

[2009 Holden VE Sedan](#) | [VE, WM, Caprice, Statesman, Lumina, Omega, VXR8, Sportwagon Service Manual](#) |

## Diagnostic Trouble Code List

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## Diagnostic Trouble Code (DTC) List - Vehicle

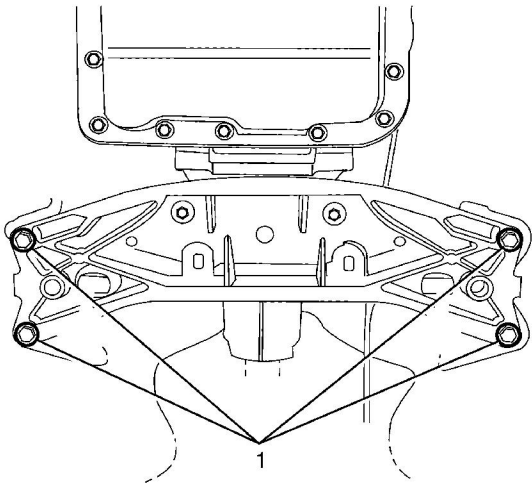
This master DTC list includes all applicable DTCs in alphanumeric order with descriptors.

DTC	DTC Descriptor	Module That Sets the DTC	Diagnostic Procedure
B0012	Driver Frontal Deployment Loop Stage 1	SDM	<a href="#">DTC B0012 or B0013</a>
B0013	Driver Frontal Deployment Loop Stage 2	SDM	<a href="#">DTC B0012 or B0013</a>
B0014	Driver Side Deployment Loop	SDM	<a href="#">DTC B0014</a>
B0015	Driver Pretensioner Deployment Stage 1 Loop	SDM	<a href="#">DTC B0015</a>
B0016	Driver Curtain Deployment Loop Initiator	SDM	<a href="#">DTC B0016</a>
B0019	Passenger Frontal Deployment Loop Stage 1	SDM	<a href="#">DTC B0019 or B0020</a>
B0020	Passenger Frontal Deployment Loop Stage 2	SDM	<a href="#">DTC B0019 or B0020</a>
B0021	Passenger Side Deployment Loop Stage 1	SDM	<a href="#">DTC B0021</a>
B0022	Passenger Pretensioner Deployment Stage 1 Loop	SDM	<a href="#">DTC B0022</a>
B0023	Passenger Curtain Deployment Loop Initiator	SDM	<a href="#">DTC B0023</a>
B0052	Deployment Commanded	SDM	<a href="#">DTC B0052 or B0053</a>
B0053	Deployment Commanded with Loop DTCs Present	SDM	<a href="#">DTC B0052 or B0053</a>
B0055	Side Airbag Deployment Commanded	SDM	<a href="#">DTC B0055</a>
B0072	Driver Seat Belt Sensor Circuit	SDM	<a href="#">DTC B0072</a>
B0079	Driver Seat Position Sensor Circuit	SDM	<a href="#">DTC B0079</a>
B0083	Front End Sensor 1	SDM	<a href="#">DTC B0083 or B0084</a>
B0084	Front End Sensor 2	SDM	<a href="#">DTC B0083 or B0084</a>
B0085	Left Front Side Impact Circuit	SDM	<a href="#">DTC B0085 or B0086</a>
B0086	Right Front Side Impact Sensor Circuit	SDM	<a href="#">DTC B0085 or B0086</a>
	Coil Compressor Stroke Control		



5. Remove the transmission support to lower sub frame rail retaining bolts.
6. Remove the transmission support from the vehicle.

## Installation Procedure



1. Install the transmission support to the vehicle.

**Notice:** Refer to [Fastener Notice](#) in the Preface section.

2. Install the transmission support to lower sub frame rail retaining bolts (1).

### **Tighten**

Tighten the bolts to 55 N·m (41 lb ft).

3. Remove the suitable supporting stand from the transmission.

## Plastic Identification and Refinishing Systems

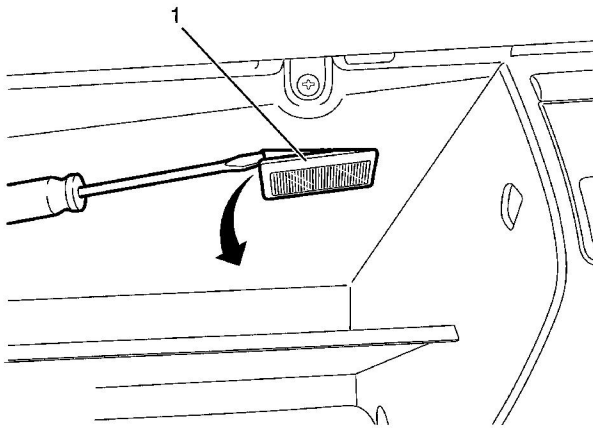
Identifying Symbol - Old Symbol in ( )s	Chemical Composition or Plastic Family Name	Typical Area(s) Where Part is Used	Examples of Common/Trade Names	Type of Plastic
ABS	Acrylonitrile/ Butadiene-Styrene	Armrest Support, Console, Instrument Panel Console, Steering Column Bracket/Jacket, Trim Molding	ABS, Absafil, Magnum, Cyclocac, Dyel, Kralastic, Lustran	Thermoplastic
ABS + PC	Acrylonitrile/ Butadiene-Styrene + Polycarbonate	Instrument Panel, Instrument Panel Console	Bayblend, Cycloloy, KHA, Pulse	Rigid
ABS/PVC	ABS/Vinyl (Soft)	Head Rest Cover, Instrument Panel Pad, Trim Molding/Panel	ABS Vinyl	Flexible, Vinyl
EPDM	Ethylene Propylene Diene Monomer	Body Panel, Bumper Impact Strip	EPDM, Nordel	Rigid
EVA (EVAC)	Ethylene/Vinyl Acetate	Head Rest Cover, Miscellaneous Soft Trim	Elvax, Microthane	Flexible
PA	Polyamide	Headlamp Bezels, Exterior Finish Trim Panels	Nylon, Capron, Zytel, Rilsan, Minion, Vydine, Welland	Rigid
PA, PAG, PAGG	Polyamide	Exterior Finish Trim Panel, Headlamp Bezel	Capron, Minlon, Nylon, Rilsan, Vydine, Wellamid, Zytel	Rigid, Thermoset
PA + PPE	Polymide + Polyphenylene Ether	Exterior Trim	GTX	Rigid, Thermoset
PBT + TEEE (PBTP + EEBC)	Polybutylene, Terephthalate + Ether, Ester Block Compound	Fascia, Rocker Panel Molding	Bexloy M	Rigid
PC	Polycarbonate	Interior Rigid/Hard Trim Panel, Valance Panel	Calibre, Lexan, Merlon, Makrolon	Rigid, Thermoset
PC + PETP	Polycarbonate + Polybutylene, Terephthalate	Bumper Fascia	Macroblend, Valox, Xenoy	Flexible, Thermoset
PE	Polyethylene	Interior Trim Panel, Seat Belt Cover, Spoiler, Valance	Alathon, Dylan, Foriflex, Hi-fax, Hosalen, Marlex, Paxon	Rigid, Thermoplastic

## Instrument Panel Compartment Lamp Replacement

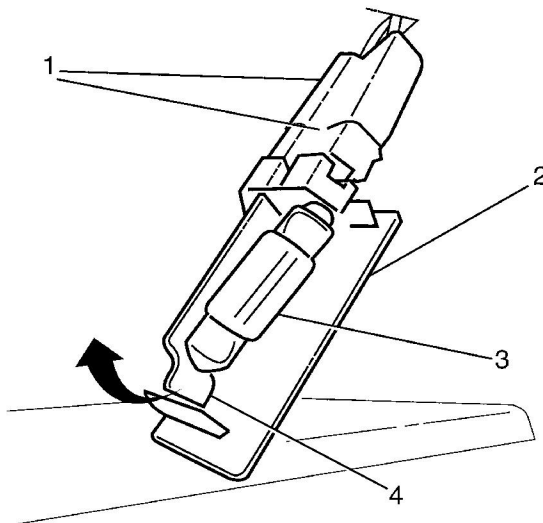
### Removal Procedure

**Caution:** Refer to [Battery Disconnect Caution](#) in the Preface section.

1. Disconnect the battery ground cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Open the instrument panel compartment.



3. Insert a suitable tool under the instrument panel compartment lamp assembly (1) and gently pry the lamp assembly from the instrument panel compartment.



## **Mist Operation**

Windshield wiper/washer system mist operation is identical to wiper low speed operation, except that the mist switch is a press and release type switch. When the wiper switch is moved to the mist position and released, low speed wiper motor operation is started and will continue until 1 wipe cycle is complete. If the wiper switch is moved to the mist position and held, the wiper motor will operate in the low mode until the switch is released.

## **Intermittent Operation**

Windshield wiper intermittent operation is a low speed wiper motor function with a variable delay interval between the wiper motor cycles. The delay interval is determined by a series of 6 resistors within the wiper/washer switch. The BCM monitors the wiper switch low signal circuit to determine the delay interval between the low speed wiper motor wipe cycles.

## **High Speed Operation**

When the wiper switch is in the high speed position, ground is applied through the windshield wiper switch high signal circuit to the BCM indicating the wiper high speed request. In response to this signal, the BCM then energizes the wiper relay, by applying battery voltage through the wiper relay control circuit to the coil side of the relay. This allows battery positive voltage from the F21 15A fuse to flow through the switch input side of the wiper relay and out to the switch input side of the wiper high relay. At the same time, the BCM also energizes the wiper high relay by applying ground through the control circuit to the coil side of the wiper high relay. As the wiper high relay is energized and its switch contacts closed to the high speed control circuit of the wiper motor, the motor will operate at high speed.

## **Wash Operation**

In the wash position windshield wiper/washer switch grounds the control circuit of the windshield washer pump to the BCM. The BCM monitors this voltage input to detect when a wash cycle is requested so it can enable the wipers. The BCM energizes the wiper relay which will operate the windshield wiper motor at low speed.

The windshield washer pump sprays solvent onto the windshield. The windshield wipers operate at low speed for 3-5 wipes and returns to the park position.

## **Moisture Sensitive Wipers (If Equipped)**

The outside moisture sensor monitors moisture accumulation on the windshield and uses a windshield wiper/washer switch status input to provide wipe commands to the body control module (BCM). The DELAY positions on the wiper/washer switch are used to activate the AUTOMATIC rain sensing operating mode. They are also used to adjust the level of sensitivity to moisture accumulation, which determines the dwell time for commanding a wiper motor wipe cycle. Accessory voltage is supplied to the outside moisture sensor through the 10A Fuse, located in the I/P fuse block. The sensor is grounded through the ground circuit .. Whenever the ignition is in the run or accessory positions, the BCM sends the wiper/washer switch status using a pulse width modulation (PWM) signal through the outside moisture sensor signal 1 circuit to the outside moisture sensor. When a wipe cycle is needed, the moisture sensor sends a PWM voltage signal through the moisture sensor signal 2 circuit back to the BCM requesting the wiper operation. The outside moisture sensor uses the moisture sensor signal 2 circuit to command wiper motor wipe cycles and to confirm the moisture sensor signal 1 is being received. If at anytime communication

## DTC C0035-C0050

### Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

### DTC Descriptors

**DTC C0035 00:** Left Front Wheel Speed Sensor Circuit

**DTC C0035 5A:** Left Front Wheel Speed Sensor Circuit Plausibility Failure

**DTC C0040 00:** Right Front Wheel Speed Sensor Circuit

**DTC C0040 5A:** Right Front Wheel Speed Sensor Circuit Plausibility Failure

**DTC C0045 00:** Left Rear Wheel Speed Sensor Circuit

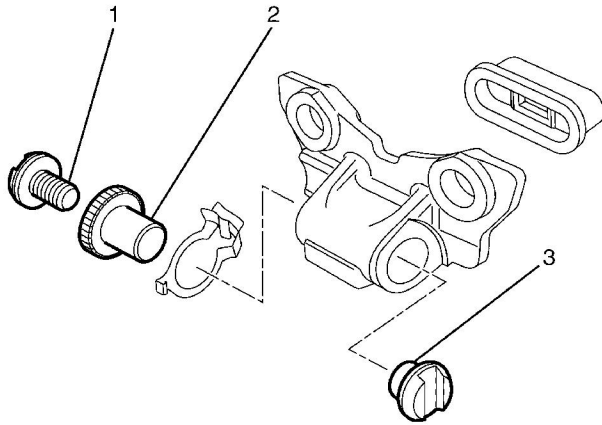
**DTC C0045 5A:** Left Rear Wheel Speed Sensor Circuit Plausibility Failure

**DTC C0050 00:** Right Rear Wheel Speed Sensor Circuit

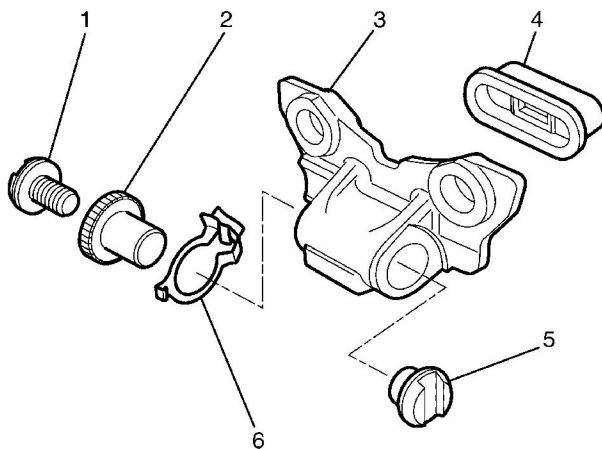
**DTC C0050 5A:** Right Rear Wheel Speed Sensor Circuit Plausibility Failure

### Diagnostic Fault Information

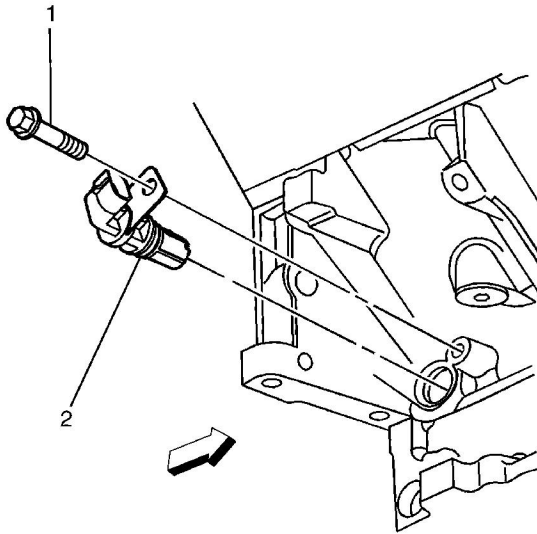
Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Left Front Wheel Speed Sensor 12-Volt Reference	C0035 00	C0035 00	--	C0035 5A
Left Front Wheel Speed Sensor Signal	C0035 00	C0035 00	C0035 00	C0035 5A
Right Front Wheel Speed Sensor 12-Volt Reference	C0040 00	C0040 00	--	C0040 5A
Right Front Wheel Speed Sensor Signal	C0040 00	C0040 00	C0040 00	C0040 5A
Left Rear Wheel Speed Sensor 12-Volt Reference	C0045 00	C0045 00	--	C0045 5A
Left Rear Wheel Speed Sensor Signal	C0045 00	C0045 00	C0045 00	C0045 5A
Right Rear Wheel Speed Sensor 12 Volt Reference	C0050 00	C0050 00	--	C0050 5A
Right Rear Wheel Speed Sensor Signal	C0050 00	C0050 00	C0050 00	C0050 5A



1. Apply a small amount of GM approved silicone grease to positions (2, 3). DO NOT apply grease to the bolt threads (1).

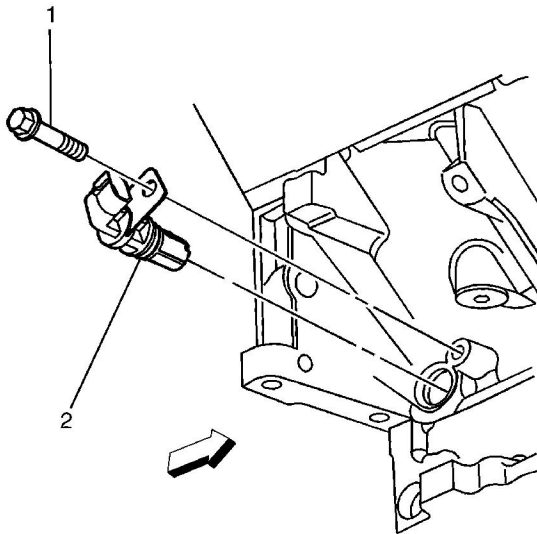


2. Install the dust cover (4) to the abutment plate (3).
3. Install the adjustment pawl (6).
4. Install the tappet (5) to the abutment plate (3).
5. Install the adjustment screw (1) to the adjuster nut (2).
6. Install the adjuster nut (2) to the abutment plate (3).



5. Remove the CKP sensor to engine block retaining bolt (1).
6. Remove the CKP sensor (2) from the engine block.

## Installation Procedure

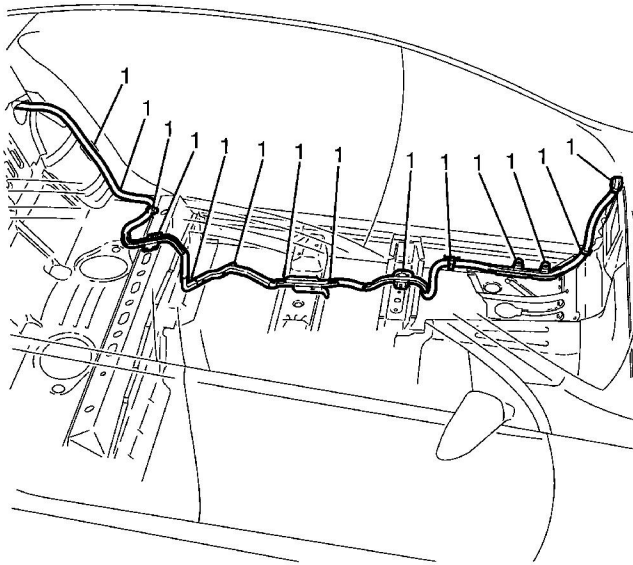


1. Install the CKP sensor (2) to the engine block.

**Notice:** Refer to [Fastener Notice](#) in the Preface section.

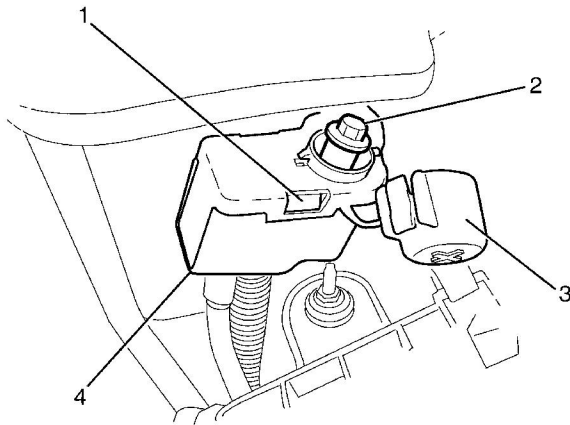
2. Install the CKP sensor to engine block retaining bolt (1).





1. Install the battery positive cable to the vehicle.
2. Install the battery positive cable to chassis retaining clips (1).

**Notice:** Refer to [Fastener Notice](#) in the Preface section.



3. Install the battery post retaining bolt (2)

**Tighten**

Tighten the post retaining bolt to 15 N·m ( 11 lb ft).

4. Install the battery post protective cover (4).
5. Attach the battery post cover (3).

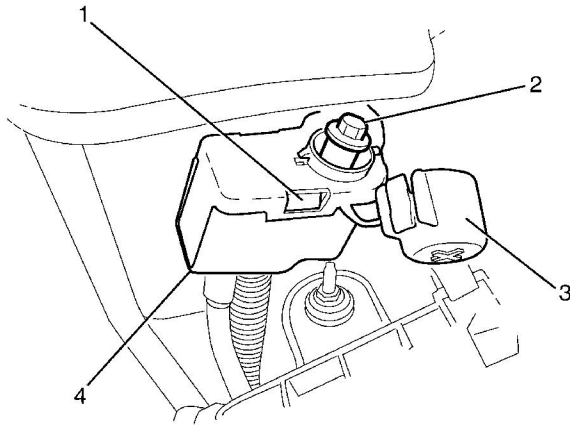


4. Install the battery post protective cover (4).
5. Attach the battery post cover (3).

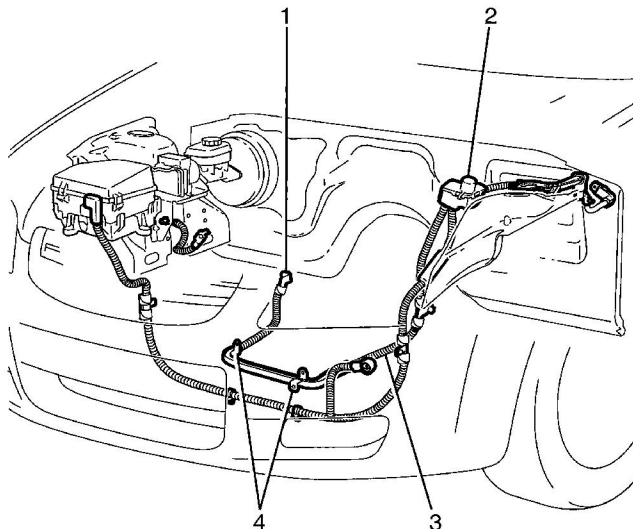
## **Removal Procedure - Starter (6.0L Engines)**

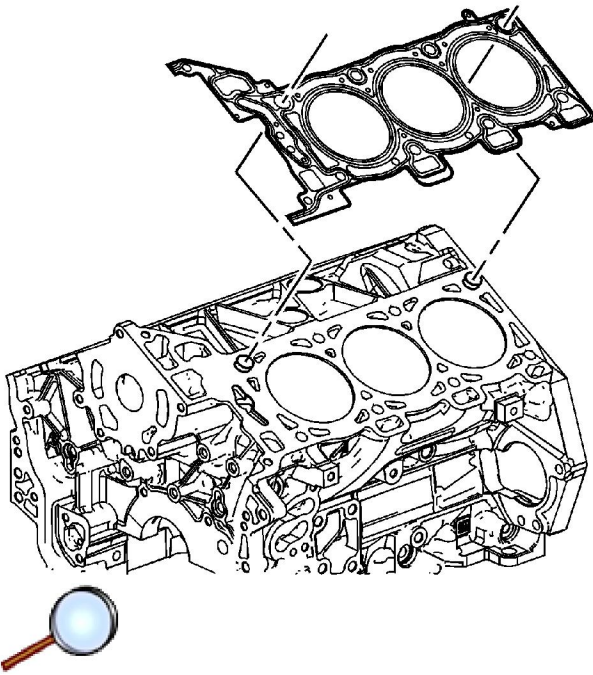
**Caution:** Refer to [Battery Disconnect Caution](#) in the Preface section.

1. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Remove the front air deflector. Refer to [Front Air Deflector Replacement](#).

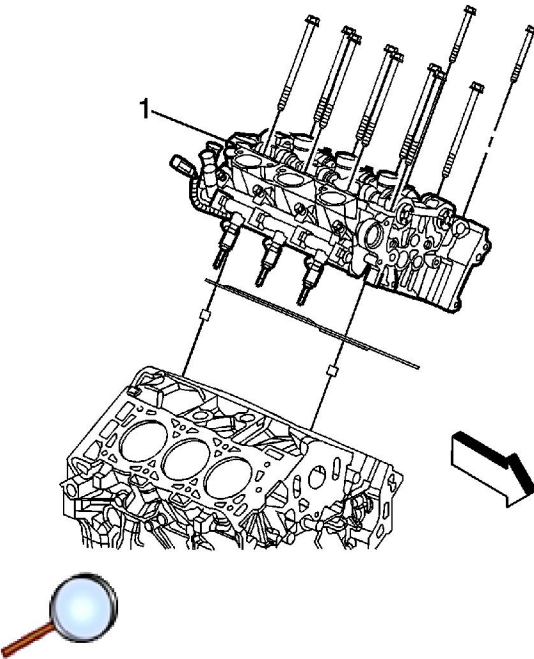


3. Detach the battery post cover (3).
4. Press the retaining clip (1) to remove battery post protective cover (4).
5. Remove the battery post retaining bolt (2).





2. Install a NEW cylinder head gasket.

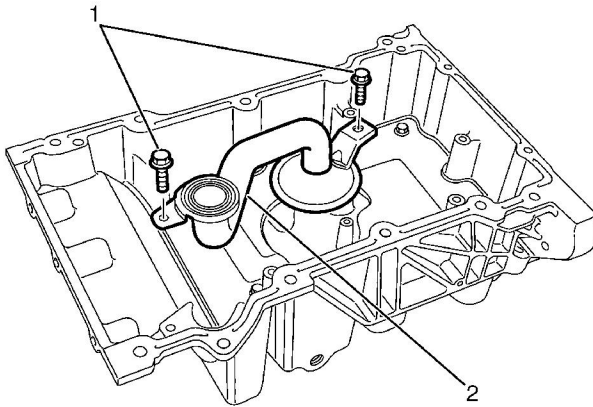


3. Carefully install the cylinder head (1) with the exhaust manifold to the engine. Refer to [Cylinder Head Installation - Left Side](#).
4. Install the oil filter adapter upper bolt. Refer to [Oil Filter Adapter Installation](#).
5. Install the oil level indicator. Refer to [Oil Level Indicator and Tube Replacement](#).
6. Install the catalytic converter to the exhaust manifold. Refer to [Catalytic Converter Replacement - Left Side](#).
7. Install the wiring harness bracket to the rear of the cylinder head.
8. Install the surge tank hose to the bracket at the rear of the cylinder head.
9. Install the power steering pump bolts. Refer to [Power Steering Pump Replacement](#).
10. Install the wiring harness connector bracket from the side of the cylinder head.
11. Disconnect the wiring harness electrical connector located at the side of the cylinder head.

**Caution:** Refer to [Fastener Caution](#) in the Preface section.



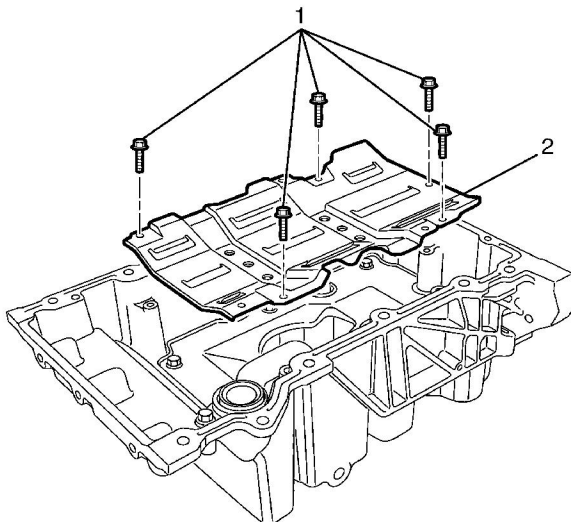
3. Install a NEW oil suction pipe seal (1) onto the oil suction pipe (2).



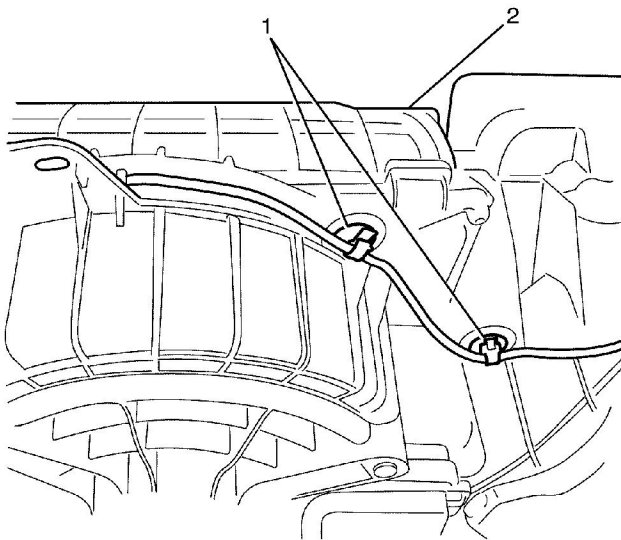
4. Install the oil suction pipe (2).
5. Install the oil suction pipe to oil pan retaining bolts (1).

**Tighten**

Tighten the bolts to 10 N·m (89 lb in).

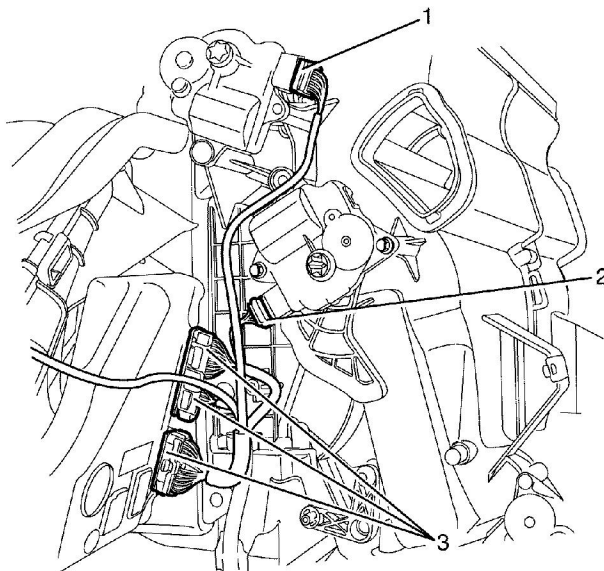


6. Install the oil pan scraper (2).
7. Install the oil pan scraper to oil pan retaining bolts (1).



**Important:** Use a pair of long nose pliers to close the wiring harness retaining clip (1) ends to remove the wiring harness retaining clips (1) from the HVAC module assembly (2).

4. Detach the wiring harness retaining clips (1) from the HVAC module assembly (2).



5. Disconnect the defrost actuator air intake fresh/recirculation electrical connector (1).
6. Disconnect the air mix actuator electrical connector (2).

**Important:** The single zone HVAC module only has the one 22 pin connector. The dual zone HVAC module has a 22 pin connector and a 7 pin connector. The tri zone HVAC module has a 22 pin connector, a 7 pin connector and a 10 pin connector.

7. Disconnect the HVAC module electrical connectors (3) as required.

24	0.75 YE	581	TAC Motor Control - 1
25	0.75 WH/BK	5283	Cam Phaser Exhaust 2 Signal
26	0.75 PK/BK	1746	Fuel Injector 3 Control
27	--	--	Not Used
28	0.75 BN/WH	845	Fuel Injector 5 Control
29	--	--	Not Used
30	0.5 PU/WH	23	Generator Field Duty Cycle Signal
31-32	--	--	Not Used
33	0.5 YE/RD	5276	Intake 2 Cam Position Sensor Signal
34	0.5 D-GN	5273	Exhaust 1 Cam Position Sensor Signal
35	0.5 YE/BU	573	CKP Sensor 1 Signal
36-38	--	--	Not Used
39	0.5 GY	2701	5-Volt Reference
40	0.5 GY	596	5-Volt Reference
41	0.75 PK/BK	632	Low Reference
42	--	--	Not Used
43	0.5 BN/RD	470	Low Reference
44	0.5 BK	2755	Low Reference
45	0.5 PU/WH	605	5-Volt Reference
46	0.5 PU	574	Low Reference
47	--	--	Not Used
48	0.75 BN	582	TAC Motor Control - 2
49	0.75 OG/BK	5272	Cam Phaser Intake 2 Signal
50	0.75 L-BU/BK	844	Fuel Injector 4 Control
51	0.75 BN/BK	1744	Fuel Injector 1 Control
52	0.75 L-GN/BK	1745	Fuel Injector 2 Control
53-54	--	--	Not Used
55	0.5 PU	2121	IC 1 Control
56	0.5 L-BU	2123	IC 3 Control
57	0.5 D-GN/RD	2125	IC 5 Control
58	--	--	Not Used
59	0.5 D-BU	496	Knock Sensor 1 Signal
60	0.5 BN	407	Low Reference
61	0.5 BN/WH	331	Oil Pressure Sensor Signal
62-66	--	--	Not Used
67	0.5 BN/YE	1664	HO2S Low Signal (Bank 1 Sensor 1)
68	0.5 WH		HO2S Output Pump Current (Bank 1 Sensor 1)
69	0.5 OG		HO2S Input Pump Current (Bank 2 Sensor 1)
70	0.5 PU	1666	HO2S High Signal (Bank 2 Sensor 1)
71	--	--	Not Used

- Diagnostic trouble codes (DTCs) that may have set during the testing. Refer to the applicable DTC.
- Scan tool data for any abnormal readings or data.

## **Electrical Function Check**

Perform this check first, in order to make sure the electronic transmission components are connected and functioning properly. If these components are not checked, a simple electrical condition may be mis-diagnosed.

1. Connect the scan tool.
2. Ensure the gear selector is in PARK and set the parking brake.
3. Start the engine.
4. Verify that the following scan tool data can be obtained and is functioning properly.

Refer to [Control Module References](#) for typical data values. Data that is questionable may indicate a concern.

- Engine speed
  - Transmission output speed
  - Vehicle speed
  - TFP manual valve position switch
  - Transmission range, engine list
  - Commanded gear, current gear
  - PC solenoid reference current
  - PC solenoid actual current
  - PC solenoid duty cycle
  - Brake switch
  - Engine coolant temperature
  - Transmission fluid temperature
  - Throttle angle
  - Ignition voltage
  - 1-2 shift solenoid
  - 2-3 shift solenoid
  - TCC solenoid duty cycle
  - TCC slip speed
5. Monitor the brake switch signal while depressing and releasing the brake pedal. The scan tool should display:
    - Closed when the brake pedal is released.
    - Open when the brake pedal is depressed.
  6. Check the garage shifts.
    - 6.1. Apply the brake pedal and make sure that the parking brake is set.
    - 6.2. Move the gear selector through the following ranges:
      - 6.2.1. PARK to REVERSE
      - 6.2.2. REVERSE to NEUTRAL