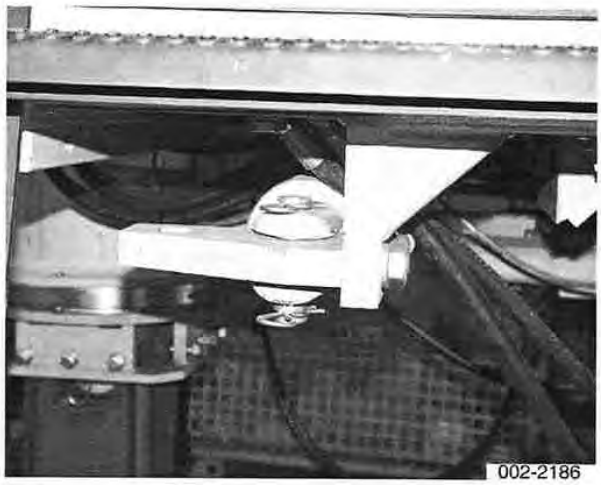
Maximum left extension of rear leg with mold shift extended

⚠ WARNING! ⚠

FOR STABILITY, THE RIGHT FRONT TRACK MUST BE EXTENDED TO THE MAXIMUM OUT POSITION BEFORE SHIFTING THE REAR TRACK. DO NOT EXTEND THE REAR TRACK PAST THE LEFT END OF THE MOUNTING FLANGE. SEVERE INJURY CAN OCCUR IF THE REAR LEG IS EXTENDED OFF THE END OF THE FLANGE.

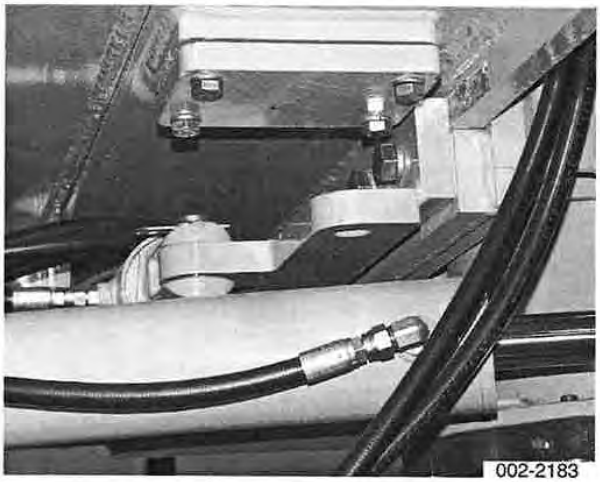
The rear leg assembly may be shifted towards the left or right sides of the machine frame. The drawing above indicates the appropriate mounting position for the rear shift cylinder when the mold shift is extended to the left. It is possible to shift the rear leg off the end of the machine frame mounting flange if the cylinder is not mounted in the pin holes as indicated above. The following rear shift cylinder mounting procedures should be implemented to prevent the rear leg from

extending past the end of the frame mounting flange (reference photo 002-2382).



Attach the cylinder mount bracket

Remove the bolts holding the cylinder mount to the bracket under the left rear corner of the machine frame. Reattach it to the outside bracket under the right rear corner of the machine frame. The beveled side of the cylinder mount should face away from the cylinder. Tighten the bolts securely. Place the piston end of the cylinder over the mount and insert the cylinder pin as shown in the previous photo. Secure the cylinder pin with a clip pin.



Change rear shift cylinder connection

Extend the rod end of the cylinder as necessary to insert the cylinder pin in the center pin position of the rear sliding mount. Secure the cylinder pin with a clip pin.

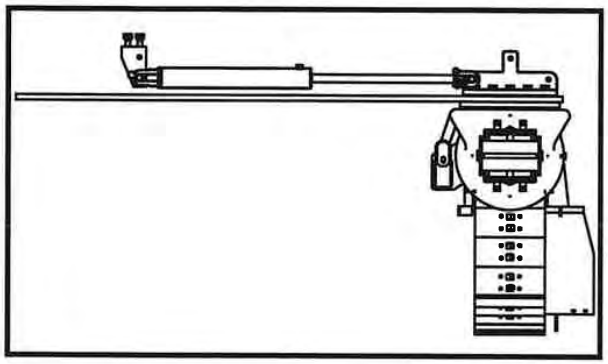


Shift rear leg to the left

⚠ WARNING! ⚠

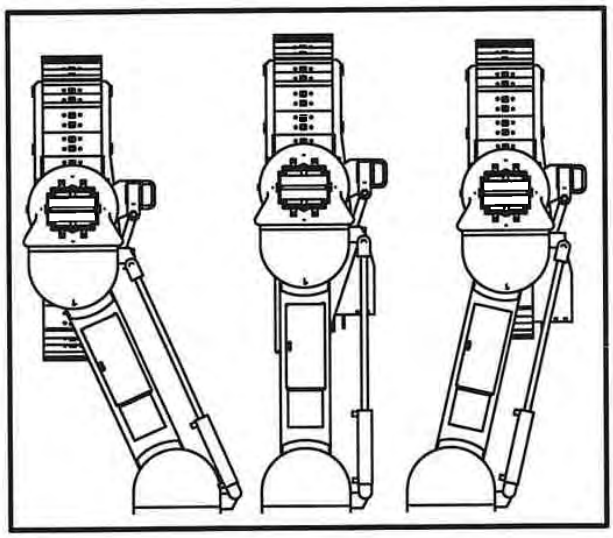
THE REAR LEG ASSEMBLY CAN BE SHIFTED OFF THE END OF THE MOUNTING FLANGE WHEN THE SLIPFORM MOLD IS SHIFTED TO THE LEFT. SEVERE INJURY CAN OCCUR IF THE REAR LEG IS SHIFTED OFF THE END OF THE MOUNTING FLANGE. DO NOT EXTEND THE REAR TRACK PAST THE LEFT END OF THE MOUNTING FLANGE.

The rear track assembly should normally be positioned so enough clearance exists between the front of the track and the rear of the slipform mold to allow the track to turn without running into the concrete when doing radius work. Move the rear shift switch "left" or "right" to position the rear leg as desired. It is advised that the machine be moving during positioning operations. It is possible to extend the rear leg off of the frame mounting flange when the mold shift is extended to the left.



Monolithic position of rear shift cylinder

For monolithic slipform molds, the rear shift cylinder is mounted to the left side of the rear leg. Retract the rear shift cylinder until approximately 3 inches (7 cm) of cylinder rod is visible. Remove the cylinder pins from both ends of the cylinder and move the cylinder to the left side of the rear leg. Remove the cylinder mount from the right side of the machine frame and attach it to the mount bracket on the left rear corner of the machine frame. Tighten the bolts securely. Attach the cylinder between the mount on the machine frame and the sliding mount on the rear leg. Make certain to attach the cylinder to the appropriate pin holes so that the cylinder is mounted parallel to the rear of the machine frame.



Left front swinging leg positions

The pivoting left front leg extension can be adjusted to position the left front leg from straight ahead (aligned with the outside of the main frame) to 12, 24 or 36 in. (300, 610 or 910 mm) to the outside (left) of the main frame, or 12 or 24 in. (300 or 610 mm) to the inside (right) of the frame.



Left track off ground

To swing the leg, the track must be raised clear of the ground. Support the left front corner of the machine frame with the trimmerhead or blocking. Do not place blocking under the swinging front leg extension. Move the jog switch for the left front grade to the down position to lower the machine. Continue to hold the switch in the down position until the track is lifted clear of the ground.



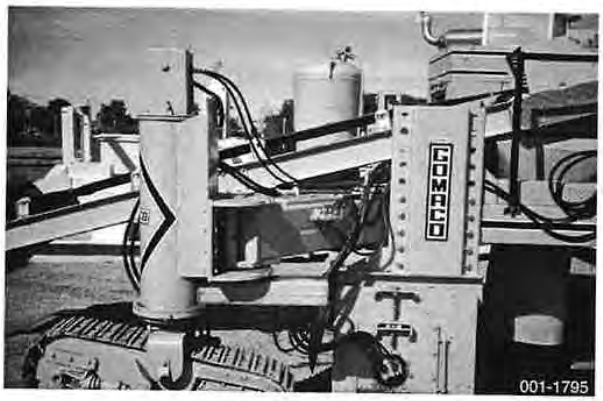
Left front leg remote



Connect the left front leg remote

Connect the cable for the left front remote to the bulkhead connector located under the left front leg pivot.

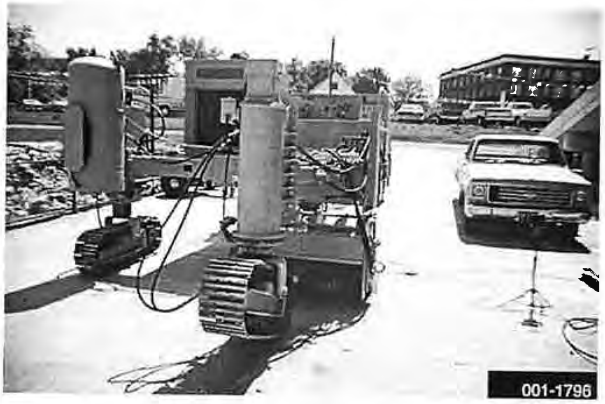
Note: On early model machines, the cable is routed under the machine frame and into the operators console where it is connected to bulkheads on the back of the switch console.



Swing leg to the left

To swing the assembly to the left from any position, remove the locking pin from the frame end of the mount and move the swing control switch to extend the swing cylinder, swinging the leg to the left, until the locking pin can be inserted in the desired position. Make certain the pin is fully inserted.

Remove the locking pin from the track end of the mount and move the swing control switch to retract the swing cylinder, turning the leg mount, until the locking pin can be installed in a position that corresponds to the rear pin position. The front track mounting plate must be parallel to the front of the machine frame.



Swing leg to the right

⚠ CAUTION! ⚠

DO NOT SWING THE LEFT FRONT LEG ASSEMBLY TO THE RIGHT OF STRAIGHT AHEAD UNLESS THE RIGHT FRONT LEG ASSEMBLY IS EXTENDED TO THE MAXIMUM RIGHT POSITION. THE REAR LEG ASSEMBLY MUST BE AS CLOSE TO CENTER AS POSSIBLE, OR TO THE LEFT OF CENTER. IF THE LEGS ARE NOT IN THE PROPER POSITION WHEN THE LEFT FRONT LEG IS SWUNG TO THE RIGHT, THE MACHINE MAY TIP OVER TO THE LEFT.

It is not recommended to operate the machine with the left front leg swung to the right of straight ahead unless absolutely necessary. When swinging the left front leg to the right of straight ahead, the right front leg must be extended to the maximum and the rear leg must be centered, or to the left of center (such as for side-mounted barrier or extending the mold shift towards the left).

To swing the assembly to the right from any position, remove the locking pin from the track end of the mount and move the swing control switch to extend the swing cylinder, turning the leg mount, until the locking pin can be installed in the desired position. Make certain the pin is all the way in. Remove the locking pin from the frame end of the mount and move the swing control switch handle to retract the swing cylinder, swinging the leg to the right, until the locking pin can be installed in a position that corresponds to the front pin position. The front track mounting plate must be parallel to the front of the machine frame.

07 Preparing and Mounting the Conveyor



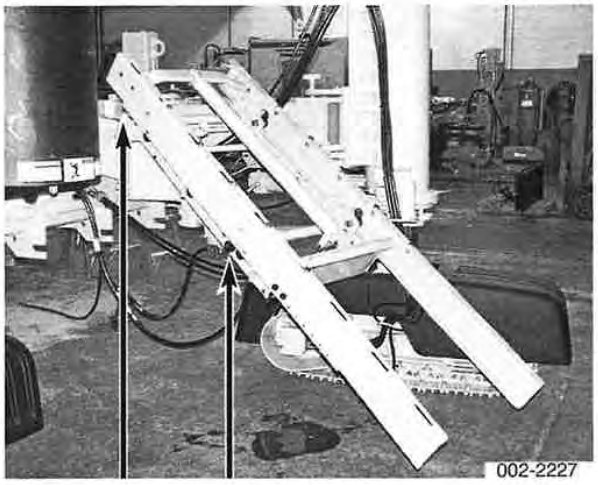
Install the conveyor mount

The conveyor is removed from the machine for shipment. The conveyor mount assembly is mounted to the machine frame for shipping purposes. Remove the shipping straps from the conveyor mounts. Remove the bolt through the conveyor lift assembly yoke at the bottom of the upper conveyor support. Lay the conveyor lift assembly to one side until required. Lift the upper support out of the pivot mount. Remove the angled support mount from the machine frame and turn it over so it is angled downward and reinstall it on the frame. The conveyor mount is normally positioned in the 5th and 6th holes from the right (engine) side of the front mount plate. Install and tighten the mounting bolts securely.



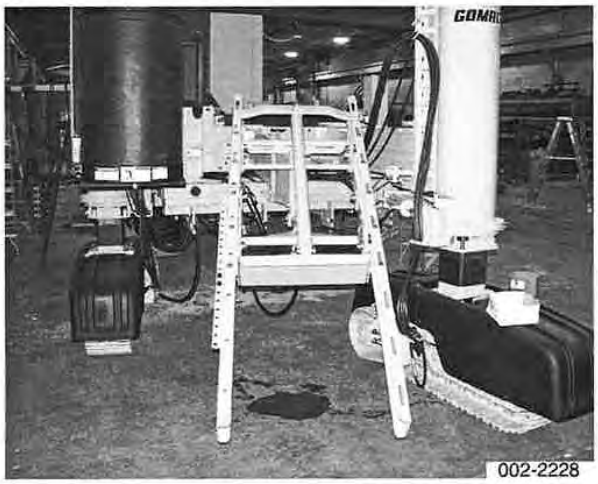
Install the conveyor pivot mount

Using a suitable lifting device, raise the conveyor pivot mount into position and insert the hinge pin.



Attach the upper and lower support tubes

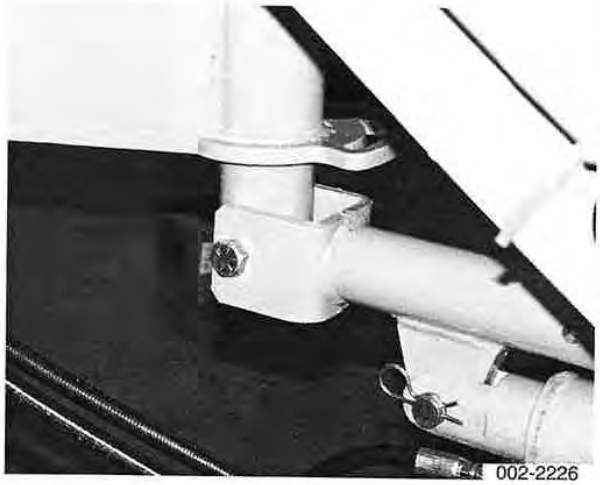
Using a suitable lifting device, raise one end of the conveyor shift assembly off the ground. Align the upper support tube between the pin holes on either side of the conveyor shift assembly. Insert the retainer pin through the upper support tube assembly and secure with a flat washer and clip pin. Align the lower support tube between the pin holes on either side of the conveyor shift assembly. The conveyor lift cylinder should be positioned under the lower support tube mount. Insert the retainer pin through the lower support tube assembly and secure with a flat washer and clip pin.



Mount Conveyor Cam Follower Assembly to Machine frame

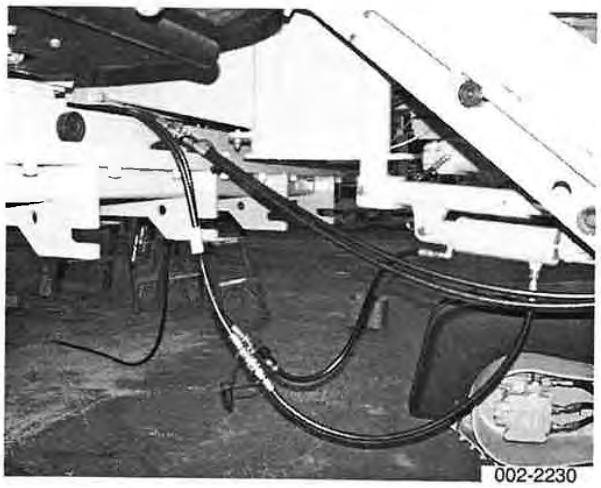
Raise the conveyor shift assembly, with the upper support tube and lower support tube assembly attached, into position above the frame mount. Carefully lower the conveyor shift assembly and start the upper support tube into the frame mount. Lower

the conveyor shift assembly until it is supported by the frame mount.



Attach the lower support to the upper support tube

Raise the yoke end of the conveyor lift cylinder assembly and attach it to the lower end of the pivot arm. Install the bolt and tighten securely.



Connect the conveyor hoses

Connect the conveyor lift hoses (1/4 inch (6 mm) hoses) to the conveyor lift cylinder. Connect the conveyor shift hoses to the conveyor shift cylinder. Be certain the lift cylinder is positioned below the two piece tube.



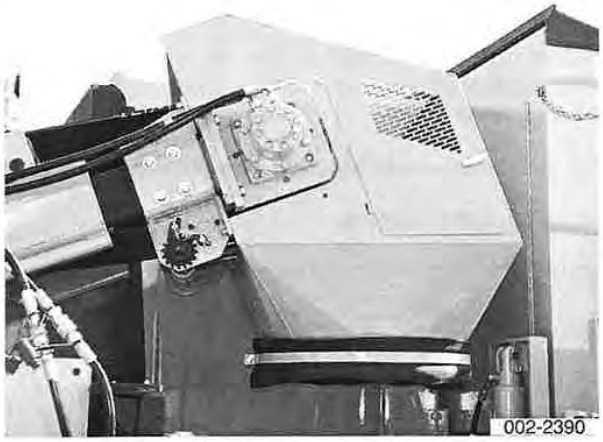
Conveyor remote control



Conveyor remote control

Locate the conveyor remote control and route the cable to the bulkhead under the left front leg pivot. The conveyor lift and conveyor shift cylinders may be operated from the console area or from the conveyor remote control.

Note: On early model machines, the cable is routed under the machine frame and into the operators console where it is connected to bulkheads on the back of the switch console.



Install discharge chute

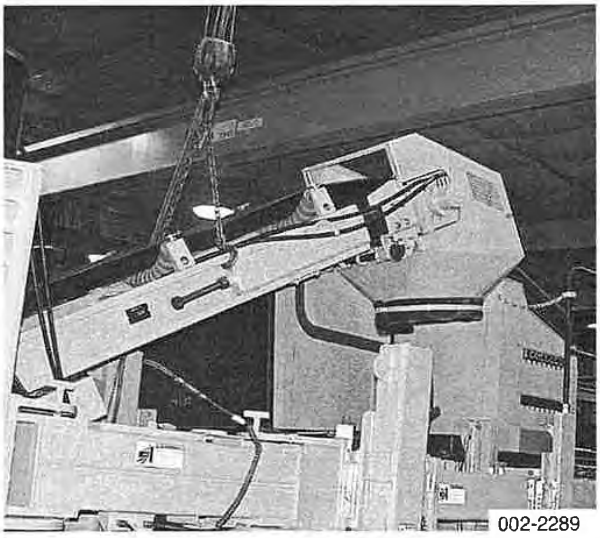
Raise the drive end of the conveyor off the ground, using a suitable lifting device. Lift the discharge chute into place and insert the four bolts and tighten securely.



Install rubber discharge chute

Slide the rubber discharge chute into place on the conveyor discharge ring with the seam of the rubber chute towards the front of the machine. Place the clamp around the rubber chute. Use a clamping tool to bring the ends of the chute clamp together so that the bolt may be inserted. Tighten the clamp securely. Be certain that the end of the rubber chute is 2 to 3 in. (50 to 76 mm) above the ring and the clamp is just above the bottom ring.

Note: The rubber chute is normally installed on the discharge chute from the factory and should be pulled from inside the discharge chute to full extension.

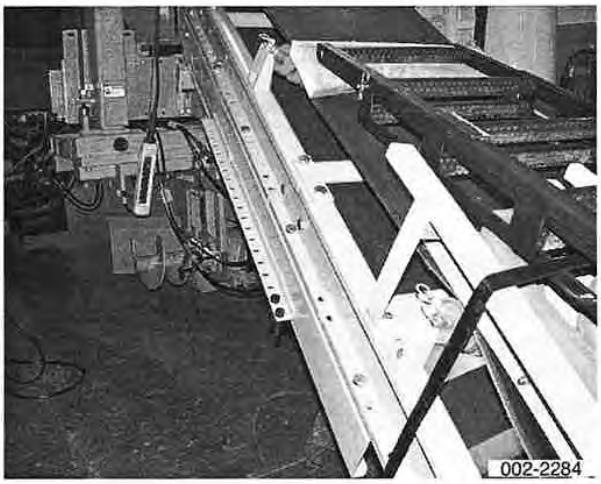


Mounting Conveyor to Conveyor Shift Assembly

⚠ WARNING! ⚠

DO NOT GET BENEATH CONVEYOR DURING ASSEMBLY. IF THE CONVEYOR WERE TO FALL, SERIOUS INJURY CAN OCCUR.

Position the conveyor frame over the conveyor shift assembly. Slowly move the machine forward until the discharge end of the conveyor is centered over the slipform mold hopper location.



Attach the conveyor frame to the shift assembly

Align the mounting holes and insert four bolts along the length of the conveyor shift assembly.



Retainer plates over the slotted holes

Place a retainer plate over each bolt with lock washers and nuts to secure the conveyor frame to the conveyor shift assembly and tighten securely.



Connect conveyor drive hoses

⚠ WARNING! ⚠

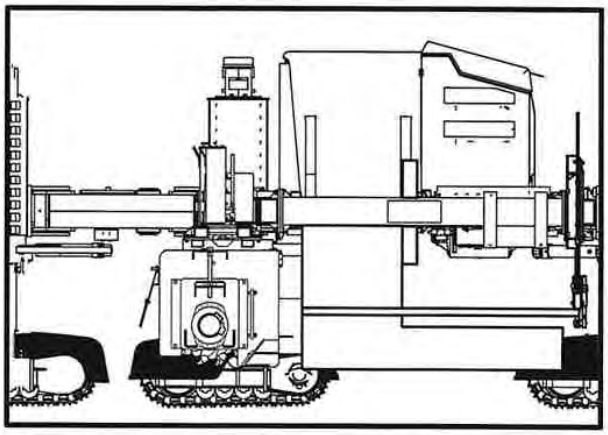
KEEP HANDS, FEET AND CLOTHING AWAY FROM MOVING CONVEYOR BELT AND ROLLERS. SERIOUS INJURY OR DEATH MAY RESULT IF ENTANGLED.

Connect the conveyor drive hoses to the drive motor. Connect the hoses to the quick couplers on the bulkhead. Start the engine and place the conveyor forward/neutral/reverse switch in the "forward" position. Rotate the conveyor variable speed knob clockwise to begin turning the conveyor belt. The conveyor should run in a direction that would bring concrete up the belt. If the belt runs the wrong direction, reverse the hoses on the drive motor.

Adjust the conveyor belt tension and adjust the alignment of the belt following the instructions in the Maintenance chapter.

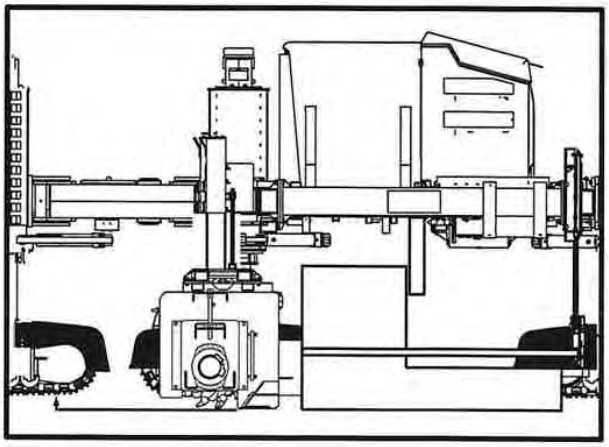
08 Positioning and Mounting the Trimmerhead

Trimmer Lift Positions



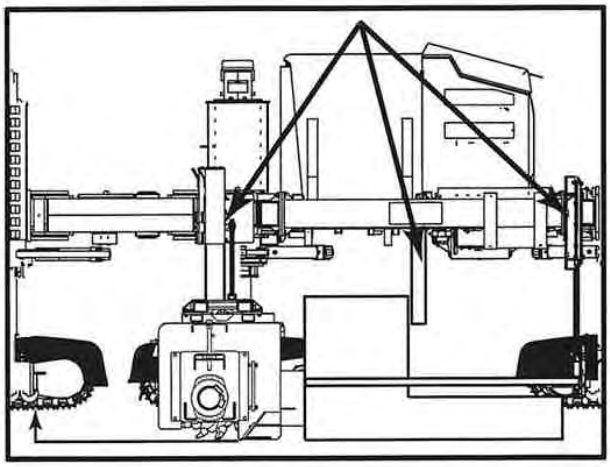
Trimmer and slipform mold fully retracted

The trimmer may be adjusted to a varied vertical position using the trimmer lift cylinder and mounting bracket. Begin by adjusting each of the elevation cylinders on the machine frame to a stroke of approximately 12 to 18 inches (30 to 45 cm). Make certain that there is enough stroke on each of the elevation cylinders to prevent the cylinders from fully extending or retracting during a pour. Determine what the job site requirements are and adjust the mounting brackets and trimmer lift cylinders as necessary.



Maximum cylinder extension (18 in. or 45 cm)

The trimmer lift assembly is equipped with an 18 inch (45 cm) cylinder stroke when fully extended. The trimmer lift cylinder may be extended as necessary for job site conditions. Depending on the machine leg stroke, this may allow the trimmerhead and slipform mold to operate below the trackline. If obstacles are present in the path of the trimmerhead and slipform mold, the 18 inches (45 cm) of cylinder stroke may allow retraction of the trimmer and mold, so that the machine may continue to operate on the guideline. When the machine has passed over the obstacle, the trimmer and mold lift cylinders may be extended and pouring can continue.

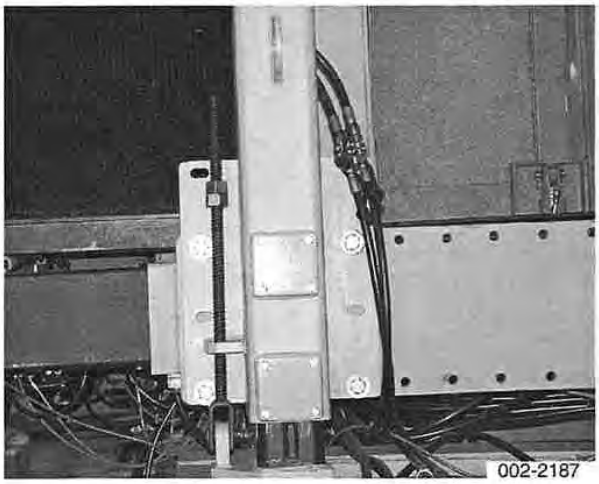


Maximum cylinder extension plus manual adjustment of mounts (24 in. or 61 cm)

If required, the trimmer lift assembly can be attached an additional 6 inches (15 cm) lower on the machine frame. This allows the trimmerhead and slipform mold to operate below the trackline when necessary.

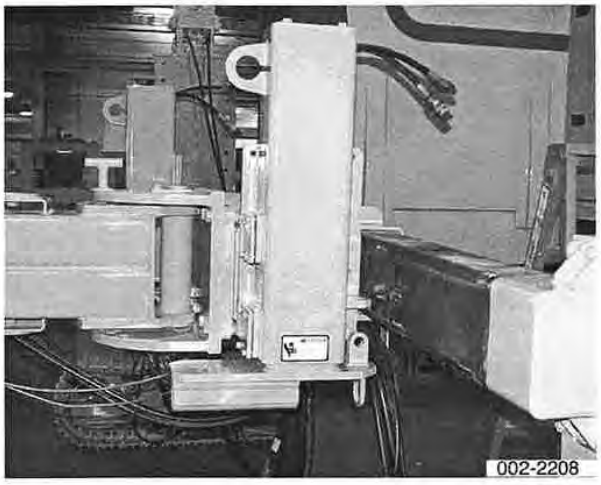
Note: If the trimmer lift mounts are lowered on the machine frame, it will be necessary to adjust the drawbar and hold down lift mounts in the same manner. Refer to the appropriate section of this chapter for adjustment procedures.

Installation of Trimmer Lift Assembly



Manual adjustment for trimmer lift cylinder

Using a suitable lifting device, attach the right trimmer lift cylinder assembly to the front of the machine frame. Standard mounting position of the trimmer lift assembly is shown in the photo. The assembly may also be lowered 6 inches (15 cm) using the additional mounting holes.



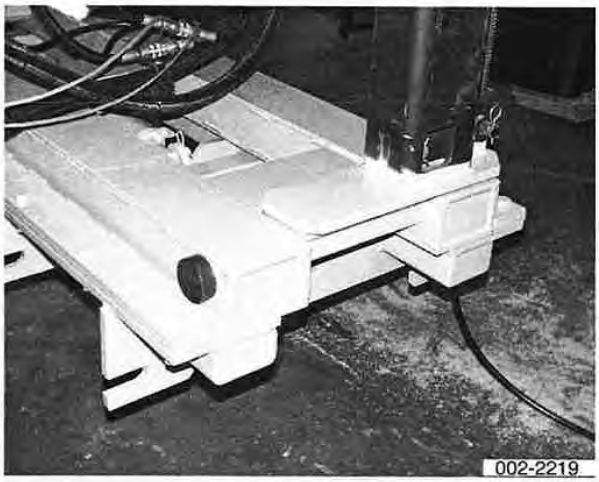
Attach the left trimmer lift assembly

Using a suitable lifting device, attach the left trimmer lift cylinder assembly to the left front corner of the machine frame. The left and right lift assemblies are normally mounted in parallel positions on the machine frame. Tighten the attaching bolts securely.



Attach the trimmer lift hydraulic hoses

Attach the hydraulic hoses to the appropriate trimmer lift cylinders as labeled.

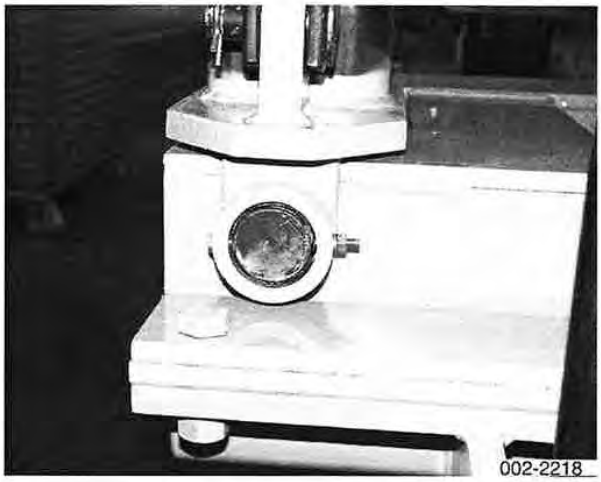


Attach the trimmer shift assembly

⚠ WARNING! ⚠

WHEN ADJUSTING THE POSITION OF THE TRIMMER LIFT, DO NOT GET UNDER THE SHIFT ASSEMBLY. DO NOT PLACE FINGERS IN HOLES TO CHECK FOR ALIGNMENT. SEVERE INJURY, OR AMPUTATION COULD OCCUR IF THE ASSEMBLIES WERE TO MOVE OR FALL.

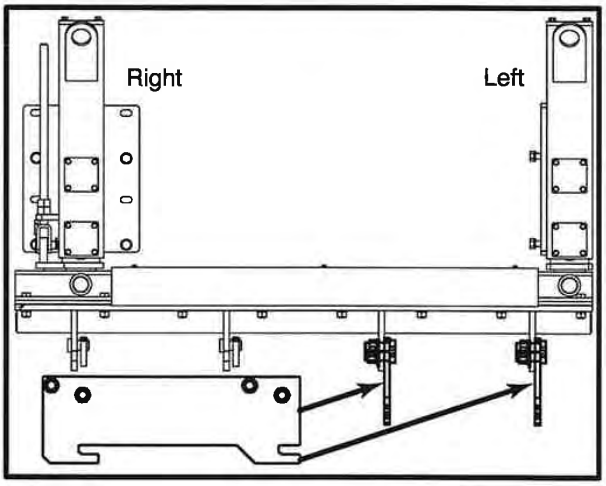
Using a suitable lifting device, raise the trimmer shift assembly into position below the left and right trimmer lift mounts. Raise or lower the trimmer lift cylinders to align the pin holes. Insert the pins from the front of the trimmer shift assembly.



Attach the locking collar

Place the retaining ring over the pin and align the pin holes. Insert the retaining bolt and tighten securely.

Installation of Monolithic Adapter Mounting Plates



Monolithic trimmer adapter mounting plate

When attachment of a monolithic trimmerwheel is necessary, an adapter plate must be attached to the left mounting bracket on the trimmer shift assembly. This is necessary to allow attachment of the monolithic trimmerwheel due to the 8 inch (203 mm) difference between the mounting bars on the profile section of the trimmer shroud and the standard trimmer shroud. Remove the J-bolts from the left mounting bracket and attach the adapter plate using the mounting holes for the J-bolt and the mounting slots to insert the bolts. Place flat washers over the mounting slots and tighten the bolts securely. Attach the J-bolts in the adapter plate. A second adapter mounting plate is provided and should be attached to one of the other mounting

brackets to provide adequate support for the monolithic trimmerwheel.

Trimmerhead Installation



Trimmer alignment

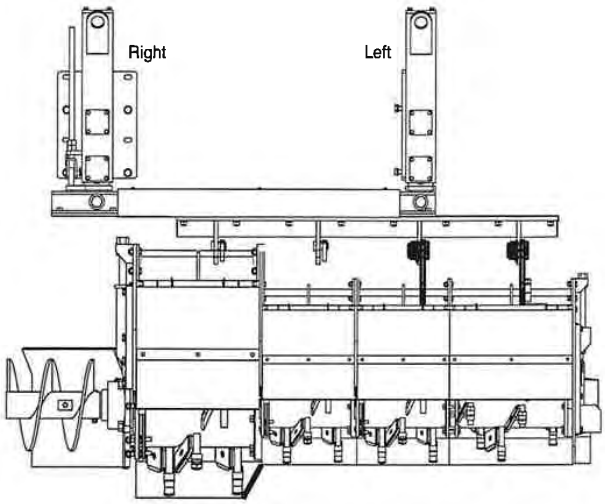
It is normally advised to position the trimmerhead on a relatively flat area when mounting it to the machine. Move the machine into position over the trimmerhead. Lower the machine until the slots in the mounts line up with the mounting bars across the top of the trimmerhead. Normally it is advised to keep the rear of the machine higher than the front as the trimmer tilts forward a small amount when it is removed.

Slowly move the machine forward and make certain the mounting bars slide completely into the four mounting slots.



Secure the trimmer with the J-bolts

When the trimmer mounting bars have fully engaged into the mounting slots, place the J-bolt retainers over the bar. Tighten the retainer nuts and jam nuts securely.



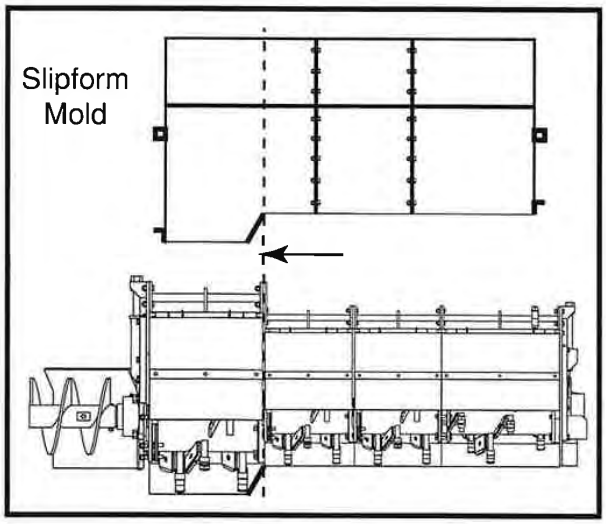
Extend trimmerhead to the left

When installing a trimmerhead that is 5 ft. (1.52 m), or wider, it will be necessary to extend the trimmer shift assembly to the left. The trimmerhead should be centered between the two ends of the trimmer shift slide (as shown in the previous drawing). This will allow an equal amount of weight distribution across the width of the trimmer shift assembly. The amount that the trimmer shift assembly is extended will depend on the width of the trimmerhead and the mounting position of the slipform mold behind the trimmerhead.



42 inch (1.1 m) trimmer clearance to right track

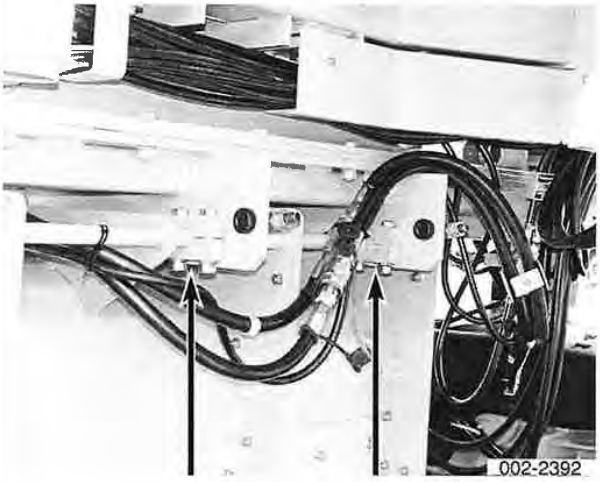
Notice: When installing a trimmerhead that is 4 ft. (1.22 m) or wider, it will be necessary to shift the trimmerhead to the left before moving the machine when the right front track is fully retracted into the frame.



Trimmerhead/slipform mold relationship

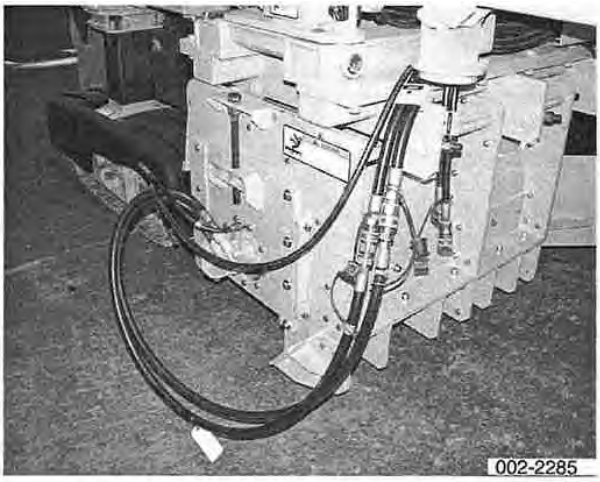
When installing a profile trimmerhead, it may be necessary to place blocking under the left end of the trimmerhead to hold it level. Attach the profile trimmer to the trimmer shift assembly as previously indicated. When the profile trimmerhead is installed, the profile section of it must be in approximately the same lateral position as the profile section of the slipform mold when it is installed.

After the slipform mold is installed, it may be necessary to slide the trimmerhead left or right, so the profile at the bottom of the slipform mold hopper front plate will clear the final trimmed grade profile by an equal amount all the way across. Sight under the slipform mold to determine if adjustment is necessary.



Install anti-shift blocks

After the lateral positioning of the trimmerhead is correct, install the anti-shift blocks to the rear mounting bar of the trimmerhead. Place one block to the inside of the left trimmerhead mount and the other block to the inside of the right mount. Tighten the clamp bolts securely.



Connect trimmer drive hoses

Thoroughly clean the quick couplers on the trimmer drive hoses and on the left front bulkhead to prevent dirt from entering the hydraulic system. Connect the trimmer drive hoses to their respective quick couplers on the bulkhead. Whenever the trimmerhead is removed, always place the protective covers over/in the quick couplers to prevent dirt from entering the hydraulic system.



Connect case drain line

⚠ DANGER! ⚠

TO PREVENT SERIOUS INJURY, OR DEATH, BE CERTAIN THAT THE TRIMMERHEAD AREA IS CLEAR BEFORE STARTING THE TRIMMERWHEEL. STAY CLEAR OF THE TRIMMERWHEEL WHEN THE ENGINE IS RUNNING. STOP THE ENGINE BEFORE PERFORMING ANY SERVICE WORK ON THE TRIMMERWHEEL UNLESS OTHERWISE INSTRUCTED.

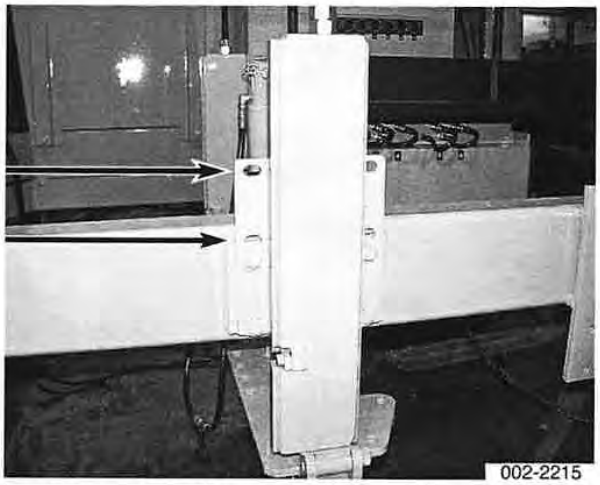
Clean all dirt from the case drain line fittings. Connect the case drain line from the trimmer to the machine case drain line. Whenever the trimmerhead is removed, always place the protective covers over/in the case drain line connections to prevent dirt from entering the hydraulic system.

> **Note:** A one-way check valve is located in the end of the hydraulic line connected to the machine. The check valve should remain in the machine hydraulic line to prevent oil leakage when the trimmer is removed from the machine.

Notice: Do not place quick couplers in the case drain line. Do not allow the case drain line to become restricted or pinched. Excessive back pressure, caused by quick couplers or flow restriction may cause trimmer gearbox seal failure.

09 Mounting Slipform Mold

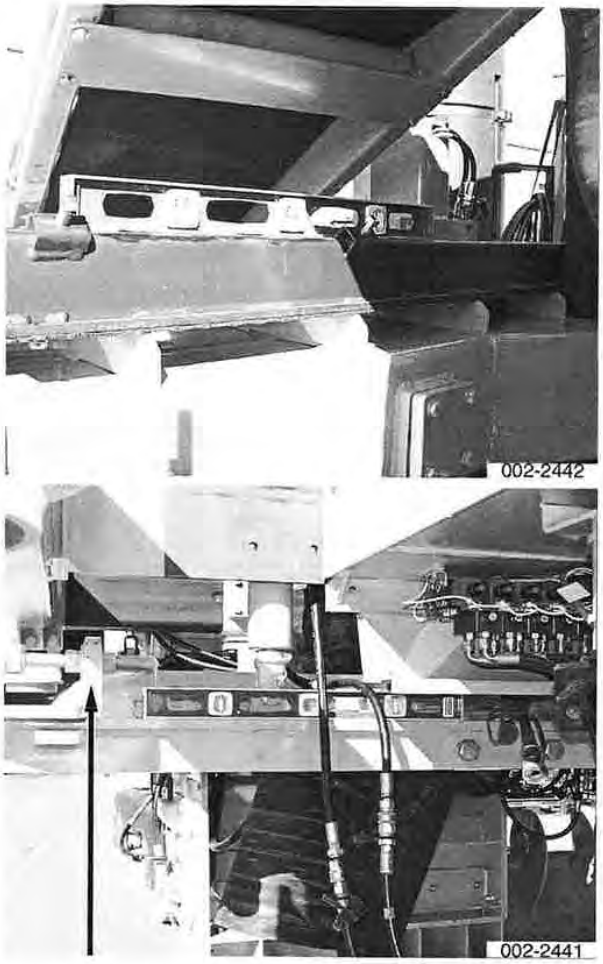
Drawbar Adjustment





Drawbar manual adjustment

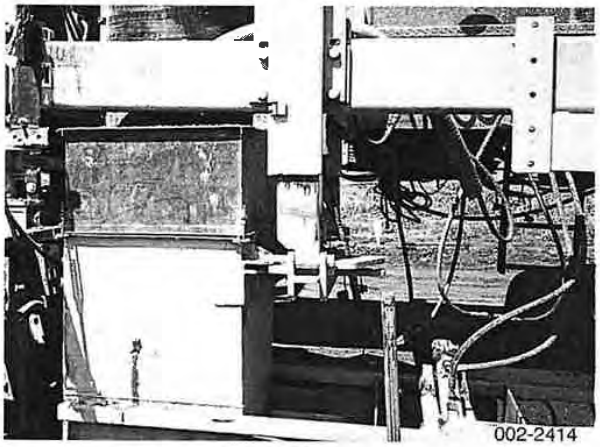
If the subgrade is bi-level, it may be necessary to adjust the drawbar lower on the machine frame. This will allow the slipform mold to contact the subgrade and allow additional stroke on the elevation legs to control the machine properly. Using a suitable lifting device, remove the bolts from the mounts and lower the mounts to the second mounting position. Insert the bolts and tighten securely. The drawbar cylinder is equipped with 18 inches (45 cm) of stroke and the manual adjustment allows the drawbar to be lowered an additional 6 inches (15 cm).



Adjust drawbar parallel to machine frame

Place a level across the front of the machine frame and adjust the machine frame to a level position using the jog switches. Place the level across the drawbar and adjust the cross slope adjustment bolt so that the drawbar is parallel to the machine frame. Tighten the jam nut securely. For most applications, the drawbar is adjusted to operate parallel to the machine frame. Any additional slope required in the finished product is adjusted into the machine frame using the cross slope adjustment switches on the network controller.

Another method for operation, is to adjust the drawbar and trimmerhead to the appropriate slope while the machine frame is in a level position. This method is best used when there are no slope changes required during a day of operation. The machine frame would remain in a level position using this method. Adjust the limit bolts on the trimmerhead lift cylinders and the cross slope adjustment bolt and limit bolts on the drawbar to the slope required. Tighten the jam nuts securely.



Align machine and form drawbars

Place the slipform mold on a relatively flat area. It may be necessary to place blocking under one edge of a monolithic profile mold to hold it level. Coil the vibrator hoses and place them into the mold hopper. Extend the mold sideshift so that the drawbar is beyond the frame of the machine. Move the machine into position next to the slipform mold. Be sure that the mold is far enough forward, so that when the machine is lowered, the machine drawbar will clear the drawbar mounting plates on the mold.

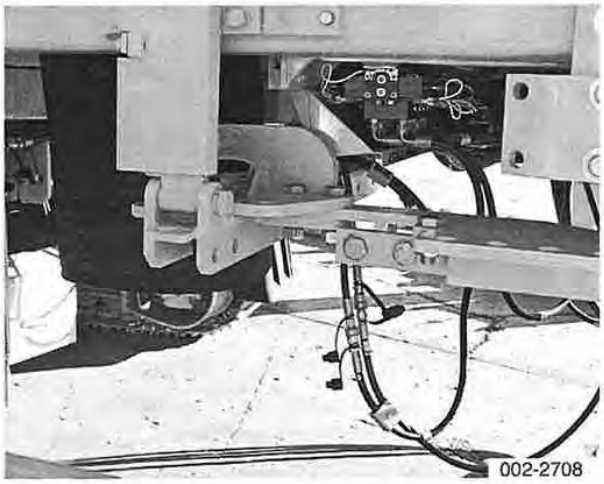


Align Drawbar

Lower the machine far enough to align the machine drawbar with the drawbar mounting plates on the back of the mold hopper. It may be necessary to lower the machine drawbar, by loosening the upper adjusting nuts, if the trimmerhead prevents the machine from being lowered enough. Slowly drive the machine forward and make certain the machine drawbar slips in between the drawbar plates on the mold. Normally the mold is mounted to the far left side of the drawbar for clearance reasons. Align the hole in the mold drawbar

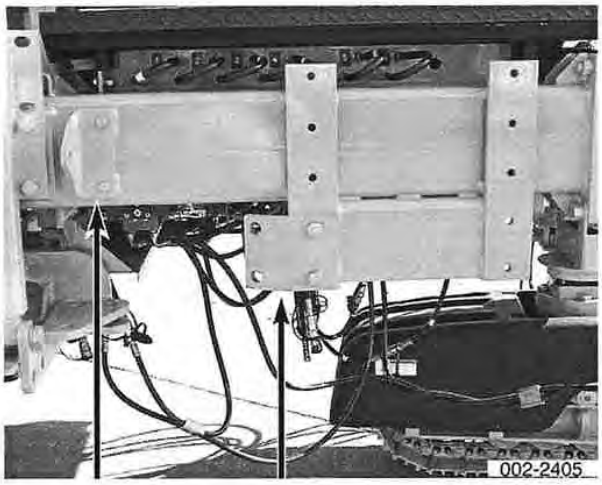
with the appropriate hole in the drawbar. Insert the drawbar pin.

Installation of Drawbar Extension

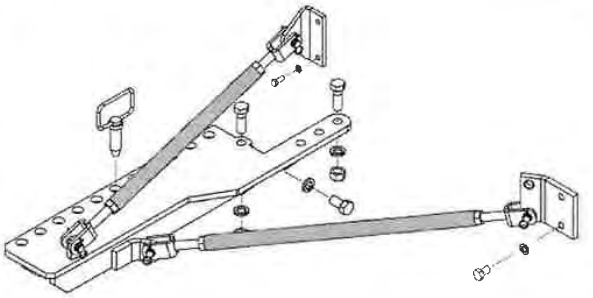


Install swinging drawbar extension

Current machines are equipped with a swinging drawbar mount for easier transport. Insert the drawbar extension into the welded mount on the end of the drawbar. Insert a 1 in. cylinder pin and bolt and tighten the bolt securely. When ready to mount the slipform mold, remove four bolts and swing the drawbar extension on the cylinder pin pivot into a parallel position with the drawbar. Insert the bolts to hold the drawbar extension in position and tighten securely.



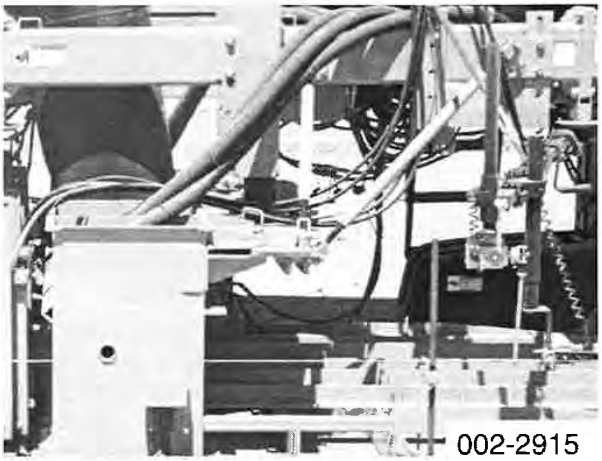
Shipping position of turnbuckle support mounts



Install turnbuckle mounts and turnbuckles

Notice: Once the turnbuckles have been installed, the drawbar lift cylinder cannot be raised or lowered.

Adjust the drawbar and slipform mold up or down as necessary prior to installation of the turnbuckles. Install the turnbuckle mounts as necessary and attach the turnbuckles between the mounts. Place a straight edge across the top of the drawbar and extension. Adjust the top turnbuckle until the top of the drawbar extension is aligned parallel with the drawbar on the machine frame. Place the straight edge across the front of the drawbar and extension. Adjust the rear turnbuckle to align the front of the drawbar extension with the front of the drawbar on the machine frame. Do not over tighten. Tighten the turnbuckle locking nut against the barrel of the turnbuckle.



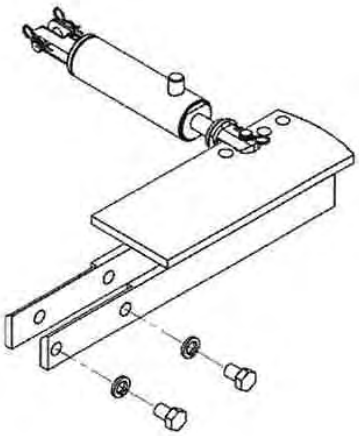
Sidewalk form mounted to drawbar extension

When installing a 5 ft. (1.52 m) or wider mold, the notch in the mold drawbar must be positioned around the drawbar support on the left side of the machine. Install one drawbar pin through the hole in each end of the mold drawbar.

When radius work is involved, insert one pin in the center hole and a second pin in the hole at either end of the drawbar. When pouring around a radius,

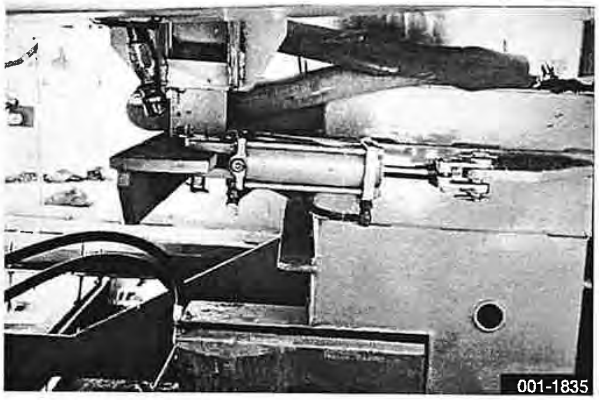
remove the pin from the end of the drawbar so the form can pivot. Reinsert the pin for straight line pours.

Installation of Form Steering Cylinder



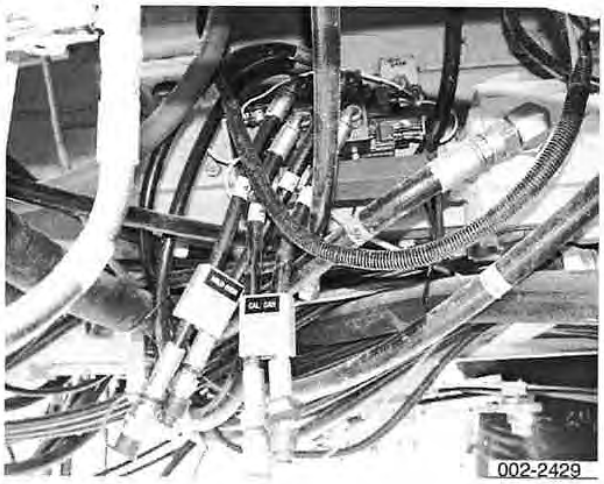
Form steering drawbar extension

If the machine is equipped with the mono steering package, attach the right drawbar extension and tighten the bolts securely.



Install slipform mold steering cylinder

Connect the clevis on the rod end of the steering cylinder to the bracket on the right end of the mold hopper. Loosen the fittings on the two control hoses and extend or retract the cylinder until 6 in. (150 mm) of rod is exposed. Tighten fittings. Be certain the form is set for straight ahead. Align the hole in the barrel end of the cylinder with one of the holes in the right end of the drawbar (maintain 6 in. (150 mm) exposure on rod). Insert the pin and secure in place with the hair pins.



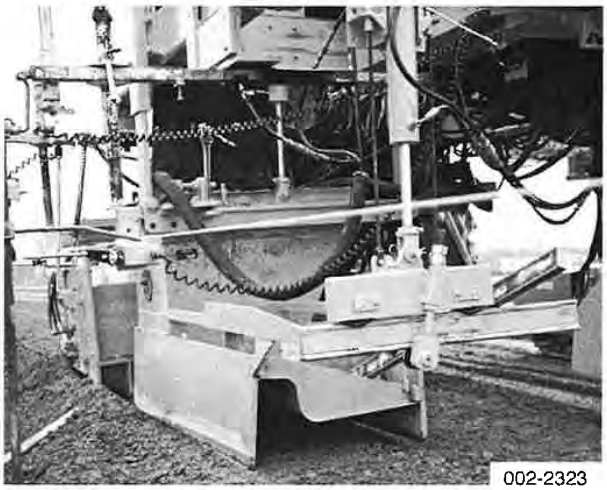
Connect the form steering cylinder

Connect the steering cylinder hoses to the "cal can" quick couplers under the engine console. Be certain the quick couplers are clean and install protective covers when they are disconnected to prevent dirt from entering the hydraulic system.



Connect the form steering controller

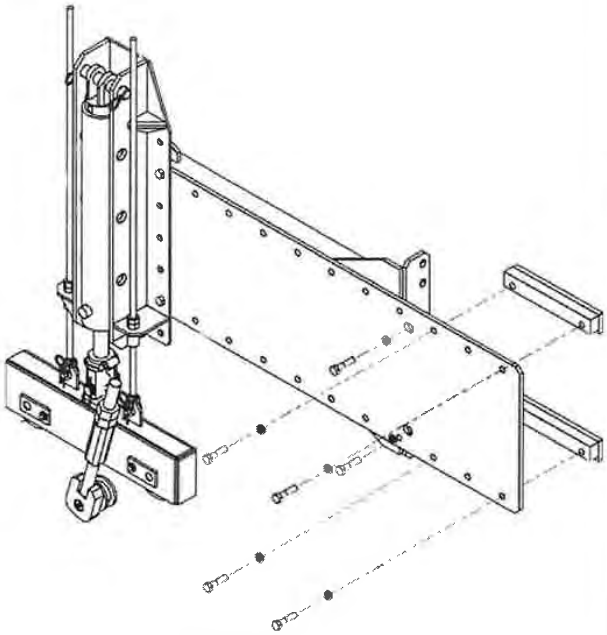
Connect the steering controller to the bulkhead located at the left rear corner of the machine frame (inset photo).



Connect form hold-down

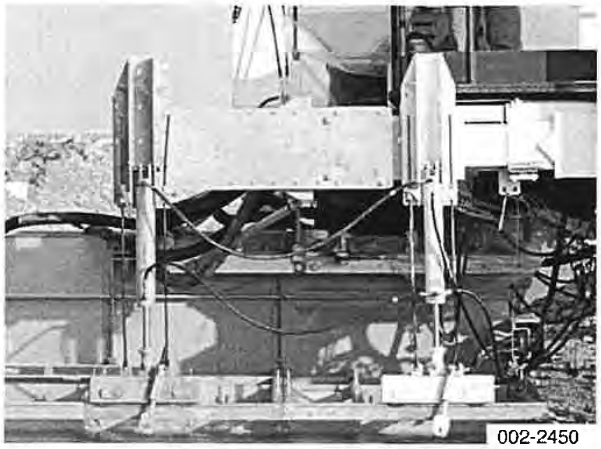
Using the form hold-down control switch, extend (lower) the hold-down cylinder until the trolley wheels contact the hold-down bar on the rear of the form. Place the retaining wheel under the hold-down bar and tighten the adjustment bolt until the hold down bar rolls freely between the top and bottom rollers. It may be necessary to turn the adjustment nuts on the hold-down limiting rods to the end of the rods to allow the hold-down cylinder to extend enough.

Installation of Hold Down Mount Extension



Attach hold down mount extension

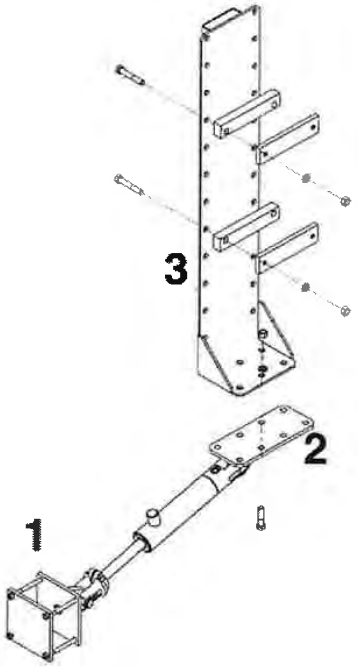
If a sidewalk or monolithic form is 8 feet (2.44 m) or wider it will be necessary to mount a hold down extension. Using an appropriate lifting device, lift the extension into position on the rear of the machine frame. Align the two bolt holes in the mounting plate with the threaded holes in the mold shift extension tube mounting flange. Insert two bolts and tighten securely. Place a clamp bar over the top and bottom of the mounting flange and insert four bolts with lock washers and nuts. Tighten all bolts securely. Attach the additional hold down cylinder assembly at the end of the hold down extension. Mount it as necessary to provide the same amount of cylinder extension on both hold down cylinders.



Hold down extension ready for use

To connect the additional hold down cylinder to the hydraulic system, it will be necessary to remove the fittings from the original cylinder and transfer them to the added cylinder. Before removing the hydraulic lines, make certain to mark the line connections for the top and bottom ports on the cylinder. Insert tee fittings into the original cylinder and connect the hydraulic lines. Attach the extension lines between the two cylinders as shown in the previous photo. Tighten all fittings securely.

Installation of Hold Over Cylinder

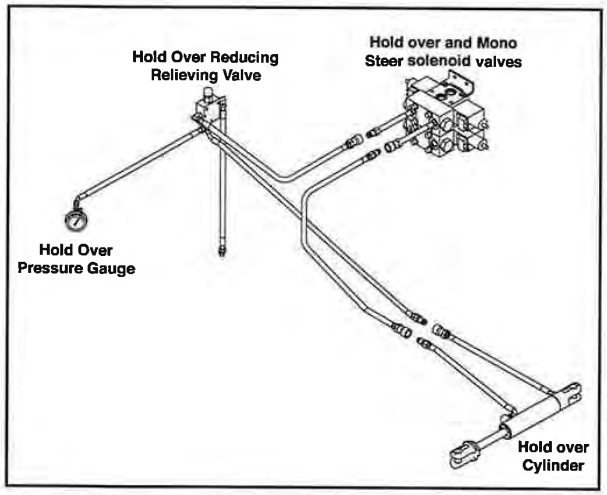


Install holdover assembly

It will be necessary to install the holdover assembly to the rear of the machine frame when pouring against the existing roadway (scab-on). Normally the frame mount (3) should be clamped to the rear of the frame on the left side of the hold-down assembly. The lower end of the mount (2) should be 2 to 6 in. (50 to 150 mm) above the hold-down bar when the form is in the pouring position.

Attach the cylinder mount (1) to the right square hold-down tube on the form. Connect the rod end of the holdover cylinder to the mount on the tube and secure with the clevis pin and hair pin. Extend the cylinder 3 in. (76 mm) (half stroke). Connect the barrel end of the cylinder to the anchor plate (2). Make certain the side of the form is parallel to the side of the machine. Attach the anchor plate (2) to the bottom of the frame mount (3) in the holes that match the closest. Tighten the bolts securely. The frame mount (3) can be shifted left or right as necessary to properly position the form.

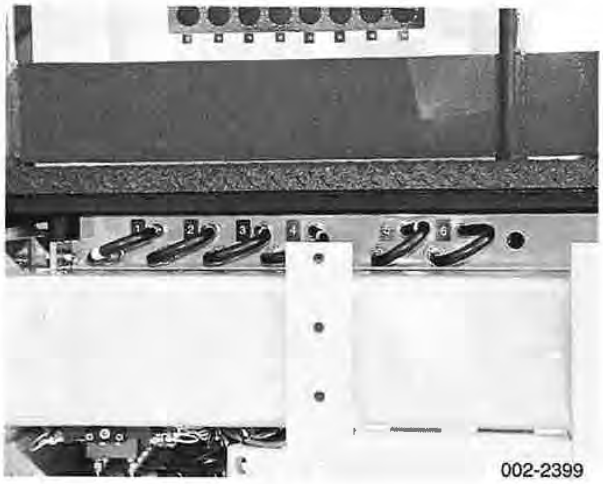
> **Note:** For clearance, it may be necessary to mount the hold over cylinder so that the hydraulic hose connections are facing down.



Connect the holdover hoses

Connect the holdover cylinder hoses to the holdover quick couplers under the engine console as indicated in the diagram. Move the holdover control switch to the "right" position and observe the cylinder movement. It should extend, forcing the rear of the form against the edge of the existing roadway. If not, swap the hoses on the holdover cylinder. The pressure may be adjusted between 0-600 psi (0-41 bar) using the hold over reducing relieving valve. Adjust the pressure as necessary to maintain the position of the slipform mold against the existing roadway.

Hydraulic Connections



Connect vibrator hoses

Thoroughly clean the quick couplers on the vibrator drive hoses and on the bulkhead quick couplers to prevent dirt from entering the hydraulic system. Connect the vibrator drive hoses to the vibrator outlet

quick couplers. It is recommended that the vibrators be connected in a consecutive order beginning with number 1. Any vibrator outlet that does not have a vibrator attached to it, must have the loop hose connected.

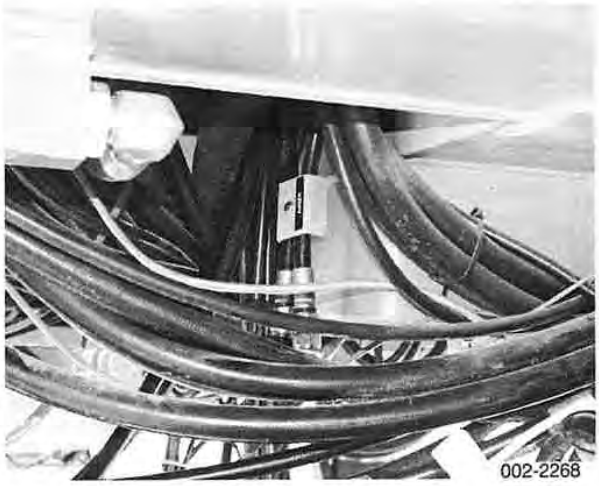
When the vibrators are disconnected, place the protective covers over the quick couplers, or connect couplers to keep dirt from entering the hydraulic system.



Connect driveway cutter

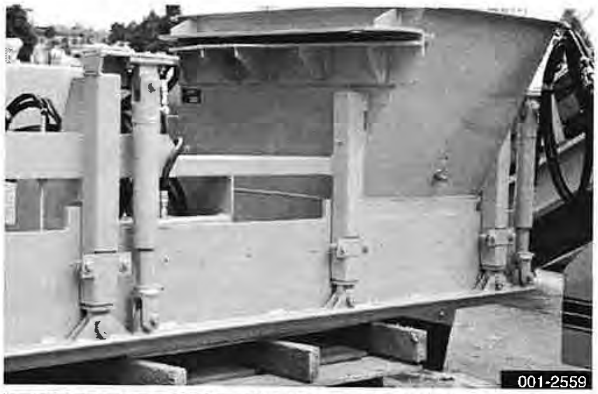
The slipform mold driveway cutter, or depressor attachment (if so equipped) is normally powered by the rear leg shift switch. Position the rear track, left or right, to the necessary operating position and disconnect the quick couplers from the rear leg shift cylinder. Clean all the dirt from the driveway cutter or depressor cylinder quick couplers and connect them to the quick couplers for the rear leg shift. When the driveway cutter, or depressor hoses are disconnected, return the hoses to the rear leg shift cylinder.

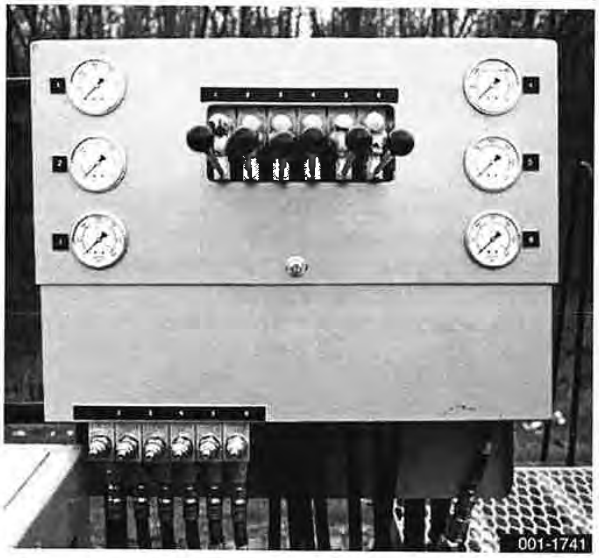
If the machine is equipped with a hold over solenoid valve, the driveway cutter or depressor may be connected directly to the hold over valve, rather than connecting to the rear leg shift solenoid valve. Make certain to bypass the hold over pressure reducing relieving valve by connecting directly to the quick couplers exiting the hold over solenoid valve.



Connect auger drive hoses

Thoroughly clean the quick couplers on the auger drive hoses and on the hoses from the control valve to prevent dirt from entering the hydraulic system. Connect the hoses from the auger drive motor to the hoses under the control console from the control valve. When disconnecting the auger drive hoses, always place the protective covers over/in the quick couplers to prevent dirt from entering the hydraulic system.

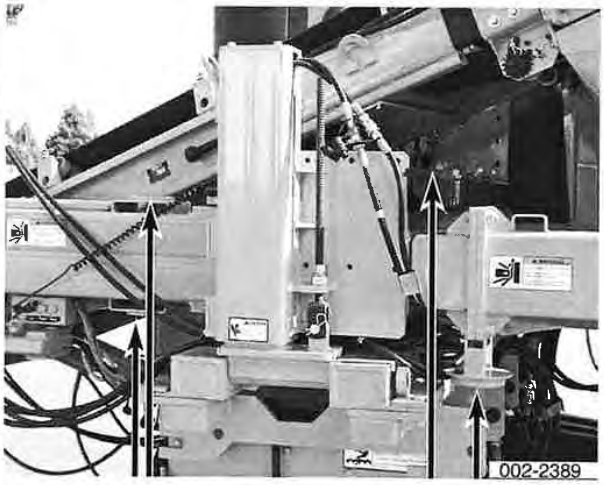




Connect hydraulic sideplate controls

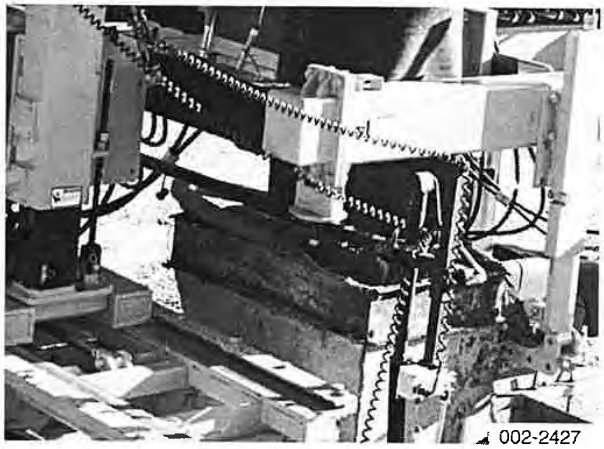
If the slipform mold is equipped with hydraulic sideplates, connect a pressure and return line between the sideplate control valve bank and the sideplate lines under the right side of the control console on the machine. Connect the individual sideplate cylinders to the individual control valves. Place the valves in the down position and allow the sideplate cylinders to extend to full stroke or until they reach a solid surface. The pressure reading for each cylinder should be 300 psi (21 bar), if not, loosen the locking nut on the appropriate pressure reducing-relieving valve and adjust the pressure using a hex wrench.

10 Mounting the Sensors (Standard)



Sensor pivot mount positions

The front sensor pivot mount may be attached to the machine frame in four different positions. The positions are located on the top and bottom of the left front leg swinging arm and on the bottom of the front mold shift extension tube. The fourth position is located above the front mold shift extension tube.

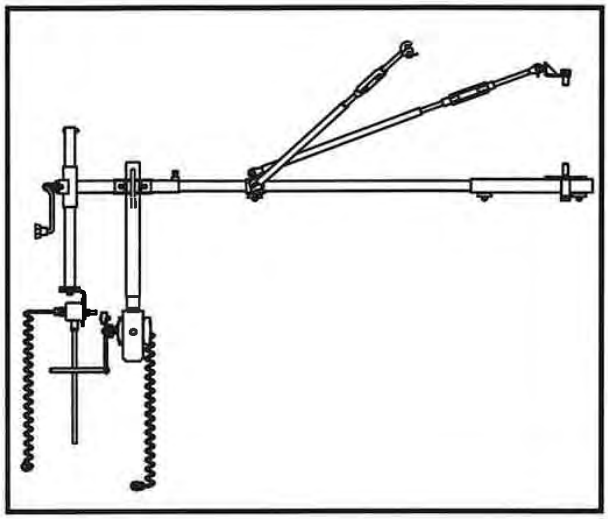


Install front sensor arm

Mount a sensor pivot mount to one of the locations and tighten securely. It is normally advised to have the long end of the pivot mount out towards the sensor arm assembly for added stability. It may be necessary to mount the pivot mount on one of the higher locations to accommodate higher guideline.

Slide a sensor arm assembly into the pivot mount. Align the end of the sensor arm with the trimmer drive motor. Slide the sensor arm assembly in or out until the end of the arm is near the final offset distance from

the side of the slipform mold. Tighten the setscrews in the pivot mount securely.

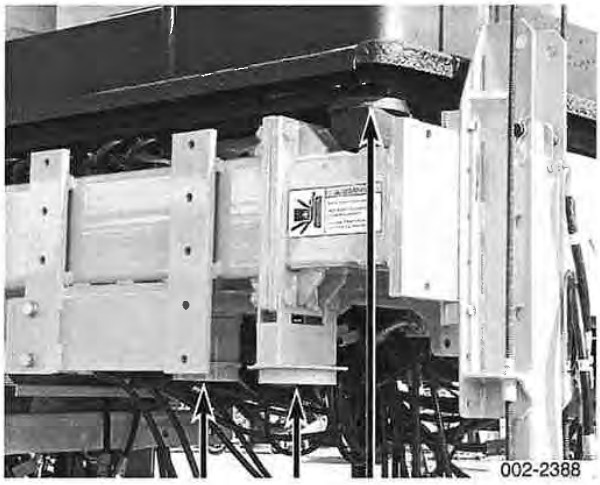


Attach turnbuckles for support

When the sensor arm assemblies are extended to where they are no longer stable, it will be necessary to install a brace assembly to stabilize them.

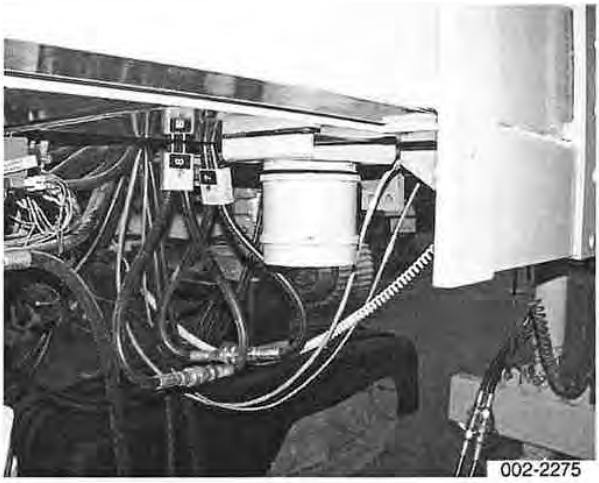
On the front assembly, install the brace bracket on the sensor arm assembly square tube before inserting it in the pivot mount. Turn the adjustment turnbuckle on each brace rod until 1 in. (25 mm) of threads remain inside each end of the turnbuckle. Connect the long end of one brace rod to the eyelet on the guard rail and the opposite end to an eyelet on the bracket on the sensor arm. Bolt the L-shaped bracket to either the top of the front frame extension, or to the left front leg mount and attach the long end of a brace rod to it. Attach the opposite end to an eyelet on the bracket and tighten the turnbuckles until all flex is removed from the sensor arm assembly.

> **Note:** It is advised to leave the setscrew in the brace bracket and the turnbuckles loose until the machine frame has been set parallel to the guideline.



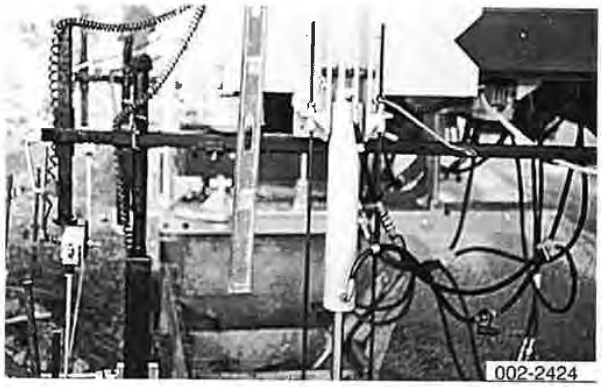
Rear sensor pivot mount positions

The rear sensor pivot mount may be attached to the machine frame in three different positions. The positions are located on the bottom of the machine frame and the rear mold shift extension tube. The third mounting position is located above the rear mold shift extension tube.



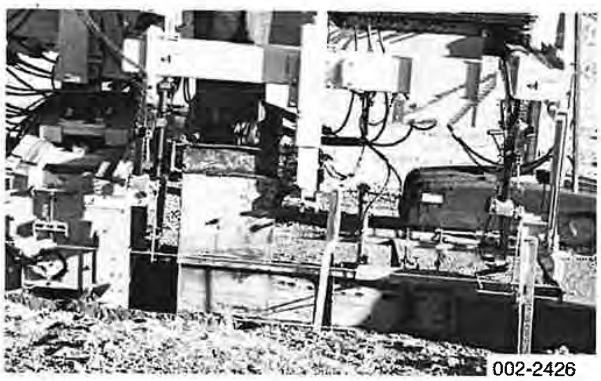
Install the pivot mount extension

A pivot mount extension is provided for the mounting position under the machine frame. This allows the sensor arm to swing below the side mount barrier weldment on the side of the mold shift extension frame. Install the pivot mount extension to the mounting position under the left rear corner of the machine frame and tighten securely.



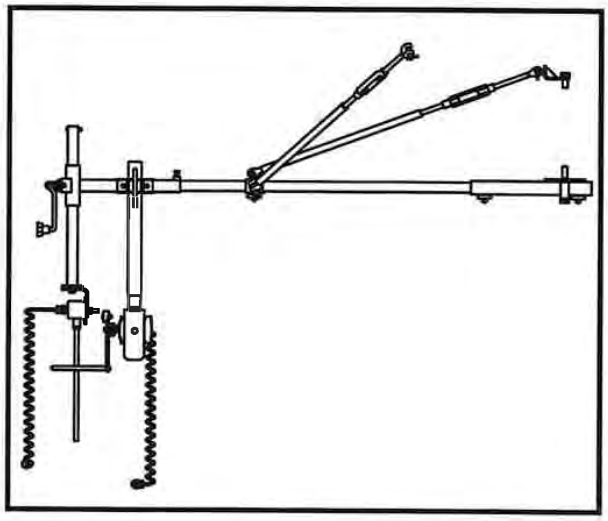
Install rear sensor arm

Mount a sensor pivot mount to one of the locations and tighten securely. It is normally advised to have the long end of the pivot mount out towards the sensor arm assembly for added stability. It may be necessary to mount the pivot mount on one of the higher locations to accommodate higher guideline.



Sensor placement

Slide a sensor arm assembly into the pivot mount. Align the end of the sensor arm with the leading edge of the stainless trowel section on the slipform mold. Slide the sensor arm in or out until the end of the arm is near the final offset distance from the side of the slipform mold. Tighten the setscrews in the pivot mount securely.

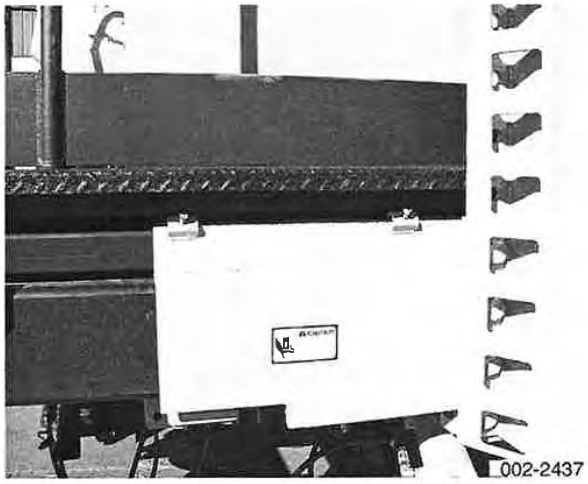


Attach turnbuckles for support

When the sensor arm assemblies are extended to where they are no longer stable, it will be necessary to install a brace assembly to stabilize them.

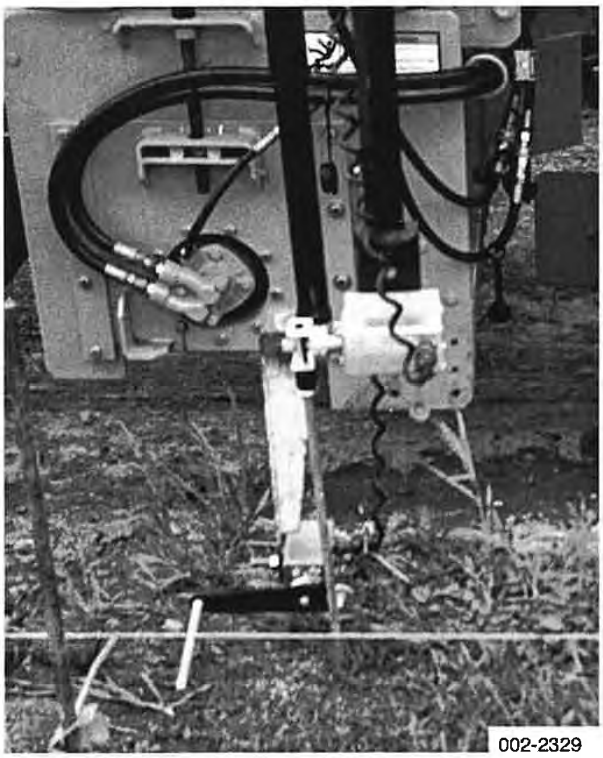
On the rear, install the brace bracket on the sensor arm assembly square tube before inserting it into the pivot mount. Turn the adjustment turnbuckle on each brace rod until 1 in. (25 mm) of threads remain inside each end of the turnbuckles. Connect the long end of the brace rod to a brace clamp on the guard rail and the opposite end to an eyelet on the bracket on the sensor arm. Tighten the setscrew securely in the brace bracket and tighten the turnbuckles until all flex is removed from the sensor arm assembly.

Note: It is advised to leave the setscrew in the brace bracket and the turnbuckles loose until the machine has been set parallel to the guideline.



Sensor arm extension set screws

When using the sensor arm extension tubes on top of the machine frame, make certain to tighten the set screws securely before the final adjustments.



Mount sensors and wands

Network Sensor Installation: Mount a sensor for elevation control to the mount on the adjustable grade jack with the mounting bolt facing forward and the sensor hub away from the side of the machine. Mount the sensor so the top of it is level and tighten the mounting bolt securely. The front and rear grade sensors are mounted in the same manner.

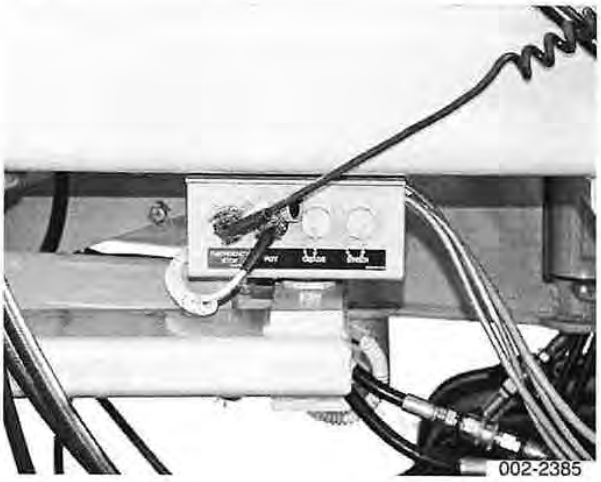
The grade sensor wand is mounted so that the round tube is towards either the front of the machine (same side as mounting bolt) and pointing away from the side of the machine or; toward the rear of the machine (same side as the cord) and pointing away from the side of the machine. The wand should be attached, so that when the stop pin in the sensor shaft is centered between the stops on the sensor, the wand is parallel to the mounting bolt (horizontal). Tighten the attaching "thumbscrew" securely.

> **Note**: All grade sensors and wands must be installed in the same manner. If one sensor or wand is facing the wrong direction according to the calibrate settings in the Network controller, it will work backwards (see later).

Mount a sensor for steering control to the square tube mount with the mounting bolt facing away (out) from the machine frame and the sensor hub towards either the front or the rear. Mount the sensor so the top of it is level and tighten the mounting bolt securely. The front and rear steering sensors are mounted in the same manner.

The steering sensor wand should be attached to the sensor hub, so that when the stop pin in the sensor shaft is centered between the stops on the sensor, the wand is at a 90° angle to the mounting bolt (vertical). Tighten the attaching "thumbscrew" securely.

> **Note**: All steer sensors and wands must be installed in the same manner. If one sensor or wand is facing the wrong direction according to the calibrate settings in the Network controller, it will work backwards (see later).

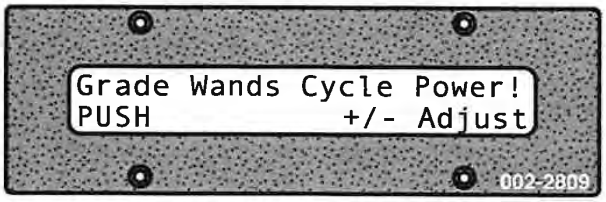


Connect sensor cords

Connect the front sensors to the electrical connectors on the left front bulkhead. Connect the rear sensors to the electrical connectors on the lower left side of the control console. The steering sensors are connected to the "steer" plugs and the grade sensors to the "grade" plugs. When the sensors are disconnected, place the dust caps over/in the electrical plugs to keep moisture and dirt out.

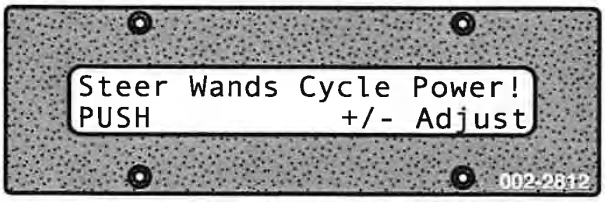
If pouring monolithic curb, gutter and sidewalk, connect the form steering controller if so equipped, to the large plug on the lower left side of the control console.

Control Panel Calibration



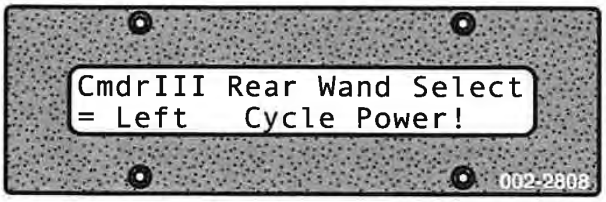
Grade sensor mode selection

Depress the calibrate switch on the service panel and use the NEXT switch to scroll forward to the grade sensor mode. Use the slope adjust switches (+ or -) to change the grade sensor mode to "PULL" if the round tube of the grade wand is on the same side as the cord. If the round tube of the grade wand is on the same side as the mounting bolt, change the grade sensor mode to "PUSH".



Steer sensor mode selection

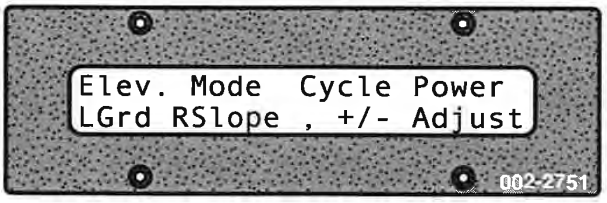
Using the NEXT switch, scroll forward to the steer sensor mode. Use the slope adjust switches (+ or -) to change the steer sensor mode to "PUSH" if the round tube of the steer wand is facing forward. If the round tube of the steer wand is facing towards the rear of the machine, change the steer sensor mode to "PULL".



Rear wand select

Using the NEXT switch, scroll forward to the rear wand select mode. Use the slope adjust switches (+ or -) to select the appropriate bulkhead connection that the sensors will be connected to for operation. If the sensors are connected to the left rear bulkheads, the main screen selection should indicate the message "left". If the sensors are connected to the right rear bulkheads, the main screen selection should indicate the message "right".

Note: The rear steer sensor, grade sensor and smart steer cylinder feedback pot must be connected into the same bulkhead connection as indicated on the rear wand select display.



Network panel for left grade, right slope

To operate the machine with left hand grade control, and right side slope control, depress the calibrate switch. Scroll through the various displays until the elevation mode is indicated. Use the slope adjust switches (+ or -) to change the elevation mode to "L GR/R SLOPE". After the appropriate grade and steering mode settings are selected, depress the calibrate switch to return to the main screen. Adjust

the desired amount of cross slope with the appropriate switch on the main control panel. Refer to the Preliminary Adjustments section for final adjustment procedures.

The left front leg elevation is controlled by the front grade sensor connected to the left front grade plug, and the left front elevation control loop. The rear leg elevation is controlled by the rear grade sensor, connected to the left rear grade plug, and the rear elevation control loop. The right front leg elevation is controlled by the slope sensor, located in the battery box, and the right front elevation control loop. The steering of both front tracks is controlled by the front steer sensor connected to the front steer plug and the front steer control loops. The steering of the rear tracks is controlled by the rear steer sensor connected to the rear steer plug and the rear steer control loop.

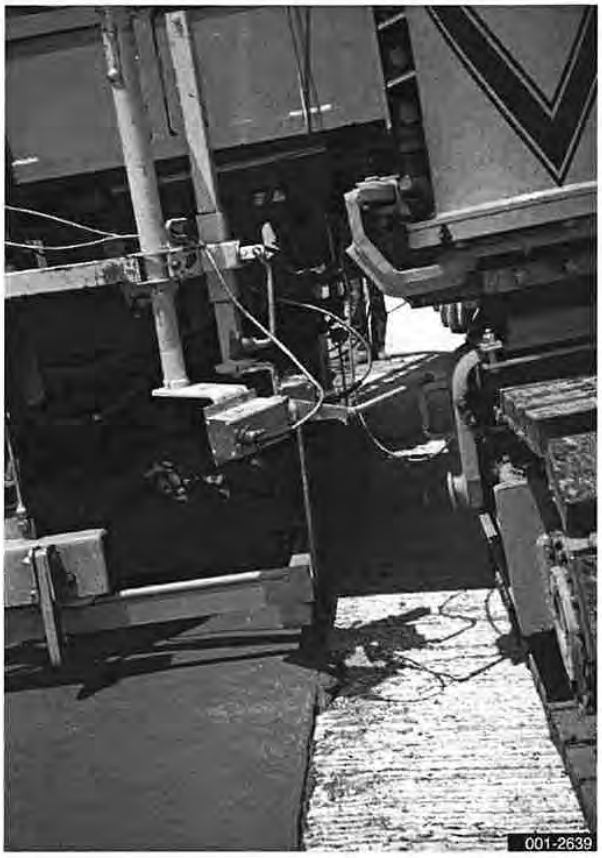
11 Mounting Sensors (Scab-On)



Install front sensor arm for scab-on

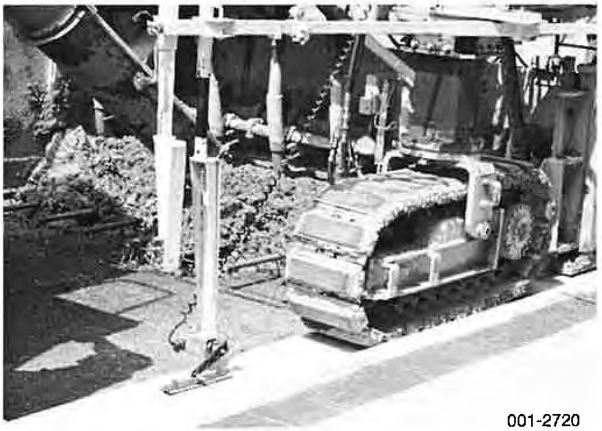
The sensor arm assemblies can be mounted under the machine for scab-on pouring operations, eliminating the need for a guideline. Steering control can be referenced from the edge of the existing roadway and grade control can be referenced from the top surface of the roadway. The edge and top surface should be smooth and even when using them for reference points.

To install the front sensors, attach the special mount bracket (part #GT60-389) to the bottom of the front frame cross tank. Tighten the bolts securely. Attach a sensor pivot mount to the bottom of the inner tube and tighten securely. Insert the sensor arm assembly into the pivot mount so the end of it is towards the left side of the machine. Tighten the setscrews securely. Mount the sensors to the sensor arm as described in the previous section.



Install rear sensor arm for scab-on

To install the rear sensors, attach the sensor pivot mount to the bottom of the rear mold shift extension tube and tighten securely. Insert the sensor arm assembly into the pivot mount so the end of it is towards the rear track. Tighten the setscrews securely. Mount the sensors to the sensor arm as shown in the previous photo.

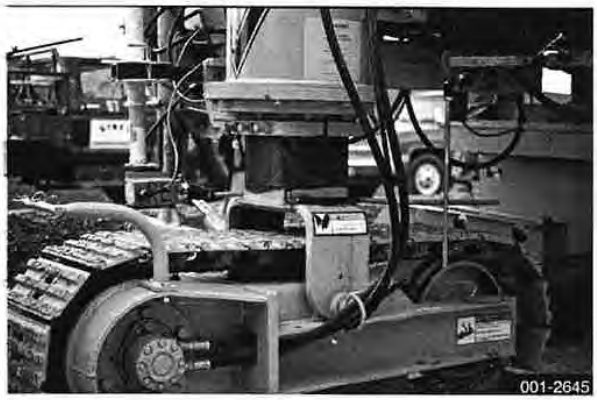


Skate/ski on grade sensor

A grade skate/ski assembly can be attached to the grade sensor to sense grade from the existing slab. To install the skate/ski assembly, remove the break away tube from the right angle grade wand. Attach the skate assembly to the arm in place of the tube and tighten securely. Snap the ski assembly into place on the blade of the skate. Attach the grade arm assembly to the hub of the grade sensor so that when the stop pin in the sensor shaft is centered between the stops on the sensor, the wand is angled downward 45°. The skate/ski assembly should be on the cord side of the sensor. Attach the grade sensor to the grade jack so that the mounting bolt is facing forward travel and the sensor is mounted in a level position. When using the skate/ski assembly be certain the running surface is clean and free of imperfections. Any imperfections in the running surface may be transferred into the finished product. Keep the grade sensor as close to the edge of the slab as possible.

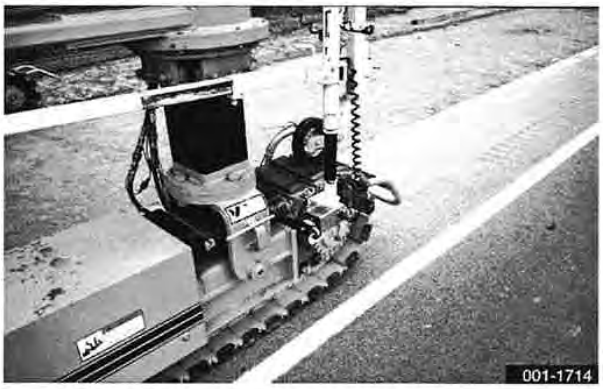
Note: A grade skate/ski should always be dragged by the sensor to prevent damage to the sensor if the skate/ski should catch on any obstacle.

12 Mounting the Sensors (Lock-To-Grade)



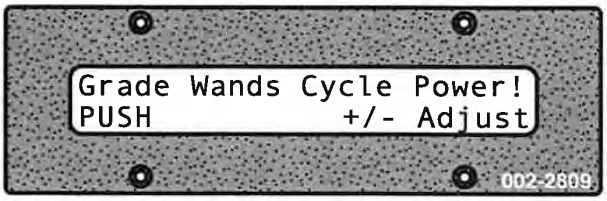
Mount grade jack on turning ring

The grade control for the machine can be setup to run lock-to-grade on any or all of the three legs, using the track as a grade ski. It will be necessary to mount an adjustable grade jack on the appropriate leg. Weld a 1 3/4" x 1 3/4" x 12" (4.5 cm x 4.5 cm x 30 cm) square tube to the turning portion of the lower guide tube bearing with the end of it pointing away from the machine. Weld a piece of 3/8" x 6" (1 cm x 15 cm) round bar to the front of the track yoke with the end pointed the same way as the square tube. Mount a grade jack to the square tube. Tighten the mounting bolt securely.



Mount sensor for lock to grade

The grade sensors are all mounted the same for lock-to-grade. Mount a sensor to the adjustable grade jack with the mounting bolt towards the leg. The grade sensor wand is mounted so that the round tube is towards the leg (same side as mounting bolt) and pointing away from the side of the sensor. The wand should be attached, so that when the stop pin in the sensor shaft is centered between the stops on the sensor, the wand is parallel to the mounting bolt (horizontal). Tighten the attaching "thumbscrew" securely.

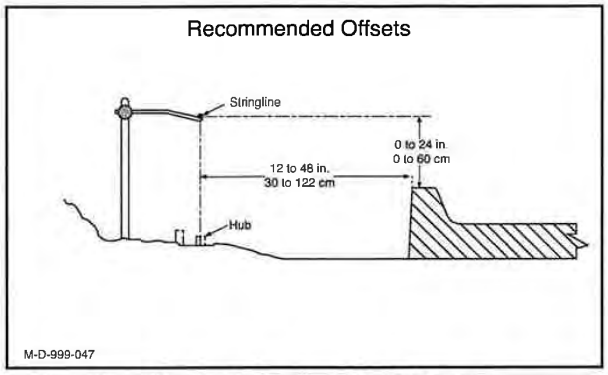


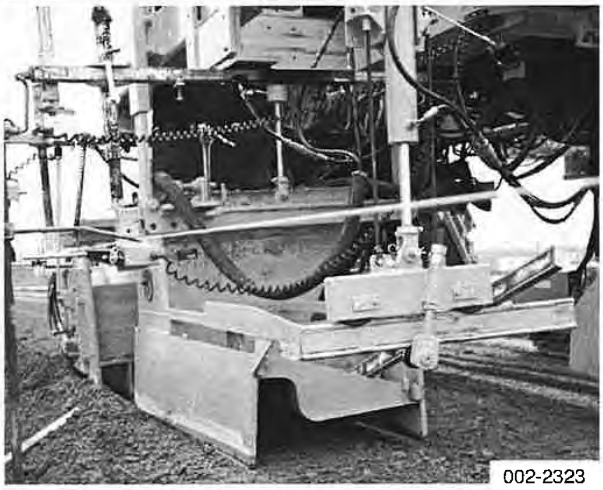
Grade sensor mode selection

Depress the calibrate switch on the service panel and use the NEXT switch to scroll forward to the grade sensor mode. Use the slope adjust switches (+ or -) to change the grade sensor mode to "PUSH".

13 Preliminary Adjustments

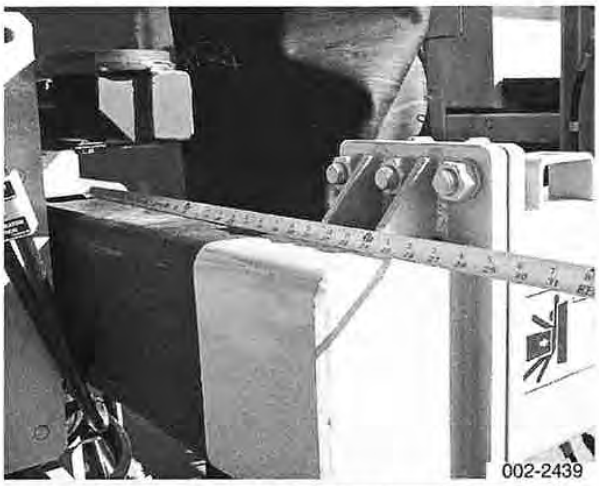
Trimmer and Mold Alignment to Machine Frame





Extend trimmer and slipform mold

Determine what offsets will be used with the slipform mold that is attached. These may vary from one jobsite to the next with the minimum steering offset being 12 inches (30 cm). Also determine if any obstacles require the slipform mold to be fully retracted under the machine or extended partially or fully. Shifting the mold and trimmerhead fully to the left will allow the machine to turn a tighter radius and will allow pouring up to obstacles with the front of the mold hopper. Shift the slipform mold to the left as required.



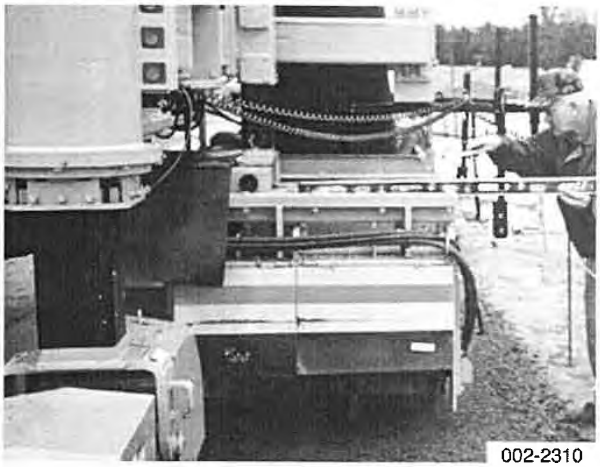


Measure mold shift for parallel

If the mold will only be shifted partially to the left, it will be necessary to measure and extend the front and rear mold shift tubes equally. Measure and record the distance between the end of the front and rear mold shift extension tubes to the corresponding outer frame tube when fully retracted. Extend the front and rear tubes equally and measure in the same manner. Subtract the original measurement from the new measurement. The total for the front tube and the rear tube should be equal, if not, adjust the front or rear tubes until the measurement is equal.

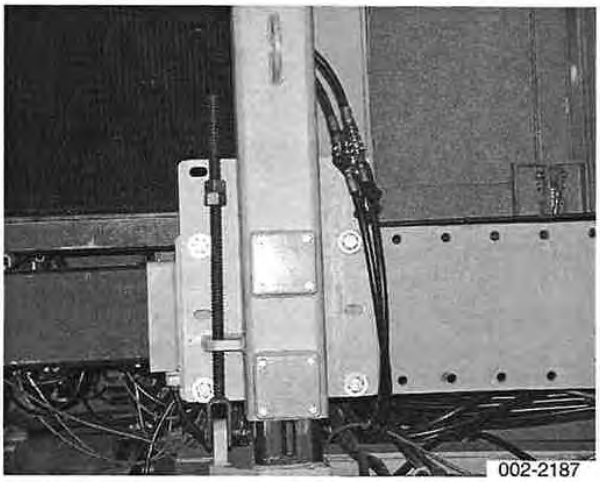
Extend the trimmerhead lift, drawbar lift and hold down cylinders as necessary to allow for obstacles on the jobsite. Make certain that there is 12 to 18 inches (30 to 45 cm) of extension on each of the track legs to allow adjustment of the legs during pouring operations over rough terrain. Allow enough extension on each of the lift legs so that the trimmerhead and mold may be

lifted over obstacles without disengaging the machine from the guideline.



Adjust trimmer parallel to machine frame

Place a level across the top of the trimmer and adjust it parallel to the machine frame using the trimmer lift cylinders.



Trimmer lift limit bolt

Adjust the trimmer lift limit bolts down to the stop plate and tighten the jam nuts. This will prevent the trimmer from dropping below grade and will allow raising and lowering the trimmer during pouring operations without losing the trimmer grade reference. Retract the slipform mold drawbar and hold down cylinders temporarily.

Machine Frame Alignment to Guideline



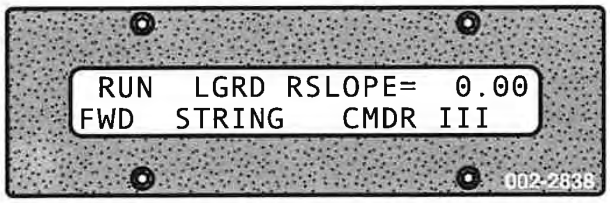
Machine parallel to line (horizontal)

⚠ WARNING! ⚠

BE CERTAIN AREA AROUND MACHINE IS CLEAR BEFORE MOVING THE MACHINE. USE CAUTION WHEN TRAVELING DOWN EMBANKMENTS, OR OVER UNEVEN GRADE, TO AVOID TIP-OVER. BE CERTAIN THAT THE AREA AROUND THE MACHINE IS CLEAR BEFORE TURNING.

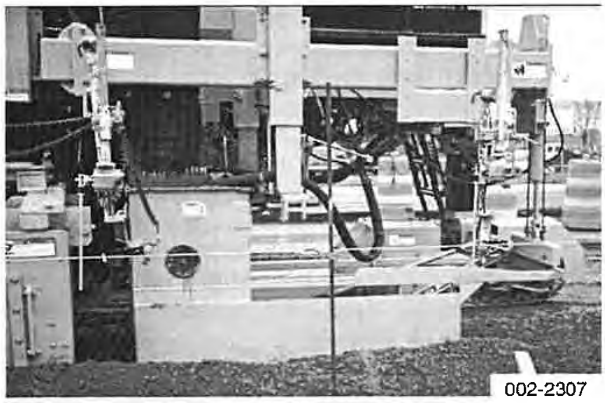
Move the machine into position along the guideline (Refer to Controls and Gauges section 05 for procedures to move the machine). Steer the front or rear of the machine left or right as necessary until approximately the same distance exists between the guideline and the front of the frame and the guideline and the rear of the frame. Also have the machine set so the distance between the slipform mold and the guideline is approximately the correct offset distance. Steer the front and rear tracks to the straight ahead position.

Note: If the machine will not move, check the emergency stop reset light (if equipped). If it is illuminated, depress the reset switch.



Adjust slope control of machine frame

Place the slope control circuit in "automatic" and adjust the slope setting to the required amount of slope.

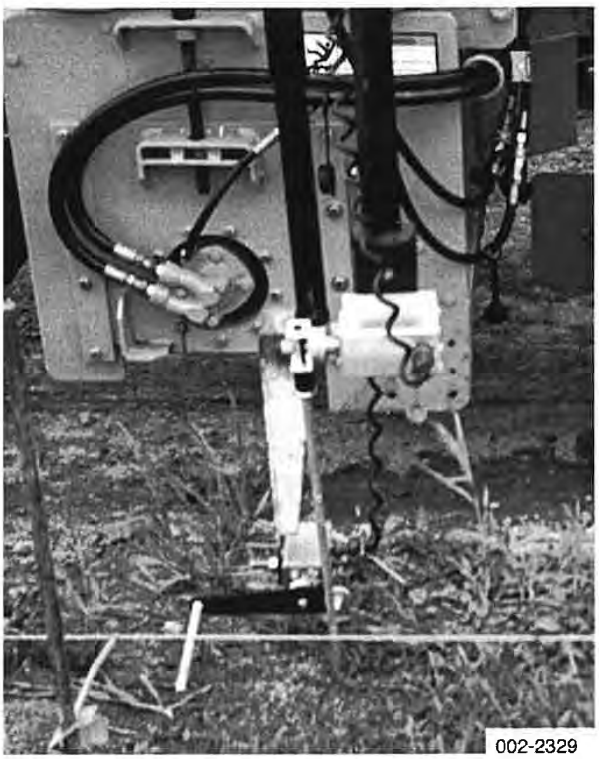


Machine parallel to line (vertical)

Make certain that the trimmer lift cylinders are extended to the limit bolt adjustment. Lower the machine using the front and rear grade jog switches until the trimmerhead is resting on the grade. Be certain the machine frame is approximately the same distance above the guideline at the front and at the rear. Be certain the tracks are set straight ahead and stop the engine. Place the ignition switch in the "on" position.

Note: The trimmer should be resting on grade at least 1/2 in. (13 mm) high, to prevent undercutting when moving the machine forward.

Sensor Adjustments



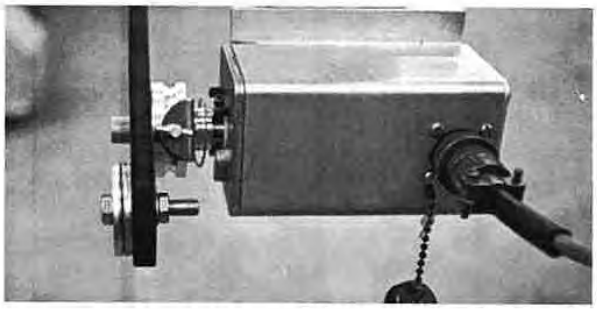
Place wands on line

It is advised to screw the steering adjustment crank in the end of the sensor arm assembly out (clockwise) 3 to 4 in. (76 to 100 mm) before making sensor adjustments. Adjust the grade jack out the same amount. This will allow for minor steering or grade adjustments if needed. Place the grade sensor wands under the guideline and the steering sensor wands on the machine side of the line. Turn the L-shaped mount bracket until the shaft through each of the grade sensors is at a 90° right angle to the guideline and the shaft through each of the steering sensors is parallel to the guideline. Adjust the steering sensors left or right (in or out) until the deviation meter needle on the steering system is centered. Place the individual control loops for the steer sensors in "A" automatic by depressing the "A/M" switch and rotate the manual steer selector dial to the stringline sensor position. If a large amount of adjustment, 1 in. (25 mm) or more, is necessary to center the deviation meter needles, loosen the setscrews in the sensor pivot mount and adjust the sensor arm assemblies in or out as needed (save crank adjustment for final fine adjustment). Tighten the setscrews securely. After preliminary steering sensor adjustments are made, tighten the setscrew in the brace brackets (if required). Adjust the

brace turnbuckles until all flex is removed from the sensor arms. Recheck the sensor centering.

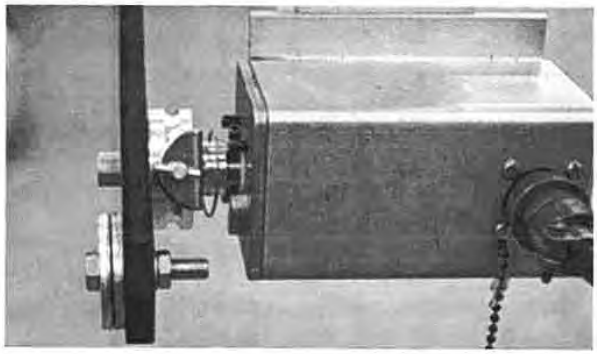
Adjust the front and rear grade sensors up or down until the deviation meter needle is centered on the corresponding grade system. Place the individual control loops for the grade sensors in "A" automatic by depressing the "A/M" switch. If a large amount of adjustment is necessary to center the deviation meter indicators, loosen the setscrews in the grade sensor jack brackets and raise or lower the jacks as needed. Tighten the setscrews securely.

Loosen the L-shaped clamp bolt in the grade jack bracket and slide the jack left or right until the grade sensor wand is centered beneath the guideline. Tighten the clamp bolt securely. Loosen the setscrew in the steering sensor square tube mount and slide the sensor assembly up or down until the guideline is 10 to 12 in. (250 to 300 mm) from the sensor shaft. Tighten the setscrew securely. The sensor mounts should be adjusted until there is no less than 1/4 in. (6 mm) and no more than 1 1/2 in. (38 mm) between the sensor wands.



Two counterweight washers removed

It is normally recommended to remove two of the counterweight washers from the rear of the grade wand, so only two remain.



Adjust sensor spring tension

Adjust the spring tension on the sensor hubs to hold the wands firmly in contact with the guideline, but not tight enough to deflect the line. Check for correct spring tension after the machine has been adjusted to the line. Note the position of the line on the grade sensor wand. Push the steering wand away from the line and note the movement of the line on the grade wand. If the movement exceeds 1/8 in. (3 mm), the steering sensor spring tension is too tight. Loosen tension slightly. Note the position of the line on the steering wand. Pull the grade sensor wand down, away from the line and note the movement of the line on the steering wand. If the movement exceeds 1/8 in. (3 mm), the grade sensor spring tension is too tight. Loosen the tension slightly. Pull the line away from both sensor wands. The steering sensor wand should move out towards the line until the stop pin in the sensor hub contacts the stop pin in the side of the sensor. If not, tighten the spring slightly. The grade sensor wand should move up towards the line, until the stop pin in the sensor hub contacts the stop pin in the side of the sensor. If not, tighten the spring slightly. If the sensor wands deflect the line more than 1/8 in. (3 mm), but the stop pins in the sensor and hub will not contact one another when the line is pulled away, suspect that the line is inadequately tensioned. Adjust the line as necessary.

Note: When checking sensor wand spring tension, it should be done half way between stations so line holders do not interfere. The control system should be in the "standby" mode or the servo lock switch must be in the "on" position when checking the sensor spring tension.

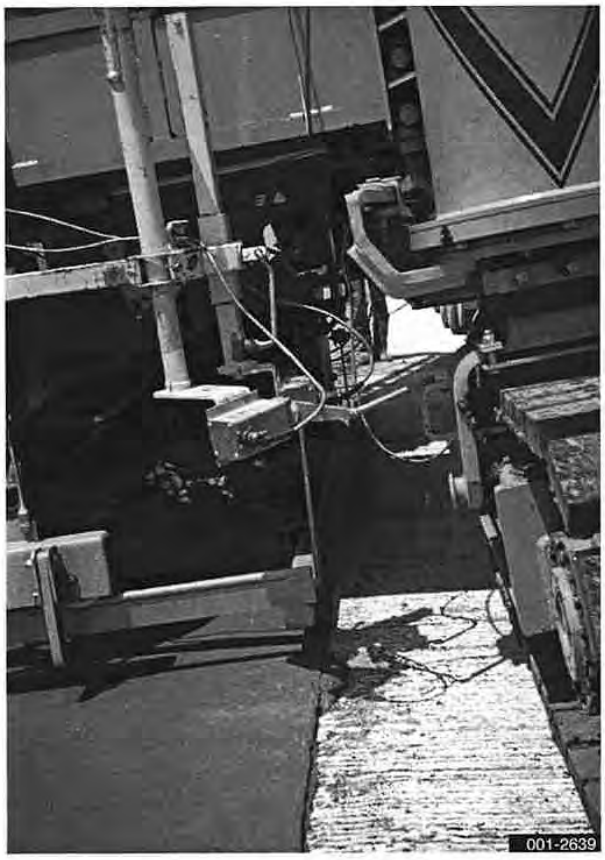


Front steer sensor for scab-on

When pouring against an existing roadway (scab-on), with no guideline, the front steering sensor wand is adjusted to run against the edge of the roadway. It may be necessary to wind the spring on the sensor hub in reverse to hold the wand against the roadway.

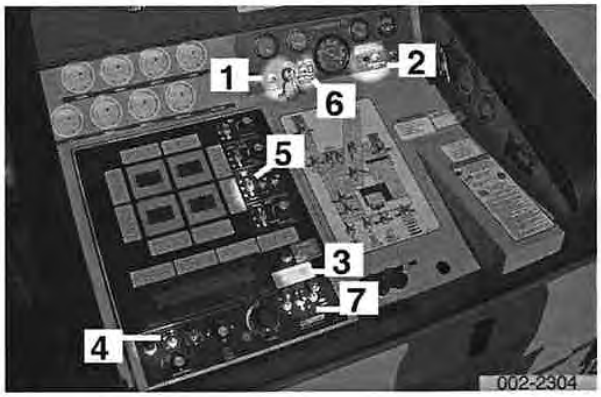
Adjust the vertical position of the steering sensor so the wand does not catch on the grade or on protruding tie bars. The grade sensor can either be positioned to run lock-to-grade off of the track, or sense grade directly off of the slab with the skate/ski assembly.

Note: It is advised to place a 6 in. (150 mm) piece of hose over the end of the steering wand to protect it from wear.



Rear sensors for scab-on

The rear sensor for scab-on steering is adjusted so the wand will run against the square hold-down tube on the slipform mold. Adjust the spring on the sensor hub to hold the wand against the square tube. Adjust the vertical position of the steering sensor so the square tube is 10 to 12 in. (250 to 300 mm) from the sensor shaft. The rear grade sensor is mounted and adjusted the same as the front. The adjustment procedures for scab-on setup are basically the same as for standard setup. The only difference is that all references are made from the roadway instead of the guideline. Keep the grade sensor as close as possible to the edge of the slab.



Controls set to trim forward

⚠ DANGER! ⚠

CONTACT WITH MOVING TRACKS OR TRIMMERWHEEL CAN CAUSE SERIOUS INJURY OR DEATH. BE CERTAIN THAT NO ONE IS NEAR THE TRIMMERWHEEL BEFORE ENGAGING THE CONTROL SWITCH. BE CERTAIN THAT NO ONE IS NEAR THE TRACKS BEFORE MOVING THE MACHINE. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS TO PREVENT SEVERE PERSONAL INJURY.

Depress the start assist switch and start the engine (1). Depress the emergency stop reset switch to set the emergency stop system for operation (2). Place the control system in "run" by depressing the run/standby switch (3). Place the servo lock switch in the "off" position (4). Place the trimmer forward/neutral/reverse switch in the "forward" position (5) and increase the engine speed to maximum (6). Place the two speed switch in the "slow" position and the forward/reverse travel switch in the forward "F" position (7). Place the travel/neutral switch in the "travel" position and slowly move the travel variable speed control dial clockwise to start machine movement (7). Move forward 20 to 30 ft. (6 to 9 m) and stop the machine. Place the trimmer switch in the neutral "N" position.

Parallel Measurements and Adjustment



Check frame elevation

Hold a straight edge under the mold shift extension frame just to the rear of the front mold shift extension tube. Extend the straight edge over the guideline and measure the distance between the machine side of the straight edge and the guideline. Record this measurement.

> **Note:** When setting the machine parallel to the guideline, it should be performed in an area where the guideline is straight (not in a radius).

Place a straight edge under the mold shift extension frame just to the front of the rear mold shift extension tube. Extend the straight edge over the guideline and measure the distance between the machine side of the straight edge and the guideline. This measurement should be within 1/4 in. (6 mm) of the front measurement. If not, adjust the grade sensors, up or down as necessary and recheck this measurement.

> **Note:** It is advised to raise the low end of the machine, rather than lower the high end, to prevent the trimmerhead from undercutting the grade.



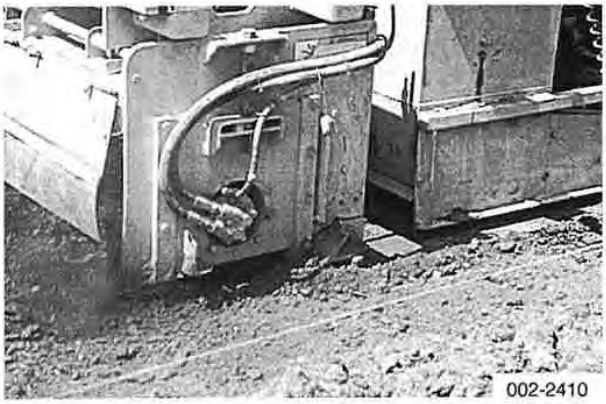
Check frame offset

Place a straight edge against the outer edge (left) of the mold shift frame, just to the rear of the front mold shift extension tube and extend it down to the guideline height. Measure the distance between the machine side of the straight edge and the guideline. Record this measurement.

⚠ DANGER! ⚠

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Place a straight edge against the outer edge (left) of the mold shift frame, just to the front of the rear mold shift extension tube and extend it down to the guideline height. Measure the distance between the machine side of the straight edge and the guideline. This measurement should be within 1/4 in. (6 mm) of the front measurement. If not, adjust the steering sensors left or right. After adjusting the sensors, move the machine forward 20 to 30 ft. (6 to 9 m) to allow the steering system to correct itself and recheck the measurements.



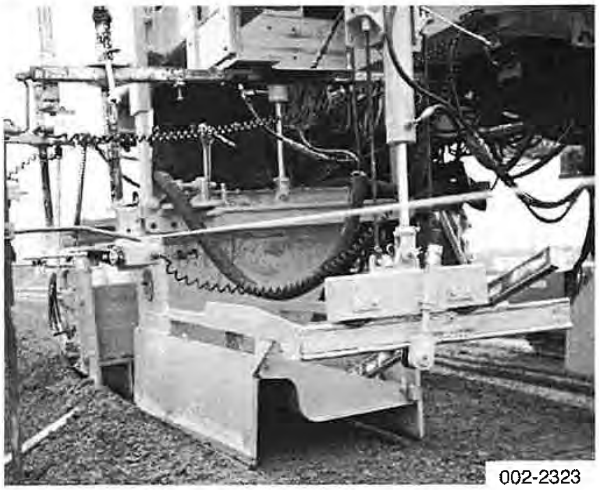
Adjust drawbar height

⚠ DANGER! ⚠

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Turn the adjustment nuts on the drawbar and hold down limiting rods to the end of the threaded rods. Move the hold-down control switch to the "down" position and adjust the hold-down pressure control valve to the minimum (counterclockwise) position. With the machine slowly moving forward, adjust the drawbar up or down with the drawbar cylinder, until the bottom of the slipform mold, on each side, is lightly riding on the trimmed subgrade. After the mold has been adjusted to the trimmed grade, turn the limit nuts down to the limit stop. Lock the adjustment nut and jam nut together.

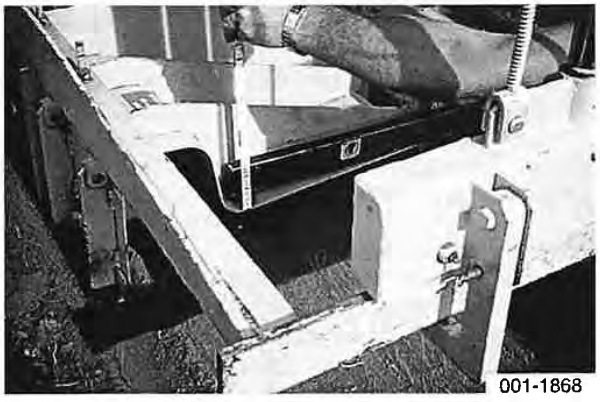
> **Note:** If the trimmerhead is not cutting any grade, lower the machine evenly, front and rear, until it is cutting. The form should be set to a trimmed grade.



Position hold-down cylinder

Check the position of the hold-down cylinder on the rear of the slipform mold. With the slipform mold parallel to the grade, the hold-down cylinder should be extended approximately the same distance as the drawbar cylinder. If the cylinder is extended less than 4 in. (100 mm), move the mount up on the frame. If the cylinder is extended more than 10 in. (250 mm), move the mount down on the frame. With the side of the form parallel to the side of the machine, the hold-down trolley assembly should be centered on the hold-down bar on the rear of the form. If not, slide the hold-down cylinder mount left or right as necessary. Tighten the mounting bolts securely.

14 Final Adjustments



Check gutter slope

Place a level in the gutter portion of the slipform mold at the rear of the main form. Raise the lower end of the level until it is plumb. Measure the distance between the form side of the level and the top of the form to determine the amount of slope. If the amount

of slope is incorrect, adjust the slope setting on the machine until the desired amount of slope is attained.

Note: When checking the slope on a curb and gutter form, be certain to allow for edge slump, which may be 1/4 to 3/8 in. (6 to 9 mm).

When checking the cross slope of a sidewalk form, place a level across the rear of the main form. Raise the lower end of the level until it is plumb. Measure the distance between the level and the top of the form. If the amount of slope is incorrect, adjust the slope setting on the machine until the desired amount of slope is attained.



Check grade elevation

⚠ DANGER! ⚠

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Hold a level, plumbed horizontally, above or below the guideline and extended over the trimmed grade. Measure from the guideline side of the level down to the trimmed grade directly below the reference point (top of back of curb, gutter line, etc.). If the measurement is incorrect, adjust both grade sensors equally as required. Moving the sensors up, lowers the grade and moving the sensors down raises the grade. One turn of the grade jack crank changes the grade approximately 1/8 in. (3 mm). After a grade adjustment has been made, move the machine forward 20 to 30 ft. (6 to 9 m) and recheck the grade. Readjust as necessary.

Note: If the grade must be lowered, it will be necessary to have the machine moving forward slowly.

When adjusting the grade for pouring against an existing roadway, raise or lower the machine until the edge of the slipform is even with the roadway.

If the product is being poured on a smooth surface (no trimmerhead), such as concrete or asphalt, the grade is normally adjusted so that the bottom of the form clears any high spots in the grade by at least 1/8 in. (3 mm). Adjust the grade sensors up or down as necessary. Be certain that the bottom of the form is parallel to the machine frame when changing grade.



Check offset of form

⚠ DANGER! ⚠

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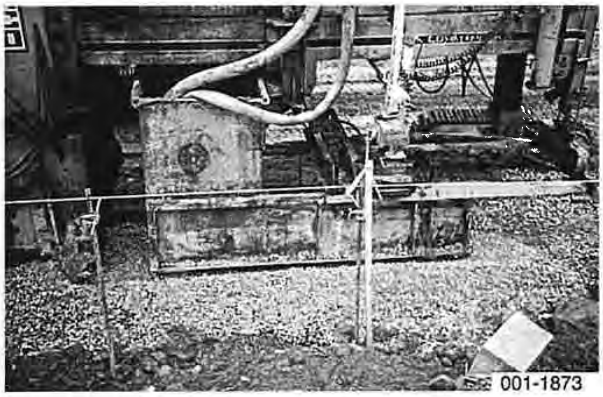
Set a level, plumbed vertically, against the guideline, in line with the machine drawbar. Measure the distance between the guideline side of the level and the reference point (top of back of curb, gutter line, etc.) on the slipform mold. This measurement should be the required offset distance. If not, adjust the front and rear steering sensors evenly as necessary. Moving the sensors towards the guideline, increases the distance between the line and the form. Moving the sensors away from the guideline, decreases the distance between the form and line. After each

adjustment, move the machine forward 20 to 30 ft. (6 to 9 m) and recheck the offset.

Note: Make certain the form is parallel to the guideline before checking the offset.

When adjusting the offset for pouring against an existing roadway, adjust the steering until the lip on the edge of the form (if so equipped) is approximately 1/8 in. (3 mm) from the roadway edge.

15 Pouring Operations



Back machine to start of pour

After the machine has been set to line and grade, it will be necessary to move it back to the start of the job.

Method 1: Place the front and rear grade control circuits in the "manual" mode and the hold-down control switch in the center (neutral) position. Using the jog switches on the front and rear grade control circuits, raise the machine high enough so the trimmerhead and slipform mold will clear all obstacles.

Method 2: Leave the grade control circuits in "auto" and retract the trimmer lift, drawbar and hold down cylinders using the corresponding control switches to clear any obstacles.

Note: Method 2 cannot be used if turnbuckles are used to support a drawbar extension.

Place the travel directional control switch in the "reverse" position. Place the travel/neutral switch in the "travel" position and rotate the travel variable speed knob to begin moving the machine to the start of the pour. While moving the machine when using method 1, raise or lower the front and/or rear of the machine as necessary to prevent the steering wands from coming off of the guideline, or to prevent the trimmerhead or the form from striking an obstacle.

GOMACO Tip: Loosen the setscrew in the steering sensor square tube mount and lower the steering sensor. The machine can then be raised higher for backing to the start of the pour. Mark the tube location before lowering it so it can be returned to the same position.

Note: It may be necessary to manually steer the machine to the start of the pour, when pouring scab on.

⚠ DANGER! ⚠

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Back the machine approximately 15 to 20 ft. (4.6 to 6 m) beyond the starting point of the pour, if possible and stop the machine.

Method 1: Place the travel forward/reverse switch in the "forward" position. Using the jog switches on the front and rear grade control circuits, lower the machine until the trimmerhead and slipform mold are resting on the grade. Move the trimmerhead control switch to the "forward" position. Place the grade sensor wands under the guideline and the steering sensor wands (if necessary) on the machine side of the line. Place the steering control circuits in "automatic". Notice the position of the deviation indicators on the front and rear grade control circuits. If either, or both, of the indicators are centered, or an arrow above center is indicated, place the corresponding grade control circuit in "automatic". If either, or both, of the indicators indicate an arrow below center, start the machine slowly moving forward. Using the front grade jog switch, lower the front of the machine slowly until the deviation indicator centers, or goes above center. Place the front grade control circuit in "automatic". Using the rear grade jog switch, lower the rear of the machine slowly until the deviation indicator centers or goes above center. Place the rear grade control circuit in "automatic".

Method 2: Place the travel forward/reverse switch in the "forward" position. Move the trimmerhead control switch to the "forward" position. Using the trimmer lift, drawbar and hold down switches; lower the machine until the trimmerhead and slipform mold are resting on the grade. Rotate the travel variable speed knob to begin moving the machine slowly forward. Using the trimmer lift switches, gradually lower the trimmer into the grade. When the trimmer lift cylinders are down to the limit bolt stops, continue in the same manner with the drawbar and hold down cylinders until the slipform mold is resting on the trimmed grade.

Move the machine forward until the starting point of the pour is lined up with a point approximately 2 ft. (600 mm) to the rear of the slipform mold hopper. Using the hold-down control switch, adjust the rear of the slipform mold up or down, until the bottom of it is parallel to the guideline. Pivot the rear of the form right or left so the side of it is parallel to the guideline.



Rear of form against existing product

If the pour is to start from an existing product, it will first be necessary to be certain that the grade at the end of the existing product is correct. The grade at the end of the existing product to a point at least 10 ft. (3 m) beyond the end must be at least on grade to 1/2 in. (13 mm) low. Back the machine to the start of the pour, as previously described, until the rear of the slipform mold is against the existing curb and gutter.

Note: The slipform mold will not fit over the product that was poured with it at a previous time. Concrete slump causes the product to expand wider than the slipform profile.

⚠ CAUTION! ⚠

DO NOT PLACE FORM OIL ON THE OPERATORS PLATFORM, OR THE BOARDING LADDER, AS IT MAY CAUSE THEM TO BECOME VERY SLIPPERY. INJURY MAY RESULT IF SLIPPAGE OCCURS.

It is advised to coat the inside and outside of the form and the machine frame below the conveyor with form oil. The conveyor frame, receiving hopper and the discharging hopper should also be coated. Avoid placing oil on the inside surface of the belt as it could cause slippage.

GOMACO Tip: Place plastic or burlap over the machine frame directly below the conveyor to aid in clean up at the end of the day.

A minimum of 30 minutes prior to arrival of concrete on the jog site, the operator should test all controls and accessories on the machine for proper operation. This procedure should be repeated daily to allow enough time for replacement or repair of a defective component should it become necessary.

⚠ WARNING! ⚠

KEEP HANDS, FEET AND CLOTHING AWAY FROM MOVING CONVEYOR BELT AND ROLLERS. BE CERTAIN THAT NO ONE IS NEAR THE CONVEYOR BEFORE STARTING IT. SERIOUS INJURY OR DEATH MAY RESULT IF ENTANGLED. DO NOT STAND BEHIND THE CONCRETE SUPPLY TRUCK WHEN IT IS BACKING INTO POSITION. SERIOUS INJURY OR DEATH MAY OCCUR IF STRUCK BY THE MOVING TRUCK.

Move the conveyor forward/neutral/reverse switch in the "forward" position and rotate the conveyor variable speed control knob clockwise to begin turning the conveyor. Place the appropriate vibrator off/auto switch in the "auto" position. Rotate each vibrator variable control valve, that has a vibrator attached, counterclockwise to the maximum position. Discharge concrete onto the conveyor belt from the supply truck. Fill the hopper of the slipform mold at least three fourths full. Rotate the travel variable speed knob "clockwise" just enough to start the operation of the vibrators without moving the machine. Allow the vibrators to force the concrete back into the form, until they can force no more into it. Keep the slipform hopper at least three fourths full by starting and stopping the conveyor as necessary.

GOMACO Tip: By spraying the underside of the form and the grade with water, before dumping concrete into the form, it may be possible to fill the form more fully. It may also help to spray a small amount of water onto the first small amount of concrete in the hopper to help it slip into the form more easily.



Adjust hold-down pressure

⚠ DANGER! ⚠

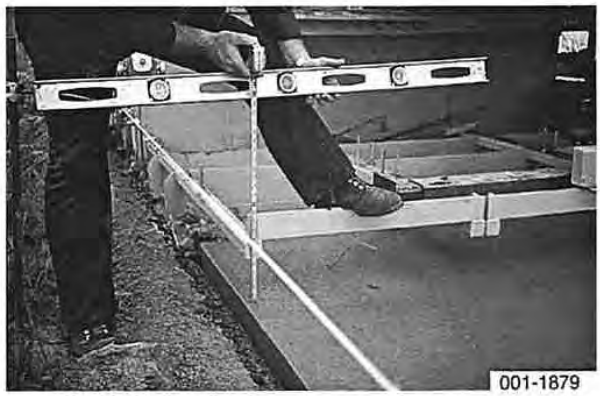
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When the form is completely full, place the trimmer control switch in the "forward" position. Rotate the travel variable speed control knob clockwise to start the machine forward movement. As soon as the concrete begins to slip from the rear of the form, move the hold-down control switch to the "down" position. Adjust the hold-down pressure, by turning the hold-down pressure control valve clockwise to increase pressure, or counterclockwise to decrease pressure, to hold the form in firm contact with the concrete. If the hold-down pressure is too high, the top surfaces will appear to "puff up" as the concrete slips from under the form. If the hold-down pressure is too low, the stainless trowel section will appear to "leave" the concrete, causing the top surfaces to appear streaked. Adjust the travel speed and vibration as required.



Check cross slope of product

After pouring 15 to 20 ft. (4.6 to 6 m) check the finished product for proper slope, line and grade. If adjustments are needed, make them in small increments over a great distance. For example, if the grade requires a change of 1/4 in. (6 mm), adjust it 1/8 in. (3 mm) every 5 ft. (1.5 m) or more. To check the cross slope, place a level in the gutter section, or across the surface of a sidewalk and raise the lower end until the level is plumb. Measure from the bottom of the level to the top surface of the concrete. Adjust the slope setting of the machine as necessary.



Check grade of product

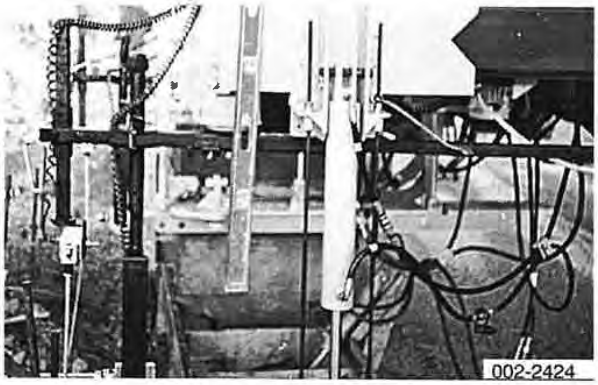
To check the grade, place a level above, or below the guideline and plumb it out over the edge of the finished product. Measure from the guideline side of the level down to the reference point on the concrete (top of back of curb, flow line, etc.). Adjust the front and rear grade sensors, up or down, evenly to get the proper measurement. If the grade must be raised, lower the sensors. If the grade must be lowered, raise the sensors.

Note: When checking the grade to the top back of the curb, be certain that the curb has not slumped down too far by measuring the back side of the curb for the correct measurement.



Check offset of product

To check the offset, plumb the level vertically along the side of the line. Measure the distance between the guideline side of the level and the concrete reference point (top back of curb, flow line, etc.). Adjust the front and rear steering sensors evenly, right or left as necessary. If the concrete line must be moved away from the guideline, move the sensors towards the guideline. If the concrete line must move closer to the guideline, move the sensors away from the guideline.



Adjust hold-down limiters

Adjust the hold-down limiting bolts to carry the rear of the slipform mold, should any low grade be encountered. With concrete under the slipform mold, turn the adjustment nuts until they just contact the support plate. Lock the adjustment nuts in place with the locking nuts.

Note: Loosen adjustment nuts to be certain form is in firm contact with the concrete, before making adjustments.



Good product

Production rate (or travel speed) is determined by many factors, of which a few are:

1. Delivery rate of the concrete mix. If the concrete mix cannot be readily discharged from the supply truck, the production rate will be lowered. The size of the slipform mold will have a direct affect on how far each load of concrete will go.

2. Amount of pressure required to turn the trimmerhead. A narrow width trimmerhead, trimming a small amount of material, will operate at low pressure, allowing for higher production rate. A wide trimmerhead, trimming a large amount of material, will operate at high pressure, reducing the production rate. Ideally the subgrade to be trimmed during pouring operations should be 1/2 to 1 in. (13 to 25 mm) high.

3. How wet or dry the concrete mix is (slump). With high slump (wet) concrete, the travel speed can be increased, which in turn will increase the production rate. With low slump (dry) concrete, the travel speed must be decreased, which in turn will decrease the production rate. The recommended concrete slump, for curb and gutter or sidewalk, is 1 1/2 to 2 in. (38 to 50 mm).

4. Amount of hand work to be done behind the machine. If pouring a curb which requires the cutting of many driveway openings, it is important that the machine not get too far ahead. If the machine were to get too far ahead, it would allow the concrete to begin to set, making the cutting of each driveway opening progressively more difficult.

Concrete Problems



Wet concrete

When the concrete mix becomes too wet (high slump), it may be necessary to increase travel speed and/or decrease vibration to avoid a "puffy" surface. If the concrete is extremely wet, the edges or curb may slump excessively, or even fall over. The solution would then be to get the concrete mix drier, or refuse to accept it.



Dry concrete

When the concrete mix becomes too dry (low slump), it may be necessary to decrease travel speed and/or increase vibration to eliminate "voids" in the concrete surface. If the concrete is extremely dry, large "voids" may appear in the surface, or the concrete may pull apart completely. The solution would then be to add water to the concrete mix, or if necessary, refuse to accept it.



Hump caused by running vibrators

During paving operations, it occasionally becomes necessary to stop and start the machine travel. When stopping, rapidly move the travel variable speed knob "counterclockwise" to the detent off position. This causes the vibrators to stop at the same instant as the machine travel ceases. When starting the machine travel, rapidly move the travel variable speed knob arrow "clockwise" to the 25% position or above. This will start the vibrators at the same instant as the machine travel begins. After the machine is moving, adjust the travel speed as necessary.



Hump caused by bumping line

During pouring operations, it is important that nothing, or no one, comes in contact with the guideline. Be certain there is no debris against the guideline which could become entangled in the sensor wands. Be certain that persons working around the machine do not come in contact with the line.



Trimming excessive grade

⚠ DANGER! ⚠

IF THE TRIMMER WHEEL IS FULL OF MATERIAL THAT MUST BE CLEARED BY HAND OR MATERIAL MUST BE REMOVED FROM THE SUBGRADE, THE TRIMMERWHEEL MUST BE STOPPED AND THE ENGINE MUST BE SHUT OFF BEFORE CLEARING THE MATERIAL OR SERIOUS INJURY, OR DEATH, CAN RESULT. FOR ADDITIONAL SAFETY, REMOVE THE KEY FROM THE IGNITION SWITCH. BE CERTAIN THAT PERSONNEL ARE CLEAR OF THE TRIMMERWHEEL BEFORE STARTING THE ENGINE. KEEP HANDS, FEET AND LOOSE CLOTHING CLEAR OF TRIMMER WHEEL WHILE IN OPERATION.

During trimming and pouring operations, it is normally recommended to trim no more than 1 to 1 1/2 in. (25 to 38 mm). If more than 2 in. (50 mm) of material must be removed, it is best to remove it with a motorized blade or scraper. If an attempt is made to remove an excessive amount of material with the trimmerhead, it could cause frequent stalling of the trimmerhead drive system. This would reduce the production rate. Also, if the rear track is running on the windrow created by excessive trimming, it could cause a build up in the track, which could result in track damage. The leg may also bottom out while running on the windrow created by excessive trimming, causing loss of grade control.

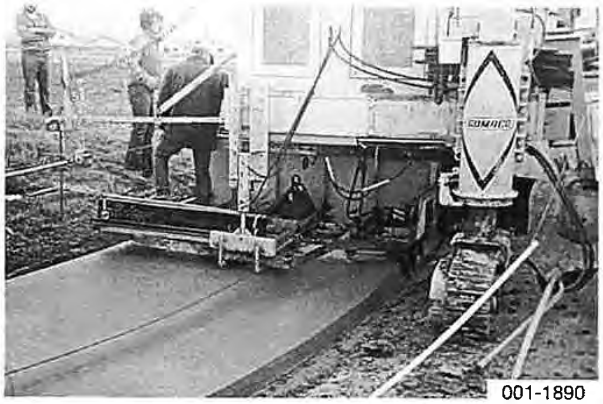
Note: If a motorized blade or scraper is not available, the grade can be pre-trimmed by raising the machine 1 in. (25 mm). After the grade is pre-trimmed, back the machine to the start of the pour, lower it the 1 in. (25 mm) and begin pouring operations. The windrow from pre-trimming should be removed in some manner.



Low grade boil out

When low spots are present in the subgrade, it is advised to fill them with fill material prior to pouring operations. Enough fill should be added so that when it is compacted, the grade is 1/2 to 1 in. (13 to 25 mm) high. Low areas can also cause the top line of the finished product to sag, especially if the hold-down limiters are not used. It is recommended to spot check the entire job for high and low grade spots.

Pouring on low grade can cause severe loss of concrete yield. For example, with the grade 1/2 in. (12 mm) low over a width of 3 ft. (0.91 m), an additional cu. yd. (0.718 m^3) would be required for every 216 ft. (65.8 m) poured.



Steering form around radius

When pouring around a radius with a 5 ft. (1.5 m) wide, or wider form, remove the outside pin from the form drawbar. As the machine travels around the radius, the form will pivot. As the machine exits the radius, the form should return to straight ahead. Install the removed pin when the holes are aligned.



Connect the form steering control remote

If the machine is equipped with the form steering system, use it to steer the form left or right as necessary. Remove the outside pin from the form drawbar. When the radius is to the left, intermittently press and release the "left" button on the steering controller, keeping the vertical portion of the stainless trowel section against the vertical face on the right side of the finished product. When the radius is to the right, intermittently press and release the "right" button on the steering controller, keeping the vertical portion of the stainless trowel section against the vertical faces on the left side of the finished product. When exiting a radius, operate the steering controller as for a radius of the opposite direction, until the form is straight ahead and the pin can be reinserted.



Depress sidewalk

⚠ DANGER! ⚠

BE CERTAIN TO STOP THE TRIMMERWHEEL AND SHUT OFF THE ENGINE BEFORE REMOVING MATERIAL FROM IN FRONT OF THE TRIMMERHEAD. SERIOUS INJURY OR DEATH CAN RESULT IF ENTANGLED IN TRIMMERWHEEL. FOR ADDITIONAL SAFETY, REMOVE THE KEY FROM THE IGNITION SWITCH. BE CERTAIN THAT PERSONNEL ARE CLEAR OF THE TRIMMERWHEEL BEFORE STARTING THE ENGINE. KEEP HANDS, FEET AND LOOSE CLOTHING CLEAR OF TRIMMER WHEEL WHILE IN OPERATION.

When necessary to depress a driveway into the sidewalk portion of a monolithic curb, gutter and sidewalk pour, the subgrade in the driveway must be undercut. When the trimmerhead reaches the driveway area, the trimmerwheel must be stopped and the excess material removed from in front of it before continuing.

When the leading edge of the depressor gets to the start of the driveway, activate the control switch to start the depression. If the rear shift switch is used, slowly jog the switch in the lower position to gradually depress the sidewalk. If the hold over switch is used (connect depressor cylinder directly to hold over solenoid valve bypassing the pressure control), slowly jog the switch in the lower position to gradually depress the sidewalk. After the machine has moved through the driveway area, jog the appropriate control switch to start retracting the depressor when the front of the slipform hopper is at the end of the driveway.

Note: If the machine must be stopped before the depressor is fully depressed or retracted, it is advised to place the control switch in neutral (center). When retracting the depressor, it may be necessary to move the control switch intermittently between neutral (center) and retract, to regulate the retraction speed.



Curb drop form

Occasionally, it becomes necessary to install a driveway opening in the curb. If attached, insert the curb cutout blade using the rear shift switch at the beginning of the driveway opening and retract the blade at the end of the driveway opening. Place adequate forms of the proper height behind the curb and stake securely. Place a form of the proper height in the gutter section and remove the top of the curb (if no blade is attached).

After the top of the curb has been removed, finish the concrete to produce a smooth transition from the full curb to the cut curb.



Moving sensors past obstacles

Occasionally obstacles are situated between the guideline and the finished product. It will be necessary to swing the sensor arms, or remove them to clear the obstacles. When the front sensors get to the obstacle, stop the machine. Place the front grade control circuit and the front steer control circuit in the "manual" position. Mark the position of the sensor pivot mount on the frame mount and swing the sensor arm back out of the way. If the sensor arm cannot be swung out of the way, it may be necessary to remove the arm. Mark the sensor arm position in the pivot mount and loosen the setscrews. Disconnect the sensor plugs at the bulkhead connectors and remove the sensor arm.

⚠ DANGER! ⚠

CONTACT WITH MOVING TRACKS, TRIMMERWHEEL OR CONVEYOR CAN CAUSE SERIOUS INJURY OR DEATH. BE CERTAIN THAT NO ONE IS NEAR THE TRIMMERWHEEL OR CONVEYOR BEFORE ENGAGING THE CONTROL SWITCH. BE CERTAIN THAT NO ONE IS NEAR THE TRACKS BEFORE MOVING THE MACHINE. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS TO PREVENT SEVERE PERSONAL INJURY.

Move the machine forward until the obstacle is past the sensor mount. Swing the assembly back into position until the marks are aligned, or slide the sensor arm back into the mount until the mark is aligned. Reconnect the sensors. Place the grade wand under the line and the steering wand on the machine side of the line. Place the front steer and the front grade control circuits in "automatic". Continue to pour forward until the rear sensors are to the obstacle. Repeat the procedures for the rear sensors.

Ending the Pour



Ending pour

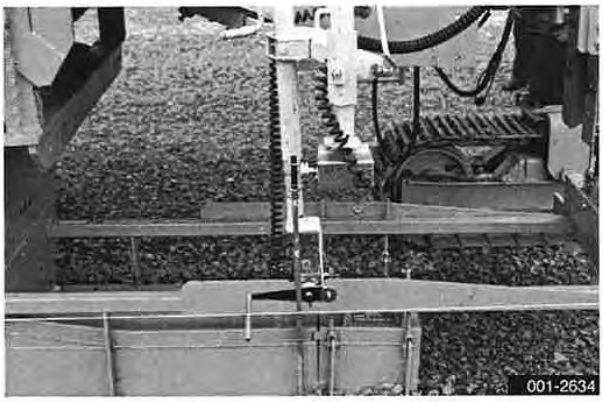
If the end of the pour is up against an existing curb and gutter or sidewalk, stop the machine forward motion when the front of the trimmerhead, is up against the end of the existing product. Place the trimmerhead control switch in the "neutral" position. Use the trimmerhead lift switches to raise the trimmerhead and sideshift the trimmerhead if necessary to avoid the obstacle. Move the machine forward until the front of the slipform mold hopper is against the existing product and stop the machine forward motion. Use the drawbar and hold-down lift switches to evenly raise the slipform mold above the concrete. Rotate the conveyor variable speed knob to the "off" position. Place the vibrator off/auto switch in

the "off" position. Place the grade control system in "standby" and the manual steer select switch in one of the manual steer positions. Raise the machine using the all jog switch and move the machine to an area where it can be cleaned.

⚠ DANGER! ⚠

CONTACT WITH MOVING TRACKS, TRIMMERWHEEL OR CONVEYOR CAN CAUSE SERIOUS INJURY OR DEATH. BE CERTAIN THAT NO ONE IS NEAR THE TRIMMERWHEEL OR CONVEYOR BEFORE ENGAGING THE CONTROL SWITCH. BE CERTAIN THAT NO ONE IS NEAR THE TRACKS BEFORE MOVING THE MACHINE. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS TO PREVENT SEVERE PERSONAL INJURY.

If the pour is to be stopped in an open area, it is advised to trim forward an additional 20 to 30 ft. (6 to 9 m) past the stopping point. By doing this, when the pour is continued, the subgrade is already trimmed for the machine setup. To continue trimming past the end of the pour, stop the conveyor and vibrators. Continue to trim forward the desired amount. When the desired amount has been trimmed, raise the machine and move it to an area to be cleaned as previously described.



Mark sensor location

The sensors should be removed before washing the machine. It is advised to mark the sensor location on the mounts prior to their removal. This will speed setup time if the pour is to be continued at a later date. Be certain to place protective dust caps over the electrical plugs to keep moisture and dirt out.

Cleaning Operations



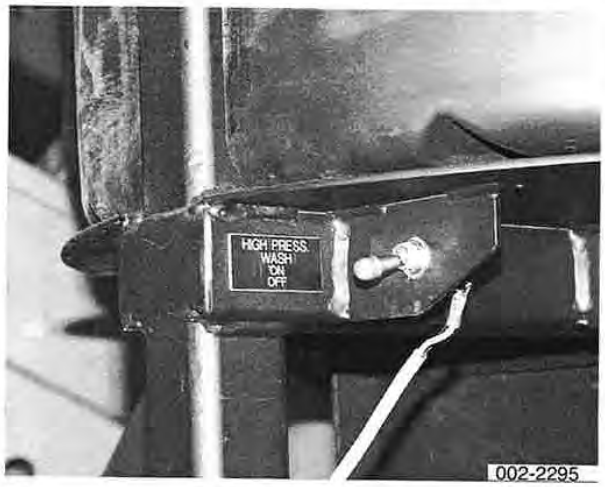
Clean machine

The machine should be cleaned as soon as possible after pouring operations have ended. It is advised to fill the water tank on the machine (if so equipped) at the start of the pour, so water for cleaning purposes is available at the end of the pour. Turn and remove the lid to fill the water tank.

⚠ WARNING! ⚠

CONTACT WITH A MOVING CONVEYOR BELT AND ROLLERS, OR A MOVING AUGER, CAN CAUSE SERIOUS INJURY. BE CERTAIN THAT THE CONVEYOR, OR AUGER, AREA IS CLEAR BEFORE STARTING THE ENGINE. DO NOT STAND ON THE CONVEYOR OR IN THE SLIPFORM MOLD HOPPER AREA DURING CLEANING OPERATIONS. DO NOT OPERATE THE CONVEYOR OR THE AUGER WHEN WASHING THE MACHINE.

Uncoil the hose from the hose hanger and wash the concrete off of the machine. It is recommended that the bottom of the form be washed first. Clean the bottom of the form thoroughly, as any concrete left to dry on the bottom will affect the final concrete finish when the pour is resumed. When washing the conveyor belt, stop the belt travel and wash the side that is visible. After the belt is clean on one side, rotate the belt enough to expose the opposite side and stop it before cleaning it. When washing the auger in the slipform mold, stop the auger and wash the side that is visible. After the auger is clean on one side, rotate the auger enough to expose the opposite side and stop it before cleaning it.



High pressure wash switch

⚠ WARNING! ⚠

THE HIGH PRESSURE WASH SYSTEM USES HIGH PRESSURE WATER. DO NOT AIM THE NOZZLE AT ANY PART OF THE BODY, AS SERIOUS INJURY CAN OCCUR. WEAR PROPER EYE PROTECTION WHEN CLEANING THE MACHINE.

If the machine is equipped with the optional high pressure wash system, uncoil the hose from the hanger. Place the high pressure wash switch in the "on" position and decrease engine speed to 1500 rpm. Direct the nozzle on the hose at the concrete and pull the trigger. Be certain that the water tank has water in it, and do not allow the pump to run without water, as severe damage to the pump could result.

⚠ WARNING! ⚠

THE REAR TRACK (WHEN IN 3-TRACK MODE) MUST BE KEPT AS FAR TO THE LEFT AS POSSIBLE TO PROVIDE THE MOST STABILITY DURING LOADING OR UNLOADING. THE MACHINE SHOULD ALSO BE DISASSEMBLED TO THE NORMAL TRANSPORT WIDTH WHETHER IN 3-TRACK OR 4-TRACK CONFIGURATIONS.

16 Daily Operation Check List

1. Check engine crankcase oil level.
2. Check engine coolant level.
3. Check hydraulic oil level. (ref. maintenance chapter)
4. Start Engine. Depress E-stop reset switch. Warmup engine at 1500 rpm for 15 minutes.
5. Check engine and hydraulic gauges for proper operating levels.
6. While the engine is warming up, extend the sensor arms to the previously marked positions (if using the same slipform mold from the previous pour). Adjustment may be necessary when changing slipform molds. Tighten securely.
7. Attach the stringline sensors to the sensor arms and connect the sensor cables to the machine. Adjustment of the sensor jacks may be necessary when changing slipform molds. Make certain the sensors are sending signals to the controller.
8. Extend the right front leg shift for stability. Check the wear pads on the right front leg shift for proper adjustment. Adjust the left front leg shift if necessary for stability.
9. Extend the trimmerhead and slipform mold to the previous positions (if using the same slipform mold from the previous pour). Check the wear pads on the mold sideshift for proper adjustment. Additional adjustments may be required when switching slipform molds.
10. Extend the rear leg shift for stability.
11. Place the slope control in automatic and adjust for proper slope in the slipform mold.
12. Move the machine to the guideline starting point. Lower the machine, place the sensors on the guideline and place the control system in automatic. Slowly trim forward until all sensor controls are centered.
13. Check and adjust as necessary for parallel between the machine frame and the guideline. Move the machine forward after each steering correction to realign the machine with the guideline. Recheck the measurements.
14. Check and adjust the steer and grade offset measurements. Move the machine forward after each steering correction to realign the machine with the guideline. Recheck the measurements.
15. Move the machine to the beginning of the pour.
16. Check the vibrators and conveyor for operation. Switch any defective components as necessary.
17. Apply a form release agent to the areas exposed to concrete for ease of cleaning at the end of the day. Do not apply the form release agent to the under side of the conveyor belt.
18. Fill the slipform mold with concrete and vibrate to the rear of the form. Operate the trimmerwheel and begin to move forward.
19. Check the measurements of the final product and make minor adjustments to correct the placement.
20. Wash the machine thoroughly at the end of the day. Do not operate the conveyor or trimmerwheel when washing the machine.
21. Lubricate the machine components as indicated in the Maintenance chapter.
22. If more than one slipform mold is required, make certain that the appropriate slipform molds will be located in the areas where the change will take place. For quick change, additional vibrators should already be mounted in the slipform molds.
23. Make certain that the appropriate slipform mold is attached to the machine for the following day and the trimmerwheel is a minimum of 6 inches (15 cm) wider than the largest slipform mold to be used.

CHAPTER IV Side Mounted Barrier Setup

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CHAPTER IV Side Mounted Barrier Setup

01 Content of Chapter

This chapter covers the instructions necessary for the preparation of the machine and slipform mold for pouring barrier wall on the left side of the machine. The instructions for mounting the attachments and pouring operations are also included. At the end of the chapter are instructions for cleaning the machine at the end of the pour. Some procedures pertain to machines that are being assembled for the first time, while others pertain to machines that may have been in service for some time. Disregard procedures that do not apply. All adjustments are recommended procedures only. **Pay particular attention to all safety statements!**

NOTICE



WARNING!
DO NOT OPERATE THIS EQUIPMENT UNTIL YOU HAVE READ AND THOROUGHLY UNDERSTAND THE OPERATORS MANUAL. FAILURE TO FOLLOW THIS PROCEDURE MAY RESULT IN INJURY OR DEATH.

DANGER!
DO NOT ALTER OR MODIFY THIS PRODUCT WITHOUT THE EXPRESS WRITTEN CONSENT OF THE MANUFACTURER.
UNAUTHORIZED MODIFICATION MAY RESULT IN SERIOUS INJURY OR DEATH.

DCAL-058

02 Form Preparation

Notice: The following information covers standard barrier and parapet molds. For more information on the setup and adjustment of variable barrier molds, refer to chapter 7. When attaching a variable barrier mold to a three track machine, a counterbalance weight on the right side of the machine may be required. A minimum of 500 lbs. (226 kg) up to 2000 lbs. (907 kg) should be added to the right side of the machine. Add weight as necessary depending upon the size and weight of the variable barrier mold

Adjusting Standard Sideplates



Adjust rear of sideplate

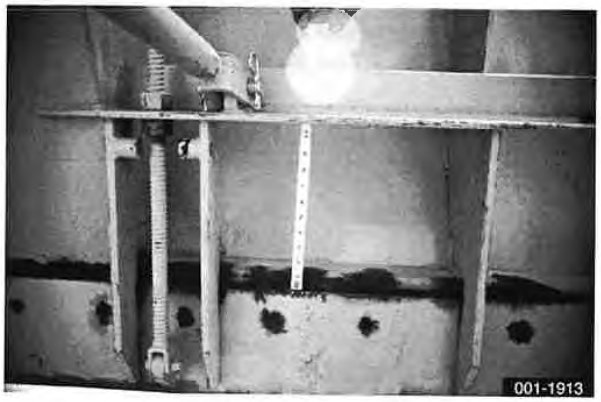
Adjust the rear of the sideplate on each side of the form to give the proper amount of exposed vertical surface. Measure from the angled transition bend line to the bottom of the sideplate. Adjust the sideplate up or down with the rear adjustment bolt. Lock the adjustment in place when the proper measurement is attained. Make the measurement in line with the adjustment bolt.

Note: Sideplate adjustment is normally easier with the form attached to the machine and raised off the ground.



Adjust rear of sideplate

If the back of the barrier form is a straight side (parapet), measure the amount of exposed sideplate below the main portion of the form on the front side, after it has been set for the proper amount of exposed surface. Adjust the sideplate on the back side of the form until the amount of exposed sideplate below the main portion of the form is the same as the front. Make the measurement in line with the adjustment bolt.



Adjust front of sideplate

Measure from the top of the sideplate to the bottom of the angle iron on the side of the form, in line with the rear adjustment bolt. Measure the distance from the top of the sideplate to the bottom of the angle iron on the side of the form, in line with the front adjustment bolt. Adjust the front of the sideplate until the measurement is the same as the rear.

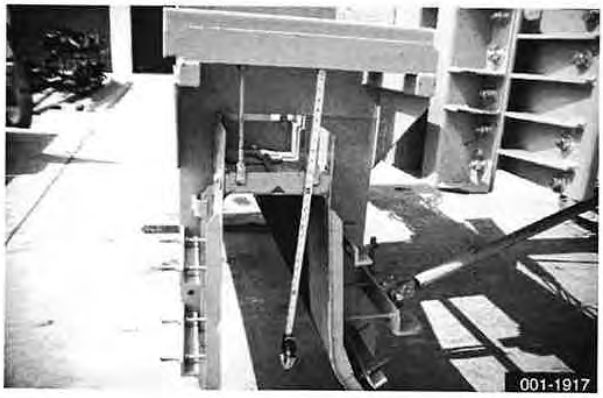
> **Note:** If sensored, or pressure compensated sideplates are installed on the form, refer to the Final Adjustment section (**section 08**) for adjustment procedures.

Adjusting Top Plate



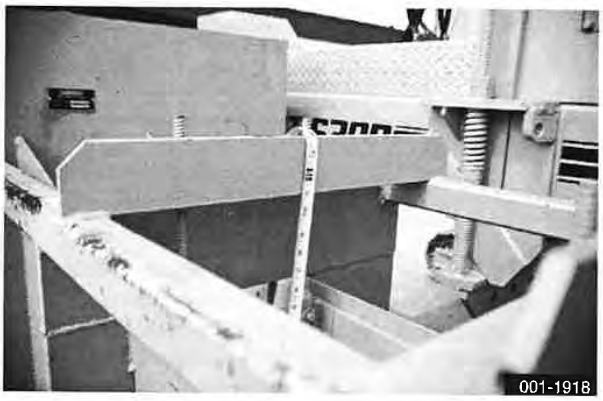
Measure height of wall

Place a straight edge, from side to side, below the bottom rear edge of the sideplates. Measure from the straight edge to the rear edge of the stainless top cap. This measurement should be the same as the required height of the wall, plus approximately 3/4 in. (20 mm) allowance for slump.



Adjust top of wall to proper slope

To adjust the top plate, loosen the attaching bolts on both sides of the form. Adjust the rear edge of the top plate up or down with the adjusting bolts until the wall is the correct height. Lock the nuts on the adjusting bolts securely. Place a straight edge across the two square tubes on the top of the form directly over the rear of the top plate. Measure from the straight edge down to the flat portion of the plate on each side. These two measurements should normally be even. If not, adjust one side or the other as necessary.

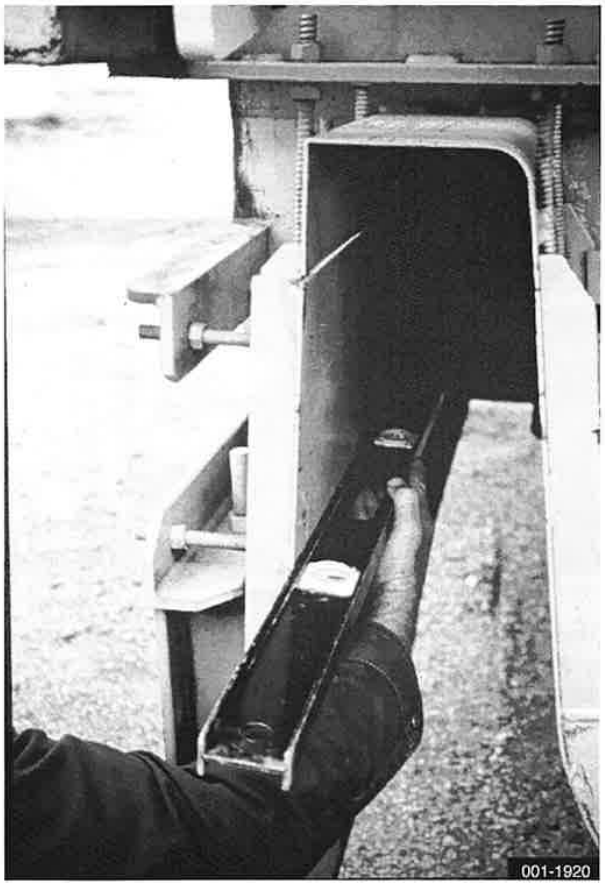


Adjust top at center

Note the measurement at the rear of the form between the straight edge and the top plate. Move the straight edge forward to the center set of adjusting bolts. Adjust the center of the top plate until it is approximately 1/4 in. (6 mm) above the rear of the plate. Move the straight edge forward to the front set of adjusting bolts. Adjust the front of the plate until it is approximately 1/2 in. (13 mm) above the rear of the plate. Tighten all of the adjusting nuts securely. Tighten the attaching bolts on both sides of the form securely.

Note: Some forms may be equipped with interchangeable throat plates that can be bolted into the throat opening. The plates allow the vertical opening of the throat to be narrowed from 6 in. (150 mm) maximum to 4 1/2 in. (114 mm) or 3 in. (76 mm). It is recommended to install the 3 in. (76 mm) throat plate in most applications.

Stainless Trowel Adjustment



Adjust side stainless

Adjust the stainless trowel section on each side of the slipform mold so the leading edge is approximately 1/8 in. (3 mm) outside of the rear edge of the main form. Make the adjustment at all adjustment points. Tighten the adjustment nuts securely.

Place a 4 ft. (1.2 m) straight edge from the rear of the stainless trowel section, up into the main form in line with one of the adjusting bolts. Adjust the rear of the stainless until there is a 1/8 in. (3 mm) gap between the rear edge of the main form and the straight edge. Tighten the adjustment nuts securely. Do the same at each set of adjustment bolts.

Vibrator Installation



Install vibrator in parapet wall base

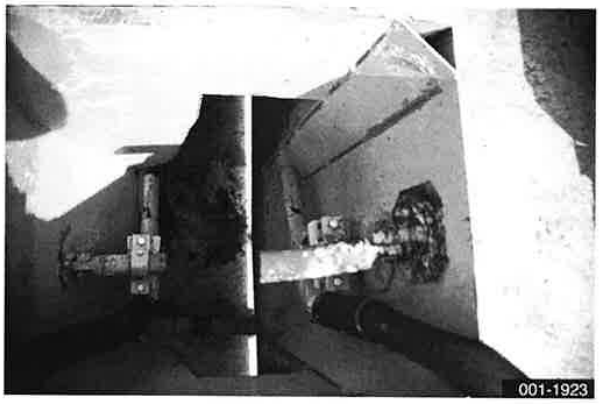
The first vibrator is installed in the underslung (horizontal) manner with the tip centered in the width of the wall base if pouring straight back (parapet) wall. Place the vibrator to one side if pouring over cage steel making certain that there is at least 1 in. (25 mm) of clearance.



Install vibrators in barrier wall base

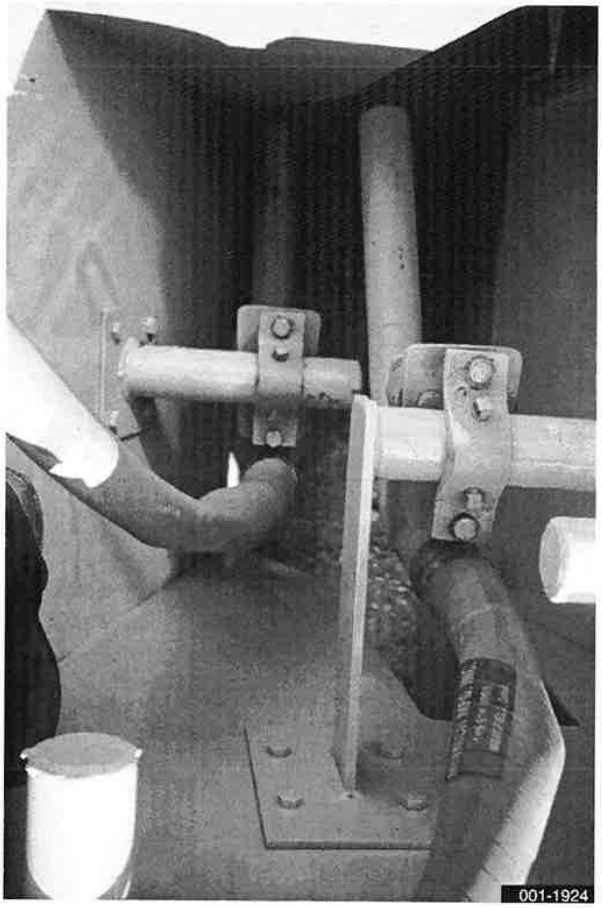
If the wall is of the standard design, a second vibrator can be installed in the right side of the form. The vibrator should be installed in the underslung (horizontal) manner. Place the vibrator to one side if pouring over cage steel making certain that there is at least 1 in. (25 mm) of clearance.

Position the left and right vibrators with their tips 6 to 8 in. (150 to 200 mm) in from their respective sides. The tips should be positioned 4 to 6 in. (100 to 150 mm) off the grade.



Install second vibrator

If the wall is of the straight back (parapet) design, the second vibrator is positioned in the underslung (horizontal) manner when pouring over cage steel. The vibrator should be positioned in the back of the wall, as low as possible and still clear the cage steel by 1 in. (25 mm).



Install third vibrator

The third vibrator is installed in the underslung (horizontal) manner when pouring over cage steel. The vibrator should be positioned to the right (machine side) of the center vertical portion of the wall. The vibrator should be mounted in a higher position in relation to the second vibrator. The vibrator should clear the steel by a minimum of 1 in. (25 mm). If no steel is being inserted into the wall, the vibrator can be installed with the tip pointing into the center of the vertical portion of the wall.

Note: Additional vibrators may be installed in a continuously higher staggered pattern depending upon the height of the wall to be poured and the number of available vibrator circuits.

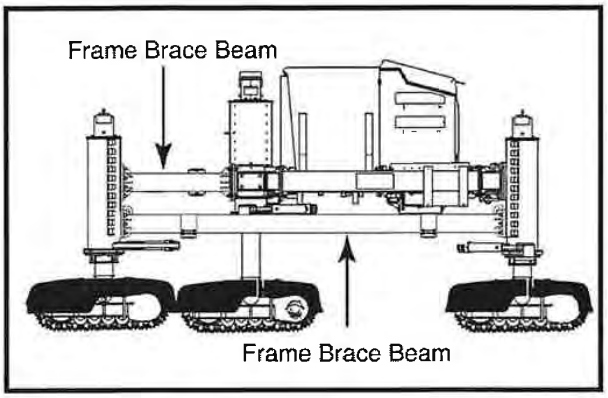


Install top vibrator

The top vibrator is installed in the overslung (vertical) manner with the tip tilted rearward slightly when pouring over cage steel. The vibrator should be centered in the throat opening of the wall top. Be certain that the tip will clear the steel by a minimum of 1 in. (25 mm). The top vibrator is installed in the same manner if no steel is being inserted. Tighten the mounting bolts and setscrews securely on all vibrators.

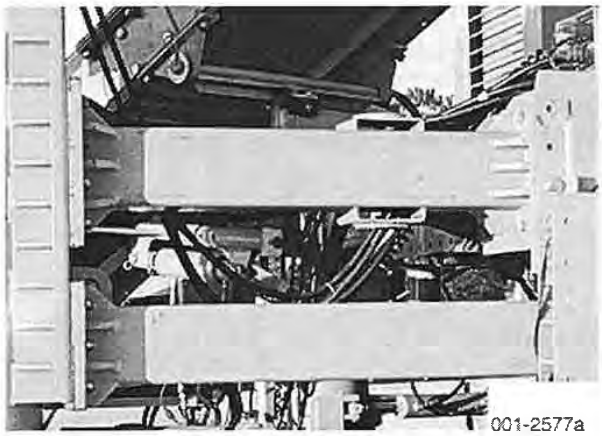
03 Positioning the Legs

Preparation of Machine Frame for a Variable Barrier Mold



Frame brace beams

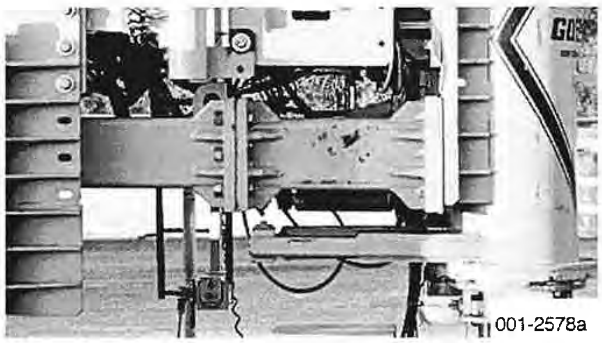
When attaching a variable barrier mold to the machine frame, it is required to remove the left front leg pivot mount and replace it with a solid beam. A second frame brace is attached between the left front leg mounting flange and the rear leg mounting flange. This procedure requires the repositioning of the left front leg and the rear leg to raise the machine frame higher on the leg mounting flanges. The trimmerhead and lift assembly, drawbar and hold down assemblies must be removed to allow attachment of the frame brace between the left front and rear leg flanges. Refer to section 4 of this chapter for additional information.



Replace pivot arm with solid frame brace beam

To accomplish this procedure it will be necessary to place adequate support blocking under the left front corner of the machine frame. Make certain that the machine frame is blocked high enough to allow mounting of the left front leg in the higher mounting position as shown in the previous drawing and photo. Lower the machine frame on to the blocking and fully retract the left front leg lift cylinder. The left front track should be completely raised in the air. Disconnect the hydraulic lines to the left front leg lift cylinder, steer cylinder and track drive motor. Cap or cover the fittings to prevent contamination. Remove the cover from the top of the left front leg and attach a suitable lifting device. Support the weight of the leg and remove the bolts attaching the leg to the pivot arm. Set the leg and track assembly aside temporarily.

Attach a suitable lifting device to the left front leg pivot arm. Remove the bolts attaching the pivot arm to the front of the machine frame. Set the pivot arm to the side and attach the lifting device to the short frame brace beam. Attach the frame brace beam, in place of the pivot arm, on the front of the machine frame. Reattach the left front leg to the frame brace beam as shown in the previous photo. Tighten the bolts securely and reattach the hydraulic lines to their appropriate connections. Thoroughly clean the hydraulic connections to prevent contamination from entering the hydraulic system.



Attach frame brace between legs

Change the vertical position of the rear leg as described in Chapter 3 and the lateral position as described in the following paragraphs. Position the rear leg in the same manner as the left front leg. Using a suitable lifting device, place the frame brace beam between the left front leg and the rear leg mounting flanges. Insert and tighten all bolts securely.

> **Note:** The previous photo shows an additional frame brace extension beam. This extension beam is only used on a stagger 4-track machine frame and is not required on a 3-track machine.

Vertical Positioning



Vertical leg position

⚠ WARNING! ⚠

WHEN ADJUSTING THE POSITION OF THE LEG, DO NOT GET UNDER THE MACHINE, OR THE LEG. DO NOT PLACE FINGERS IN HOLES TO CHECK FOR ALIGNMENT. SEVERE INJURY, OR AMPUTATION, COULD OCCUR IF THE LEG WERE TO MOVE OR FALL.

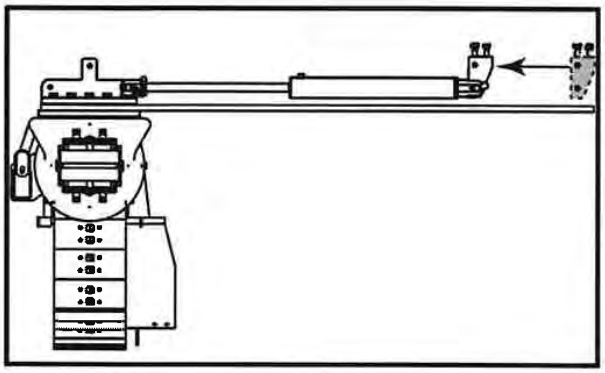
The vertical positioning of the track mounts will be determined by the height of the wall. Normally, for side mounted barrier wall, the track mounts are placed in the lowest position (position #1). Refer to the vertical leg positioning section of the standard Setup chapter for instructions for repositioning the track mounts vertically.

Lateral Positioning



Remove the hold down cylinder

The rear leg is normally positioned to the left side of the machine frame when pouring side mounted barrier for best stability. For this reason, it is necessary to remove the hold down cylinder from its' location to the left side of the rear leg. Disconnect the quick couplers and place the protective covers over/in the couplers to prevent dirt from entering the hydraulic system. Remove the bottom clamp bar and loosen the top clamp bar. Using a suitable lifting device, remove the hold down assembly.



Rear shift cylinder position for full left leg position

⚠ WARNING! ⚠

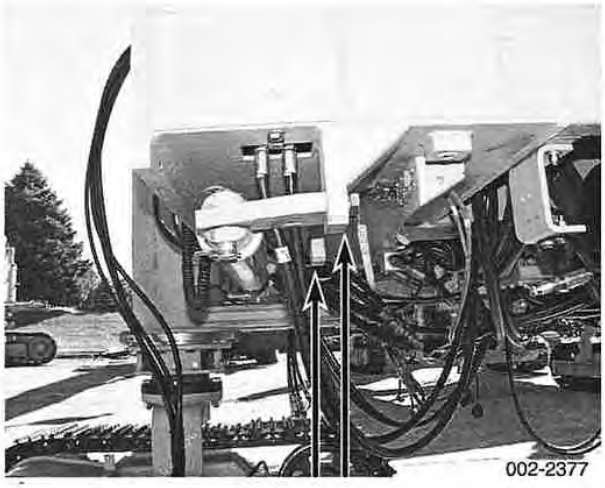
MAKE CERTAIN THAT THE MOLD SHIFT EXTENSION TUBES ARE FULLY RETRACTED INTO THE MACHINE FRAME. SEVERE DAMAGE AND PERSONAL INJURY CAN OCCUR IF THE REAR LEG IS SHIFTED OFF THE END OF THE MACHINE FRAME.

The rear leg assembly can be moved to the left side of the machine frame by repositioning the hydraulic shift cylinder connection on the rear sliding mount as shown in the previous drawing.



Lateral leg position

To change the connection, extend the rear shift cylinder to within 3 in. (76 mm) of being fully extended. Remove the pin from the rod end of the cylinder and retract the cylinder until the pin can be inserted in the right pin position on the rear sliding mount. Adjust the pin locations at either end of the cylinder so that the cylinder extends and retracts parallel to the rear of the machine frame. Extend the rear shift cylinder to within 3 in. (76 mm) of being fully extended.



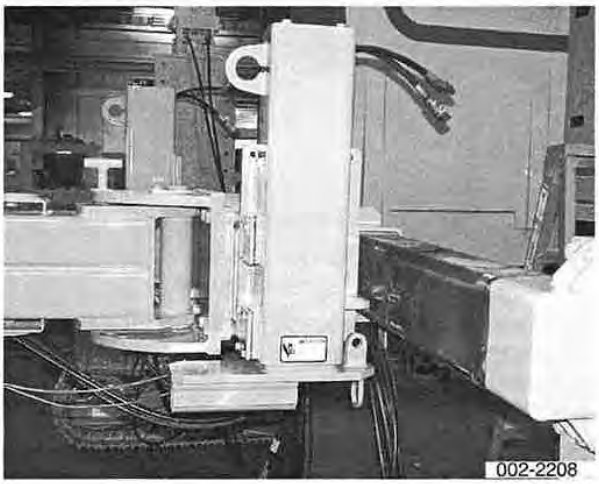
Attach the cylinder mount bracket

Remove the pin from the piston end of the cylinder. Retract the cylinder and move the beveled cylinder mount to the bracket located 18 inches (45 cm) closer to the center of the machine frame. Reattach the pin locations at either end of the cylinder so that the cylinder extends and retracts parallel to the rear of the machine frame.

04 Mounting the Slipform Mold

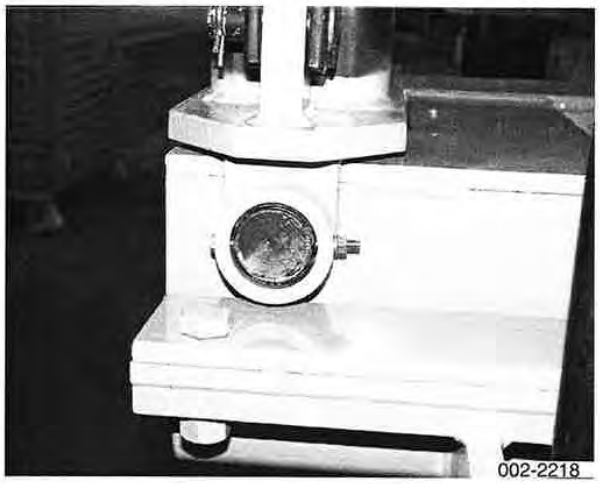
Remove trimmerhead and trimmer lift assemblies

When installing the side mounted barrier package it will be necessary to remove the trimmerhead and trimmer lift assembly.



Remove the trimmer lift assemblies

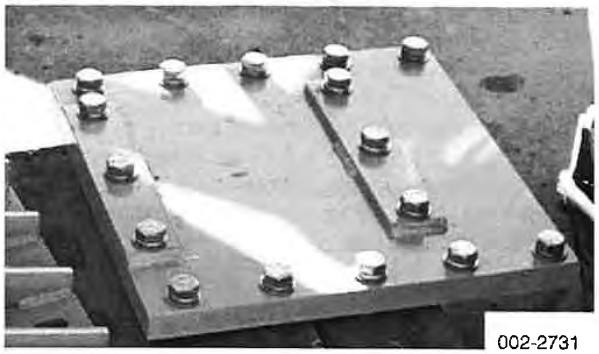
With the trimmerhead fully retracted under the machine frame, disconnect all hydraulic hoses from the trimmerhead and place the protective covers over/ in the quick couplers to prevent dirt from entering the hydraulic system. Place a cap over the case drain line fitting to prevent dirt from entering the hydraulic system. Lower each of the trimmer lift legs enough to allow easy removal of the retainer pins. Place blocking under the left front corner of the trimmerhead and under the right hand side of the trimmer mount assembly to support it during removal from the machine.



Remove the locking collar

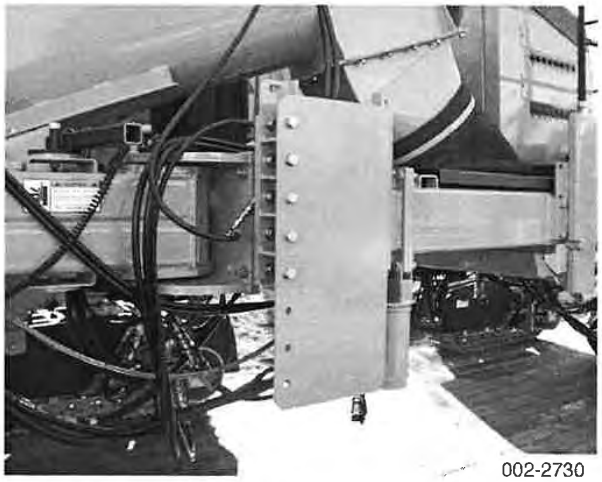
With the trimmerhead assembly adequately supported, remove the locking collar from each of the retaining pins and remove the pins. Raise the machine high enough to clear the trimmerhead assembly. Crab steer the machine and move the machine away from the trimmerhead assembly.

Installing Form Mounts



Install the front mount adapter plate

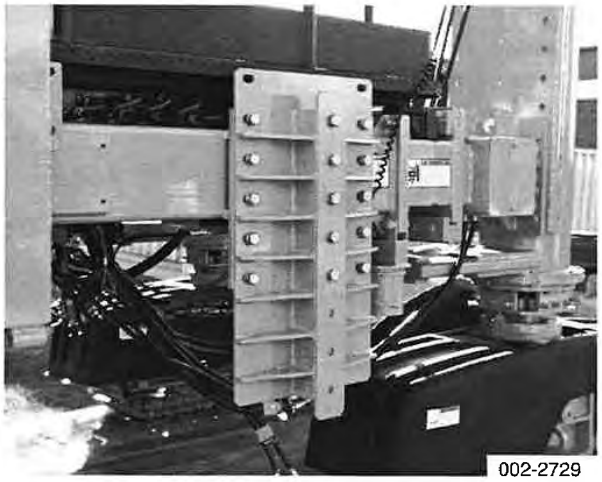
After removal of the trimmer lift assembly, an adapter plate must be attached in place on the left trimmer lift mount flanges. The welded mounting bars on the plate shown in the previous photo should face toward the machine frame. The welded mounting bar at the edge of the adapter plate should be at the bottom of the adapter plate when mounted to the machine frame. Tighten the six mounting bolts securely.



Install front form mounting plate

Install the front form mounting plate on the adapter plate as shown in the previous photo. The bottom holes in the front form mounting plate are normally aligned with the bottom holes of the mounts on the machine frame. Tighten the mounting bolts securely.

Note: A small amount of vertical adjustment with the extra hole in the form mounting bracket may be used if necessary.



Install rear form mounting plate

Install the rear form mounting plate to the mounts on the left rear side of the machine frame. The bottom holes in the rear form mounting plate are normally aligned with the bottom holes of the mounts on the machine frame. Tighten the mounting bolts securely.

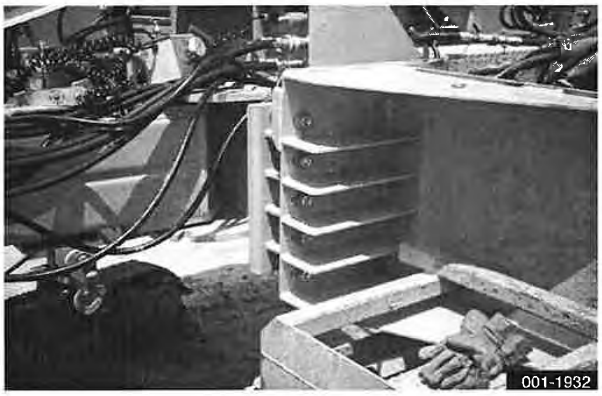
Note: A small amount of vertical adjustment with the extra hole in the form mounting bracket may be used if necessary.

Mounting the Form



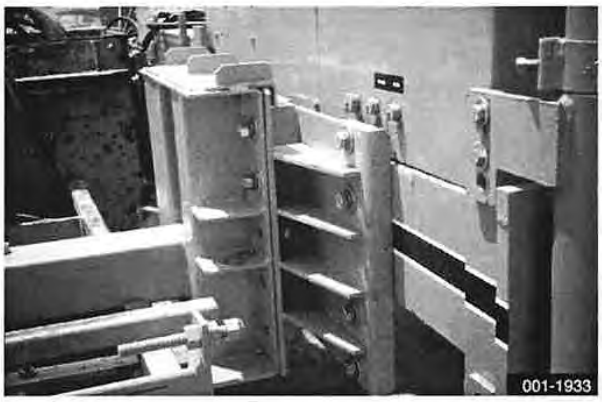
Mount form to machine

Place the slipform mold on a relatively flat spot. Coil the vibrator hoses and place them into the form hopper. Move the machine into position along side of the slipform mold. Raise or lower one side of the machine or the other so that the mounts on the machine are parallel to the mounts on the form. The top of the machine mounts should be slightly lower than the top of the form mounts.



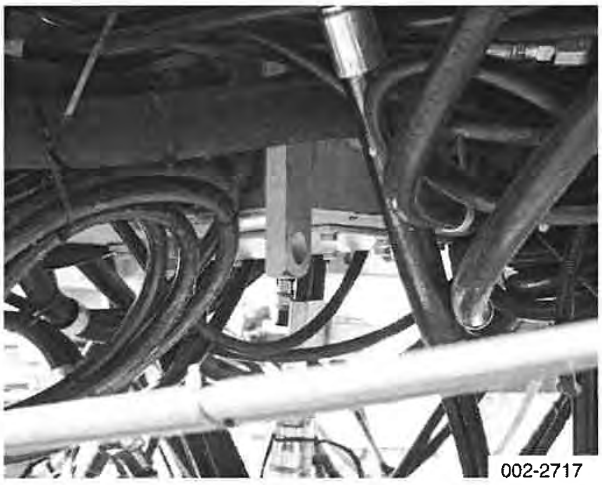
Insert bolts in front mount

Slowly drive the machine forward, making sure that the clip on the top of the form mount captures the machine mount. Install the bolts, flat washers, lock washers and nuts and tighten securely (flat washers go on slotted hole side) on the front mount.



Insert bolts in rear mount

Install the bolts, flat washers, lock washers and nuts on the rear mount and tighten securely (flat washers go on slotted hole side).



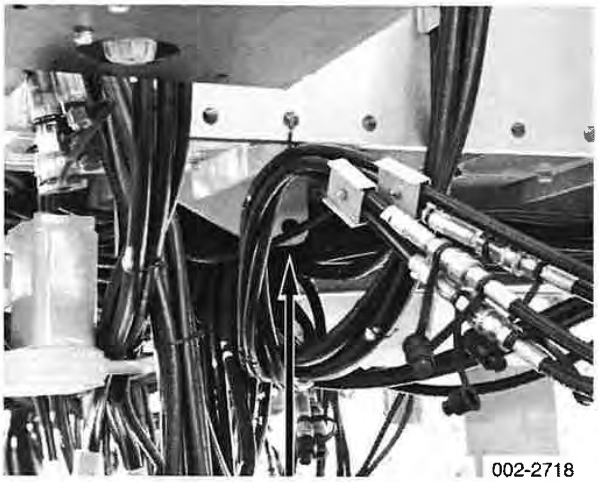
Rear turnbuckle mount



Install rear stabilizing turnbuckle

Install the rear stabilizing turnbuckle between the clip below the rear of the engine on the right side of the

frame and the clip on the rear of the form, near the bottom.

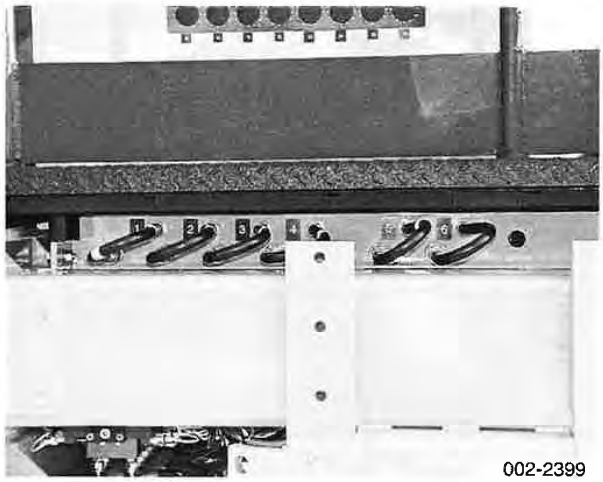


Front turnbuckle mount



Install front stabilizing turnbuckle

Install the front stabilizing turnbuckle between the clip below the front of the engine on the right side of the frame and the clip on the front of the form, near the bottom.



Connect vibrator quick couplers

Thoroughly clean the quick couplers on the vibrator drive hoses and the bulkhead quick couplers to prevent dirt from entering the hydraulic system. Connect the vibrator drive hoses to the vibrator outlet quick couplers. It is recommended that the vibrators be connected in a consecutive order beginning with number one at the top. Any vibrator outlet that does not have a vibrator attached to it, must have a loop hose connected.



Connect pressure compensated valves

Connect the sideplate hydraulic control valve hoses (if equipped) on the machine. The pressure and return hoses on the machine are located under the right side of the operators control console. Be sure to thoroughly clean the quick couplers to prevent dirt from entering the hydraulic system.

Notice: When removing the slipform mold, do not connect the hoses on the machine for the hydraulic sideplates together, or loss of lift pressure will result.

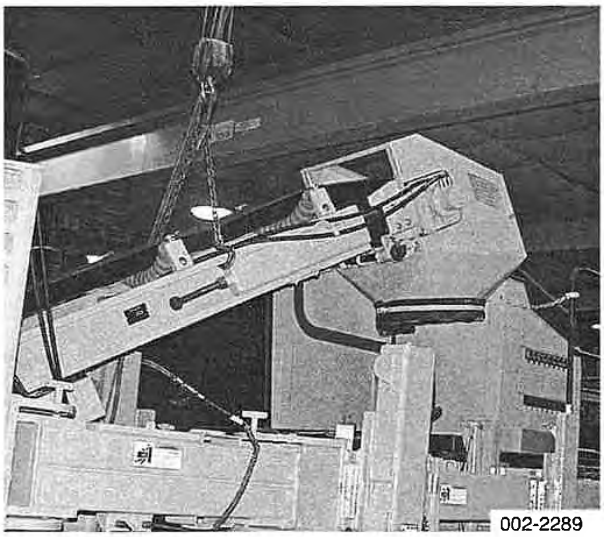
05 Preparing and Mounting the Conveyor

⚠ WARNING! ⚠

DO NOT GET BENEATH CONVEYOR DURING ASSEMBLY. IF THE CONVEYOR WERE TO FALL, SERIOUS INJURY CAN OCCUR.

When pouring barrier wall, it may be required that a 4 ft. (1.2 m) conveyor extension be installed. If the slipform mold is of the variable barrier type, the top of the slipform mold is higher in relation to the conveyor discharge chute versus a standard barrier or parapet mold. A standard barrier or parapet mold may not require a longer conveyor frame. It will only be necessary to use the conveyor shift to align the discharge chute with the hopper of the slipform mold. If the slipform mold hopper is too high for the conveyor or the receiving hopper is too high above grade to allow the trucks to effectively discharge into it, then the following procedures must be completed.

The conveyor must be removed from the machine to install the extension. Run the conveyor so the belt splice is centered on the top of the conveyor. Disconnect the conveyor drive hoses at the bulkhead quick couplers. Lower the conveyor lift cylinder and the machine frame as necessary until the receiving hopper end of the conveyor is setting on a solid surface.



Support the conveyor frame

Attach an adequate lifting device to the upper end of the conveyor and tension slightly to support the weight of the conveyor frame.



Remove bolts

⚠ WARNING! ⚠

DO NOT GET BENEATH CONVEYOR DURING ASSEMBLY. IF THE CONVEYOR WERE TO FALL, SERIOUS INJURY CAN OCCUR.

Remove the bolts through the conveyor frame and the conveyor shift assembly. Using the lifting device, raise the conveyor to separate the conveyor frame from the conveyor shift assembly. Start the machine and slowly move the machine in reverse while watching for clearance between the conveyor frame and the machine. When the machine frame is clear, lower the conveyor frame and remove the conveyor discharge chute. Lay the conveyor on a flat, level surface.

> **Note:** It may be necessary to remove the hoses from the drive motor before laying the conveyor on the ground. Be certain to plug the motor ports to keep dirt from entering the motor.



Remove the belt splice

With Spliced Belt: Loosen the belt tension by loosening the conveyor adjusting bolts (drive pulley end) completely. Bend the locking washer on the end of each conveyor belt splice pin straight. Remove the splice pins. Remove the belt extension.

> **Note**: For easier splice pin removal, it may be necessary to remove all of the concrete out of the splice.

Install the 8 ft. (2.4 m) belt extension so the splice rivet heads are up. Insert the splice pin and secure by bending the locking washer.



Connect belt splice

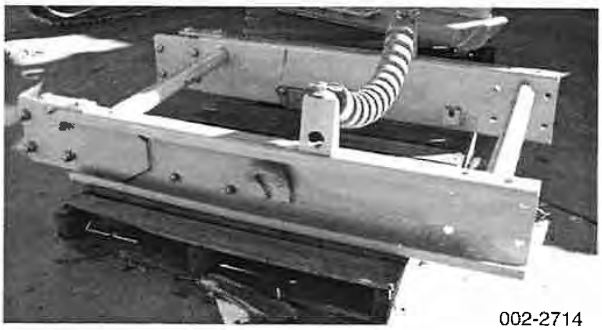
After the extension has been inserted, pull the ends of the belt together and install the splice pin. Secure the pin by bending the locking washer.

> **Note**: It will be necessary to remove the return roller from the conveyor extension prior to inserting it into the frame. Reattach the return roller after the frame and belt are assembled.



Separate the conveyor sections

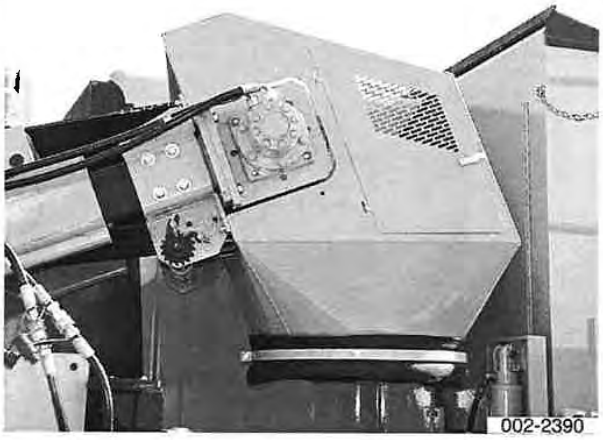
Installing Conveyor Extension: Remove the belt as previously described. Remove the four bolts through the connector joints on each side of the conveyor frame. Pull the two sections of conveyor apart approximately 3 ft. (91 cm). Remove the 2 ft. (60 cm) frame insert.



Insert frame extension

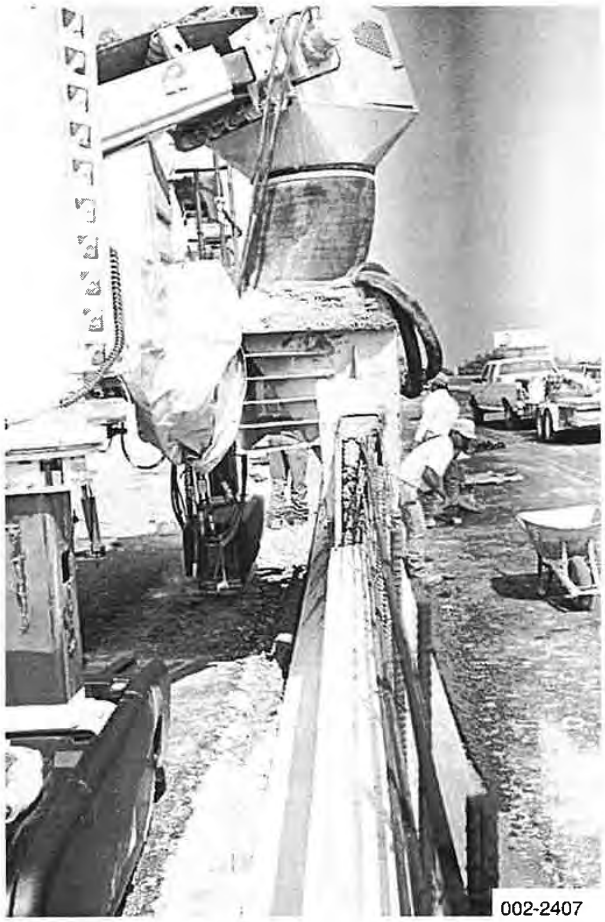
Slide the 4 ft. (1.2 m) frame extension into place so it engages the ears on the lower conveyor section. Install the four bolts, lock washers and nuts on each side and tighten securely. Slide the upper conveyor section towards the extension so the ears on it engage the upper section. Install the four bolts, lock washers and nuts on each side and tighten securely.

Install the belt as previously described and adjust the belt tension. The belt should be tight enough to prevent slippage. Adjust the tension by turning the adjusting bolts and nuts on the drive and idler pulleys. Be certain each pulley is adjusted evenly on both sides. Adjust the conveyor belt alignment as instructed in the Maintenance chapter.



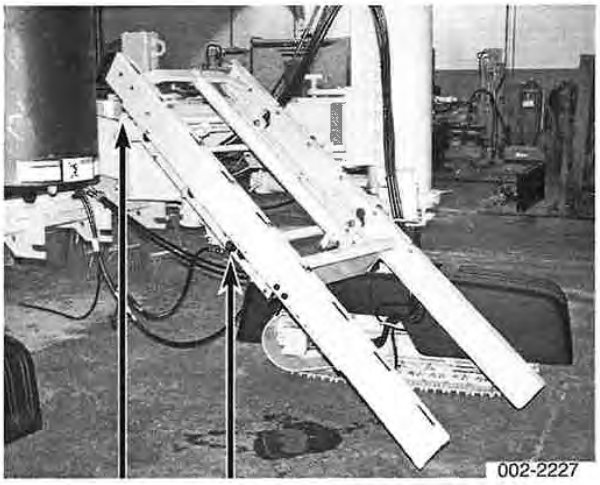
Attach discharge chute

Using a suitable lifting device, raise the drive end of the conveyor off the ground. Lift the discharge chute into place and insert the mounting bolts. Tighten the bolts securely.



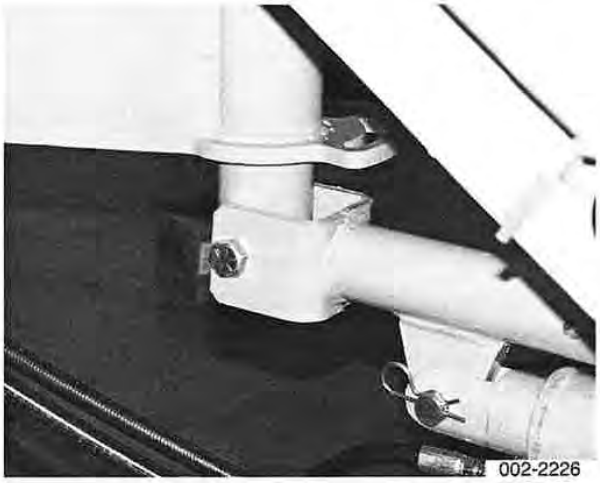
Determine mounting position according to discharge height

It may be necessary to remove the conveyor frame mount and reattach it to the machine frame so that it is angled up instead of down. View the slipform hopper height and determine if the conveyor discharge hopper will be high enough to easily flow concrete into the slipform mold.



Remove conveyor shift assembly

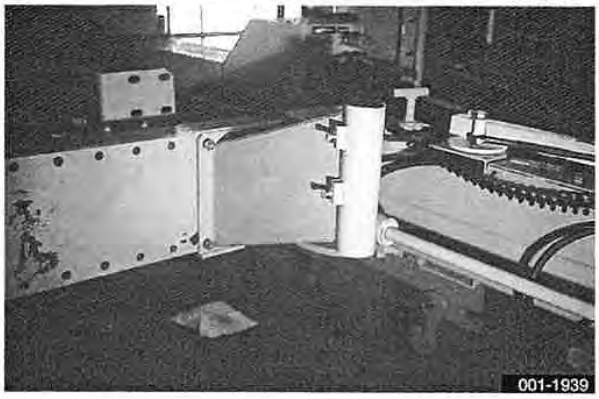
Attach a suitable lifting device and remove the upper and lower support pins. Set the conveyor shift assembly to the side.



Remove the lower support arm

Remove the bolt from the lower support arm and set the arm to the side. Remove the upper support tube from the conveyor frame mount.





Position conveyor mount

After the conveyor shift has been removed from the machine, remove the bolts securing the conveyor mount to the front of the frame. Remove the mount and turn it over, so it is angled upward. Install the mount and tighten the mounting bolts securely. Reattach the conveyor shift components as previously described.

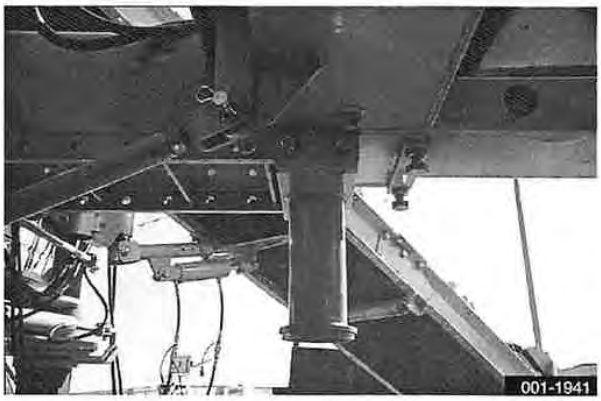


Conveyor mounted

Using a suitable lifting device, raise the discharge end of the conveyor frame high enough to clear the machine mounted components. Slowly move the machine forward until the conveyor shift assembly and the conveyor frame are aligned. Make certain that transport clearance for the discharge end of the conveyor is accounted for when attaching the conveyor frame to the shift assembly. Slowly move the machine to align the bolt holes. Insert and tighten the bolts securely. Install and connect the conveyor drive hoses to their respective bulkhead quick couplers. Swing the conveyor so the discharge chute is positioned over the center of the slipform mold hopper. Tighten the setscrews in the mount securely to hold the conveyor in place. It may be necessary to adjust the conveyor shift cylinder to properly align the discharge chute with the slipform mold hopper.

06 Mounting the Sensors

Line Under Machine:



Attach right hand front sensor mount

Mount the front sensor mount on the right end of the front mount plate. Install the bolts and tighten securely. Mount a sensor pivot mount to the mount at the front of the machine, with the long end of the mount pointed towards the right rear corner of the machine. Tighten the mounting bolt securely. Slide a sensor arm assembly into the pivot mount. The sensor mounts should be positioned just below the conveyor mount. Tighten the mounting setscrews securely.

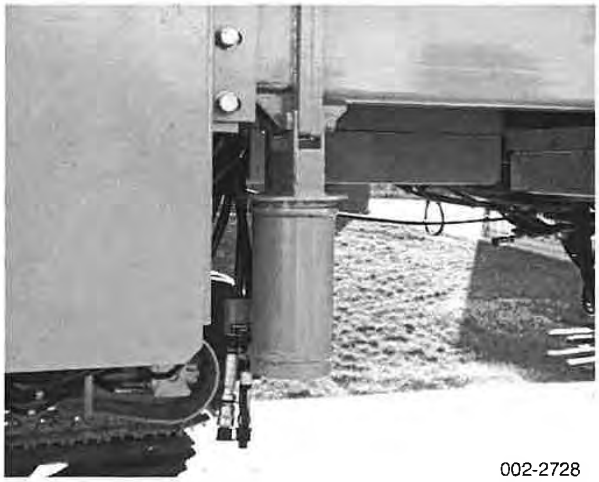


Attach right hand rear sensor mount

To install the rear sensor mount, remove the bracket from between the frame and the air reservoir tank. Install the rear sensor mount in place of the bracket and tighten the bolts securely. Mount a sensor pivot mount to the mount at the rear of the machine, with the long end of the mount pointed towards the right front corner of the machine. Tighten the mounting bolts securely. Slide a sensor arm assembly into the pivot mount. The sensor mounts should be positioned below the control console. Tighten the setscrews securely.

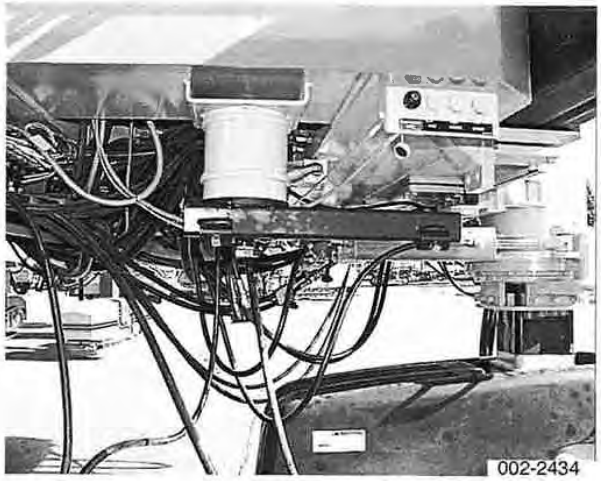


Front sensor pivot mount extension

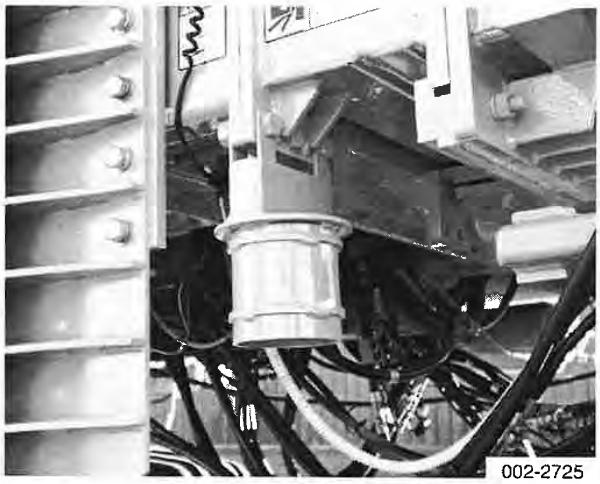


Front sensor pivot mount extension

Additional front sensor arm mount positions are available when operating the machine from a guideline under the machine frame as shown in the previous photos. Choose the most appropriate position, attach the pivot mount extension and tighten the mounting bolts securely. Attach a pivot mount to the extension and tighten the bolt securely. Slide a sensor arm assembly into the pivot mount. The sensor mounts should be positioned just below the conveyor mount. Tighten the mounting setscrews securely.



Rear sensor pivot mount extension



Rear sensor pivot mount extension

Additional rear sensor arm mount positions are available when operating the machine from a guideline under the machine frame as shown in the previous photos. Choose the most appropriate position, attach the pivot mount extension and tighten the mounting bolts securely. Attach a pivot mount to the extension and tighten the bolt securely. Slide a sensor arm assembly into the pivot mount. The rear sensor mounts should be positioned just below the operators console. Tighten the mounting setscrews securely.

Line on Left Side of Machine:



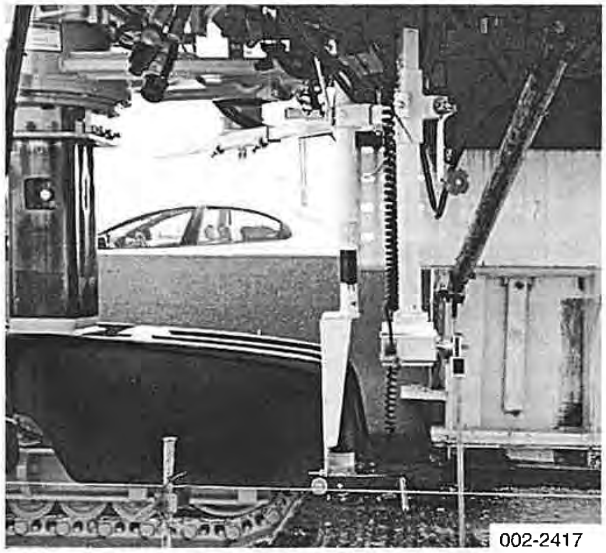
Attach front sensor arm to left side

Mount a sensor pivot mount to the bottom, or the top of the left front frame extension (swinging leg) and tighten securely. It is normally advised to have the long end of the pivot mount out towards the sensor arm assembly for stability. Slide a brace bracket onto the sensor arm assembly, with the center lug up if the pivot mount is mounted under the frame extension. If the pivot mount is on top of the frame extension, install the brace bracket with the center lug down. Slide the sensor arm assembly into the pivot mount until the end of the arm is near the final offset distance from the side of the slipform mold. Align the end of the sensor arm with the front of the hopper on the mold. Tighten the setscrews securely. Attach the L-shaped bracket to the top or bottom of the frame extension. Connect the long end of the brace rod to the bracket on the frame extension and the short end of the brace rod to the bracket on the sensor arm. Adjust the turnbuckle to remove all flex from the sensor arm.

Install the round tube mount to the left rear corner of the machine frame with the sensor mount plate up or down. Install a pivot mount to the mounting plate with the long end towards the sensor arm assembly for stability. Slide a brace bracket onto the sensor arm assembly, with the center lug up if the arm is mounted to the bottom of the round tube, or down if the arm is mounted to the top of the round tube. Slide the sensor arm assembly into the pivot mount until the end of the arm is near the final offset distance from the side of the slipform mold. Align the end of the sensor arm with the rear of the form. Tighten the setscrews securely. Slide the brace bracket over the round tube opposite the sensor mount and tighten the setscrews. Connect the long end of the brace rod to the eyelet on the bracket and the opposite end to the eyelet on the

sensor arm bracket. Adjust the turnbuckle to remove all flex from the sensor arm.

Network Sensor Installation



Mount grade and steer sensors

Mount a sensor for elevation control to the mount on the adjustable grade jack with the mounting bolt facing forward and the sensor hub away from the side of the machine. Mount the sensor so the top of it is level and tighten the mounting bolt securely. The front and rear grade sensors are mounted in the same manner.

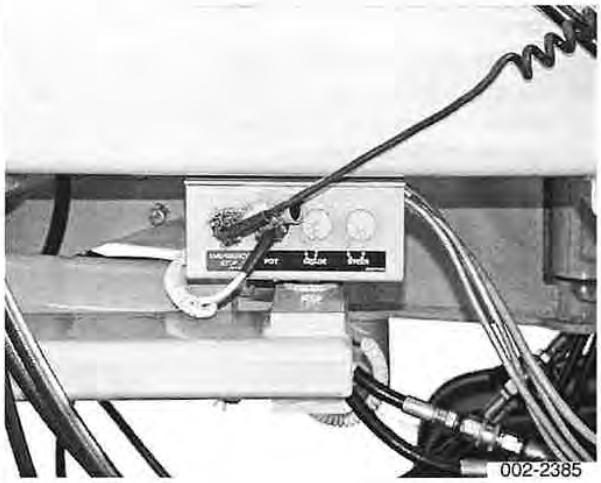
The grade sensor wand is mounted so that the round tube is towards either the front of the machine (same side as mounting bolt) and pointing towards the side mounted form or; toward the rear of the machine (same side as the cord) and pointing towards the side mounted form. The wand should be attached, so that when the stop pin in the sensor shaft is centered between the stops on the sensor, the wand is parallel to the mounting bolt (horizontal). Tighten the attaching "thumbscrew" securely. It is normally recommended to remove two of the counterweight washers from the rear of the grade wand, so only two remain. This will allow the spring tension to be increased without deflecting the guideline.

> **Note:** All grade sensors and wands must be installed in the same manner. If one sensor or wand is facing the wrong direction according to the calibrate settings in the Network controller, it will work backwards (see later).

Mount a sensor for steering control to the square tube mount with the mounting bolt facing towards the side mounted form and the sensor hub towards either the front or the rear. Mount the sensor so the top of it is level and tighten the mounting bolt securely. The front and rear steering sensors are mounted in the same manner.

The steering sensor wand should be attached to the sensor hub, so that when the stop pin in the sensor shaft is centered between the stops on the sensor, the wand is at a 90° angle to the mounting bolt (vertical). Tighten the attaching "thumbscrew" securely.

> **Note:** All steer sensors and wands must be installed in the same manner. If one sensor or wand is facing the wrong direction according to the calibrate settings in the Network controller, it will work backwards (see later).

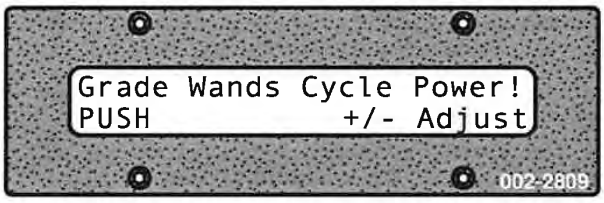


Connect sensors to bulkhead

Connect the front sensors to their respective electrical connectors on the left front bulkhead. Connect the rear sensors to their respective connectors under the left rear corner of the machine frame. The steering sensor should be connected to the "steer" plug and the grade sensor to the "grade" plug.

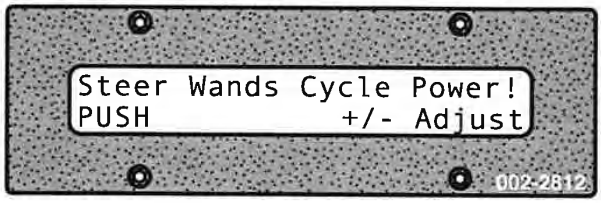
Notice: When the sensors are disconnected, place the dust caps over the electrical plugs to keep moisture and dirt out.

Control Panel Calibration



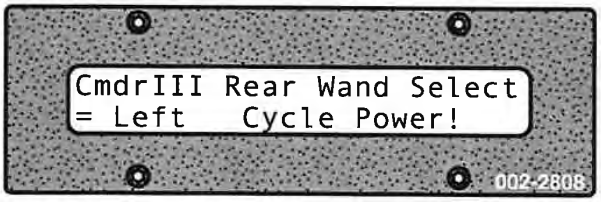
Grade sensor mode selection

Depress the calibrate switch on the service panel and use the NEXT switch to scroll forward to the grade sensor mode. Use the slope adjust switches (+ or -) to change the mode to "PULL" if the round tube of the grade wand is on the same side as the cord. If the round tube of the grade wand is on the same side as the mounting bolt, change the mode to "PUSH".



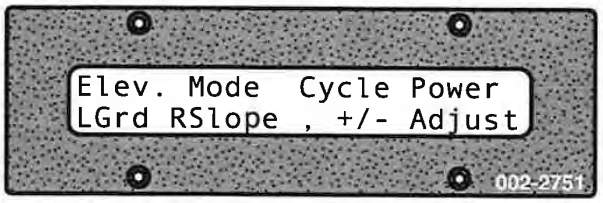
Steer sensor mode selection

Using the NEXT switch, scroll forward to the steer sensor mode. Use the slope adjust switches (+ or -) to change the mode to "PUSH" if the round tube of the steer wand is facing forward. If the round tube of the grade wand is facing towards the rear of the machine, change the mode to "PULL".



Rear wand select

Using the NEXT switch, scroll forward to the rear wand select mode. Use the slope adjust switches (+ or -) to select the appropriate bulkhead connection that the sensors will be connected to for operation. If the sensors are connected to the left rear bulkheads, the main screen selection should indicate the message "left". If the sensors are connected to the right rear bulkheads, the main screen selection should indicate the message "right".



Network panel for left grade, right slope

To operate the machine with left hand grade control, and right side slope control, depress the calibrate switch. Scroll through the various displays until the elevation mode is indicated. Use the slope adjust switches (+ or -) to change the mode to "LGrd RSlope". After the appropriate grade and steering mode settings are selected, depress the calibrate switch to return to the main screen. Adjust the desired amount of cross slope with the appropriate switch on the main control panel. Refer to the Preliminary Adjustments section for final adjustment procedures.

> **Note:** The network controller must be turned off and restarted to activate any new calibrate selections as indicated by "cycle power".

The left front leg elevation is controlled by the front grade sensor connected to the left front grade plug, and the left front elevation control loop. The rear leg elevation is controlled by the rear grade sensor, connected to the left rear grade plug, and the rear elevation control loop. The right front leg elevation is controlled by the slope sensor, located in the battery box, and the right front elevation control loop. The steering of both front tracks is controlled by the front steer sensor connected to the front steer plug and the front steer control loops. The steering of the rear tracks is controlled by the rear steer sensor connected to the rear steer plug and the rear steer control loop.

07 Preliminary Adjustments

Mold Alignment to Machine Frame



Level form to machine frame

Place a level across the frame of the machine (left to right). Using the grade or slope jog switches, manually level the machine from side to side. Stop the engine or place the servo lock switch in the "on" position. Place the level across the square tubes at the top of the open front extension shroud on the form. Adjust the front stabilizing turnbuckle until the top front of the form is level. Secure the turnbuckle in place with the jam nut. Place the level across the square tubes near the rear of the form. Adjust the rear stabilizing

turnbuckle until the top of the form is level. Secure the turnbuckle in place with the jam nut.

Note: If the form does not have the open front extension shroud, place the level on the top of the front of the hopper to adjust the front turnbuckle.



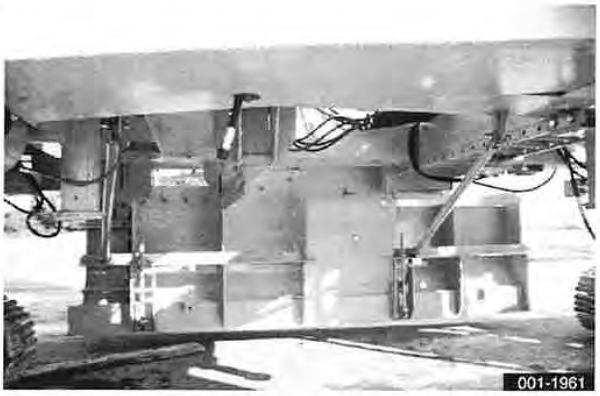
Move machine over guideline

⚠ WARNING! ⚠

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If control of the machine is being taken from a guideline on the left side, refer to the Preliminary Adjustment section of the Standard Set-Up chapter. If the guideline is under the machine, move the machine into position over the guideline. Steer the front or rear of the machine left or right as necessary, until approximately the same distance exists between the guideline and the front of the form and the guideline and the rear of the form. If pouring over cage steel, the form should be parallel to and centered over the steel. Steer the front and rear tracks to the straight ahead position.

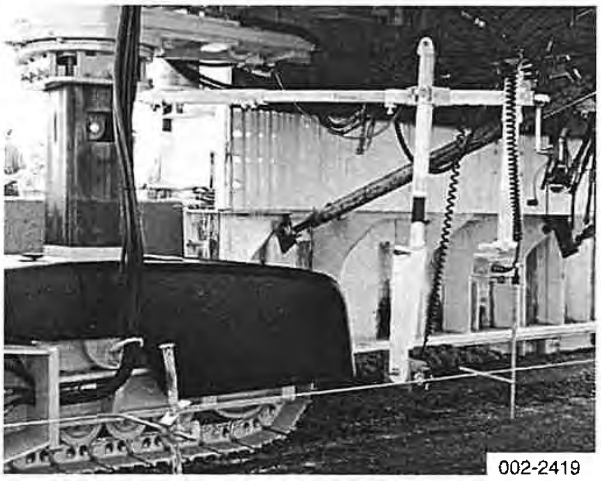
Note: If the machine will not move, check the emergency stop reset light (if equipped). If it is illuminated, depress the reset switch.



Lower form to grade

Place the slope control circuit in "automatic" and adjust the slope setting to the required amount of slope. Lower the machine using the front and rear grade jog switches until the bottom of the slipform mold is lightly resting on the grade. Be sure the frame is approximately the same distance above the guideline at front and rear. Be certain that the tracks are straight ahead and stop the engine. Leave the ignition switch in the "on" position.

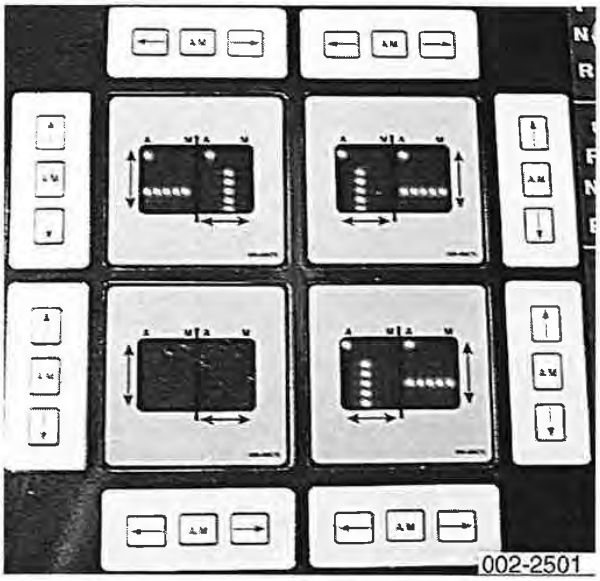
Sensor Adjustments



Center sensor wands on guideline

It is advised to screw the steering adjustment crank, in the end of the sensor arm assembly, out (clockwise) 3 to 4 in. (76 to 100 mm) before making sensor adjustments. Adjust the grade jack out the same amount. This will allow for minor steering adjustments if needed. Place the grade sensor wands under the guideline and the steering sensor wands on the right side of the guideline. Turn the sensor mount brackets until the shaft through each of the steering sensors is parallel to the guideline and the shaft through each of

the grade sensors is at a 90° right angle to the guideline.



Center each sensor

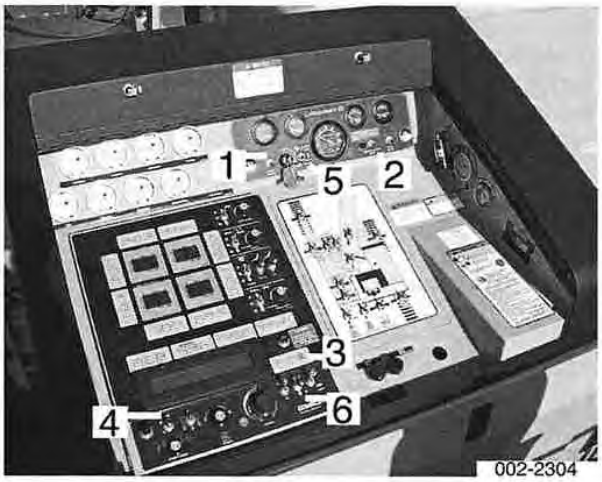
Adjust the steering sensors left or right (in or out) until the deviation meter indicator lights on each steering system is centered. If a large amount of adjustment, 1 in. (25 mm) or more, is necessary to center the deviation meter lights, loosen the setscrews in the sensor pivot mount and adjust the sensor arm assembly in or out as needed (save crank adjustment for final fine adjustments). Tighten the setscrews securely.

Adjust the front and rear grade sensors up or down until the corresponding grade deviation indicator lights are centered. If a large amount of adjustment is necessary to center the lights, loosen the setscrews in the grade sensor jack and raise or lower the jack as needed. Tighten the setscrews securely. Depress the A/M switch on each of the control loops to display a light under the "A" for automatic operation. Depress the Run/Standby switch to place the main screen in the "run" mode. The steer select should be in the Stringline sensor position.

Loosen the L-shaped clamp bolt in the grade jack bracket and slide the jack left or right until the grade sensor wand is centered beneath the guideline. Tighten the clamp bolt securely. Loosen the setscrew in the steering sensor square tube mount and slide the sensor assembly up or down until the line crosses the wand 8 to 9 in. (200 to 230 mm) from the pivot point. Tighten the setscrew securely. The sensor mounts should be adjusted until there is no less than 1/4 in. (6 mm) and no more than 1 1/2 in. (38 mm) between the sensor wands.

Adjust the spring tension on the sensor hubs to hold the wands firmly in contact with the guideline, but not tight enough to deflect the line. Check for the correct spring tension after the machine has been adjusted to the line. Note the position of the line on the grade wand. Pull the steering wand away from the line and note the movement of the line on the grade wand. If the movement exceeds 1/8 in. (3 mm), the steering spring tension is too tight. Loosen the tension slightly. Note the position of the line on the steering wand. Pull the grade wand down, away from the line and note the movement of the line on the steering wand. If the movement exceeds 1/8 in. (3 mm), the grade sensor spring tension is too tight. Loosen the tension slightly. Pull the line away from both sensor wands. The steering wand should move left towards the line until the stop pin in the sensor hub contacts the stop pin in the side of the sensor. If not, tighten the spring slightly. The grade wand should move up towards the line, until the stop pin in the sensor hub contacts the stop pin in the side of the sensor. If not, tighten the spring slightly. If the sensor wands deflect the line more than 1/8 in. (3 mm), but the stop pin in the sensor and the hub will not contact one another, suspect that the line is inadequately tensioned. Adjust the line as necessary.

Note: When checking the sensor wand spring tension, it should be done half way between stations so the line holders do not interfere. The control system should be in the "standby" mode or the servo lock switch must be in the "on" position when checking the sensor spring tension.



Controls set to trim forward

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Depress the start assist switch and start the engine (1). Depress the emergency stop reset switch to set the emergency stop system for operation (2). Place the control system in "run" by depressing the run/standby switch (3). Place the servo lock switch in the "off" position (4). Increase the engine speed to maximum (5). Place the two speed switch in the "slow" position and the forward/reverse travel switch in the forward "F" position (6). Place the travel/neutral switch in the "travel" position and slowly move the travel variable speed control dial clockwise to start machine movement (7). Move forward 20 to 30 ft. (6 to 9 m) and stop the machine.

Parallel Measurements and Adjustment



Check frame elevation

Measure from the bottom of the machine frame down to the guideline at the front. Record this measurement.

Measure from the bottom of the machine frame down to the guideline at the rear. This measurement should be within 1/4 in. (6 mm) of the front measurement. If not, adjust the grade sensors up or down and recheck the measurement.

> **Note:** It is advised to raise the low end of the machine, rather than lower the high end.



Check frame offset

Place a straight edge against the outer edge (left) of the frame, just to the rear of the front form mount and extend it down to the guideline height. Measure the distance between the machine side of the straight edge and the guideline. Record this measurement.

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Place a straight edge against the outer edge (left) of the frame, just to the rear of the rear sensor connectors and extend it down to the guideline height. Measure the distance between the machine side of the straight edge and the guideline. This measurement should be within 1/4 in. (6 mm) of the front measurement. If not, adjust the steering sensors left or right. After adjusting the sensors, move the machine forward 20 to 30 ft. (6 to 9 m) to allow the steering system to correct itself and recheck the measurements.

08 Final Adjustments



Adjust slope (parapet)

Adjust the slope of the straight back barrier form by holding a level against the straight side of the form. Plumb the level vertically and adjust the slope setting on the machine until the batter of the back of the wall is correct.



Adjust slope (barrier)

To adjust the slope of a standard barrier, locate the center of the top of the wall. Locate the center of the base of the wall. Hold a level in line with these two marks. Adjust the slope setting until the wall is at the desired slope.



Check offset (left guideline)

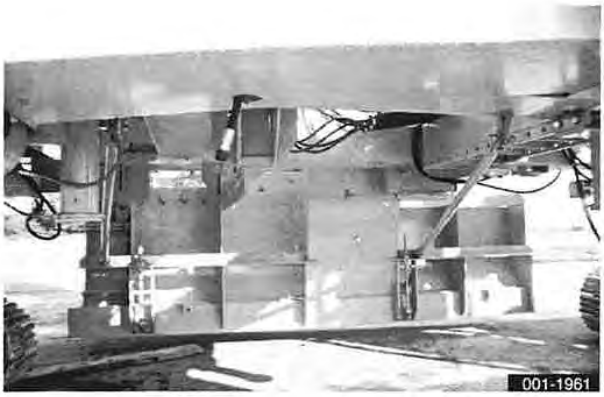
When the guideline is on the left side of the machine, plumb a level vertically against the guideline, in line with the rear of the slipform hopper. Measure the distance between the guideline side of the level and the reference point (center of top, edge of base, etc.) on the slipform mold. This measurement should be the required offset distance. If not, adjust the front and rear steering sensors evenly as necessary. Moving the sensors towards the guideline (left), increases the distance between the line and form. Moving the sensors away from the guideline (right) decreases the distance between the line and form. After each adjustment, move the machine forward 20 to 30 ft. (6 to 9 m) and recheck the offset.



Check offset (guideline under machine)

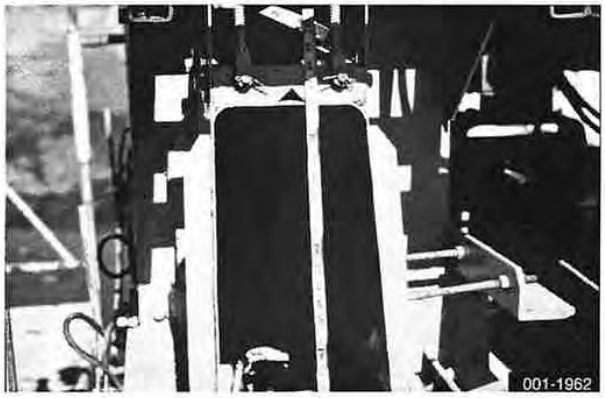
When the guideline is under the machine, plumb a level vertically against the guideline, in line with the rear of the slipform hopper. Measure the distance between the guideline side of the level and the reference point (center of top, edge of base, etc.) on the slipform mold. This measurement should be the required offset distance. If not, adjust the front and rear steering evenly as necessary. Moving the sensors toward the guideline (left), decreases the distance between the line and the form. Moving the

sensors away from the guideline (right) increases the distance between the line and the form. After each adjustment, move the machine forward 20 to 30 ft. (6 to 9 m) and recheck the offset.



Check stationary sideplate clearance

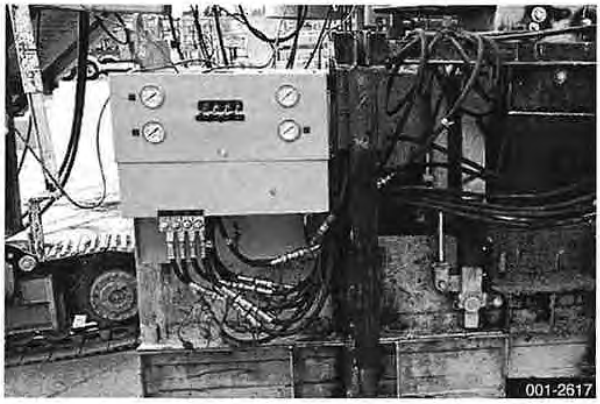
If the barrier form is equipped with standard sideplates and the wall is being poured on a smooth surface such as concrete or asphalt, the grade is normally adjusted so that the bottom of the form clears any high spots in the grade by at least 1/8 in. (3 mm). Adjust the grade sensors up or down evenly as necessary and recheck measurement.



Check final elevation

If the barrier form is equipped with pressure compensated hydraulic sideplates and the wall is being poured on a smooth surface such as concrete or asphalt, hold a level, plumbed horizontally, above or below the guideline and extended over to the rear of the form. Measure from the guideline side of the level to the top of the rear of the form. If the measurement is incorrect, adjust both grade sensors up or down equally as required. Moving the sensors up, lowers the grade and moving the sensors down raises the grade. One turn of the grade jack crank changes the grade approximately 1/8 in. (3 mm).

Note: Be certain to allow for top slump when checking grade.



Check pressure comp. setting

After the machine has been set to grade, move the hydraulic sideplate control valves to the down position. Lower the sideplates until they are resting on the grade front and rear. Adjust each pressure control valve so that there is 300 psi ±50 psi (20.67 bar ±3.45 bar) indicated on the gauges. To adjust the pressure, loosen the jam nut and turn the adjusting screw in to increase pressure, or out to decrease pressure. Tighten the jam nut securely. The valves are normally adjusted to the same pressure.



Check cage steel clearance

If the barrier wall is to be poured over cage steel, it is recommended to dry run the length of the job, if possible. Make certain that the steel is properly set and the vibrators clear it by a minimum of 1 in. (25 mm).

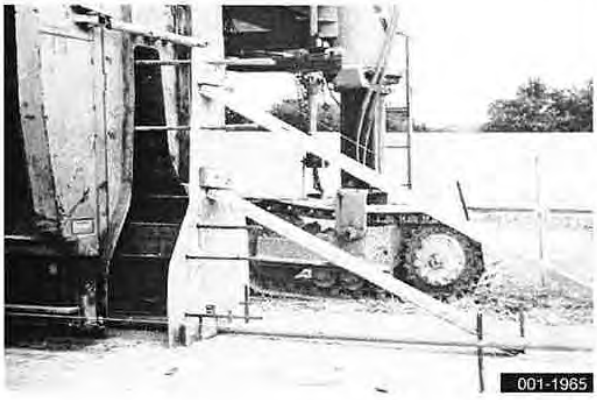
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After the machine has been set to line and grade, it will be necessary to move it back to the start of the job. Depress the calibrate switch and the Next/Last switches until the Steer Authority display is on the main screen. Depress the slope setpoint (+/-) switches to place the steer authority in the "half" mode. Depress the Calibrate switch to return to the normal operating display. Move the control valves for the pressure compensated sideplates to the up position to raise the sideplates off of the grade. Set the forward/ reverse travel switch to the "reverse" position. Rotate the travel variable speed knob in the clockwise direction to move the machine to the start of the pour. It may be necessary to raise the machine a small amount to prevent the form from catching on any obstacles.

09 Pouring Operations

Starting Pour From Header



Brace header

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When first beginning the barrier wall pour, it is recommended that a template header form be used to start from. The header form should be at least 1/2 in. (13 mm) smaller than the wall on the top and both sides. Set the header form at the beginning point of the pour and brace it adequately as there will be an extreme amount of pressure against it when the concrete is first vibrated against it. After the header form is set, slowly back the machine over it until it is approximately 1 1/2 ft. (46 cm) from the rear of the form hopper. Stop the machine. Place the forward/ reverse travel switch in the "forward" position. Be certain that the control system is in "automatic" and the servo lock switch is in the "off" position. Move the control valves for the pressure compensated sideplates to the down position to lower the sideplates on to the grade.

⚠ CAUTION! ⚠

DO NOT PLACE OIL ON THE OPERATORS PLATFORM OR THE BOARDING LADDER, AS IT MAY CAUSE THEM TO BECOME VERY SLIPPERY. INJURY MAY RESULT IF SLIPPAGE OCCURS.

It is advised to coat the inside and outside of the form and the machine frame below the conveyor with form oil. The conveyor frame, receiving hopper and the discharge hopper should also be coated. Avoid placing oil on the inside surface of the belt as it could cause slippage.

GOMACO Tip: Place plastic or burlap over the machine frame, directly below the conveyor to aid in clean up at the end of the day.



Starting from header

Place the conveyor forward/neutral/reverse switch in the "forward" position and rotate the variable speed knob clockwise to begin turning the conveyor belt. Place the appropriate vibrator off/auto switch in the

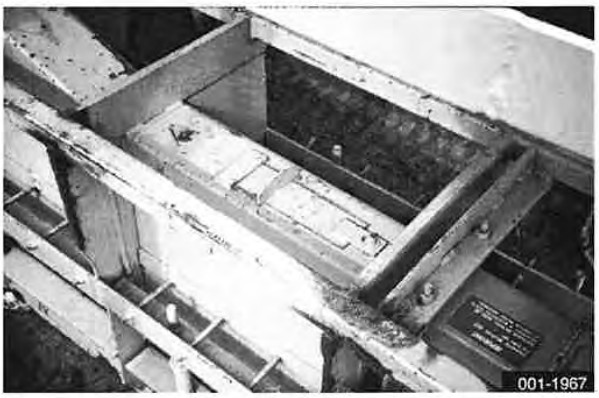
"auto" position. Rotate each vibrator variable control valve, that has a vibrator attached, counterclockwise to the maximum position. Discharge concrete onto the conveyor from the supply truck. Fill the hopper of the slipform mold at least three-fourths full. Move the travel variable speed knob in the clockwise direction just enough to start the vibrators without moving the machine. Allow the vibrators to force the concrete back into the form around the header, until it is completely full. Keep the slipform hopper a minimum of three-fourths full by starting and stopping the conveyor as necessary.

When the form is completely full around the header form, move the travel variable speed knob in the clockwise direction to start the machine forward movement. After the concrete begins to slip from the form, adjust the travel speed and vibration as required.

Continuing the Pour from an Existing Wall



Starting from existing wall



Top cover plate in form

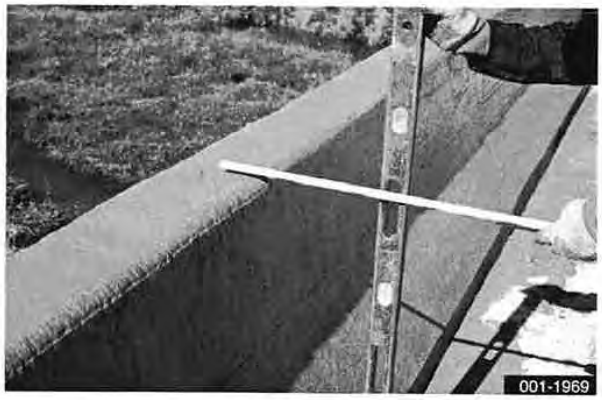
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If the pour is to start or continue, from an existing wall, it is necessary that the grade at the end of the existing wall is correct. Back the machine to the start of the pour, as previously described, until the rear of the slipform mold is against the existing wall.

> **Note:** The slipform mold will not fit over the product that was poured with it at a previous time. Concrete slump causes the product to expand wider than the slipform profile.

Set all controls for pouring as previously described. Remove the cover plate from the top of the form. Begin filling the form and vibrating the concrete back into the form. Insert a stinger type vibrator into the opening in the top of the form and "work" the concrete to the rear of the form. Continue to "work" the concrete until the form is completely full. Stop the main vibrators on the machine and withdraw the stinger vibrator. Reinstall the cover plate on the top of the form. Begin pouring forward as previously described. By filling the form in this manner, a majority of the hand work needed to complete the joint is eliminated.



Check for proper slope

After pouring 15 to 20 ft. (4.6 to 6 m) check the final product for proper slope, line and grade. If adjustments are needed, make them in small increments over a great distance. For example, if the grade requires a change of 1/4 in. (6 mm), adjust it 1/8 in. (3 mm) every 5 ft. (1.5 m) or more. To check the slope of a straight backed barrier (parapet), plumb a level vertically along the back of the wall and check for the correct amount of batter. To check the slope of a standard barrier, plumb a level vertically along the edge of the wall base and measure over to the center of the wall. Adjust the slope setting as necessary.



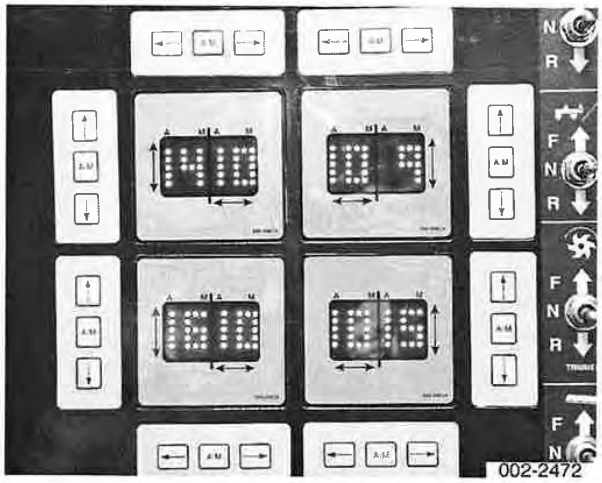
Check for proper offset

To check the offset, plumb a level vertically along the side of the guideline. Measure the distance between the guideline side of the level and the concrete reference point (center of top, edge of base, etc.). Adjust the front and rear steering sensors evenly, left or right as necessary.



Check for proper elevation

To check the grade, lightly place a level on the top of the wall and plumb it over, or under, the guideline. Measure the distance between the concrete side of the level and the guideline. Adjust the front and rear grade sensors up or down, evenly, to get the proper measurement.



Sensitivities on control loop

Adjust the sensitivity level on each grade and steer control loop to prevent the machine from reacting too fast or too slow. Sensitivity settings can be checked by depressing and releasing either the elevation or steer sensitivity switches under the service panel. The settings will be shown on the individual control loops by the number of indicators displayed. Minimum sensitivity is with one indicator showing and maximum is with 19 showing. The sensitivity can be set at any place in between. Individual control loop sensitivities can be increased by depressing the up switch, or decreased by depressing the down switch for elevation or depressing the left and right switch for steer. For each depression of either switch, the sensitivity will change one setting. Initial setting for the sensitivity on

the grade, slope and steering control loops is typically with ten to fifteen indicators showing. For optimum performance, it may be necessary to increase or decrease the sensitivity. Sensitivity settings can be made in the standby or run mode. For final setup instructions, refer to the setup chapter.



Good product

Continuing the Pour: Production rate (or travel speed) is determined by many factors, of which a few are:

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1. Delivery rate of the concrete mix. If the concrete mix cannot be readily discharged from the supply truck, the production rate will be lowered. The size of the slipform mold will have a direct affect on how far each load will go.

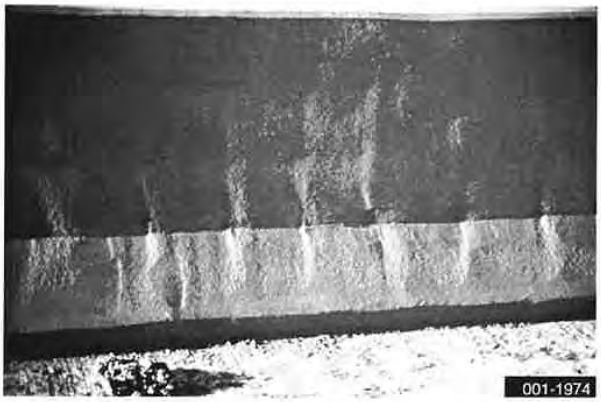
   GOMACO Tip: If the concrete redi-mix truck is equipped with secondary discharge fins, it is recommended to remove them to aid in the discharge of the low slump concrete mix.

2. How dry the concrete mix is (slump). The drier the concrete, the slower the travel speed will be, resulting in a lower production rate. The recommended concrete slump is 1 in. ±1/4 in. (25 mm ±6 mm).



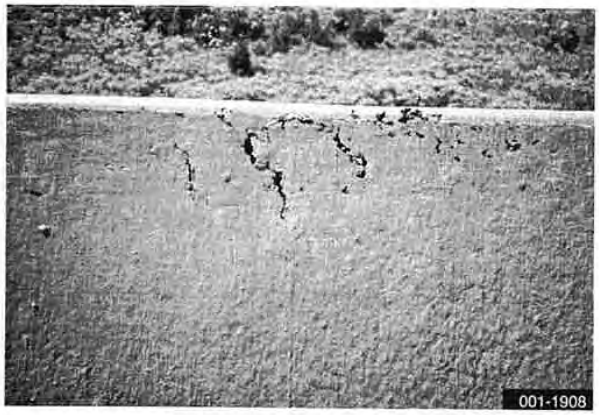
Cage steel centered in front of form

When pouring over cage steel, it is important that the steel be set straight and even. Observe the steel going into the front of the form to be sure there is equal clearance on all sides. Adjust steel or machine as necessary. Be certain that the steel is adequately tied and braced to prevent movement.



Wet concrete mix

When the concrete mix becomes too wet (high slump), it may be necessary to increase the travel speed and/or decrease the vibration to avoid a "puffy" surface. If the concrete is extremely wet, the top of the wall may slump excessively, or even fall over. When pouring over cage steel, wet concrete may cause the bars of steel to reflect in the concrete surface. The solution would be to get the concrete mix drier, or refuse to accept it.



Dry concrete mix

When the concrete mix becomes too dry (low slump), it may be necessary to decrease travel speed and/or increase vibration to eliminate "voids" in the concrete surface. If the concrete is extremely dry, large "voids" may appear in the surface, or the concrete may even pull apart. The solution would then be to add water to the concrete mix, or if necessary, refuse to accept it.



Hump caused by vibrators

During pouring operations, it occasionally becomes necessary to stop and start the machine travel. When stopping, rapidly move the variable speed control knob counterclockwise to the off position. This will stop the vibrators and the machine travel simultaneously. When starting the machine travel, rapidly move the variable speed control knob clockwise to number 25 or above. This will start the vibrators and the machine travel simultaneously. After the machine is moving, adjust the travel speed as necessary.

GOMACO Tip: When it is necessary to stop for a short period of time, it is recommended rotate the variable speed control knob just clear of the off position to start the vibrators operating. Allow the vibrators to operate for 5 to 10 seconds before moving the machine to shake the concrete free in the form. This will help eliminate the possibility of the wall tearing when the machine moves forward. It may also be advised to turn all the vibrator variables to the maximum position.



Waiting too long for concrete

When it becomes necessary to wait for concrete delivery, it is recommended to have the hopper completely full when the last truck departs, especially if the temperature is extremely warm. Slowly move the machine forward approximately 1 ft. (300 mm) every 5 to 10 minutes. It is recommended to set the vibrators to maximum before moving the machine, after it has set for a period of time.



Example of something hitting guideline

During pouring operations, it is important that nothing, or no one bumps the guideline. Be sure there is no debris against the guideline which could become entangled in the sensor wands. Be certain that

persons working around the machine do not come in contact with the line.



Installation of repair forms

When the top of the wall needs to be repaired due to any of the preceding causes, it is recommended to install forms on each side. Clamp the forms in place so the ends are even with the top of the good sections of wall. Fill the forms with concrete and finish as necessary.



Example of concrete slump variance

Small variations of concrete slump can cause the top of the product to vary up or down during pouring operations. Maintaining a constant concrete slump will help eliminate the variance in the top of the wall. To check, a 10 to 12 foot (3.0 to 3.7 m) straight edge may be used when placed lightly on top of the wall. Repair any fluctuation greater than 1/8 in. (3 mm) as necessary.



Finishing wall

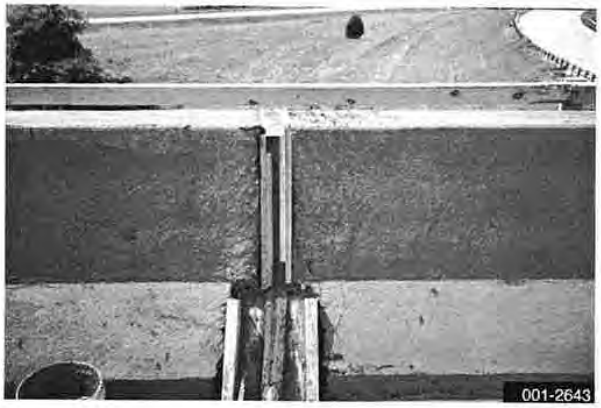
Apply any finishing practices to the wall as may be necessary such as a broom finish. Cut any necessary control joints. After all finishing is completed, apply curing compound as necessary.

Expansion Joints



Expansion joint going through variable barrier

Expansion joints have been placed in walls by a number of different methods. The first photo shows a well braced expansion header that is run through the form during the pouring of a variable barrier. The expansion joint header is cut at least 1/2 inch (13mm) smaller on all sides to allow clearance of the form sidewalls. After the machine has passed over the expansion header, the concrete finishers will complete the joint as required.



Bridge parapet expansion joint

This photo shows an expansion joint that was wired into the cage steel of a bridge parapet and is being finished as required after the machine has poured over the expansion joint. Two steel plates with styrofoam sandwiched between have been used in this application as well.



Formed expansion joint

This photo shows forms placed on either side of the joint in the barrier wall with just enough space between the forms to pass a steel plate to cut open the joint.

After the concrete has set up enough to remove the forms, hand finishing is required to complete the joint.



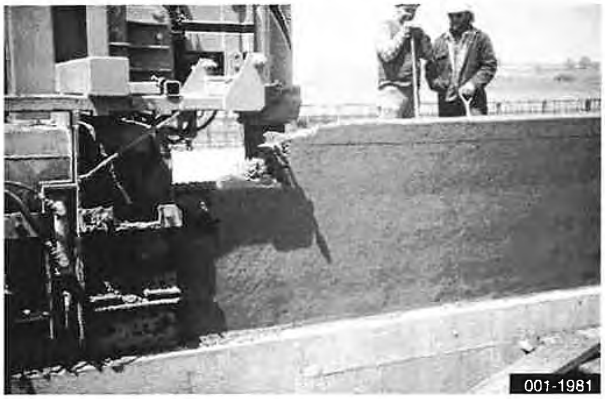
Spray the wall with cure

Cover the wall with wet burlap or spray with a curing compound as required to prevent excessive moisture evaporation.



End of pour header form

If pouring over cage steel, it is possible to set a template header form to pour over at the end of the pour. The header form should be cut at least 1/2 in. (13 mm) smaller than the wall on the top and both sides. Set the header form at the end of the pour and brace it adequately, as there will be an extreme amount of pressure against it as the concrete in the hopper, being vibrated, goes over it. As the header form begins to go into the front of the form, be certain that it does not catch on the sides or top.



End of pour over header

When ending the pour, stop the conveyor. Continue to move the machine forward until all of the concrete has slipped from under the form. Place the vibrator off/ auto switch in the "off" position. Depress the A/M switch on each elevation control loop to place the elevation control system in "manual". Select a manual steer mode with the steer select switch. Raise the machine using the all jog switch and move the machine to an area where it can be cleaned.

The sensors should be removed before washing the machine. It is advised to mark the sensor location on the mounts prior to their removal. This will speed setup time if the pour is to be continued at a later date. Be sure to place the protective dust caps over electrical plugs to keep moisture and dirt out.

Cleaning Operations



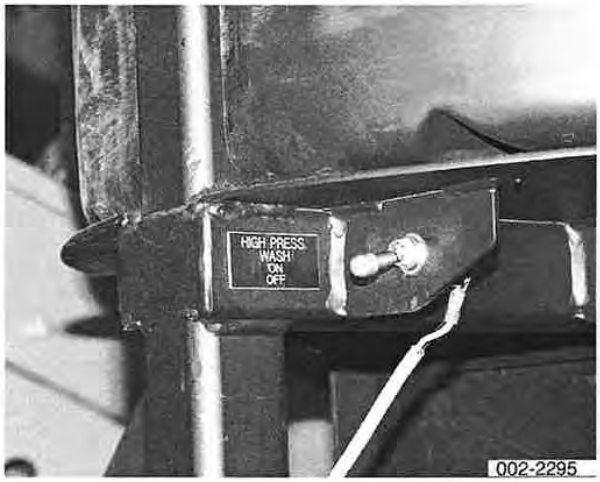
Clean machine

The machine should be cleaned as soon as possible after pouring operations have ended. It is advised to fill the water tank on the machine (if so equipped) at the start of the pour, so water for cleaning purposes is available at the end of the pour. Turn and remove the lid to fill the water tank.

⚠ WARNING! ⚠

CONTACT WITH A MOVING CONVEYOR BELT AND ROLLERS, OR A MOVING AUGER, CAN CAUSE SERIOUS INJURY. BE CERTAIN THAT THE CONVEYOR, OR AUGER, AREA IS CLEAR BEFORE STARTING THE ENGINE. DO NOT STAND ON THE CONVEYOR OR IN THE SLIPFORM MOLD HOPPER AREA DURING CLEANING OPERATIONS. DO NOT OPERATE THE CONVEYOR OR THE AUGER WHEN WASHING THE MACHINE.

Uncoil the hose from the hose hanger and wash the concrete off of the machine. It is recommended that the bottom of the form be washed first. Clean the bottom of the form thoroughly, as any concrete left to dry on the bottom will affect the final concrete finish when the pour is resumed. When washing the conveyor belt, stop the belt travel and wash the side that is visible. After the belt is clean on one side, rotate the belt enough to expose the opposite side and stop it before cleaning it.



High pressure wash switch

⚠ WARNING! ⚠

THE HIGH PRESSURE WASH SYSTEM USES HIGH PRESSURE WATER. DO NOT AIM THE NOZZLE AT ANY PART OF THE BODY, AS SERIOUS INJURY CAN OCCUR. WEAR PROPER EYE PROTECTION WHEN CLEANING THE MACHINE.

If the machine is equipped with the optional high pressure wash system, uncoil the hose from the

hanger. Place the high pressure wash switch in the "on" position and decrease engine speed to 1500 rpm. Direct the nozzle on the hose at the concrete and pull the trigger. Be certain that the water tank has water in it, and do not allow the pump to run without water, as severe damage to the pump could result.

⚠ WARNING! ⚠

THE REAR TRACK (WHEN IN 3-TRACK MODE) MUST BE KEPT AS FAR TO THE LEFT AS POSSIBLE TO PROVIDE THE MOST STABILITY DURING LOADING OR UNLOADING. THE MACHINE SHOULD ALSO BE DISASSEMBLED TO THE NORMAL TRANSPORT WIDTH WHETHER IN 3-TRACK OR 4-TRACK CONFIGURATIONS.

Lubrication and Maintenance Service Interval Chart

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Lubrication and Maintenance Service Interval Chart

Item	10 Hour	50 Hour	250 Hour	500 Hour	600 Hour
Check E-stop operations	•				
Check engine oil level	•				
Lubricate auger bearings and tension chains	•				
Grease tamper bar drive converters	•				
Grease steering cylinder pins	•				
Clean engine compartment	•				
Drain air reservoir	•				
Check hydraulic fluid level	•				
Check air filter restriction indicator	•				
Fill fuel tank	•				
Grease trimmer gearbox	•				
Check engine coolant level	•				
Clean power washer water inlet screen	•				
Check power washer gearcase oil level	•				
Grease trimmer idler shaft bearing		•			
Grease conveyor bearings		•			
Check auger drive shaft seal, lubricate chains		•			
Grease PTA sprockets, lubricate chain		•			
Check track drive gearbox oil level		•			
Check pump drive gearbox oil level		•			
Check conveyor drive gearbox oil level		•			
Check battery electrolytes		•			
Check alternator and fan belts		•			
Adjust conveyor belt tension		•			
Check wear on conveyor belt wipers		•			
Adjust trimmer wheel height		•			
Check trimmer teeth for replacement		•			

Dry lubricate leg inner guide tubes			•		
Dry lubricate mold shift extension tubes			•		
Dry lubricate right front leg extension			•		
Grease upper and lower leg guide bearings			•		
Grease track yoke pivot pin			•		
Grease hold down trolley			•		
Grease swinging leg pivot pin			•		
Replace engine oil filter			•		
Replace fuel filters				•	
Replace hydraulic oil filter		*			•
Replace high pressure lift filter		*			•
Clean sump filters		*			•
Change oil in torque hub gearbox		*			•
Change oil in pump drive gearbox		*			•
Change oil in conveyor drive gearbox		*			•
Check wear pads for replacement and tension		•			•
Service or replace engine air filter		*			•
Check engine air intake fittings		•			
Clean battery cable connections		•			•
Drain water trap on air oiler option	•				
Adjust servo pilot valves					•
Adjust trimmerhead pressure					•
Adjust conveyor pressure					•
Adjust track pressure					•
Adjust vibrator pressure					•
Adjust lift pressure					•
Check air pressure adjustment					•
Calibrate the slope sensor					•
* Indicates a one time service interval after the first 50 hours of machine operation					

Chapter V Maintenance

01 Content of Chapter

This chapter contains detailed instructions for the lubrication and adjustments necessary for trouble free operation of the Commander III. The services listed for the engine are basic services only. Refer to the engine service manual for more detailed instructions. It is advisable to perform all lubrication checks and services prior to initial machine setup.

Instructions for the servicing of the battery, charging system, fuel system, engine cooling system, engine lubrication system and the machine hydraulic systems are included in this chapter. Also included are instructions for adjusting the pressures of the various hydraulic circuits and instructions for adjusting the steering and slope systems. **Pay particular attention to all safety statements.**



DCAL-058

02 Fuels

The quality of fuel oil used for high speed diesel engine operation is a very important factor in obtaining satisfactory engine performance, long engine life and acceptable exhaust.

Fuel oil should be kept clean and free of contamination. Storage tanks should be inspected regularly for dirt, water or water emulsion sludge and cleaned if contaminated. Storage instability of the fuel can lead to the formation of varnish or sludge in the tank. To keep the fuel system in its most efficient condition, keep all dirt, water and other foreign matter out of the fuel and avoid storing fuel for a long period of time.

Refer to the engine manual for further information and specifications.

03 Lubricants

Effective use of the proper lubricating oils and grease is perhaps the most important step towards low upkeep cost, long machine life and satisfactory service. Use only lubricants specified in this section. Apply them at the intervals and according to the instructions in this chapter.

Engine Lubrication Oil

Cummins Engine recommends the use of multigrade oils in their engines, using the following requirements:

1. Use of 15W40 or 20W40 in temperatures above 14° F. (-10° C.).
2. Use of 10W30 in temperatures below 14° F. (-10° C.).
3. The lubricant shall meet the performance requirements shown in service classifications CC/CD (equivalent to MIL-L-45199B).
4. A maximum sulfated ash content of 1.85% by weight. Refer to the Cummins engine operators manual for further information.

HYDRAULIC OIL CONVERSION CHART

AMOCO	MOBIL
AMOCO AW 46 RYKON OIL #46	DTE 25
ARCO *	PHILLIPS
ARCO DURO AW 46	MAGNUS A OIL 46
CHEVRON	SHELL
EP HYD OIL 46	TELLUS 46
CITIES SERVICE	STANDARD OIL (OHIO)
PACEMAKER XD46	INDUSTRON 48
CONOCO	SUN
SUPER HYD OIL 46	SUNVIS 747 SUNVIS 821 WR
EXXON	TEXACO
NUTO 46	RANDO OIL HD 46
GULF	UNION 76
HARMONY 46AW	UNAX AW 46
KENDALL	* GOMACO Standard Oil
047 EP	

M-D-999-007

Hydraulic oil chart

Hydraulic Oil

GOMACO recommends any anti-wear hydraulic oil with an I.S.O. viscosity rating of 215 at 100° F (37.8° C) such as Arco Duro AW-46, which is installed in the machine at the factory. The oil has non-foaming and anti-wear additives in it. Refer to the chart for equivalent oils.

Gear Case Oils

Use SAE 90 gear oil with EP additives in the various gear drives unless otherwise instructed. Use of other types of oils will not give satisfactory service and may result in eventual damage.

Grease

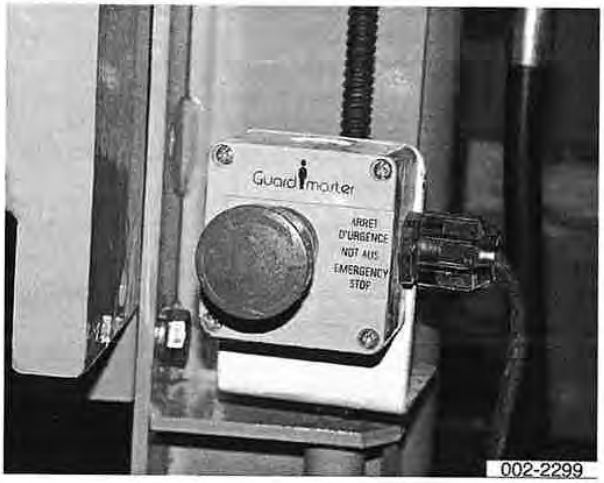
Use any multipurpose lithium soap grease for all grease fittings. Application of grease as instructed in this chapter will provide proper lubrication and will keep contamination out of bearings.

Notice: Use only high grade lubricants which have been stored in clean containers. Wipe away all grease and dirt before removing filler caps or plugs. Wipe grease fittings clean before lubricating.

04 Ten Hour or Daily Service

⚠ WARNING! ⚠

A DEFECTIVE EMERGENCY STOP SYSTEM MAY CAUSE SEVERE INJURY OR DEATH. DO NOT OPERATE THE MACHINE WITH AN INOPERATIVE EMERGENCY STOP SYSTEM. CHECK THE EMERGENCY STOP SYSTEM FOR PROPER WORKING ORDER BEFORE BEGINNING PAVING OPERATIONS.



Check E-stop buttons

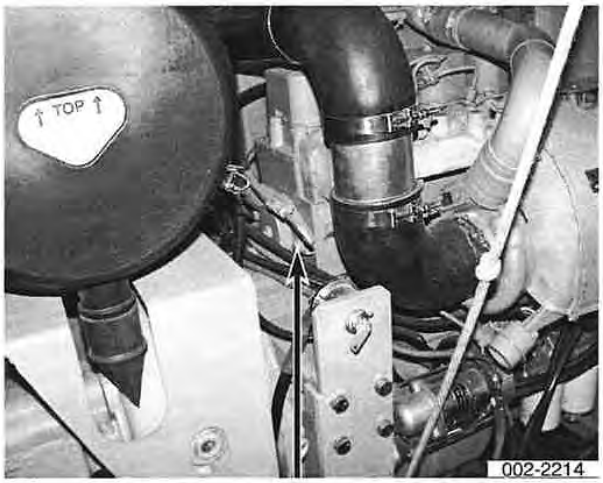


Check E-stop light

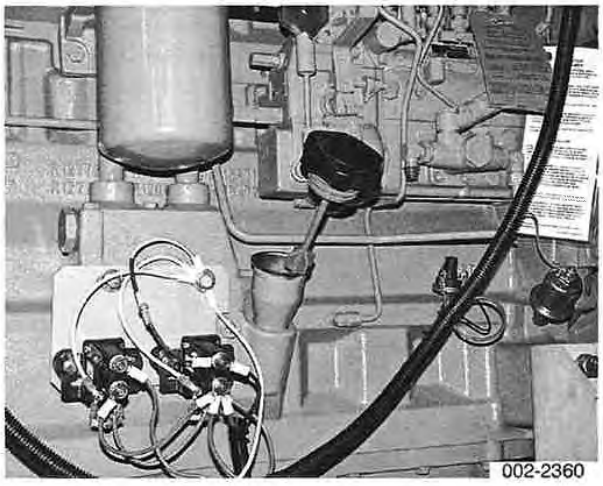
Check the operation of each emergency stop button every day before beginning operation. Make certain that all emergency stop buttons are out and that the check E-stop light on the panel is not illuminated. Depress each emergency stop button, one at a time. Depressing any one emergency stop button should cause the check E-stop light to illuminate. If the check E-stop light does not illuminate after depressing any certain emergency stop button, check the system for faults and correct before operating the machine.



Cat engine dipstick

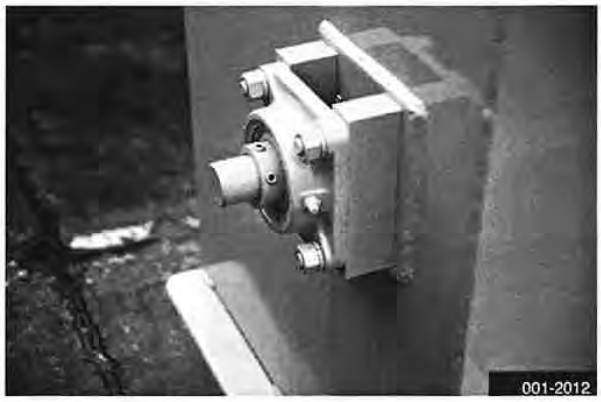


Cummins engine dipstick



John Deere engine dipstick

Check engine crankcase oil level with the bayonet gauge. Do not operate the engine with oil level below the bottom mark. Check the oil level ten minutes after stopping the engine. If the oil level is low, add the proper grade of oil through the oil fill opening until the oil level is to the full mark on the bayonet gauge.



Grease auger bearings (sidewalk form)

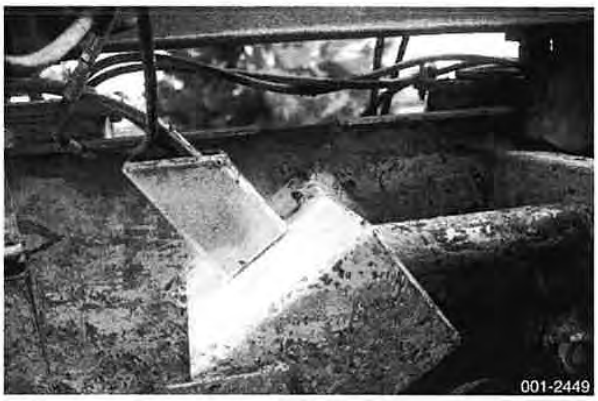
Grease the bearings on each end of the slipform mold cross auger (if so equipped) until resistance is felt against the grease gun handle (1 or 2 pumps). Do not over grease as seal damage could result.



Grease auger bearings (paving form)

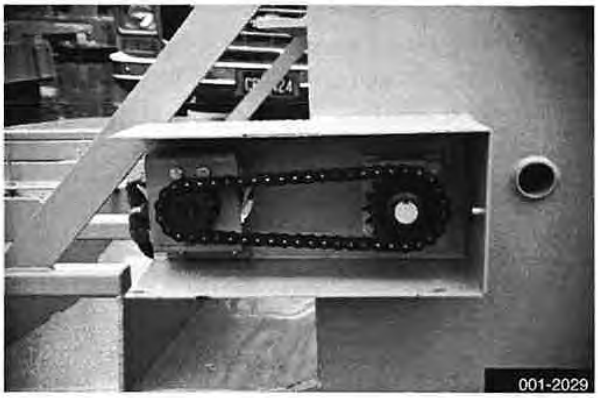
Grease the center hanger bearings on both augers until grease is expelled from between the bearing and the auger shaft.

Note: It is recommended that the auger center hanger bearings should be greased every 2 to 3 hours to flush concrete from the bearings.



Grease the auger drive end bearing (paving form)

Grease the bearing on the drive end of each auger until resistance is felt against the grease gun handle. Do not over grease as bearing seal damage could result. Grease fittings are extended through the top of the drive housing.

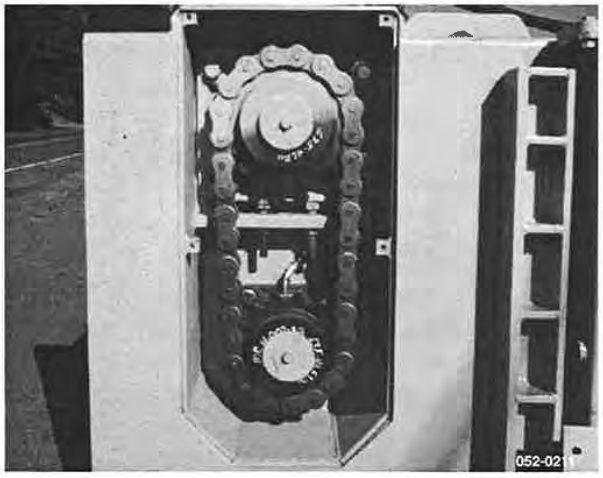


Adjust auger drive chain (sidewalk)

⚠ WARNING! ⚠

TO PREVENT SERIOUS INJURY, DO NOT ATTEMPT TO GREASE THE BEARINGS ON THE AUGER OR ADJUST THE CHAIN TENSION WITH THE AUGER OPERATING. CONTACT WITH MOVING CHAIN OR SPROCKETS CAN CAUSE SERIOUS INJURY. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS TO PREVENT SEVERE INJURY. DO NOT OPERATE THE SLIPFORM MOLD AUGER WITH THE ACCESS COVER REMOVED. STOP THE AUGER AND SHUT OFF THE ENGINE BEFORE GREASING OR ADJUSTING THE CHAIN.

Check the tension of the auger drive chain by removing the access cover from the side of the form. Adjust the chain tension by loosening the motor mount bolts and turning the nut on the adjustment bolt. Proper tension is with approximately 1/4 in. (6 mm) deflection between the sprockets. Tighten all mounting bolts securely.

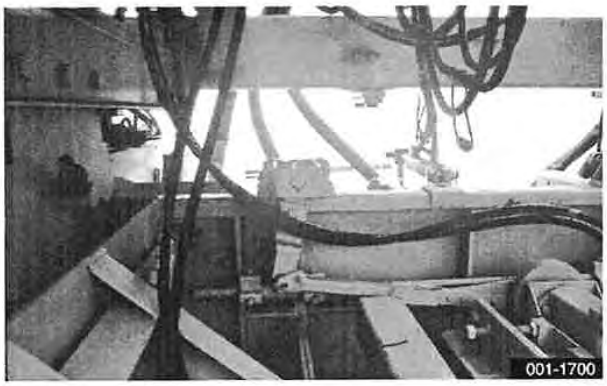


Adjust auger drive chain (paving form)

⚠ WARNING! ⚠

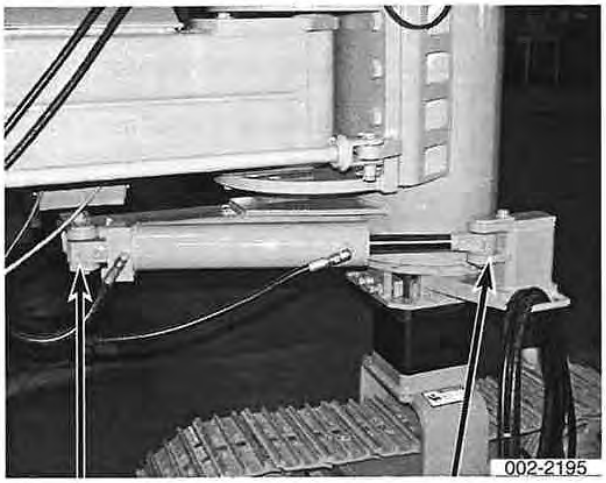
DO NOT ATTEMPT TO ADJUST THE AUGER DRIVE CHAIN TENSION WITH THE ENGINE RUNNING. SEVERE INJURY WILL OCCUR IF CAUGHT IN MOVING CHAIN.

Check the tension of each auger drive chain by removing the access cover from the side of the form. Adjust the chain tension by loosening the motor mount bolts and turning the nut on the adjustment bolt. Proper tension is with approximately 1/4 in. (6 mm) deflection between the sprockets. Tighten all mounting bolts securely. Lubricate the chain with a good chain lubricant. After the cover is installed, seal the joints with a silicone type sealer to keep concrete grout out of the chain box.



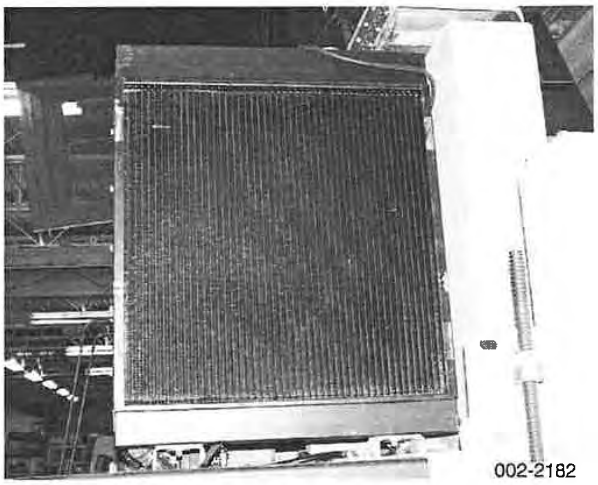
Grease tamper bar drive converters (paving form)

Grease all three points on the tamper bar drive converters on the top of the paving form until grease is expelled from between the bearing and the shaft.



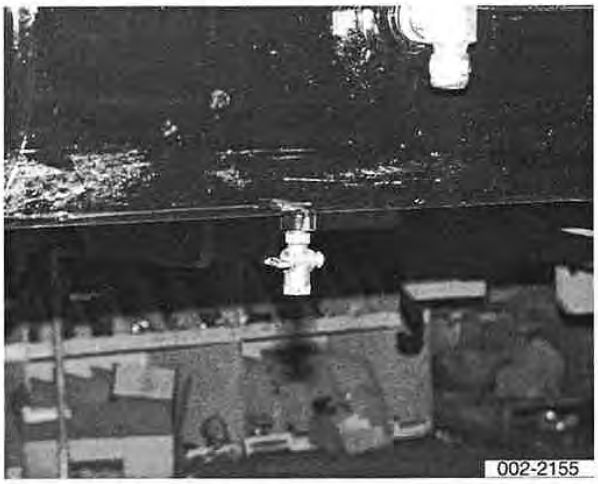
Grease steering cylinder pins

Grease the cylinder pins and bushings on each steering cylinder until grease is expelled from between the bushing and the pin.



Clean engine compartment

Check and clean the engine compartment, radiator core and oil cooler core if necessary. The engine compartment should be cleaned by blowing it out with compressed air or by washing it out with a pressure washer (maximum pressure 100 psi; 6.9 bar). Allow the engine to cool before washing the compartment. The radiator and oil cooler cores can also be cleaned with compressed air or a pressure washer (maximum pressure 100 psi; 6.9 bar). The cores should be cleaned from the outside to the inside.



Drain air reservoir

⚠ WARNING! ⚠

BE CERTAIN TO DRAIN THE AIR RESERVOIR DAILY. IF MOISTURE IS ALLOWED TO ACCUMULATE IN THE TANK IT MAY CAUSE RUSTING ON THE INTERIOR SURFACES. RUST PITS IN THE TANK MAY WEAKEN THE TANK AND CAUSE IT TO BURST. SEVERE INJURY MAY OCCUR IF THE TANK WERE TO BURST.

Open the drain valve on the bottom of the air reservoir tank. Allow all condensation to drain and then close the valve.



Check hydraulic fluid level

Check the hydraulic oil level by observing the oil level in the reservoir sight glass. Oil level should be to the full mark with the oil cold. Do not operate the machine when oil is not visible in the sight glass. Fill to the full mark with the proper grade of hydraulic oil. Oil needs to be changed only if contaminated.



Check air filter restriction indicator

Check the air filter restriction indicator. If the red line is in the window, the air filter element must be replaced. Refer to the air filter service section for replacement instructions. To reset the restriction indicator, push in on the button on the bottom of the indicator and release it.



Fill fuel tank

⚠ WARNING! ⚠

DIESEL FUEL IS FLAMMABLE. WHEN REFUELING THE MACHINE, STOP THE ENGINE. DO NOT SMOKE WITHIN 50 FT. (15 M) OF THE MACHINE. DO NOT ALLOW ANY HOT OR BURNING MATERIALS NEAR THE FUEL FILL LOCATION. SEVERE BURNS MAY OCCUR IF THE FUEL WERE TO IGNITE.

Refill the fuel tank at the end of each day with clean, fresh fuel. Keeping the fuel tank full, reduces condensation to a minimum.



Grease trimmer gearbox

⚠ DANGER! ⚠

TO PREVENT SERIOUS INJURY, OR DEATH, KEEP HANDS, FEET AND CLOTHING CLEAR OF ROTATING TRIMMERWHEEL. IT IS RECOMMENDED TO HAVE SOMEONE AT THE OPERATORS STATION TO STOP THE TRIMMERWHEEL IN CASE OF EMERGENCY.

With the engine idling and the trimmer wheel rotating slowly, inject grease into the fitting next to the drive motor, until grease is expelled from around the large trimmerhead gearbox mounting flange seal (approximately 20 pumps). It is recommended that a multipurpose, high temperature grease be used in this location.

Note: Under dry, dusty or sandy conditions, it is recommended to grease the fitting next to the drive motor more frequently (2 or 4 times a day).



Check engine coolant level

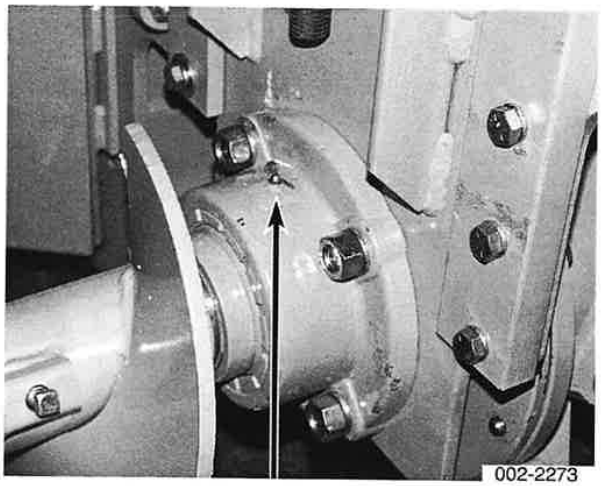
⚠ WARNING! ⚠

IF NECESSARY TO ADD COOLANT TO THE SYSTEM WHEN THE ENGINE IS HOT AND/OR HAS OVERHEATED, USE CARE TO AVOID BEING SCALDED. ALLOW THE ENGINE TO COOL BEFORE REMOVING THE RADIATOR CAP. PLACE A RAG OVER THE RADIATOR CAP AND TURN IT SLOWLY TO THE FIRST STOP, WHICH ALLOWS STEAM TO ESCAPE THROUGH THE OVERFLOW TUBE.

Check the coolant level in the engine radiator. Open the access door to reach the radiator cap. The coolant level should be no more than 1 in. (25 mm) down from the bottom of the filler neck. See the appropriate engine manual for further coolant system instructions. Refer to the specification chapter for coolant system capacities.

05 Fifty Hour or Weekly Service

Perform all ten hour lubrication and periodic services.



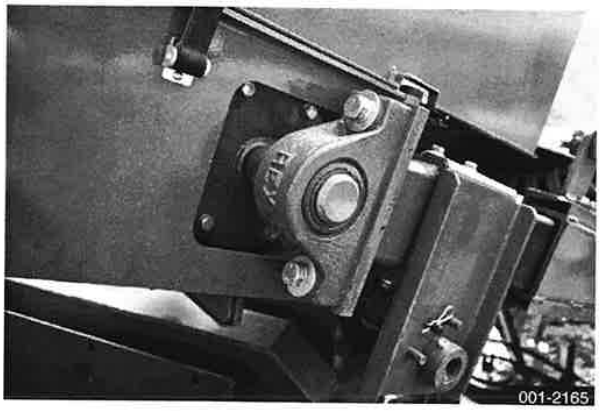
Grease trimmer discharge bearing

⚠ DANGER! ⚠

TO PREVENT SERIOUS INJURY, OR DEATH, DO NOT ATTEMPT TO GREASE THE BEARING ON THE DISCHARGE END OF THE TRIMMERWHEEL WITH THE WHEEL ROTATING. STOP THE WHEEL AND SHUT OFF THE ENGINE BEFORE GREASING.

With the trimmerwheel stopped, grease the bearing on the auger shaft end of the trimmerhead until resistance is felt against the grease gun handle (1 or 2 pumps). Do not over grease as seal damage could result.

Note: Under dry, dusty or sandy conditions, it may be necessary to grease the trimmer auger shaft bearing more frequently.

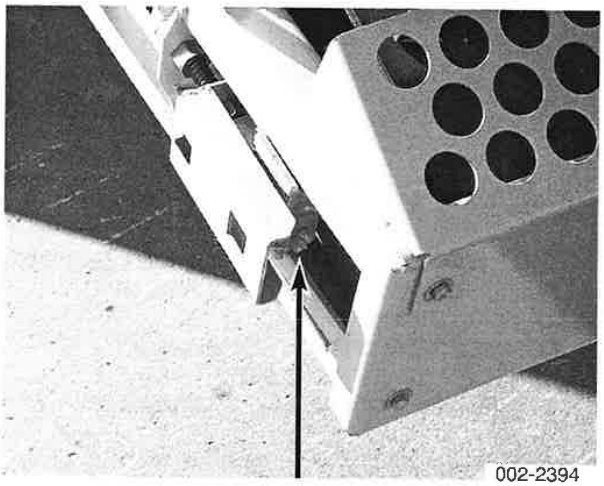


Grease conveyor bearings

⚠ WARNING! ⚠

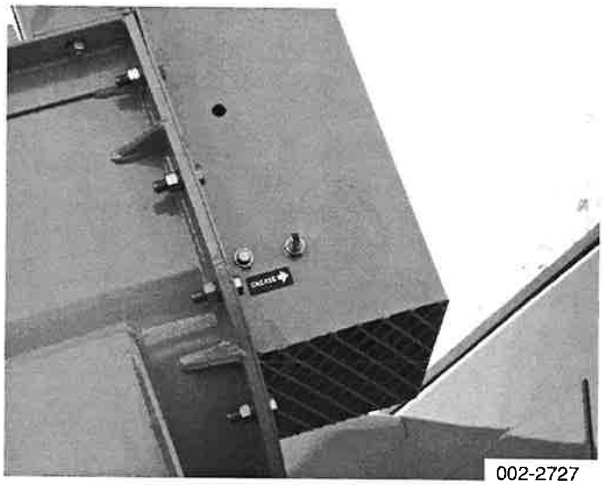
TO PREVENT SERIOUS INJURY, DO NOT ATTEMPT TO GREASE THE BEARINGS ON THE CONVEYOR WITH THE CONVEYOR OPERATING. STOP THE CONVEYOR AND STOP THE ENGINE BEFORE GREASING.

Grease the conveyor drive pulley (upper end) bearing, on the side opposite of the drive motor, until resistance is felt against the grease gun handle (1 or 2 pumps). Do not over grease as seal damage could result.



Grease conveyor idler pulley bearings

Grease bearings on each side of the conveyor idler pulley (lower end) until resistance is felt against the grease gun handle (1 or 2 pumps). Do not over grease as seal damage could result.



Grease auger conveyor bearing

⚠ WARNING! ⚠

TO PREVENT SERIOUS INJURY, DO NOT ATTEMPT TO GREASE THE BEARINGS ON THE AUGER CONVEYOR WHILE IN OPERATION. STOP THE AUGER CONVEYOR AND STOP THE ENGINE BEFORE GREASING.

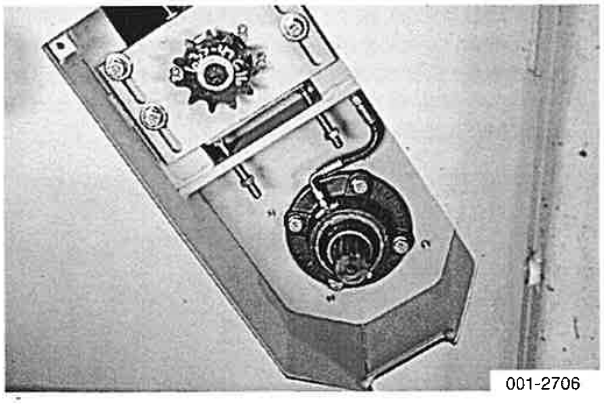
Grease the auger conveyor drive bearing until resistance is felt against the grease gun handle (3 or 4 pumps). Do not over grease as seal damage could result.

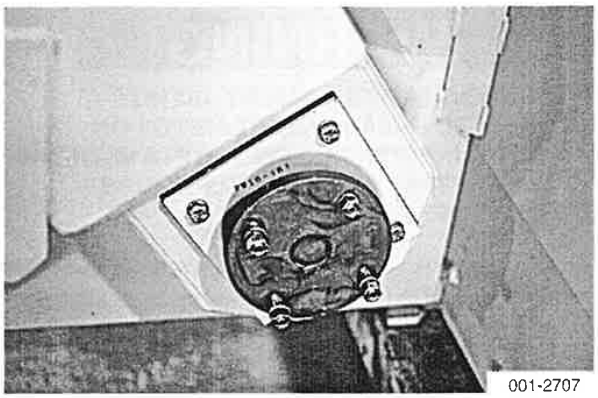


002-2720

Grease auger conveyor idler bearing

Grease the auger conveyor idler bearing (lower end) until resistance is felt against the grease gun handle (1 or 2 pumps). Do not over grease as seal damage could result.


001-2706

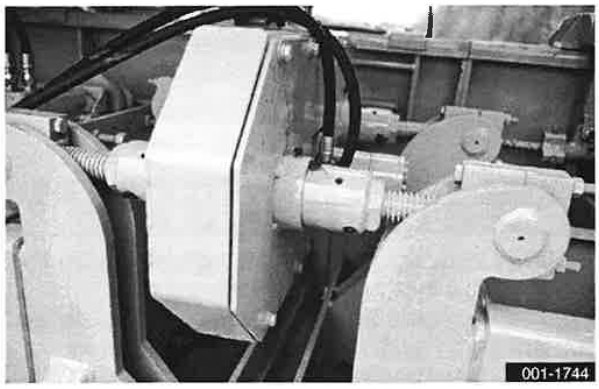

001-2707

Check auger shaft seal

Check the seal around the paving form auger shaft. Lower the hydraulic sideplates to allow the removal of the access plate over the auger drive chain. Check for visible signs of wear and leakage of concrete into the auger bearing housing. Replace the seal as necessary.

To replace the seal, remove the chain from the sprocket wheel and mark the outside of the sprocket wheel. Remove the sprocket wheel and the spacer from the splined shaft. Remove a section of the auger to allow removal of the splined shaft. Remove the bolts from the cover plate over the shaft seal. Loosen the allen screws in the bearing locking collar and pull the splined shaft from the bearing. Replace the seal and assemble the parts in reverse order.

Note: Make certain that the step in the stub shaft is fully inserted to contact the back of the bearing.


001-1744

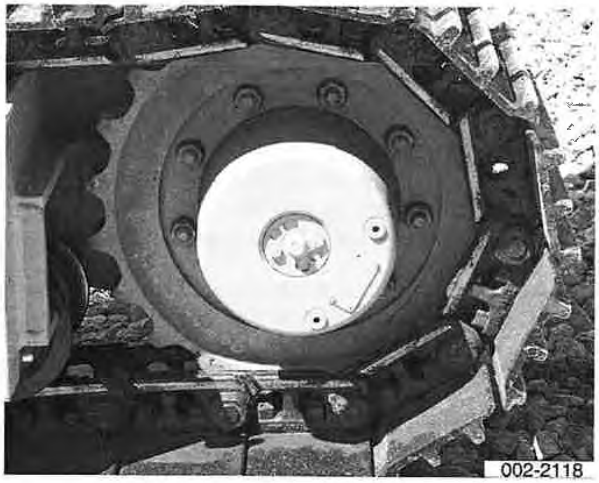
Grease PTA sprockets

⚠ WARNING! ⚠

TO PREVENT SERIOUS INJURY, DO NOT ATTEMPT TO GREASE THE BEARINGS OR ADJUST CHAIN TENSION ON THE PTA WITH THE PTA OPERATING. SHUT OFF THE ENGINE BEFORE GREASING.

Grease the drive sprockets on the PTA drive assembly in the paving form (if equipped). It may be necessary to remove the chain covers, or to turn the PTA assembly, using the PTA switch on the control console, to gain access to the grease fittings. Lubricate the drive chain with chain lube.

Check the tension of the PTA drive chain. Adjust the chain tension by loosening the motor mount bolts and tightening the motor mount adjustment bolt. Proper tension is with approximately 1/4 in. (6 mm) deflection between the sprockets. Tighten all mounting bolts securely.



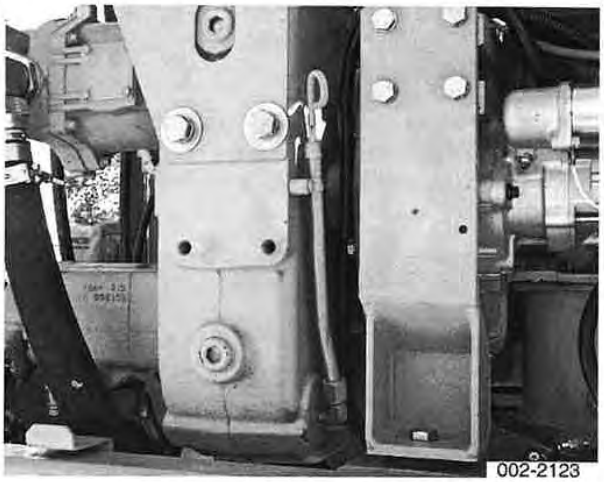
Check track drive gearbox oil level

⚠ WARNING! ⚠

MOVING TRACKS CAN CAUSE SERIOUS INJURY. BE CERTAIN THAT NO ONE IS NEAR THE TRACKS BEFORE MOVING THE MACHINE. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS.

Check the gear oil level in the track drive gearboxes. Rotate the box until the fill/drain plug is on the top. Remove the check plug from the center of the gearbox. Gear oil should flow from the opening. If not, add EP-90 gear oil until it begins to flow from the check plug opening.

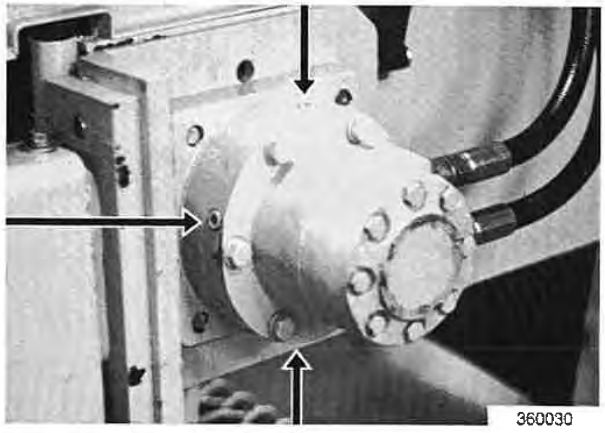
Note: If hydraulic oil flows from the check plug hole, suspect that the shaft seal on the hydraulic drive motor has failed. It will be necessary to remove the drive motor and replace the seal.



Check pump drive gearbox oil level

Check gear oil level in the pump drive gearbox with the bayonet gauge. Do not operate the pump drive gearbox with the gear oil level below the bottom mark. If the oil level is low, remove the pipe plug near the top of the gearbox and add EP-90 gear oil until the oil level is to the full mark on the bayonet gauge.

Note: If the oil level is above the full mark on the bayonet gauge, or oil is being expelled from the breather, suspect that the shaft seal on one of the hydraulic pumps has failed. It will be necessary to remove one, or possibly all, of the pumps to find and replace the defective seal.



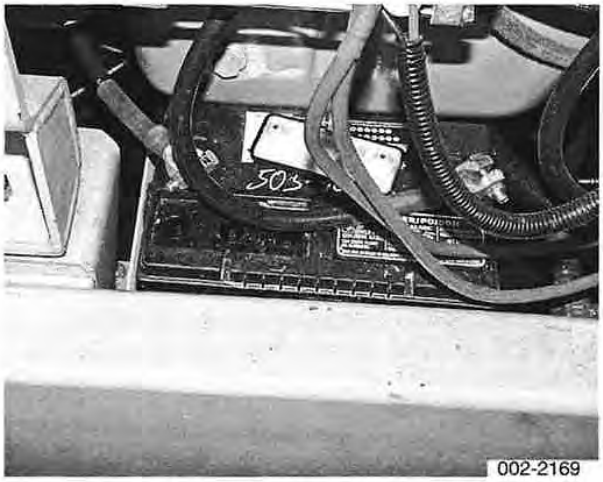
Conveyor drive gearbox check plug

⚠ WARNING! ⚠

KEEP HANDS, FEET, TOOLS AND CLOTHING AWAY FROM MOVING CONVEYOR BELT AND ROLLERS. SERIOUS INJURY OR DEATH MAY RESULT IF ENTANGLED.

Check the gear oil level in the conveyor drive gearbox. Gear oil should flow from the check opening when the plug is removed. If not, add EP-90 gear oil through the top fill plug opening, until it begins to flow from the check plug opening.

Note: If hydraulic oil flows from the check plug hole, suspect that the shaft seal on the hydraulic drive motor has failed. It will be necessary to remove the drive motor and replace the seal.



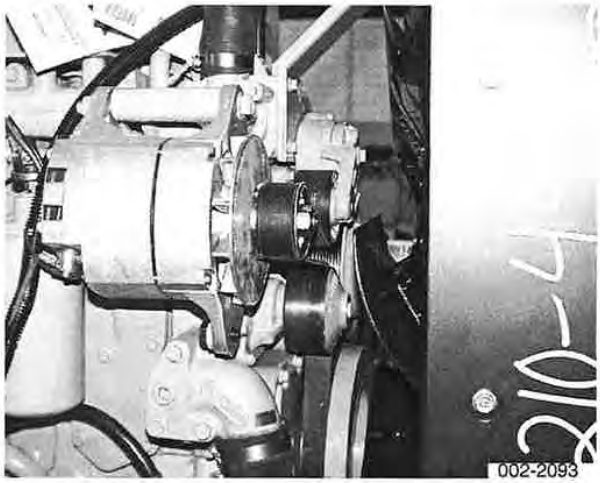
Check battery electrolyte level

⚠ WARNING! ⚠

BATTERIES CONTAIN SULFURIC ACID AND NORMALLY PRODUCE EXPLOSIVE GASES WHICH CAN CAUSE SERIOUS INJURY. THEREFORE, DO NOT ALLOW FLAMES OR SPARKS TO COME NEAR THE BATTERY. WHEN CHARGING OR WORKING NEAR A BATTERY, ALWAYS SHIELD YOUR FACE AND PROTECT YOUR EYES. IN CASE OF ACID CONTACT WITH SKIN OR EYES, FLUSH IMMEDIATELY WITH WATER FOR A MINIMUM OF 15 MINUTES AND GET PROMPT MEDICAL ATTENTION. IF ACID IS SWALLOWED, CALL A PHYSICIAN IMMEDIATELY.

Check the level of the electrolyte (acid and water solution) in each of the cells of the battery. Use distilled water or any clean water that is fit to drink and does not have a high mineral content to fill the cells to the bottom of the filler necks.

Note: Do not add water in freezing weather unless the engine is to be ran two or three hours, or the battery is to be charged for a minimum of one hour, to thoroughly mix the water and electrolyte.



Check alternator and fan belts

⚠ WARNING! ⚠

DO NOT ATTEMPT TO CHECK THE BELTS WITH THE ENGINE RUNNING. SEVERE INJURY WILL OCCUR IF CAUGHT IN MOVING BELTS.

Check the belts for any sign of wear. Replace belts that are cracked or frayed. Refer to the engine manual for further instructions.



Adjust conveyor belt tension

⚠ WARNING! ⚠

KEEP HANDS, FEET, TOOLS AND CLOTHING AWAY FROM MOVING CONVEYOR BELT AND ROLLERS. SERIOUS INJURY OR DEATH MAY RESULT IF ENTANGLED.

Check the conveyor belt tension and alignment. If the belt tension is insufficient (apparent by drive pulley slippage), tighten the belt by adjusting the position of the idler pulley evenly on both sides.

To align the belt, start the engine and allow it to run at 1000 rpm. Move the conveyor directional control switch to the "forward" position and allow the belt to rotate. Observe the belt to see which side it is running to. Turn the idler pulley adjuster nut, in small increments, on the side the belt is running to. Allow the belt to rotate five or six complete revolutions before making more adjustments to allow time for belt to center itself. Secure adjuster nut with jam nut.

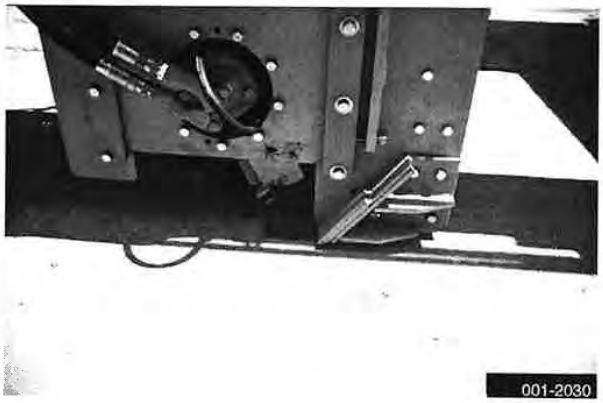
Note: If belt will not stay properly aligned, check troughing rollers for squareness to frame and adjust if necessary.



Replace belt wiper

Inspect the belt wipers on the underside of the conveyor just inside of the discharge hopper. If the wipers are damaged or are worn out, they will need to be replaced. Release the spring tension on the wiper assembly. Remove the lock nut and the retainer plate on each wiper assembly. Remove and replace the wipers. Reinstall the retainer plates and the locking nuts, and tighten securely. Tension the wipers against the conveyor belt until there is enough tension to wipe the belt clean.

Note: The belt wiper must be thoroughly cleaned at the end of each day to maintain its' effectiveness.



Adjust trimmer wheel height

⚠ DANGER! ⚠

TO PREVENT SERIOUS INJURY, OR DEATH, KEEP HANDS, FEET AND CLOTHING CLEAR OF ROTATING TRIMMERWHEEL. IT IS RECOMMENDED TO HAVE SOMEONE AT THE OPERATORS STATION TO STOP THE TRIMMERWHEEL IN CASE OF EMERGENCY.

The trimmer wheel is properly adjusted when the teeth are 1/4 in. to 3/8 in. (6 to 10 mm) below the cutting edge of the moldboard.

One way to adjust the trimmer wheel is to position the machine on a flat, level, concrete or asphalt surface. Place a 6 in. x 6 in. x 3/8 in. (150 mm x 150 mm x 10 mm) steel plate under each end of the trimmerhead moldboard. Lower the machine until the moldboard rests on the plate. Make certain the machine frame is parallel to the surface it is setting on. Allow the engine to run at the lowest speed and move the trimmerhead control switch to the "forward" position.

If the trimmerwheel teeth do not strike the surface, it will be necessary to adjust the trimmerwheel down. Place the trimmerhead control switch in the "neutral" position and stop the engine. Slightly loosen the cap screws securing the guide plates at each end of the trimmerhead. Adjust the trimmer wheel up or down with the adjusting bolts until the teeth lightly strike the concrete or asphalt surface. Tighten all cap screws and setscrews securely.



Tooth marks in grade

⚠ DANGER! ⚠

TO PREVENT SERIOUS INJURY, OR DEATH, KEEP HANDS, FEET AND CLOTHING CLEAR OF ROTATING TRIMMERWHEEL. IT IS RECOMMENDED TO HAVE SOMEONE AT THE OPERATORS STATION TO STOP THE TRIMMERWHEEL IN CASE OF EMERGENCY.

The trimmer wheel can also be adjusted during trimming operations by observing the finished grade behind the machine. When trimming, teeth marks should be slightly visible in the subgrade. If teeth are set more than 3/8 in. (10 mm) below the moldboard, excessive loose material will be left on the subgrade. If the teeth are set above the moldboard, increased tractive pressure will result as well as a poorly finished subgrade. If the teeth are set above the moldboard, it can cause the machine to shift sideways, creating steering problems. Trimmer wheel adjustment must be made to compensate for tooth wear. Adjust the trimmer wheel height as previously described.



Replace trimmer teeth

⚠ DANGER! ⚠

TO PREVENT SERIOUS INJURY, OR DEATH, BE CERTAIN THAT THE ENGINE IS STOPPED BEFORE WORKING ON THE TRIMMERWHEEL. IT IS RECOMMENDED TO REMOVE THE KEY FROM THE IGNITION SWITCH TO KEEP THE ENGINE FROM BEING ACCIDENTALLY STARTED. WEAR EYE PROTECTION WHEN REMOVING AND REPLACING THE TEETH.

If the carbide tip breaks off of the tooth, it will allow the remaining portion to wear off rapidly. It will be necessary to replace the tooth to prevent the holder from wearing also. Stop the engine. Place a punch against the rear of the tooth shank and drive it out from the rear. Set a new tooth in place in the holder and place the special driver tool (GOMACO part # GT80-119) over the tip. Tap the new tooth into place. Be certain the flat area on the shank of the tooth is on the same side as the flat area on the holder before driving the tooth in place.

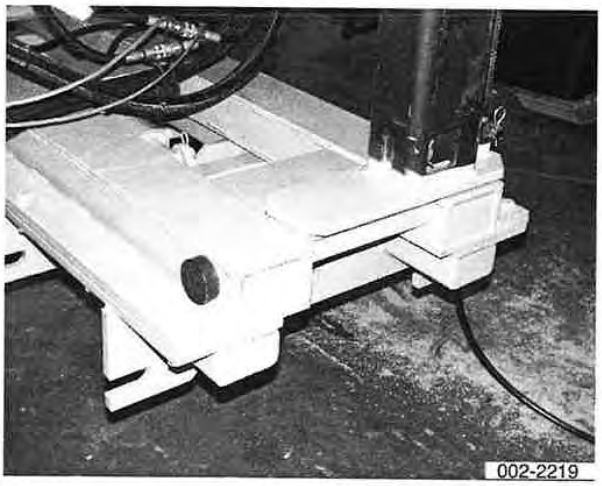
06 150 Hour or Monthly Service

Perform all 10 and 50 hour lubrication and periodic services.



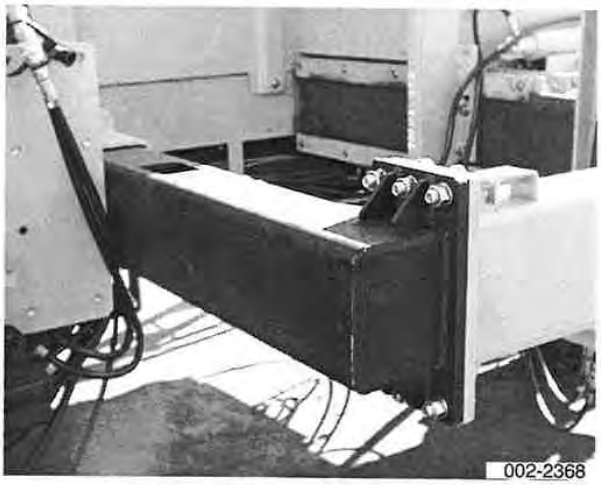
Grease inner guide tubes

Using the control loop jog switches, raise the machine to maximum up position. Apply a graphite dry lubricant on all four sides of each inner leg guide tube. The dry lubricant prevents accumulation of foreign material which could cause premature replacement of the wear pads.



Lubricate the trimmer lift legs

Using the trimmer lift jog switches, extend the trimmer lift legs to the maximum down position (it may be necessary to raise the machine frame to allow full extension). Apply a graphite dry lubricant on all four sides of each inner leg guide tube. The dry lubricant prevents accumulation of foreign material which could cause premature replacement of the wear pads.



Lubricate the mold shift extension tubes

Using the mold shift extend jog switches, fully extend the mold shift extension tubes. Apply a graphite dry lubricant on all four sides of each inner extension tube. The dry lubricant prevents accumulation of foreign material which could cause premature replacement of the wear pads.



Lubricate the right front leg extension tube

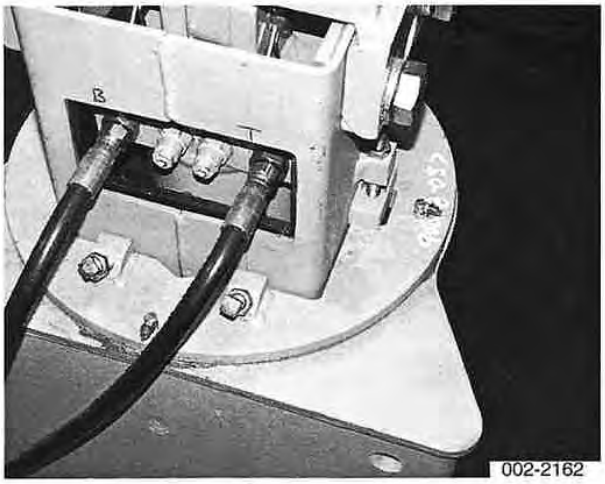
Using the right front leg extend jog switch, fully extend the right front extension tube. Apply a graphite dry lubricant on all four sides of the inner extension tube. The dry lubricant prevents accumulation of foreign material which could cause premature replacement of the wear pads.



Lower guide tube grease fittings

Grease the bronze bearing at the lower end of each track guide tube. Give each of the four grease fittings, on each guide tube, 5-6 pumps of grease.

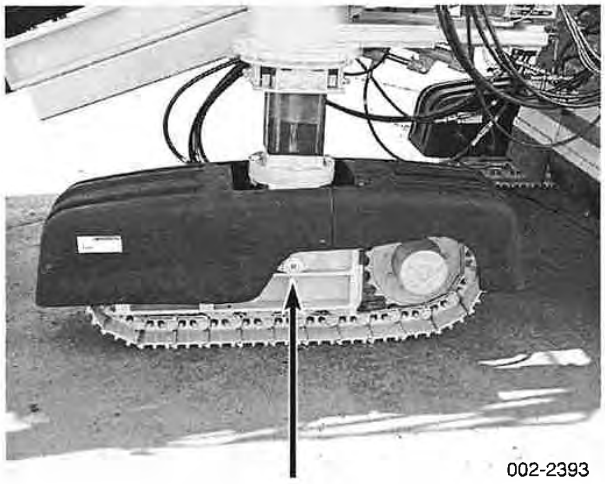
Loosen the jam nuts on the adjustment setscrews on the bottom of each leg, and turn the setscrews in snug against the wear bar to eliminate any looseness between the inner and outer guide tubes. Tighten the jam nuts securely. Repeat the procedure on all three legs.



Upper guide tube grease fittings

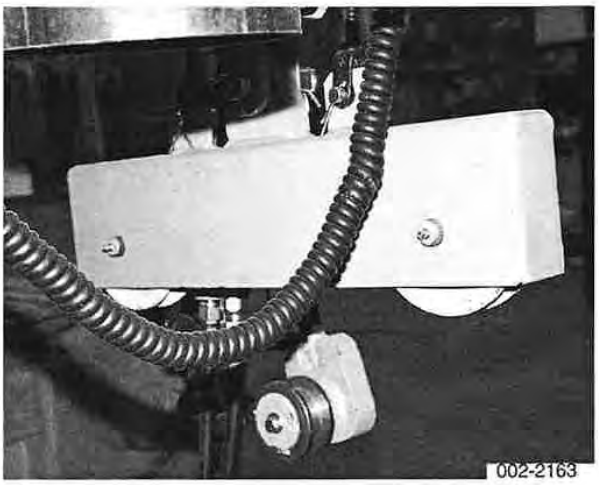
Grease the guide plate at the upper end of each track guide tube. Give each of the four grease fittings, on each guide tube, 5-6 pumps of grease.

Loosen the jam nuts and turn the setscrews in snug against the retainer blocks on the top of the upper guide tube plate. Tighten the jam nuts securely. Loosen the jam nuts and turn the setscrews in tight against the side of the square guide tube. Tighten the jam nuts securely. Repeat the procedure on all three legs.



Grease track yoke pivot pin

Grease the track pivot yoke pin, on each track, through the bottom of each guide tube and track frame yoke until grease is expelled from between the guide tube and the yoke.



Grease hold-down trolley

Grease each of the trolley wheels on the hold down assembly until grease is expelled from between the shaft and the wheel.



Grease swinging leg

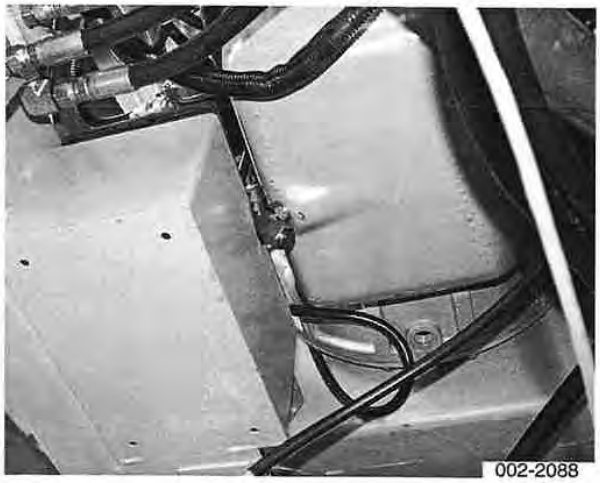
Grease the front and rear pivot pins in the swinging left front extension assembly until grease is expelled from between the pins and the bushings.



Grease the 4-track swinging leg pin

Grease the pivot pins for each swinging leg assembly until grease is expelled from between the pin and the hinge tube.

07 250 Hour Service

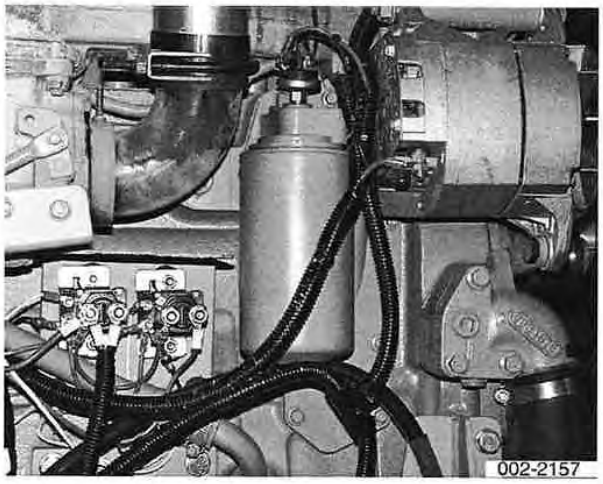


Drain engine oil

⚠ WARNING! ⚠

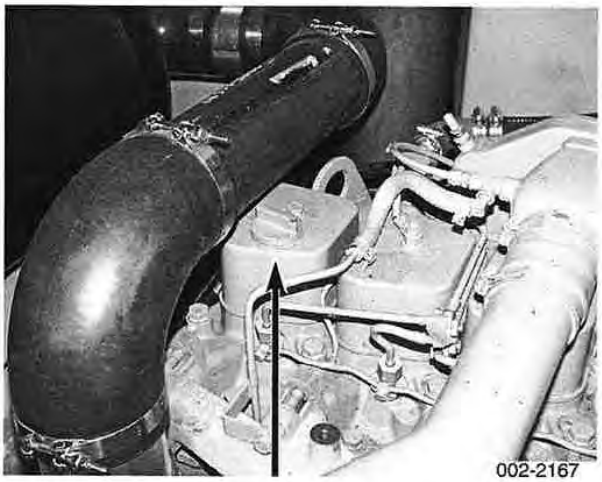
USE CARE WHEN REMOVING THE DRAIN PLUG TO PREVENT CONTACT WITH THE HOT OIL. HOT OIL CAN CAUSE SEVERE BURNS.

Change the engine oil by removing the drain plug from the end of the drain line and allowing the oil to drain into a container. The oil should be drained at the end of a work day while it is still warm. This will allow the oil to drain faster and all contamination suspended in the oil will drain with it.



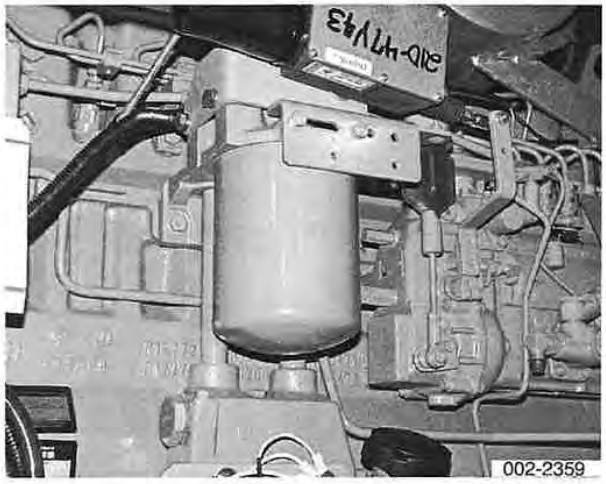
Replace oil filter

Remove the engine oil filter element and discard the oil filter and the oil properly. Make certain that all of the old gasket is removed and clean any dirt from the filter base. When installing the new engine oil filter, coat the gasket with a light coat of engine oil. Fill the filter with clean engine oil and install it. Hand tighten the filter element 3/4 turn after the gasket contacts the base.



Fill engine with oil

Replace the drain plug and refill the engine with the proper grade of oil in accordance with the instructions given in the lubricating oil specification section of the appropriate engine manual. Start the engine and inspect the oil filter canister for leaks.



John Deere engine oil filter

Note: The engine oil filter should be changed after the first 100 hours of operation, then every 250 hours thereafter.

Run the engine approximately 5 minutes to warm up the oil. Shut off the engine. Remove the oil drain plug and drain into a container. Remove and discard the engine filter element using a suitable wrench. Remove the oil filter seal and clean the filter mounting pad. Oil the new seal and install the new filter element on to the filter housing. Tighten the element approximately 1/2 to 3/4 turn after the seal contacts the filter housing. Do not overtighten the element. Install the oil drain plug with a new seal if necessary.

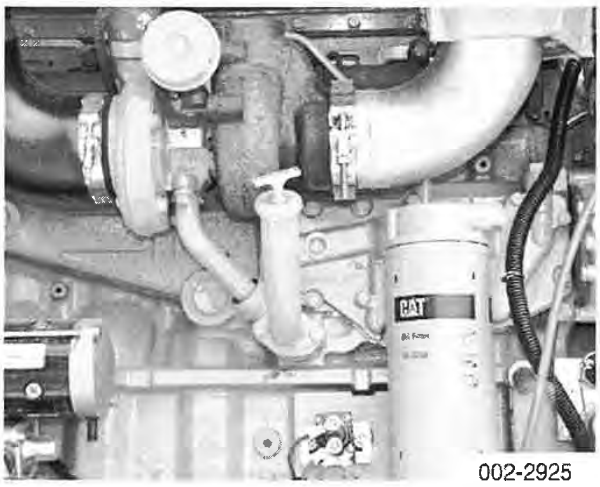


Engine oil fill

Fill the engine crankcase with the appropriate oil through the dipstick opening.

Notice: Immediately after completing any oil change, crank the engine for 30 seconds without permitting the engine to start. This will help insure adequate lubrication to engine components before the engine starts.

Start the engine and run to check for possible leaks. Stop the engine and check the oil level after 10 minutes. Add oil as necessary.



Cat engine oil filter

Run the engine approximately 5 minutes to warm up the oil. Shut off the engine. Remove the oil drain plug and drain into a container. Remove and discard the engine filter element using a suitable wrench. Remove the oil filter seal and clean the filter mounting pad. Oil the new seal and install the new filter element on to the filter housing. Tighten the element as indicated on the new filter housing. Do not overtighten the element.

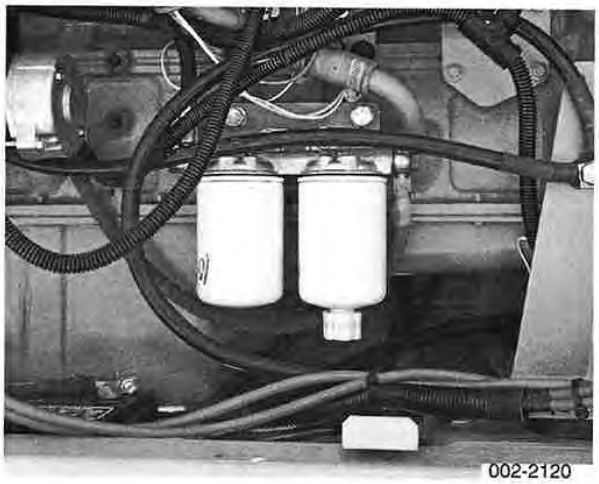
Replace the drain plug and refill the engine with the proper grade of oil in accordance with the instructions given in the lubricating oil specification section of the appropriate engine manual. Start the engine and operate at low idle for two minutes. Inspect the oil filter canister for leaks.

08 500 Hour Service

Perform all 10, 50 and 250 hour lubrication and periodic services.



Replace in-line filter

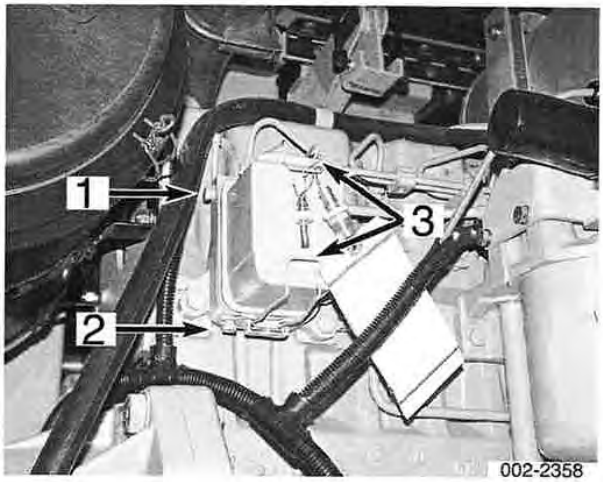


Replace fuel filters

Remove the engine fuel filter elements as well as the in-line fuel filter and discard the fuel filters properly. Make certain that all of the old gasket is removed and clean any dirt from the filter bases. Fill the new elements with clean fuel and reinstall them. Tighten the filter elements 3/4 of a turn after the gasket contacts the base. Refer to the Cummins Diesel Engine Manual for further fuel system service.

Note: Drain the water from the bottom of the front fuel filter at least once a week. Turn the drain plug out approximately 2 turns and allow a small amount of fuel and any water to drain. Tighten the drain fitting securely. Refer to the Cummins engine manual for further instructions.

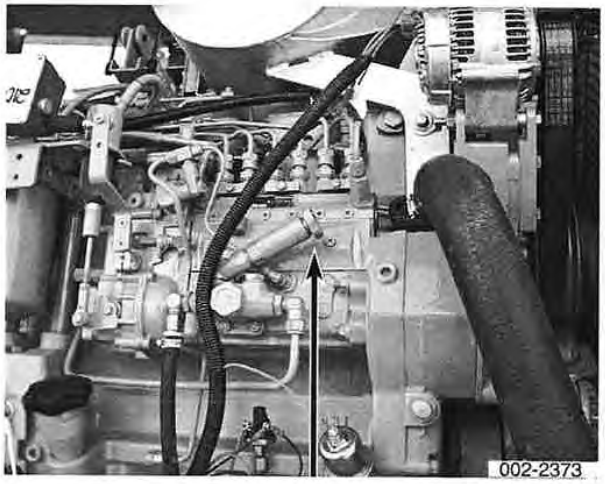
Notice: The in-line fuel filter may require servicing more often depending upon fuel quality and working conditions.



John Deere engine fuel filter

Loosen the bleed plug (1) on the side of the filter base. Place a small container under the drain plug to catch draining fuel and remove the drain plug (2) to drain the fuel from the filter. With the fuel filter held firmly against the base, lift up on the top retaining spring (3) and pull down on the bottom retaining spring (3). Pull the fuel filter off the guide pins of the filter base and discard the filter. Install the new fuel filter onto the guide pins of the base. Firmly hold the filter against the base and secure it with the top and bottom retaining springs. Install a new drain plug (2). Tighten the drain plug securely. Do not overtighten.

Notice: The in-line fuel filter may require servicing more often depending upon fuel quality and working conditions.



Fuel hand primer

Loosen the bleed plug (1) on the fuel filter base. Operate the hand primer until a smooth flow of fuel, free of bubbles, comes out of the filter plug hole.

Simultaneously stroke the hand primer down and close the bleed plug. This prevents air from entering the system. Tighten the bleed plug securely. Do not overtighten. Start the engine and check for leaks.

Note: If the engine does not start, it may be necessary to bleed air from the fuel system at the injection nozzles.



Cat engine fuel filters

Remove the in-line fuel filter and discard properly. Insert the new in-line fuel filter, being careful to insert it for proper direction of flow and tighten the band clamps securely.

Notice: The in-line fuel filter may require servicing more often depending upon fuel quality and working conditions.

The primary filter/water separator also provides filtration to help extend the life of the secondary fuel filter. The element should be changed regularly. Remove the drain plug and loosen one of the fuel lines to vent, at the filter base, to start the flow of fuel. Allow the fuel to drain into a suitable container and dispose of the fuel properly. Install the drain plug and tighten the fuel line. Remove the canister from the filter base and remove the element from the canister. Dispose of the used element properly. Inspect the gasket and replace if necessary. Lubricate the gasket with clean diesel fuel. Install a new element in the canister. The canister may be filled with fuel at this time. Install the canister on the filter base and tighten as indicated on the filter canister.

Note: Drain the water from the bottom of the primary fuel/water separator at least once a week. Turn the drain plug out approximately 2 turns and allow a small amount of fuel and any water to drain. Tighten the drain fitting securely. Refer to the Caterpillar engine manual for further instructions.

Remove the secondary filter. Clean the filter base. Lubricate the gasket on the new filter with clean diesel fuel. Install the filter on the filter base and tighten as indicated on the filter canister. Loosen the fuel line exiting the secondary filter base and turn the ignition key to the "on" position. Capture any leaking fuel in a suitable container and dispose of properly. Tighten the fuel line after all air has escaped from the fuel canister. Start the engine and immediately increase to 1500 rpm. Maintain the engine rpm until it operates smoothly. Refer to the Caterpillar Diesel Engine Manual for further fuel system service.

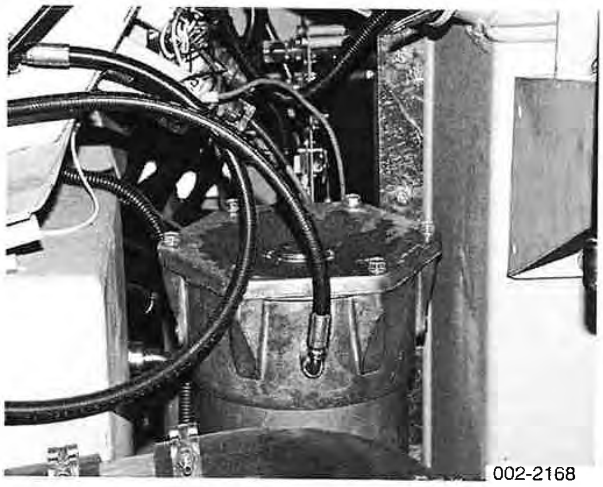
09 600 Hour or Annual Service

Perform all 10, 50, 250 and 500 hour lubrication and periodic services.

It will be necessary to lower the hydraulic oil level when changing the hydraulic filters. Locate the drain plug under the vertical surge tank and remove the drain plug. Allow the oil to drain into a clean container of approximately 55 gallons (208 L) until the oil level is below the bottom of the access plate on the rear of the vertical surge tank. Place thread sealer on the drain plug and install it. Tighten the plug securely.

Note: It is recommended to replace all hydraulic filters before replacing the hydraulic oil that was drained.

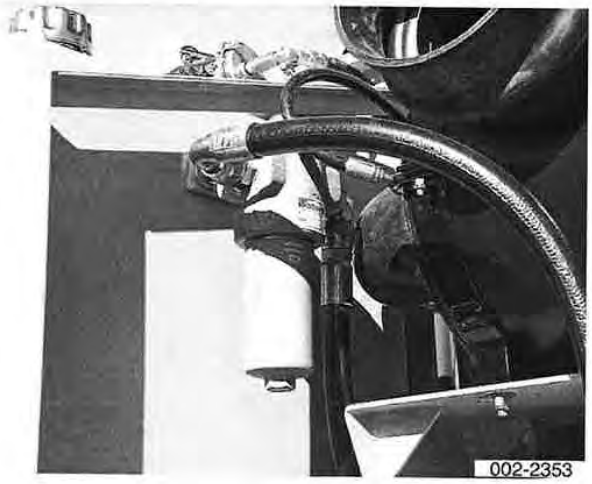
Remove the cover over the main filter. Remove the filter cap by removing the capscrews and lifting the cover off. Notches are provided on each side of the cap to pry it off if necessary.



Replace hydraulic oil filter

Remove the retainer spring, relief valve assembly and the filter element from the filter. Discard the old element properly and replace it with a new one. Be certain the element is centered over the guide in the bottom of the filter canister. Replace the relief valve assembly (spring end down) and then the retainer spring. Check the o-ring on the cover and replace it if necessary. Bolt the filter cap in place and replace the cover. Replace the hydraulic oil which was drained from the system if no other filters are to be replaced.

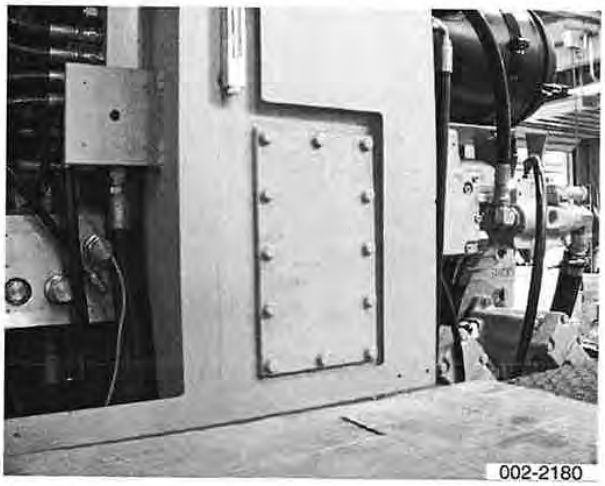
Note: The main filter element should be replaced after the first 50 hours of operation and then annually, or whenever the filter pressure indicator is in the replace zone, with the hydraulic oil at operating temperature.



Replace high pressure lift filter

Replace the high pressure lift filter. Unscrew the filter canister from the base and discard the old filter element properly. Clean the inside of the filter canister thoroughly. A magnetic ring may be located inside the filter canister and should remain in the canister for collection of metal particles. Install a new filter element in the canister and replace the assembly. Tighten the canister securely.

Note: The high pressure lift filter element should be replaced after the first 50 hours of operation and then annually, or whenever the filter pressure indicator on the filter head is popped up with the hydraulic oil at operating temperature.



Remove sump filter access cover

Remove and clean the sump filters. Drain the hydraulic oil level down as previously described. Remove the access cover from the rear of the surge tank. Reach down into the tank and unscrew the sump filters and remove them. Remove all gasket material from the sump tank opening and from the access cover.

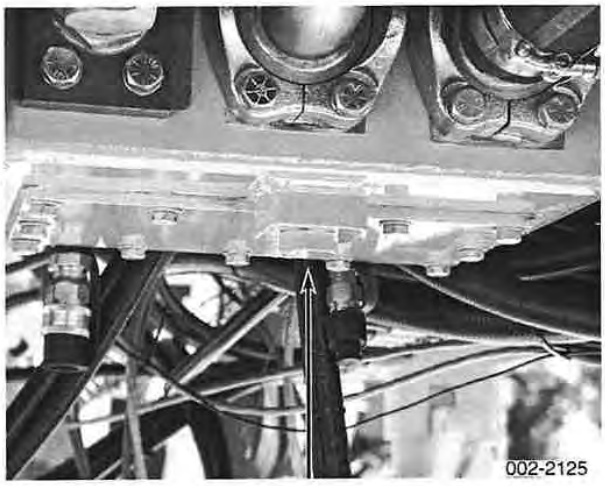


Remove sump filters

After the filter elements are removed, wash the elements in clean solvent or diesel fuel. Blow the elements dry and reinstall the filters. Hand tighten the

elements only. Replace the access cover gasket (part GT60-396) and reinstall the cover. Replace the rubber seal washers (part #420-30A96) on the cover cap screws if damaged. Replace the hydraulic oil which was drained from the system if no other filters are to be replaced.

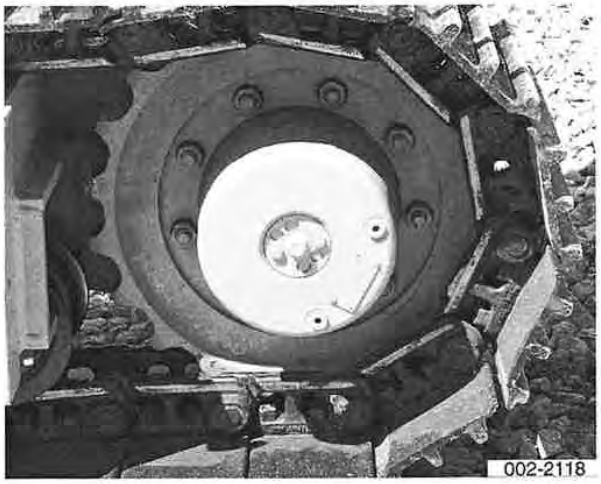
Note: The sump filters should be cleaned any time that the main filter elements are replaced. The sump filters need to be replaced only if damaged.



Hydraulic oil drain plugs

The hydraulic oil needs to be changed only if it is contaminated. The oil is contaminated when the main filters need frequent changing, or when water or diesel fuel has gotten into the system. To drain, remove the drain plugs from the bottom of each tank (3 locations). Remove any contamination from the drain plugs, replace the o-ring seal if necessary and reinsert the plug. Tighten the plug securely. Dispose of the hydraulic oil properly. Refill the hydraulic system with the proper hydraulic oil. Hydraulic oil capacity is approximately 150 US gallons (568 Liters).

Note: It is recommended that a hydraulic oil sample should be taken at least once a year to check for contamination. Send the sample to an accredited laboratory for testing. It may be necessary to take samples more than once a year for better accuracy in testing.



Change oil in torque hub gearbox

⚠ WARNING! ⚠

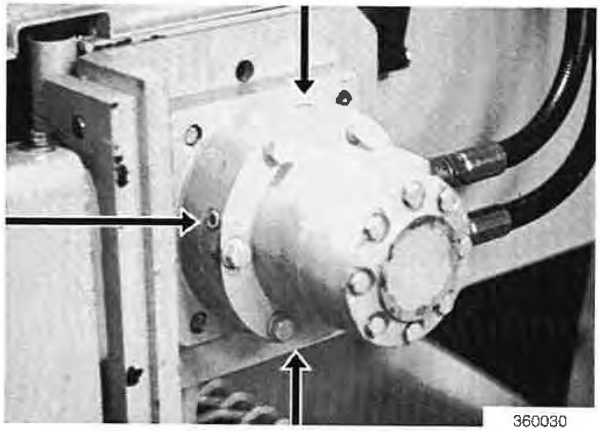
MOVING TRACKS CAN CAUSE SERIOUS INJURY. BE CERTAIN THAT NO ONE IS NEAR THE TRACK BEFORE MOVING IT. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS.

Drain the gear oil from the track drive gearboxes and dispose of the oil properly. Refill with clean new EP-90 gear oil. To drain the oil, rotate the fill plug to the bottom.



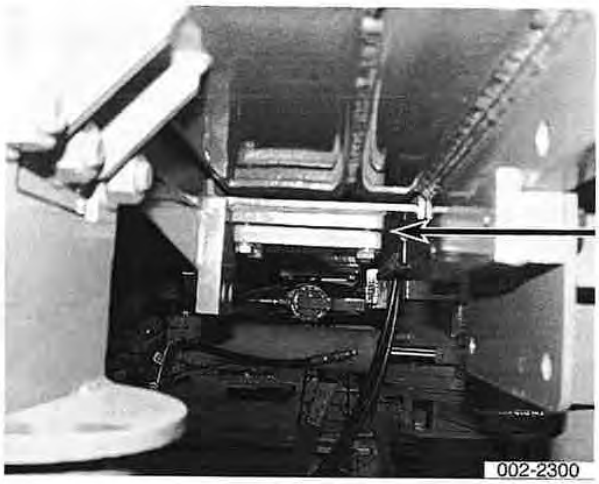
Change oil in pump drive gearbox

Drain the gear oil from the pump drive gearbox on the rear of the engine and dispose of the oil properly. Refill with clean new EP-90 gear oil. To drain, remove the drain plug located in the bottom of the gearbox.



Change oil in conveyor drive gearbox

Drain the gear oil from the conveyor drive gearbox and dispose of the oil properly. Refill with clean new EP-90 gear oil. To drain, remove the drain plug located in the bottom of the gearbox.



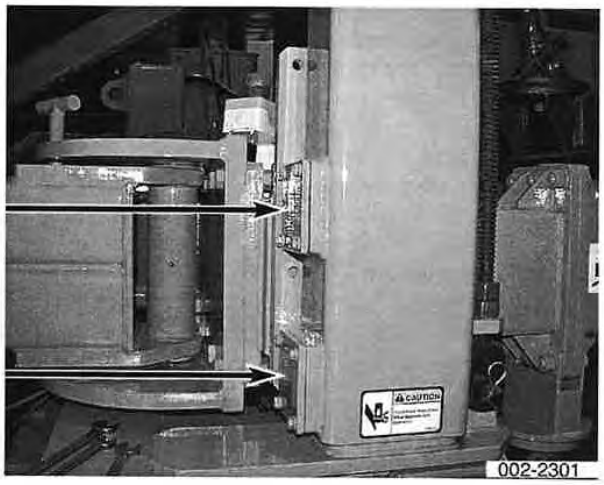
Check wear pads for replacement

Adjust the wear pads to remove any excessive movement from the mold shift extension tubes. When proper tension is adjusted, the top of the inner extension tube should be sliding against the top of the outer tube. There should be a minimum of 1/16 inch (1.5 mm) space between the steel adjustment plates if the wear pad is good. If excessive movement is apparent after adjustment, remove and replace any wear pads as necessary on each of the mold shift extension tubes.



Check wear pads on right front leg

Adjust the wear pads to remove any excessive movement from the right front leg extension tube. When proper tension is adjusted, the top of the inner extension tube should be sliding against the top of the outer tube. There should be a minimum of 1/16 inch (1.5 mm) space between the steel adjustment plates if the wear pad is good. If excessive movement is apparent after adjustment, remove and replace any wear pads as necessary on the right front leg extension tube.



Check wear pads on trimmer lift

Adjust the wear pads to remove any excessive movement from the trimmer lift tubes. There should be a minimum of 1/16 inch (1.5 mm) space between the steel adjustment plates if the wear pad is good. If excessive movement is apparent after adjustment, remove and replace any wear pads as necessary on each of the trimmer lift tubes.

10 Servicing Air Cleaner



Remove the air filter

Release the clamps and remove the air cleaner cover. Pull the element from the filter canister. When servicing the air cleaner, check all connections from the air cleaner to the engine. Connections should be air tight at all times.

When the element must be serviced in the field, pat the side of the element gently near the end with the palm of the hand while rotating the element. Do not tap the element against a hard surface as this may dent or rupture the element.



Clean element with air

The element may be cleaned with compressed air by using an air nozzle and blowing air through the element from the inside to the outside. Do not blow air from the outside to the inside. Keep the nozzle at least 1 in. (25 mm) from the pleated paper. Maximum air pressure to use to prevent damage to the element is 30 psi (2 bar).



Inspect filter element with light

To inspect the air filter element, place a bright light inside of the element and slowly rotate the element. If any holes or ruptures are discovered, replace the element. The filter element should be replaced after being cleaned six times or annually, whichever comes first. Inspect the gasket on the end of the element. Do not use the element if the gasket is damaged. Wipe out the inside of the filter canister before installing the element. Install the element into the filter canister. Install the filter canister cover and latch securely.

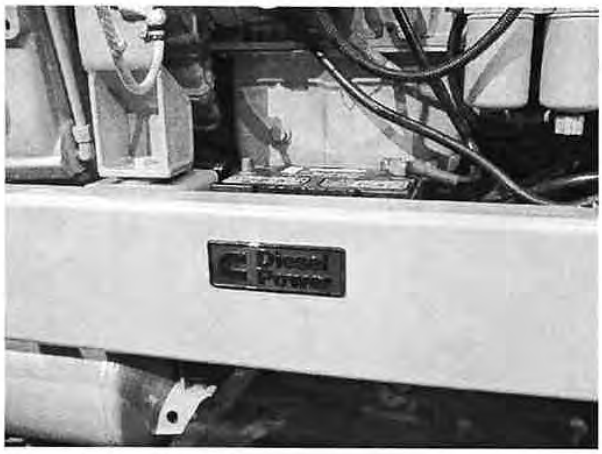


Remove the safety element

If the engine is equipped with a safety air filter element inside of the main element, it must be replaced if the element is dirty, or if the main air filter element has failed. Remove the element and wipe the inside of the housing clean prior to installing a new safety element. Install the main element. The safety element should

be replaced on an annual basis regardless of condition and should never be cleaned and reused.

11 Battery Service



Batteries

⚠ WARNING! ⚠

BATTERIES CONTAIN SULFURIC ACID AND NORMALLY PRODUCE EXPLOSIVE GASES WHICH CAN CAUSE SERIOUS INJURY. THEREFORE, DO NOT ALLOW FLAMES OR SPARKS TO COME NEAR THE BATTERY(S). WHEN CHARGING OR WORKING NEAR A BATTERY, ALWAYS SHIELD YOUR FACE AND PROTECT YOUR EYES. IN CASE OF ACID CONTACT WITH SKIN OR EYES, FLUSH IMMEDIATELY WITH WATER FOR A MINIMUM OF 15 MINUTES AND GET PROMPT MEDICAL ATTENTION. IF ACID IS SWALLOWED, CALL A PHYSICIAN IMMEDIATELY.

The paver electrical system is a 12 volt negative ground system. Battery size is 850 cold cranking amps. Keep sparks and flames away from the battery as electrolyte gas is highly flammable. The battery is located to the right side of the engine compartment. When replacing the battery, discard the old battery properly.



052-0226

Badly pitted battery terminal

⚠ CAUTION! ⚠

WHEN SERVICING THE ELECTRICAL SYSTEM OR WELDING ON THE MACHINE, ALWAYS DISCONNECT THE GROUND STRAP FROM THE BATTERY(S) TO PREVENT DAMAGE TO THE MACHINE ELECTRICAL SYSTEMS.

Before connecting the battery, make certain all electrical switches and accessories are turned off. Be certain that the terminals and battery posts are thoroughly cleaned and that the battery cable terminals are tight, as dirty or loose connections can create high electrical resistance and permit arcing, which will quickly burn and pit terminals and posts.

> **Note:** The electrical system is a negative ground system. Connect the starter cable to the positive (+) post of the battery. Connect the ground cable to the negative (-) post of the battery. It is advisable to disconnect the negative cable first and connect it last. Reversed polarity can damage the electrical system.

Use a battery hydrometer to check the specific gravity of the electrolyte in each battery cell. A fully charged battery will have a specific gravity of 1.260. Charge the battery if the reading is below 1.215.

Keep the battery clean by washing it off whenever dirt build up is excessive. If corrosion is present around terminal connections, remove them and wash with ammonia solution or a solution consisting of 1/4 lb. (0.11 kg) baking soda added to one quart of warm water. Make certain the vent caps are tight to prevent solution from entering the cells. After cleaning, pour clean water over the battery and surrounding area to wash the solution away. Check vent cap breather openings to make sure they are open.

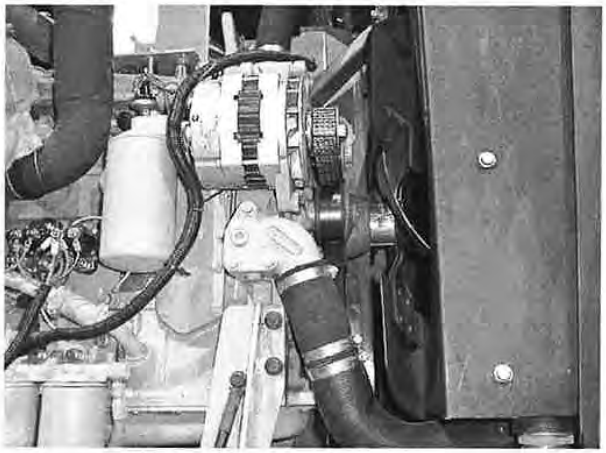
Be sure to keep the battery filled and fully charged during cold weather to keep it from freezing. Freezing weather has little affect on a fully charged battery.

⚠ WARNING! ⚠

DO NOT ATTACH THE END OF THE NEGATIVE (-) CABLE OPPOSITE THE BOOSTER BATTERY TO THE NEGATIVE (-) POST OF THE DEAD BATTERY. A SPARK COULD OCCUR AND CAUSE AN EXPLOSION OF GASES NORMALLY PRESENT AROUND THE BATTERY.

When connecting a booster battery, if necessary for cold weather starting, connect one end of the first jumper cable to the positive (+) terminal of the dead battery and the other end to the positive (+) terminal of the booster battery. Connect one end of the second jumper cable to the negative (-) terminal of the booster battery and the other end to the frame of the machine with the dead battery.

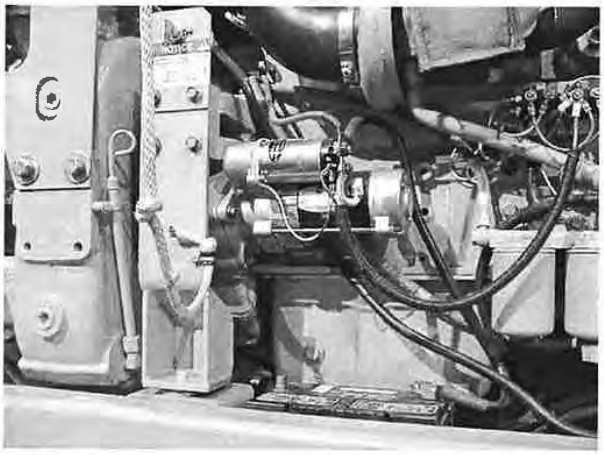
12 Alternator, Regulator and Starter Service



Alternator

The alternator supplies electrical current for charging the battery and ample electrical power to the electronic controls. The built-in regulator in the alternator controls the voltage output. If for any reason the wires must be disconnected from the alternator, mark them so that they can be reconnected properly. Use the following precautions to prevent damage to the alternator and/or regulator:

1. An alternator is never to be polarized. Never ground any alternator terminals or circuits.
2. Always disconnect the battery before disconnecting or connecting the alternator. Never disconnect the alternator with it operating. Be certain the wiring is properly connected before connecting the battery.
3. Always connect a booster battery in the proper polarity. Negative to negative and positive to positive.



Starter

The starter is used to crank the engine. If for any reason the wires must be disconnected from the starter, mark them so that they can be reconnected properly.

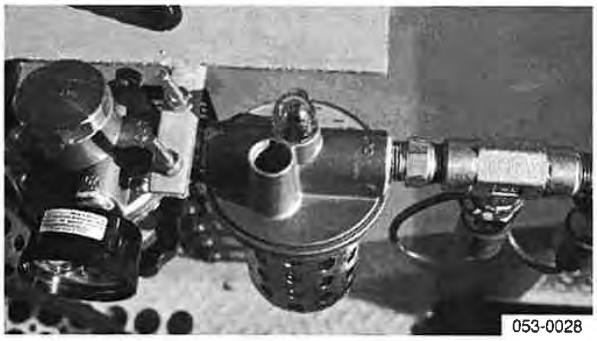
13 Air Regulator Service (Optional System)



Drain water trap

Open the drain valve in the bottom of the water separator on the air regulator assembly and allow all moisture to drain. Close the valve tight. If the reservoir must be cleaned, it will first be necessary to relieve all air pressure from the system. Stop the engine and open the drain valve in the bottom of the air reservoir tank and the valve in the bottom of the separator reservoir. Allow all air pressure to subside before removing the reservoir. Note the direction in which the plastic retainer is installed in the protective

cover. Pull on the retainer while turning the cover in the same direction as the installation. After the retainer is removed, turn the cover so that the slot in the bottom of the cover for the drain valve aligns with the drain valve and remove the cover. Unscrew the reservoir to remove it. Clean the reservoir and screw it into the head until it is tight. Install the cover over the reservoir. Insert the plastic retainer into the notch and slowly rotate the cover, opposite the installation direction, while pushing on the retainer until it is fully installed.

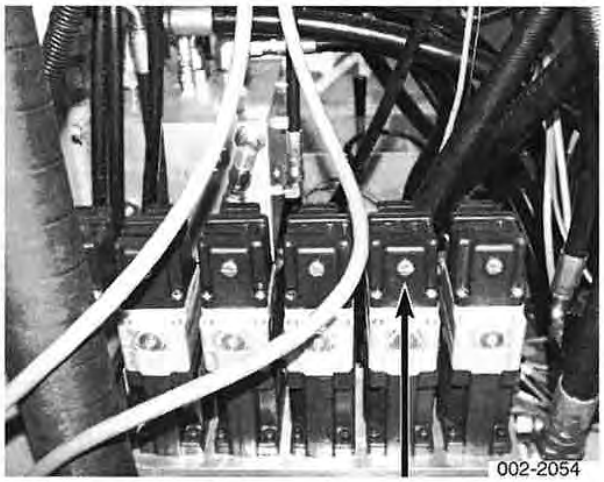


Oil fill and adjustment

If the oil injection reservoir must be filled, it will first be necessary to relieve all air pressure from the injection assembly. Note the pressure on the gauge and turn the pressure adjuster out (clockwise) until the pressure gauge shows "0" pressure. Remove the filler plug from the top of the assembly and fill the reservoir to the full mark with the proper oil (hydraulic oil when using the bar inserters). Replace the plug and adjust the pressure back to the original setting (turn adjuster counterclockwise).

To adjust the oil flow into the system, relieve the air pressure as previously instructed. Disconnect a hose from the outlet side of the regulator assembly. With the engine running, adjust the pressure to 20 psi (1.4 bar). Observe the number of drops of oil per minute in the sight glass. The correct flow is with 3 to 4 drops per minute. Adjust the oil flow by turning the adjustment knob on top of the injector assembly counterclockwise to increase the oil flow or clockwise to decrease it. Relieve the air pressure and reconnect the hose. Adjust the pressure back to the original setting.

14 Adjusting Servo Valves



Adjust servo pilot valves

The grade servo pilot valves need only be adjusted if the grade cylinders slowly "creep" up or down with the engine running and the system in the "manual" mode. The steering servo pilot valves need only be adjusted if the tracks slowly "drift" left or right with the system in the "manual" mode. The hydraulic oil should be at operating temperature before adjusting the servos. Proceed as follows:

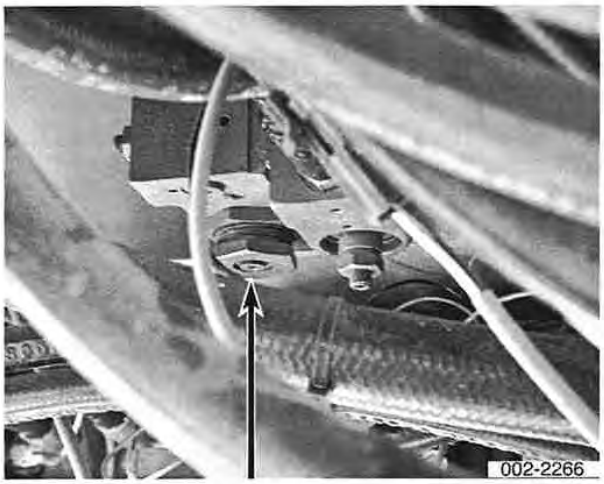
1. Place the circuit to be adjusted in the manual mode. Run the engine at 1500 rpm. Remove the access plug to gain access to the adjustment screw.

2. Turn the servo centering screw on the proper servo valve until the corresponding cylinder stops moving in one direction and begins to move in the opposite direction. Mark the position of the adjusting hex wrench on the servo valve.

3. Turn the servo centering screw back the opposite direction until the cylinder begins to move in the original direction. Mark the position of the adjusting hex wrench on the servo valve. Turn the centering screw to the center position between the two marks.

15 Adjusting Pressures

Trimmerhead Pressure



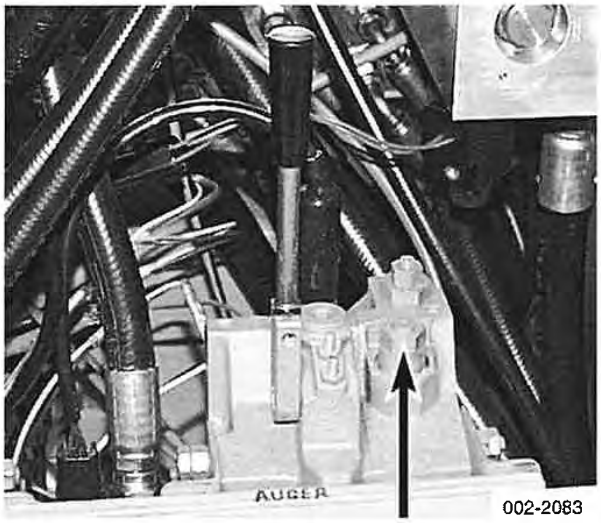
Trimmer relief valve

⚠ CAUTION! ⚠

DO NOT STALL A SYSTEM WITH AN UNKNOWN RELIEF PRESSURE SETTING. IF THE PRESSURE SETTING IS TOO HIGH, SERIOUS MACHINE DAMAGE MAY OCCUR. WHEN CHECKING A RELIEF PRESSURE SETTING, TURN THE ADJUSTMENT SCREW OUT 1 OR 2 TURNS BEFORE STALLING THE SYSTEM.

To adjust the trimmerhead pressure, disconnect the trimmer drive motor hoses at the quick couplers. Remove the SAE plug in the end of the relief cartridge. It is recommended to turn the pressure adjustment screw on the relief valve out one turn before checking the pressure. Start the engine, run it at 1000 rpm and depress the emergency stop reset switch. Depress the network controller run/standby switch to place the system in the run (R) mode. Place the trimmerhead forward/neutral/reverse switch (FNR) in the forward (F) position and note the increasing pressure on the corresponding pressure gauge. If the pressure continues to increase above 2500 psi (172 bar), immediately place the trimmerhead forward/neutral/reverse switch (FNR) in the neutral (N) position. Turn the pressure relief adjustment screw out an additional one turn and recheck. If the pressure does not increase above 2500 psi (172 bar), increase the engine speed to maximum. If adjustment is necessary, turn the adjusting screw in to increase pressure or out to decrease pressure. Place the trimmer forward/neutral/reverse switch (FNR) in the neutral (N) position. Insert and tighten the SAE plug securely. Clean and connect the trimmer drive hoses.

Auxiliary Auger/Tamper Pressure



Aux. auger/tamper relief valve

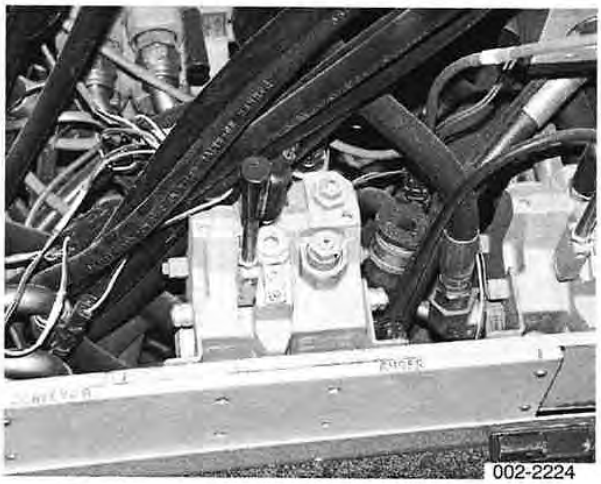
⚠ CAUTION! ⚠

DO NOT STALL A SYSTEM WITH AN UNKNOWN RELIEF PRESSURE SETTING. IF THE PRESSURE SETTING IS TOO HIGH, SERIOUS MACHINE DAMAGE MAY OCCUR. WHEN CHECKING A RELIEF PRESSURE SETTING, TURN THE ADJUSTMENT SCREW OUT 1 OR 2 TURNS BEFORE STALLING THE SYSTEM.

To adjust the auger/tamper pressure, disconnect the auger/tamper drive motor hoses at the quick couplers. Remove the SAE plug in the end of the relief cartridge. It is recommended to turn the pressure adjustment screw on the relief valve out one turn before checking the pressure. Start the engine, run it at 1000 rpm and depress the emergency stop reset switch. Depress the network controller run/standby switch to place the system in the run (R) mode. Place the forward/neutral/reverse switch (FNR) in the forward (F) position and slowly rotate the auger/tamper control knob clockwise. Note the increasing pressure on the corresponding pressure gauge. If the pressure continues to increase above 2350 psi (162 bar), immediately move the auger/tamper control knob counterclockwise to the off position. Turn the pressure relief adjustment screw out an additional one turn and recheck. If the pressure does not increase above 2350 psi (162 bar), rotate the knob clockwise to the maximum amount and increase the engine speed to maximum. If adjustment is necessary, turn the adjusting screw in to increase

pressure or out to decrease pressure. Rotate the auger/tamper control knob counterclockwise to the off position. Insert and tighten the SAE plug securely. Clean and connect the auger/tamper drive hoses.

Conveyor/Paving Auger 1 Pressure



Conveyor/Paving Auger relief valve

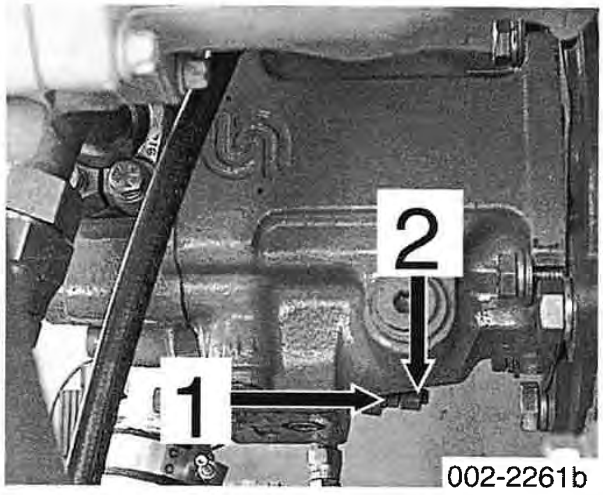
⚠ CAUTION! ⚠

DO NOT STALL A SYSTEM WITH AN UNKNOWN RELIEF PRESSURE SETTING. IF THE PRESSURE SETTING IS TOO HIGH, SERIOUS MACHINE DAMAGE MAY OCCUR. WHEN CHECKING A RELIEF PRESSURE SETTING, TURN THE ADJUSTMENT SCREW OUT 1 OR 2 TURNS BEFORE STALLING THE SYSTEM.

To adjust the conveyor/paving auger pressure, disconnect the conveyor/paving auger drive motor hoses at the quick couplers. Remove the SAE plug in the end of the relief cartridge. It is recommended to turn the pressure adjustment screw on the relief valve out one turn before checking the pressure. Start the engine, run it at 1000 rpm and depress the emergency stop reset switch. Depress the network controller run/standby switch to place the system in the run (R) mode. Place the forward/neutral/reverse switch (FNR) in the forward (F) position and slowly rotate the conveyor/paving auger control knob clockwise. Note the increasing pressure on the corresponding pressure gauge. If the pressure continues to increase above 2400 psi (165 bar), immediately move the conveyor/paving auger control knob counterclockwise to the off position. Turn the pressure relief adjustment screw out an additional one turn and recheck. If the pressure does not increase above 2400 psi (165 bar), rotate the knob clockwise to the maximum amount and increase the engine speed to maximum. If adjustment is necessary, turn the adjusting screw in to increase pressure or out to decrease pressure. Rotate the conveyor/paving auger control knob counterclockwise to the off position. Insert and tighten the SAE plug securely. Clean and connect the conveyor/paving auger drive hoses.

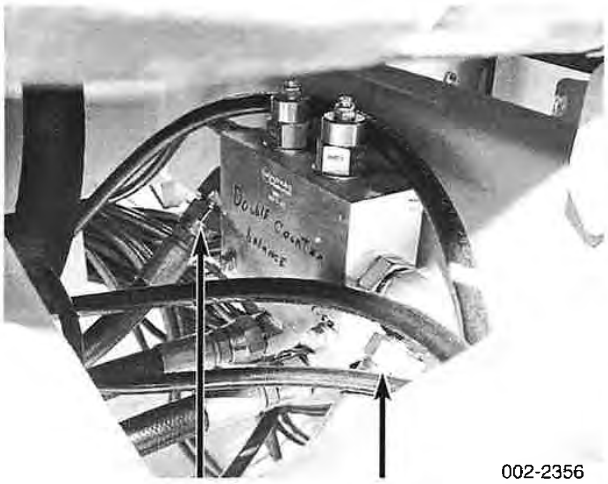
> **Note:** The pressure relief for the conveyor/paving auger valve also protects the optional paving auger number 2 control valve against high pressure (when installed for four track machine operations).

Tractive Pressure



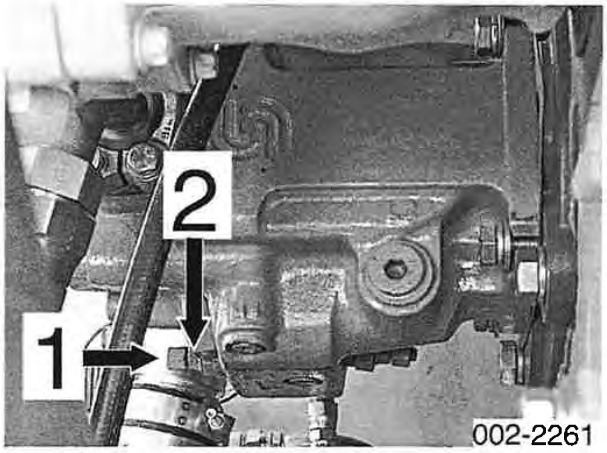
Load sense adjustment

The standby pressure is used for control pressure, in the control valve, by the Pulsar solenoids. The load sense adjustment screw, at the pump, controls the standby pressure on the track system pressure gauge. Start the engine and operate at maximum rpm. The console track pressure gauge should indicate approximately 365 psi (25 bar) with the hydraulic oil at normal operating temperature. If adjustment is required, loosen the adjustment screw lock nut (number 1 in photo) and turn the adjustment screw nut (number 2 in photo) in to increase pressure or out to decrease pressure. The adjustment screws only allow one clockwise turn from the original factory setting. Torque the adjustment screw lock nut to 27 lbf•ft (23 Nm) while holding the adjustment screw. If additional adjustment is required, contact GOMACO for service information.



Connections on track counterbalance valve block

To check the track pump pressure limit adjustment it will be necessary to block the system oil flow. Park the machine on a level surface and stop the engine. Disconnect the hydraulic lines from each side of the track counterbalance valve block (ports 2A and 2B). Place a plug in the end of each hydraulic line and tighten securely. Collect and dispose of any hydraulic oil which may be lost from the open fittings on the counterbalance valve block.

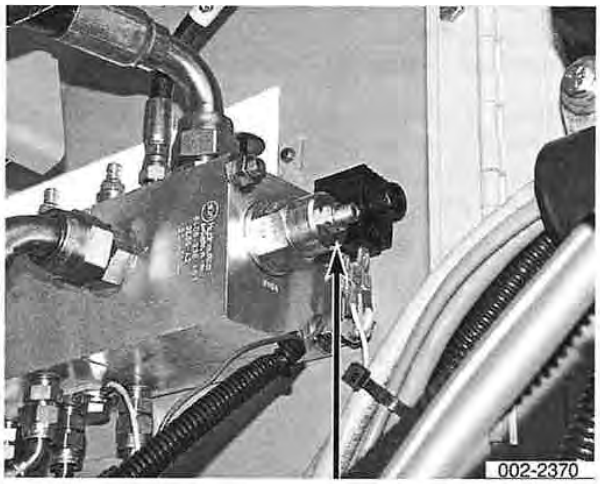


Track relief valve

Start the engine, run it at 1000 rpm and depress the emergency stop reset switch. Depress the network controller run/standby switch to place the system in the run (R) mode. Place the forward/reverse switch (F/R) in the forward (F) position and the travel/neutral switch in the travel position. Place the fast/slow switch in the slow position and slowly rotate the travel control knob clockwise. Note the increasing pressure on the console track pressure gauge. The pressure reading should be 2800 psi (193 bar). If adjustment is necessary, loosen the adjustment screw lock nut (number 2 in photo) and turn the adjustment screw nut (number 1 in photo) in to increase pressure or out to decrease pressure. The adjustment screws only allow one clockwise turn from the original factory setting. If additional adjustment is required, contact GOMACO for service information. Stop the engine and reattach the disconnected hoses to their appropriate connections on the track counterbalance valve block.

Note: There is no testing procedure available for the preset track counterbalance valves. Contact GOMACO for service information.

Vibrator Pressure



Adjust main vibrator pressure

⚠ CAUTION! ⚠

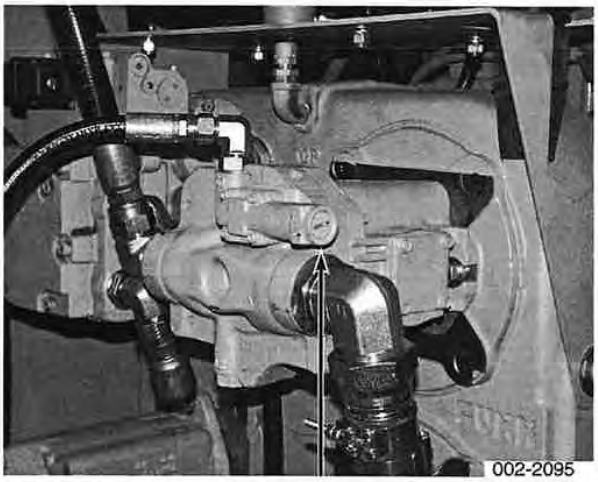
DO NOT STALL A SYSTEM WITH AN UNKNOWN RELIEF PRESSURE SETTING. IF THE PRESSURE SETTING IS TOO HIGH, SERIOUS MACHINE DAMAGE MAY OCCUR. WHEN CHECKING A RELIEF PRESSURE SETTING, TURN THE ADJUSTMENT SCREW OUT 3 OR 4 TURNS BEFORE STALLING THE SYSTEM.

Note: The vibrator relief on each of the vibrator variable control manifolds is adjusted in the same manner.

To adjust the vibrator relief, disconnect one vibrator or loop hose at the quick couplers. Start the engine, run it at 1000 rpm and depress the emergency stop reset switch. It is recommended to turn the pressure adjustment screw on the vibrator relief valve out 1 or 2 turns before checking the pressure. Place the vibrator override switch in the "auto" position. Rotate the variable control valve that corresponds to the

disconnected circuit to the full increase position (full counterclockwise). Rotate the travel variable control knob clockwise a small amount to break contact with the off position and note the increasing pressure on the corresponding pressure gauge. If the pressure continues to increase above 1850 psi (127 bar), immediately move the travel variable control knob to the off position. Turn the pressure relief adjustment screw on the vibrator relief out an additional 1 or 2 turns and recheck. Rotate the travel variable control knob a small amount. If the pressure does not increase above 1850 psi (127 bar), increase the engine speed to maximum. If adjustment is necessary to increase the pressure to 1850 psi (127 bar), loosen the jam nut on the relief valve adjusting screw. Turn the adjusting screw in to increase, or out to decrease the pressure. Tighten the jam nut.

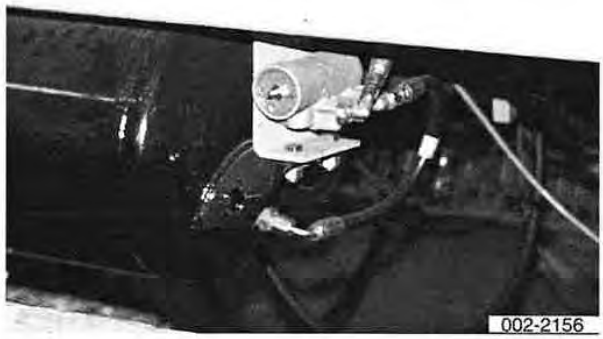
Note: If the machine is equipped with the auxiliary vibrator manifold, connect the trimmer quick coupler to the auxiliary vibrator manifold prior to following the previous adjustment procedures.



Adjust lift pressure

Lift Pressure

To adjust the lift pressure, run the engine at 2250 rpm (maximum). Place the servo lock switch in the "on" position. Place the hold down and hold over control switches in the "neutral" or center position. Observe the pressure reading on the lift pressure gauge. The reading should be 2000 psi (138 bar). If adjustment is necessary, turn the pump pressure adjustment screw in to increase or out to decrease pressure.



Adjust air pressure

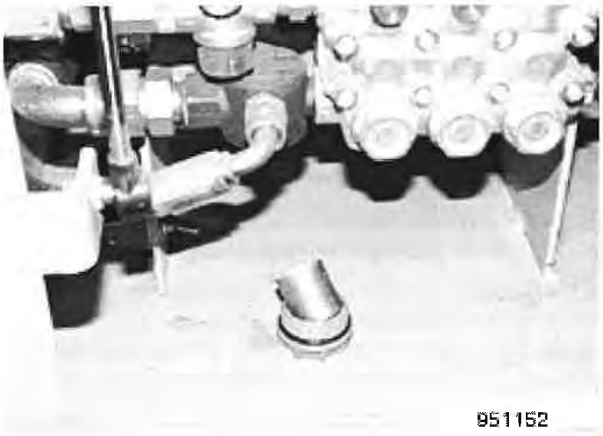
⚠ CAUTION! ⚠

THE AIR PRESSURE SHOULD NEVER EXCEED 125 PSI (8 BAR). DO NOT REPLACE THE RELIEF VALVES WITH PLUGS. IF THE RELIEF VALVE MUST BE REPLACED, BE CERTAIN TO REPLACE IT WITH ONE OF EQUAL VALUE. THE AIR RESERVOIR TANK CAN RUPTURE IF PRESSURE INCREASES ABOVE 125 PSI (8 BAR).

Air Pressure: To adjust the air pressure, install a 300 psi gauge into the drain valve on the air reservoir tank. Open the valve after the gauge has been installed and start the engine to allow air pressure to increase. Note the pressure reading on the gauge. The pressure reading should be 85 psi (5.8 bar). If adjustment is necessary, remove the rubber dust cap from the control governor. Hold the adjustment screw with a wrench and loosen the jam nut. On some models of air compressors, it is necessary to turn the adjuster screw in to increase pressure or out to decrease it. On other models it is necessary to turn the adjuster out to increase or in to decrease pressure. Adjust pressure as necessary and tighten the jam nut while holding the adjustment screw.

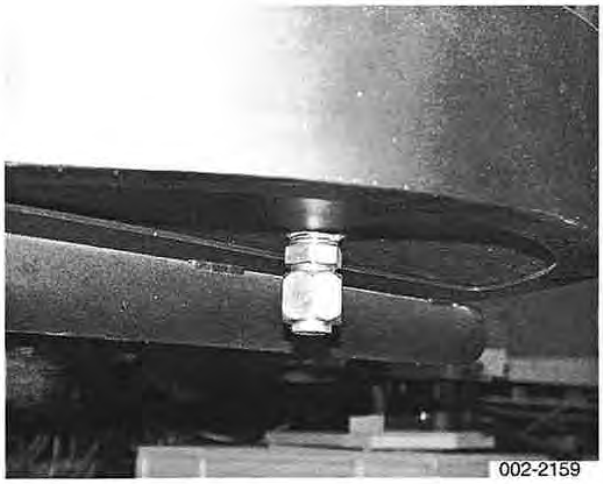
Note: If pressure is to be decreased, it will be necessary to release part of the air pressure from the reservoir tank and then allow the pressure to build up again to check the pressure setting.

16 High Pressure Wash System Service



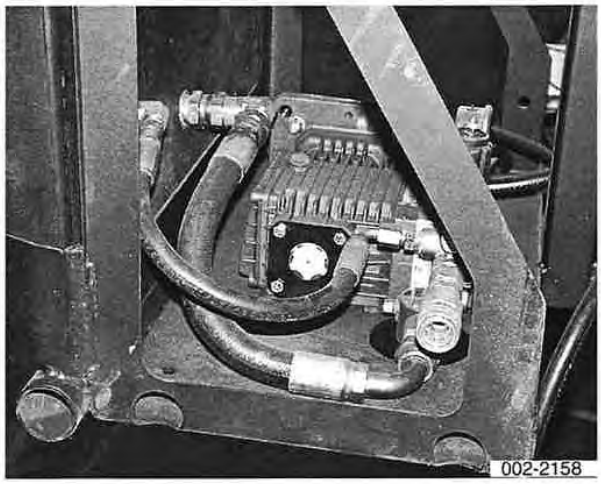
Clean water pump inlet screen

If the flow from the wash nozzle slows down, it may be necessary to remove the filter from the inlet side of the pump and clean it. Remove the retainer cup and filter. Wash the filter in water and blow dry. Inspect the filter and replace it if damaged. Insert the clean filter into the opening and tighten the retainer cup securely. The filter should be cleaned on a daily basis.



Drain the water tank

If the machine is to be used in an area that freezing temperatures will be encountered, open the drain fitting on the bottom of the tank and drain all water.

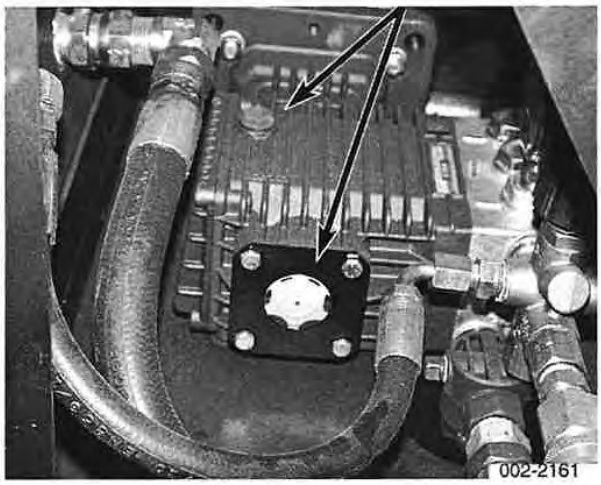


Drain water pump and lines

⚠ CAUTION! ⚠

SEVERE DAMAGE WILL RESULT TO THE PUMP IF IT IS ALLOWED TO FREEZE. BE CERTAIN TO COMPLETELY DRAIN IT IN FREEZING WEATHER. IF THE PUMP IS TO REMAIN IN FREEZING WEATHER, RUN A SMALL AMOUNT OF ANTIFREEZE THROUGH IT FOR PROTECTION.

Remove the inlet and outlet lines from the pump and allow all water to drain from the pump and hoses. It is recommended to remove the water pump from the machine and store it in a warm place.



Check gearcase oil level

Remove the filler plug in the top of the gearcase and check the oil level with the bayonet gauge. If the oil level is low, add 30 weight engine oil through the oil fill opening until the oil level is to the full mark on the bayonet gauge. The oil needs to be changed

whenever it is contaminated. The site gauge may be used to check for visible contamination of the oil and the oil level should be to the midpoint of the site glass.

Calibrating the Control Knob Thresholds

Notice: If it is necessary to replace the network control panel, it will be required to calibrate the control knob thresholds prior to moving the machine.

The purpose of this procedure is to adjust the variable speed control knobs so that movement of the individual component begins at or around 25 % of the full rotation of the knob. This is especially important on the track drive system so that vibration will occur within the 0 to 25% range of the knob. The vibrators must begin operating before track movement when vibrating through a slipform mold to an existing concrete surface at the starting point of a pour. It may be necessary to vibrate the concrete for several seconds before the operator may begin track movement by turning the control knob above 25%.

> **Note:** This procedure is only to be used when a control problem exists in one of the hydraulic systems controlled by a knob (travel, conveyor/ auger, paving auger, auxiliary auger/tamper).

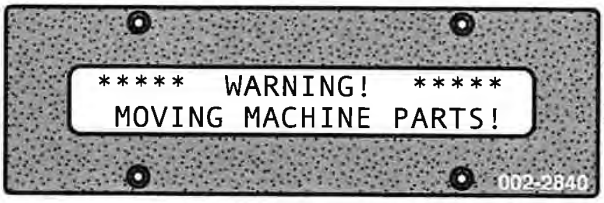
To set the thresholds for the travel, paving auger 2, auxiliary auger/tamper and conveyor/paving auger1 it will be necessary to turn all control knobs counterclockwise. Place all FNR (Forward/Neutral/ Reverse) switches in the neutral position. Place the travel fast/slow switch in the "slow" position. Start the machine and depress the E-stop reset switch. The E-stops must be off before continuing. Make certain that the hydraulic oil is at normal operating temperature before proceeding.

To begin the procedure, depress and hold the calibrate switch and depress the ENG (engine) switch. The main screen should read:



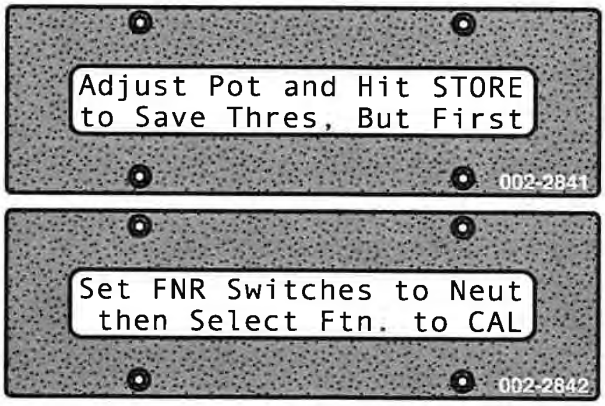
Calibrate control knob thresholds

The main screen indicates "Calibrate Proportional Threshold" mode and to depress the LAST or NEXT switches to continue. Depress the NEXT switch and the main screen will read:



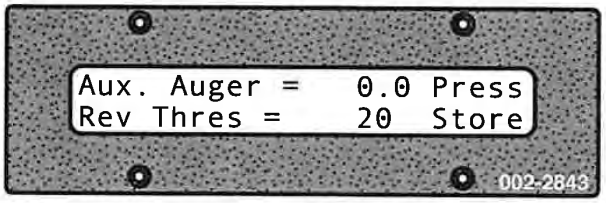
Operator warning display

This display serves to warn the operator that machine parts will move and proper caution should be exercised to prevent an accident. Depress the NEXT switch and the instructional displays will read:



Instructional messages

The messages instruct the operator to turn the potentiometer (control knobs) clockwise and depress the STORE switch to save the threshold value. Before proceeding, place the FNR switches in the "neutral" position and select which circuit will be calibrated. Depress the NEXT switch until the appropriate circuit is displayed:



Reverse threshold calibration display

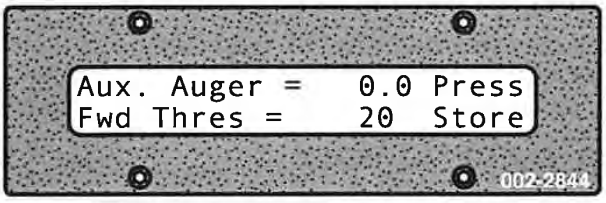
Place the appropriate FNR switch in the "reverse" position. Slowly turn the control knob clockwise until the machine part begins to move. Note the position of the control knob.

If the machine part begins to move before 25% rotation of the control knob, it will be necessary to decrease the stored value displayed on the screen.

Rotate the control knob to decrease the value on the top line of the screen until it is lower than the value on the bottom line of the screen. Depress the STORE button and repeat the procedure to check how the new value affects the rotation of the control knob.

If the machine part begins to move after 25% rotation of the control knob, it will be necessary to increase the stored value displayed on the screen. Rotate the control knob to increase the value on the top line of the screen until it is higher than the value on the bottom line of the screen. Depress the STORE button and repeat the procedure to check how the new value affects the rotation of the control knob.

If necessary, repeat the adjustment procedure until the machine part begins movement at or around 25% rotation of the control knob. Depress the NEXT switch and the main screen will read:



Forward threshold calibration display

Place the appropriate FNR switch in the "forward" position. Repeat the previous adjustment procedure for forward movement of the appropriate control system.

Each control knob threshold is adjusted in the same manner. Depress the NEXT switch to scroll through the screens until the appropriate control system is displayed.



Return to normal operations

Depressing the calibrate switch twice will return the control system to the automatic mode.

17 Calibrating the Steering Systems

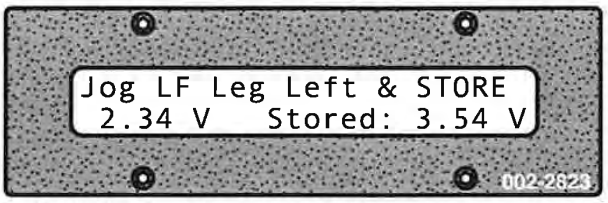
Notice: If it is necessary to replace the network control panel, it will be required to calibrate the steering systems prior to moving the machine.

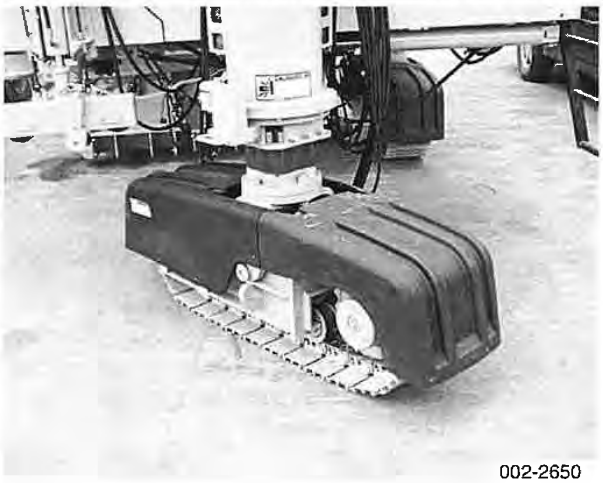


Set mode

Three adjustments are required for each steering cylinder: left turn limit, center and right turn limit. Begin by starting the engine. Depress and release the SET switch. The main screen will indicate "STORE to Save Slope Null & Feedback Pot. Points". To select a smart steering cylinder for adjustment, depress the LAST or NEXT switch until the appropriate cylinder signal is indicated on the main screen (Photo 002-2823).

Note: Each of the limits may be calibrated separately. It is not necessary to recalibrate all three limits if only one limit requires adjustment.





Left limit display

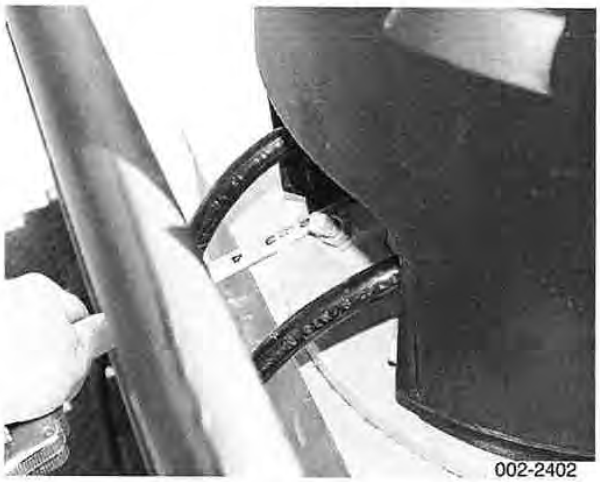
LEFT LIMIT – Turn the corresponding track as far to the left as required to prevent the track from contacting obstacles on the jobsite. Depress the STORE switch to store the left turning limit for the corresponding track. Depress the NEXT switch until the center limit for the corresponding track is indicated on the main screen (Photo 002-2824).

Note: When radius work is required, make certain that the left limit setting does not prevent the track from turning enough to complete the radius.

Notice: If the operator turns the track the wrong direction to store the left or right limits, the network controller will store the voltage but will not operate correctly.

CENTER LIMIT – Turn the track to the straight ahead position and measure for correct adjustment. Refer to the following 3-track and 4-track information for appropriate measurement procedures.

3-Track Procedures: The procedures for adjusting the steering system on any of the legs is the same. Be certain the setscrews are snug against the wear bar on the bottom of the outer guide tube on each leg to eliminate any looseness between the inner and outer guide tubes. Be certain the setscrews are snug against the top guide plate retainer and against the side of the square guide tube. Tighten the jam nuts securely.



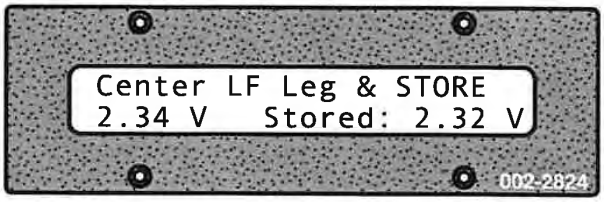
Straighten the track

Set the appropriate track straight ahead by measuring the distance from each side of the square tube at the top of the leg to the mounting flange. The measurements should be equal. Steer the track left or right until both measurements are equal.



Adjust machine frame and tracks parallel to stringline

4-Track Procedures: The procedures for adjusting the steering system on any of the legs is the same. Move the machine so that the end frame of the machine is parallel with the guideline to be used on the job site. When the measurements between the guideline and the machine frame at the front and rear of the machine are equal, measure the distance between the guideline and the front of the track and between the guideline and the rear of the track. Using the manual jog switches, steer the track until both measurements are equal.



Center limit display

When it is adjusted parallel to the machine frame or stringline depress the STORE switch to store the center limit for the corresponding track. Depress the NEXT switch until the right turn limit for the corresponding track is indicated on the main screen (Photo 002-2825).



Right limit display

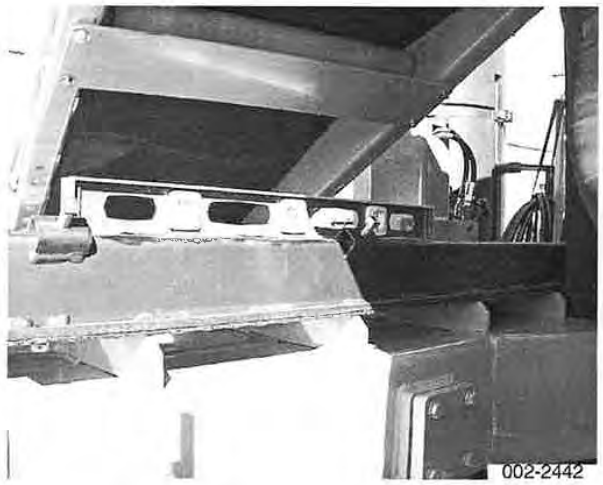
RIGHT LIMIT – Turn the track to the right as far as possible without contacting obstacles on the jobsite. Depress the STORE switch. Continue to depress the NEXT switch to repeat the procedure for the other tracks (if necessary).

> **Note:** When radius work is required, make certain that the right limit setting does not prevent the track from turning enough to complete the radius.

Notice: If the operator turns the track the wrong direction to store the left or right limits, the network controller will store the voltage but will not operate correctly.

18 Calibrating the Slope Sensors

Prior to storing a new null point, the 3-track machine frame should be leveled from side to side while the 4-track machine frame should be leveled on all four sides.



Level the machine frame

To level the 3-track machine frame, place a level on the front cross frame in front of the engine. Use the jog switch for the right front elevation to raise or lower the right front leg until the machine frame is level. Stop the engine, but leave the ignition switch on.



Level the 4-track machine frame

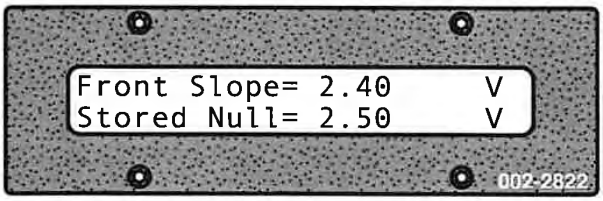
To level the 4-track machine frame, place a level on the left end frame from front to rear. Adjust the left

front or rear, up or down until the frame is level. Place the level across the front of the frame from the left to right and adjust the right front side of the frame up or down until the frame is level. Place the level on the right end frame from front to rear. Adjust the right rear, up or down, until the right side of the frame is level. Place the level across the rear of the frame from the left to right and check for level. It may be necessary to repeat the procedures several times to get the frame level. Stop the engine, but leave the ignition switch on.



Set mode

Depress and release the SET switch. The main screen will indicate "STORE to Save Slope Null & Feedback Pot. Points". To select a slope sensor for adjustment, depress the LAST or NEXT switch until the appropriate slope sensor is indicated on the main screen (Photo 002-2822).

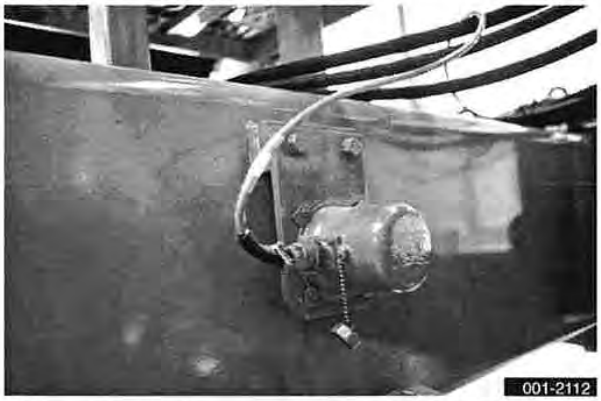


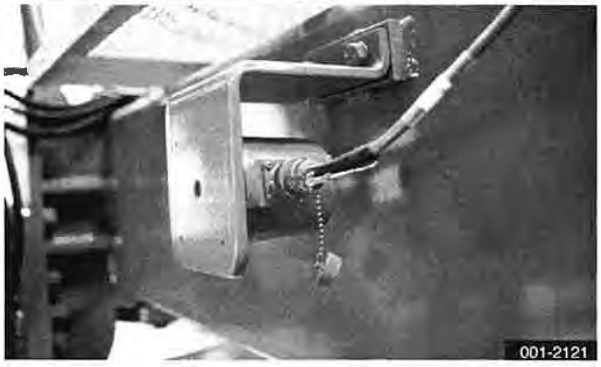
Front slope sensor calibration

If the top line of the main screen does not read between 2.40 and 2.60 Volts, loosen the appropriate slope sensor and rotate it until the voltage reads between 2.40 and 2.60 Volts. Tighten the mounting screws securely. Depress the STORE switch to store the new null point. Depress the NEXT switch and repeat the procedure for the other slope sensor (if applicable).



3-track slope sensor under the console





Front and rear 4-track slope sensors

Chapter VI 4-track Paving Setup

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Chapter VI 4-track Paving Setup

01 Content of Chapter

This chapter covers the preparation, setup, and paving operations for a Commander III 4-track paving frame. Included are instructions for changing paving widths up to 20 ft. (6.1 m). If the 4-track hydraulic and electrical components are not installed, it will be necessary to contact GOMACO for the instructions and procedures for installation. Choose a stable, flat level area to assemble the machine. Refer to the 4-track barrier setup section for preparation, setup and barrier paving operation instructions. **Pay particular attention to all Safety statements.**

NOTICE



WARNING!
DO NOT OPERATE THIS EQUIPMENT UNTIL YOU HAVE READ AND THOROUGHLY UNDERSTAND THE OPERATORS MANUAL. FAILURE TO FOLLOW THIS PROCEDURE MAY RESULT IN INJURY OR DEATH.

DANGER!
DO NOT ALTER OR MODIFY THIS PRODUCT WITHOUT THE EXPRESS WRITTEN CONSENT OF THE MANUFACTURER.
UNAUTHORIZED MODIFICATION MAY RESULT IN SERIOUS INJURY OR DEATH.

DCAL-058

⚠ WARNING! ⚠

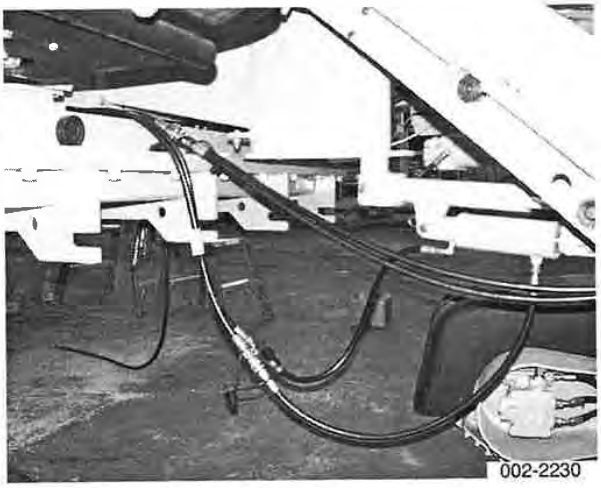
USE ADEQUATE LIFTING AND BLOCKING EQUIPMENT WHILE ASSEMBLING THE MACHINE. IT IS RECOMMENDED TO KEEP AS MANY TRACKS (ONE TRACK MINIMUM) ON THE GROUND AS POSSIBLE FOR ADDED STABILITY DURING ASSEMBLY. KEEP ALL PERSONNEL FROM UNDER THE MACHINE DURING ASSEMBLY. FAILURE TO FOLLOW SAFETY PRECAUTIONS CAN RESULT IN SEVERE INJURY OR DEATH.

02 Prime Mover Preparation

⚠ CAUTION! ⚠

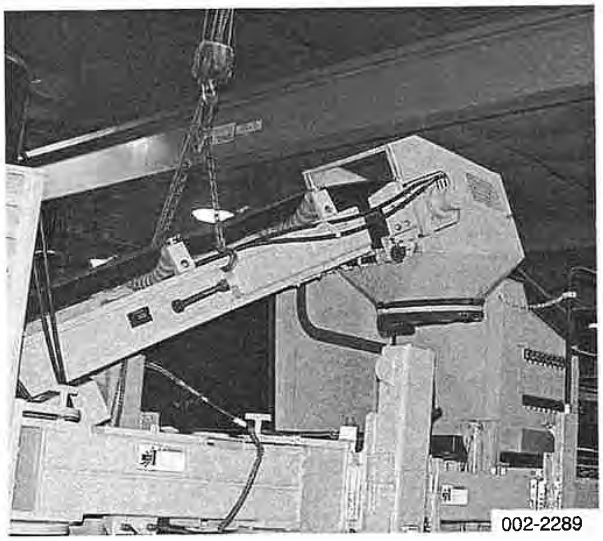
CONTINUOUS EXPOSURE TO ENGINE NOISE CAN CAUSE HEARING INJURY. DO NOT OPERATE THE MACHINE WITHOUT HEARING PROTECTION.

When installing a 4-track frame, it will be necessary to remove the conveyor, conveyor mounts, trimmerhead, trimmerhead mounts, hold down assembly, drawbar and left rear sensor mount. These components will not be used on the 4-track paving frame.



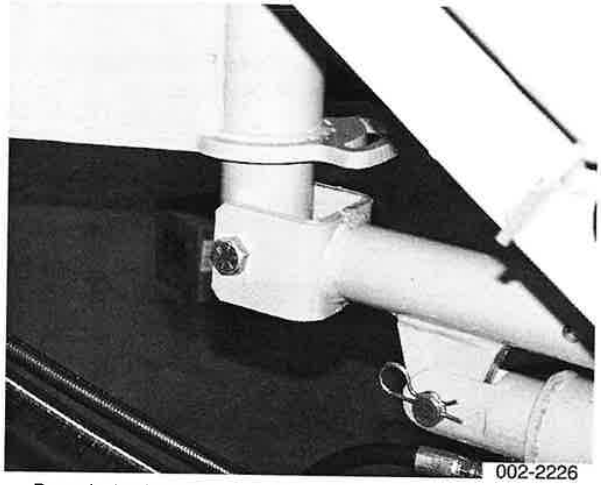
Disconnect conveyor hydraulic hoses

To remove the conveyor, disconnect the hose quick couplers from the conveyor lift cylinder. Disconnect the conveyor drive hose quick couplers from the bulkhead quick couplers.



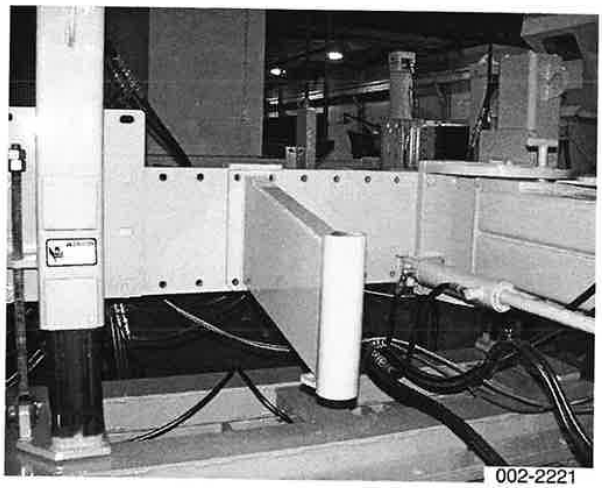
Support conveyor frame

Using a suitable lifting device, support the upper end of the conveyor. Remove the bolts attaching the conveyor frame to the conveyor shift assembly. Slowly move the machine in reverse, away from the conveyor frame until clear. Lower the conveyor onto support blocking to prevent damage to the discharge chute.



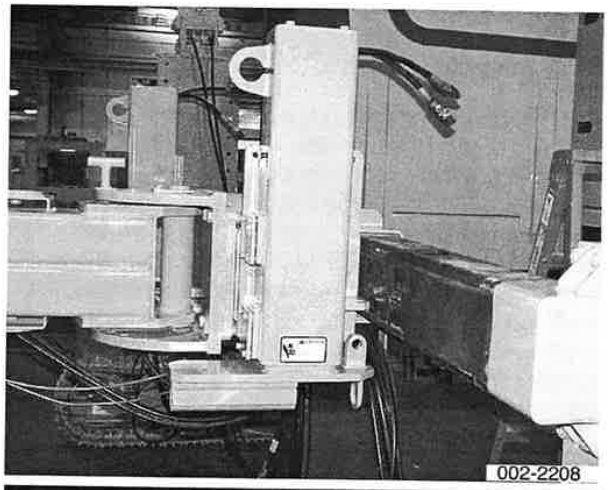
Detach the lower support tube from upper support tube

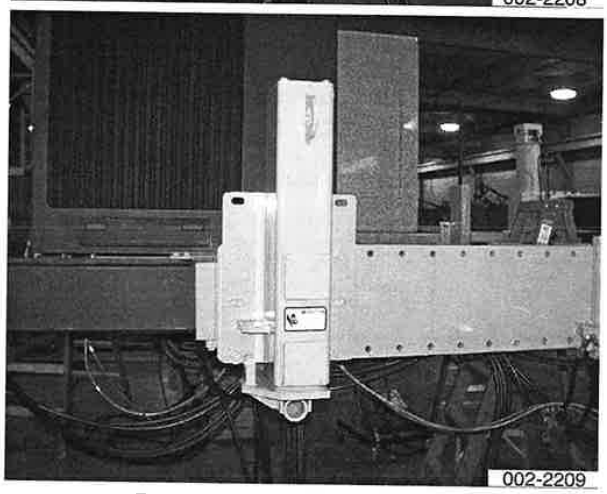
Remove the bolt from the yoke at the bottom of the upper support tube. Using a suitable lifting device, lift the conveyor shift assembly clear of the machine.



Remove conveyor mount

Remove the conveyor mount from the front of the machine frame.





Remove trimmerhead and mounts

Disconnect the trimmer drive hose quick couplers and the case drain line. Lower the trimmerhead down to the ground. Swing the lock latches free of the mounting bar and slowly back the machine free of the trimmerhead. Using a suitable lifting device, remove the left trimmerhead mount. Remove the entire right trimmerhead mount.



Remove hold down assembly

Remove the hoses from the hold down cylinder fittings. Install a 3/8 inch JIC plug in the swivel of each hose and install a 3/8 inch JIC cap to each fitting on the hold down cylinder. Remove the bottom clamp from the hold down assembly. Loosen the top clamp and with a suitable lifting device, lift the hold down assembly clear of the rear frame mount.

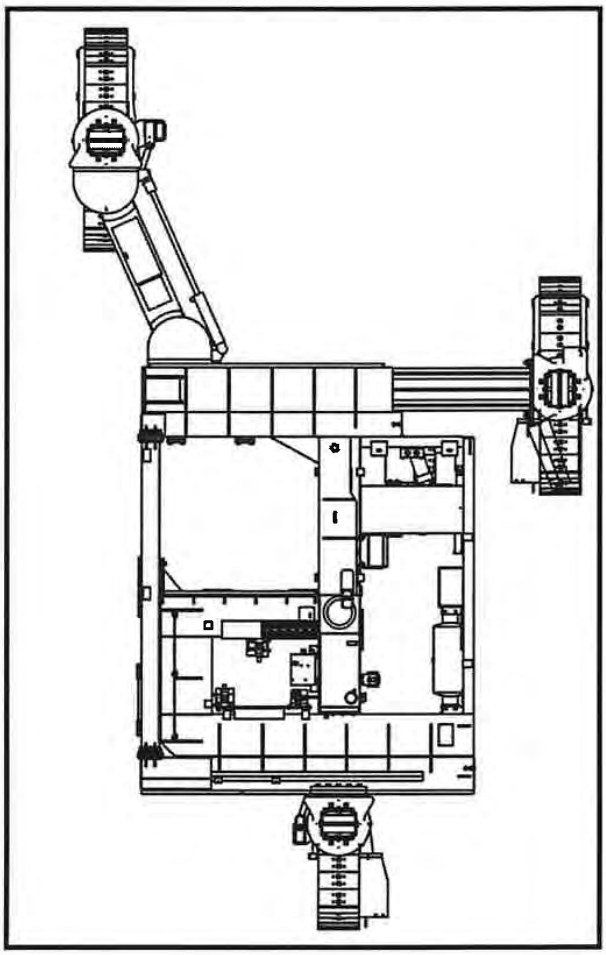


Remove drawbar assembly

⚠ CAUTION! ⚠

MAKE CERTAIN ALL PERSONNEL ARE CLEAR OF THE DRAWBAR WHEN REMOVING IT. SEVERE INJURY CAN OCCUR IF PERSONNEL ARE CAUGHT UNDER OR STRUCK BY THE DRAWBAR IF IT FALLS FROM THE MOUNT.

Remove the lock nut and adjusting nut from the adjusting bolt on each side of the drawbar. Lower the drawbar from the mounts and remove the drawbar.

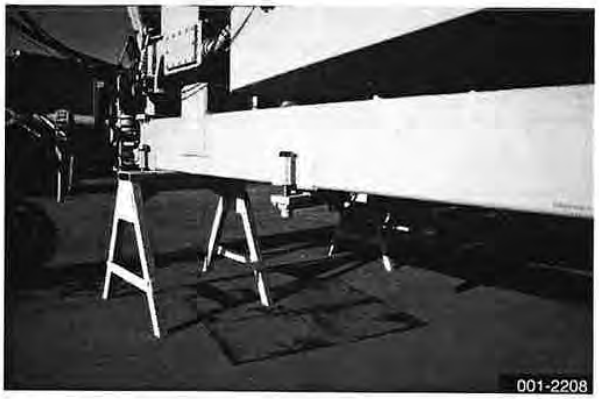


Shift legs to straddle 4-track frame

⚠ WARNING! ⚠

BE CERTAIN THAT THE AREA IN FRONT OF, AND BEHIND THE MACHINE IS CLEAR BEFORE MOVING THE MACHINE. BE CERTAIN THAT THE AREA AROUND THE MACHINE IS CLEAR BEFORE TURNING.

Shift the rear leg to the center of the machine, fully extend the right front leg shift cylinder to the right and shift the left front leg pivot to the left (insert the pin in the last slot to the left). Refer to chapter 3 for more information on shifting the legs.

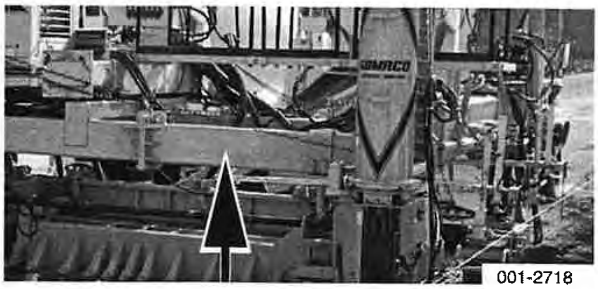


Frame Support

⚠ WARNING! ⚠

USE ADEQUATE LIFTING AND BLOCKING EQUIPMENT WHILE ASSEMBLING THE MACHINE. IT IS RECOMMENDED TO KEEP AS MANY TRACKS ON THE GROUND AS POSSIBLE FOR ADDED STABILITY DURING ASSEMBLY. KEEP ALL PERSONNEL FROM UNDER THE MACHINE DURING ASSEMBLY. FAILURE TO FOLLOW SAFETY PRECAUTIONS CAN RESULT IN SEVERE INJURY OR DEATH.

With the 4-track frame well supported on a flat level area with at least 40 inches (1.01 m) between ground level and the bottom of the 4-track frame, remove the end frame from the extendible side of the 4-track frame. Remove the hose hanger brackets if attached and temporarily set aside the end frame.



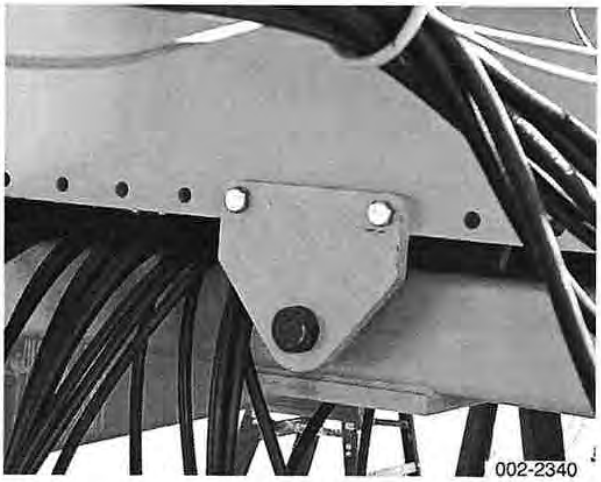
6 ft. (1.83 m) frame extension

If the width of the form exceeds 16 ft. (4.88 m) it will be necessary to remove the end frame from the stationary side of the 4-track frame and install a 6 ft. (1.83 m) frame extension in both the front and rear frames. The added frame extensions allow the machine frame to clear the width of a form that exceeds 16 ft. (4.88 m). Reattach the end frame to the added frame extensions and tighten all bolts securely. The 6 ft. (1.83 m) frame extensions should not be used when operating in the side mounted barrier mode. Also consider the spacing needed to allow the tracks to clear tie bars being inserted into the side of the concrete slab when adding or removing frame extensions.



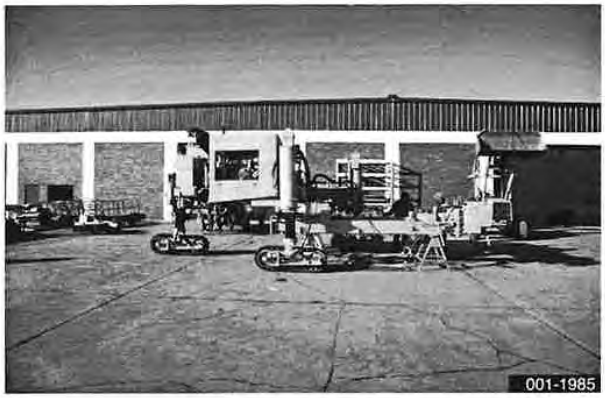
Rear Mounting Brackets Attached

Attach the two mounting brackets to the rear of the machine frame on either side of the rear leg. Slide the brackets to the outer edge of the machine frame. Do not tighten until the machine has been positioned over the 4-track frame and the brackets are properly aligned with the mounting plates on top of the 4-track frame.



Front Mounting Bracket

Attach two mounting brackets to the bottom of the front cross frame in the 5th and 7th holes from the right side of the front cross frame. One bracket will be installed to the front of the front cross frame and one will be installed to the rear of the front cross frame. Tighten securely.

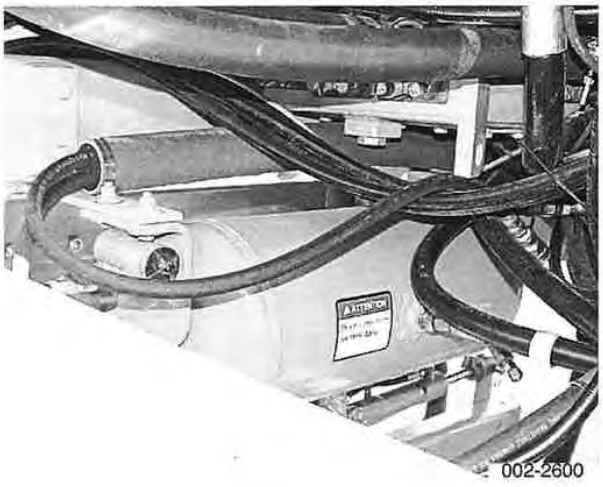


Move Machine Over Frame

⚠ WARNING! ⚠

CONTACT WITH MOVING TRACKS CAN CAUSE SERIOUS INJURY. BE CERTAIN THAT NO ONE IS NEAR THE TRACKS BEFORE MOVING THE MACHINE. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS TO PREVENT SEVERE INJURY. BE CERTAIN THAT NO HOSES, OR ELECTRICAL CABLES CATCH ON THE 4-TRACK FRAME.

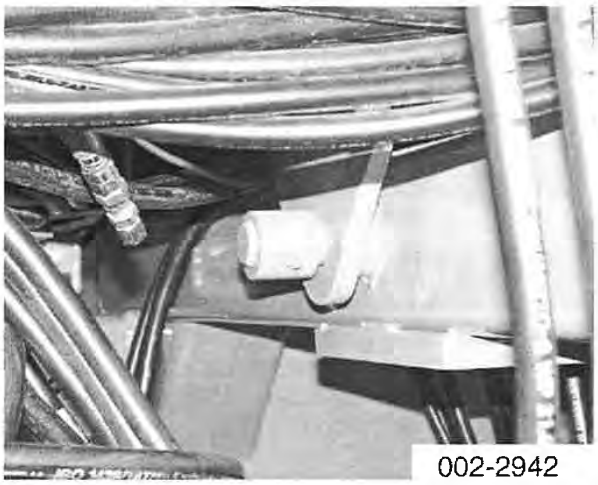
Move and position the machine so that the left front and right front legs straddle the 4-track frame. The rear leg will be positioned between the mount flanges for the extendible side of the 4-track end frame that was removed previously.



Air tank mount

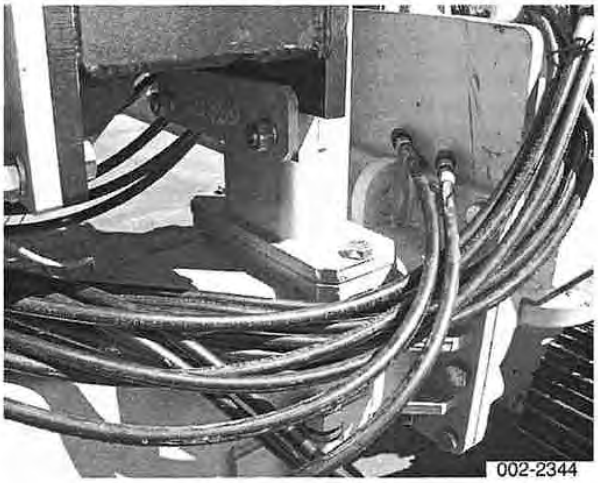
Remove the reserve air tank and mounts from the 3 track frame. The U-shaped air tank mount will be replaced by an L-shaped mount identical to the other mount bracket on the air tank. The air tank can then be mounted to the 4-track cross frame in the mounting holes provided. Tighten the bolts securely.

Lower the machine and align the three attachment brackets with the corresponding points on the 4-track frame.



Insert Front Connecting Pin

Place the connecting pin through the front mounting bracket and secure it in place with the collar, bolt, lock washer and nut. Tighten the bolt securely.



Attach Rear Brackets to Frame

Align the two rear mounting brackets with the holes in the mounting plates. Insert the bolts, lock washers and nuts and tighten securely. Tighten the mounting bracket to the machine frame securely.



Remove Leg and Leg Pivot

⚠ WARNING! ⚠

WHEN REMOVING HYDRAULIC HOSES THAT MAY BE PRESSURIZED USE EXTREME CAUTION. ESCAPING HIGH PRESSURE FLUID CAN CAUSE SEVERE SKIN AND EYE INJURY.

Place blocking between the track and the track yoke to hold the left front track in a stationary position. Raise the left front track off the ground and wrap a chain under the yoke and around the steer arm of the leg to support the track when the hoses are removed. Stop the engine, label and disconnect the hydraulic hoses on the leg and insert plugs temporarily into each of the hydraulic hoses. Attach 12 inch (300 mm) length hydraulic hoses with quick couplers to the fittings in the grade and steer cylinders. Attach a 25 in. (635 mm) length hydraulic hose with quick coupler to the fitting in the track tension cylinder and 30 in. (760 mm) length hydraulic hoses with quick couplers to the track drive motor fittings. The grade cylinder will be equipped with male and female quick couplers while all other cylinders and the drive motor will be equipped with female quick couplers only. Disconnect all electrical cables to the leg. With a suitable lifting device, remove the left front leg from the machine frame and set it aside temporarily. With a suitable lifting device, remove the left front leg pivot from the machine frame. Set the left front leg pivot off to the side of the work area as it will not be used.

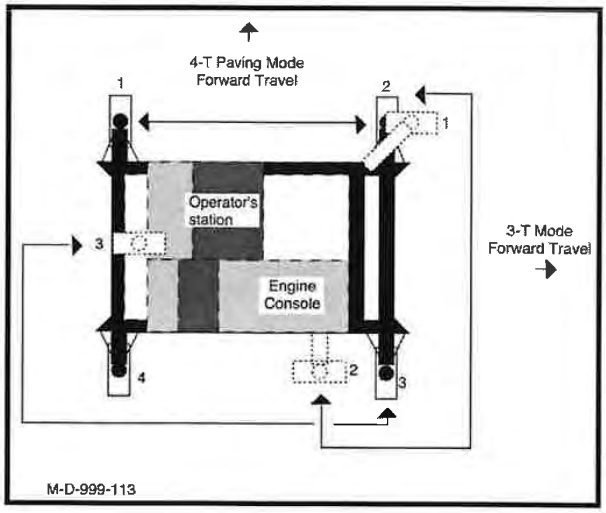


Diagram of leg positions

Place blocking between the track and the track yoke to hold the right front track in a stationary position. Raise the right front track (2) off the ground. Stop the engine, label and disconnect the hydraulic hoses on the leg and insert plugs temporarily into each of the hydraulic hoses. Attach 12 inch (300 mm) length hydraulic hoses with quick couplers to the fittings in the grade and steer cylinders. Attach a 25 in. (635 mm) length hydraulic hose with quick coupler to the fitting in the track tension cylinder and 30 in. (760 mm) length hydraulic hoses with quick couplers to the track drive motor fittings. The grade cylinder will be equipped with male and female quick couplers while all other cylinders and the drive motor will be equipped with female quick couplers only. Disconnect all electrical cables to the leg. With a suitable lifting device, remove the right front leg (2) from the 3 track frame. The mounting plate on the rear of the leg, near the rear of the track, should be used for the 4-track frame mounting.

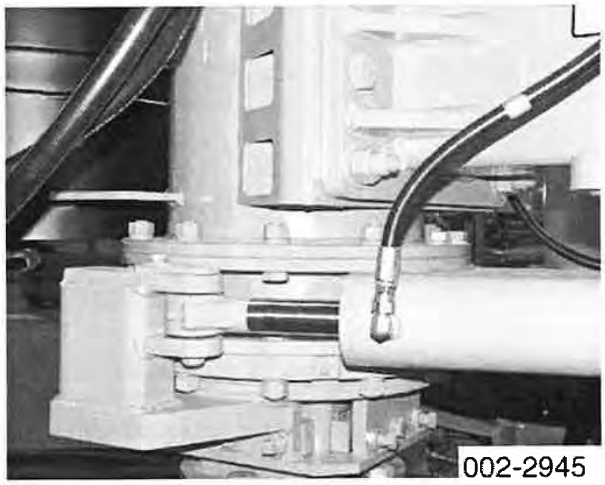


Attach Right Front Leg

With a suitable lifting device, attach the right front leg (2) to the right front corner (2) of the 4-track frame. Position #1 on the mounting plate is normally used to mount the leg to the machine frame. Mounting the leg in position #1 will allow approximately 12 inches (300 mm) of inner leg tube exposed when paving. Mount all legs in the same position according to jobsite conditions. For more information, refer to chapter three leg positioning.

Attach 72 inch (1.82 m) extension hoses to the ends of the existing hydraulic hoses from the left front corner of the 3 track frame. These hoses are connected to the right front corner of the 4-track paving frame. One end of the extension hoses should be equipped with the appropriate quick couplers to match the hoses that were connected into the leg cylinders and track drive motor. Tighten all fittings securely and connect the quick couplers to the appropriate cylinders and motor.

Note: Thoroughly clean all quick couplers before connection to prevent dirt from entering the hydraulic system.



Rotate cylinder location on leg

Remove twelve bolts from the outside ring of the right front leg located between the frame mounting flange and the cylinder mount assembly. Rotate the cylinder mount 90° to align the track and cylinder mount with the 4-track pivot arm. Install the bolts in ring and tighten securely. Start the engine and lower the track to the ground for added frame support.



Relocate Rear Leg

Place blocking between the track and the track yoke to hold the rear track in a stationary position. Raise the rear track (3) off the ground and wrap a chain under the yoke and around the steer arm of the leg to support the track when the hoses are removed. Stop the engine, label and disconnect the hydraulic hoses on the leg and insert plugs temporarily into each of the hydraulic hoses. Attach 12 inch (300 mm) length hydraulic hoses with quick couplers to the fittings in the grade and steer cylinders. Attach a 25 in. (635 mm) length hydraulic hose with quick coupler to the fitting in the track tension cylinder and 30 in. (760 mm) length hydraulic hoses with quick couplers to the track drive motor fittings. The grade cylinder will be equipped with male and female quick couplers while all other cylinders and the drive motors will be equipped with female quick couplers only. Disconnect all electrical cables to the leg. With a suitable lifting device, remove the rear leg (3) from the machine frame and attach it to the right rear corner (3) of the 4-track frame.

Attach 72 inch (1.82 m) extension hoses onto the ends of the existing hydraulic hoses from the right front corner of the 3 track frame. These hoses are connected to the right rear corner of the 4-track paving frame. One end of the extension hoses should be equipped with the appropriate quick couplers to match the hoses that were connected into the leg cylinders and track drive motor. Tighten all fittings securely and connect the quick couplers to the appropriate cylinders and motor. Start the engine and lower the track to the ground for added frame support.

Note: Additional extension hoses may be needed if a 6 ft. (1.83 m) frame extension is added to the machine frame.



Attach Left End Frame

With a suitable lifting device, attach the left end frame in its' original position and tighten all bolts securely.

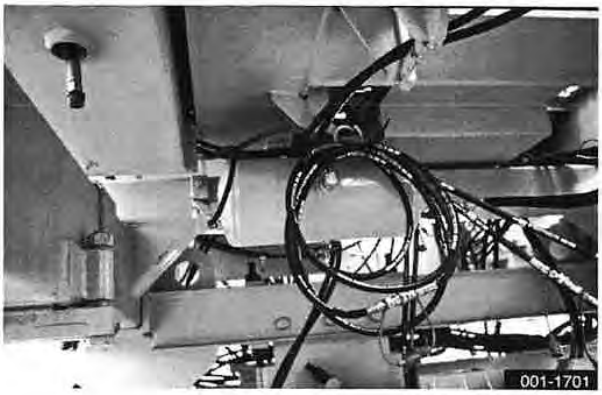
With a suitable lifting device, attach the 3 track left front leg to the left front corner of the 4-track frame. Connect 192 inch (4.8 m) steer and grade extension hoses to the quick couplers of the existing hydraulic hoses from the left rear corner of the 3 track frame. Connect 264 inch (6.7 m) track and track tension extension hoses to the quick couplers of the existing hydraulic hoses from the left rear corner of the 3 track frame. These hoses are connected to the left front corner of the 4-track paving frame. One end of the extension hoses should be equipped with the appropriate quick couplers to match the hoses that were connected into the leg cylinders and track drive motor. Tighten all fittings securely and connect the quick couplers to the appropriate cylinders and motor. Attach the leg in the same mounting holes as the first leg was installed.



Attach left rear leg

With a suitable lifting device, attach the left rear leg to the left rear corner of the 4-track frame. Connect 168 inch (4.3 m) steer and grade extension hoses to the quick couplers of the existing hydraulic hoses from the left rear corner of the 3 track frame. Connect 156 inch (3.9 m) track and track tension extension hoses onto the ends of the existing hydraulic hoses from the rear leg of the 3 track frame. These hoses are connected to the left rear corner of the 4-track paving frame. One end of the extension hoses should be equipped with the appropriate quick couplers to match the hoses that were connected into the leg cylinders and track drive motor. Tighten all fittings securely and connect the quick couplers to the appropriate cylinders and motor. Attach the leg in the same mounting holes as the first leg was installed.

Test each hydraulic circuit for the correct connection of the hydraulic hoses. Refer to the Controls and Gauges section of the Operator's Manual for the manual operation of the servo valves and correct extension and retraction of the steer and grade cylinders. The track drive motors should be connected to operate in the same direction.



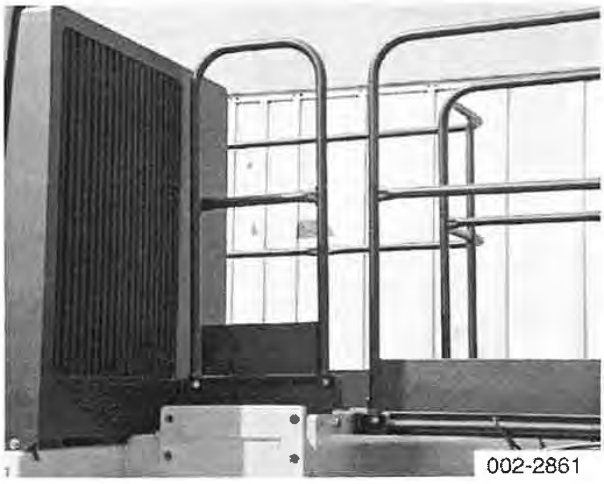
Hose hanger location

Connect the trimmer shift/front frame extend hoses to the front 4-track frame extend cylinder. Connect the conveyor slide/rear frame extend hoses to the rear 4-track frame extend cylinder. Route the hydraulic hoses through the hose hangers.



Operator's Platform

Connect a suitable lifting device to the operator's platform. Lift the platform into position between the operator's station and the front frame tube of the 3 track frame.

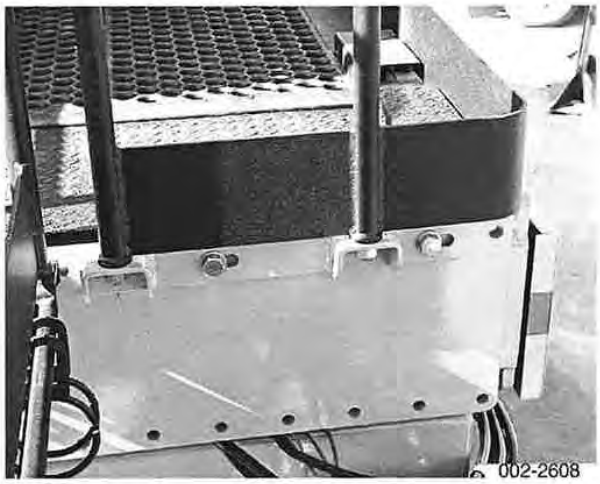


Walkway and Handrail

Connect a suitable lifting device to the walkway and lift into position on the front frame of the machine. Align the mounting holes in the walkway with the 10th and 15th holes from the left side of the 3 track cross frame and install two 3/4 X 2-1/2 inch bolts, lock washers and nuts. Tighten all bolts securely. Insert the hand rails on both sides of the walkway and tighten securely. One hand rail is designed to cover the area in front of the engine console.



Corner handrail



Guard rail mount



Hand rail mount

Install the corner hand rail mount bracket to the front 3 track cross frame in the second and fifth holes from the left side of the frame. Insert the corner hand rail into the mount bracket on the front cross frame and secure with two lock washers and nuts. Secure the side guard rail stud bolts with two lock washers and nuts. Tighten securely.



6 ft. (1.83 m) walkway extension

If the 4-track frame was assembled with the 6 ft. (1.83 m) extensions for 20 ft. (6.1 m) width paving then a 6 ft. (1.83 m) walkway extension will also be needed. The 6 ft. (1.83 m) walkway extension is bolted to the 3 track cross frame. The standard walkway will attach to the end of the 6 ft. (1.83 m) walkway extension. Secure the 6 ft. (1.83 m) hand rails to the walkway extension with lock washers and nuts and tighten securely.



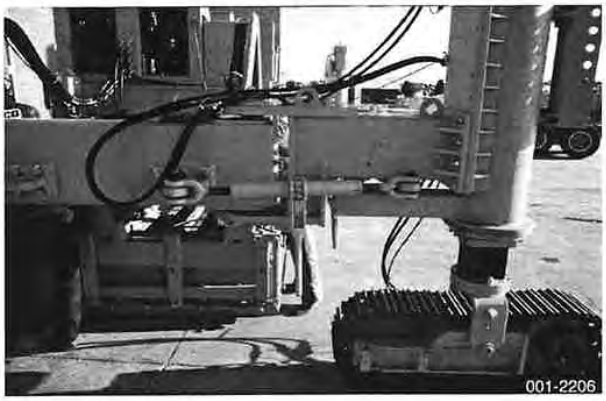
Ladder

Connect a suitable lifting device to the ladder and lift into position. Hook the ladder over the metal strap on the walkway. The support brace on the ladder will rest against the 4-track end frame.



Tool Storage Box

Using a suitable lifting device, attach the tool storage box to the right front leg extension tube located in front of the engine compartment. Use four bolts with flat washers, lock washers and nuts. Tighten securely.



Attach turnbuckles, adjust swinging legs

Swing the swinging legs into position and attach the turnbuckles on either side of each leg. If necessary, the swinging legs on each track can be moved to the left or right of an in-line position with the end frames to bypass obstacles or for narrow clearances. Loosen the turnbuckle on one side of the swinging leg and tighten the other turnbuckle simultaneously until the desired position is reached. Make certain enough bolt thread remains in the barrel of the turnbuckle for proper support. It may be necessary to switch the turnbuckles to opposite sides of the swinging leg to maintain proper support. Adjust each of the swinging legs in the same manner.

Note: The legs will be more stable if both turnbuckles remain connected to the swinging legs.

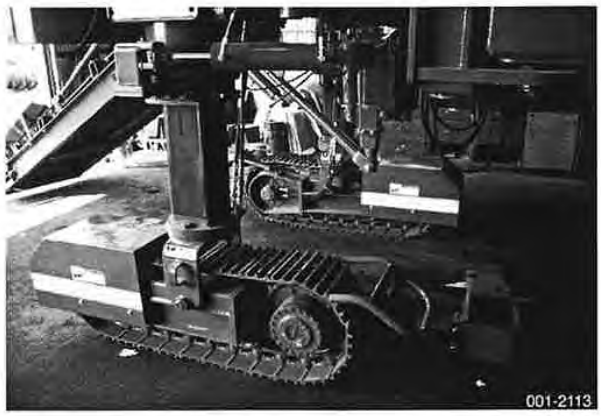


Track yoke adjustment

After adjusting the swinging legs, check the stroke of the steer cylinders (also refer to the track positioning section at this time). If the steer cylinder is not near the center of its stroke when the track is straight ahead, adjustment may be necessary. Each inner leg tube is bolted to the track yoke allowing adjustment to center the stroke of the steer cylinder and allowing the track to be turned approximately the same amount in either direction. Support the frame near the track that will be rotated. Lower the frame onto the support and take the weight off the track. Remove the four bolts from the track yoke and retract or extend the steer cylinder until the cylinder is extended approximately 6 in. (150 mm). Turn the track on the center spindle bolt to the set of holes required to face the track straight ahead (it may be necessary to loosen the center spindle bolt). Insert the bolts, lock washers and nuts and tighten securely.



Tracks facing correct direction



Tracks facing incorrect direction

⚠ WARNING! ⚠

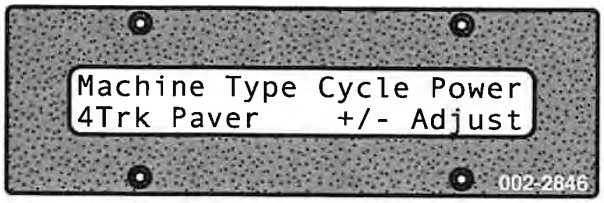
MAKE CERTAIN ALL PERSONNEL ARE CLEAR OF THE MACHINE AND ANY MOVING PARTS BEFORE STARTING THE ENGINE. CONTACT WITH MOVING TRACKS CAN CAUSE SERIOUS INJURY. KEEP HANDS, FEET AND LOOSE CLOTHING CLEAR OF ANY PINCH POINTS AND MOVING PARTS. SEVERE INJURY OR AMPUTATION CAN OCCUR IF PERSONNEL ARE CAUGHT IN OR STRUCK BY MOVING PARTS.

Track Positioning: When switching from barrier mode to paving mode, the track drive sprockets should be to the rear of the track frame when the machine travels forward. If all tracks do not face the same direction as previously indicated it will be necessary to rotate the track(s) to face the correct direction. Adequately support the 4-track frame next to the track(s) to be rotated. Disconnect the hydraulic hoses to the track drive motor and the track tension cylinder. Remove the four bolts, lock washers, and nuts connecting the track yoke to the inner leg tube. Start the engine and jog the inner leg tube up to remove the weight from the track. Kill the engine. Rotate the track to face the correct direction (a bolt in the center of the track yoke will maintain correct alignment). Before inserting the bolts connecting the track yoke to the inner leg tube, check the steer cylinder stroke as indicated previously in the lateral positioning section. Align the holes and insert the four bolts, lock washers and nuts and tighten securely. Thoroughly clean the quick couplers on the track tension and track drive hoses to prevent dirt from entering the hydraulic system. Connect the track tension hose and the track drive motor hoses. Start the engine and raise the leg high enough to remove the blocking. If needed, rotate any other tracks on the machine to face the correct direction using the same procedure.

⚠ WARNING! ⚠

CONTACT WITH MOVING TRACKS CAN CAUSE SERIOUS INJURY. BE CERTAIN THAT NO ONE IS NEAR THE TRACKS BEFORE MOVING THE MACHINE. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS.

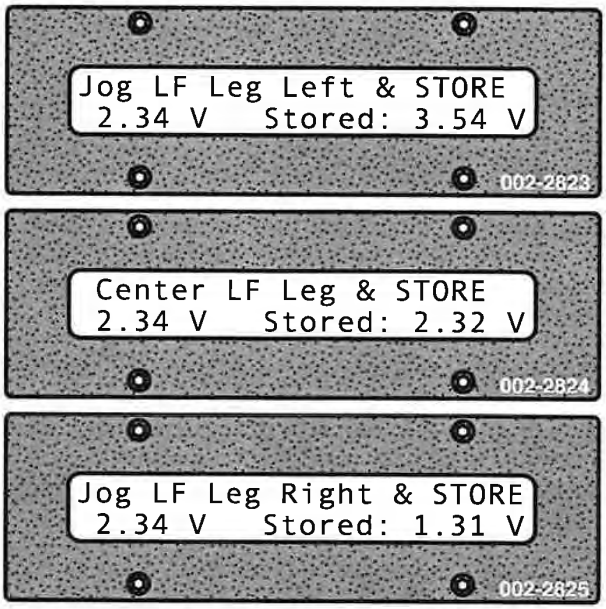
Check the track drive motor hoses for correct connection by starting the engine and placing the track directional control switch in the "forward" position. Rotate the travel variable speed knob clockwise and make certain all tracks are rotating in the forward direction. If not, stop the machine, kill the engine and reverse the track drive hoses on the incorrectly connected tracks.



Change network program configuration

Prior to moving the machine, it will be necessary to properly align the steering on each of the tracks.

Begin by depressing and releasing the calibrate (CALIB) switch on the network control box. Depress and release the NEXT switch until the machine type is displayed on the main screen. Depress the slope set switches +/- until the "Paver" designation is displayed. Depress and release the CALIB switch to return the main screen to the normal operating display. The operator must cycle the power before any changes are enabled.

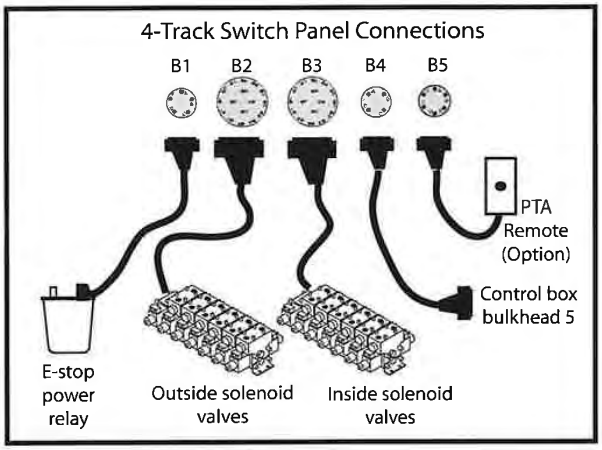


Center feedback pots on each leg

Calibrating the Steering Cylinders: Three adjustments are required for each steering cylinder: left turn limit, center and right turn limit. Begin by starting the engine and depress and release the SET switch. The main screen will indicate "STORE to Save Slope Null & Feedback Pot. Points". To select a steering control loop, depress the LAST or NEXT switch until the appropriate sensor signal is indicated on the main screen (Photo 002-2823). Turn the track as far to the left as required to prevent the track from contacting obstacles on the jobsite. Depress the STORE switch and depress the NEXT switch (Photo 002-2824). Turn the track to the straight ahead position and measure for correct adjustment (Refer to the maintenance chapter for measurement information). When it is adjusted parallel to the machine frame or guideline depress the STORE switch and depress the NEXT switch (Photo 002-2825). Turn the track as far to the right as required to prevent the track from contacting obstacles on the jobsite. Depress the STORE switch. Continue to depress the NEXT switch to repeat the procedure for

the other tracks (if necessary). Refer to the Maintenance chapter for more information.

Note: The left and right limits prevent the network controller from stroking the cylinder completely and causing the track to contact an obstacle. When radius work is required, make certain that the left and right limit settings do not prevent the track from turning enough to complete the radius.



Switch panel connections

Remove the 3-track switch panel and replace it with the 4-track switch panel. Disconnect the cables from the panel and remove the nuts and lock washers from the retainer bolts. Lift the switch panel from the consoleand insert the 4-track switch panel. Secure with lock washers and nuts and tighten securely. Connect the cables as indicated in the previous diagram.

03 Form Preparation

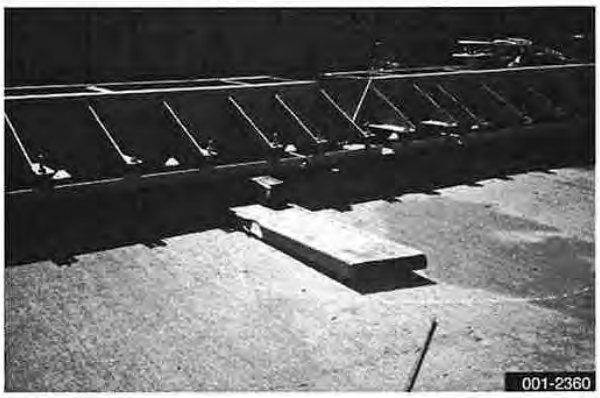
The form may be shipped from the factory with the profiles installed and assembled to the width requested on the machine order. Secured to the top of the form are several miscellaneous parts. Cut the bands securing these parts and remove all loose items from the top of the form before unloading the form.

Note: A 20 ft. (6.1 m) form is shipped as described above. A form that measures 16 ft. (4.88 m) or less is normally mounted to the machine frame when shipped from GOMACO unless otherwise requested. Shipping length and height restrictions may affect this procedure.

⚠ DANGER! ⚠

DO NOT GET UNDER THE FORM WHEN LIFTING IT. SEVERE INJURY OR DEATH CAN OCCUR IF PERSONNEL ARE CAUGHT UNDER OR STRUCK BY THE FORM IF IT WERE TO FALL.

To unload the form, connect the lifting cables to the form mount pins on each side. Connect lifting cables to the powered transition adjuster (PTA) section to support. Using suitable lifting equipment, raise the form clear of the transport bed and move the transport out from under the form. Lower the form down onto support blocking.



Blocking Under Form

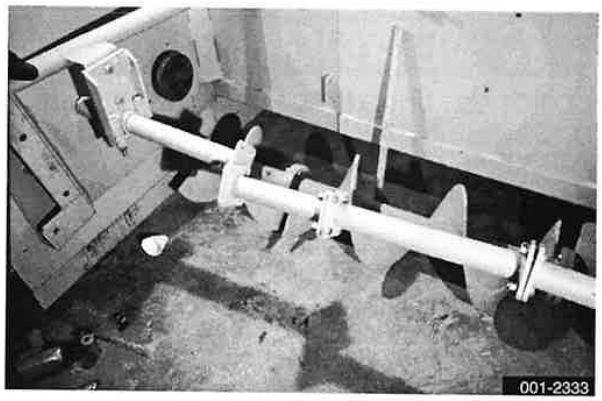
⚠ WARNING! ⚠

KEEP HANDS, FEET AND LOOSE CLOTHING CLEAR WHEN THE FORM IS LOWERED ONTO BLOCKING. SEVERE INJURY OR AMPUTATION CAN OCCUR IF PERSONNEL ARE CAUGHT BETWEEN THE FORM AND THE BLOCKING.

Changing Form Widths

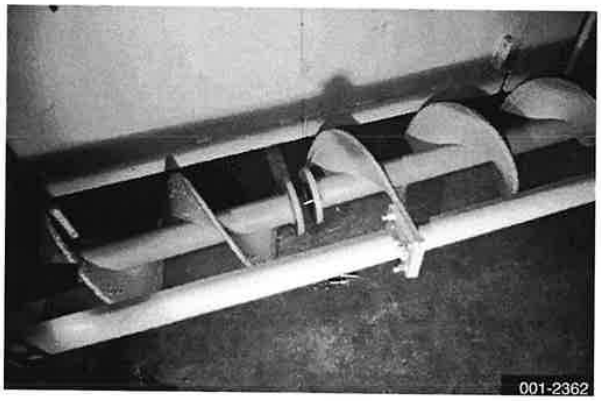
When changing the width of the form, it should be removed from the machine. Place adequate support blocking under the form on each side of the joint where the form is to be split.

Note: If a section is to be removed, place blocking to each side of, but not under the section.



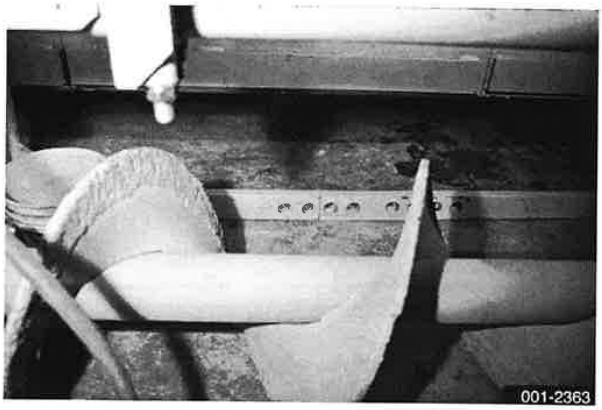
Vibrator Mount Tube

Remove the bolts through the vibrator mount tube at the joint where the form is to be split. If a section is to be removed, remove the bolts at each end of the vibrator tube and remove section.



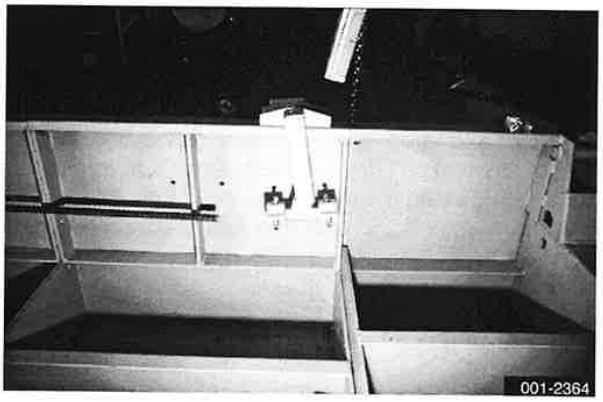
Auger Flange

Remove the bolts through the auger flange at the joint where the form is to be split. If a section is to be removed, remove the bolts at each end of the auger section and lift the section clear. Support the ends of the auger near the disassembled flange by blocking or chaining it to the front of the form.



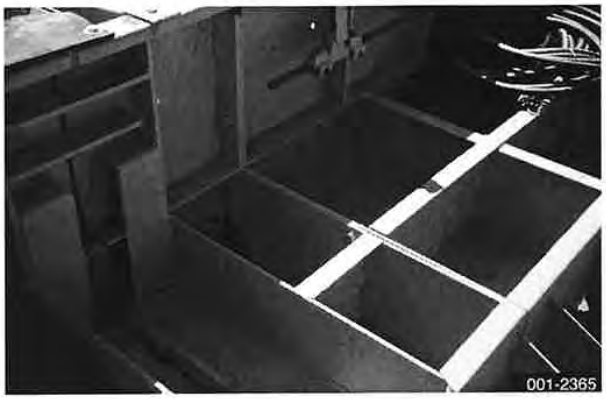
Bottom Tamper Bar Connection

Remove the two bolts through the end of the tamper bar at the joint where the form is to be split. If a section is to be removed, remove the bolts at each end and remove the section. If the tamper bar section to be removed has a vertical hanger rod attached to it, remove the retainer nut and remove the pin holding the vertical hanger in the drive converter to remove the tamper section.



Tamper Bar Drive Converter Set screws

Loosen the set screws in the tamper bar drive converters on the back of the form and pull the tamper bar drive rod from the converters.



Form Connection Bolts

Remove the bolts from the adjoining ends of the stainless trowel section. Remove the bolts from the back of the form at the joint where the form is to be split. If a section is to be removed, remove the bolts at each side of the section and lift the section clear. Push the sections together and insert the bolts previously removed. If a section is to be added, use suitable lifting equipment and lift the idler section away from the other sections enough to insert section(s) of desired width. Insert the bolts through each end of the added section(s). Do not tighten bolts at this point.

If a self supporting powered transition adjuster (PTA) is needed (for transitions from a flat product to a crowned product), locate the desired position in the form and insert the PTA section in that position. Make certain that the center of the PTA section is located directly above the crowning point that is needed in the finished product.

Note: It is highly recommended that the self supporting PTA should be equipped with a sensor system when rideability specifications are required. Contact your GOMACO dealer or GOMACO for further details.



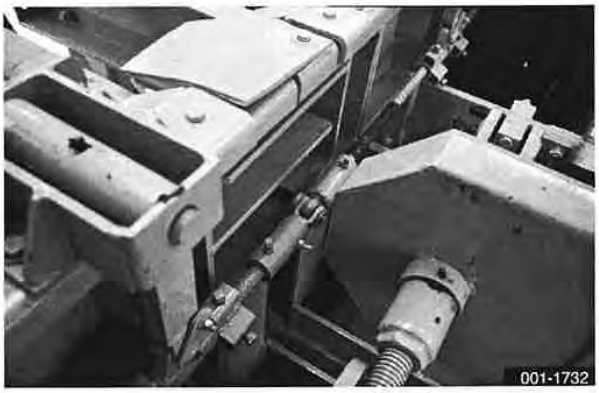
Align Bottom Sections

Using a suitable lifting device, align the bottom edge of the form where the sections adjoin. Tighten all bolts securely.



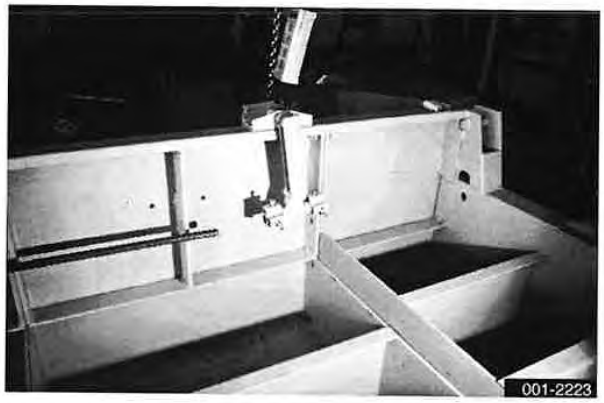
Tamper Bar Connections

Insert two 1/2 X 1-1/2 inch carriage bolts through the ends of adjoining tamper bar sections. If a form section has been inserted, add additional tamper bar sections as necessary and insert bolts through the adjoining ends. Install nuts and lock washers but do not tighten bolts until tamper bar has been adjusted.



PTA drive rod connector

If the form contains a PTA section it will be necessary to provide a joint at the center of the breaking point so that the tamper bar can follow the same angle as the form. The drive converters will be mounted in the same manner. The tamper bar will be split at the PTA breaking point and the tamper bar drive rod will also be split at the PTA. Insert the drive rod connector between the two drive rods on either side of the PTA and tighten the set screws securely. For proper support, make certain that the drive rod is fully inserted into the connector tube before tightening the set screws.



Tamper Bar Drive Converter

If there is more than 5 ft. (1.52 M) between tamper supports, it will be necessary to install an additional drive converter to the top of the form hopper. Position the drive converter as shown and fasten it securely to the top of the hopper with three 1/2 X 1-1/4 inch bolts, lock washers and nuts. It may be necessary to drill two holes in the top and one hole in the front of the hopper to mount the drive converter if holes have not been provided.

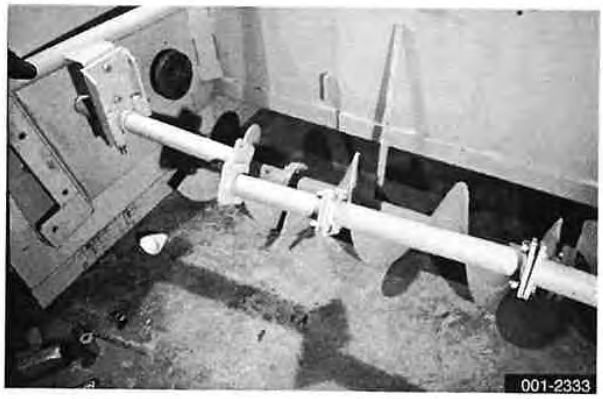


Auger Connection

⚠ WARNING! ⚠

KEEP HANDS AND FINGERS CLEAR WHEN HOLES ARE ALIGNED. SEVERE INJURY OR AMPUTATION CAN OCCUR IF PERSONNEL ARE CAUGHT IN OR STRUCK BY MOVING PARTS.

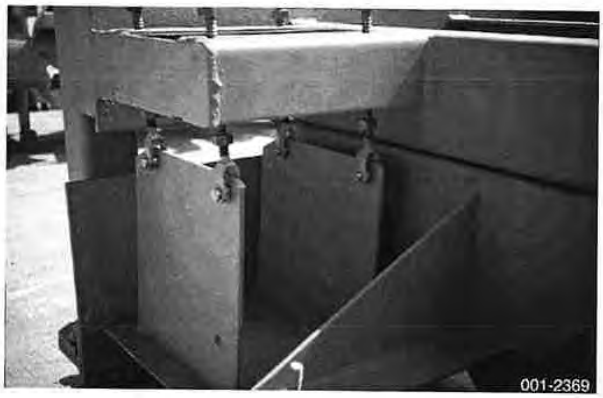
Insert four bolts through the auger flange. If a form insert section has been installed, insert auger sections as necessary. Align the ends of the auger to form a continuous spiral. Install nuts and lock washers to the bolts and tighten securely.



Vibrator Mount Tube

Connect the vibrator mount tube together with four bolts, lock washers and nuts. Tighten securely. If form insert sections have been added, insert vibrator mount tube section(s) as necessary.

Changing Curb Profiles



Remove stainless adjustment pins

When changing the curb profile, the sideplate must be loosened first. Loosen the seven contour thread sideplate anchor bolts. Loosen the nuts on the four contour thread adjusting bolts directly above the outer end of the stainless section (curb profiles only). Remove the cotter keys and remove the pins from the clevis' on the adjustment bolts. Remove the bolt through the adjoining ends of the stainless trowel sections.



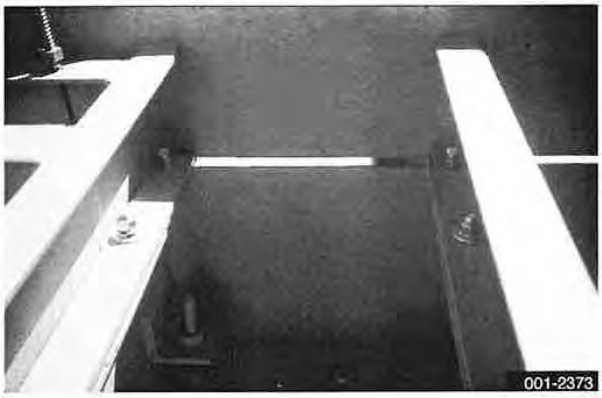
Edge Slump Adjustment Bolts

If the flat profile is being removed, loosen the three 1-1/4 in. Contour thread edge slump adjustment bolts and remove the hair pins and 3/4 in. pins from the lower end of the adjustment bolts. After the flat profile is removed, it is recommended to remove the adjustment bolts if a curb profile is being installed.



Profile Section

Remove the six bolts through the side of the profile section into the main section. Remove the six bolts through the top of the profile section into the frame members. Lower the profile section and then pull section to the rear until it is clear of the main form.



Profile Section in Place

If the flat profile section is being installed, insert the three 1 1/4 in. contour thread edge slump adjustment bolts first (if removed previously). Using a suitable lifting device, lift the desired profile section into place. Insert six 3/4 in. X 2 in. bolts through the side of the profile section into the main section, and place a lock washer and nut on each. Place 1/2 in. flat washers on six 1/2 in. X 2 in. bolts and insert them through the top of the profile section into the frame members. Place a flat washer, lock washer and nut on each of the installed bolts. Do not tighten any bolts at this time. Back the 1/2 in. adjustment setscrews out all the way. If the flat profile section has been installed, insert the 3/4 in. X 2 1/4 in. pins through the lower end of the three edge slump adjustment bolts and secure in place with #7 hair pins. Insert 1/2 in. X 1 1/2 in. pins through the four adjuster bolt clevis' and holes in the top of the stainless section (curb profiles only) and secure with 1/8 in. X 1 1/2 in. cotter keys. Insert a 1/2 in. X 1 3/4 in. bolt through the adjoining ends of the stainless trowel section, but do not tighten until the stainless is adjusted.

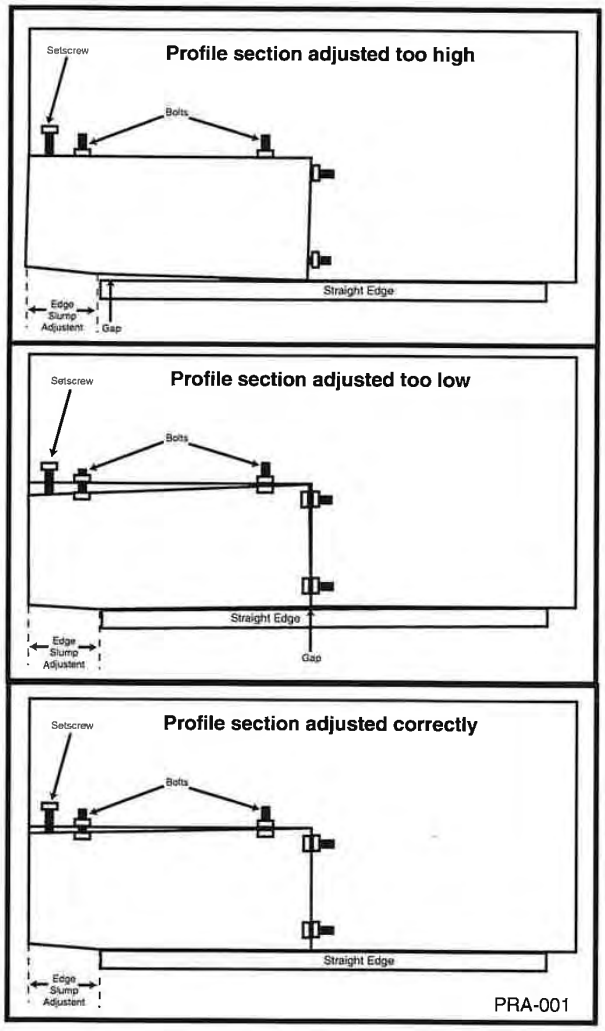
⚠ WARNING! ⚠

WHEN LIFTING A SECTION IN OR OUT OF THE FORM, DO NOT GET UNDER THE LIFTING DEVICE, OR THE SECTION. DO NOT PLACE FINGERS IN HOLES TO CHECK FOR ALIGNMENT. SEVERE INJURY, OR AMPUTATION, COULD OCCUR IF THE SECTION WERE TO FALL.



Align Bottom of Profile to Main Form

Using a suitable lifting device, align the bottom edge of the profile section with the bottom edge of the main form where the sections adjoin. Tighten the six 3/4 inch bolts securely.

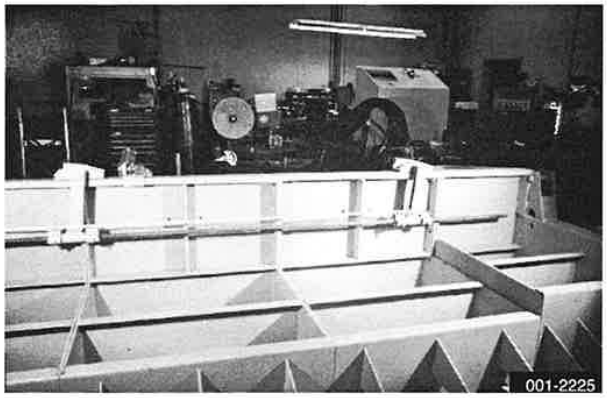


Straightedge Profile Section

Place a straight edge under the profile section and main form and adjust the entire profile section up or down until the bottom of the form is straight. If the profile section must go down, loosen the six 1/2 inch mounting bolts and turn the adjustment screws in to force the section down. If the profile section must go up, turn the adjustment screws out and tighten the six 1/2 inch mounting bolts.

Note: A small amount of slope can be adjusted into the profile section through the use of the adjustment screws.

Tamper Bar Adjustments

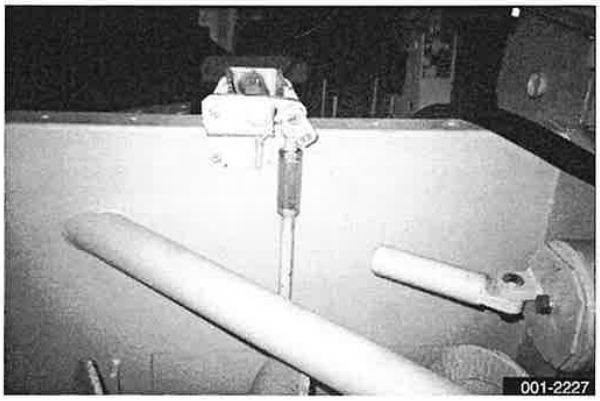


Measure Drive Converters

To adjust the tamper bar, the drive converters must first be timed. To time the drive converters, measure the distance from center to center between the upper pivot pins, starting at the main drive converter. Measure the distance from center to center, between the lower pivot pins, starting at the main drive converter. The measurements should be the same. Adjust the drive converters by loosening the four set screws in each drive converter and sliding it left or right until equal measurements exist between the pins. Tighten the screws securely. If a tamper bar drive shaft joint exists at a drive converter, be sure the ends of the drive shafts are inserted equally into the drive converter as far as possible. When the timing of the drive converters is completed, the drive converter arms should all be parallel.



Straightedge Tamper Bar



Tamper Bar Drive Converter

Rotate the tamper bar drive motor until the drive converters are in the down position on the front of the form. Extend a straightedge from the bottom of the main form under the tamper bar. Adjust the tamper bar up or down by turning the connector couplers on each of the tamper bar connecting rods on the front of the form until the bottom edge of the bar is even with but no more than 1/4 inch (6 mm) above the straight edge. Tighten both jam nuts securely against the connector coupler. Make sure the tamper bar is straight from side to side and tighten the bolts through the ends of tamper bar sections securely.

If a flat profile section is installed, the outer end section of the tamper bar (closest to the sideplate) must be adjusted to match the edge slump adjustment. Pull up on the end of the section and tighten the bolts securely. If a curb profile is installed, it will be necessary to remove the end section of the tamper bar.

⚠ CAUTION! ⚠

WHEN SERVICING THE ELECTRICAL SYSTEM OR WELDING ON THE MACHINE, ALWAYS DISCONNECT THE GROUND STRAP FROM THE BATTERY TO PREVENT DAMAGE TO THE MACHINE ELECTRICAL SYSTEMS.

GOMACO TIP: It is recommended to spot weld the adjoining ends of the tamper bar to prevent them from slipping during pouring operations.

Vibrator Adjustments



Edge Vibrator Underslung

Be sure the vibrator lift cylinder is in the fully extended position. Place a vibrator 6-8 in. (150-200 mm) in from each edge in an underslung (horizontal) manner, with the bottom of the tip of the vibrator flush with the bottom of the form. Tighten the mounting bolts and set screws securely to hold the vibrator in place.



Vibrators Installed Underslung

Place additional vibrators at 12 to 24 in. (300-600 mm) intervals along the entire width of the vibrator mount tube. Tighten the mounting bolts and set screws securely to hold the vibrators in place with the bottom of the tips flush with the bottom of the form.

Note: It may be necessary to limit the retraction of the vibrator lift cylinders to clear mesh, baskets, etc.

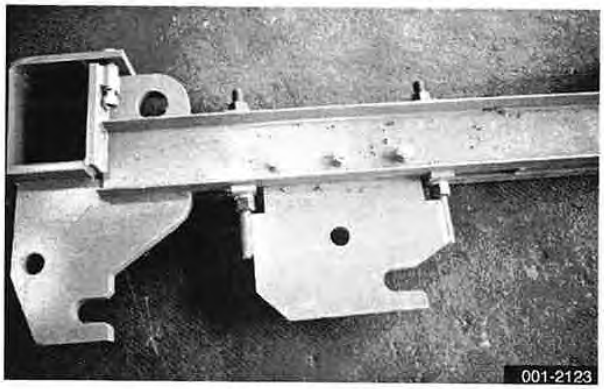


Curb Vibrator

If integral curb is to be formed, mount a vibrator to the adjustable mount on the end plate in an overslung (vertical) manner. The vibrator should be positioned with the end centered in the curb opening and tilted back slightly. Rotate the vibrator mount as necessary to position the vibrator 1 to 2 in. (25 to 50 mm) from the back of the hopper. Tighten all bolts and set screws securely.

GOMACO Tip: It is normally easier to install the vibrators before mounting the form under the machine.

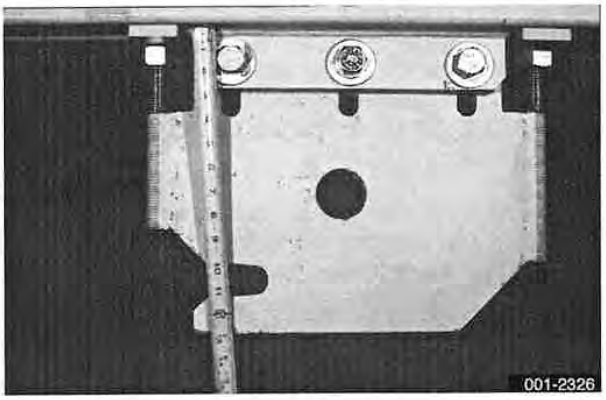
Installation of Form Mounts



Install adjustable hangers

Raise one of the form mount beams off of the ground and support it with blocking. Slide an adjustable mount into place, from the bottom up, between the form mount tubes. Screw a 1 inch nut onto each adjustment bolt as they reach the opening at the top of the form mount beam. Place a lock washer on each bolt, followed by a retainer bar. Continue raising and adjusting the form mount until a retainer bar, lock washer and nut can be attached to the bolts. Insert three 3/4 in. X 3 in. bolts into the holes in the side of the form mount beam and the adjustable form mount.

Install a lock washer and nut on each bolt. The mounting slots in the adjustable form mounts should face the same direction as the stationary mount at the rear of the form mount beam.



Measure adjustable hanger

Measure the distance between the bottom of the mounting beam and the top of the slot in the stationary form mount. Record this measurement. Adjust the adjustable form mount up or down until the measurement between the bottom of the form mount beam and the top of the slot in the form mount is the same as the stationary mount. Adjust the mount so it is parallel to the mount beam. Tighten all bolts securely. Repeat the procedure for the opposite side.



Install latch pin and J-bolt

Insert a latch pin through the hole in the form mount. Insert a latch bolt through the hole in the latch pin. Place a 1 in. nut and a 1 in. jam nut on the bolt, but do not tighten at this time. Be certain that the latch bolt is to the outside of the mounting bracket. Repeat this step to install the other latch pin and latch bolt on the remaining mounting bracket. Repeat the procedures for the opposite form mount assembly.

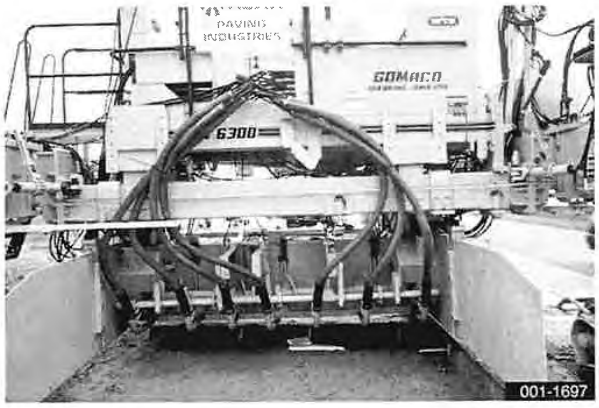


Extend frame

It may be necessary to extend or retract the main frame to attain the proper clearance between the tracks and the form. Measure the distance between the centers of the left and right mounting pins on the form. Using the frame extend switches on the control console, extend or retract the frame until the measurement between the form mounts on the machine is the same as the measurement between the mount pins.

Note: The front and rear of the 4-track frame must be extended or retracted simultaneously.

GOMACO Tip: If the frame cannot be extended, or retracted, raise the machine on the tracks. Manually turn both left tracks full left, and both right tracks full right. If the frame must be extended, slowly move the machine forward while continuing to hold the frame extend switches in the extend position. If the frame must be retracted, slowly move the machine in reverse while continuing to hold the frame extend switches in the retract position.



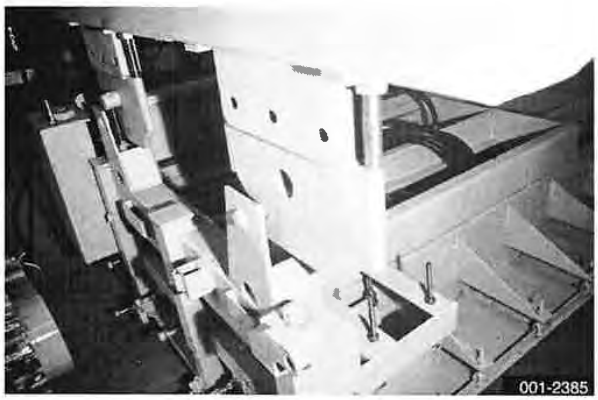
Measure to end car frame for parallel

After the frame has been adjusted to the proper width, measure the front 4-track frame from end frame to end frame. Record the measurement. Repeat the same measurement across the rear of the 4-track frame. The two measurements should be the same. If not, hydraulically adjust either the front frame extend or the rear until the measurements are the same. Tighten the frame extend clamps securely.



Machine positioned behind form

Position the machine directly behind the form. Using the appropriate jog switches, raise the machine high enough for the form mounts on the machine to clear the mounting pins on the form. Slowly drive the machine forward over the form until the front edge of the hangers are slightly behind the mounting pins. Using the jog switches, lower the machine down until the slots on all four mounts line up with the mounting pins.



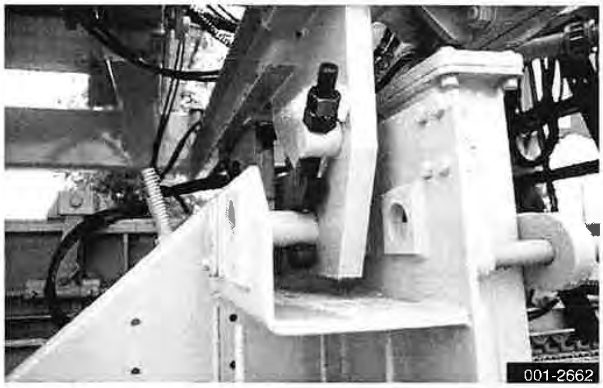
Mount slots aligned with pins

⚠ WARNING! ⚠

CONTACT WITH MOVING TRACKS CAN CAUSE SERIOUS INJURY. BE CERTAIN THAT NO ONE IS NEAR THE TRACKS BEFORE MOVING THE MACHINE. KEEP HANDS, FEET AND LOOSE CLOTHING AWAY FROM MOVING PARTS TO PREVENT SEVERE INJURY. BE CERTAIN THAT NO HOSES, OR ELECTRICAL CABLES CATCH ON THE FORM.

Slowly drive the machine forward making sure the mounting pins slide into the slots in the hangers. Drive forward until the mounting pins are fully engaged in the slots.

> **Note:** It may be necessary to temporarily remove the safety shield from the auger drive motor on the form to gain clearance for the tracks. Install the safety shield when the machine has cleared the auger area.



Connect latch pin

Place the latch bolts over the top or under the pin as necessary. Tighten the latch bolt adjustment nut securely and lock in place with the jam nut. Do the same on both sides.



Auger Quick Couplers

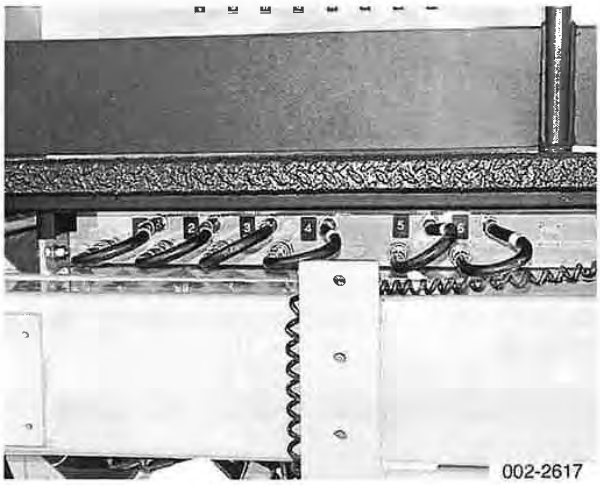
Thoroughly clean the quick couplers from the left auger drive motor and the conveyor/auger drive hoses from the machine to prevent dirt from entering the hydraulic system. Connect the left auger drive hose quick couplers to the conveyor/auger quick couplers. Connect the pave auger quick couplers to the right auger drive motor in the same manner. Whenever the auger hoses are disconnected, always place the protective covers over/in the quick couplers to prevent dirt from entering the hydraulic system.



Tamper Quick Couplers

Thoroughly clean the quick couplers on the tamper bar drive motor hoses and the auxiliary auger/tamper quick couplers from the machine to prevent dirt from entering the hydraulic system. Connect the hoses from the tamper bar drive motor to the auxiliary auger/tamper quick couplers. Whenever the tamper bar drive hoses are disconnected, always place the protective covers over/in the quick couplers to prevent dirt from entering the hydraulic system.

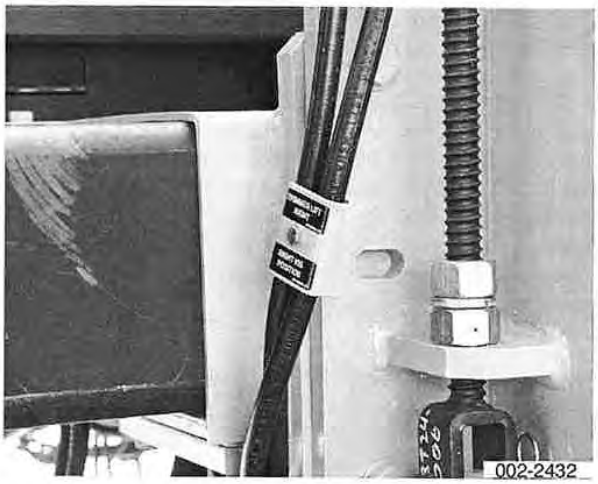
If the form is equipped with a PTA, thoroughly clean the quick couplers on the PTA drive motor hoses and the PTA solenoid valve. Connect the quick couplers on the PTA solenoid valve and the PTA drive motor hoses. Whenever the PTA hoses are disconnected, always place the protective covers over/in the quick couplers to prevent dirt from entering the hydraulic system.



Vibrator Quick Couplers

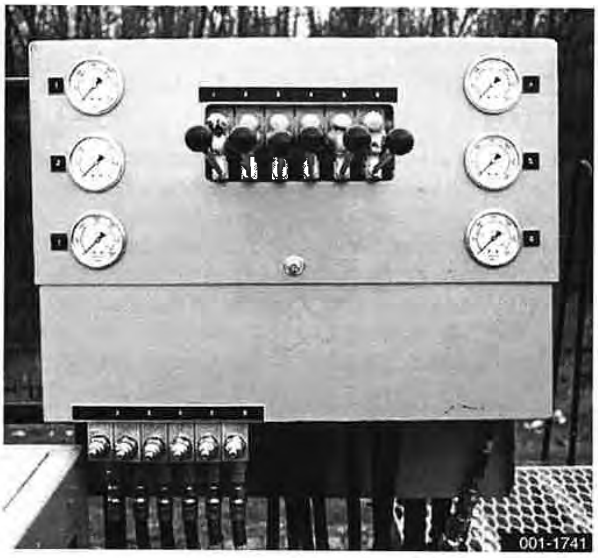
Thoroughly clean the quick couplers on each vibrator and on the bulkhead quick couplers to prevent dirt from entering the hydraulic system. Connect the vibrators to the circuits provided on the machine. It is recommended that the vibrators be connected in a consecutive order across the width of the machine beginning with number 1 circuit. When the vibrators are disconnected, connect the couplers on the vibrator together and connect the loop hoses on the machine together. Any vibrator circuit that does not have a vibrator attached to it must have a loop hose attached.

Note: If more than eight vibrator circuits are needed, the machine may be equipped with up to sixteen vibrator circuits. Contact GOMACO for additional information and procedures for installation.



Vibrator Lift Hoses

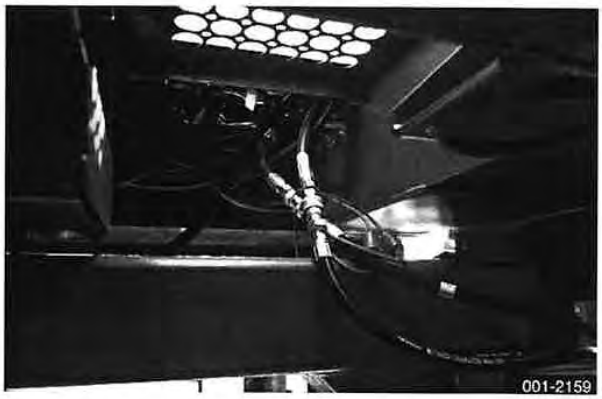
Thoroughly clean the quick couplers for the vibrator lift to prevent dirt from entering the hydraulic system. Connect the right trimmer lift/vibrator lift quick couplers to the right vibrator lift cylinder. Connect the left trimmer lift/vibrator lift quick couplers to the left vibrator lift cylinder.



Install sideplate controls

If the slipform mold is equipped with hydraulic sideplates, it will be necessary to install the sideplate control box. Hang the sideplate control box on the end frame of the machine or from the paving mold.

Note: The sideplate controls pictured above are equipped with gull wing sideplate controls and a hydraulic over build control valve.



Connect sideplate hydraulic hoses

Thoroughly clean the quick couplers on the pressure and return hoses on the control box and on the hoses under the console to prevent dirt from entering the hydraulic system. Connect the pressure and return hoses from the sideplate control box to the quick couplers under the control console.

Note: Do not connect the hoses under the console for the hydraulic sideplates together when the sideplate control box is removed, or loss of lift pressure will result.

Thoroughly clean the quick couplers on the pressure and return hoses on the control box and on the sideplate hoses to prevent dirt from entering the hydraulic system. Connect the pressure and return hoses from the sideplate control box to the hoses from the hydraulic sideplate cylinders. Be certain to connect the hoses in the proper order. The left front control valve should be connected to the left front cylinder, etc.

Note: The hydraulic sideplates will be adjusted after the machine is set for final grade.

04 Slipform Final Adjustments

Position the machine on a flat, level surface and extend each of the elevation legs equally prior to making any adjustments.



Line pulled across frame

Pull a stringline tight across the top of the front and rear frame members approximately 18 in. (460 mm) in from the form mount beam (towards center). Measure from the line down to the rear of the main form (do not measure to stainless). Note this measurement.



Measure at front of pan

Measure from the line down to the front of the form (to rear of hopper). This measurement should be the same as the rear. If not, adjust the adjustable hanger mount up, or down, as necessary until the measurement is the same. Tighten all bolts in the mounts securely. Repeat the procedure on the opposite side.



Straight edge across joint

Hold a straight edge under the form across adjoining sections. If the straight edge will "rock" from side to side across the joint, the joint is low and must be raised. To raise the joint, remove the two bolts connecting the joint from the vertical leg, the three bolts across the top of the joint and the three bolts across the center of the joint. Slightly loosen the three bolts across the bottom of the joint.

Place a hydraulic jack under the joint and raise it until it is flat. Insert flat washers or shims between the spread vertical leg as necessary, and replace the bolts that were removed. Tighten the bolts securely. Repeat the procedure on all joints if necessary.



Line pulled across front of form

Loosen the sideplate anchor bolts on both sides of the form. Thread a stringline between the sideplate and the form on one side and pull it to the opposite side. Thread the line between the sideplate and the form

and pull it tight enough to eliminate any sag. Position the line just to the rear of the tapered throat at the front of the form. Place a 1 in. X 1 in. X 2 in. (25 mm x 25 mm x 50 mm) block of wood between the line and the bottom of the form on each side. Position the blocks approximately 18 in. (450 mm) in from each edge. Using a third block of the same size, adjust the center of the form up or down, with the PTA switch, until the block of wood will just slip between the stringline and the bottom of the form, directly below the front adjustment screw of the PTA. After the PTA is set flat, check the rest of the joints in the form with the third block. If any joint indicates that there is more than 1/8 inch (3 mm) deviation from the actual size of the block, it will be necessary to shim the appropriate joint to adjust it to within 1/8 inch (3 mm). Tighten each joint securely.



Stringline at rear of main form

Thread a stringline between the sideplate and the form on one side and pull it to the opposite side. Thread the line between the sideplate and the form and pull it tight enough to eliminate any sag. Position the line just to the front of the stainless trowel section (not under stainless). Place a 1 in. X 1 in. X 2 in. (25 mm x 25 mm x 50 mm) block of wood between the line and the bottom of the form on each side. Position the blocks approximately 18 in. (450 mm) in from each edge. Using a third block of the same size, check the gap between the stringline and the bottom of the form, directly below the rear PTA adjustment screw. The block should just slip between the stringline and the form.





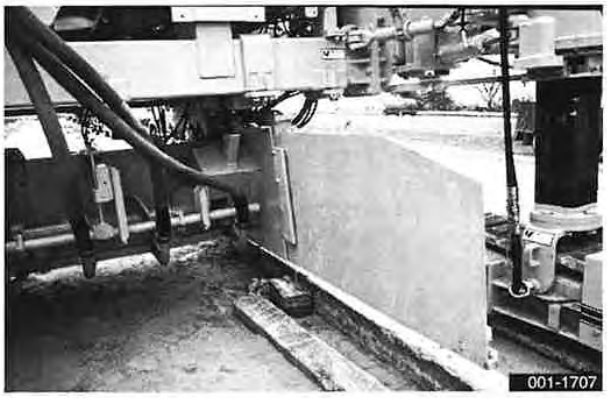
Adjust rear PTA

⚠ WARNING! ⚠

DISCONNECT THE HYDRAULIC HOSES TO THE PTA DRIVE MOTOR WHEN WORKING ON ANY MOVING PARTS OF THE PTA. KEEP HANDS, FEET AND LOOSE CLOTHING CLEAR OF ANY MOVING PARTS. ALWAYS REPLACE ACCESS PLATES OR GUARDS. SEVERE INJURY CAN OCCUR IF PERSONNEL ARE CAUGHT IN OR STRUCK BY MOVING PARTS.

If adjustment is necessary, remove the cover over the PTA drive chain. Loosen the drive chain and remove the chain from the rear sprocket. Rotate the sprocket to shorten or lengthen the turnbuckle as required. Replace the chain and cover after making necessary adjustments (form is set flat at this point).

After the PTA is set flat, check the rest of the joints in the form with the third block. If any joint indicates that there is more than 1/8 inch (3 mm) deviation from the actual size of the block, it will be necessary to shim the appropriate joint to adjust it to within 1/8 inch (3 mm). Tighten each joint securely.



Sideplate Extensions

Mount the sideplate extensions to the front of each sideplate with four 1 x 2 inch bolts, lock washers and nuts. Tighten the bolts securely. The sideplate extensions may be removed for installation of the optional keyway former.



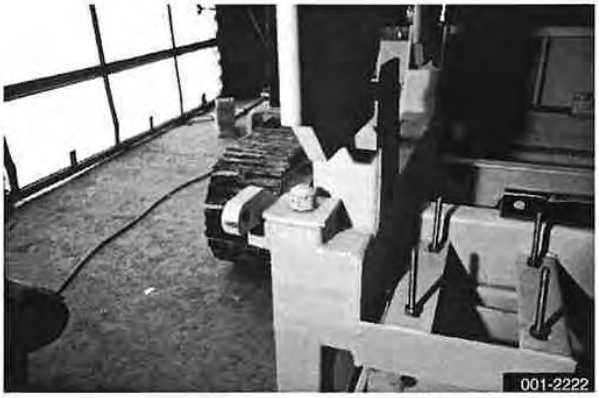
Measure Rear of Sideplate

To adjust the sideplates for the correct depth of concrete, place a straight edge under the rear of the form at a right angle to the sideplate. Measure from the top of the straight edge to the bottom of the sideplate. This measurement should be the desired depth of the concrete. Do not place the straight edge under the stainless trowel section.



Measure Front of Sideplate

Extend a straight edge, at a slight angle to the sideplate, from under the front of the form to a point below the auger shaft. Hold the straight edge tight under the form and measure from the top of the straight edge to the bottom of the sideplate. This measurement should be the desired depth of the concrete.



Sideplate Adjustment Screws

Adjust the front and/or rear sideplate adjustment screws up or down until the desired measurement exists between the straight edge and the bottom of the sideplate, both on the front and the rear. Tighten the six sideplate anchor bolts securely against the sideplate and lock in place with the jam nuts.



Straightedge Under Form

Profile Adjustments: When pouring with a flat profile section, the edge should be pulled up approximately 1/2 in. (13 mm) to allow for edge slump on an 8 in. (200 mm) thick slab, with 1 in. (25 mm) slump concrete. As the slab gets thinner or thicker, or the slump of the concrete increases or decreases, it may be necessary to adjust the allowance. Place a straight edge under the form, near the rear of the main pan, at a right angle to the sideplate. Measure from the top of the straight edge to the bottom of the form. Do not place the straight edge under the stainless trowel section. Loosen the adjustment nuts on the front and center adjustment bolts. Loosen the nuts on the two 1/2 in. bolts that attach the profile to the rear of the form hopper. Adjust the rear edge of the main profile section up or down, using the rear adjustment bolt. When the desired measurement exists, tighten the upper and lower nuts on the adjustment bolt securely.

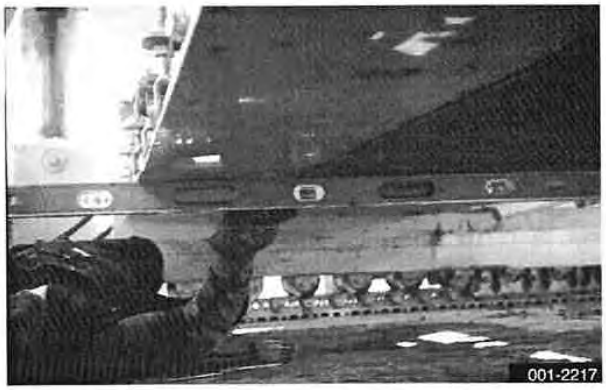


Profile Adjustment Bolts

Adjust the rear edge of the main profile section up or down, using the adjustment bolts located inside the form. When the desired measurement exists, tighten the upper and lower nuts on the adjustment bolts securely.

If the flat profile section is equipped with a center and front adjustment bolt, adjust the center adjustment to 1/16 in. (1.5 mm) more than the rear. Adjust the front adjustment to 1/8 in. (3 mm) more than the rear. It will be necessary to loosen the bolts on the rear of the hopper to make the front slump adjustment.

When pouring with a curb profile section, place a straight edge under the form near the rear of the main pan at a right angle to the sideplate. Measure from the top of the straight edge to the top of the curb profile. This measurement should be 1/2 to 3/4 in. (13 to 19 mm) more than the desired curb height. Adjust the profile up or down as needed using the adjustment bolts located at the outer edge of the main profile section.



Front to rear adjustment on stainless

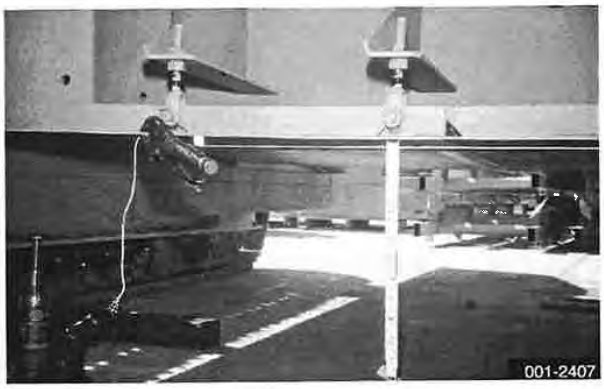
Stainless Trowel Adjustment: Extend a straight edge from the rear of the stainless trowel section, up into the main pan in line with an adjustment bolt. Adjust the rear edge of the stainless until a maximum 1/8 in. (3 mm) gap exists between the straight edge and the rear edge of the main pan. Tighten both adjustment nuts on each adjustment bolt securely. Adjust the stainless across the entire width, at each adjustment bolt, in this same manner.



Adjust curb profile stainless

Place a straight edge in the top of the curb profile (if so equipped) and make adjustments as for the flat portion of the form. Check the sides of the curb profile to be certain that the leading edge of the stainless is not protruding inside of the dimensions of the main profile.

Adjusting the stainless trowel section in this manner assures that the rear edge of the stainless will push down slightly on the concrete to give it a troweled finish.



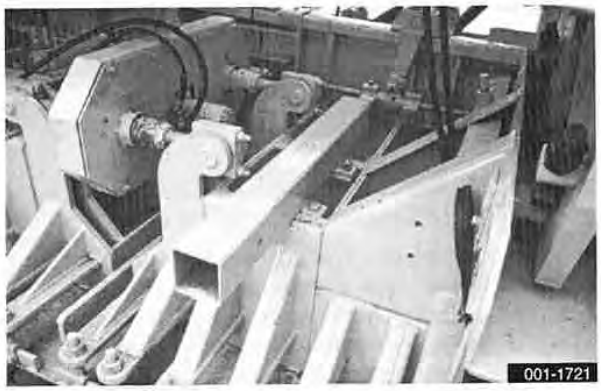
Line under rear of stainless

After the stainless trowel section has been adjusted front to rear, it will be necessary to adjust it from side to side to eliminate any unevenness. Thread a stringline between the sideplate and the form on one side near the rear of the stainless and pull it to the opposite side. Thread the line between the sideplate and the form and pull it tight enough to eliminate any sag. Position the line directly below the rear edge of the stainless section. Place an 1 in. X 1 in. X 2 in. (25 mm x 25 mm x 50 mm) block of wood between the line and the bottom of the form on each side. Position the blocks approximately 18 in. (46 mm) in from each edge. Using a third block of the same size, adjust the stainless up or down, until the block will just slip between the stringline and the bottom of the form.

Take the measurements at each adjustment bolt, and adjust the stainless as necessary. Make certain that each stainless joint is even and tighten the 1/2 in. bolt through the joint securely.

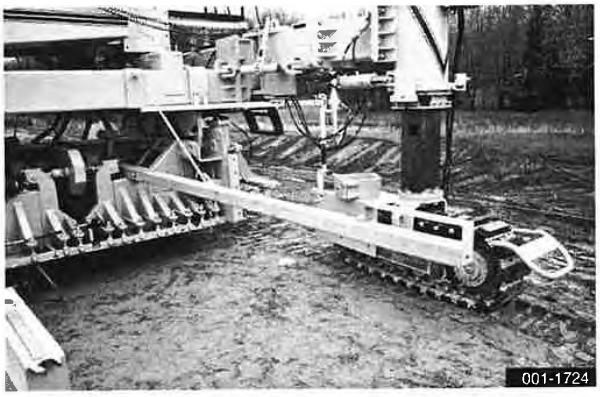
Note: If it is necessary to adjust the rear of the stainless up more than 1/8 in. (3 mm) at any adjustment bolt, the front to rear adjustment will be eliminated. It may be necessary to recheck the pan for flatness.

05 Mounting the Work Bridge (Optional)



Attach the work bridge mount tubes

Attach the work bridge mount tubes to the top of the form sections using the clamps and bolts provided. To properly support the work bridge, make certain that a mount tube is placed as close to the form end sections as possible. Evenly space any other mount tubes across the width of the form. Tighten the bolts securely.



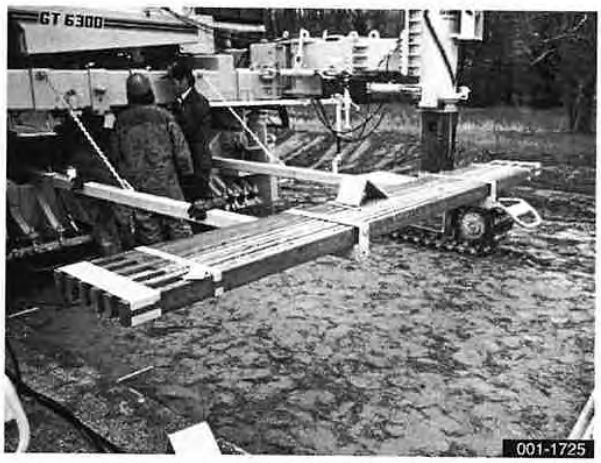
Insert the workbridge support tube

Insert the work bridge support tube until the pin holes in the side of the mount tube and the support tube are aligned. Insert the retaining pin and secure with a hair clip.



Attach chain support bracket to main frame

Place a chain support bracket over the 4-track machine frame. Align a chain support bracket with each of the support tubes and connect the chain in the eyelet on the support tube. The chain should not be slack to properly support the work bridge.



Attach the work bridge to the support tube

Remove the clamps from the support tube and place the work bridge on the support tubes. The work bridge can be pulled from either end to lengthen it for the width to be covered. Place the clamps over the work bridge and secure with the bolts provided.

06 Mounting the Water Spray Bar (Optional)



Spray Bar Mounts

Install the spray bar mounts to support the spray bar evenly across the form. Insert two 1/2 X 1-3/4 inch bolts through the bar mount and the clamp. Install lock washers and nuts and tighten securely.

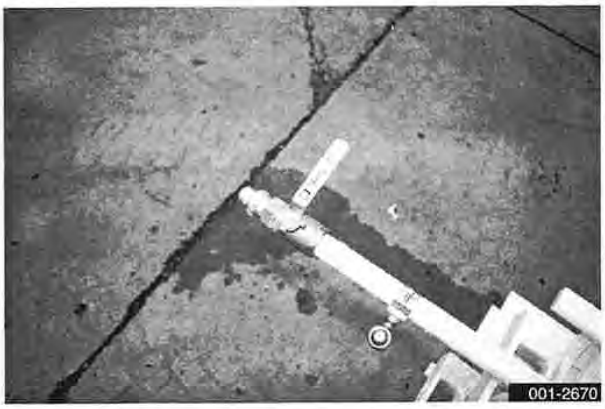


Spray Bar Mounted

Attach the spray bar sections together using thread sealer until the spray bar extends to the edges of the form. It should not produce a spray pattern beyond the edge of the slab. Apply thread sealer and install a cap on the end of the spray bar that will be mounted farthest away from the water tank. Tighten securely. Apply thread sealer on the threads on the opposite end of the water spray bar and install a ball valve. Tighten securely. Apply thread sealer to the pipe threads on the pipe/JIC fitting (Aeroquip # 2021-12-12) and install the fitting into the ball valve. Tighten securely. Install the spray bar, with the spray nozzles pointed down; to the spray bar mounts with 1/4 X 1-1/2 inch U-bolts. Tighten all bolts securely.

Remove the 3/4 inch street elbow from the bottom of the water tank. Apply thread sealer to the pipe threads

on the Tee fitting (Aeroquip # 2092-12-12) and screw it into the bottom of the water tank. Tighten securely until the Tee port is pointed at the opening in the bottom flange of the tank. Remove the brass pipe/hose fitting (Sherman 19R-351429) from the original street elbow. Apply thread sealer on the pipe threads of the pipe/hose fitting and screw into the Tee port in the Tee fitting. Tighten securely. Reconnect the spray hose to the pipe/hose fitting and tighten securely. Apply thread sealer to the pipe threads on the pipe/pipe fitting (Aeroquip # 2083-12-12) and screw it into the bottom port of the Tee fitting. Tighten securely. Apply thread sealer to the other end of the pipe/pipe fitting and attach the original street elbow. Tighten securely. Apply thread sealer to the pipe threads on the original street elbow and attach the ball valve. Tighten securely until the shut off handle can be rotated freely in both directions. Apply thread sealer to the pipe threads on the pipe/JIC fitting (Aeroquip # 2021-12-12) and insert it into the ball valve. Tighten securely.



Hose Connection

Route the 20 foot hose between the water tank and the spray bar and tie it out of the way. Attach each end of the hose to the JIC fittings on the spray bar and the water tank. Tighten securely.

07 Mounting the Auto Float (optional)



Auto Float Mounting Brackets

Using a suitable lifting device, raise the auto float mounting bracket into position on the two rear legs of the 4-track paving frame. Insert the pin through the clips on the leg and on the mounting bracket. Secure with a hair pin.



Turnbuckle mount at top of leg



Auto Float Beam Mounted

Determine the height at which the auto float mounting beams will be installed. Connect a suitable lifting device to the mounting beam and position it in the

predetermined hole on the mounting bracket on the rear legs. Insert the mounting pin and secure with a hair pin. Refer to the auto float manual for further mounting instructions.

08 Mounting the Sensors



Sensor Bulkhead Box

Mount a sensor bulkhead box on the top front and the top rear of the left end frame tube with a 3/8 X 3 inch bolt and lock washer. Route the extension wiring along the hose hangers and connect them to the appropriate bulkhead connections (grade to grade, steer to steer, pot to pot) closest to the corresponding leg on the 3 track frame of the machine.



Attach sensor arms and pivots

Attach a sensor pivot mount to the pivot cap (located on top of or under each swinging leg on the end frames) with a 3/4 x 5-1/2 inch bolt and lock washer. It is normally advisable to have the long end of the sensor pivot mount out towards the guideline to add more stability to the sensor arm.

Install a turnbuckle mount to each sensor arm with the turnbuckle eye pointed up. Slide a sensor arm into the sensor pivot mount. The sensor arm should be mounted in a perpendicular position to the end frame and tighten the sensor pivot mounting bolt securely. Slide the sensor arm assembly in or out until the center of the steering sensor mount is near the correct offset measurement from the sideplate of the form. Tighten the set screws in the sensor mount securely.

If the sensor arms are extended far enough to become unstable, install a turnbuckle mount to the mounting plate on the leg with a 3/4 X 1-1/2 inch bolt and lock washer. Install a turnbuckle between the turnbuckle mount on the sensor arm and the turnbuckle mount on the leg with pins and secure with cotter pins. Tighten the brackets on the tube securely. Tighten the turnbuckles to remove all flex from the tube.

> **Note:** It is advisable to turn the turnbuckles out, until approximately 1 inch (25 mm) of thread is exposed inside the turnbuckle body on each end, before tightening the brackets on the tube.



Mount Grade Sensor

Network Sensor Installation

Mount a sensor for elevation control to the mount on the adjustable grade jack with the mounting bolt facing forward and the sensor hub away from the side of the machine. Mount the sensor so the top of it is level and tighten the mounting bolt securely. The front and rear grade sensors are mounted in the same manner.

The grade sensor wand is mounted so that the round tube is towards either the front of the machine (same side as mounting bolt) and pointing away from the side of the machine or; toward the rear of the machine (same side as the cord) and pointing away from the side of the machine. The wand should be attached, so that when the stop pin in the sensor shaft is centered between the stops on the sensor housing, the wand is parallel to the mounting bolt (horizontal). Tighten the attaching "thumbscrew" securely.

Note: All grade sensors and wands must be installed in the same manner. If one sensor or wand is facing the wrong direction according to the calibrate settings in the Network controller, it will work backwards (see later).

Mount a sensor for steering control to the square tube mount with the mounting bolt facing away (out) from the machine frame and the sensor hub towards either the front or the rear. Mount the sensor so the top of it is level and tighten the mounting bolt securely. The front and rear steering sensors are mounted in the same manner.

The steering sensor wand should be attached to the sensor hub, so that when the stop pin in the sensor shaft is centered between the stops on the sensor, the wand is at a 90° angle to the mounting bolt (vertical). Tighten the attaching "thumbscrew" securely.

Note: All steer sensors and wands must be installed in the same manner. If one sensor or wand is facing the wrong direction according to the calibrate settings in the Network controller, it will work backwards (see later).



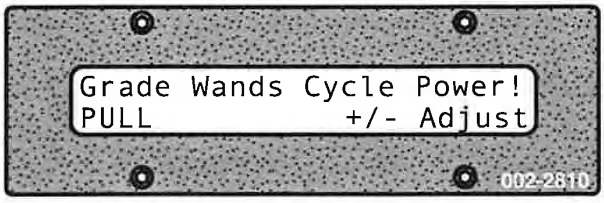
Connect Sensor Cords to Bulkhead Plug

Connect the sensors to their respective plugs on the bulkhead. Steering sensors to the "steer" plugs, and grade sensors to the "grade" plugs.

Note: When connecting the sensors for each control circuit, connect the sensor into the bulkhead nearest the leg the sensor is going to control.

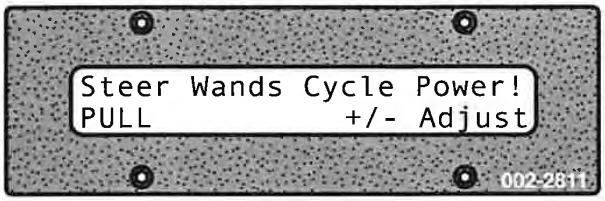
Notice: When the sensors are disconnected, place dust caps over/in the electrical plugs to keep moisture and dirt out.

Control Panel Calibration



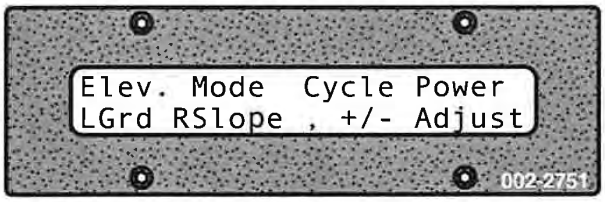
Grade sensor mode selection

Depress the calibrate switch on the service panel and use the NEXT switch to scroll forward to the grade sensor mode. Use the slope adjust switches (+ or -) to change the mode to "PULL" if the round tube of the grade wand is on the same side as the cord. If the round tube of the grade wand is on the same side as the mounting bolt, change the mode to "PUSH".



Steer sensor mode selection

Using the NEXT switch, scroll forward to the steer sensor mode. Use the slope adjust switches (+ or -) to change the mode to "PUSH" if the round tube of the steer wand is facing forward. If the round tube of the steer wand is facing towards the rear of the machine, change the mode to "PULL".

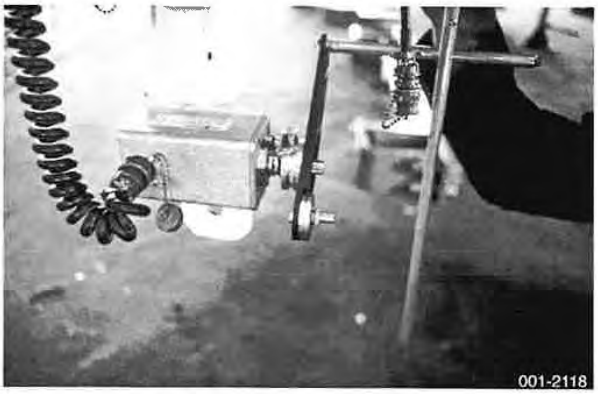


Network panel for left grade, right slope

To operate the machine with left hand grade control, and right side slope control, depress the calibrate switch. Scroll through the various displays until the elevation mode is indicated. Use the slope adjust switches (+ or -) to change the mode to "LGrd RSlope". After the appropriate grade and steering mode settings are selected, depress the calibrate switch to return to the main screen. Adjust the desired amount of cross slope with the appropriate switch on the main screen. Refer to the Preliminary Adjustments section for final adjustment procedures.

The left front leg elevation is controlled by the front grade sensor connected to the left front grade plug,

and the left front elevation control loop. The left rear leg elevation is controlled by the left rear grade sensor, connected to the left rear grade plug, and the left rear elevation control loop. The right front leg elevation is controlled by the slope sensor, located in the battery box, and the right front elevation control loop. The right rear leg elevation is controlled by the right rear grade sensor, connected to the right rear grade plug, and the right rear elevation control loop. The steering of both front tracks is controlled by the front steer sensor connected to the front steer plug and the front steer control loops. The steering of the rear tracks is controlled by the rear steer sensor connected to the rear steer plug and the rear steer control loop.



Grade Wand Weight Washers; spring tension

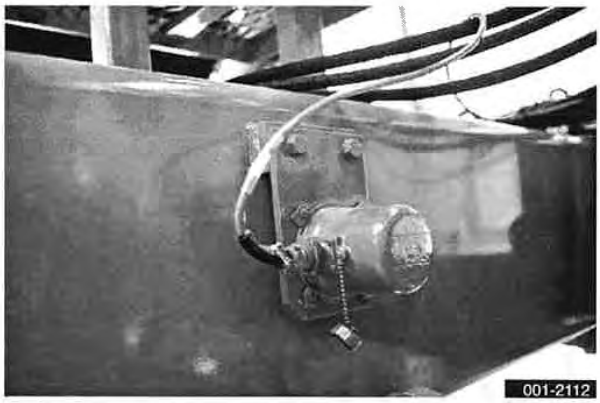
It is normally recommended to remove two of the counterweight washers from the rear of the grade wand, so only two remain.

Adjust the spring tension on the sensor shafts to hold the roll pin in contact with the stop pin. Adjust the spring tension to hold the grade wand in the up position and the steering wand away from the machine frame.

Check for correct sensor wand spring tension after the machine has been adjusted to the line. Note the position of the line on the grade sensor wand. Pull the steering sensor wand away from the line and note movement of the line on the grade wand. If movement exceeds 1/8 in. (3 mm), the steering sensor spring tension is too tight. Loosen tension slightly. Check for looseness of spring tension by pulling the line away from the steering wand. The steering sensor wand should move out towards the line until the stop pin in the sensor shaft contacts the stop pin in the side of the sensor. If not, tighten the spring tension slightly. If sensor wands deflect the line more than 1/8 in. (3 mm), but stop pins in sensor and shaft will not contact one another, suspect inadequately tensioned line. Adjust the line as necessary.

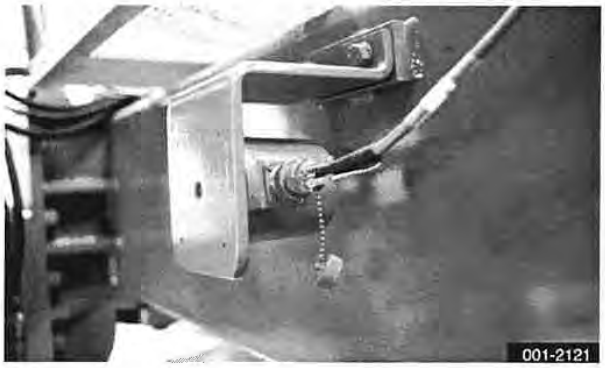
Note the position of the line on the steering sensor wand. Pull grade sensor wand down, away from the line and note movement of the line on the steering wand. If movement exceeds 1/8 inch (3 mm), the grade sensor spring tension is too tight. Loosen tension slightly. Check for looseness of spring tension by pulling the line away from the grade wand. The grade sensor wand should move up towards the line, until the stop pin in the sensor shaft contacts the stop pin in the side of the sensor. If not, tighten the spring slightly. If sensor wands deflect the line more than 1/8 inch (3 mm), but stop pins in the sensor and the shaft will not contact one another, suspect inadequately tensioned line. Adjust the line as necessary.

Slope Sensor Mounting



Front Slope Sensor Mount

To operate the machine on slope control, it will be necessary to install the front and rear slope sensor mounts and slope sensors. On the 4-track frame, there are two mounting positions for the front slope sensor and two mounting positions for the rear slope sensor. Facing forward direction of travel in the paving mode will determine the front of the 4-track frame. The front slope sensor should be mounted to the flat mounting plate with 4 screws and clamps. The mounting plate should be attached to the front mount on the 4-track frame with two 1/2 X 3/4 inch bolts and lock washers. When the sensor has been properly mounted the cable bulkhead in the side of the slope sensor canister should face towards the left side of the 4-track frame and the notch in the side of the slope sensor canister should face down. Connect a sensor cable between the slope sensor and the bulkhead on the front of the engine console.



Rear slope sensor mount

The rear slope sensor should be mounted to the formed mounting plate with 4 screws and clamps. The mounting plate should be attached to the rear mount on the 4-track frame with two 1/2 X 3/4 inch bolts and lock washers. When the sensor has been properly mounted, the cable bulkhead in the side of the slope sensor canister should face towards the left side of the 4-track frame and the notch in the side of the slope sensor canister should face down. Connect a sensor cable between the rear slope sensor and the bulkhead for the 3 track slope sensor on the back of the control box.

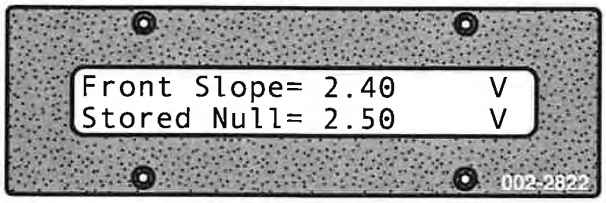
Note: When changing from 4 track paving mode to 4 track barrier mode it will be necessary to change the position of the slope sensors to the appropriate positions on the 4-track frame. Refer to the 4-track barrier setup section for slope sensor positioning.

Center the Slope Sensors



Level the machine frame

It will be necessary to calibrate the slope sensors to each other to get accurate slope control. It will be necessary to level all four sides of the 4-track frame before calibrating the slope sensors. Using the manual jog switches on each of the individual modules for grade control, place a level on the top or bottom of the left end frame and jog the front or rear legs up or down until the left end frame is level. Place a level on the top or bottom of the front frame and jog the right side up or down until the frame is level. Place a level on the top or bottom of the right end frame and jog the front or rear legs up or down until the right end frame is level. Place a level on the top or bottom of the rear frame and jog the right side up or down until the frame is level. Double check all sides, making adjustments as necessary until all four sides are level. When this is finished, stop the engine and return the key to the "on" position.

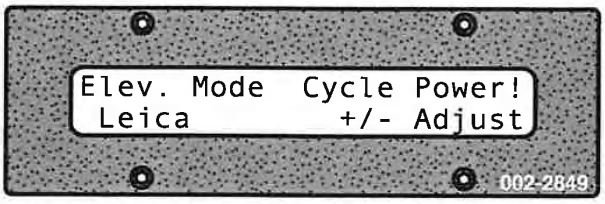


Front slope sensor calibration

Depress and release the SET switch. The main screen will indicate "STORE to Save Slope Null & Feedback Pot. Points". Depress the LAST or NEXT switch until the appropriate slope sensor is indicated on the main screen. The main screen will indicate which sensor is ready for adjustment and the voltage value that the network controller is receiving from the sensor. The lower line will indicate the stored null voltage of the sensor.

Adjust the machine frame in a level position as previously described. If the top line of the main screen does not read between 2.40 and 2.60 Volts, loosen the appropriate slope sensor and rotate it until the top line voltage reads between 2.40 and 2.60 Volts. Tighten the mounting screws securely. Depress the STORE switch to store the new null point. Depress the NEXT switch and repeat the procedure for the other slope sensor (if applicable). Refer to the Maintenance chapter for more information.

Leica Guidance Control

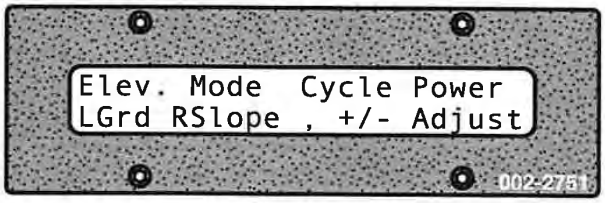


Leica Display

To operate the machine with the Leica guidance control system, depress the calibrate switch. Scroll through the various displays until the elevation mode is indicated. Use the slope adjust switches (+ or -) to change the mode to "Leica". After the appropriate grade and steering mode settings are selected, depress the calibrate switch to return to the main screen. Refer to the Leica operators manual for final adjustment procedures.

> **Note:** The network controller power must be cycled, turned off and restarted, to enable any changes that have been selected in the calibrate mode.

Left Side Grade Control/Right Side Slope Control



Grade Left; Slope Right Display

To operate the machine with left hand grade control, and right side slope control, depress the calibrate switch. Scroll through the various displays until the elevation mode is indicated. Use the slope adjust switches (+ or -) to change the mode to "LGrd RSlope". After the appropriate grade and steering mode settings are selected, depress the calibrate switch to return to the main screen. Adjust the desired amount of cross slope with the appropriate switch on the main screen. Refer to the Preliminary Adjustments section for final adjustment procedures.

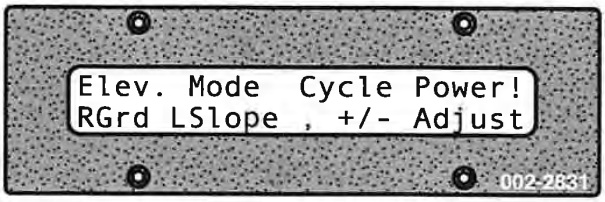
> **Note:** The network controller power must be cycled, turned off and restarted, to enable any changes that have been selected in the calibrate mode.

The left front leg elevation is controlled by the left front grade sensor connected to the grade bulkhead plug nearest to the left front leg, and the left front elevation control loop. The right front leg elevation is controlled by a slope sensor, (located on the front cross frame of the 4-track frame) and the right front elevation control loop.

The left rear leg elevation is controlled by the left rear grade sensor connected to the grade bulkhead plugs nearest to the left rear leg, and the left elevation control loop. The right rear leg elevation is controlled by a slope sensor, (located on the rear cross frame of the 4-track frame) and the right rear elevation control loop.

Notice: When setting guideline through a transition from a straight section of highway to a curved section of highway it is extremely important to project grade out to the guideline. An unsatisfactory product will occur when operating with dual grade or slope control if the guideline is not projected to grade.

Right Side Grade Control/Left Side Slope Control



Grade Right; Slope Left Display

To operate the machine with right hand grade control, and left side slope control, depress the calibrate switch. Scroll through the various displays until the elevation mode is indicated. Use the slope adjust switches (+ or -) to change the mode to "RGrd LSlope". After the appropriate grade and steering mode settings are selected, depress the calibrate switch to return to the main screen. Adjust the desired amount of cross slope with the appropriate switch on the main screen. Refer to the Preliminary Adjustments section for final adjustment procedures.

> **Note:** The network controller power must be cycled, turned off and restarted, to enable any changes that have been selected in the calibrate mode.

The left front leg elevation is controlled by the front slope sensor (located on the front cross frame of the 4-track frame) and the left front elevation control loop. The right front leg elevation is controlled by the right front grade sensor, connected to the right front bulkhead, and the right front elevation control loop.

The left rear leg elevation is controlled by the rear slope sensor (located on the rear cross frame of the 4-track frame), and the left rear elevation control loop. The right rear leg elevation is controlled by the right rear grade sensor, connected to the right rear bulkhead, and the right rear elevation control loop.