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Fastener Tightening Specifications

Application	Specification	
	Metric	English
Air Conditioning Compressor Clutch Bolt	14 N·m	16 lb ft
Air Conditioning Compressor Coil Bolt	4 N·m	35 lb in
Air Conditioning Compressor Mounting Bolts	22 N·m	16 lb ft
Air Conditioning Compressor And Condenser Hose Nut	22 N·m	16 lb ft
Air Conditioning Compressor And Condenser Hose Bolt	22 N·m	16 lb ft
Air Conditioning Evaporator Hose Assembly Nut	22 N·m	16 lb ft
Air Conditioning Refrigerant Pressure Sensor	6 N·m	54 lb in
Air Inlet Housing Fastener	1.2 N·m	11 lb in
Air Inlet Valve Actuator Screw	1.2 N·m	11 lb in
Blower Motor Resistor Screw	1.2 N·m	11 lb in
Blower Motor Screws	1.2 N·m	11 lb in
Blower Motor Service Ring Screws	1.2 N·m	11 lb in
Center Air Distributor Duct Screw	2.5 N·m	22 lb in
Cover Assembly Screw - Heater	1.2 N·m	11 lb in
HVAC Module Assembly Fastener	22 N·m	16 lb ft
Thermal Expansion Valve Bolt	7 N·m	62 lb in

Thermal Expansion Valve Bolt	7 N·m	62 lbin

Refrigerant System Specifications

Application	Specification	
	Metric	English
PAG Oil ISU 105		
Compressor Replacement The service compressor for all Engines for T300 is precharged with 70 ml (2.5 oz) of PAG oil.		
Condenser Replacement	30-40 ml	1.0-1.4 oz
Evaporator Replacement	30-40 ml	1.0-1.4 oz
Total System PAG Oil Capacity	110 ml	3.7 oz
R-134a		
Refrigerant Charge	500 g	17.6 oz

Refrigerant Recovery and Recharging

Special Tools

GE-45037 A/C Oil Injector

For equivalent regional tools, refer to [Special Tools](#) .

Warning: To prevent personal injury, avoid breathing A/C Refrigerant and lubricant vapor or mist. Work in a well ventilated area. To remove refrigerant from the A/C System, use service equipment designed for recovery that is certified to meet the requirements of the appropriate SAE Standards. If an accidental system discharge occurs, ventilate the work area before continuing service. Additional health and safety information may be obtained from the refrigerant, refrigerant recovery, and lubricant manufacturers.

Warning: For personal protection, goggles and lint-free gloves should be worn and a clean cloth wrapped around fittings, valves, and connections when doing work that includes opening the refrigerant system. If refrigerant comes in contact with any part of the body severe frostbite and personal injury can result. The exposed area should be flushed immediately with cold water and prompt medical help should be obtained.

Caution: R-134a is the only approved refrigerant for use in this vehicle. The use of any other refrigerant may result in poor system performance or component failure.

Caution: To avoid system damage use only R-134a dedicated tools when servicing the A/C system.

Caution: Use only Polyalkylene Glycol Synthetic Refrigerant Oil (PAG) for internal circulation through the R-134a A/C system and only 525 viscosity mineral oil on fitting threads and O-rings. If lubricants other than those specified are used, compressor failure and/or fitting seizure may result.

Caution: R-12 refrigerant and R-134a refrigerant must never be mixed, even in the smallest of amounts, as they are incompatible with each other. If the refrigerants are mixed, compressor failure is likely to occur. Refer to the manufacturer instructions included with the service equipment before servicing.

The air conditioning filling device service center is a complete air conditioning service center for R-134a. The ACR2000 recovers, recycles, evacuates and recharges A/C refrigerant quickly, accurately and automatically. The unit has a display screen that contains the function controls and displays prompts that will lead the technician through the recover, recycle, evacuate and recharge operations. R-134a is recovered into and charged out of an internal storage vessel. The ACR2000 automatically replenishes this vessel from an external source tank in order to maintain a constant 5.45–6.82kg (12–15lb) of A/C refrigerant.

The ACR2000 has a built in A/C refrigerant identifier that will test for contamination, prior to recovery and will notify the technician if there are foreign gases present in the A/C system. If foreign gases are present, the ACR2000 will not recover the refrigerant from the A/C system.

The ACR2000 also features automatic air purge, single pass recycling and an automatic oil drain.

Refer to the air conditioning filling device service center manual for operation and setup instruction. Always recharge the A/C system with the proper amount of R-134a. Refer to [Refrigerant System Specifications](#) for the correct amount.

A/C Refrigerant System Oil Charge Replenishing

If oil was removed from the A/C system during the recovery process or due to component replacement, the oil must be replenished. Oil can be injected into a charged system using

GE-45037 injector

. For the proper quantities of oil to add to the A/C refrigerant system, refer to [Refrigerant System Specifications](#) .

Flushing

Special Tools

- *BO42220* Universal 12V Leak Detection Lamp
- *GE41447* R-134A A/C Tracer Dye Box of 24
- *GE45268* A/C Flush Adapter Kit

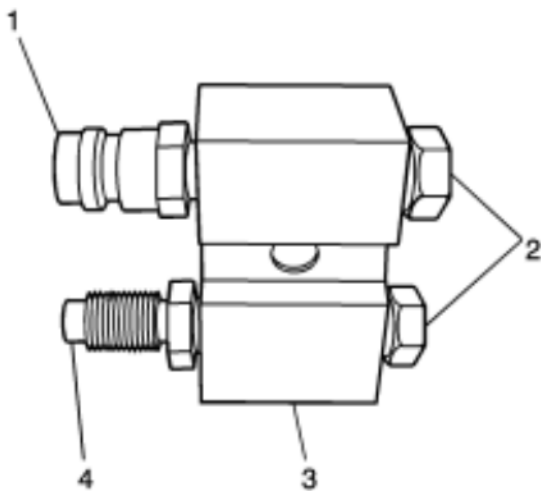
For equivalent regional tools, refer to [Special Tools](#) .

Note: Flushing with the ACR 2000 is not intended to remove metal from the A/C system.

Flushing is intended to remove the following:

- Contaminated polyalkylene glycol (PAG) oil
- Desiccant, following a desiccant bag failure
- Overcharge of PAG oil
- Refrigerant contamination

Forward Flushing Setup



Note: Forward flow refrigerant flushing is recommended for contaminated refrigerant or PAG oil.

Note: Inspect and lubricate *GE 45268* adapter kit fitting O-rings. Refer to [Air Conditioning O-Ring Seal Replacement](#)

1. Install both *GE 45268-9* fitting O-ring onto *GE 45268-10* adapter .
2. Install *GE 45268-8* fitting O-ring onto suction side of *GE 45268-10* adapter .
3. Install *GE 45268-7* fitting O-ring onto discharge side of *GE 45268-10* adapter .

Reverse Flushing Setup

Note:

- Reverse flow refrigerant flush is recommended for desiccant bag failure. Replace condenser/receiver dehydrator assembly when A/C flush is complete and perform the following procedure:
- Inspect and lubricate *GE 45268* adapter kit fitting O-rings. Refer to [Air Conditioning O-Ring Seal Replacement](#)

1. Install both *GE 45268-9* fitting O-ring onto *GE 45268-10* adapter .
2. Install *GE 45268-8* fitting O-ring onto suction side of *GE 45268-10* adapter .
3. Install *GE 45268-7* fitting O-ring onto discharge side of *GE 45268-10* adapter .

Flush Procedure

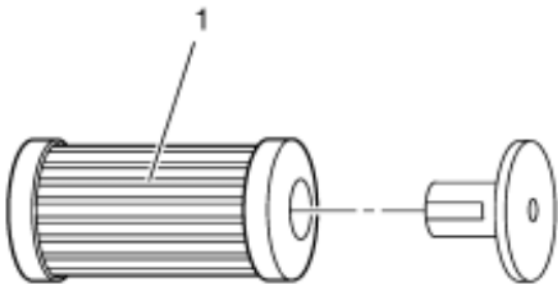
Note: Warmer engine or ambient temperatures decreases refrigerant recovery time during the A/C flush procedure.

1. Recover the refrigerant. Refer to [Refrigerant Recovery and Recharging](#) .
2. Remove the thermal expansion valve (TXV). Refer to [Air Conditioning Evaporator Thermal Expansion Valve Replacement](#) .
3. Install the TXV stud onto *GE 45268-115* adapter .
4. Install new sealing washers onto evaporator core. Refer to [Air Conditioning O-Ring Seal Replacement](#) .
5. Install *GE 45268-115* adapter in place of the TXV.

Caution: Refer to [Fastener Caution](#) .

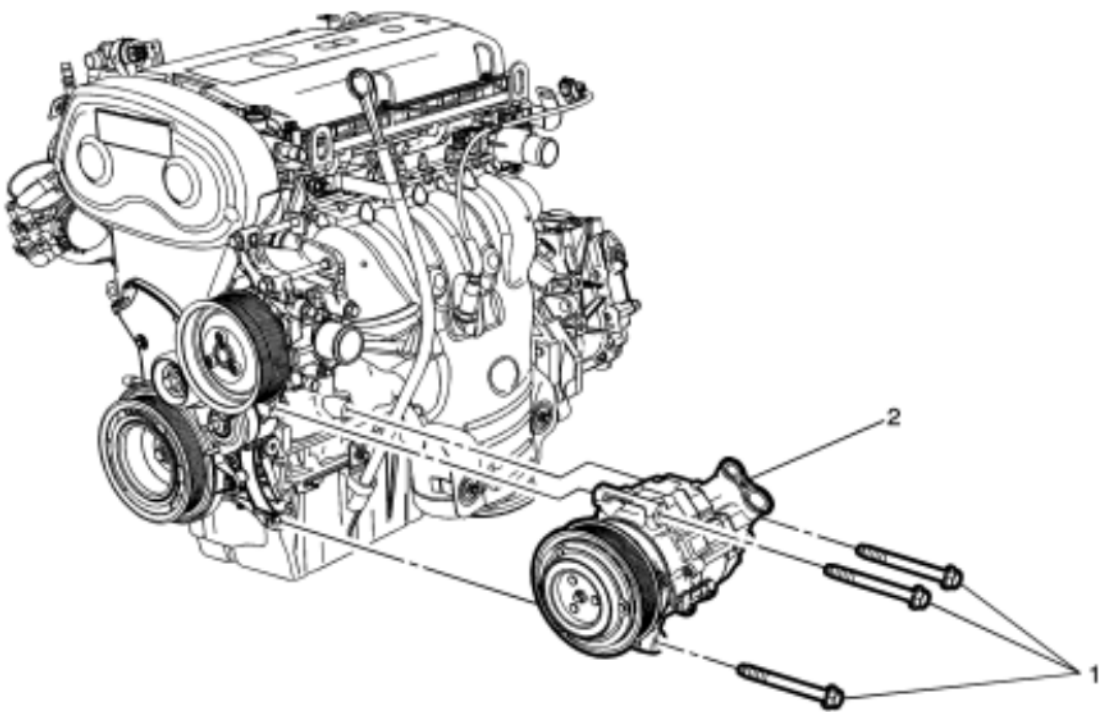
6. Install the TXV mounting bolts and tighten to **7 N·m (62 lbin)**.
7. Install new washers onto liquid line and suction hose. Refer to [Air Conditioning O-Ring Seal Replacement](#) .
8. Connect liquid line and suction hose to *GE 45268-115* adapter .

9. Install the TXV block fitting nut and tighten to **22 N·m (16 lb ft)**.
10. Remove the A/C compressor. Refer to [Air Conditioning Compressor Replacement](#) .



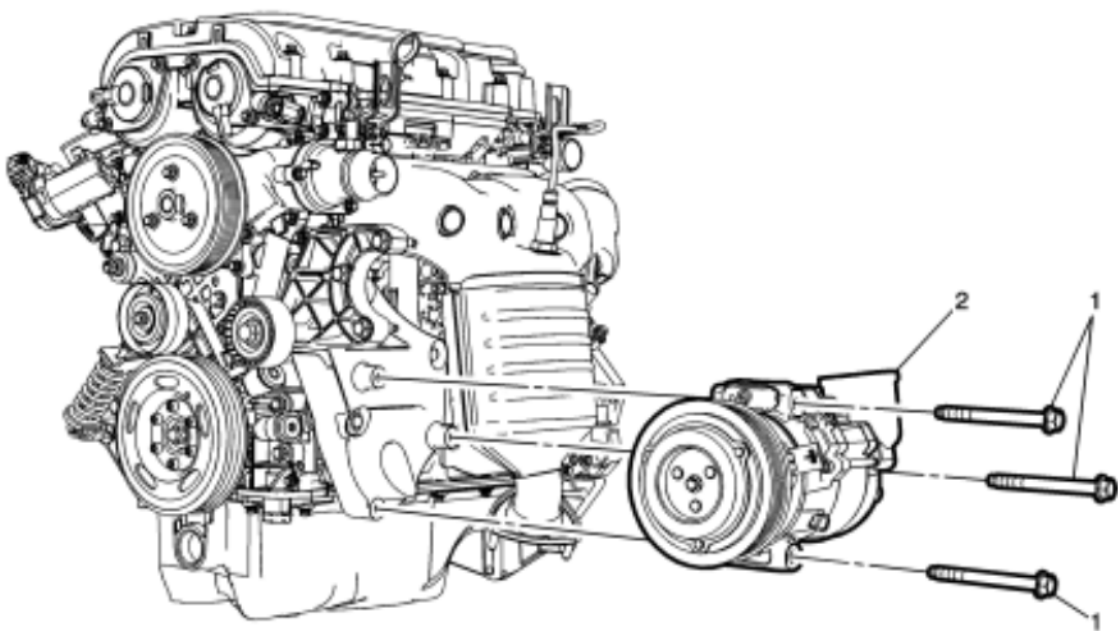
11. Remove the A/C refrigerant filter(1). Refer to [Air Conditioning \(AC\) Refrigerant Filter Replacement](#) .
- Note:** The filter inside *GE 45628-1* adapter is serviceable. Remove and discard check valve from the filter.
12. Service the filter before each flush.
- Note:** Assure that suction and discharge ports on *J45268-10* correspond to suction and discharge ports on compressor hose assembly.
13. Install new sealing washers onto A/C compressor and condenser hose. Refer to [Air Conditioning O-Ring Seal Replacement](#) . Assure that suction and discharge ports on *GE 45268-10* adapter correspond to suction and discharge ports on A/C compressor to condenser hose.
14. Install *GE 45268-10* filter adapter to the A/C compressor to condenser hose.
15. Connect *GE 45268-1* filter to *J 45268-7* adapter .
16. Connect blue hose from A/C filling device to *GE 45268* adapter .
17. Connect red hose from A/C filling device to *GE 45268* adapter .
18. Disconnect blue hose from A/C filling device to *GE 45268-1* adapter .
19. Disconnect *GE 45268-1* adapter from *GE 45268-10* adapter .
20. Remove *GE 45268-10* adapter from the A/C compressor to condenser hose.
- Note:** Flushing will remove all PAG oil from the A/C system. The A/C system must be replenished with the correct amount of PAG oil.
21. If you will reinstall the removed A/C compressor, perform the following procedure:
- Drain PAG oil from the A/C compressor. Rotate compressor input shaft to assist in draining the PAG oil from compressor.
 - Add the total system capacity of PAG oil to A/C compressor. Refer to [Refrigerant System Specifications](#) .
 - Add one bottle of *GE41447* tracer dye .
- Note:** Flushing will remove fluorescent leak detection dye from A/C system.
22. Install the A/C compressor. Refer to [Air Conditioning Compressor Replacement](#) .
23. Install new A/C refrigerant filter. Refer to [Air Conditioning \(AC\) Refrigerant Filter Replacement](#) .
24. Remove the TXV block fitting nut.
25. Disconnect liquid line and suction line from *GE 45268-115* adapter .
26. Remove the TXV bolts retaining *GE 45268-115* adapter .
27. Remove *GE 45268-115* adapter .
28. Inspect the TXV for debris. Clean or replace as needed.
29. Install the TXV. Refer to [Air Conditioning Evaporator Thermal Expansion Valve Replacement](#) .
30. Evacuate and recharge the A/C system. Refer to [Refrigerant Recovery and Recharging](#) .
31. Leak test fittings using *BO 42220* lamp .

Air Conditioning Compressor Replacement (1.6L or 1.8L)



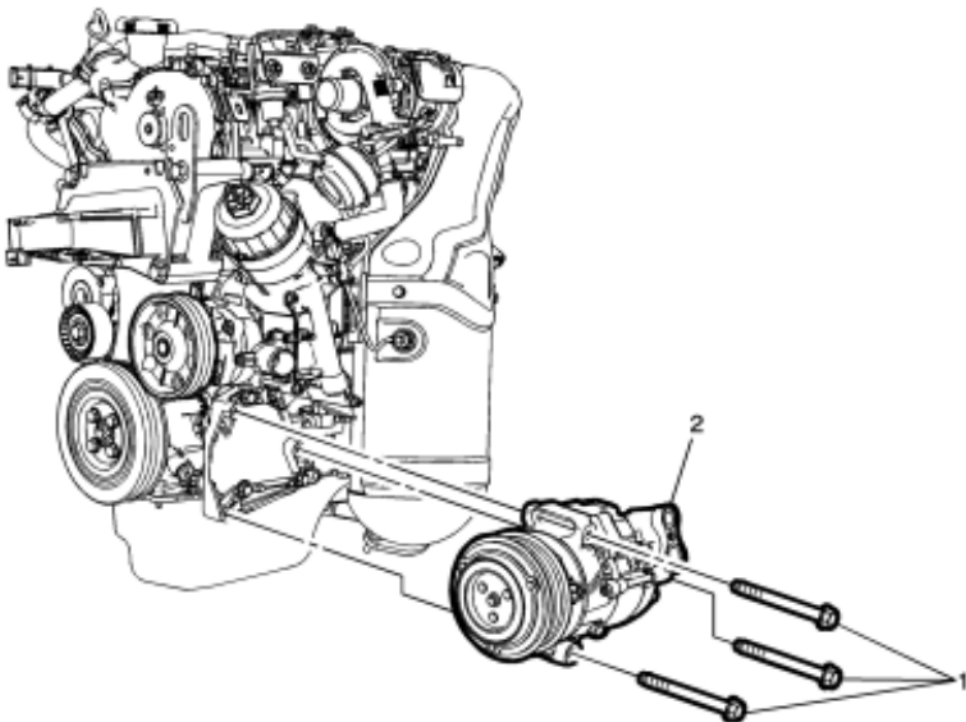
Callout	Component Name
Preliminary Procedure 1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging . 2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 3. Remove the drive belt. Refer to Drive Belt Replacement . 4. Remove the air conditioning compressor and condenser hose. Refer to Air Conditioning Compressor and Condenser Hose Replacement . 5. Disconnect the electrical connector.	
1	Air Conditioning Compressor Bolts (Qty :3) Caution: Refer to Fastener Caution . Tighten 22N·m (16lbft)
2	Air Conditioning Compressor Procedure When replacing the A/C compressor, balance the compressor oil. Refer to Air Conditioning Compressor Oil Balancing

Air Conditioning Compressor Replacement (1.2L or 1.4L)



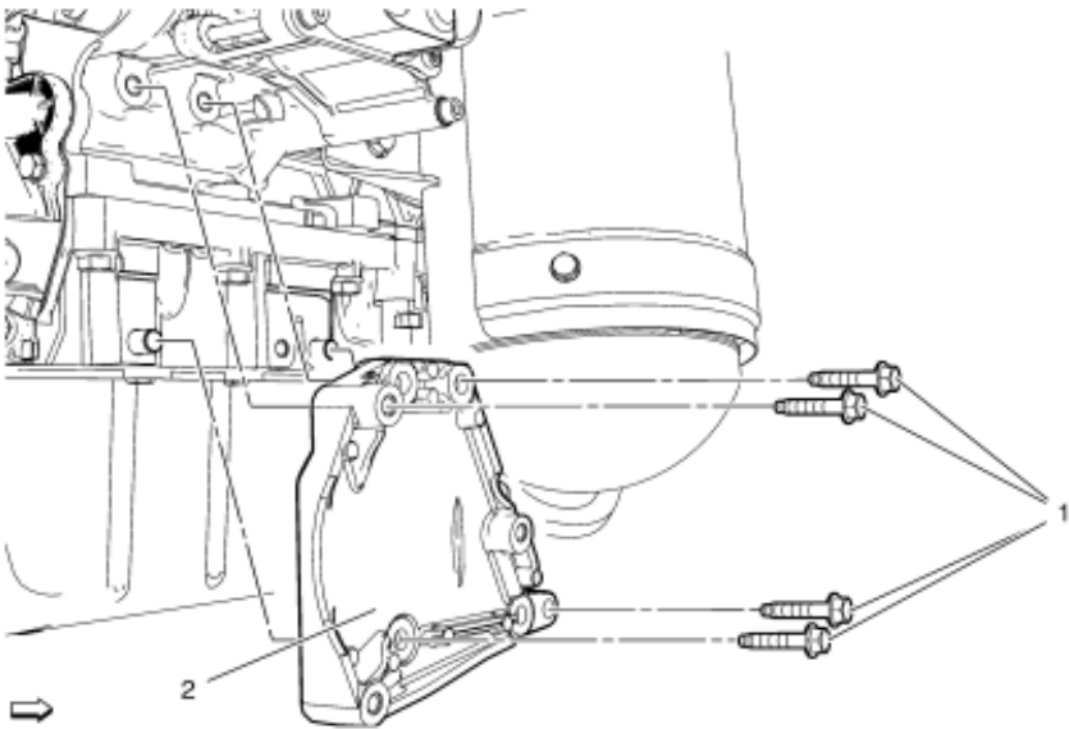
Callout	Component Name
Preliminary Procedure 1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging 2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle 3. Remove the drive belt. Refer to Drive Belt Replacement 4. Remove the air conditioning compressor and condenser hose. Refer to Air Conditioning Compressor and Condenser Hose Replacement 5. Disconnect the electrical connector.	
1	Air Conditioning Compressor Bolts (Qty: 3) Caution: Refer to Fastener Caution . Tighten 22 N·m (16 lbft)
2	Air Conditioning Compressor Procedure When replacing the A/C compressor, balance the compressor oil. Refer to Air Conditioning Compressor Oil Balancing

Air Conditioning Compressor Replacement (Diesel)



Callout	Component Name
Preliminary Procedures 1. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection . 2. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging . 3. Remove the air conditioning compressor belt. Refer to Air Conditioning Compressor Belt Replacement . 4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle . 5. Loosen the air conditioning compressor and the condenser hose from the air conditioning compressor. Refer to Air Conditioning Compressor and Condenser Hose Replacement .	
1	A/C Compressor Bolt(Qty: 3) Caution: Refer to Fastener Caution . Tighten 22N·m (16 lb ft)
2	A/C Compressor Assembly Procedure 1. Disconnect the electrical connector. 2. Use a low viscosity, poly-alkylene glycol (PAG) oil. Use of the incorrect oil can result in compressor failure. 3. When replacing the A/C compressor, balance the compressor oil. Refer to Air Conditioning Compressor Oil Balancing . 4. Using <i>GE-39400-A</i> detector leak test A/C compressor fittings. Special Tools <i>GE-39400-A</i> Electronic Halogen Leak Detector For equivalent regional tools, refer to Special Tools .

Air Conditioning Compressor Bracket Replacement (Diesel)

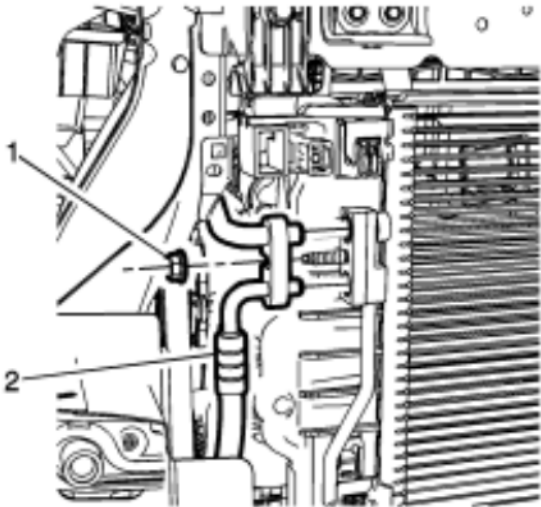


Callout	Component Name
Preliminary Procedures Remove air conditioning compressor. Refer to Air Conditioning Compressor Replacement .	
1	Air Conditioning Compressor Bracket Bolt (Qty: 4) Caution: Refer to Fastener Caution . Tighten 22N·m (17lbft)
2	Air Conditioning Compressor Bracket

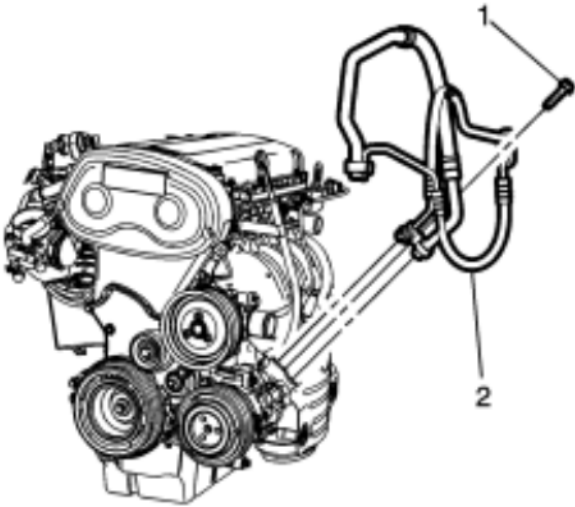
Air Conditioning Compressor and Condenser Hose Replacement (1.6L or 1.8L)

Removal Procedure

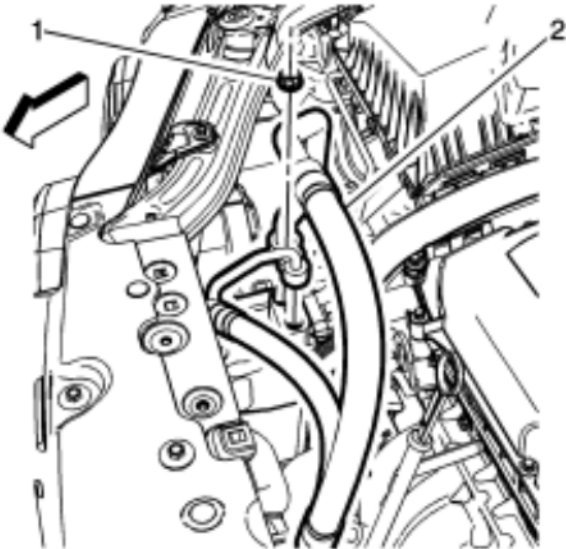
1. Recover the refrigerant. Refer to [Refrigerant Recovery and Recharging](#) .
2. Disconnect the A/C refrigerant pressure sensor electrical connector.



3. Remove air conditioning compressor and condenser hose nut(1).
4. Remove air conditioning compressor and condenser hose(2) from A/C condenser.



5. Remove A/C compressor and condenser hose bolt(1).
6. Remove A/C compressor and condenser hose(2) from A/C compressor.



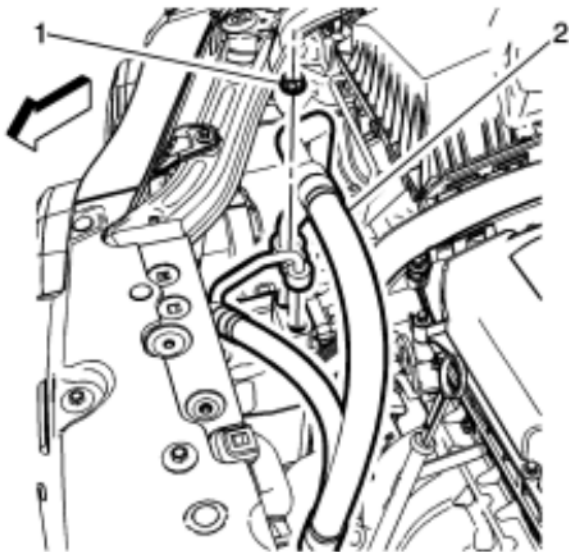
7. Remove air conditioning compressor and condenser hose nut(1).
8. Remove air conditioning compressor and condenser hose(2) from refrigerant hose.
9. Remove air conditioning compressor and condenser hose from the vehicle.

Installation Procedure

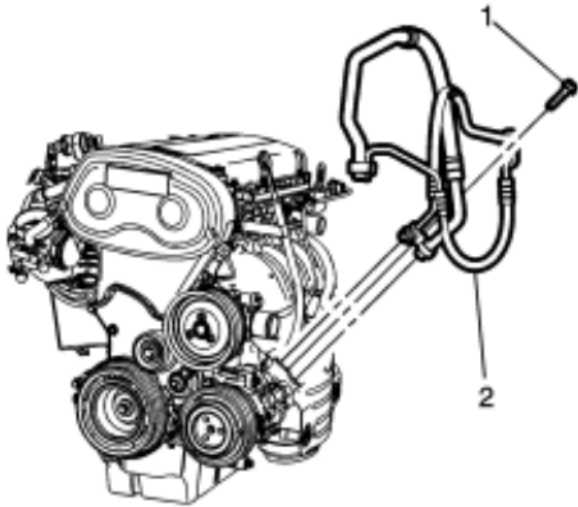
Note: Use NEW system seals. Refer to [Air Conditioning System Seal Replacement](#) .

1. Install air conditioning compressor and condenser hose.

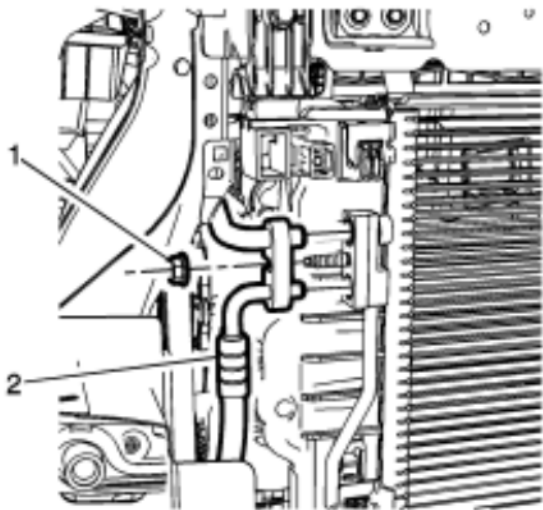
Caution: Refer to [Fastener Caution](#) .



2. Install air conditioning compressor and condenser hose(2) to the refrigerant hose.
3. Install air conditioning compressor and condenser hose nut(1). Tighten nut to **22 N·m (16 lb ft)**.



4. Install air conditioning compressor and condenser hose(2) to the A/C compressor.
5. Install air conditioning compressor and condenser hose bolt(1). Tighten bolt to **22 N·m (16 lb ft)**.

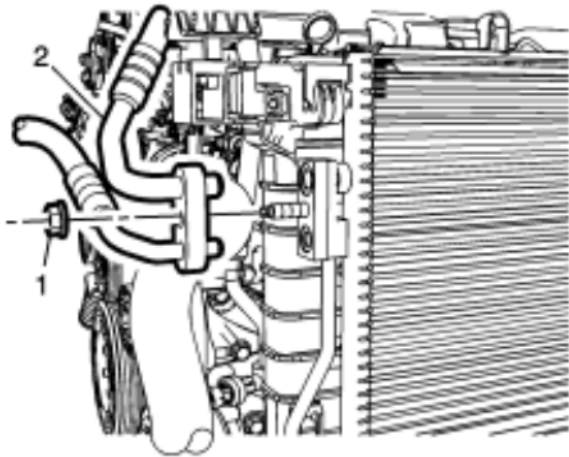


6. Install air conditioning compressor and condenser hose(2) to the A/C condenser.
7. Install air conditioning compressor and condenser hose nut(1). Tighten nut to **22 N·m (16 lb ft)**.
8. Connect the A/C refrigerant pressure sensor electrical connector.
9. Evacuate and charge the refrigerant system. Refer to [Refrigerant Recovery and Recharging](#) .

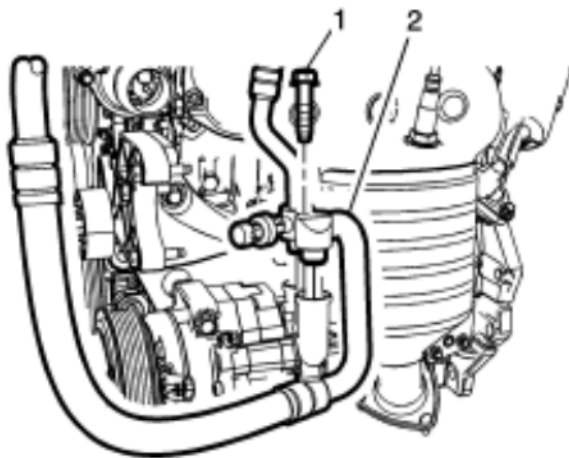
Air Conditioning Compressor and Condenser Hose Replacement (1.2L or 1.4L)

Removal Procedure

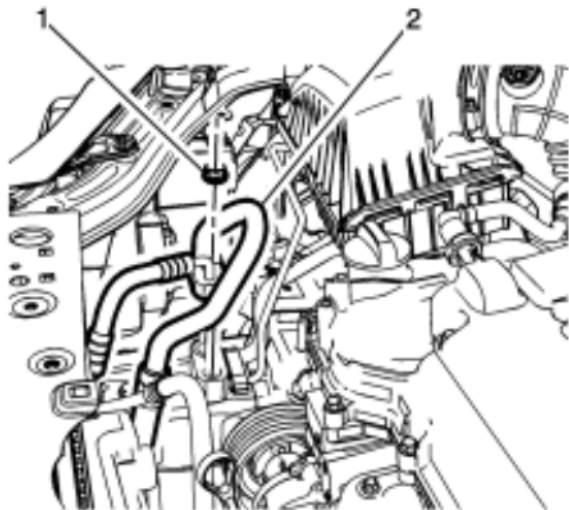
1. Recover the refrigerant. Refer to [Refrigerant Recovery and Recharging](#) .
2. Disconnect the A/C refrigerant pressure sensor electrical connector.



3. Remove air conditioning compressor and condenser hose nut(1).
4. Remove air conditioning compressor and condenser hose(2) from A/C condenser.



5. Remove A/C compressor and condenser hose bolt(1).
6. Remove A/C compressor and condenser hose(2) from A/C compressor.



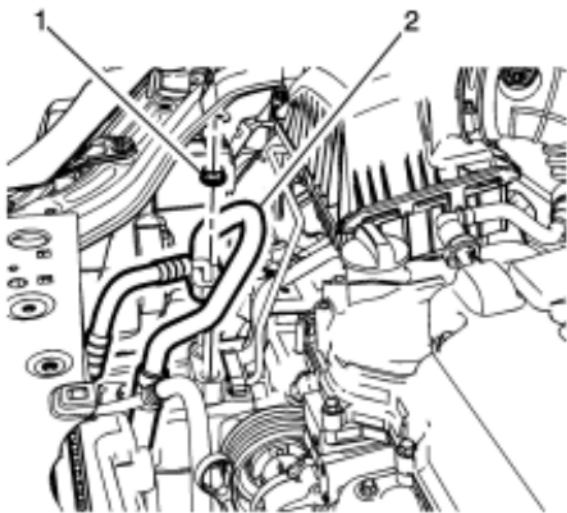
7. Remove air conditioning compressor and condenser hose nut(1).
8. Remove air conditioning compressor and condenser hose(2) from refrigerant hose.
9. Remove air conditioning compressor and condenser hose from the vehicle.

Installation Procedure

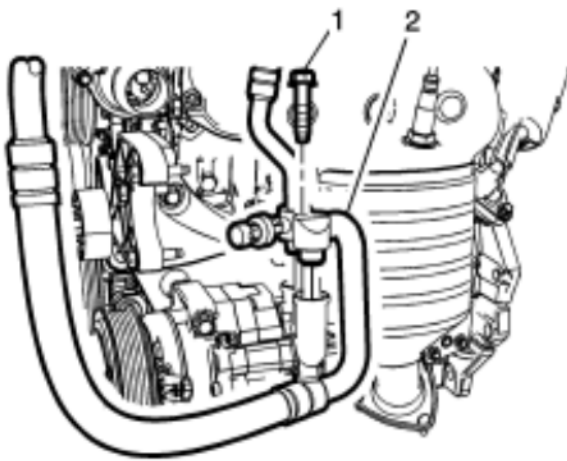
Note: Use NEW system seals. Refer to [Air Conditioning System Seal Replacement](#) .

1. Install air conditioning compressor and condenser hose.

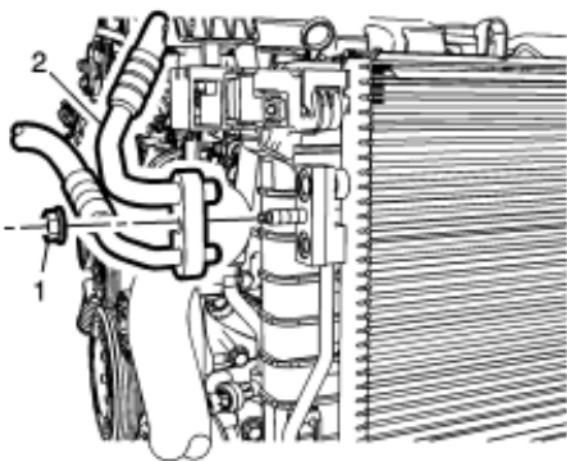
Caution: Refer to [Fastener Caution](#) .



2. Install air conditioning compressor and condenser hose(2) to the refrigerant hose.
3. Install air conditioning compressor and condenser hose nut(1). Tighten nut to **22 N·m (16 lb ft)**.



4. Install air conditioning compressor and condenser hose(2) to the A/C compressor.
5. Install air conditioning compressor and condenser hose bolt(1). Tighten bolt to **22 N·m (16 lb ft)**.

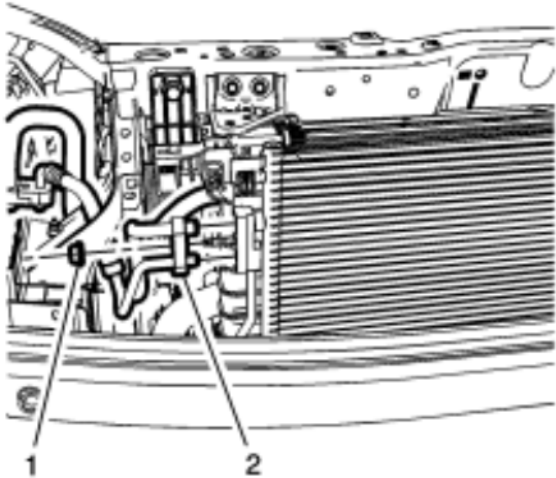


6. Install air conditioning compressor and condenser hose(2) to the A/C condenser.
7. Install air conditioning compressor and condenser hose nut(1). Tighten nut to **22 N·m (16 lb ft)**.
8. Connect the A/C refrigerant pressure sensor electrical connector.
9. Evacuate and charge the refrigerant system. Refer to [Refrigerant Recovery and Recharging](#) .

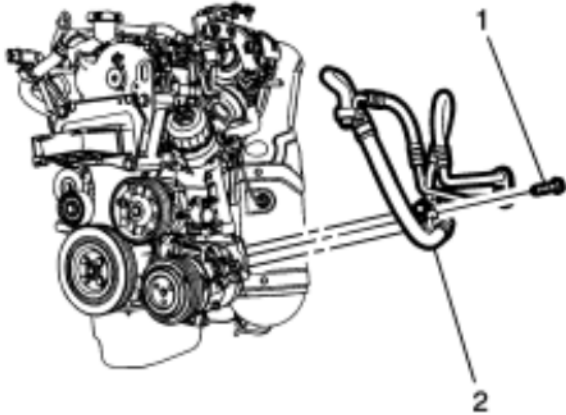
Air Conditioning Compressor and Condenser Hose Replacement (Diesel)

Removal Procedure

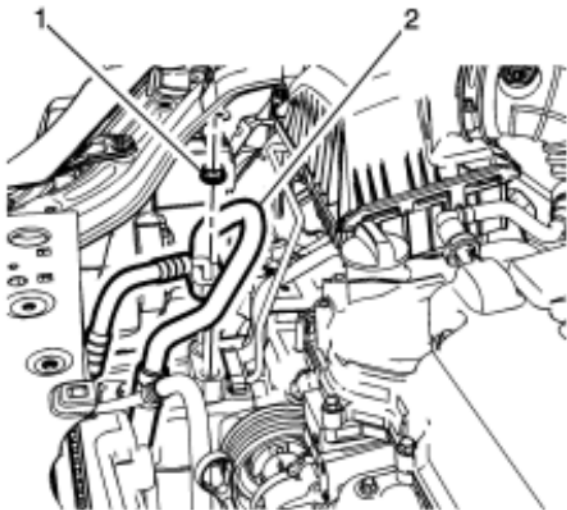
1. Recover the refrigerant. Refer to [Refrigerant Recovery and Recharging](#) .
2. Remove front bumper fascia. Refer to [Front Bumper Fascia Replacement](#) .



3. Remove air conditioning compressor and condenser hose nut(1).
4. Remove air conditioning compressor and condenser hose(2) from A/C condenser.



5. Remove A/C compressor and condenser hose bolt(1).
6. Remove A/C compressor and condenser hose(2) from A/C compressor.



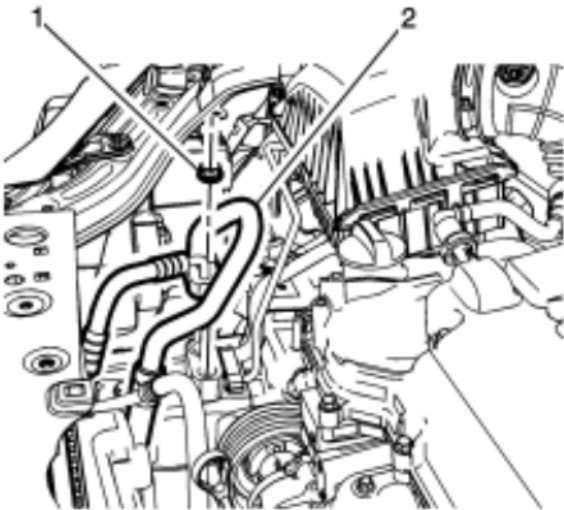
7. Remove air conditioning compressor and condenser hose nut(1).
8. Remove air conditioning compressor and condenser hose(2) from refrigerant hose.
9. Remove air conditioning compressor and condenser hose from the vehicle.

Installation Procedure

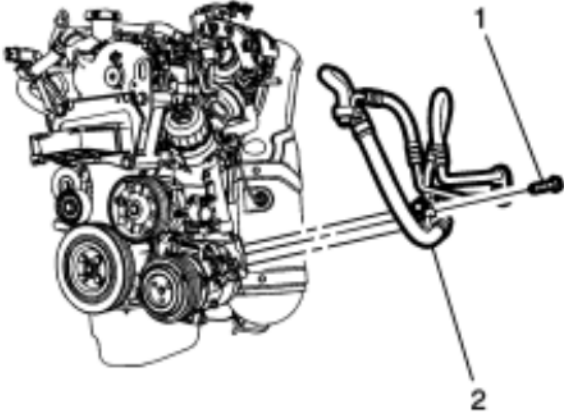
Note: Use NEW O-ring seals. Refer to [Air Conditioning O-Ring Seal Replacement](#) .

1. Install air conditioning compressor and condenser hose.

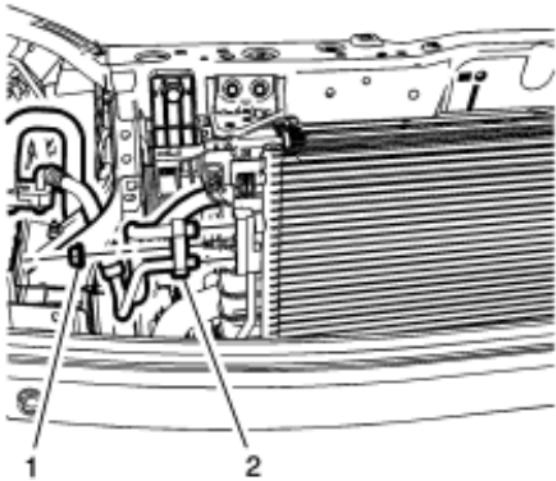
Caution: Refer to [Fastener Caution](#) .



2. Install air conditioning compressor and condenser hose(2) to the refrigerant hose.
3. Install air conditioning compressor and condenser hose nut(1). Tighten nut to **22 N·m (16 lb ft)**.

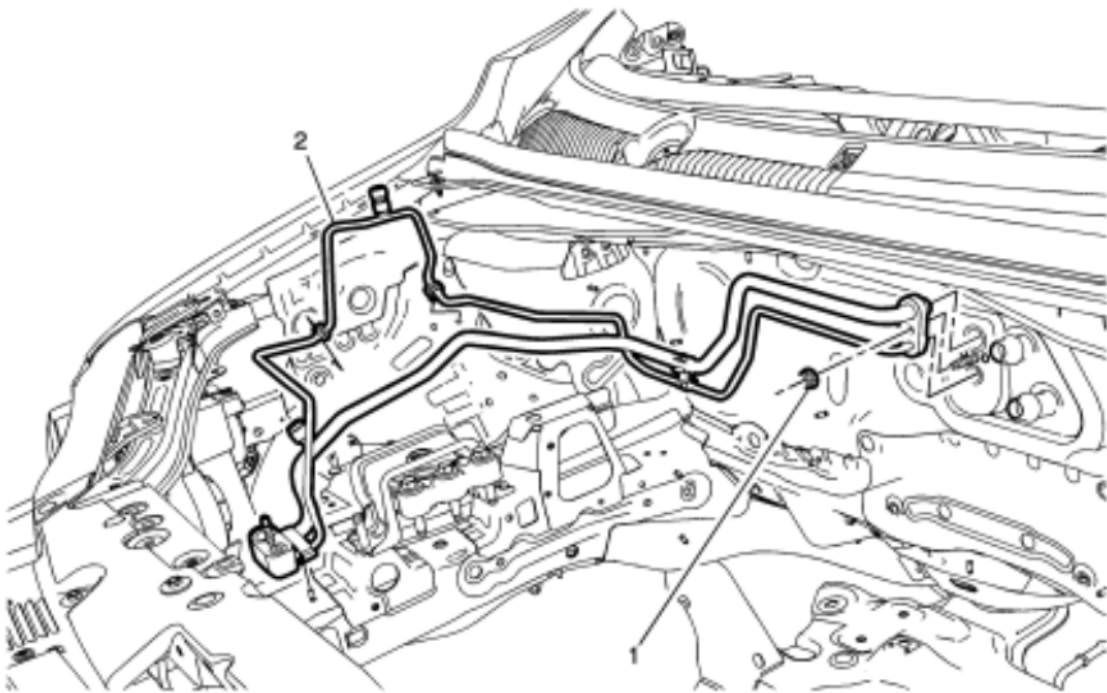


4. Install air conditioning compressor and condenser hose(2) to the A/C compressor.
5. Install air conditioning compressor and condenser hose bolt(1). Tighten bolt to **22 N·m (16 lb ft)**.



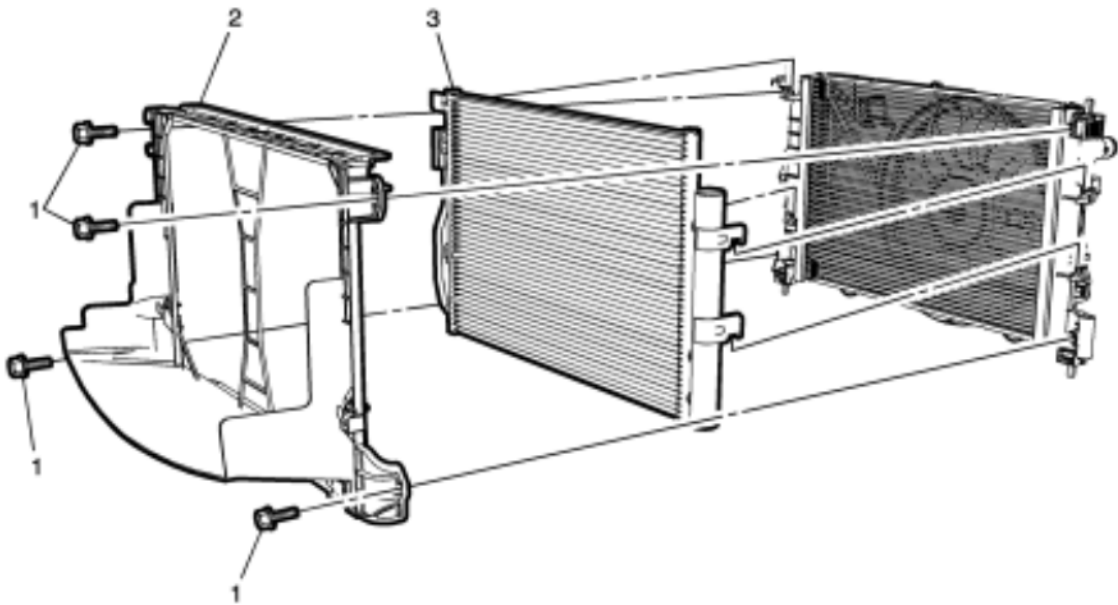
6. Install air conditioning compressor and condenser hose(2) to the A/C condenser .
7. Install air conditioning compressor and condenser hose nut(1). Tighten nut to **22 N·m (16 lb ft)**.
8. Install front bumper fascia. Refer to [Front Bumper Fascia Replacement](#) .
9. Evacuate and charge the refrigerant system. Refer to [Refrigerant Recovery and Recharging](#) .

Air Conditioning Evaporator Hose Assembly Replacement



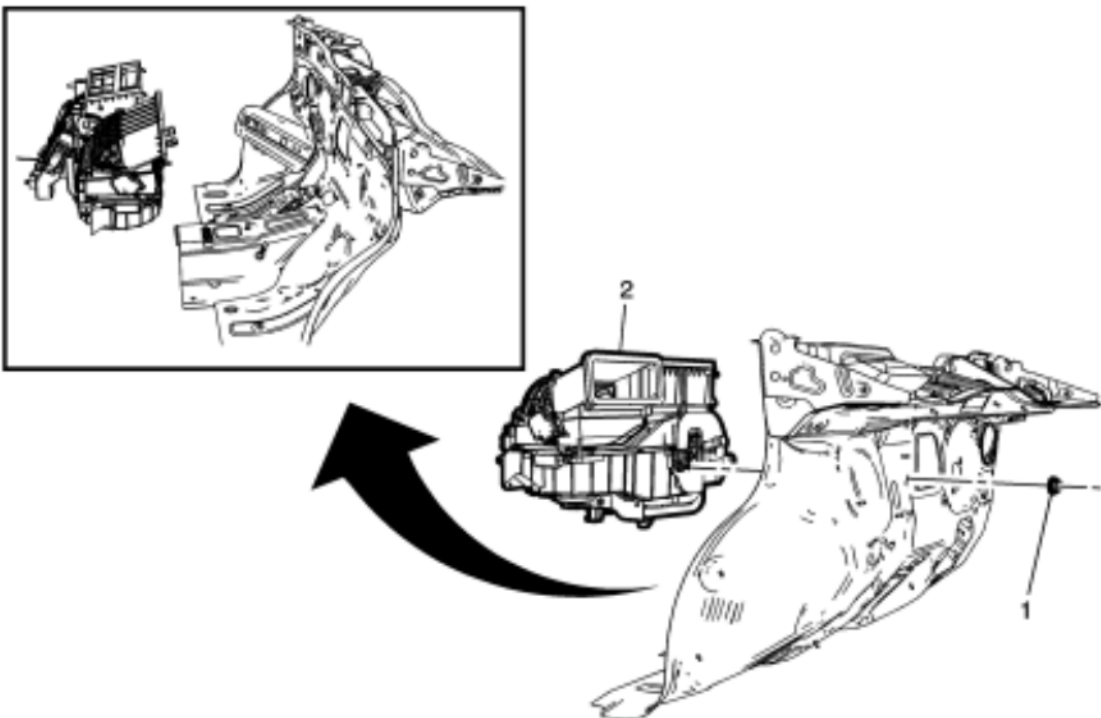
Callout	Component Name
Preliminary Procedure 1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging 2. Remove the air conditioning compressor and condenser hose. Refer to Air Conditioning Compressor and Condenser Hose Replacement 3. Remove the air cleaner assembly. Refer to Air Cleaner Assembly Replacement or Air Cleaner Assembly Replacement .	
1	Air Conditioning Evaporator Hose Assembly Nut. Caution: Refer to Fastener Caution . Tighten 22 N·m (16 lb ft)
2	Air Conditioning Evaporator Hose Assembly Procedure Discard and replace all sealing washers. Refer to Air Conditioning System Seal Replacement .

Air Conditioning Condenser Replacement



Callout	Component Name
Preliminary Procedure 1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging . 2. Remove front bumper fascia. Refer to Front Bumper Fascia Replacement . 3. Remove the air conditioning compressor and condenser hose from the condenser. Refer to Air Conditioning Compressor and Condenser Hose Replacement .	
1	Air Conditioning Condenser Baffel Bolt (Qty: 4) Caution: Refer to Fastener Caution Tighten 10 N·m (89 lbin)
2	Air Conditioning Condenser Baffel
3	Air Conditioning Condenser Tip Unclip condenser from radiator.

Heater and Air Conditioning Evaporator and Blower Module Replacement



Callout	Component Name
Preliminary Procedures 1. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging . 2. Drain the cooling system. Refer to Cooling System Draining and Filling . 3. Remove the instrument panel tie bar. Refer to Instrument Panel Tie Bar Replacement . 4. Disconnect the HVAC module electrical connectors. 5. Remove the air conditioning evaporator hose assembly from the thermal expansion valve. Refer to Air Conditioning Evaporator Hose Assembly Replacement . 6. Remove the heater outlet hose. Refer to Heater Outlet Hose Replacement . 7. Remove the heater inlet hose. Refer to Heater Inlet Hose Replacement .	
1	Heater and Air Conditioning Evaporator and Blower Module Fastener Caution: Refer to Fastener Caution . Tighten 22N·m (16lb ft)
2	Heater and Air Conditioning Evaporator and Blower Module Assembly

Heater Inlet Hose Replacement (1.6L or 1.8L)

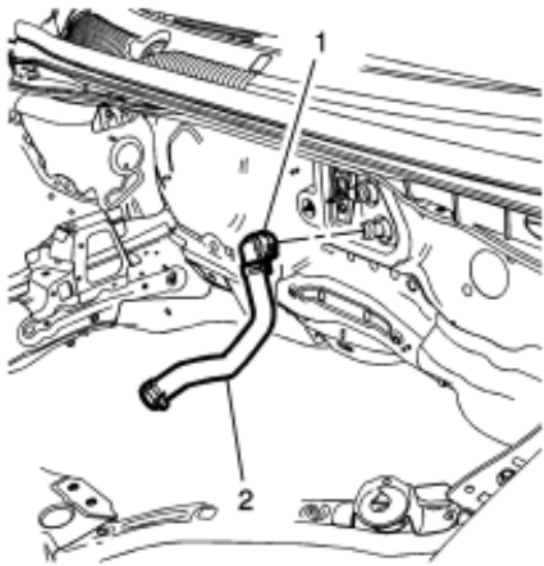
Special Tools

BO-38185 Hose Clamp Pliers

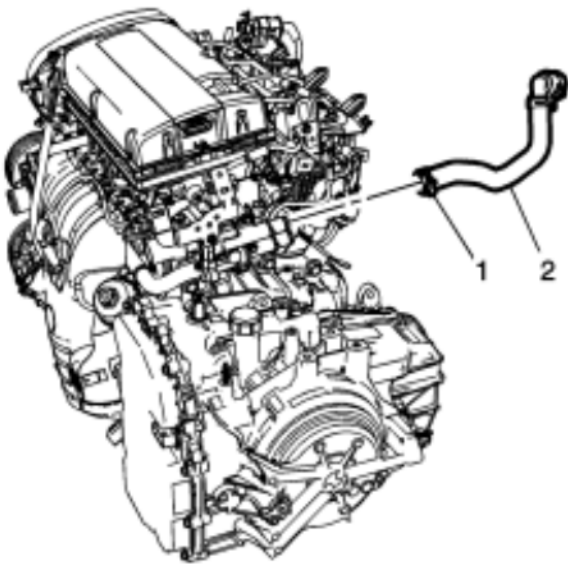
For equivalent regional tools, refer to [Special Tools](#) .

Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#) .

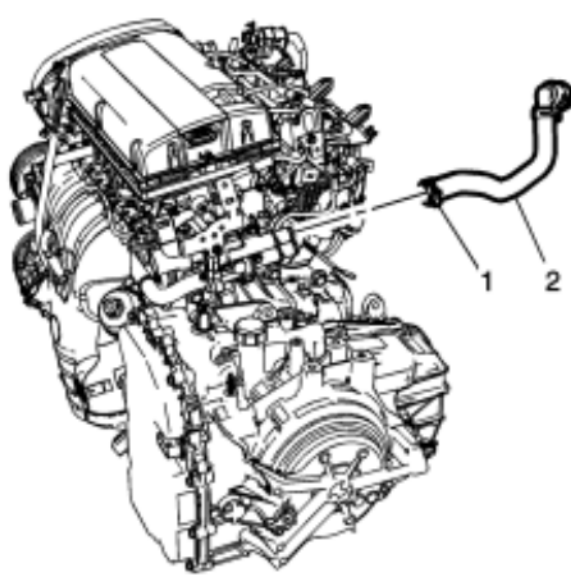


2. Disengage the heater inlet hose quick connect clip (1) at the heater core.
3. Remove the heater inlet hose (2) from the heater core.

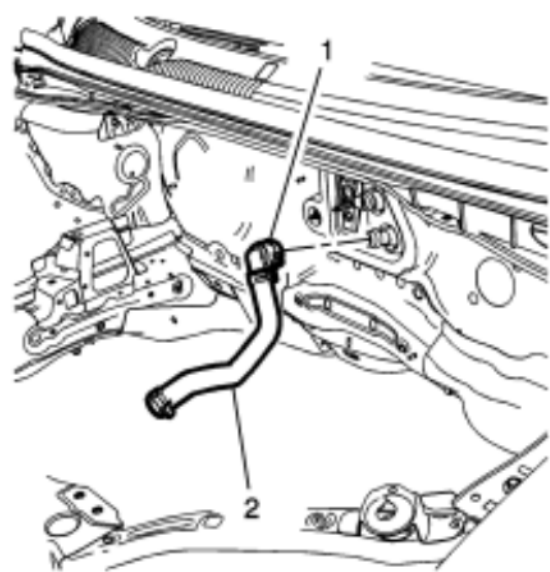


4. Remove the heater inlet hose clamp (1) at the engine using BO-38185 Hose Clamp Pliers .
5. Remove the heater inlet hose (2) from the engine.
6. Remove the heater inlet hose from the vehicle.

Installation Procedure



- 1. Install the heater inlet hose to the vehicle.
- 2. Install the heater inlet hose(2) to the engine.
- 3. Install the heater inlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .



Note: The quick connector has an internal anti-rotation feature. The ensure the quick connector is properly aligned to the heater core pipe, position the white mark to the 12:00 O'clock position during installation.

- 4. Install the heater inlet hose(2) to the heater core.
- 5. Engage the heater inlet hose quick connect clip(1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#) .

Heater Outlet Hose Replacement (1.6L or 1.8L)

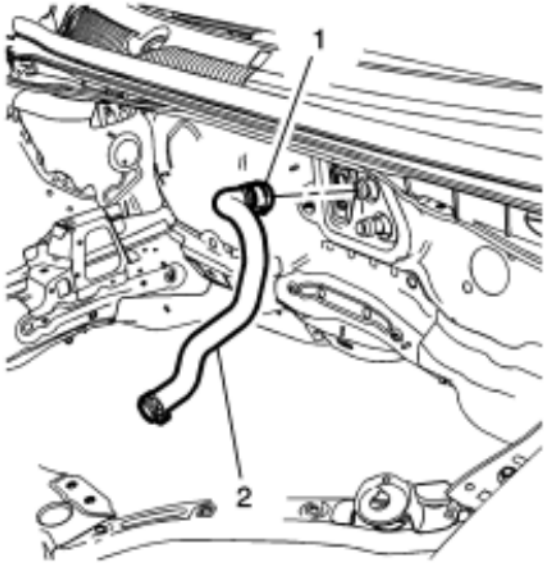
Special Tools

BO-38185 Hose Clamp Pliers

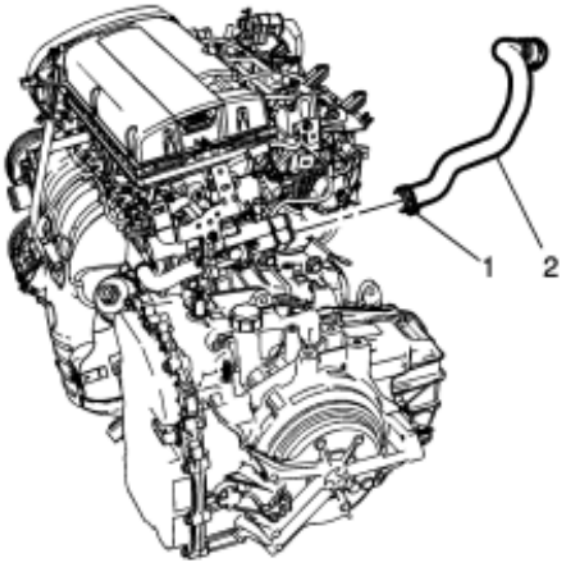
For equivalent regional tools, refer to [Special Tools](#) .

Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#) .

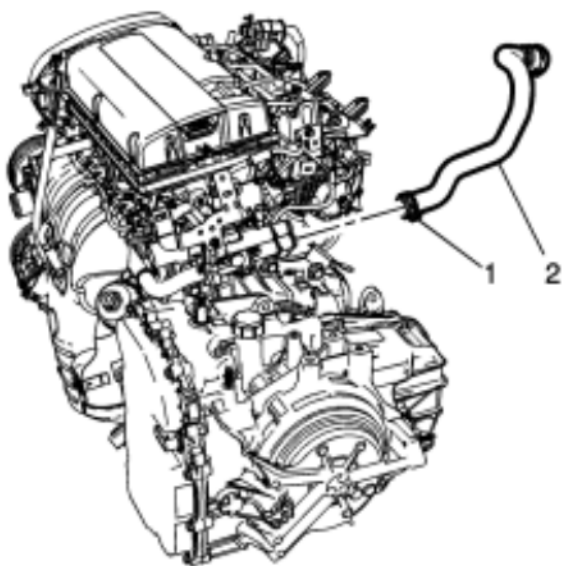


2. Disengage the heater outlet hose quick connect clip (1) at the heater core.
3. Remove the heater outlet hose (2) from the heater core.

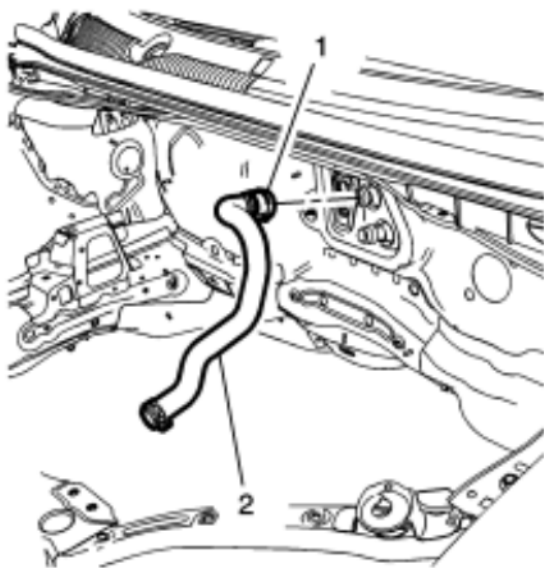


4. Remove the heater outlet hose clamp (1) at the engine using BO-38185 Hose Clamp Pliers .
5. Remove the heater outlet hose (2) from the engine.
6. Remove the heater outlet hose from the vehicle.

Installation Procedure



1. Install the heater outlet hose to the vehicle.
2. Install the heater outlet hose(2) to the engine.
3. Install the heater outlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .



Note: The quick connector has an internal anti-rotation feature. The ensure the quick connector is properly aligned to the heater core pipe, position the white mark to the 12:00 O'clock position during installation.

4. Install the heater outlet hose(2) to the heater core.
5. Engage the heater outlet hose quick connect clip(1) at the heater core.
6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#) .

Heater Outlet Hose Replacement (1.2L or 1.4L)

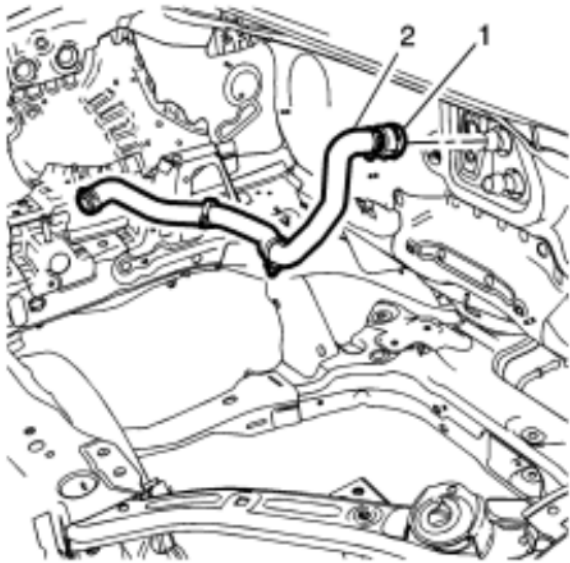
Special Tools

BO-38185 Hose Clamp Pliers

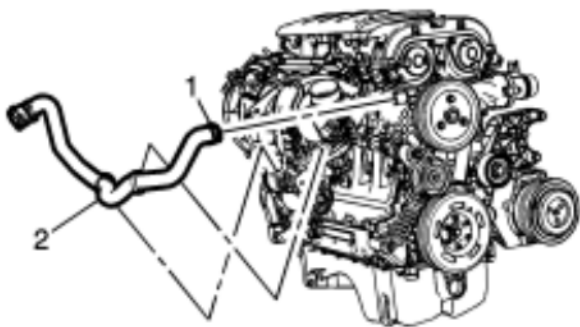
For equivalent regional tools, Refer to [Special Tools](#)

Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#)

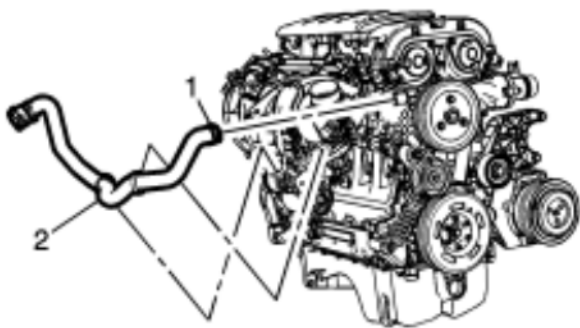


2. Disconnect the heater outlet hose quick connect fitting (1) at the heater core.
3. Remove the heater outlet hose (2) from the heater core.

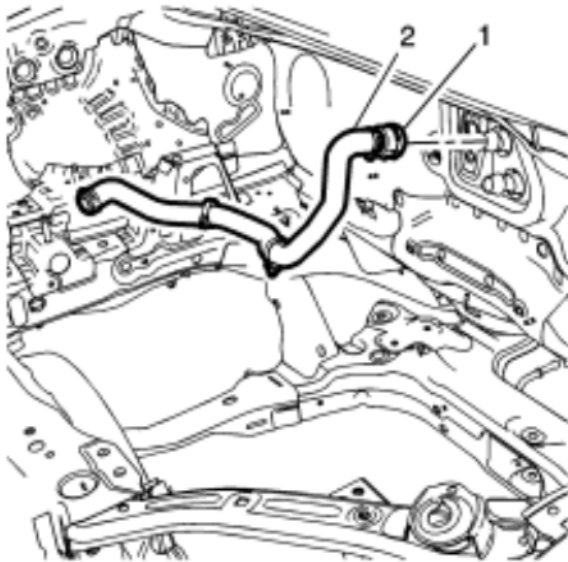


4. Remove the heater outlet hose clamp (1) at the engine using BO-38185 Hose Clamp Pliers .
5. Remove the heater outlet hose (2) from the engine.
6. Remove the heater outlet hose from the vehicle.

Installation Procedure



- 1. Install the heater outlet hose to the vehicle.
- 2. Install the heater outlet hose(2) to the engine.
- 3. Install the heater outlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .



- 4. Install the heater outlet hose(2) to the heater core.
- 5. Connect the heater outlet hose quick connect fitting(1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#)

Heater Inlet Hose Replacement (1.2L or 1.4L)

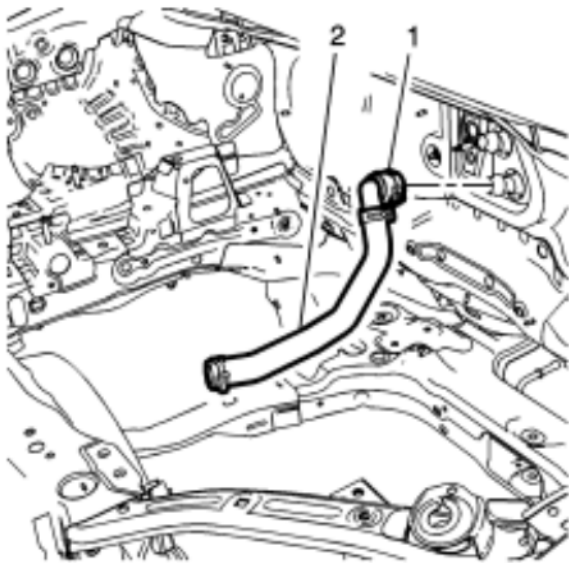
Special Tools

BO-38185 Hose Clamp Pliers

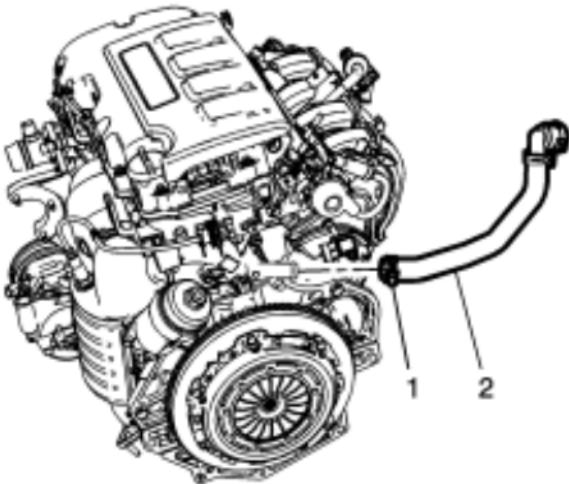
For equivalent regional tools, Refer to [Special Tools](#)

Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#)

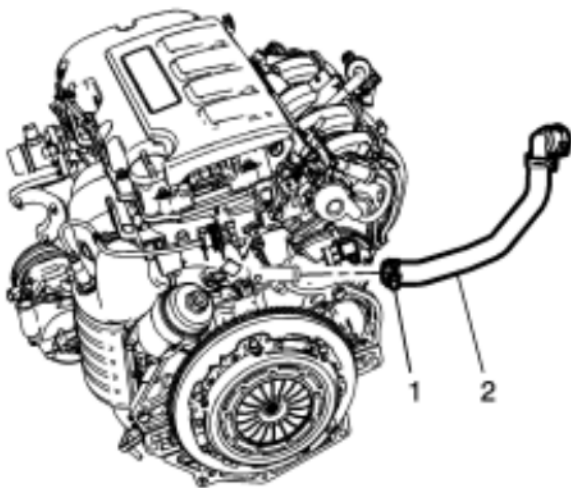


2. Disconnect the heater inlet hose quick connect fitting (1) at the heater core.
3. Remove the heater inlet hose (2) from the heater core.

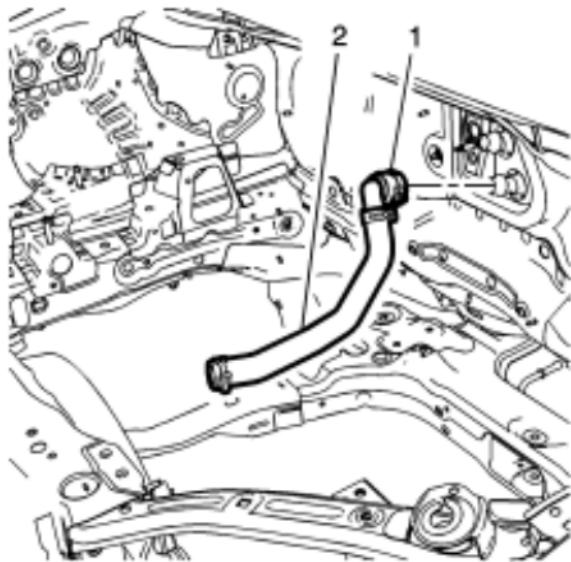


4. Remove the heater inlet hose clamp (1) at the engine using BO-38185 Hose Clamp Pliers .
5. Remove the heater inlet hose (2) from the engine.
6. Remove the heater inlet hose from the vehicle.

Installation Procedure



- 1. Install the heater inlet hose to the vehicle.
- 2. Install the heater inlet hose(2) to the engine.
- 3. Install the heater inlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .



- 4. Install the heater inlet hose(2) to the heater core.
- 5. Connect the heater inlet hose quick connect fitting(1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#)

Heater Inlet Hose Replacement (Deisel)

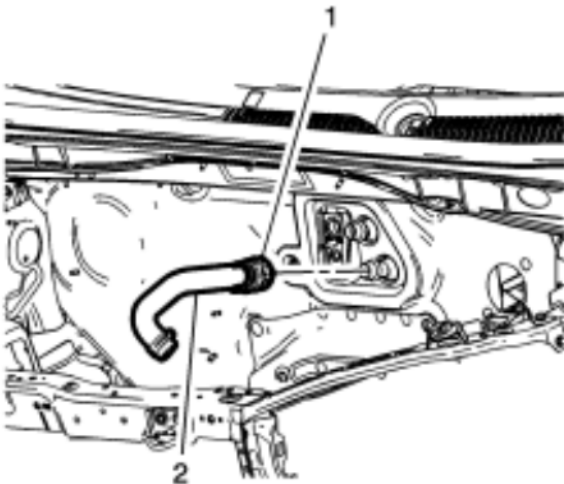
Special Tools

BO-38185 Hose Clamp Pliers

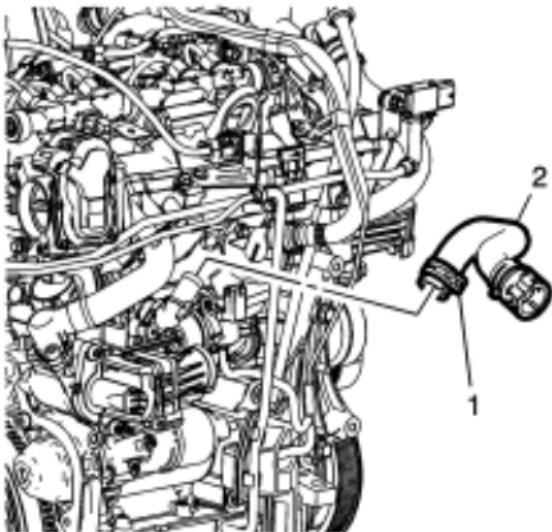
For equivalent regional tools, Refer to [Special Tools](#)

Removal Procedure

1. Drain the cooling system. Refer to [Cooling System Draining and Filling](#)

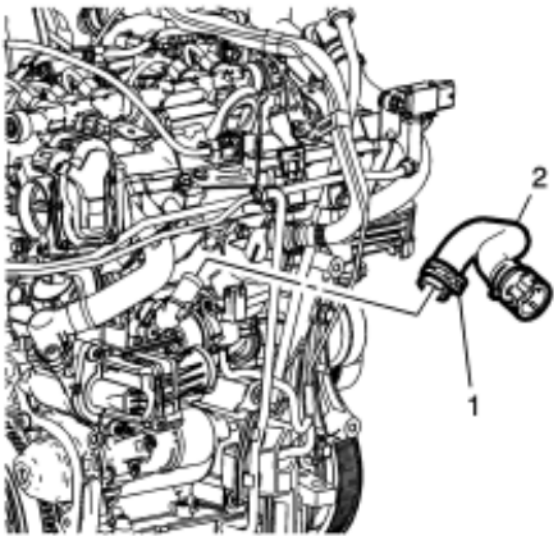


2. Disconnect the heater inlet hose quick connect fitting (1) at the heater core.
3. Remove the heater inlet hose (2) from the heater core.

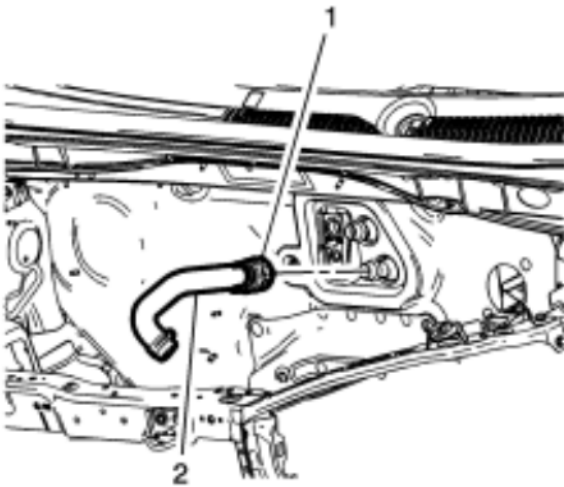


4. Remove the heater inlet hose clamp (1) at the engine using BO-38185 Hose Clamp Pliers .
5. Remove the heater inlet hose (2) from the engine.
6. Remove the heater inlet hose from the vehicle.

Installation Procedure

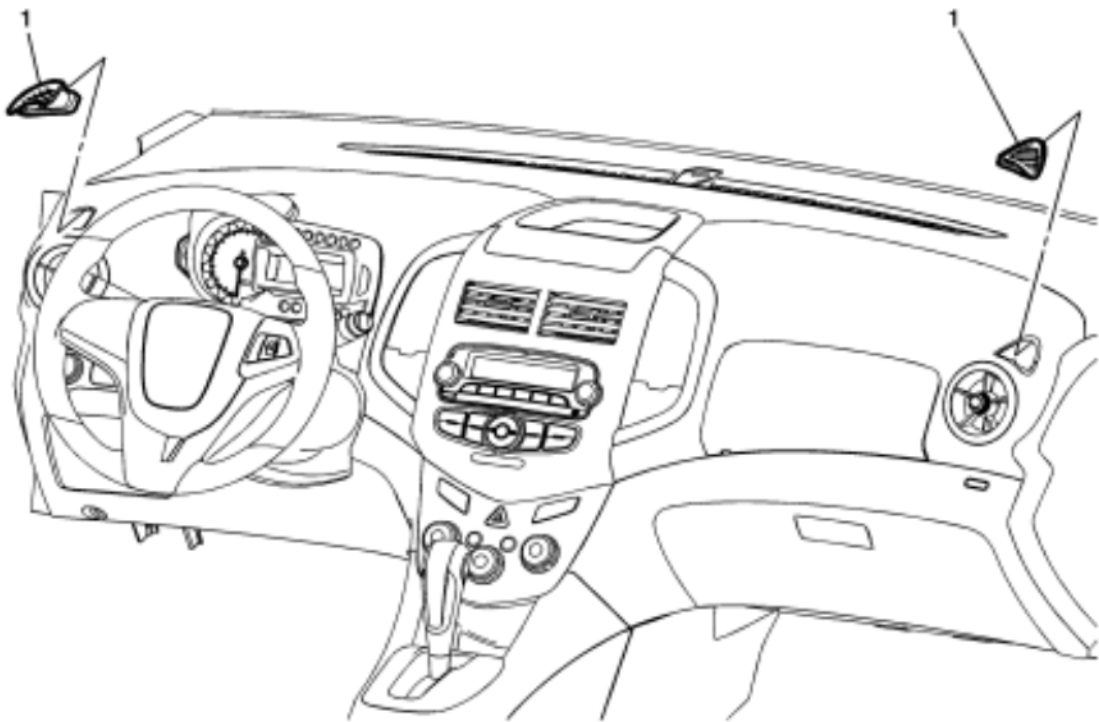


- 1. Install the heater inlet hose to the vehicle.
- 2. Install the heater inlet hose(2) to the engine.
- 3. Install the heater inlet hose clamp(1) at the engine using *BO-38185* Hose Clamp Pliers .



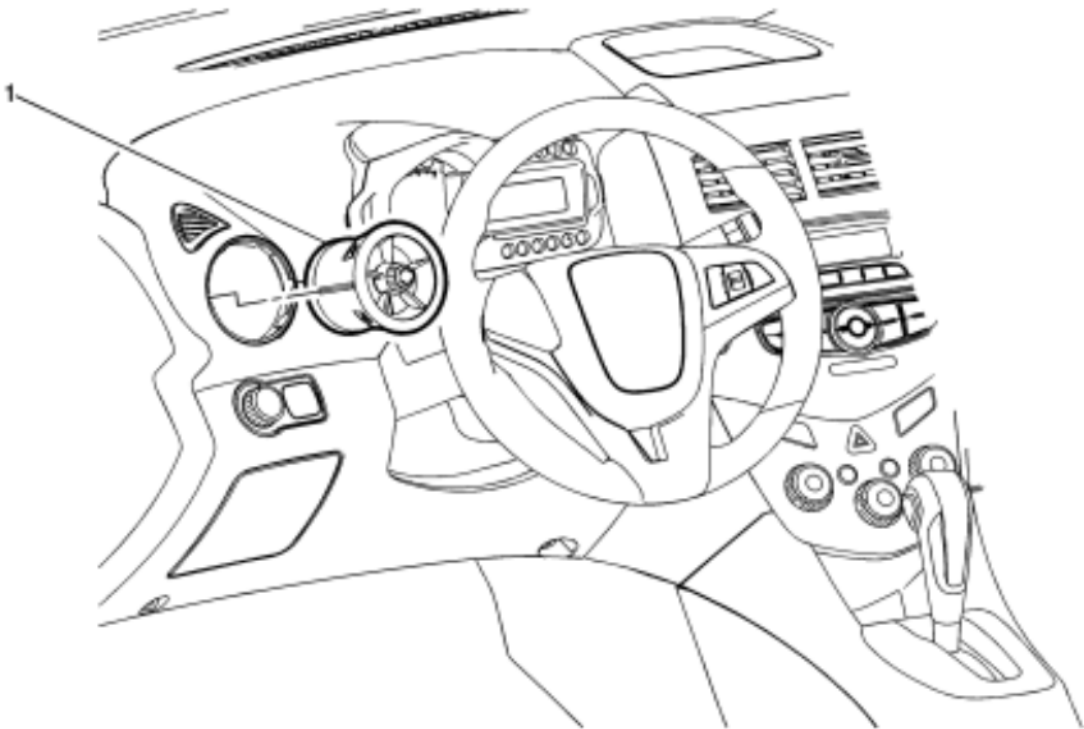
- 4. Install the heater inlet hose(2) from the heater core.
- 5. Connect the heater inlet hose quick connect fitting(1) at the heater core.
- 6. Fill the cooling system. Refer to [Cooling System Draining and Filling](#)

Side Window Defogger Outlet Grille Replacement



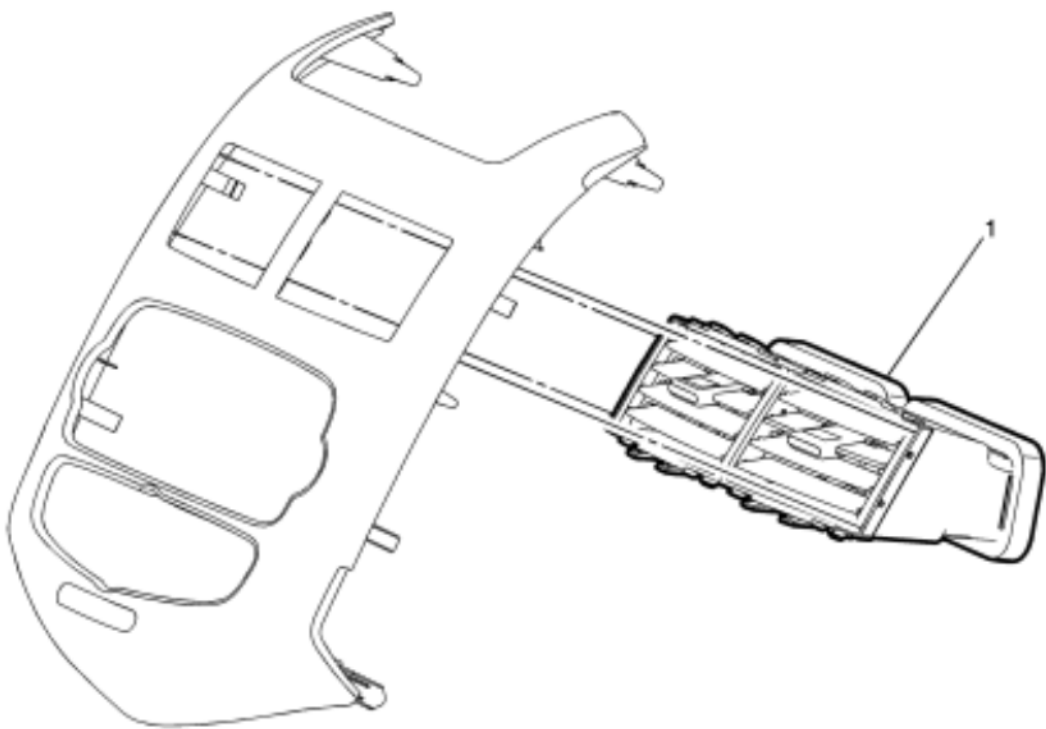
Callout	Component Name
1	Side Window Defroster Outlet Grille (Qty: 2) Procedure Use a flat bladed plastic trim tool to aid in the removal of the grille assemblies from the instrument panel.

Instrument Panel Outer Air Outlet Replacement - Left Side



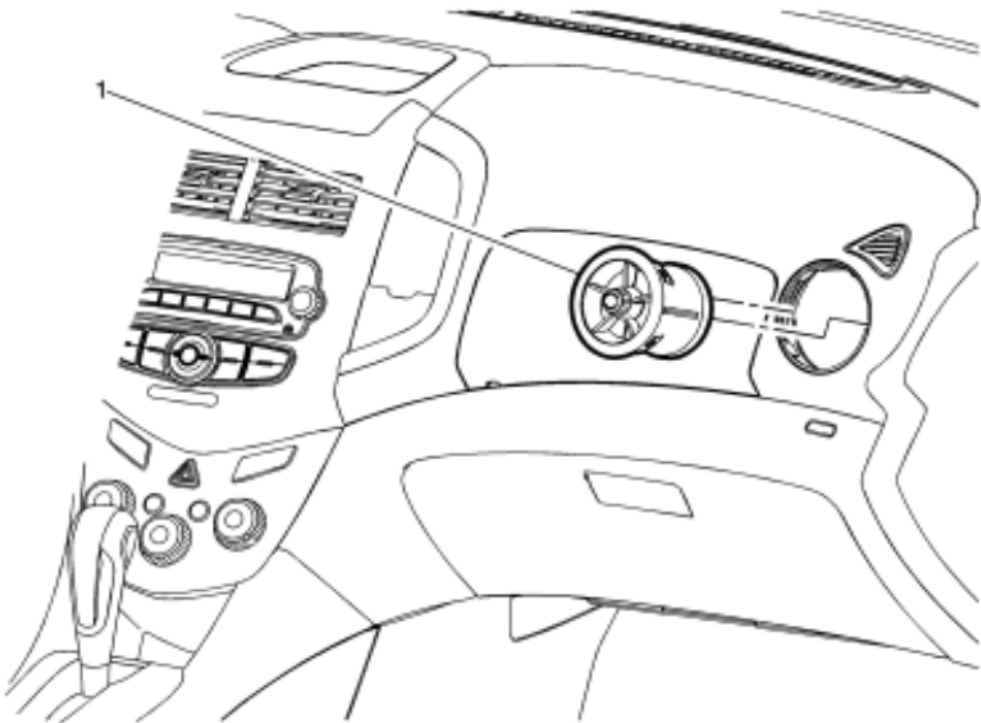
Callout	Component Name
1	Instrument Panel Outer Air Outlet Assembly Procedure Use a flat bladed plastic trim tool to aid in the removal of the air outlet assembly from the instrument panel.

Instrument Panel Center Air Outlet Replacement



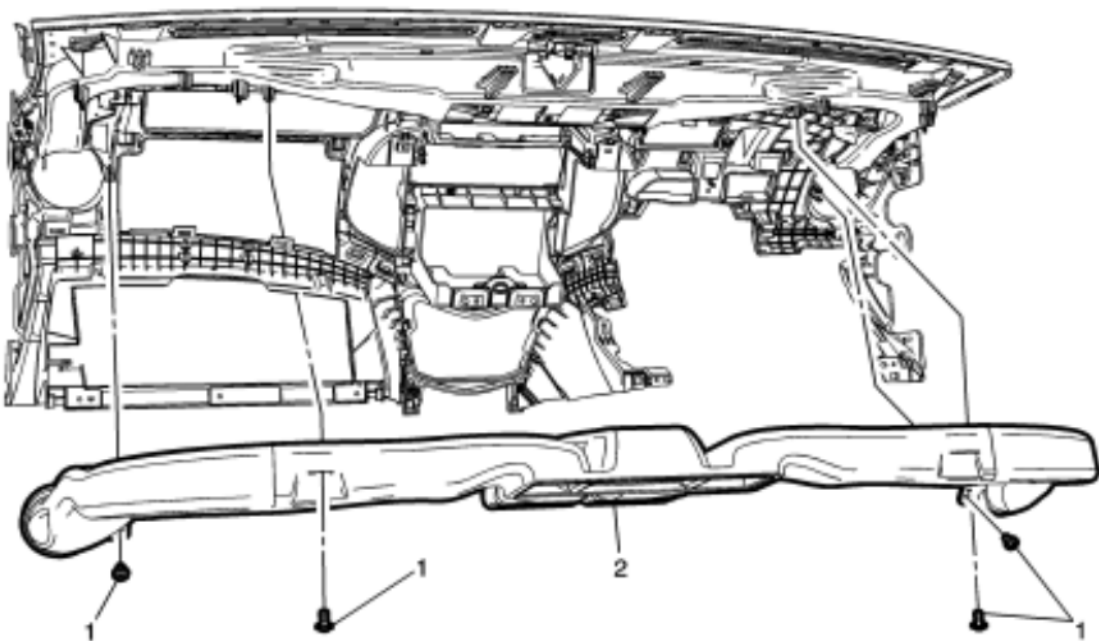
Callout	Component Name
Preliminary Procedure Remove the instrument panel center molding. Refer to Instrument Panel Center Molding Replacement .	
1	Instrument Panel Center Air Outlet Assembly Procedure Unsnap the instrument panel center air outlet from the center molding assembly.

Instrument Panel Outer Air Outlet Replacement - Right Side



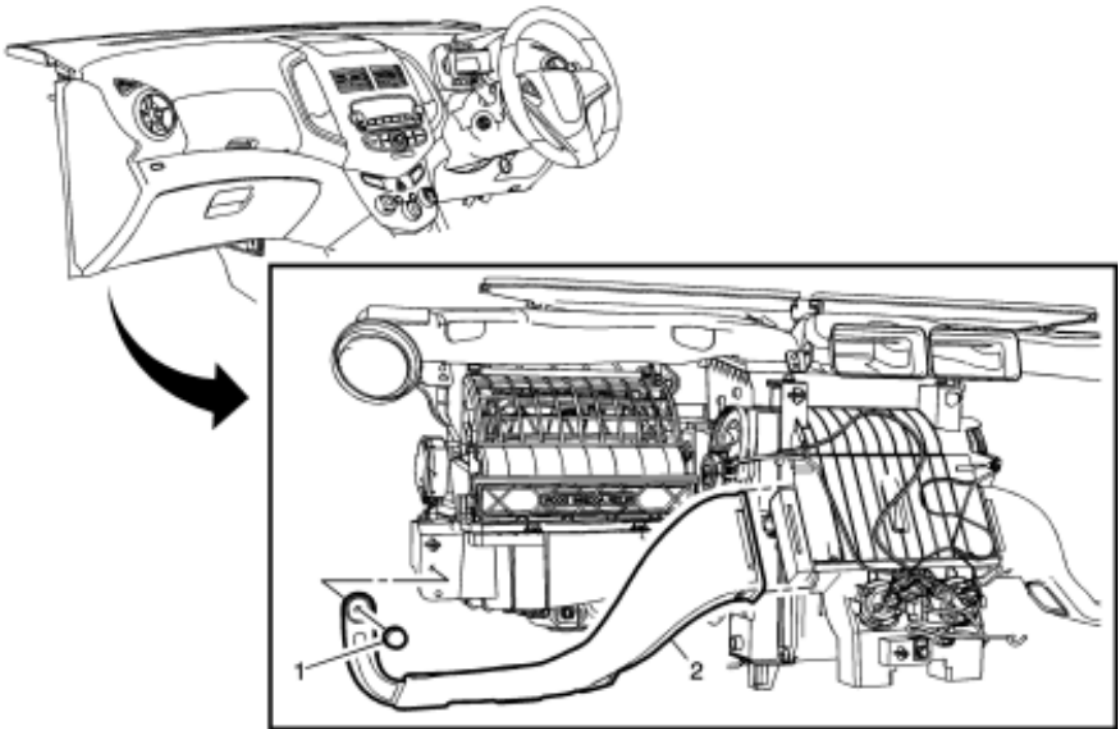
Callout	Component Name
1	Instrument Panel Outer Air Outlet Assembly Procedure Use a flat bladed plastic trim tool to aid in the removal of the air outlet assembly from the instrument panel.

Instrument Panel Outer Air Outlet Duct Replacement



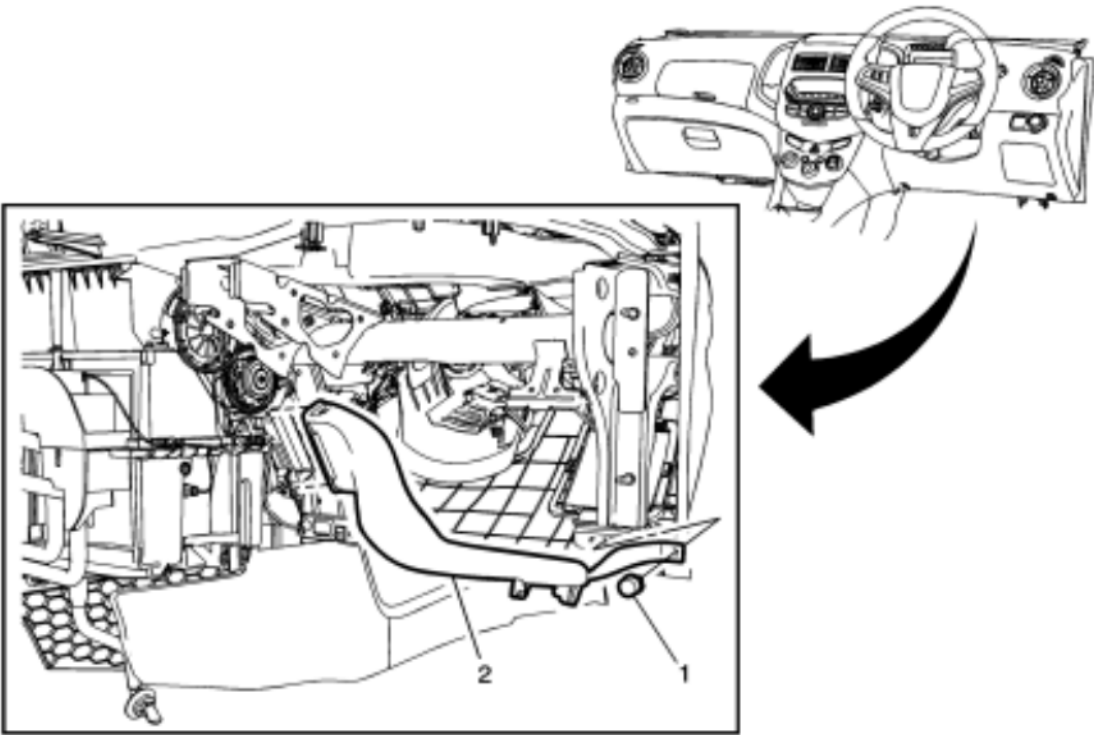
Callout	Component Name
Preliminary Procedures 1. Remove the instrument panel assembly. Refer to Instrument Panel Assembly Replacement . 2. Reposition any wiring or hoses to gain access to air duct.	
1	Center Air Distributor Duct Screw (Qty: 4) Caution: Refer to Fastener Caution .
2	Center Air Distributor Duct

Floor Air Outlet Duct Replacement - Left Side (RHD)



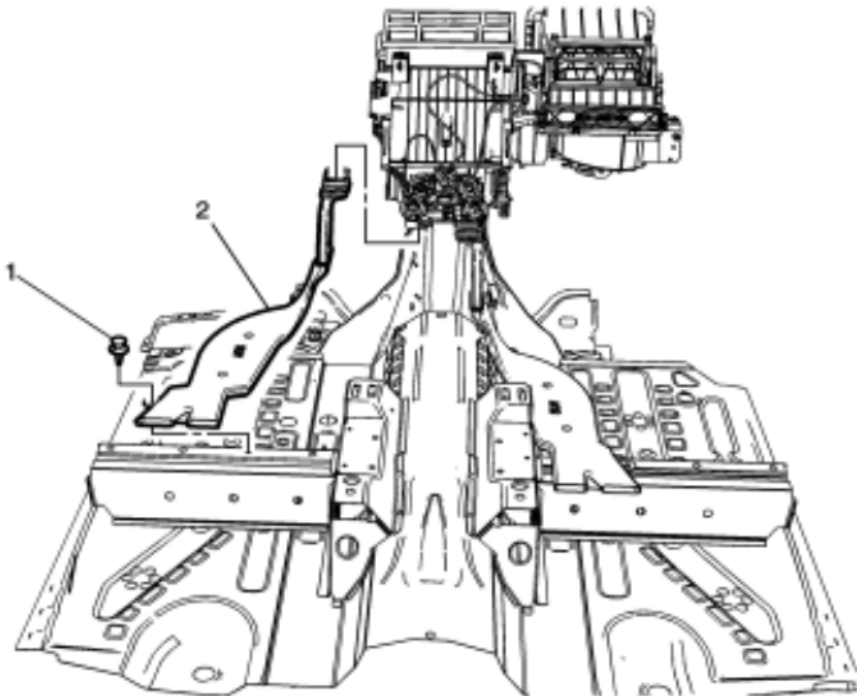
Callout	Component Name
Preliminary Procedure Remove the instrument panel compartment housing. Refer to Instrument Panel Compartment Housing Replacement .	
1	Floor Air Outlet Duct Fastener
2	Floor Air Outlet Duct

Floor Air Outlet Duct Replacement - Right Side (RHD)



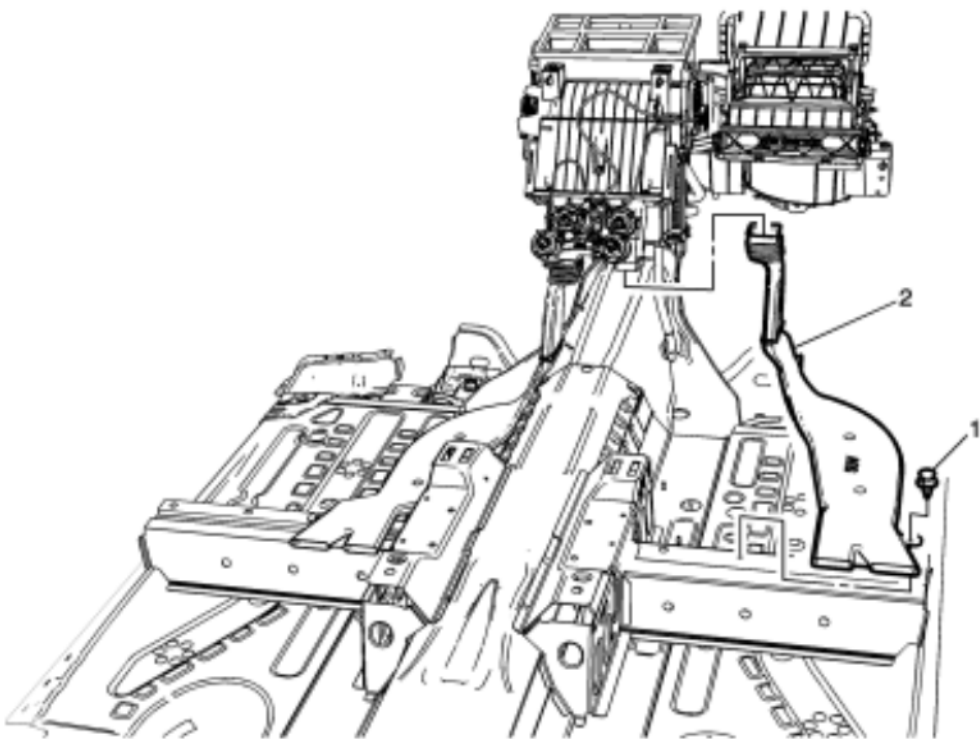
Callout	Component Name
Preliminary Procedure 1. Remove the instrument panel insulator, if equipped. 2. Remove the instrument panel lower trim pad cover. Refer to Instrument Panel Lower Trim Pad Cover Replacement .	
1	Floor Air Outlet Duct Fastener
2	Floor Air Outlet Duct

Floor Rear Air Outlet Duct Replacement - Left Side



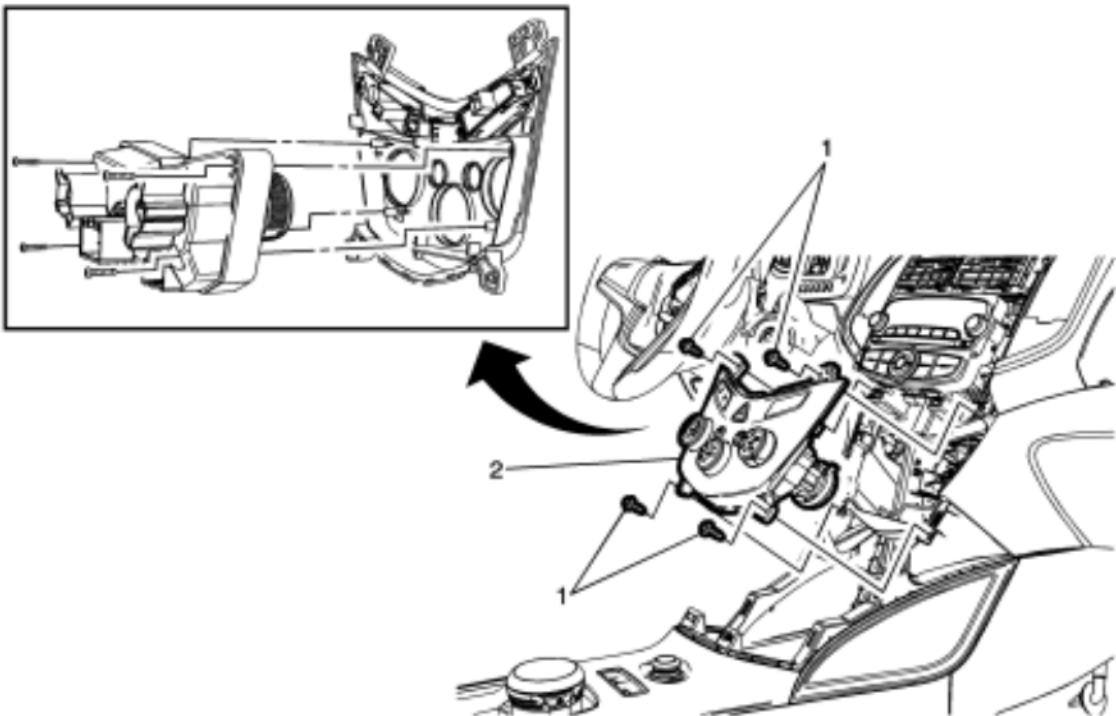
Callout	Component Name
Preliminary Procedure Remove the floor panel carpet . Refer to Floor Panel Carpet Replacement .	
1	Floor Rear Air Outlet Duct Push-In Fastener
2	Floor Rear Air Outlet Duct

Floor Rear Air Outlet Duct Replacement - Right Side



Callout	Component Name
Preliminary Procedure Remove the front floor I carpet. Refer to Floor Panel Carpet Replacement .	
1	Floor Rear Air Outlet Duct Procedure 1. Remove the floor rear air outlet duct fastener. 2. If replacing the floor rear air outlet duct, transfer all necessary components.
2	Floor Rear Air Outlet Duct

Heater and Air Conditioning Control Replacement



Callout	Component Name
Preliminary Procedures 1. Remove I/P center bezel. Refer to Instrument Panel Center Molding Replacement . 2. Remove front floor shifter bezel. Refer to Front Floor Console Cover Replacement .	
1	Heater and Air Conditioning Control Retainer (Qty: 4) Caution: Refer to Fastener Caution . Tighten 2.5 N·m (22 lbin)
2	Heater and Air Conditioning Control Procedure 1. Disconnect the electrical connectors 2. Disconnect the heater and air conditioning temperature control cable. Refer to Temperature Control Cable Replacement . 3. Disconnect the mode control cable. Refer to Mode Control Cable Replacement .

Heating and Air Conditioning System Description and Operation

Engine Coolant

Engine coolant is the key element of the heating system. The engine thermostat controls the normal engine operating coolant temperature. Coolant pumped out of the engine enters the heater core through the inlet heater hose. The air flowing through the HVAC module absorbs the heat of the coolant flowing through the heater core. The coolant then exits the heater core through the heater outlet hose and returns back to the engine block.

A/C Cycle

Refrigerant is the key element in an air conditioning system. R-134a is presently the only EPA approved refrigerant for automotive use. R-134a is a very low temperature gas that can transfer the undesirable heat from the passenger compartment to the outside air.

A Delphi model CSP-17 compressor is used on this model year vehicle. The A/C compressor is belt driven and operates when the magnetic clutch is engaged. The compressor builds pressure in the A/C system. Compressing the refrigerant also adds heat to the refrigerant. The refrigerant is discharged from the compressor through the discharge hose, and forced to flow to the condenser and then through the balance of the A/C system. The A/C system is mechanically protected with the use of a high pressure relief valve. If the high pressure A/C switch were to fail or if the refrigerant system becomes restricted and refrigerant pressure continued to rise, the high pressure relief will pop open and release refrigerant from the system.

Compressed refrigerant enters the condenser in a high temperature, high pressure vapor state. As the refrigerant flows through the condenser, the heat of the refrigerant is transferred to the ambient air passing through the condenser. Cooling the refrigerant causes the refrigerant to condense and change from a vapor to a liquid state.

The condenser is located in front of the radiator for maximum heat transfer. The condenser is made of aluminum tubing and aluminum cooling fins, which allows rapid heat transfer for the refrigerant. The semi-cooled liquid refrigerant exits the condenser and flows through the liquid line, to the TXV.

The TXV is located at the evaporator inlet. The TXV is the dividing point for the high and the low pressure sides of the A/C system. As the refrigerant passes through the TXV, the refrigerant is lowered. Due to the pressure differential on the liquid refrigerant, the refrigerant will begin to boil at the TXV. The TXV also meters the amount of liquid refrigerant that can flow into the evaporator.

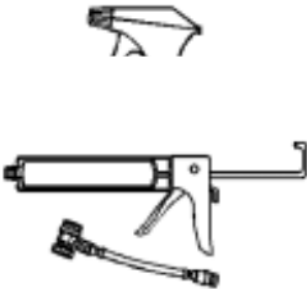
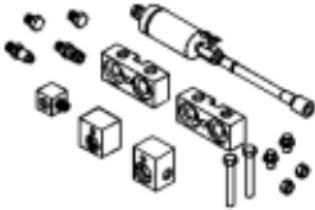
Refrigerant exiting the TXV flows into the evaporator core in a low pressure, liquid state. Ambient air is drawn through the HVAC module and passes through the evaporator core. Warm and moist air will cause the liquid refrigerant to boil inside the evaporator core.

The boiling refrigerant absorbs heat from the ambient air and draws moisture onto the evaporator. The refrigerant exits the evaporator through the suction line and back to the compressor, in a vapor state. This completes the A/C cycle of heat removal. At the compressor, the refrigerant is compressed again and the cycle of heat removal is repeated.

The conditioned air is distributed through the HVAC module for passenger comfort. The moisture removed from the passenger compartment will also change form, or condense, and is discharged from the HVAC module as water.

Special Tools

Illustration	Tool Number/ Description
	A/C Filling Device
	BO-38185 J-38185 Hose Clamp Pliers
	GE-39400 J-39400 GE-50078 Electric Halogen Leak Detector
	GE-39400-A J-39400-A GE-50078 Halogen Leak Detector
	GE-41447 J-41447 R-134A A/C Tracer Dye - Box of 24

	BO-42220 J-42220 Universal 12V Leak Detection Lamp
	GE-43872 J-43872 Florescent Dye Cleaner
	GE-45037 J-45037 A/C Oil Injector
	GE-45268 J-45268 A/C Flushing Adapter Kit
	GE-46246 J-46246 Valve Core Tool



	GE-46297 J-46297 A/C Dye Injector Kit
	GE-46297-12 J-46297-12 Replacement Dye Cartridges
	DT-48280 Clutch Plate Holder

