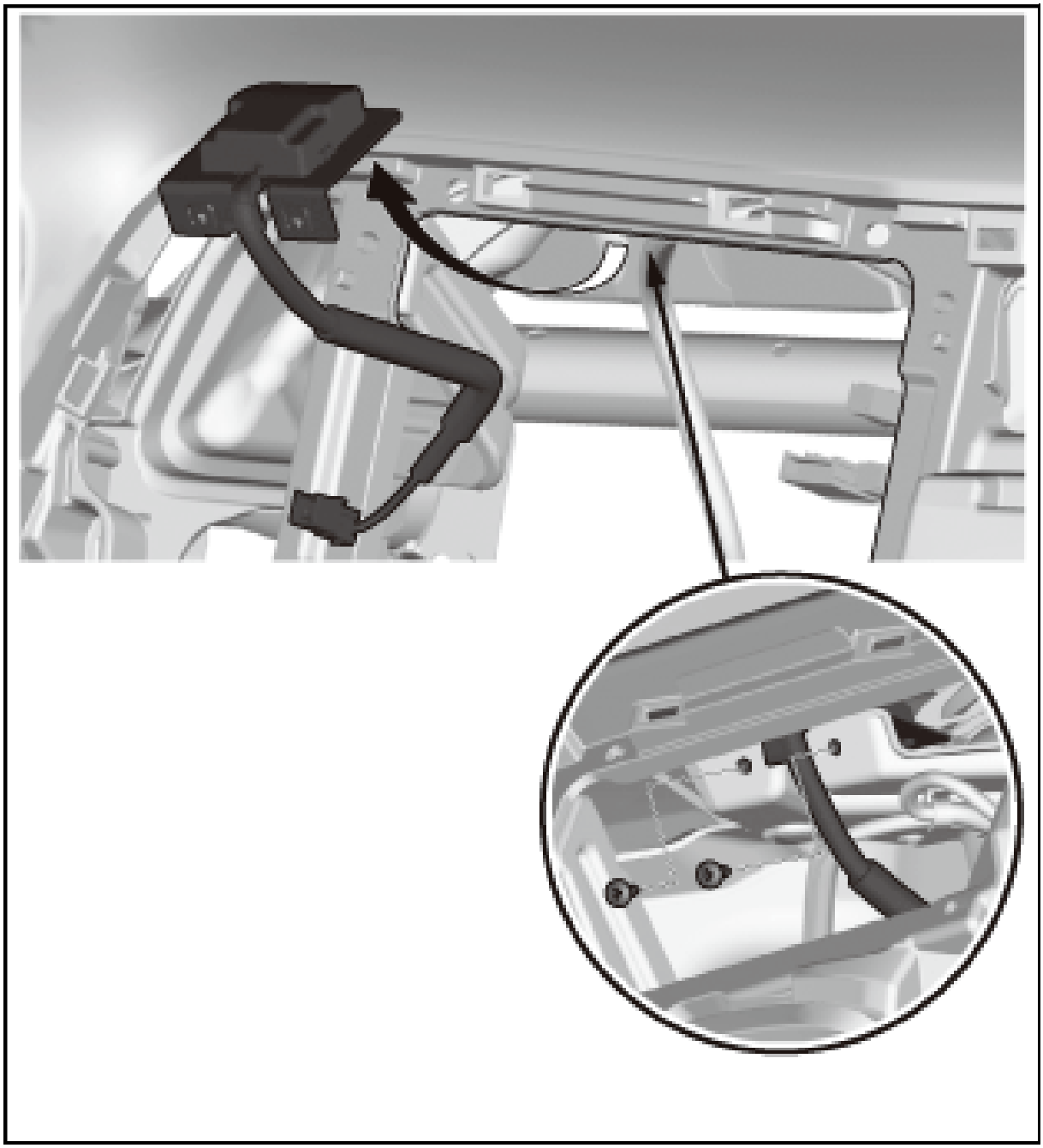
GPS ANTENNA REMOVAL AND INSTALLATION

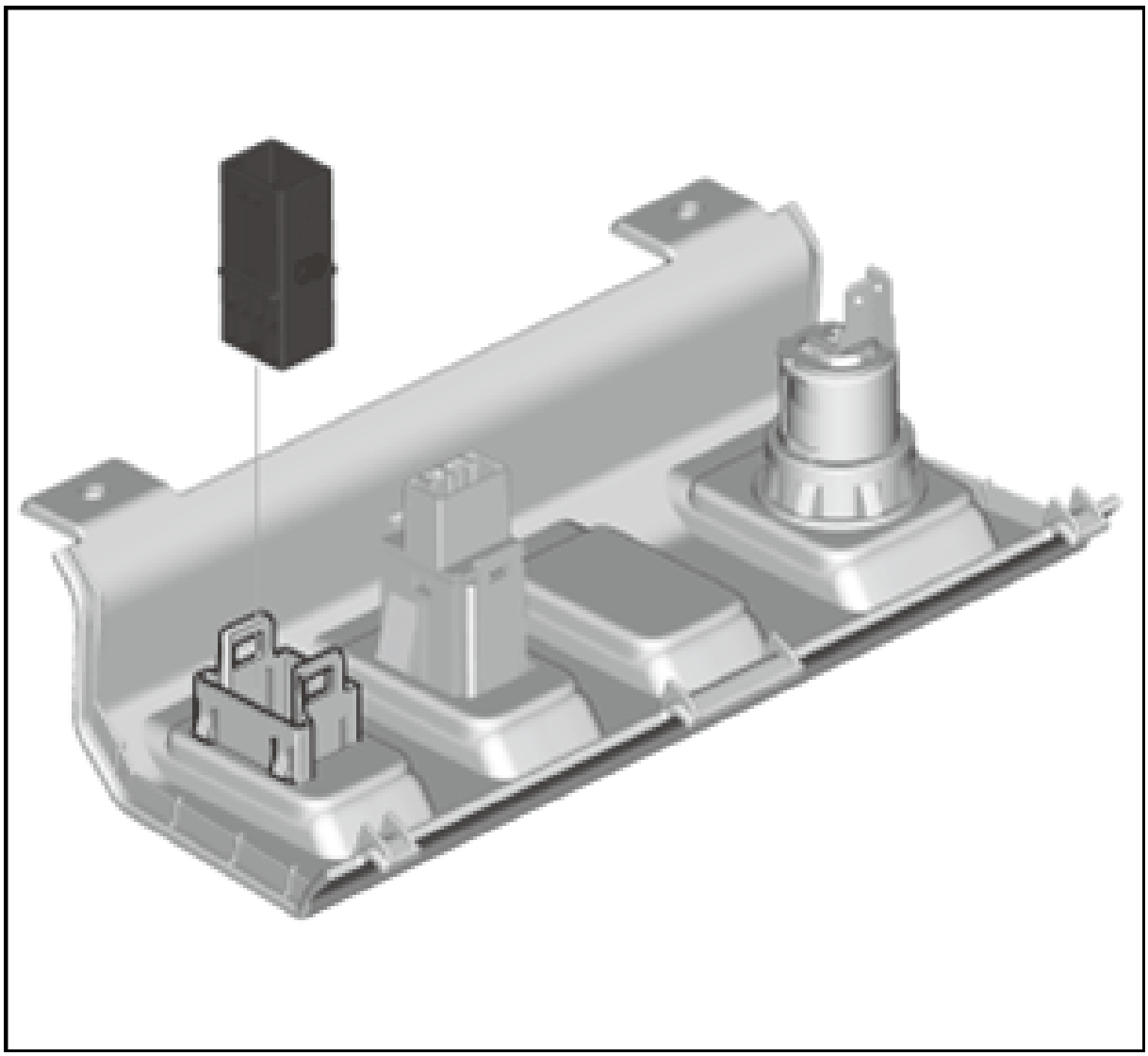
Removal & Installation

1. Audio Unit Assembly (Without Navigation) - Remove - Refer to: **Audio Unit Removal and Installation(Display Audio Type (7-inch Screen),** or **Audio Unit Removal and Installation(Color Audio Type (5-inch Screen))**
2. **Audio-Navigation Unit Assembly (With Navigation) - Remove**
3. GPS Antenna - Remove



4. All Removed Parts - Install

Â	1. Install the parts in the reverse order of removal.



3. All Removed Parts - Install

Â	1. Install the parts in the reverse order of removal.

XM RECEIVER REMOVAL AND INSTALLATION

Removal & Installation

SRS components are located in this area. Review the SRS component locations - Refer to: **SRS Component Location Index (KA/KC),** or **SRS Component Location Index (KA/KC)** and the **precautions and procedures** before doing repairs or service.

NOTE: If you are replacing the XM receiver, register the new XM receiver I.D. number with XM Radio by calling 800- 852-9696.

1. **Glove Box - Remove**
2. XM Receiver - Remove

Is there continuity?

YES

Repair a short in the wires between the audio-navigation unit and the rearview camera.

NO

The CAMERA BIT0 wire to CAMERA BIT1 wire are not shorted. Go to step 4.

4. Open wire check (CAMERA BIT0, CAMERA BIT1 lines).

Check for continuity between test points 1 and 2.

Test condition Â Â	Vehicle OFF (LOCK) mode
	Audio-navigation unit connector C (24P): disconnected
	Rearview camera 8P connector: disconnected
Test circuit 1	Â
Test point 1	**Audio-navigation unit connector C (24P) No. 5**
Test point 2	**Rearview camera 8P connector No. 2**

Test circuit 2	Â
Test point 1	**Audio-navigation unit connector C (24P) No. 18**
Test point 2	**Rearview camera 8P connector No. 1**

Is there continuity?

YES

The CAMERA BIT0 wire and CAMERA BIT1 wire are OK. Go to step 5.

NO

Repair an open in the wire (s) between the audio-navigation unit and the rearview camera.

5. Audio-navigation unit check 1 (CAMERA BIT0 line):

- 1. Reconnect the following connectors.

Audio-navigation unit connector C (24P)
Rearview camera 8P connector

- 2. Turn the vehicle to the ON mode.

- 3. Shift the transmission to R position/mode.

- 4. Measure the voltage between test points 1 and 2 as specified in the table.

Test condition	Vehicle ON mode
Test point 1	**Audio-navigation unit connector C (24P) No. 5**
Test point 2	Body ground

Selected view mode	**Voltage**
Wide View	0 V
Normal View	About 5 - 8 V
Top Down View	0 V

Is the voltage OK?

YES

Go to step 6.

NO

Replace the audio-navigation unit .

6. Audio-navigation unit check 2 (CAMERA BIT1 line).

Measure the voltage between test points 1 and 2 as specified in the table.

Test condition	Vehicle ON mode
Test point 1	**Audio-navigation unit connector C (24P) No. 18**
Test point 2	Body ground

Selected view mode	**Voltage**
Wide View	0 V
Normal View	0 V
Top Down View	About 5 - 8 V

NO

Go to step 9.

4. Keyless access control unit ESL SW line check 3:1.

   Check the parameter(s) below with the HDS.

Signal	Threshold		Current conditions	
	Values	Unit	Values	Unit
Electrical Steering Lock SWITCH C	OFF	Â	Â	Â
Electrical Steering Lock SWITCH D	OFF	Â	Â	Â

   Are ELECTRICAL STEERING LOCK SWITCH D data list value OFF?

   YES

   Go to step 5.

   NO

   Go to step 11.

5. Shorted wire check (ESL SW C line) 1:1.

   - 1. Turn the vehicle to the OFF (LOCK) mode.

   - 2. Disconnect the following connector.

Electric steering lock 12P connector

   - 3. Check for continuity between test points 1 and 2.

Test condition	Vehicle OFF (LOCK) mode Electric steering lock 12P connector: disconnected
Test point 1	Electric steering lock 12P connector No. 9
Test point 2	Body ground

Symptom	Diagnostic procedure	Also check for
	Keyless Access System Symptom Troubleshooting - All the doors and the tailgate will not lock and unlock, or **Keyless Access System Symptom Troubleshooting - The key-in reminder sounds in vehicle OFF (LOCK) mode when door is open,** or **Keyless Access System Symptom Troubleshooting - The doors will not unlock or lock with the keyless remote, but will unlock or lock with the door outer handles,** or **Keyless Access System Symptom Troubleshooting - The engine starts but stalls immediately,** or **Keyless Access System Symptom Troubleshooting - The key-in reminder does not sound,** or **Keyless Access System Symptom Troubleshooting - Immobilizer indicator does not go off or does not come on,** or **Keyless Access System Symptom Troubleshooting - Cannot select ON mode with keyless access, but can select ON mode with the keyless remote touching the engine start/stop switch,** or **Keyless Access System Symptom Troubleshooting - The doors will not unlock or lock with the door outer handle touch sensor or lock switch, but will unlock or lock with the keyless remote,** or **Keyless Access System Symptom Troubleshooting - Cannot select ON mode with keyless access and with the keyless remote touching the engine start/stop switch**	
Immobilizer indicator does not go off or does not come on	Symptom troubleshooting - Refer to: **Keyless Access System Symptom Troubleshooting - Keyless access indicator does not go off or does not come on,** or **Keyless Access System Symptom Troubleshooting - All the doors**	• Gauge control module • Keyless access control unit • PCM

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DTC Description	DTC	Freeze Frame
16-12 Right-Rear Wheel Speed Sensor Short to the Other Sensor Circuit	Â	Â
18-12 Left-Rear Wheel Speed Sensor Short to the Other Sensor Circuit	Â	Â

Is DTC 12-12, 14-12, 16-12, or 18-12 indicated?

YES

The failure is duplicated. Go to step 2.

NO

Intermittent failure, the system is OK at this time. **Refer to intermittent failures troubleshooting** .

2. Shorted wire check (Wheel speed sensor lines wire to wire):

- 1. Turn the vehicle to the OFF (LOCK) mode.

- 2. Disconnect the following connector.

VSA modulator-control unit 21P connector

- 3. Check for continuity between the appropriate VSA modulator-control unit 21P connector wheel speed sensor GND terminals (see table).

Test condition Â	Vehicle OFF (LOCK) mode
	VSA modulator-control unit 21P connector: disconnected

DTC Â	**VSA Modulator-Control Unit 21P Connector Terminal**			
	Appropriate Terminal	Other Terminals		
12-12	No. 21	No. 19	No. 18	No. 20
14-12	No. 19	No. 21	No. 18	No. 20
16-12	No. 18	No. 21	No. 19	No. 20
18-12	No. 20	No. 21	No. 19	No. 18

Is there continuity?

YES

Repair a short in the wires between the appropriate wheel speed sensor and the VSA modulator-control unit.

NO

The wheel speed sensor wires are OK. Go to step 3.

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4. VSA modulator-control unit check (update):

- 1. **Update the VSA modulator-control unit if it does not have the latest software** .

- 2. Turn the vehicle to the OFF (LOCK) mode.

- 3. Test-drive the vehicle.

NOTE: Drive the vehicle on the road, not on a lift.

- 4. Check for DTCs with the HDS.

DTC Description	DTC	Freeze Frame
Â	Â	Â

Is DTC 12-120, 14-120, 16-120, or 18-120 indicated?

YES

Check for loose terminals in the VSA modulator-control unit 21P connector. If the VSA modulator-control unit was updated and the symptom/indication is still present, **replace the VSA modulator-control unit** .

NO

Troubleshooting is complete. If any other DTCs are indicated, go to the indicated DTCs troubleshooting.

DTC TROUBLESHOOTING 12-13, 14-13, 16-13, 18-13: WHEEL SPEED SENSOR INSTALLATION ERROR

NOTE: Before you troubleshoot, review the general troubleshooting information .

DTC Description	DTC	Freeze Frame
12-13 Right-Front Wheel Speed Sensor Installation Error	Â	Â
14-13 Left-Front Wheel Speed Sensor Installation Error	Â	Â
16-13 Right-Rear Wheel Speed Sensor Installation Error	Â	Â
18-13 Left-Rear Wheel Speed Sensor Installation Error	Â	Â

1. Wheel speed sensor performance check:

- 1. Test-drive the vehicle in a straight line at 6 mph (10 km/h) or more.

NOTE: Drive the vehicle on the road, not on a lift.

- 2. Check the parameter(s) below with the HDS.

Signal	Current conditions	
	Values	Unit
RIGHT FRONT WHEEL SPEED	Â	Â

EGR-VSEN

EGR Vacuum Sensor

EGR-VSOL

EGR Vent Solenoid

EGR-VSS

EGR Vacuum Switching Solenoid

EGR-VST

EGR Vacuum Surge Tank

EGR-VSV

EGR Vacuum Switching Valve

EGR-VVCS

EGR Venturi Vacuum Control System

EGRB

EGR Boost Sensor

EGRC

EGR Control Solenoid

EGRC-BPT

EGR Control Backpressure Transducer

EGRC-SV

EGR Control Solenoid Valve

EHOC

Electronically Heated Oxidation Catalyst

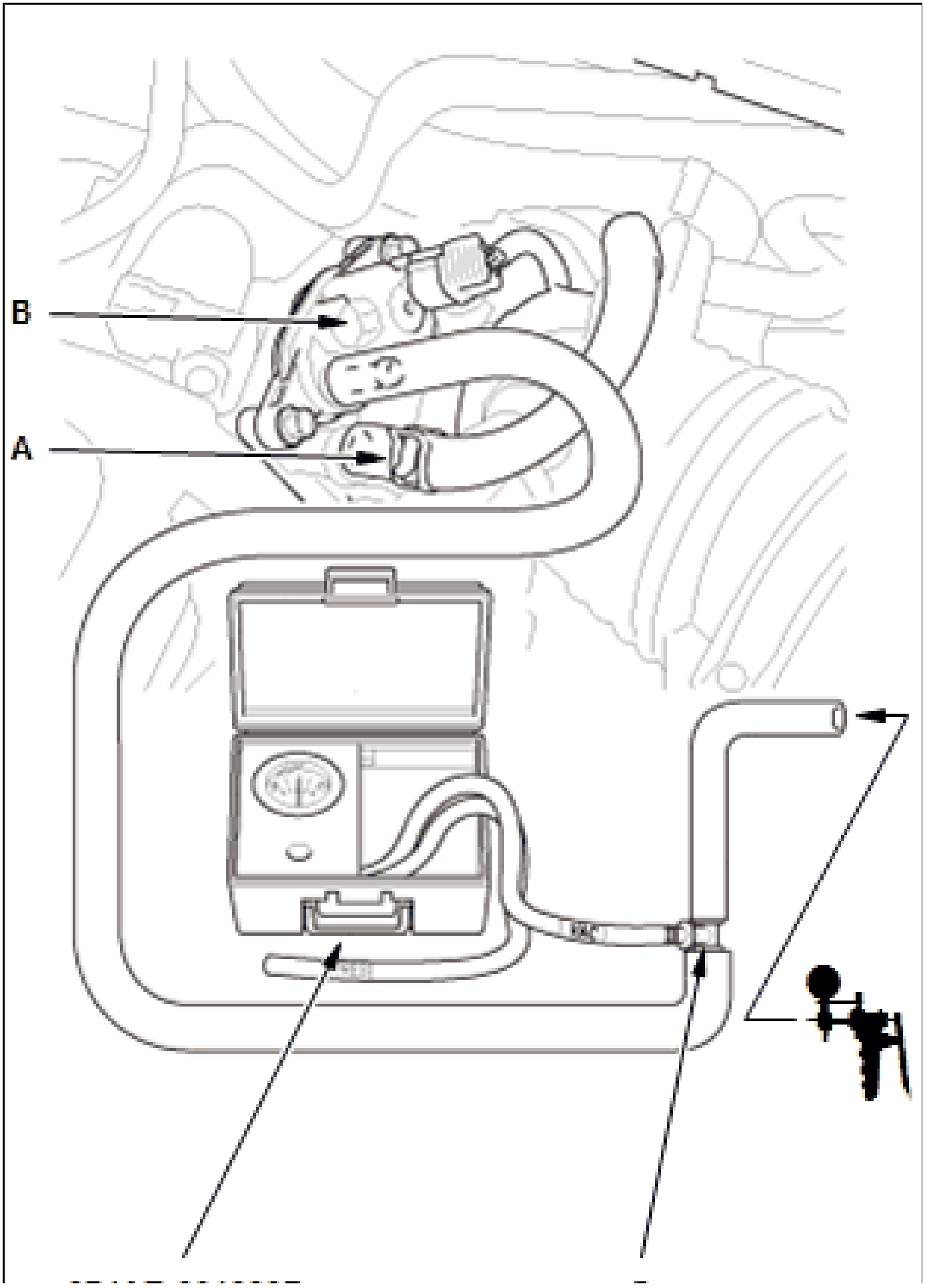
EHTWC

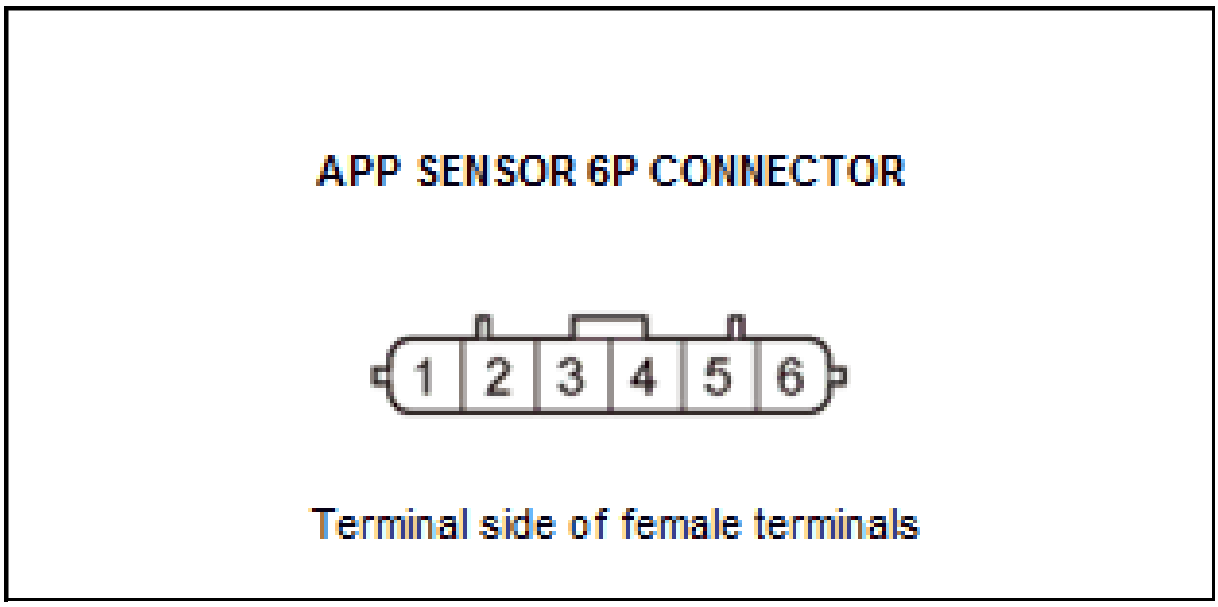
Electronically Heated Three-Way Catalyst

EI

Electronic Ignition System

EIS


B
A



Is there continuity?

YES

Repair a short in the APS2 wire between the PCM (A29) and the APP sensor.

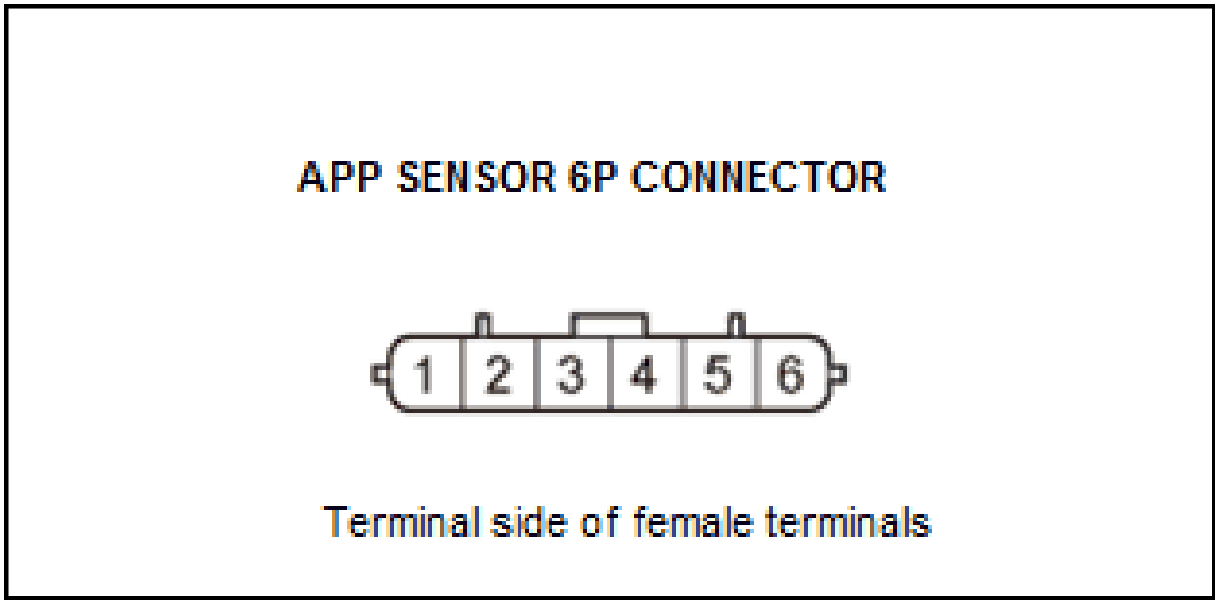
NO

The APS2 wire is not shorted. Go to step 4.

4. Open wire check (APS2 line):

- 1. Connect terminals A and B with a jumper wire.

Terminal A	APP sensor 6P connector No. 3
Terminal B	Body ground



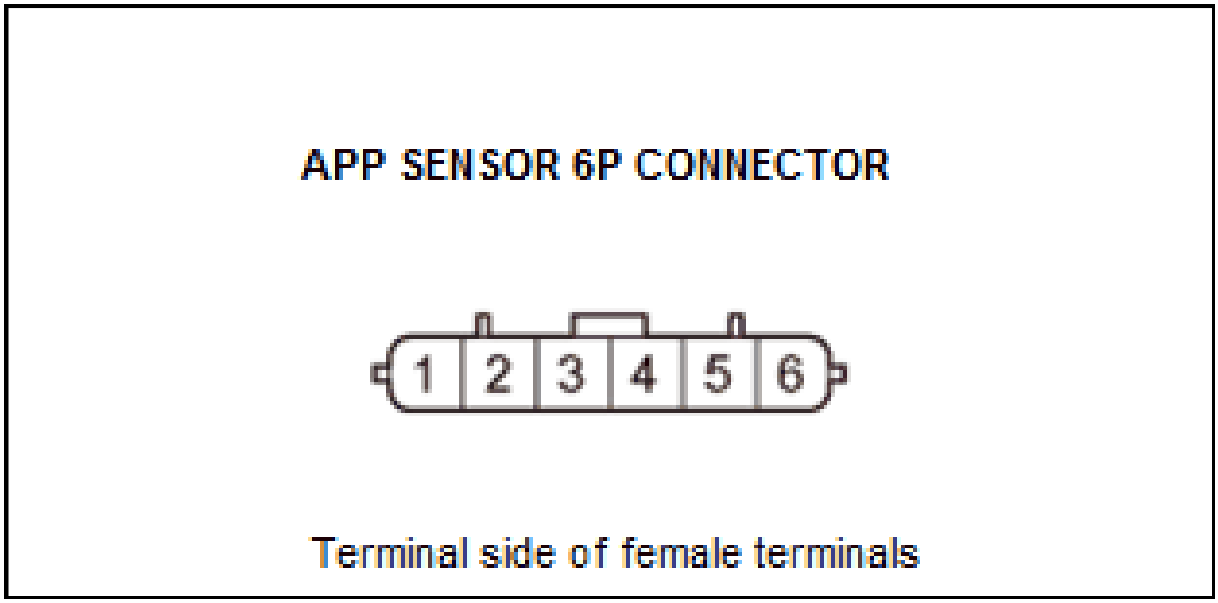
- 2. Jump the SCS line with the HDS.

- 3. Disconnect the following connector.

PCM connector A (51P)

- 4. Connect terminals A and B with a jumper wire.

Terminal A	APP sensor 6P connector No. 2
Terminal B	Body ground



- 5. Check for continuity between test points 1 and 2.

Test condition Â Â Â	Vehicle OFF (LOCK) mode
	APP sensor 6P connector: disconnected
	APP sensor 6P connector No. 2: jumped to body ground
	PCM connector A (51P): disconnected
Test point 1	**PCM connector A (51P) No. 47**
Test point 2	Body ground

Is there continuity?

YES

The SG5 wire is OK. **Update the PCM** if it does not have the latest software, or **substitute a known-good PCM** , then recheck. If DTC P2128 goes away and the PCM was updated, troubleshooting is complete. If DTC P2128 goes away and the PCM was substituted, **replace the original PCM** .

NO

Repair an open in the SG5 wire between the PCM (A47) and the APP sensor.

DTC TROUBLESHOOTING P2135: TP SENSOR A/B INCORRECT VOLTAGE CORRELATION

Application	Carbon Monoxide (Grams/Mile)	
	Composite	Phase 2
Light Duty Vehicles		
1996 & Newer	10.0	8.0
1983-95	15.0	12.0
1980-82	30.0	24.0
1975-79	65.0	52.0
1968-74	120.0	96.0
High Altitude Light Duty Vehicles		
1983-84	30.0	24.0
1982	45.0	36.0
Light Duty Trucks (0-6000 Lbs. GVWR)		
1996 & Newer (Less Than 3750 LVW)	10.0	8.0
1996 & Newer (More Than 3750 LVW)	13.0	10.0
1984-95	40.0	32.0
1979-83	70.0	56.0
1975-78	80.0	64.0
1968-74	120.0	96.0
High Altitude Light Duty Trucks (0-6000 Lbs. GVWR)		
1988 & Newer	60.0	48.0
1984-87	60.0	48.0
1982-83	90.0	72.0
Light Duty Trucks (6001-8500 Lbs. GVWR)		
1996 & Newer (Less Than 5750 ALVW)	13.0	10.0
1996 & Newer (More Than 5750 ALVW)	15.0	12.0
1984-95	40.0	32.0
1979-83	70.0	56.0
1975-78	80.0	64.0
1968-74	120.0	96.0
High Altitude Light Duty Trucks (6001-8500 Lbs. GVWR)		
1984 & Newer	60.0	48.0
1982-83	90.0	72.0
Heavy Duty Trucks (Greater Than 8500 Lbs. GVWR)		
1998 & Newer	30.0	24.0
1987-97	40.0	32.0
1985-86	50.0	40.0
1979-84	75.0	60.0
1974-78	150.0	120.0
1970-73	175.0	140.0
1969 & Earlier	200.0	160.0

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recheck. If the symptom/indication goes away and the PCM was updated, troubleshooting is complete. If the symptom/indication goes away and the PCM was substituted, **replace the original PCM** .

3. Shorted wire check (SCS line).

- 1. Turn the vehicle to the OFF (LOCK) mode.

- 2. Jump the SCS line with the HDS.

SCS Short

- 3. Disconnect the following connector.

PCM connector A (51P)

- 4. Disconnect the HDS.

- 5. Check for continuity between test points 1 and 2.

Test condition	Vehicle OFF (LOCK) mode
Â	PCM connector A (51P): disconnected
Test point 1	**PCM connector A (51P) No. 44**
Â Test point 2	Body ground

Is there continuity?

YES

Repair a short in the SCS wire between the PCM (A44) and the DLC.

NO

The SCS wire is OK. **Update the PCM** if it does not have the latest software, or **substitute a known-good PCM** , then recheck. If the symptom/indication goes away and the PCM was updated, troubleshooting is complete. If the symptom/indication goes away and the PCM was substituted, **replace the original PCM** .

PCM POWER AND GROUND CIRCUIT TROUBLESHOOTING

1. Engine starting check.

- 1. Try to start the engine.

Does the engine start and idle smoothly?

YES

Go to the F-CAN circuit troubleshooting .

NO

- Incorrect valve clearance
- Confirmation of cam timing
- Oil pressure relief valve
- Damage or worn cam lobes
- Damage or worn valve and seats
- Damage cylinder head gasket
- Damage or worn piston rings
- Damage or worn piston and cylinder bore

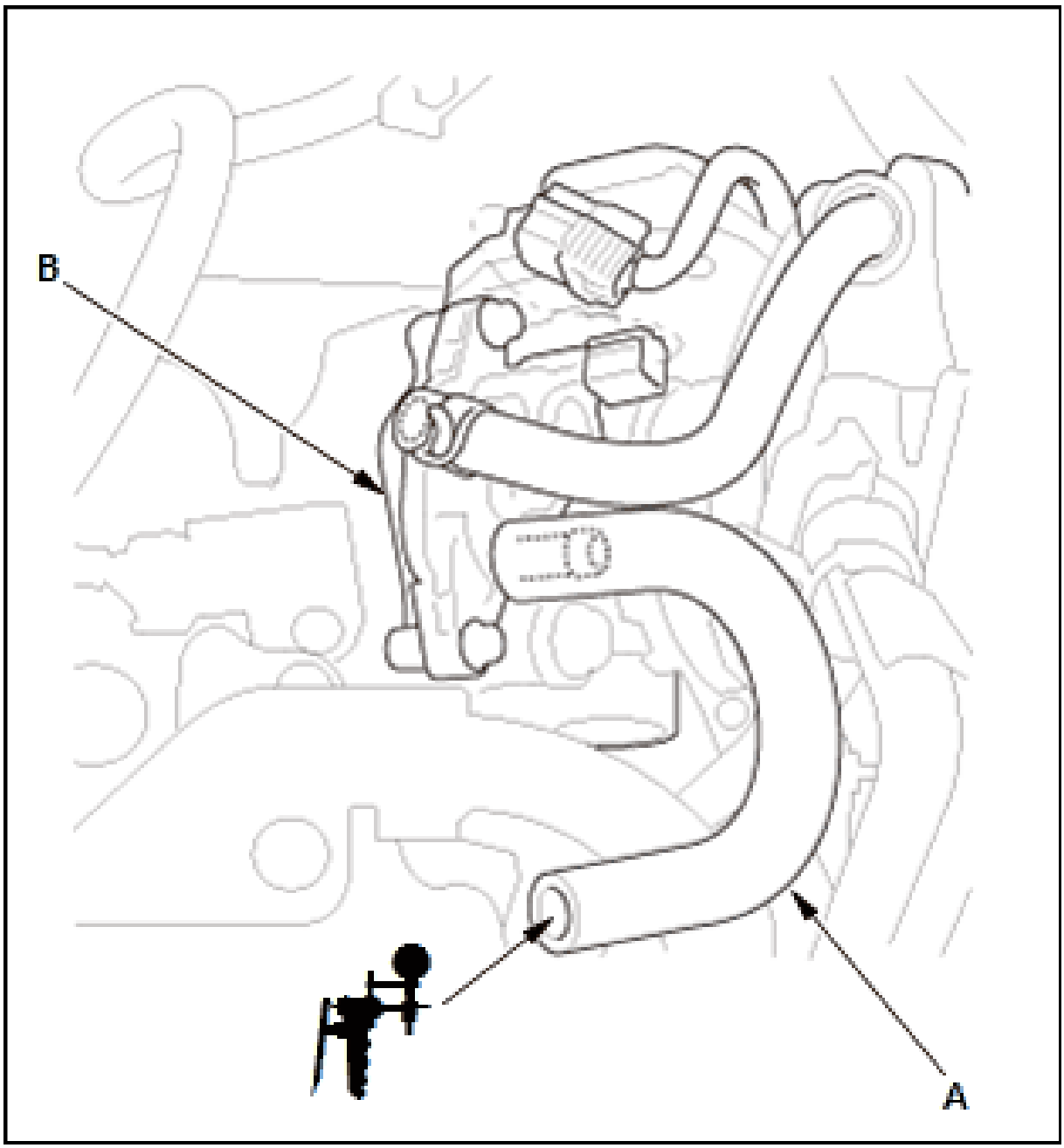
27. 27.EVAP canister purge valve check.

- 1. Turn the vehicle to the OFF (LOCK) mode.

- 2. Disconnect the following connector.

EVAP canister purge valve 2P connector

- 3. Disconnect the vacuum hose (A) from the EVAP canister purge valve (B) in the engine compartment, and connect the vacuum pump/gauge, 0-30 inHg, to the purge valve.



- 4. Start the engine.

Does the vacuum pump indicate vacuum?

YES

Replace the EVAP canister purge valve .

NO (Reproducible failure)

Go to step 28 (fuse check).

NO (Intermittent failure)

Go to step 29 (relay check).