

Transmission/Transaxle Cooling -

Torque Specifications

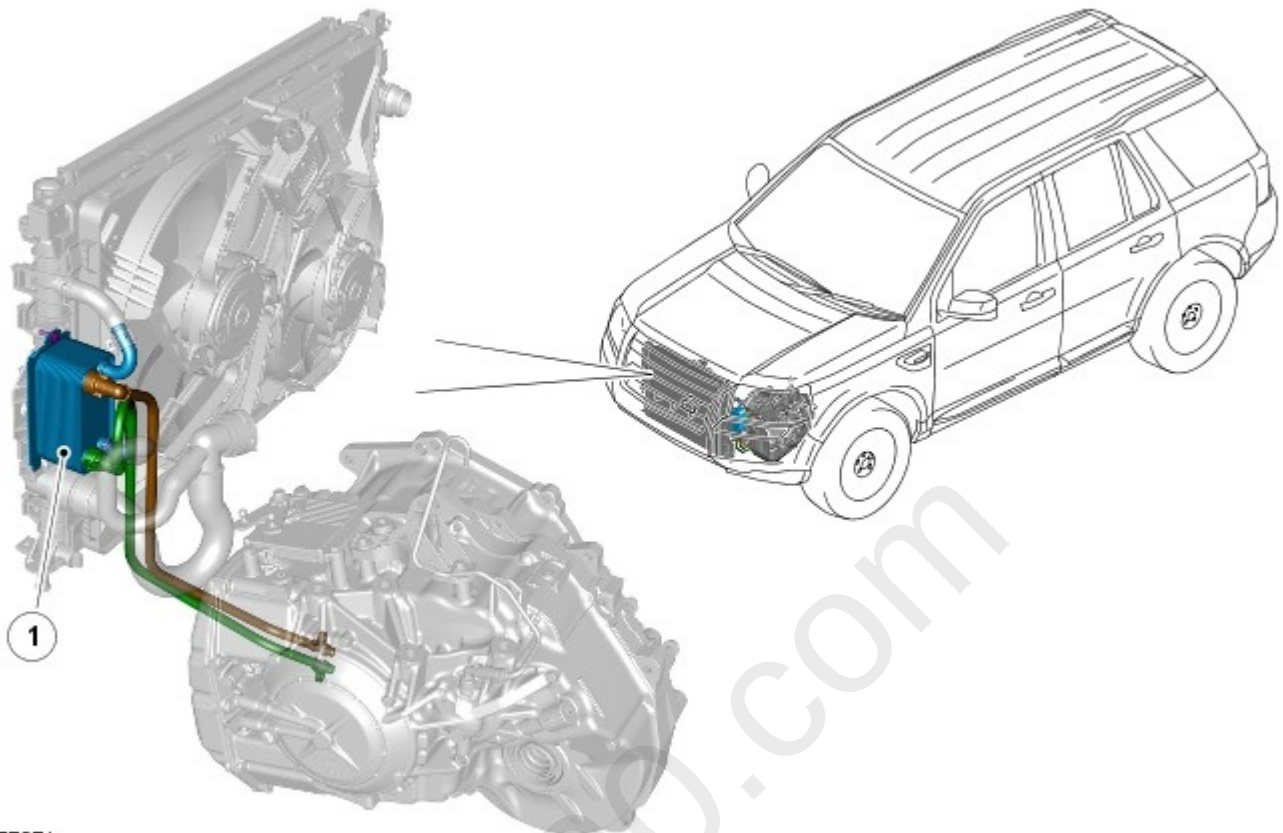
Description	Nm	lb-ft
Transmission fluid cooler bolt	10	7

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Transmission/Transaxle Cooling - Transmission Cooling

Description and Operation

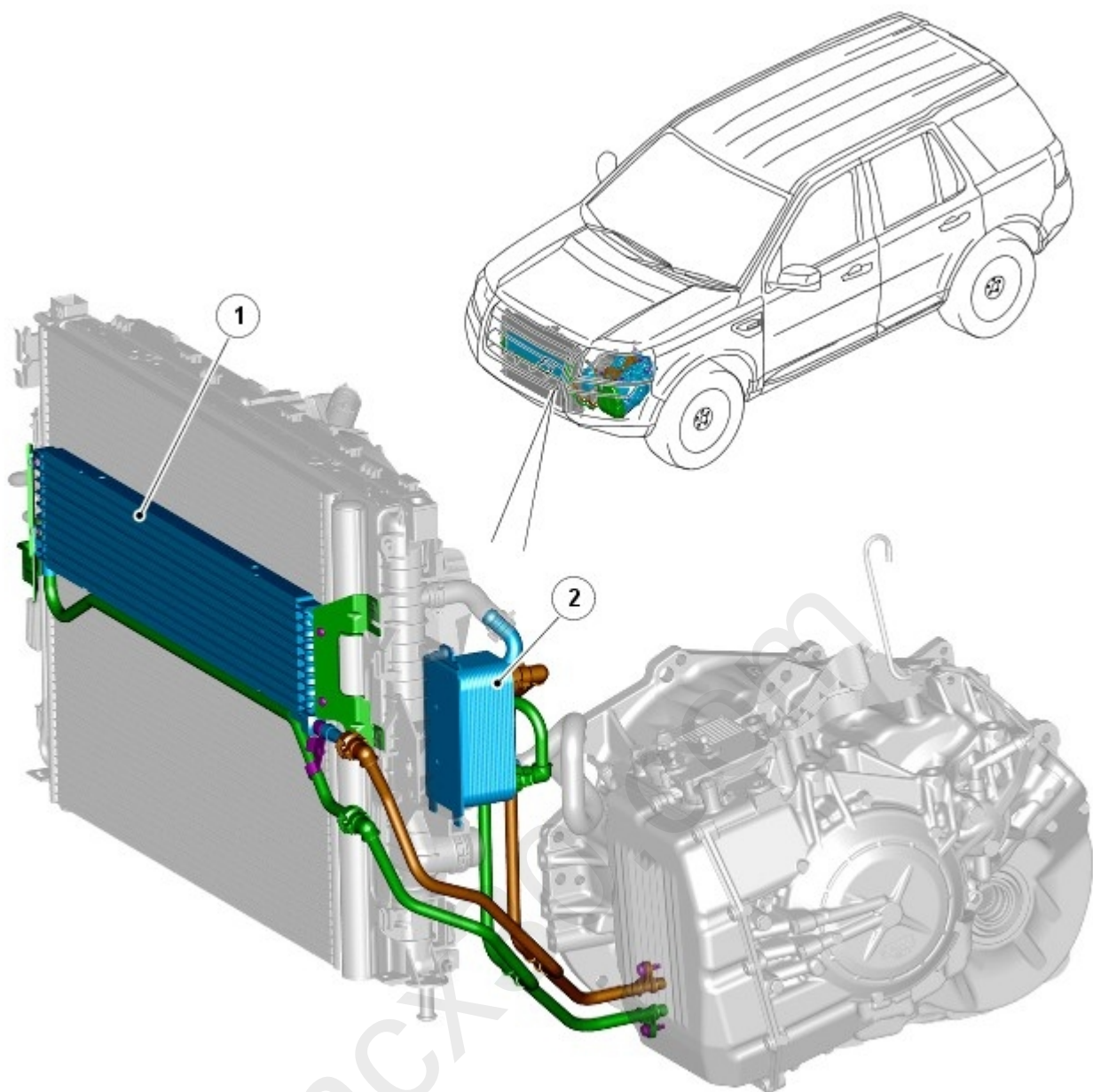
COMPONENT LOCATION - STANDARD CLIMATE



E77071

Item	Part Number	Description
1	-	Transmission fluid cooler

COMPONENT LOCATION - HOT CLIMATE



E77072

Item	Part Number	Description
1	-	Air blast transmission cooler
2	-	Engine coolant transmission cooler

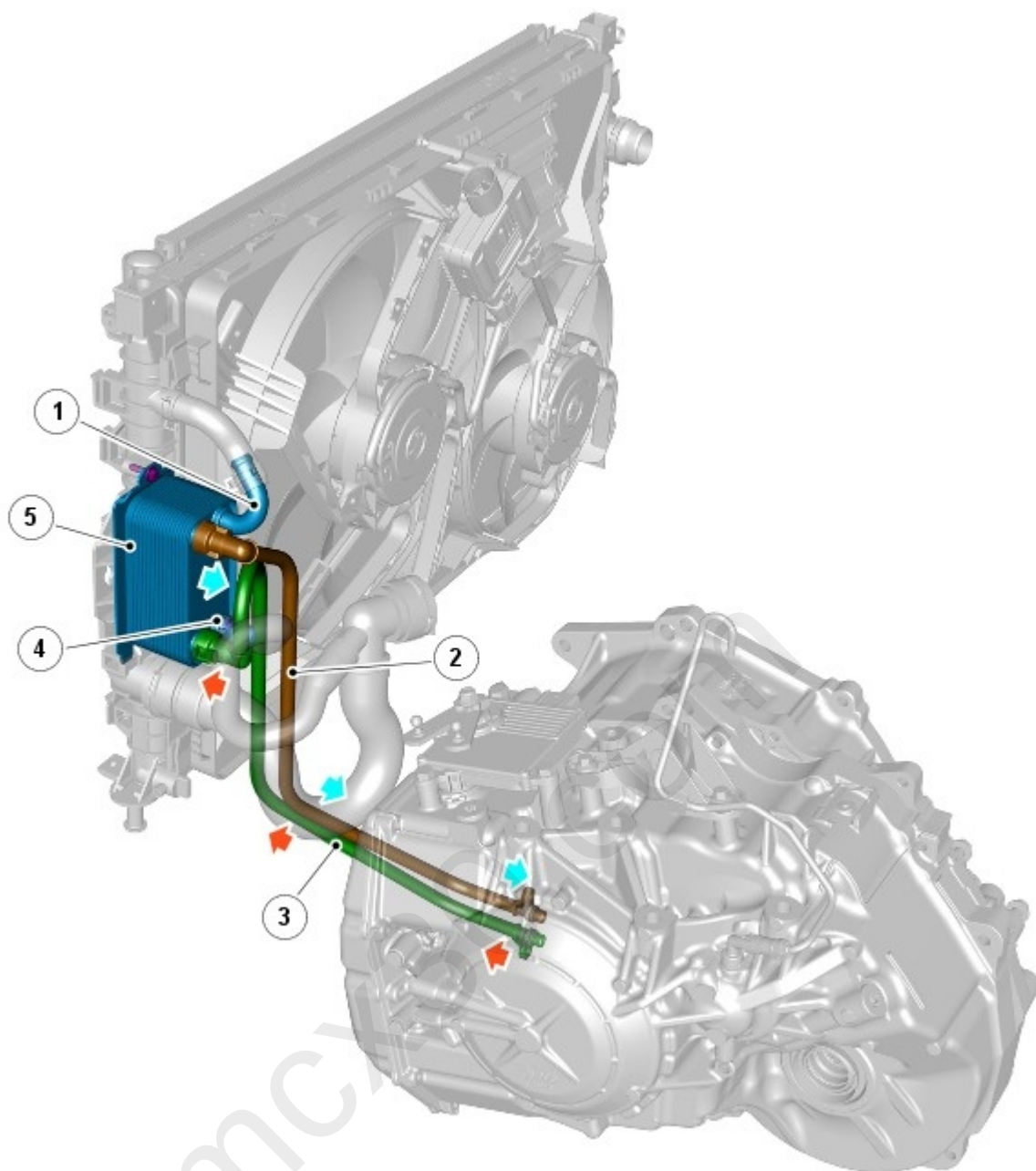
OVERVIEW

The AWF21 transmission uses an external fluid cooler to reduce the temperature of the transmission fluid.

In standard climate markets a plate type cooler is used and uses engine coolant to reduce the fluid temperature.

In hot climate markets, an air blast cooler is used in addition to the plate type cooler used on standard climate vehicles. This provides additional cooling for the higher ambient temperatures experienced in these countries.

COOLER - STANDARD CLIMATE



E77073

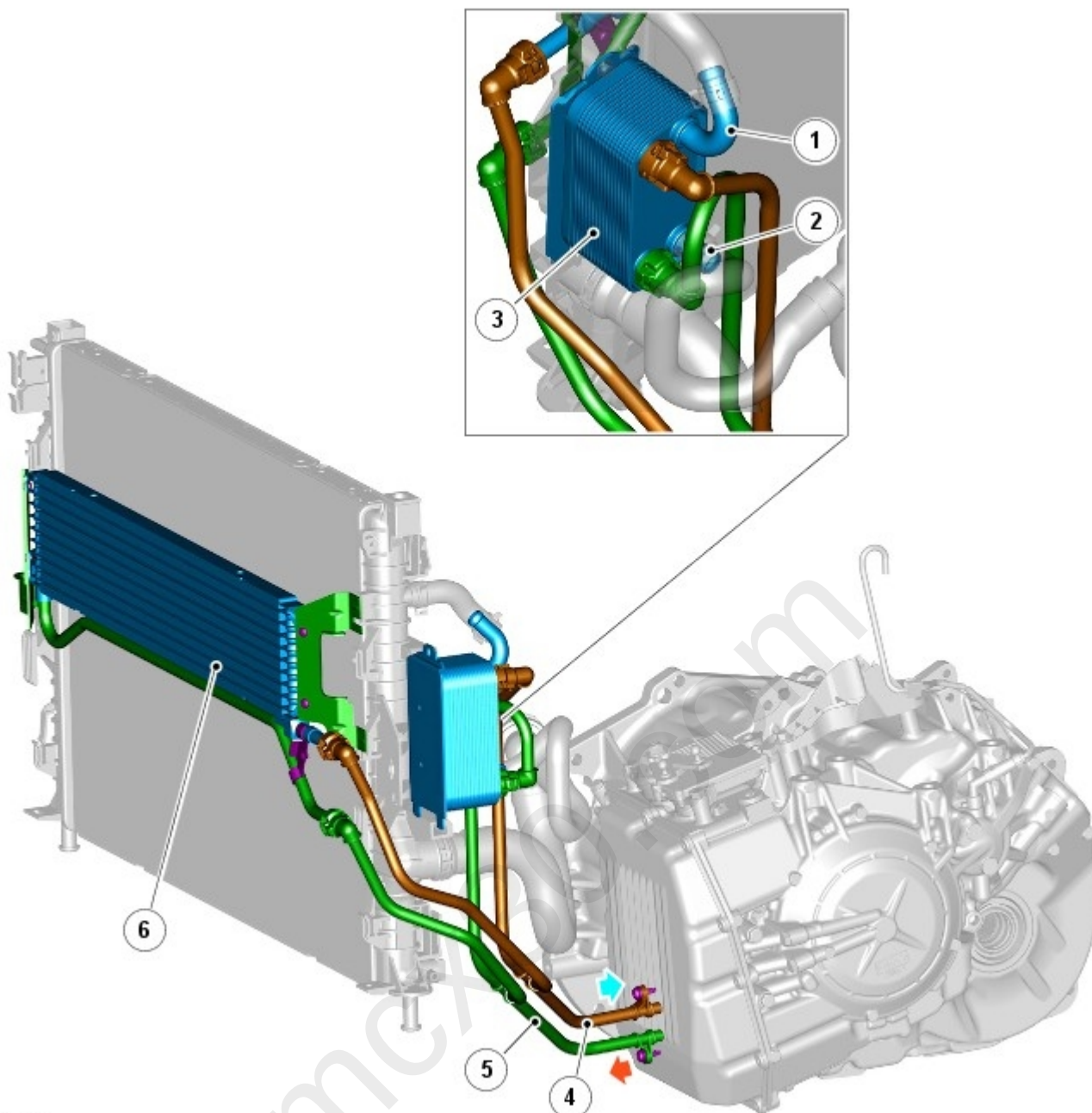
Item	Part Number	Description
1	-	Engine coolant inlet
2	-	Transmission fluid pipe - to transmission
3	-	Transmission fluid pipe - from transmission
4	-	Engine coolant outlet
5	-	Transmission cooler

The transmission fluid cooler is attached to the Left Hand (LH) end of the radiator. The fluid cooler is an aluminum housing comprising louvred fins and plates. The plates allow a cross-flow of transmission fluid and engine coolant through the cooler. The plates are immersed in engine coolant from the 'cold' side of the radiator which provides cooling of the transmission fluid by the temperature differential between the transmission fluid and the engine coolant.

The engine cooling system has a low temperature zone in the top third of the radiator. The engine coolant flow through this section of the radiator is restricted by the transmission fluid cooler. Therefore the engine coolant has a slower flow rate across the cooling tubes of this section of the radiator. This cools the engine coolant more than the lower part of the radiator and consequently provides increased cooling of the transmission fluid.

Fluid is supplied from the transmission fluid pump into the lower connection of the cooler. After passing through the cooler, the fluid passes out of the upper connection and is returned to transmission fluid pan.

COOLER - HOT CLIMATE



E77074

Item	Part Number	Description
1	-	Engine coolant inlet
2	-	Engine coolant outlet (hidden)
3	-	Transmission coolant transmission cooler
4	-	Transmission fluid pipe - to transmission
5	-	Transmission fluid pipe - from transmission
6	-	Transmission air blast cooler

In hot climate markets, the transmission fluid cooling system uses the same cooler as the standard climate system, but with an additional air blast cooler located in front the radiator and the Air Conditioning (A/C) condenser.

The operation of the fluid cooler is as described for the standard climate cooler. The air blast cooler comprises 2 end tanks, interconnected with hollow plates. The plates allow transmission fluid to flow from one end tank to the other, with the air flowing over the plates cooling the fluid as it passes through the cooler.

The transmission fluid output from the transmission pump is split between the standard climate cooler and the air blast cooler. Some of the transmission fluid from the transmission pump is diverted into the air blast cooler. The fluid flows through plates in the cooler and the air flow over the plates removes the heat from the fluid. The fluid is then directed back to a tee connection with the fluid pipe to the standard climate cooler and is then returned to the transmission.

Transmission/Transaxle Cooling - Transmission Cooling

Diagnosis and Testing

Principles of Operation

For a detailed description of the automatic transmission cooling system, refer to the relevant Description and Operation section in the workshop manual.

REFER to: [Transmission Cooling](#) (307-02 Transmission/Transaxle Cooling, Description and Operation).

Inspection and Verification

1. **1.** Verify the customer concern.
2. **2.** Visually inspect for system integrity and obvious signs of mechanical damage.

Visual Inspection

Mechanical
● Feed and return tubes ● Connections to the automatic transmission and the automatic transmission fluid cooler ● Automatic transmission fluid level

3. **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. **4.** If the cause is not visually evident, verify the symptom and refer to the Symptom Chart.

Symptom Chart

Condition	Possible Cause	Action
Over heating of the automatic transmission	Obstruction in the automatic transmission fluid cooler	● Flush out the automatic transmission fluid cooler with new automatic transmission fluid ● If the flushing is unsuccessful, install a new cooler. REFER to: Transmission Fluid Cooler - I6 3.2L Petrol (307-02 Transmission/Transaxle Cooling, Removal and Installation) / Transmission Fluid Cooler - TD4 2.2L Diesel (307-02 Transmission/Transaxle Cooling, Removal and Installation).
Over heating of the automatic transmission	Obstruction in the automatic transmission fluid tubes	● Flush out the automatic transmission fluid cooler tubes with new automatic transmission fluid ● If the flushing is unsuccessful install new automatic transmission fluid cooler tubes
Loss of automatic transmission fluid	Connections to the automatic transmission and the automatic transmission fluid cooler	● Check the integrity of tubes, connections and seals ● Check the torque of the tube fixings. REFER to: Specifications (307-02 Transmission/Transaxle Cooling, Specifications).
Loss of automatic transmission fluid	Leak at automatic transmission fluid cooler	● Check the integrity of tubes, connections and seals ● Check the torque of the tube fixings. REFER to: Specifications (307-02 Transmission/Transaxle Cooling, Specifications). ● Check for automatic transmission fluid contamination of the engine coolant. Install new cooler as required. REFER to: Transmission Fluid Cooler - I6 3.2L Petrol (307-02 Transmission/Transaxle Cooling, Removal and Installation) / Transmission Fluid Cooler - TD4 2.2L Diesel (307-02 Transmission/Transaxle Cooling, Removal and Installation).

Transmission/Transaxle Cooling - Transmission Fluid Cooler I6 3.2L Petrol

Removal and Installation

Removal

1. Remove the cover and disconnect the battery ground cable.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

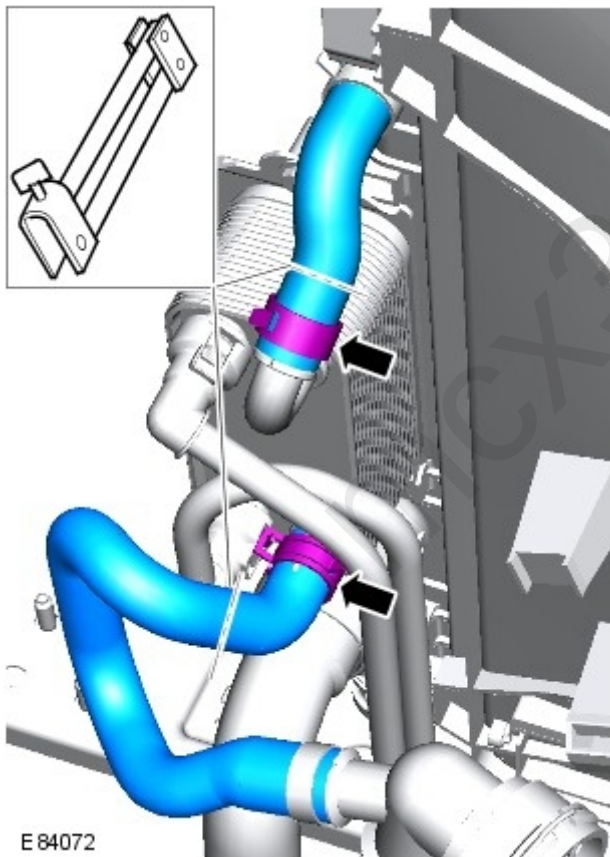
2.  **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

3. Drain the transmission fluid.

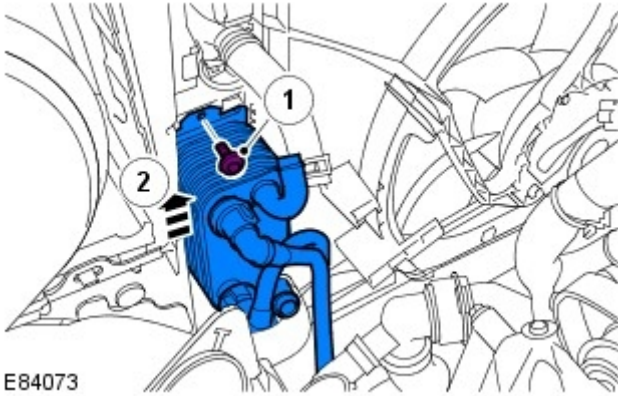
Refer to: [Transmission Fluid Drain and Refill - I6 3.2L Petrol](#) (307-01 Automatic Transmission/Transaxle, General Procedures).

4. Clamp the relevant hoses, to minimise the coolant loss.

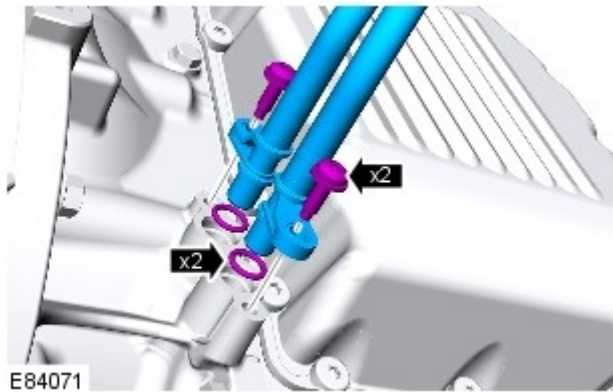


5.  **CAUTION:** Be prepared to collect escaping coolant.

Disconnect the 2 transmission fluid cooler coolant hoses.



6. Release the automatic transmission fluid cooler.



7. **7. CAUTIONS:**



Be prepared to collect escaping fluids.



Make sure that all openings are sealed.

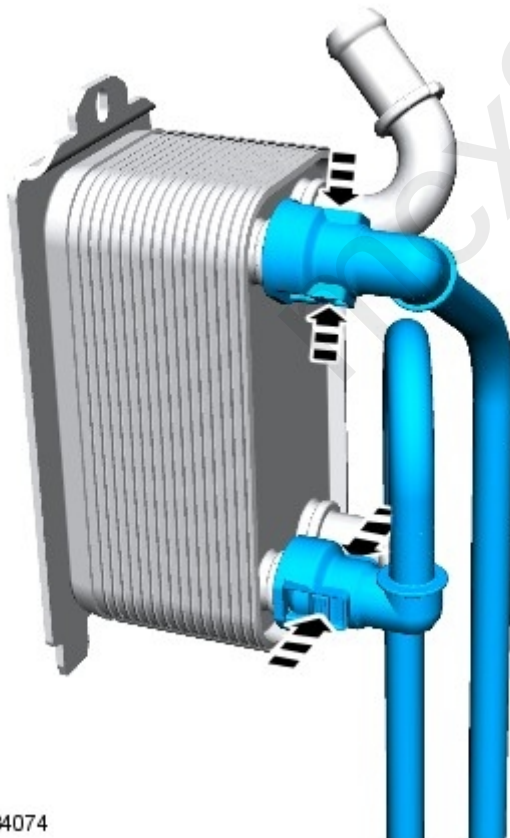


Discard the seals.

• **NOTE:** Do not disassemble further if the component is removed for access only.

Remove the transmission fluid cooler.

8. **8. NOTE:** Do not disassemble further if the component is removed for access only.



Installation

1. Install the fluid cooler hoses.

2. Connect and secure the coolant hoses.

3. Install the transmission fluid cooler.

Torque: 10 Nm

4. Connect the battery ground cable and install the cover.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

5. Refill the transmission with fluid.

Refer to: [Transmission Fluid Drain and Refill - I6 3.2L Petrol](#) (307-01 Automatic Transmission/Transaxle, General Procedures).

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Transmission/Transaxle Cooling - Transmission Fluid CoolerTD4 2.2L Diesel

Removal and Installation

Removal

1. Remove the cover and disconnect the battery ground cable.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

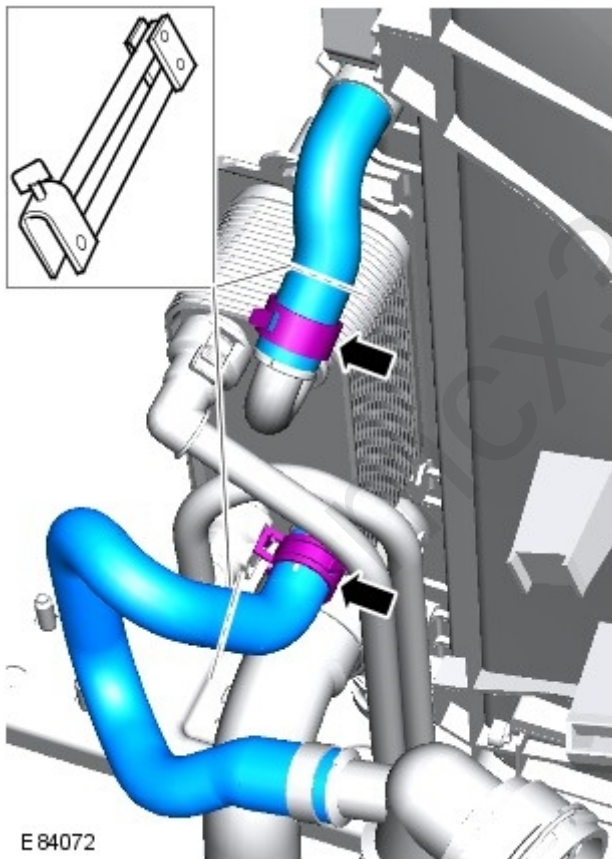
2.  **WARNING:** Make sure to support the vehicle with axle stands.

Raise and support the vehicle.

3. Drain the transmission fluid.

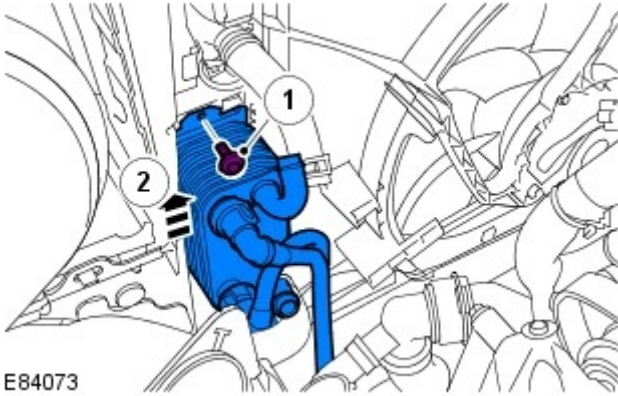
Refer to: [Transmission Fluid Drain and Refill - TD4 2.2L Diesel](#) (307-01 Automatic Transmission/Transaxle, General Procedures).

4. Clamp the relevant hoses, to minimise the coolant loss.

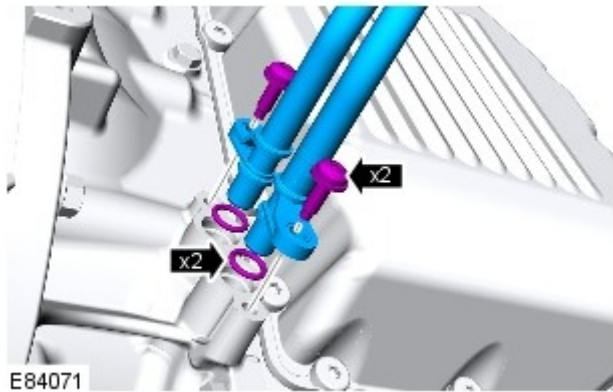


5.  **CAUTION:** Be prepared to collect escaping coolant.

Disconnect the 2 transmission fluid cooler coolant hoses.



6. Release the automatic transmission fluid cooler.



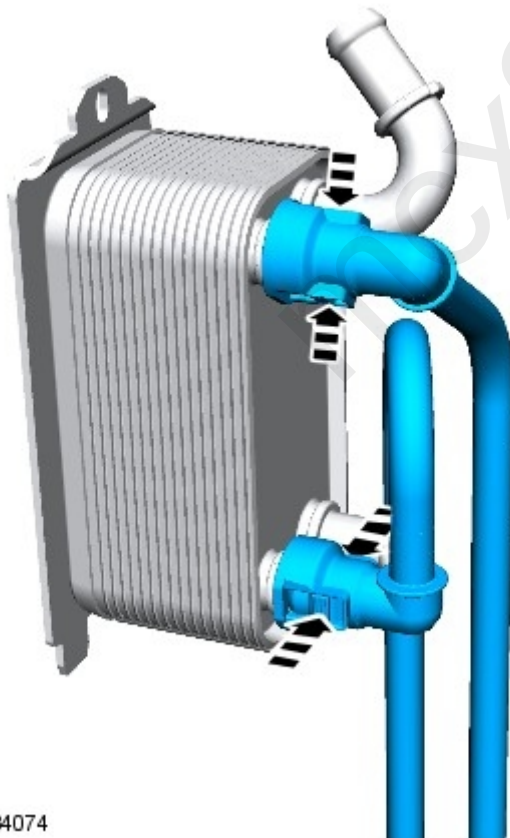
7. **7. CAUTIONS:**

-  Be prepared to collect escaping fluids.
-  Make sure that all openings are sealed.
-  Discard the seals.

• **NOTE:** Do not disassemble further if the component is removed for access only.

Remove the transmission fluid cooler.

8. **8. NOTE:** Do not disassemble further if the component is removed for access only.



Installation

1. Install the fluid cooler hoses.

2. Connect and secure the coolant hoses.

3. Install the transmission fluid cooler.

Torque: 10 Nm

4. Connect the battery ground cable and install the cover.

Refer to: [Specifications](#) (414-00 Battery and Charging System - General Information, Specifications).

5. Refill the transmission with fluid.

Refer to: [Transmission Fluid Drain and Refill - TD4 2.2L Diesel](#) (307-01 Automatic Transmission/Transaxle, General Procedures).

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