CHRYSLER ACADEMY

SCHOOL OF TECHNICAL TRAINING

Dodge Durango Special Service Vehicle

Overview, Maintenance, and Up-fitting

FIRE
DODGE
RESCUE

Student Guide

SAFETY NOTICE

This publication's purpose is to provide technical training information to individuals in the automotive trade. All test and repair procedures must be performed in accordance with manufacturer's service and diagnostic manuals. All ***warnings***, ***cautions***, and ***notes*** must be observed for safety reasons. The following is a list of general guidelines:

- Proper service and repair is critical to the safe, reliable operation of all motor vehicles.
- The information in this publication has been developed for service personnel, and can help when diagnosing and performing vehicle repairs.
- Some service procedures require the use of special tools. These special tools must be used as recommended throughout this Technical Training Publication, the diagnostic manual, and the service manual.
- Special attention should be exercised when working with spring- or tension-loaded fasteners and devices such as E-Clips, Cir-clips, snap rings, etc. Careless removal may cause personal injury.
- Always wear safety goggles when working on vehicles or vehicle components.
- Improper service methods may damage the vehicle or render it unsafe.
- Observe all ***warnings*** to avoid the risk of personal injury.
- Observe all ***cautions*** to avoid damage to equipment and vehicles.
- ***Notes*** are intended to add clarity and should help make your job easier.

Cautions and ***warnings*** cover only the situations and procedures Chrysler Group LLC has encountered and recommended. Neither Chrysler Group LLC nor its subsidiaries or affiliates cannot know, evaluate, and advise the service trade of all conceivable ways in which service may be performed, or of the possible hazards for each. Consequently, Chrysler Group LLC and its subsidiaries and affiliates have not undertaken any such broad service review. Accordingly, anyone who used a service procedure or tool that is not recommended in this publication, must be certain that neither personal safety, nor vehicle safety, is jeopardized by the service methods they select.

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TABLE OF CONTENTS

Notes:

INTRODUCTION

Welcome, the area of special service vehicles is large and diverse with localities and municipalities using these vehicles for a wide range applications. Each application needs a unique and specific up-fitting. The up-fitting community for these vehicles is diverse with regards to adherence of industry up-fitting standards.

This one-day, instructor-led course provides a complete vehicle overview that includes all vehicle systems, fluid types, maintenance intervals, and procedures. The course also highlights the contents of the Dodge Durango Special Services Vehicle (SSV) package. The up-fitter's guide can be used in conjunction with the Student Guide both for diagnosis and up-fitting. Specific system theories, diagnosis, repair, and up-fitting will be covered. The up-fitting will be addressed from both Chrysler engineering and industry approved up-fitting procedures.

In addition to this Introduction, this course includes the following lessons:

- Lesson 1 - Introduction to the Vehicle
- Lesson 2 - Vehicle Labels and Placards
- Lesson 3 - Vehicle Maintenance
- Lesson 4 - Powertrain
- Lesson 5 - Chassis
- Lesson 6 - Electrical
- Lesson 7 - Trailer Towing
- Lesson 8 - Up-fitting

COURSE OBJECTIVES

After completing this course, a technician will be able to:

- Locate and interpret all vehicle labels and placards
- Identify all vehicle module locations and module functionality
- Correctly raise and support the vehicle
- Select, check, drain, and replace all vehicle fluids, filters, and spark plugs
- Locate all restraint system components, both active and passive
- Identify all base brake system components, their location, system operation, and unique service procedures
- Identify all ABS, ESP, traction control components, and system operation
- Identify, diagnose, and program the tire pressure monitoring system
- Identify network topology and communication circuits
- Explain WIN system operation of the FOBIK system
- Identify the trailer towing components and explain safe trailer towing procedures
- Locate all up-fitting systems, components, and connectors

ACRONYMS

The following is a list of acronyms used throughout this publication:

- ABM Antilock brake module
- ABS Antilock brake system
- ACC Adaptive cruise control
- AGM Absorbent glass mat (battery)
- AH Ampere-hours
- AHLM Automatic head lamp module
- ALR Automatic locking retractor
- API American Petroleum Institute
- ASD Automatic shutdown relay
- AWDCM All wheel drive control module
- BCI Battery Council International
- BSM Blind spot module
- BTCS Brake traction control system
- BTSI Brake transmission shifter/ignition interlock
- CAN Controller area network
- CCA Cold cranking amperage
- CCN Cabin compartment node
- CHMSL Center high mounted stop lamp
- CVI Clutch volume index
- DLC Data link connector
- DMFL Door module front left
- DOHC Dual over head cam
- DRL Daytime running lamps
- DRW Dual rear wheels
- DTC Diagnostic trouble code
- DTCM Drivetrain control module
- EARS Enhanced accident response support
- EATX Electronic automatic transmission controller
- ECM Electronic control module
- EHPS Electro-hydraulic power steering
- ELR Emergency locking retractor
- EMIC Electromechanical instrument cluster
- EOM Electronic overhead module
- EPA Environmental protection agency
- EPS Electronic power steering

- ERS Electronic range selection
- ESC Electronic stability control
- ESM Electronic seat module
- EVIC Electronic vehicle information center
- EVR Electronic voltage regulator
- FCM Front control module
- FOBIK FOB integrated key
- GAWR Gross actual weight rating
- GCWR Gross combined weight rating
- GTW Gross trailer weight
- GVWR Gross vehicle weight rating
- HCU Hydraulic control unit
- HFM Hands free module
- HOAT Hybrid organic additive technology
- HVAC Heating ventilation air conditioning
- IAC Idle air control
- IOD Ignition off draw
- ISO International vehicle control and display symbols
- ITBM Integrated trailer brake module
- ITC Integrated transfer case
- LCD Liquid crystal display
- LED Light-emitting diode
- LIN Local interface network
- MAP Manifold absolute pressure
- MDS Multiple displacement system
- MSMD Memory seat mirror driver
- MTC Manual temperature control
- O2S Oxygen sensor
- OAT Organic additive technology
- OBD On-board diagnostics
- OCV Oil control valve
- ORC Occupant restraint controller
- PCM Powertrain control module
- PDC Power distribution center
- PEM Passive entry module
- PLGM Power lift gate module
- PTC Positive coefficient thermistor
- PWM Pulse-width modulation

- RC Reserve capacity
- RF Radio frequency
- RKE Remote keyless entry
- SAS Steering angle sensor
- SCCM Steering column control module
- SCM Steering control module
- SKIS Sentry key immobilizer system
- SKREEM Sentry key remote entry electronic module
- SLA Shift lever assembly
- SLSA Shift lever sensor assembly
- SRS Supplemental restraint system
- SSV Special services vehicle
- TCM Transmission control module
- TIPM Totally integrated power module
- TPM Tire pressure monitor
- TTW Trailer tongue weight
- TW Tongue weight
- UGDO Universal garage door opener
- VCI Vehicle certification label
- VCT Variable camshaft timing
- VECI Vehicle emissions certification label
- VIN Vehicle Identification number
- VTSS Vehicle theft security system
- VVT Variable valve timing
- WCM Wireless control module
- WIN Wireless ignition node
- WOT Wide open throttle
- WSS Wheel speed sensor

BODY CODES		
CODE	**DESCRIPTION**	**YEARS APPLICABLE**
DC	Ram Chassis Cab 3500	2007-2010
DD	Ram Chassis Cab 3500	2011
DH/D1	Ram Pickup HD (Heavy Duty)	2005-2009
DJ/D2	Ram Pickup HD (Heavy Duty)	2010-Current
DM	Ram 4500/5500 Chassis Cab	2008-2010
DP	Ram 4500/5500 Chassis Cab	2011
DS	Ram Truck	2009-Current
HB	Durango	2005-2009
HG	Aspen	2007-2009
JC	Journey	2008-Current
JK	Wrangler	2007-Current
JS	Sebring/Avenger	2007-Current
KA	Nitro	2007-Current
KK	Liberty	2008-Current
LC	Challenger	2008-Current
LD	Charger	2011
LX	300	2011
LX	300, Charger	2005-2010
MK49	Compass	2007-Current
MK74	Patriot	2007-Current
ND	Dakota	2005-Current
PF	Dart	2013-Current
PM	Caliber	2007-Current
RT	Caravan, Town & Country	2008-Current
WD	Durango	2011-Current
WK	Grand Cherokee	2005-Current
XK	Commander	2006-2010
ZB	Viper	2003-2010

Table 1 Chrysler Group LLC Body Codes

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LESSON 1 INTRODUCTION TO THE VEHICLE

Figure 1 Vehicle Features

FEATURES OF THE DODGE DURANGO SPECIAL SERVICE VEHICLE

The Dodge Durango Special Services Vehicle is equipped with unique features that make it fit each fleet's unique needs.

Included in these features are:

- 5.7L HEMI V8 engine with a 6-speed automatic transmission
- All-wheel drive/four-wheel drive (optional)
- Four-wheel independent suspension
- Floor-mounted shifter
- Engine oil cooler
- Additional key fob
- 3.6L engine with a 5-speed automatic transmission
- Electronic stability control
- 10-way power cloth driver's seat
- Unique headliner/auxiliary dome light
- 220-amp alternator
- Remote keyless entry
- Cruise control

UNDERHOOD COMPONENTS

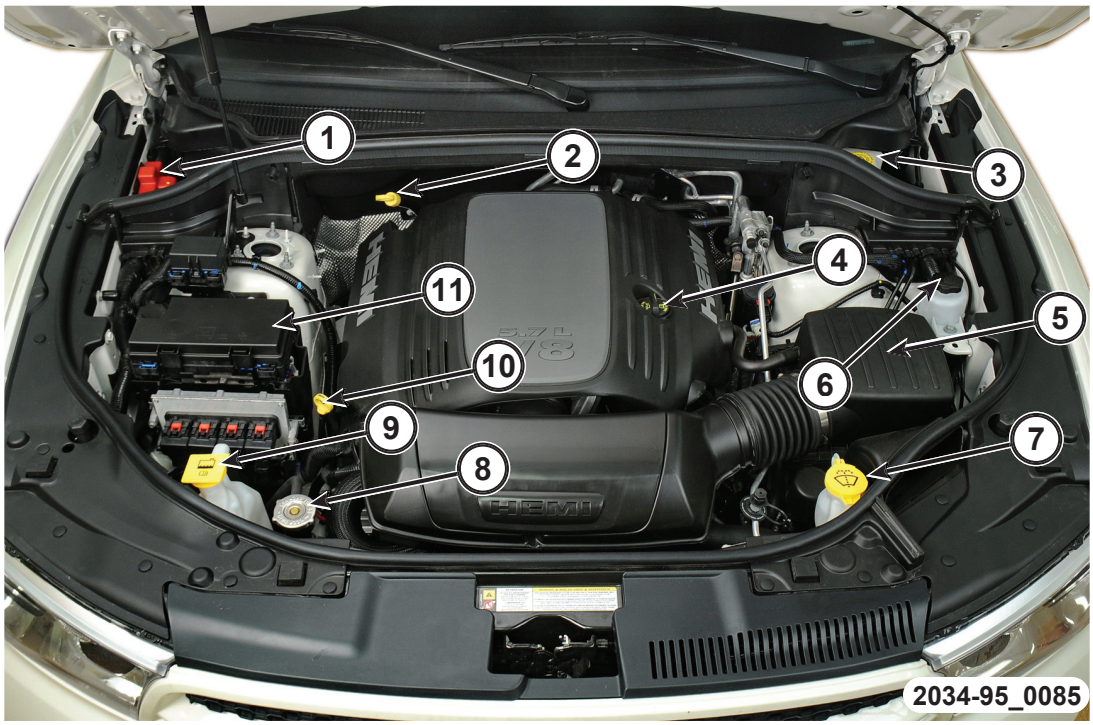

Figure 2 Under Hood Component Identification (5.7L shown)

1. Identify the under hood fluids filters and labels.

1	**Jump Start Positive Post**	**7**	**Windshield Washer Reservior**
2	**Transmission Dipstick Tube**	**8**	**Radiator Cap**
3	**Brake Fluid Reservior**	**9**	**Engine Coolant Reservior**
4	**Engine Oil Fill Cap**	**10**	**Engine Oil Dipstick**
5	**Air Cleaner Housing**	**11**	**Underhood Fuse/Relay Location**
6	**Power Steering Reservior**		

Radiator Coolant

The cooling system of the Dodge Durango Special Services Vehicle (SSV) utilizes an ambient overflow bottle for coolant recovery/reservoir. The coolant is a Mopar® Antifreeze/Coolant, 5 Year/100,000 Mile Formula. The coolant is ethylene-glycol based with hybrid organic additive technology (HOAT) inhibitors.

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Powertrain Control Module (PCM)

The next generation controller version 4 (NGC4) PCM is utilized on the Dodge Durango SSV. In both applications, the controller is responsible for engine functions. The NGC4 controller handles control of the transmission in the 5.7L application; in the 3.6L application, there is a separate transmission control module (TCM). The controller in both applications is located on the passenger side of the front-of-dash under-hood. The controller has unique programming specific to the special services application

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Jumper Terminals

Because the battery is located in the passenger compartment under the passenger front seat, special terminals are provided to assist in jump starting the vehicle.

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Transmission Control Module (TCM)

The transmission control module (TCM) allows for the precise adaptation of pressures to the corresponding operating conditions and to the engine output during the gearshift phase, resulting in a noticeable improvement in shift quality. The engine speed limit can be reached in the individual gears at full throttle and kickdown. The shift range can be changed in the forward gears while driving, but the TCM employs a downshift safeguard to prevent over-revving the engine.

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A/C Service Ports

Two refrigerant system service ports are used to recover, recycle, evacuate, charge, and test the A/C refrigerant system. Unique sizes are used on the service ports for the R-134a refrigerant system.

The high-side service port is located on the A/C liquid line. The low-side service port is located on the A/C suction line.

Note: The Dodge Durango SSV is delivered from the manufacture with refrigerant dye pre-installed in the A/C system. The label identifying this is located on the A/C line directly below the PCM.

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Antilock Brake System

The Dodge Durango SSV has an antilock brake system (ABS) that is an electronically operated, four-channel brake control system that includes electronic stability control (ESC). The vehicle also has electronic variable brake proportioning (EVBP) designed into the system, which eliminates the combination/proportioning valve. A specially programmed ABS module operates the system components.

ABS system bleeding requires conventional bleeding methods plus the use of a scan tool. The ABS module is located on the driver's side front of dash under-hood, directly below the up-fitter PDC.

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Auxiliary Relay Center PDC

The auxiliary relay center is located in the engine compartment next to the TIPM. Contained in the relay center is the left and right day time running light (DRL) relays and the relay for the lift gate unlock.

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Totally Integrated Power Module (TIPM)

The totally integrated power module (TIPM) is a combination unit that performs the functions of the power distribution center (PDC) and the front control module. The TIPM provides the primary means of voltage distribution and protection for the entire vehicle.

The TIPM is located in the engine compartment, next to the battery, and connects directly to the B+ cable via a stud located on top of the unit.

Notes: _____

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INTERIOR COMPARTMENT

Instrument Cluster

The instrument cluster is located in the instrument panel above the steering column opening to serve as an electronic control module for body and lighting functions. Besides analog gauges and indicators, the cluster module also incorporates an electronic vehicle information center (EVIC) to display mileage and other engine parameters.

Notes: _____

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Battery

The Dodge Durango SSV is equipped with an absorbent glass mat (AGM) type battery located in the interior of the vehicle under the front passenger seat.

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Data Link Connector (DLC)

The data link connector is located on the left side of the instrument panel and allows access to the vehicle diagnostic system.

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Hands-free Module

The Dodge Durango SSV may include a hands-free module to allow Bluetooth communication with a cell phone or other hands-free device. See the owner's manual for connection instructions.

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Police Dome Light

The police dome light has a three-position switch that is controlled by a direct battery feed and is independent of all other functions of the vehicle lighting. Position one turns on a white light. When the switch is moved to position two, the light changes to red. Position three (center) turns the light off.

Notes: _____

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Spot Lamp Wiring

There are wiring provisions for spot lamps located both sides of the vehicle. The wiring connections are taped to the outer most edge of the head liner near each A-pillar.

Notes: _____

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Restraints

The Dodge Durango SSV is equipped with a three-point shoulder and lap belt system as well as a supplemental restraint system. The supplemental restraint system includes the following:

- Driver and passenger air bags
- Side curtain air bags on both the driver and passenger side
- Seatbelt pre-tensioners

Notes: _____
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Jack Storage

The jack and jack tools are located on the passenger side, under the rear cargo floor.

Note: See the vehicle maintenance section for information related to proper jack usage.

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UNDER VEHICLE

Load Leveling Shock Absorbers

The vehicle is equipped with a load leveling shock absorber. This shock is a fully self contained shock and requires no outside air source. There are differences between the standard shock and the load leveling shock. These shocks are not interchangeable.

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A/C Lines

There are A/C lines to the rear HVAC unit located under the vehicle.

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Skid Plates

The skid plate is standard equipment on the 5.7L engine and a two speed transfer case. The 3.6L engine and single speed transfer case does not have a standard skid plate. There are provisions for a skid plate to be installed.

Notes: _____

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Battery Vent Opening

The battery vent is located on the passenger side of the vehicle under the front seat location.

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Differential Fill and Drain Plugs

The differentials are equipped with both a fill and drain plug. The differentials are equipped with both a fill and drain plug.

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Transfer Case Fill and Drain Plugs

The transfer case is equipped with both a fill and drain plug. A unique measuring tool is used to measure the fluid level.

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LESSON 2 VEHICLE LABELS AND PLACARDS

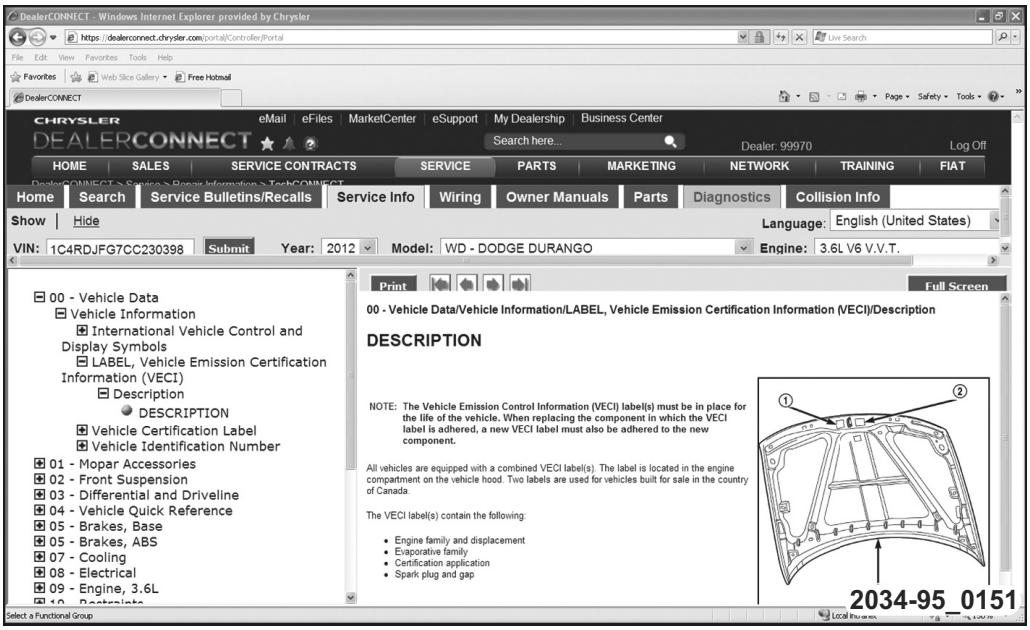

Figure 3 Vehicle Data

To safely and accurately diagnose, repair, and order parts for any vehicle, it is important to know what equipment is in the vehicle. Through the use of various vehicle labels and placards, it is possible to identify various equipment installed such as the type of occupant restraint systems, fuel tank type and location, engine type, transmission, brakes, and more. The following will provide a basis on how to locate and interpret the various labels located on the Dodge Durango SSV.

DEALERCONNECT/TECH AUTHORITY

DealerCONNECT and Tech Authority can be accessed to help locate the various labels and placards on the vehicle.

- International Organization of Standards (ISO)
- Vehicle emission certification information (VECI)
- Vehicle certification labels (VCI)
- Vehicle identification number (VIN)

Notes: _____
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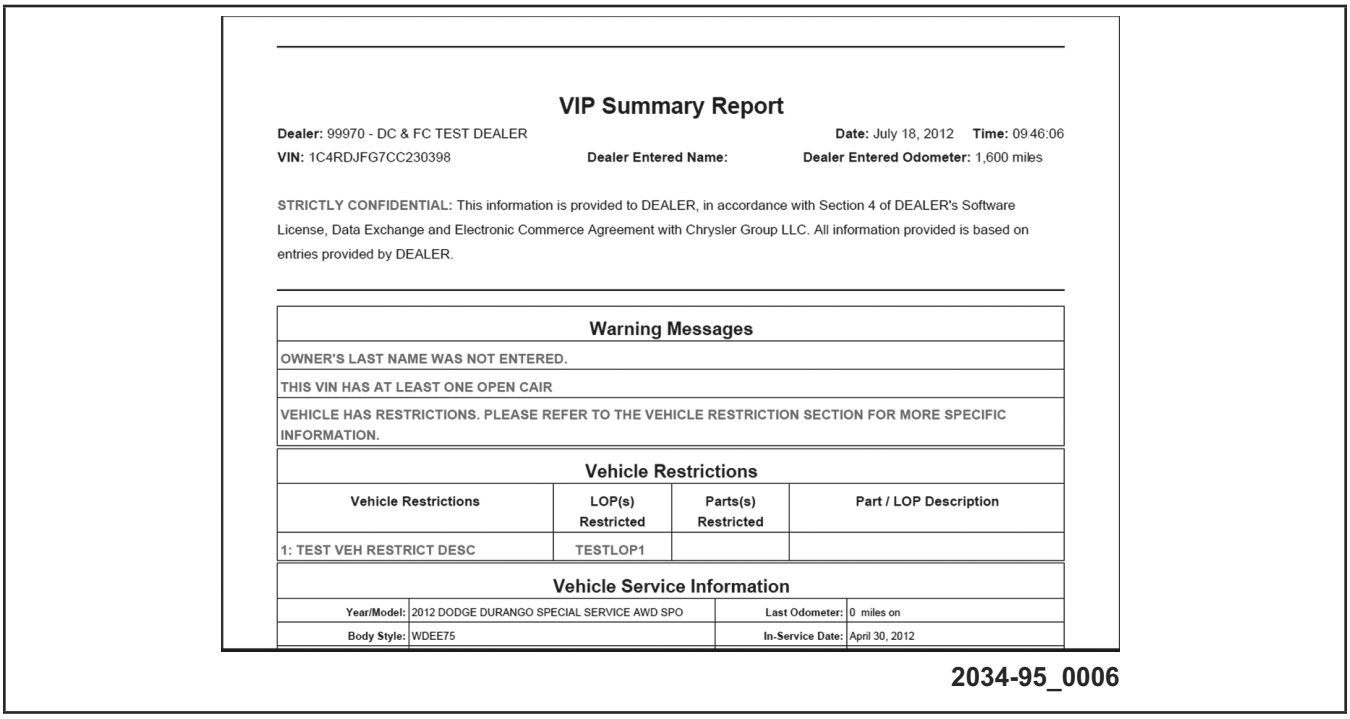
VEHICLE INFORMATION PLUS



VIP Summary Report

Dealer: 99970 - DC & FC TEST DEALER **Date:** July 18, 2012 **Time:** 09:46:06
VIN: 1C4RDJFG7CC230398 **Dealer Entered Name:** **Dealer Entered Odometer:** 1,600 miles

STRICTLY CONFIDENTIAL: This information is provided to DEALER, in accordance with Section 4 of DEALER's Software License, Data Exchange and Electronic Commerce Agreement with Chrysler Group LLC. All information provided is based on entries provided by DEALER.

Warning Messages
OWNER'S LAST NAME WAS NOT ENTERED.
THIS VIN HAS AT LEAST ONE OPEN CAIR
VEHICLE HAS RESTRICTIONS. PLEASE REFER TO THE VEHICLE RESTRICTION SECTION FOR MORE SPECIFIC INFORMATION.

Vehicle Restrictions

Vehicle Restrictions	LOP(s) Restricted	Parts(s) Restricted	Part / LOP Description
1: TEST VEH RESTRICT DESC	TESTLOP1		

Vehicle Service Information

Year/Model:	2012 DODGE DURANGO SPECIAL SERVICE AWD SPO	Last Odometer:	0 miles on
Body Style:	WDEE75	In-Service Date:	April 30, 2012

2034-95_0006

Figure 4 VIP Summary Report

Vehicle information plus (VIP) is part of DealerCONNECT. This resource can be used to find the following information on the vehicle.

- Repair history
- Warranty coverages
- Vehicle options

Notes: _____
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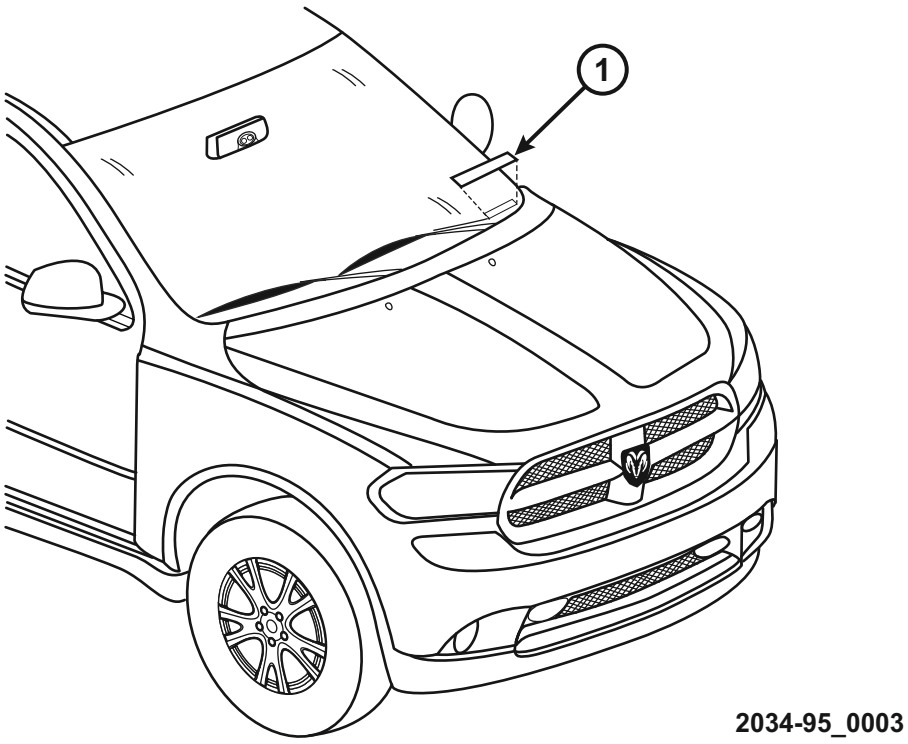
VEHICLE IDENTIFICATION NUMBER



1	Vehicle Identification Number (VIN)

Figure 5 VIN Location

The vehicle identification number is in four locations on the vehicle. All of the locations are accessible but may require additional work to read them. The vehicle identification number (VIN) plate is located on the lower windshield fence near the left a-pillar. The VIN contains 17 characters that provide data concerning the vehicle.

The letters I and O are not used in the VIN due to possible confusion with the numbers 1 and 0.

The other locations are as follows:

- Equipment identification plate
- Vehicle safety certification Label
- Various body parts

Notes: _____
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Table 2 Vehicle Identification Number

Vehicle Identification Number		
Position	**Interpretation**	**Code Description**
1	Country of Origin	1=Chrysler Group LLC (USA)
2	Make	C=Chrysler
3	Vehicle Type	4=MPV
4	Brake System GVWR Restraint System	R=Hydraulic Brakes 6001-7000 lbs (2722-3175 KG) Active Belts, Airbags, Side Bags-All Rows S=Hydraulic Brakes 7001-8000 lbs (3176 - 3628 KG) Active Belts, Airbags, Side Bags-All Rows
5	Brand, Marketing Name, Drive Wheels, Cab/Body Type, Drive Position, and Price Series	DHD=2-Wheel drive, Sport Utility Four-Door, Left Hand Drive, Crew Trim Level
6		DJD=All-Wheel Drive, Sport Utility Four-Door, Left Hand Drive, Crew Trim Level
7		
8	Engine	G=3.6L V6, Non-turbo, Gasoline, (ERB) T=5.7L V8, Non-turbo, Gasoline, (EZH)
9	Check Digit	0 through 9 or X
10	Model Year	C=2012 D=2013 E=2014
11	Assembly Plant	C=Jefferson Assembly Plant
12 - 17	Vehicle Build Sequence	Six Digit Number Assigned by the Assembly Plant

Notes: _____
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VEHICLE CERTIFICATION LABEL

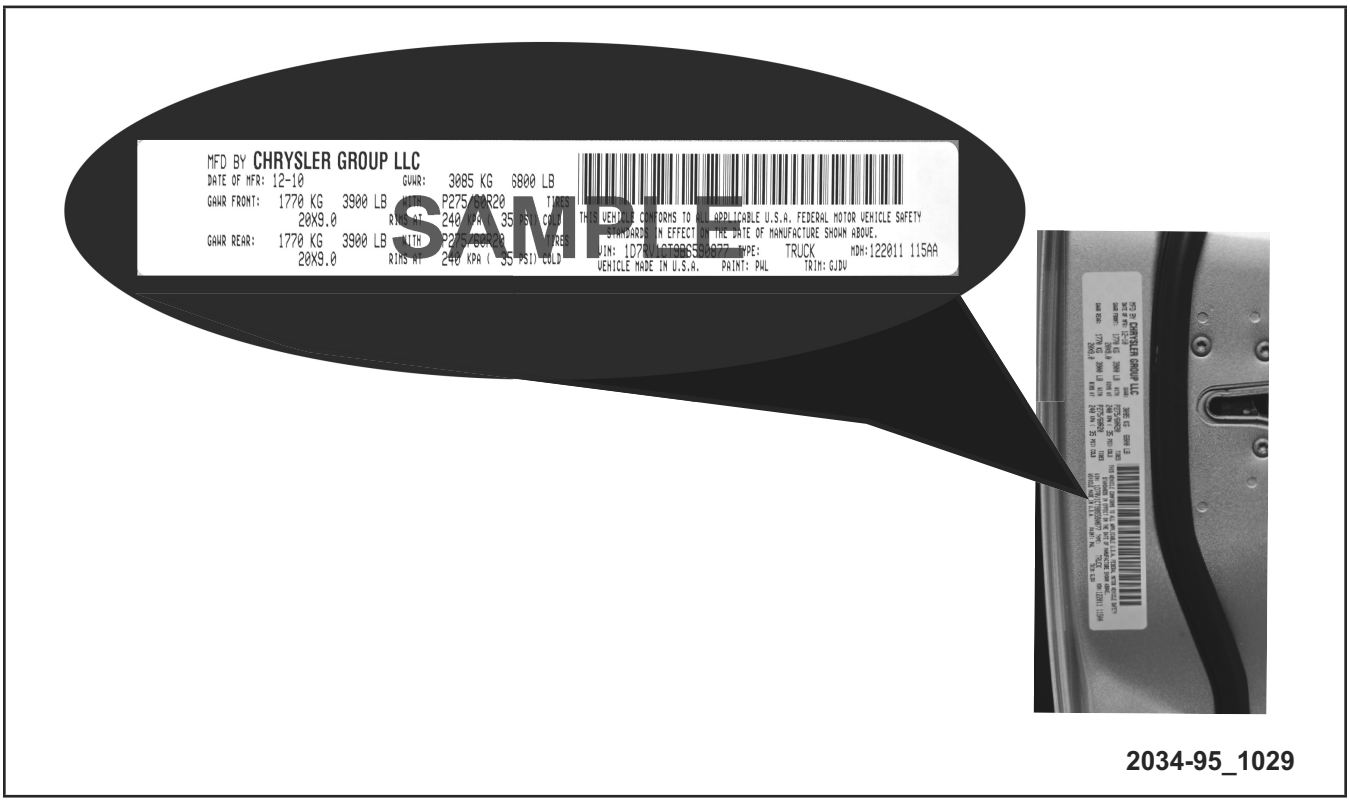

Figure 6 Vehicle Certification Label

The vehicle certification label is located on the inside rear portion of the driver's door. This label may not be present if the door has been replaced.

A vehicle certification label indicates that the vehicle conforms to all applicable Federal Motor Vehicle Standards.

The label also lists:

- Month and year of vehicle manufacture
- Gross vehicle weight rating (GVWR); the gross front and rear axle weight ratings are based on the minimum size and the maximum cold tire inflation pressure
- VIN
- Type of vehicle
- Size of wheels
- Bar code
- Month, day, and hour (MDH) of final assembly
- Paint and trim codes
- Country of origin

Notes: _____
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VEHICLE EMISSIONS CERTIFICATION LABEL

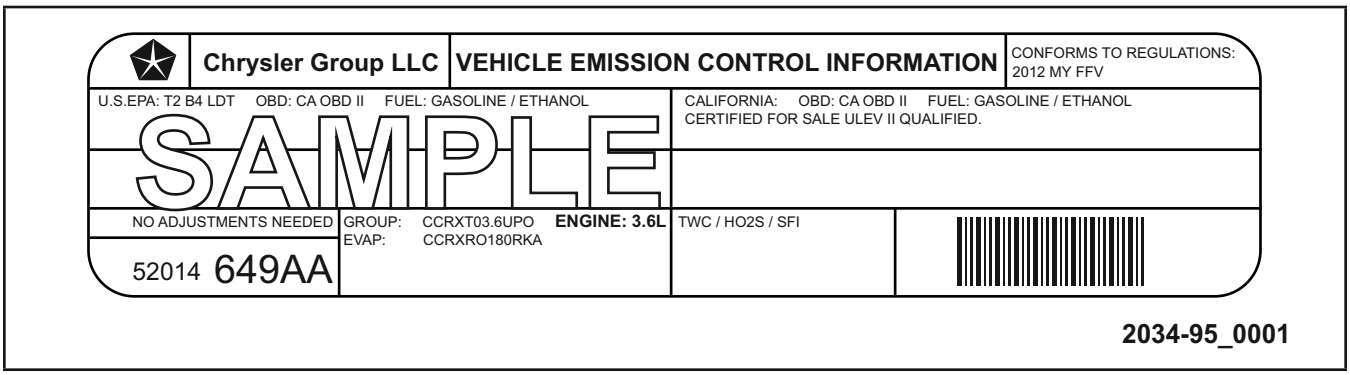

Figure 7 VECI Label

All models have a vehicle emissions control information (VECI) label in the engine compartment. This label is generally attached to the upper radiator core support or on the underside of the hood (on the front leading edge). It cannot be removed without defacing information and destroying the label. There are unique labels for vehicles built for sale in the state of California and the country of Canada. Canadian label are written in both English and French.

- The label contains the vehicle model year and the regulations to which the vehicle conforms.
- The VECI label may contain some or all of the following:
- Engine family and displacement
- Evaporative family
- Emissions control system schematic
- Engine timing specifications (if adjustable)Idle speeds
- Spark plug type and gap

The label may also contain an engine vacuum schematic.

NOTE: The vehicle emission control information (VECI) label must be in place for the life of the vehicle. When replacing the component in which the VECI label is adhered, a new VECI label must be adhered to the new component.

TIRE AND LOADING INFORMATION LABEL

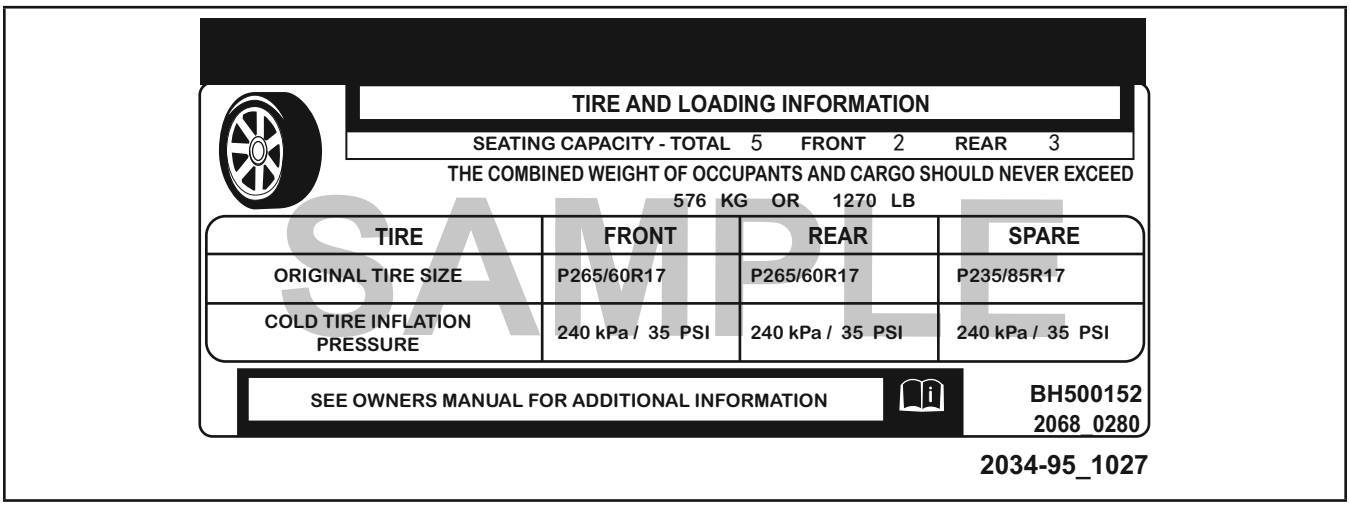

Figure 8 Tire and Loading Information Label

The tire and loading information label is located on the driver side b-pillar. The tire and loading label may contain:

- The number of people that can be carried in the vehicle
- The total weight the vehicle can carry
- The tire size designed for the vehicle
- The cold tire psi for the front, rear, and spare (depending on type)
- The last eight numbers of the VIN

Notes: _____
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SECONDARY LOAD LABEL

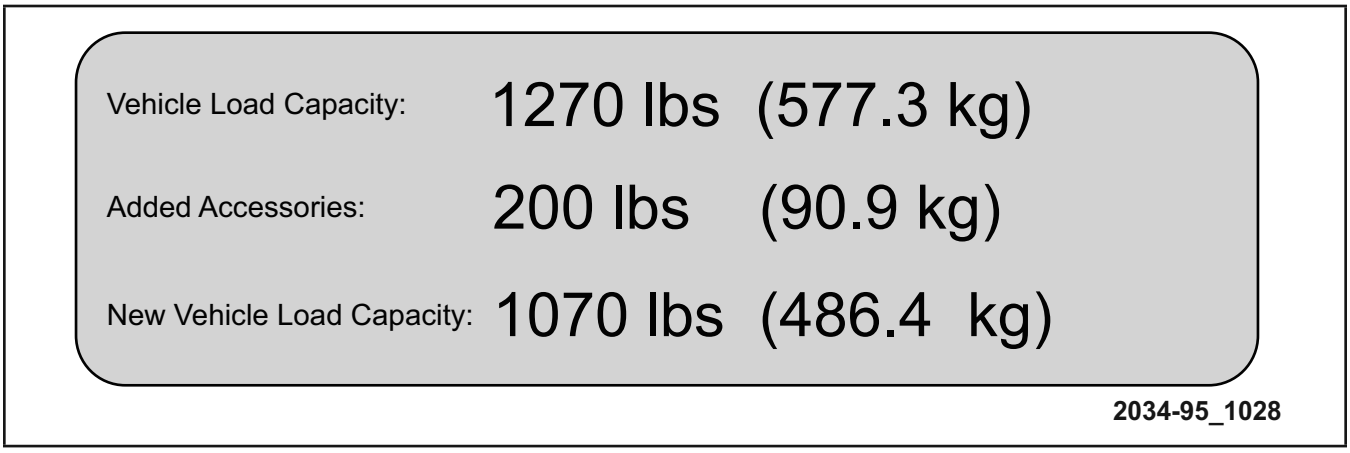

Figure 9 Secondary Load Label

After up-fitting is complete, the vehicle must have a secondary label added to certify the new weight capacity of the vehicle with the added equipment. This label is the responsibility of the up-fitter and may be hand written.

Notes: _____
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AIR CONDITIONING LABEL

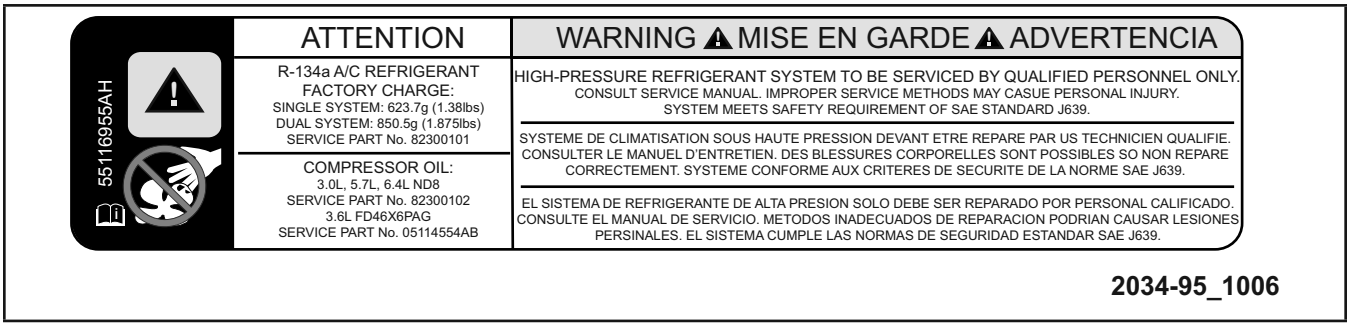

Figure 10 Air Conditioning Label

The air conditioning label is located on the front radiator core support. Contained on this label is the type of refrigerant the system utilizes. The compressor oil type is also listed on this label.

Notes:

LESSON 3 VEHICLE MAINTENANCE

MAINTENANCE

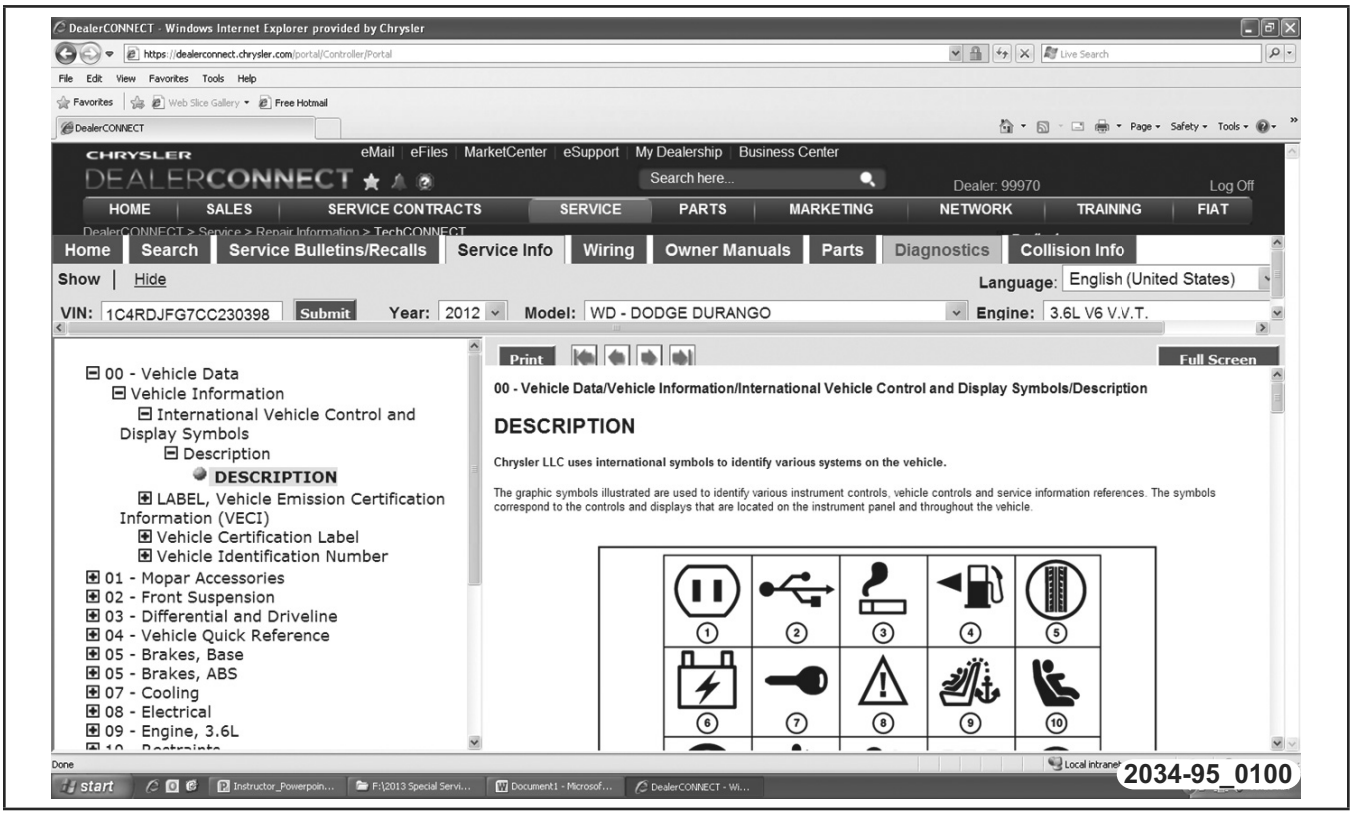

Figure 11 TechCONNECT

A vehicle that is not properly tuned and maintained cannot be expected to perform at its maximum efficiency and can have an adverse effect on fuel economy. The following recommendations will ensure that the vehicle is performing at its maximum efficiency.

Use the recommended motor oil grade. Using the manufacturer's recommended grade of Mopar® motor oil or equivalent can improve fuel mileage. Motor oil labeled Energy Conserving contains friction-reducing additives.

Check and replace air filters. Replace a clogged air filter with a new Mopar® air filter or equivalent can improve fuel mileage.

Performing routine maintenance such as an engine tune up, properly inflating the tires, performing regular oil changes, and prompt repairs (such as replacing a faulty oxygen sensor) can have a significant effect on vehicle performance and fuel economy.

The scheduled maintenance services listed in the owner's manual must be done at the times or mileages specified to protect the vehicle warranty and ensure the best vehicle performance and reliability. More frequent maintenance may be needed for vehicles in severe operating conditions, such as dusty areas and very short trip driving. Inspection and service should also be done any time a malfunction is suspected.

TECHCONNECT/TECH AUTHORITY

TechCONNECT and Tech Authority can be accessed to help locate service information related to the vehicle.

Service Bulletins

Frequently, the vehicle manufacturer will issue service bulletins. These publications contain information regarding updated parts, service procedures, or updated warranty administration. Service Bulletins should always be checked when performing maintenance or repairs because they contain the latest information.

Service Information

The manufacturer provides service information to assist with the repair of the vehicle. Service information contains diagnostics, repair procedures, cautions, warnings, and diagrams of components and component locations.

Maintenance Schedules

Maintenance schedules provide a sound basis for those areas of the vehicle that require routine service. The maintenance schedule is included in the owner's manual.

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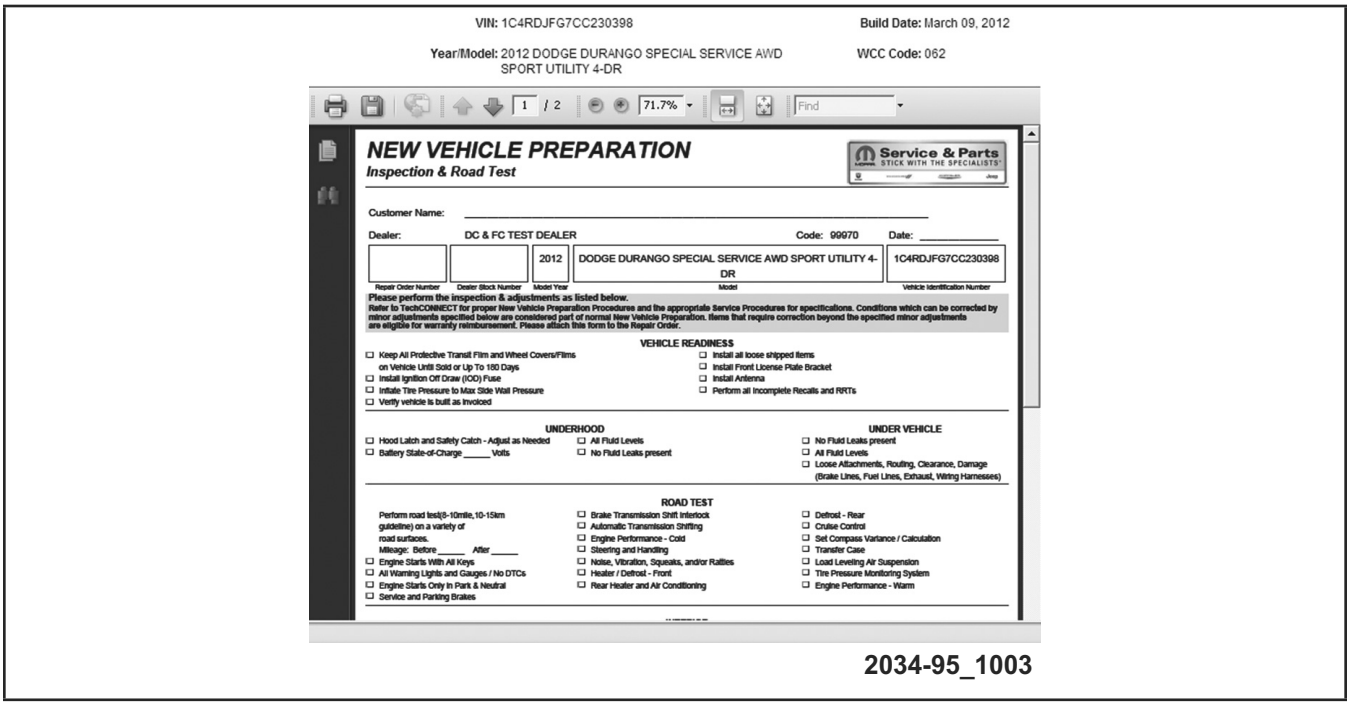
NEW VEHICLE PREP



VIN: 1C4RDJFG7CC230398 Build Date: March 09, 2012

Year/Model: 2012 DODGE DURANGO SPECIAL SERVICE AWD SPORT UTILITY 4-DR WCC Code: 062

1 / 2 71.7% Find

NEW VEHICLE PREPARATION

Inspection & Road Test

Service & Parts STICK WITH THE SPECIALISTS

Customer Name: _____

Dealer: DC & FC TEST DEALER Code: 99970 Date: _____

Repair Order Number	Dealer Stock Number	Model Year	Model	Vehicle Identification Number
		2012	DODGE DURANGO SPECIAL SERVICE AWD SPORT UTILITY 4-DR	1C4RDJFG7CC230398

Please perform the inspection & adjustments as listed below.

Refer to TechCONNECT for proper New Vehicle Preparation Procedures and the appropriate Service Procedures for specifications. Conditions which can be corrected by minor adjustments specified below are considered part of normal New Vehicle Preparation. Items that require correction beyond the specified minor adjustments are eligible for warranty reimbursement. Please attach this form to the Repair Order.

VEHICLE READINESS

- ☐ Keep All Protective Transit Film and Wheel Covers/Rims on Vehicle Until Sold or Up To 180 Days
- ☐ Install Ignition Off Draw (IOD) Fuse
- ☐ Inflate Tire Pressure to Max Side Wall Pressure
- ☐ Verify vehicle is built as invoiced
- ☐ Install all loose shipped items
- ☐ Install Front License Plate Bracket
- ☐ Install Antenna
- ☐ Perform all Incomplete Recalls and RRTs

UNDERHOOD

- ☐ Hood Latch and Safety Catch - Adjust as Needed
- ☐ Battery State-of-Charge _____ Volts
- ☐ All Fluid Levels
- ☐ No Fluid Leaks present

UNDER VEHICLE

- ☐ No Fluid Leaks present
- ☐ All Fluid Levels
- ☐ Loose Attachments, Routing, Clearance, Damage (Brake Lines, Fuel Lines, Exhaust, Wiring Harnesses)

ROAD TEST

Perform road test(8-10mile,10-15km guideline) on a variety of road surfaces.
Mileage: Before _____ After _____

- ☐ Engine Starts With All Keys
- ☐ All Warning Lights and Gauges / No DTCs
- ☐ Engine Starts Only in Park & Neutral
- ☐ Service and Parking Brakes
- ☐ Brake Transmission Shift Interlock
- ☐ Automatic Transmission Shifting
- ☐ Engine Performance - Cold
- ☐ Steering and Handling
- ☐ Noise, Vibration, Squeaks, and/or Rattles
- ☐ Heater / Defrost - Front
- ☐ Rear Heater and Air Conditioning
- ☐ Defrost - Rear
- ☐ Cruise Control
- ☐ Set Compass Variance / Calculation
- ☐ Transfer Case
- ☐ Load Leveling Air Suspension
- ☐ Tire Pressure Monitoring System
- ☐ Engine Performance - Warm

2034-95_1003

Figure 12 New Vehicle Prep Form

Another feature available through TechCONNECT is a VIN-specific New Vehicle Preparation form. This form provides a complete check list of those items needed to check the vehicle for delivery.

Notes: _____

_____

_____

VEHICLE LIFTING

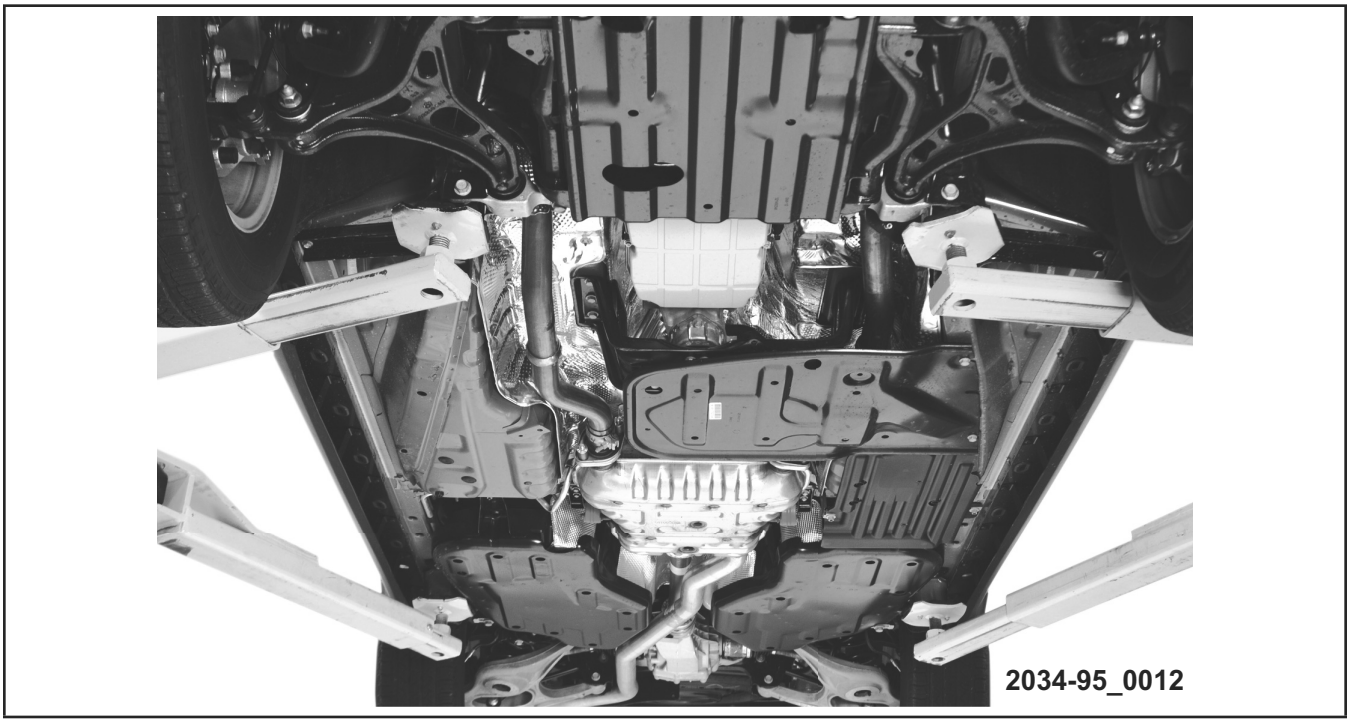


Figure 13 Vehicle Lifting Points

Floor Jack Lifting Points

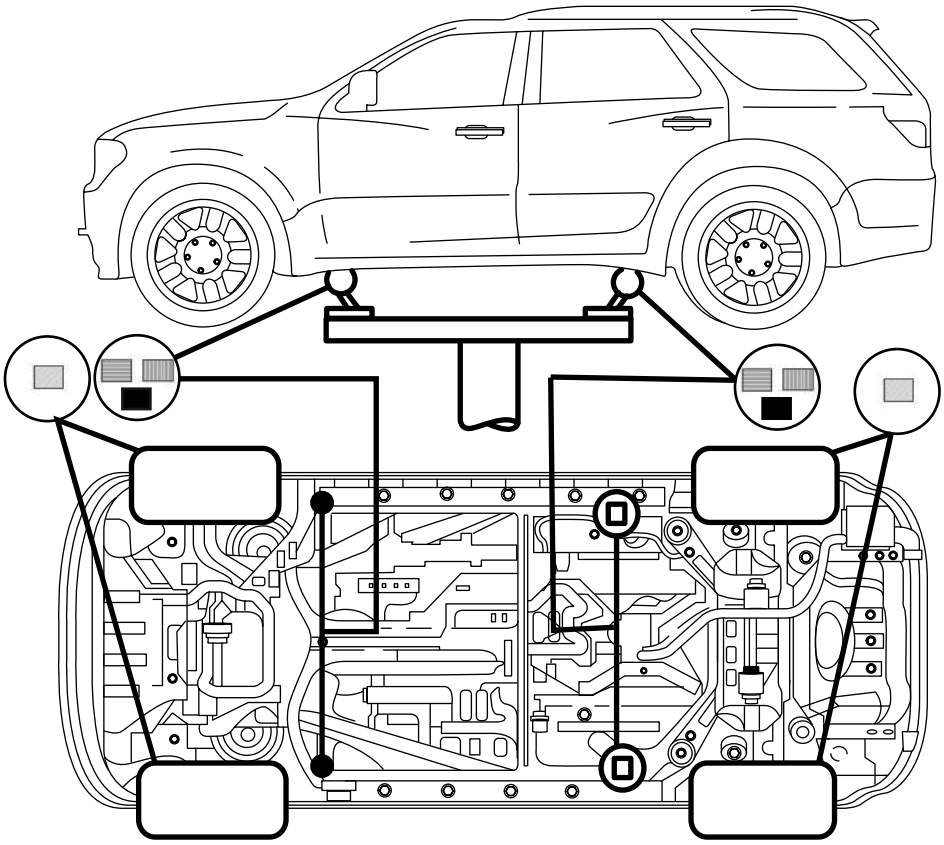
When properly positioned, a floor jack can be used to lift a vehicle. Support the vehicle in the raised position with jack stands at the front and rear ends of the frame rails.

For emergency jacking, refer to the owner's manual for the procedure.

Caution: Do not lift the vehicle with a floor jack positioned under the following components, an axle tube, body side sill, steering linkage components, driveshafts, engine or transmission oil pans, fuel tank, or front suspension arms.

Note: Use the correct rear frame rail lifting locations only.

Hoist



	Drive-on Hoist		Twin Post Chassis Hoist
	Frame Contact Hoist		Floor Jack

Figure 14 Jacking and Lifting Points

A vehicle can be lifted with:

- A single-post, frame-contact hoist
- A twin-post, chassis hoist
- A ramp-type, drive-on hoist

WARNING: THE HOISTING AND JACK LIFTING POINTS PROVIDED ARE FOR A COMPLETE VEHICLE. WHEN A CHASSIS OR DRIVETRAIN COMPONENT IS REMOVED FROM A VEHICLE, THE CENTER OF GRAVITY IS ALTERED MAKING SOME HOISTING CONDITIONS UNSTABLE. PROPERLY SUPPORT OR SECURE THE VEHICLE TO THE HOISTING DEVICE WHEN THESE CONDITIONS EXIST.

SPARK PLUGS

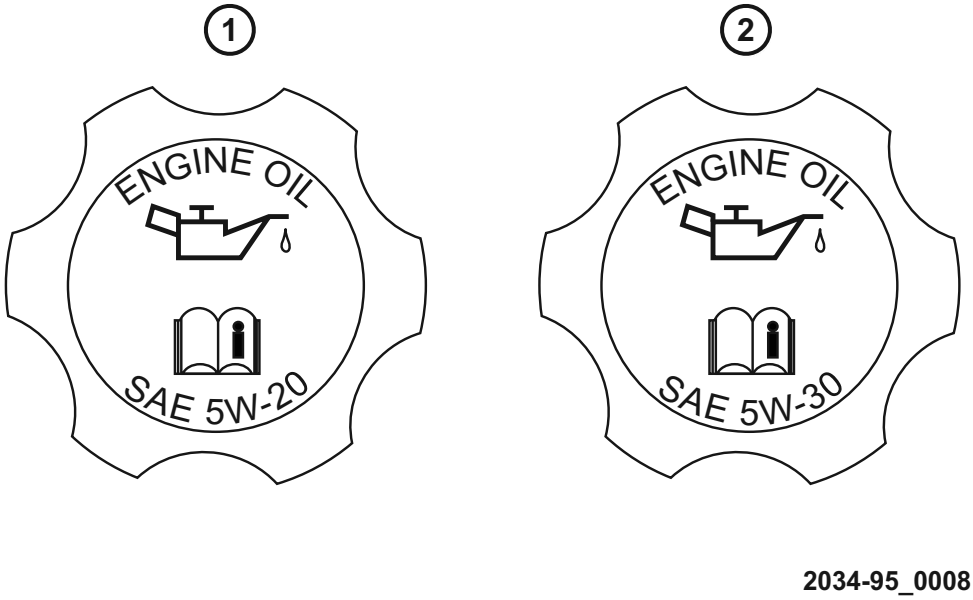
Figure 15 Spark Plug Removal/Installation

Coil-on-plug ignition is used along with long-life platinum tip spark plugs that should be replaced according to the maintenance schedule. Do no mix standard and platinum tip spark plugs in the same engine. Standard and platinum tip spark plugs do not operate at the same temperatures and can cause a performance concern.

Table 3 Spark Plugs

Engine	Plug Type	Electrode Gap
3.6L V-6	SP149125AD (RER8ZWYCB4)	1.10 mm (0.043 in.)
5.7L V-8	SP143877AA (68143877AA)	1.10 mm (0.043 in.)

ENGINE OIL



1	5.7L Engine (SAE 5W-20)	2	3.6L Engine (SAE 5W-30)

Figure 16 Oil Fill Caps

Chrysler recommends the use of 5W-20 motor oil for the 5.7L engine and 5W-30 for the 3.6L engine.

Note: Make sure all oil is American Petroleum Institute (API) certified and has a minimum rating of SL. Neither straight weight oil nor non-detergent oil is allowed to be used at any time in the engine.

Note: Synthetic engine oils may be used if the recommended oil quality requirements are met and recommended maintenance intervals for oil and filter changes are followed.

Note: Do not add any supplemental materials, other than leak detection dyes, to the engine oil. Engine oil is an engineered product and its performance may be impaired by supplemental additives.

Notes: _____
_____
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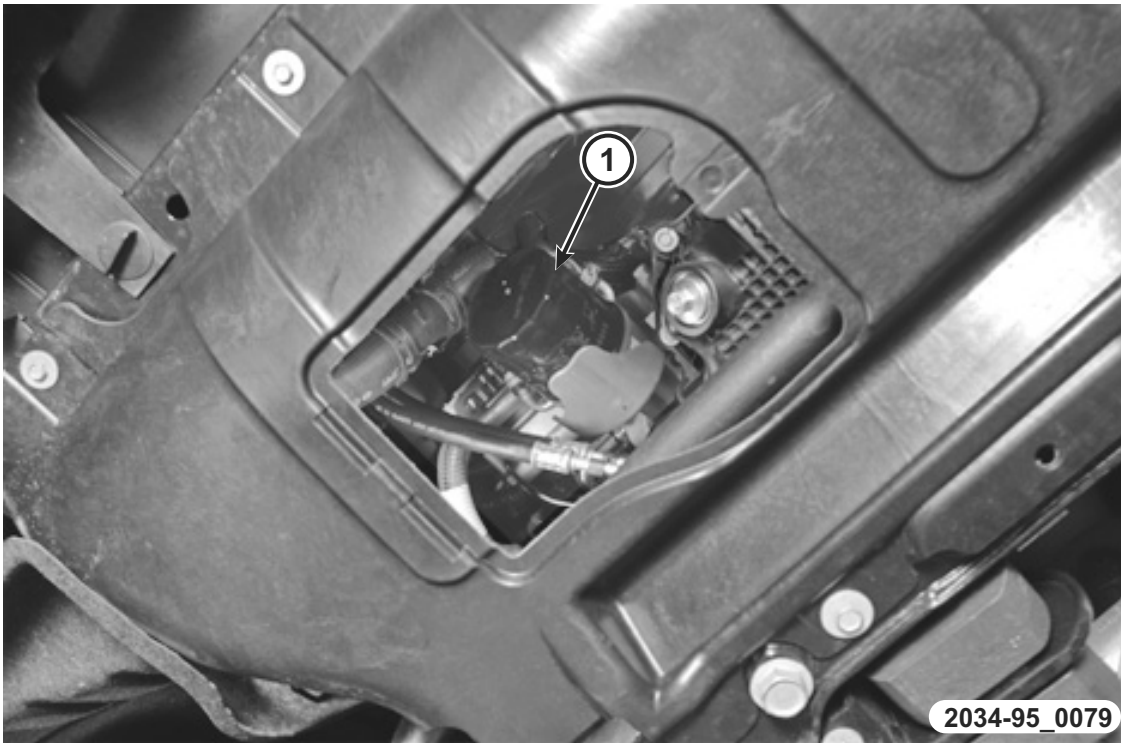
Engine Oil Filter

1	Oil Filter Canister

Figure 17 3.6L Oil Filter Location

The oil filter on the 3.6L is located on the top center of the engine. There is a special access cover located in the engine cover. Unlike the filter on the HEMI, this filter is a cartridge type filter. Use care when removing or installing the cap of the cartridge canister. Do not damage the cap or related threads.

Note: The oil filter must be changed at every oil change interval. The filter should be replaced with a MOPAR filter or equivalent.



1	Oil Filter

Figure 18 5.7 Hemi Filter Location

The oil filter on the 5.7L is located on the under side of the engine. Unlike the filter on the 3.6L engine, this filter is a canister type filter. Use care when removing or installing the filter. Do not damage the gasket or related threads.

Note: The oil filter must be changed at every oil change interval. The filter should be replaced with a MOPAR filter or equivalent.

Notes: _____
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Hour Meter

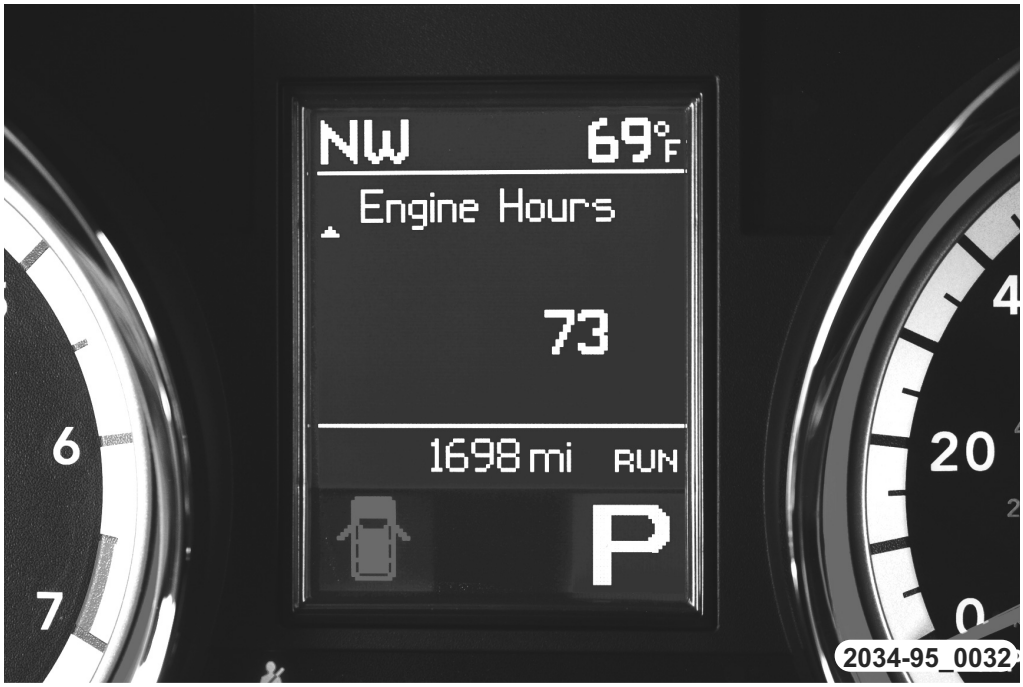

Figure 19 Engine Run Hours

The Dodge Durango SSV package has an oil change minder that calculates oil change intervals based on:

- Engine start temperature
- Engine load
- Vehicle speed
- Idle time

The vehicle has software programming that contains an algorithm which prompts the driver to change the oil after given hours of engine operation based on the parameters listed above. The Dodge Durango SSV has an engine hour meter that can be viewed in the electronic vehicle information center (EVIC).

The engine hour meter is accessed via the steering wheel controls on the left side of the steering wheel. The hours are shown on the electronic vehicle information center (EVIC) display.

Oil Change Light

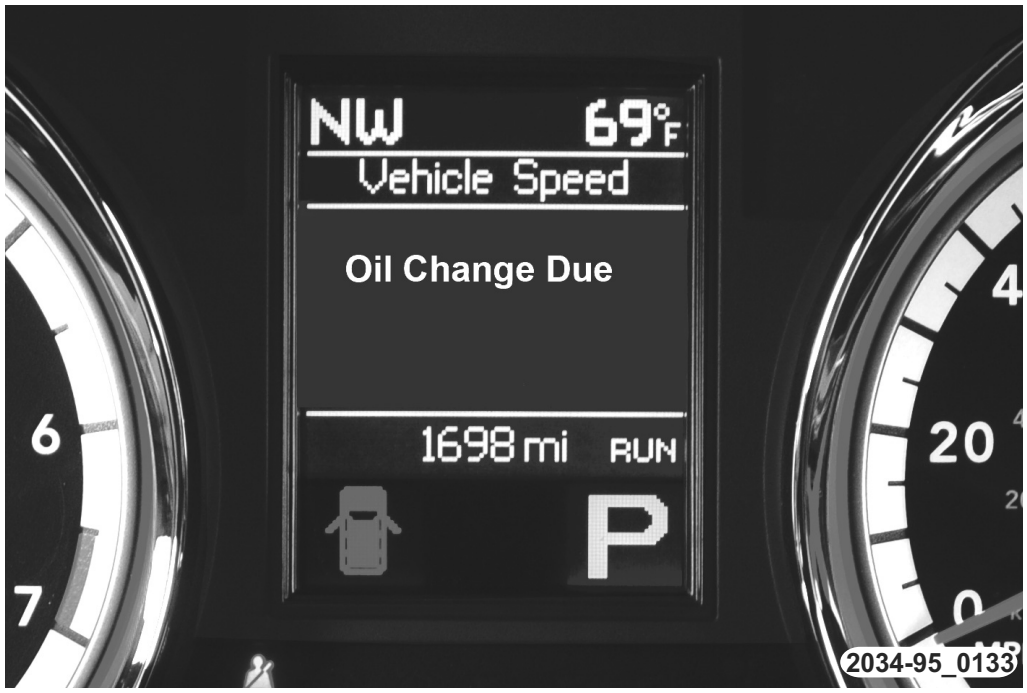

Figure 20 Oil Change Indicator

Reset the oil change minder system and turn off the indicator light as follows:

1. With the engine off, press the START button until the ignition is in the RUN position.
2. Fully depress the accelerator pedal three times within 10 seconds.
3. If the indicator was on before the reset procedure, it should now be off.

Notes: _____
_____
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TRANSMISSION FLUID

Mopar ATF+4 is being used as the factory fill for the Dodge Durango Special Services SUV package. ATF+4 offers the following significant benefits:

- Fully synthetic (Chrysler engineered fluid)
- Anti-wear properties
- Rust/corrosion prevention
- Control of oxidation
- Elimination of deposits
- Control of friction
- Retention of anti-foaming properties
- Superior properties for low temperature operation
- Seal conditioner
- Meets material standard (MS-9602)

Note: ATF+4 must always be used in vehicles that were originally filled with ATF+4.

Note: The use of any other transmission fluid not produced by Chrysler Group LLC must meet MS-9602. Transmission fluids that claim to be universal in nature are NOT to be used in this transmission or any others that require ATF+4 MS-9602.

Note: Chrysler does NOT approve the addition of any type or kind of additives to the transmission. The exception to this is the use of special dyes to aid in detecting leaks.

Note: If using a fluid exchanger to service the transmission, be sure to always remove non-ATF+4 fluids from the fluid exchanger before exchanging the fluid. Under no circumstances are the transmission cooler lines to be cut in order to service the transmission, unless they are to be replaced.

Note: Mopar ATF+4 is red in color when new. The ATF is dyed red so it can be identified from other fluids used in the vehicle such as engine oil or antifreeze. The red color is not permanent and is not an indicator of fluid condition. As the vehicle is driven, the ATF will begin to look darker in color and may eventually become brown. This is normal. ATF+4 also has a unique odor that may change with age. Consequently, odor and color cannot be used to indicate the fluid condition or the need for a fluid change.

Notes: _____
_____
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FLUID LEVEL CHECK

Low fluid level can cause a variety of conditions because it allows the pump to take in air along with the fluid. As in any hydraulic system, air bubbles make the fluid spongy, therefore, pressures will be low and build up slowly.

Improper filling can also raise the fluid level too high. When the transmission has too much fluid, the geartrain churns up foam and cause the same conditions that occur with a low fluid level.

In either case, air bubbles can cause overheating, fluid oxidation, and varnishing. This can interfere with normal valve, clutch, and accumulator operation. Foaming can also result in fluid escaping from the transmission vent where it may be mistaken for a leak.

The 65RFE transmission has a dipstick to check the oil level. It is located on the right side of the engine. Be sure to wipe all dirt from the dipstick handle before removing.

The NAG1 transmission does not have a dipstick readily available for checking the fluid level. A dipstick for checking fluid can be ordered (PN 9336A).

The torque converter fills in both the park and neutral positions. Place the selector lever in P (park) to be sure that the fluid level check is accurate. The engine should be running at idle speed for at least one minute, with the vehicle on level ground. At normal operating temperature (approximately 82°C or 180°F), the fluid level is correct if it is in the HOT region (cross-hatched area) on the oil level indicator. The fluid level will be approximately at the upper COLD hole of the dipstick at 21°C (70°F) fluid temperature.

Notes: _____
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_____

Fluid Level Check 5.7L

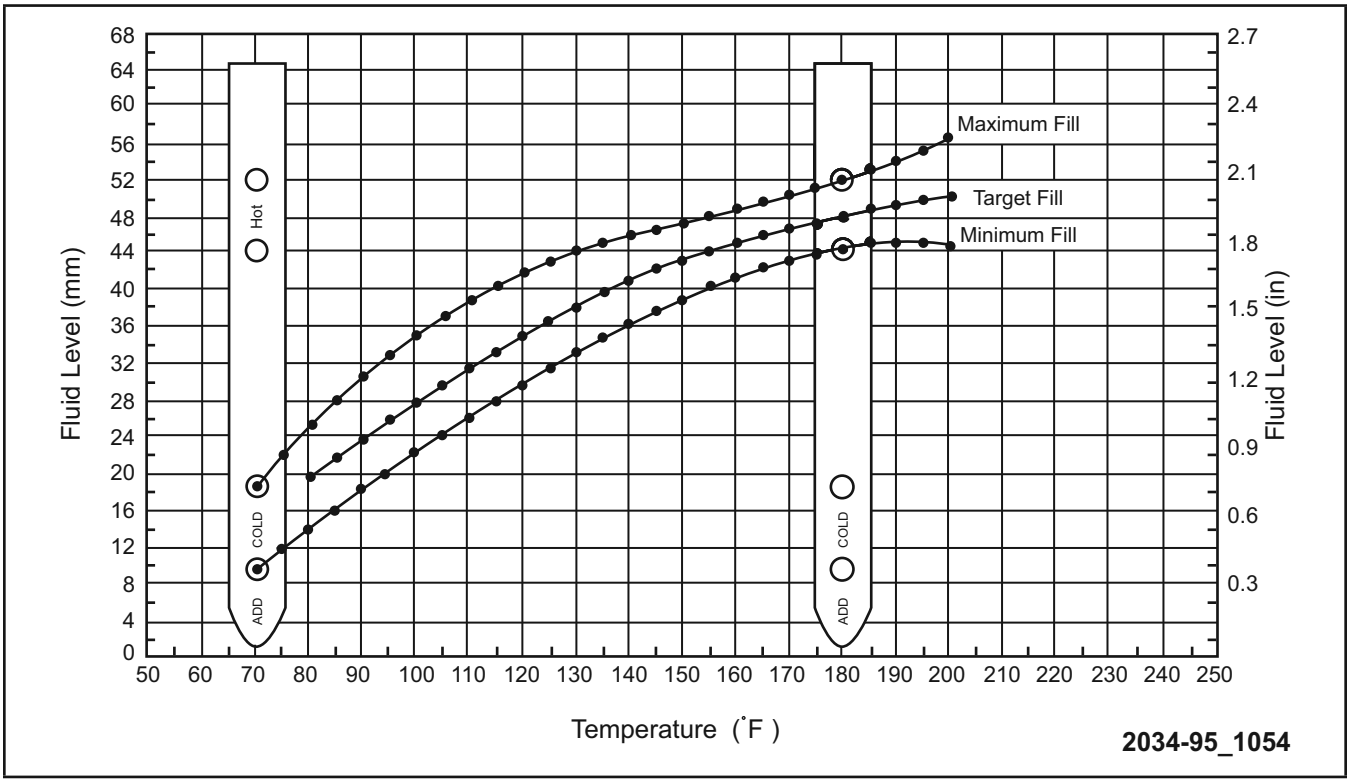


Figure 21 Transmission Fluid Temperatures 65RFE Transmission

The transmission fluid can be checked using the following steps:

1. Start the engine and apply parking brake.
2. Shift the transmission into drive for approximately 2 seconds.
3. Shift the transmission into reverse for approximately 2 seconds.
4. Shift the transmission into park.
5. Read the transmission temperature value using the EVIC. To access the transmission temperature, select Vehicle Info and then scroll through the data until transmission data appears.
6. Compare the fluid temperature value with the chart.
7. Adjust the transmission fluid level shown on the dipstick according to the Transmission Fluid Temperature Chart.

Note: The engine and transmission should be at normal operating temperature before performing this procedure. After the fluid has been checked, seat the dipstick fully to seal out water and dirt.

Note: After adding any fluid to the transmission, wait a minimum of 2 minutes for the oil to fully drain from the fill tube into the transmission before rechecking the fluid level.

Fluid Level Check 3.6L

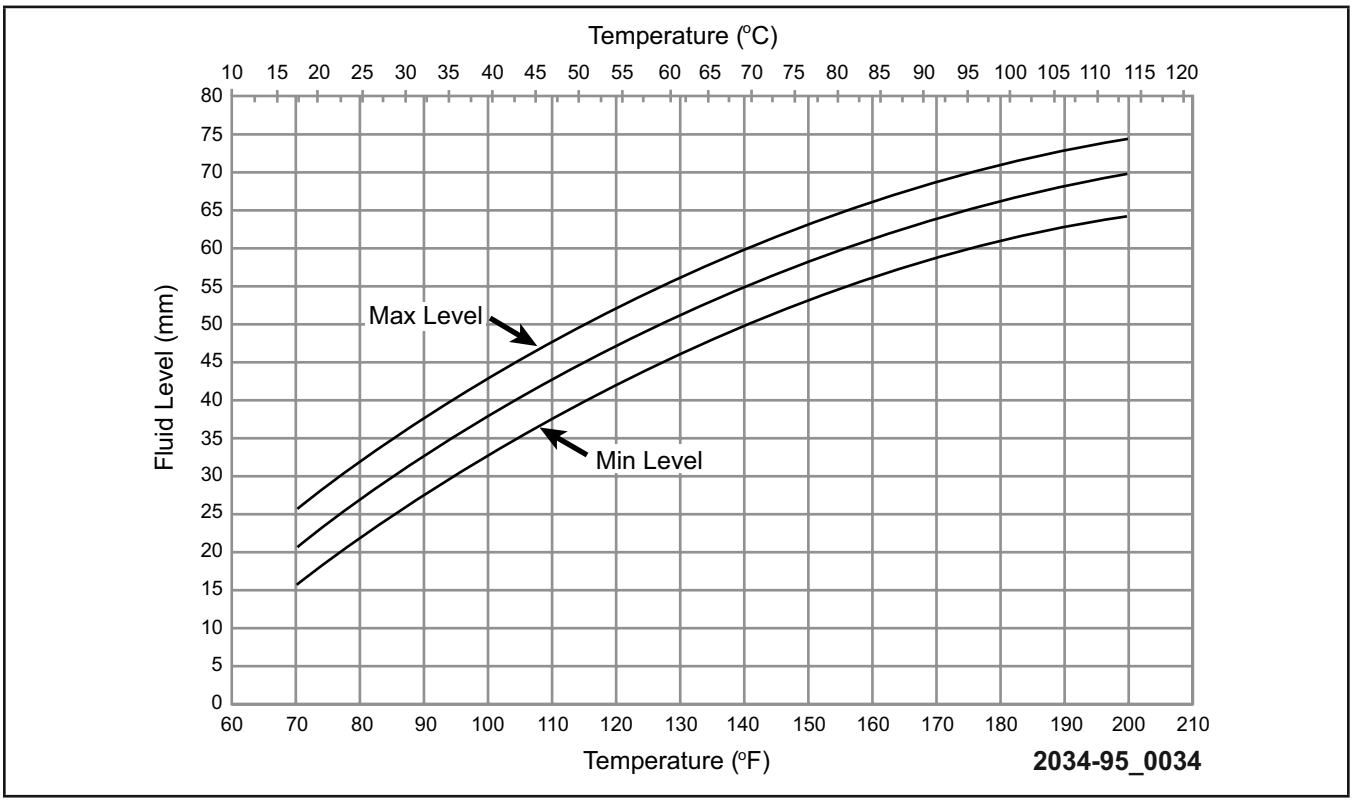


Figure 22 Transmission Fluid Temperatures 3.6L Engine

Because the NAG1 transmission does not have a dipstick as original equipment, it is necessary to order dipstick to check the fluid level. Like the 65RFE transmission is possible to obtain transmission fluid temperatures by either accessing the EVIC. After completing the fluid level check, it will be necessary to remove the dipstick and replace the fill tube cap.

Special Tools:

- 9336A - Dipstick

The transmission fluid can be checked using the following steps:

1. Start the engine and apply the parking brake.
2. Shift the transmission into drive for approximately 2 seconds.
3. Shift the transmission into reverse for approximately 2 seconds.
4. Shift the transmission into park.
5. Read the transmission temperature value using the EVIC and access the transmission temperature on the NAG1 transmission, select Vehicle Info and then scroll through the data until transmission data appears. The data can only be read with the transmission in drive.
6. Remove the dipstick tube cap.
7. Warm up the transmission, wait at least 2 minutes and check the oil level with the engine running. Push dipstick 9336A into the transmission fill tube until the dipstick tip contacts the oil pan and pull the dipstick out again, read the oil level, repeat if necessary.

Note: The dipstick protrudes from the fill tube when installed.

8. Compare the fluid temperature value with the chart.
9. Adjust the transmission fluid level shown on the dipstick according to the Transmission Fluid Temperature Chart.
10. When the oil level is correct, install the dipstick tube cap.

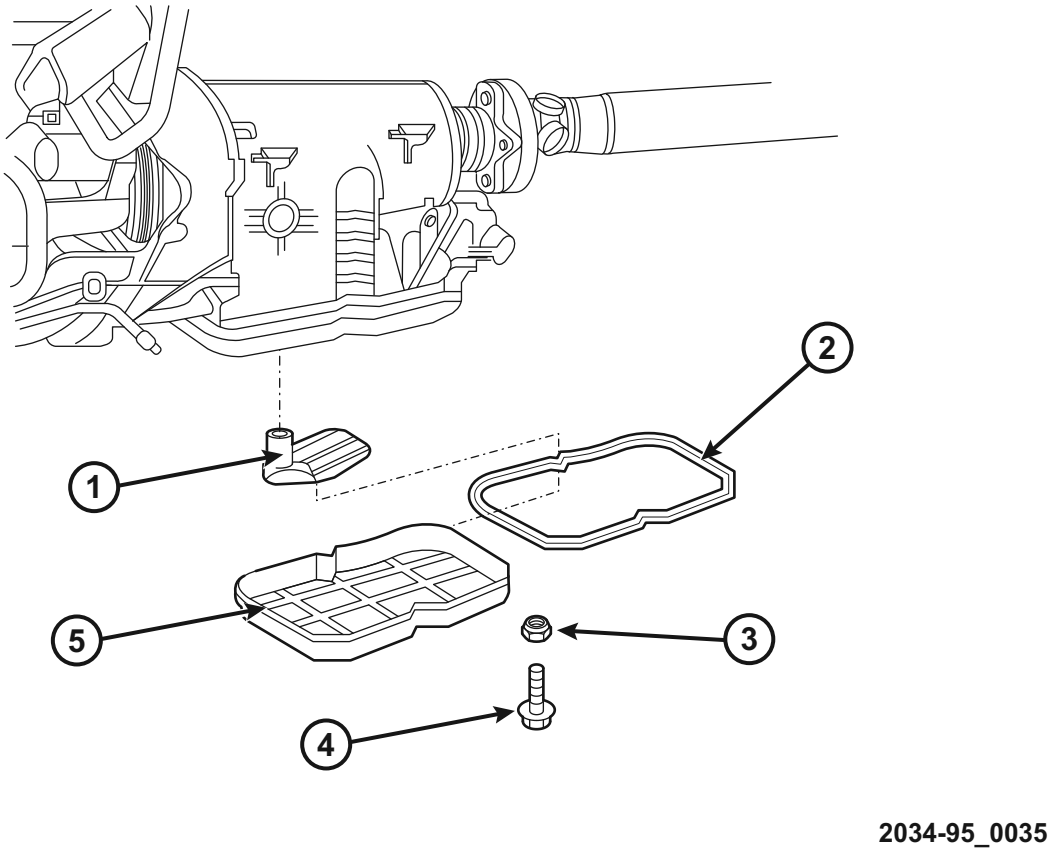
Note: The engine and transmission should be at normal operating temperature before performing this procedure. After the fluid has been checked, seat the dipstick fully to seal out water and dirt.

Note: After adding any fluid to the transmission, wait a minimum of 2 minutes for the oil to fully drain from the fill tube into the transmission before rechecking the fluid level.

WARNING: RISK OF ACCIDENT FROM VEHICLE STARTING OFF BY ITSELF WHEN ENGINE RUNNING. THERE IS A RISK OF INJURY FROM CONTUSIONS AND BURNS IF YOU INSERT YOUR HANDS INTO THE ENGINE WHEN IT IS STARTED OR WHEN IT IS RUNNING. SECURE THE VEHICLE TO PREVENT IT FROM MOVING OFF BY ITSELF. WEAR PROPERLY FASTENED AND CLOSE FITTING WORK CLOTHES. DO NOT TOUCH HOT OR ROTATING PARTS.

Notes: _____
_____
_____

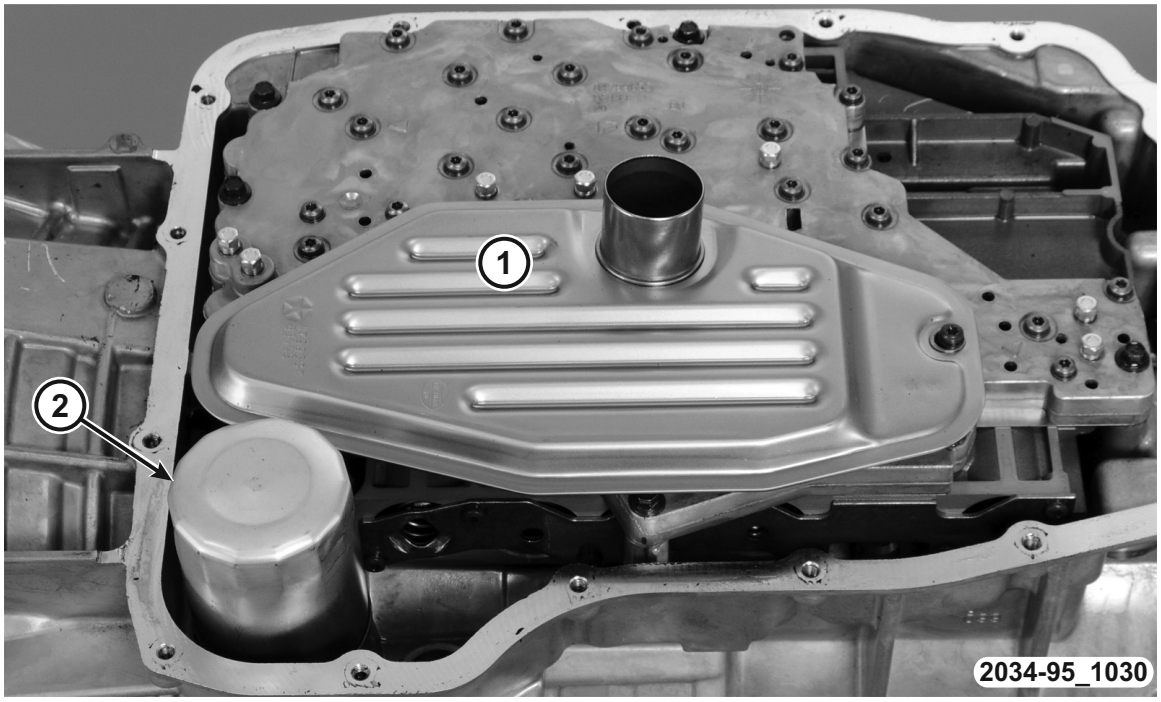
TRANSMISSION SERVICE INTERVAL



1	Filter	4	Mounting Bolt
2	Transmission Pan Gasket	5	Transmission Fluid Pan
3	Nut		

Figure 23 NAG1 Transmission Fluid Filter

Notes: _____
_____
_____



1	Primary Filter	2	Secondary Filter

Figure 24 65RFE Transmission Filters

The transmission fluid and filters should be serviced at regular intervals based on the owner's manual guidelines for police vehicle. The NAG1 transmission utilizes one filter located in the oil pan. This filter is located on the valve body intake side of the hydraulic system. There are two filters utilized on the 65RFE transmission application. The primary filter is located in the transmission oil pan below the valve body, which filters fluid entering the pump. A second filter that is a spin-on is located next to the primary filter. Fluid from the oil cooler passes through this filter prior to being returned to the sump.

Note: The transmission spin-on filter must be changed with each fluid service.

Notes: _____

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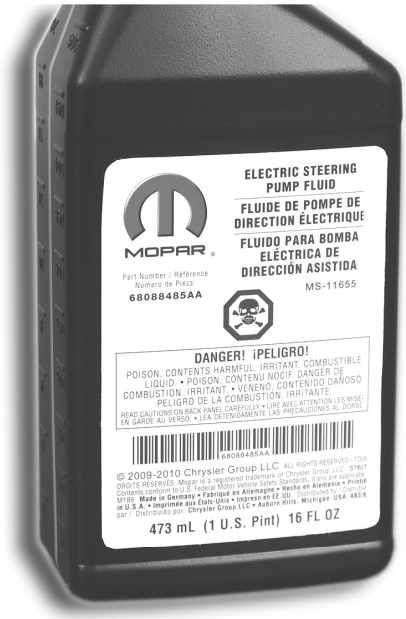
POWER STEERING FLUID



2034-95_1023

Figure 25 Power Steering Fluid

The Dodge Durango SSV uses two different types of power steering fluid. Vehicles equipped with conventional power steering use Mopar ATF+4 automatic transmission fluid in the hydraulic system. Vehicles equipped with electro-hydraulic power steering (EHPS) systems require power steering fluid that meets material specification MS-11655 or equivalent

Caution: **There is an electro-hydraulic power steering (EHPS) pump on some vehicles requiring a different fluid. Do not mix power steering fluid types. Damage may result to the power steering pump and system if any other fluid is used. The mechanical power steering pump systems on this vehicle require the use of Power Steering Fluid +4, which meets material specification MS-9602 or equivalent. The EHPS system uses fluid that meets material specification MS-11655 or equivalent. Do not overfill!**

Caution: **If the air is not purged from the power steering system correctly, pump failure could result.**

WARNING: **THE FLUID LEVEL SHOULD BE CHECKED WITH THE ENGINE OFF TO PREVENT INJURY FROM MOVING COMPONENTS.**

ENGINE COOLANT

The cooling system is designed around the coolant. The coolant accepts heat from the engine metal (in the cylinder head area near the exhaust valves and the engine block). Then coolant carries the heat to the radiator where the tube/fin radiator can transfer the heat to the air.

HOAT Coolant

The use of aluminum cylinder blocks, cylinder heads, and water pumps requires special corrosion protection. The 2012 Dodge Durango Special Services SUV uses MOPAR® Antifreeze/Coolant 5 Year/100,000 Mile Formula Hybrid Organic Additive Technology (HOAT) or equivalent ethylene-glycol based coolant with organic corrosion inhibitors. This coolant offers the best engine cooling without corrosion when mixed 50% ethylene-glycol and 50% distilled water to obtain a freeze point of -37°C (-35°F). If it loses color or becomes contaminated, drain, flush, and replace with fresh, properly mixed coolant solution.

The required ethylene-glycol and water mixture depends upon climate and vehicle operating conditions. The coolant performance of various mixtures follows:

- Pure water - Water can absorb more heat than a mixture of water and ethylene-glycol. This is for the purpose of heat transfer only. Water also freezes at a higher temperature and allows corrosion.
- 100 % ethylene-glycol - The corrosion inhibiting additives in ethylene-glycol need the presence of water to dissolve. Without water, additives form deposits in the system. These act as insulation causing temperature to rise to as high as 149°C (300°F). This temperature is hot enough to melt plastic. The increased temperature can result in sever engine damage. In addition, 100 % ethylene-glycol freezes at -22°C (-8°F).
- 50/50 ethylene-glycol and water - This is the recommended mixture, it provides protection against freezing to -37°C (-34°F). The antifreeze concentration must always be a minimum of 44%, year-round in all climates. If the percentage is lower, engine parts may be eroded by cavitation. Maximum protection against freezing is provided with a 68% antifreeze concentration, which prevents freezing down to -67.7°C (-90°F). A higher percentage will freeze at a warmer temperature. Also, a higher percentage of antifreeze can cause the engine to overheat because specific heat of antifreeze is lower than water.

OAT Coolant

Starting with the 2013 model year the recommended coolant for all Dodge Durango SSV engines is MOPAR® Antifreeze/Coolant 10 Year 150,000 Mile Formula Parafull OAT (organic additive technology).

The use of aluminum cylinder blocks, cylinder heads, and water pumps requires special corrosion protection. Mopar® Antifreeze/Coolant, or the equivalent ethylene-glycol based coolant with organic corrosion inhibitors (called OAT, for organic additive technology) is recommended. This coolant offers the best engine protection without corrosion when mixed 50/50 with distilled or deionized water to obtain a freeze point of -37°C (-34°F). If the coolant loses color or becomes contaminated, drain, flush, and replace with a fresh, properly mixed coolant solution.

Caution: **Mopar® Antifreeze/Coolant, is a lifetime engine formula. It may <u>not</u> be mixed with any other types of antifreeze. Mixing of coolants other than specified (non-OAT or other OAT formulations), may result in engine damage.**

Notes: _____

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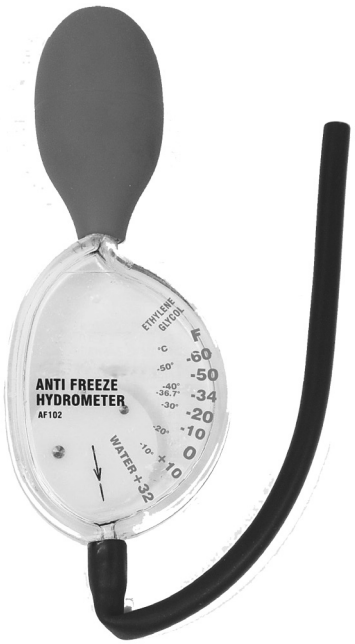
COOLANT CONCENTRATION TESTING

2034-95_1060

Figure 26 Refractometer



2034-95_1059

Figure 27 Typical Hydrometer

Coolant concentration should be checked when any additional coolant is added to the system or after a coolant drain, flush, and refill. The coolant mixture offers optimum engine cooling and protection against corrosion when mixed to a freeze point of -37°C (-34°F) to -46°C (-50°F). Use a hydrometer or a refractometer to test the coolant concentration.

A hydrometer tests the amount of glycol in a mixture by measuring the specific gravity of the mixture. The higher the concentration of ethylene glycol, the larger the number of balls that will float, and the higher the freeze protection (up to a maximum of 60% by volume glycol). Coolant should be tested at room temperature.

A refractometer (Special Tool 8286) tests the amount of glycol in a coolant mixture by measuring the amount a beam of light bends as it passes through the fluid.

Caution: **Use of propylene-glycol based coolants is not recommended because they provide less freeze protection and less corrosion protection. Do not mix ethylene and propylene-glycol based coolants. Through heat and pressure, the two components will make sludge. Mopar Antifreeze/Coolant, 5 year/100,000 Mile Formula (MS-9769) may not be mixed with any other type of antifreeze. Mixing coolants other than specified (non-HOAT or other HOAT) may result in engine damage that may not be covered under the new vehicle warranty, and decreased corrosion protection.**

WARNING: **ANTIFREEZE IS AN ETHYLENE-GLYCOL BASED COOLANT AND IS HARMFUL IF SWALLOWED OR INHALED. IF SWALLOWED, DRINK TWO GLASSES OF WATER AND INDUCE VOMITING. IF INHALED, MOVE TO FRESH AIR AREA. SEEK MEDICAL ATTENTION IMMEDIATELY. DO NOT STORE IN OPEN OR UNMARKED CONTAINERS. WASH SKIN AND CLOTHING THOROUGHLY AFTER COMING IN CONTACT WITH ETHYLENE GLYCOL. KEEP OUT OF REACH OF CHILDREN. DISPOSE OF GLYCOL-BASED COOLANT PROPERLY. CONTACT YOUR DEALER OR GOVERNMENT AGENCY FOR LOCATION OF COLLECTION CENTER IN YOUR AREA.**

WARNING: **DO NOT OPEN A COOLING SYSTEM WHEN THE ENGINE IS AT OPERATING TEMPERATURE OR HOT UNDER PRESSURE; PERSONAL INJURY CAN RESULT. AVOID THE RADIATOR COOLING FAN WHEN ENGINE COMPARTMENT RELATED SERVICE IS PERFORMED; PERSONAL INJURY CAN RESULT.**

Notes: _____

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ENGINE COOLANT FILL

1	Coolant Reservoir	3	Washer Reservoir
2	Radiator Cap		

Figure 28 3.6L Front Underhood

Note: If the cooling system is opened for repair, be sure to purge the air from the system.

Note: The cooling system fill procedure is critical to overall cooling system performance.

Note: Make sure all hoses are connected and the radiator drain is closed. The drain should be hand tightened only.

Notes: _____

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1	Coolant Reservoir	3	Washer Reservoir
2	Radiator Cap		

Figure 29 5.7L Front Underhood

When topping off the coolant system, use caution when opening the system. Be sure to use the correct type and concentration of coolant for the vehicle. If it is necessary to replace the coolant or flush the cooling system, use the correct procedure listed in the service information.

Notes: _____
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WARNING:	**ANTIFREEZE COOLANT IS HARMFUL IF SWALLOWED OR INHALED. IF SWALLOWED, DRINK TWO GLASSES OF WATER AND INDUCE VOMITING. IF INHALED, MOVE TO FRESH AIR AREA. SEEK MEDICAL ATTENTION IMMEDIATELY. DO NOT STORE IN OPEN OR UNMARKED CONTAINERS. WASH SKIN AND CLOTHING THOROUGHLY AFTER COMING IN CONTACT WITH ETHYLENE-GLYCOL. KEEP OUT OF REACH OF CHILDREN. DISPOSE OF GLYCOL BASED COOLANT PROPERLY. CONTACT YOUR DEALER OR GOVERNMENT AGENCY FOR LOCATION OF COLLECTION CENTER IN YOUR AREA.**

WARNING:	**DO NOT OPEN A COOLING SYSTEM WHEN THE ENGINE IS AT OPERATING TEMPERATURE OR HOT UNDER PRESSURE; PERSONAL INJURY CAN RESULT. AVOID RADIATOR COOLING FAN AND OTHER MOVING COMPONENTS WHEN ENGINE COMPARTMENT RELATED SERVICE IS PERFORMED; PERSONAL INJURY CAN RESULT.**

WARNING:	**WEAR APPROPRIATE EYE AND HAND PROTECTION WHEN PERFORMING THIS PROCEDURE.**

CAUTION: **Do not use well water or suspect water supply in the cooling system. A 50/50 mixture of the recommended antifreeze coolant and distilled water is recommended.**

Notes: _____
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BRAKES

The Dodge Durango SSV utilizes a four-wheel disc brake system. Dual piston disc brake calipers are used on the front. Single-piston disc brake calipers are used on the rear. Ventilated disc brake rotors are used on the front. Solid rotors are standard on the rear, with a heavy duty option using ventilated rotors.

Power brake assist is supplied by a vacuum operated, dual diaphragm power brake booster. The master cylinder used for all applications has an aluminum body and nylon reservoir with single filler cap. A fluid level indicator is mounted to the side of the reservoir.

Factory installed brake linings on all models consists of organic base material combined with metallic particles

If either the front or rear hydraulic system loses normal braking capability, the remaining system will still function with some loss of overall braking effectiveness. This will be evident by increased pedal travel during application, greater pedal force required to slow or stop, and activation of the brake warning light or the ABS warning light (if equipped) during brake use.

WARNING: CHRYSLER GROUP LLC DOES NOT MANUFACTURE ANY VEHICLES OR REPLACEMENT PARTS THAT CONTAIN ASBESTOS. AFTERMARKET PRODUCTS MAY OR MAY NOT CONTAIN ASBESTOS. REFER TO AFTERMARKET PRODUCT PACKAGING FOR PRODUCT INFORMATION WHETHER THE PRODUCT CONTAINS ASBESTOS OR NOT, DUST AND DIRT CAN ACCUMULATE ON BRAKE PARTS DURING NORMAL USE. FOLLOW PRACTICES PRESCRIBED BY APPROPRIATE REGULATIONS FOR THE HANDLING, PROCESSING, AND DISPOSING OF DUST AND DEBRIS.

CAUTION: Never use gasoline, kerosene, alcohol, motor oil, transmission fluid, or any fluid containing mineral oil to clean the system components. These fluids damage rubber cups and seals. Use only fresh brake fluid or Mopar brake cleaner to clean or flush brake system components. These are the only cleaning materials recommended. If system contamination is suspected, check the fluid for dirt, discoloration, or separation into distinct layers. Also check the reservoir cap seal for distortion. Drain and flush the system with new brake fluid if contamination is suspected.

Brake Fluid

The brake fluid used in this vehicle must conform to DOT 3 specifications and SAE J1703 standards. No other type of brake fluid is recommended or approved for usage in the vehicle brake system. Use only Mopar brake fluid or an equivalent from a tightly sealed container.

Caution: Never use reclaimed brake fluid or fluid from a container that has been left open. An open container of brake fluid will absorb moisture from the air and contaminate the fluid.

Caution: Never use any type of a petroleum-based fluid in the brake hydraulic system. Use of such type fluids will result in seal damage of the vehicle brake hydraulic system causing a failure of the vehicle brake system. Petroleum based fluids would be items such as engine oil, transmission fluid, power steering fluid, etc.

Caution: Use Mopar brake fluid, or an equivalent quality fluid meeting SAE/DOT standards J1703 and DOT 3. Brake fluid must be clean and free of contaminants. Use fresh fluid from sealed containers only to ensure proper antilock component operation.

Caution: Use Mopar multi-mileage or high-temperature grease to lubricate caliper slide surfaces, drum brake pivot pins, and shoe contact points on the backing plates. Use multi-mileage grease or GE 661 or Dow 111 silicone grease on caliper slide pins to ensure proper operation.

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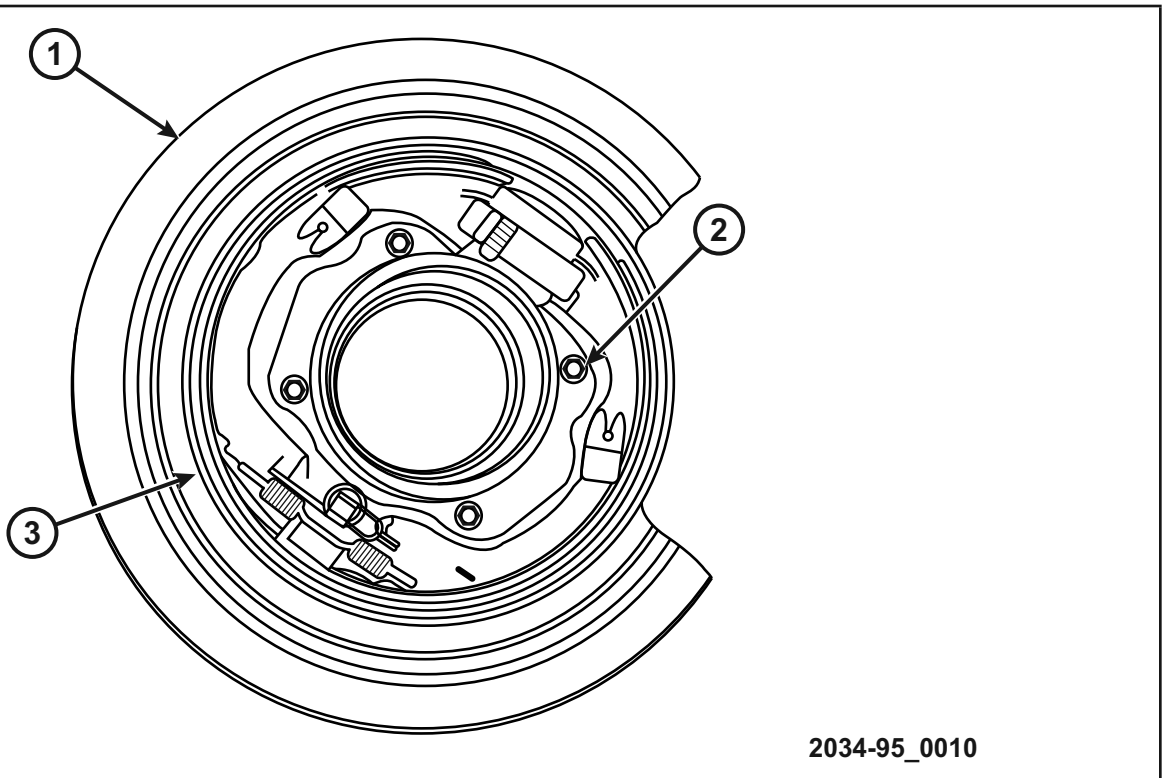
PARKING BRAKE SYSTEM



1	Supporting Plate	3	Brake Shoes
2	Mounting Bolts		

Figure 30 Parking Brakes

The parking brakes are operated by an automatic tensioner mechanism built into the foot lever and cable system. The front cable is connected to the foot lever and the equalizer. The rear cables attach to the equalizer and the parking brake shoe actuator.

A set of drum type brake shoes are used for parking brakes. The shoes are mounted to the rear disc brake adaptor. The parking brake drum is integrated into the rear disc brake rotor.

Parking brake cable adjustment is controlled by an automatic tensioner mechanism. The only adjustment (if necessary) is to the parking brake shoes if the linings are worn.

FRONT SUSPENSION LUBRICATION

There are no grease fittings on the front suspension.

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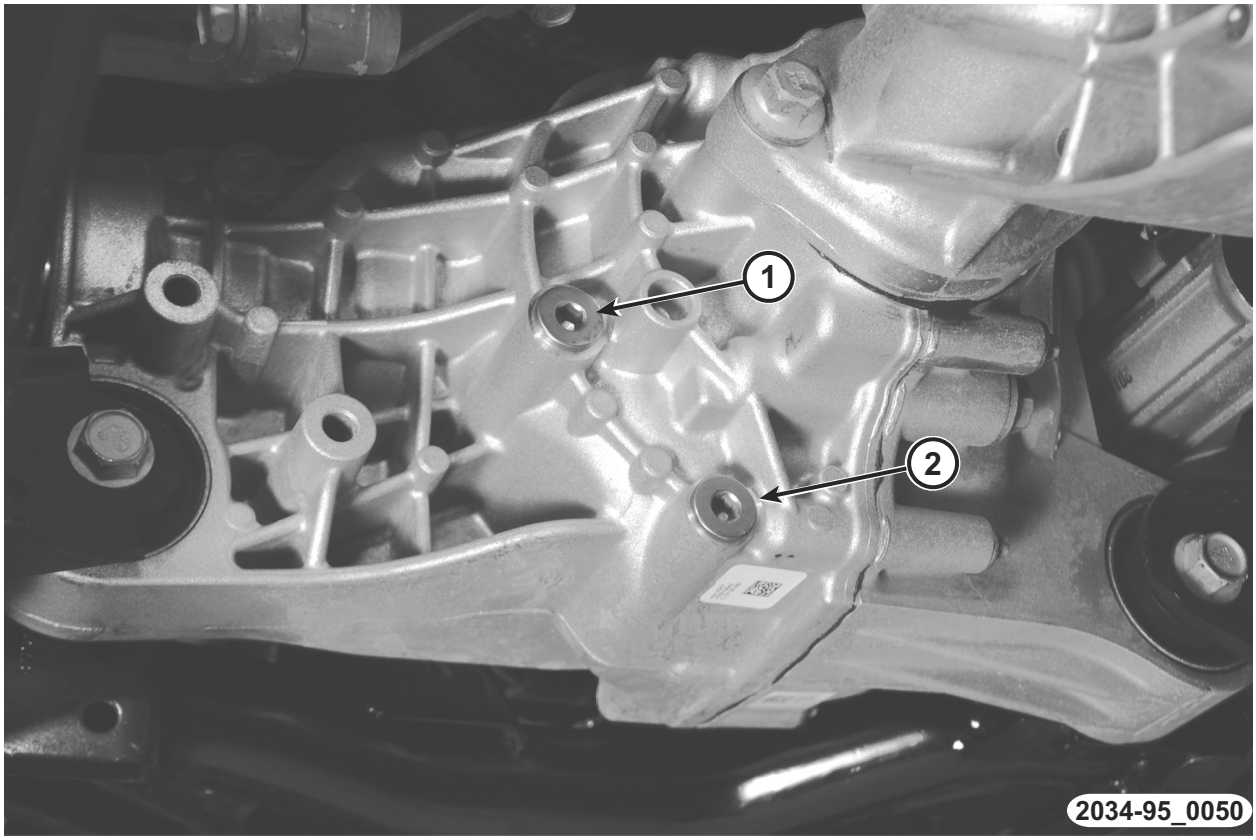
DIFFERENTIAL FILL



1	Fill Plug	2	Drain Plug

Figure 31 Front Differential Fluid Plugs

To check the front or rear axle fluid levels, park the vehicle on a level surface. Take a piece of wire (or pipe cleaner) and make a 90-degree bend 2 inches from the end of the wire. Insert the wire into the fill plug hole and use it like a dipstick. Remove the wire and measure from the 90-degree bend to the oil level.

The axle oil level needs to be between 3 mm (1/8 in.) below the bottom of the fill hole.

The axle fill and drain plugs should be tightened to 30 to 40 Nm (22 to 29 lbs./ft.).

Caution: Do not over tighten the plugs as it could damage them and cause them to leak.

Limited-slip Differential

This vehicle requires that 118 ml (4 oz.) MOPAR® Limited Slip Additive or equivalent be added to the gear lubricant. Refer to "Fluids, Lubricants, and Genuine Parts" in Maintaining Your Vehicle for further information. The MOPAR® Limited Slip Additive or equivalent should be added to the gear lubricant whenever a fluid change is made.

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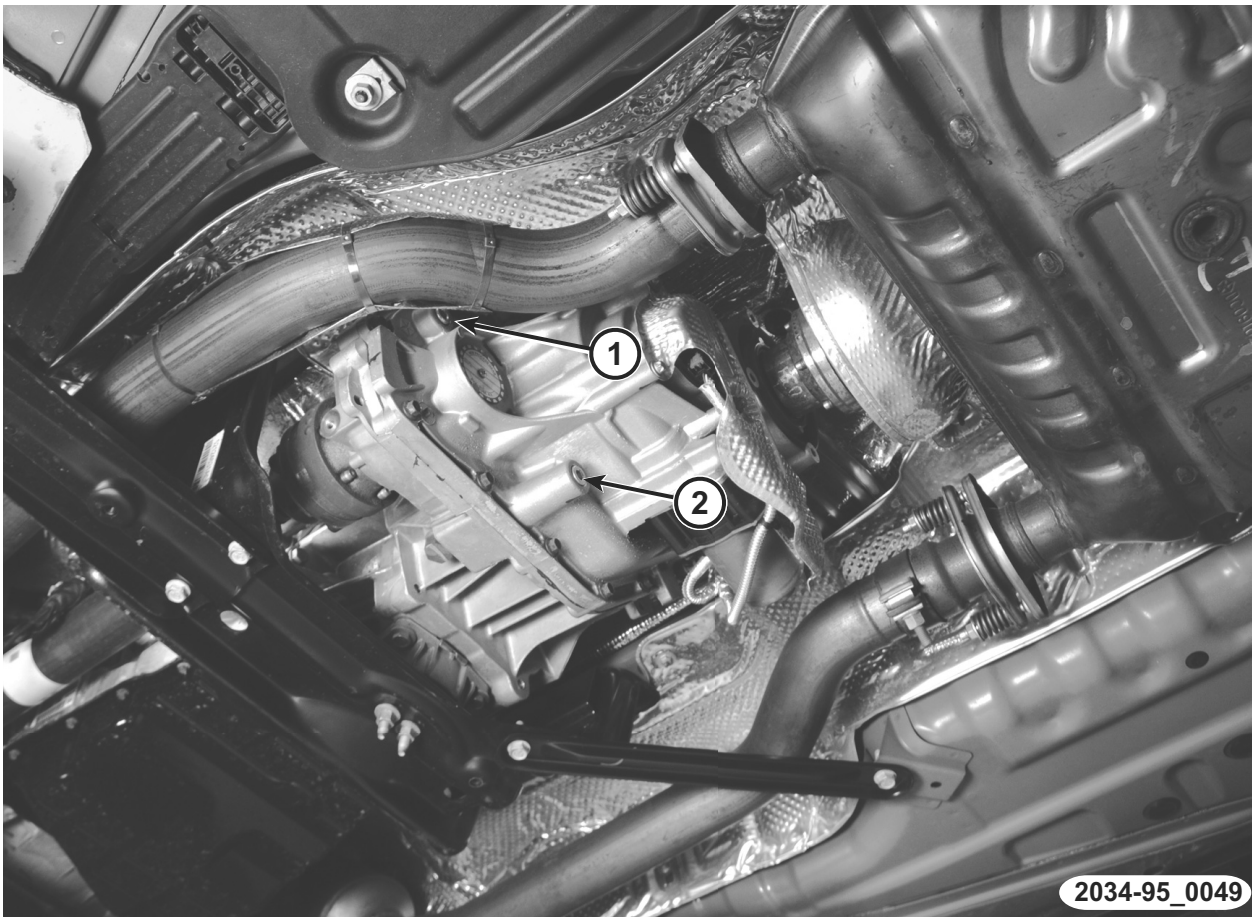
TRANSFER CASE FILL



1	Fill Plug	2	Drain Plug

Figure 32 Drain and Fill Plug MP2010 Transfer Case Shown

The transfer case fill should be checked at the fill plug location. This plug is located in the center part of the transfer case housing. The transfer case should be filled to the bottom edge of the fill plug opening with the appropriate fluid.

Note: Refer to fluid recommendations at the end of this section.

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FLUID REQUIREMENTS

Capacities

Table 4 Capacities

Fuel		
	US	**Metric**
Durango Regular Cab Shortbed/Crew Quad Cab Models	24 Gallons	91 Liters
Engine Oil with Filter		
3.6L Engine (SAE 5W-30, API Certified)	6 Quarts	5.6 Liters
5.7L (SAE 5W-20, API Certified)	7 Quarts	6.6 Liters
Cooling System		
3.6L Engine (MOPAR® Engine Coolant/Antifreeze 5-Year/100,000 Mile Formula or equivalent) – Without Trailer Tow Package	10 Quarts	9.8 Liters
3.6L Engine (MOPAR® Engine Coolant/Antifreeze 5-Year/100,000 Mile Formula or equivalent) – With Trailer Tow Package	11 Quarts	10.4 Liters
3.6L Engine (MOPAR® Engine Coolant/Antifreeze 5-Year/100,000 Mile Formula or equivalent) – Front and Rear Heat Without Trailer Tow Package	11.5 Quarts	10.8 Liters
3.6L Engine (MOPAR® Engine Coolant/Antifreeze 5-Year/100,000 Mile Formula or equivalent) – Front and Rear Heat With Trailer Tow Package	12 Quarts	11.4 Liters
5.7L Engine (MOPAR® Engine Coolant/Antifreeze 5-Year/100,000 Mile Formula or equivalent) – Front and Rear Heat Without Trailer Tow Package	16 Quarts	15.2 Liters
5.7L Engine (MOPAR® Engine Coolant/Antifreeze 5-Year/100,000 Mile Formula or equivalent) – Front and Rear Heat With Trailer Tow Package	17 Quarts	16.2 Liters

Notes: _____
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FLUIDS, LUBRICANTS, AND GENUINE PARTS

Table 5 Fluids, Lubricants and Genuine Parts

Engine	
Component	**Fluid, Lubricant, or Genuine Part**
Engine Coolant	MOPAR Antifreeze/Coolant 5 Year/100,000 Mile Formula HOAT (Hybrid Organic Additive Technology) or equivalent
Engine Oil – 3.6L Engine	Use API Certified SAE 5W-30 Engine Oil, meeting the requirements of Chrysler Material Standard MS-6395; refer to your engine oil filler cap for correct SAE grade
Engine Oil – 5.7L Engine	Use API Certified SAE 5W-20 Engine Oil, meeting the requirements of Chrysler Material Standard MS-6395; refer to your engine oil filler cap for correct SAE grade
Engine Oil Filter	MOPAR Engine Oil Filter or Equivalent
Spark Plugs – 3.6L Engine	RER8ZWYCB4 (Gap 1.1 mm [0.043 in.])
Spark Plugs 5.7L Engine	LZFR5C–11G (Gap 1.1 mm [0.043 in.])
Fuel Selection – 3.6L Engine	87 Octane
Fuel Selection - 5.7L Engine	87 Octane Acceptable - 89 Octane Recommended
Chassis	
Component	**Fluid, Lubricant, or Genuine Part**
Automatic Transmission	MOPAR ATF+4 automatic transmission fluid or equivalent licenses ATF+4 product
Transfer Case – 3.6L Engine	Shell Automatic Transmission Fluid 3353 or equivalent
Transfer Case – 5.7L Engine	MOPAR ATF+4 automatic transmission fluid or equivalent licenses ATF+4 product
Front Axle and Rear Axle Lubricant	GL-5 SAE 75W-90 (MS-9763) or equivalent
Brake Master Cylinder	MOPAR DOT 3 and SAE J1703 or equivalent; if DOT 3 brake fluid is not available, then DOT 4 is acceptable; use only recommended brake fluids
Power Steering Reservoir – 3.6L Engine	MOPAR® Hydraulic Fluid or equivalent meeting MS-11655, such as Fuchs EG ZH 3044 or Pentosin CHF 11s
Power Steering Reservoir – 5.7L Engine	MOPAR® Power Steering Fluid +4, MOPAR® ATF+4® Automatic Transmission Fluid or equivalent licensed ATF+4® product

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Notes:

LESSON 4 POWERTRAIN

3.6L ENGINE OVERVIEW

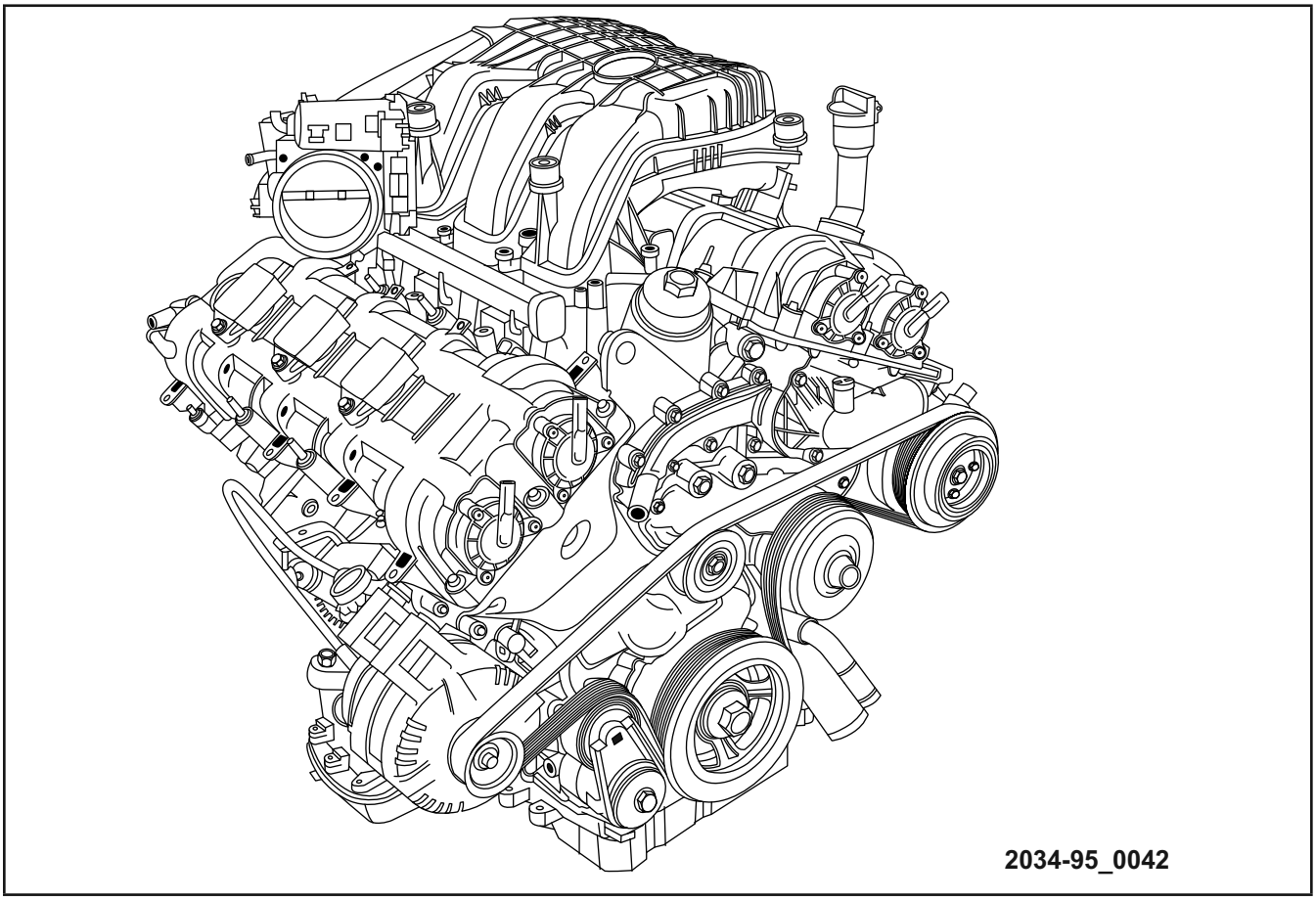


Figure 33 3.6L Pentastar V6

The 3.6L (219.7 CID) flexible fuel V-6 engine features variable valve timing (VVT); dual overhead camshafts (DOHC); and a high-pressure, die-cast aluminum cylinder block with steel liners in a 60-degree configuration. The 3.6L engine has a chain driven variable discharge oil pump with a two-stage pressure regulator for improved fuel economy. The exhaust manifolds are integrated into the cylinder heads for reduced weight. The cylinders are numbered from front to rear. The right bank is numbered 1, 3, 5 and the left bank is numbered 2, 4, 6. The firing order is 1-2-3-4-5-6. The engine serial number is located on the left side of the cylinder block at the transmission flange.

5.7L ENGINE OVERVIEW

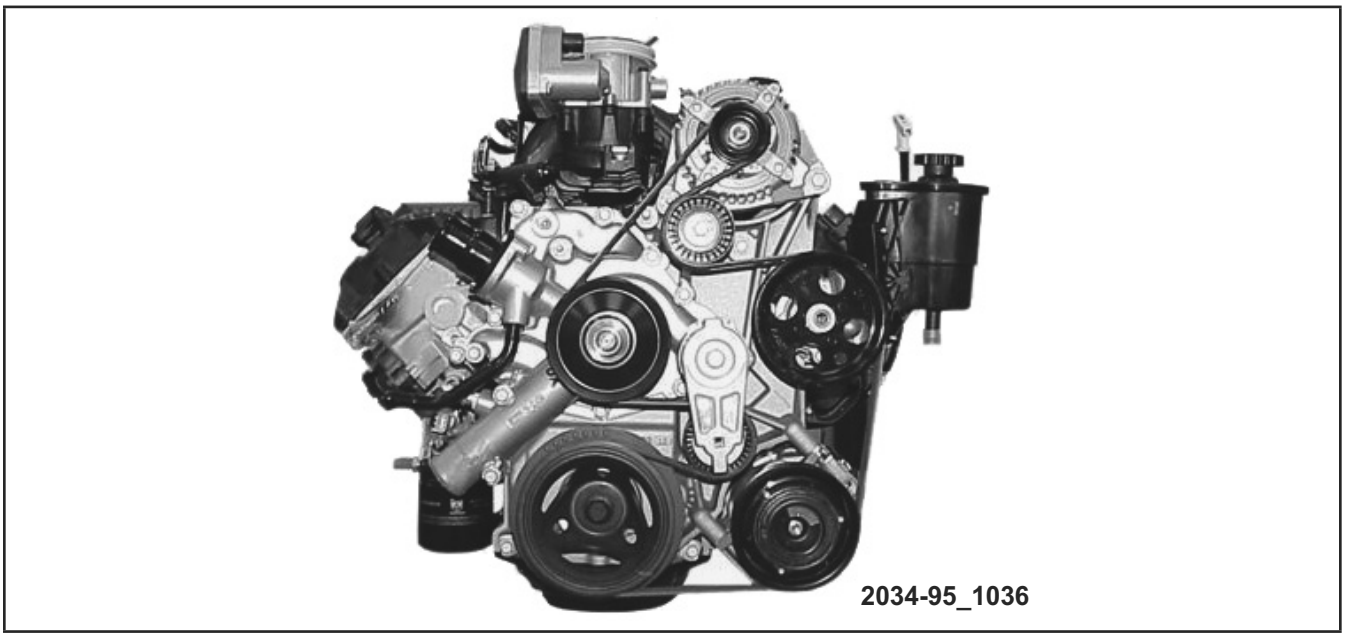


Figure 34 5.7L Hemi Engine

The 5.7L engine (348 CID) eight-cylinder engine is a 90-degree V-Type lightweight, deep skirt cast iron block, aluminum heads, single cam, overhead valve engine with hydraulic roller tappets. The heads incorporate splayed valves with a hemispherical style combustion chamber and dual spark plugs. The cylinders are numbered from front to rear; 1, 3, 5, 7 on the left bank and 2, 4, 6, 8 on the right bank. The firing order is 1-8-4-3-6-5-7-2.

Engine Specifications

Table 6 Specifications

Description	Application	
	5.7L HEMI	**3.6L**
Bore	99.5 mm (3.92 in.)	96.0 mm (3.78 in.)
Stroke	90.0 mm (3.58 in.)	83.0 mm (3.27 in.)
Displacement	5654 cc (348 CID)	3600 cc (219.7 CID)
Location of #1 Cylinder	Driver's side first cylinder	Passenger side first cylinder
Right Bank Numbering	2, 4, 6, 8	1,3,5
Left Bank Numbering	1, 3, 5, 7	2,4,6
Compression Ratio	9.6:1	10.2:1
Firing Order	1-8-4-3-6-5-7-2	1-2-3-4-5-6
Oil Specification	5W-20	5W-30
Oil Capacity with Filter	7 qts.	6 qts.
Oil Capacity w/o Filter	6 qts.	5 qts.
Horsepower	390@5900 rpm	292 HP@6350 rpm
Torque	407 lbs./ft.@3900 rpm	260 lbs./ft. @4800 rpm

Serpentine Belt Routing

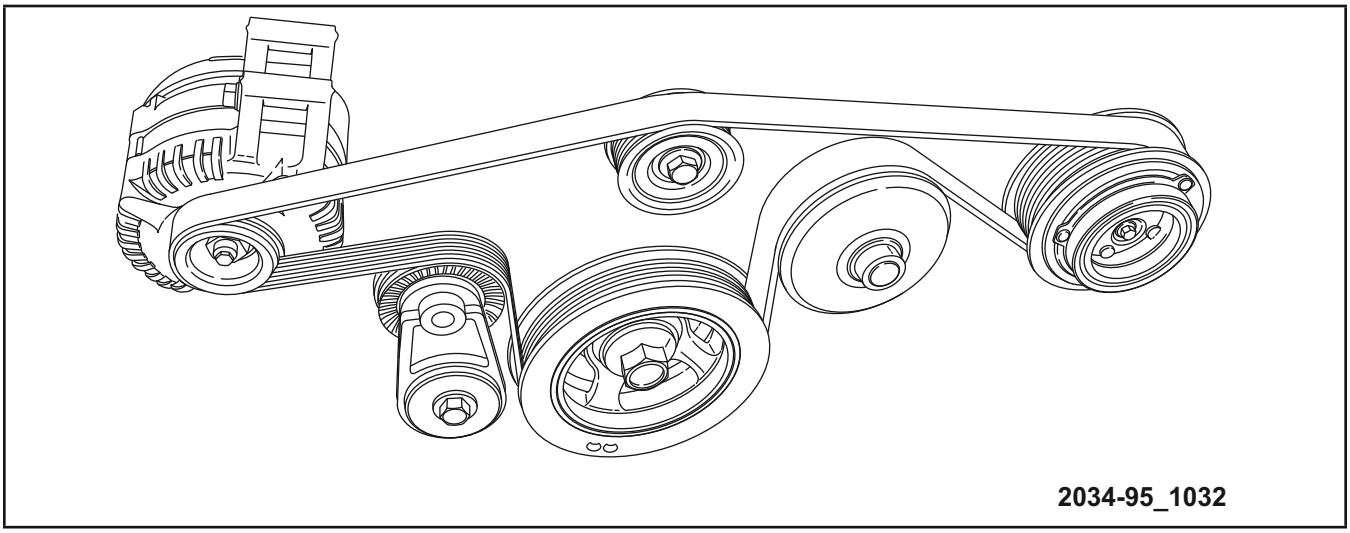


Figure 35 3.6L Belt Routing

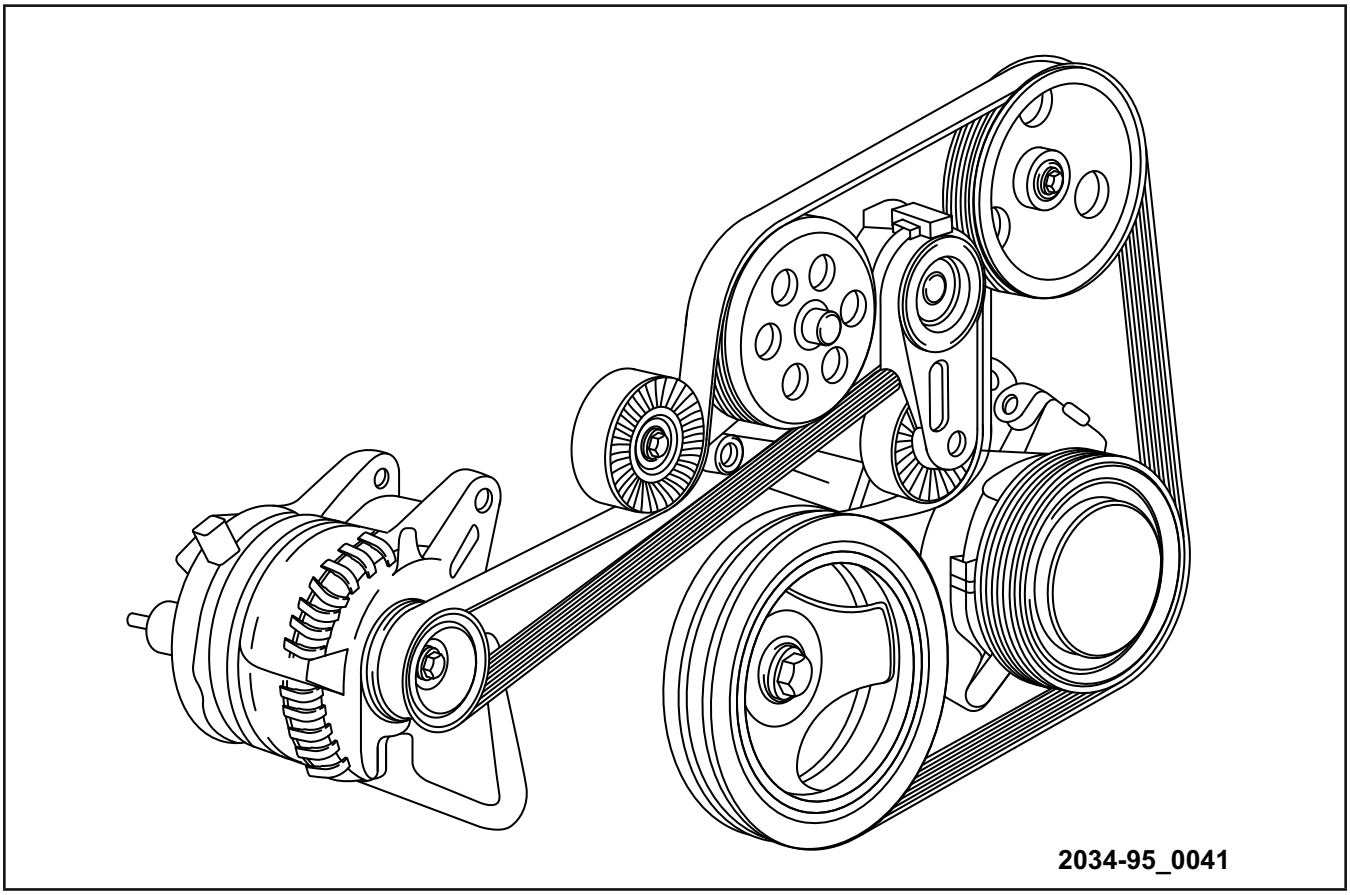
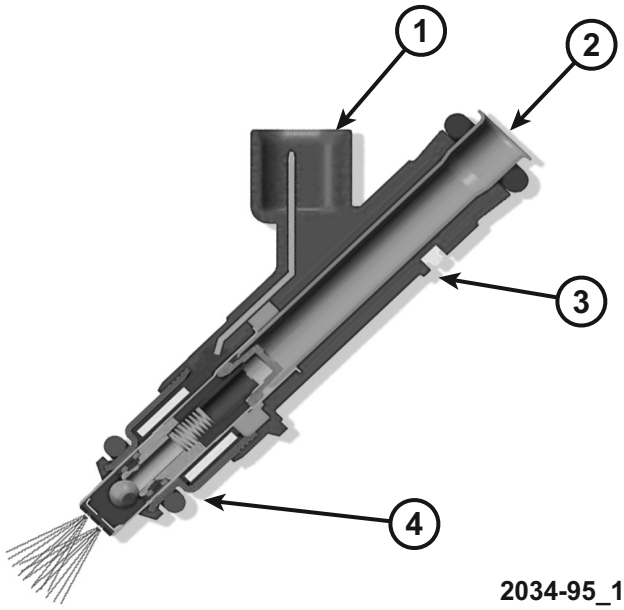


Figure 36 5.7L Belt Routing

FUEL INJECTION

Fuel Injectors



1	Fuel Injection Electrical Harness Connection	3	Injector Fuel Rail Connection
2	Fuel Injector Body	4	Injector Tip

Figure 37 Fuel Injector

Fuel injectors are an output-operated device of the PCM. The PCM controls the "on" time of the injector. When the fuel injector is energized, fuel is sprayed into the engine. The fuel injectors are electrical solenoids. The injector contains a pintle that closes off an orifice at the nozzle end. When electric current is supplied to the injector, the armature and needle move a short distance against a spring, allowing fuel to flow out the orifice. Because the fuel is under high pressure, a fine spray is developed in the shape of a pencil stream. The spraying action atomizes the fuel, adding it to the air entering the combustion chamber.

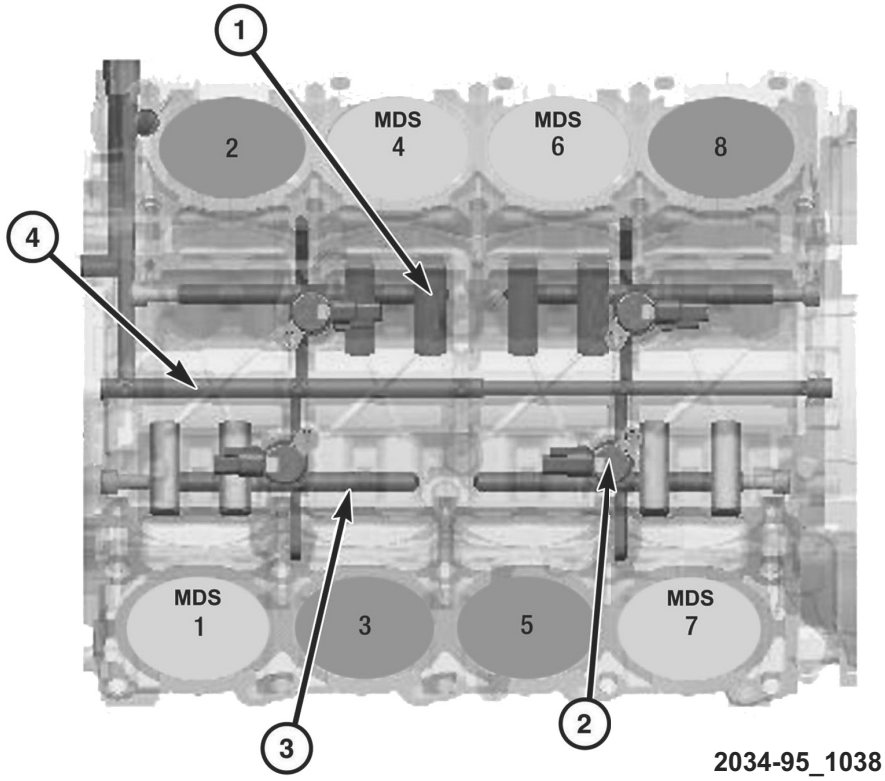
The nozzle (outlet) ends of the injectors are positioned into openings in the intake manifold just above the intake valve ports of the cylinder head. The engine wiring harness connector for each fuel injector is equipped with an attached numerical tag (INJ 1, INJ 2, etc.). This is used to identify each fuel injector.

The injectors are energized individually in a sequential order by the powertrain control module (PCM). The PCM will adjust injector pulse width by switching the ground path to each individual injector on and off. Injector pulse width is the period of time that the injector is energized. The PCM will adjust injector pulse width based on various inputs it receives.

Battery voltage is supplied to the injectors through the ASD relay.

The PCM determines injector pulse width based on various inputs.

Multiple Displacement System



1	MDS Lifter	3	Lifter Oil Passage
2	MDS Solenoid	4	Main Oil Galley

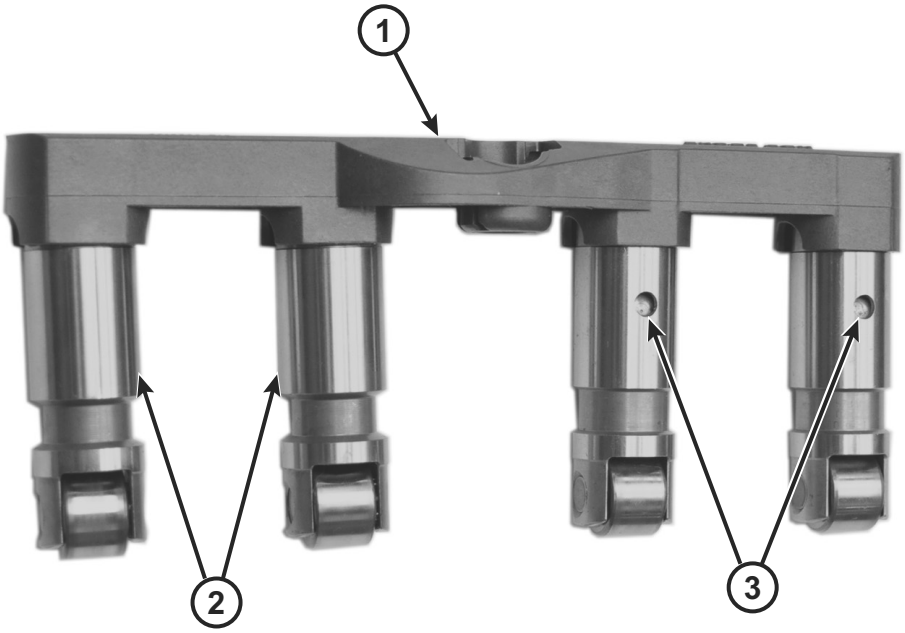
Figure 38 Multiple Displacement System (MDS)

The multiple displacement system (MDS) selectively deactivates cylinders 1, 4, 6, and 7 during steady speed, low acceleration, and shallow grade climbing conditions to increase fuel economy.

The MDS can provide a fuel economy benefit when operating in four-cylinder mode, depending on driving habits and vehicle usage. For EPA rating purposes, the fuel economy is 8 to 15% higher than if the engine was operating on eight-cylinders at all times.

The MDS deactivating lifter can be distinguished from the non-MDS lifter by the disconnecting pin on the side of the MDS lifter.

Lifters



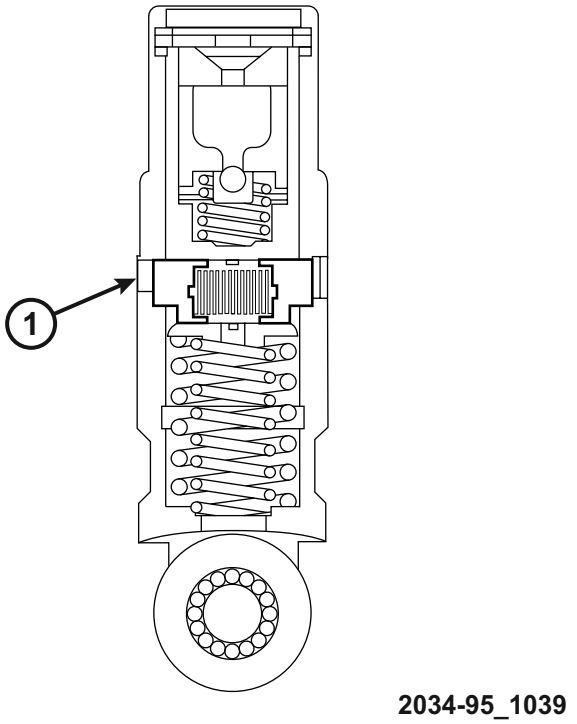
1	MDS Lifter Rail	3	MDS Lifter
2	Non-MDS Lifter		

Figure 39 MDS and Non-MDS Lifter

The MDS is integrated into the basic engine architecture, requiring these additional components:

- Unique MDS camshaft
- Deactivating roller lifters
- MDS control valve solenoids
- MDS control valve solenoid wiring harness
- Oil temperature sensor

Operation



1	Lock Pin

Figure 40 MDS Lifter Cross-section

The multiple displacement system (MDS) provides cylinder deactivation during steady speed, low acceleration and shallow grade climbing conditions to increase fuel economy. Both four-cylinder and eight-cylinder configurations have even firing intervals to provide smooth operation. The MDS selectively deactivates cylinders one, four, six, and seven to improve fuel economy. All deactivated cylinders have unique hydraulic lifters that collapse when deactivated to prevent the valves from opening. Engine oil pressure is used to activate and deactivate the valves. Oil is delivered through special oil passages drilled into the cylinder block. The MDS solenoid valves control the flow. When activated, pressurized oil pushes a latching pin on each MDS lifter, which becomes a lost motion link. The base of the MDS lifter follows the camshaft while the top remains stationary. The MDS lifter is held in place against the pushrod by light spring pressure but is unable to move because of the much higher force of the valve spring.

Deactivation occurs during the compression stroke of each cylinder, after air and fuel enter the cylinder. Ignition occurs, but the combustion products remain trapped in the cylinder under high pressure because the valves no longer open. No fuel-air enters or leaves during subsequent piston strokes. This high-pressure gas is repeatedly compressed and expanded like an air spring.

NOTE: It is critical to use the recommended oil viscosity in engines that use MDS.

CYLINDER HEAD SERVICE

The cylinder head service has unique features that need to be observed including the following:

- Head gaskets that are not interchangeable between sides and need to be installed with the correct side up
- Push rods that are different lengths for intake or exhaust
- Rocker arms that are marked for the correct valve

NOTE: When removing spark plugs on a hot engine may cause damage to the threads of the spark plug hole.

NOTE: Use compressed air to remove dirt and debris from around the base of the spark plug prior to removing the spark plug.

CAUTION: The cylinder head gaskets are not interchangeable between the left and right sides. They are marked with an L and R to indicate the left or right side and they are marked TOP to indicate which side goes up.

CAUTION: The head gaskets are marked TOP to indicate which side goes up.

CAUTION: The longer pushrods are for the exhaust side and the shorter pushrods are for the intake side.

CAUTION: The rocker shaft assemblies are not interchangeable between the intake and the exhaust, failure to install them in the correct location could result in engine damage. The intake rocker arms are marked with the letter I.

CAUTION: The intake manifold must be thoroughly cleaned and blown out completely before installation as unidentified foreign matter may be lodged in the air intake system. All other items being transferred to this engine must be washed, blown out, and inspected for damage. Remove, inspect, and thoroughly clean the exhaust manifold, down pipe and catalytic converter by inverting, shaking and blowing with compressed air.

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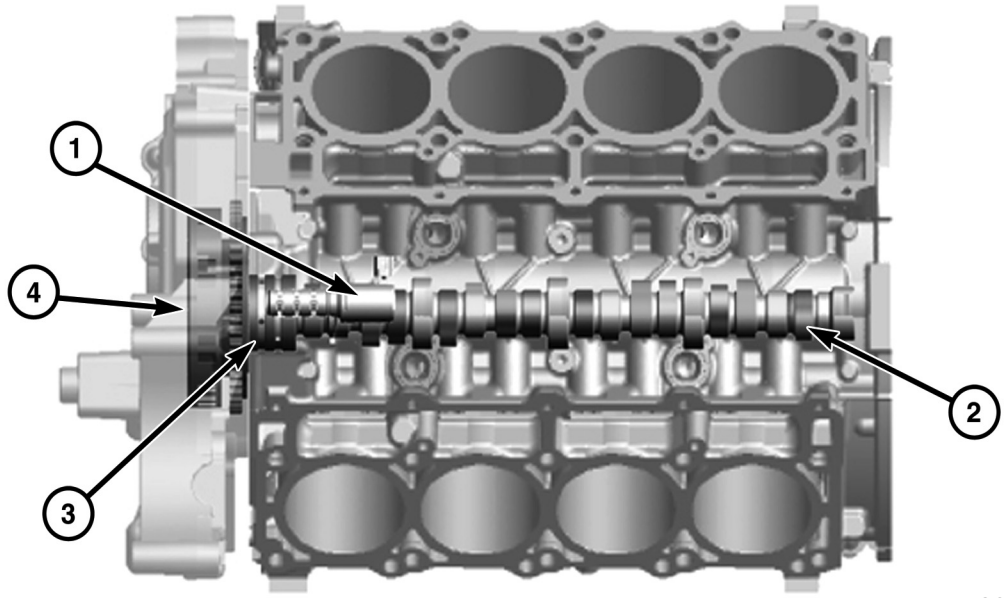
VARIABLE CAM TIMING

VCT System

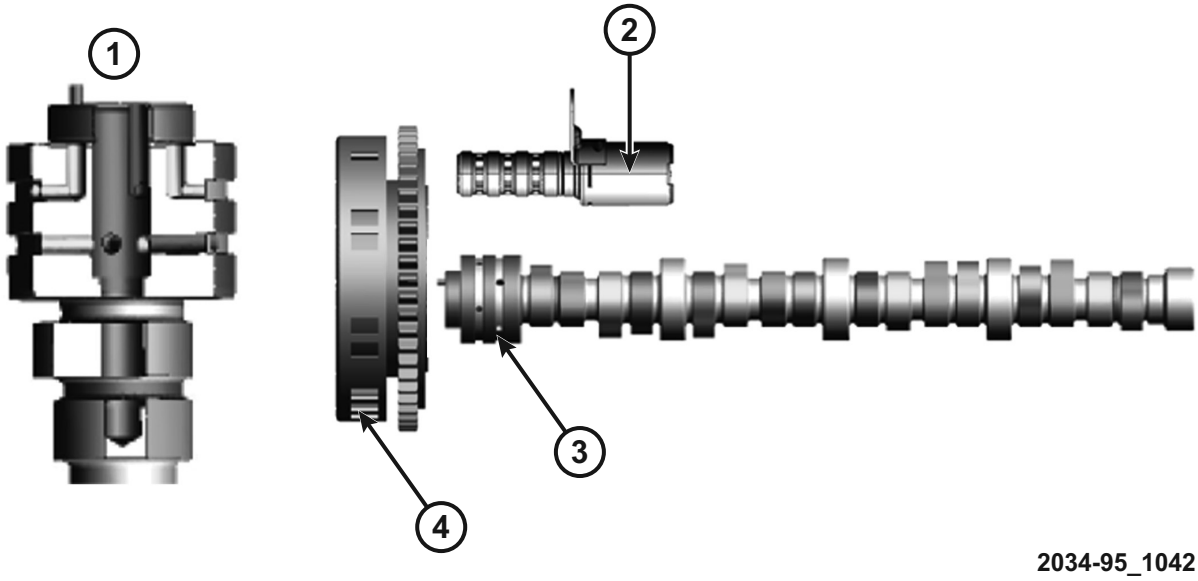


1	Oil Control Valve	3	Oil Passages
2	Camshaft	4	VCT Phaser

Figure 41 VCT System

The 5.7L HEMI utilizes a variable camshaft timing (VCT) system. This system is controlled by the powertrain control module (PCM). The PCM varies the timing of the valves, advancing or retarding the opening relative to piston motion. The lobes on the camshaft open the valves for a certain amount of time during the combustion cycle. The timing of the opening and closing of the valves is controlled by the VCT system. In a non-VCT system, the timing is fixed, and optimized for a certain engine speed, so there is a trade-off that limits power and torque, emissions reduction, and fuel economy. VCT allows the timing to change, which means the engine can achieve the best overall performance across the engine's normal operating range.

VCT Components



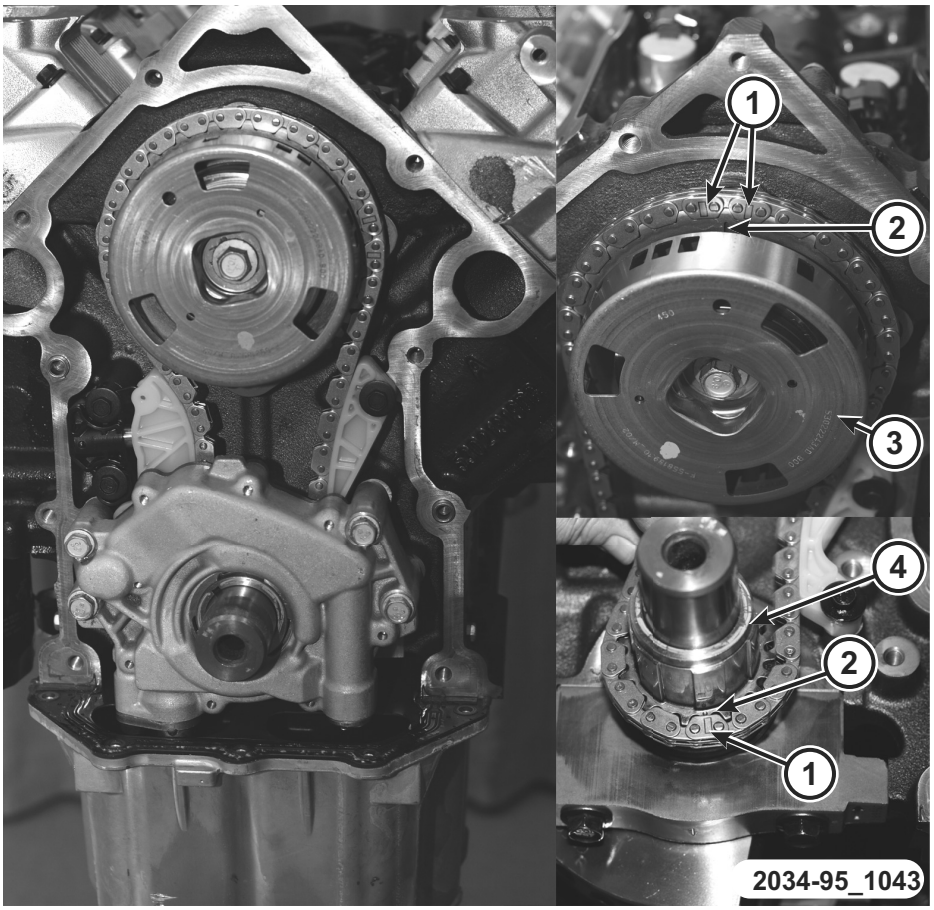
1	Camshaft Front	3	Camshaft
2	Oil Control Valve	4	Camshaft Phaser

Figure 42 VCT Components

The following components make up the VCT system:

- Camshaft phaser with tone wheel
- Oil control valve (OCV)
- Camshaft
- Unique oil passages
- Powertrain control module (PCM)

VCT Cam Drive



1	Laser Marked Rectangles	3	VCT Phaser
2	Timing Marks	4	Crankshaft Sprocket

Figure 43 VCT Cam Drive

CAUTION: Never attempt to disassemble the camshaft phaser, severe engine damage could result.

VCT Reset

Figure 44 VCT Reset

If an engine is replaced (this includes short block replacement), it will be necessary to perform the New Engine Installed procedure using the scan tool. When working with the scan tool, select PCM, then select Miscellaneous, and then New Engine Installed.

The scan tool resets the oil pressure range that enables the VCT. On a new engine, lower engine oil pressure does not allow the VCT system to actuate quickly enough and could cause a performance fault. The scan tool changes the window for enabling VCT by changing the oil pressure specification. After 3750 miles, the oil pressure specification returns to normal.

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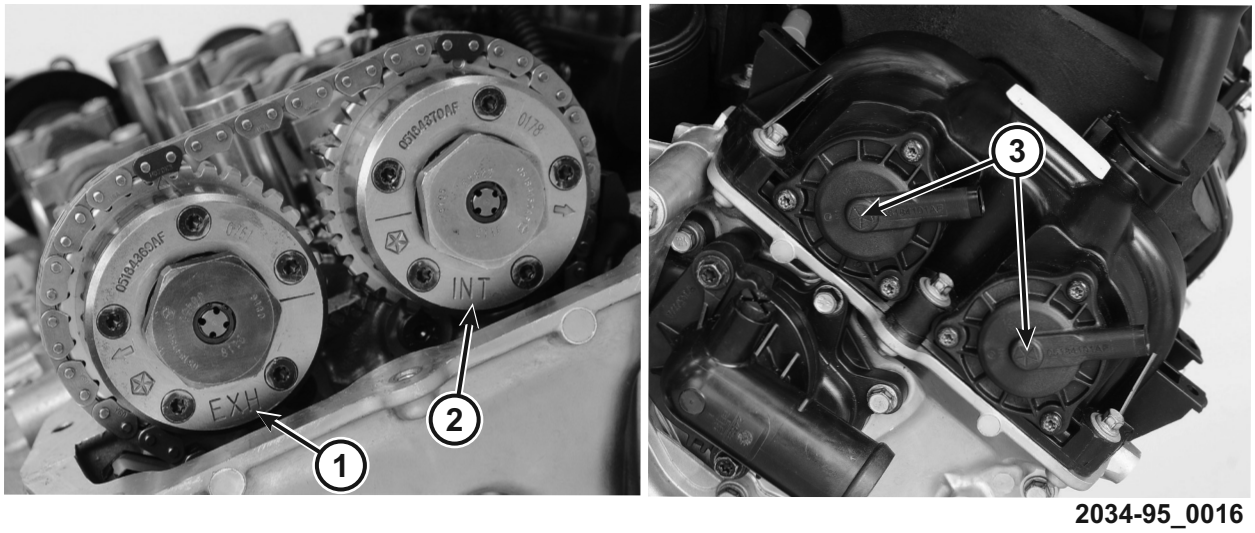
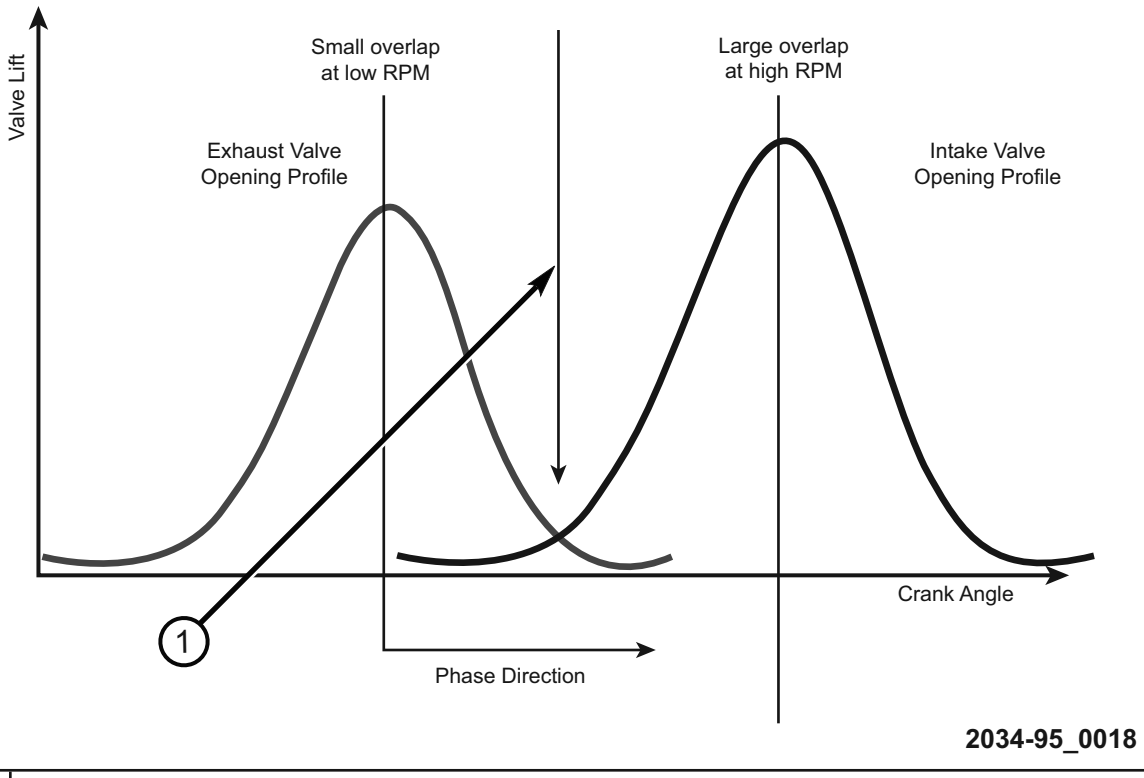
3.6L VVT System



1	Exhaust Cam Phaser	3	Phaser Sensor
2	Intake Cam Phaser		

Figure 45 3.6L VVT Cam Phaser and Cover

All Pentastar engines are equipped with VVT by means of dual independent camshaft phasers. The 3.6L has a dual overhead camshaft (DOHC), equipped with four phasers: one intake and one exhaust per cylinder head. The system advances or retards the intake and exhaust valve timing to adjust the valve overlap and improves performance, mid-range torque, idle quality, and fuel economy, and reduce emissions. Each phaser can move up to 25 degrees (50 crankshaft degrees) relative to the base camshaft position, resulting in an increase in valve overlap of up to 100 crankshaft degrees.



1	Overlap

Figure 46 3.6L VVT Operation

In a non-VVT system, the valve overlap is fixed and optimized for a certain engine speed that provides a trade-off made at other operating points. The 3.6L phasers begin at the minimum valve overlap condition, with the intake phaser biased toward a retard position and the exhaust toward the advanced position. The phasers rotate away from their start or lock-pin positions as valve overlap increases.

The OCV at 0% duty cycle is in lock-pin position and the exhaust phaser is advanced. At 100% duty cycle, the exhaust camshaft retards up to 25 degrees camshaft and the exhaust valve opens later. The OCV at 0% duty cycle is in lock-pin position and the intake phaser retards. At 100% duty cycle, the intake camshaft advances up to 25 degrees camshaft and the intake valves open earlier.

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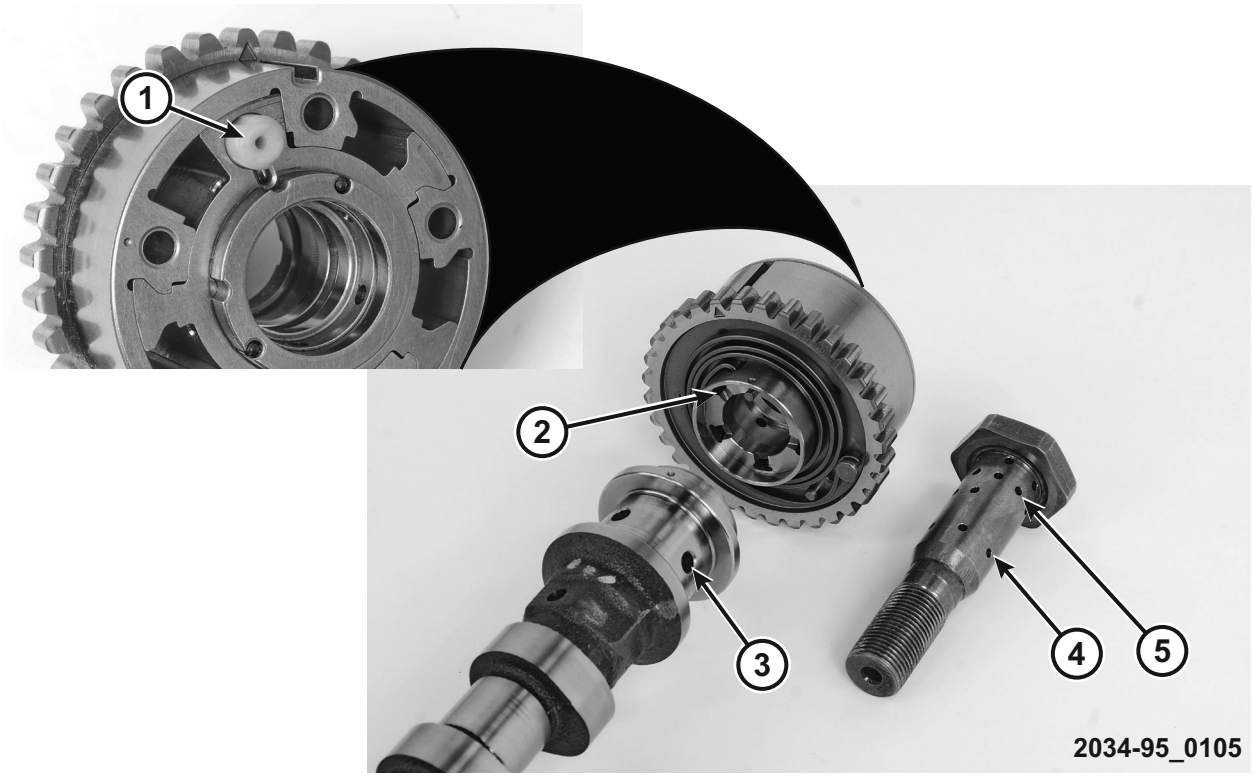

1	Lock-Pin	4	Retard Oil Passages
2	Oil Return	5	Advance Oil Passages
3	Oil Supply		

Figure 47 Oil Feed to Camshaft Phaser

Each phaser position is adjusted using regulated oil pressure through an oil control valve (OCV), which also serves as a bolt mounting the camshaft phaser/sprocket to the camshaft. The phaser/sprocket replaces the standard camshaft sprocket. At engine start-up, system oil pressure overcomes spring pressure and unlocks the phaser lock-pin in preparation for phasing. The phasers remain in this position until a PCM signal is given to pulse-width modulate the solenoid/actuator. To begin phaser movement, a voltage signal is applied to the actuator to extend or retract the solenoid pintle. The pintle pushes against an internal spool valve within the OCV, moving the valve forward and backward to direct oil flow.

Variable Valve Timing 3.6L

The position of the spool inside the OCV determines which ports and chambers inside the phaser are fed. The OCV either advances the timing of the phaser/sprocket relative to the camshaft, retards it, or holds a desired position. As oil pressure pushes against the vanes of the phaser rotor, the rotor begins to move. Because this rotor is physically attached to the camshaft, rotor rotation causes the camshaft position to rotate relative to the standard sprocket position.

The variable valve timing system is designed and calibrated to operate using 5W-30 weight engine oil. Using any other type of oil may cause system response and controllability issues, potentially causing fault codes/MIL lights depending on the severity. Phasing is disabled when oil temperature is below -5°C (23°F) and above 120°C (248°F). As long as all other enablers are met, such as oil pressure, load, and speed, phasing can occur between this range.

Notes: _____
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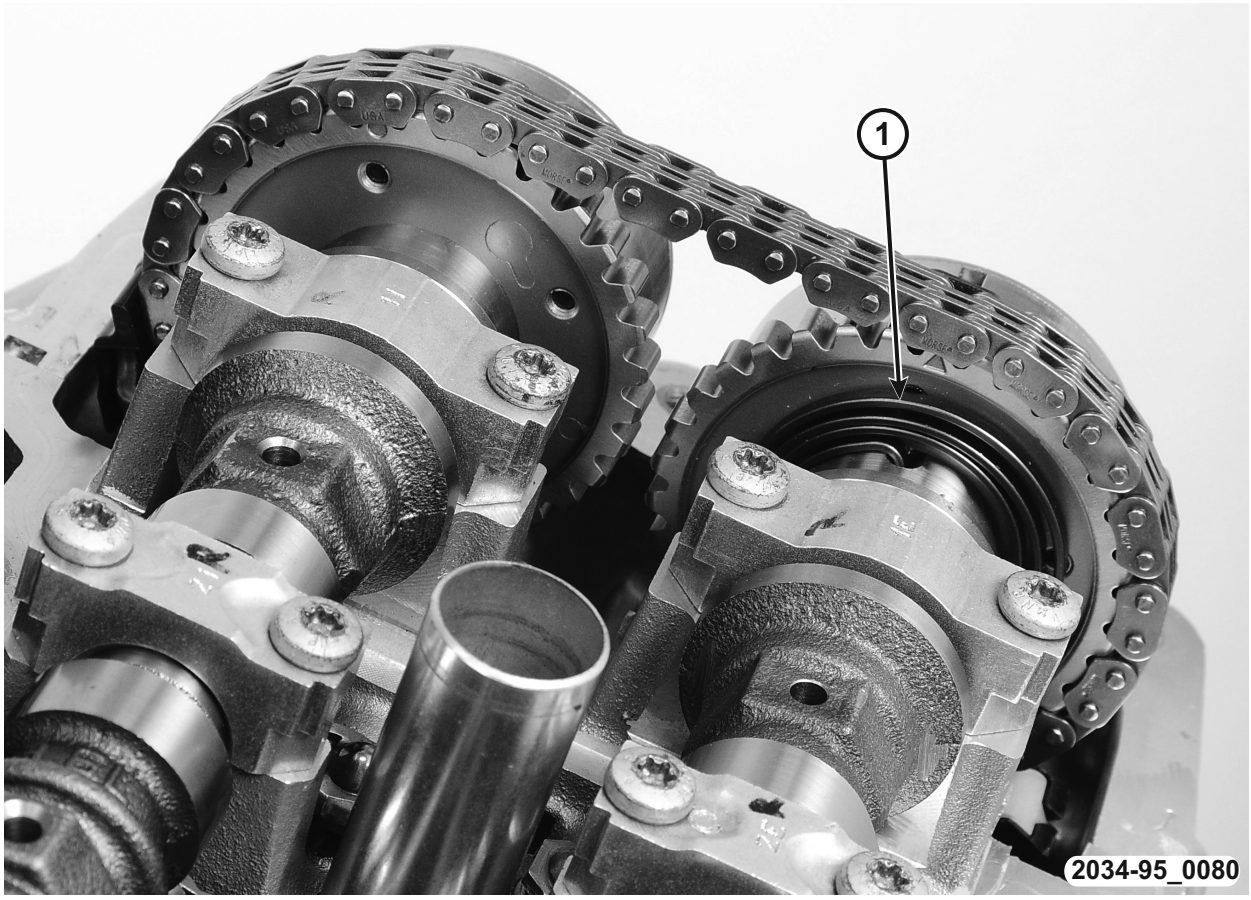
Exhaust Phaser Clock Spring



1	Exhaust Camshaft Phaser Clock Spring

Figure 48 Exhaust Camshaft Phaser

Upon engine shutdown, as oil pressure is reduced, both phasers return to their lock-pin position. However, because the exhaust phaser needs to travel to a position above and beyond the standard camshaft clockwise rotation, the assistance of a clock spring is required. The intake phaser, on the other hand, simply relies on the torsional resistance from the valve train to push it back toward the lock-pin position.

It is possible that the intake phasers do not have a chance to return to lock-pin. In this case, the phaser returns to lock-pin upon the first revolution during engine restart.

Notes: _____
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OIL

Viscosity DTC

Improper oil change intervals or incorrect oil viscosity can cause DTCs to be set with both engines. If the vehicle sets a P1521 Incorrect Engine Oil Type DTC, check the following.

P1521 INCORRECT ENGINE OIL TYPE

When Monitored:

- Engine running

Set Condition:

Incorrect viscosity will affect the operation of the multi- displacement system (MDS) and/or the variable cam timing (VCT) system. The powertrain control module (PCM) can determine the viscosity of the engine oil, based on oil pressure, oil temperature, and other engine inputs.

Possible Causes:

- Incorrect engine oil type
- Engine oil contamination
- Engine oil

Review the customer's oil change history. Make sure the customer is using the correct engine oil viscosity. If the incorrect oil is being used, change the oil, using the correct engine oil viscosity.

The following conditions must be checked:

- OEM recommended oil viscosity is being used
- Customer is following the oil change schedule
- Check the engine oil for contamination (such as fuel and/or engine coolant)
- Internal engine conditions that may affect oil pressure

TRANSMISSION

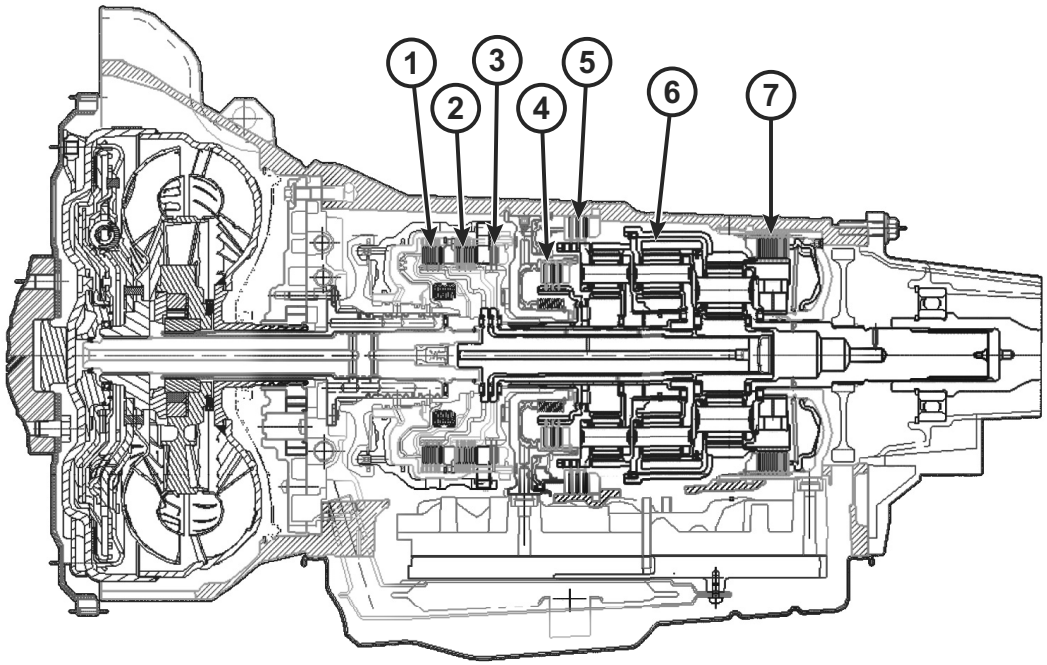
65RFE Automatic Transmission

The 65RFE automatic transmissions is a sophisticated, multi-range, electronically controlled transmission that combines optimized gear ratios for responsive performance, state of the art efficiency features, and low noise, vibration, and harshness (NVH). Other features include driver adaptive shifting and three planetary gear sets to provide wide ratio capability with precise ratio steps for optimum drivability. The three planetary gear sets also make a unique alternate second gear ratio available. The primary 2nd gear ratio fits between 1st and 3rd gears for normal through-gear accelerations. The alternate second gear ratio (2 prime) allows smoother 4-2 kickdowns at high speeds to provide 2nd gear passing performance over a wider highway cruising range.

The hydraulic portion of the transmission consists of the transmission fluid, fluid passages, hydraulic valves, and various line pressure control components.

The primary mechanical components of the transmission consist of the following:

- Three multiple disc input clutches
- Three multiple disc holding clutches
- Five hydraulic accumulators
- Three planetary gear sets
- Dual stage hydraulic oil pump
- Valve body
- Solenoid pack



1	Under Drive Clutch	5	2C Clutch
2	Overdrive Clutch	6	Planetary Gear Sets
3	Reverse Clutch	7	Low-Reverse Clutch
4	4C Clutch		

Figure 49 65RFE Transmission

The transmission control module (TCM) is the “heart” or “brain” of the electronic control system and relies on information from various direct and indirect inputs (sensors, switches, etc.) to determine driver demand and vehicle operating conditions. The TCM is housed along with the powertrain control module (PCM) in a single module. With this information, the TCM can calculate and perform shifts through various output or control devices (solenoid pack, transmission control relay, etc.).

Notes: _____

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Transmission Identification

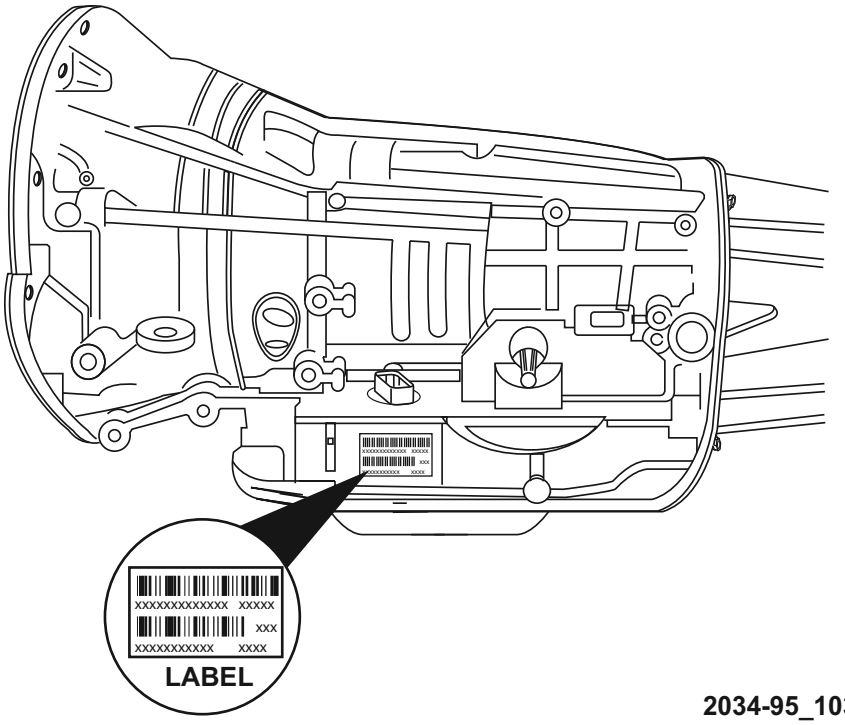

Figure 50 Transmission Identification Plate

Transmission identification numbers are stamped on the left side of the case just above the oil pan sealing surface. Refer to this information when ordering replacement parts. A label is attached to the transmission case above the stamped numbers. The label gives additional information that may also be necessary for identification purposes.

Table 7 Transmission Gear Ratios

Gear	Gear Ratio
1st	3.00:1
2nd	1.67:1
3rd	1.50:1
4th	1.00:1
5th	0.75:1
6th	0.67:1
Reverse	3.00:1

Notes: _____
_____
_____

TOW/HAUL Mode

1	TOW/HAUL Switch

Figure 51 TOW/HAUL Switch

If driving in hilly areas, towing a trailer, carrying a heavy load when frequent transmission shifting occurs, press the TOW/HAUL switch. This will improve performance and reduce the potential for transmission overheating or failure due to excessive shifting. When operating in TOW/HAUL mode, the transmission will shift to third gear and fourth gear will be enabled under steady cruise conditions.

The TOW/HAUL indicator light will illuminate in the instrument cluster to indicate when the switch has been activated. Pressing the switch a second time restores normal operation. If the TOW/HAUL mode is desired, the switch must be pressed each time the engine is started.

Notes: _____
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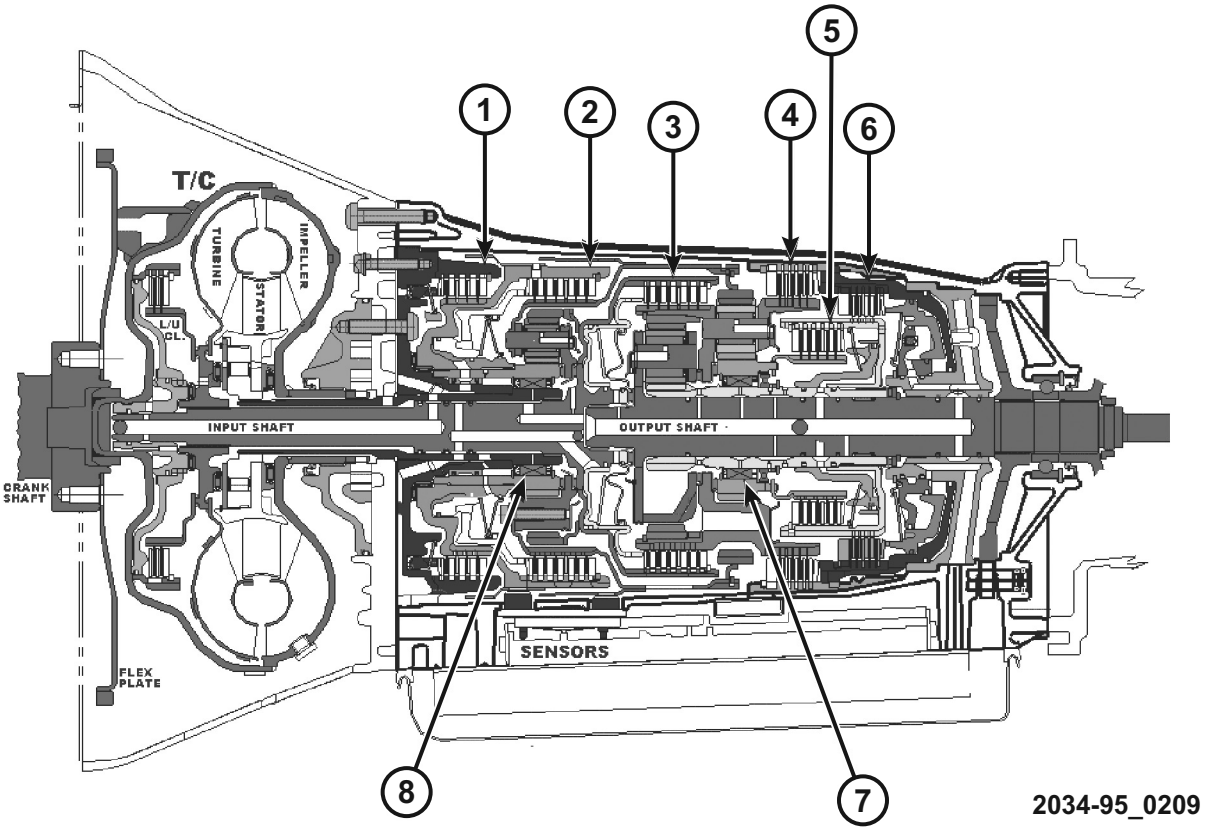
NAG1 Automatic Transmission

DESCRIPTION



1	B1 Brake	5	K3 Clutch
2	K1 Clutch	6	B2 Brake
3	K2 Clutch	7	F2 Overrunning Clutch
4	B3 Brake	8	F1 Overrunning Clutch

Figure 52 NAG1 Automatic Transmission

The NAG1 automatic transmission is an electronically controlled five-speed transmission with a lock-up clutch in the torque converter. The ratios for the gear stages are obtained by 3 planetary gear sets. Fifth gear is designed as an overdrive with a high-speed ratio.

Various marketing names are associated with the new automatic gearbox, generation 1 (NAG1) family of transmissions, depending on the transmission variation being used in a specific vehicle. Some examples of the marketing names are: W5A300, W5A380, and W5A580.

The marketing name can be interpreted as follows:

- W = A transmission using a hydraulic torque converter
- 5 = Five forward gears
- A = Automatic Transmission
- 580 = Maximum input torque capacity in Newton meters

The gears are actuated electronically/hydraulically. The gears are shifted by means of an appropriate combination of three multi-disc holding clutches, three multi-disc driving clutches, and two freewheeling clutches.

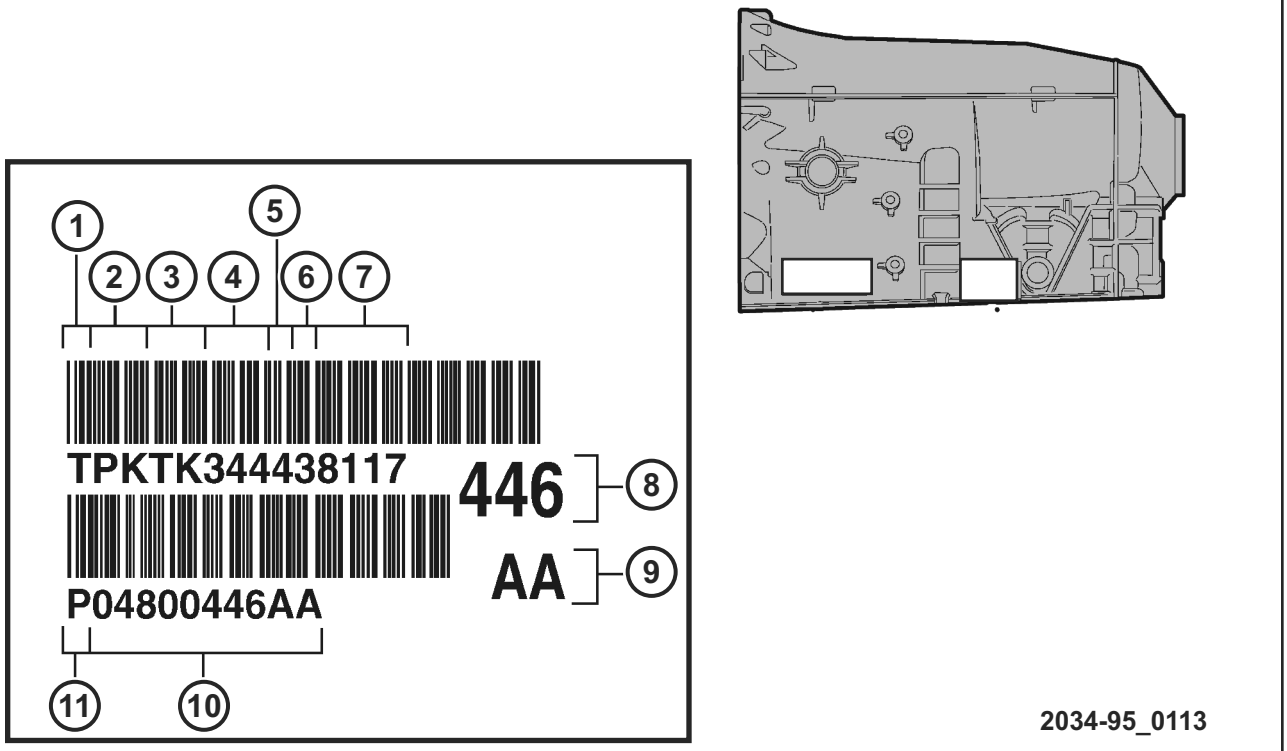
Electronic transmission control enables precise adaptation of pressures to the respective operating conditions and to the engine output during the shift phase which results in a significant improvement in shift quality.

Furthermore, it offers the advantage of a flexible adaptation to various vehicle and engines.

Basically, the automatic transmission with electronic control offers the following advantages:

- Reduces fuel consumption
- Improves shift comfort
- Provides more favorable step-up through the five gears
- Increased service life and reliability
- Lowers maintenance costs

Transmission Identification



1	Traceability	7	Build Sequence
2	Supplier Code	8	Last Three Part Number Digits
3	Component Code	9	Revision Level
4	Build Day (Julian Date)	10	Transmission Part Number
5	Build Year	11	Part Number Pre x
6	Line/Shift Code		

Figure 53 NAG1 Transmission Bar Code

Visual Identification

The transmission can be generically identified visually by the presence of a round 13-way connector located near the front corner of the transmission oil pan, on the right side. Specific transmission information can be found stamped into a pad on the left side of the transmission, above the oil pan rail.

Table 8 NAG1 Gear Ratios

Gear	Ratio
1st Gear	3.59:1
2nd Gear	2.19:1
3rd Gear	1.14:1
4th Gear	1.00:1
5th Gear	0.83:1
Reverse	3.16:1

Emergency Running Function NAG1 Transmission

In order to ensure a safe driving state and to prevent damage to the automatic transmission, the TCM control module switches to limp-home mode in the event of critical faults. A DTC assigned to the fault is stored in memory. All solenoid and regulating valves are thus de-energized.

The net effect is:

- The last engaged gear remains engaged
- The modulating pressure and shift pressures rise to the maximum levels
- The torque converter lockup clutch is deactivated

In order to preserve the operability of the vehicle to some extent, the hydraulic control can be used to engage 2nd gear or reverse using the following procedure:

- Stop the vehicle
- Move selector lever to P
- Turn off the engine
- Wait at least 10 seconds
- Start the engine
- Move the selector lever to D: 2nd gear
- Move the selector lever to R: Reverse gear

The limp-home function remains active until the DTC is rectified or the stored DTC is erased with a scan tool. Sporadic faults can be reset via ignition OFF/ON.

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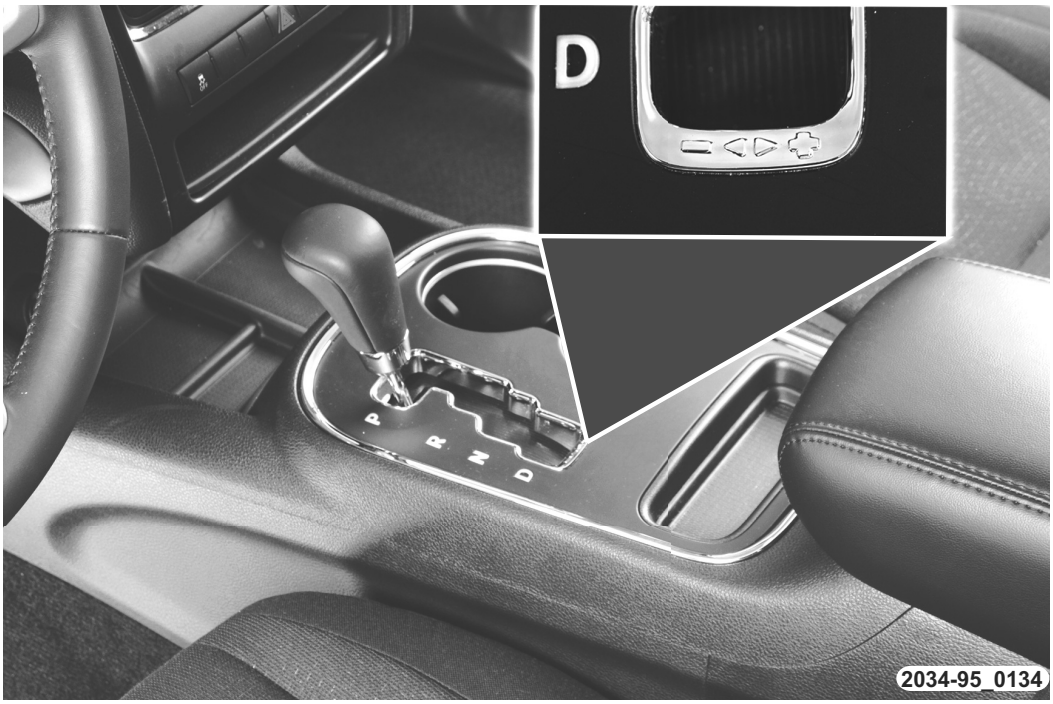
Electronic Range Selection (ERS)



1	ERS Shift Identification

Figure 54 Shifter

Table 9 Electronic Range Selection (ERS) Mode Switch NAG1 Transmission

Screen Display	1	2	3	4	D*
Actual Gear(s) Allowed	1	1-2	1-3	1-4	1-5

Table 10 Electronic Range Selection (ERS) Mode Switch 65RFE Transmission

Screen Display	1	2	3	4	5*	D
Actual Gear(s) Allowed	1	1-2	1-3	1-4	1-5	1-6

On vehicles equipped with 3.6L or 5.7L engines, use of ERS (or TOW/HAUL mode) also enables an additional underdrive gear that is not normally used during through-gear accelerations. This additional gear improves vehicle performance and cooling capability when towing a trailer on certain grades. In ERS mode, first through third gear are underdrive gears, and fourth gear is direct drive. ERS fifth gear (overdrive) is the same as the normal fourth gear.

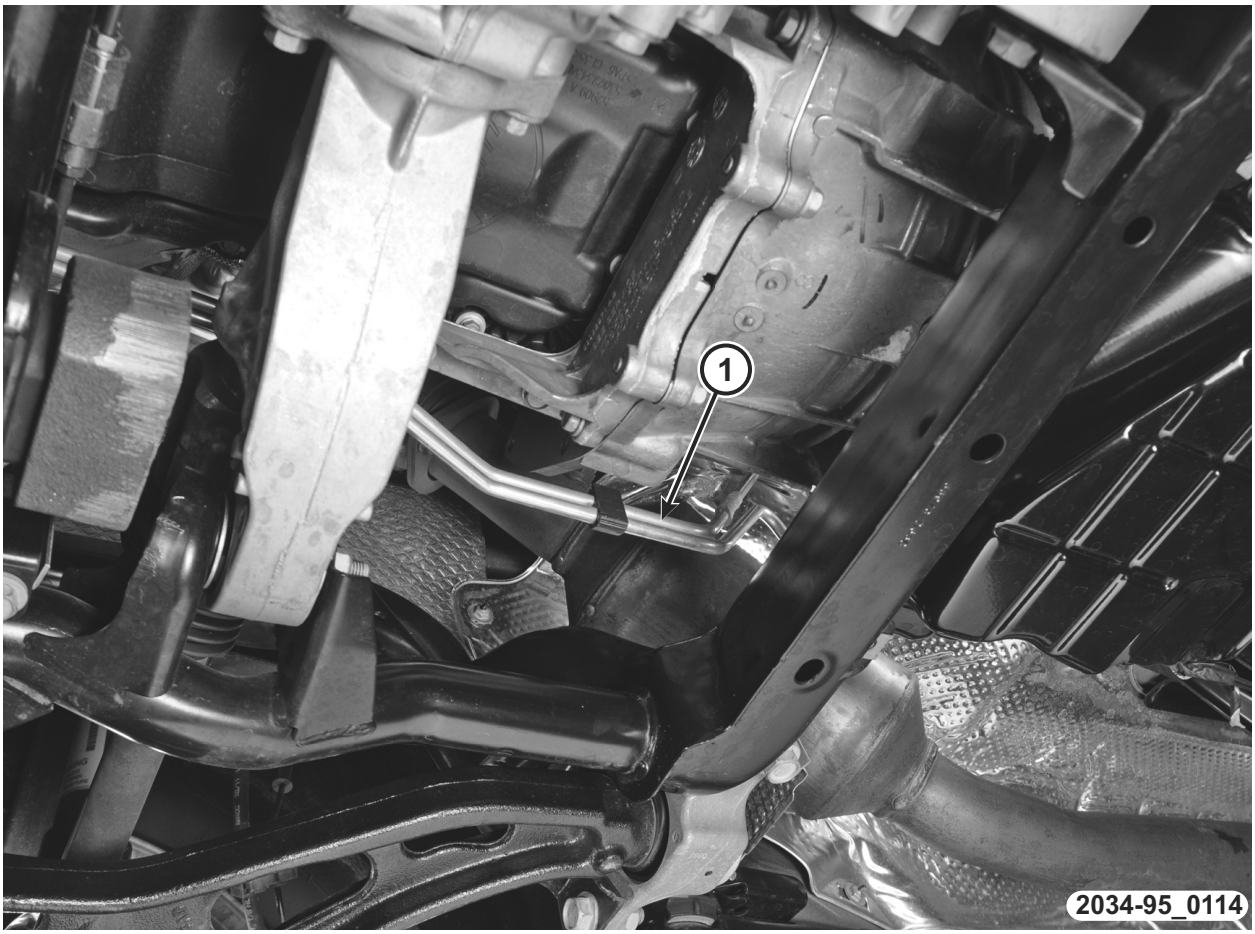
When in the drive position in first through fourth gear, the first tap down (-), will display the ERS designation for the current gear (the transmission will not downshift). For example, if you are in drive and are in third (direct) gear, when you tap the shift lever/switch one time in the (-) direction, the display will show 4 (ERS 4 is direct gear). Another tap down (-) will shift the transmission down to ERS 3 (the added underdrive gear). When in the drive position in fifth gear, the first tap down (-) will downshift the transmission and display 5 (ERS 5 is the same as normal fourth gear). Another tap down (-) will shift the transmission down to ERS 4 (direct gear).

To exit ERS mode, press and hold the shift lever/switch in the (+) position until D is once again highlighted in the instrument cluster display.

WARNING: DO NOT DOWNSHIFT FOR ADDITIONAL ENGINE BRAKING ON A SLIPPERY SURFACE. THE DRIVE WHEELS COULD LOSE THEIR GRIP AND THE VEHICLE COULD SKID.

Note: To select the proper gear position for maximum deceleration (engine braking), hold the shift lever/switch in the (-) position continuously while braking. The transmission will shift to the range from which the vehicle can best be slowed down.

Transmission Cooler



1	Transmission Cooler Lines

Figure 55 Transmission Cooler Lines

An air-to-oil transmission oil cooler is standard on all engine packages. The transmission oil cooler is mounted to the front of the radiator above the power steering cooler.

Transmission Cooler Line Fittings

Similar to other lines in the engine compartment, the transmission cooler utilizes quick connect fittings. Special tools are required to service these fittings.

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TRANSFER CASE

Integrated Transfer Case (ITC), MP2010

The integrated transfer case MP2010 (ITC) is a single-speed transfer case. It provides convenient, full-time, four-wheel drive. The transfer case operates with an open center differential dividing engine torque: 50 percent torque to the front axle and 50% of torque to the rear axle. The Brake Traction Control System, which combines standard ABS and Traction Control, provides resistance to any wheel that is slipping to allow additional torque transfer to wheels with traction.

The MP2010 single-speed transfer case provides the following benefits:

- No shift lever or driver interaction required
- Full-time, four-wheel drive provides smooth operation and vehicle stability under all conditions because torque is constantly being transferred
- Torque distribution provides traction to maintain forward motion under most conditions
- The brake traction control system (BTCS) works in tandem with full-time four-wheel drive. BTCS provides resistance to any wheel that is slipping to allow additional torque transfer to wheels with traction
- Robust design and improved sealing enhance reliability
- No maintenance required

Operation

Full-time, four-wheel drive distributes torque to all wheels under all conditions. The transfer case center differential divides torque to the front and rear axles, while also allowing the driveshafts to rotate at different speeds to account for front and rear wheels traveling different distances while turning. Given that the drive shafts can rotate at different speeds, the vehicle can remain in full-time four-wheel drive mode indefinitely — even on dry pavement — without threat of damage to the drivetrain. The vehicle uses brake traction control to modulate the torque from one wheel to another across each axle and the transfer case.

Select-Trac® II MP3023 Transfer Case

The Select-Trac® II is the MP3023 two-speed, on-demand, active, four-wheel drive transfer case that provides optimum traction for a wide range of conditions, while maximizing driver convenience. When operating in 4WD Auto mode, this sophisticated system anticipates and prevents slip by redirecting torque as necessary.

For added traction capability when traversing steep grades, rough terrain, or extremely poor traction surfaces, the transfer case includes a 4WD Low mode. This second speed gear multiplies engine torque 2.72 times and locks the clutch pack for maximum traction.

Electric shifting between 4WD AUTO and 4WD Low is activated with a console-mounted switch. A pushpin button is used to shift to Neutral mode.

The MP3023 transfer case provides the following benefits:

- On-demand, active, four-wheel drive requires no driver input
- Instantly anticipates slip and preemptively redirects torque as needed
- Vehicle stability under all conditions because torque is constantly being transferred
- 4WD Low operation mode provides an advantage over vehicles equipped with a single-speed, all-wheel drive transfer case
- A neutral mode permits flat towing

Operating Ranges

Figure 56 Transfer Case Mode Switch

Transfer case operating ranges are:

- 4WD Auto = Electronically controlled wet clutch for torque biasing
- N = Transfer case neutral for 4-wheel flat recreational towing
- 4WD Low = Low range (2.72:1) part time mode

The 4WD Low range is for off-road use only. It is not for use on hard surface roads unless the road surface is wet, slippery, or covered by ice and snow.

The low range reduction gear system is operative in 4WD Low range only. This range is for extra pulling power in off road situations. Low range reduction ratio is 2.72:1.

Active Transfer Case Controls

Controls for the MP3023 transfer case active clutch (torque biasing device) are located in the drive train control module (DTCM) and communicated on the controller area network C (CAN-C) bus. The DTCM monitors multiple vehicle sensors to anticipate conditions that may result in wheel slip or reduced performance and preemptively adjusts torque split to front and rear axles as needed. The DTCM also compares wheel speeds at the front and rear axles to detect wheel slippage. A complete vehicle dynamics model, or algorithm, calculates slip at each tire for given vehicle-operating conditions. When wheel slip is detected, pressure applied to the transfer case clutch pack can be increased or decreased to apply increased torque to the axle with higher traction.

Electric Shift Mechanism

The electronically controlled wet clutch pack uses an electric motor to actuate an internal gear train, clutch cam, and low range barrel cam. The clutch cam actuates the clutch levers that apply normal force to the multi-disc wet clutch pack. The clutch discs are alternately splined to the front and rear drive shafts. When normal force is applied to this clutch pack, torque is transferred to equalize speed differences between front and rear axles.

Transfer of torque from one wheel to the other on the same axle is accomplished by using brake traction control.

Electronic Stability Program (ESP)

Standard electronic stability program (ESP) works with the four-wheel drive system to enhance traction and control through three new features:

- Hill descent
- Hill start assist
- Trailer sway control

Identification

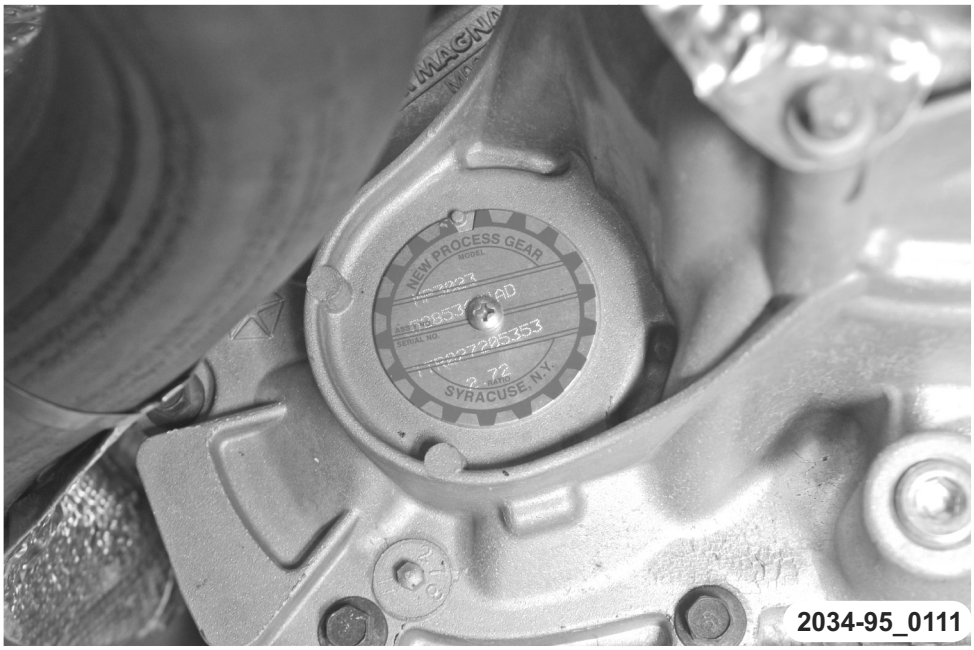

Figure 57 Transfer Case Identification

A circular ID tag (1) is attached to the rear case of each transfer case. The ID tag provides the transfer case model number, assembly number, serial number, and low range ratio.

The transfer case serial number also represents the date of build.

Service and Fluid Type

Refer to the maintenance information section of the Student Guide.

Notes: _____
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Towing the Vehicle

Table 11 Towing

Towing Condition	Wheels off the Ground	RWD Models	AWD Models
Flat Tow	None	If the transmission is operable: • Transmission in Neutral • 48 km/h (30 mph) max speed • 24 km (15 miles) max distance	See instructions in "Recreational Towing" under "Starting and Operating" • Transmission in park • Transfer case in neutral • Tow in forward direction
Wheel Lift or Dolly Tow	Front		Not Allowed
	Rear	OK	Not Allowed
Flatbed or Rollback	ALL	Best Method	Best Method

Proper towing or lifting equipment is required to prevent damage to your vehicle. Use only tow bars and other equipment designed for the purpose. Follow the equipment manufacturer's instructions. Use of safety chains is mandatory. Attach a tow bar or other towing device to main structural members of the vehicle, not to bumpers or associated brackets. State and local laws applying to vehicles under tow must be observed.

If the accessories must be used while being towed, the ignition must be in the ON/RUN position, not the ACC position.

If the vehicle's battery is discharged, see "Brake/Transmission Interlock Manual Override under Starting and Operating, Automatic Transmission" for instructions on shifting the automatic transmission out of the park position for towing.

Caution: **Do not attempt to use sling type equipment when towing. When securing the vehicle to a flat bed truck, do not attach to the front or rear suspension components. Damage to the vehicle may result from improper towing.**

If the vehicle being towed requires steering, the ignition must be in the ON/RUN or ACC position, not in the LOCK position.

Notes: _____

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Notes:

LESSON 5 CHASSIS

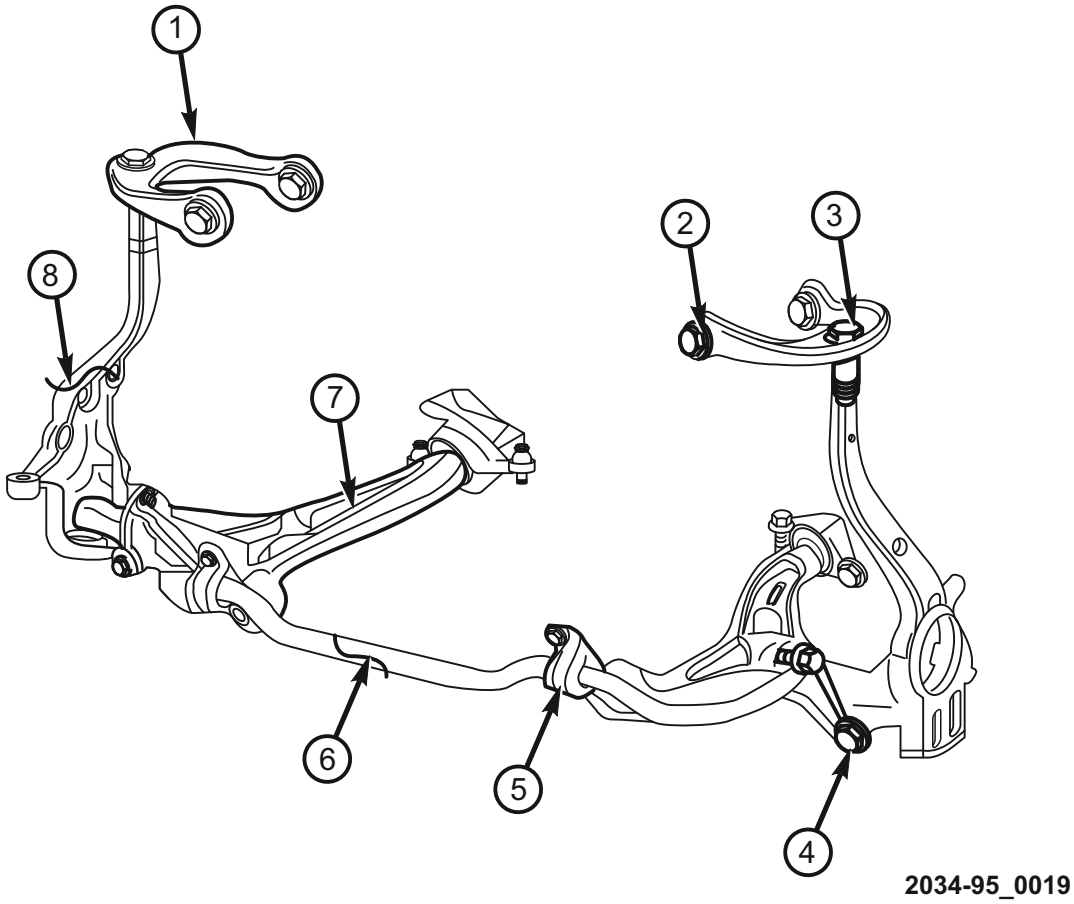
CHASSIS

Figure 58 Chassis View

The Dodge Durango SSV is built using a unibody construction. The body and frame is an integrated design. There are mounts provided for vehicle mechanical systems to be attached. Unibody construction offers structural strength while incorporating weight saving technologies.

SUSPENSION

Front Suspension

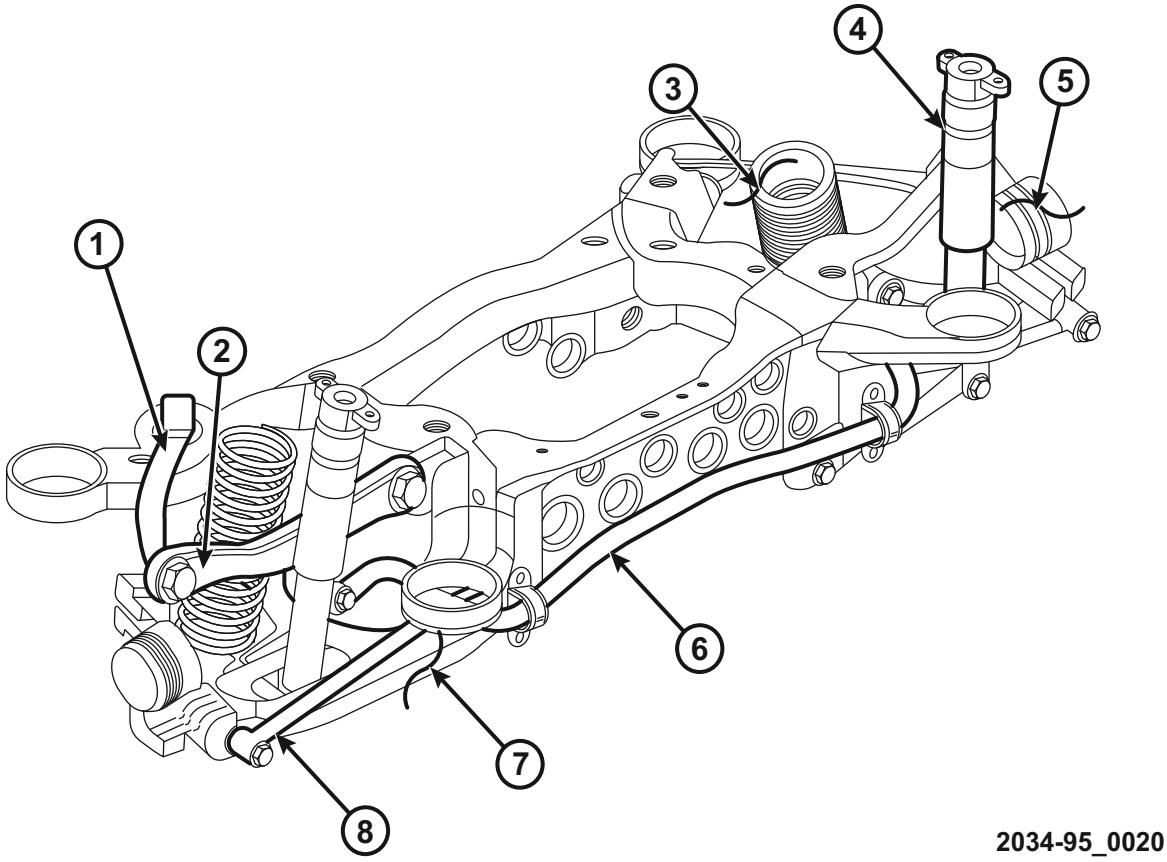


1	Steering Knuckle	5	Stabilizer Bar Retraining Bracket/ Bushings
2	Bushing	6	Stabilizer Bar
3	Ball Joint	7	Lower control Arm
4	Stabilizer Link	8	Upper Control Arm

Figure 59 Front Suspension

The front suspension is designed to allow each wheel to adapt to different road surfaces independently. The wheels are mounted to hub bearings (not shown) on the steering knuckles. The hub bearings are sealed and lubricated for life. The steering knuckles turn (pivot) on ball joints that are pressed into the outboard portion of the upper control arms and pressed into the steering knuckle for the lower control arms. The ball joints are lubricated for life. The upper and lower control arms are attached to the frame with bushings that are not serviceable. The stabilizer bar is attached to the lower control arms by a stabilizer bar link, and to the frame with stabilizer bar retaining bracket/bushings that are not serviceable.

Rear Suspension



1	Tension Links	5	Knuckles
2	Camber Links	6	Stabilizer Bar with Links
3	Coil Springs	7	Lower Control Arms
4	Shock Absorbers	8	Toe Links

Figure 60 Rear Suspension

The rear suspension is an independent suspension system.

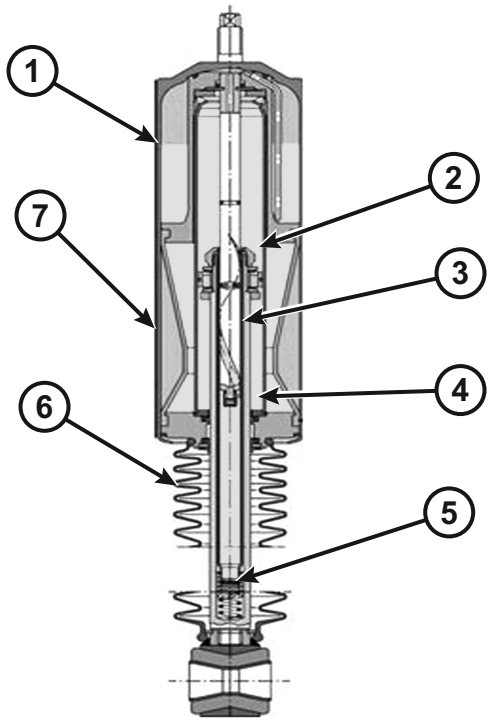
The rear suspension is comprised of :

- Camber links
- Coil springs
- Knuckles
- Lower control arms
- Shock absorbers
- Stabilizer bar with links
- Tension links
- Toe links

Like the front suspension, the rear suspension is designed to allow each wheel to adapt to different road surfaces independently. The wheels are mounted to hub bearings (not shown) on knuckles. The hub bearings are sealed and lubricated for life. The suspension joints are also lubricated for life. The upper and lower control arms are attached to a cradle assembly that is then bolted to the frame with bushings that are not serviceable. The stabilizer bar is attached to the lower control arms by a stabilizer bar link, and to the frame with stabilizer bar retaining bracket/bushings that are not serviceable.

CAUTION: Suspension components with rubber/urethane bushings should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. This will maintain vehicle ride comfort and prevent premature bushing wear.

NIVOMAT Shock Absorber



1	Low Pressure Reservoir	5	Pump
2	Release Bore	6	Control Sleeve
3	Spiral Cut Pump Rod	7	High Pressure Accumulator
4	Inlet Valve		

Figure 61 Nivomat Shock

NIVOMAT shock absorber is standard equipment on the Dodge Durango SSV rear suspension.

The load-leveling units are self-contained, gas pressurized, maintenance-free shock absorbers that automatically level the vehicle to the proper position. They maintain normal ride height whether the vehicle is driven over normal streets or uneven road surfaces. The load leveling units also level the vehicle to within 25.4 mm (1 in.) below curb height when weight is added to the rear of the vehicle. If the vehicle is allowed to sit for an extended period of time, the vehicle will settle. After the vehicle is driven, the vehicle will return to the correct ride height.

On the outside, the load-leveling unit looks like a slightly larger version of the standard shock absorber. Because of its additional stiffness, the load leveling unit is matched with a spring lighter than the standard spring.

Because the Nivomat shock is mechanical, the vehicle must be moving before the pump starts to work; and it takes about a mile to a mile-and-a-half of travel before the vehicle reaches its optimal level point. It takes very little input to actuate the pump. Even on smooth roads, the Nivomat shock pumps up quickly.

The Nivomat system does not just level the vehicle under load. As the load increases, the pressure inside the shock increases as oil is displaced from the reservoir to the inside of the unit. This action causes the gas in the shock to compress. This creates a progressive increase in spring rate and damping with little or no change to ride frequency.

The top of the shock absorbers attach to a mounting bracket that is bolted to the body. The bottom of the shocks are bolted to the lower control arm. The shock can be serviced either as a complete assembly (including bracket) or the shock itself. The mounting bracket and the dust shield can also be serviced individually. The shock assembly must be removed from the vehicle to service the individual components.

TIRES AND WHEELS

Tires

Tires are designed and engineered to specific vehicles and applications. They provide the best overall performance for normal operation. The ride and handling characteristics match the vehicle's requirements. With proper care, they give excellent reliability, traction, skid resistance, and tread life.

Driving habits have more effect on tire life than any other factor. Careful drivers will obtain, in most cases, much greater mileage than severe use or careless drivers. A few of the driving habits that will shorten the life of any tire are:

- Rapid acceleration
- Severe brake applications
- High-speed driving
- Excessive speeds on turns
- Striking curbs and other obstacles

Tire Rotation

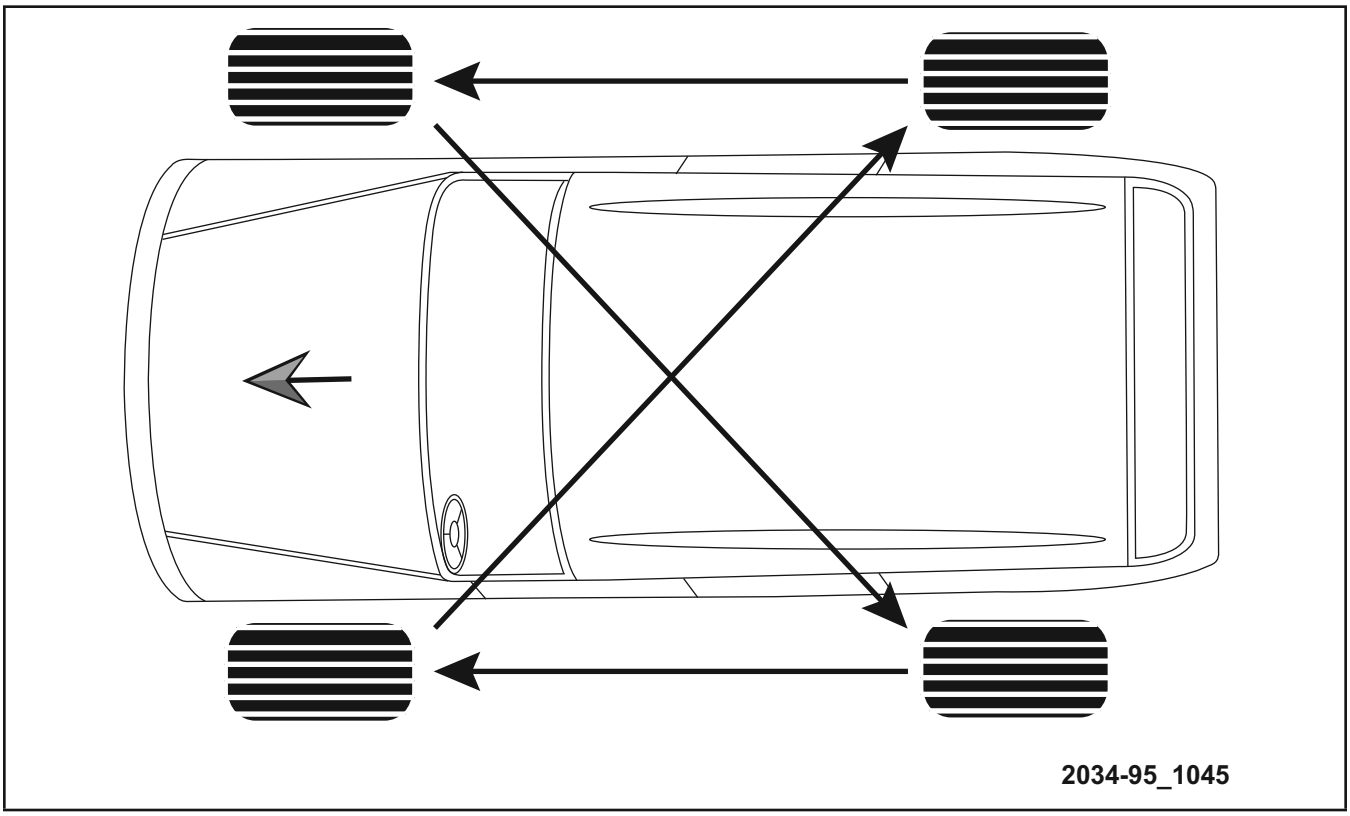


Figure 62 Tire Rotation

Tires on the front and rear axles of vehicles operate at different loads and perform different steering, driving, and braking functions. For these reasons, they wear at unequal rates.

These effects can be reduced by timely rotation of tires. The benefits of rotation are especially worthwhile with aggressive tread designs such as those on all-season type tires. Rotation will increase tread life; help to maintain mud, snow, and wet traction levels; and contribute to a smooth, quiet ride.

Refer to the maintenance schedule for the proper maintenance intervals. More frequent rotation is permissible if desired. The reasons for any rapid or unusual wear should be corrected prior to rotation being performed.

The suggested rotation method is the forward cross shown in the above diagram. This rotation pattern does not apply to some directional tires that must not be reversed.

Notes: _____
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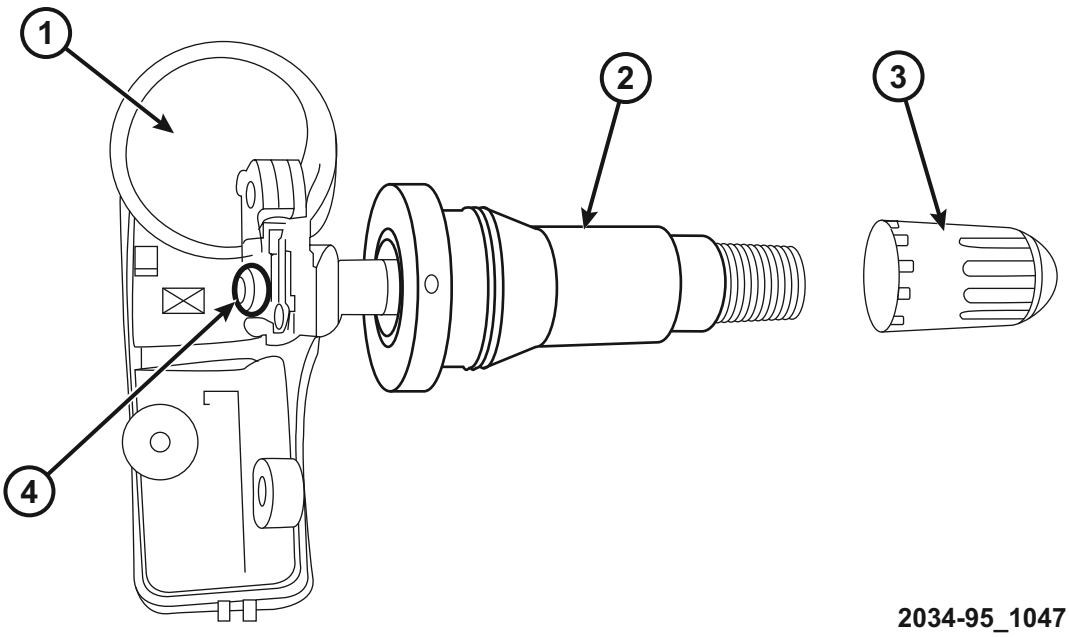
Tire Pressure Monitor System



1	Sensor Module	3	Dust Cap
2	Valve Stem	4	Screw

Figure 63 Tire Pressure Sensor

The Dodge Durango SSV uses a tire pressure monitor system.

The TPM system consists of tire pressure monitoring sensors attached to each road wheel (and spare if equipped with a sensor) valve stem, a central receiver module, an indicator lamp, and (on some applications) a light load switch located on the instrument panel center stack. The valve stem used on this system is redesigned to look similar to a standard valve stem. The Dodge SSV uses the wireless ignition node (WIN) as the central receiver module.

Tire Identification

Tire type, size, aspect ratio, and speed rating are encoded in the letters and numbers imprinted on the side wall of the tire. Performance tires have a speed rating letter after the aspect ratio number. The speed rating is not always printed on the tire sidewall.

These ratings are:

- Q - up to 99 mph
- S - up to 112 mph
- T - up to 118 mph
- U - up to 124 mph
- H - up to 130 mph
- V - up to 149 mph
- W - (consult the tire manufacturer for the specific speed rating)
- Z - more than 149 mph (consult the tire manufacturer for the specific speed rating)

An all-season tire will have either M + S, M AND S, or M–S (indicating mud and snow traction) imprinted on the side wall.

Metric Tire Sizes

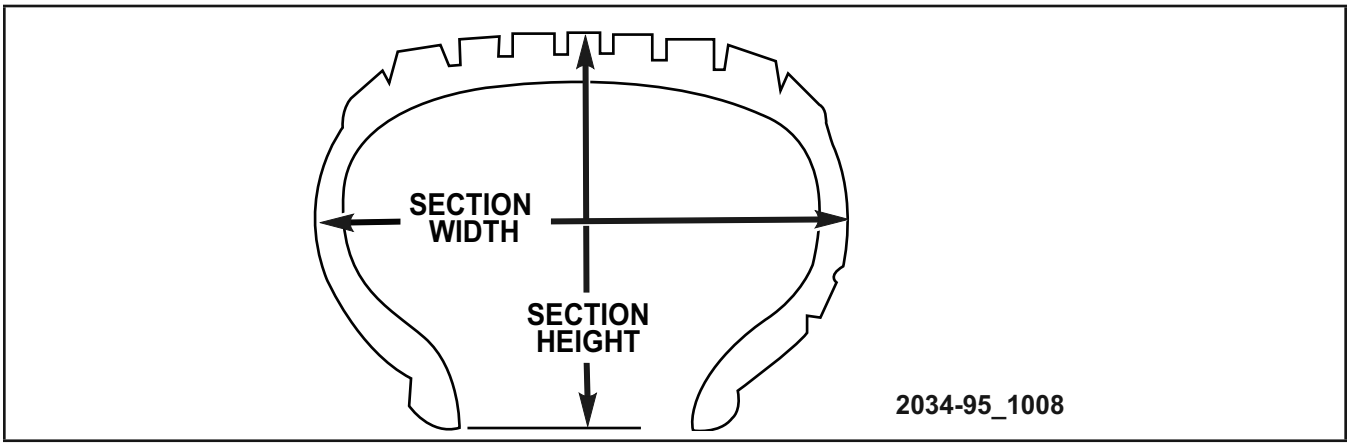


Figure 64 Tire Cross-section

Table 12 Tire Side Wall Breakdown

Tire Type	Section Width (Millimeters)	Aspect Ratio	Construction Type	Rim Diameter
P - Passenger	185	65	R - Radial	13
T - Temporary	195	70	B - Bias Belted	14
C - Commercial	205	75	D - Diagonal (Bias)	15
LT - Light Truck	ETC.	80		16

Replacement Tires

The original equipment tires provide a proper balance of many characteristics such as:

- Ride
- Noise
- Handling
- Durability
- Tread life
- Traction
- Rolling resistance
- Speed capability

Speedometer Certification

It is recommended that tires equivalent to the original equipment tires be used when replacement is needed.

Note: The Dodge Durango Special Services Vehicle is equipped with a certified speedometer. The vehicle is delivered with a letter of certification for the speedometer. This certification is valid based on the vehicle maintaining original equipment tires. Modifying or changing the tires to non-original equipment will take the vehicle speedometer out of certification.

Failure to use equivalent replacement tires may adversely affect the safety and handling of the vehicle.

The use of oversize tires may cause interference with vehicle components. Under extremes of suspension and steering travel, interference with vehicle components may cause tire damage.

WARNING:	**FAILURE TO EQUIP THE VEHICLE WITH TIRES HAVING ADEQUATE SPEED CAPABILITY CAN RESULT IN SUDDEN TIRE FAILURE.**

Snow Tires

Some areas of the country require the use of snow tires during the winter. All season tires can be identified by the M+S designation on the tire sidewall.

If you need snow tires, select tires equivalent in size and type to the original equipment tires. Use snow tires only in sets of four; failure to do so may adversely affect the safety and handling of your vehicle.

Snow tires generally have lower speed ratings than what was originally equipped with your vehicle and should not be operated at sustained speeds over 120 km/h (75 mph). For speeds above 120 km/h (75 mph) refer to original equipment or an authorized tire dealer for recommended safe operating speeds and loading and cold tire inflation pressures.

While studded tires improve performance on ice, skid and traction capability on wet or dry surfaces may be poorer than that of non-studded tires. Some states prohibit studded tires; therefore, local laws should be checked before using these tire types.

Tire Chains

Use Class S chains, or other traction aids that meet SAE Type S specifications.

Note: Chains must be the proper size for the vehicle as recommended by the chain manufacturer.

Caution: To avoid damage to your vehicle, tires, or chains, observe the following precautions:

Because of limited chain clearance between tires and other suspension components, it is important that only chains in good condition are used. Broken chains can cause serious vehicle damage. Stop the vehicle immediately if noise occurs that could suggest chain breakage. Remove the damaged parts of the chain before further use.

Install chains as tightly as possible and then retighten after driving about 0.8 km (0.5 miles).

Do not exceed 72 km/h (45 mph).

Drive cautiously and avoid severe turns and large bumps, especially with a loaded vehicle.

Do not install tire chains on the front wheels of 4x2 vehicles.

Do not drive for a prolonged periods on dry pavement.

Observe the tire chain manufacturer's instructions on method of installation, operating speed, and conditions for usage. Always use the lower suggested operating speed of the chain manufacturer if different than the speed recommended by the manufacturer.

These cautions apply to all chain traction devices, including link and cable (radial) chains.

Note: **On 4x2 and 4x4 Durango model trucks, the use of Class S snow chains is permitted on the rear wheels of trucks equipped with P265/70R17 tires only.**

Caution: **Do not use tire chains on the front wheels of any model except for 3500 dual rear wheel (DRW) trucks equipped with LT235/80R17E tires. There may not be adequate clearance for the chains and you are risking structural or body damage to your vehicle. Do not use tire chains on the rear wheels of Durango model trucks equipped with LT275/70R17, P275/60R20, or 285/45R22 tires. There may not be adequate clearance for the chains and you are risking structural or body damage to your vehicle.**

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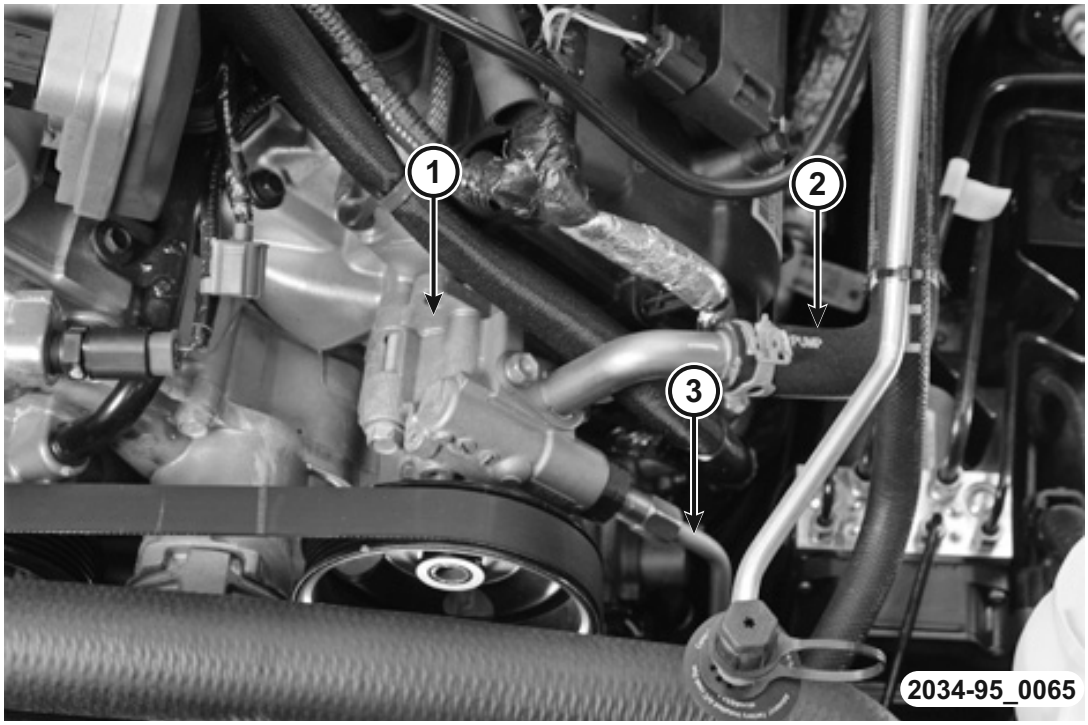
STEERING



1	Pump	2	Supply Hose
3	Pressure Line		

Figure 65 Non-EHPS Steering Pump

Without EHPS Description

Hydraulic pressure for the power steering system is provided by a belt driven power steering pump. The pump shaft has a pressed-on drive pulley that is belt driven by the crankshaft pulley. The system uses a remote power steering reservoir mounted to a bracket near the air cleaner.

CAUTION: There is an electro-hydraulic power steering (EHPS) pump on some vehicles requiring a different fluid. Do not mix power steering fluid types. Damage may result to the power steering pump and system if any other fluid is used. The mechanical power steering pump systems on this vehicle require the use of Power Steering Fluid +4, which meets material specification MS-9602 or equivalent. The EHPS system uses fluid which meets material specification MS-11655 or equivalent. Do not overfill.

The belt driven power steering systems consist of:

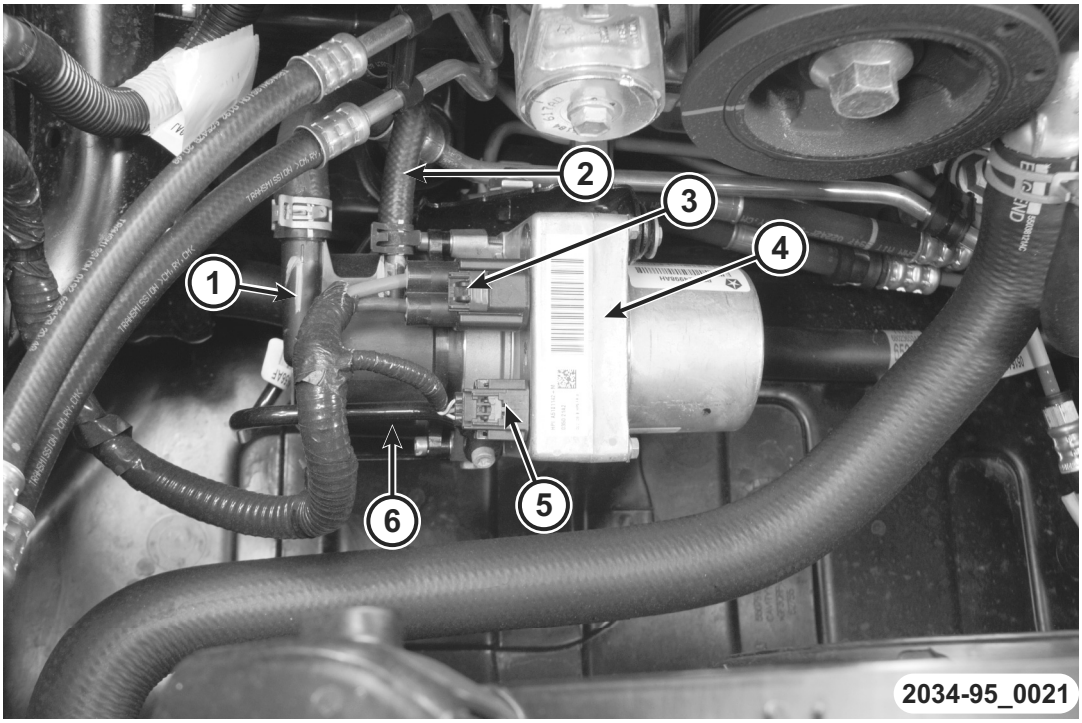
- Steering column and intermediate shaft
- Rack and pinion steering gear
- Hydraulic power steering pump
- Pump pressure and return hoses
- Remote power steering reservoir
- Oil cooler

Operation

The power steering pump is a constant flow rate and displacement, vane-type pump. The pump internal parts operate submerged in fluid. The flow control orifice is part of the high-pressure line fitting. The pressure relief valve inside the flow control valve limits the pump pressure. The reservoir is remote and is attached to the body behind the engine air cleaner body. The power steering pump is connected to the steering gear by the pressure and return hoses.

NOTE: Power steering pumps have different pressure rates and are not interchangeable with other pumps.

With EHPS Description



1	Pump Return Line Assembly	4	EHPS Pump
2	Pump Supply Line Assembly	5	Electrical Connector
3	Electrical Connector	6	Pump Pressure Line Assembly

Figure 66 Electro-hydraulic Power Steering (EHPS) Pump

CAUTION: There is an electro-hydraulic power steering (EHPS) pump on some vehicles requiring a different fluid. Do not mix power steering fluid types. Damage may result to the power steering pump and system if any other fluid is used. The mechanical power steering pump systems on this vehicle require the use of Power Steering Fluid +4, which meets material specification MS-9602 or equivalent. The EHPS system uses fluid which meets material specification MS-11655 or equivalent. Do not overfill.

The EHPS system consists of:

- Steering column and intermediate shaft
- Rack and pinion steering gear
- EHPS pump
- Pump pressure and supply/return line assembly
- Remote power steering reservoir (the EHPS reservoir has only one hose connection)

Note: Some early built vehicles with EHPS do not have a power steering system cooler affecting the power steering line/hose configuration.

Power assist is provided by the EHPS pump mounted to the cradle in front of the engine. The EHPS pump is an electrically operated hydraulic pump that supplies variable hydraulic fluid flow and pressure to the steering gear. The EHPS pump replaces the conventional belted power steering pump. The EHPS pump has an EHPS module attached (not replaceable separately). There are two electrical connectors on the EHPS pump assembly. One connector is a 12V low amperage module connector, and the other is a 12V higher amperage pump connector containing a larger gauge wire for motor operation. The power steering hoses and steering gear are substantially unchanged in function from a conventional system. However, there are unique components for this system, such as hoses for routing and the gear for valve tuning.

Operation With EHPS

Multiple modules work together to improve vehicle steering assist at different rates at different speeds. At slow speeds (parking maneuvers), more assist is available. At high speeds, less assist is available. The EHPS module uses the CAN-C data bus for inputs and outputs of the information necessary for operation. The use of a scan tool is necessary for diagnostics. EHPS module faults are stored in a diagnostic program memory and are accessible with the scan tool. Faults remain in memory until cleared, or until after the vehicle is started approximately 50 times. Stored faults are not erased if the battery is disconnected. For descriptions and procedures related to DTCs. The electro-hydraulic power steering (EHPS) pump assembly contains a control module, brushless electric motor, and hydraulic pump integrated into a single unit. The EHPS pump draws power from the 12-volt electrical system and provides the necessary flow and pressure to the steering gear to provide normal power steering. The output flow of the EHPS pump is varied as a function of steering wheel rate (received from the SAS) and vehicle speed (received from the ABS module) in order to provide the optimum flow of power steering fluid to the steering gear under all operating conditions. The EHPS Pump will start to provide steering assist when the Vehicle speed message greater than 5 km/h (3 mph) is received on CAN-C. If the vehicle speed message is missing at vehicle startup, the EHPS Pump will not operate. If the vehicle speed message is lost during operation the EHPS pump will use a default vehicle speed of 85 km/h (59 mph) to calculate desired flow; as a result, steering effort will no longer be speed sensitive. If the steering wheel position message is lost, the EHPS pump will use a default steering wheel rate of 230 degrees per second of rotation to calculate desired flow; as a result, steering effort may be higher on evasive steering maneuvers. The EHPS pump will resume normal operation automatically after any missing message or out of range condition noted above is restored to normal.

Power Steering Reservoir

Figure 67 Power Steering Reservoir

The Dodge Durango SSV utilizes a common power steering reservoir that is located on the driver's side engine compartment inner fender.

Fuel System

The lines, tubes, and hoses used on fuel injected vehicles are of a special construction. This is due to the higher fuel pressures and the possibility of contaminated fuel in this system. If it is necessary to replace these lines, tubes, and hoses, only those marked EFM/EFI may be used.

If equipped, the hose clamps used to secure rubber hoses on fuel injected vehicles are of a special rolled edge construction. This construction is used to prevent the edge of the clamp from cutting into the hose. Only these rolled edge type clamps may be used in this system. All other types of clamps may cut into the hoses and cause high-pressure fuel leaks.

Use new, original equipment type hose clamps.

WARNING:	**THE FUEL SYSTEM MAY BE UNDER A CONSTANT PRESSURE (EVEN WITH THE ENGINE OFF). BEFORE SERVICING ANY FUEL SYSTEM HOSES, FITTINGS, LINES, OR MOST COMPONENTS, FUEL SYSTEM PRESSURE MUST BE RELEASED. REFER TO THE FUEL SYSTEM PRESSURE RELEASE PROCEDURE.**

E-85 General Information

Figure 68 E-85 Fuel Cap

Caution: Only vehicles with the E-85 fuel filler door label can operate on E-85.

Ethanol Fuel (E-85)

The information in this section is for flexible fuel vehicles only. These vehicles can be identified by a unique fuel filler door label that states Ethanol (E-85) or Unleaded Gasoline Only. This section only covers those subjects that are unique to these vehicles. Please refer to the other sections of this manual for information on features that are common between flexible fuel and gasoline-only powered vehicles.

E-85 is a mixture of approximately 85% fuel ethanol and 15% unleaded gasoline.

WARNING: ETHANOL VAPORS ARE EXTREMELY FLAMMABLE AND COULD CAUSE SERIOUS PERSONAL INJURY. NEVER HAVE ANY SMOKING MATERIALS LIT IN OR NEAR THE VEHICLE WHEN REMOVING THE FUEL FILLER TUBE CAP (GAS CAP) OR FILLING THE TANK. DO NOT USE E-85 AS A CLEANING AGENT AND NEVER USE IT NEAR AN OPEN FLAME.

Fuel Requirements

Your vehicle will operate on both unleaded gasoline with an octane rating of 87, or E-85 fuel, or any mixture of these two. For best results, a refueling pattern that alternates between E-85 and unleaded gasoline should be avoided.

When switching fuel types:

- Do not switch when the fuel gauge indicates less than 1/4 full
- Do not add less than 19 liters (5 gallons) when refueling
- Operate the vehicle immediately after refueling for a period of at least 5 minutes

Observing these precautions will avoid possible hard starting and/or significant deterioration in drivability during warm up.

Note: When the ambient temperature is above 32°C (90° F), you may experience hard starting and rough idle following start up even if the above recommendations are followed.

Some additives used in regular gasoline are not fully compatible with E-85 and may form deposits in your engine. To eliminate drivability issues that may be caused by these deposits, a supplemental gasoline additive, such as MOPAR® Injector Cleanup or Techron may be used.

Engine Oil for Flexible Fuel Vehicles (E-85) and Gasoline Vehicles

FFV vehicles operated on E-85 require specially formulated engine oils. These special requirements are included in MOPAR® engine oils, and in equivalent oils meeting Chrysler Specification MS-6395. The manufacturer requires engine oils that are API certified and meet the requirements of Material Standard MS-6395. MS-6395 contains additional requirements, developed during extensive fleet testing, to provide additional protection to Chrysler Group LLC engines. Use MOPAR® or an equivalent oil meeting the specification MS-6395.

Starting

The characteristics of E-85 fuel make it unsuitable for use when ambient temperatures fall below -18°C (0°F). In the range of -18°C (0°F) to 0°C (32°F), you may experience an increase in the time it takes for your engine to start, and a deterioration in drivability (sags and/or hesitations) until the engine is fully warmed up.

Note: Use of the engine block heater (if equipped) is beneficial for E-85 starting when the ambient temperature is less than 0°C (32°F).

Cruising Range

Because E-85 fuel contains less energy per gallon/liter than gasoline, you will experience an increase in fuel consumption. You can expect your miles per gallon (mpg)/miles per liter and your driving range to decrease by about 30%, compared to gasoline operation.

Replacement Parts

Many components in your flexible fuel vehicle (FFV) are designed to be compatible with ethanol. Always be sure that your vehicle is serviced with correct ethanol compatible parts.

Caution: Replacing fuel system components with non-ethanol compatible components can damage your vehicle.

Caution: Do not use ethanol mixture greater than 85% in your vehicle. It will cause difficulty in cold starting and may affect drivability.

Notes:

LESSON 6 ELECTRICAL

BATTERY

Figure 69 Battery

The AGM battery is located under the passenger seat. A breather line runs from the battery through the bottom of the recess well to the outside of the vehicle.

The battery negative cable is attached to the outboard side of the battery compartment.

The AGM battery is located and removed in the same manner as the standard battery for the appropriate starter battery removal procedure.

WARNING: VEHICLES EQUIPPED WITH THE AGM STARTER BATTERY UTILIZE A UNIQUE ABSORBENT GLASS MAT BATTERY DESIGN. THIS BATTERY HAS A MAXIMUM CHARGING VOLTAGE THAT MUST NOT BE EXCEEDED IN ORDER TO RESTORE THE BATTERY TO ITS FULL POTENTIAL, FAILURE TO USE THE FOLLOWING AGM BATTERY CHARGING PROCEDURE COULD RESULT IN DAMAGE TO THE BATTERY OR PERSONAL INJURY.

Specifications

The battery group size number, the cold cranking amperage (CCA) rating, and the reserve capacity (RC) rating or ampere-hours (AH) rating can be found on the original equipment battery label. Be certain that a replacement battery has the correct group size number, as well as CCA, and RC or AH ratings that equal or exceed the original equipment specification for the vehicle being serviced. Battery sizes and ratings are discussed in more detail below.

Group Size

The outside dimensions and terminal placement of the battery conform to standards established by the Battery Council International (BCI). Each battery is assigned a BCI Group Size number to help identify a correctly-sized replacement.

Cold Cranking Amperage

The cold cranking amperage (CCA) rating specifies how much current (in amperes) the battery can deliver for 30 seconds at -18°C (0°F). Terminal voltage must not fall below 7.2 volts during or after the 30-second discharge period. The CCA required is generally higher as engine displacement increases, depending also upon the starter current draw requirements.

Reserve Capacity

The reserve capacity (RC) rating specifies the time (in minutes) it takes for battery terminal voltage to fall below 10.5 volts, at a discharge rate of 25 amperes. RC is determined with the battery fully-charged at 26.7°C (80°F). This rating estimates how long the battery might last after a charging system failure, under minimum electrical load.

Ampere-Hours

The ampere-hours (AH) rating specifies the current (in amperes) that a battery can deliver steadily for 20 hours, with the voltage in the battery not falling below 10.5 volts. This rating is also sometimes identified as the 20-hour discharge rating.

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Open-Circuit Voltage Test

A battery open-circuit voltage (no load) test will show the approximate state-of-charge of a battery.

Before proceeding with this test, completely charge the battery, refer to the appropriate battery charging procedure.

Before measuring the open-circuit voltage, the surface charge must be removed from the battery. Turn on the head lamps for 15 seconds, then allow up to 5 minutes for the battery voltage to stabilize.

Disconnect and isolate both battery cables, negative cable first.

Using a voltmeter connected to the battery posts (see the instructions provided by the manufacturer of the voltmeter), measure the open-circuit voltage.

See the Open-Circuit Voltage Table. This voltage reading will indicate the battery state-of-charge, but will not reveal its cranking capacity. If a battery has an open-circuit voltage reading of 12.4 volts or greater, it may be load tested to reveal its cranking capacity.

Table 13 Open Circuit Voltage Table

Open Circuit Voltage	Charge Percentage
11.7 volts or less	0%
12.0 volts	25%
12.2 volts	50%
12.4 volts	75%
12.6 volts or more	100%

Notes: _____
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WARNING: IF THE BATTERY SHOWS SIGNS OF FREEZING, LEAKING, LOOSE POSTS OR LOW ELECTROLYTE LEVEL, DO NOT TEST, ASSIST-BOOST, OR CHARGE. THE BATTERY MAY ARC INTERNALLY AND EXPLODE. PERSONAL INJURY AND/OR VEHICLE DAMAGE MAY RESULT.

WARNING: EXPLOSIVE HYDROGEN GAS FORMS IN AND AROUND THE BATTERY. DO NOT SMOKE, USE FLAME, OR CREATE SPARKS NEAR THE BATTERY. PERSONAL INJURY AND/OR VEHICLE DAMAGE MAY RESULT.

WARNING: THE BATTERY CONTAINS CORROSIVE MATERIALS. AVOID CONTACT WITH THE SKIN, EYES, OR CLOTHING. IN THE EVENT OF CONTACT, FLUSH WITH WATER AND CALL A PHYSICIAN IMMEDIATELY. KEEP OUT OF THE REACH OF CHILDREN.

CAUTION: Always disconnect and isolate the battery negative cable before charging a battery. Charge the battery directly at the battery terminals. Do not exceed 14.4 volts while charging a battery.

CAUTION: The battery should not be hot to the touch. If the battery feels hot to the touch, turn off the charger and let the battery cool before continuing the charging operation. Damage to the battery may result.

After the battery has been charged to 12.6 volts or greater, perform a load test to determine the battery cranking capacity. If the battery passes a load test, return the battery to service. If the battery fails a load test, it is faulty and must be replaced.

Clean and inspect the battery hold downs, well, terminals, posts, and top before completing battery service.

Charging a Completely Discharged Battery

The following procedure should be used to recharge a completely discharged battery. Unless this procedure is properly followed, a good battery may be needlessly replaced.

Measure the voltage at the battery posts with a voltmeter, accurate to 1/10 (0.10) volt. If the reading is below ten volts, the battery charging current will be low. It could take several hours before the battery accepts a current greater than a few milliamperes. Such low current may not be detectable on the ammeters built into many battery chargers.

Disconnect and isolate the battery negative cable.

NOTE: Some battery chargers are equipped with polarity-sensing circuitry. This circuitry protects the battery charger and the battery from being damaged if they are improperly connected. If the battery state-of-charge is too low for the polarity-sensing circuitry to detect, the battery charger will not operate. This makes it appear that the battery will not accept charging current. See the instructions provided by the manufacturer of the battery charger for details on how to bypass the polarity-sensing circuitry.

WARNING: NEVER EXCEED 14.4 VOLTS WHEN CHARGING THE ABSORBENT GLASS MAT (AGM) STARTER BATTERY. PERSONAL INJURY AND/OR BATTERY DAMAGE MAY RESULT.

Battery chargers vary in the amount of voltage and current they provide. The amount of time required for a battery to accept measurable charging current at various voltages is shown in the Charge Rate Table. If the charging current is still not measurable at the end of the charging time, the battery is faulty and must be replaced. If the charging current is measurable during the charging time, the battery may be good and the charging should be completed in the normal manner.

Table 14 Battery Charge Rate Table

Voltage	Time in Minutes
14.4 volts maximum	Up to 10 minutes
13.0 to 14.0 volts	Up to 20 minutes
12.9 volts or less	Up to 30 minutes

Charging Time Required

The time required to charge a battery will vary, depending upon the following factors:

- Battery Capacity - A completely discharged heavy-duty battery requires twice the charging time of a small capacity battery
- Temperature - A longer time will be needed to charge a battery at -18°C (0°F) than at 27°C (80°F); when a fast battery charger is connected to a cold battery, the current accepted by the battery will be very low at first; as the battery warms, it will accept a higher charging current rate (amperage)
- Charger Capacity - A battery charger that supplies only five amperes will require a longer charging time; a battery charger that supplies eight amperes will require a shorter charging time
- State-of-Charge - A completely discharged battery requires more charging time than a partially discharged battery; electrolyte is nearly pure water in a completely discharged battery; at first, the charging current (amperage) will be low; as the battery charges, the specific gravity of the electrolyte will gradually rise

Table 15 Battery Charging Time Table

Charging Amperage	**5 Amps**	**8 Amps**
Open Circuit Voltage	**Hours Charging @ 21°C (70°F)**	
12.25 to 12.49	6 hours	3 hours
12.00 to 12.24	10 hours	5 hours
10.00 to 11.99	14 hours	7 hours
Below 10.00	18 hours	9 hours

The Battery Charging Time Table gives an indication of the time required to charge a typical battery at room temperature based upon the battery state-of-charge and the charger capacity.

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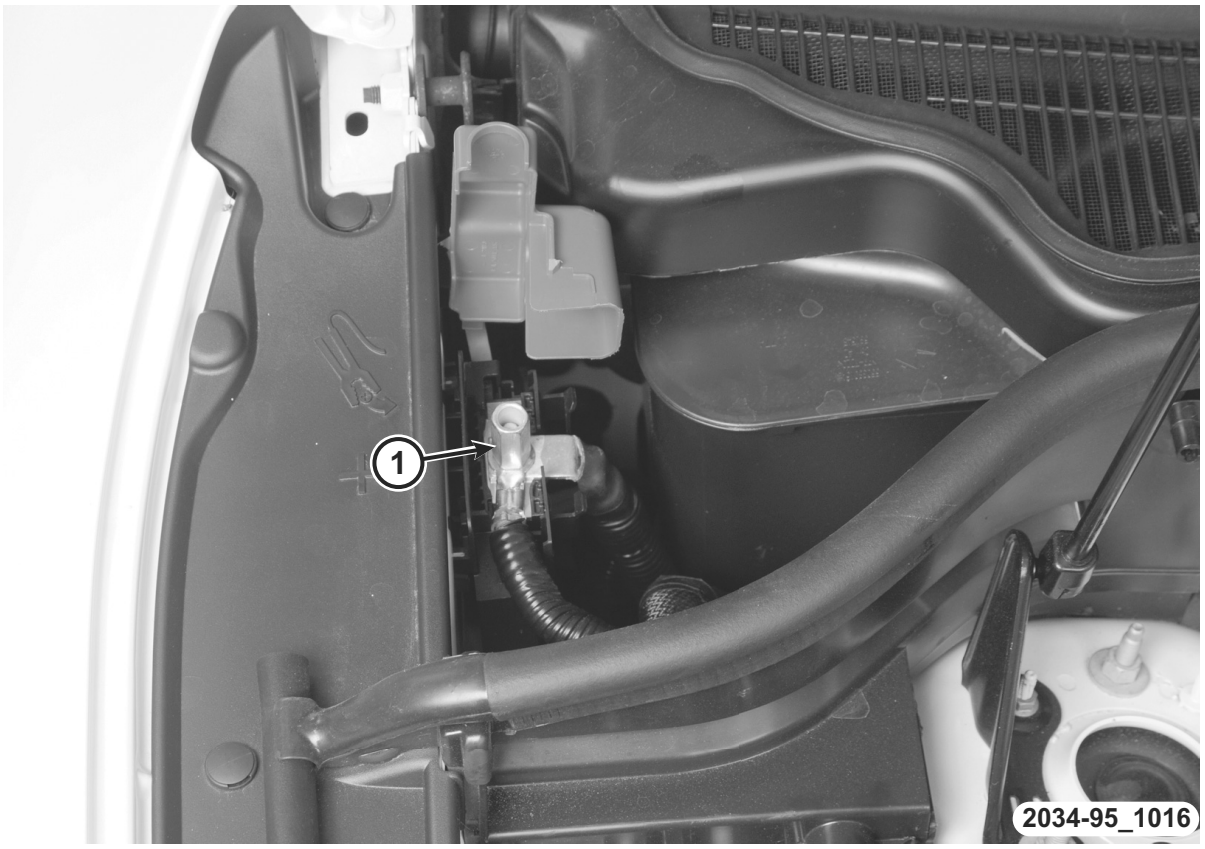
JUMP STARTING



1	Remote Positive Battery Terminal

Figure 70 Remote Positive Battery Terminal

On the disabled vehicle, remove the battery compartment lid from under the passenger seat and inspect the battery.

- Inspect the battery cable terminal clamps for damage. Replace any battery cable that has a damaged or deformed terminal clamp.
- Inspect the battery tray and battery hold down hardware for damage. Replace any damaged parts.
- Slide the thermal guard off of the battery case, if equipped. Inspect the battery case for cracks or other damage that could result in electrolyte leaks. Also, check the battery terminal posts for looseness. Batteries with damaged cases or loose terminal posts must be replaced.

- Inspect the battery thermal guard for tears, cracks, deformation, or other damage. Replace any battery thermal guard that has been damaged.
- Inspect the battery built-in test indicator sight glass (if equipped) for an indication of the battery condition. If the battery is discharged, charge as required.

WARNING: REVIEW ALL SAFETY PRECAUTIONS AND WARNINGS IN THE BATTERY SYSTEM SECTION OF THE SERVICE MANUAL.

DO NOT JUMP START A FROZEN BATTERY, PERSONAL INJURY CAN RESULT.

IF EQUIPPED, DO NOT JUMP START WHEN MAINTENANCE FREE BATTERY INDICATOR DOT IS YELLOW OR BRIGHT COLOR.

DO NOT JUMP START A VEHICLE WHEN THE BATTERY FLUID IS BELOW THE TOP OF LEAD PLATES.

DO NOT ALLOW JUMPER CABLE CLAMPS TO TOUCH EACH OTHER WHEN CONNECTED TO A BOOSTER SOURCE.

DO NOT USE OPEN FLAME NEAR BATTERY.

REMOVE METALLIC JEWELRY WORN ON HANDS OR WRISTS TO AVOID INJURY BY ACCIDENTAL ARCING OF BATTERY CURRENT.

WHEN USING A HIGH OUTPUT BOOSTING DEVICE, DO NOT ALLOW BATTERY VOLTAGE TO EXCEED 16 VOLTS. REFER TO INSTRUCTIONS PROVIDED WITH DEVICE BEING USED.

FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY OR DEATH.

Caution: When using another vehicle as a booster, do not allow vehicles to touch. Electrical systems can be damaged on either vehicle.

Raise the hood on the disabled vehicle and visually inspect the engine compartment for generator drive belt condition and tension.

Caution: If the cause of starting problem on disabled vehicle is severe, damage to the booster vehicle charging system can result.

When using another vehicle as a booster source, park the booster vehicle within cable reach. Turn off all accessories, set the parking brake, place the automatic transmission in park or the manual transmission in neutral and turn the ignition OFF.

On disabled vehicle, place gear selector in park or neutral and set park brake. Turn off all accessories.

Connect jumper cables to booster battery; RED clamp to positive terminal (+). BLACK clamp to negative terminal (-). DO NOT allow clamps at opposite end of cables to touch, electrical arc will result. Review all warnings in this procedure.

Caution: It is very important not to use the B+ connection at the TIPM when jump starting the vehicle. The 150-amp fuse in the fuse block that feeds the TIPM will blow. Use only the positive jump post (3) that is located in the wiper plenum on the right hand side of the vehicle.

On the disabled vehicle, pull up and remove the protective cover over the remote positive (+) battery post.

Connect the RED jumper cable clamp to positive (+) terminal. Connect BLACK jumper cable clamp to engine ground.

Start the engine in the vehicle which has the booster battery, let the engine idle a few minutes, then start the engine in the vehicle with the discharged battery.

Caution: Do not crank the starter motor on disabled vehicle for more than 15 seconds, the starter will overheat and could fail.

Allow the battery in disabled the vehicle to charge to at least 12.4 volts (75% charge) before attempting to start the engine. If the engine does not start within 15 seconds, stop cranking the engine and allow the starter to cool (15 min.), before cranking again.

Disconnect Cable Clamps

When disconnecting the cable clamps use the following procedure:

- Disconnect the BLACK cable clamp from the engine ground on the disabled vehicle.
- When using a booster vehicle, disconnect the BLACK cable clamp from the battery negative terminal. Disconnect the RED cable clamp from the battery positive terminal.
- Disconnect the RED cable clamp from the battery positive terminal on the disabled vehicle.

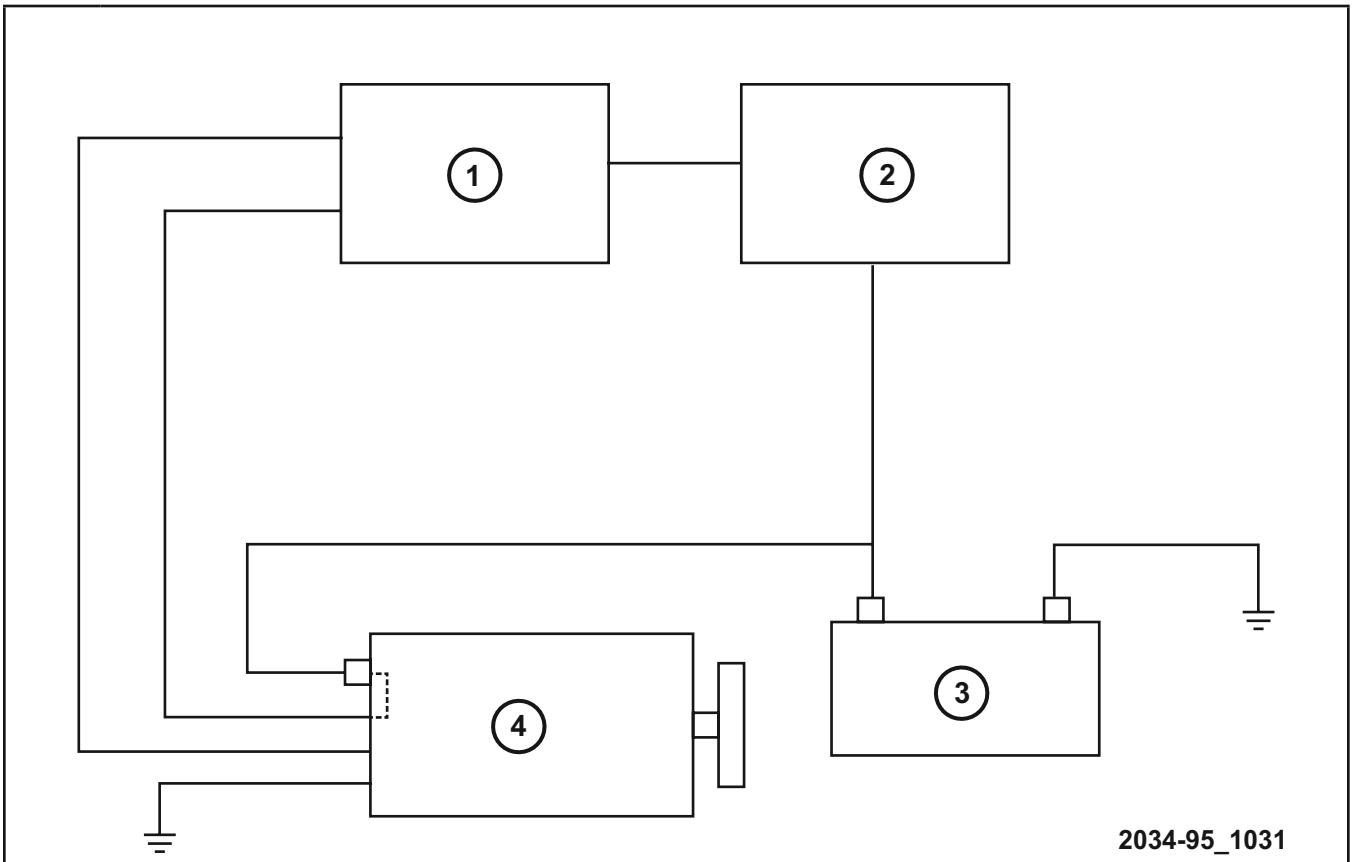
ALTERNATOR/GENERATOR

Description

The charging system consists of:

- Generator
- Electronic voltage regulator (EVR) circuitry within the powertrain control module (PCM)
- Ignition switch
- Battery
- Battery temperature sensor
- Check gauges lamp (if equipped)
- Voltmeter
- Wiring harness and connections

Operation



1	PCM	3	Battery
2	TIPM	4	Generator

Figure 71 Charging Circuit

The Dodge Durango SSV is equipped with a standard 220-amp alternator. The charging system is turned on and off with the powertrain control module (PCM) and ignition switch with the engine running. The generator is driven by the engine through a serpentine belt and pulley, or a decoupler pulley arrangement. The field circuit will not be energized until the engine is running and the ignition switch is ON. This voltage is connected through the PCM and supplied to one of the generator field terminals (generator source B+) at the back of the generator. The generator is internally grounded. The generator regulates the field using pin-1 of the field connector (high-side driver).

The PCM receives a voltage input from the generator and also a battery voltage input from the totally integrated power module (TIPM), it then compares the voltages to the desired voltage programmed in the electronic voltage regulator (EVR) software and, if there is a difference, it sends a signal to the generator EVR circuit to increase or decrease output. It uses pulse-width modulation (PWM) to send signals to the generator circuitry to control the amount of output from the generator. The amount of DC current produced by the generator is controlled by the EVR circuitry contained within the generator.

All OBD-sensed systems, including EVR circuitry, are monitored by the PCM. Each monitored circuit is assigned a diagnostic trouble code (DTC). The PCM will store a DTC in electronic memory for certain failures it detects.

The check gauges lamp (if equipped) monitors charging system voltage, engine coolant temperature, and engine oil pressure. If an extreme condition is indicated, the lamp will be illuminated. This is done as reminder to check the three gauges. The lamp is located on the instrument panel.

Voltage is monitored at the B+ terminal stud to ensure it is connected. If the B+ cable is loose, the PCM will shut down the generator field. Because of this new feature, pin-2 of the field connector is internally connected to the B+ terminal.

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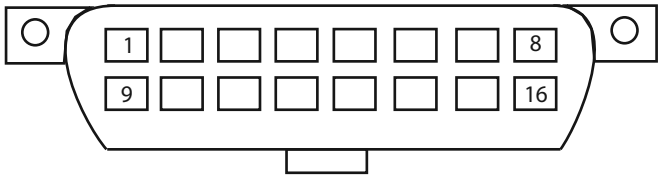
Table 16 DLC



	J1962 Data Link Connector Pin Location	Configuration A (1994 MY-2002 MY	Configuration B (2002 MY +)	TIPM Based	PowerNet
1	Mfr. Discretionary	RKE Program Input	Not Used/Empty	Not Used/Empty	Not Used/Empty
2	SAE J1850 (+)	SAE J1850 (+)	SAE J1850 (+)	Not Used/Empty	Not Used/Empty
3	Mfr. Discretionary	CCD (+)	Not Used/Empty	Not Used/Empty	CAN-IHS (+)
4	Chassis Ground	Power Ground	Power Ground	Power Ground	Power Ground
5	Signal Ground	Signal Ground	Signal Ground	Signal Ground	Signal Ground
6	ISO 15765, CAN-C (+)	SCI A Rx	ISO 15765-4 CAN-C (+)	Diagnostic CAN-C (+)	CAN-C (+)
7	K-Line	ISO 9141-2, K-line/SCI Tx	SCI Tx (engine)	Not Used/Empty	Not Used/Empty
8	Mfr. Discretionary	A/D Signal Output/ Switched Ign.	Switched Ignition	Not Used/Empty	Not Used/Empty
9	Mfr. Discretionary	SCI B R/J1850 Flash Enable	SCI Rx (trans)/ J1850 Flash Enable	Not Used/Empty	Not Used/Empty
10	SAE J1850 (-)	SAE J1850 (-)	SAE J1850 (-)	Not Used/Empty	Not Used/Empty
11	Mfr. Discretionary	CCD (-)	Not Used/Empty	Not Used/Empty	CAN-IHS (-)
12	Mfr. Discretionary	SCI C Rx	SCI Rx (engine)	Not Used/Empty	Not Used/Empty
13	Mfr. Discretionary	Low Side Driver/ SCI Tx	Not Used/Empty	Not Used/Empty	Not Used/Empty
14	ISO 15765, CAN-C (-)	SCI D Rx	ISO 15765-4 CAN-C (-)	Diagnostic CAN-C (-)	CAN-C (-)
15	L-Line	Inverted SCI Tx	SCI Tx (trans)	Not Used/Empty	Not Used/Empty
16	Permanent Positive Voltage	Battery Voltage	Battery Voltage	Battery Voltage	Battery Voltage

FUSES

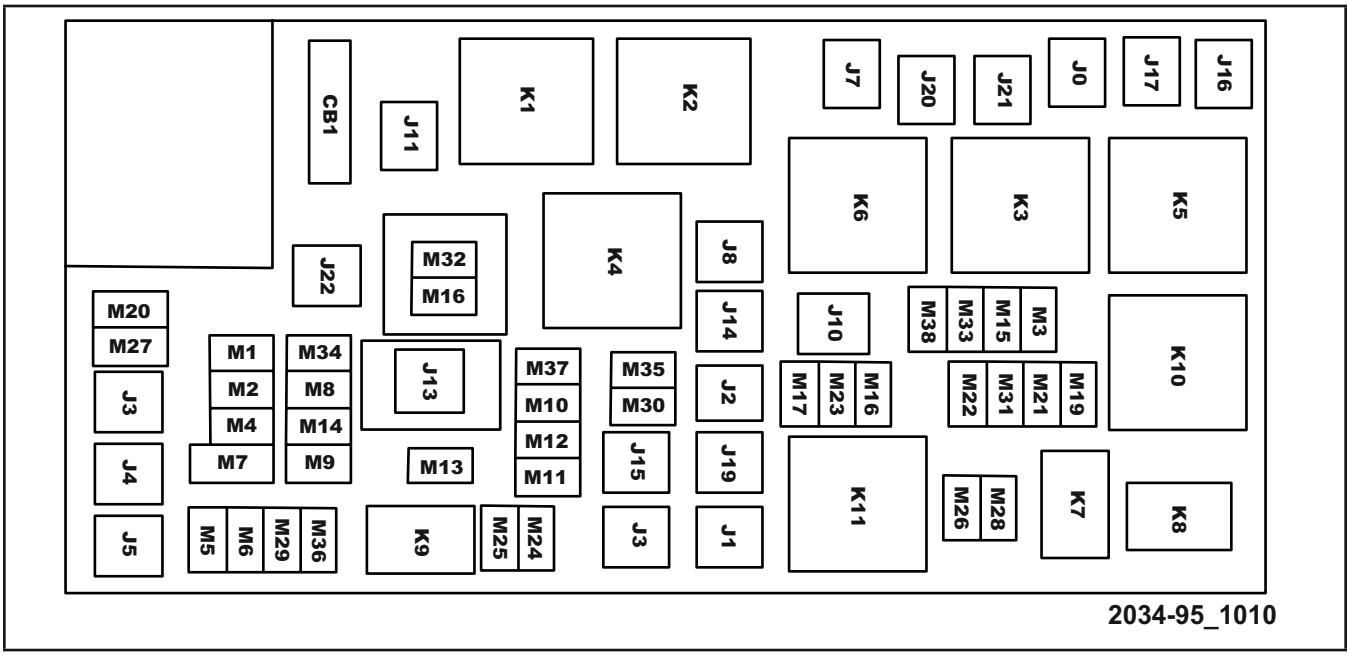


Figure 72 TIPM

Table 17 Fuse Locations

Cavity	Cartridge Fuse	Mini Fuse	Description
J1	40 Amp Green		Air Suspension
J2	30 Amp Pink		Power Liftgate Module
J3	30 Amp Pink		Trailer Tow
J4	25 Amp Natural		Driver Door Node
J5	25 Amp Natural		Passenger Door Node
J6	40 Amp Green		Antilock Brakes Pump/Stability Control System
J7	30 Amp Pink		Antilock Brakes Pump/Stability Control System
J8	40 Amp Green		Power Seat
J9	30 Amp Pink		E-Brake
J10	30 Amp Pink		Headlamp Wash Relay Contact
J11	30 Amp Pink		Drive Train Control Module
J12	30 Amp Pink		Rear Defroster
J13	60 Amp Yellow		Main Ignition off Draw (IOD)
J14	20 Amp Blue		Trailer Tow Lamps/Park Lamps
J15	40 Amp Green		Front Cabin Fan/Blower

J17	40 Amp Green		Starter Motor Solenoid
J18	20 Amp Blue		Powertrain Control Module/Powertrain Control Module Transmission Range
J19	60 Amp Yellow		Radiator Fan Motor HI/Radiator Fan Motor Low
J20	30 Amp Pink		Front Wiper
J21	20 Amp Blue		Front/Rear Washer Control
J22	25 Amp Natural		Sunroof Module
M1		15 Amp Blue	Stop Lamp
M2		20 Amp Yellow	Electronic Limit Slip Differential/Air Suspension
M3		20 Amp Yellow	Liftgate Unlock/DRL Relay
M5		25 Amp Natural	115V AC Power Inverter
M6		20 Amp Yellow	Rain Sensor/Cigar Lighter
M7		20 Amp Yellow	Power Outlet #2 (switchable)
M8		20 Amp Yellow	Front Heated Seat & Steering Wheel
M9		20 Amp Yellow	Rear Heated Seats
M10		15 Amp Blue	Video\Universal Garage Door Opener
M11		10 Amp Red	Heating, Ventilation, and Air Conditioning (climate control system)
M12		30 Amp Green	Radio/Amplifer
M13		20 Amp Yellow	Instrument Cluster
M14		20 Amp Yellow	Back Up Camera
M15		20 Amp Yellow	Power Seat Module(s)/Adaptive Cruise Control/Audio Telematics/Daytime Running Lights Relay/Air Suspension Module/ Instrument Cluster
M16		10 Amp Red	Occupant Restraint Controller
M18		15 Amp Blue	Stop Lamp
M19		25 Amp Natural	Automatic Shutdown 1 and 2
M20		15 Amp Blue	Instrument Cluster
M21		20 Amp Yellow	Automatic Shutdown 3
M22		10 Amp Red	Horns (low/high) - Right
M23		10 Amp Red	Horns (low/high) - Left
M24		25 Amp Natural	Rear Wiper
M25		20 Amp Yellow	Fuel Pump Motor Output/Diesel Lift Pump (export only)
M26		10 Amp Red	Driver Door Switch Bank

Table 17 Fuse Locations Continued

M27		10 Amp Red	Ignition Switch/Wireless Control Module/ Keyless Entry Module
M28		15 Amp Blue	Powertrain Controller/Transmission Controller
M29		10 Amp Red	Tire Pressure Monitor
M30		15 Amp Blue	J1962 Diagnostic Connector
M31		20 Amp Yellow	Backup Lamps
M32		10 Amp Red	Occupant Restraint Controller
M33		10 Amp Red	Powertrain Controller/Transmission Controller
M34		10 Amp Red	Park Assist Module/Climate Control System Module/IR Sensor/Compass Module
M35		15 Amp Blue	Left Hand Rear Parklamps
M36		20 Amp Yellow	Power Outlet
M37		10 Amp Red	Antilock Brakes/Stability Control System Module/Stoplamp Switch Sensor
M38		25 Amp Natural	All Door Lock & Unlock

Caution: **When installing the totally integrated power module cover, it is important to ensure the cover is properly positioned and fully latched. Failure to do so may allow water to get into the totally integrated power module and possibly result in a electrical system failure.**

When replacing a blown fuse, it is important to use only a fuse having the correct amperage rating. The use of a fuse with a rating other than indicated may result in a dangerous electrical system overload. If a properly rated fuse continues to blow, it indicates a problem in the circuit that must be corrected.

Table 17 Fuse Locations Continued

Table 18 Relay Locations

K1	Run/Accessory
K2	Ignition/Run
K3	Starter
K4	Run/Start
K5	Powertrain Control Module
K6	Trailer Tow Lamps/Park Lamp
K7	Not Used
K8	Not Used
K9	Electrical Back Light (EBL)
K10	Automatic Shut Down (ASD)
K11	Radiator Fan Low

NETWORK

Data Link Connector (DLC)

The PCM maintains communication with the scan tools through the vehicle data link connector (DLC). The DLC is located under the instrument panel, near the steering column.

Communications System

Network communication is a way to send multiple messages over a single wire or a pair of twisted wires. Modules share information between each other across these common wires. Locating modules close to the components they control reduces the amount and number of wires. This network is referred to as a bus.

Most networks are composed of a twisted pair of wires. Electronic control modules (ECMs) can both transmit and receive data on the bus. Data placed on the bus includes input data, output data, and configuration data. Modules also monitor the input sensors, output actuators, communications, and other modules for faults. If a fault occurs with a particular input or output, the module that is hard-wired to that particular device may be designed to detect it and send a diagnostic trouble code (DTC) on the bus.

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CAN Bus

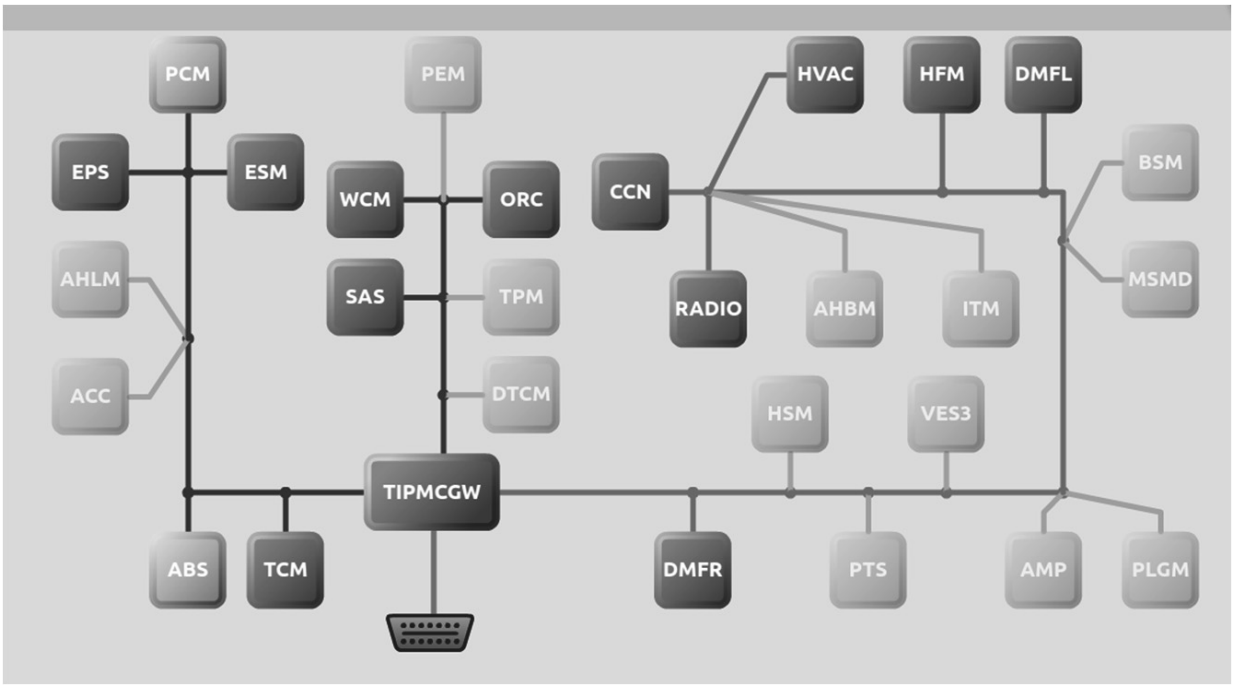

Figure 73 Network Topology

Description

The primary on-board communication network between microprocessor-based electronic control modules in this vehicle is the controller area network (CAN) data bus system. A data bus network minimizes redundant wiring connections; and, at the same time, reduces wire harness complexity. By allowing each sensing device to be connected to only one module or node, it reduces the sensor current loads and the need for more controller hardware. Each node reads, then broadcasts its sensor data over the bus for use by all other nodes requiring that data. Each node ignores the messages on the bus that it cannot use.

The CAN bus is a two-wire multiplex system. Multiplexing is any system that enables the transmission of multiple messages over a single channel or circuit. The CAN bus is used for communication between most vehicle nodes. However, in addition to the CAN bus network, certain nodes may also be equipped with a LIN data bus. The LIN data bus is a single-wire low-speed (9.6 Kbps) serial link bus used to provide direct communication between a LIN master module and certain switch or sensor inputs.

There are actually three separate CAN bus systems used in the vehicle. They are the CAN-IHS, the CAN-C, and the Diagnostic CAN-C. The CAN-IHS and CAN-C systems provide on-board communication between all nodes in the vehicle. The CAN-C is the faster of the two systems providing near real-time communication (500 Kbps). The CAN-C is used typically for communications between more critical nodes, while the slower (125 Kbps) CAN-IHS is used for communications between less critical nodes.

Operation

Table 19 CAN Bus Voltages

CAN Bus Voltages (Normal Operation)								
CAN-C Bus Circuits	**Sleep**	**Recessive (Buss Idle)**	**Dominant (Bus Active)**	**CAN-L Short to Ground**	**CAN-H Short to Ground**	**CAN-L Short to Battery**	**CAN-H Short to Battery**	**CAN-H Short to CAN-L**
Can-L (-)	0V	2.4-2.5V	1. 3-2.3V	0V	0.3-0.5V	Battery Voltage	Battery Voltage Less 0.75V	2.45V
Can-H (+)	0V	2.4-2.5V	2.6-3.5V	0.02V	0V	Battery Voltage Less 0.75V	Battery Voltage	2.45V
CAN Interior Bus Circuits	**Key OFF (Bus Asleep)**		**Key ON (Bus Active)**	**CAN-L Short to Ground**	**CAN-H Short to Ground**	**CAN-L Short to Battery**	**CAN-H Short to Battery**	**Can-H Short to CAN-L**
CAN-L (-)	0V		1.3-2.3V	0V	0.3-0.5V	Battery Voltage	Battery Voltage Less 0.75V	2.45V
CAN-H (+)	0V		2.6-3.5V	0.02V	0V	Battery Voltage Less 0.75V	Battery Voltage	2.45V

The communication protocol being used for the CAN data bus is a non-proprietary, open standard adopted from the Bosch CAN Specification 2.0b. The CAN-C is the faster of the two primary buses in the CAN bus system, providing near real-time communication (500 Kbps).

The CAN bus nodes are connected in parallel to the two-wire bus using a twisted pair. The wires are wrapped around each other to provide shielding from unwanted electromagnetic induction, preventing interference with the relatively low voltage signals being carried through them. The twisted pairs have between 33 and 50 twists per meter (yard). While the CAN bus is operating (active), one of the bus wires will carry a higher voltage and is referred to as the CAN High or CAN bus (+) wire, while the other bus wire will carry a lower voltage and is referred to as the CAN Low or CAN bus (–) wire.

Note: All measurement of termination resistance is done with the vehicle battery disconnected.

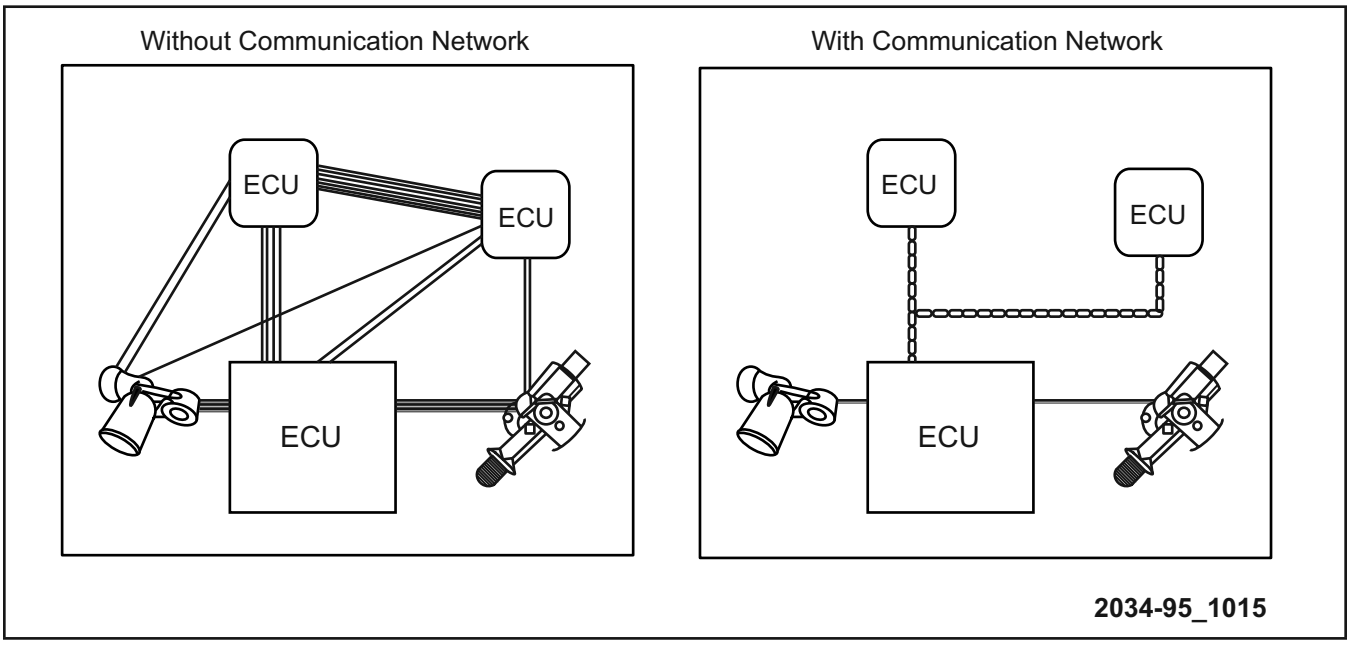

Figure 74 Twisted Pair Communications

TOTALLY INTEGRATED POWER MODULE (TIPM)

The totally integrated power module and the PCM share the responsibility to power many devices.

The TIPM performs multiple functions including:

- Acts as the gateway of the communication network
- Processes bused messages from the PCM and other controllers
- Provides power and logic control for various systems
- Processes inputs
  - A/C pressure transducer
  - Ambient air temp
  - Ignition RUN/START relay
- Controls outputs
  - ASD relay
  - A/C compressor
  - Clutch
  - Fuel pump
  - Starter solenoid
  - Cooling fans

The TIPM contains solid-state, high-side and low-side drivers, as well as fuses. The high-side driver or a relay for the starter is located inside the TIPM. The PCM buses starter information to the TIPM. The TIPM then supplies voltage directly to the starter assembly.

The high-side driver for the fuel pump is also located inside the TIPM.

Description and Operation

Figure 75 TIPM

The totally integrated power module (TIPM) is a combination unit that performs the functions of the power distribution center (PDC) and the front control module. The TIPM is a printed-circuit-board-based module that contains fuses, internal relays, and a microprocessor that performs the functions previously executed by the FCM. The TIPM is located in the engine compartment, next to the battery, and connects directly to the B+ cable via a stud located on top of the unit. The ground connection is via electrical connectors. The TIPM provides the primary means of voltage distribution and protection for the entire vehicle.

All of the current from the battery and the generator output enters the totally integrated power module (TIPM) via a stud on the top of the module. The TIPM cover is removed to access the fuses or relays. Internal connections of all of the power distribution center circuits are accomplished by a combination of bus bars and a printed circuit board.

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IOD Fuse

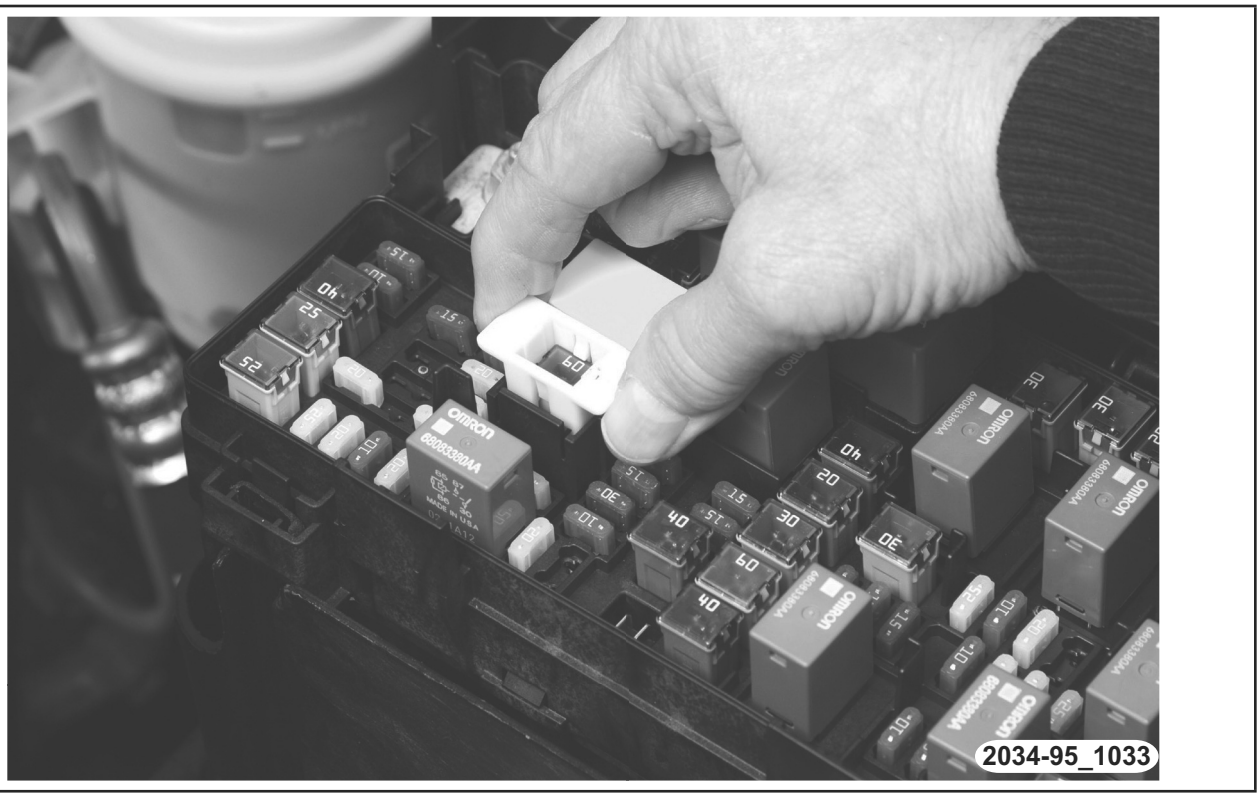

Figure 76 IOD Fuse

All vehicles are equipped with an ignition-OFF draw (IOD) fuse that is disconnected within the integrated power module when the vehicle is shipped from the factory. Dealer personnel are to reconnect the IOD fuse in the integrated power module as part of the preparation procedures performed just prior to new vehicle delivery. The IOD fuse can be removed to avoid discharging the battery by disconnecting non-essential, low-current memory functions that are normally on at all times. A detent on the IOD fuse holder allows it to be stored in its normal cavity but out of contact. The holder is pushed into place to restore power to the systems it supplies. When the vehicle is prepared for delivery, the IOD function of this fuse becomes transparent and the fuse that has been assigned the IOD designation becomes another Fused B (+) circuit fuse.

The following circuits are protected by the IOD fuse:

- Cluster (CCN)
- Electronic overhead module (EOM
- Sentry key remote entry module (SKREEM)
- Video module (DVD system), spot lamps, and police dome light
- Hands free telephone module
- Map lamps
- Glove box lamp
- Courtesy lamps
- Radio

The IOD fuse can be used by the vehicle owner as a convenient means of reducing battery depletion when a vehicle is to be stored for periods not to exceed about 30 days. However, it must be remembered that disconnecting the IOD fuse will not eliminate IOD, but only reduce this normal condition. If a vehicle will be stored for more than about thirty days, the battery negative cable should be disconnected to eliminate normal IOD; and, the battery should be tested and recharged at regular intervals during the vehicle storage period to prevent the battery from becoming discharged or damaged.

POWERTRAIN CONTROL MODULE (PCM)

Figure 77 3.6L PCM

The powertrain control module (PCM) is located in the right side of the engine compartment. The PCM operates the ignition and fuel system along with controlling other subsystems. The PCM is a pre-programmed, triple microprocessor digital computer. It regulates ignition timing, air-fuel ratio, emission control devices, charging system, certain transmission features, speed control, air conditioning compressor clutch engagement, and idle speed. The PCM can adapt its programming to meet changing operating conditions.

The PCM receives input signals from various switches and sensors. Based on these inputs, the PCM regulates various engine and vehicle operations through different system components. These components are referred to as powertrain control module (PCM) outputs. The sensors and switches that provide inputs to the PCM are considered powertrain control module (PCM) inputs.

The PCM adjusts ignition timing based upon inputs it receives from sensors that react to engine rpm, manifold absolute pressure, engine coolant temperature, throttle position, transmission gear selection (automatic transmission), vehicle speed, power steering pump pressure, and the brake switch.

The PCM adjusts idle speed based on inputs it receives from sensors that react to:

- Throttle position
- Vehicle speed
- Transmission gear selection
- Engine coolant temperature
- Inputs from the air conditioning clutch switch
- Brake switch

Based on inputs that it receives, the PCM adjusts ignition coil dwell. The PCM also adjusts the generator charge rate through control of the generator field and provides speed control operation.

PCM Inputs

- ABS module (if equipped)
- A/C request (if equipped with factory A/C)
- A/C select (if equipped with factory A/C)
- A/C pressure transducer
- Auto shutdown (ASD) sense
- Battery temperature sensor
- Battery voltage
- Brake switch
- CAN-C bus (+) circuits
- CAN-C bus (-) circuits
- Camshaft position sensor signal
- Crankshaft position sensor
- Data link connection for a scan tool
- EATX module (if equipped)
- Engine coolant temperature sensor

- Fuel level
- Generator (battery voltage) output
- Ignition circuit sense (ignition switch in ON/OFF/CRANK/RUN position)
- Intake manifold air temperature sensor
- Knock sensors (two on the 3.7L engine)
- Leak detection pump (switch) sense (if equipped)
- Manifold absolute pressure (MAP) sensor
- Oil pressure
- Oxygen sensors
- Park/neutral switch (automatic transmission only)
- Power ground
- Power steering pressure switch (if equipped)
- Sensor return
- Signal ground
- Speed control multiplexed single-wire input
- Throttle position sensor
- Transfer case switch (4WD range position)
- Vehicle speed signal

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PCM Outputs

- A/C clutch relay
- Auto shutdown (ASD) relay
- CAN-C BUS (+/-) circuits for:
  - Speedometer
  - Voltmeter
  - Fuel gauge
  - Oil pressure gauge/lamp
  - Engine temperature gauge
  - Speed control warning lamp
- Data link connection for diagnostic scan tool
- EGR valve control solenoid (if equipped)
- EVAP canister purge solenoid
- Five-volt sensor supply (primary)
- Five-volt sensor supply (secondary)
- Fuel injectors
- Fuel pump relay
- Generator field driver (-)
- Generator field driver (+)
- Idle air control (IAC) motor
- Ignition coil(s)
- Leak detection pump (if equipped)
- Malfunction indicator lamp (Check engine lamp)
- Oxygen sensor heater relays
- Oxygen sensors (pulse-width-modulated)
- Radiator cooling fan relay (pulse-width-modulated)
- Speed control vacuum solenoid
- Speed control vent solenoid
- Tachometer (if equipped)
- Transmission convertor clutch circuit

Modes of Operation

During open loop modes, the PCM receives input signals and responds only according to preset PCM programming. Input from the oxygen sensors (O2S) is not monitored during open loop modes.

During closed loop modes, the PCM will monitor the oxygen sensors (O2S) input. This input indicates to the PCM whether or not the calculated injector pulse width results in the ideal air-fuel ratio. This ratio is 14.7 parts air to 1 part fuel. By monitoring the exhaust oxygen content through the O2S sensor, the PCM can fine tune the injector pulse width. This is done to achieve optimum fuel economy combined with low emission engine performance.

PCM/TCM Flash Programing

The PCM/TCM may need to be reflashed under one or more of the following conditions:

- A vehicle's powertrain control module (PCM) has been replaced
- A diagnostic trouble code (DTC) is set, P1602 - PCM Not Programmed
- An updated calibration or software release is available for either the PCM or TCM ECUs

Electronic Throttle Control (ETC) Learn

The 3.6L or 5.7L V-8 engine is equipped with a fully electronic accelerator pedal position sensor. If the PCM/TCM has been replaced or flashed the following procedure must be performed.

1. Turn the ignition switch ON, but do not crank the engine.
2. Leave the ignition switch ON for a minimum of 10 seconds. This will allow the PCM to learn the electrical parameters.
3. The scan tool may also be used to learn electrical parameters. If the previous step is not performed, a diagnostic trouble code (DTC) will be set.
4. If necessary, use a scan tool to erase any diagnostic trouble codes (DTCs) from the PCM. Also use the scan tool to reprogram the new PCM with the vehicle's original vehicle identification number (VIN) and the original vehicle mileage.

Caution: Use the scan tool to reprogram the new PCM with the vehicle's original identification number (VIN) and the vehicle's original mileage. If this step is not done, a diagnostic trouble code (DTC) may be set.

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TRANSMISSION CONTROL FUNCTIONS OF THE PCM

The transmission control module is integrated into the PCM on the Dodge Durango SSV truck equipped with the 5.7L engine and the 65RFE transmission.

The powertrain control module (PCM) controls all electronic operations of the transmission. The PCM receives information regarding vehicle operation from both direct and indirect inputs, and selects the operational mode of the transmission. Direct inputs are hard-wired to, and used specifically by, the PCM. Indirect inputs are shared with the PCM via the vehicle communication bus.

Some examples of direct inputs to the PCM are:

- Battery (B+) voltage
- Ignition ON voltage
- Transmission control relay (Switched B+) (if equipped)
- Throttle position sensor
- Crankshaft position sensor
- Transmission range sensor
- Pressure switches
- Transmission temperature sensor
- Input shaft speed sensor
- Output shaft speed sensor
- Line pressure sensor

Some examples of indirect inputs to the PCM are:

- Target idle
- Torque reduction confirmation
- Engine coolant temperature
- Ambient/battery temperature
- Scan tool communication

Based on the information received from these various inputs, the PCM determines the appropriate shift schedule and shift points, depending on the present operating conditions and driver demand. This is possible through the control of various direct and indirect outputs.

Some examples of PCM direct outputs are:

- Transmission control relay
- Solenoids
- Torque reduction requests
- PRNDL position (to cluster CCN)

In addition to monitoring inputs and controlling outputs, the PCM has other important responsibilities and functions:

- Storing and maintaining clutch volume indexes (CVI)
- Storing and selecting appropriate shift schedules
- System self diagnosis
- Diagnostic capabilities (with the scan tool)

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Transmission Limp-in Mode

Loss of power causes the solenoids to revert to their default, power off state, causing the transmission to enter limp-in mode. If power is restored to the PCM, the transmission resumes normal operation. A DTC may be set if there is vehicle speed.

When the transmission enters into a condition that causes a limp-in mode to occur, the PCM will turn on the check engine light. The PCM will set default gears available of:

- Park
- Neutral
- Reverse
- 4th gear

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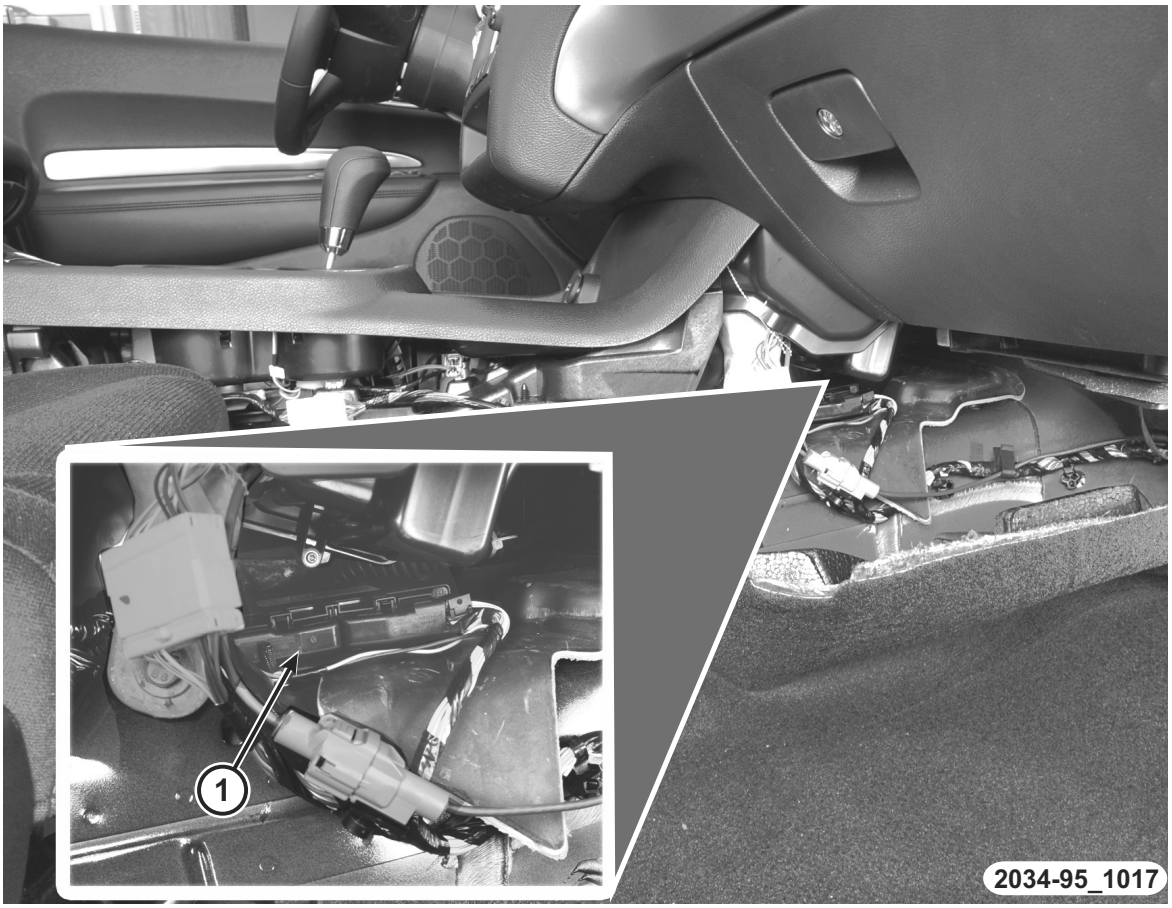
NAG1 Transmission Control



1	NAG1 Transmission Control Module (TCM)

Figure 78 NAG1 Transmission Control Module

The transmission control module (TCM) determines the current operating conditions of the vehicle and controls the shifting process for shift comfort and driving situations. It receives this operating data from sensors and broadcast messages from other modules.

The TCM uses inputs from several sensors that are directly hard-wired to the controller and it uses several indirect inputs that are used to control shifts. This information is used to actuate the proper solenoids in the valve body to achieve the desired gear.

The shift lever sensor assembly (SLSA) has sensors that are monitored by the TCM to calculate shift lever position. The reverse light switch, an integral part of the SLSA, controls the reverse light relay control circuit. The brake/transmission shift interlock (BTSI) solenoid and the park lockout solenoid (also part of the SLSA) are controlled by the TCM.

The ECM and ABS broadcast messages over the controller area network (CAN-C) bus for use by the TCM. The TCM uses this information, with other inputs, to determine the transmission operating conditions.

The TCM:

- Determines the momentary operating conditions of the vehicle
- Controls all shift processes
- Considers shift comfort and the driving situation

The TCM controls the solenoid valves for modulating shift pressures and gear changes. Relative to the torque being transmitted, the required pressures are calculated from load conditions, engine rpm, vehicle speed, and ATF temperature.

The following functions are contained in the TCM:

- Shift program
- Downshift safety
- Torque converter lock-up clutch
- Adaptation

This transmission does not have a TCM relay. Power is supplied to the SLSA and the TCM directly from the ignition.

The TCM continuously checks for electrical problems, mechanical problems, and some hydraulic problems. When a problem is sensed, the TCM stores a diagnostic trouble code (DTC). Some of these codes cause the transmission to go into limp-in or default mode. Some DTCs cause permanent limp-in and others cause temporary limp-in. The NAG1 defaults in the current gear position if a DTC is detected, then after a key cycle the transmission will go into limp-in, which is mechanical 2nd gear. Some DTCs may allow the transmission to resume normal operation (recover) if the detected problem goes away. A permanent limp-in DTC will recover when the key is cycled, but if the same DTC is detected for three key cycles, the system will not recover and the DTC must be cleared from the TCM with the scan tool.

TCM Signals

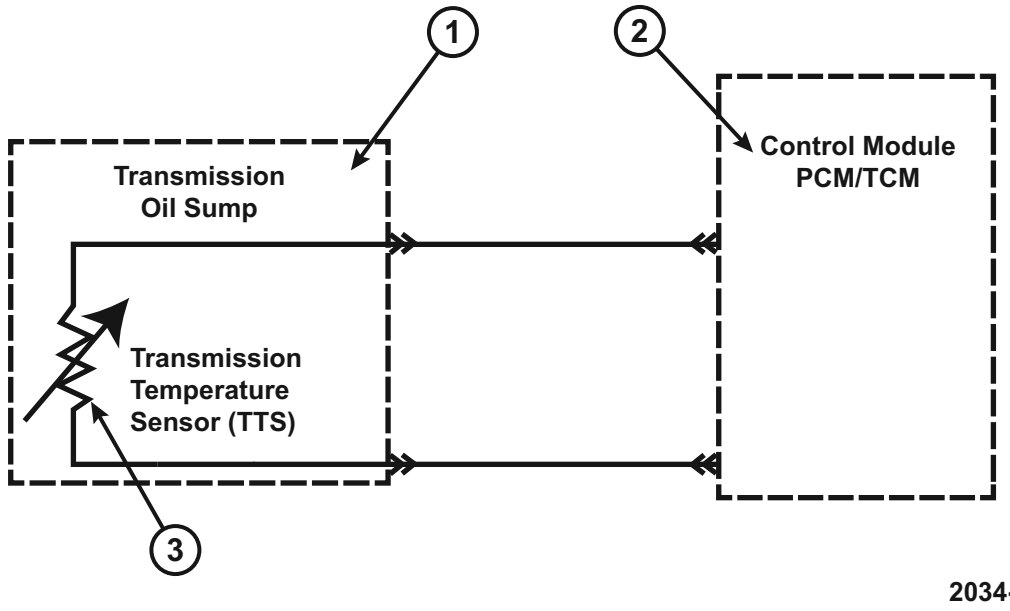
The TCM registers one part of the input signals by direct inputs, the other part by CAN-C bus. In addition to the direct control of the actuators, the TCM sends various output signals by CAN-C bus to other control modules.

Selector Lever Position

The automatic transmission is operated with the help of a shift lever assembly (SLA) (1) located in the floor console. There are four positions to which the selection lever can be shifted: P, R, N, and D. In addition, the selector lever can be moved sideways (+/-) in position D to adjust the shift range.

All selector lever positions, as well as selected shift ranges in position D, are identified by the SLA. The information is then sent to the transmission control module (TCM) via a hard-wire connection. At the same time, the selector lever positions P, R, N, and D are transmitted by a shift cable to the selector shaft in the transmission.

ATF Temperature Sensor



1	Transmission Oil Sump	3	Transmission Temperature Sensor (TTS)
2	Control Module PCM/TCM		

Figure 79 ATF Temperature Sensor

The ATF temperature sensor is a positive temperature coefficient (PTC) thermistor. It measures the temperature of the transmission fluid and is a direct input signal for the TCM. The temperature of the ATF has an influence on the shift time and resulting shift quality. As the temperature rises, resistance rises, and therefore, the probing voltage is decreasing. Because of its registration, the shifting process can be optimized in all temperature ranges.

The ATF temperature sensor is wired in series with the park/neutral contact. The temperature signal is transmitted to the TCM only when the reed contact of the park/neutral contact is closed because the TCM only reads ATF temperature while in any forward gear, or reverse. When the transmission is in park or neutral, the TCM will substitute the engine temperature for the ATF temperature.

Starter Interlock

The TCM monitors a contact switch wired in series with the transmission temperature sensor to determine park and neutral positions. The contact switch is open in park and neutral. The TCM senses transmission temperature as high (switch supply voltage), confirming switch status as open. The TCM then broadcasts a message over CAN bus to confirm switch status. The PCM receives this information and allows operation of the starter circuit.

N2 and N3 Speed Sensors

The N2 and N3 input speed sensors are two Hall-effect speed sensors that are mounted internally in the transmission and are used by the TCM to calculate the transmission's input speed. Because the input speed cannot be measured directly, two of the drive elements are measured. Two input speed sensors were required because both drive elements are not active in all gears.

Indirect Input Signals

- Wheel speed sensors
- Transfer case switch status
- Brake switch
- Engine rpm
- Engine temperature
- Cruise control status
- Gear limit request
- Throttle Position - 0% at idle, 100% at WOT; if open, TCM assumes idle (0% throttle opening)
- Odometer mileage
- Maximum effective torque
- Engine in limp-in mode/mileage where DTC was set

Shift Schedules

The basic shift schedule includes up and downshifts for all five gears. The TCM adapts the shift program according to driving style, accelerator pedal position, and deviation of vehicle speed. Influencing factors are:

- Road conditions
- Incline, decline, and altitude
- Trailer operation, loading
- Engine coolant temperature
- Cruise control operation
- Sporty driving style
- Low and high ATF temperature

Downshift Safety

Selector lever downshifts are not performed if inadmissibly high engine rpm is sensed.

Adaptation

To equalize tolerances and wear, an automatic adaptation takes place for:

- Shift time
- Clutch filling time
- Clutch filling pressure
- Torque converter lock-up control

Adaptation data may be stored permanently and to some extent, can be diagnosed.

Driving Style Adaptation

The shift point is modified in steps based on the information from the inputs. The control module looks at inputs such as:

- Vehicle acceleration and deceleration (calculated by the TCM)
- Rate of change as well as the position of the throttle pedal (fuel injection information from the ECM)
- Lateral acceleration (calculated by the TCM)
- Gear change frequency (how often the shift occurs)

Based on how aggressive the driver is, the TCM moves up the shift so that the present gear is held a little longer before the next upshift. If the driving style is still aggressive, the shift point is modified up to 10 steps. If the driving returns to normal, then the shift point modification also returns to the base position.

This adaptation has no memory. The adaptation to driving style is nothing more than a shift point modification meant to assist an aggressive driver. The shift points are adjusted for the moment and return to base position as soon as the inputs are controlled in a more rational manner.

CONTROLLER MODES OF OPERATION

Permanent Limp-in Mode

When the TCM determines there is a non-recoverable condition present that does not allow proper transmission operation, the TCM places the transmission in permanent limp-in mode. When the condition occurs, the TCM turns off all solenoids as well as the solenoid supply output circuit. If this occurs while the vehicle is moving, the transmission remains in the current gear position until the ignition is turned OFF or the shifter is placed in the P position. When the shifter has been placed in P, the transmission only allows 2nd gear operation. If this occurs while the vehicle is not moving, the transmission only allows operation in 2nd gear.

Temporary Limp-in Mode

This mode is the same as the permanent limp-in mode, but if the condition is no longer present, the system resumes normal operation.

Under Voltage Limp-in Mode

When the TCM detects that system voltage has dropped below 8.5 volts, it disables voltage-dependant diagnostics and places the transmission in the temporary limp-in mode. When the TCM senses that the voltage has risen above 9.0 volts, normal transmission operation is resumed.

Hardware Error Mode

When the TCM detects a major internal error, the transmission is placed in the permanent limp-in mode and ceases all communication over the CAN bus. When the TCM has entered this mode normal transmission operation does not resume until all DTCs are cleared from the TCM.

Loss of Drive

If the TCM detects a situation that has resulted or may result in a catastrophic engine or transmission problem, the transmission is placed in the neutral position. Improper ratio, input sensor overspeed, or engine overspeed DTCs cause the loss of drive.

Controlled Limp-in Mode

When a failure does not require the TCM to shut down the solenoid supply, but the failure is severe enough that the TCM places the transmission into a predefined gear, there are several shift performance concerns. For instance, if the transmission is slipping, the controller tries to place the transmission into 3rd gear and maintain 3rd gear for all forward drive conditions.

WIRELESS IGNITION NODE (WIN)

Description

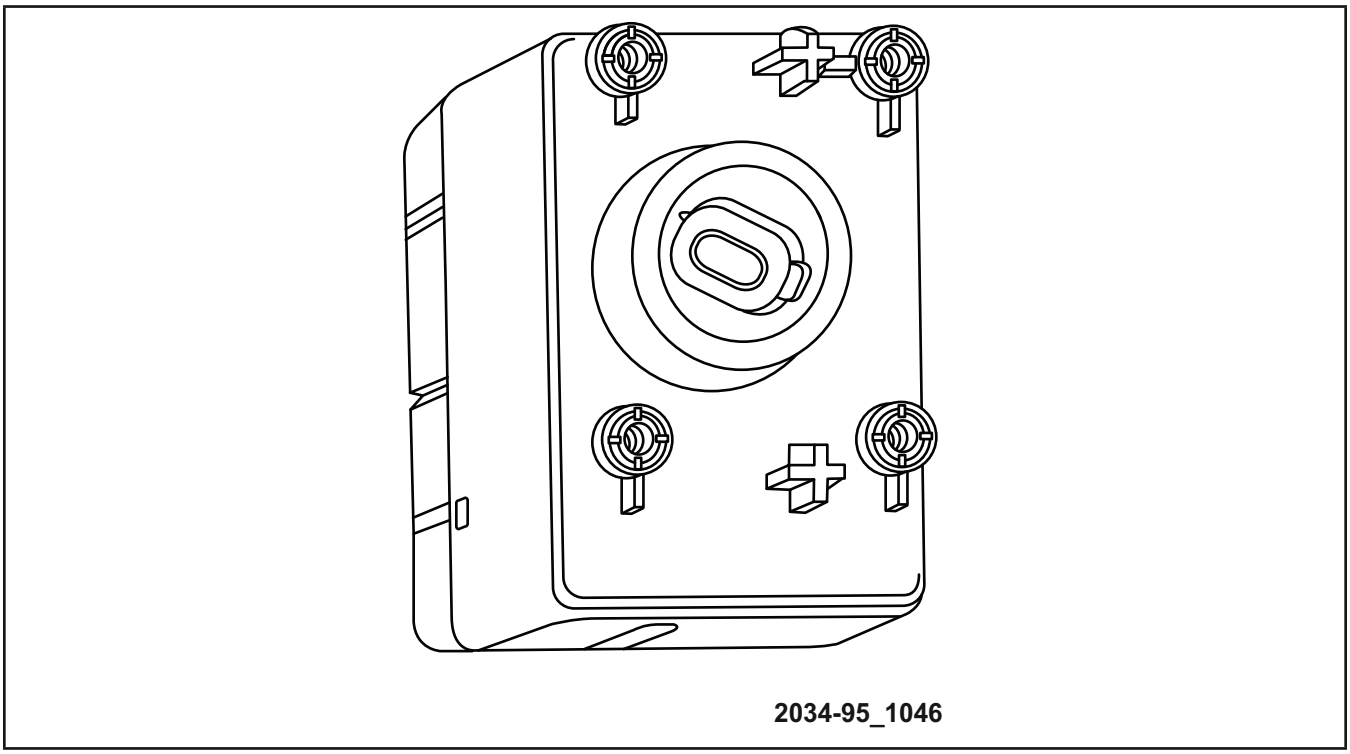


Figure 80 Wireless Ignition Node

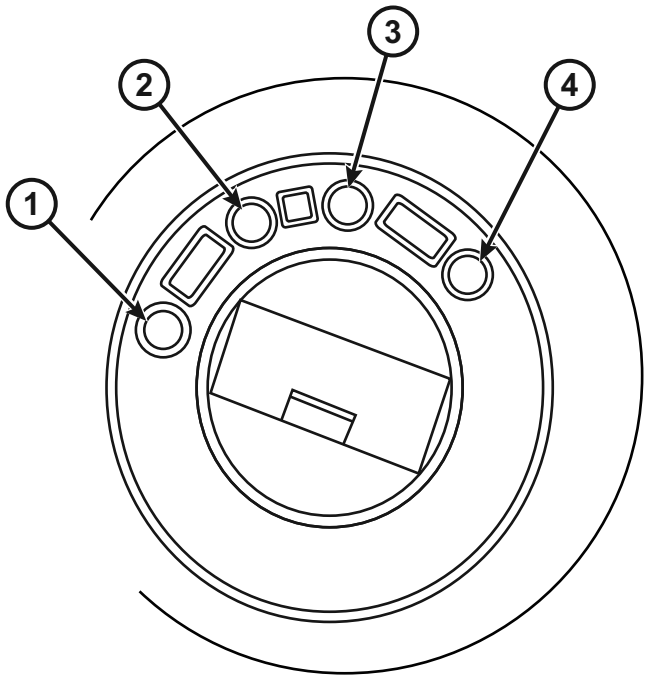
This Dodge Durango SSV is equipped with a wireless ignition node (WIN). The WIN and the remote keyless entry (RKE) device or FOB, with the integrated key (FOBIK) are the primary components of the keyless ignition system. The only visible component of the WIN is the ignition switch located on the face of the instrument panel just to the inboard side of the steering column.

The WIN housing is constructed of molded black plastic and it includes four integral mounting bosses, which are secured to the instrument panel structure with screws. Two connector receptacles are integral to the back of the switch housing. One connects the WIN to the vehicle electrical system through a dedicated takeout and connector of the instrument panel wire harness.

The WIN is an integrated electronic receiver that replaces the ignition switch. The WIN communicates with other electronic modules in the vehicle over the controller area network (CAN) data bus.

The WIN interfaces with the RKE FOBIK and the tire pressure monitor (TPM) sensors (if equipped) using radio frequency (RF) communication. The WIN cannot be adjusted or repaired, but is flash update capable. If ineffective or damaged, the entire WIN must be replaced. When replacing the WIN, you must also replace the steering column lock module (if equipped).

Functions of the WIN Module



1	OFF	3	ON/RUN
2	ACC (ACCESSORY)	4	START

Figure 81 Ignition Switch

This vehicle is equipped with a wireless ignition node (WIN). The WIN, along with the FOB with integrated key (FOBIK) are the primary components of the keyless ignition system. The only visible component of the WIN is the ignition switch located on the face of the instrument panel just to the inboard side of the steering column.

Two connector receptacles are integral to the back of the switch housing. One connects the WIN to the vehicle electrical system through a dedicated takeout and connector of the instrument panel wire harness. The other is a dedicated connector for the coaxial cable input from the optional remote start system external antenna module.

In addition to replacing a conventional keyed ignition switch, the WIN is an integrated electronic receiver that serves as the base station in the vehicle. It communicates with other electronic modules in the vehicle over the controller area network (CAN) data bus.

The WIN interfaces with the remote keyless entry (RKE) FOBIK and the tire pressure monitor (TPM) sensors (if equipped) using radio frequency (RF) communication, with the immobilizer system (theft) transponder within the FOBIK using low frequency (LF) RF communication. It also communicates with the TPM trigger transponders (if equipped) and electronic shaft lock module (if equipped) using a local interface network (LIN) data bus connection.

The WIN contains a key removal inhibit solenoid, an electronic brake transmission shift interlock (BTSI) solenoid, and a key-in warning contact that serves as the real time vehicle clock by transmitting the clock information to other electronic modules over the CAN data bus.

The WIN cannot be adjusted or repaired, but is flash update capable. If ineffective or damaged, the entire WIN must be replaced.

Sentry Key Immobilizer System (SKIS)

Upon failure of proper sentry key immobilizer (SKIS) communication to the powertrain control module (PCM), the PCM will not allow the vehicle to crank. The engine will not re-crank on the key cycle that the failure occurred, a full key down sequence must be performed for the engine to crank again.

Remote Keyless Entry (RKE)

The RKE transmitter uses RF signals to communicate with the WIN, and the WIN relays the RKE requests to other modules in the vehicle over the CAN data bus.

Tire Pressure Monitor (TPM)

The TPM system consists of tire pressure monitoring sensors attached to each road wheel (and spare if equipped with a sensor) valve stem, a central receiver module, an indicator lamp, and (on some applications) a light load switch located on the instrument panel center stack. The valve stem used on this system is redesigned to look similar to a standard valve stem. The Dodge Durango SSV uses the wireless ignition node (WIN) as the central receiver module.

IGNITION KEYS

Key FOB with Integrated Key

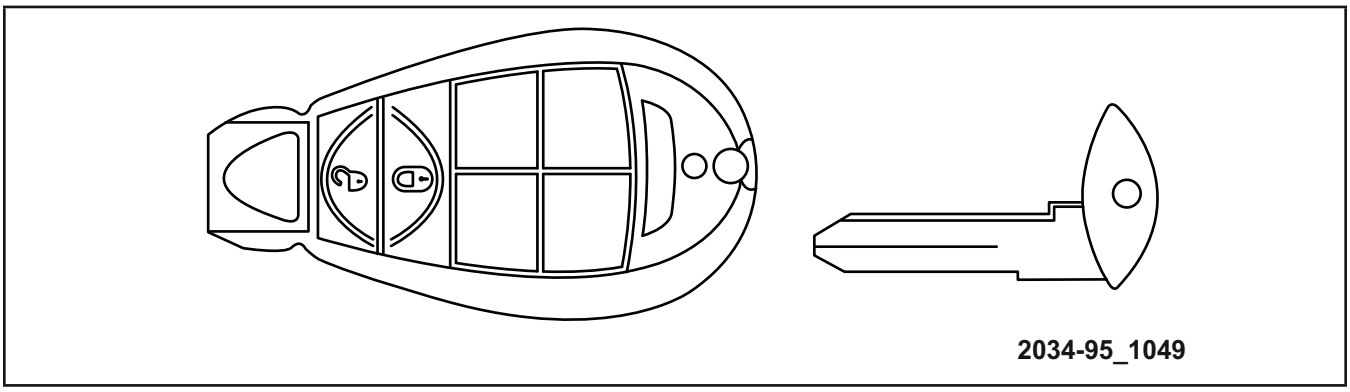


Figure 82 FOBIK

The key FOBIK operates the ignition switch. Insert the square end of the key FOBIK into the ignition switch located on the instrument panel and rotate to the desired position. The key FOB also contains the RKE transmitter and an emergency key, which stores in the rear of the key FOBIK.

Removing the Key FOBIK from the Ignition

Place the shift lever in park (if equipped with an automatic transmission). Turn the key FOBIK to the OFF position and then remove the key FOBIK.

Emergency Key Removal

The emergency key allows for entry into the vehicle should the battery in the vehicle or the RKE transmitter go dead. You can keep the emergency key with you when valet parking.

To remove the emergency key, slide the mechanical latch at the top of the key FOB sideways with your thumb and then pull the key out with your other hand.

Note: Insert the double-sided emergency key into the lock cylinder with either side up.

Note: For vehicles not equipped with the electronic vehicle information center (EVIC), the power window switches, radio, power sunroof (if equipped), and power outlets will remain active for 10 minutes after the ignition switch is turned to the OFF position. Opening either front door will cancel this feature.

For vehicles equipped with the EVIC, the power window switches, radio, power sunroof (if equipped), and power outlets will remain active for up to 10 minutes after the ignition switch is turned to the OFF position. Opening either front door will cancel this feature. The time for this feature is programmable. Refer to "Electronic Vehicle Information Center (EVIC)/Personal Settings (Customer-Programmable Features)" in "Understanding Your Instrument Panel" for further information.

Key-in-ignition Reminder

Opening the driver's door when the key FOB is in the ignition and the ignition switch position is OFF or ACC, sounds a signal to remind you to remove the key FOB.

Note: The key-in-ignition reminder only sounds when the key FOB is placed in the OFF or ACC ignition position.

If equipped with electronic vehicle information center (EVIC) the EVIC will display Key In Ignition.

SENTRY KEY®

The Sentry Key® immobilizer system prevents unauthorized vehicle operation by disabling the engine. The system does not need to be armed or activated. Operation is automatic, regardless of whether the vehicle is locked or unlocked.

The system uses a key FOB with a factory-mated RKE transmitter and WIN to prevent unauthorized vehicle operation. Therefore, only key FOBs that are programmed to the vehicle can be used to start and operate the vehicle. The system will not allow the engine to crank if an invalid key FOB is used to start and operate the vehicle.

Note: A key FOB that has not been programmed is also considered an invalid key.

During normal operation, after turning the ignition switch ON, the vehicle security light will turn on for 3 seconds for a bulb check. If the light remains on after the bulb check, it indicates that there is a problem with the electronics. In addition, if the light begins to flash after the bulb check, it indicates that someone used an invalid key FOB to try to start the engine. Either of these conditions will result in the engine being shut off after 2 seconds.

If the vehicle security light turns on during normal vehicle operation (vehicle running for longer than 10 seconds), it indicates that there is a fault in the electronics.

Caution: The Sentry Key® immobilizer system is not compatible with some after-market remote starting systems. Use of these systems may result in vehicle starting problems and loss of security protection.

Replacement Keys

At the time of purchase, the original owner is provided with a four-digit personal identification number (PIN). The owner should keep the PIN in a secure location. This number is required for authorized dealer replacement of key FOBs. Duplication of key FOBs may be performed at an authorized dealer, this procedure consists of programming a blank key FOB to the vehicle electronics. A blank key FOB is one that has never been programmed.

Note: Only key FOBs that are programmed to the vehicle electronics can be used to start and operate the vehicle. After a key FOB is programmed to a vehicle, it cannot be programmed to any other vehicle.

Note: When having the Sentry Key® Immobilizer System serviced, bring all vehicle keys to the authorized dealer.

If a programmed key FOB is lost, have all the remaining key FOBs erased from the system's memory. This will prevent the lost key FOBs from starting your vehicle. The remaining keys FOBs must then be reprogrammed.

Caution: Always remove the Sentry Keys® from the vehicle and lock all doors when leaving the vehicle unattended.

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ANTILOCK BRAKE SYSTEM (ABS)

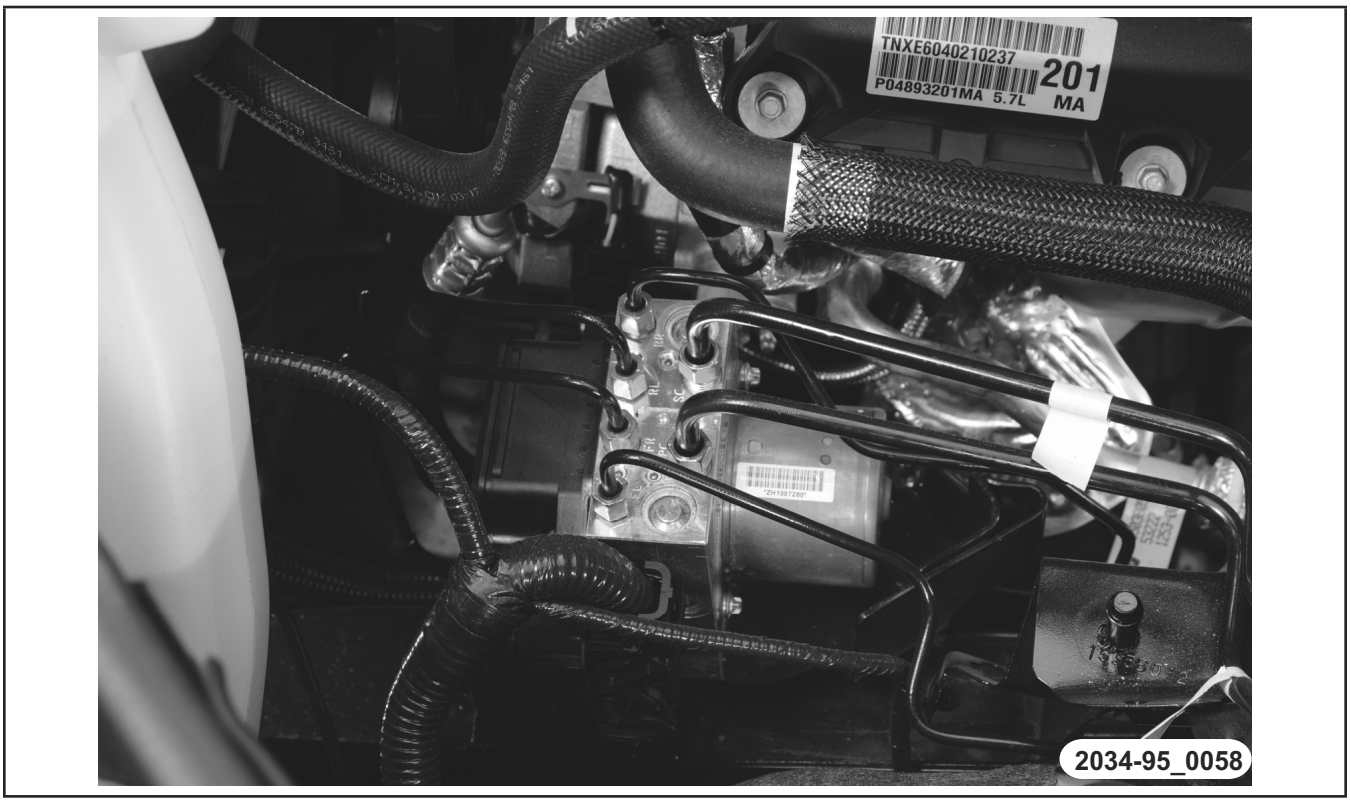

Figure 83 ABS Module

The antilock brake system (ABS) is an electronically operated, four-channel brake control system that is part of electronic stability control (ESC). The vehicle also has electronic variable brake proportioning (EVBP) designed into the system which eliminates the combination/proportioning valve.

The system is designed to prevent wheel lockup and maintain steering control during braking. Preventing lockup is accomplished by modulating fluid pressure to the wheel brake units.

The hydraulic system is a four-channel design. All wheel brakes are controlled individually. The ABS electrical system is separate from other electrical circuits in the vehicle. A specially programmed controller antilock brake unit operates the system components.

ABS system major components include:

- Antilock brake module (ABM)
- Hydraulic control unit (HCU)
- Wheel speed sensors (WSS)
- ABS warning light

Operation

Battery voltage is supplied to the ABM. The ABM performs a system initialization procedure at start up along with an ABS motor check. Initialization consists of a static and dynamic self check of system electrical components.

The static and dynamic checks occurs at ignition start up. During the dynamic check, the ABM briefly cycles solenoids to verify operation. An audible noise may be heard during this self check. This noise should be considered normal.

If an ABS component exhibits a fault during initialization, the ABM illuminates the amber warning light and registers a fault code in the microprocessor memory.

The ABM monitors wheel speed sensor inputs continuously while the vehicle is in motion. However, the ABM will not activate any ABS components as long as sensor inputs indicate normal braking.

During normal braking, the master cylinder, power booster, and wheel brake units all function as they would in a vehicle without ABS. The HCU components are not activated.

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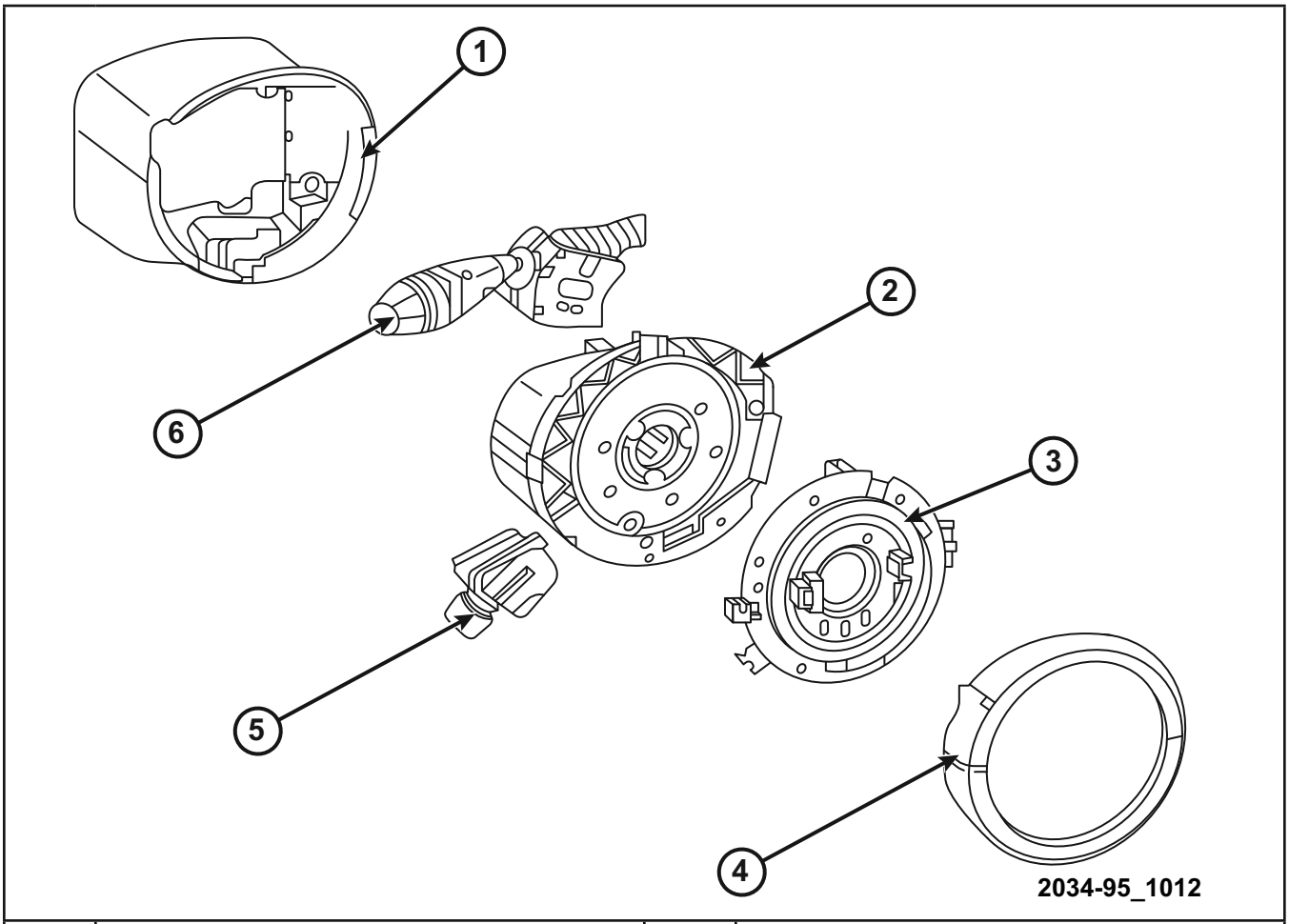
STEERING COLUMN MODULE



1	Steering Column Shroud	4	Trim Cover
2	Steering Angle Sensor (SAS)	5	Steering Column Power Tilt and Telescope Switch
3	Clock spring	6	Multi-function Switch

Figure 84 Steering Column Module

The steering control module (SCM) for this vehicle is integral to the steering column control module (SCCM). The SCCM is located near the top of the steering column below the steering wheel. The SCCM includes the steering column shroud , the steering angle sensor (SAS), the clock spring , the multi-function switch, a steering column power tilt and telescope switch for vehicles so equipped, and a trim cover.

Note: The steering column module is only serviceable as a complete assembly.

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INSTRUMENT CLUSTER

Figure 85 Cabin Compartment Node

The instrument cluster for this vehicle includes the hardware and software necessary to serve as the electronic body control module and is also referred to as the cabin compartment node (CCN) The instrument cluster is located directly in front of the driver above the steering column opening. The remainder of the CCN, including the mounts and the electrical connections, are concealed within the instrument.

Besides analog gauges and indicators, the CCN module incorporates two liquid crystal display (LCD) units. One is a fixed segment unit for displaying odometer information, automatic transmission gear selector position (PRNDL), and the cruise indicator. The second is a large, reconfigurable visual display and interface for the electronic vehicle information center (EVIC), the trip computer, the universal garage door opener (UGDO), the customer programmable features, numerous textual warning or reminder indicators, and certain diagnostic information.

The instrument cluster gauges, indicators, LCD units, as well as the cluster illumination are all integral components of the CCN and its electronic circuit board. If any part of the internal working components of the instrument cluster become damaged or inoperative, the entire instrument cluster assembly must be replaced. The cluster lens and hood unit are the only components of the instrument cluster assembly that can be serviced separately.

CCN Support Systems

The CCN supports the following functions:

- **Fuel Level Data Support** - The CCN provides a current source for and receives a hard-wired analog input from the fuel level sending unit located on the fuel pump module in the fuel tank. The CCN uses this input to calculate the proper fuel gauge needle position and to control low fuel indicator operation. Based upon this input, the CCN also uses electronic messaging to transmit this data over the CAN data bus for use by other electronic modules in the vehicle.
- **Interior Lamp Load Shedding** - The CCN provides a battery saver feature that will automatically turn off all interior lamps if they remain on after a timed interval of about eight minutes.
- **Interior Lighting Control** - The CCN monitors electronic messages and hard-wired inputs from the interior lighting switch, the door ajar switches, the liftgate ajar switch, the liftgate flip-up glass ajar switch, the reading lamp switches and the WIN to provide courtesy lamp control. This includes support for timed illuminated entry with theater-style fade-to-off and courtesy illumination defeat features.
- **Local Interface Network Master Module** - The CCN is the master module for the LIN data bus. In this role, it gathers information from the compass sensor, the heated seat module (HSM), the instrument panel switch pods, the steering wheel switches, and the SCM, then either acts on that information directly or places electronic messages on the CAN data bus for use by other modules.
- **Panel Lamps Dimming Control** - The CCN monitors electronic dimming level messages received from the panel lamps dimmer switch input to the SCM over the LIN data bus. The CCN provides both a hard-wired 12-volt pulse-width-modulated (PWM) output and electronic message outputs over the LIN data bus. This controls the synchronized dimming level of all panel lamps and the dimmer controlled lamps of the cluster general illumination lighting.

- **Power Lock System Control** - The CCN monitors inputs from the power lock switches and the WIN to provide control of the power lock motors through high-side and low-side driver outputs. This includes support for rolling door locks (also known as automatic door locks), automatic door unlock, and a door lock inhibit mode.
- **Remote Keyless Entry Support** - The CCN supports the remote keyless entry (RKE) system features, including support for the RKE LOCK, UNLOCK (with optional driver-door-only unlock, and unlock-all-doors), PANIC, audible chirp, optical chirp, illuminated entry modes, an RKE programming mode, as well as optional vehicle theft security system (VTSS) arming (when the proper VTSS arming conditions are met) and disarming.
- **Remote Radio Switch Support** - The CCN receives electronic message inputs from the remote radio switches on the steering wheel over the LIN data bus, then provides electronic radio request messages over the CAN data bus to support the remote radio switch function.
- **Steering Wheel Switch Support** - The CCN receives electronic message inputs from the steering wheel switches on the steering wheel over the LIN data bus to control and configure many of the EVIC displays and functions.
- **Vehicle Theft Security System Control** - The CCN monitors inputs from the door ajar switches, and the WIN, on vehicles so equipped. The intrusion module then provides electronic horn and lighting request messages to the front control module (FCM) located on the integrated power module (IPM) for the appropriate VTSS alarm output features.
- **Wiper and Washer Switch Support** - The CCN monitors electronic wiper switch and washer switch status messages from the SCM on the steering column over the LIN data bus and transmits the appropriate electronic wiper and washer request messages to the FCM located on the IPM over the CAN data bus to support the wiper and washer system functions, including the headlamps-on with wipers programmable feature.

Cluster Illumination

The illumination intensity of the LCD unit is controlled by the CCN circuitry based upon an input from the headlamp switch and a dimming level input received from the panel dimmer switch. The CCN synchronizes the illumination intensity of other LCD units with that of the unit in the CCN by sending electronic dimming level messages to other electronic modules in the vehicle over the CAN data bus.

The CCN has several light-emitting diode (LED) units that provide cluster back lighting whenever the exterior lighting is turned ON, or whenever the ignition switch is in the ON position. The illumination intensity of these LED units is adjusted with the panel lamps dimmer function of the headlamp switch when the switch is rotated.

The CCN uses this PWM output to control the illumination intensity of the cluster general illumination lighting and the LCD display units on the CCN circuit board, then provides a synchronized PWM output on various hard-wired fused panel lamps dimmer switch signal circuits to control and synchronize the illumination intensity of other incandescent illumination lamps in the vehicle. The CCN also transmits electronic dimming level messages over the CAN data bus to other electronic modules in the vehicle to control and synchronize the illumination intensity of their display units to that of the CCN displays.

Self Test

The self-diagnostic test will put the instrument cluster into its self-diagnostic mode. In this mode the instrument cluster can perform a diagnostic test that will confirm that the cab compartment node (CCN) circuitry, the gauges and the indicators are capable of operating as designed. During the test the CCN circuitry will position each of the gauge needles at various calibration points, illuminate each of the segments in the liquid crystal display (LCD) units, and turn all of the indicators ON and OFF again.

Successful completion of the self test will confirm that the instrument cluster is operational. However, there may still be a problem with the controller area network (CAN) data bus, local interface network (LIN) data bus, powertrain control module (PCM), totally integrated power module (TIPM), body control module (BCM), controller antilock brake (CAB), all-wheel drive control module (AWDCM), occupant restraint controller (ORC), compass module, wireless control module (WCM), or the inputs to one of these electronic control modules. Use a diagnostic scan tool to diagnose these components. Refer to the appropriate diagnostic information.

- Begin the test with the ignition switch in the OFF position.
- Depress the electronic vehicle information center (EVIC) menu down scroll switch button.
- While still holding the scroll switch button depressed, turn the ignition switch to the ON position, but do not start the engine.
- Release the switch button.
- The instrument cluster will simultaneously begin to illuminate all of the operational segments in the LCD units, and perform a bulb check of each operational LED indicator. The LCD segments and LED indicators remain illuminated as each gauge needle is swept to several calibration points and back. If an LCD segment or an LED indicator fails to illuminate, or if a gauge needle fails to sweep through the calibration points and back during this test, the instrument cluster must be replaced.
- The self test is now complete. The instrument cluster will automatically exit the self-diagnostic mode and return to normal operation at the completion of the test. The self test will be aborted if the ignition switch is turned to the OFF position, or if an electronic vehicle speed message indicating that the vehicle is moving is received over the CAN data bus during the test.

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Instrument Panel Switch POD

1	Electronic Stability Control (ESC) Off Switch	3	Hazard Warning Switch
2	Automatic Transmission Tow/Haul Mode Switch		

Figure 86 Instrument Panel Switch POD

The instrument panel switch pod is located just below the heater and air conditioner controls in the center stack area of the instrument panel. This switch is available in multiple configurations, which vary depending upon the equipment in the vehicle. However, every available configuration includes the hazard warning push button switch. The switch pod on the Dodge Durango SSV contains the following switches:

- Automatic transmission tow/haul mode switch
- Hazard warning switch
- Electronic stability control (ESC) off switch

Panel lamps dimmer controlled illumination lamps integral to the circuit board within the switch provide back lighting for visibility at night, but these lamps are not serviceable. The individual switches in the upper instrument panel switch pod cannot be repaired and are not serviced individually. If any component within the switch pod is ineffective or damaged, the entire switch pod must be replaced.

RESTRAINTS

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY ON VEHICLES EQUIPPED WITH THE SUPPLEMENTAL RESTRAINT SYSTEM (SRS), NEVER ATTEMPT TO REPAIR THE ELECTRICALLY CONDUCTIVE CIRCUITS OR WIRING COMPONENTS RELATED TO THE SRS FOR WHICH THERE IS NO MOPAR WIRING REPAIR KIT. IT IS IMPORTANT TO USE ONLY THE RECOMMENDED SPLICING KIT AND PROCEDURE. FOR APPLICABLE AND AVAILABLE MOPAR WIRING REPAIR KITS, PLEASE VISIT THE MOPAR CONNECTOR WEB SITE AT THE FOLLOWING ADDRESS ON THE INTERNET: (HTTP://DTO. VFTIS. COM/MOPAR/DISCLAIMER. ASP). INAPPROPRIATE REPAIRS CAN COMPROMISE THE CONDUCTIVITY AND CURRENT CARRYING CAPACITY OF THOSE CRITICAL ELECTRICAL CIRCUITS, WHICH MAY CAUSE SRS COMPONENTS NOT TO DEPLOY WHEN REQUIRED, OR TO DEPLOY WHEN NOT REQUIRED. ONLY MINOR CUTS OR ABRASIONS OF WIRE AND TERMINAL INSULATION WHERE THE CONDUCTIVE MATERIAL HAS NOT BEEN DAMAGED, OR CONNECTOR INSULATORS WHERE THE INTEGRITY OF THE LATCHING AND LOCKING MECHANISMS HAVE NOT BEEN COMPROMISED MAY BE REPAIRED USING APPROPRIATE METHODS.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY DURING AND FOLLOWING ANY SEAT BELT OR CHILD RESTRAINT ANCHOR SERVICE, CAREFULLY INSPECT ALL SEAT BELTS, BUCKLES, MOUNTING HARDWARE, RETRACTORS, TETHER STRAPS, AND ANCHORS FOR PROPER INSTALLATION, OPERATION, OR DAMAGE. REPLACE ANY BELT THAT IS CUT, FRAYED, OR TORN. STRAIGHTEN ANY BELT THAT IS TWISTED. TIGHTEN ANY LOOSE FASTENERS. REPLACE ANY BELT THAT HAS A DAMAGED OR INEFFECTIVE BUCKLE OR RETRACTOR. REPLACE ANY BELT THAT HAS A BENT OR DAMAGED LATCH PLATE OR ANCHOR PLATE. REPLACE ANY CHILD RESTRAINT ANCHOR OR THE UNIT TO WHICH THE ANCHOR IS INTEGRAL THAT HAS BEEN BENT OR DAMAGED. NEVER ATTEMPT TO REPAIR A SEAT BELT OR CHILD RESTRAINT COMPONENT. ALWAYS REPLACE DAMAGED OR INEFFECTIVE SEAT BELT AND CHILD RESTRAINT COMPONENTS WITH THE CORRECT, NEW, AND UNUSED REPLACEMENT PARTS LISTED IN THE CHRYSLER MOPAR® PARTS CATALOG. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN POSSIBLE SERIOUS OR FATAL INJURY.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE SUPPLEMENTAL RESTRAINT SYSTEM (SRS) BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, AIRBAG, SEAT BELT TENSIONER, IMPACT SENSOR, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE SRS. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT.**

WARNING:	**TO AVOID POTENTIAL PHYSICAL INJURY OR DAMAGE TO SENSITIVE ELECTRONIC CIRCUITS AND SYSTEMS, ALWAYS DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE AND THE POSITIVE CABLE, THEN GROUND THE POSITIVE CABLE TO DISCHARGE THE OCCUPANT RESTRAINT CONTROLLER (ORC) CAPACITOR BEFORE PERFORMING ANY WELDING OPERATIONS ON THE VEHICLE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT, POSSIBLE DAMAGE TO THE SUPPLEMENTAL RESTRAINT SYSTEM (SRS) CIRCUITS AND COMPONENTS, AND POSSIBLE DAMAGE TO OTHER ELECTRONIC CIRCUITS AND COMPONENTS. WHENEVER A WELDING PROCESS IS BEING PERFORMED WITHIN 12 INCHES (30 CENTIMETERS) OF AN ELECTRONIC MODULE OR WIRING HARNESS, THEN THAT MODULE OR HARNESS SHOULD BE RELOCATED OUT OF THE WAY, OR DISCONNECTED. ALWAYS PROTECT AGAINST COMPONENT OR VEHICLE DAMAGE FROM WELD SPATTER BY USING WELD BLANKETS AND SCREENS.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY, DO NOT ATTEMPT TO DISMANTLE AN AIRBAG UNIT OR TAMPER WITH ITS INFLATOR. DO NOT PUNCTURE, INCINERATE OR BRING INTO CONTACT WITH ELECTRICITY. DO NOT STORE AT TEMPERATURES EXCEEDING 93°C (200°F). AN AIRBAG INFLATOR UNIT MAY CONTAIN SODIUM AZIDE AND POTASSIUM NITRATE. THESE MATERIALS ARE POISONOUS AND EXTREMELY FLAMMABLE. CONTACT WITH ACID, WATER, OR HEAVY METALS MAY PRODUCE HARMFUL AND IRRITATING GASES (SODIUM HYDROXIDE IS FORMED IN THE PRESENCE OF MOISTURE) OR COMBUSTIBLE COMPOUNDS. AN AIRBAG INFLATOR UNIT MAY ALSO CONTAIN A GAS CANISTER PRESSURIZED TO OVER 17.24 KPA (2500 PSI). FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN POSSIBLE SERIOUS OR FATAL INJURY.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY WHEN HANDLING A SEAT BELT TENSIONER RETRACTOR. EXERCISE PROPER CARE TO KEEP FINGERS OUT FROM UNDER THE RETRACTOR COVER AND AWAY FROM THE SEAT BELT WEBBING WHERE IT EXITS FROM THE RETRACTOR COVER. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN POSSIBLE SERIOUS OR FATAL INJURY.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY, REPLACE ALL SUPPLEMENTAL RESTRAINT SYSTEM (SRS) COMPONENTS ONLY WITH PARTS SPECIFIED IN THE CHRYSLER MOPAR® PARTS CATALOG. SUBSTITUTE PARTS MAY APPEAR INTERCHANGEABLE, BUT INTERNAL DIFFERENCES MAY RESULT IN INFERIOR OCCUPANT PROTECTION. WARNING: TO AVOID SERIOUS OR FATAL INJURY, THE FASTENERS, SCREWS, AND BOLTS ORIGINALLY USED FOR THE SUPPLEMENTAL RESTRAINT SYSTEM (SRS) COMPONENTS MUST NEVER BE REPLACED WITH ANY SUBSTITUTES. THESE FASTENERS HAVE SPECIAL COATINGS AND ARE SPECIFICALLY DESIGNED FOR THE SRS. ANYTIME A NEW FASTENER IS NEEDED, REPLACE IT WITH THE CORRECT FASTENERS PROVIDED IN THE SERVICE PACKAGE OR SPECIFIED IN THE CHRYSLER MOPAR® PARTS CATALOG.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY WHEN A STEERING COLUMN HAS AN AIRBAG UNIT ATTACHED, NEVER PLACE THE COLUMN ON THE FLOOR OR ANY OTHER SURFACE WITH THE STEERING WHEEL OR AIRBAG UNIT FACE DOWN. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN POSSIBLE SERIOUS OR FATAL INJURY.**

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Supplimental Restraint System (SRS) Description

An occupant restraint system is standard factory-installed safety equipment on this vehicle. Available occupant restraints for this vehicle include both active and passive types. Active restraints are those which require the vehicle occupants to take some action to employ, such as fastening a seat belt; while passive restraints require no action by the vehicle occupants to be employed.

Active Restraints

The active restraints for this vehicle include:

- **Child Restraint Anchors** - All vehicles are equipped with three, fixed-position, child seat upper tether anchors for the second row seat and two for the optional third row split bench seat. Two anchors are integral to the back of the left (60%) second row seat back panel, one is integral to the right (40%) second row seat back panel, and one is integral to each of the two third row seat back panels. Two lower anchors are also provided for each second row outboard seating position. The lower anchors are integral to the second row seat frame and are accessed from the front of the second row seats, where the seat back meets the seat cushion.
- **Front Seat Belts** - Both front seating positions are equipped with three-point seat belt systems employing lower B-pillar mounted inertia latch-type emergency locking retractors, height-adjustable upper B-pillar mounted turning loops, a traveling lower seat belt anchor secured to the outboard side of the seat frame, and a traveling end-release seat belt buckle secured to the inboard side of the seat frame. The passenger side front seat belt retractor is switchable to an automatic locking retractor for compatibility with child seats. The driver side front seat belt buckle includes an integral Hall-effect seat belt switch that detects whether the driver side front seat belt has been fastened. In domestic market vehicles, a second seat belt switch in the passenger side front seat belt buckle detects whether the passenger side front seat belt has been fastened.
- **Second Row Seat Belts** - All second row seating positions are equipped with three-point seat belt systems. The outboard seating position belts employ C-pillar mounted inertia latch-type emergency locking retractors, fixed position upper C-pillar mounted turning loops, and fixed lower seat belt anchors secured to the rear floor panel. The second row center seating position belt lower anchor is secured to the seat cushion frame. All second row seat belts have fixed end-release seat belt buckles. All second row seat belt retractors are switchable to an automatic locking retractor for compatibility with child seats.

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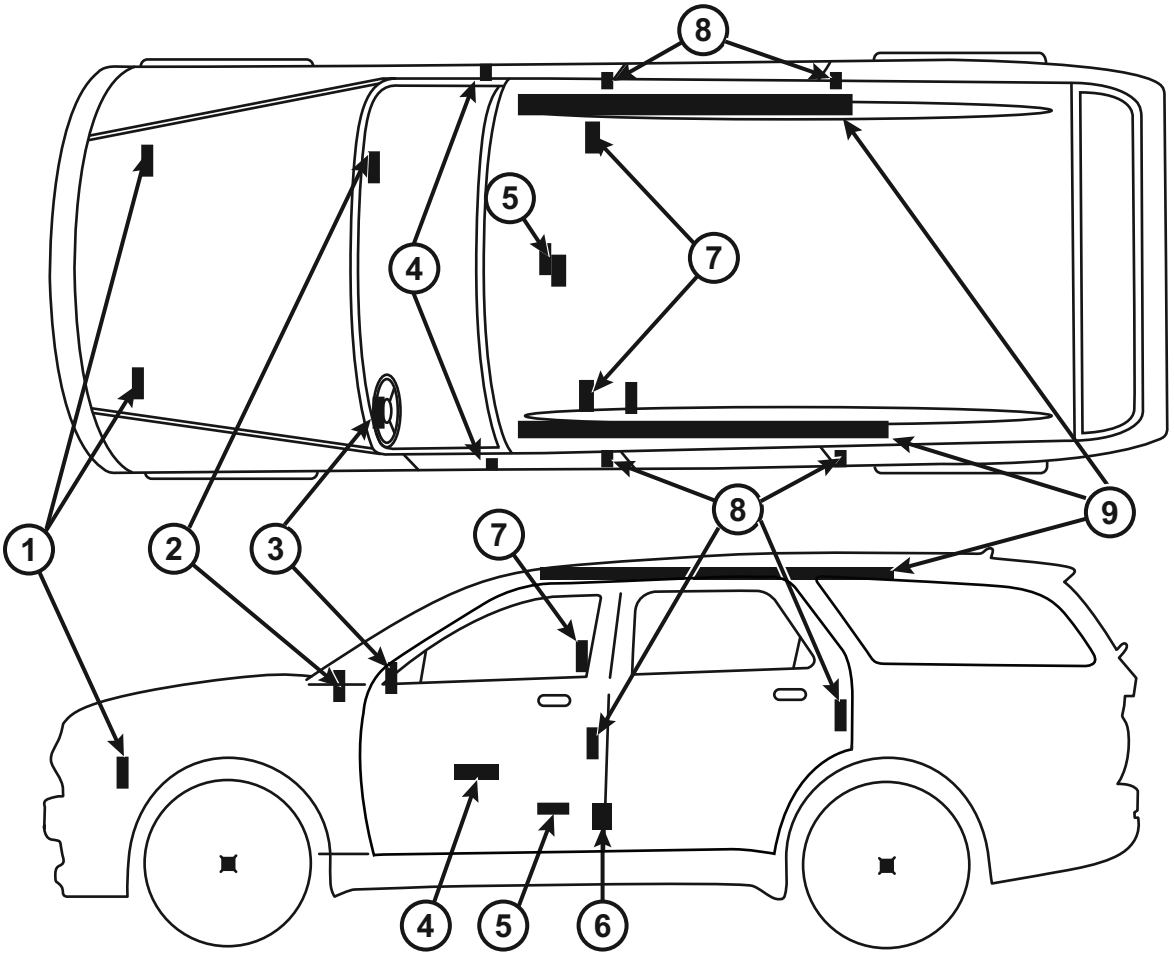
PASSIVE RESTRAINTS



1	Front Impact Sensor	6	Seatbelt Tensioner
2	Passenger Airbag	7	Seat Airbag
3	Door Pressure Sensor	8	Side Impact Sensor
4	Pressure-type Sensor	9	Side Curtain Airbag
5	Occupant Restraint Controller (ORC)		

Figure 87 Component Locations

The passive restraints available for this vehicle include the following:

- **Active Head Restraints** - Active head restraints (AHR) are standard equipment for both front seating positions in this vehicle. An AHR can be readily distinguished from a non-active head restraint by the two-piece construction used for an AHR. The forward-facing surface is padded and covered in a material coordinated with the other soft trim on the seat, while the rearward-facing surface is equipped with a molded plastic trim cover that matches the other hard trim on the seat.
- **Dual Front Airbags** - Multi-stage driver and front passenger airbags are used in this vehicle. This airbag system consists of passive, inflatable, supplemental restraint system (SRS) components and vehicles with this equipment can be readily identified by the SRS - AIRBAG logo molded into the driver airbag trim cover in the center of the steering wheel and also into the passenger airbag area of the instrument panel top cover above the glove box. Vehicles with the airbag system can also be identified by the airbag indicator, which will illuminate in the electromechanical instrument cluster (EMIC) (also known as the cab compartment node/CCN) for about four to six seconds as a bulb test each time the ignition switch is turned to the ON position. Pyrotechnic-type seat belt tensioners are also included for the driver and passenger front seat belts of all airbag equipped vehicles to work in conjunction with the dual front and side curtain airbags.
- **Seat Airbags** - Front seat-mounted seat (pelvic and thorax) airbags are standard equipment in this vehicle. This airbag system consists of passive, inflatable, SRS components and vehicles with this equipment can be readily identified by a sewn tag with the SRS - AIRBAG logo located on the outboard side of the front seat back trim cover.
- **Side Curtain Airbags** - Side curtain airbags are standard equipment for this vehicle when it is also equipped with dual front airbags. This airbag system consists of passive, inflatable, SRS components and vehicles with this equipment can be readily identified by a molded identification trim plug with the SRS - AIRBAG logo located near the headliner at the tops of each B-, C-, and D-pillar trim.

The SRS includes the following major components:

- **Active Head Restraints** - On vehicles with this equipment, one active head restraint (AHR) is located atop each front seat back unit.
- **Airbag Indicator** - The airbag indicator is integral to the electromechanical instrument cluster (EMIC) (also known as the cab compartment node/CCN), which is located on the instrument panel in front of the driver.
- **Clock spring** - The clock spring is integral to the steering column control module (SCCM) located near the top of the steering column, directly beneath the steering wheel.
- **Driver Airbag** - The driver airbag is located in the center of the steering wheel, beneath the driver airbag trim cover.
- **Driver Knee Blocker** - The driver knee blocker is a structural unit secured to the instrument panel, beneath the instrument panel steering column opening cover.
- **Front Impact Sensor** - Two front impact sensors are used on vehicles equipped with dual front airbags, one left side and one right side. One sensor is located on the back side of each vertical member of the radiator support.
- **Occupant Detection Sensor** - An occupant detection sensor (ODS) is located on the top of the seat cushion foam of the passenger side front seat in domestic market vehicles.
- **Occupant Restraint Controller** - The occupant restraint controller (ORC) is located on a mount on the floor panel transmission tunnel behind the transmission gear selector, and is concealed below the center floor console.
- **Passenger Airbag** - The passenger airbag is located in the instrument panel, beneath the instrument panel top cover, just forward and above the glove box on the passenger side of the vehicle.
- **Seat Airbag** - A seat (pelvic and thorax) airbag unit is secured to each outboard front seat back frame, where it is concealed beneath the seat back trim cover and foam.
- **Seat Belt Tensioner** - A seat belt tensioner is integral to both front seat belt retractor units on vehicles equipped with dual front airbags. The seat belt retractor tensioner units are secured to the right and left lower inner B-pillar and are concealed behind the lower B-pillar trim.
- **Side Curtain Airbag** - A side curtain airbag is secured to each inside roof side rail above the headliner, which extends from the A-pillar to the D-pillar.

- **Side Impact Sensor** - Up to eight side impact sensors are used, four on each side of the vehicle. One pressure-type sensor is located on each right and left front door hardware module carrier behind the front door trim panel. In addition, an acceleration-type sensor is located behind the B-pillar trim near the base of each B-pillar, one acceleration-type sensor is located behind the quarter panel trim near the belt line of each C-pillar, and if the vehicle is equipped with an optional third row seat, one sensor is located behind the quarter panel trim near the belt line of each quarter inner panel just forward of the D-pillar.

Note: Refer to the wiring information in the service manual when performing repairs on this system. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin out and location views for the various wire harness connectors, splices and grounds.

Note: The airbag wiring for the Dodge Durango SSV SRS system typically has yellow connectors, conduit or tape on the exposed harness wiring. Do not back probe or test any airbag system component without first referring to service information. Improper testing may result in an inadvertent deployment of the airbag system.

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SRS Deployment

Deployment of the SRS components depends upon the angle and severity of an impact. Deployment is not based upon vehicle speed; rather, deployment is based upon the rate of deceleration as measured by the forces of gravity (G force) upon the acceleration-type impact sensors, or by a pressure wave within a front door as measured by the pressure-type impact sensor. When an impact is severe enough, the microprocessor in the ORC signals the inflator of the appropriate airbag units to deploy their airbag cushions.

The front seat belt retractor tensioners are provided with a deployment signal by the ORC in conjunction with the front airbags. The side curtain airbags and the seat airbags (also known as pelvic and thorax airbags) are provided with a deployment signal individually by the ORC based upon a side impact sensor input for the same side of the vehicle. The ORC also contains a rollover sensor. Should the vehicle roll over and not cause any acceleration-type or pressure-type impact sensor to signal the need for a deployment, the rollover sensor in the ORC will deploy the side curtain airbags, the seat airbags, and under certain conditions, will also actuate the seat belt retractor tensioners.

The two AHR units are provided with a simultaneous deployment signal by the ORC independent from any of the other passive restraints only as a result of an impact pulse originating at the rear of the vehicle, but will not deploy with the transmission gear selector in the reverse (R) position.

During a frontal vehicle impact, the static knee blockers work in concert with properly fastened and adjusted seat belts to restrain both the driver and the front seat passenger in the proper position for an airbag deployment. The static knee blockers also absorb and distribute the crash energy from the driver and the front seat passenger to the structure of the instrument panel. The seat belt tensioners remove the slack from the front seat belts to provide further assurance that the driver and front seat passenger are properly positioned and restrained for an airbag deployment.

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ACTIVE HEAD RESTRAINT

1	Hard Molded Plastic Trim Cover	4	Plastic Guide Sleeves
2	Forward-facing Pad	5	Posts
3	Front Seat Back		

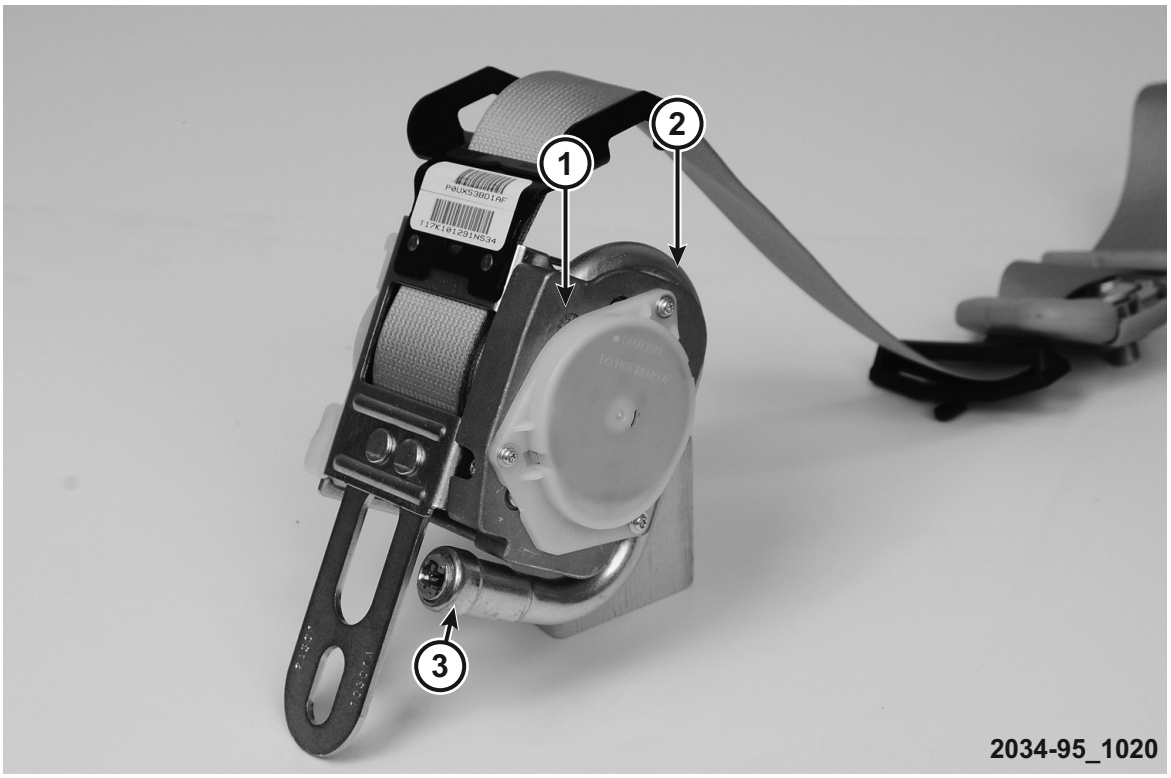
Figure 88 Active Headrest

Active head restraint (AHR) units are standard equipment for both front seating positions in this vehicle. On vehicles so equipped, one AHR unit is located atop each front seat back. An AHR can be readily distinguished from a non-active head restraint by the two-piece construction used for an AHR.

The AHR cannot be repaired. If damaged or ineffective, it must be replaced with a new unit. However, unlike many other supplemental restraint system (SRS) components, following an AHR deployment if no visible damage to the unit is observed, the AHR can usually be successfully reset and reused.

SEATBELT PRE-TENSIONER

Description



1	Cast Metal Housing	3	Pyrotechnically Activated Gas Generator with a Connector Receptacle
2	Steel Tube		

Figure 89 Seatbelt Pre-tensioner

Seat belt tensioners supplement the dual front airbags for this vehicle. The seat belt tensioners are integral to the front seat belt retractor units, which are secured to the lower inner b-pillar on the right and left sides of the vehicle. The retractor is concealed beneath the molded plastic lower inner b-pillar trim.

The seat belt tensioner consists primarily of a sprocket/pinion, a steel tube, a cast metal housing, numerous steel balls, a stamped metal ball trap, a torsion bar, and a small pyrotechnically activated gas generator with a connector receptacle. All of these components are located on one side of the retractor spool, on the outside of the retractor housing, except for the torsion bar, which serves as the spindle upon which the retractor spool rides. The seat belt tensioners are controlled by the occupant restraint controller (ORC) and are connected to the vehicle electrical system through a dedicated take out of the body wire harness by a keyed and latching yellow molded plastic connector insulator to ensure a secure connection.

The seat belt tensioners cannot be repaired and, if ineffective or damaged, the entire front seat belt and retractor unit must be replaced. If the front airbags have been deployed, the seat belt tensioners have also been deployed. The seat belt tensioners are not intended for reuse and must be replaced following any front airbag deployment. A growling or grinding sound while attempting to operate the seat belt retractor is a sure indication that the seat belt tensioner has been deployed and requires replacement.

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ROLLOVER PROTECTION

Rollover Sensing

Rollover sensing is the ability to sense the conditions leading up to a vehicle rollover event. Rollover sensing is used for enhanced restraint systems on some vehicles. These enhanced systems provide additional protection for the vehicle occupants in the event the vehicle rolls over. When the ACM of a rollover sensing equipped vehicle determines a rollover event is occurring, the ACM deploys both pretensioners for slow developing events or both pretensioners and both side curtain airbags for faster developing events to protect the occupants.

Rollover Events

A ramp rollover event occurs when one side of the vehicle suddenly drives up on an object similar to a ramp lifting one side of the vehicle causing it to rollover.

A ditch rollover event occurs when the vehicle leaves the road and the wheels on one side of the vehicle encounter significantly lower ground causing the vehicle to rollover.

A trip rollover event occurs when the vehicle enters a sideways skid and then encounters an object causing the vehicle to tip. A trip rollover can be further defined as a curb trip or a soil trip.

A curb trip occurs when a sideways skidding vehicle encounters a rigid object such as a curb causing it to tip.

A soil trip occurs when a sideways skidding vehicle digs into the soil causing the vehicle to tip.

To provide protection, the rollover sensing system must be able to detect the conditions leading to a rollover regardless of the cause of the rollover.

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HEATING AND AIR CONDITIONING

Figure 90 Automatic Temperature Control (ATC) Panel

The Dodge Durango SSV utilizes a three-zone, automatic temperature control (ATC) HVAC system. Unique to the SSV is the absence of the rear climate control head.

Note: To maintain the performance level of the heating, ventilation, and air conditioning (HVAC) system, the engine cooling system must be properly maintained. The use of a bug screen is not recommended. Any obstructions in front of the radiator or A/C condenser will reduce the performance of the A/C and engine cooling systems.

The engine cooling system includes the radiator, thermostat, radiator hoses, and the engine coolant pump.

Automatic Temperature Control

The automatic temperature control (ATC) allows both driver and front passenger seat occupants to select individual comfort settings.

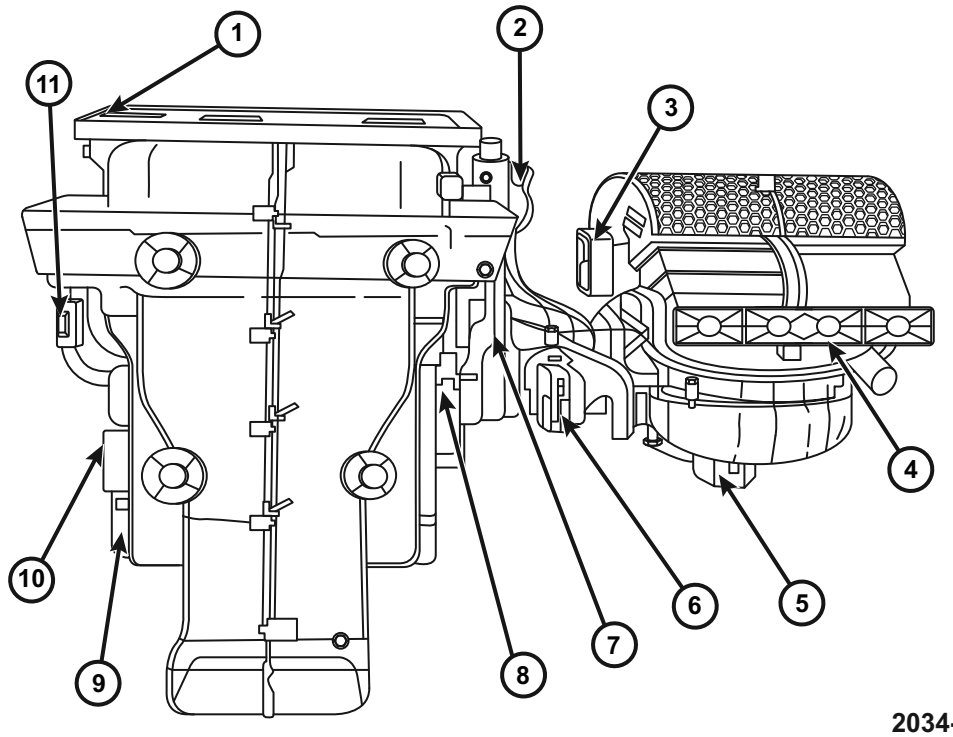
When occupants in the vehicle select the AUTO mode operation, a comfort temperature can be set by using the temperature up and down buttons, and the auto blower operation will be set automatically.

The system provides set-and-forget operation for optimum comfort and convenience.

The system can be controlled manually, if desired.

The ATC system automatically maintains the interior comfort level desired by the driver and passenger.

Front Heating and A/C System

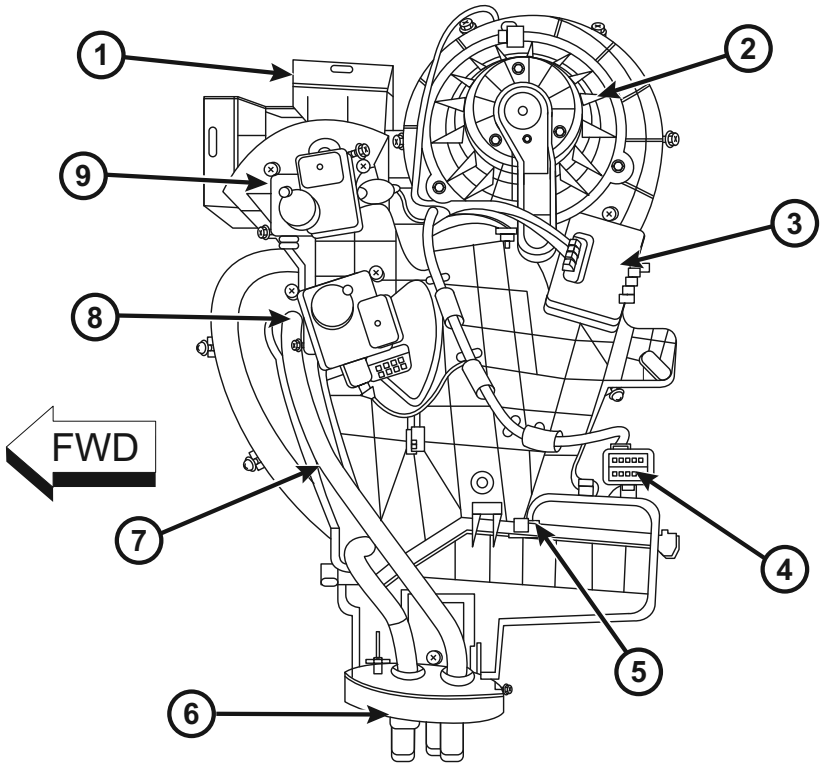


1	HVAC Housing	7	Passenger Side Blend Door Actuator and Air-door
2	Mode Door Actuator and Air-doors	8	Evaporator Temperature Sensor
3	Recirculation Door Actuator and Air-Door	9	Heater Core
4	Particulate Air Filter, when Equipped	10	A/C Evaporator
5	Blower Motor	11	Driver Side Blend Door Actuator and Air-door
6	Blower Motor Power Module		

Figure 91 HVAC Housing

Based upon the system and selected mode, conditioned air can exit the HVAC housing through one or a combination of the four main housing outlets: defrost, panel, floor, and console. The defrost and panel outlets are located on the top of the HVAC housing, the floor outlets are located at each side of the HVAC housing, and the console outlet is located at the bottom rear of the HVAC housing. After the conditioned air exits the HVAC housing, it is further directed through molded plastic ducts to the outlets within the vehicle interior.

Rear Heating and A/C System



1	Rear HVAC Housing	6	A/C Expansion Valve
2	Blower Motor	7	Heater Core
3	Blower Motor Power Module	8	Blend Door and Actuator
4	Wire Harness	9	Mode Door and Actuator
5	A/C Evaporator		

Figure 92 Rear HVAC Housing

The available rear heating-A/C system is equipped with a housing that combines A/C and heating capabilities into a single unit that is mounted in the rear passenger compartment, behind the right quarter trim panel.

Based upon the rear temperature selected, conditioned air can exit the rear heater-A/C housing through one or a combination of the two outlets at the top of the housing. After the conditioned air exits the rear heater-A/C housing, it is further directed through molded plastic ducts to the air outlets located in the rear of the passenger compartment.

These air outlets and their locations are as follows:

- Upper Air Outlets - There are four air outlets with adjustable vanes located in the headliner.
- Lower (floor) Air Outlet - There is one air outlet with fixed vanes located in the right quarter trim panel.

A/C System Specifications

Table 20 A/C System Specifications

Item	Description	Notes
A/C Compressor	Denso 10SRE18-5.7L Engine	ND-8 PAG oil*
	Visteon RS-18-3.6L Engine	VC-46 PAG oil*
A/C Clutch Air Gap	0.35-0.60 mm (0.014-0.024 in.)	5.7L Engine
	0.35-0.65 mm (0.014-0.025 in.)	3.6L Engine
A/C Clutch Coil Draw	3.2 Max amps @ 12V ± 0.5V @ 21°C (70°F)	5.7L Engine
	3.1-4.0 amps @ 12V ± 0. 5V @ 21°C (70°F)	3.6L Engine
A/C Clutch Coil Resistance	3.3-3.5 ohms	5.7L Engine
	3.0-4.0 ohms	3.6L Engine
Freeze–up Control	Evaporator Temperature Sensor	HVAC housing mounted
Pressure Control	A/C Pressure Transducer	A/C discharge line mounted
Refrigerant Charge Capacity R134a	Front A/C Only-623.7g (1.38 lbs.)	See the A/C Underhood Specification Label located in the engine compartment
	Front and Rear A/C - 921. 4g (2.03 lbs.)	

*Always use the type of PAG oil listed for the model being serviced. See the A/C Underhood Specification Label located in the engine compartment. Do not mix different types of PAG oils.

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LESSON 7 TRAILER TOWING

Figure 93 Trailer Hitch and Trailer Connectors

TRAILER TOWING

In this section, safety tips and information on limits to the types of towing that can reasonably be done with the vehicle. Before towing a trailer, carefully review this information to tow as efficiently and safely as possible.

Common Towing Definitions

The following trailer towing related definitions will assist in understanding the following information.

Gross Vehicle Weight Rating (GVWR)

The GVWR is the total allowable weight of the vehicle. This includes driver, passengers, cargo and trailer tongue weight. The total load must be limited so that you do not exceed the GVWR. Refer to "Vehicle Loading/Vehicle Certification Label" in "Starting and Operating" for further information.

Gross Trailer Weight (GTW)

The GTW is the weight of the trailer plus the weight of all cargo, consumables and equipment (permanent or temporary) loaded in or on the trailer in its "loaded and ready for operation" condition.

The recommended way to measure GTW is to put the fully loaded trailer on a vehicle scale. The entire weight of the trailer must be supported by the scale.

WARNING: IF THE GROSS TRAILER WEIGHT IS 1587 KG (3,500 LBS.) OR MORE, IT IS MANDATORY TO USE A WEIGHT-DISTRIBUTING HITCH TO ENSURE STABLE HANDLING OF YOUR VEHICLE. IF YOU USE A STANDARD WEIGHT-CARRYING HITCH, YOU COULD LOSE CONTROL OF YOUR VEHICLE AND CAUSE A COLLISION.

Gross Combination Weight Rating (GCWR)

The GCWR is the total permissible weight of the vehicle and trailer when weighed in combination.

Note: The GCWR rating includes a 68 kg (150 lbs.) allowance for the presence of a driver.

Gross Axle Weight Rating (GAWR)

The GAWR is the maximum capacity of the front and rear axles. Distribute the load over the front and rear axles evenly. Make sure that you do not exceed either front or rear GAWR. Refer to "Vehicle Loading/Vehicle Certification Label" in "Starting and Operating" for further information.

WARNING: IT IS IMPORTANT THAT YOU DO NOT EXCEED THE MAXIMUM FRONT OR REAR GAWR. A DANGEROUS DRIVING CONDITION CAN RESULT IF EITHER RATING IS EXCEEDED. YOU COULD LOSE CONTROL OF THE VEHICLE AND HAVE A COLLISION.

Trailer Tongue Weight (TW)

The TW is the downward force exerted on the hitch ball by the trailer. In most cases it should not be less than 10% or more than 15% of the trailer load. It must be considered as part of the load on the vehicle.

Frontal Area

The frontal area is the maximum height multiplied by the maximum width of the front of a trailer.

Trailer Sway Control

The trailer sway control can be a mechanical telescoping link that can be installed between the hitch receiver and the trailer tongue that typically provides adjustable friction associated with the telescoping motion to dampen any unwanted trailer swaying motions while traveling.

The Dodge Durango SSV is equipped with electronic trailer sway control (TSC). TSC recognizes a swaying trailer and automatically applies individual wheel brakes and/or reduces engine power to attempt to eliminate the trailer sway.

Weight-carrying Hitch

A weight-carrying hitch supports the trailer tongue weight, just as if it were luggage located at a hitch ball or some other connecting point of the vehicle. These kinds of hitches are the most popular on the market today and they are commonly used to tow small- and medium-sized trailers.

Weight-distributing Hitch

A weight-distributing hitch system works by applying leverage through spring (load) bars. They are typically used for heavier loads, to distribute trailer tongue weight to the tow vehicle's front axle and the trailer axle(s). When used in accordance with the manufacturer's directions, it provides for a more level ride, offering more consistent steering and brake control, thereby enhancing towing safety. The addition of a friction/hydraulic sway control also dampens sway caused by traffic and crosswinds, and contributes positively to tow vehicle and trailer stability. A friction/hydraulic sway control mechanism and a weight distributing (load equalizing) hitch are recommended for heavier trailer tongue weights (TW) and may be required depending on vehicle and trailer configuration/loading to comply with gross axle weight rating (GAWR) requirements.

WARNING: **AN IMPROPERLY ADJUSTED WEIGHT-DISTRIBUTING HITCH SYSTEM MAY REDUCE HANDLING, STABILITY, AND BRAKING PERFORMANCE, AND COULD RESULT IN A COLLISION.**

WARNING: **WEIGHT-DISTRIBUTING HITCH SYSTEMS MAY NOT BE COMPATIBLE WITH SURGE BRAKE COUPLERS. CONSULT WITH YOUR HITCH AND TRAILER MANUFACTURER OR A REPUTABLE RECREATIONAL VEHICLE DEALER FOR ADDITIONAL INFORMATION.**

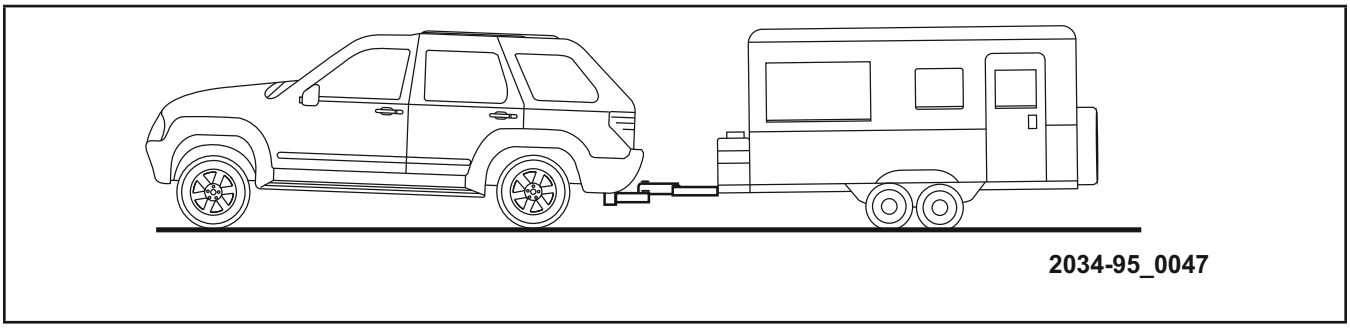

Figure 94 Without Weight-distributing Hitch

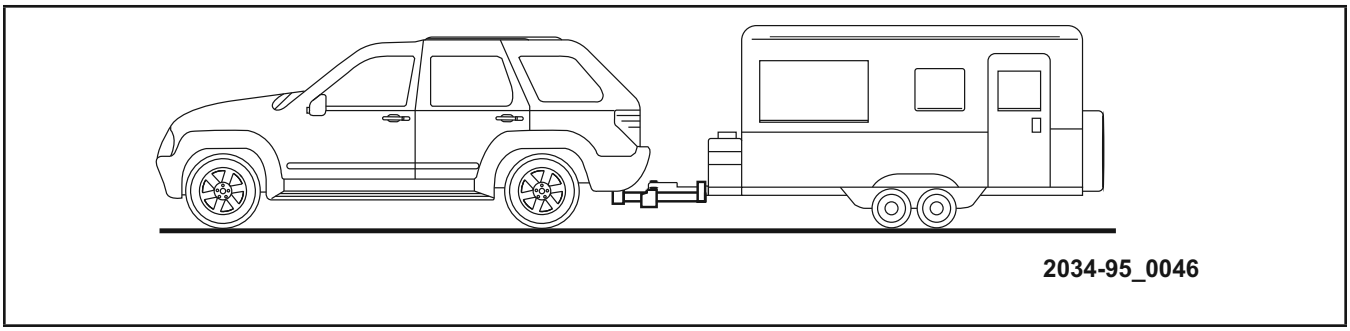

Figure 95 With Weight-distributing Hitch

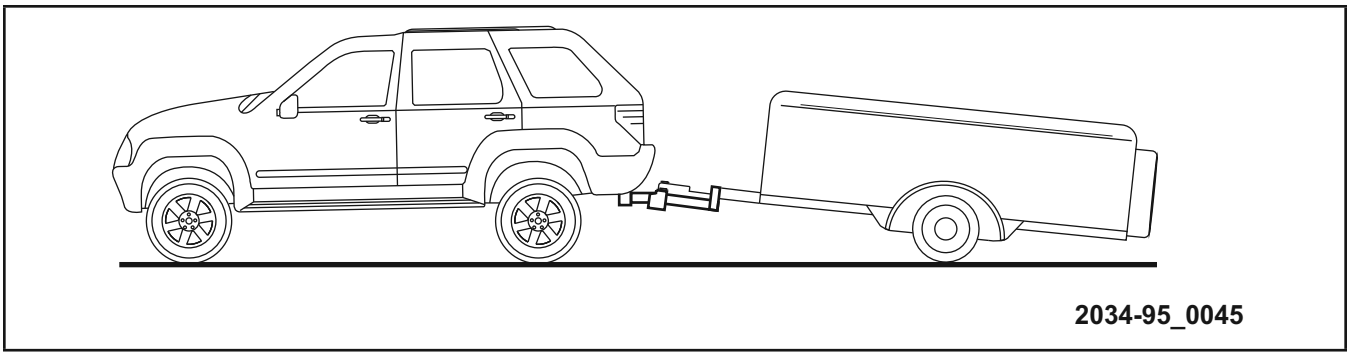

Figure 96 Improper Adjustment of Weight-distributing Hitch

Trailer Hitch Classification

The vehicle may be factory equipped for safe towing of trailers weighing over 1,587 kg (3,500 lbs) with the optional Trailer Tow Prep Package. See your authorized dealer for package content.

The following chart provides the industry standard for the maximum trailer weight a given trailer hitch class can tow and should be used to assist you in selecting the correct trailer hitch for your intended towing condition. Refer to the Trailer Towing Weights (Maximum Trailer Weight Ratings) chart for the maximum GTW allowable for your given drivetrain.

Trailer Hitch Classification Definitions

Class Max. Trailer Hitch Industry Standards

Class I - Light Duty 907 kg (2,000 lbs.)

Class II - Medium Duty 1,587 kg (3,500 lbs.)

Class III - Heavy Duty 2,268 kg (5,000 lbs.)

Class IV - Extra Heavy Duty 4,540 kg (10,000 lbs.)

Refer to the Trailer Towing Weights (Maximum Trailer Weight Ratings) chart for the maximum gross trailer weight (GTW) allowable for your given drivetrain.

All trailer hitches should be professionally installed on the vehicle.

Trailer Towing Weights

Table 21 Maximum Trailer Weight Ratings Allowable

Engine/ Model	Model	GCWR (Gross Combined Wt. Rating)	Frontal Area	Max. GTW (Gross Trailer Wt.)	Max. Trailer Tongue Wt. (See Note)
3.6L	RWD	5262 kg. (11,600 lbs.)	3.72 sq. m. (40 sq. ft.)	2812kg. (6,200 lbs.)	281 kg. (620 lbs.)
3.6L	AWD	5262 kg. (11,600 lbs.)	3.72 sq. m. (40 sq. ft.)	2812 kg. (6,200 lbs.)	281 kg. (620 lbs)
5.7L	RWD	5942 kg. (13,100 lbs.)	5.57 sq. m. (60 sq. ft.)	3266 kg. (7,200 lbs.)	327 kg. (720 lbs)
5.7L	AWD	5942 kg. (13,100 lbs.)	5.57 sq. m. (60 sq. ft.)	3266 kg. (7,200 lbs.)	327 kg. (720 lbs)

NOTE: The trailer tongue weight must be considered as part of the combined weight of occupants and cargo, and should never exceed the weight referenced on the Tire and Loading Information placard. Refer to "Tire Safety Information" in "Starting and Operating" for further information. The addition of passengers and cargo may require reducing trailer tongue load and gross trailer weight (GTW). Redistributing cargo (to the trailer) may be necessary to avoid exceeding rear gross axle weight rating (GAWR) of 1,769 kg (3,900 lbs).

If the gross trailer weight is 1,587 kg (3,500 lbs) or more, it is mandatory to use a weight-distributing hitch to ensure stable handling of your vehicle.

Note: Vehicles not factory equipped with trailer tow package are limited to 3,500 lbs. (350 lbs. tongue weight).

Trailer and Tongue Weight

Always load a trailer with 60% to 65% of the weight in the front of the trailer. This places 10% to 15% of the gross trailer weight (GTW) on the tow hitch of your vehicle. Loads balanced over the wheels, or heavier in the rear, can cause the trailer to sway severely side-to-side which will cause loss of control of vehicle and trailer. Failure to load trailers heavier in front is the cause of many trailer collisions.

Consider the following items when computing the weight on the front/rear axles of the vehicle:

- The trailer tongue weight of the trailer
- The weight of any other type of cargo or equipment put in or on the vehicle
- The weight of the driver and all passengers

Note: **Remember that everything put into or on the trailer adds to the load on your vehicle. Also, additional factory-installed options, or authorized dealer-installed options, must be considered as part of the total load on your vehicle. Refer to "Tire Safety Information/Tire and Loading Information Placard" in "Starting and Operating" for further information.**

Towing Requirements

To promote proper break-in of your new vehicle drivetrain components, the following guidelines are recommended.

Caution: **Do not tow a trailer at all during the first 805 km (500 miles) the new vehicle is driven. The engine, axle or other parts could be damaged.**

Then, during the first 805 km (500 miles) that a trailer is towed, do not drive over 80 km/h (50 mph) and do not make starts at full throttle. This helps the engine and other parts of the vehicle wear in at the heavier loads.

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WARNING: **IMPROPER TOWING CAN LEAD TO A COLLISION. FOLLOW THESE GUIDELINES TO MAKE YOUR TRAILER TOWING AS SAFE AS POSSIBLE:**

MAKE CERTAIN THAT THE LOAD IS SECURED IN THE TRAILER AND WILL NOT SHIFT DURING TRAVEL. WHEN TRAILERING CARGO THAT IS NOT FULLY SECURED, DYNAMIC LOAD SHIFTS CAN OCCUR THAT MAY BE DIFFICULT FOR THE DRIVER TO CONTROL. YOU COULD LOSE CONTROL OF YOUR VEHICLE AND HAVE A COLLISION.

WHEN HAULING CARGO OR TOWING A TRAILER, DO NOT OVERLOAD YOUR VEHICLE OR TRAILER. OVERLOADING CAN CAUSE A LOSS OF CONTROL, POOR PERFORMANCE OR DAMAGE TO BRAKES, AXLE, ENGINE, TRANSMISSION, STEERING, SUSPENSION, CHASSIS STRUCTURE OR TIRES.

SAFETY CHAINS MUST ALWAYS BE USED BETWEEN YOUR VEHICLE AND TRAILER. ALWAYS CONNECT THE CHAINS TO THE HOOK RETAINERS OF THE VEHICLE HITCH. CROSS THE CHAINS UNDER THE TRAILER TONGUE AND ALLOW ENOUGH SLACK FOR TURNING CORNERS.

VEHICLES WITH TRAILERS SHOULD NOT BE PARKED ON A GRADE. WHEN PARKING, APPLY THE PARKING BRAKE ON THE TOW VEHICLE. PUT THE TOW VEHICLE TRANSMISSION IN PARK. FOR FOUR-WHEEL DRIVE VEHICLES, MAKE SURE THE TRANSFER CASE IS NOT IN NEUTRAL. ALWAYS, BLOCK OR "CHOCK" THE TRAILER WHEELS.

GCWR MUST NOT BE EXCEEDED.

TOTAL WEIGHT MUST BE DISTRIBUTED BETWEEN THE TOW VEHICLE AND THE TRAILER SUCH THAT THE FOLLOWING FOUR RATINGS ARE NOT EXCEEDED: GVWR, GTW, GAWR.
TRAILER TONGUE WEIGHT RATING FOR THE TRAILER HITCH UTILIZED (THIS REQUIREMENT MAY LIMIT THE ABILITY TO ALWAYS ACHIEVE THE 10% TO 15% RANGE OF TONGUE WEIGHT AS A PERCENTAGE OF TOTAL TRAILER WEIGHT).

Towing Requirements – Tires

Do not attempt to tow a trailer while using a compact spare tire.

Proper tire inflation pressures are essential to the safe and satisfactory operation of your vehicle. Refer to "Tires – General Information" in "Starting and Operating" for proper tire inflation procedures.

Check the trailer tires for proper tire inflation pressures before trailer usage.

Check for signs of tire wear or visible tire damage before towing a trailer.

When replacing tires, refer to "Tires – General Information" in "Starting and Operating" for proper tire replacement procedures. Replacing tires with a higher load carrying capacity will not increase the vehicle's GVWR and GAWR limits.

Towing Requirements – Trailer Brakes

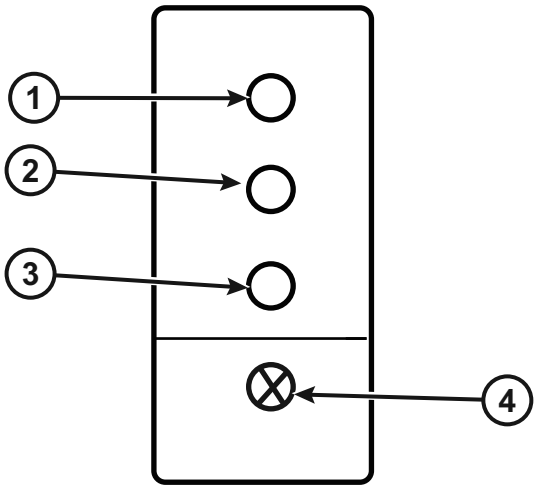
An electronically-actuated trailer brake controller is required when towing a trailer with electronically-actuated brakes. When towing a trailer equipped with a hydraulic surge-actuated brake system, an electronic brake controller is not required.

Trailer brakes are recommended for trailers over 454 kg (1,000 lbs.), and required for trailers in excess of 907 kg (2,000 lbs).

The vehicle is not equipped with an integrated trailer brake controller. There is a harness provided that can be used when installing an aftermarket brake controller.

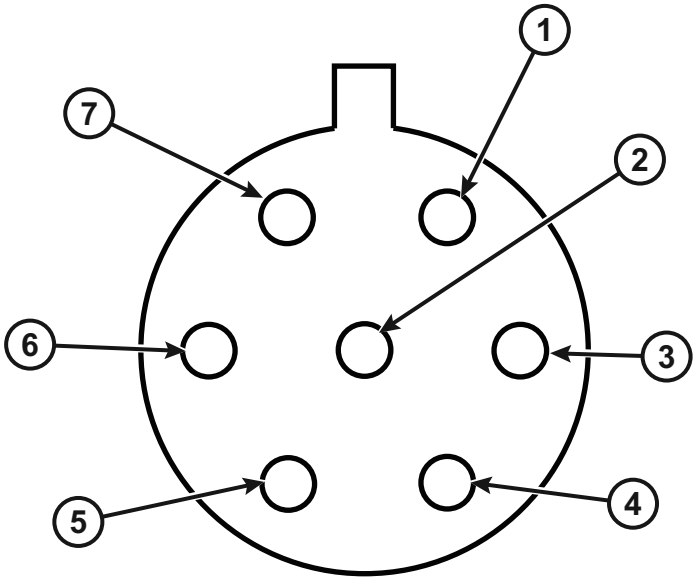
WARNING:	**DO NOT CONNECT TRAILER BRAKES TO YOUR VEHICLE'S HYDRAULIC BRAKE LINES. IT CAN OVERLOAD YOUR BRAKE SYSTEM AND CAUSE IT TO FAIL. YOU MIGHT NOT HAVE BRAKES WHEN YOU NEED THEM AND COULD HAVE A COLLISION.** **TOWING ANY TRAILER WILL INCREASE YOUR STOPPING DISTANCE. WHEN TOWING, YOU SHOULD ALLOW FOR ADDITIONAL SPACE BETWEEN YOUR VEHICLE AND THE VEHICLE IN FRONT OF YOU. FAILURE TO DO SO COULD RESULT IN A COLLISION.**

Towing Requirements – Trailer Lights and Wiring



1	Right Stop/Turn-Green (Female)	3	Park-Brown (Female)
2	Left Stop/Turn-Yellow (Female)	4	Ground-White (Male)

Figure 97 Four-pin Connector



1	Battery-Red/Black (Female)	5	Ground-White (Female)
2	Backup Lamps-Purple (Male)	6	Left Stop/Turn-Yellow (Female)
3	Right Stop/Turn-Green (Female)	7	Running Lamps-Brown (Female)
4	Electric Brakes-Blue (Female)		

Figure 98 Seven-Pin Connector

Towing Tips

Whenever pulling a trailer, regardless of the trailer size, stop lights and turn signals on the trailer are required for motoring safety.

The Trailer Tow Package includes both a seven-pin and a four-pin connector at the rear of the vehicle.

The electrical connections are all complete to the vehicle but must mate the harness to a trailer connector.

Note: Before setting out on a trip, practice turning, stopping and backing the trailer in an area away from heavy traffic.

The trailer lamps are provided voltage by the high side drivers of the TIPM. If performing diagnostics and there is no voltage present, it may be necessary to perform TIPM diagnostics before proceeding with additional repairs.

Automatic Transmission

The drive range can be selected when towing. However, if frequent shifting occurs while in this range, the TOW/HAUL mode (if equipped), or a lower gear range, should be selected.

Note: Using the TOW/HAUL mode (if equipped) or selecting a lower gear range (using the electronic range select feature) while operating the vehicle under heavy operating conditions, will improve performance and extend transmission life by reducing excessive shifting and heat buildup. This action will also provide better engine braking.

The transmission fluid and filter should be changed if you REGULARLY tow a trailer for more than 45 minutes of continuous operation. Refer to “Maintenance Schedule” for the proper maintenance intervals.

Note: Check the transmission fluid level before towing (5.7L engine).

Electronic Speed Control if Equipped

Do not use in hilly terrain or with heavy loads.

When using the speed control, if you experience speed drops greater than 16 km/h (10 mph), disengage until you can get back to cruising speed.

Use speed control in flat terrain and with light loads to maximize fuel efficiency.

Cooling System

To reduce the potential for engine and transmission overheating, take the following actions:

City Driving:

- When stopped for short periods of time, shift the transmission into neutral and increase engine idle speed.

Highway Driving:

- Reduce speed

Air Conditioning:

- Turn off temporarily

Notes:

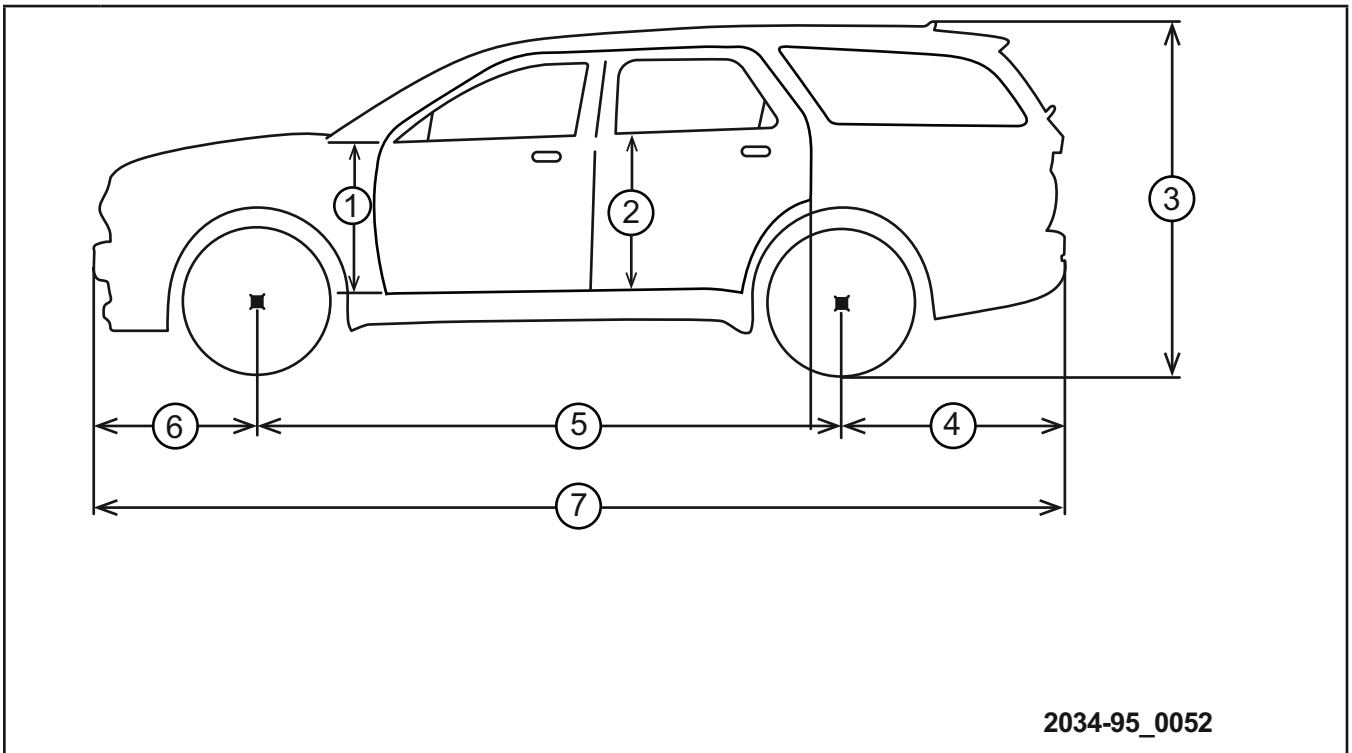
LESSON 8 UP-FITTER

Figure 99 Up-Fitted Durango

The Dodge Durango Special Service Vehicle (SSV) features a special interior dome lamp and spot-lamp wiring. The vehicle also has the 3rd row seating removed to increase available storage. The SSV package also has rear seat HVAC and full side-curtain SRS systems.

DIMENSIONS

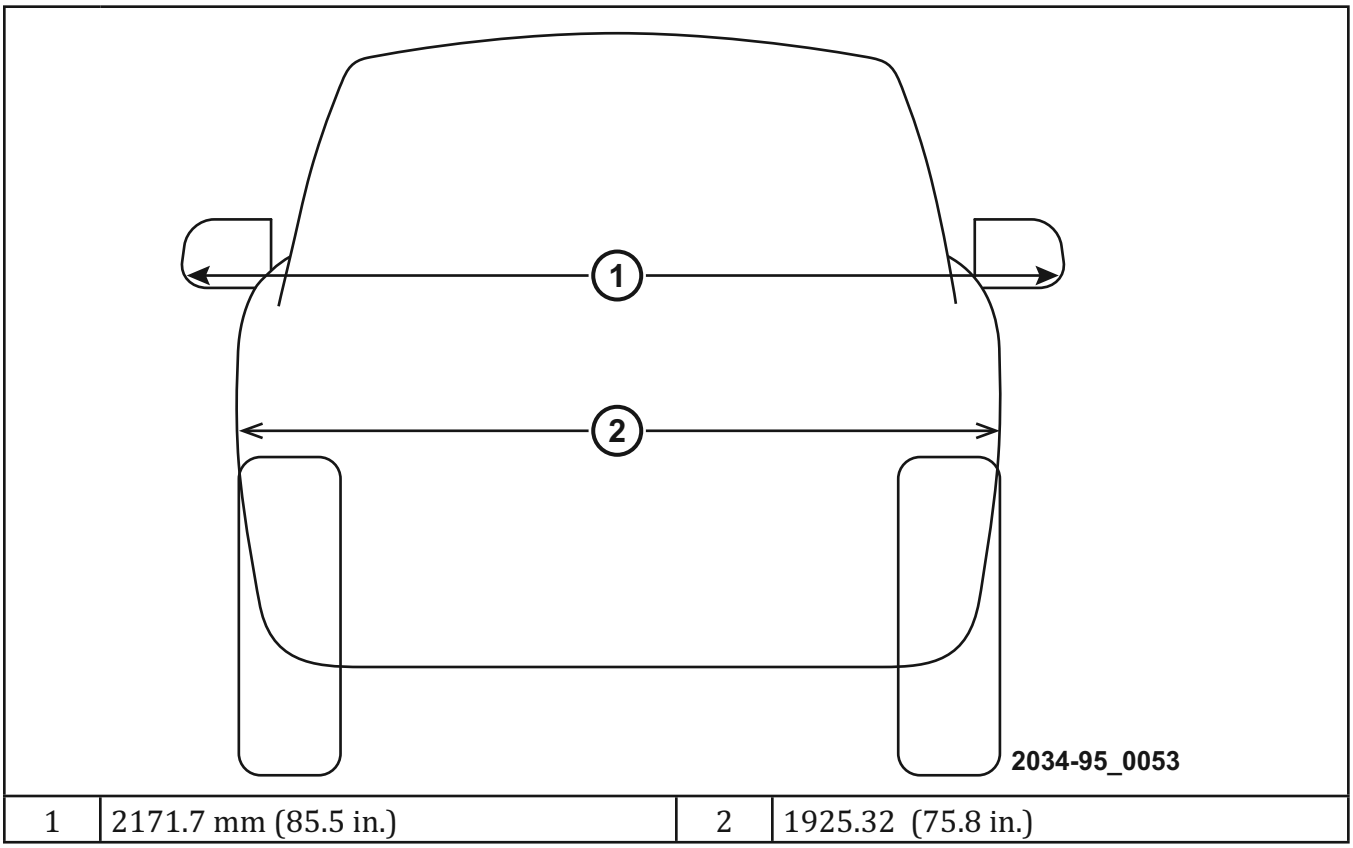
Side View



1	726.44 mm (28.6 in.)	5	3042.92 mm (119.8 in.)
2	756.92 mm (29.8 in.)	6	863.6 mm (34.0 in.)
3	1818.64 mm (71.6 in.)	7	5074.92 mm (199.8 in.)
4	1168.4 mm (46.0 in.)		

Figure 100 Vehicle Side Dimensions

Front View



1	2171.7 mm (85.5 in.)	2	1925.32 (75.8 in.)

Figure 101 Front View Dimensions

LIGHTS

Figure 102 Police Dome light

Dome Light

The police dome light has three positions. Position one is used for white light, and position two is used for red LED light. Always remember to return the dome light switch to the OFF (center) position when finished using to prevent discharging the vehicle battery.

Spot Light Connection

Figure 103 Spot Light Connection

The spot lamp connector is located at the leading edge of the headliner just off the A-pillars. The connector is taped in place. There is a single terminal in the connector and a 22-gauge wire leading to the connector.

WARNING:	**PRIOR TO CONNECTING A SPOT LAMP TO THE WIRING, DETERMINE THE AMPERAGE DRAW OF THE LAMP. EXCESSIVE AMPERAGE DRAW COULD EXCEED THE CAPABILITIES OF THE WIRE HARNESS AND LEAD TO CIRCUIT FAILURE.**

GROUND LOCATIONS

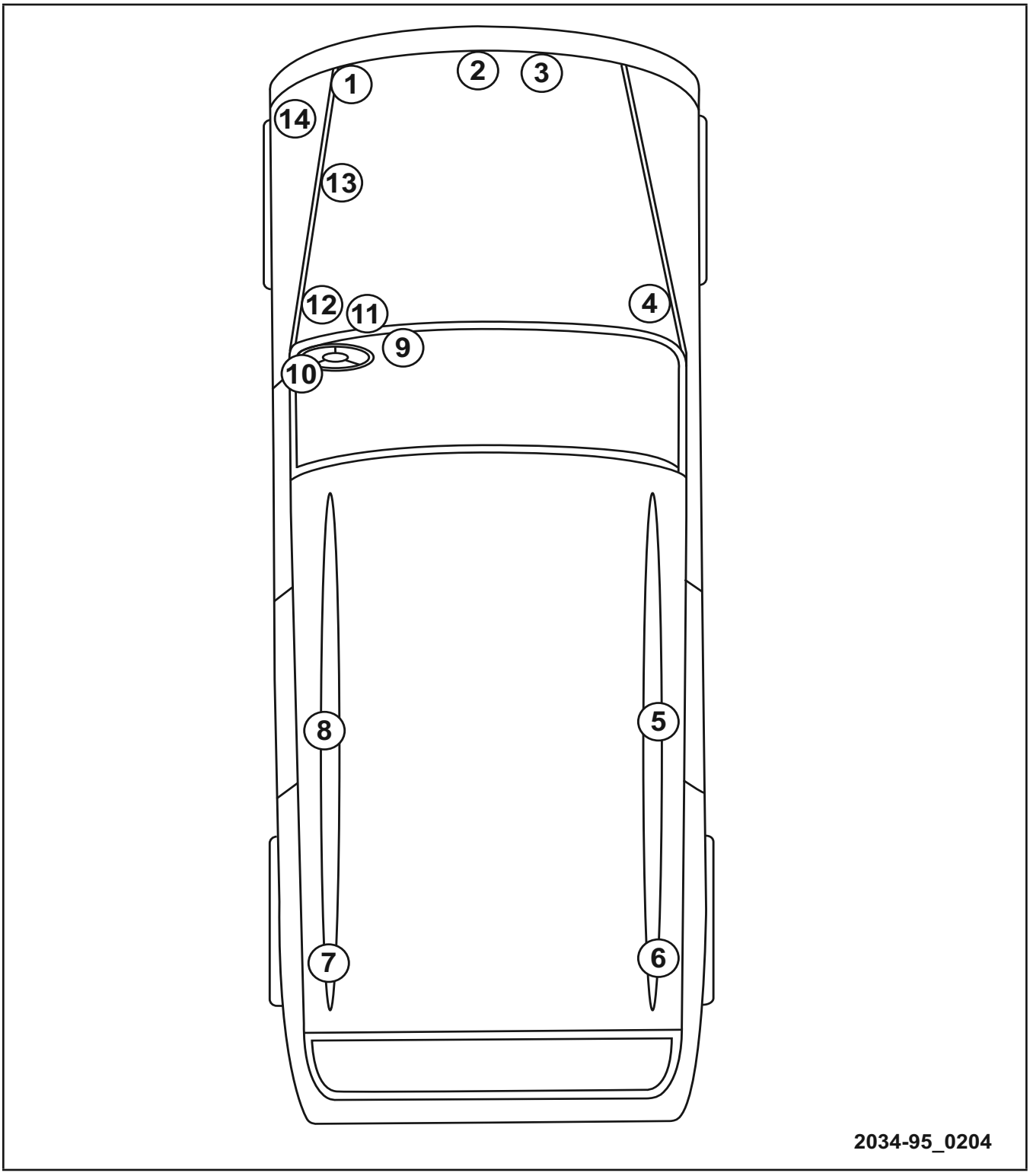


Figure 104 Available Ground Locations

There are multiple ground locations throughout the vehicle. Eight grounds are located underhood, six grounds are located within the interior.

Table 22 Ground Locations

1	G905	8	G916
2	G903	9	G911
3	G906	10	G912
4	G909A	11	G913
5	G919	12	G901
6	G924	13	G904
7	G923	14	G918

Note: When adding a component ground to the vehicle ground, care should be taken not to interrupt the integrity of the manufacturer's installation. It is possible to create electronic malfunctions as a result of improper handling of the ground attachment.

Caution: Before opening or adding a ground, consult the service information. Certain components have dedicated grounds that should not have additional components added to them (such as PCM and passive restraint circuits).

PASSIVE RESTRAINTS

WARNING: TO AVOID SERIOUS OR FATAL INJURY ON VEHICLES EQUIPPED WITH THE SUPPLEMENTAL RESTRAINT SYSTEM (SRS), NEVER ATTEMPT TO REPAIR THE ELECTRICALLY CONDUCTIVE CIRCUITS OR WIRING COMPONENTS RELATED TO THE SRS FOR WHICH THERE IS NO MOPAR WIRING REPAIR KIT. IT IS IMPORTANT TO USE ONLY THE RECOMMENDED SPLICING KIT AND PROCEDURE. FOR APPLICABLE AND AVAILABLE MOPAR WIRING REPAIR KITS, PLEASE VISIT THE MOPAR CONNECTOR WEB SITE AT THE FOLLOWING ADDRESS ON THE INTERNET:
(://DTO.VFTIS.COM/MOPAR/DISCLAIMER.ASP).
INAPPROPRIATE REPAIRS CAN COMPROMISE THE CONDUCTIVITY AND CURRENT CARRYING CAPACITY OF THOSE CRITICAL ELECTRICAL CIRCUITS, WHICH MAY CAUSE SRS COMPONENTS NOT TO DEPLOY WHEN REQUIRED, OR TO DEPLOY WHEN NOT REQUIRED. ONLY MINOR CUTS OR ABRASIONS OF WIRE AND TERMINAL INSULATION WHERE THE CONDUCTIVE MATERIAL HAS NOT BEEN DAMAGED, OR CONNECTOR INSULATORS WHERE THE INTEGRITY OF THE LATCHING AND LOCKING MECHANISMS HAVE NOT BEEN COMPROMISED MAY BE REPAIRED USING APPROPRIATE METHODS.

WARNING: TO AVOID SERIOUS OR FATAL INJURY DURING AND FOLLOWING ANY SEAT BELT OR CHILD RESTRAINT ANCHOR SERVICE, CAREFULLY INSPECT ALL SEAT BELTS, BUCKLES, MOUNTING HARDWARE, RETRACTORS, TETHER STRAPS, AND ANCHORS FOR PROPER INSTALLATION, OPERATION, OR DAMAGE. REPLACE ANY BELT THAT IS CUT, FRAYED, OR TORN. STRAIGHTEN ANY BELT THAT IS TWISTED. TIGHTEN ANY LOOSE FASTENERS. REPLACE ANY BELT THAT HAS A DAMAGED OR INEFFECTIVE BUCKLE OR RETRACTOR. REPLACE ANY BELT THAT HAS A BENT OR DAMAGED LATCH PLATE OR ANCHOR PLATE. REPLACE ANY CHILD RESTRAINT ANCHOR OR THE UNIT TO WHICH THE ANCHOR IS INTEGRAL THAT HAS BEEN BENT OR DAMAGED. NEVER ATTEMPT TO REPAIR A SEAT BELT OR CHILD RESTRAINT COMPONENT. ALWAYS REPLACE DAMAGED OR INEFFECTIVE SEAT BELT AND CHILD RESTRAINT COMPONENTS WITH THE CORRECT, NEW, AND UNUSED REPLACEMENT PARTS LISTED IN THE CHRYSLER MOPAR® PARTS CATALOG. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN POSSIBLE SERIOUS OR FATAL INJURY.

WARNING: **TO AVOID SERIOUS OR FATAL INJURY ON VEHICLES EQUIPPED WITH AIRBAGS, DISABLE THE SUPPLEMENTAL RESTRAINT SYSTEM (SRS) BEFORE ATTEMPTING ANY STEERING WHEEL, STEERING COLUMN, AIRBAG, SEAT BELT TENSIONER, IMPACT SENSOR, OR INSTRUMENT PANEL COMPONENT DIAGNOSIS OR SERVICE. DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE, THEN WAIT TWO MINUTES FOR THE SYSTEM CAPACITOR TO DISCHARGE BEFORE PERFORMING FURTHER DIAGNOSIS OR SERVICE. THIS IS THE ONLY SURE WAY TO DISABLE THE SRS. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT.**

WARNING: **TO AVOID POTENTIAL PHYSICAL INJURY OR DAMAGE TO SENSITIVE ELECTRONIC CIRCUITS AND SYSTEMS, ALWAYS DISCONNECT AND ISOLATE THE BATTERY NEGATIVE (GROUND) CABLE AND THE POSITIVE CABLE, THEN GROUND THE POSITIVE CABLE TO DISCHARGE THE OCCUPANT RESTRAINT CONTROLLER (ORC) CAPACITOR BEFORE PERFORMING ANY WELDING OPERATIONS ON THE VEHICLE. FAILURE TO TAKE THE PROPER PRECAUTIONS COULD RESULT IN ACCIDENTAL AIRBAG DEPLOYMENT, POSSIBLE DAMAGE TO THE SUPPLEMENTAL RESTRAINT SYSTEM (SRS) CIRCUITS AND COMPONENTS, AND POSSIBLE DAMAGE TO OTHER ELECTRONIC CIRCUITS AND COMPONENTS. WHENEVER A WELDING PROCESS IS BEING PERFORMED WITHIN 12 INCHES (30 CENTIMETERS) OF AN ELECTRONIC MODULE OR WIRING HARNESS, THEN THAT MODULE OR HARNESS SHOULD BE RELOCATED OUT OF THE WAY, OR DISCONNECTED. ALWAYS PROTECT AGAINST COMPONENT OR VEHICLE DAMAGE FROM WELD SPATTER BY USING WELD BLANKETS AND SCREENS.**

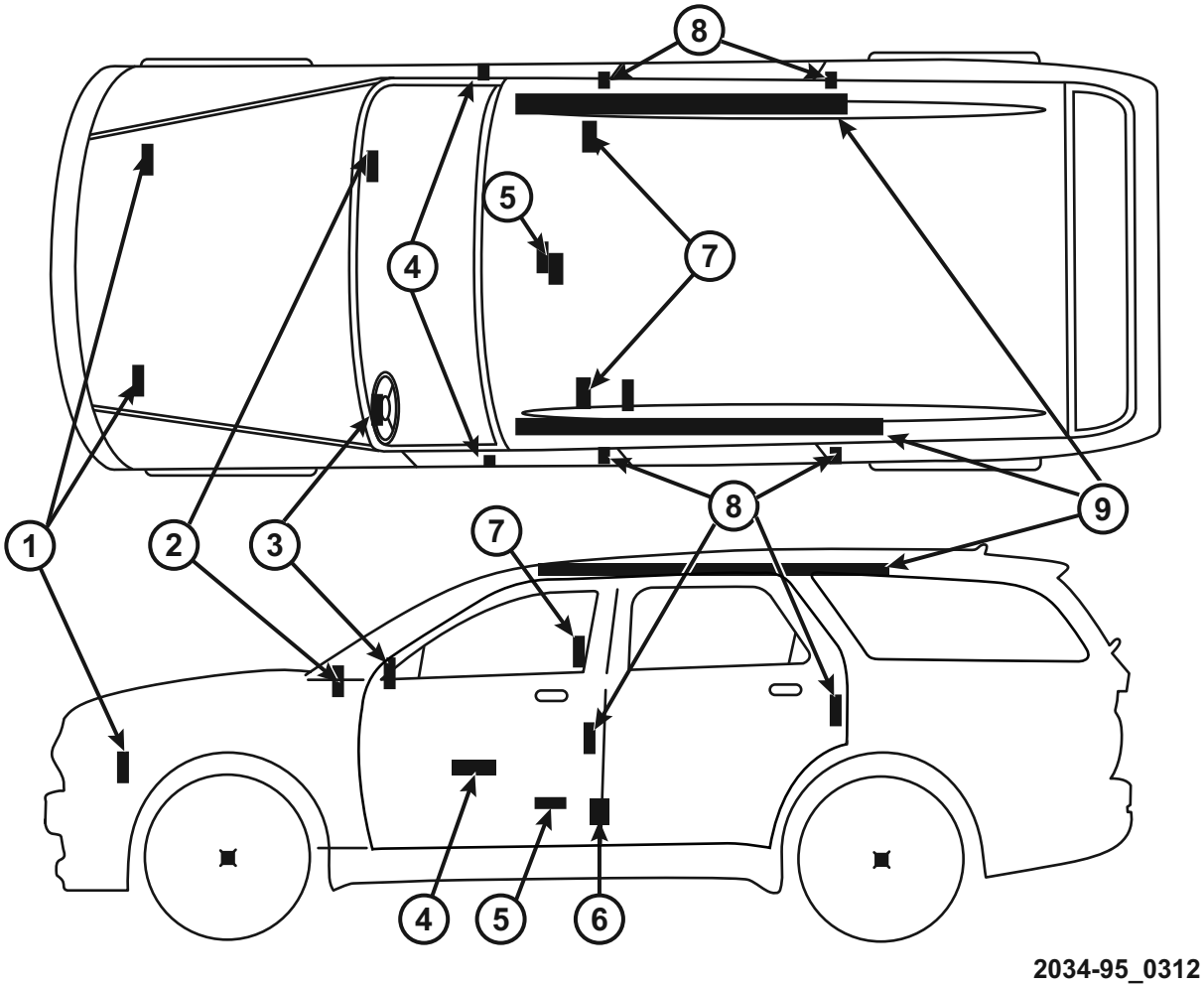
WARNING: **TO AVOID SERIOUS OR FATAL INJURY, DO NOT ATTEMPT TO DISMANTLE AN AIRBAG UNIT OR TAMPER WITH ITS INFLATOR. DO NOT PUNCTURE, INCINERATE OR BRING INTO CONTACT WITH ELECTRICITY. DO NOT STORE AT TEMPERATURES EXCEEDING 93°C (200°F). AN AIRBAG INFLATOR UNIT MAY CONTAIN SODIUM AZIDE AND POTASSIUM NITRATE. THESE MATERIALS ARE POISONOUS AND EXTREMELY FLAMMABLE. CONTACT WITH ACID, WATER, OR HEAVY METALS MAY PRODUCE HARMFUL AND IRRITATING GASES (SODIUM HYDROXIDE IS FORMED IN THE PRESENCE OF MOISTURE) OR COMBUSTIBLE COMPOUNDS. AN AIRBAG INFLATOR UNIT MAY ALSO CONTAIN A GAS CANISTER PRESSURIZED TO OVER 17.24 KPA (2500 PSI). FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN POSSIBLE SERIOUS OR FATAL INJURY.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY WHEN HANDLING A SEAT BELT TENSIONER RETRACTOR. EXERCISE PROPER CARE TO KEEP FINGERS OUT FROM UNDER THE RETRACTOR COVER AND AWAY FROM THE SEAT BELT WEBBING WHERE IT EXITS FROM THE RETRACTOR COVER. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN POSSIBLE SERIOUS OR FATAL INJURY.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY, REPLACE ALL SUPPLEMENTAL RESTRAINT SYSTEM (SRS) COMPONENTS ONLY WITH PARTS SPECIFIED IN THE CHRYSLER MOPAR® PARTS CATALOG. SUBSTITUTE PARTS MAY APPEAR INTERCHANGEABLE, BUT INTERNAL DIFFERENCES MAY RESULT IN INFERIOR OCCUPANT PROTECTION.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY WHEN A STEERING COLUMN HAS AN AIRBAG UNIT ATTACHED, NEVER PLACE THE COLUMN ON THE FLOOR OR ANY OTHER SURFACE WITH THE STEERING WHEEL OR AIRBAG UNIT FACE DOWN. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN POSSIBLE SERIOUS OR FATAL INJURY.**

WARNING:	**TO AVOID SERIOUS OR FATAL INJURY, THE FASTENERS, SCREWS, AND BOLTS ORIGINALLY USED FOR THE SUPPLEMENTAL RESTRAINT SYSTEM (SRS) COMPONENTS MUST NEVER BE REPLACED WITH ANY SUBSTITUTES. THESE FASTENERS HAVE SPECIAL COATINGS AND ARE SPECIFICALLY DESIGNED FOR THE SRS. ANYTIME A NEW FASTENER IS NEEDED, REPLACE IT WITH THE CORRECT FASTENERS PROVIDED IN THE SERVICE PACKAGE OR SPECIFIED IN THE CHRYSLER MOPAR® PARTS CATALOG.**

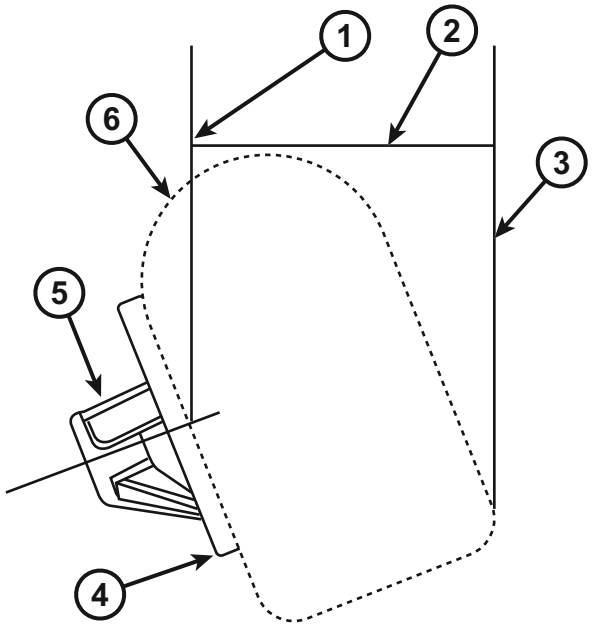


1	Front Impact Sensors	6	Seat Belt Tensioner
2	Passenger Air Bag	7	Seat Airbag (Driver and Passenger)
3	Driver Air Bag	8	Side Impact Sensors
4	Door Pressure Sensor	9	Side Curtain Air Bags
5	Occupant Restraint Controller (ORC)		

Figure 105 SRS Component Locations

Airbag Dimensions

Steering Wheel



1	Vertical Plane Passing Through the Center of the Steering Wheel	4	Steering Wheel
2	331 mm (13 in.)	5	Driver Airbag Retainer/Housing
3	Vertical Plane Passing Through the Maximum Rearward Point that the Driver Airbag Cushion Reaches	6	Driver Airbag Cushion

Figure 106 Drivers Airbag Dimensions

Note: Illustration represents the maximum dynamic deployment shape

Table 23 Driver Airbag Cushion Position

Description	Dimension
Driver Airbag (DAB) Diameter when Full	762 mm (30 in.)
Driver Airbag (DAB) Depth when Full	533 mm (21 in.)
Maximum Rearward Displacement During Fill	559 mm (22 in.)

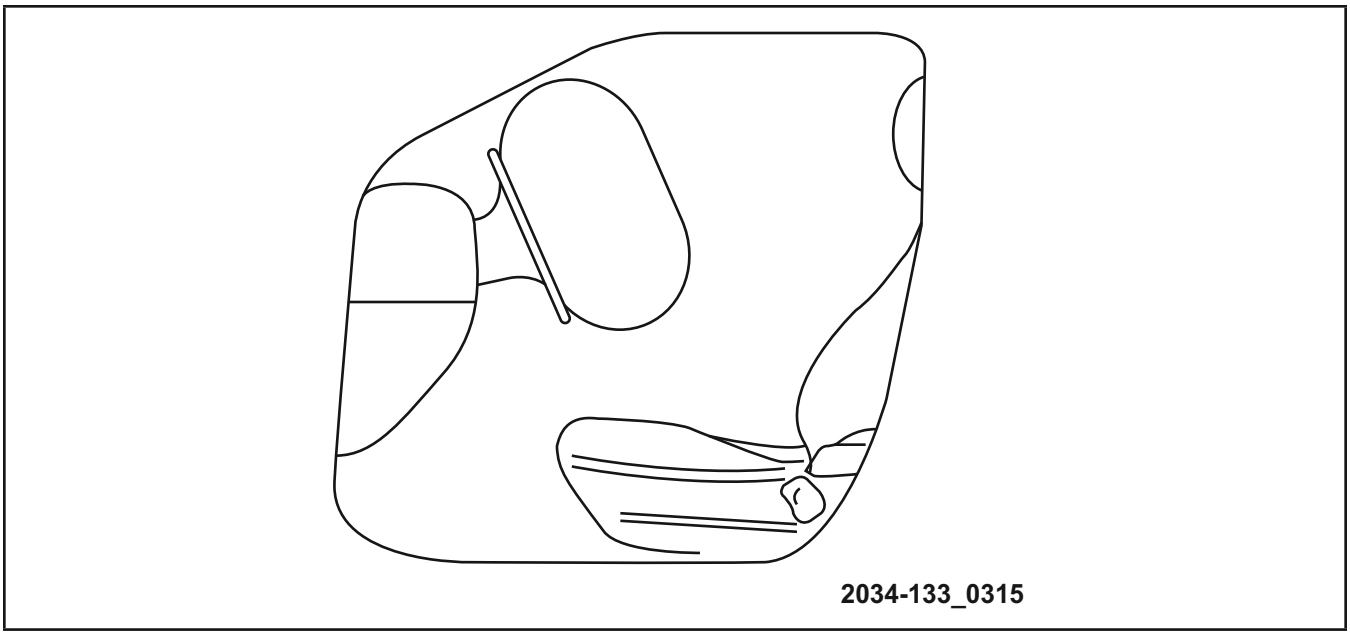
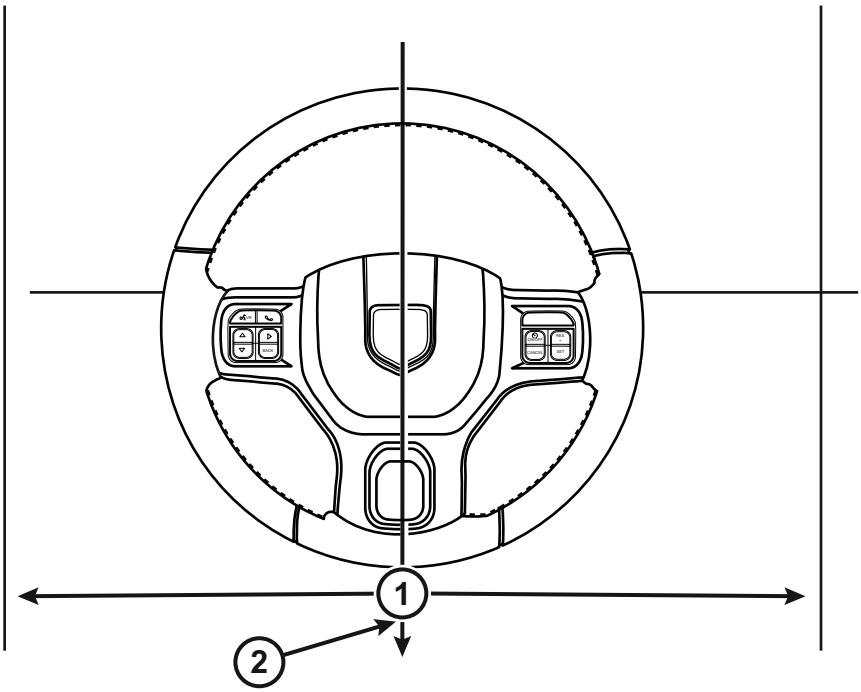


Figure 107 Driver Airbag Deployed Shape

Table 24 Steering Column Tilt Position Range

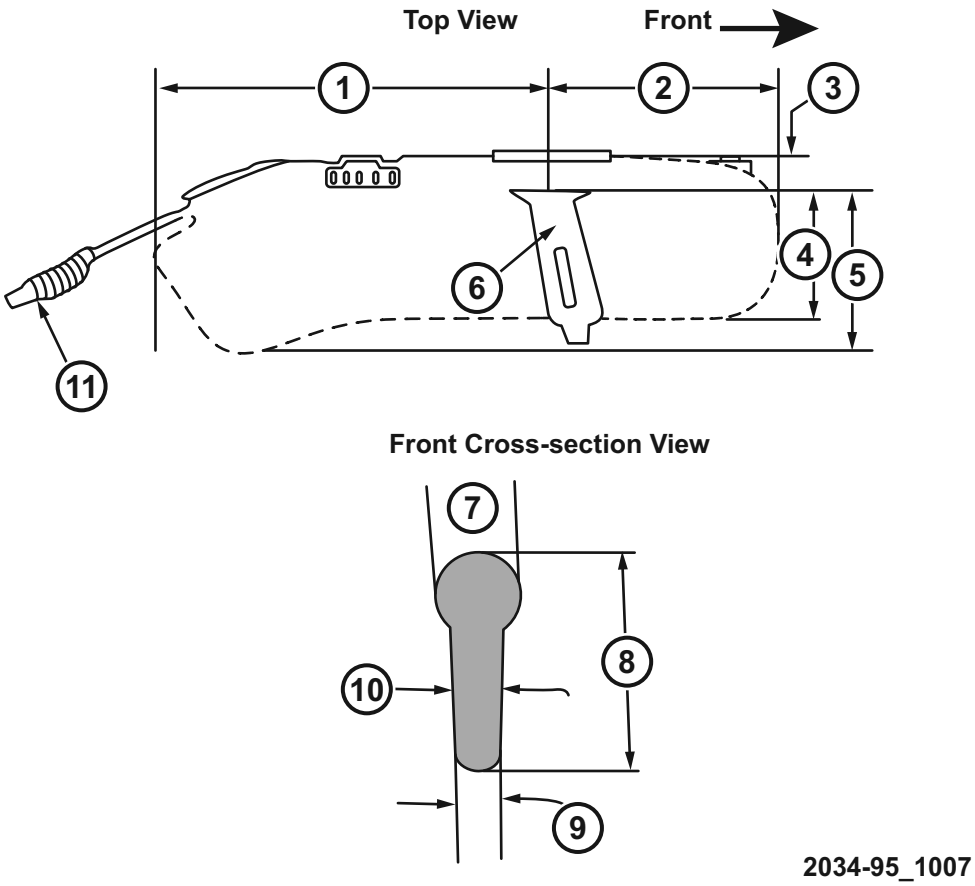
± 2 degrees from steering column tilt pivot point
~ 22.0 degrees from vertical is the normal position



1	Driver Airbag Cushion Lateral Deployment Zone ~ 762 mm (30 in.)	2	Driver Seating Reference

Figure 108 Deployment Zone

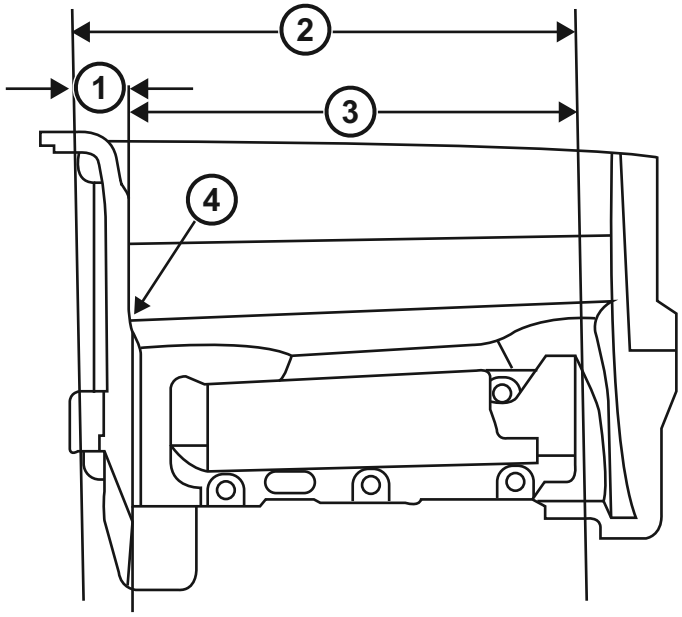
Side Curtain Airbag



1	1454 mm (57.3 in.)	7	150 mm (6.0 in.)
2	940 mm (37.0 in.)	8	470 mm (18.5 in.)
3	17 mm (0.7 in.)	9	150 mm (6.0 in.)
4	452 mm (17.8 in.)	10	150 mm (6.0 in.)
5	788 mm (31.0 in.)	11	Side Curtain Airbag Inflator Module
6	B Pillar		

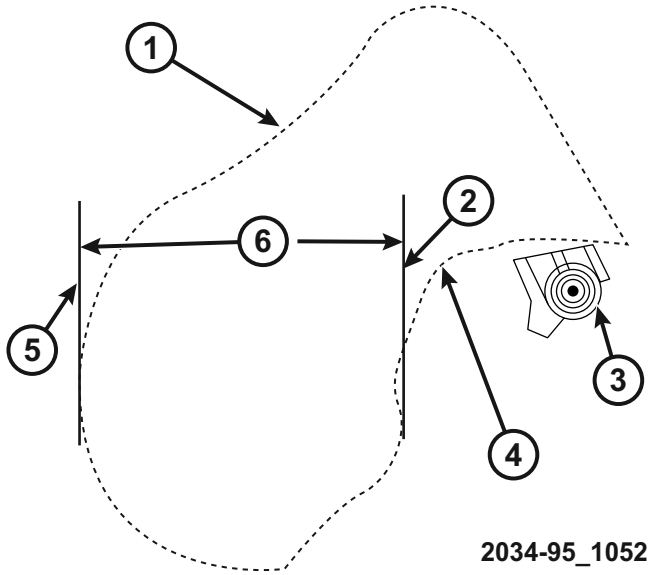
Figure 109 Side Curtain Deployment Zone

Passenger Side Instrument Panel



1	152.7 mm (6.0 in.)	3	600 mm (23.6 in.)
2	Passenger Airbag Deployment Zone	4	Reference Point

Figure 110 Deployment Zone



1	Passenger Air Cushion	4	Instrument Panel
2	Vertical Plane from Point of Instrument Panel	5	Vertical Plane Passing Through the Maximum Rearward Point that the Passenger Airbag Cushion Reaches
3	Passenger Airbag Module	6	475 mm (18.7 in.)

Figure 111 Passenger Airbag Deployment Zone

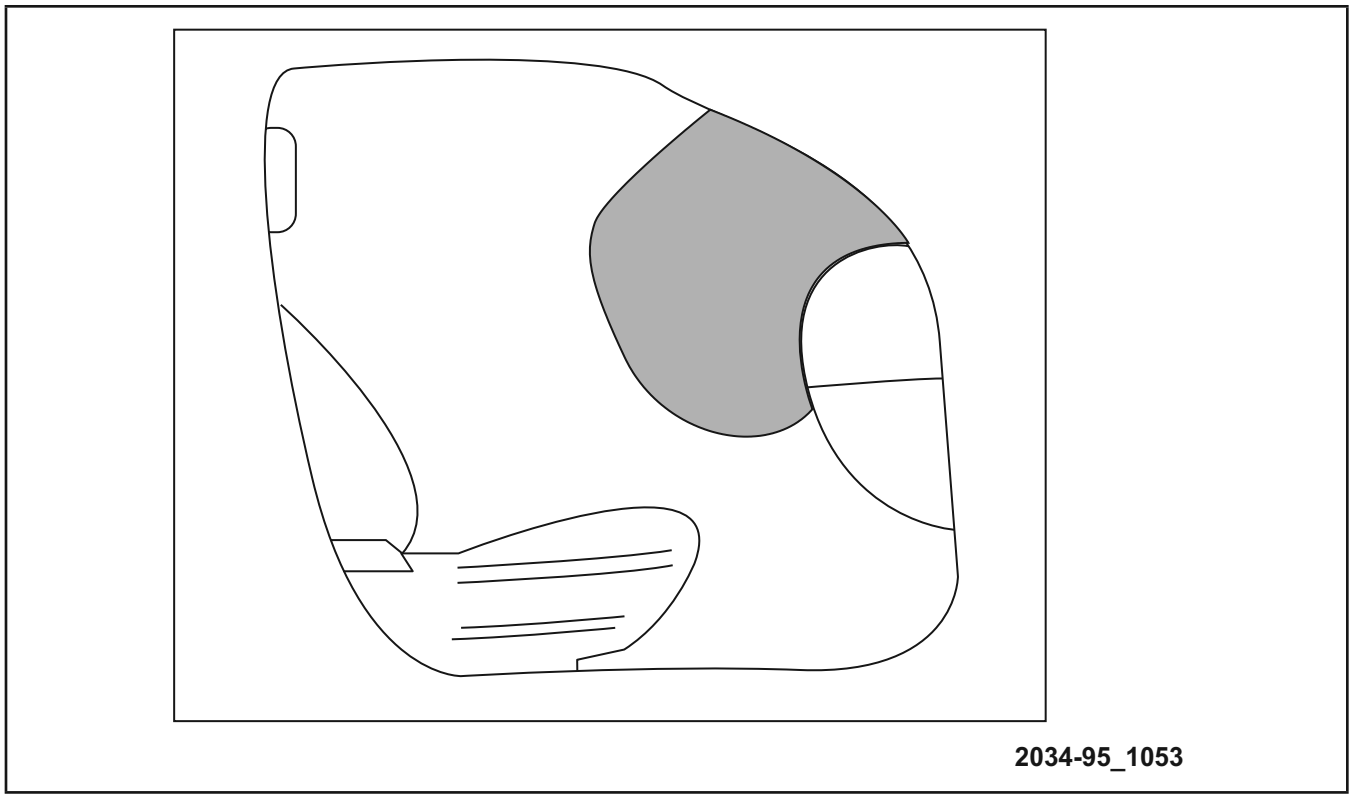


Figure 112 Final Passenger Airbag Deployment Shape

Note: The illustration represents the maximum dynamic deployment shape.

VEHICLE STORAGE

If a vehicle is not immediately delivered to the customer, store the vehicle according to the following guidelines.

If possible, store the vehicle indoors, in a clean and dry place.

If vehicles must be stored outside:

- Avoid storage locations near obvious sources of industrial or environmental contamination (such as, trees, factories, steam or vapor vents, railroad tracks, etc.)
- Maintain tight security to help prevent vandalism; inspect the vehicle regularly to check for such damage
- If the vehicle must be parked on an incline, park it with the front end higher than the rear
  - This prevents hydrostatic lock caused by fuel draining into the engine
- Rinse the vehicle at least once a week; wash away the snow more often because it can trap harmful contaminants; dry all horizontal surfaces

IOD fuse

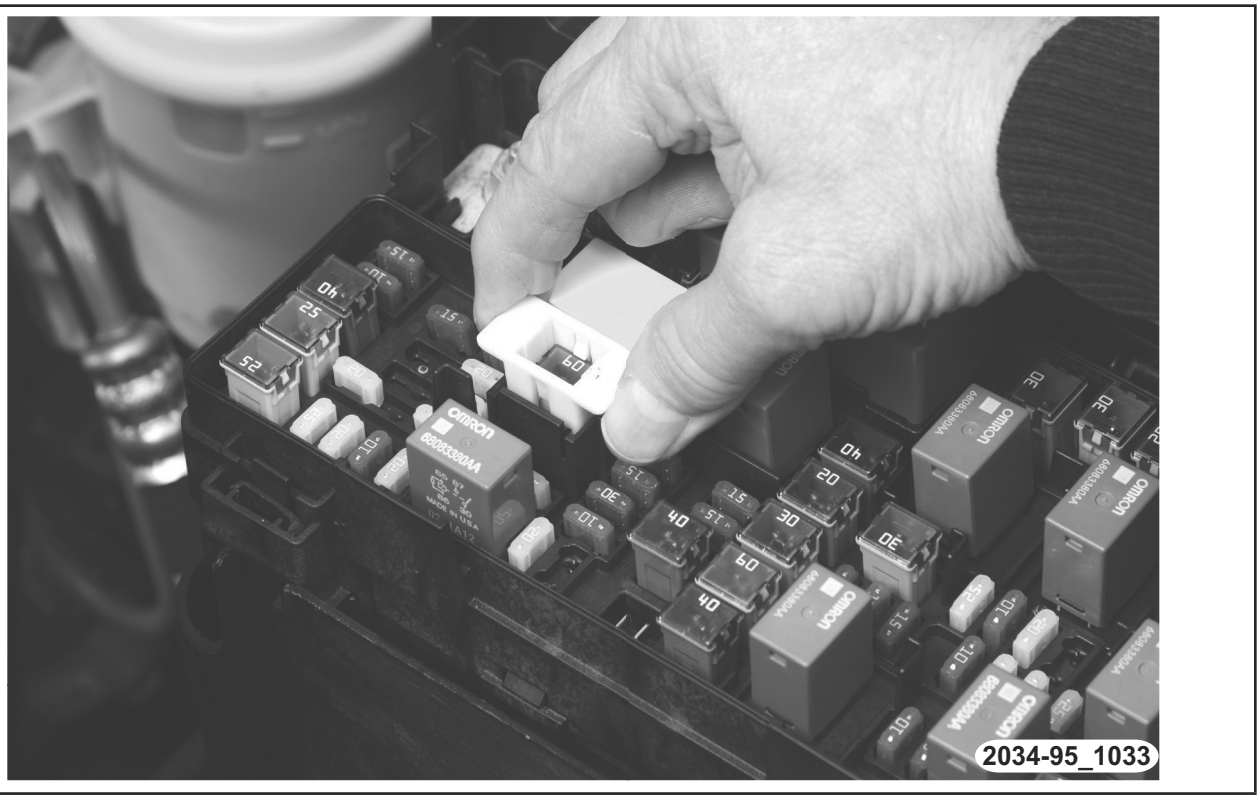


Figure 113 IOD Fuse

All vehicles are equipped with an ignition-OFF draw (IOD) fuse that is disconnected within the integrated power module when the vehicle is shipped from the factory. Dealer personnel are to reconnect the IOD fuse in the integrated power module as part of the preparation procedures performed just prior to new vehicle delivery. The IOD fuse can be removed to avoid discharging the battery by disconnecting non-essential, low-current memory functions that are normally on at all times. A detent on the IOD fuse holder allows it to be stored in its normal cavity but out of contact. The holder is pushed into place to restore power to the systems it supplies. When the vehicle is prepared for delivery, the IOD function of this fuse becomes transparent and the fuse that has been assigned the IOD designation becomes another Fused B (+) circuit fuse.

The following circuits are protected by the IOD fuse:

- Cluster (CCN)
- Electronic overhead module (EOM)
- Sentry key remote entry module (SKREEM)
- Video module (DVD system), spot Lamps, police dome light
- Hands free telephone module
- Map lamps
- Glove box lamp
- Courtesy lamps
- Radio

The IOD fuse can be used by the vehicle owner as a convenient means of reducing battery depletion when a vehicle is to be stored for periods not to exceed about 30 days. However, it must be remembered that disconnecting the IOD fuse will not eliminate IOD, but only reduce this normal condition. If a vehicle will be stored for more than about 30 days, the battery negative cable should be disconnected to eliminate normal IOD; and, the battery should be tested and recharged at regular intervals during the vehicle storage period to prevent the battery from becoming discharged or damaged.

Notes:

GLOSSARY

a/c service port	Refrigerant system service ports are used to recover, recycle, evacuate, charge, and test the A/C refrigerant system
absorbent glass mat (AGM) battery	A class of valve regulated lead acid (VRLA) battery in which the electrolyte is absorbed into a fiberglass mat
active restraints	Active restraints are those which require the vehicle occupants to take some action to employ
ampere-hours (AH)	The ampere-hours (AH) rating specifies the current (in amperes) that a battery can deliver steadily for 20 hours, with the voltage in the battery not falling below 10.5 volts
antilock brake system (ABS)	The antilock brake system (ABS) is an electronically operated, four-channel brake control system which is part of electronic stability control (ESC); the system is designed to prevent wheel lockup and maintain steering control during braking; preventing lockup is accomplished by modulating fluid pressure to the wheel brake units
audible warnings	The CCN electronic circuit board is equipped with an audible tone transducer and programming that allows it to provide various audible alerts to the vehicle operator, including chime tones and beep tones, and emulates the sound of a conventional turn signal or hazard warning flasher
cabin compartment node	The cabin compartment node (CCN) is located in the instrument cluster, which is located in the instrument panel above the steering column opening; the CCN includes the hardware and software necessary to serve as the electronic body control module and regular instrument panel functions
clockspring	The clockspring is located near the top of the steering column, directly beneath the steering wheel; it is comprised of the wires needed to connect the steering wheel air bag to the deployment systems; the wires are wound to allow for steering wheel movement
cold cranking amperage (CCA)	The cold cranking amperage (CCA) rating specifies how much current (in amperes) the battery can deliver for 30 seconds at -18°C (0°F)
communications system	See network
data link connector (DLC)	The data link connector allows access to the vehicle diagnostic system and an interface port for diagnostic tools such as wiTECH
DealerCONNECT/ TechAUTHORITY	Information containing resources, procedures, cautions, and warnings related to the repair of the vehicle; see TechCONNECT
diagnostic trouble code (DTC)	An electronic signal stored in an onboard automotive computer that indicates a possible fault detected in the inputs or outputs of a monitored system
electronic throttle control	A fully electronic accelerator pedal position sensor

electronic range selection (ERS)	ERS (or TOW/HAUL mode) enables an additional underdrive gear that is not normally used during through-gear accelerations
enhance accident response support	The CCN monitors an input from the occupant restraint controller (ORC) and, following an airbag deployment; the CCN monitors an input from the powertrain control module (PCM) to automatically turn on the interior lighting after an airbag deployment event, 10 seconds after the vehicle speed is zero
exterior lighting fail-safe	The TIPM provides default park lamp and headlamp low beam operation and the CCN turns on the cluster general illumination lighting at full intensity if there is a failure of the electronic data bus communication between the CCN and the TIPM
foundation brakes	Base brake components consist of the brake pads, calipers, brake drum-in-hat rotor in the rear, rotors, brake lines, master cylinder, booster, and parking brake components
front impact sensor	Two front impact sensors are used, one left side and one right side; one sensor is located on the back side of each end of the lower radiator support cross member on each side of the cooling module and below the inboard side of each front lamp unit
gain	The gain setting is used to set the trailer brake control for the specific towing condition and should be changed as towing conditions change; changes to towing conditions include trailer load, vehicle load, road conditions, and weather
gear ratio	The ratio of the speed of rotation of the powered gear to that of the driven gear
hour meter	The vehicle has software programmed into the PCM that is different from that of the civilian version; the package contains an algorithm that prompts the driver to change the oil after predetermined hours of engine operation based on the parameters listed above
instrument panel synchronization	The CCN monitors hard-wired multiplexed inputs from the headlamp switch on the instrument panel, then transmits electronic panel lamp dimming level messages that allows all other electronic modules on the CAN data bus to coordinate their illumination intensity with that of the CCN
interior lamp load shedding	The CCN provides a battery saver feature which will automatically turn off all interior lamps and the cargo lamps if they remain on after a timed interval of about 5 minutes
liquid crystal display	The instrument cluster includes an odometer/trip odometer display that is a liquid crystal display (LCD)
multiple displacement system (MDS)	The multiple displacement system (MDS) selectively deactivates cylinders 1, 4, 6, and 7 during steady speed, low acceleration, and shallow grade climbing conditions to increase fuel economy

network	Network communication is a way to send multiple messages over a single wire or a pair of twisted wires; modules share information between each other across these common wires
park shift interlock (BTSI)	The part shift interlock is also referred to as a brake transmission shift interlock (BTSI)
passive restraints	An occupant restraint system is standard factory-installed safety equipment on this vehicle; passive restraints require no action by the vehicle occupants to be employed
PCM inputs	The sensors and switches that provide inputs to the PCM are considered powertrain control module (PCM) inputs
PCM outputs	The PCM regulates various engine and vehicle operations through different system components; these components are referred to as powertrain control module (PCM) outputs
power distribution center (PDC)	The PDC contains fuses and relays that enable an up-fitter to connect to the vehicle's electrical system with the provided circuit protection and control circuits available in one location
reserve capacity	The reserve capacity (RC) rating specifies the time (in minutes) it takes for battery terminal voltage to fall below 10.5 volts, at a discharge rate of 25 amperes
secondary load label	After up-fitting is complete, the vehicle must have a secondary label added to certify the new weight capacity of the vehicle with the added equipment; this label is the responsibility of the up-fitter and may be hand written
sentry key immobilizer system (SKIS)	The Sentry Key® immobilizer system prevents unauthorized vehicle operation by disabling the engine; the system does not need to be armed or activated; operation is automatic, regardless of whether the vehicle is locked or unlocked
service information	Information containing resources, procedures, cautions, and warnings related to the repair of the vehicle See TechCONNECT
side window demister outlet	A heater that removes mist from the windshield or glass of a car (i.e. window defroster)
steering column module	The steering control module (SCM), is an electronic circuit board with a microprocessor that is internal to the multi-function switch housing; the SCM is a local interface network (LIN) slave and communicates over a dedicated LIN bus circuit with the electromechanical instrument cluster (EMIC); also known as the cab compartment node (CCN), which is the LIN master and also provides a gateway to the controller area network (CAN) data bus
TechCONNECT/ Tech Authority	TechCONNECT and Tech Authority are web-based resources that can be accessed to help locate service related information of the vehicle

tire and loading information label	The tire and loading label that may contains information on the number of people that can be carried in the vehicle, total weight the vehicle carry, proper tire size, correct tire pressures, and the last eight numbers of the vehicle identification number
tire pressure monitor (TPM)	The TPM system consists of tire pressure monitoring sensors attached to each road wheel (and spare if equipped with a sensor) valve stem, a central receiver module, an indicator lamp, and (on some applications) a light load switch located on the instrument panel center stack
totally integrated power module (TIPM)	The totally integrated power module (TIPM) is a combination unit that performs the functions of the power distribution center (PDC) and the front control module
tow-haul mode	Tow/haul mode over-rides normal transmission programing and the transmission will shift to third gear and fourth gear, will be enabled under steady cruise conditions
transmission limp in mode	A loss of power to the transmission solenoids causes the solenoids to revert to their default, power off state; when this condition occurs, the transmission is said to be in a limp-in mode
variable cam timing (VCT)	This variable cam timing is controlled by the powertrain control module (PCM); the PCM varies the timing of the valves, advancing or retarding the opening relative to piston motion
vehicle identification number (VIN)	The VIN contains 17 characters that provide data concerning the vehicle
viscosity	The internal property of a fluid that offers resistance to flow
wireless ignition node (WIN)	The WIN is an integrated electronic receiver that replaces the ignition switch; the WIN communicates with other electronic modules in the vehicle over the controller area network (CAN) data bus

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UNITED STATES AND CANADA

The special service tools referred to herein are required for certain service operations. These special service tools or their equivalent, if not obtainable through a local source, are available through the following outlet.

28635 Mound Road, Warren, Michigan 48092, U.S.A.

MILLER SPECIAL TOOLS

OTC Division, SPX Corporation

Telephone 1-800-801-5420 FAX 1-800-578-7375

The special tools referred to herein are required for certain service operations. These special service tools or their equivalent, if not obtainable through a local source, are available through the following outlets.

MILLER SPECIAL TOOLS INTERNATIONAL **SPX Corporation** 28635 Mound Road Warren, Michigan 48092, U.S.A. Tel: 1-507-455-7320 Fax: 1-507-455-7063	**SPX Australia** 28 Clayton Road Notting Hill 3168 Victoria Australia Fax: 61-3-9544-5222	**SPX UK** Genoa House, Everdon Park Daventry, Northants, NN11 5Y5 Tel: 44-1327-303400 Fax: 44-1327-871625
SPX Jatek 5-53 Minowacho, 2-Chome Kohoku-Ku, Yokohama Kanagawa 223-0051 Japan Fax: 81-45-562-7800	**SPX De Mexico** Mitla No. 442 Col. Vertiz Narvarte 03600 Mexico D.F. Fax: 52-55-2595-1639