

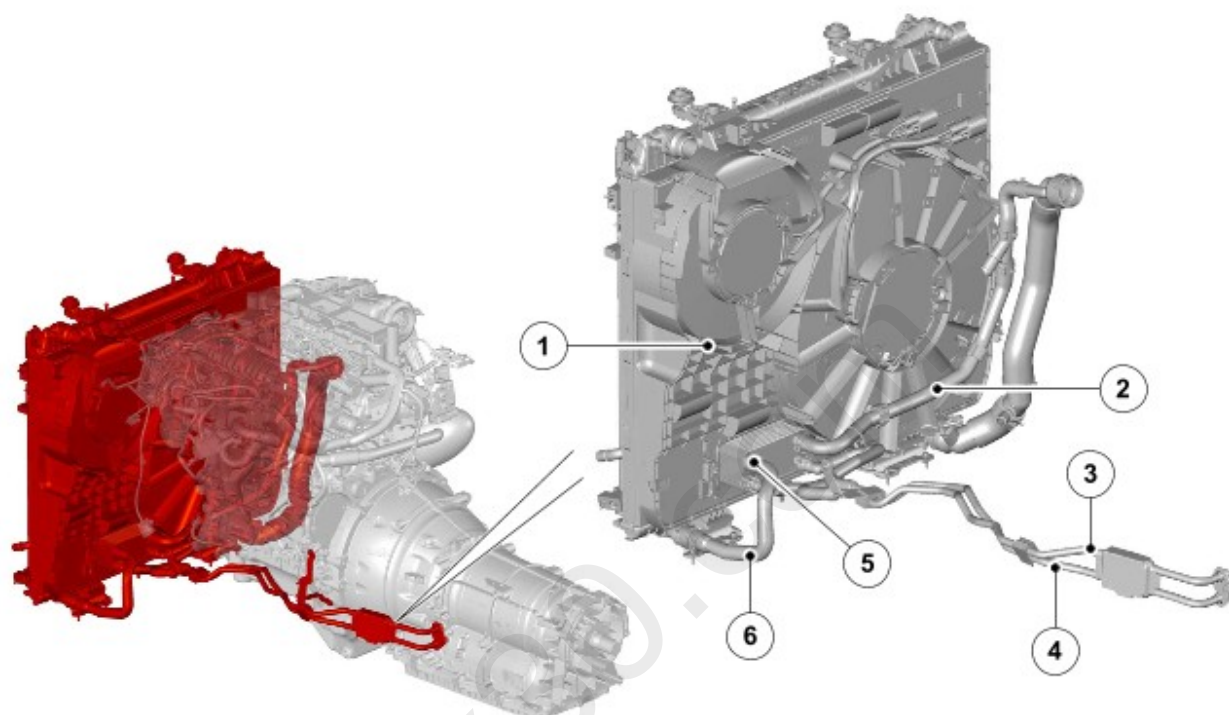
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AUTOMATIC TRANSMISSION COOLING

## TRANSMISSION COOLING – VEHICLES WITH: 8HP70 8-SPEED AUTOMATIC TRANSMISSION AWD (G2413253)

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## COMPONENT LOCATION



E252041

| ITEM | DESCRIPTION                 |
|------|-----------------------------|
| 1    | Engine cooling radiator     |
| 2    | Engine coolant inlet        |
| 3    | Transmission coolant inlet  |
| 4    | Transmission coolant outlet |
| 5    | Engine coolant outlet       |
| 6    | Engine coolant outlet       |

## OVERVIEW

Transmission cooling is provided by an Automatic Transmission Fluid (ATF) cooler, which transfers heat from the transmission to the engine cooling system. The ATF cooler is a separate unit attached to a mounting bracket on the front subframe, in the rear left corner of the engine compartment.

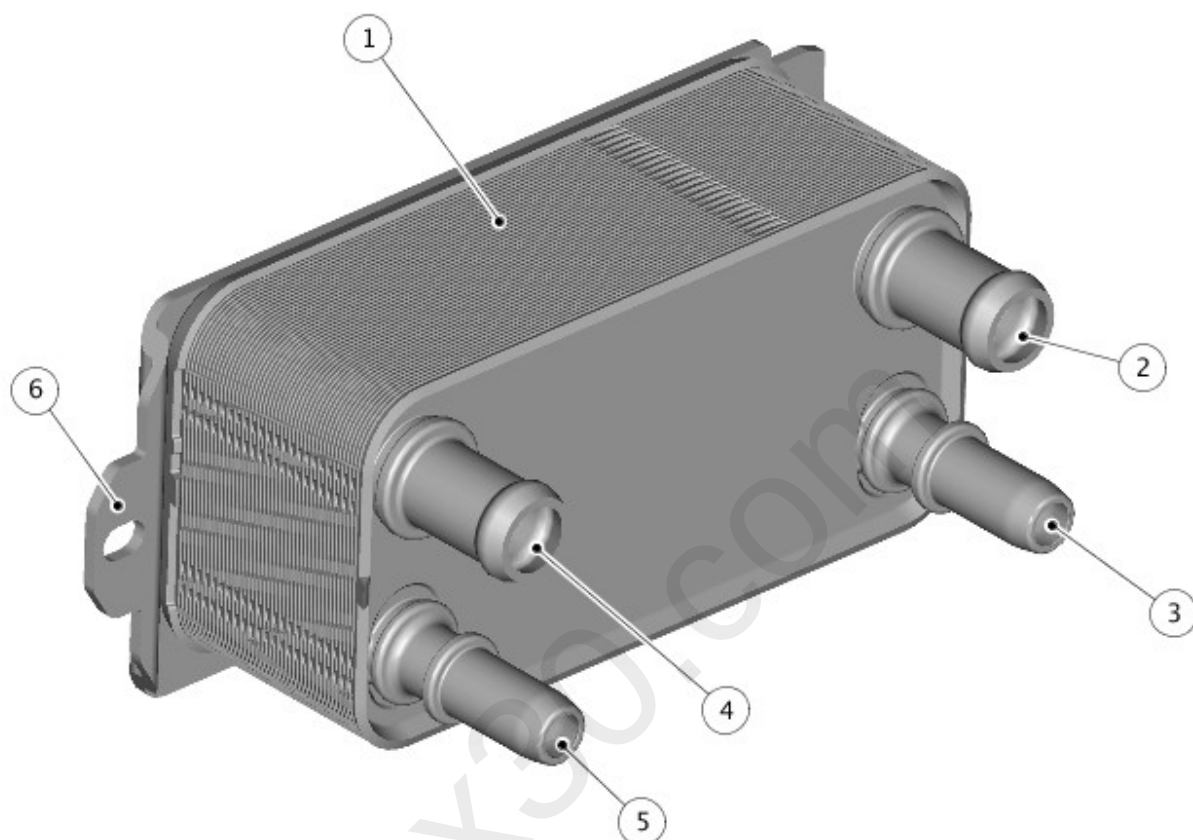
The transmission is connected to the ATF cooler through flexible hoses and metal pipes.

## DESCRIPTION

There are 2 hose and pipe assemblies connecting the Automatic Transmission Fluid (ATF) cooler to the automatic transmission. The 2 engine coolant hose connections are incorporated into the top of the ATF cooler for the supply and return of coolant from the engine cooling system.

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

## AUTOMATIC TRANSMISSION FLUID COOLER



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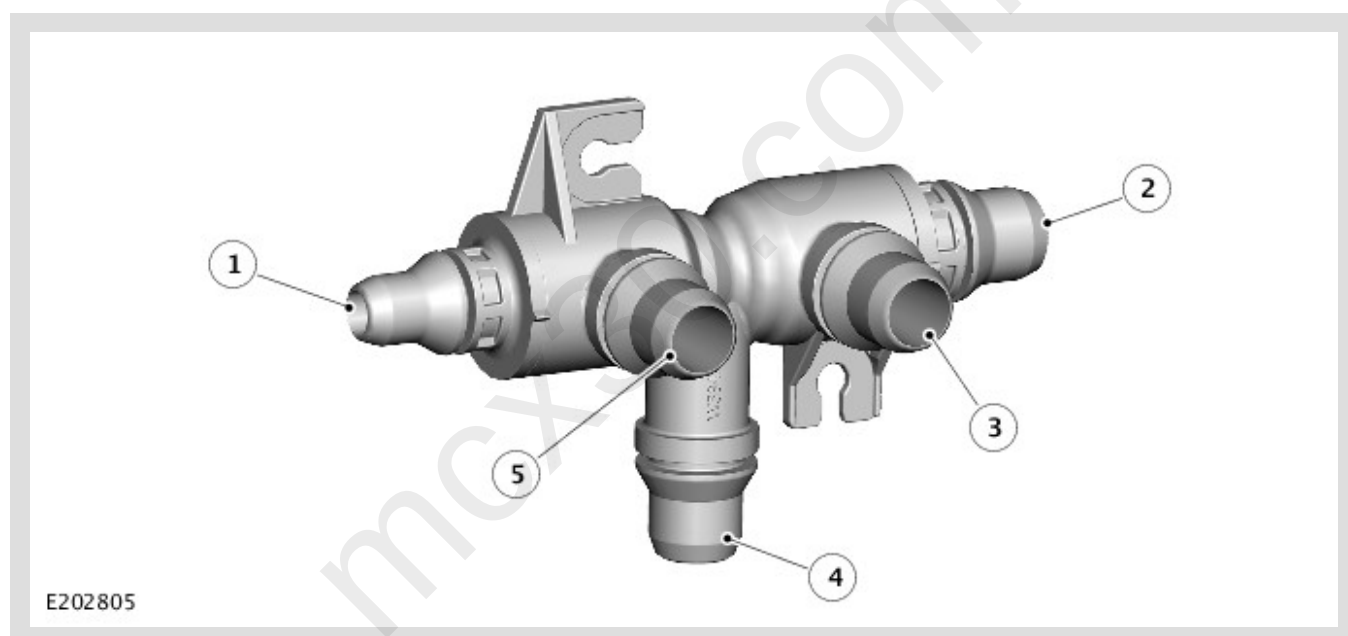
| ITEM | DESCRIPTION                               |
|------|-------------------------------------------|
| 1    | Automatic Transmission Fluid (ATF) cooler |
| 2    | Engine coolant inlet                      |
| 3    | Transmission fluid pipe inlet connection  |
| 4    | Engine coolant outlet                     |
| 5    | Transmission fluid pipe outlet connection |
| 6    | Mounting bracket                          |

The Automatic Transmission Fluid (ATF) cooler is attached to a mounting bracket and is secured to the left side of the front subframe with 2 bolts. The ATF cooler has 2 lugs which locate in corresponding lugs on the mounting bracket and secured with a screw. The ATF cooler is an aluminum housing comprising louvred fins and plates. The plates allow a cross-flow of ATF and engine coolant through the ATF cooler. The plates are immersed in engine coolant from the cold side of the radiator. This provides cooling of the ATF by the temperature differential between the ATF and the engine coolant.

The ATF cooler receives engine coolant from the low temperature zone at the left side of the radiator. The engine coolant flow through this section of the radiator is restricted by the ATF 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 right side of the radiator and consequently provides increased cooling of the ATF. The engine coolant then passes from the ATF cooler to the thermostat housing.

The 2 quick release connectors on the cooler provide for the attachment of the ATF pipes to and from the automatic transmission.

#### AUTOMATIC TRANSMISSION FLUID WARMING VALVE

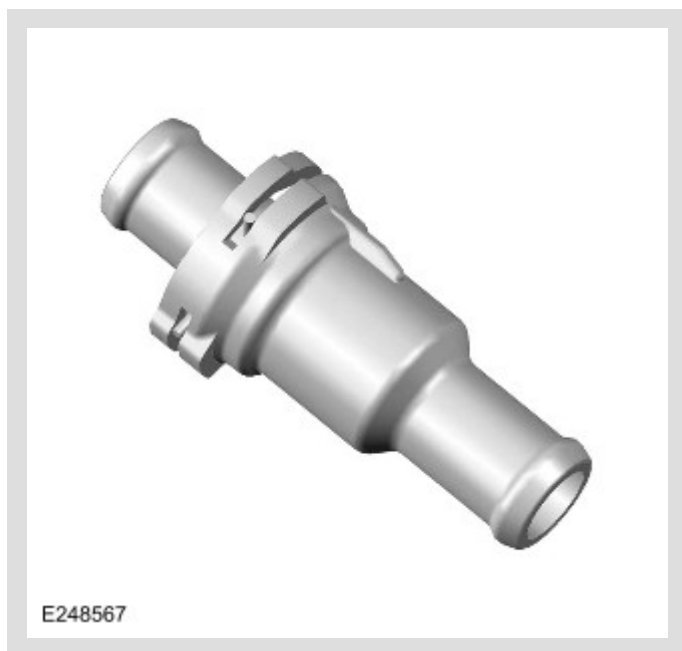


| ITEM | DESCRIPTION                                                               |
|------|---------------------------------------------------------------------------|
| 1    | Hot engine coolant inlet hose connection                                  |
| 2    | Engine coolant return to variable coolant pump inlet hose connection      |
| 3    | Automatic Transmission Fluid (ATF) cooler outlet hose connection          |
| 4    | Radiator low temperature zone (cold engine coolant inlet) hose connection |
| 5    | ATF cooler inlet hose connection                                          |

The Automatic Transmission Fluid (ATF) warming valve is a thermostatic ATF mixing valve. It is designed to reduce ATF warm up time and provides a precise temperature control for the ATF temperature. The ATF warming valve

mixes the hot engine coolant from the thermostatic valve and cold engine coolant from the low temperature zone at the left side of the radiator. This provides the desired temperature control of the ATF temperature.

#### THERMOSTATIC CONTROL VALVE



The thermostatic control valve is supplied from the variable engine coolant pump outlet, providing the warmest engine coolant possible during warm up. The thermostatic control valve has a designed leak to provide sensing flow Automatic Transmission Fluid (ATF) warming valve.

#### OPERATION

##### AUTOMATIC TRANSMISSION FLUID COOLING AND WARMING

The operation of the Automatic Transmission Fluid (ATF) warming valve the following three phases can be differentiated:

- Warm up phase - Hot engine coolant from the thermostatic valve of the ATF cooler is directed to the ATF cooler. This provides a reduced ATF warm up time.
- Temperature control phase - Hot engine coolant from the thermostatic valve of the ATF cooler and cold engine coolant coming from the radiator are mixed. This provides an accurate control to maintain the ATF at the desired operation temperature.
- Cooling phase - Cold engine coolant from the radiator is directed to the ATF cooler to provide the maximum ATF cooling capability.