

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HYUNDAI MOTOR COMPANY,

Petitioner

v.

MEL NAVIP LLC,

Patent Owner

Patent No. 8,649,971

Inter Partes Review No.
IPR2024-00173

DECLARATION OF SYLVIA HALL-ELLIS, PH.D.

I. INTRODUCTION

1. My name is Sylvia D. Hall-Ellis. I have been retained as an expert on behalf of Hyundai Motor Company (“Petitioner”).

2. I have written this report on behalf of Petitioner to provide my expert opinion regarding the authenticity and public availability of two publications. My report sets forth my opinions in detail and provides the basis for my opinions regarding the public availability of these publications.

3. I reserve the right to supplement or amend my opinions, and bases for them, in response any additional evidence, testimony, discovery, argument, and/or other additional information that may be provided to me after the date of this report.

4. I am being compensated for my time spent working on this matter at my normal consulting rate of \$350 per hour, plus reimbursement for any additional reasonable expenses. My compensation is not in any way tied to the content of this report, the substance of my opinions, or the outcome of this litigation. I have no other interests in this proceeding or with any of the parties.

5. All of the materials that I considered are discussed explicitly in this declaration.

II. QUALIFICATIONS

6. I am currently an Adjunct Professor in the School of Information at San José State University. I obtained a Master of Library Science from the University of North Texas in 1972 and a Ph.D. in Library Science from the University of Pittsburgh in 1985. Over the last 50-plus years, I have held various positions in the field of library and information resources. I was first employed as a librarian in 1966 and have been involved in the field of library sciences since, holding numerous positions.

7. I am a member of the American Library Association (ALA) and its Association for Library Collections & Technical Services (ALCTS) Division, and I served on the Committee on Cataloging: Resource and Description (which wrote the new cataloging rules) and as the chair of the Committee for Education and Training of Catalogers and the Competencies and Education for a Career in Cataloging Interest Group. I also served as the Chair of the ALCTS Division's Task Force on Competencies and Education for a Career in Cataloging. Additionally, I have served as the Chair for the ALA Office of Diversity's Committee on Diversity, as a member of the REFORMA National Board of Directors, as a member of the Editorial Board for the ALCTS premier cataloging journal, *Library Resources and Technical Services*, as a Co-Chair of the Library

Research Round Table (LRRT) for the American Library Association, and as a member of the LRRT Nominating Committee.

8. I have also given over one hundred presentations in the field, including several on library cataloging systems and Machine-Readable Cataloging (“MARC”) standards. My current research interests include library cataloging systems, metadata, and organization of electronic resources.

9. My full curriculum vitae is attached hereto as Exhibit 1013.

III. PRELIMINARIES

10. *Scope of this declaration.* I am not an attorney and will not offer opinions on the law. I am, however, rendering my expert opinion on the authenticity of the documents referenced herein and on when and how each of these documents was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, could have located the documents before on or around the listed dates of their respective publications below.

11. I am informed by counsel that a printed publication qualifies as publicly accessible as of the date it was disseminated or otherwise made available such that a person interested in and ordinarily skilled in the relevant subject matter could locate it through the exercise of ordinary diligence.

12. While I understand that the determination of public accessibility under the foregoing standard rests on a case-by-case analysis of the facts particular to an individual publication, I also understand that a printed publication is rendered “publicly accessible” if it is cataloged and indexed by a library such that a person interested in the relevant subject matter could locate it (*i.e.*, I understand that cataloging and indexing by a library is sufficient, though there are other ways that a printed publication may qualify as publicly accessible). One manner of sufficient indexing is indexing according to subject matter category. I understand that the cataloging and indexing by a single library of a single instance of a particular printed publication is sufficient, even if the single library is in a foreign country. I understand that, even if access to a library is restricted, a printed publication that has been cataloged and indexed therein is publicly accessible so long as a presumption is raised that the portion of the public concerned with the relevant subject matter would know of the printed publication. I also understand that the cataloging and indexing of information that would guide a person interested in the relevant subject matter to the printed publication, such as the cataloging and indexing of an abstract for the printed publication, is sufficient to render the printed publication publicly accessible.

13. I understand that routine business practices, such as general library cataloging and indexing practices, can be used to establish an approximate date on which a printed publication became publicly accessible.

14. *Persons of ordinary skill in the art.* I am told by counsel that the subject matter of this proceeding generally relates to navigation systems.

15. I have been informed by counsel that a “person of ordinary skill in the art at the time of the inventions” is a hypothetical person who is presumed to be familiar with the relevant field and its literature at the time of the inventions. This hypothetical person is also a person of ordinary creativity, capable of understanding the scientific principles applicable to the pertinent field.

16. I am told by counsel that persons of ordinary skill in this subject matter or art would have had an undergraduate degree in electrical engineering, computer engineering, computer science, or an equivalent degree, as well as at least three years of experience in the design and implementation of navigation systems.

17. It is my opinion that such a person would have been engaged in research, learning, thorough study and practice in the field and possibly through formal instruction the bibliographic resources relevant to his or her research. In the 2008 timeframe, such a person would have had access to a vast array of long-established print resources in the area of navigation systems.

IV. DOCUMENT 1: EXHIBIT 1007 (“RDX”)

18. Exhibit 1007 is a copy of the document titled *2008 RDX Navigation Manual (Unlinked)* prepared by the Honda Motor Company, Limited (hereafter “RDX”). The document is identified as P/N31STK810 (*see* EX1007, page 1). I downloaded the document from the Internet¹ and made the copy that is Exhibit 1007.

19. The *2008 RDX Navigation Manual (Unlinked)* is a true and accurate copy of the document that was issued and distributed to purchasers of automobiles with the navigation system. The document bears a 2007 copyright date (*see* EX1007, page 1). Specifically, the text of the *2008 RDX Navigation Manual (Unlinked)* document is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1007 was found within the custody of the issuing corporate entity – a place where, if authentic, a copy of this document would likely be.

20. Attachment A is an official press release titled “2008 Acura RDX Press Kit” announcing the release of the 2008 Acura Sport Utility Vehicle with the Acura Navigation System with Voice Recognition™ on September 13, 2007, which was prepared and distributed by the Honda Motor Company, Limited on

¹ <https://techinfo.honda.com/rjanisis/pubs/om/BOM352/BOM35224.pdf>

September 13, 2007. Attachment A is a true and correct copy of the press release which I also accessed from the Internet.² Specifically, the text of Attachment A is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to Attachment A compared to what is currently accessible on the Internet. Further, Attachment A was found within the custody of the archives for the issuing corporate entity (*i.e.*, Honda Motor Company, Limited), a place where, if authentic, a copy of this press release would likely be. Attachment A is a true and correct copy in a condition that creates no suspicion about its authenticity.

21. A press release exhibits the following characteristics: the press release is attributed to a creator or author (in this case, Honda Motor Company, Limited) which affixes a date of creation (in this case, September 13, 2007) and publishes the document (in this case national press, Facebook, Twitter, and LinkedIn).

22. Based on finding a digital copy of Attachment A on the Internet, it is my opinion that the press release titled “2008 Acura RDX Press Kit” was available to the public on September 13, 2007, as indicated on the document. It is also my opinion that there is no reason to doubt the authenticity of Attachment A given its

² <https://acuranews.com/en-US/releases/release-91835d2fe2f4151ae54b37004c34bdfc-2008-acura-rdx-introduction#:~:text=2008%20Acura%20RDX%20%2D%20Overview&text=The%20first%20ever%20Acura%20RDX,the%20Acura%20TSX%20sports%20sedan>

appearance, contents, and the web address from which it was obtained.

23. Exhibit 1007 is a true and correct copy of the document titled *2008 RDX Navigation Manual (Unlinked)* in a condition that creates no suspicion about its authenticity. Based on the date recorded in the document and the Honda Motor Company, Limited press release (Attachment A), it is my opinion that the document titled *2008 RDX Navigation Manual (Unlinked)* was available to the public on September 13, 2007, or shortly thereafter.

V. DOCUMENT 2: EXHIBIT 1016 (“AVIC-Z1”)

24. Exhibit 1016 is a copy of the document titled *AVIC-Z1 Operation Manual* prepared by the Pioneer Corporation (hereafter “AVIC-Z1”). The document is identified as CRB2184-A> UC (*see* EX1016, page 207A). I downloaded the document from the Internet³ and made the copy that is Exhibit 1016.

25. The *AVIC-Z1 Operation Manual* is a true and accurate copy of the document that was issued and distributed to purchasers of automobiles with the navigation system. The document bears a 2006 copyright date (*see* EX1016, page 207). Specifically, the text of the *AVIC-Z1 Operation Manual* document is complete; no pages are missing, and the text on each page appears to flow

³https://www.pioneerelectronics.com/pio/pe/images/portal/cit_11221/308223015A_VICZ1OperationManual.pdf

seamlessly from one page to the next; further, there are no visible alterations to the document. Exhibit 1016 was found within the custody of the issuing corporate entity – a place where, if authentic, a copy of this document would likely be.

26. Attachment A is a product review of the Pioneer AVIC-Z1 titled “Pioneer AVIC Z-1 Review: Pioneer AVIC Z-1” written by Kevin Massy which appeared on the America media website, CNET,⁴ on August 10, 2006. Attachment B is a true and correct copy of the product review which I also accessed from the Internet.⁵ Specifically, the text of Attachment B is complete; no pages are missing, and the text on each page appears to flow seamlessly from one page to the next; further, there are no visible alterations to Attachment B compared to what is currently accessible on the Internet. Further, Attachment B was found within the custody of the archives for the issuing corporate entity (*i.e.*, CNET), a place where, if authentic, a copy of this product review would likely be. Attachment B is a true and correct copy in a condition that creates no suspicion about its authenticity.

27. A product review exhibits the following characteristics: the product review is attributed to a creator or author (in this case, Kevin Massy) which affixes a date of creation (in this case, August 10, 2006) and publishes the document (in this case CNET).

⁴ <https://www.cnet.com/>

⁵ <https://www.cnet.com/roadshow/reviews/pioneer-avic-z-1-review/>

28. Based on finding a digital copy of Attachment B on the Internet, it is my opinion that the product review titled “Pioneer AVIC Z-1 Review: Pioneer AVIC Z-1” was available to the public on August 10, 2006, as indicated on the document. It is also my opinion that there is no reason to doubt the authenticity of Attachment B given its appearance, contents, and the web address from which it was obtained.

29. Exhibit 1016 is a true and correct copy of the document titled *AVIC-Z1 Operation Manual* in a condition that creates no suspicion about its authenticity. Based on the date recorded in the document and the CNET product review (Attachment B), it is my opinion that the document titled *AVIC-Z1 Operation Manual* was available to the public on August 10, 2006, or shortly thereafter.

VI. SUMMARY OF OPINIONS

30. In view of the foregoing, it is my opinion that the publications described above were publicly available no later than the corresponding date listed in the table below:

Exhibit	Publication	Publicly Available No Later Than
1007	Honda Motor Co., Ltd., <i>2008 RDX Navigation Manual (Unlinked)</i> , P/N 31STK810, Honda Motor Co., Ltd., c2007.	September 13, 2007
1016	Pioneer Corporation, <i>AVIC-Z1 Operation Manual</i> , <CRB2184-A> UC, Tokyo, Japan: Pioneer Corporation, c2006.	August 10, 2006

31. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

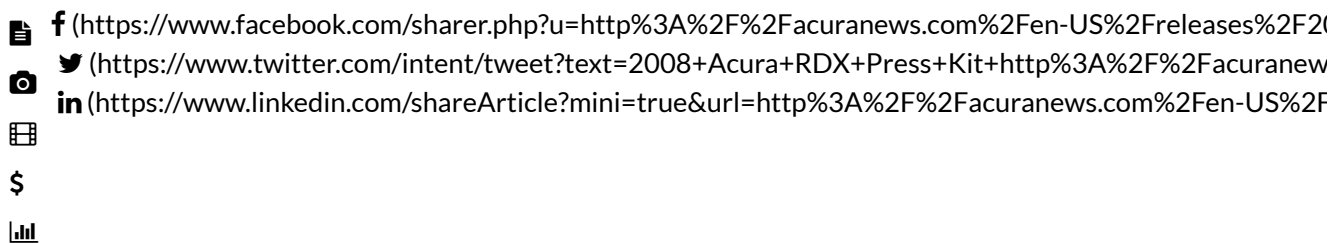
32. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1034 of Title 18 of the United States Code.

DATED: November 14, 2023


Sylvia D. Hall-Ellis, Ph.D.

ATTACHMENT A

2008 Acura RDX Press Kit



SECTIONS

September 13, 2007 — Torrance, Calif.

2008 Acura RDX Press Kit

2008 Acura RDX - Overview

OVERVIEW

The first ever Acura RDX burst on to the Sport Utility Vehicle scene in 2007. For 2008 the RDX returns with as an advanced 5-passenger Entry Premium SUV with handling and performance that positions it as the SUV soul mate of the Acura TSX sports sedan.

The RDX concept was initiated in California and then developed in Japan. It features precedent-setting engineering features for Acura, including the luxury division's first turbocharged and intercooled engine, the first adaptation of the Super Handling All-Wheel Drive™ (SH-AWD™) system to an SUV, and Acura's first standard 18-inch wheels and tires. Likewise, the RDX continues Acura's "Safety Through Innovation" with the application of cutting edge standard safety technologies. True to form for Acura, the RDX also offers a class-leading array of sophisticated electronic technologies that are seamlessly integrated to keep its passengers informed, in touch and entertained.

ENTRY PREMIUM SUV MARKET

The Entry Premium SUV segment is relatively new, at present populated by only a few vehicles including the Acura RDX, BMW X3 and Land Rover LR2. This segment is expected to grow five-fold in the next few years and the RDX positions Acura strongly within it, with a host of unique and attractive features.

TARGET CUSTOMER

Do not sell
 ing professionals that are upwardly mobile, who work hard and play hard to. typical buyer enjoys playing a sport, lives in the city, and on the weekends often travels to the mountains, country or coast. This customer wants an emotional and stylish vehicle that offers a higher "eye-point" (driving position) and more cargo flexibility than a sedan - but with the style, handling and performance of a great sports sedan. Thus, the transformable utility of the RDX, along with its engaging performance and handling, is a perfect fit.

POWERTRAIN FEATURES

- Turbocharged and intercooled 2.3-liter 16-valve, DOHC i-VTEC® inline-four engine
- 240 horsepower at 6000 rpm
- 260 lb-ft of torque at 4500 rpm
- i-VTEC® (Intelligent Variable Valve Timing and Lift Electronic Control)
- Dual balance shafts
- Sequential SportShift 5-speed automatic transmission with F1®-style paddle shifters
- Super Handling All-Wheel Drive™ (SH-AWD™)
- Drive-by-Wire Throttle System™
- EPA estimated 17/22 mpg* (city/highway)
- CARB-certified LEV II ULEV and EPA-certified Tier-2 Bin-5 emissions

BODY & CHASSIS FEATURES

- Advanced Compatibility Engineering™ (ACE™) unit body structure with extensive use of high-tensile steel
- Independent MacPherson strut front suspension
- Independent multi-link rear suspension
- Torque-sensing, variable power-assist rack-and-pinion steering
- 18 x 7.5-inch aluminum alloy wheels

- P235/55R18 99V M+S all-season high-performance tires
- 4-wheel anti-lock braking system (ABS) with Electronic Brake Distribution (EBD) and brake assist
- Vehicle Stability Assist™ (VSA®) with traction control
- 1,500-pound tow rating
- Xenon High-Intensity Discharge (HID) low-beam headlights
- Heated outside mirrors with passenger reverse gear tilt-down and integrated directional signals

INTERIOR FEATURES

- Luxurious cockpit designed for performance driving
- Perforated leather-trimmed seats
- LED backlit gauges with progressive illumination
- Leather-wrapped 3-spoke steering wheel with fingertip controls and F1®-style paddle shifters
- Multi-Information Display
- Power moonroof with tilt, auto-open/close, auto-reverse and key-off operation
- Dual-mode cargo system
- Supportive sport-type front seating
- Dual-zone automatic climate control system with air filtration
- Briefcase-sized, locking center front console with dual-level storage
- 60/40 split-folding flat-folding rear seating
- 7-speaker Acura Premium Sound System with multi-format 6-disc changer, AM/FM tuner, and XM® Satellite Radio receiver
- Driver's 8-way power seat with power-adjustable lumbar support
- Heated front seats
- Manual tilt and telescoping steering column
- HomeLink®
- MP3/auxiliary input jack
- Bluetooth® HandsFreeLink® connectivity
- 2-position memory seat
- Auto-dimming rear view mirror

Optional Technology Package

- Acura Navigation System with Voice Recognition™
- Rearview camera
- AcuraLink™ Satellite Communication System with real-time traffic
- 10-speaker Acura/ELS Surround® Premium Sound System with multi-format DVD-Audio 6-disc changer, AM/FM tuner, and XM® Satellite Radio
- Multi-Information Display (MID) with steering wheel controls
- GPS-linked, solar-sensing, dual-zone, automatic climate control system

SAFETY FEATURES

- Advanced Compatibility Engineering™ (ACE™) body structure
- Side impact door beams
- Impact-absorbing crumple zones (front/rear)
- Dual stage, dual threshold front airbags (SRS)
- Front side airbags with passenger-side Occupant Position Detection System (OPDS)
- Side curtain airbags for front and rear outboard seats with rollover sensor
- Active front head restraints
- 3-point adjustable-height front seat belts with pretensioners and load limiters
- 3-point seat belts at all three rear seating positions
- Automatic Locking Retractor/Emergency Locking Retractors (ALR/ELR) (excluding driver)
- LATCH (Lower Anchors and Tethers for Children) child-seat mounting system
- Tire Pressure Monitoring System (TPMS) with optional pressure readout
- 4-wheel anti-lock braking system (ABS) with Electronic Brake Distribution (EBD) and Brake Assist
- Vehicle Stability Assist™ (VSA®) with traction control
- Mirror integrated LED directional signals
- All around visibility (276 degrees)
- Theft-deterrent system with electronic immobilizer

ENGINE & POWERTRAIN

The RDX is engineered to be a technical tour de force within the emerging Entry Premium SUV segment. Its engine and powertrain feature a host of new and updated technologies for Acura that deliver strong driving performance with good fuel economy and low emissions.

RDX features Acura's first application of a forced-induction engine. The all-new 2.3-liter aluminum engine features an advanced variable flow turbocharger designed to provide quick response at low rpm as well as strong high-rpm power. The advantage is immediate acceleration that drivers want in the city environment, together with 240 horsepower for the passing and hill-climbing ability of a traditional 6-cylinder engine. The RDX's

turbocharged inline four produces 260 lb.-ft. of torque. It also returns an EPA estimated 17/22* mpg (city/highway), while meeting tough CARB LEV II ULEV and EPA Tier-2 Bin-5 emissions standards.

Acura's commitment to making the RDX fun to drive continues with a Sequential SportShift 5-speed automatic transmission with F1®-style paddle shifters. But perhaps the most breathtaking feature of the RDX is its Super Handling All-Wheel Drive™ (SH-AWD™). First introduced in the 2005 Acura RL and then specially adapted for the RDX, the system deters understeer by shifting power to the outside rear wheel to help boost cornering power and steering precision. The level of handling response and driver control provided by SH-AWD puts the RDX in a class by itself.

*Based on 2008 EPA mileage estimates, reflecting new EPA fuel economy methods beginning with 2008 models. Use for comparison purposes only. Do not compare to models before 2008. Your actual mileage will vary depending on how you drive and maintain your vehicle.

BODY & CHASSIS

Befitting its concept as an urban sports vehicle for young professional singles or couples, the RDX body design is powerful and athletic with muscular bodylines that impart a sense of command and control. Key styling elements include body sides that rake upward front to rear, large wheel arches that emphasize the big 18-inch wheels and tires, a short rear overhang, and a cargo door that's positioned flush with the bumper.

Highlights include:

- Compact size that is well proportioned for maneuvering through city traffic and parking structures
- A high eye-point that allows an excellent outward field of view
- Rigid unit body structure and independent suspension enhance steering precision and ride quality
- Low Noise, Vibration and Harshness (NVH) levels befitting a luxury SUV

Widespread use of high-tensile steel provides the rigidity necessary for the 4-wheel independent suspension system to work optimally while helping to reduce NVH. The RDX uses 39-percent (by weight) high-tensile steel to provide increased strength at a lower weight. Other engineering features include precise aerodynamic tuning that reduces drag and improves quietness inside the cabin. This tailoring includes a tailgate spoiler, rear wheel strakes, and aerodynamic side mirrors.

The RDX rides on 4-wheel independent suspension with specially tuned MacPherson struts in front and a multi-link design in back. The mounting points for the suspension were carefully engineered to reduce the transmission of NVH into the passenger cabin. Standard 18-inch tires and wheels are a first for Acura, and the 4-wheel disc brakes include a 4-wheel Anti-lock Braking System (ABS) with Electronic Brake Distribution (EBD) and Brake Assist. Torque-sensing power rack-and-pinion steering provides quick steering response with outstanding feel.

INTERIOR

A finely appointed urban loft apartment is the feel that Acura designers sought when crafting the RDX interior. The contemporary styling and high-quality materials are confident, functional and upscale. The driver-oriented cockpit includes a leather-wrapped steering wheel, LED backlit gauges with progressive illumination and a Multi-Information Display (MID) that allows access to multiple electronic functions. Among the advanced electronic technologies in the RDX is a standard 7-speaker Acura Premium Sound System with a multi-format 6-disc changer, AM/FM tuner and XM® Satellite Radio. A convenient auxiliary input jack makes it easy to connect an iPod® or other similar electronic devices to the audio system.

The RDX seats five and caters to the driver and front passenger first and foremost. The RDX has an elevated eye-point that enhances the outward view. Its standard leather seating surfaces and ergonomically designed seat contours are designed to provide sedan-like comfort. The power driver's seat is 8-way adjustable with power adjustable lumbar support for a custom fit.

Besides exemplary comfort, interior roominess and cargo carrying were high priorities for RDX designers. The rear seats are highly versatile and permit a wide range of storage capabilities. With the 60/40 split-folding rear seats folded flat, the rear cargo area offers up to 60.6 cubic feet of storage. Numerous interior storage compartments include a large lockable dual-level center console between the front seats. For greater passenger comfort, a dual-zone automatic climate control system is standard.

Optional Technology Package

The RDX is so well equipped that only one optional package is available. Appealing to audiophile and computer-savvy customers, the Technology Package makes the RDX truly "wired." The Technology Package includes a 10-speaker Acura/ELS Surround® Premium Sound System with multi-format 6-disc DVD-Audio changer, AM/FM tuner, and XM® Satellite Radio. The Technology Package also includes AcuraLink™ Satellite Communication System with real-time traffic, the Acura Navigation System with Voice Recognition™, rearview camera and a GPS-linked, solar-sensing, dual-zone, automatic climate control system. In total, these technologies put the RDX at the cutting edge of the Entry Premium SUV segment.

SAFETY

The 2008 RDX breaks ground in a number of important safety areas. Its ACE™ body structure makes the RDX compatible with smaller vehicles if a car-to-car frontal collision should occur, and it has a specially engineered hood and other components to reduce the chance of injury in the event of a collision with a pedestrian.

Passive safety features include the latest dual-stage, dual-threshold airbag technology for the driver and front passenger, side airbags for the driver and front passenger, and side curtain airbags with rollover sensors for all outboard occupants. LATCH (Lower Anchors and Tethers for Children), a child-seat mounting system, makes it easy to quickly secure a child seat in the rear seats (see Safety section for more details).

ENGINEERING & MANUFACTURING

The RDX is the first Acura light truck to be assembled in Honda of America Manufacturing's facility in Marysville, Ohio, the same factory that produces the Acura TL. As a result, it now brings light-truck production capacity and even greater versatility to the Marysville, Ohio plant. In addition, RDX represents the first time that an American engineer has headed a Japanese development team in developing a new Acura vehicle.

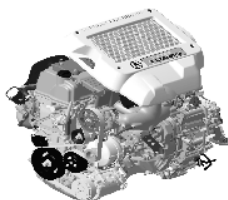
Producing both an SUV and a sedan on the same assembly line requires additional flexibility because of dimensional differences (in particular the height and width of the RDX rear section). The assembly process in Marysville was optimized for workers installing the overhead rear hatch, to minimize overhead lifting and reaching. In addition, the assembly plant was modified to accommodate the installation of the RDX's SH-AWD™ system. This was necessary due to the additional components such as the rear propeller shaft and rear differential.

ACCESSORIES

A host of attractive Genuine Acura Accessories were developed simultaneously with the RDX. Like all Genuine Acura Accessories, the upgrades are covered by the RDX's 4-year, 50,000-mile basic warranty when purchased with the vehicle or 12 months/12,000 miles when purchased separate from the vehicle.

2008 Acura RDX - Powertrain

POWERTRAIN



Acura's new RDX shares much in concept with the TSX. Though one is an SUV and the other is a sports sedan, both

vehicles are designed to blend strong performance with agility and precise handling. The unique positioning of this new Entry Premium SUV within the Acura product line guided the development of a special powertrain for the RDX. A conventional 4-cylinder engine would lack the horsepower and torque needed to make the RDX a strong performer. On the other hand, a 6-cylinder would add extra weight.

A perfect solution came in the form of a turbocharger - a first for an Acura production vehicle. The RDX has an innovative new variable flow turbocharger that overcomes the shortcomings of conventional turbo designs and delivers an unusually broad powerband with little or no lag in throttle response. In addition, Acura's turbo design provides this benefit with high reliability. This is because airflow is controlled before it enters the turbocharger, rather than within the turbocharger as in traditional variable-flow designs. Acura's variable flow turbo design thus eliminates moving components that work directly in the stream of hot exhaust gases.

Architecturally similar to the TSX's 2.4-liter in-line four, the RDX applies a 2.3-liter DOHC 16-valve in-line 4-cylinder engine. Like the TSX, the RDX uses i-VTEC® valve control that combines Variable Valve Timing and Lift Electronic Control (VTEC®) with Variable Timing Control™ (VTC™). With the variable flow turbo working in unison with i-VTEC®, the RDX delivers strong power and torque, excellent fuel economy and very low emissions.

Rated output for the engine is 240 horsepower @ 6000 rpm and 260 lb-ft of torque @ 4500 rpm. That gives it the highest torque output of any engine in the Acura lineup. The RDX is EPA rated at 17/22* city/highway mileage, which puts it ahead of some less powerful SUV competitors.

*Based on 2008 EPA mileage estimates, reflecting new EPA fuel economy methods beginning with 2008 models. Use for comparison purposes only. Do not compare to models before 2008. Your actual mileage will vary depending on how you drive and maintain your vehicle.

	2008 Acura RDX
Engine	DOHC i-VTEC Turbocharged I-4
Displacement	2300cc (2.3-liter)
Compression ratio	8.8:1
Horsepower SAE net @ rpm	240 @ 6000
Torque SAE net @ rpm (lbs.-ft.)	260 @ 4500
Transmission	5-speed automatic
EPA estimated mileage City/Highway	17/22*
Emissions certification (CARB/EPA)	LEV II ULEV/Tier-2 Bin-5
Fuel type	Premium unleaded

With its rear-mounted exhaust manifold feeding directly into the turbocharger and the use of a close-coupled catalytic converter, the RDX uses its advanced Programmed Fuel Injection (PGM-FI) to meet strict CARB LEV II ULEV and EPA Tier-2 Bin-5 standards.

The RDX's 5-speed automatic with Sequential SportShift can function as a conventional automatic transmission or, at the driver's option, be shifted manually via steering-wheel-mounted paddles. The electronically controlled Drive-by-Wire Throttle System™ and automatic transmission work together to execute shifts, resulting in exceptionally quick and smooth gear changes.

To maximize available traction with handling balance and responsiveness, the RDX comes standard with Super Handling All-Wheel Drive™ (SH-AWD™). This all-wheel-drive system progressively distributes the optimum amount of torque not only between the front and rear axles but also between the left and right rear wheels. The system's direct yaw control helps reduce understeer, improve steering accuracy and total cornering power.

Engine

- Turbocharged and intercooled 2.3-liter inline-four engine, 16-valve DOHC i-VTEC®
- 240 horsepower at 6000 rpm
- 260 lb-ft of torque at 4500 rpm
- i-VTEC® variable valve timing system

- Variable flow turbocharger
- Air-to-air intercooler
- Mobil 1® synthetic oil
- Oil-life monitoring system
- Drive-by-Wire Throttle System™
- Direct ignition system

Transmission and Drive System

- Super Handling All-Wheel Drive™ (SH-AWD™)
- Sequential SportShift 5-speed automatic transmission with F1®-style paddle shifters
- Advanced Shift-hold Control and Grade Logic Control
- Torque converter specially designed to match turbo power characteristics
- Specially tuned lockup clutch damper
- Transmission fluid cooler

Noise, Vibration, and Harshness (NVH)

- Dual chain-driven balance shafts mounted in oil pan
- Maintenance-free silent-chain camshaft drive
- Aluminum cylinder block with cast-in iron cylinder liners for light weight and durability
- Block and 1-piece aluminum crankshaft carrier for improved strength

Emissions/Fuel Economy

- EPA certified 17/22* mpg (city/highway)
- Meets strict CARB ULEV-2 and EPA Tier-2 Bin-5 standards
- Rear-facing exhaust ports, aluminum exhaust manifold and close-coupled catalytic converter provide fast catalytic converter light-off
- Jet-pump purge system captures evaporative emissions from the fuel tank, directing emissions into the intake system for proper burn-off

CRANKSHAFT, ENGINE BLOCK AND OIL PAN

The RDX utilizes an all-new turbocharged engine. The die-cast lightweight aluminum block has cast-in iron cylinder liners with 86mm bores. The block is a 2-piece design that fully supports the five main bearings with a single cast-alloy bed-plate assembly to maximize the rigidity and minimize noise and vibration. For even greater rigidity, the oil pan is a stiff aluminum alloy die casting.

To handle the 20-percent increase in horsepower and a 60-percent increase in torque output due to turbocharging, there are numerous strengthening measures throughout the engine. The cylinder block has been reinforced and additional structural reinforcements stiffen the engine's mating surface with the transmission.

The RDX uses a forged-steel crankshaft with a long 99mm stroke. To reduce friction and improve durability, the crankshaft journals are micropolished. Special forged connecting rods are engineered to handle the engine's high power output. The RDX has special alloy pistons with thick crowns and super hard Ni-P plating in the piston ring grooves to provide a long-wearing surface with extra heat resistance. A high-capacity oil pump supplies oil jets directed at the underside of the piston crowns to help dissipate heat.

CYLINDER HEAD / VALVETRAIN

The RDX cylinder head is a low-pressure aluminum alloy casting that features four valves per cylinder driven by dual overhead camshafts. Due to turbocharging, the compression ratio is set at 8.8:1 and Premium Unleaded fuel is required to provide resistance to detonation. Valve sizes are 35mm intake and 30mm exhaust, as in the TSX. An automatically adjusted silent-type cam chain is maintenance free and runs in an oil bath for maximum durability. For better cooling, the RDX has small-diameter 12mm spark plugs (the TSX has 14mm plugs) with a long 26.5mm reach (the TSX has 20.5mm reach plugs). The added reach allows the cylinder-head coolant jacket to be larger, with more coolant volume for better cooling and detonation resistance.

i-VTEC®

The RDX engine features i-VTEC, which adds Variable Timing Control™ (VTC™) to Variable Valve Timing and Lift Electronic Control (VTEC®) to provide optimal camshaft phasing. By allowing the valve lift and valve timing to be adjusted to suit the engine's operating parameters from moment to moment, i-VTEC provides substantial performance, efficiency and emissions improvements.

Variable Valve Timing and Lift Electronic Control

VTEC® adjusts the lift and opening duration of the valves to help the engine produce stronger low-rpm torque and excellent high-rpm power. At low rpm, the timing of the two intake valves is staggered and their lift is asymmetric within each cylinder; this creates a swirl effect within the combustion chambers. With better mixing in the cylinders, burn speed and combustion stability are improved. As engine rpm builds, VTEC® transitions to a high-lift, long-duration cam profile for improved high-rpm engine output.

Variable Timing Control

The i-VTEC® system incorporates VTC™, which continuously adjusts the intake cam timing to suit engine operating conditions. This precise control of cam timing improves power output, fuel economy and emissions performance.

A powertrain control unit monitors camshaft position, ignition timing, exhaust oxygen content and throttle position, and then it commands a VTC™ actuator to advance or retard the intake cam optimizing engine output and reducing emissions. At idle, the intake cam timing is retarded to deliver a stable idle and to reduce oxides of nitrogen (NOx) emissions. The intake cam is progressively advanced as rpm builds, so the intake valves open

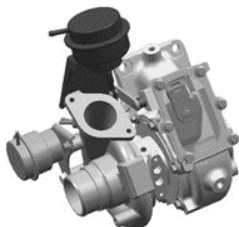
sooner and valve overlap increases. This reduces pumping losses, which increases fuel economy and further reduces exhaust emissions due to the creation of an internal exhaust gas recirculation effect. By continuously optimizing the amount of intake cam advance based on the operating conditions, the RDX engine develops high peak power without compromising running manners at a full range of other operating speeds.

DRIVE-BY-WIRE THROTTLE SYSTEM™

Smart electronics connect the RDX throttle pedal to the throttle-body butterfly in the intake tract, optimizing engine response to suit driving conditions. An adjustable "gain" between the throttle pedal and engine offers a significant step forward in drivability.

The Drive-by-Wire Throttle System™ establishes the current driving conditions by monitoring throttle pedal position, throttle-body butterfly position, road speed, and engine speed. This information is used to define the throttle control sensitivity. This gives the RDX throttle pedal a predictable and responsive feel that meets drivers' expectations.

VARIABLE FLOW TURBOCHARGER



A variable flow turbo is the key element that allows the RDX's 4-cylinder engine to perform like a larger-displacement

6-cylinder engine, while still returning small-displacement fuel economy and very low emissions.

One of the challenges of turbocharging is the difficulty in sizing the turbo for optimal performance at all engine speeds. A small turbo spins up quicker, reducing lag (the delay between throttle-pedal movement and a substantial increase in boost pressure), but doesn't have enough flow for the best high engine-rpm performance. Conversely, a large turbo takes longer to spin up, but delivers maximum high rpm performance.

The new Acura variable flow turbo is designed to combine the best qualities of both small and large turbochargers, while avoiding their respective downsides or introducing any reliability concerns. The variable flow turbo increases exhaust gas velocity into the turbo housing at low speeds by restricting the inlet area with a movable valve, enabling the impeller to speed up quicker. At higher engine speed where exhaust gas flow is abundant, the valve opens progressively to maintain optimum exhaust gas flow into both the inner and outer scroll of the turbo housing.

Both the movable flow control valve and the wastegate that limits maximum boost pressure are powered by diaphragm-type actuators that are controlled by electric solenoids, which are in turn controlled by the engine's Electronic Control Unit (ECU). Under full-throttle operation, the flow control valve typically begins to open at 2000 rpm, and is fully open by 2500 rpm. Flow control valve position is determined by exhaust gas flow and not directly by engine rpm. Maximum boost pressure, which is dependent on temperature, altitude and other factors, is 13.5 pounds per square inch (700mm Hg).

Acura's variable flow turbo is designed for maximum durability. Unlike competitor variable-vane turbo designs that put the pivot point of moving parts in very high-temperature areas of the turbo housing, the Acura variable flow turbo has fewer moving parts inside the hot turbo housing, and is designed to shield the control valve pivot from the highest temperatures.

RDX's turbocharger is positioned to the rear of the engine, close to the exhaust ports for maximum transfer of the exhaust velocity to the turbo. Water passages in the aluminum exhaust manifold help keep the temperature within the exhaust system at optimum levels for both the turbocharger and catalytic converter. The turbo housing is made of austenite stainless cast iron for durability when exposed to high-temperature exhaust gases.

When the engine is shut off, coolant continues to circulate due to thermal convection, helping to prevent long-term heat-related damage to the turbo bearings.

COLD-AIR INDUCTION SYSTEM AND INTERCOOLER

An air inlet is positioned in the front fascia to supply the RDX engine with cold, dense air (see the Body & Chassis section). From there, ducting carries cold air to a large air filter assembly, and then on to the turbo located behind the engine block. From the turbo, compressed intake air flows forward over the engine via an air-to-air intercooler which lowers the temperature of the intake charge. Intake air exits the intercooler and passes through a drive-by-wire throttle body, a manifold and then into each cylinder.

To provide the intercooler with a constant flow of cooling air, the RDX has a large front air inlet above the grille, with ducting directly to the intercooler, creating a ram effect for increased air velocity across the intercooler.

EXHAUST SYSTEM

Spent gases flow through a liquid-cooled aluminum exhaust manifold on the rear side of the cylinder head, through the variable flow turbo, and then into a close-coupled catalytic converter. From there, exhaust is passed to an under-floor catalyst, through an 8-liter under-floor pre-chamber, and then back to a 15-liter silencer. Dual exhaust outlets with bright exhaust tips terminate at the rear fascia. The RDX's exhaust note within the cabin has been specially tuned to deliver a sporty exhaust sound under acceleration, while remaining refined at cruising speeds.

EMISSIONS CONTROL

The RDX's turbocharged engine achieves a high output of 104.3 horsepower per liter. At the same time, it meets strict CARB ULEV-2 standards.

Basic engine architecture contributes to the RDX's excellent emissions performance. The aluminum exhaust manifold and turbocharger are positioned to the rear of the transversely mounted engine, allowing the catalytic converter to be positioned very close to the turbo. With the close-coupled multi-cell catalytic converter, light-off is quick after startup. The i-VTEC cylinder head also plays a role in emissions reduction by fostering internal exhaust gas recirculation, which significantly cuts NOx. Special high-flow fuel injectors with a wide dynamic range contribute to the RDX's low emissions and high horsepower, and a variable flow fuel system also contributes to low evaporative emissions. The accuracy of the control of the injector has been increased so that less fuel can be injected during certain situations (such as when at idle).

Depending on operating conditions, evaporative emissions from the fuel tank are fed into the RDX's intake tract, to prevent fuel vapors from escaping to the atmosphere. Whereas a normally aspirated engine always has a partial vacuum in its intake tract that pulls evaporative emissions in, a turbocharged engine has high pressure in its intake tract whenever the turbocharger is providing forced induction. The RDX directs turbo pressure through a small nozzle to create negative pressure and pull evaporative emissions into the engine through a valve before the turbocharger.

LUBRICATION

To provide maximum lubrication even at high operating temperatures inside the variable flow turbo, the RDX only uses specified synthetic engine oils, such as Mobil 1® to satisfy anti-deposit and anti-deterioration performance requirements. The Maintenance Minder™ system integrated into the instrument cluster calculates synthetic engine oil life based on the vehicle's driving history, and alerts the driver when an oil change and other maintenance needs are required.

NOISE, VIBRATION AND HARSHNESS CONTROL

The RDX's high output in-line 4-cylinder engine features extensive Noise, Vibration and Harshness (NVH) reduction technologies. The aluminum alloy die cast cylinder block with a bed-plate type main bearing cap helps resist vibration. A pair of chain-driven balance shafts further smoothes the inherent vibration of the large displacement in-line 4-cylinder layout. The RDX oil pan is cast aluminum for better strength and sound attenuation than stamped metal designs. A self-adjusting silent-type cam chain and a serpentine accessory drive belt also help minimize NVH.

SEQUENTIAL SPORTSHIFT 5-SPEED AUTOMATIC TRANSMISSION WITH PADDLE SHIFTERS AND GRADE LOGIC CONTROL

To maximize acceleration, fuel economy and driver control, the RDX has a standard Sequential SportShift 5-speed automatic transmission with F1®-style paddle shifters and Grade Logic Control. Scaled to handle the RDX's high horsepower and torque output, the transmission has a standard fluid cooler that is mechanically similar to the RL. Special torque converter settings are designed to complement the RDX's turbo boost curve and power delivery by allowing more initial slip and rpm gain so that torque can build more quickly.

5-Position Shift Gate and Sequential SportShift Paddle Shifter Operation

The RDX has a 5-position shift gate that simplifies the operation of the transmission. In the "D" position, the transmission operates automatically, selecting among the five forward gear ratios based on the driving conditions. By pulling the lever back into the "S" position, the transmission is placed in "Sport" mode, providing sportier automatic shifts among the first three gears during normal speeds. When initially engaging sport mode, the transmission will automatically shift between first, second and third gears until a paddle shifter is activated, at which time the transmission goes into full manual sport mode.

The Sequential SportShift Paddle Shifters can operate in both the "D" and "S" position. Engaging a paddle when in "D" temporarily places the transmission in manual mode (but without gear holding at redline) and after relatively steady-state cruise conditions are detected, the transmission returns to full automatic operation. Engaging a paddle when in "S" additionally enables gear holding (which allows only driver commanded shifts), only automatically shifting to first gear at a stop, if not driver-selected. The steering wheel paddles are activated when a fingertip pull of the right paddle commands an upshift and a pull of the left paddle commands a downshift. A digital display in the right meter pod indicates which gear the transmission is in when the steering wheel paddles are active.

Automatic Mode

The RDX transmission can be operated in conventional fully automatic mode ("D" and "S") via the console-mounted shifter. When in automatic mode, the transmission incorporates an advanced Grade Logic Control System and Shift Hold Control, both of which work to reduce gear "hunting" on hills and through turns.

Grade Logic Control alters the transmission's shift schedule when traveling uphill or downhill, reducing shift frequency and improving speed control. Throttle position, vehicle speed and acceleration/deceleration are continuously measured, then compared with a map stored in the transmission computer. The Grade Logic Control System then determines when the RDX is on a hill; in this case, the shift schedule is adjusted to automatically hold the transmission in a lower gear for better climbing power or increased downhill engine braking.

Shift Hold Control keeps the transmission in its current (lower) ratio when the throttle is quickly released and the brakes are applied (as might be the case when decelerating for a corner). This leaves the chassis undisturbed by excess shifting, while ensuring that abundant power is immediately available without a downshift. This is beneficial in a turbocharged engine where higher rpm helps to assure higher boost pressures and power output.

Manual Mode Protective Features

To help protect the engine and drivetrain from damage, an array of preventative features are active when the transmission is in manual mode (i.e. paddles active). If the driver doesn't command an upshift in time, the transmission ECU cuts off fuel flow to the engine if there is a possibility of over-revving in each gear. While downshifting, the transmission will not execute a driver-commanded downshift that would send the engine beyond redline in the lower gear. The Sequential SportShift transmission will automatically downshift to first gear as the vehicle comes to a stop to prevent lugging away from a stop in a high gear.

Cooperation between 5-Speed Automatic Transmission and Drive-by-Wire Throttle System™

With the RDX's Drive-by-Wire Throttle System™ and electronically controlled automatic transmission, the function of the engine and transmission can be closely choreographed for faster, smoother shifting. As a result, shift shock is reduced significantly during upshifts and downshifts.

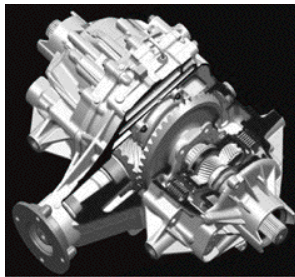
SUPER HANDLING ALL-WHEEL DRIVE™

The RDX has standard Super Handling All-Wheel Drive™ (SH-AWD™). The RDX system differs mechanically from the RL luxury sedan, but is similar in principle. This all-wheel-drive system progressively distributes the optimum amount of torque not only between the front and rear axles but also between the left and right rear wheels. The result is neutral, accurate steering when cornering under power that front-drive, rear-drive or conventional all-wheel-drive can't equal.

SH-AWD™ counters understeer by rotating the outside rear wheel faster than the speed of the front axle to yaw the vehicle through the turn while cornering. By relieving the front tires of some of the work of turning the vehicle, the system reduces understeer, and handling balance and controllability are improved. In addition, with the cornering load more evenly distributed between the front and rear tires, the total cornering grip is increased. In conventional vehicles, cornering is created almost entirely by the steering angle of the front tires. But in the RDX, additional cornering force is created by the steering angle of front tires combined with the extra drive torque supplied by the outside rear tire.

To deal with high power output, conventional front- or rear-drive systems generally use some type of limited-slip device to maintain traction under power. However, the linking effect of the inside and outside drive wheels in these systems resists turning, or creates understeer. This is a factor that works against the front tires as they attempt to turn the car. Conventional AWD systems have a similar linking effect between the inboard and outboard tires and front and rear axles, causing a similar resistance to turning. By using drive torque to actually help turn the vehicle, the RDX can be more responsive, neutral and predictable, while simultaneously offering all of the usual benefits of all-wheel drive.

Electronic Controls and Parameters



The logic and control of SH-AWD™ is integrated with the RDX engine/transmission Electronic Control Unit (ECU),

and Vehicle Stability Assist™ (VSA®) ECU. The engine/transmission ECU provides engine rpm, airflow meter and transmission gear ratio data, while the VSA® ECU provides data on wheel speed. The SH-AWD™ ECU also monitors lateral g-forces, yaw rate and steering angle, and the status of rear right and left direct electromagnetic clutch torque. Drive torque is calculated based on the information from the engine/transmission ECU, then the acceleration situation, wheel spin, lateral G and steering angle are used to set the front to rear torque distribution, and torque split between the right and left rear wheels. SH-AWD™ operating parameters include:

- Up to 90-percent of available driveline torque can be transferred to the front wheels during high-speed driving
- During straight line full-throttle acceleration, up to 45-percent of available torque can be transferred to the rear wheels
- In hard cornering during acceleration, up to 70-percent of available torque can be directed to the rear wheels for enhanced vehicle dynamics
- Up to 100-percent of the torque sent to the rear axle can be applied to either rear wheel as the conditions dictate

SH-AWD™ System Layout

SH-AWD™ is a full-time all-wheel drive system that requires no driver interaction for operation. The RDX system differs mechanically from the RL system, but is similar in principle.

A torque transfer unit is bolted directly to the front-mounted transaxle. Attached to the front differential's ring gear is a helical gear that provides input torque to the transfer unit. A short horizontal shaft and a hypoid gear set within the case send power to the rear propeller shaft, which in turn carries it to the rear drive unit.

The rear drive unit of the RL sedan has a clutch and planetary gear set, called the "acceleration device," that can increase the speed of the rear axle up to 5.7-percent. In contrast, the RDX's rear driveshaft is constantly overdriven by 1.7-percent and the resulting overdrive effect is regulated by the left and right rear clutch packs. The difference in the chosen rear axle speed increase is due to the differing handling dynamics of the two vehicles. The RDX achieves the desired SH-AWD™ cornering characteristics with less outside rear wheel speed increase. A matched pair of direct electromagnetic clutch systems, one on each side, control the power delivered to each rear wheel.

Direct Electromagnetic Clutch Systems

Located on either side of the hypoid gear that drives the rear axle, two identical direct electromagnetic clutch systems control the amount of drive torque that reaches each rear wheel, and provide limited-slip differential function. These clutch systems can be controlled as a pair to alter the front/rear torque split, or be controlled independently, to allow up to 100-percent of the total rear axle torque to go to one side of the vehicle.

An electric coil controls the pressure in each clutch device, which slows the sun gear in a planetary gear set to modulate the torque sent to the wheel. The amount of available rear axle torque transmitted to each rear wheel can vary continuously, between zero and 100-percent, depending on the conditions. Since the clutches are electromagnetically operated, the amount of drive torque delivered to each rear wheel can be controlled quickly and precisely, reducing wheel slip in low traction conditions.

The clutch packs and friction material are specially designed to withstand the small amount of continuous slip between front and rear axles (created by the 1.7-percent speed differential), while ensuring the expected level of Acura durability. An oil-temperature sensor allows the ECU to estimate the clutch plate coefficient of friction (which changes with heat) in each clutch pack and then adjusts voltage sent to the electromagnetic coil that controls each clutch to compensate. To ensure that the amount of torque transmitted remains optimized as miles accumulate a coil provides a feedback loop that the ECU uses to adjust voltage to the electromagnetic clutches to compensate for any clutch wear.

MAINTENANCE MINDER SYSTEM

To eliminate unnecessary service visits while ensuring that the vehicle is properly maintained, the RDX has a Maintenance Minder™ system that automatically monitors the vehicle's operating conditions. When maintenance is required, the driver is alerted via a series of messages on the Multi-Information Display (MID) located in the instrument cluster. The alerts occur well in advance of required maintenance for scheduling convenience.

The resettable system monitors operating conditions such as oil and coolant temperature and engine rotations to determine the proper service intervals. It indicates when maintenance is due on many normal service parts and systems, including oil and filter change, tire rotation, air cleaner, automatic transmission fluid, parts replacement and more. To prevent driver distraction, maintenance alerts are presented when the ignition is first turned on, not while driving unless an urgent need arises.

2008 Acura RDX - Body

OVERVIEW

The RDX is a fusion of SUV functionality and sports sedan handling. Together in one package, these qualities create Acura's first urban adventure crossover vehicle - the perfect compliment to a fast-paced urban lifestyle.

The RDX's crossover body styling simultaneously supports several agendas. First, its lines have a taut, muscular presence that promises energetic driving performance. But this performance edge doesn't come at the cost of functionality, as evidenced by the versatile 5-door exterior format and generous interior storage space. Overall, the RDX has an urban-friendly size that's both maneuverable and personal. Finally, while satisfying stylistic goals, the RDX is designed to provide a high level of crash safety performance.

DESIGN CONCEPT

To suit the dynamic (and sometimes hectic) urban setting, the RDX wears what its designers call "athletic armor," a design approach that suggests the powerful image of a football running back, outfitted in protective gear. The look is muscular, taut, and poised for acceleration and agile split-second maneuvering.

Starting with the front end, the signature Acura grille has an aggressive flair with a sharply creased leading edge. This first theme in the body form decisively sets the tone for the rest of the design, which follows with a long 104.3-inch wheelbase and wide track (61.9-in. front, 62.6-in. rear). Elegant and decisive style lines run the length of the body, with muscular wheel arches and short overhangs further adding to a poised, powerful look.

In exterior dimensions the RDX is most similar to the BMW X3.

	2008 Acura RDX	2007 BMW X3
Overall length, in.	180.7	179.9
Overall width, in. (excludes mirrors)	73.6	73.0
Overall height, in.	65.2	66.0
Wheelbase, in.	104.3	110.1
Track, front/rear, in.	61.9/62.6	60.0/60.7
Turning diameter, ft.	39.2	38.4
Curb weight, lbs.	3,932	4,067 (AT)
Tire size	P235/55VR18	P235/55HR17

Form Follows Function

The overall size of the RDX matches the needs of the urban commuter. Key functional points for the RDX include a low hood line that improves forward visibility. A high eye point for the driver and front passenger further improve outward visibility and add to a sense of confidence and control. New "skin-mount" exterior mirrors have specially designed compact housings that improve the A-pillar area visibility, providing good outward visibility for urban intersections. And finally, excellent approach and departure angles pay dividends when approaching or leaving steep driveways or parking garages.

RDX Design Elements include:

- Dynamic urban style
- "Athletic armor" look
- Sharp body lines
- Standard 18-inch wheels and tires
- Tailgate surface flush with bumper

AERODYNAMIC EFFICIENCY

The RDX marries aggressive styling with function. The windswept front fascia features a main opening that feeds the aluminum engine radiator. The top inlet, located above the bright Acura badge, is a separate cold-air inlet for the large aluminum turbocharger intercooler, which is horizontally mounted above the engine. This fully functional inlet takes in ambient-temperature air as the RDX moves forward, routing it through a duct in the

hood and then down through the intercooler. A separate cool-air intake leads to a large-volume intake airbox and high-volume cartridge air filter.

Additional details that contribute to the RDX's aerodynamic efficiency include a spoiler above the tailgate (which helps air separate cleanly off the body at speed), strakes located in front of the rear tires, and the streamlined "skin-mount" mirrors.

KEY STYLING FEATURES

High-intensity discharge (HID) low beam headlights command the front corners of the fascia and fenders. Their design compliments the angular and elegant pattern set by the trademark Acura grille. Fog lamps are standard as well.

Both front and rear wheel arches are bold and broad, further adding to the dramatic appearance of the standard 18-inch aluminum alloy wheels, the first application for an Acura. The RDX's beltline rises visibly from the sharply raked A-pillar back to the substantial C- and D-pillars.

Door dimensions were selected to enhance the RDX's primary mission as a driver's vehicle while retaining high usability for children or adult passengers in back. The front doors have long proportions for easy ingress and egress, while the rear doors are shorter.

TAILGATE TRIM

In styling the rear portion of the RDX body, Acura designers introduced a unique new design element. Instead of a conventional rear tailgate panel positioned above a large protruding bumper, the RDX tailgate panel drops cleanly downward and terminates smoothly at the trailing edge of the body. This creates a custom look for the rear of the body.

For accident repairs, the rear tailgate uses a replaceable resin lower panel that has a far lower replacement cost than an entire conventional metal tailgate. Without a thick bumper to reach over, loading and unloading cargo in the RDX is also easier. The tailgate design is another way the RDX creatively balances style, safety and convenience.

HID HEADLIGHTS

A powerful combination of Xenon HID low-beam and halogen high-beam headlights provides excellent lighting firepower for the RDX. Contained within aerodynamic headlight units, the inner lens of the HID unit glitters, making the headlights more distinctive. The RDX also features Daytime Running Lights (DRL), which enhance its visibility to other drivers and can help reduce accidents during daytime driving.

BODY PROTECTION

Designed for arduous driving conditions, the lower door panels of the RDX incorporate a wide molding to help protect the lower body sides from chipping. This molding extends down past the body side sills, ensuring that the sills stay clean to avoid soiling clothing when passengers enter and exit the vehicle.

CONSTRUCTION

A rigid structure enables designers to maintain tight body-panel fit tolerances, tune the suspension for precise ride and handling, keep the ride squeak- and rattle-free, and provide long-term durability and high levels of crash protection for the occupants. The widespread use of high-tensile steel enables the RDX to meet all of these challenges.

Polygonal-shaped frame members, which are computer designed to disperse and absorb forces in a collision, are located behind the front bumper beam. These high-strength steel frame members send collision forces upward and rearward where they can be absorbed by the main structure. In the event of a rear collision, polygonal-shaped high-tensile steel frame members direct the loads forward and outward. These rear frame members also use a "wave shape" design, which provides high strength, yet deforms controllably in a collision. In a side impact, large longitudinal high-tensile steel side sills extending front to rear underneath the vehicle, along with lateral high tensile steel cross members, absorb energy (see the Safety section for more information).

For greater steering precision and handling stability, RDX designers paid particular attention to improving body rigidity around the front and rear suspension. These reinforcements are comprised of side-to-side bracing behind and above the firewall and inside the tailgate area.

HIGH-TENSILE STEEL

The use of varying grades of steel in the unit body is key to its stiffness, performance in a collision, and light weight. HSS780 grade steel is used in the "box" section of the front, side, and rear frame members at the bottom of the body. Additional high tensile steel (HSS780 and 590) is used in other areas under the floor, and in the A- and B-pillars and roof rails. By utilizing high strength steel (39-percent by weight) the RDX exceeds the BMW X3's torsional rigidity while keeping vehicle weight under control.

EXTERIOR DETAIL

Specially designed windshield wiper arms with flat blades ensure that the driver cannot see the stowed wipers from inside the vehicle. The hidden design also reduces wind noise and adds to the RDX's clean lines. Even the washer nozzles are located underneath the trailing edge of the hood, improving both their performance at high speeds and the exterior look of the vehicle. Elimination of rear quarter glass panels in the doors gives RDX a cleaner appearance, with large 1-piece side windows that provide a more wide-open feeling.

TAILGATE

Designers spent a significant amount of time with the RDX's target audience in order to understand how they use their vehicles. One of the messages designers heard was that a high degree of functionality is essential. As a result, the RDX's thoughtful design is evident even in small details, like the tailgate hinges that are hidden at the top rear edge of the roof. This makes the body lines smoother, while allowing for a higher tailgate opening.

The RDX's clean exterior look is further enhanced by the use of an electronic tailgate switch, which replaces a traditional outside handle. Touching the switch releases the tailgate, which can then be easily lifted open thanks to the counterbalancing effect of the gas-filled struts, tuned to suit the forward hinge positioning.

NOISE, VIBRATION AND HARSHNESS (NVH)

The city is a challenging environment and a great test of a vehicle's NVH. Varied street surfaces, potholes and other navigational hazards mean the body structure (together with tire and suspension tuning) must address a wide range of NVH issues.

Engineering rigid front and rear suspension mounting points was key to achieve a low NVH character in the RDX. The low road noise allows easy conversation between the driver and all seats. Internal Acura tests measured the RDX at 71 decibels during city driving speeds, similar to other luxury vehicles.

POWER WINDOWS

Front power windows with auto-reverse are standard. The RDX's front power windows also incorporate a 1-touch auto up/down feature for convenience. Window operation is retained for 10 minutes after the ignition is turned off or until the front doors are opened. Tinted door glass reduces eyestrain and the sun load on the inside of the vehicle.

POWER DOOR LOCKS AND REMOTE KEYLESS ENTRY

For owner convenience, the RDX has standard power door locks and remote keyless entry. A retractable ignition key is built into the transmitter fob, and can be folded for easier carrying.

POWER MOONROOF

A large power moonroof with auto-reverse can be opened or closed with one touch of the ceiling-mounted switch. A timer allows it to be operated for 10 minutes after the ignition is shut off or until the doors are opened. The moonroof's flush-fitting glass panel reduces air turbulence and wind noise, and an inside sliding shade is provided to block the sun.

EXTERIOR MIRRORS

A sleek "skin-mount" mirror design that maximizes the mirror area while minimizing the size of the mirror housing provides good outward visibility in the A-pillar area. Both the driver and passenger-side mirrors are heated, and the passenger-side mirror has a reverse auto-tilt feature.

PAINT COLORS

The 2008 Acura RDX is available in a choice of five pearl and two metallic colors. All are topped with durable clear-coat finishes that resist scratching and urban pollutants.

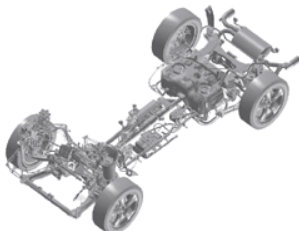
Exterior Color	Paint Type	Interior Color	
White Diamond Pearl	Pearl	Ebony	Taupe
Polished Metal Metallic	Metallic	Ebony	Taupe
Alabaster Silver Metallic	Metallic	Ebony	Taupe
Royal Blue Pearl	Pearl	Ebony	Taupe
Moroccan Red Pearl	Pearl	Ebony	Taupe
Nighthawk Black Pearl	Pearl	Ebony	Taupe
Carbon Bronze Pearl	Pearl	Ebony	Taupe

2008 Acura RDX - Chassis

CHASSIS

A challenging and varied urban driving landscape steered development of the RDX chassis. In an urban driving environment, the ability to accelerate, turn and brake quickly - with stability and control - are essential capabilities. But the RDX was also designed to excel on wide-open highways, sweeping mountain roads, and long stretches of Interstate.

The design goal for the RDX chassis was to provide the sporty handling of the Acura TSX sports sedan with the versatility of an SUV. These difficult goals for dynamic performance were not easy to achieve because the RDX needed to provide a high eye-point (seating position) to provide the driver and passenger's better visibility in urban traffic conditions. And the higher the center of gravity a vehicle has, the more difficult it is to provide responsive and nimble handling like a sports sedan.



Acura designers answered this challenge by giving the RDX a low center of gravity, SH-AWD™ for superb

cornering capability (see the Powertrain section), and overall chassis specifications rivaling those of a sports sedan. The result is an especially confident experience when changing lanes or cornering.

Acura RDX Chassis Goals includes:

- Responsive steering
- A "Sports AWD" ride and handling
- High dynamic performance
- Low Noise, Vibration and Harshness (NVH)

BEST-IN-CLASS CORNERING

The RDX achieves its mission to provide sports sedan handling, and one-ups its rivals. When tested on the skid pad, Acura internal measurements show the RDX achieves a maximum cornering force of 0.85g. This exceeds the cornering performance of the BMW X3 in the same test conditions. Much of the credit for the RDX's cornering performance goes to the SH-AWD™ system (see the Powertrain section). As a result, the RDX provides sharp steering through intersections, direct and linear response on winding roads, and high speed stability on highway.

SUSPENSION

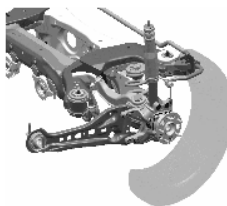
Acura engineers wanted to create a vehicle that transcended the traditional SUV driving experience. So rather than target SUV driving characteristics, they benchmarked the dynamic characteristics of the Acura TSX. As a result, the RDX is at the top of its class for acceleration, turning and stopping, while delivering excellent ride quality. The SH-AWD™ system plays an important part in this, but so does the 4-wheel independent suspension, which provides crisp, compliant handling in the city and confident handling on the highway.

**Front Suspension**

The RDX front suspension is a specially designed and tuned MacPherson strut arrangement with compact packaging, ride comfort, and the long wheel travel and ruggedness necessary to meet harsh urban roads. The geometry has been optimized with both a high caster angle and "trail," to provide sharp on-center steering response and stability.

Additional specifics of the front suspension that help achieve sports sedan-like handling include:

- High-friction upper strut mount provides a good on-center steering feel, along with increased linearity while reducing steering shimmy
- Asymmetrical coil springs improve steering quality
- Large-diameter lower arm compliance bushing reduces NVH
- Optimized kingpin layout enhances steering feel and linearity
- Large-diameter steering gearbox with rigid bushings adds stiffness and improves linear steer feel
- 21mm front stabilizer bar helps control body roll for flatter cornering

REAR SUSPENSION

An independent multi-link rear suspension system with aluminum knuckle fits compactly underneath the rear seating

and storage areas while providing excellent ride and handling characteristics, with low NVH. The suspension uses large-diameter trailing arm bushings to reduce harshness and improve ride comfort. A special steel suspension subframe with large "floating" bushings markedly reduces NVH while maintaining stability. Front and rear stays increase the subframe mounting point rigidity, improving stability and steer feel.

Rear suspension features:

- Anti-squat geometry to reduce pitching under acceleration
- 19mm rear stabilizer bar contributes to flatter cornering

STEERING

The Acura RDX has quick-ratio (15.1:1) power rack-and-pinion steering for steering response like that of a sports sedan. The hydraulically assisted steering is engine-speed sensing, for easy maneuvering at low speeds and maximum feel and driving enjoyment at higher speeds. The turning diameter is 39.2 feet, curb to curb.

To improve steering precision, a stay (or stiffener) supports each end of the steering rack, further improving steering rigidity. In addition, the rack-and-pinion gearbox has aluminum mounting brackets. When a severe crash occurs these aluminum brackets are designed to break off when the engine is pushed rearward into the rack-and-pinion gearbox. This helps reduce intrusion into the interior.

WHEELS & TIRES

The RDX is the first Acura with standard 18-inch wheels and tires. RDX comes with 18x7.5-inch aluminum alloy wheels paired with Michelin P235/55R18 99V high-performance all-season tires. These high-performance all-season tires are exclusively designed for the RDX, and have optimized sidewall rigidity that maintains vehicle stability in all load conditions. The low-profile tires also provide top class traction and braking in all weather conditions. In addition, an optional dealer-installed 19-inch wheel and tire package is available.

4-WHEEL DISC BRAKES

RDX features 4-wheel disc brakes, 11.7-inch diameter brake rotors in front and 12.0-inch diameter rotors in the rear. Besides providing highly fade-resistant performance, the RDX brake system has a firm pedal feel with linear response.

An Anti-lock Braking System (ABS) with Electronic Brake force Distribution (EBD) is standard on the RDX. ABS helps the driver retain steering control during hard braking. EBD automatically proportions brake power to the rear brakes according to the vehicle load and driving conditions, improving stopping performance.

The RDX also has brake assist, which uses a microprocessor that recognizes the driver's intention to quickly and forcefully apply the brakes in a panic stop situation. In this case, Brake Assist immediately supplements the braking force, enabling the best braking performance in the moment when it's most needed. Brake Assist only supplements the driver's intentions, and its function terminates immediately when the driver releases the brake pedal.

VEHICLE STABILITY ASSIST WITH TRACTION CONTROL

Vehicle Stability Assist™ (VSA®) is included as standard equipment. By continually monitoring the vehicle's operating parameters (such as vehicle speed, throttle position, steering angle, individual wheel speeds, lateral g, and yaw rate), VSA® detects if the vehicle is about to oversteer or understeer. To help correct either of these situations, 4-channel VSA®

automatically reduces the engine's torque output as needed, and applies one or more brakes individually, to help stabilize the chassis. The response is so quick that the instability may be corrected even before the driver knows it's occurring. Traction Control is integrated into the VSA® and in cooperation with SH-AWD™ helps the RDX accelerate smoothly on slippery surfaces.

TIRE PRESSURE MONITORING SYSTEM

Acura RDX has an onboard Tire Pressure Monitoring System (TPMS) that warns the driver if the air pressure decreases significantly in any tire. The system helps reduce the chance of damaging a tire or losing control of the vehicle due to low air pressure. This is important because a slow leak, such as one that might be caused by a nail or road debris, might not be easily detectable but could cause significant air loss, loss of grip and potentially a blowout.

TPMS uses a sensor mounted on each wheel that continually monitors tire pressure and sends a coded signal to the TPMS electronic control unit (ECU). The process begins with a signal initiator located inboard of each tire on the chassis. The initiator sends a unique signal for each TPMS sensor. Then the TPMS sensor sends tire pressure data to the TPMS ECU, which compares the values for each tire's pressure against an acceptable range of pressures.

On the RDX the Multi-Information Display (MID) shows the location of the tire with significant pressure loss.

On the RDX with Technology Package the system can also display the air pressure in all four tires simultaneously via the MID, making it simple to locate a low-pressure tire.

FUEL TANK AND DRIVING RANGE

The RDX's large 18-gallon fuel tank is located in a protected position under the body and forward of the rear wheels. Based on Acura's estimated combined fuel economy of 19 mpg, the RDX can cover over 340 miles on one tank of fuel.

1,500-POUND TOW RATING

For added utility, the RDX has a 1,500-pound tow rating when equipped with the available towing package. The tow rating makes the RDX capable of pulling a small camping trailer, personal watercraft or motorcycle trailer.

RDX EXTERIOR ACCESSORIES

A wide range of exterior accessories have been developed for the Acura RDX. Because of this simultaneous engineering, the accessories are guaranteed to fit right, work right, and have the lasting durability and value that Acura customers expect. When selected at the time of vehicle purchase, they are also covered by Acura's 4-year/50,000-miles basic warranty.

- Front spoiler
- Rear diffuser
- Sport running boards
- Full nose mask
- Splash guards
- Hood air deflector
- Roof rack
- Body Side Molding (color matched)
- 19-inch aluminum alloy wheels
- Class 1 towing package (1,500 lbs.)
- Moonroof visor

- Back-up sensors (color matched)
- Rear bumper appliqué
- Gold emblems
- Wheel locks

ECOLOGY

Like all products from Honda of America Manufacturing's facility in Marysville, Ohio, the RDX follows strict guidelines for environmental care - both in manufacturing and in the actual vehicle components. Following is a partial list of significant environmental processes used in creating the RDX and reducing its long-term environmental impact.

- More than 90-percent of RDX component parts are made of recyclable materials
- The use of non-chromed tanned leather in leather-equipped models reduces hazardous waste generation during the tanning process, and can be composted at the end of the vehicle's life
- Elimination of PVC material in most interior parts (door lining, seat trim, shift knob, etc.) and exterior parts (roof and door moldings, weather strips and tubes) improves with recycling
- Halogen is eliminated from fire-retardant materials, and wheel balance weights and electro-deposition paints contain no lead
- Use of molded-in color plastics reduces paint use and factory emissions
- Replacement of ABS plastic with polypropylene material in the center console, instrument panel and doors reduces emissions during plastic manufacturing

2008 Acura RDX - Interior

INTERIOR OVERVIEW

The RDX interior artfully integrates the themes of sporting capability and urban intelligence that drove the development of the entire vehicle. The result is an interior that would look fully at home in a high performance luxury sport sedan, coupled with fully integrated electronic technologies and a new level of practical utility.

Fine interior materials and careful attention to detail and finish highlight the RDX interior. Stylish and highly supportive perforated leather-trimmed, heated front seats are designed to provide a sporty yet refined driving experience. The power driver's seat adjusts 10 ways for optimum comfort, and the front passenger seat is 4-way manually adjustable. Supporting the RDX's versatility is a dual-mode cargo lid, which can be flipped over and placed on the cargo floor when carrying dirty objects.

The RDX brings a formidable list of standard equipment to its developing new market segment. The leather-wrapped 3-spoke steering wheel has fingertip controls and F1®-style paddle shifters, and frames striking LED backlit gauges. The standard 360-watt 7-speaker Acura Premium Sound System with 6-disc CD changer can play just about every type of current audio format, and includes standard XM® Satellite Radio and an auxiliary jack for the easy connection of an iPod® or MP3 player. Acura MusicLink™ is available as an accessory. Staying connected is not a problem as the RDX comes standard with Bluetooth® HandsFreeLink™ wireless telephone interface that is compatible with many Bluetooth® mobile phones.

Dual-zone automatic climate control keeps occupants comfortable and interior storage abounds. There is a locking center console with room inside for a briefcase, and the large rear cargo area is both private and highly versatile.

The available Technology Package adds even more capability, and integrates seamlessly into the RDX's performance-oriented driving environment. The Acura Navigation System with Voice Recognition™ and rearview camera has a large 8-inch screen. With the AcuraLink™ Satellite Communication System with real-time traffic, the RDX driver can navigate around congested ways, while enjoying the spectacular 410-watt 10-speaker Acura/ELS Surround® Premium Sound System with multi-format 6-disc DVD-Audio, AM/FM tuner, XM® Satellite Radio, and Dolby Pro Logic II.

Interior Features

- Luxurious cockpit designed for performance driving
- Perforated leather-trimmed seats
- Supportive sport-type front seating
- Driver's 10-way power seat with power-adjustable lumbar support
- Front Passenger 4-way manual seat
- Heated front seats
- 60/40 split-folding second row seating
- LED backlit gauges with progressive illumination
- Leather-wrapped 3-spoke steering wheel with fingertip controls and F1®-style paddle shifters
- Manual tilt and telescoping steering column
- Power moonroof with tilt, auto-open/close, auto-reverse and key-off operation
- Dual-mode cargo system
- Dual-zone automatic climate control system
- Generous interior storage space
- Large locking center console
- 7-speaker Acura Premium Sound System with multi-format 6-disc changer and AM/FM tuner, and XM® Satellite Radio
- Auxiliary jack for personal audio devices
- Bluetooth® HandsFreeLink® wireless telephone interface

- HomeLink®
- Multi-Information Display (MID) allows access to multiple electronic functions
- 6.5-inch display shows audio and climate control info
- Acura blue ambient overhead lighting
- Illuminated switches
- Driver seat with memory and 10-position adjustability
- Auto-dimming rear-view mirror

Optional Technology Package Features

- Acura Navigation System with Voice Recognition™ and rearview camera
- AcuraLink™ Satellite Communication System with real-time traffic
- 10-speaker Acura/ELS Surround® Premium Sound System with multi-format 6-disc DVD-Audio changer, AM/FM tuner, XM® Satellite Radio, and Dolby Pro Logic II
- MID display with steering wheel controls allows access to multiple electronic functions, including tire pressures readout and feature customization options
- Additional display for audio and climate control info
- GPS-linked, solar-sensing, dual-zone, automatic climate control system

STYLING AND MATERIALS

The concept of a downtown loft, with its feeling of generous space, modern elements and emotional presence, was the inspiration for the RDX interior. To that end, the RDX interior blends a dynamic and substantial look with advanced features. At the same time, the RDX provides a new level of secure and useful utility. Quality of materials along with fit and finish has received close attention in the RDX interior. Rich surface finishes and clean technical accents reflect the RDX's integration of welcoming comfort and high technology. Two interior color themes are available: Ebony and Taupe.

DRIVER-ORIENTED COCKPIT AND INSTRUMENTATION

With the commanding outward view of an SUV and a sedan-like seating position, the RDX interior creates a uniquely sporting environment. Acura interior design has always made intuitive functionality a priority, and in the RDX, all important systems and controls are within easy reach of the driver with large-format controls and precise tactile feel. The systems used most frequently - audio and cruise control - have switches positioned on the steering wheel. Technology Package items like Bluetooth® HandsFreeLink™, Satellite-Linked Navigation System and Multi-Information Display (MID) also can be controlled via switches on the steering wheel.

The main instrumentation is easy-to-read analog, supplemented with digital and graphic displays. Even though the RDX gives its driver access to many electronic features and conveniences, the interface with each system is simple and intuitive. Sight lines are clear with important items placed within easy view.

MULTI-INFORMATION DISPLAY

The RDX provides important vehicle information via the LCD Multi-Information Display (MID) positioned in the lower portion of the speedometer face. The MID shows outside temperature, vehicle mileage and trip mileage, average fuel economy, TPMS status and is operated via an illuminated control on the instrument panel. The RDX with Technology Package has controls positioned near the steering wheel hub that allow the driver to cycle the display through additional screens of information while keeping both hands on the wheel. It also provides programmable feature customization on the RDX with the technology package.

Trip computer functions include average and instantaneous fuel economy. In addition, the Technology Package MID can display:

- Fuel range
- Average vehicle speed
- Elapsed time
- SH-AWD™ torque distribution
- TPMS pressure readouts from each wheel
- Feature customization options

Maintenance Minder™ also alerts the driver of upcoming maintenance needs via the MID.

CENTER INSTRUMENT PANEL DISPLAY

To make the climate control and audio systems easy to operate, the RDX (without Technology Package) has a 6.5-inch display centrally positioned in the instrument panel. In addition to a digital clock, the upper portion of the screen is devoted to the audio system, and features a multi-line display that can show CD title, as well as RDS radio station information when available. The lower half of the display is devoted to the automatic climate control system, and shows the operating mode and selected temperature settings.

When equipped with the Technology Package, the center dash display is replaced with an 8-inch navigation system screen, and an additional display is positioned just above. This display shows the most frequently used audio system and climate control settings, which are accessed via the easy-to-use interface dial.

LEATHER-WRAPPED STEERING WHEEL

The leather wrapped 3-spoke steering wheel is designed to put the most commonly used controls within fingertip reach. Audio system controls are positioned on the left spoke, and cruise control switches are on the right spoke. A pair of F1®-style paddles are tucked almost out of view but within fingertip reach to manually upshift and downshift the Sequential SportShift automatic transmission.

When equipped with the Technology Package, the four o'clock position on the steering wheel has switches that operate the MID. The eight o'clock position is reserved for navigation system controls, including a push-to-talk button to activate the voice recognition system, which provides voice control over the navigation system. Controls for Bluetooth® HandsFreeLink® are located on the lower left corner of the steering wheel.

SEATING

The sporting performance of the RDX and the sharp handling afforded by SH-AWD™ demanded seating of sport sedan caliber. All seating surfaces are wrapped in soft perforated leather for cool comfort. The front bucket seats are designed to provide solid support for high energy cornering, along with abundant comfort for long drives. The contoured shape features substantial side bolsters to help keep passengers comfortably in position as cornering g forces build.

The highly adaptable driver seat is 10-way power adjustable and includes a power-adjustable lumbar support mechanism. The smooth shape of the articulated lumbar mechanism matches the occupant's spinal curvature to provide solid support for the torso. The front passenger seat is 4-way manually adjustable. In the rear seat area, the outer seating positions are carefully engineered - complete with side bolsters - to combine luxurious comfort with good lateral support.

INTERIOR ROOMINESS AND CONVENIENCE

The RDX interior accommodates five passengers, with generous headroom and legroom. Rear outboard passengers will also find ample foot room under the front seats.

Convenient storage areas are easily accessible throughout the interior. Each front door has a utility box compartment built into the padded armrest. The lockable 6.3-liter glove box is illuminated. Up front, there are two cupholders in the center console. In the rear seat area, the center armrest folds down to reveal dual cupholders. The front center console is engineered with the urban driver in mind. Beneath the padded, lockable lid, there's a total of 18 liters of illuminated storage space - enough for a briefcase.

A fold-up interior divider and internal 12-volt power outlet make the console easily adaptable for a variety of needs, including secure, out-of-view storage of valuables like cameras, personal music players or other items. In addition, integrated to the underside of the lid is a coin holder and place for holding cards.

CARGO CARRYING VERSATILITY

Versatile cargo utility is an important RDX attribute. Behind the rear seats, there's 27.8 cubic feet of storage, easily accessible through the flip-up rear hatch. A hard lid provides privacy for items in the cargo area - perfect for urban environments where security is a priority. When not needed, the hard lid can be stored on the cargo floor, or flipped over to carry dirty objects on an easy-to-clean "wipeable" surface.

To carry larger items, the 60/40 split-folding rear seats can be easily stowed to create a flat load floor. First, the seat base cushions are lifted and tumbled forward; then the rear seat backs are folded flat. In this configuration, the RDX offers a total of 60.6 cubic feet of storage behind the front seats, more than enough for two 19-inch mountain bikes (with front wheels removed). When the rear seats are returned to their upright position, indicators built into the seatback release handles clearly inform when the seatbacks are fully latched in place.

INTERIOR LIGHTING

The RDX's driver-oriented interior takes on a clear technical edge after dark. The analog instruments are LED backlit, with high-contrast markings and a subdued blue accent hue. The progressive self-illuminating gauge package gives the RDX a "welcoming" feel. When the door is first opened, the instrument lighting comes to life, and then brightens progressively to 100-percent when the ignition is switched on. The illuminated instrument needles and enunciator lights then come alive, indicating that the RDX is ready to go. At the end of the drive, the instrument lighting dims progressively.

Interior switches are illuminated to make them easy to locate at night, including those switches on all four doors and the steering wheel. The RDX has blue low-level ambient lighting in the ceiling that illuminates the front center console area. All four doors have courtesy lights that are illuminated when the doors are open. The RDX with Technology Package has interior lights featuring "theater dimming," which can be customized by the driver via the Multi-Information Display (MID) to any of three dimming times.

DUAL-ZONE AUTOMATIC CLIMATE CONTROL SYSTEM

RDX has a dual-zone, automatic climate control system that lets the driver and front passenger set the temperature to their individual liking. Large, simple-to-use system controls are positioned within easy reach, just below the center instrument panel vents. In addition, the RDX with Technology Package offers a GPS-linked, solar-sensing, dual-zone, automatic climate control system. Based on continuously updated vehicle position and direction of travel, the navigation system determines the position of the sun relative to the driver and passenger. Combining this information with input from the solar sensor located on top of the instrument panel, the climate control system automatically adjusts the temperature, fan speed, and vent position from side to side as needed to compensate for asymmetrical solar heating.

OVERHEAD CONSOLE

The overhead console incorporates a variety of useful features. Controls for the standard HomeLink® system are positioned here within easy reach. Other overhead console features include controls for interior lighting and the power tilt/slide moonroof.

7-SPEAKER ACURA PREMIUM SOUND WITH 6-CD CHANGER

Acura RDX comes standard with a 7-speaker Acura Premium Sound audio system with a multi-format 6-disc changer. This 360-watt system is designed to give RDX owners exceptional sound quality, where the changer uses a 24-bit D/A converter along with the ability to enjoy a wide range of audio formats. In addition to AM and FM radio bands, the system's changer can play CD, CD-R/RW, CD-Text, and MP3/WMA discs. CDs with embedded text information can also be displayed. Speed-dependent volume control increases the audio gain automatically as road speed increases.

The system also includes XM® Satellite Radio, which provides more than 170 channels of digital program material with near-CD quality sound. A text display provides informational text on the program material. XM® Satellite Radio provides virtually uninterrupted coverage of the 48 contiguous states and select Canadian cities, and requires a monthly subscription. XM® Satellite Radio service for Alaska and Hawaii does not exist at this time. Three months of complimentary XM® Satellite Radio service is provided with RDX models.

For RDX owners who have personal music players, an easily accessible auxiliary input jack with nearby 12-volt power outlet makes a high quality audio connection simple.

Large-format controls make the audio system easy to operate, and the center dash display clearly shows system operating settings. The sound system sends a total of 360-watts of power through seven channels. A 6.7-inch Kevlar-cone Neodymium-magnet speaker is positioned in each door and a pair of 1-inch aluminum-dome Neodymium-magnet tweeters are located near the A-pillars to provide clear and detailed sound imaging. An 8-inch Ferrite-magnet subwoofer is positioned in a tuned enclosure in the right sidewall of the cargo area, to improve low frequency sound linearity.

Speed-sensitive Volume Compensation

For optimum sound regardless of vehicle speed, the system includes automatic Speed-sensitive Volume Compensation (SVC). SVC adjusts audio volume based on vehicle speed to compensate for increasing or decreasing external background sounds in the RDX. The result is transparent operation and a more consistent perceived sound level regardless of vehicle speed. SVC is available on the RDX Premium audio system and RDX with Technology Package.

10-SPEAKER ACURA/ELS SURROUND® PREMIUM SOUND SYSTEM WITH 6-CD/DVD-AUDIO CHANGER (TECHNOLOGY PACKAGE)

A key part of the RDX's available Technology Package is a 10-speaker Acura/ELS Surround® Premium Sound System with multi-format 6-disc DVD-Audio changer. The Acura/ELS Surround® Premium Sound System adds a new and dramatic dimension to the automotive audio experience. Engineered by Grammy® award-winning recording engineer and producer Elliot Scheiner, Panasonic and Acura, the 410-watt surround system reaches new levels of clarity and definition to provide a highly accurate listening experience. When playing DVD-Audio discs, the system provides a total of six discrete audio channels.

Head unit

Like the standard Acura Premium Sound System, the Acura/ELS Surround® Premium Sound System is remarkably versatile. The 6-disc in-dash changer can play CD, CD-R/RW, CD-Text, and MP3/WMA discs. In addition, it can also play DVD-Audio discs (the system will not play DVD movies, DVD-Video or DVD-R/RW). The system also includes AM, FM and XM® Satellite Radio. An easily accessible AUX input jack with nearby 12-volt power makes it simple to connect a personal music player to the system. A display above the navigation screen shows the most frequently used audio system settings at all times, independent of the Navigation system, which is included in the Technology Package. Screens within the navigation system menu allow more detailed fine-tuning of the audio system.

Acura/ELS® Surround Sound

Acura/ELS Surround® Sound is included in the RDX with Technology Package. The system gets its name from Elliot Scheiner's recording industry-recognized moniker "ELS." Scheiner's goal was to tune, capture and reproduce music the way it is heard in the recording studio. Vehicle noise aside, the defined space of an automotive interior is an excellent setting to achieve studio sound, since the positions of the passengers and speakers and the acoustics of the interior surfaces are known.

In addition to the accurate reproduction of music from two-channel sources, the Acura/ELS Surround system features DVD-Audio playback and a discrete multi-channel surround sound experience. By featuring discrete multi-channel, the system can reproduce six independent channels of audio source material, creating sound that truly surrounds the listener - a dramatic change from standard automotive audio systems where only two channels (left and right) are available. The key to a discrete surround experience is the extra data on the DVD-Audio disc.

Even when not playing DVD-Audio discs in Acura/ELS Surround® Sound, the system delivers a remarkable listening experience. Uniquely engineered equalization for each media type allows the sound quality to be optimized regardless of whether the system plays conventional CDs, XM® Satellite Radio or any other format. In the first application for an Acura, the system also features selectable Dolby Pro Logic II signal processing that creates simulated 5.1-channel surround sound from CD, MP3/WMA, XM, or AUX.

Amplification/Speaker System

The Acura/ELS Premium Sound® System uses a 24-bit D/A converter, and it is the first production sound system to use a digital 96 kHz sample rate for smoother sound. Advanced electronics in the system gave Scheiner the ability to precisely tune the acoustics of each speaker, and the timing of each of six audio channels to achieve the truest possible reproduction.

Nine of the 10 speakers in the RDX with Technology Package uses a high-energy Neodymium magnet (subwoofer uses a Ferrite magnet) for unparalleled sound quality and drastically reduced weight. There's a 6.7-inch mid/low-range dual thickness polypropylene-cone speaker in each door and a 1-inch soft-dome tweeter near each A-pillar. A center channel 2.75-inch mid-range polypropylene-cone speaker is centered on top of the instrument panel, and the left and right two satellite channel speakers (same as center speaker) are positioned just behind the second-row seats, positioned high and angled into the interior. A special Super Low Distortion 8-inch subwoofer powered by a separate 100-watt amplifier is positioned in a tuned enclosure on the right sidewall of the cargo area, to provide rich, deep bass, without intruding on passenger room or useful storage space.

BLUETOOTH® HANDSFREELINK® WIRELESS TELEPHONE INTERFACE (TECHNOLOGY PACKAGE)

All RDX models feature standard Bluetooth® HandsFreeLink® hands free phone interface that is designed to work with many Bluetooth®-enabled mobile phones (sold separately). Bluetooth® is a radio frequency-based cable replacement technology that lets portable devices like mobile phones, PDAs, laptops and other devices communicate wirelessly. The RDX system is compatible with Bluetooth® enabled cell phones that have the Hands Free Profile (HFP). Some early Bluetooth®-enabled phones do not have this communications protocol. After the driver completes a 1-time "pairing" process, the RDX can communicate wirelessly and securely with the driver's cell phone. The phone needs to be on, but it can be stowed in a pocket, briefcase, purse, or anywhere inside the RDX cabin.

Bluetooth® HandsFreeLink® allows the driver to send or answer telephone calls without removing hands from the steering wheel. When a call comes in, the number of the incoming caller is displayed on the Multi-Information Display (MID) located in the speedometer face. The phone ring tone is also played over the audio system. If the driver chooses to answer the call, a press of the steering wheel-mounted "Pick up" button (located at the eight o'clock position) mutes the audio system and the incoming caller is heard over the audio system speakers. An overhead microphone picks up the driver's voice. Algorithms built into the Bluetooth® HandsFreeLink® system cancel "echo effect" and reduce background noise to improve the transmission quality of the driver's speech.

To send a call hands-free, the driver can dial the number by voice, again using fingertip controls mounted at the eight o'clock position on the steering wheel to activate the system. The driver also can store frequently called numbers with voice tags in the system's address book. Up to six different compatible mobile phones can be paired with the Bluetooth® HandsFreeLink™ system at one time. Additional information can be found at www.acura.com/handsfreelink or www.handsfreelink.com.

ACURALINK™ SATELLITE COMMUNICATION SYSTEM WITH REAL TIME TRAFFIC (TECHNOLOGY PACKAGE)

The RDX with Technology Package comes with the latest generation of the AcuraLink™ Satellite Communication System with real-time traffic. AcuraLink™ allows for 2-way communication between Acura and the vehicle, providing customers with the latest information specific to their vehicle. In cases where communication to and from the Acura Telematics server is needed, the owner's Bluetooth®-compatible cell phone is used (once the owner has paired it with the vehicle, enabled its data-transmission function and agreed to the data charges from their cellular phone service provided).

AcuraLink™ messages consist of limited text displayed on the navigation screen plus full details via Text-To-Speech that can be heard over the RDX audio system. Each message is prioritized by importance. High priority messages are displayed immediately upon receipt. Other messages trigger an icon on the navigation screen. Some low priority messages show up only on vehicle start-up to avoid distractions. In all cases, the RDX owner can choose to read the message immediately, or archive it to be read later.

A variety of messages can be sent to the RDX, including Maintenance Minder™ (detailed information regarding the next required maintenance), Quick Tips (information to help maximize the benefit and enjoyment of RDX features), Feature Guide (supplements to the Owner's Manual), Diagnostic Info (detailed information and instruction should an onboard system issue arise), information regarding a service or repair required, and Service Appointment Reminders. The RDX owner has complete control over the types of messages received. All AcuraLink™ preferences can be set via the Owner Link web site.

Since the system allows 2-way data communication between the RDX and the Acura Telematics Server, AcuraLink™ can provide the owner with vital information that previously has been unavailable. For example, if an ABS/BRAKE warning light should appear on the RDX instrument panel, AcuraLink™ will automatically send a trouble code to the Acura Telematics Server (if a linked-phone is in range and the user has authorized data transmission), which interprets the code, then sends a message back to the RDX, such as "ABS and EBD shut down! Drive slowly. Avoid sudden hard braking." This way, the owner knows if a particular fault is serious enough to cancel a trip, if it can be dealt with later or if it requires special driving techniques. The data connection is enabled even if the monthly XM® Satellite Radio service is not in effect.

Real-Time Traffic Information

The navigation screen can display up-to-the-minute traffic information including flow (traffic speed where available), accidents, incident, construction and weather on freeways in 76 major metropolitan areas-an increase of 32 metro areas for 2008. The information is aggregated by NAVTEQ™ from multiple sources including police and highway patrol accident reports and transportation departments and then transmitted by XM® Satellite Radio satellites to the RDX where it is graphically displayed on the navigation system.

RDX drivers can select an icon on the map to see incident details. Traffic information is continuously updated, allowing drivers to avoid congestion en route and choose the best path to their destination. The system gives RDX owners a useful time saving tool on freeways. Unlike radio or television traffic reports, real-time traffic provides a constant flow of relevant information reflecting conditions along a driver's chosen route. Real-time traffic data services are offered on a subscription basis for a nominal fee following the 3-month free trial period. In addition to the on-screen traffic information, RDX owners who maintain their XM® Satellite Radio service also receive more general audio traffic information that runs on a 2-3 minute loop in selected metropolitan areas.

76 major metropolitan markets

(Traffic flow data and incident reporting coverage vary by market)

Albany-Schenectady-Troy	Indianapolis, IN	Portsmouth-Manchester, NH
Albuquerque, NM	Jacksonville, FL	Providence-Warwick-Pawtucket, RI
Allentown-Bethlehem, PA	Kansas City, KS	Raleigh-Durham, NC
Atlanta, GA	Lancaster-York, PA	Richmond, VA
Austin, TX	Las Vegas, NV	Rochester, NY
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ACURA NAVIGATION SYSTEM WITH VOICE RECOGNITION™ (TECHNOLOGY PACKAGE)

The RDX with Technology Package is equipped with the latest generation Acura Navigation System with Voice Recognition™. This highly capable system is designed for intuitive and quick operation.

Feature Summary

- 8-inch screen for easy viewing
- Centrally positioned multi-function interface dial provides simple control of system and is accessible to driver and front seat passenger
- Voice recognition function with 683 commands minimizing the need for manual entry
- Voice recognition system recognizes spoken 1.7 million U.S city and street names
- Seven million points of interest are stored on updatable DVD
- Business and recreation phone directory of virtually the entire continental United States
- Audio system automatically mutes for turn-by-turn voice guidance in either male or female voice (voice can be turned off at any time)
- Destination memory recalls current trip addresses, previous destinations and user address books
- Directory categories include restaurants (searchable by type of cuisine), lodging, shopping, airports, hospitals, recreation areas and more
- Zagat® restaurant guide provides detailed information and reviews on restaurants in / ase, which can be read on-screen or spoken over the audio system by an advanced Text-to-Speech voice
- Split-screen mode features a simultaneous "map view" and selective "3-D" route visualization
- Make calls to on-screen points of interest with Bluetooth® HandsFreeLink®
- User selectable Day/Night screen or display off modes
- Trip routing can include up to five user-chosen way points
- Trip routing can avoid user-selected areas
- Exit list shows which businesses are available at a given highway exit
- On-screen graphic of highway interchanges indicates which lane to use to stay on route

System Operation

Based on positioning data from up to 12 orbiting Global Positioning Satellites (GPS), the Acura Navigation System with Voice Recognition™ locates the vehicle's position. If the GPS antenna is blocked by a tunnel, tall building or parking garage, an internal gyroscopic system and a speed sensor track the location of the vehicle to help keep the mapping information current and reliable until satellite reception is restored. A DVD database is located in the system's ECU. Updated DVD data discs are available on an annual basis at www.acura.com or by calling a toll-free number.

The system can be controlled by voice, or by the interface dial. For voice operation, the driver simply presses the "Talk" button on the steering wheel and says any of a number of preset command phrases. The system responds to 683 command phrases, as well as to spoken city and street names (1.7 million available names). By speaking the city and street names aloud, this advanced voice recognition system simply allows the RDX owner to completely route to their destination by only using voice commands.

When the "Talk" button is pressed, the audio system is automatically muted, and an overhead microphone receives the command from the driver. Commands can be given in plain English, like "Display gas stations," "Find nearest hospital," or "Find nearest Chinese restaurant." You can choose to display points of interest on the map (like restaurants or ATMs), or have the system provide turn-by-turn navigation - all by voice command. The

extensive point-of-interest database includes phone numbers, which can be dialed easily by using the Bluetooth® HandsFreeLink™ system and the driver's compatible Bluetooth cell phone.

The Acura Navigation System with Voice Recognition™ and real-time traffic can also be controlled via the Interface Dial by choosing menu options or spelling out a word (e.g., an address, business name or place). The interface dial functions much like a computer pointing device, allowing characters and items to be selected from the on-screen display.

INTERIOR ACCESSORIES

A variety of high-quality genuine Acura accessories are available for the 2008 RDX. Designed specifically for the vehicle, they add to luxury and improve the vehicle's utility. The accessories include:

- All-season floor mats
- Leather wrapped shift knob
- Wood patterned trim panels
- Ashtray
- Interior center console cooler bag
- Auto dimming mirror with compass
- Acura Music Link
- Rear cargo net
- Rear cargo liner
- Rear cargo organizer

SAFETY OVERVIEW

Acura's mission for the RDX is to provide an extraordinarily high level of safety that meets or exceeds current regulations and standards. The goals embrace a core Acura brand concept called "Safety Through Innovation."

Specific Safety Information:

- New FMVSS 208 frontal and FMVSS 301 rear collision standards implemented by the federal government for 2008 model year
- 5-Star rating in NHTSA Front and Side NCAP tests
- GOOD ratings in Insurance Institute for Highway Safety (IIHS) front offset, Side Impact Crashworthiness Evaluation (SICE) and seat/head restraint rear crash tests
- Advanced control of intrusion into the passenger compartment during a side collision with an SUV in SICE tests
- IIHS TOP SAFETY PICK
- Improved protection in the event of frontal collisions with larger vehicles
- Enhanced crash compatibility with smaller vehicles in a car-to-car collision compared to previous generation vehicles
- Advanced protection for pedestrians in event of a collision

REQUIRED VS. OPTIONAL TESTS

All 2008 model year vehicles are required to meet the latest federal crash-performance regulations known as FMVSS 208 (frontal) and FMVSS 301 (rear).

Above and beyond these are key safety evaluation tests from National Highway Traffic Safety Administration (NHTSA) and the Insurance Institute for Highway Safety (IIHS), which are often referenced by customers but not required by law. For the RDX, the engineering target was 5 Stars for the NHTSA tests and Good ratings for all IIHS tests - the best results possible.

This includes the IIHS ratings test called Side Impact Crashworthiness Evaluation (SICE), which limits the intrusiveness if hit by an SUV in a side collision. Finally, the RDX adopts pedestrian head protection measures that are above and beyond NHTSA standards.

ADVANCED COMPATIBILITY ENGINEERING™

Advanced Compatibility Engineering™ (ACE™) is the cornerstone engineering feature that defines much of the RDX structure. ACE™ helps maintain the structural integrity of the passenger cabin in a frontal crash. It does so by markedly improving energy distribution away from the cabin during the crash, and allowing a more uniform absorption of energy. This helps reduce the chance of intrusion into the passenger cabin. Also, ACE™ provides benefits in vehicle compatibility in frontal crashes, which can improve passenger safety when vehicles of dissimilar size and height collide.

2008 Acura RDX - Safety

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OFFSET REAR COLLISION

The new requirements for NHTSA's FMVSS 301 include a more severe rear crash test. In the current test, a 1,367 kg (3,015 lb.) deformable barrier sled strikes 70-percent of the vehicle's width at 50 mph. In contrast, the previous FMVSS 301 used a 1,814 (4,000 lb.) flat rigid moving barrier that struck the full width of the vehicle at 30 mph. The new test requires that the vehicle absorb more crash energy than before-and the 2008 Acura RDX does.

FRONT-TO-FRONT VOLUNTARY IMPROVEMENTS

As popular full-size pickups and SUVs have become larger and taller, so has the dilemma presented when such vehicles collide head-on with smaller vehicles. For the Acura RDX, engineers voluntarily adopted a vehicle-to-vehicle collision philosophy above and beyond what is required by the government.

ACE™ helps distribute the forces of a larger and heavier vehicle across the front structure of the RDX. This helps to reduce the risk of intrusion and at the same time, helps disperse the crash energy across a wider area of the front of the vehicle to help reduce the risk of occupant injury.

Acura RDX also has a front member that extends below the front bumper beam. This lower member helps ensure that if the RDX collides with a smaller vehicle, the lower front member will engage the other vehicle's bumper system. Also, the upper portions of the ACE™ front structure improve cabin protection if the RDX sustains a frontal crash with a larger vehicle.

PEDESTRIAN SAFETY

The RDX takes the well being of pedestrians into account in its safety engineering. Accordingly, engineers optimized certain structures in the front end of the vehicle to help absorb energy in the event of a collision with a pedestrian. Research shows that these features can dramatically improve a pedestrian's chance of survival if struck by a moving vehicle.

Key Pedestrian Safety Features include:

- Hood designed to deform if contact is made with either an adult or a child pedestrian
- Energy-absorbing fender mounts and supports located under the hood
- Greater clearance between hood and hard engine parts
- Deformable windshield wiper pivots
- Crushable hood hinge

DRIVER AND FRONT PASSENGER DUAL-STAGE, DUAL-THRESHOLD AIRBAG SUPPLEMENTAL RESTRAINT SYSTEM

Dual-stage airbags are provided for the driver and front passenger. These airbags are designed to maximize protection for the head and chest during a moderate to severe front collision. In dual-stage technology, each airbag inflator has two stages instead of a traditional single inflation stage. Dual-threshold technology allows for these two stages of inflation to be ignited at different times. Combining dual-stage and dual-threshold technology with technology that detects if the occupants are belted or unbelted, the airbags are deployed in a sequence based on crash severity. To reduce the potential for airbag injuries during a moderate collision, the airbags are deployed in a delayed mode to slow the rate of inflation. In the event of a severe crash, both stages are deployed at the same time to provide immediate occupant protection.

Dual-Stage, Dual-Threshold Airbag parameters:

- Airbag deployment characteristics are finely controlled depending on the severity of a collision
- The dual stage, dual-threshold strategy applies to front airbags only and does not affect operation of side airbags or side curtain airbags

In addition, the airbag system also uses a seat weight sensor to assess the weight of the front passenger. The front passenger airbag is shut off if the weight sensor indicates that a small child or a baby carrier is occupying the front seat. Finally, a seamless instrument panel cover fully conceals the passenger airbag. The driver's airbag is located in a small steering-wheel mounted housing.

DRIVER'S AND FRONT PASSENGER'S SIDE AIRBAGS WITH FRONT PASSENGER OCCUPANT POSITION DETECTION SYSTEM

Side airbags mounted in the outboard area of each front seatback are designed to provide upper torso protection in the event of a sufficient side impact. In addition, the front passenger's seat is equipped with Occupant Position Detection System (OPDS), an innovative system designed to deactivate the side airbag if a small child (or small stature adult) is occupying the front seat and the passenger leans into the side airbag deployment path. When the passenger returns to an upright seating position, the side airbag reactivates so it can deploy and help protect the occupant in a side impact. The system utilizes sensors in the passenger seatback to determine the height and position of the occupant, and determine if it is safe to deploy the side airbag.

SIDE CURTAIN AIRBAGS

In a sufficient side impact or rollover, the RDX's side curtain airbags deploy from roof-mounted modules, providing head protection for both rows of seating. Side curtain airbags effectively cover the window area from the A-pillar back to the C-pillar. Tests show that the g-forces acting upon an occupant's head are far lower with side curtain airbags.

LOWER ANCHORS AND TETHERS FOR CHILDREN (LATCH)

The RDX includes a LATCH (Lower Anchors and Tethers for CHildren) child-seat mounting system for all rear seat positions. LATCH features built-in lower anchors and ready-to-use tether attachment points that allow compatible child safety seats to be installed without using the vehicle's seat belt system. Additionally, the LATCH system simplifies child seat installation when an owner installs a LATCH-compatible child seat. Up to two LATCH child seats can be installed simultaneously.

PRETENSIONERS AND LOAD LIMITERS

Both front seat belts have seat belt pretensioners and load limiters that work together to help protect the driver and front passenger in a collision. The components work automatically in a 1-2 sequence. In the first few milliseconds of a collision, the pretensioners automatically tighten the front seat belts. Research has shown that seat belts that are snugly secured around the occupants provide better protection. If the deceleration forces rise above a predetermined threshold, the load limiter releases a small length of seatbelt webbing to reduce the pressure on the occupant in a controlled manner. This helps reduce the injuries that seatbelts can cause in a severe high-speed collision.

ACTIVE HEAD RESTRAINTS

The RDX front seats incorporate innovative front seat active head restraints that help minimize the potential for neck injury from rear-end collisions. In the event of such a collision, the occupant's body is pushed against the seatback. The pressure to the seatback is then transmitted mechanically from the lumbar plate via links that push the head restraint upward and forward to reduce the gap between the occupant's head and seat head restraint, comparatively reducing the forces acting on the head, neck and spine at the time of the collision. This ability to help manage rear collision forces is a key component to reducing whiplash injuries. Active head restraints are standard on the Acura RDX but are unavailable on the BMW X3.

FUEL TANK SAFETY

An 18-gallon fuel tank is located in a protected area in front of the rear body-deformation zone, to minimize its risk of damage in a collision.

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Pioneer AVIC Z-1 review: Pioneer AVIC Z-1

Pioneer AVIC Z-1

Kevin Massy

Aug. 10, 2006 10:09 p.m. PT

7 min read 

When we got our first look at the Pioneer AVIC-Z1 head unit at CES 2006, we were impressed. The double-DIN in-dash system incorporates a 7-inch touch screen and brings in all the functions you would expect to see in a top-of-the-line factory-installed head unit: Bluetooth cell phone integration, voice-activated GPS navigation, and a range of audiovisual media playback options.



Pioneer AVIC Z-1

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THE GOOD

A user-friendly touch-screen interface and a decent voice-recognition system combine with intelligent navigation and Bluetooth to make the AVIC Z-1 a one-stop shop for major cabin tech.

THE BAD

The need to activate the parking brake to program the navigation is overly cautious, and some delays in start-up and music playback can be frustrating.

THE BOTTOM LINE

The Pioneer AVIC Z-1 is an impressive all-in-one aftermarket head unit incorporating most of today's in-car technology features. Despite a few usability glitches, it is a competitively priced car tech package.

And the AVIC Z-1 goes one better by incorporating a built-in 30GB hard drive enabling users to rip CDs to disc to create a mobile media library. There are those who will question the value of such a function, considering the fact that most people who are interested in creating music libraries will probably already have one on their computers and/or on their iPods. The AVIC Z-1 addresses the latter by offering a dedicated iPod interface, which enables those in the car to devolve control of their iPods to the touch screen while driving. (As usual, we expect there will be howls of disapproval from owners of portable digital music players other than the iPod, but at the moment it looks like Apple is the only one making the vendor deals.)

For our test-bench review of the AVIC Z-1, we got a number of the available add-ons, including the Bluetooth and iPod adapters. Wiring up the main head unit is pretty straightforward, and we managed connect it to four main speakers and its additional media modules without the need for any special equipment. In addition to the four standard speakers, the unit has separate RCA connectors for two more pairs of speakers and a subwoofer, all of which require separate amplifiers. There are also RCA connections for a rear video display, external video components, and a rearview camera, which is sold separately.

As a multimedia receiver, the AVIC Z-1 supports a broad range of formats: as well as being an FM/AM receiver, the head unit supports standard RedBook CDs; MP3- and WMA-encoded files; the aforementioned iPod input; and DVD video and -ROM, with video playback via the 7-inch display in one of three screen configurations. There is also an optional satellite radio connector and a dedicated XM NavTraffic module to provide real-time traffic data in conjunction with the navigation system.

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Making a mobile library is worth the wait

The first thing you notice when you fire up the AVIC Z-1 is the amount of time the Pioneer-branded start-up screen stays on--we counted at least 30 seconds before we were given a menu, putting it down to initial calibration, but we found that this wait is compulsory every time it is turned on. This start-up delay did give us time to configure the screen angle to our satisfaction--a process that requires you to hold down the eject button to bring up the screen enabling forward and backward tilt.

Use of the AVIC Z-1 as a car stereo is straightforward: hard buttons on the base of the double-DIN bezel let you skip through radio frequencies and CD tracks and control volume, with all other functions carried out using the touch screen. Discs are loaded into the unit by pressing a hard Eject button on the bezel, which causes the screen to retract, revealing a single CD slot. After loading a standard CD, the screen reverts back to its original position automatically, while the head unit digests all the information it can from the disc. An icon appears on the screen informing you that the AVIC Z-1 is equipped with Gracenote, an embedded software and metadata service, which enables devices to identify and catalog audio files for the purposes of building digital media libraries. The default on the AVIC Z-1 is for Autorecord mode, which sets the unit to automatically start ripping audio files from store-bought CDs as soon as they are inserted for playback. As with Apple's iTunes, the music files are then simultaneously played and recorded to disc.

Pioneer AVIC Z-1

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The Pioneer AVIC Z-1 enables users to record CDs to its 30GB hard drive for creation of a digital media library.

Each track takes about one minute to record to the hard drive, then it can be played back at any time. One small frustration we found with the unit set to Autorecord was the delay that precedes playback of the disc as the reader prepares itself. In addition to Auto mode, the record function can be set to Single and Manual modes, which respectively record the first track of a disc and allow users to choose recording on a track-by-track basis. Using the touch screen to control audio--either directly playing from discs or an iPod, or from the library--is relatively straightforward, with dedicated buttons for random playback, repeat, and search. For homemade digital audio discs (such as MP3s and WMAs), a search button enables navigation of music by folder, track, and artist.

Voice recognition avoids putting the brake on

While its music capabilities are plentiful, Pioneer markets the AVIC Z-1 primarily as an in-dash navigation system. Destinations can be entered via the touch-screen keypad or by voice command using the included microphone, which is activated by a voice icon on the screen. Destinations can be entered by address, by phone number, by manually selecting a point on the map, or by searching a database of more than 11 million points of

interest. We found the voice-recognition capabilities to be flawless, despite a few initial misgivings about the basic appearance of the mic. Unlike some factory-installed units that we've reviewed, the AVIC Z-1 does not require users to push the voice-command button for each stage of the destination-entry process, opting for a more user-friendly succession of beeps. The system does, however, make users push an onscreen button for final confirmation of a destination. Another quirk of the navigation system is that the parking brake has to be engaged for many of the features to be operable. While this is admirable in its safety-consciousness, it means that users of the system will be unable to reprogram a route while stopped in traffic unless they crank on the parking brake to activate the screen--a practice that will soon become frustrating. Some functions, including Address Book, are enabled without parking-brake engagement, presumably because searching a database is deemed less distracting than inputting new information: a case of differing shades of gray in our opinion.



**The optional integration of XM
NavTraffic overlays real-time
information on the AVIC Z-1's
map screens.**

When on the road, the AVIC-Z1 has text-to-speech voice guidance, letting it tell you the names of roads you need to look for. Trip routing is also adaptive so that if you consistently choose a different route than that suggested, the nav system will set your preferred route as the default. Maps are clear and bright and can be configured in a variety of views. One feature of the AVIC Z-1 that we especially like is the option of integrated live traffic data from XM Satellite Radio. This function, which requires the addition of the GEX P10XMT module, as well as an active subscription to XM's NavTraffic service, works by acquiring traffic information up to 100 miles in diameter from the vehicle's current location. As well as giving information on the location and nature of potential traffic disruptions, NavTraffic provides a clear indication of affected areas by color-coding roads according to the severity of congestion: red denoting an average speed of 5 to 15mph, yellow denoting 20 to 40mph, and green showing roads with an average speed of 45mph and over. A list of icons also serves to inform drivers of the nature of a traffic disruption.

The final major function of the AVIC Z-1 is its voice-activated Bluetooth hands-free calling function. Pairing our phone to the system was not as easy as we have found with some factory-installed systems, due to an extra step of phone registration. Users are given the option of pairing a phone using

their handset or the head unit itself. We found it easier to let our BlackBerry 8700g search for the head unit, which it discovered quickly. When paired, calls can be made in variety of ways: by using the same effective voice-recognition system as with the navigation (say, "Call, number," then punch in the digits), by using a numeric keypad on the touch screen (although, as with the navigation, the parking brake must be on for this to work), by dialing favorites (no parking brake required), or by selecting point-of-interest icons on the map that have registered a phone number. Incoming calls to the phone can also be answered using the AVIC Z-1: a single ring and a cartoon graphic on the screen notify users of inbound calls, which can be answered by pressing a green phone button. Sound quality through the front speakers was good, if a little tinny, and we were assured that we were coming through clearly on the other end of the line.



Sound was clear from both ends of the line when using the AVIC Z-1's Bluetooth hands-free calling feature.

The AVIC Z-1 has come down significantly in price since its release in May. Including \$200 for both the ND-BT1 Bluetooth adapter and the CD-IB100 iPod adapter, and another \$200 for Pioneer's GEX-P10XMT for XM NavTraffic, the unit with all its main features can now be had for less than \$2,500. At that price point, the AVIC Z-1 looks very competitive when set against factory-installed options with a similar number of features.



Pioneer AVIC Z-1

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