

Air Conditioning - TDV6 2.7L Diesel -

Lubricant

Item	Specification
Compressor oil	Denso ND-8 PAG oil
Total system capacity:	
Front	130 cm ³ (4.5 fluid ounces)
Rear	170 cm ³ (5.9 fluid ounces)
Additional amount of oil to be added to system if a component is replaced:	
Condenser	40 cm ³ (1.4 fluid ounces)
Evaporator - Front or rear	40 cm ³ (1.4 fluid ounces)
Pipe or hose	10 cm ³ (0.35 fluid ounces)

System Refrigerant Specification / Capacity

Item	Specification
Refrigerant type	R134A
Total system capacity:	
2.7 litre - Front system only fitted	550 grammes (10.25 ounces)
2.7 litre - Front and rear systems fitted	810 grammes (28.35 ounces)
4.0 and 4.4 litre - Front system only fitted	600 grammes (21.16 ounces)
4.0 and 4.4 litre - Front and rear systems fitted	900 grammes (31.83 ounces)

General Specification

Item	Description
Compressor:	
Make	Denso
Type	7SEU17
Sensor locations:	
Ambient temperature sensor	At the front of the vehicle
Smog sensor	At the front of the vehicle adjacent to the ambient temperature sensor
ICS/humidity sensor	On the instrument panel adjacent to the steering column
Solar sensor	On the vehicle centre line on top of the instrument panel
Pressure transducer	In A/C line - LH side of engine compartment

Torque Specifications

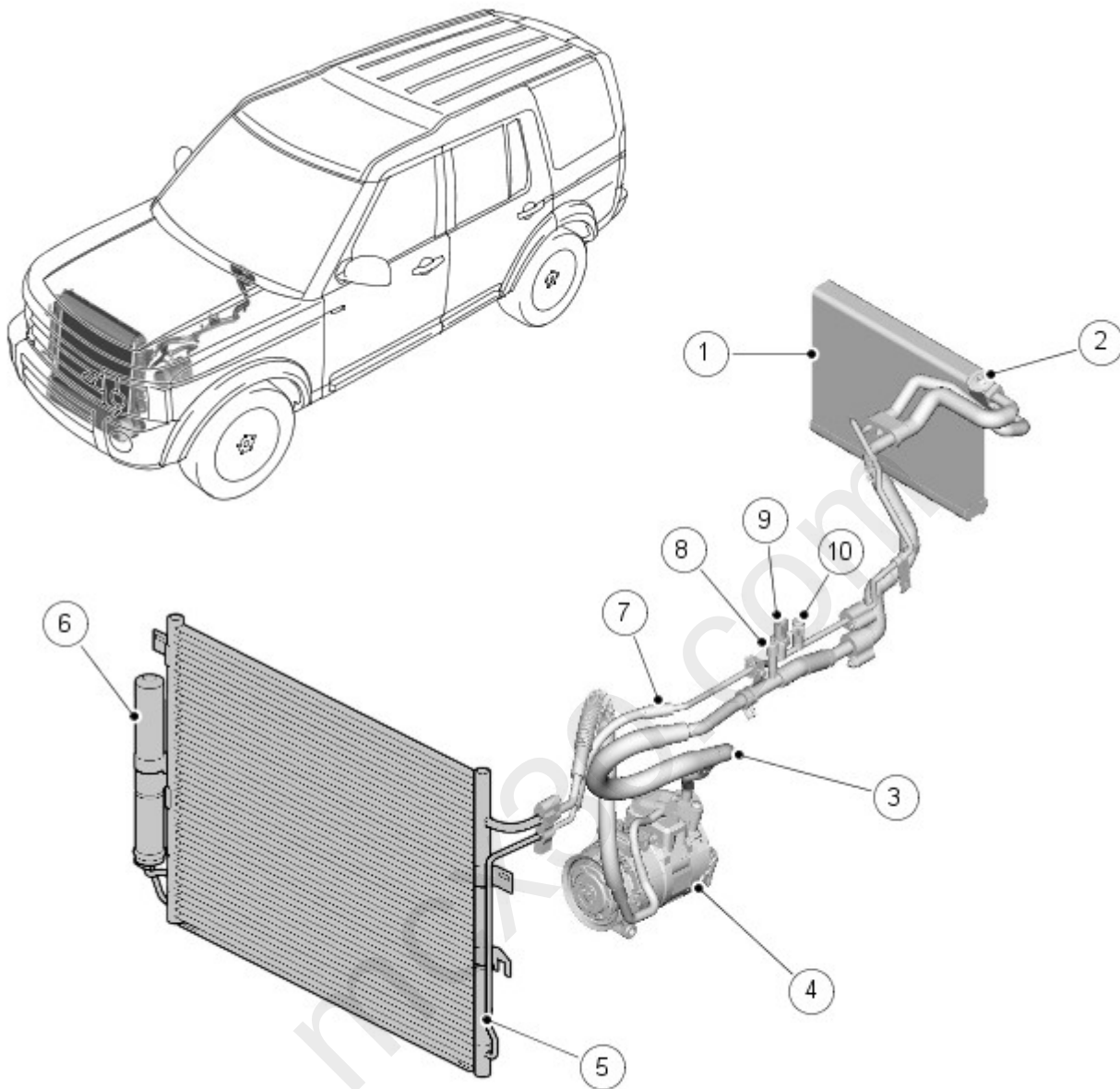
Description	Nm	lb-ft
Compressor mounting bolts	25	18
Receiver/drier mounting bolts	10	7
Refrigerant line bolts	10	7
Condenser core bolts - Not 2.7 litre	10	7
Radiator bolts	25	18
A/C pipe bolts	25	18
Coolant expansion tank bolts	10	7
Heater housing to bulkhead Torx bolts	6	4
Adaptor panel nuts	6	4
Air conditioning lines to bulkhead bolt	6	4
Air conditioning lines to body nut	6	4
Instrument panel Torx bolts	25	18
Instrument panel carrier to bulkhead Torx bolt	25	18
* Steering column intermediate shaft nut	22	16
Ground cables to passenger side lower A-pillar nuts	10	7
Ground cables to driver side lower A-pillar nuts	10	7
Pressure transducer	10	7

* New nut must be fitted

Air Conditioning - TDV6 2.7L Diesel - Air Conditioning

Description and Operation

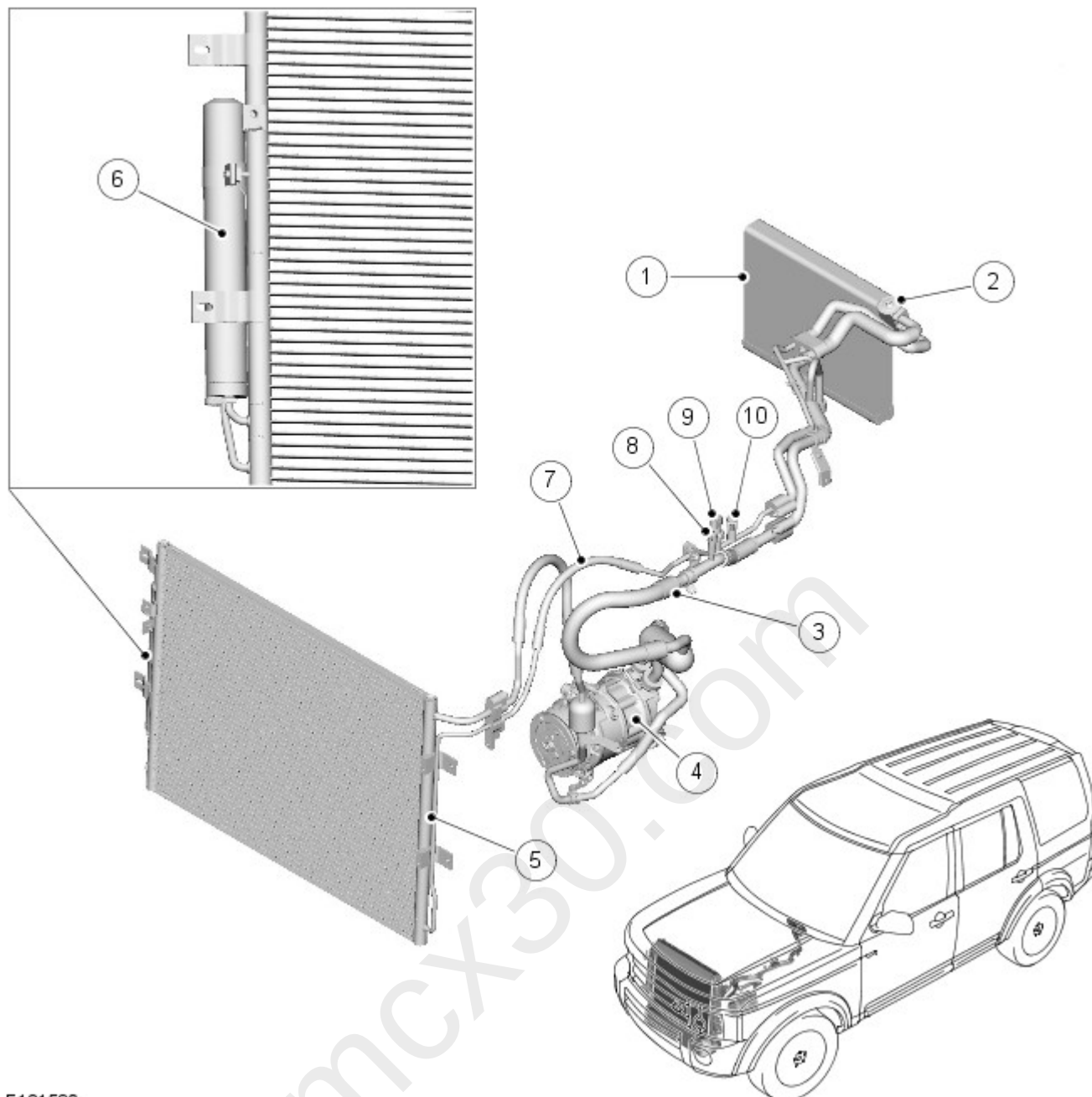
COMPONENT LOCATION 2.7L TdV6



E131578

Item	Part Number	Description
1	-	Evaporator
2	-	Thermostatic expansion valve
3	-	Low pressure line
4	-	air conditioning (A/C) compressor
5	-	Condenser
6	-	Receiver drier
7	-	High pressure line
8	-	Low pressure servicing connection
9	-	Refrigerant pressure sensor (reference)
10	-	High pressure servicing connection

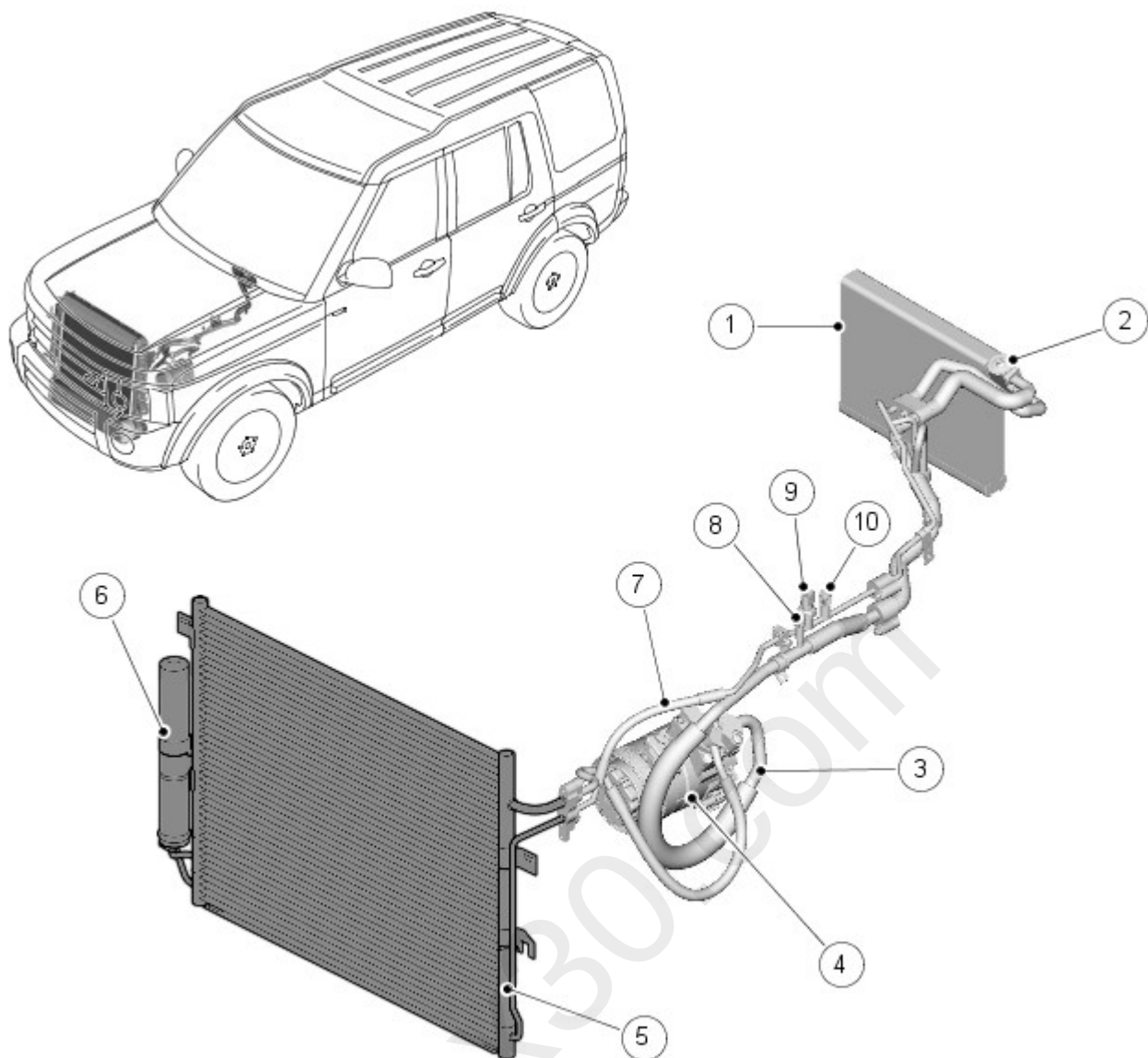
COMPONENT LOCATION 3.0L TdV6



E131580

Item	Part Number	Description
1	-	Evaporator
2	-	Thermostatic expansion valve
3	-	Low pressure line
4	-	A/C compressor
5	-	Condenser
6	-	Receiver drier
7	-	High pressure line
8	-	Low pressure servicing connection
9	-	Refrigerant pressure sensor (reference)
10	-	High pressure servicing connection

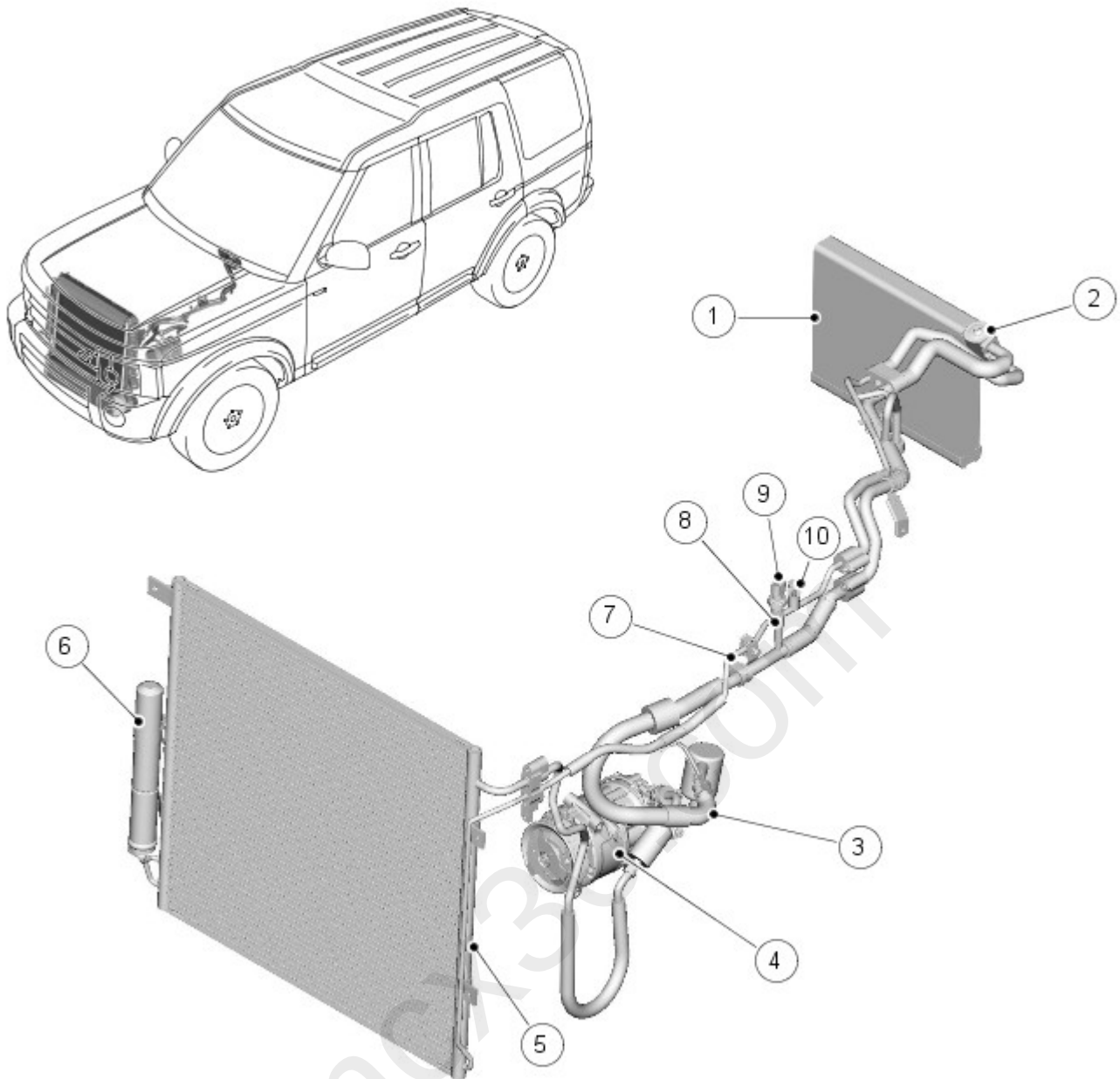
COMPONENT LOCATION 4.0L NA V6



E131582

Item	Part Number	Description
1	-	Evaporator
2	-	Thermostatic expansion valve
3	-	Low pressure line
4	-	A/C compressor
5	-	Condenser
6	-	Receiver drier
7	-	High pressure line
8	-	Low pressure servicing connection
9	-	Refrigerant pressure sensor (reference)
10	-	High pressure servicing connection

COMPONENT LOCATION 5.0L NA V8



E131583

Item	Part Number	Description
1	-	Evaporator
2	-	Thermostatic expansion valve
3	-	Low pressure line
4	-	A/C compressor
5	-	Condenser
6	-	Receiver drier
7	-	High pressure line
8	-	Low pressure servicing connection
9	-	Refrigerant pressure sensor (reference)
10	-	High pressure servicing connection

GENERAL

The A/C system transfers heat from the vehicle interior to the outside atmosphere to provide the heater assembly with dehumidified cool air. The system consists of:

- A compressor.
- A condenser.
- A receiver drier.
- A thermostatic expansion valve.
- An evaporator.
- Low and high pressure refrigerant lines.

The system is a sealed, closed loop, filled with a charge weight of R134a refrigerant as the heat transfer medium. Oil is added to the refrigerant to lubricate the internal components of the compressor.

Operation of the air conditioning system is controlled by the automatic temperature control (ATC) module. The A/C compressor circulates the refrigerant around the system by compressing low pressure, low temperature vapor from the evaporator and discharging the resultant high pressure, high temperature vapor to the condenser.

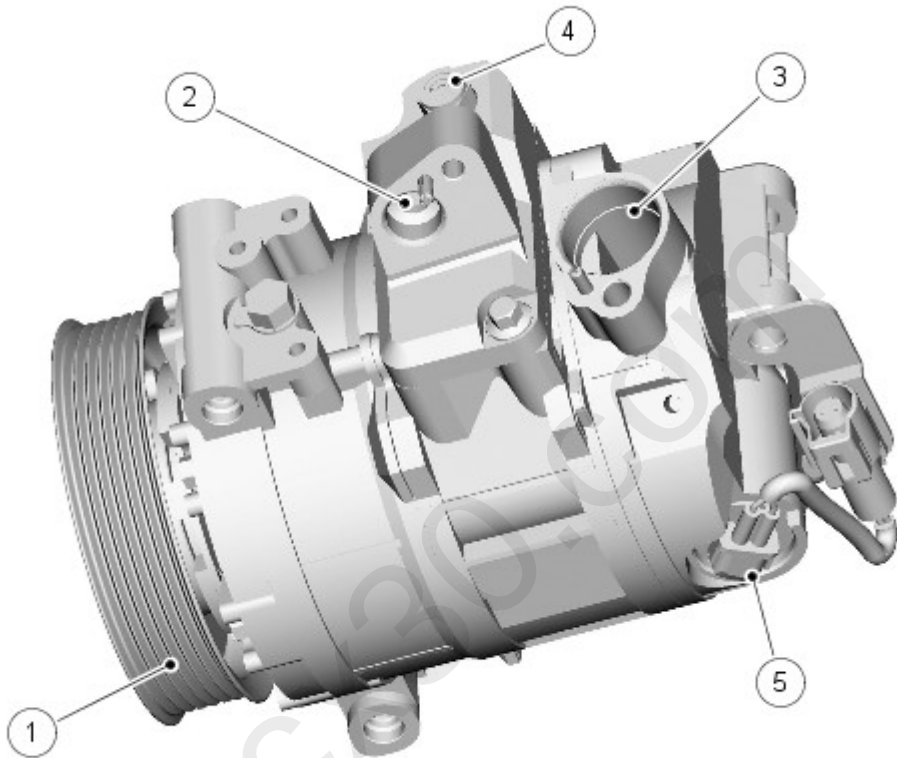
The A/C compressor is a variable displacement unit which is driven by the engine accessory drive belt. On 2.7L/4.0L and 5.0L vehicles, the [A/C \(air conditioning\)](#) compressor is permanently driven directly from the pulley. On 3.0L diesel vehicles the [A/C](#) compressor is driven via an electro-magnetic clutch.

To protect the refrigerant system from excessive pressure, a pressure relief valve is installed in the outlet side of the A/C compressor. The pressure relief valve vents excess pressure into the engine compartment.

For additional information, refer to: Control Components (412-04, Description and Operation).

A / C COMPRESSOR

2.7L TdV6



E131577

Item	Part Number	Description
1	-	Pulley
2	-	Outlet port
3	-	Inlet port
4	-	Pressure relief valve
5	-	Electronic control valve connector

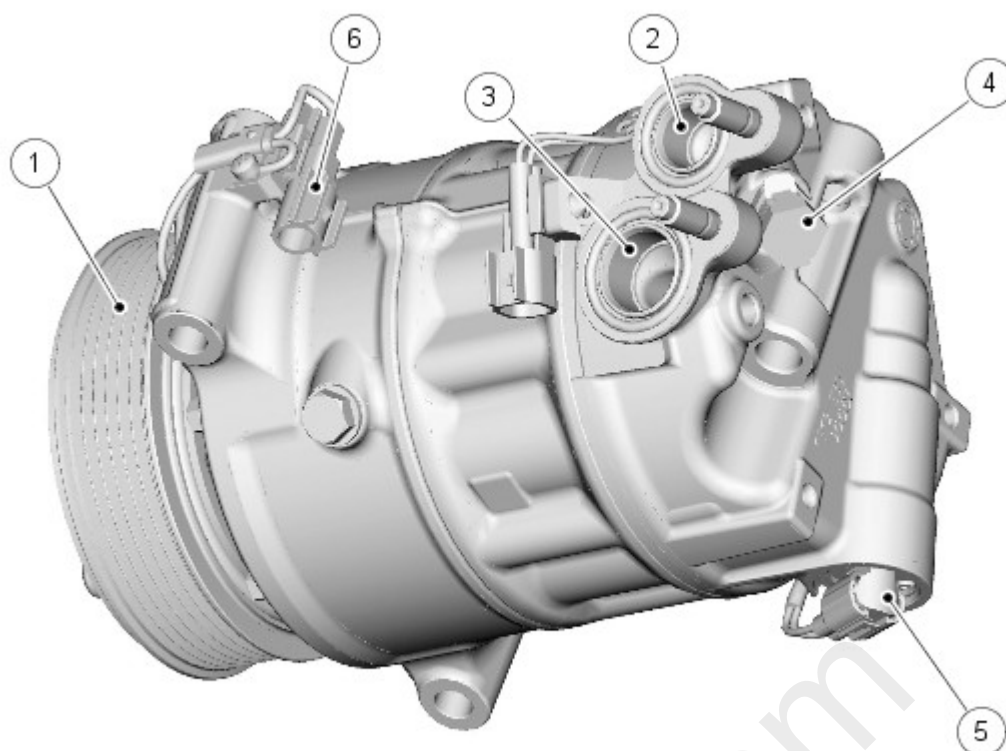
The [A/C](#) compressor fitted to 2.7L TdV6 petrol vehicles is a variable displacement unit. The secondary accessory drive belt, driven by the engine crankshaft, drives the [A/C](#) compressor via a pulley. Operation of the compressor is controlled by an electronic control valve working in conjunction with the [ATC \(automatic temperature control\)](#) module.

The [A/C](#) compressor is a 7 cylinder swash plate unit with a minimum displacement of 1.6 cm³/rev (0.10 in³/rev) and maximum displacement of 171 cm³/rev (10.43 in³/rev). The [ATC](#) module automatically adjusts the displacement of the [A/C](#) compressor between the minimum and maximum values, to match the thermal load of the evaporator. By matching refrigerant flow and the thermal load of the evaporator, the [ATC](#) module maintains cabin comfort whilst also considering fuel economy.

To protect the refrigerant system from unacceptably high pressure, a pressure relief valve is installed in the outlet side of the [A/C](#) compressor. The pressure relief valve is set to open at 3.5 to 4.3 MPa (508 to 623lbf/in²) and vents excess pressure into the engine compartment. The pressure relief valve closes again when the pressure decreases to 3.01 MPa (436 lbf/in²).

The pulley of the [A/C](#) compressor incorporates a mechanical torque limiter, which disconnects the drive plate from the compressor shaft if torque increases to a level that indicates imminent compressor seizure.

3.0L TdV6



E131579

Item	Part Number	Description
1	-	Pulley
2	-	Outlet port
3	-	Inlet port
4	-	Pressure relief valve
5	-	Electronic control valve connector
6	-	electromagnetic clutch connector

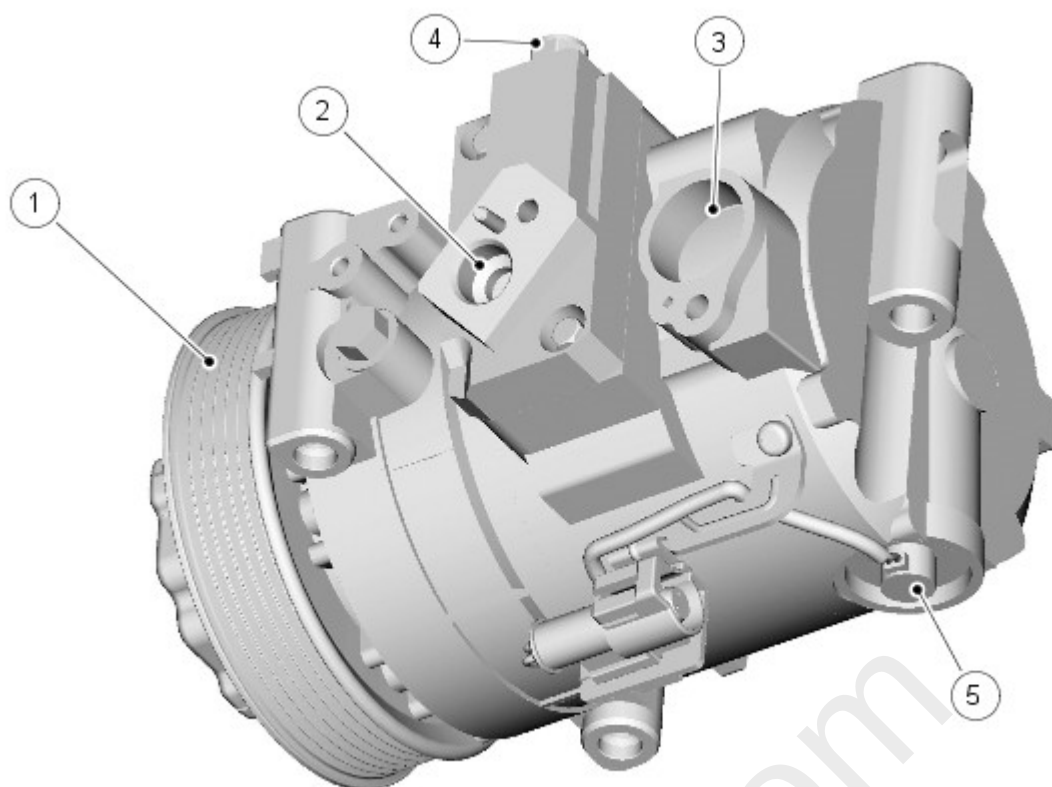
The [A/C](#) compressor fitted to 3.0L TdV6 diesel vehicles is a variable displacement unit. The secondary accessory drive belt, driven by the engine crankshaft, drives the [A/C](#) compressor via a pulley and an electromagnetic clutch. Operation of the clutch is controlled by a power feed from the [ATC](#) module.

The [A/C](#) compressor is a 7 cylinder swash plate unit with a minimum displacement of 1.6 cm³/rev (0.10 in³/rev) and maximum displacement of 163 cm³/rev (9.95 in³/rev). The [ATC](#) module automatically adjusts the displacement of the [A/C](#) compressor between the minimum and maximum values, to match the thermal load of the evaporator. By matching refrigerant flow and the thermal load of the evaporator, the [ATC](#) module maintains cabin comfort whilst also considering fuel economy.

To protect the refrigerant system from unacceptably high pressure, a pressure relief valve is installed in the outlet side of the [A/C](#) compressor. The pressure relief valve is set to open at 3.5 to 4.1 MPa (508 to 595 lbf/in²) and vents excess pressure into the engine compartment. The pressure relief valve closes again when the pressure decreases to 3.1 MPa (449 lbf/in²).

The clutch of the [A/C](#) compressor incorporates a thermal cut-off fuse, which disconnects the power feed from the [ATC](#) module if the temperature increases to 182 ± 5 °C (360 ± 9 °F).

4.0L NA V6



E131581

Item	Part Number	Description
1	-	Pulley
2	-	Outlet port
3	-	Inlet port
4	-	Pressure relief valve
5	-	Electronic control valve connector

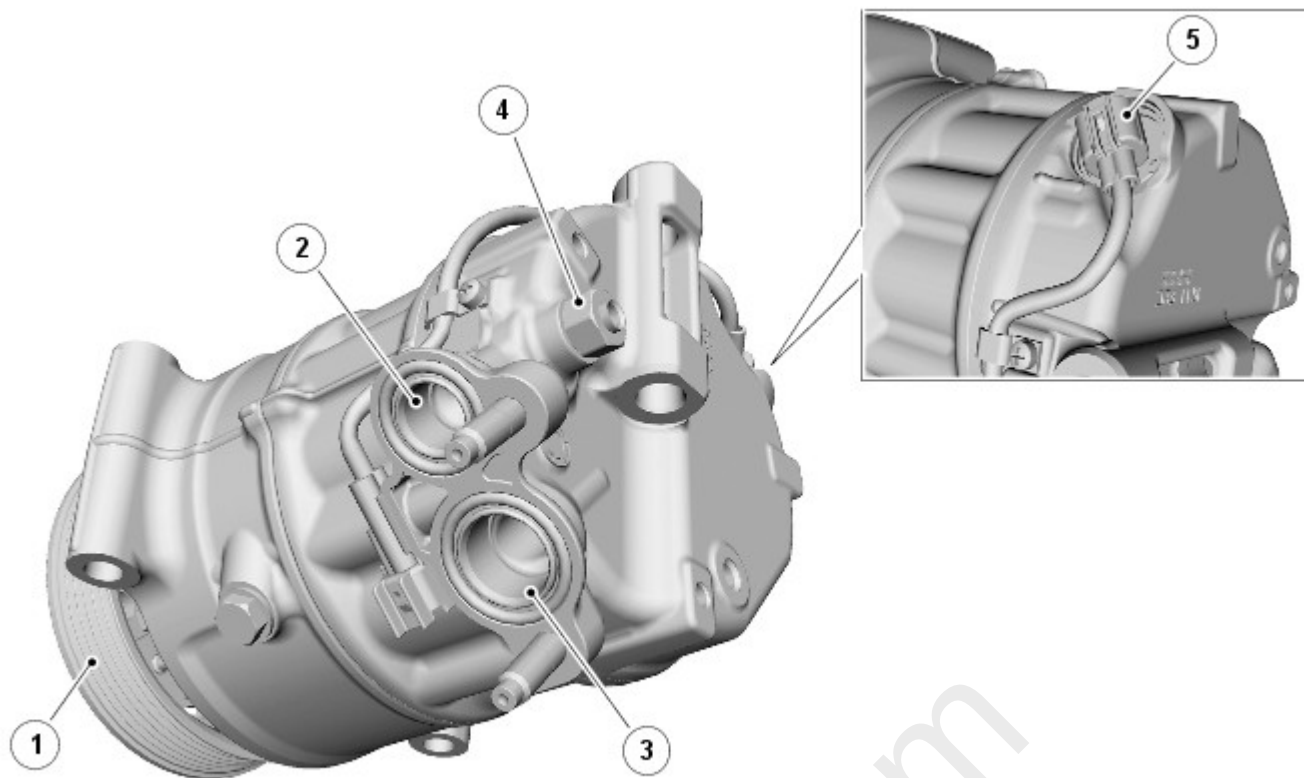
The [A/C](#) compressor fitted to 4.0L NA V6 petrol vehicles is a variable displacement unit. The secondary accessory drive belt, driven by the engine crankshaft, drives the [A/C](#) compressor via a pulley. Operation of the compressor is controlled by an electronic control valve working in conjunction with the [ATC](#) module.

The [A/C](#) compressor is a 7 cylinder swash plate unit with a minimum displacement of 1.6 cm³/rev (0.10 in³/rev) and maximum displacement of 171 cm³/rev (10.43 in³/rev). The [ATC](#) module automatically adjusts the displacement of the [A/C](#) compressor between the minimum and maximum values, to match the thermal load of the evaporator. By matching refrigerant flow and the thermal load of the evaporator, the [ATC](#) module maintains cabin comfort whilst also considering fuel economy.

To protect the refrigerant system from unacceptably high pressure, a pressure relief valve is installed in the outlet side of the [A/C](#) compressor. The pressure relief valve is set to open at 3.5 to 4.3 MPa (508 to 623 lbf/in²) and vents excess pressure into the engine compartment. The pressure relief valve closes again when the pressure decreases to 3.01 MPa (437 lbf/in²).

The pulley of the [A/C](#) compressor incorporates a mechanical torque limiter, which disconnects the drive plate from the compressor shaft if torque increases to a level that indicates imminent compressor seizure.

5.0L NA V8



E131337

Item	Part Number	Description
1	-	Pulley
2	-	Outlet port
3	-	Inlet port
4	-	Pressure relief valve
5	-	Electronic control valve connector

The [A/C](#) compressor fitted to 5.0L V8 petrol vehicles is a variable displacement unit. The secondary accessory drive belt, driven by the engine crankshaft, drives the [A/C](#) compressor via a pulley. Operation of the compressor is controlled by an electronic control valve working in conjunction with the [ATC](#) module.

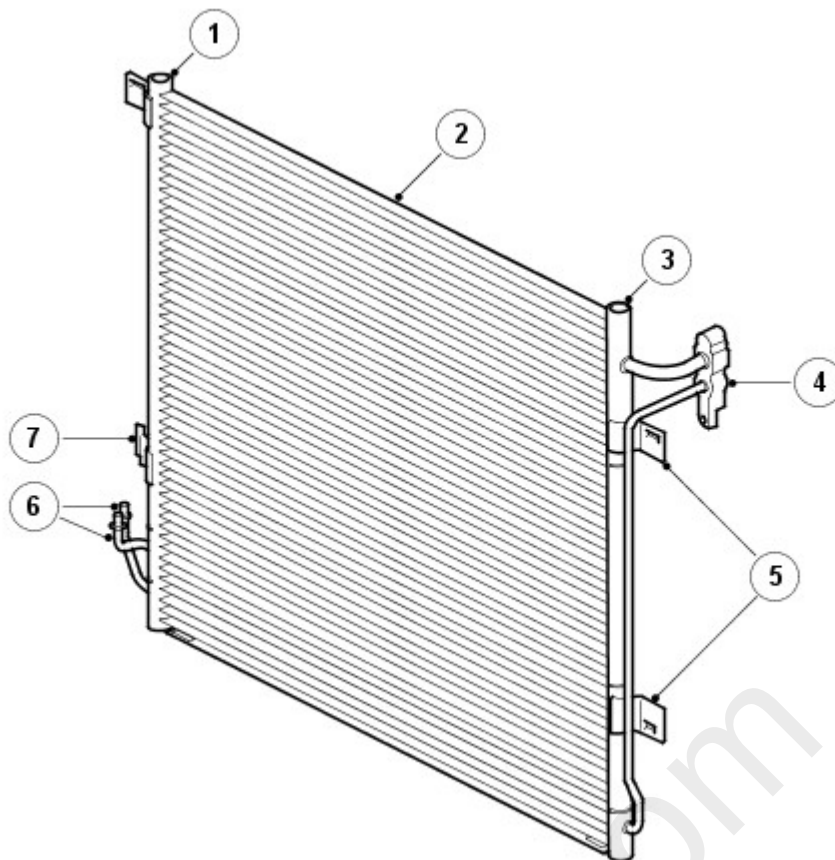
The [A/C](#) compressor is a 7 cylinder swash plate unit with a minimum displacement of 1.6 cm³/rev (0.10 in³/rev) and maximum displacement of 163 cm³/rev (9.95 in³/rev). The [ATC](#) module automatically adjusts the displacement of the [A/C](#) compressor between the minimum and maximum values, to match the thermal load of the evaporator. By matching refrigerant flow and the thermal load of the evaporator, the [ATC](#) module maintains cabin comfort whilst also considering fuel economy.

To protect the refrigerant system from unacceptably high pressure, a pressure relief valve is installed in the outlet side of the [A/C](#) compressor. The pressure relief valve is set to open at 3.5 to 4.1 MPa (508 to 595 lbf/in²) and vents excess pressure into the engine compartment. The pressure relief valve closes again when the pressure decreases to 3.1 MPa (449 lbf/in²).

The pulley of the [A/C](#) compressor incorporates a mechanical torque limiter, which disconnects the drive plate from the compressor shaft if torque increases to a level that indicates imminent compressor seizure.

CONDENSER

- **NOTE:** 5.0L NA V8 version shown other installations similar



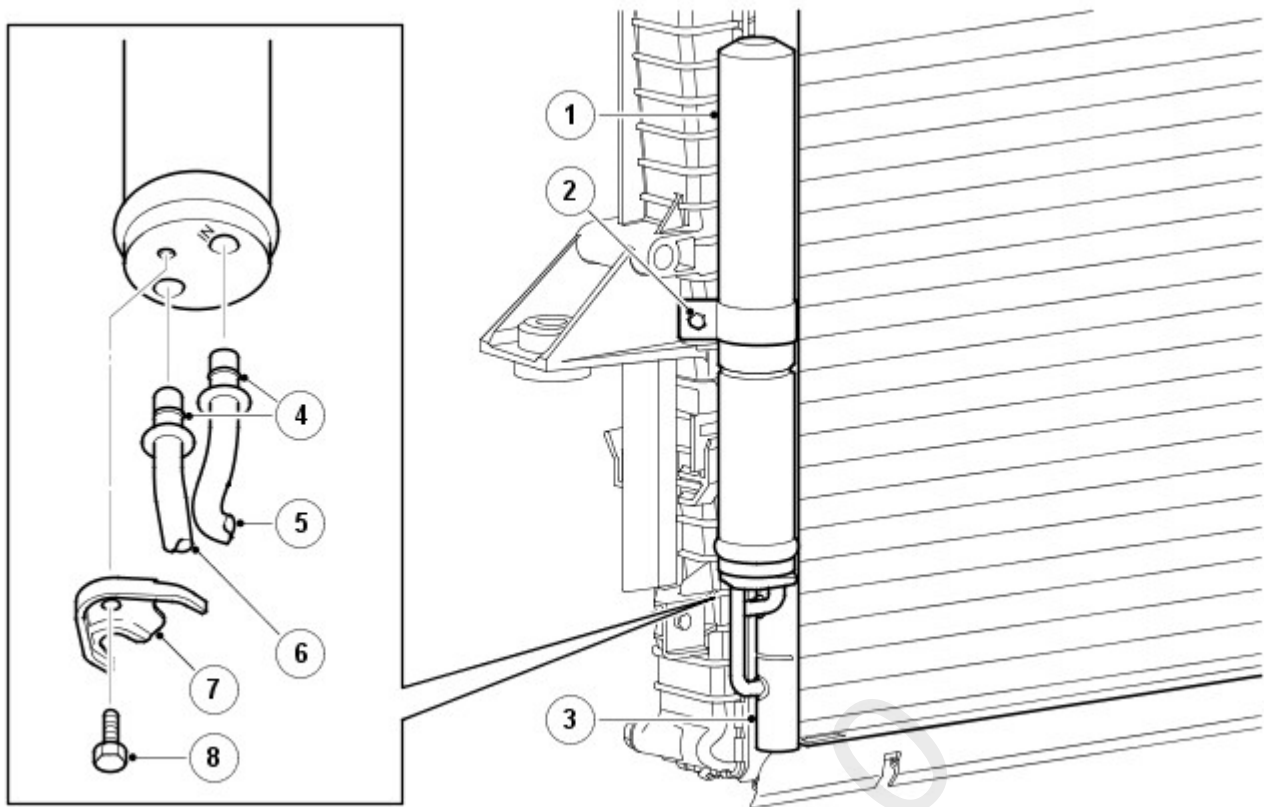
E46920

Item	Part Number	Description
1	-	right-hand (RH) end tank
2	-	Condenser core
3	-	left-hand (LH) end tank
4	-	High pressure line connector block
5	-	Condenser attachment brackets
6	-	Receiver drier pipes
7	-	Receiver drier attachment bracket

The condenser transfers heat from the refrigerant to the surrounding air to convert the high pressure vapor from the compressor into a liquid. The condenser is installed immediately in front of the radiator. Two brackets on each end tank of the condenser attach the condenser to clips on the end tanks of the radiator.

The condenser is classified as a sub-cooling condenser and consists of a fin and tube heat exchanger core installed between two end tanks. Divisions in the end tanks separate the heat exchanger into a four pass upper (condenser) section and a two pass lower (sub-cooler) section. A connector block on the left end tank of the condenser provides connections for the high pressure lines from the A/C compressor and the evaporator. Two pipes at the bottom of the right end tank of the condenser provide connections for the receiver drier.

RECEIVER DRIER



E46921

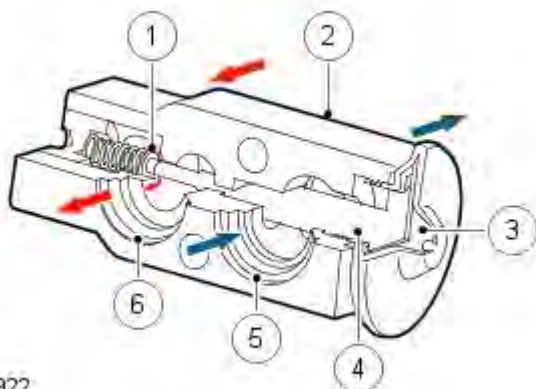
Item	Part Number	Description
1	-	Receiver drier
2	-	Clamp
3	-	Condenser RH end tank
4	-	O-ring seals
5	-	Inlet pipe
6	-	Outlet pipe
7	-	Collar
8	-	Bolt

The receiver drier removes solid impurities and moisture from the refrigerant, and provides a reservoir for liquid refrigerant to accommodate changes of heat load at the evaporator.

The receiver drier is attached to the two stub pipes on the right end tank of the condenser. A collar, located on lands on the stub pipes and secured with a bolt, attaches the stub pipes to the receiver drier. A clamp secures the body of the receiver drier to a bracket welded to the right end tank of the condenser. The inlet and outlet ports of the receiver drier are the same size, so care must be taken to install the receiver drier the correct way round on the stub pipes; to assist with installation, the inlet port is identified with the word IN etched into the receiver drier.

Refrigerant entering the receiver drier passes through a filter and a desiccant pack, then collects in the base of the unit before flowing through the outlet stub pipe back to the condenser. The desiccant and the filter are non-serviceable; the complete unit must be replaced when a change of desiccant is required.

THERMOSTATIC EXPANSION VALVE



E46922

Item	Part Number	Description
1	-	Metering valve
2	-	Housing

3	-	Diaphragm
4	-	Temperature sensitive tube
5	-	Outlet passage from evaporator
6	-	Inlet passage to evaporator

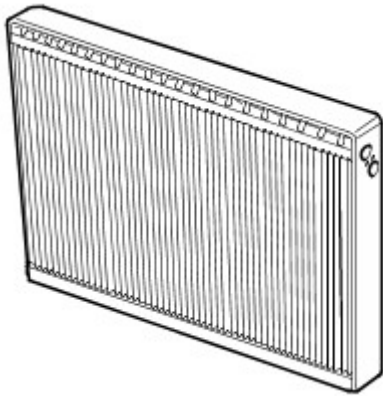
The thermostatic expansion valve meters the flow of refrigerant into the evaporator, to match the refrigerant flow with the heat load of the air passing through the evaporator.

The thermostatic expansion valve is a block type valve located behind the heater assembly, and attached to the inlet and outlet ports of the evaporator. The thermostatic expansion valve consists of an aluminum housing containing inlet and outlet passages. A ball and spring metering valve is installed in the inlet passage and a temperature sensor is installed in the outlet passage. The temperature sensor consists of a temperature sensitive tube connected to a diaphragm. The bottom end of the temperature sensitive tube acts on the ball of the metering valve. Pressure on top of the diaphragm is controlled by evaporator outlet temperature conducted through the temperature sensitive tube. The bottom of the diaphragm senses evaporator outlet pressure.

Liquid refrigerant flows through the metering valve into the evaporator. The restriction across the metering valve reduces the pressure and temperature of the refrigerant. The restriction also changes the liquid stream of refrigerant into a fine spray, to improve the evaporation process. As the refrigerant passes through the evaporator, it absorbs heat from the air flowing through the evaporator. The increase in temperature causes the refrigerant to vaporize and increase in pressure.

The temperature and pressure of the refrigerant leaving the evaporator act on the diaphragm and temperature sensitive tube, which regulate the metering valve opening and so control the volume of refrigerant flowing through the evaporator. The warmer the air flowing through the evaporator, the more heat available to evaporate refrigerant and thus the greater the volume of refrigerant allowed through the metering valve.

EVAPORATOR



The evaporator is installed in the heater assembly between the blower and the heater matrix, to absorb heat from the exterior or recirculated air. Low pressure, low temperature refrigerant changes from liquid to vapor in the evaporator, absorbing large quantities of heat as it changes state.

Most of the moisture in the air passing through the evaporator condenses into water, which drains out of the heater and through the floorpan, to the underside of the vehicle, through two drain tubes.

REFRIGERANT LINES

To maintain similar flow velocities around the system, the diameter of the refrigerant lines varies to suit the two pressure/temperature regimes. The larger diameters are installed in the low pressure/temperature regime and the smaller diameters are installed in the high pressure/temperature regime.

Low and high pressure charging connections are incorporated into the refrigerant lines for system servicing. Where auxiliary A/C is installed, connections for the auxiliary refrigerant lines are incorporated near the engine bulkhead.

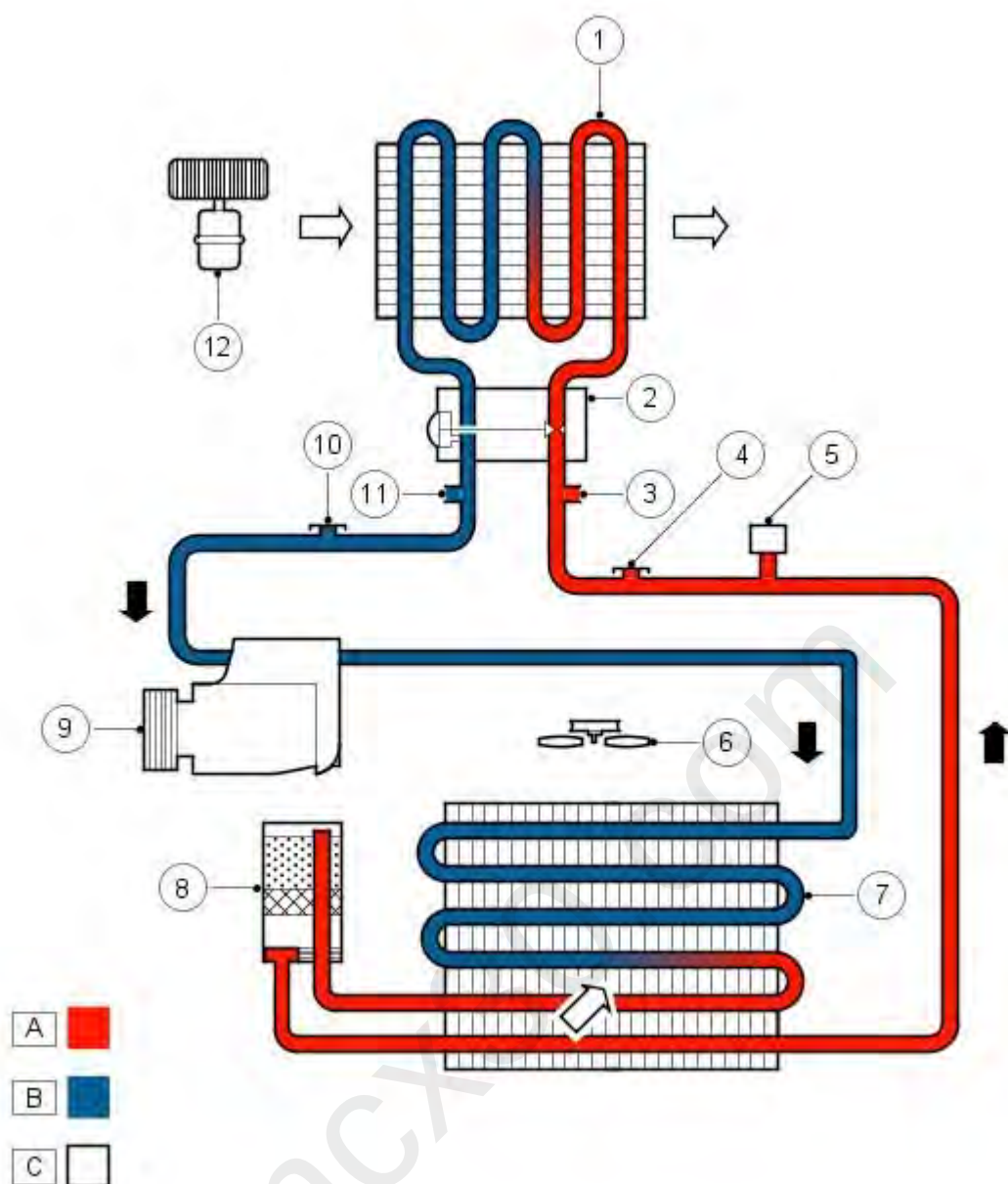
Under normal operating conditions, the smaller diameter pipes (A/C compressor discharge, liquid refrigerant) are hot to the touch and the larger diameter pipes (A/C compressor suction, gaseous refrigerant) are cold to the touch.

SYSTEM OPERATION

To accomplish the transfer of heat, the refrigerant is circulated around the system, where it passes through two pressure/temperature regimes. In each of the pressure/temperature regimes, the refrigerant changes state, during which process maximum heat absorption or release occurs. The low pressure/temperature regime is from the thermostatic expansion valve, through the evaporator to the compressor; the refrigerant decreases in pressure and temperature at the thermostatic expansion valve, then changes state from liquid to vapor in the evaporator, to absorb heat. The high pressure/temperature regime is from the compressor, through the condenser and receiver drier to the thermostatic expansion valve; the refrigerant increases in pressure and temperature as it passes through the compressor, then releases heat and changes state from vapor to liquid in the condenser.

A/C SYSTEM SCHEMATIC

- NOTE: A = Refrigerant liquid; B = Refrigerant vapor; C = Air flow



E46924

Item	Part Number	Description
1	-	Evaporator
2	-	Thermostatic expansion valve
3	-	High pressure connection with auxiliary climate control (where fitted)
4	-	High pressure servicing connection
5	-	Refrigerant pressure sensor
6	-	Cooling fan
7	-	Condenser
8	-	Receiver drier
9	-	A/C compressor
10	-	Low pressure servicing connection
11	-	Low pressure connection with auxiliary climate control (where fitted)
12	-	Blower

Air Conditioning - TDV6 2.7L Diesel - Air Conditioning

Diagnosis and Testing

Principle of Operation

For a detailed description of the air conditioning system and operation, refer to the relevant Description and Operation section of the workshop manual. REFER to: [Air Conditioning](#) (412-03A Air Conditioning - TDV6 2.7L Diesel, Description and Operation).

Inspection and Verification



CAUTION: Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault and may also cause additional faults in the vehicle being checked and/or the donor vehicle.

- **NOTE:** Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection

Mechanical	Electrical
• Auxiliary drive belt condition and tension • Compressor condition and installation • Condenser condition and installation/blockage • Air conditioning hoses and pipes • Receiver/drier condition and installation • Cooling fan	• Fuses • Harnesses • Electrical connector(s) • Relays • Sensors • Control panel(s) • Air conditioning compressor

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index.

Symptom Chart

Symptom	Possible Causes	Action
Poor or no cooling	• Drive belt fault • Compressor fault • Distribution motor/flap fault • Refrigerant leak • In-vehicle temperature sensor fault • Refrigerant pressure sensor fault	Check the drive belt condition and tension (see visual inspection). Check the compressor operation (observe the compressor as the engine is idling with the air conditioning switched on. If the compressor runs erratically or does not run. Carry out the distribution motor self test. Refer to the relevant workshop manual section. Check for sensor DTCs. Refer to the DTC index. Check the refrigerant system using your charging station.
Noise	• Drive belt fault • Compressor fault • Compressor pulley fouling • Refrigerant overcharged	Confirm the air conditioning as the source of the noise by listening for the noise with the air conditioning switched off. Refer to the relevant workshop manual section. Check the refrigerant system using your charging station.
Water entry into cabin	• Heater matrix leak • Blocked evaporator drain tubes	Check for coolant loss. Pressure test the cooling system as necessary. Check and clear the evaporator drain tubes as necessary.

DTC Index

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: [Diagnostic Trouble Code \(DTC\) Index - DTC: Climate Control Module \(HVAC\)](#) (100-00 General Information, Description and Operation).

Air Conditioning - TDV6 2.7L Diesel - Air Conditioning (A/C) Compressor

Removal and Installation

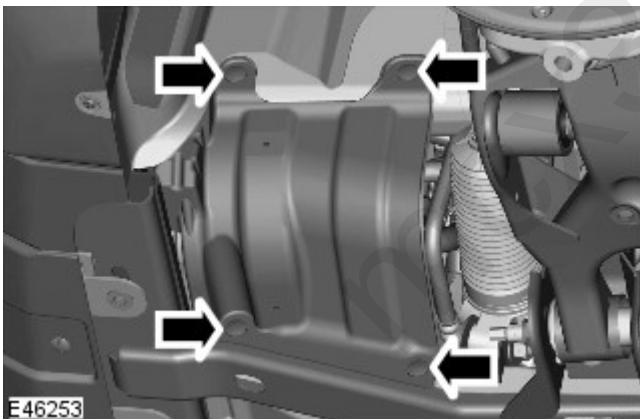
Removal

1.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

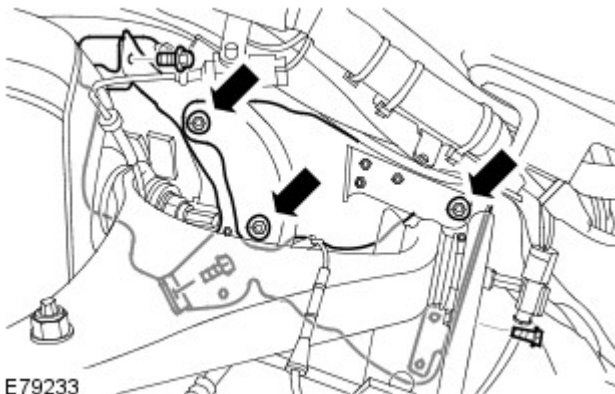
For additional information, refer to: [Jacking](#) (100-02 Jacking and Lifting, Description and Operation).

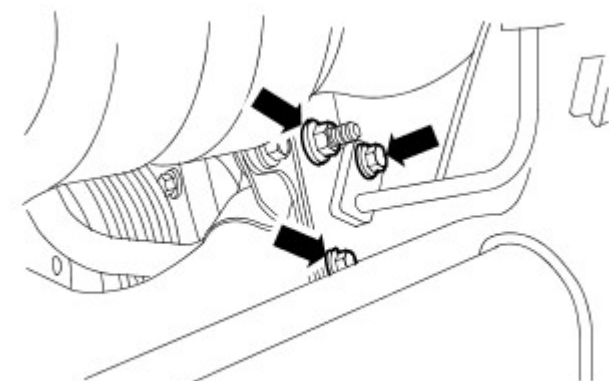
2. Disconnect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).
3. Remove the engine cover.
For additional information, refer to: [Engine Cover - TDV6 3.0L Diesel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).
4. Recover the air conditioning (A/C) refrigerant.
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).
5. Remove the auxiliary battery tray.
For additional information, refer to: [Auxiliary Battery Tray](#) (414-01 Battery, Mounting and Cables, Removal and Installation).
6. Remove the accessory drive belt.
For additional information, refer to: [Accessory Drive Belt](#) (303-05A Accessory Drive - TDV6 2.7L Diesel, Removal and Installation).
7. Remove the LH front wheel and tire.
8. Remove the front LH fender splash shield.
For additional information, refer to: [Fender Splash Shield](#) (501-02 Front End Body Panels, Removal and Installation).
9. Remove the fender splash shield lower trim panel.
 - Remove the 4 clips.



10. Remove the upper arm and brake line heat shields for access.

- Remove the 3 nuts.
- Remove the 3 bolts.

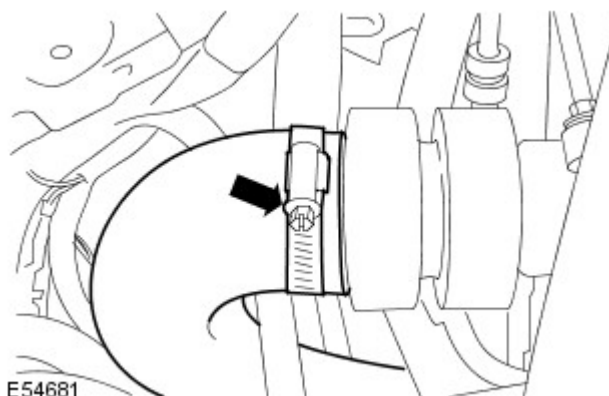




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11. Release the charge air cooler inlet pipe.

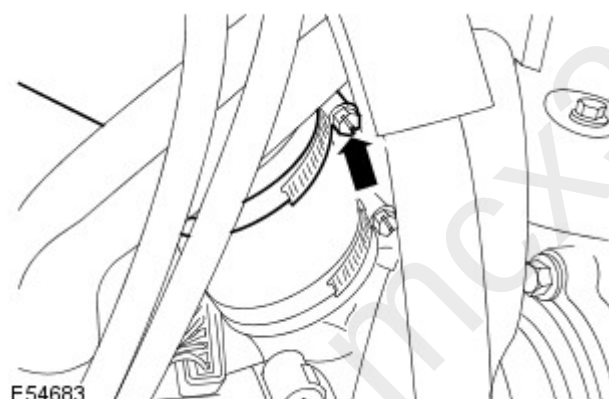
- Remove the two retaining bolts.
- Remove the retaining nut.



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12. Disconnect the charge air cooler inlet hose.

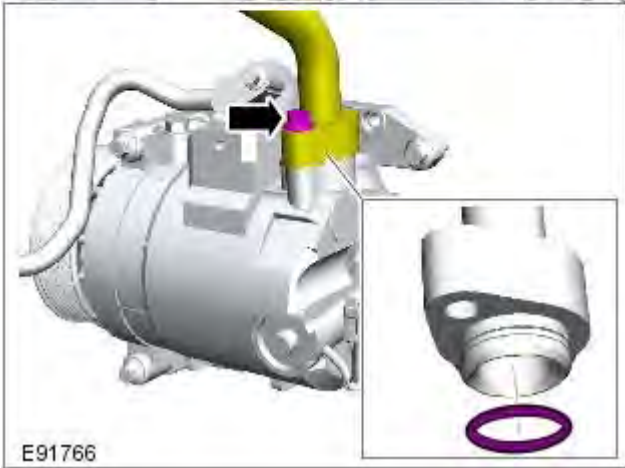
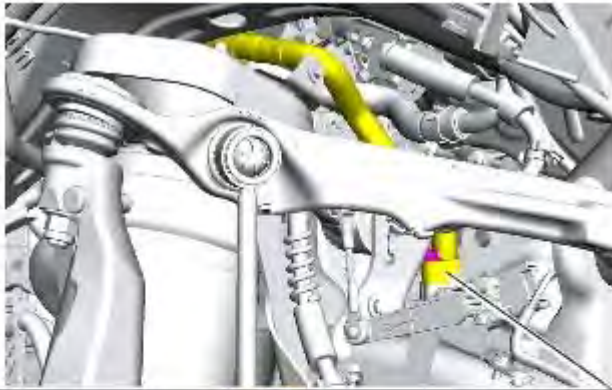
- Loosen the clip.



E54683

13. Disconnect the charge air cooler inlet hose.

- Loosen the clip.



14. CAUTIONS:



Immediately cap all refrigerant lines to prevent ingress of dirt and moisture.



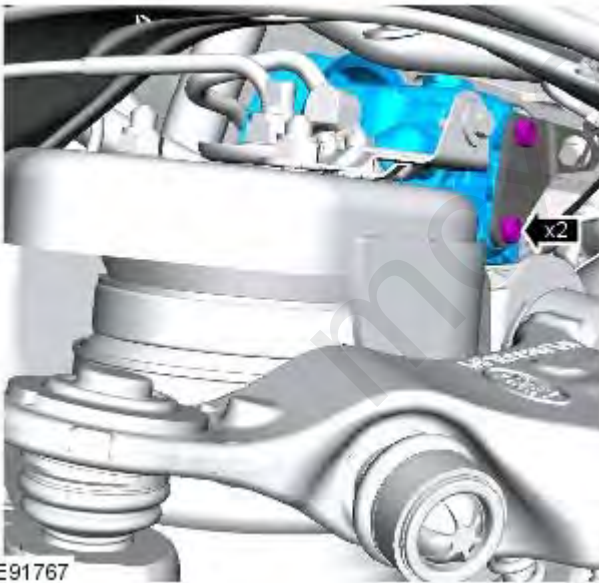
Care must be taken to avoid damage to the mating surfaces.

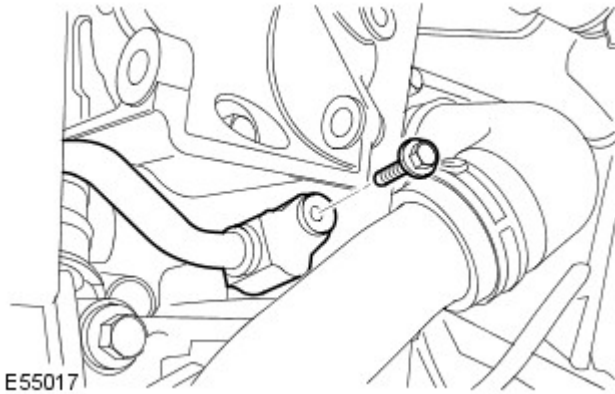
Release the A/C low-pressure pipe from the compressor.

- Remove and discard the O-ring seal.
- Using a suitable tie strap, secure the A/C low-pressure pipe aside.

15. Release the power steering pump support bracket.

- Reposition the charge air cooler inlet pipe to gain access to the power steering pump retaining bolts.
- Remove the 2 bolts.





16. CAUTIONS:



Immediately cap all refrigerant lines to prevent ingress of dirt and moisture.



Care must be taken to avoid damage to the mating surfaces.

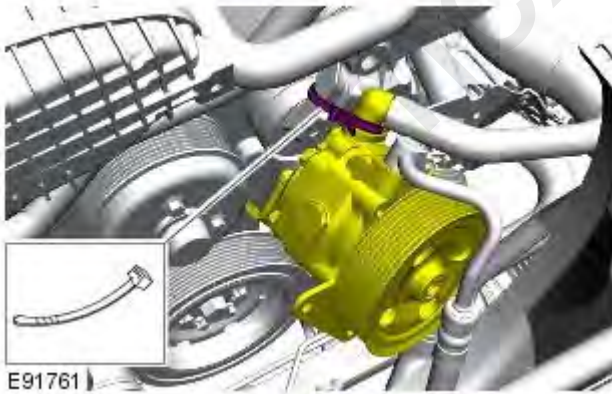
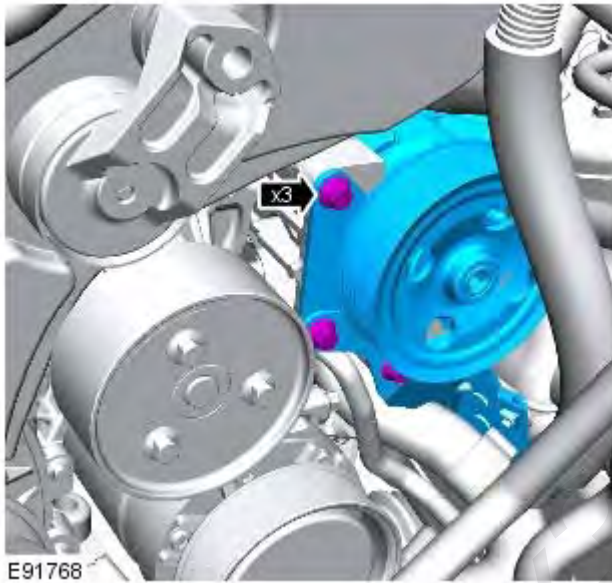
Disconnect the A/C compressor high-pressure pipe.

- Remove the LH retaining bolt.
- Remove and discard the O-ring seal.

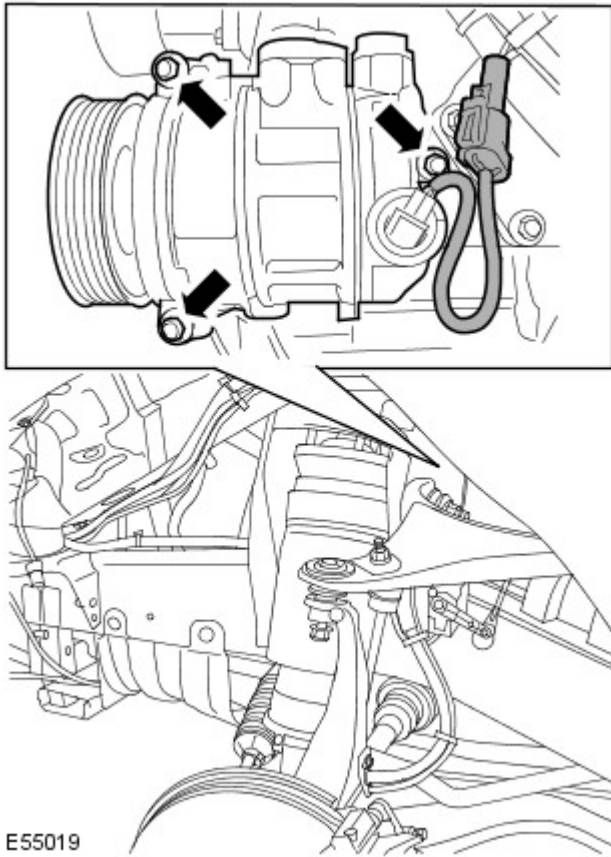
17. Reposition the A/C compressor high-pressure pipe.

18. Release the power steering pump.

- Collect the support bracket.



19. Using a suitable tie strap, secure the power steering pump.



20. Remove the A/C compressor.

- Disconnect the A/C compressor electrical connector.
- Remove the three retaining bolts.

Installation

1.  **CAUTION:** Lubricate the new seals with clean refrigerant oil.

Install the A/C compressor.

- Install the three retaining bolts.
- Tighten the bolts to 23 Nm (17 lb.ft).
- Connect the A/C compressor electrical connector.

2. Secure the power steering pump.

- Remove and discard the tie strap.
- Install the support bracket.

3. Reposition the A/C compressor high-pressure pipe.

4. Connect the A/C compressor high-pressure pipe.

- Remove the blanking caps from the ports.
- Install a new O-ring seal.
- Tighten the retaining bolt to 9 Nm (7 lb.ft).

5. Install the power steering pump rear bolts.

- Reposition the charge air cooler inlet pipe to gain access to the power steering pump retaining bolts.
- Tighten the bolts to 22 Nm (16 lb.ft).

6. Connect the A/C compressor low-pressure pipe.

- Remove the blanking caps from the ports.
- Install a new O-ring seal.
- Tighten the retaining bolt to 9 Nm (7 lb.ft).

7. Connect the charge air cooler inlet hose.
 - Tighten the clips.
8. Secure the charge air cooler inlet pipe.
 - Install the two retaining bolts.
 - Install the retaining nut.
 - Tighten to 10 Nm (7 lb.ft).
9. Install the upper arm and brake line heat shields.
 - Install the 3 bolts.
 - Install the 3 nuts.
10. Install the fender splash shield lower trim panel.
 - Install the 4 clips.
11. Install the front LH fender splash shield.
For additional information, refer to: [Fender Splash Shield](#) (501-02 Front End Body Panels, Removal and Installation).
12. Install the wheel and tire.
 - Tighten nuts to 140 Nm (103 lb.ft).
13. Install the accessory drive belt.
For additional information, refer to: [Accessory Drive Belt](#) (303-05A Accessory Drive - TDV6 2.7L Diesel, Removal and Installation).
14. Install the auxiliary battery tray.
For additional information, refer to: [Auxiliary Battery Tray](#) (414-01 Battery, Mounting and Cables, Removal and Installation).
15. Recharge the A/C system
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).
16. Install the engine cover.
For additional information, refer to: [Engine Cover - TDV6 3.0L Diesel](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).
17. Connect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

Air Conditioning - TDV6 2.7L Diesel - Air Conditioning (A/C) Pressure Transducer

Removal and Installation

Removal

1. Disconnect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).
2. Recover the A/C refrigerant.
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).

3. CAUTIONS:



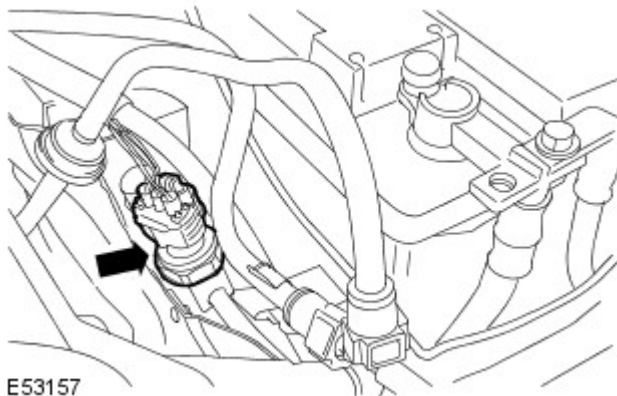
Before disconnecting or removing the components, ensure the area around the joint faces and connections are clean. Plug open connections to prevent contamination.



To prevent damage to components, use an additional wrench when loosening or tightening unions.

Remove the A/C pressure transducer.

- Disconnect the electrical connector.
- Remove and discard the seal.



E53157

Installation

1. Install the A/C pressure transducer.
 - Clean the component mating faces.
 - Install a new seal.
 - Tighten the transducer to 10 Nm (7 lb.ft).
 - Connect the electrical connector.
2. Recharge the A/C system.
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).
3. Connect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

Air Conditioning - TDV6 2.7L Diesel - Condenser Core

Removal and Installation

Removal

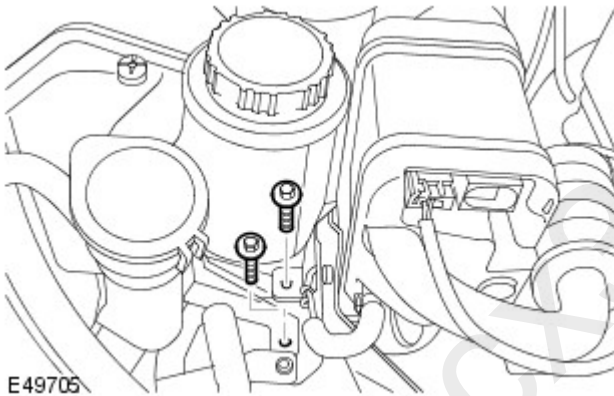
• **NOTE:** The receiver drier need only be changed under the following circumstances: There is dirt in the refrigerant circuit (eg. compressor seizure). The system is leaking and refrigerant has been lost to atmosphere. Refrigerant circuit has been open more than 24 hours due to repair.

1.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

Raise and support the vehicle.

2. Disconnect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).
3. Recover the A/C refrigerant.
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).
4. Remove the cooling fan lower shroud.
For additional information, refer to: [Cooling Fan Shroud](#) (303-03A Engine Cooling - TDV6 2.7L Diesel, Removal and Installation).
5. Remove the radiator grille.
For additional information, refer to: [Radiator Grille](#) (501-08 Exterior Trim and Ornamentation, Removal and Installation).
6. Release the coolant expansion tank.

- Remove the 2 bolts.

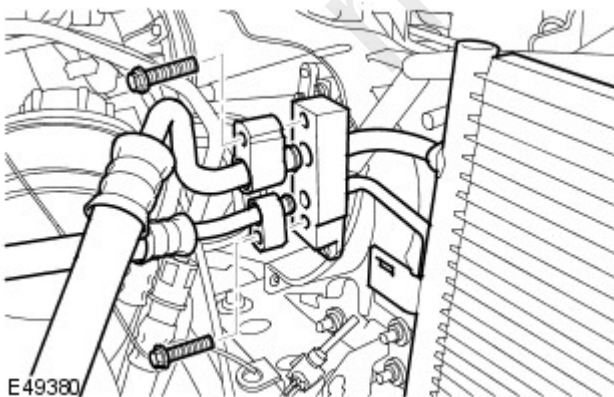


E49705

7.  **CAUTION:** Immediately cap all refrigerant lines to prevent ingress of dirt and moisture.

Disconnect the A/C condenser refrigerant lines.

- Remove the 2 bolts.
- Discard the O-ring seals.

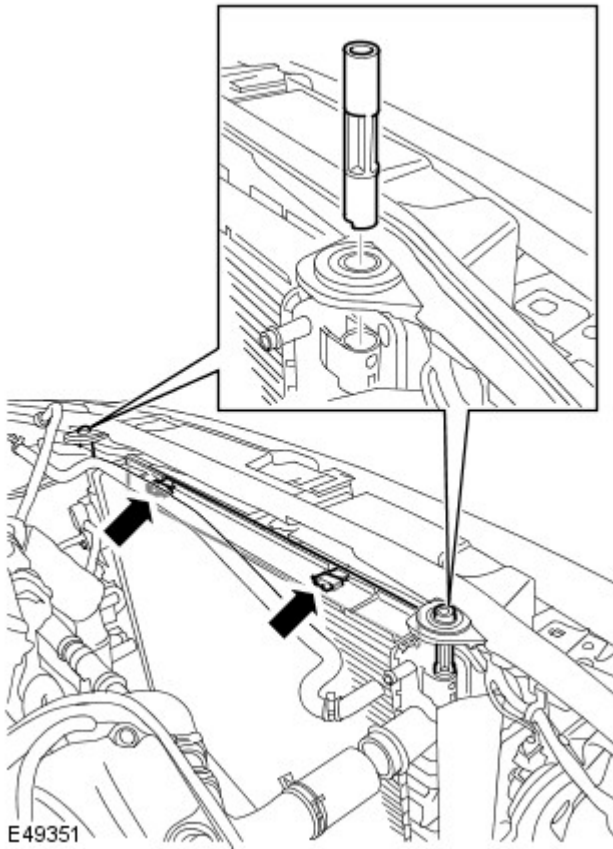


E49380

8. Remove the radiator securing pegs.

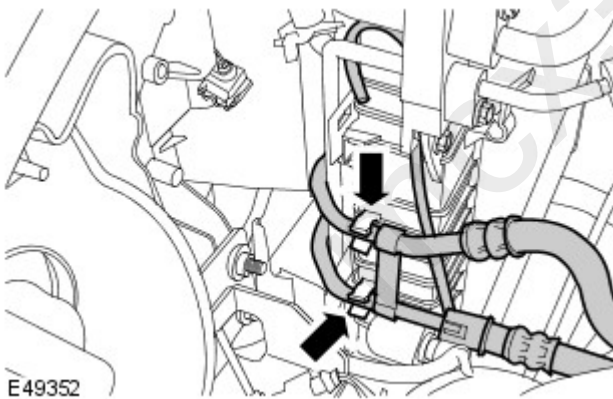
9. Remove the radiator upper deflector.

- Release the 2 clips.

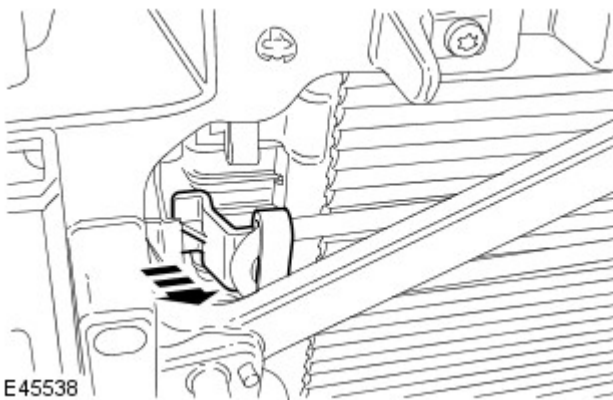


10. Release the power steering fluid cooler.

- Release it from 3 clips.



11. Release the front differential breather line.



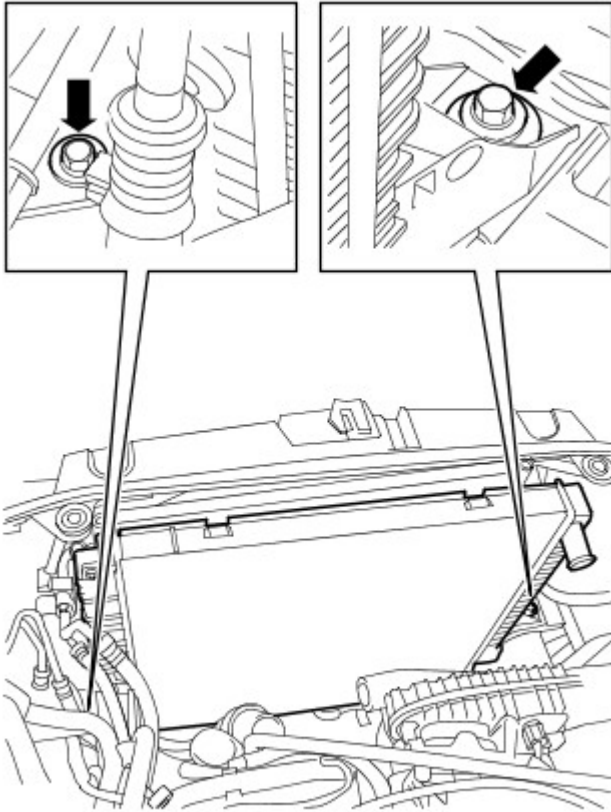
12. Remove the power steering fluid cooler line clip.

13. Tie the engine air intake duct towards the engine.

14. Tie the fuel fired booster heater coolant lines towards the engine.

15. Move the radiator towards the engine.

- Remove the 2 bolts.
- Lift it clear of its mountings.
- Tie the radiator towards the engine.



E49354

16. Remove the A/C condenser.

- Remove the bolt.
- Release it from the 4 clips

Installation

1. Install the A/C condenser.

2. Position the radiator.

- Lift the radiator onto its mountings.
- Tighten the bolts to 25 Nm (18 lb.ft).

3. Position the front differential breather line.

4. Install the power steering fluid cooler line clip.

5. Secure the power steering fluid cooler line.

- Secure in the 3 clips.

6. Install the radiator upper deflector.

7. Install the radiator securing pegs.

8. Secure the coolant expansion tank.

- Tighten the 2 bolts to 10 Nm (7 lb.ft).

9. Connect the A/C condenser refrigerant lines.

- Clean the component mating faces.
- Install new O-ring seals.
- Tighten the bolts to 25 Nm (18 lb.ft).

10. Install the radiator grille.

For additional information, refer to: [Radiator Grille](#) (501-08 Exterior Trim and Ornamentation, Removal and Installation).

11. Install the cooling fan lower shroud.

For additional information, refer to: [Cooling Fan Shroud](#) (303-03A Engine Cooling - TDV6 2.7L Diesel, Removal and Installation).

12. Fill the A/C system.

For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).

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Air Conditioning - TDV6 2.7L Diesel - Evaporator Core

Removal and Installation

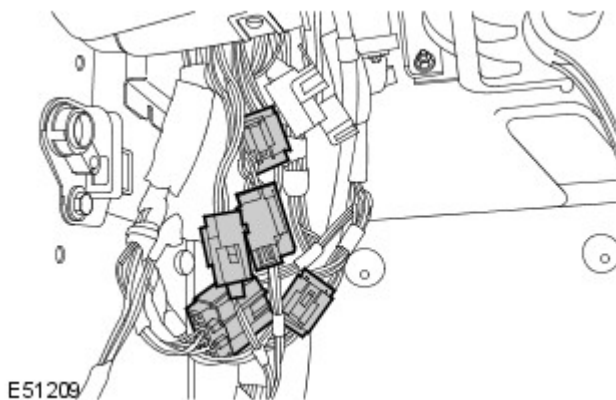
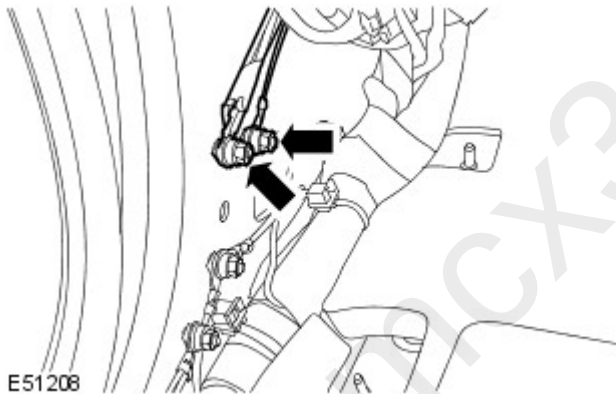
Removal

1. Remove the engine cover.
For additional information, refer to: [Engine Cover - 2.7L V6 - TdV6](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).
2. Evacuate the A/C system.
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).

3.  **WARNING:** Do not work on or under a vehicle supported only by a jack. Always support the vehicle on safety stands.

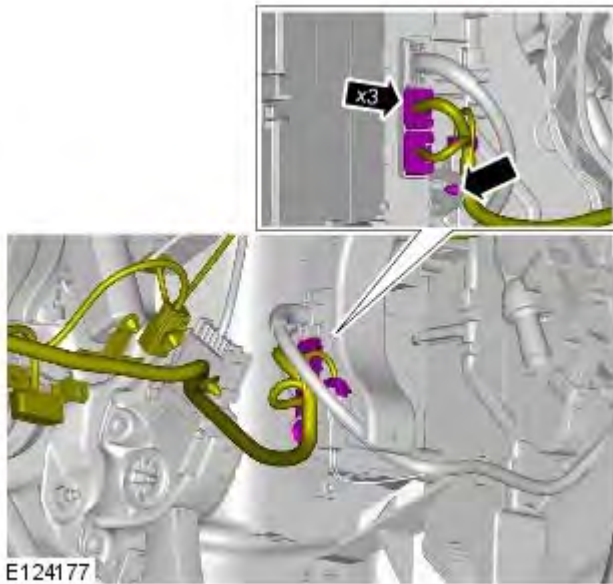
Raise and support the vehicle.

4. Drain the cooling system.
For additional information, refer to: [Cooling System Draining, Filling and Bleeding](#) (303-03A Engine Cooling - TDV6 2.7L Diesel, General Procedures).
5. Remove the driver side front seat.
For additional information, refer to: [Front Seat](#) (501-10 Seating, Removal and Installation).
6. Remove the floor console.
For additional information, refer to: [Floor Console](#) (501-12 Instrument Panel and Console, Removal and Installation).
7. Remove the instrument panel upper section.
For additional information, refer to: [Instrument Panel Upper Section](#) (501-12 Instrument Panel and Console, Removal and Installation).
8. Release the 3 ground cables from the driver side lower A-pillar.
 - Remove the 2 nuts.



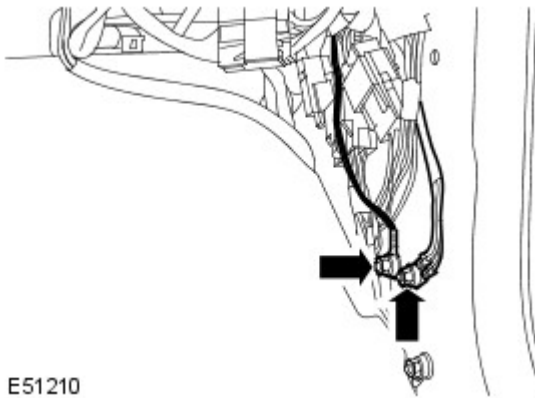
9. Disconnect the 5 electrical connectors from the driver side lower A-pillar.

10. Disconnect the 3 electrical connectors.



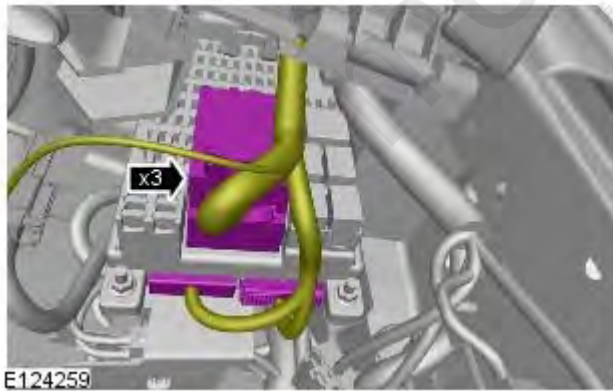
11. Release the 3 ground cables from the passenger side lower A-pillar.

- Remove the 2 nuts.



12. Disconnect the 5 electrical connectors from the passenger side lower A-pillar.

13. Disconnect the central junction box (CJB) three electrical connectors.



14. Disconnect 2 electrical connectors from the instrument panel center reinforcement.

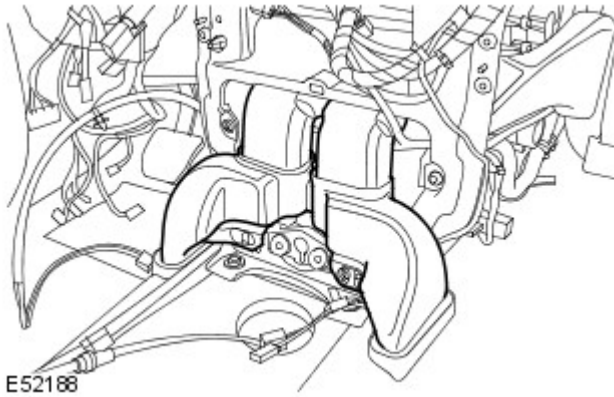


15.  **CAUTION:** Cover fiber optic cable connectors to minimize dust ingress and avoid bending the cables in a radius of less than 30 mm.

If installed, disconnect the instrument panel center reinforcement fibre optic cables.

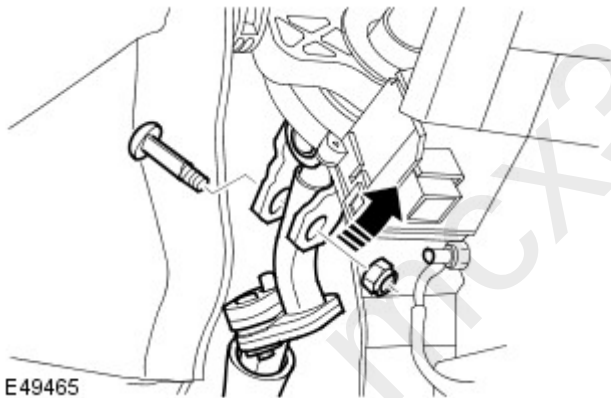
- Disconnect the electrical connector.

16. Remove the heater housing center ducts.



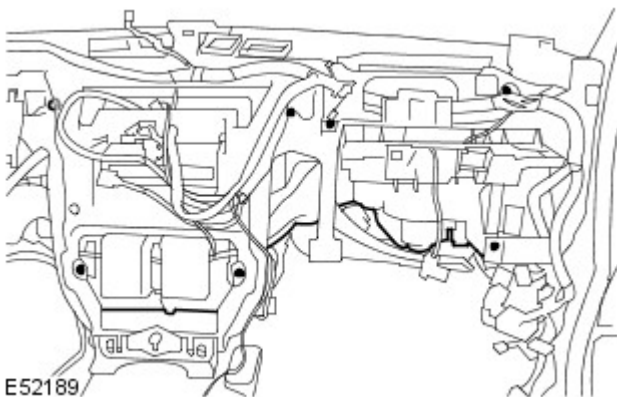
17. Disconnect the steering column intermediate shaft from the steering column.

- Note the fitted position.
- Remove the special bolt and discard the nut.



18. Release the heater housing from the instrument panel carrier.

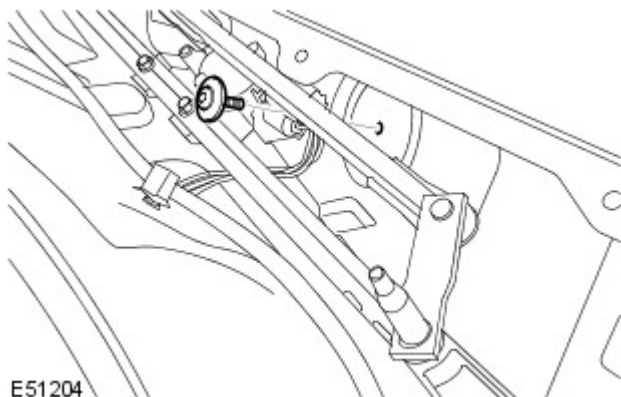
- Remove the 7 Torx screws.



19. Remove the plenum chamber panel.

For additional information, refer to: [Plenum Chamber](#) (412-01 Air Distribution and Filtering, Removal and Installation).

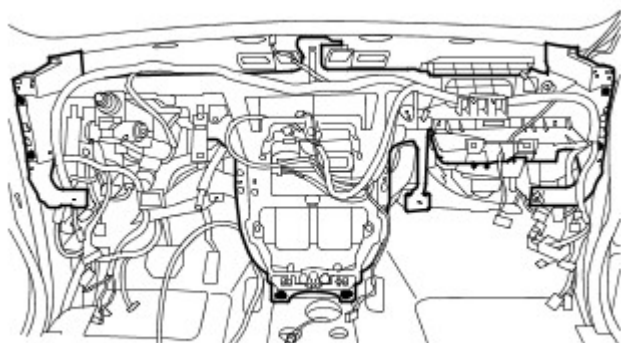
20. Remove the instrument panel carrier to bulkhead Torx bolt.



E51204

21. With assistance, remove the instrument panel.

- Remove the 6 Torx bolts.

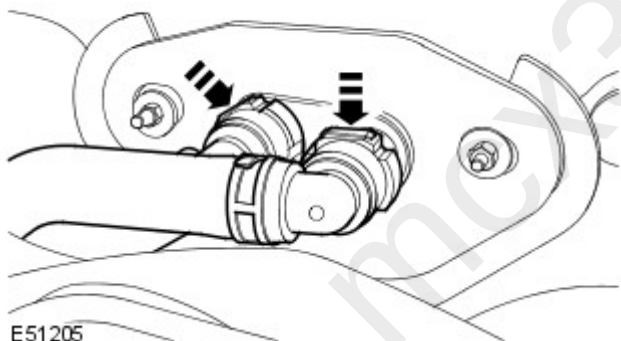


E52190

22.  **CAUTION:** Before disconnecting or removing the components, make sure the area around the joint faces and connections are clean. Plug open connections to prevent contamination.

Disconnect 2 heater hoses from the bulkhead.

- Release the 2 clips.

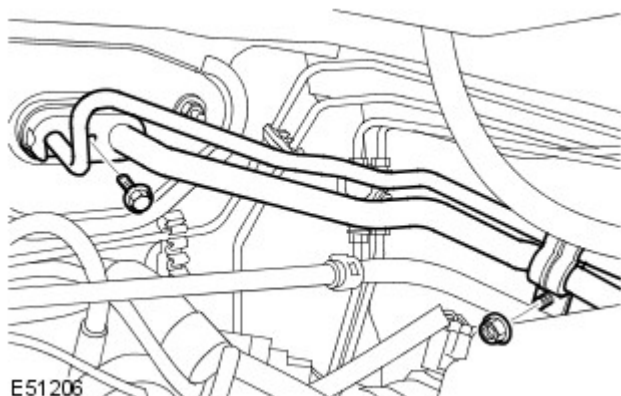


E51205

23.  **CAUTION:** Immediately cap all refrigerant lines to prevent ingress of dirt and moisture.

Release the 2 A/C refrigerant lines.

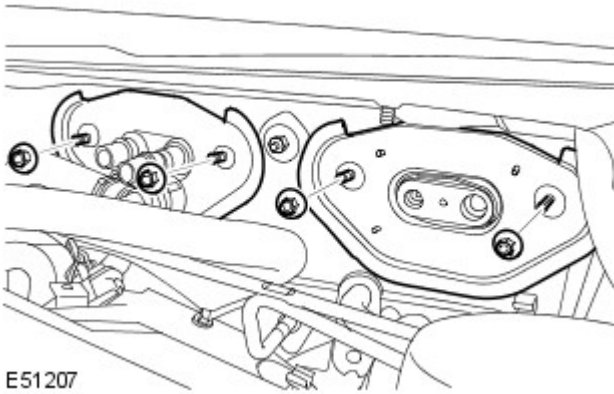
- Remove the nut and bolt.
- Remove and discard the O-ring seals.



E51206

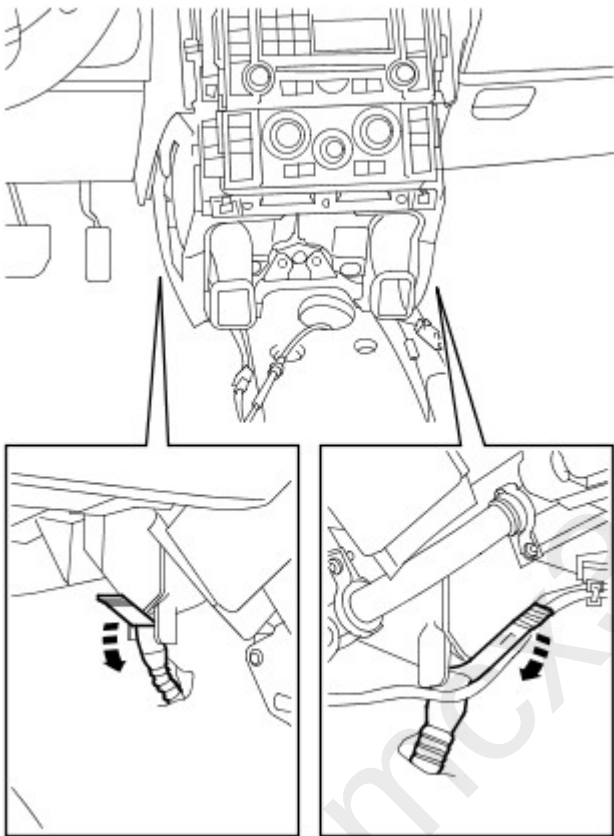
24. Remove the 2 adapter panels.

- Remove the 4 nuts.



E51207

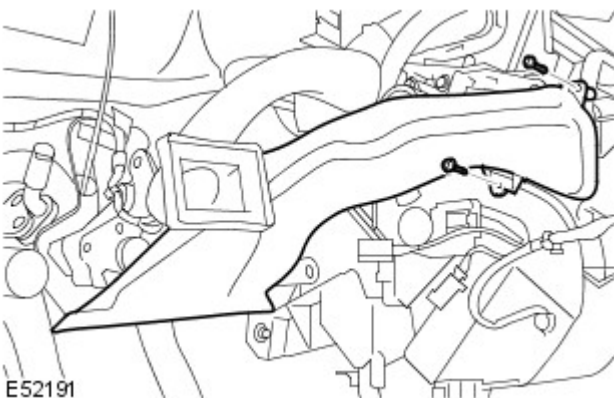
25. Disconnect 2 drain tubes from the heater housing.



E51199

26. Remove the driver side footwell duct.

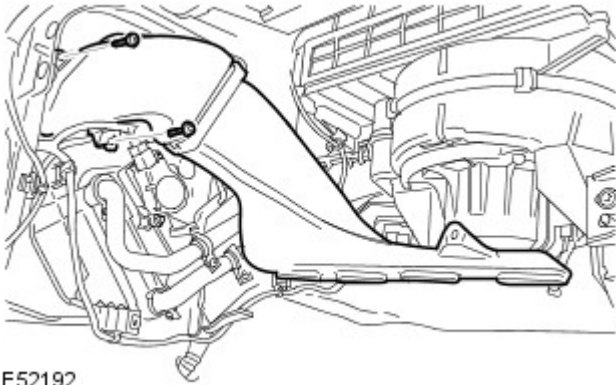
- Remove the 2 Torx screws.



E52191

27. Remove the passenger side footwell duct.

- Remove the 2 Torx screws.



E52192

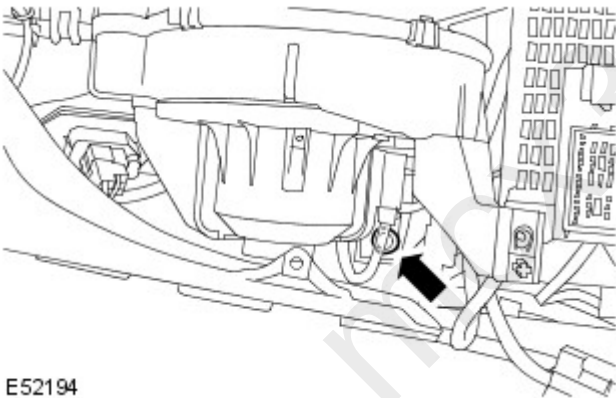
28. Driver side: Remove the heater housing to bulkhead Torx bolt.



E52193

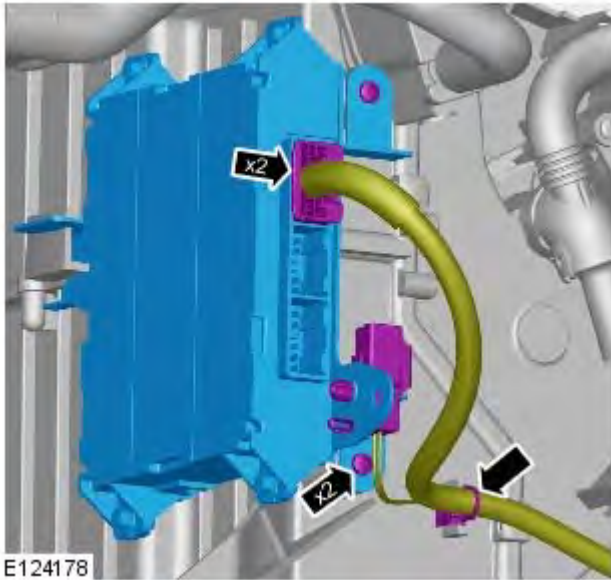
29. Passenger side: Remove the heater housing to bulkhead Torx bolt.

- With assistance, remove the heater and evaporator core housing.

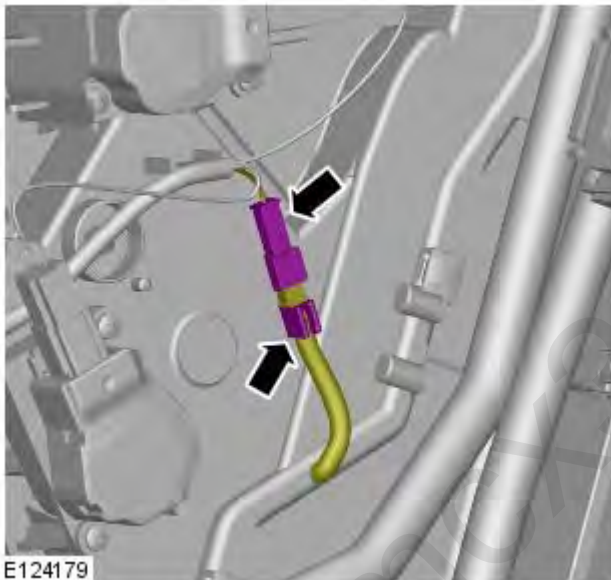


E52194

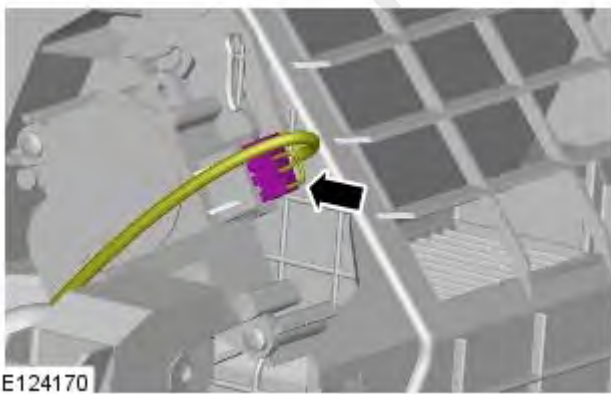
30. Remove the A/C control module.



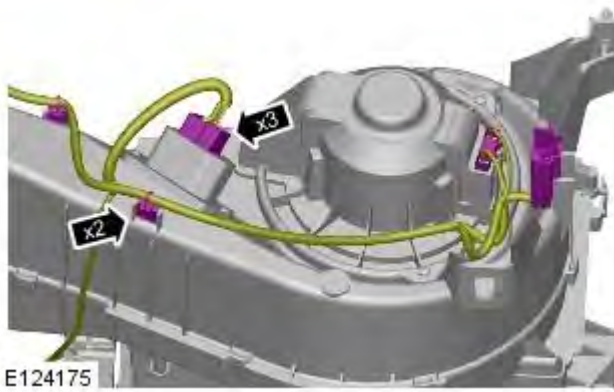
31. Disconnect the evaporator core temperature sensor electrical connector.



32. Disconnect the electrical connector.



33. Detach the wiring harness.

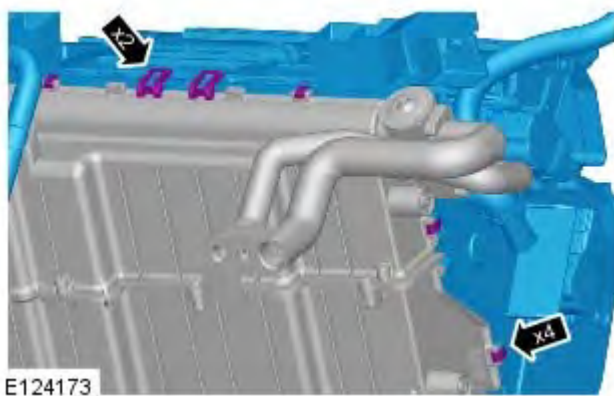
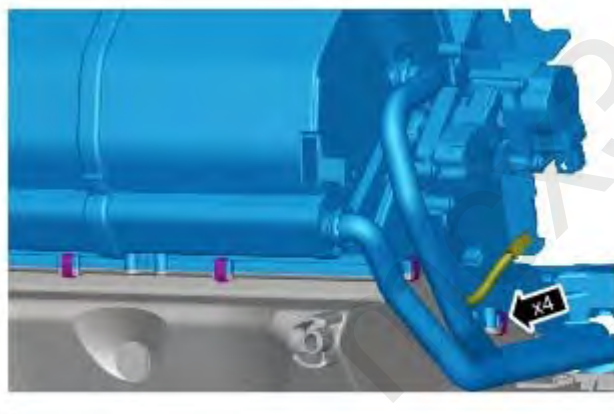


34. Remove the bolt from the support bracket.

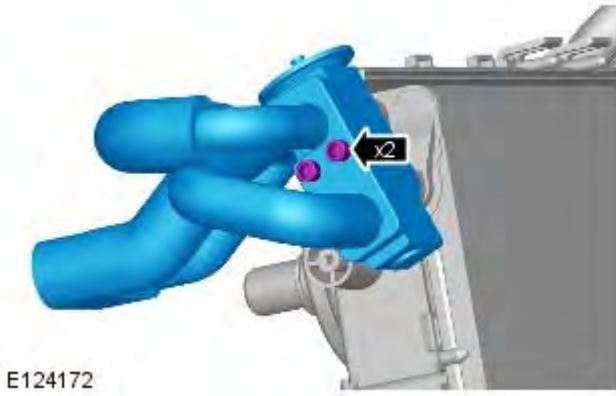


35. Remove the heater and evaporator core housing.

- Remove the 8 clips.
- Carefully release the 2 clips.

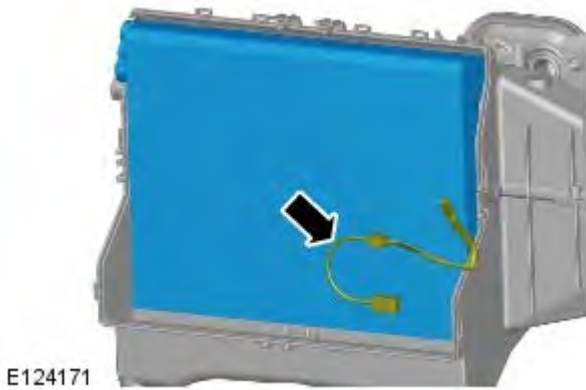


36. Remove the thermostatic expansion valve.



37. Remove the evaporator core.

- Release the temperature sensor.



Installation

1. Install the evaporator core.
 - Secure the temperature sensor.
2. Secure the heater core housing.
 - Install the clips.
3. Install the thermostatic expansion valve.
 - Tighten the bolts to 3.5 Nm (2.5 lb.ft).
4. Install the wiring harness.
5. Install and tighten the bolt.
6. Connect the temperature sensor electrical connector.
7. Install the CC module.
 - Tighten the bolts.
8. Passenger side: Install the heater housing to bulkhead Torx bolt and tighten to 6 Nm (4 lb.ft).
 - With assistance, install the heater and evaporator core housing.
9. Driver side: Install the heater housing to bulkhead Torx bolt and tighten to 6 Nm (4 lb.ft).
10. Install the footwell ducts.
 - Tighten the Torx screws.
11. Connect the drain tubes to the heater housing.
12. Install the adapter panels.
 - Tighten the nuts to 6 Nm (4 lb.ft).
13. Secure the A/C refrigerant lines.

- Clean the components.
 - Install new O-ring seals.
 - Tighten the bolt to 5 Nm (4 lb.ft).
 - Tighten the nut to 6 Nm.
- 14.** Connect the bulkhead heater hoses.
- 15.** With assistance, install the instrument panel.
- Tighten the Torx bolts to 25 Nm (18 lb.ft).
- 16.** Install the instrument panel carrier to bulkhead Torx bolt and tighten to 25 Nm (18 lb.ft).
- 17.** Install the plenum chamber panel.
For additional information, refer to: [Plenum Chamber](#) (412-01 Air Distribution and Filtering, Removal and Installation).
- 18.** Secure the heater housing.
- Tighten the screws.
- 19.** Connect the steering column intermediate shaft.
- Install the special bolt and tighten the new nut to 22 Nm (16 lb.ft).
- 20.** Install the heater housing center ducts.
- 21.** Connect the instrument panel center reinforcement fibre optic cables.
- 22.** Connect the instrument panel center reinforcement electrical connectors.
- 23.** Connect the CJB electrical connectors.
- 24.** Connect the electrical connectors to the passenger side lower A-pillar.
- 25.** Connect the ground cables to the passenger side lower A-pillar.
- Tighten the nuts to 10 Nm (7 lb.ft).
- 26.** Connect the electrical connectors to the driver side lower A-pillar.
- 27.** Connect the ground cables to the driver side lower A-pillar.
- Tighten the nuts to 10 Nm (7 lb.ft).
- 28.** Connect the 3 electrical connectors.
- 29.** Install the instrument panel upper section.
For additional information, refer to: [Instrument Panel Upper Section](#) (501-12 Instrument Panel and Console, Removal and Installation).
- 30.** Install the floor console.
For additional information, refer to: [Floor Console](#) (501-12 Instrument Panel and Console, Removal and Installation).
- 31.** Install the front seat.
For additional information, refer to: [Front Seat](#) (501-10 Seating, Removal and Installation).
- 32.** Recharge the A/C system.
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).
- 33.** Refill the cooling system.
For additional information, refer to: [Cooling System Draining, Filling and Bleeding](#) (303-03A Engine Cooling - TDV6 2.7L Diesel, General Procedures).
- 34.** Install the engine cover.
For additional information, refer to: [Engine Cover - 2.7L V6 - TdV6](#) (501-05 Interior Trim and Ornamentation, Removal and Installation).

Air Conditioning - TDV6 2.7L Diesel - Thermostatic Expansion Valve

Removal and Installation

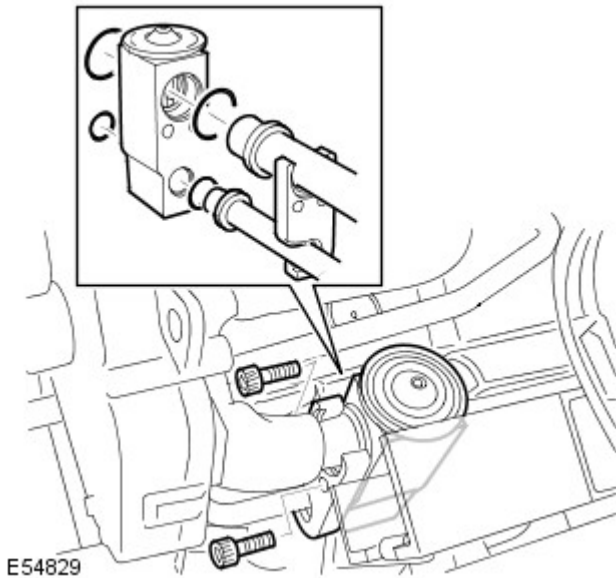
Removal

1. Evacuate the A/C system.
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).
2. Remove the instrument panel upper section.
For additional information, refer to: [Instrument Panel Upper Section](#) (501-12 Instrument Panel and Console, Removal and Installation).

3.  **CAUTION:** Immediately cap all refrigerant lines to prevent ingress of dirt and moisture.

Remove the thermostatic expansion valve.

- Remove the cover.
- Remove the 2 Allen bolts.
- Remove and discard the 4 O-ring seals.



Installation

1. Install the thermostatic expansion valve.
 - Clean the components.
 - Install the new O-ring seals.
 - Tighten the Allen bolts to 5 Nm (4 lb.ft).
 - Install the cover.
2. Install the instrument panel upper section.
For additional information, refer to: [Instrument Panel Upper Section](#) (501-12 Instrument Panel and Console, Removal and Installation).
3. Recharge the A/C system.
For additional information, refer to: [Air Conditioning \(A/C\) System Recovery, Evacuation and Charging](#) (412-00 Climate Control System - General Information, General Procedures).

Air Conditioning - TDV6 2.7L Diesel - Air Conditioning (A/C) Compressor Pulley

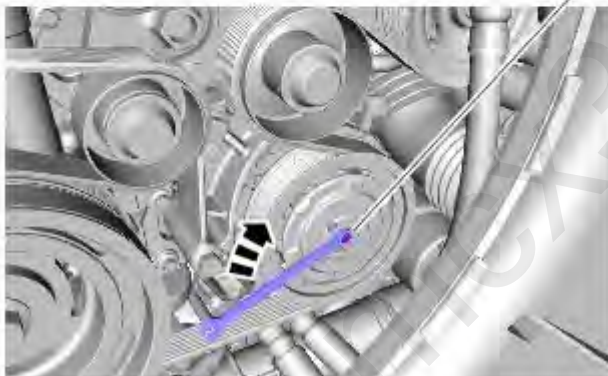
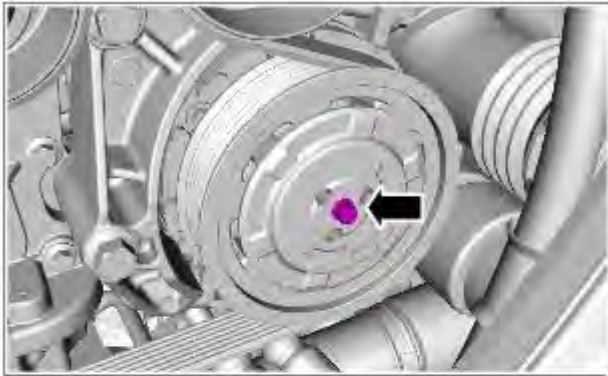
Removal and Installation

Removal

- NOTE: Some variation in the illustrations may occur, but the essential information is always correct.
- NOTE: Components removed for clarity.

1. Disconnect the battery ground cable.
For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).
2. Remove the cooling fan.
For additional information, refer to: [Cooling Fan](#) (303-03A Engine Cooling - TDV6 2.7L Diesel, Removal and Installation).
3. Using a suitable tool, release the hub locking stud.

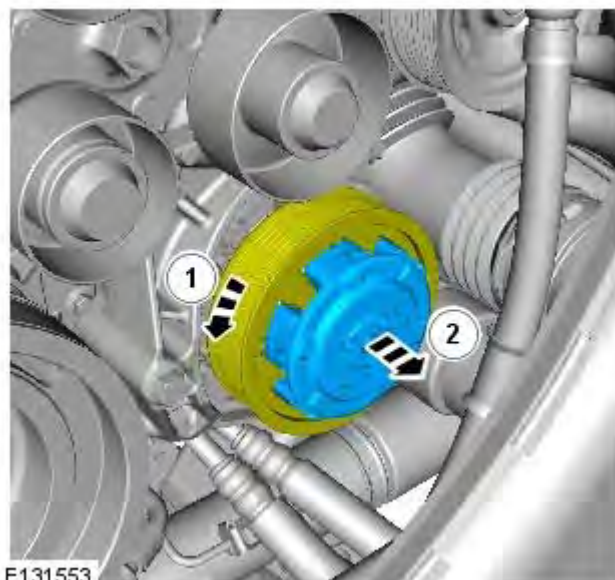
- Rotate the fixing clockwise to release the hub.
- If required, use a suitable tool to prevent the hub from rotating.



E131552

4. NOTE: Using a 3/8 square drive wrench, rotate the tensioner counter clockwise.

Release the accessory drive belt from the A/C compressor pulley.

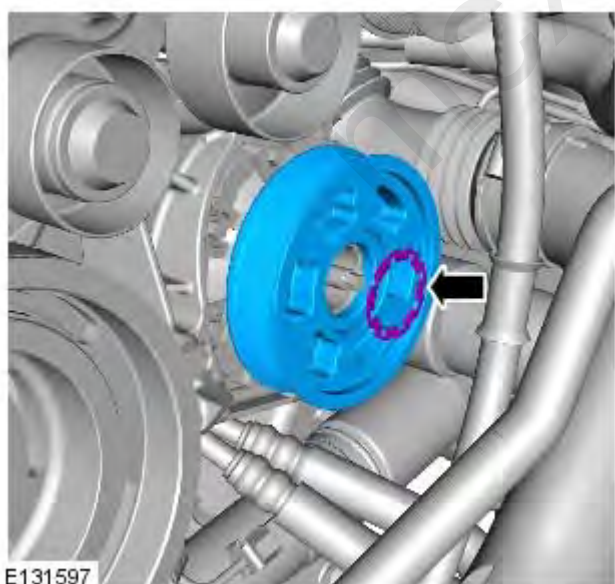


5. Remove and discard the hub assembly.

- Rotate the pulley counter-clockwise, until the hub is released from the pulley.
- Discard the rubber dampers.



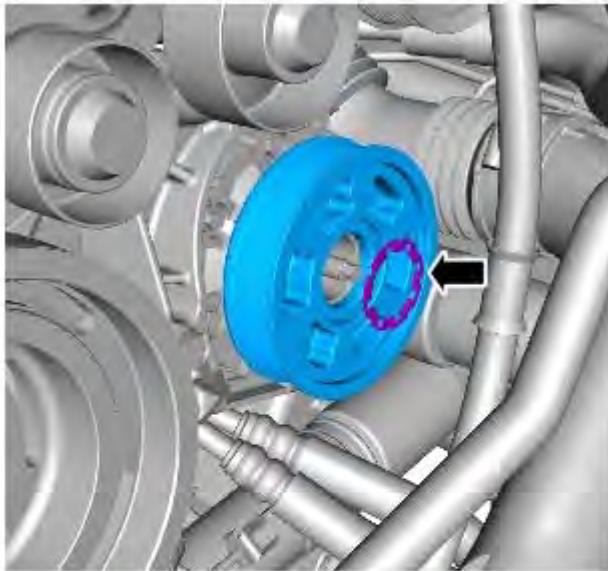
6. Remove and discard the spacer.



7. Remove and discard the drive pulley.

- Remove and discard the circlip.
- Clean the compressor mating surface.

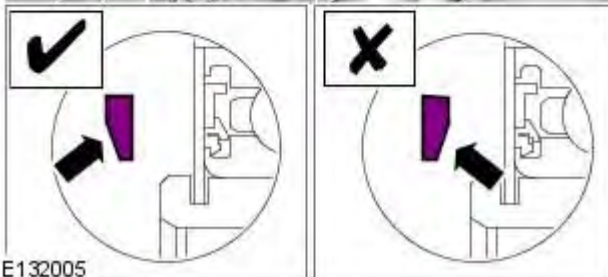
Installation



1.  **CAUTION:** Make sure the circlip is fitted in the correct orientation.

Install the drive pulley.

- Install the circlip.



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2. Install the spacer.

- Make sure the spacer is fully seated.

3. Install the 6 rubber dampers to the hub assembly.

- Make sure the dampers are installed in the correct orientation.



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4. **NOTE:** Apply a suitable water based lubricant to the rubber dampers and to the mating surfaces on pulley.

Install the hub assembly.

- Push the hub assembly onto the pulley, and rotate clockwise to screw it onto the compressor shaft.

5. NOTE: Tighten counterclockwise.

Using a suitable tool, tighten the hub locking stud.

- Prevent the pulley rotating by hand.
- Tighten to 3.5 Nm (2.6 lb.ft)

6. Install the auxiliary drive belt.

7. Install the cooling fan.

For additional information, refer to: [Cooling Fan](#) (303-03A Engine Cooling - TDV6 2.7L Diesel, Removal and Installation).

8. Connect the battery ground cable.

For additional information, refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

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