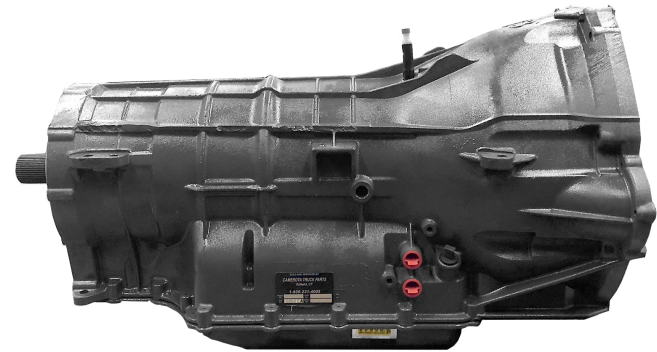


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## 6R140 TORQSHIFT INSTALLATION GUIDE

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## COOLER FLUSHING

**NOTE: The in-line transmission thermal bypass valve (if equipped) must be removed for flushing.**

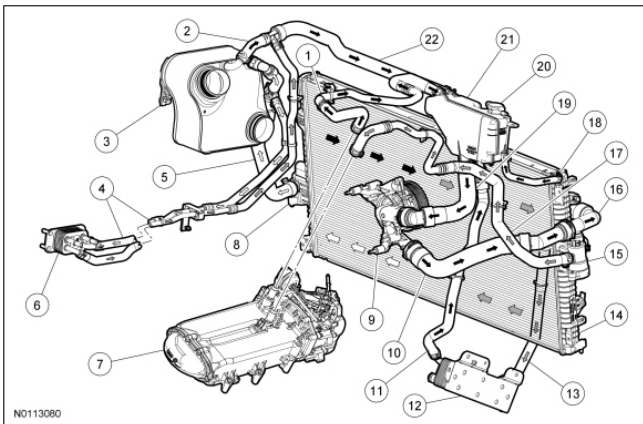
These coolers may be used either alone in front of the radiator or they may be used in series with the radiator cooler. Due to the construction of these oil to air coolers they cannot be properly flushed **and must be replaced when installing a new transmission**. When a radiator cooler is also used this cooler must still be properly flushed at this time. **Failure to follow these instructions will contaminate or starve the replacement unit of oil and cause a transmission failure!**

**Note: Trucks with Diesel engines have 2 cooling systems, primary and secondary radiators. The transmission is cooled by the secondary radiator. There are 2 thermostats in the cooling system, one in the primary and the second in the secondary.**

This will complicate transmission overheat issues.

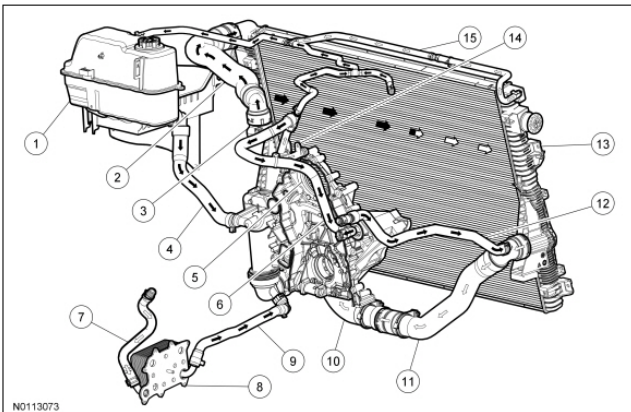
### Coolant Flow Diagrams

Note: Coolant temperature will vary with ambient temperature and load. Temperatures shown are for ambient temperature of 38 Deg C (100.4 Deg F). Black arrows indicate maximum temperature over 90 Deg C (194 Deg F), shaded arrows indicate maximum temperature approximately 60 Deg C (140 Deg F), White arrows indicate maximum temperature under 45 Deg C \*113 Deg F)



Secondary radiator (for transmission and other components)

Coolant Flow Diagram - Radiator Note: Black arrows indicate hot, white arrows indicate cold.



Primary radiator for the engine

## ADAPTIVE DRIVE CYCLE

**NOTE:** Always drive the vehicle in a safe manner according to driving conditions and obey all traffic laws.

1. Connect the scan tool to the vehicle.

2. **NOTE:** Do not clear the PCM Keep Alive Memory (KAM)

Using the scan tool, clear the Transmission Control Module (TCM) KAM and the adaptive table before conducting a solenoid body strategy drive cycle.

3. Using the scan tool, verify the transmission fluid is at normal operating temperature, between 91 Deg - 102 Deg C (196 Deg -216 Deg F). If the transmission fluid is not at operating temperature, drive the vehicle until the normal operating temperature is achieved.

4. **NOTE:** The transmission fluid must be at operating temperature before continuing with this step.

**NOTE:** Drive the vehicle on a level road surface to perform the solenoid body strategy.

1. Apply the park brake.

2. With the engine running and the brakes applied, move the selector lever in the following sequence pausing between each position for four seconds. Begin in Neutral, N-R-N-D-R-D-N. Repeat this sequence two additional times.

3. Release the park brake and accelerate at moderate throttle so each shift occurs around 2000 RPM for gasoline engines and 1500 RPM for diesel engines up to 105 kph (65 mph). Brake moderately to a stop. Repeat this pattern two additional times.

4. Accelerate at moderate throttle so each shift occurs around 3,000 rpm for gasoline engines and 2,250 rpm for diesel engines up to 105 k/mh (65 mph). Brake moderately to a stop. Repeat this pattern two additional times.

5. Stop the vehicle and apply the park brake.

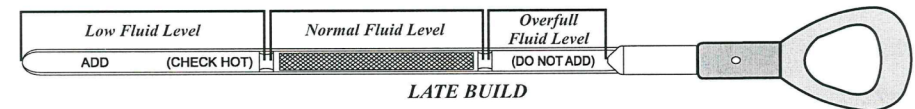
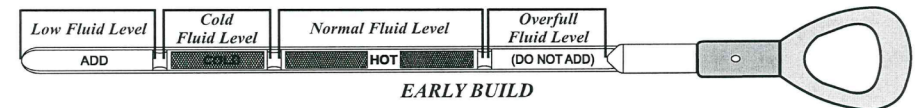
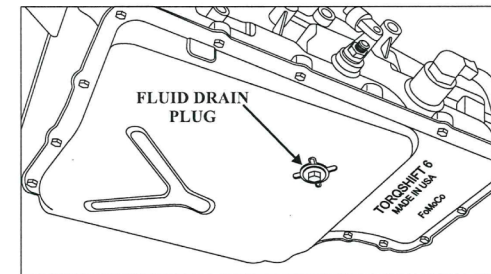
6. With the engine running and the brakes applied, move the selector lever in the following sequence pausing between each position for four seconds. Begin in NEUTRAL, N-R-N-D-R-D-N. Repeat this sequence two additional times.

**If a trouble light or code appears during the road test, the problem MUST be corrected before operating the vehicle further.**

## LUBRICATION AND INITIAL FILL RECOMMENDATIONS

**CAUTION: USE ONLY RECOMMENDED FLUID - MERCON LV**

Remove the transmission drain plug to allow fluid to drain. Replace fluid drain plug and torque to 159 lb in (18 Nm). Fluid level should be checked at normal operating temperature which is 180 Deg F to 200 Deg F. (82 Deg C to 93 Deg C) the factory recommended fluid is Mercon LV. Fluid is added through the transmission filler tube and checked with the transmission dipstick which has different graduations for early build transmissions and late build transmissions which result in a difference in final fluid level. Refer to the chart for correct fluid capacities.

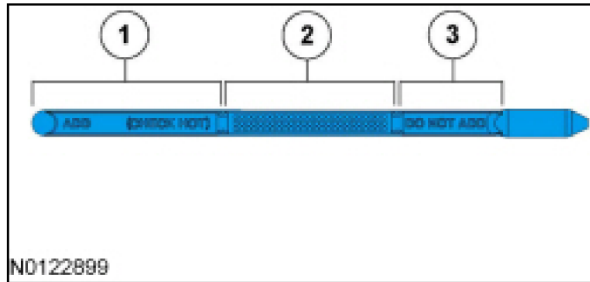


6R140W TRANSMISSION FLUID CAPACITIES			
EARLY BUILD		LATE BUILD	
Transmission Service	10.0 Quarts (9.5Liters)	Transmission Service	8.2 Quarts (7.8 Liters)
Valve Body Removed	12.0 Quarts (11.4 Liters)	Valve Body Removed	10.2 Quarts (9.7 Liters)
Transmission Overhaul	18.0 Quarts (17.0 Liters)	Transmission Overhaul	16.2 Quarts (15.3 Liters)

## TRANSMISSION FLUID LEVEL DRAIN, FILL, AND CHECK PROCEDURE

- Before starting the engine pour in 6-8 quarts of fluid.
- Start the engine, run for 30 seconds, then shut down.
- Add 4 more quarts of oil, then restart.
- Put the vehicle in drive and reverse several times.
- Re-check fluid level for proper fill.
- Be careful as residual oil in the filler tube will give false readings.
- Check both sides of the stick.
- On 4x4 units with a parking brake attached you must fill the parking brake separately.
- CTP recommends replacing the input seal of the transfer case during installation.

## Transmission Fluid Normal Operating Temperature



**1. DO NOT DRIVE IF BELOW THIS LEVEL AND AMBIENT TEMPERATURE IS ABOVE 10 DEG C (50 DEG F) (Underfill) Recheck transmission fluid level at normal operating temperature and adjust as required.**

**2. Normal Operating Range.**

**3. DO NOT DRIVE LEVEL (Overfill) Remove excess transmission fluid. Recheck transmission fluid level at normal operating temperature and adjust as required.**

## INSTALLATION RECOMMENDATIONS

- Check the vehicle solenoid harness for corrosion, cracks, and seal condition.
- A bad electrical connection will cause the transmission to malfunction.
- Check the flex plate for cracks, oblong holes and/or other damage.
- Check for transmission alignment dowel pins.
- Check vehicle battery/charging system for proper operation.
- If the original unit failure was for a cracked or broken bell housing, the source or cause must be found and corrected before installation.
- Make sure the battery cables are clean and tight. Also make sure the ground cables are good and clean at the engine block. It is always best to do a voltage drop test on your engine ground to make sure you don't have any ground issues.
- Clean the transmission and engine mating surface of all paint and debris. This is very important and should be done on every transmission.

## SOLENOID STRATEGY



## SOLENOID STRATEGY TAG CODES

Ford measures the flow rate for all of their solenoids used in the 6R140 applications.

- Transmission calibration software is then loaded, taking into consideration the individual solenoid flow characteristics and their position in the valve body.
- By using your scan tool, update the transmission controller software to match the new valve body and its solenoid configuration.

**NOTICE: If the solenoid body information does not match the module information, transmission damage or drivability concerns can occur.**

## TRANSMISSION STRATEGY DOWNLOAD

1. If a new main control was installed, record the 8-digit solenoid body identification and 13-digit solenoid body strategy from the replacement solenoid body tag provided with the main control service kit. Place the replacement tag over the existing identification tag.
  1. 13 - digit solenoid body strategy
  2. 8 - digit solenoid body identification
2. Using the scan tool, select module Programming and Programmable Parameters under the toolbox icon and select transmission. Follow the instructions displayed on the scan tool. There are fields to enter the solenoid body 8-digit identification and 13-digit strategy recorded from the solenoid body.
3. Compare the transmission strategy label to the codes displayed on the scan tool. The codes displayed on the scan tool should match the label. If not, select the update option on the tool. Once the update option is selected the tool will ask the user what best describes the repair operation that was performed on the transmission. The scan tool will only allow the user to select 1 of the five options. Once the selection is made, the user can enter the transmission code from the label into the entry box.
4. **NOTICE: If the solenoid body information is not correct, transmission damage or driveability concerns can occur.**

**NOTICE: It is critical that only 13-digit strategy be entered into the scan tool. Entering the 8-digit solenoid body identification will result in partial file download to the module. The 8-digit solenoid body identification option should only be used when directed by engineering in a case where a full 13-digit strategy cannot be obtained.**

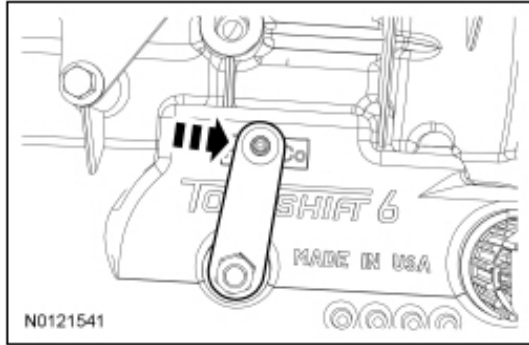
Enter the solenoid body 13-digit strategy. The scan tool verifies the numbers entered are valid and displays a message if the information is not valid. The scan tool will check to verify the file is present on the scan tool. If the file is present, the technician may proceed with downloading the file to the module. If the file is NOT present, the scan tool will prompt the user for permission to retrieve the file from the Professional Technician Society (PTS) server. Internet access will be required to download the file from the server to the scan tool.

5. Follow the instructions on the network to download the strategy file to the scan tool.
6. Follow the instructions displayed on the scan tool.
7. The scan tool automatically downloads the strategy file. The scan tool displays a message when it is finished downloading the data that states that the file was downloaded successfully.
8. The scan tool automatically downloads the strategy file or partial strategy file to the module. The scan tool displays a message when it is finished downloading the data that states that the file was downloaded successfully.
9. **NOTICE: If a drive cycle is not completed, erratic shifts and driveability concerns may occur.**

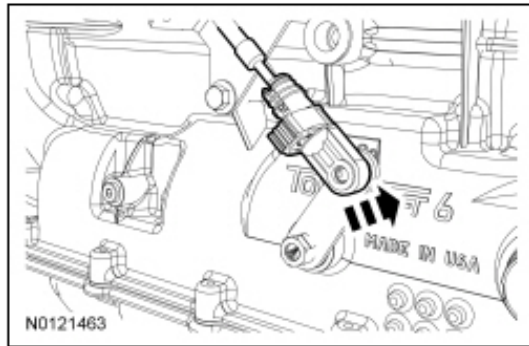
Road test the vehicle following the Adaptive Learning Drive Cycle.



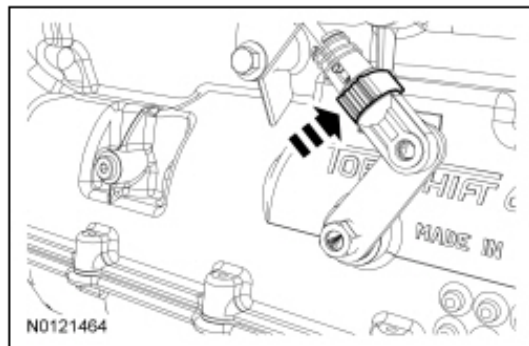
## Selector Lever Cable Adjustment, cont'd



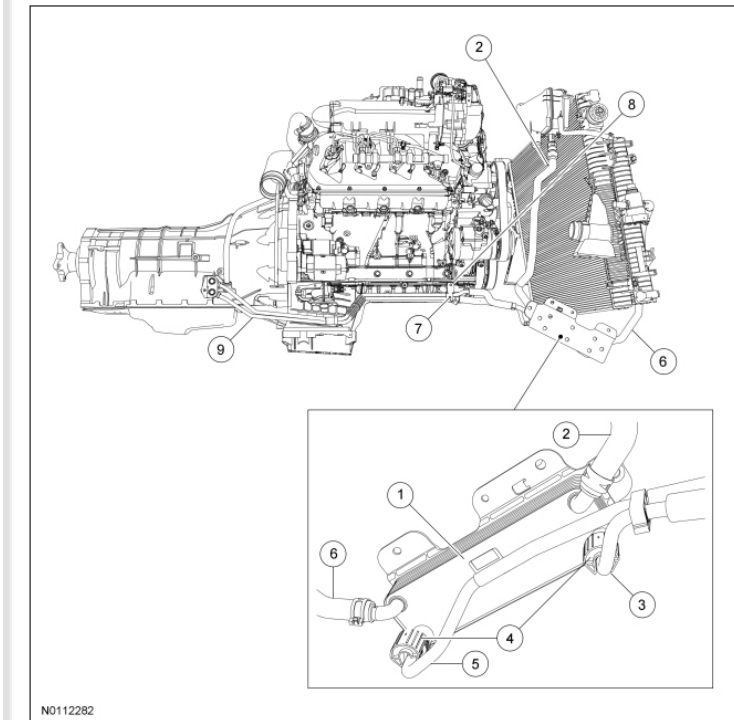
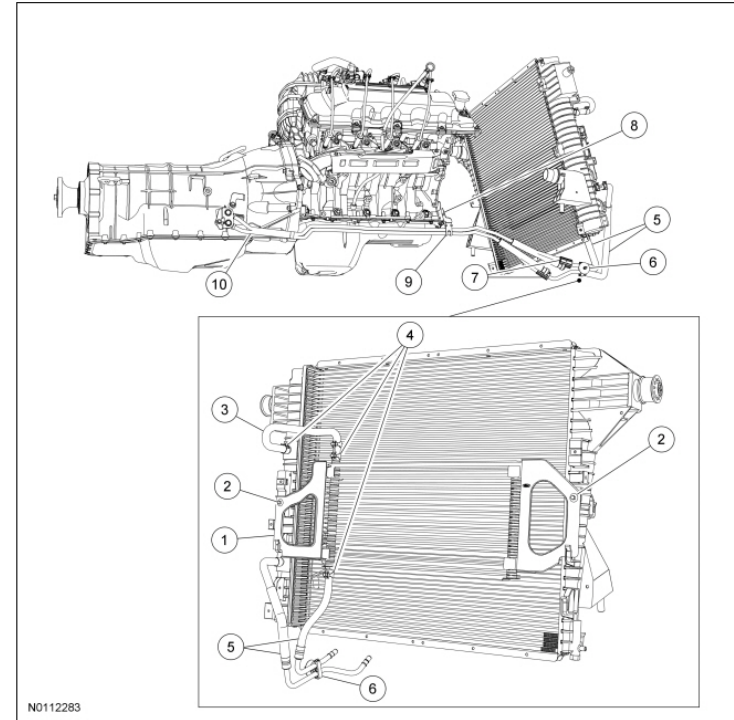
6. Connect the selector lever cable to the manual control lever.



7. Slide the adjuster tab in place to lock the selector lever cable.



8. Carefully move the selector lever from detent to detent and compare with the PRNDL. Verify that the vehicle will start in PARK and NEUTRAL, and the backup lamps illuminate in REVERSE.

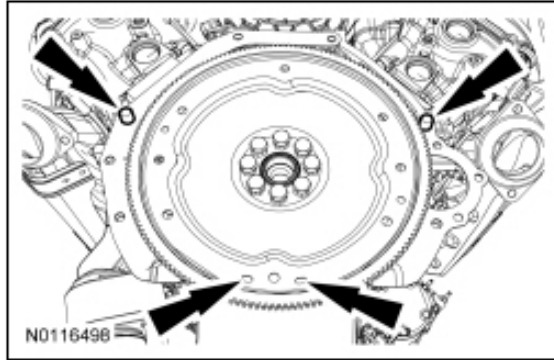


## 6R140 Converter Nut Torque Specifications:

Gas Engine - 4 nuts, 35 ft lbs (replace every time)

Diesel engine - 6 nuts, 35 ft lbs (replace every time)

## Dowel Locations:



4. Inspect the back of the engine to be sure both dowel pins are in the engine. If the dowel pins are not in the engine, install new dowel pins as needed. If installing the same transmission that was removed, remove the dowel pins from the transmission and install them in the engine. Rotate the flexplate to align the 2 slots at the 6 O'Clock position.

**NOTICE:** Prior to installation of the transmission, lubricate the torque converter pilot hub or damage to the torque converter or the engine crankshaft can occur.

## Aux cooler if used on gas engines only:

**NOTICE:** Failure to install a new auxiliary transmission fluid cooler can result in metallic contamination of the transmission.

If installing a new, remanufactured or overhauled transmission install a new auxiliary transmission fluid cooler, if equipped.

## Aux cooler if used Diesel engines only:

**NOTICE:** Failure to install a new auxiliary transmission fluid cooler can result in metallic contamination of the transmission.

If installing a new, remanufactured or overhauled transmission install a new auxiliary transmission fluid cooler if equipped.

## PTO:

**NOTICE:** Failure to clean the Power Take-Off (PTO) can result in metallic contamination of the transmission.

## Dowels:

Inspect the back of the engine to be sure both dowel pins are in the engine. If the dowel pins are not in the engine, install new dowel pins as needed. If installing the same transmission that was removed, remove the dowel pins from the transmission and install them in the engine.

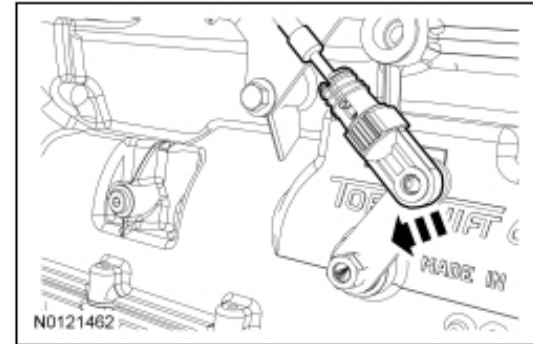
## Main Cooler Flush:

**NOTICE:** Failure to flush the transmission fluid cooler and transmission fluid cooler tubes can result in metallic contamination of the transmission.

If installing a new, remanufactured or overhauled transmission, clean and backflush the transmission fluid cooler tubes to prevent repeat repairs.

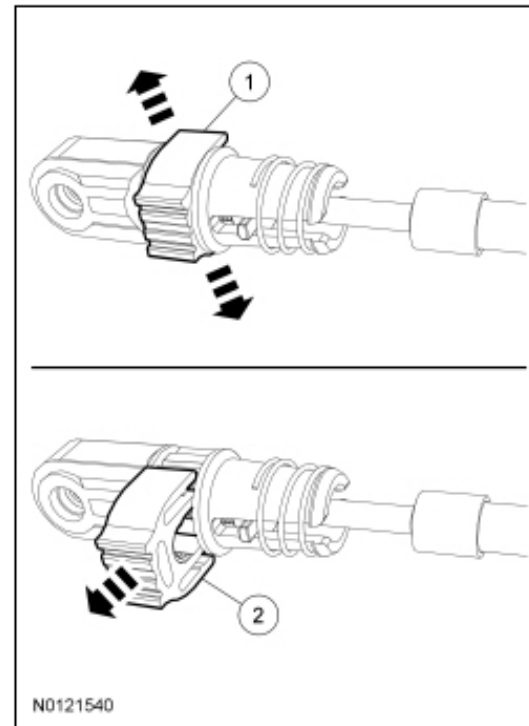
# Selector Lever Cable Adjustment

1. With the vehicle in **NEUTRAL**, position it on a hoist.
2. Place the selector lever in the **DRIVE** position.
3. Disconnect the selector lever cable from the manual control lever.



## 4. Release the selector lever cable adjuster lock.

1. Carefully pry outward the adjuster lock tabs.
2. While holding the adjuster lock tabs outward, slide the lock to unlock the selector lever cable.



## 5. Place the manual control lever in the **DRIVE** position.

1. Move the manual control lever all the way forward into the **LOW** position.
2. Move the manual control lever 3 detents rearward into the **DRIVE** position.