Section 7.0

Introduction to Chassis/Brakes/Exhaust

2002 VUE New Product Participant Guide

Section Structure

Chassis Systems and Subsystems

- Front & Rear Suspension
- Electronic Power Steering (EPS)
- Steering Column Assembly
- Steering Gear Assembly
- Brake System
- Exhaust System

Section 7.1

Front and Rear Suspension

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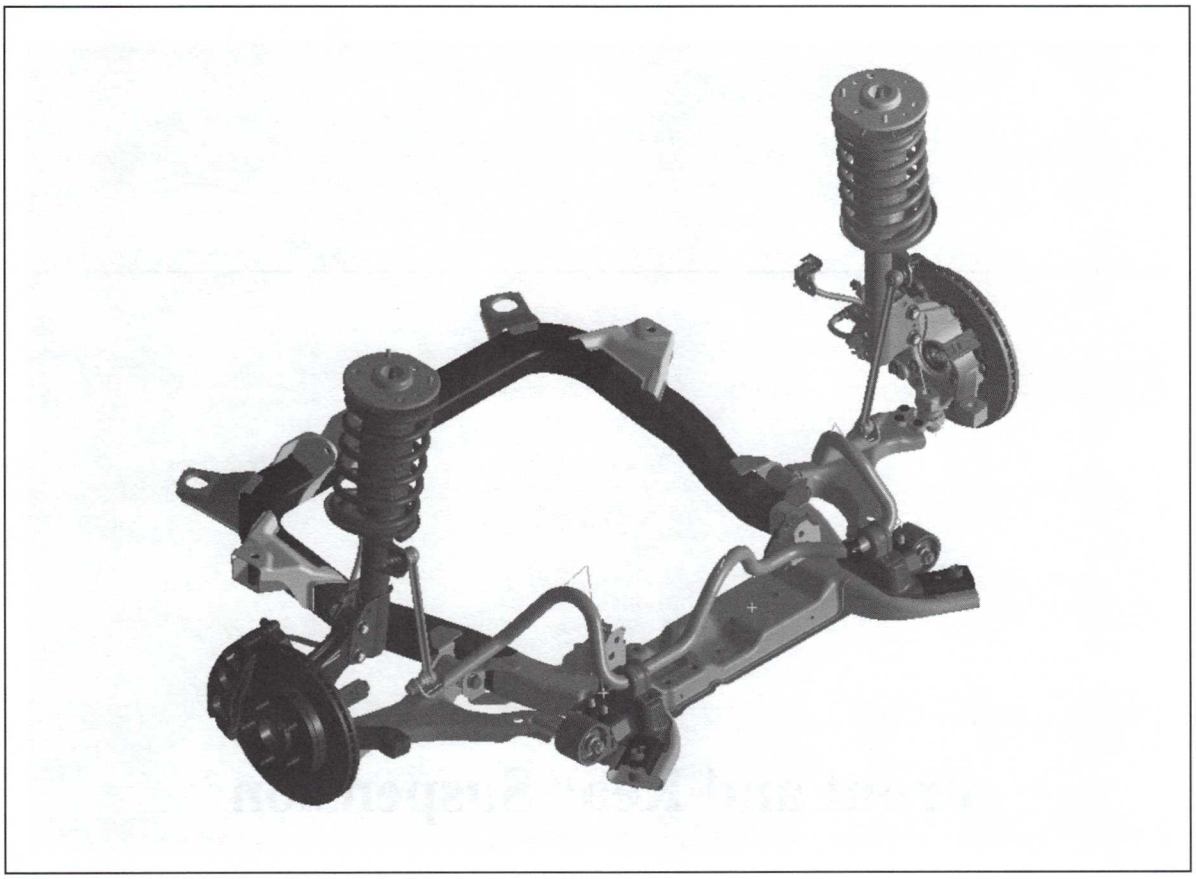
Front Suspension



System Features and Operation

Front Suspension

- The front suspension utilizes the Mac Pherson strut and coil spring design and is fully independent.
- Alignment
  - Caster - Not Adjustable
  - Camber - Adjustable
  - Toe - Adjustable

Lower Control Arms

- Ties the wheel corner to the cradle.

Stabilizer Shaft

- Designed to minimize body roll and provide side-to-side vehicle stability.

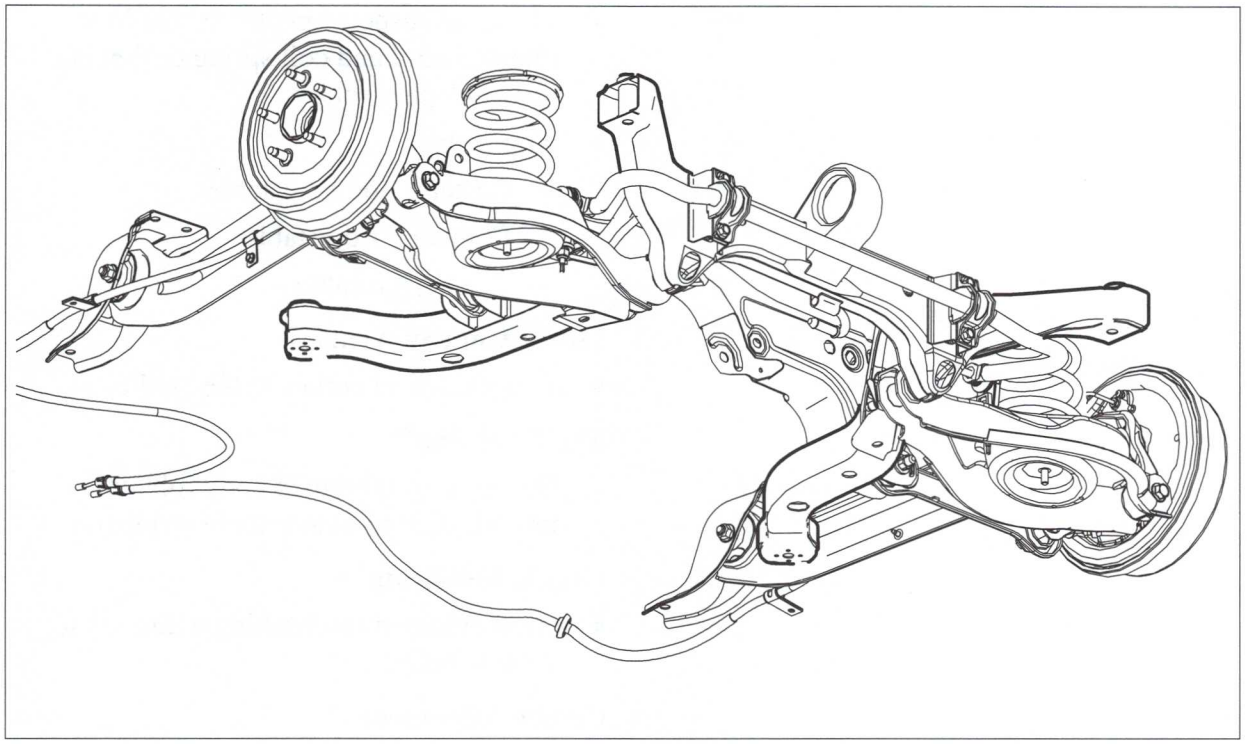
Cradle Mounting

- Hard mounted (no bushings) directly to vehicle body.

Cradle Alignment

- Cradle assembly is manufactured with alignment pins that fit into the body and is self-aligning. An alignment fixture is not required.

Rear Suspension



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System Features and Operation (Cont'd)

Rear Suspension

- Rear suspension is the independent link type.
- Maintains the relationship of the rear axle to the vehicle body
- Controls torque reaction on acceleration.
- The rear coil springs are retained between the spring seat in the under body and the spring seat in the lower control arm.
- Rubber insulators isolate the coil spring at both top and bottom positions.

The rear suspension consists of the following components:

- Rear Support
- Shock Absorber
- Coil Springs
- Upper Control Arms
- Lower Control Arms
- Toe Link
- Knuckle
- Hub and Bearings
- Stabilizer Bar
- Trailing Arm

Alignment

- Caster - Not Adjustable
- Camber - Adjustable
- Toe - Adjustable

Service, Diagnostics and Adjustments

- When diagnosing a vehicle ride/handling complaint, treat the vehicle as an entire system due to the fact that many sub-systems can contribute to the condition.
- Service procedures, diagnostics and adjustments are similar to those of the L-Series vehicle.
- Follow 2002 VUE service manual procedures

Front and Rear Suspension Worksheet

Objective: Review Front and Rear Suspension section information.

Directions: Answer the following questions individually, then review as a group.

Questions for Review

1. How does the cradle mount to the vehicle body?
   a) with selective fit nylon insulators
   b) with selective fit rubber insulating spacers
   c) direct mount with adjustable shim package
   d) hard mounted (no bushings) directly to vehicle body

2. The rear coil springs are retained between the:
   a) spring seat in the upper control arm and the spring seat in the lower control arm
   b) spring seat in the under body and the spring seat in the lower control arm
   c) rear knuckle adapter and the upper control arm
   d) none of the above

Section 7.2

Electronic Power Steering (EPS)

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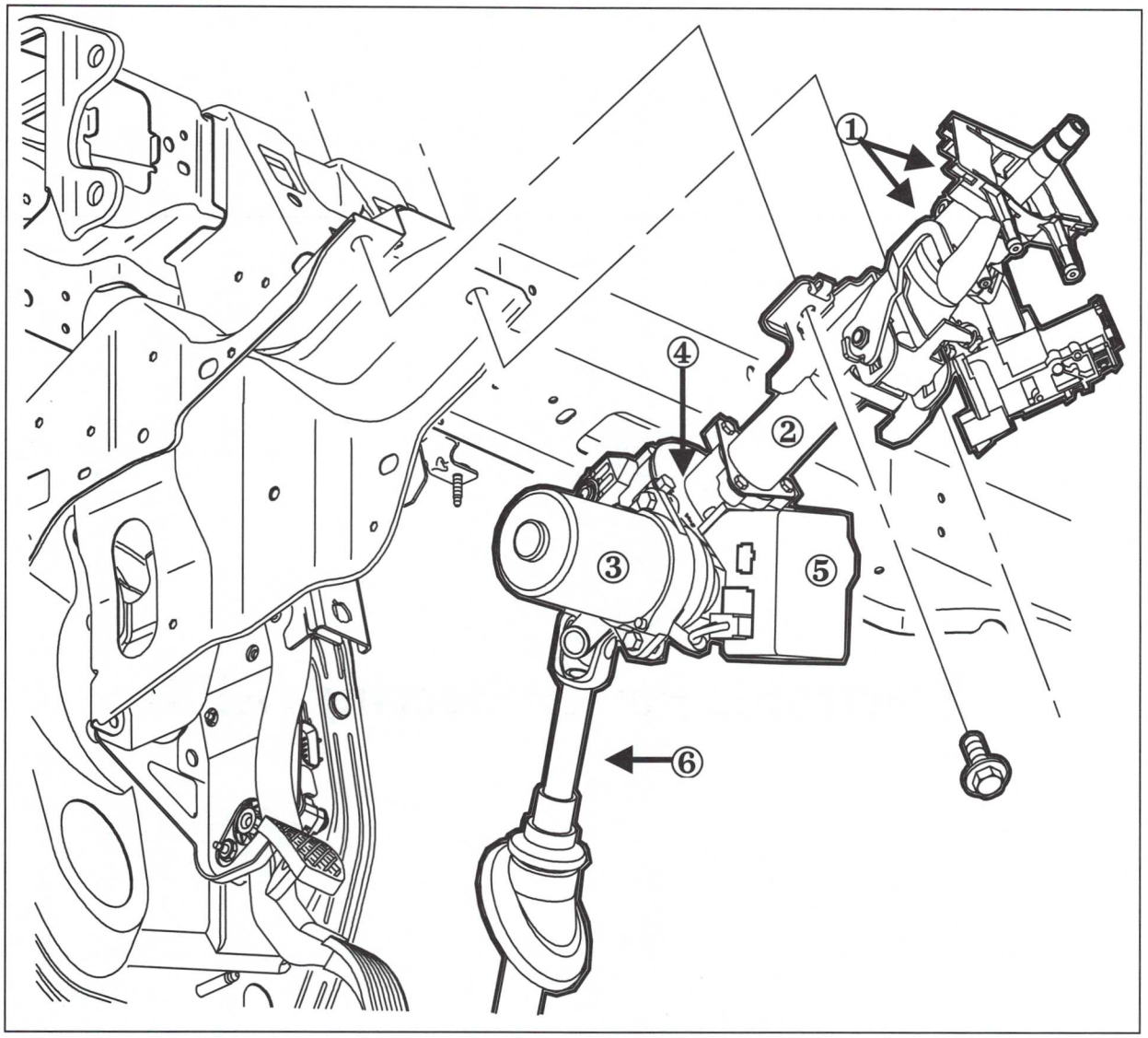
Steering Column Assembly



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(1) Ignition Switch
Switch And Lock Housing
Multi-Function Bracket
Rake Control Lever
(2) Base Column (jacket)
(3) Electronic Power Steering (EPS) Motor
(4) EPS Torque Sensor
(5) EPS Control Module
(6) Intermediate Shaft With Integral "Front Of Dash" (FOD) Seal

System Features and Operation

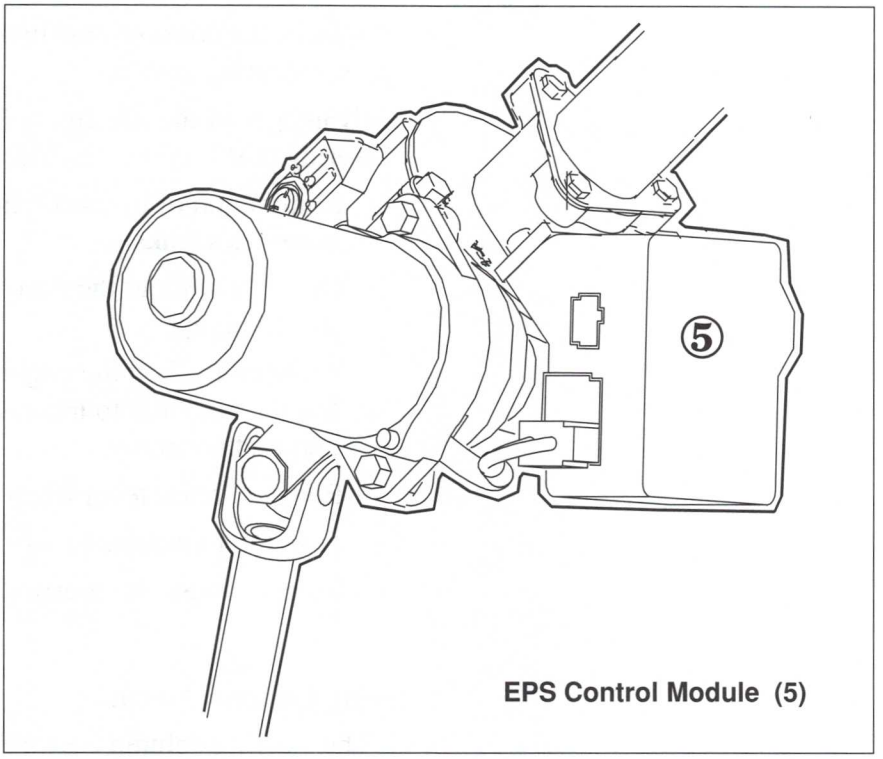
Electronic Power Steering (EPS) Column Assembly

- Replaces the conventional hydraulic power steering system.
- Advantages of the Electronic Power Steering (EPS) system include:
  - Elimination of hydraulic lines, which eliminates leaks.
  - Operates without the need for a belt driven pump.
  - Reduced load on the engine which has the potential to increase, power and fuel economy.
  - Reduced noise level when operating.
  - Fewer components to service.
  - More accurate diagnostics.

Steering Column Assembly

- The steering column assembly consists of the following components:
  - Ignition Switch (1)
  - Switch And Lock Housing (1)
  - Multi-Function Bracket (1)
  - Rake Control Lever (1)
  - Base Column (jacket) (2)
  - Electronic Power Steering motor (3)
  - EPS Torque Sensor (4)
  - EPS Control Module (5)
  - Intermediate shaft with integral "Front Of Dash" (FOD) seal. (6)
- The ignition switch, switch/lock housing, multi function bracket and rake control lever function and are serviced similar to previous models.

EPS Control Module



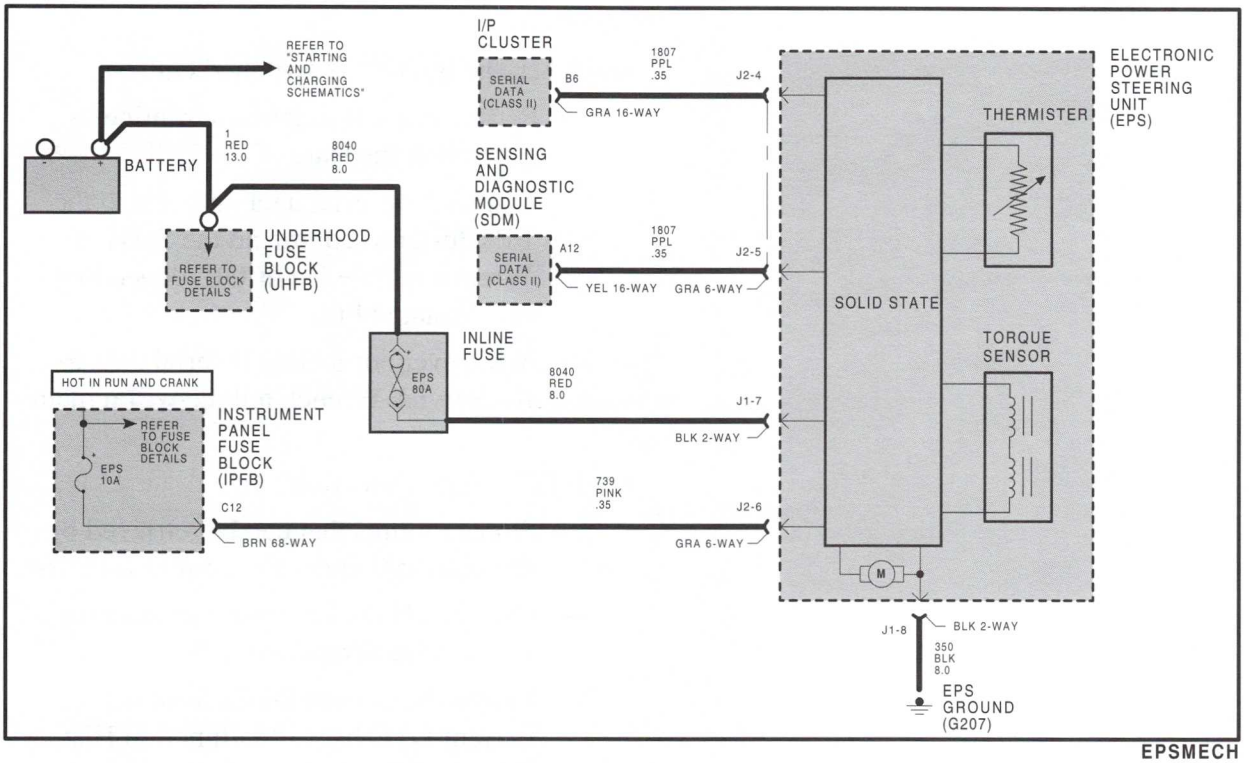
EPSMOTOR

System Features and Operation (Cont'd)

The EPS control module (5) is designed to perform the following functions in the EPS system:

- When the ignition is switched On:
  - Performs a self-diagnostic routine to determine the state of the EPS.
  - Transmits a serial data message to the I/P Cluster to command the Service Wrench telltale On or Off, depending on the state of the EPS.
  - In the event of a class II serial data loss, the Service Wrench telltale will remain On.
- DTC Failure Detection:
  - Stores failures that can be retrieved by the scan tool under the current DTC list.
  - Commands the I/P cluster to illuminate the Service Wrench telltale.
  - Moves the current DTCs from the current DTC list to Malfunction History (history DTCs), when the ignition is switched Off.
  - History table will clear after 100 ignition cycles with DTCs' tests passed.
  - Both current and history DTCs will clear when "Clear DTCs" is selected on scan tool.
  - Disconnecting power to the EPS module will clear Current DTCs but has no effect on History DTCs.

EPS System Block Diagram



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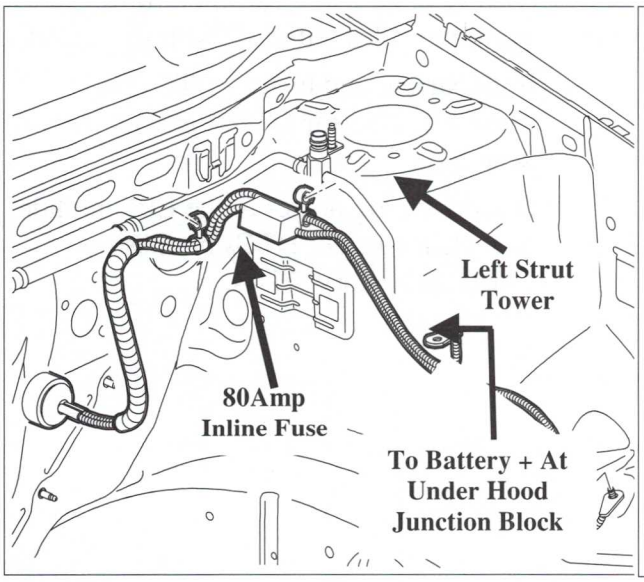
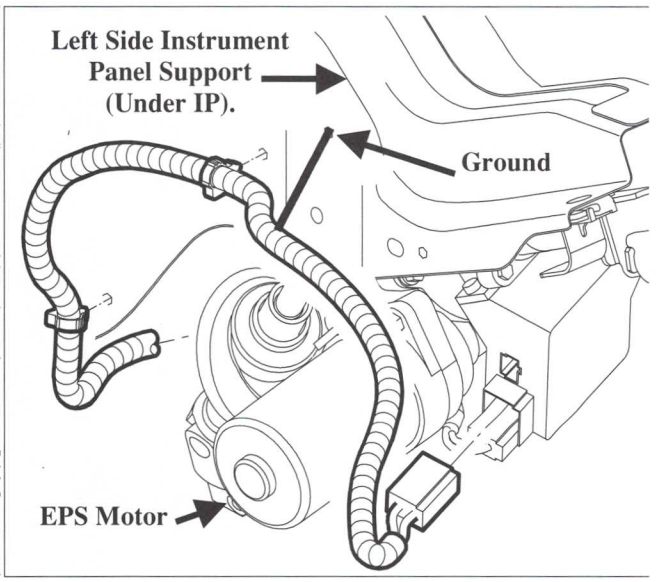
80 Amp Fuse Location



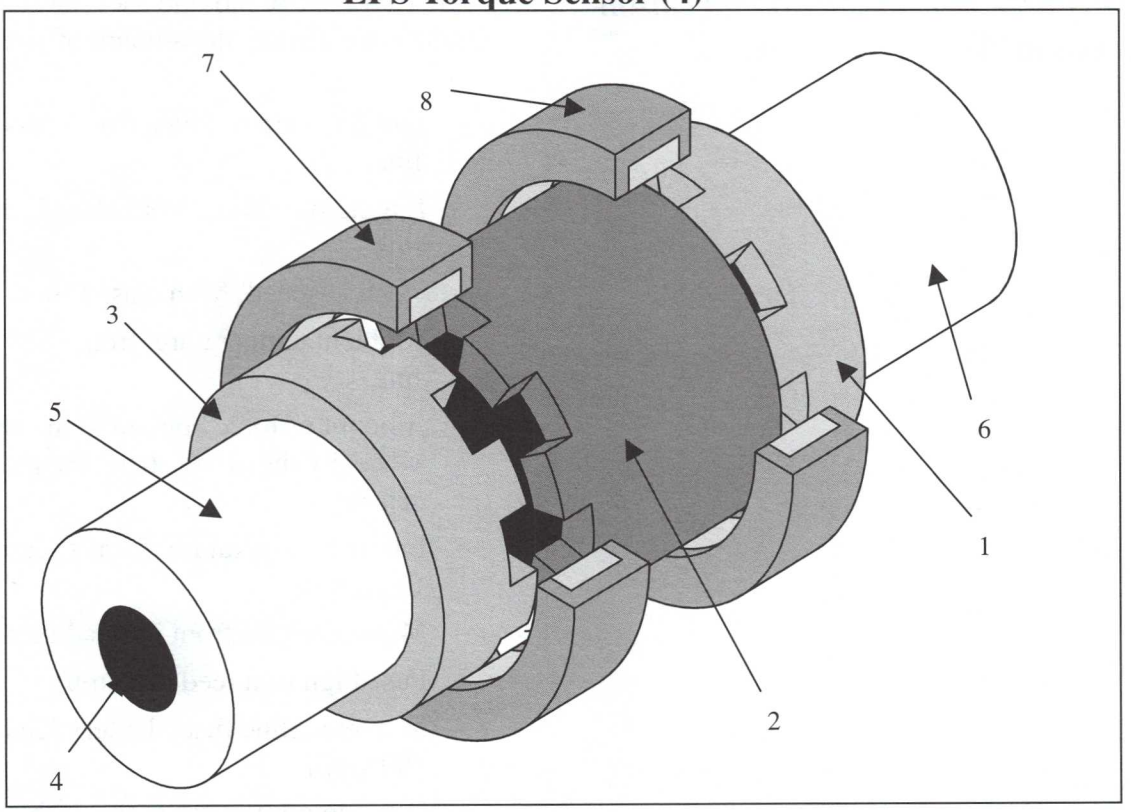
Ground Location



System Features and Operation (Cont'd)

- The EPS control module uses the following inputs to calculate the amount of steering assist:
  - Ignition switch status, from class II data link.
  - Engine run status, from class II data link.
  - Vehicle speed, from class II data link.
  - Ambient temperature, from class II data link.
  - Amount of force applied to the steering wheel by the driver, from the torque sensor.
  - Internal temperature, from an internal thermistor.
  - Motor current, from internal feedback
  - Fused ignition feed (10Amp)
  - Discrete inline fused battery feed (80Amp)
  - Discrete ground under the dash on steering support bracket.
- The EPS control module will decrease assist or go to complete No assist for the following failsafe modes:
  - Motor current is higher than 65Amps continuously.
  - Engine RPM is lost with vehicle speed above 0 mph, assist will continue till 0 mph, and then it gradually decreases to No assist.
  - For a Class II data failure after initial communication, assist will be at a default calibration.
  - Low battery voltage (below 9V) or loss of battery voltage will cause a gradual decrease to No assist.
  - Lost of ground to EPS will result in No assist.

EPS Torque Sensor (4)



(1) Detecting Ring #1
(2) Detecting Ring #2
(3) Detecting Ring #3
(4) Torsion Bar
(5) Input Shaft
(6) Output Shaft
(7) Compensation Coil
(8) Detecting Coil

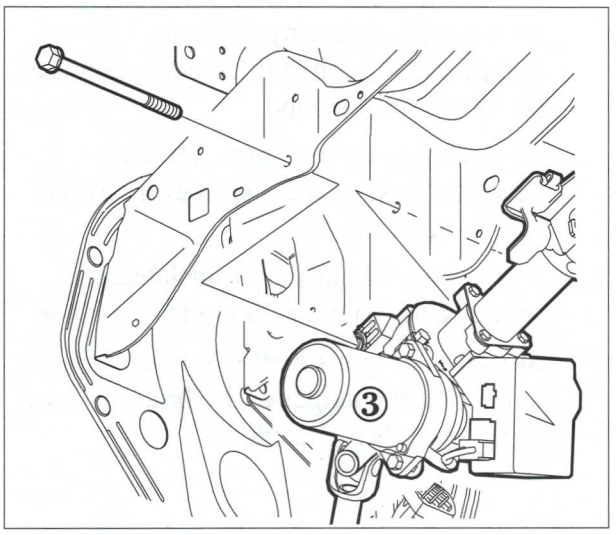
System Features and Operation (Cont'd)

- The EPS torque sensor functions and principle of detection are as follows:
  - A torsion bar **(4)**, with a certain spring rate is between the Input **(5)** and output **(6)** shafts.
  - Detecting ring **(2)** and **(3)** are fixed to the input shaft.
  - Detecting ring **(1)** is fixed to the output shaft.
  - There are 2 (two) coils, compensation **(7)** and detecting **(8)**, around the detecting rings.
  - The cores of the coils and the detecting rings are made of magnetic materials.
  - Steering torque is applied to the input shaft, twisting the torsion bar.
  - Overlap areas between detecting ring **(1)** and **(2)** are changed depending on the twisting angle.
  - Since the detecting rings **(2)** and **(3)** are fixed together, there is no status change between them.
  - Changing the overlap area between detecting ring **(1)** and **(2)** changes the magnetic characteristic around the detecting coil.
  - Alternating current is applied across the terminals of both coils.
  - As a result of the applied alternating current the impedance of the detecting coil also changes.

System Features and Operation (Cont'd)

- As the impedance of the compensation coil is changed, the terminal voltage between the detecting coil and compensation coil is different depending on the steering torque.
- By detecting the voltage difference between these two coils, steering torque can be detected.
- The voltage signals are translated and sent directly to the EPS control module.
- Since the torque signal is sensitive to temperature changes and vibrations, two separate coils are needed.

EPS Motor



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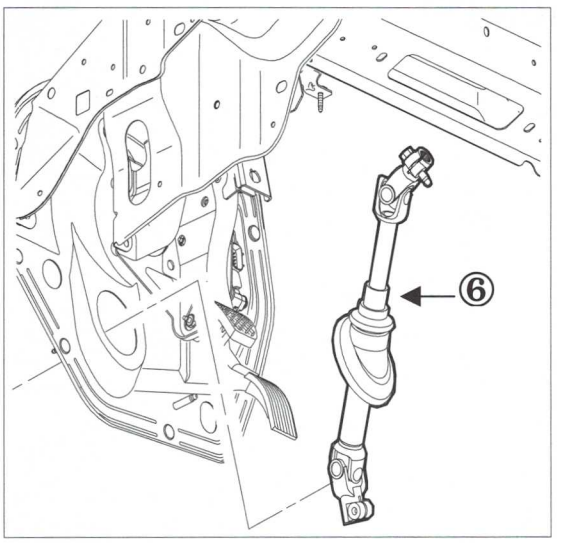
EPS Intermediate Shaft



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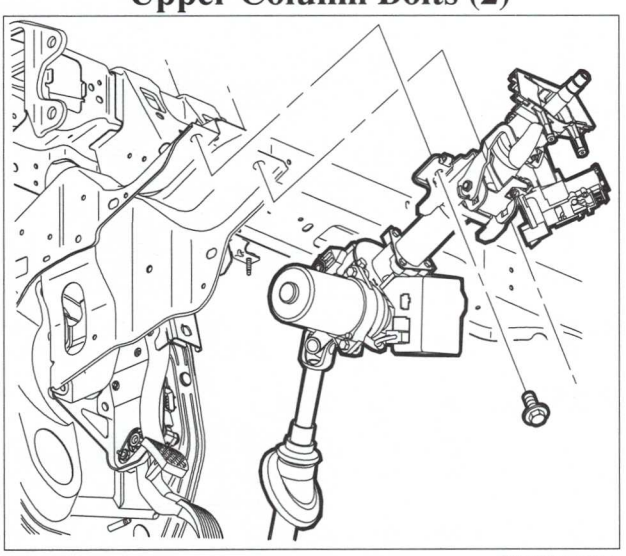
Upper Column Bolts (2)



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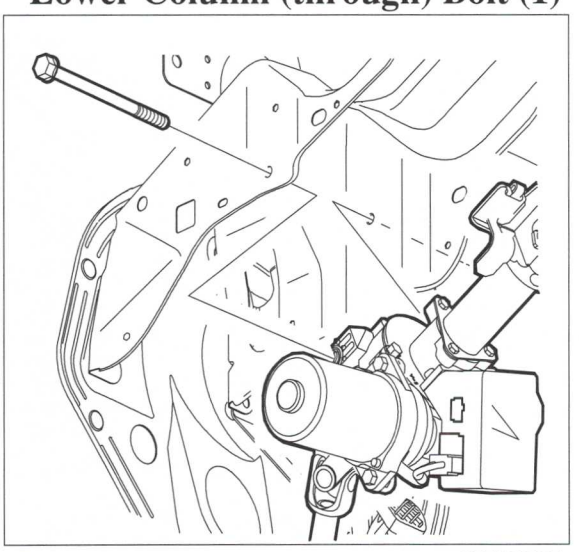
Lower Column (through) Bolt (1)



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System Features and Operation (Cont'd)

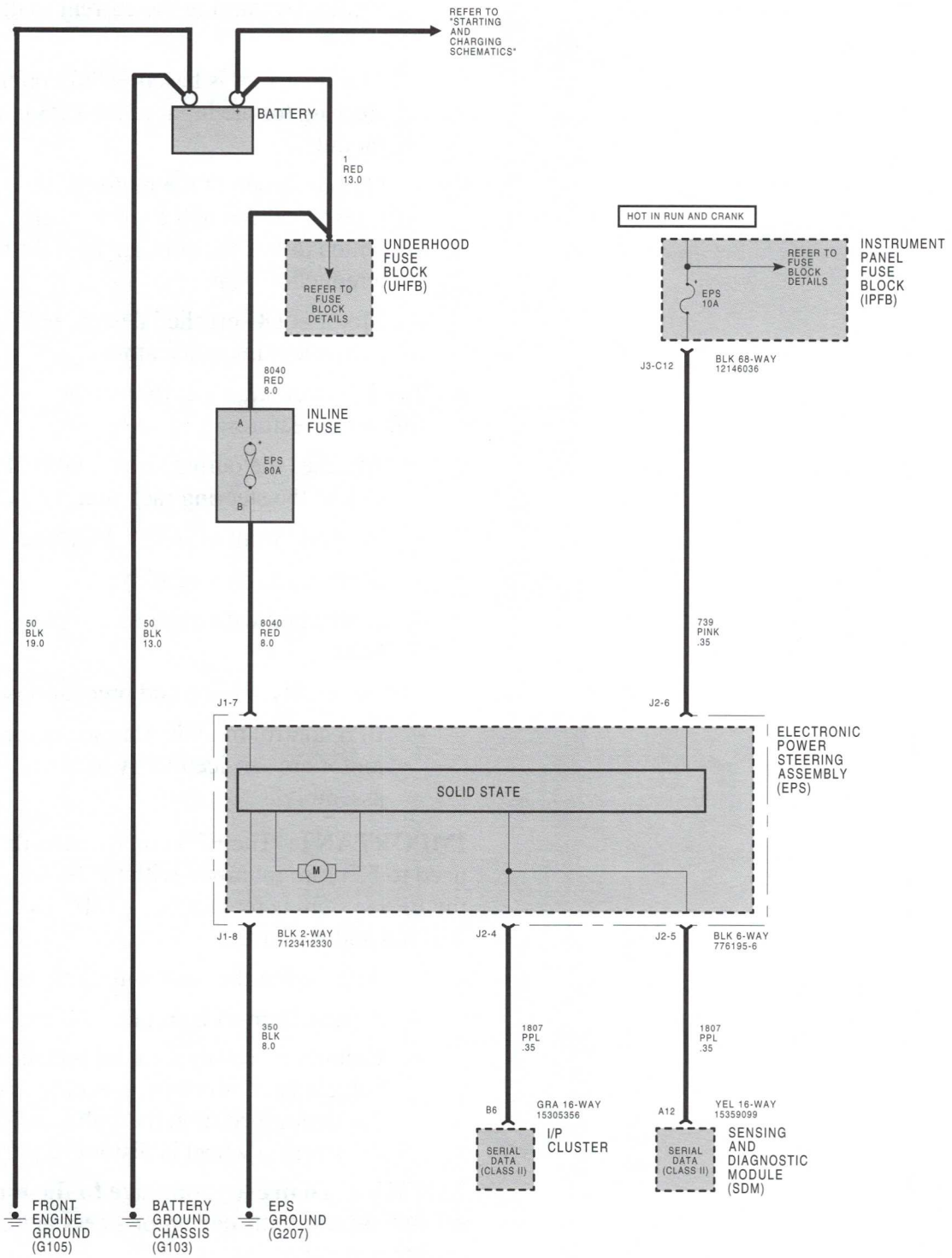
- The EPS motor **(3)** has the following features and functions:
  - EPS control module regulates the amount of steering assist that the motor applies by varying the current to the motor.
  - Motor current is based mainly on the steering torque input to the EPS control module.
  - Output torque of the motor is transferred through a worm shaft, which drives the column shaft through a reduction gear.
  - Motor is DC brushed design, with a permanent magnet stator.
- The Intermediate shaft **(6)** has the following features:
  - Attaches the output shaft on the EPS unit to the steering rack unit.
  - Integral "front of dash" (FOD) seal.
  - Serviced as an assembly.
  - Is attached with onetime use pinch bolts.
- EPS assembly service and precautions:
  - EPS control module, torque sensor and motor are serviced **Only** as an assembly.

IMPORTANT: The EPS control module will need to be reprogrammed with the SSS after the EPS system is replaced or a DTC C0551 will fail and be current.

  - Attached to the dash with three bolts.
  - Assembly must be replaced if dropped.
  - Column assembly must be replaced if vehicle is involved in an accident where the steering column has collapsed or the steering wheel is distorted.

NOTICE: To prevent damage to the torque sensor, do not hammer on or press against the steering shaft.

EPS System Wiring



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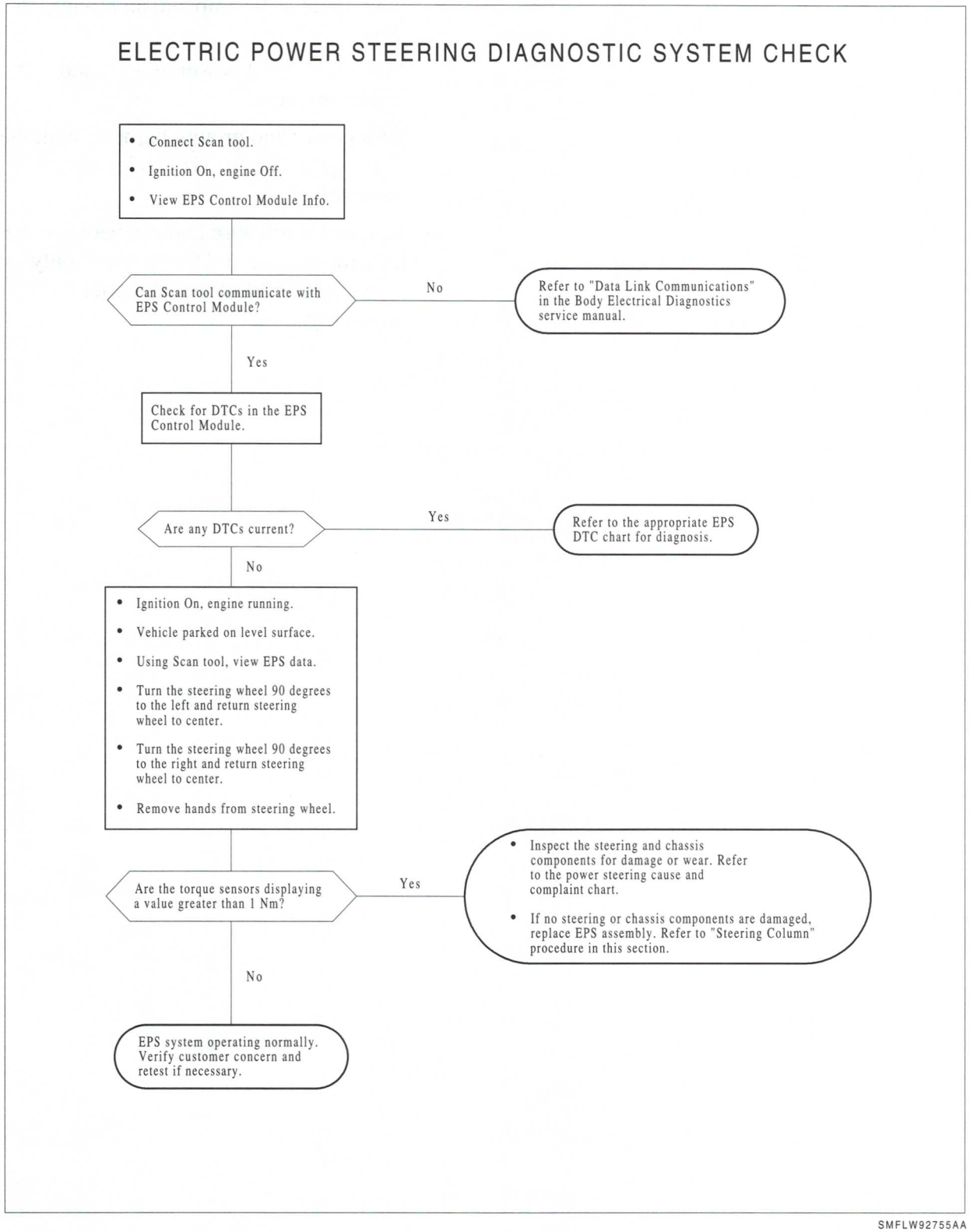
System Features and Operation (Cont'd)

- Features of the EPS system wiring:
  - Two fuses, a 10-amp and an 80-amp in-line.
  - Has a dedicated power and ground wiring harness.
  - EPS power and ground harness, with the 80-amp in-line fuse is serviced as an assembly.
  - Red and black wire harness between the control module and the motor is only serviced as part of the EPS column assembly.

Electric Power Steering Diagnostic System Check



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System Features and Operation (Cont'd)

Vehicle On-Board System Check

Because of the sharing of information, it is possible to have DTC failures in more than one module as a result of a single failure.

Important: Start all electrical diagnostics at the vehicle system level with the On-Board Diagnostic Systems Check.

EPS Diagnostic System Check

- EPS Diagnostic System Check would be preformed after the technician has completed the Vehicle On-Board Diagnostics System Check.
- This ensures the rest of the vehicle electrical system is operating correctly and no other electrical system could be causing the EPS system concern.

EPS system check must be the starting point for system diagnosis due to the following:

- Checks for proper EPS operation.
- Checks the ability of the EPS control module to communicate through the Class II serial data link.
- Checks for EPS system DTCs using a scan tool.
- Aids in isolating an electrical concern from a mechanical concern.
- Perform the EPS Diagnostic System Check after all repair or diagnostic procedures are completed.
- Verifies that the repair has been made correctly and that no other malfunctions exist.

IMPORTANT: Following all steps of the chart as written is critical. If steps are skipped or done incorrectly, improper diagnosis will occur.

System Features and Operation (Cont'd)

EPS Diagnostic Trouble Codes

C0000 – Vehicle Speed Data Invalid

C0475 – Electric Steering Motor Circuit Malfunction

C0476 – Electric Steering Motor Range/Performance

C0550 – ECU Malfunction

C0551 – Option Configuration Error

C0545 – Steering Wheel Torque Input Sensor Malfunction

C0847 – Device Ignition 1 Circuit Low

C0848 – Device Ignition 1 Circuit High

C0896 – Device Voltage Range/ Performance

C0899 – Device #1 Voltage Low

C0900 – Device #1 Voltage High

Refer to Data Link Communication section in the Body Electrical Diagnostics service manual for the following DTCs:

U1000 – Class II Data Link Malfunction

U1016 – Lost Communications with Engine Control System

U1024 – Lost Communications with Transmission Control System

U1064 – Lost Communications with Body Control System

U1096 – Lost Communications with Driver Information & Displays Control System

U1300 – Class II Data Link Low

U1301 – Class II Data Link High

The following DTCs will NOT turn On the Service Wrench or any other MIL:

C0476

C0896

C0899

C0900

EPS Scan Tool Data Chart

PARAMETER	How Measured (Tech 2 Display)
Torque Sensor Main *	N•m/ft-lb.
Torque Sensor Amplified	N•m/ft-lb.
Torque Sensor Sub *	N•m/ft-lb.
Actual Motor Current	Amps
Desired Motor Current	Amps
Motor Voltage +	Volts
Motor Voltage –	Volts
Vehicle Speed	km/h – MPH
Battery Voltage	Volts
Limiting Motor Current	Amps
Turning Profile	See Footnote 1
Ignition Voltage	Yes/No
Engine Run	Yes/No
Low Battery Voltage Incidents	Number Of Incidents
Ignition Cycles Since Last Code Set	Number Of Cycles
Overload Protection Incidents	Number Of Incidents

* Negative Reading indicates left turn, Positive Reading indicates right turn.

1 Will read 0 (Zero) if the EPS module has not been programmed

System Features and Operation (Cont'd)

- The Tech 2 can be used to view scan tool data.
- This data can aid in the diagnosis of intermittent conditions of the EPS system as follows:
- Observe parameters while:
  - Test driving
  - Wiggling wiring harnesses
- Compare parameters with those on a known good vehicle.
- Should the EPS system pass the Diagnostic System Check and there are still EPS concerns,

Or

- there are no DTC failures stored and there are customer concerns,
- Symptom diagnosis charts would be used for the following concerns:
  - Hard Steering.
  - Poor return of steering wheel to center.
  - Excessive free-play in steering.
- Rattle and/or clunking noise in steering.

EPS Diagnostic System Check Worksheet

Objective: At the completion of this worksheet, technicians will be able to perform the EPS Diagnostic Systems Check.

Reference: Chassis Service Manual.

Directions: Complete the following worksheet using the classroom vehicle, service manual and Tech 2.

Questions for Review

1. Verify vehicle battery is fully charged.
2. Perform the EPS Diagnostic System Check.
3. Did EPS controller communicate with the Tech 2? yes
4. If the Tech 2 did not communicate with the EPS controller, what would you check next? no vehicle
5. Were there any DTC failures? no
6. What could cause a DTC failure code C0000 to be stored? no vehicle spd
7. Who is the master of the vehicle speed? TCM

STOP **FOR REVIEW**

Section 7.3

Electronic Power Steering (EPS)
Steering Gear Assembly

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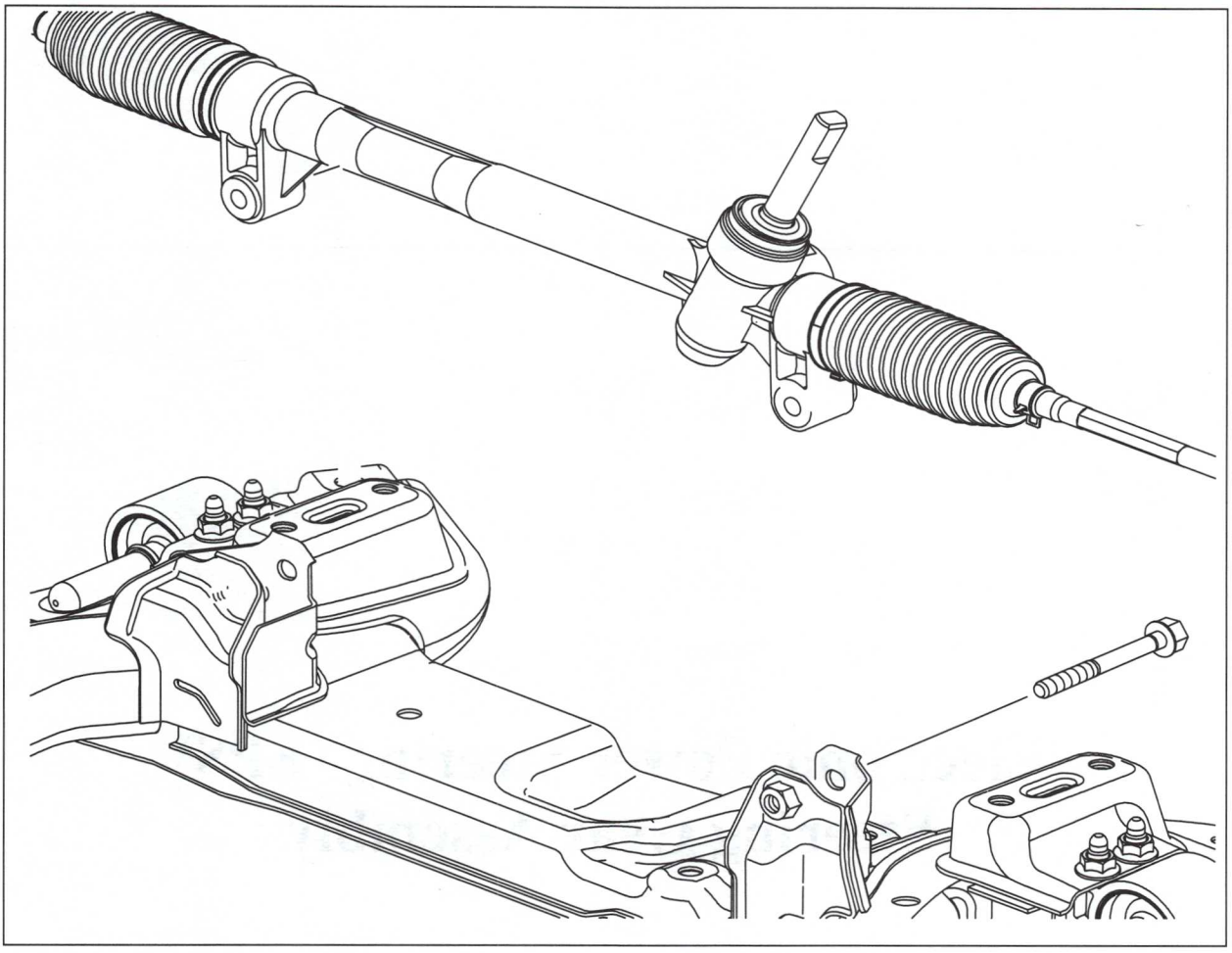
Steering Gear Assembly



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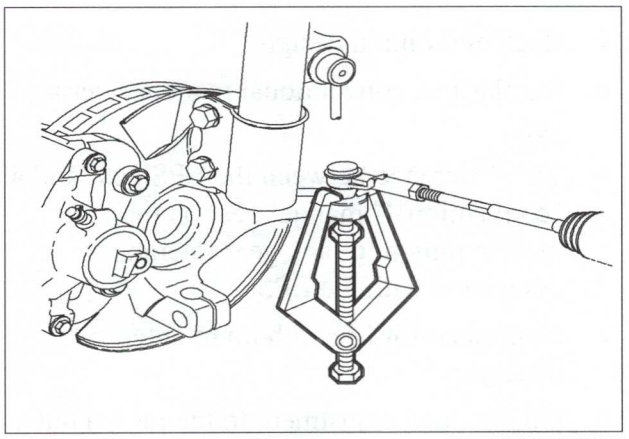
System Features and Operation

The steering gear assembly has the following features:

- Rack and Pinion design.
- Similar to a conventional manual steering gear.
- The difference between the EPS gear and a "conventional" manual gear, is the very precise pinion to rack gear tolerances associated with the EPS.
- Seal/lubed for life with no maintenance necessary.
- No pre–load adjustment to the pinion nut.
- Outer tie rods are traditional design and can be serviced.
- Gear boots (bellows) are traditional design and can be serviced.
- Steering gear and inner tie rod ends are only serviced as a unit.

Outer Tie Rod End Removal (SA91100C)



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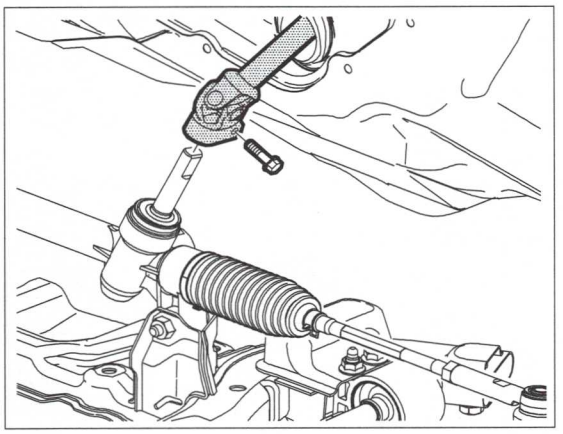
Steering Gear to Intermediate Shaft Removal



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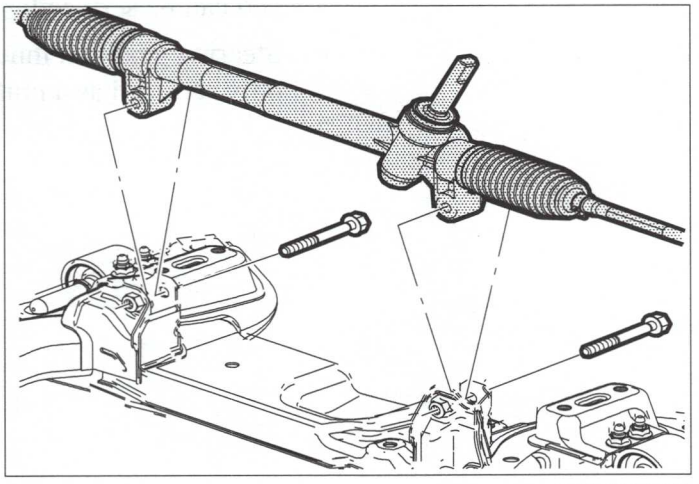
Steering Gear Assembly Removal



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System Features And Operation

Operation and Service Overview

- Steering gear receives the turning torque from the EPS column through the Intermediate shaft.
- Transmits the torque to the outer rod ends and to the steering knuckles.
- Steering gear is attached to the cradle with two through bolts.
- Steering gear will slide out the right side of the vehicle using the following procedures:
  - Remove both front wheel assemblies
  - Remove outer tie rod ends with tool SA91100C.
  - Remove and discard the Intermediate shaft bolt.

Important: Intermediate shaft position should be such that bolt head faces to the left side of the vehicle.

  - Remove both stabilizer links and swing stabilizer bar upward. You will need to hold the links from rotating when removing the nuts.
  - L81 equipped vehicles, it will be necessary to remove the heat shield.
- Care should be taken not to damage the steering gear shaft when replacing the boots and/or outer tie rod ends.

Steering Gear Diagnosis

Complaint/Condition	Possible Cause(s)	Correction(s)
Hard steering	Tire(s) improperly inflated	Inflate tire(s) correctly
	Imporper tire(s) size	Ensure tire(s) are of correct size
	Worn or binding suspension components	Check components for correct operation, replace as required
	Worn or binding outer tie rod end(s)	Replace outer tie rod end(s)
	Worn or binding Intermediate shaft	Replace Intermediate shaft
	Worn or binding steering gear	Replace steering gear
	Function of EPS steering column	Refer to EPS electrical diagnosis.
Poor return of steering wheel to center	Worn wheel bearing(s)	Replace wheel bearing(s)
	Improper tire(s) size	Ensure tire(s) are correct size
	Worn or binding Intermediate shaft	Replace Intermediate shaft
	Steering gear mounting bolt(s) loose.	Tighten bolt(s)
	Worn or binding suspension components.	Check components for correct operation replace as required
	Worn or binding outer tie rod end(s).	Replace outer tie rod end(s)
	Suspension geometry	Check/set alignment
	Check for EPS DTC(s)	Follow DTC(s) Diagnosis
Excessive free play in steering	Worn or binding suspension components.	Check components for correct operation replace as required.
	Stabilizer bar bushing(s) worn	Replace bushing(s)
	Worn or binding outer tie rod end(s)	Replace outer tie rod end(s).
	Loose steering gear mounting bolt(s)	Tighten bolt(s)
	Worn or binding steering gear	Replace steering gear.
	Loose tie rod jam nut	Tighten jam nuts.
	Worn wheel bearing(s)	Replace wheel bearing(s).
	Check for EPS DTC(s)	Follow DTC(s) Diagnosis

Steering Gear Diagnosis (Cont'd)

Complaint/Condition	Possible Cause(s)	Correction(s)
Rattle and/or clunking noise in steering	Worn or binding suspension components.	Check components for correct operation replace as required.
	Worn or binding outer tie rod end(s).	Replace outer tie rod end(s).
	Worn or binding steering gear.	Replace steering gear.
	Worn or binding intermediate shaft.	Replace intermediate shaft.
	Worn or binding steering column.	Replace steering column.
	Worn wheel bearing(s).	Replace wheel bearing(s).
	Loose steering gear mounting bolt(s)	Tighten bolt(s)
	Check for EPS DTC(s)	Follow DTC(s) Diagnosis
Intermittent change in power assist	Worn or binding suspension components.	Check components for correct operation replace as required
	Worn or binding outer tie rod end(s).	Replace outer tie rod end(s)
	Worn or binding steering gear.	Replace steering gear
	Worn or binding intermediate shaft.	Replace intermediate shaft
	Worn or binding steering column.	Replace steering column
	Worn wheel bearing(s).	Replace wheel bearing(s)
	Excessive heat in EPS motor (excessive parking lot maneuvers)	Allow system to cool
	Low Battery voltage	Ensure battery voltage is correct
	Malfunction of column (EPS) system	Refer to EPS electrical diagnostics
	Check for EPS DTC(s)	Follow DTC(s) Diagnosis

System Features And Operation

- Should the EPS system pass the Diagnostic System Check and there are still EPS concerns, the Symptom Diagnosis Charts would be used for the following concerns:
  - Hard steering.
  - Poor return of steering wheel to center.
  - Excessive free play in steering.
  - Rattle and/or clunking noise in steering.
  - Intermittent change in power assist

Electronic Power Steering (EPS)

Objective: Review Electronic Power Steering (EPS) section information.

Directions: Answer the following questions individually, then review answers as a group.

Questions for Review

1. When should you perform an EPS Diagnostic System Check?

   a) Before a Vehicle On -Board Diagnostic Systems Check

   b) After a Vehicle On -Board Diagnostic Systems Check

   c) After a front end alignment

   d) Both b and c

2. You are performing an EPS Diagnostic System Check. There are no EPS diagnostic trouble codes (DTCs) stored in the EPS control module. As you continue with the EPS Diagnostic System Check you should:

   a) Be certain the vehicle is parked on a level surface

   b) Verify the vehicle front wheels are turned no more than 20 degrees to the left or right

   c) Rotate the steering wheel a complete 360 degrees while the engine is running

   d) With ignition ON engine Off, observe scan data while turning the steering wheel 90 degrees to the left and to the right.

FOR REVIEW

Section 7.4

Brakes

2002 VUE New Product Participant Guide

System Features and Operation

Base Brake System (Non-ABS) Components

- Master cylinder
  - A conventional hydraulic master cylinder and fluid reservoir is used.
- Proportioning valve
  - A hydraulic proportioning valve is used (on vehicles without ABS).
- Brake lines and hoses
  - Flex braided brake pipes are new on the 2002 VUE. They provide additional ease of movement when servicing the brake master cylinder.
- A conventional vacuum brake booster is used to supply power assist.
- Front disc brakes
  - Dual piston calipers
  - Pad wear indicators
  - Right front wheel speed sensor on non-ABS vehicles with 6 cylinder engine
- Rear drum brakes
  - Leading/trailing system
  - Left and right shoes
- Parking brake
  - Hand operated
  - Located in the console area between the front seats.
  - Input is distributed through the park brake cables and the park brake cable equalizer, to the left and right park brake apply levers at the left and right rear wheel assemblies.

System Features and Operation (Cont'd)

Bosch 5.3 Antilock Brake System (ABS) Components (ABS is Optional on All VUE Models)

The following components are included in the operation of the Bosch 5.3 antilock brake system:

IMPORTANT: When replacing an EBTCM, calibration of the unit is not required.

- Electronic brake traction control module (EBTCM), which includes the following components:
  - System relay
  - Vent tube
- Dynamic rear proportioning (DRP)

IMPORTANT: There are rubber isolators located under the BPMV and on the mounting studs. The rubber isolators protect the BPMV and the EBTCM from vehicle vibrations.

- Brake pressure modulator valve (BPMV), which includes the following components:
  - Pump motor
  - Inlet valves (one per wheel)
  - Outlet valves (one per wheel)
  - Master cylinder isolation valves (with NW9) (one per drive wheel)
  - Prime valves (with NW9) (one per drive wheel).

Traction Control System (TCS) [NW9]

Traction control is available only on front wheel drive models. Traction control (NW9) is **not** available on all wheel drive models.

- Traction control switch
  - Traction control is manually engaged or disengaged using the traction control switch.
- Stoplamp switch
  - The EBTCM uses the stoplamp switch as an indication that the brake pedal is applied.

System Features and Operation (Cont'd)

Initialization Sequence

- The EBTCM performs one initialization test each ignition cycle.
- The initialization of the EBTCM occurs when **one set** of the following conditions occurs:
  - The EBTCM receives data from the ECM via CAN data message indicating that the engine speed is at least 500 rpm.

    and
  - The brake stoplamp switch is not applied.

Dynamic Rear Proportioning (DRP)

- A control system that replaces the hydraulic proportioning function of the mechanical proportioning valve in the base brake system.
- The DRP control system is part of the operational software in the EBTCM.
- The DRP uses active control with existing ABS in order to regulate the vehicle's rear brake pressure.
- The instrument panel cluster (IPC) brake indicator is illuminated when the dynamic rear proportioning function is disabled.

System Features and Operation (Cont'd)

Traction Control System (TCS)

- The traction control system (TCS) compares front wheel speeds to rear wheel speeds to determine if drive wheels lose traction.
- The TCS engages when drive wheel speed exceeds that of non-drive wheel speed by a calibrated value.
  - This allows the driver to maintain acceleration on low traction surfaces.
- The TCS limits wheel slip during acceleration when one or more of the drive wheels loses traction.
- The brake switch must be Off for the TCS to operate.
- During a traction event, the EBTCM sends a requested torque value to the ECM/TCM via the serial data link.
- The ECM/TCM initiates an engine torque reduction routine to slow the vehicle drive wheels.
- The torque reduction routine consists of:
  - Ignition timing reduction
  - Fuel injector cut-off
  - Transmission shift control (CVT only)
- The ECM/TCM sends a torque delivered value to the EBTCM via CAN data.
- If the EBTCM detects a malfunction, it will disable TCS and command the traction LED off.
- The driver can also disable TCS (if desired) by pressing the interior TCS switch and turning the system Off.

System Features and Operation (Cont'd)

ABS Indicator

- The IPC receives a Class II message from the EBTCM requesting illumination of the ABS indicator when the following occurs:
  - Display test at the start of each ignition cycle. The indicator illuminates for approximately 3 seconds.
  - The electronic brake traction control module (EBTCM) detects a malfunction with the antilock brake system.
- The IPC illuminates the brake indicator and the chime module is activated when the following occurs:
  - The body control module (BCM) detects the park brake is engaged and vehicle speed is 5 km/h (3 mph) or greater.
- The BCM will set code B0005 Park Brake Switch Circuit Low if the parking brake is left on.
- Low brake fluid
  - The IPC illuminates the brake indicator when a "low" signal from the brake fluid switch is received.

System Features and Operation (Cont'd)

Traction Control System Indicator(s)

- Service Traction System
  - If the electronic brake traction control module (EBTCM) detects a malfunction in the traction control system, a DTC will be set.
  - No IPC indicator will illuminate in the event of a traction control system DTC failure.
  - The LED on the interior TCS On - Off switch will not illuminate (when On) if there is a DTC detected.
- Low Traction
  - The IPC illuminates the Low Traction indicator when the Electronic Brake Traction Control Module (EBTCM) detects a traction control event. The IPC receives a class II message from the EBTCM requesting illumination.
- The IPC performs the display test at the start of each ignition cycle.

Bleeding Procedure

- Perform only manual or pressure bleed on base hydraulic portion of the brake system.
- Brake system bleeding is not recommended or required on the Bosch 5.3 ABS circuit of the brake system.

Service, Diagnostics and Adjustments

Service procedures, diagnostics and adjustments are similar to those of the L-Series vehicle. Refer to 2002 VUE Brakes service manual procedures.

Brakes Worksheet

Objective: Review Brakes section information.

Directions: Answer the following questions individually, then review answers as a group.

Questions for Review

1. New on the 2002 VUE brake system are:

   a) rear brake shoe wear indicators

   b) auto-hydraulic bleed calipers

   c) flex braided brake pipes

   d) all of the above

2. Brake system bleeding is not recommended on the Bosch 5.3 ABS circuit of the brake system:

   a) without the use of a pressure bleeder

   b) without first disabling the Dynamic Rear Proportioning Valve (DRP)

   c) unless all brake fluid must be completely flushed from the system

   d) at any time

FOR REVIEW

Section 7.5

Exhaust

2002 VUE New Product Participant Guide

System Features And Operation

- Exhaust System
  - The VUE utilizes aluminized exhaust pipe and internal stainless steel muffler components.

Important: Both the L61 and L81 engines use a flexible design downpipe. Excessive movement of downpipe during service could cause external and/or internal damage to the pipe.