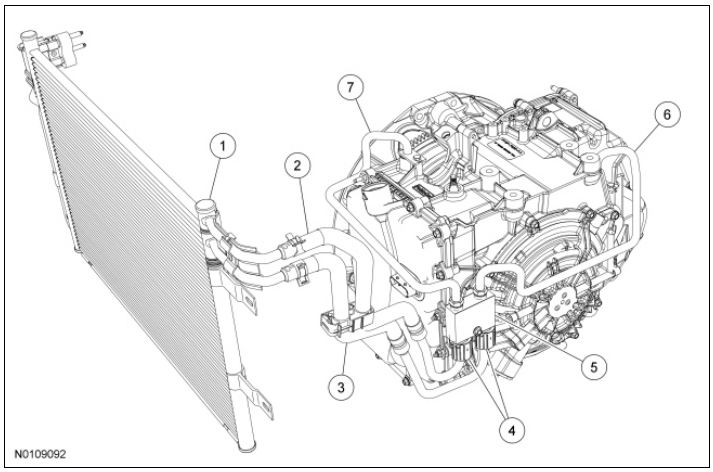
Transaxle Cooling

The transmission fluid cooling system consists of the following:

- Oil-To-Air (OTA) transmission fluid combo cooler
- Transmission fluid cooler tube assembly
- Transmission fluid cooler thermal bypass valve
- Transmission fluid cooler outlet tube
- Transmission fluid cooler inlet tube

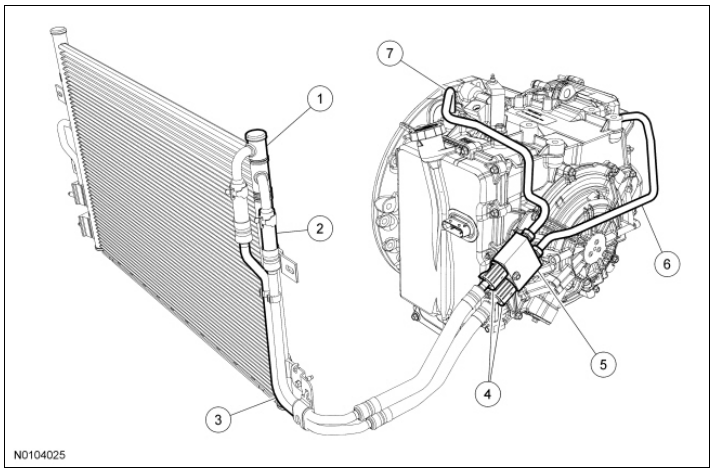
This vehicle is equipped with an external transmission fluid cooler. The transmission fluid cooler is part of the A/C condenser and cannot be serviced separately. The transmission fluid cooler is mounted in front of the engine radiator. The cooling system also consists of a transmission fluid cooler thermal bypass valve which is mounted on the transaxle main control cover. When the transmission fluid is below normal operating temperature, transmission fluid travels from the transaxle to the transmission fluid cooler thermal bypass valve and back to the transaxle. When the transmission fluid is at or above normal operating temperature, the transmission fluid cooler thermal bypass valve opens allowing transmission fluid to travel from the transaxle through the cooler and back to the transaxle. The transmission fluid cooler transfers heat from the transmission fluid to the outside air.

Transaxle Cooling - 3.7L Engine



Item	Part Number	Description
1	19712	Transmission fluid cooler
2	7R081	Transmission fluid cooler outlet tube and hose assembly
3	7R081	Transmission fluid cooler inlet tube and hose assembly
4	7J081	Transmission fluid cooler tube secondary latches
5	7H322	Transmission fluid cooler thermal bypass valve
6	7H420	Transmission fluid cooler inlet tube
7	7H420	Transmission fluid cooler outlet tube

Transaxle Cooling - 3.5L Gasoline Turbocharged Direct Injection (GTDI) Engine



Item	Part Number	Description
1	19712	Transmission fluid cooler
2	7R081	Transmission fluid cooler outlet tube and hose assembly
3	7R081	Transmission fluid cooler inlet tube and hose assembly
4	7J081	Transmission fluid cooler tube secondary latches
5	7H322	Transmission fluid cooler thermal bypass valve
6	7H420	Transmission fluid cooler inlet tube
7	7H420	Transmission fluid cooler outlet tube

Transaxle Cooling

Special Tool(s)

 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool

Material

Item	Specification
Motorcraft® MERCON® LV Automatic Transmission Fluid XT-10-QLV	MERCON® LV

Inspection and Verification

1. Verify the customer concern by operating the vehicle to duplicate the condition.
2. If the inspection reveals obvious concern(s) that can be readily identified, repair as necessary.
3. Install new components if a transmission fluid leak is found in any of the transaxle cooling components.
4. If the concern(s) remains after the inspection, determine the symptom(s). GO to Symptom Chart - Transaxle Cooling or GO to Symptom Chart - NVH .

Symptom Chart - Transaxle Cooling

Symptom Chart - Transaxle Cooling

Symptom Chart - NVH

Symptom Chart - NVH
NOTE: NVH symptoms should be identified using the diagnostic tools that are available. For a list of these tools, an explanation of their uses and a glossary of common terms, refer to Section 100-04 . Since it is possible any one of multiple systems may be the cause of a symptom, it may be necessary to use a process of elimination type of diagnostic approach to pinpoint the responsible system. If this is not the causal system for the symptom, refer back to Section 100-04 for the next likely system and continue diagnosis.

ConditionPossible SourcesAction

- Vibration - a high frequency (20-80 Hz) that is felt through the seat or gear shifter. Changes with engine speed
- Transmission fluid cooler tubes grounded
- CHECK the transmission fluid cooler tubes. REPAIR as necessary.

Check Transmission Fluid Level and Condition

NOTICE: **The vehicle should not be driven if the transmission fluid level indicator shows the transmission fluid below the minimum transmission fluid level mark or internal failure could result.**

If the vehicle has been operated for an extended period of time, at highway speeds, in city traffic, in hot weather or while pulling a trailer, the transmission fluid needs to cool down to obtain an accurate reading.

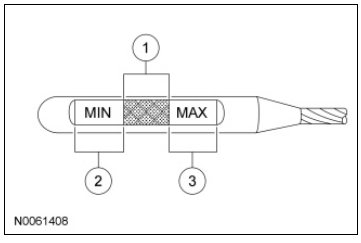
The transmission fluid level reading on the transmission fluid level indicator will differ depending on operating and ambient temperatures. The correct reading should be within the normal operating temperature range.

Transmission Fluid Level Check

NOTE: The transmission fluid should be checked at normal operating temperature 82°C-93°C (180°F-200°F) on a level surface. Normal operating temperature can be reached after approximately 32 km (20 mi) of driving and can be checked using the scan tool.

Under normal circumstances, the transmission fluid level should be checked during normal maintenance. If the transaxle starts to slip, shifts slowly or shows signs of transmission fluid leaking, the transmission fluid level should be checked.

1. With the transaxle in PARK, the engine at idle, foot pressed on the brake, move the selector lever through each gear and allow engagement of each gear. Place the selector lever in the PARK position.
2. Wipe the transmission fluid level indicator cap and remove the transmission fluid level indicator.
3. Wipe the transmission fluid level indicator with a clean cloth.
4. Install the transmission fluid level indicator back in the transmission fluid filler tube until it is fully seated, then remove the indicator. The transmission fluid level should be within the normal operating range.



Item	Description
1	Correct transmission fluid level at operating temperature 82°C-93°C (180°F-200°F)
2	Low transmission fluid level
3	High transmission fluid level

High Transmission Fluid Level

A transmission fluid level that is too high may cause the transmission fluid to become aerated due to the churning action of the rotating internal parts. This will cause erratic control pressure, foaming, loss of transmission fluid from the vent tube and possible transaxle malfunction and/or damage. If an overfill reading is indicated, refer to High Transmission Fluid Level under Preliminary Inspection in Section 307-01 .

Low Transmission Fluid Level

A low transmission fluid level could result in poor transaxle engagement, slipping, malfunction and/or damage. This could also indicate a leak in one of the transaxle seals or gaskets.

Adding Transmission Fluid

NOTICE: **The use of any transmission fluid other than what is recommended for this transaxle will cause transaxle damage.**

If transmission fluid needs to be added, add transmission fluid in 0.25L (1/2 pt) increments through the transmission fluid level indicator tube. Do not overfill the transmission fluid. For transmission fluid type, refer to Specifications in this section.

Transmission Fluid Condition Check

1. Check the transmission fluid level.
2. Observe the transmission fluid color and the odor. The color under normal circumstances should be a dark red color, not brown or black or have a burnt odor.
3. Hold the transmission fluid level indicator over a white facial tissue and allow the transmission fluid to drip onto the facial tissue and examine the stain.
4. If evidence of solid material is found, the transmission fluid pan should be removed for further inspection.
5. If transmission fluid contamination or transaxle failure is confirmed by the sediment in the bottom of the transmission fluid pan, repair the transaxle and clean the transmission fluid cooler tubes and the transmission fluid cooler.
6. If the transaxle is to be overhauled or if installing a new transaxle, the transmission fluid cooler must be backflushed. Refer to Transmission Fluid Cooler Backflushing and Cleaning under General Procedures in Section 307-01 .

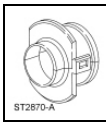
Transmission Fluid Cooler

1. **NOTE:** The transmission fluid cooler is part of the A/C condenser assembly and cannot be serviced separately.

   If installation of a new transmission fluid cooler is required, refer to Condenser Core in Section 412-01 .

Transmission Fluid Cooler Tubes - 3.7L

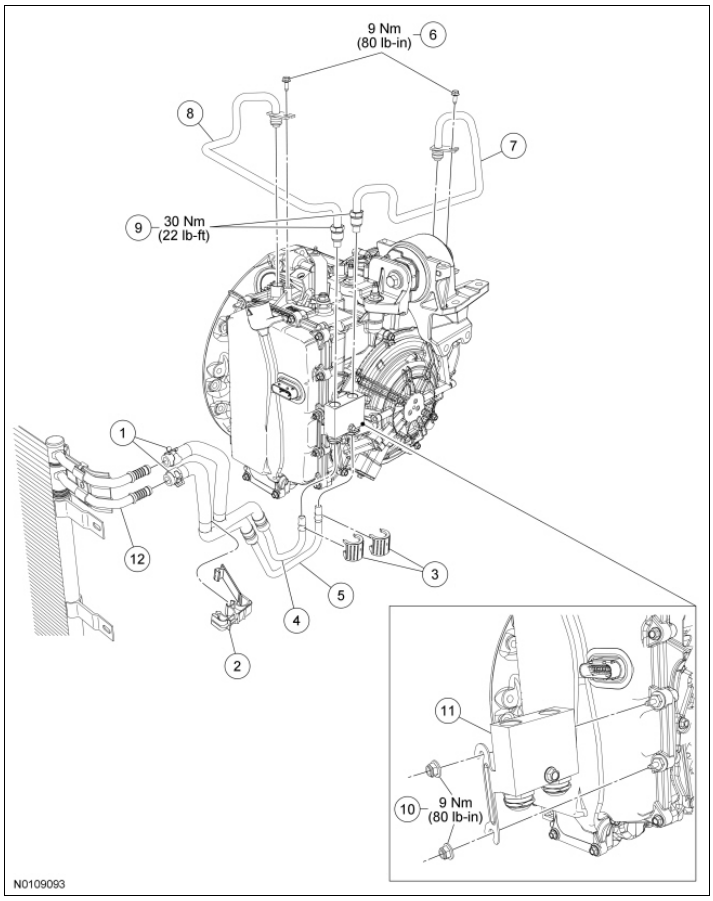
Special Tool(s)

 ST2670-A	Disconnect Tool, Transmission Cooler Line 307-569

Material

Item	Specification
Motorcraft® MERCON® LV Automatic Transmission Fluid XT-10-QLV	MERCON® LV

Transmission Fluid Cooler Tubes (3.7L Engine)



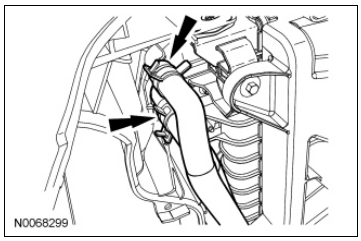
Item	Part Number	Description
1	7C107	Constant tension clamps
2	8W287	Transmission fluid cooler tube retainer

3	7J081	Transmission fluid cooler tube secondary latches
4	7R081	Transmission fluid cooler outlet tube and hose assembly
5	7R081	Transmission fluid cooler inlet tube and hose assembly
6	W711538	Transmission fluid cooler tube bolts
7	7H420	Transmission fluid cooler inlet tube
8	7H420	Transmission fluid cooler outlet tube
9	-	Transmission fluid cooler tube fittings (part of 7H420)
10	W520101	Transmission fluid cooler thermal bypass valve nuts
11	7H322	Transmission fluid cooler thermal bypass valve
12	19712	Transmission fluid cooler

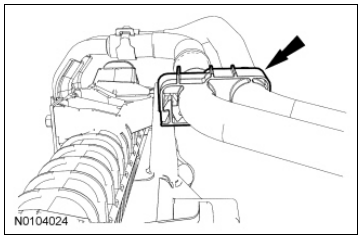
Removal

NOTICE: **The use of any transmission fluid other than what is recommended for this transaxle will cause transaxle damage.**

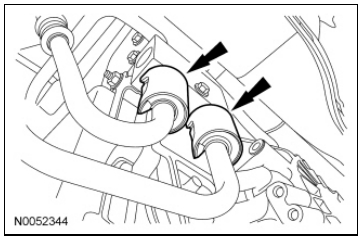
1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02 .
2. Remove the Air Cleaner (ACL) and outlet pipe. For additional information, refer to Section 303-12 .
3. Remove the battery tray. For additional information, refer to Section 414-01 .
4. Compress the constant tension clamps and remove the transmission fluid cooler tubes from the transmission fluid cooler.



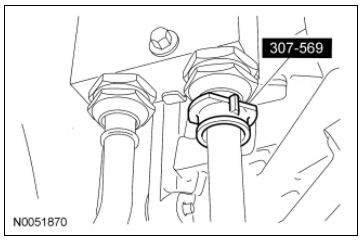
5. Release the transmission fluid cooler tube retainer and remove the transmission fluid cooler tubes from the retainer.



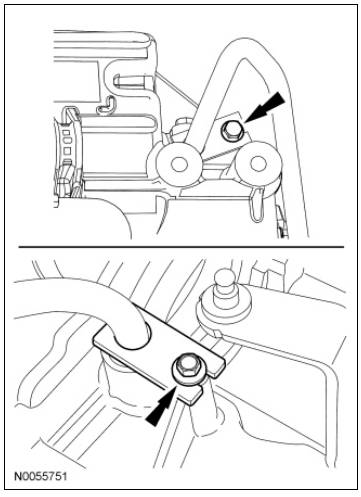
6. Remove the 2 transmission fluid cooler tube secondary latches from the transmission fluid cooler tubes at the transmission fluid cooler thermal bypass valve.



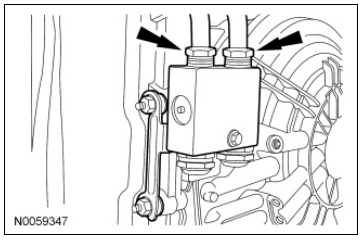
7. Using the Transmission Cooler Line Disconnect Tool, disconnect the transmission fluid cooler tubes from the transmission fluid cooler thermal bypass valve and remove the transmission fluid cooler inlet and outlet tube and hose assembly.



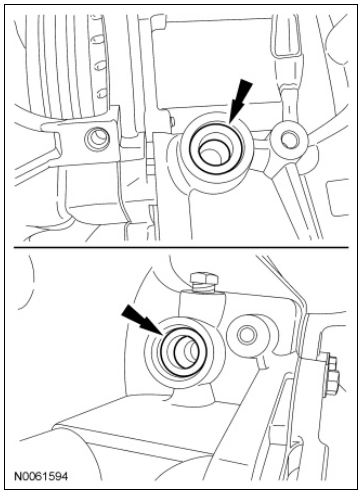
8. Remove and discard the 2 transmission fluid cooler tube bolts.



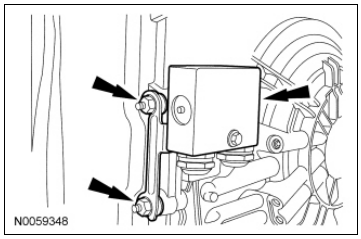
9. Loosen the 2 transmission fluid cooler tube fittings and remove the 2 transmission fluid cooler tubes from the transmission fluid cooler thermal bypass valve and the transaxle.



10. Inspect the transaxle case to be sure that the transmission fluid cooler tube seals and backing rings were removed with the transmission fluid cooler tubes and are not stuck in the transaxle case. If the transmission fluid cooler tube seals or backing rings are stuck in the transaxle case, remove the seals and backing rings.

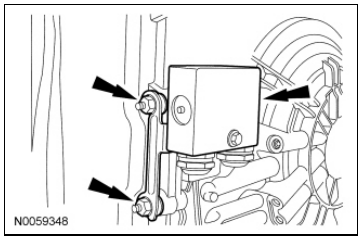


11. Remove the 2 transmission fluid cooler thermal bypass valve nuts and the transmission fluid cooler thermal bypass valve.

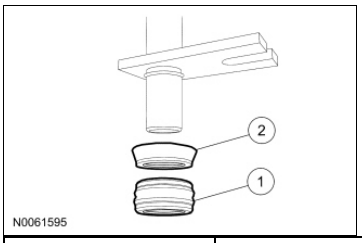


Installation

1. Position the transmission fluid cooler thermal bypass valve in place and install the 2 transmission fluid cooler thermal bypass valve nuts.
    - Tighten to 9 Nm (80 lb-in).



2. Inspect the transmission fluid cooler tube backing rings and seals for damage and install new backing rings or seals, if necessary. Lubricate the transmission fluid cooler tube seals with clean transmission fluid and install the backing rings and seals on the transmission fluid cooler tubes.



Item	Part Number	Description
1	7D285	Seal
2	7J324	Backing ring