


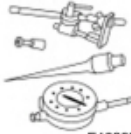



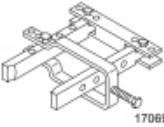

307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80
Overhaul










2019 Ranger
Procedure revision date: 09/27/2018

Transmission


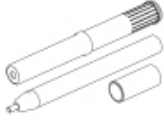



Base Part Number: 7000

Special Tool(s) / General Equipment

 E129694	100-001 (T50T-100-A) Slide Hammer
 E139373	100-002 (TOOL-4201-C) Holding Fixture with Dial Indicator Gauge
 E232969	205-1018 Installation Tube
 307-003	307-003 (T57L-500-B) Holding Fixture, Transmission
 E142010	307-091 Handle, Torque Converter TKIT-2009TC-F
 17069	307-309 Remover, Torque Converter Seal TKIT-1994-FMH/FLMH TKIT-1994-LMH/MH TKIT-1994-FH
 307-346	307-346 (T97T-7902-A) Retainer, Torque Converter TKIT-1998-LM (NavigatorR) TKIT-1997-F/FLM/LT
	307-458 Socket, Output Shaft Locknut TKIT-2003N-F

 <p>E270042</p>	
 <p>E270043</p>	307-549 Installer, Shift Shaft Fluid Seal TKIT-2005D1-F1
 <p>E216419</p>	307-584 2-6 Spring Compressor TKIT-2006UF-FLM TKIT-2006UF-ROW
 <p>E216420</p>	307-589 Overdrive clutch and balance piston service set TKIT-2006UF-FLM TKIT-2006UF-ROW
 <p>E270044</p>	307-651 Bracket, Pump Remover/Installer
 <p>E234933</p>	307-651-01 Adapter for 307-651 (Super Sub Assembly Lifting)
 <p>E270045</p>	307-653 Sizer, Input Shaft Teflon Seal
 <p>E270046</p>	307-660 Installer, Front Pump Seal TKIT-2009C-F TKIT-2009C-ROW
 <p>E270047</p>	307-661 Gauge, End Play TKIT-2009C-F TKIT-2009C-ROW
	307-662

 <p>E270048</p>	<p>Gauge, Clutch Pack Endplay TKIT-2009C-F TKIT-2009C-ROW</p>
 <p>E239703</p>	<p>307-691 Tester, Torque Converter Leak</p>
 <p>E233333</p>	<p>307-732 Tool Kit, Torque Converter Flusher</p>
 <p>E234902</p>	<p>307-733 Compressor, Clutch Piston</p>
 <p>E234903</p>	<p>307-734 Tool, OWC Alignment</p>
 <p>E234908</p>	<p>307-736 Installer, Pump Drive Gear Bearing</p>
 <p>E234909</p>	<p>307-737 Press Tool, Oil Pump Drive Idler Gear</p>
 <p>E234921</p>	<p>307-741 Spring Compressor, F Clutch</p>
 <p>E234924</p>	<p>307-743 Remover, Pump Drive Gear</p>
	<p>307-746</p>

 E234932	Remover, Transmission Wiring Harness Connector
 E248128	307-747 Installer/ Sizer , Input Shaft Solid Sealing Rings; Large
 E248129	307-748 Installer/Sizer, Input Shaft Solid Sealing Rings; Small
 E248130	307-749 Installer/Sizer, R2-S3 Shaft Solid Seal
 E248131	307-750 Installer, Converter Seal
Feeler Gauge	
Hydraulic Press	
Punch	
Wooden Block	
Magnet	

Materials

Name	Specification
Motorcraft® MERCON® ULV Automatic Transmission Fluid XT-12-QULV	WSS-M2C949-A MERCON® ULV

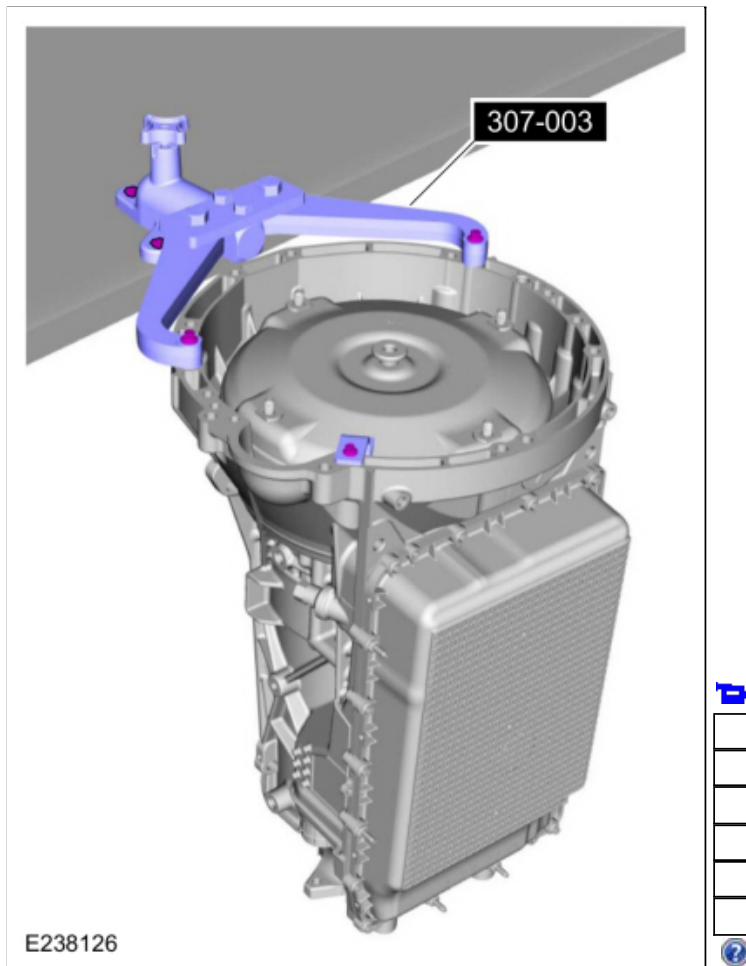
All vehicles

- The following components are discarded during disassembly and must be replaced:

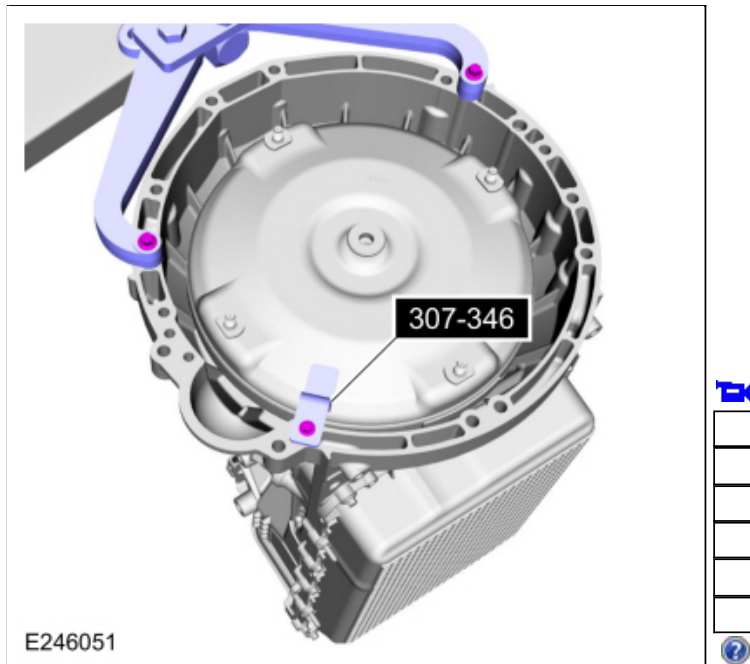
Description	Part Number
Gasket and oil seal kit	7153
Transmission fluid auxiliary pump tube seal	7J135
Output shaft flange bolt (RWD only)	7N134

Output shaft nut (RWD only)	7085
Manual control shaft-to-TR sensor roll pin	7G100
Front support assembly bolts	7N134
D clutch balance dam	7D343
E clutch piston	7A262

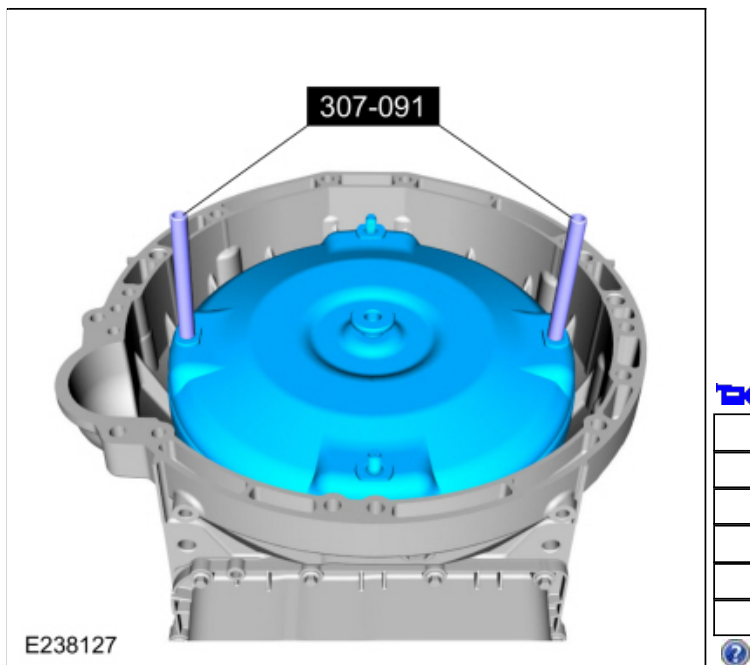
2. For information on component views and base part numbers.
Refer to: [Transmission Description](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Description and Operation).
3. Using the special tool, install the transmission on a bench.
Use Special Service Tool: [307-003 \(T57L-500-B\) Holding Fixture, Transmission](#).



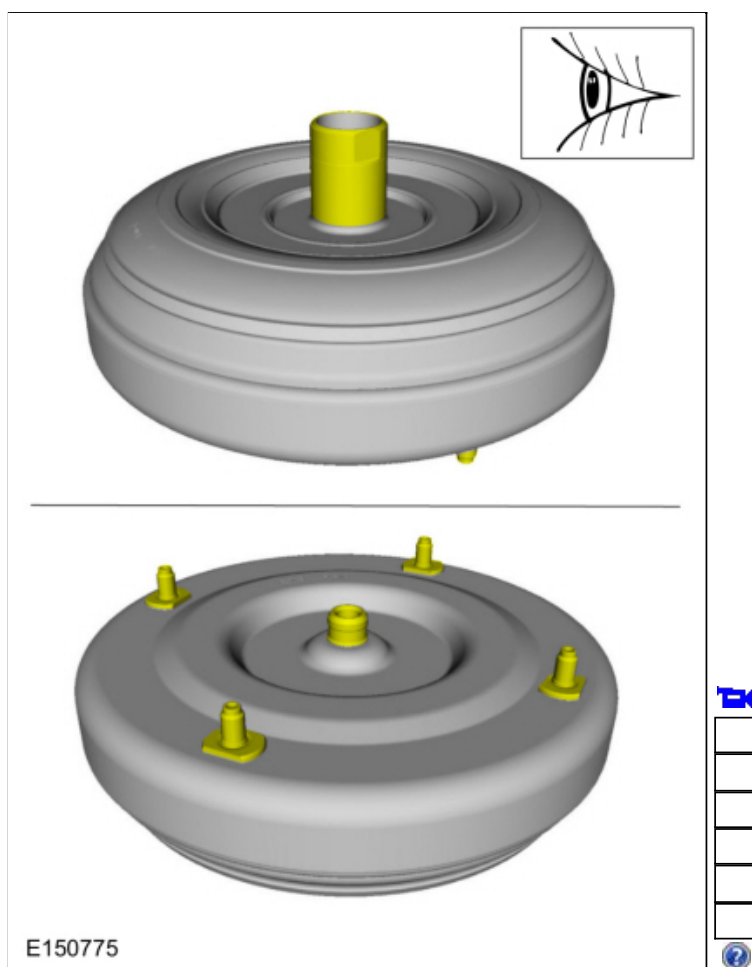
4. Remove the special tool.
Use Special Service Tool: [307-346 \(T97T-7902-A\) Retainer, Torque Converter](#).



5. Using the special tool, remove the torque converter.
Use Special Service Tool: [307-091 Handle, Torque Converter](#).



6. A new or remanufactured torque converter must be installed if one or more of the following statements are true:
- The sealing surface has a groove worn from the seal.
 - A torque converter malfunction has been determined based on complete diagnostic procedures.
 - The torque converter stud or studs, threaded pads, impeller hub or bushing are damaged.
 - The torque converter exhibits external discoloration (due to overheating).
 - There is evidence of water or antifreeze contamination.

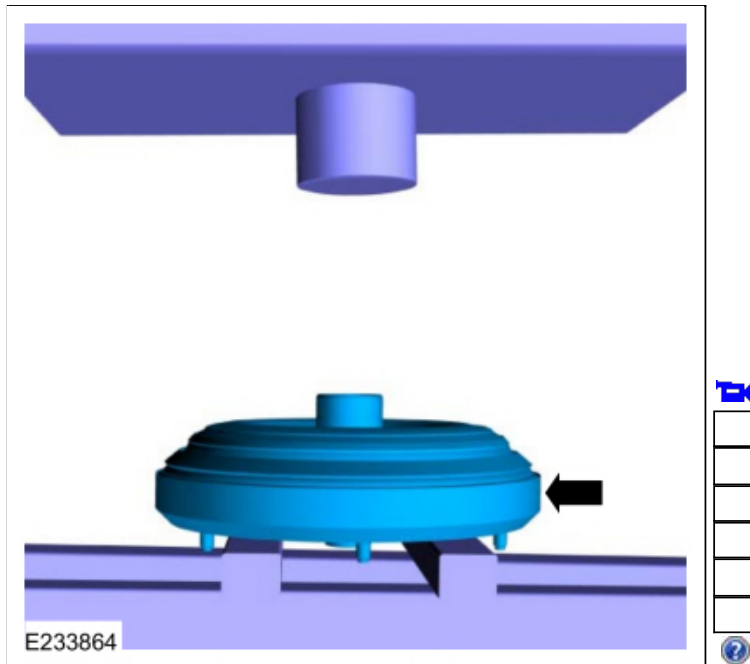


Flush The Torque Converter With The Transmission Cooling System Heated Flusher

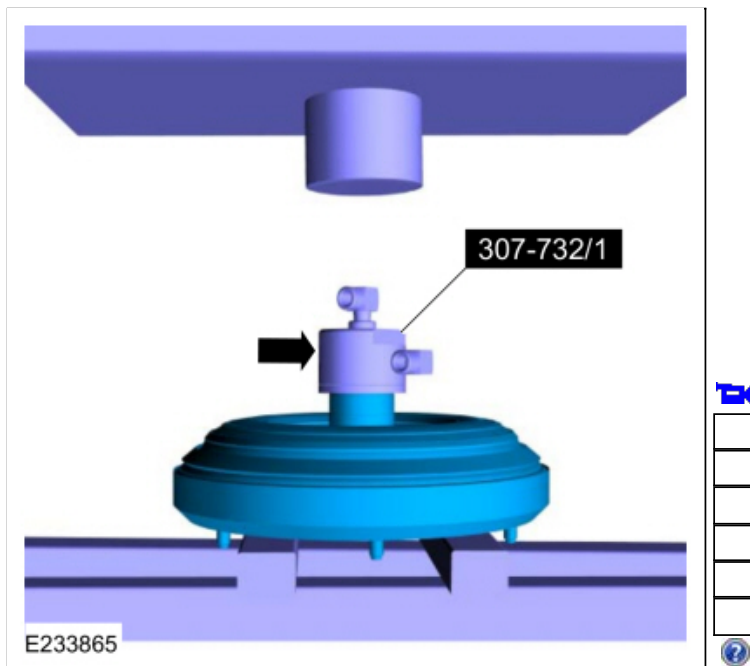
7. **NOTE:** Use transmission fluid specified for this transmission. Do not use any supplemental transmission fluid additives or cleaning agents. The use of these products could cause internal transmission components to fail, which will affect the operation of the transmission.

The torque converter must be flushed every time the transmission is overhauled. It is mandatory that proper equipment and procedures be followed when flushing the torque converter. The flushing equipment used MUST:

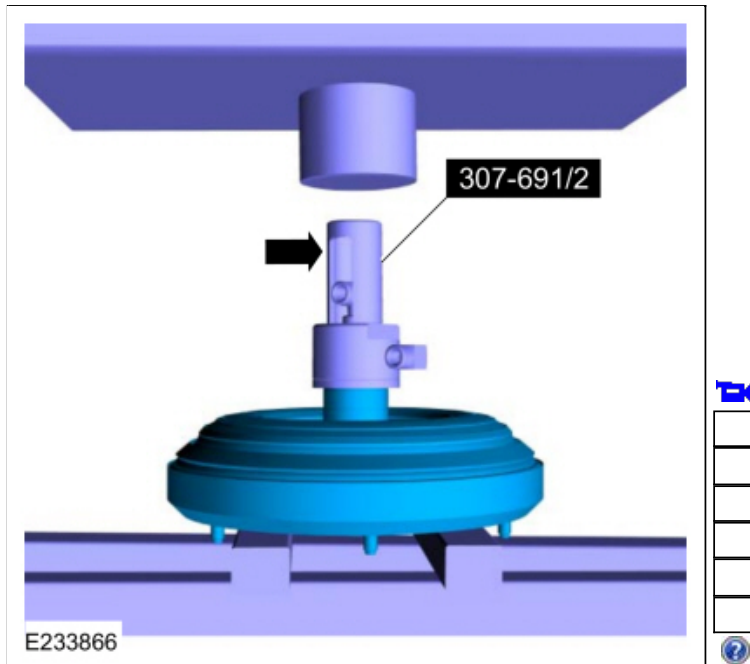
- Maintain the transmission fluid at 140°F or above
 - Pulsate the transmission fluid during cleaning
 - Have a GPM flow meter
 - Have a filter with a rating of 100 micron or less
 - Have air purge capability before and after flushing
8. If equipment meeting the specifications above is not available, the torque converter must be flushed by hand. Go to Flush The Torque Converter By Hand steps later in this procedure.
9. Check and top off the transmission fluid level of the transmission cooling system heated flusher with transmission fluid.
10. Turn on the heater and allow the transmission fluid in the transmission cooling system heated flusher 15-30 minutes to heat up to 60°C (140°F) before using.
11. Place the torque converter in an arbor press. Support the torque converter on the mounting pads.



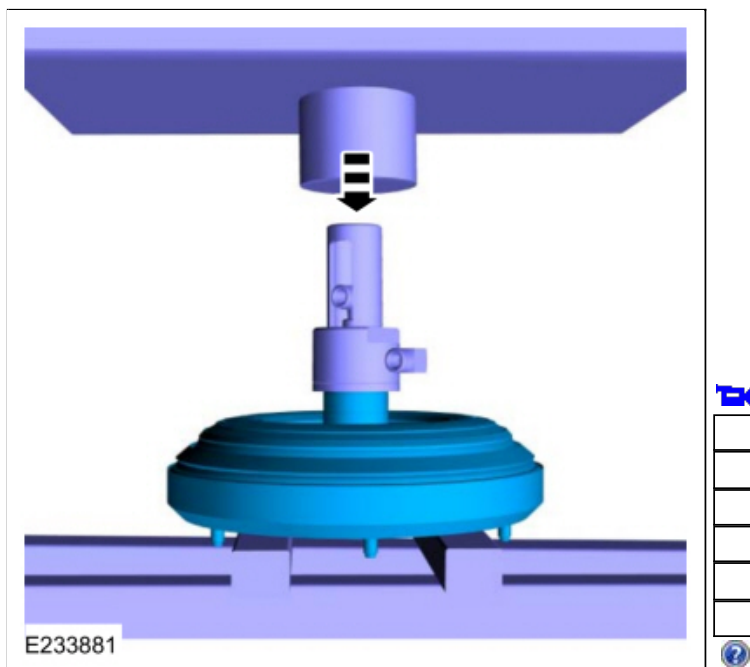
12. Using the special tools, assemble the correct turbine shaft simulator to the torque converter flush main hub and place it on the torque converter hub.
Use Special Service Tool: [307-732 Tool Kit, Torque Converter Flusher.](#)



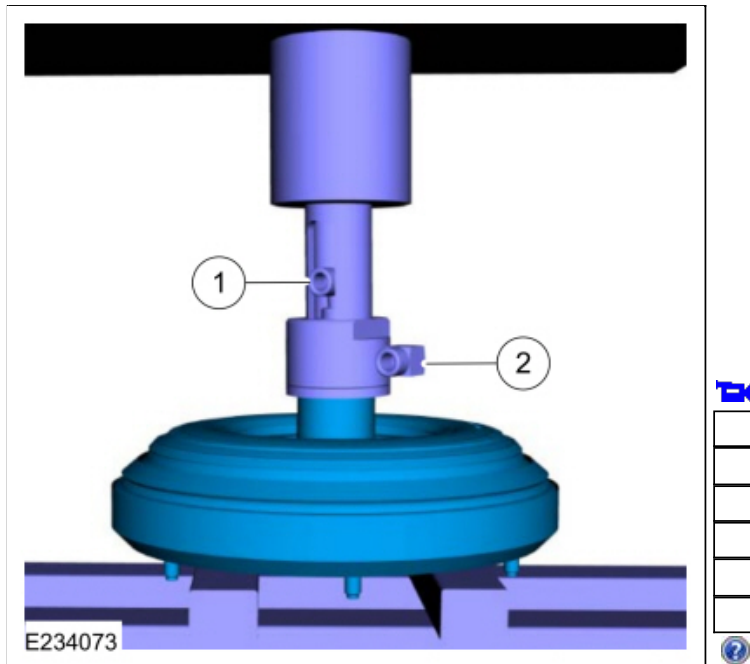
13. Using the special tool, install the slotted cap.
Use Special Service Tool: [307-691 Tester, Torque Converter Leak.](#)



14. Apply enough force from the press to seal the torque converter flush main hub to the torque converter hub.



15. Connect the flush machine to the main hub.
1. Red hose on top.
 2. Blue hose on bottom.



16. Follow the equipment instructions to purge transmission fluid from the torque converter prior to starting the flushing procedure.

17. **⚠ WARNING: The torque converter, adaptor 307-732, and the hoses will be hot.**

NOTE: Maintain visual contact with torque converter during the entire flush procedure. Immediately stop the flush machine if a leak develops. Repeat set up steps to reseal the tool to the converter hub and continue flushing.

Forward flush the converter for 15 minutes.

18. Monitor GPM flow meter periodically during the flush procedure. Flow rate above 2.0 gallons per minute is required to break up and dislodge any contamination trapped behind the TCC plate. Service flush machine filter(s) if flow rate drops below 2 GPM.
19. Follow the equipment instructions to purge the torque converter.

20. **⚠ WARNING: The torque converter, adaptor 307-732, and the hoses will be hot.**

Allow torque converter and equipment to cool for 30 minutes before handling.

21. Disconnect the hoses and remove the special tools.

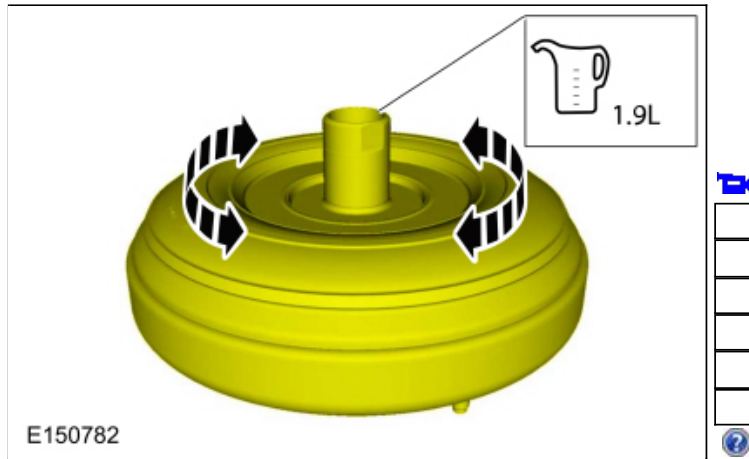
Flush The Torque Converter By Hand

NOTICE: Do not use water-based cleaners or mineral spirits to clean or flush the torque converter or transmission damage will occur. Use only clean transmission fluid designated for the transmission and torque converter being serviced.

NOTE: Only flush the torque converter by hand when the transmission cooling system heated flusher is not available.

22. Pour a small amount of transmission fluid from the torque converter onto an absorbent white tissue or through a paper filter.
23. Examine the transmission fluid for contaminants. The transmission fluid must be free of metallic contaminants. If metallic contaminants are present, do not continue with hand flushing. The torque converter must be flushed with the transmission cooling system heated flusher.

24. Drain the remaining transmission fluid from the torque converter.
25. Using only the recommended transmission fluid, add 1.9L (2 qt) of clean transmission fluid into the converter and agitate by hand.
Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (WSS-M2C949-A) (MERCON® ULV)



26. Thoroughly drain the transmission fluid.

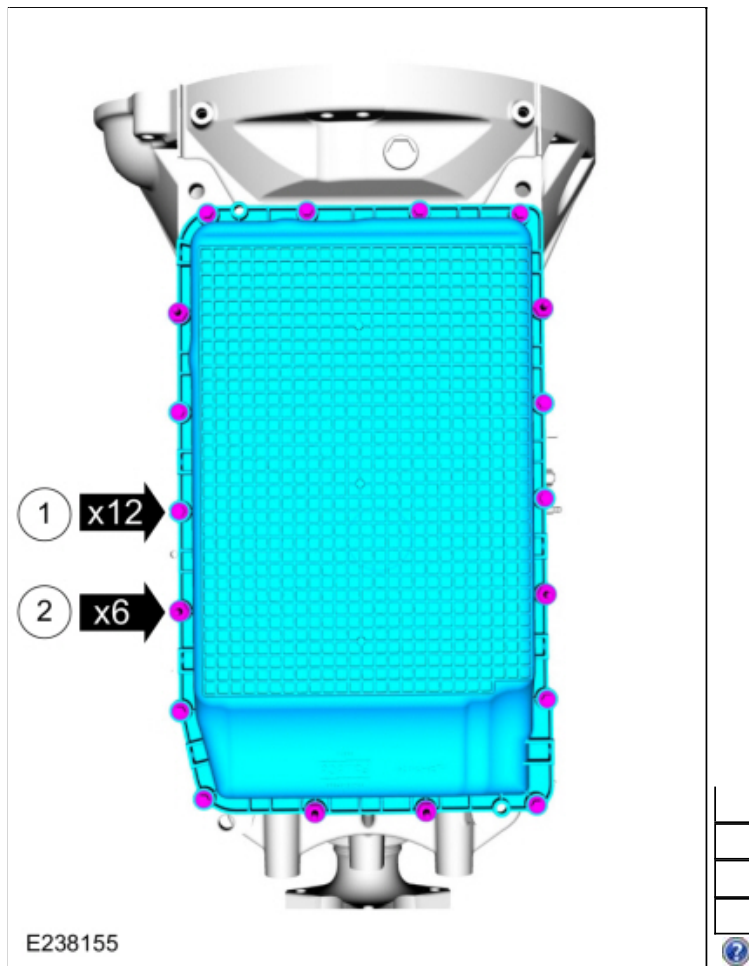
All vehicles

27. **NOTE:** Note the location of the bolts and studbolts for assembly.

Remove the bolts and studbolts and the transmission fluid pan.

1. Bolts
2. Studbolts

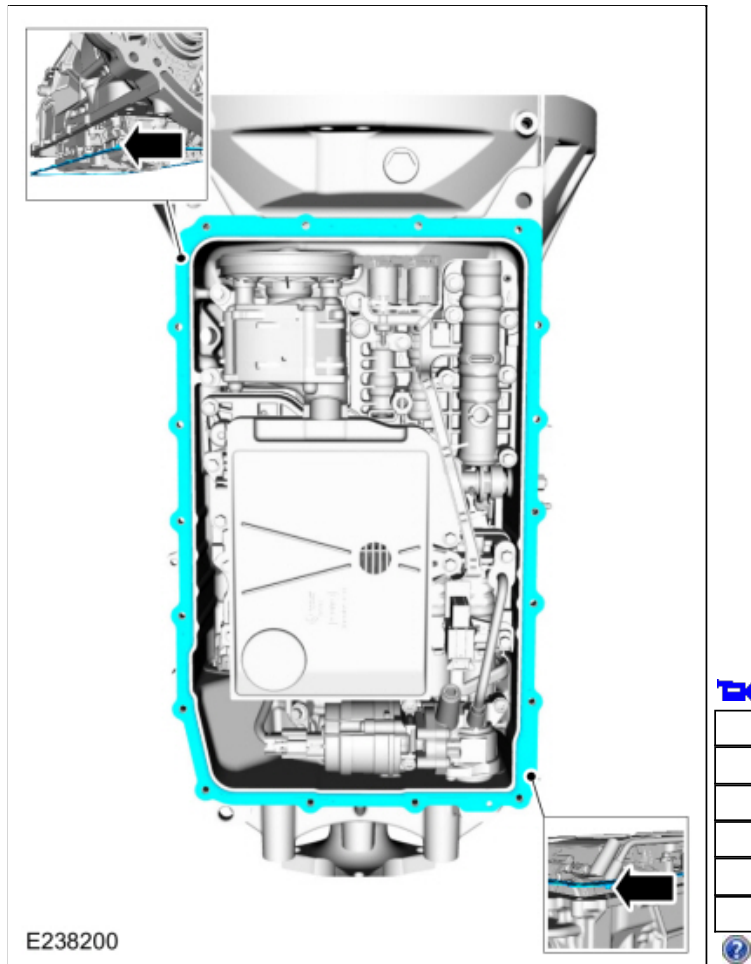




28. **NOTE:** The transmission fluid pan gasket can be reused if not damaged.

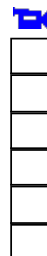
NOTE: Note the location of the alignment tabs.

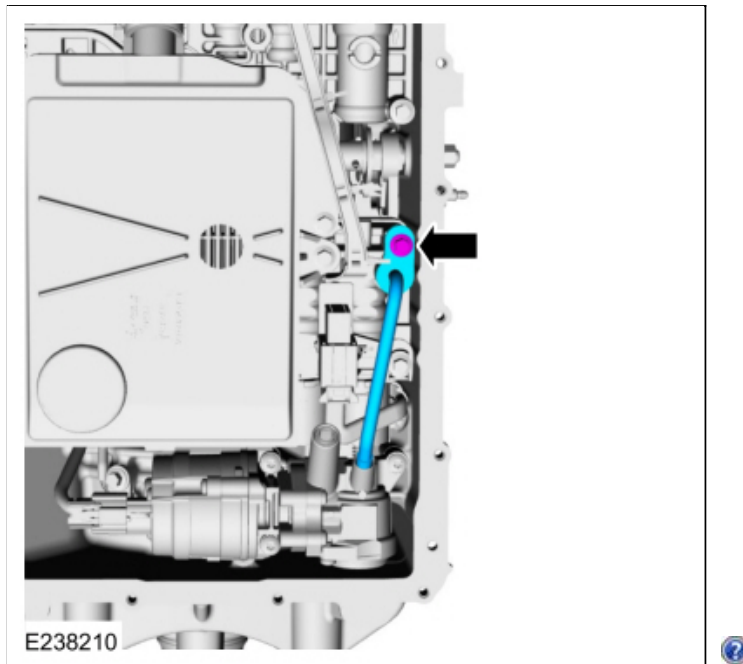
Remove the transmission fluid pan gasket.



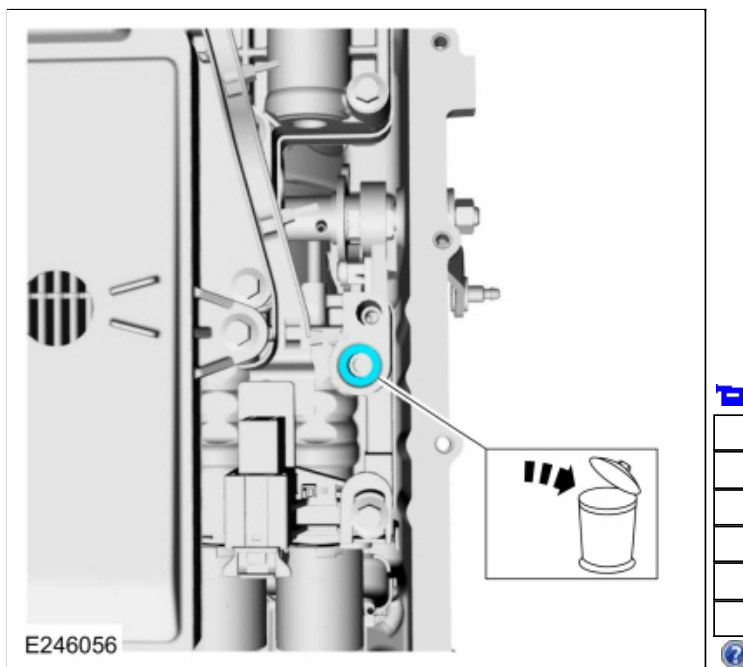
Auto-Start-Stop vehicles

29. Remove the bolt and the transmission fluid auxiliary pump tube.

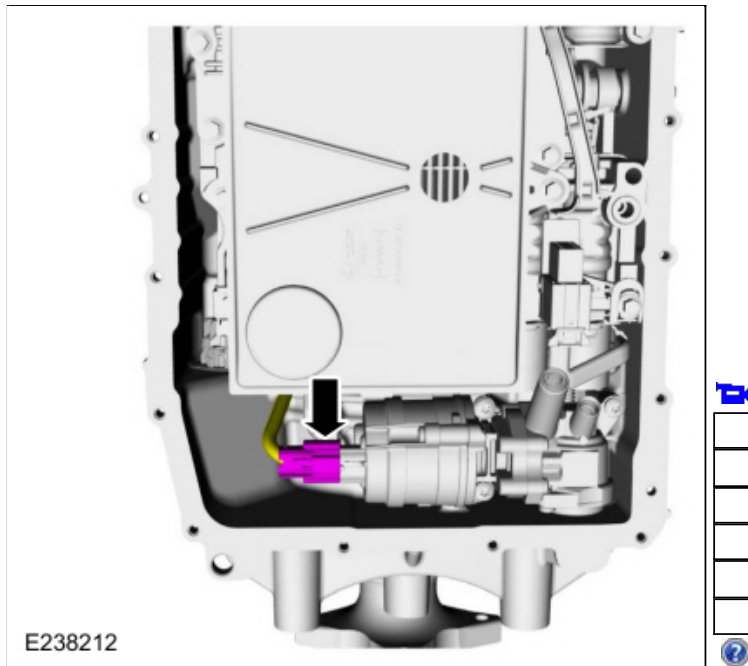




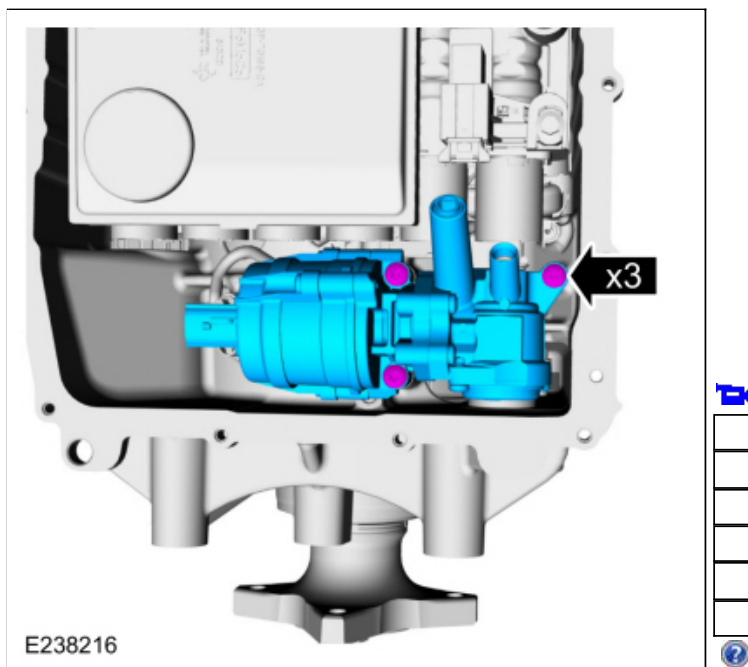
30. Remove and discard the transmission fluid auxiliary pump tube seal.



31. Disconnect the transmission fluid auxiliary pump electrical connector.



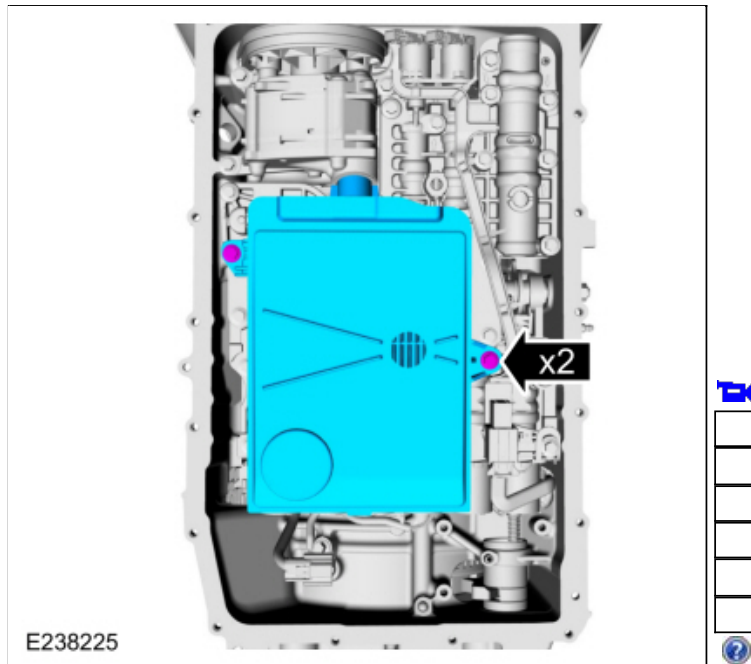
32. Remove the bolts and the transmission fluid auxiliary pump.



All vehicles

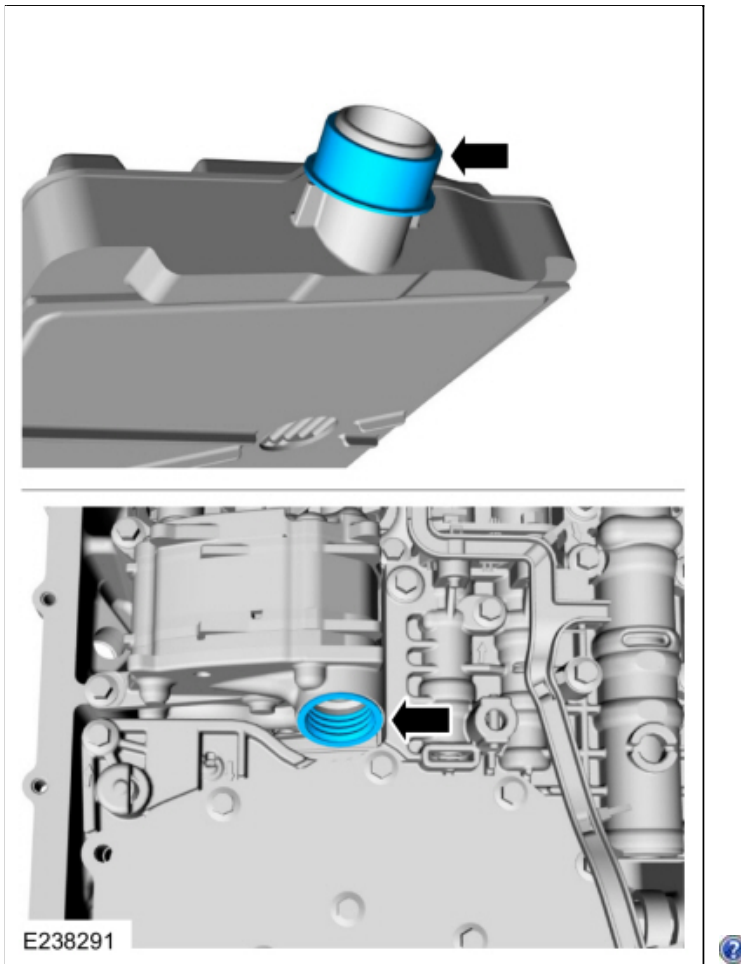
33. **NOTE:** The transmission fluid filter may be reused if no excessive contamination is indicated.

Remove the 71 mm and 20 mm bolts and the transmission fluid filter.

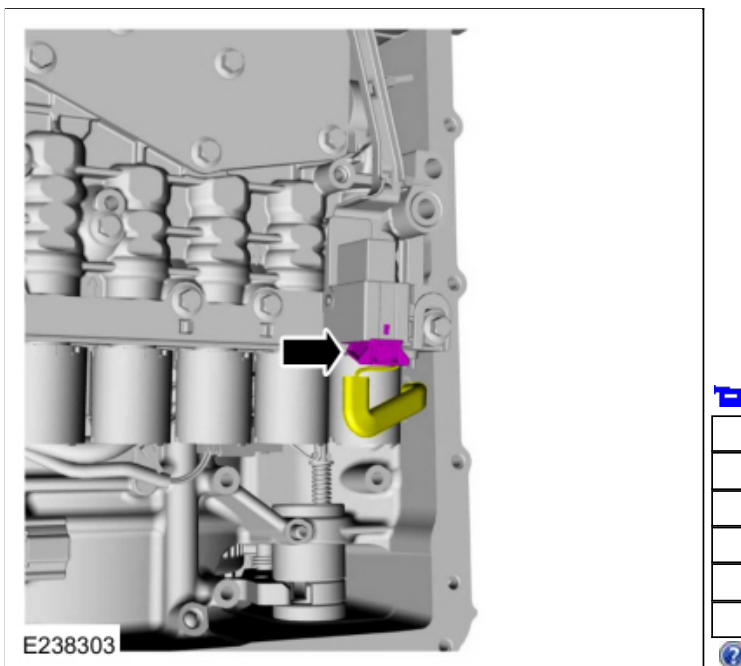


34. **NOTE:** The transmission fluid filter seal will either come off with the transmission fluid filter or it will be stuck in the pump.

Remove the transmission fluid filter seal.

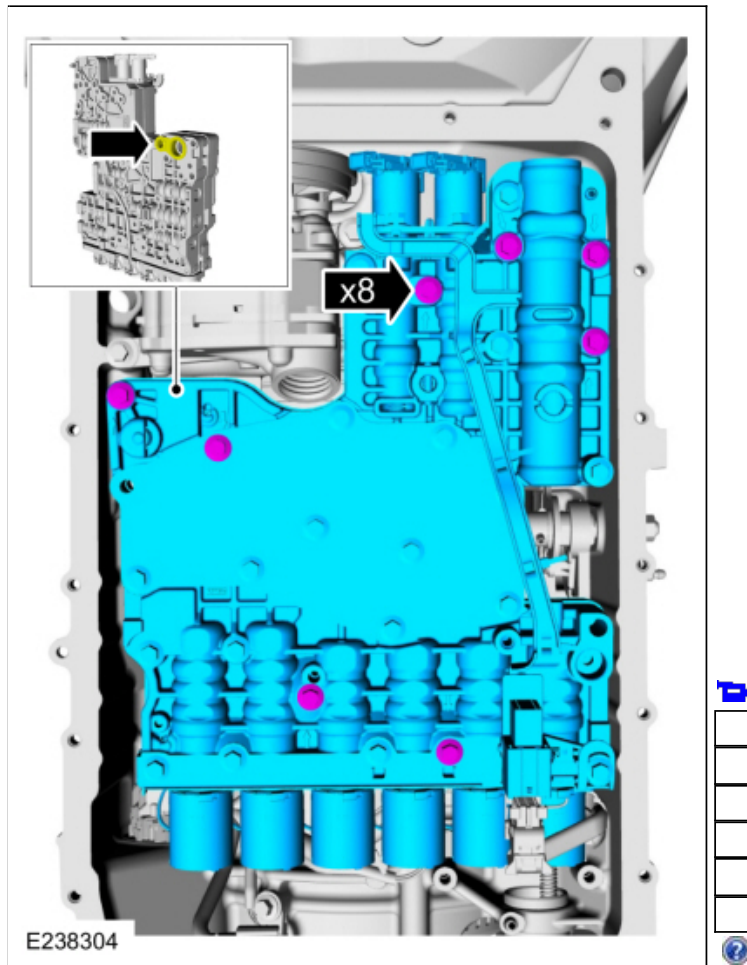


35. Disconnect the main control main electrical connector.

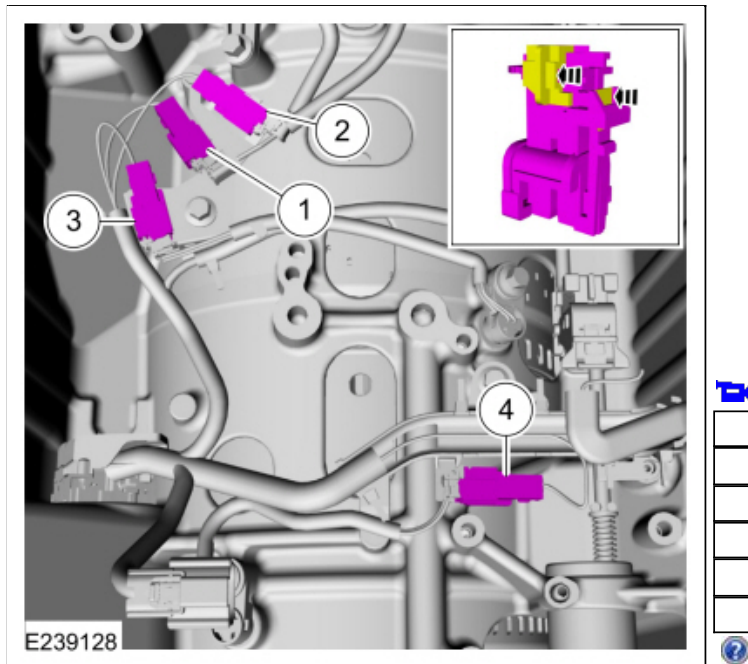


36. **NOTE:** Check to see if the main control-to-transmission fluid pump seal is attached to the main control.

Remove the 68 mm bolts and the main control assembly.

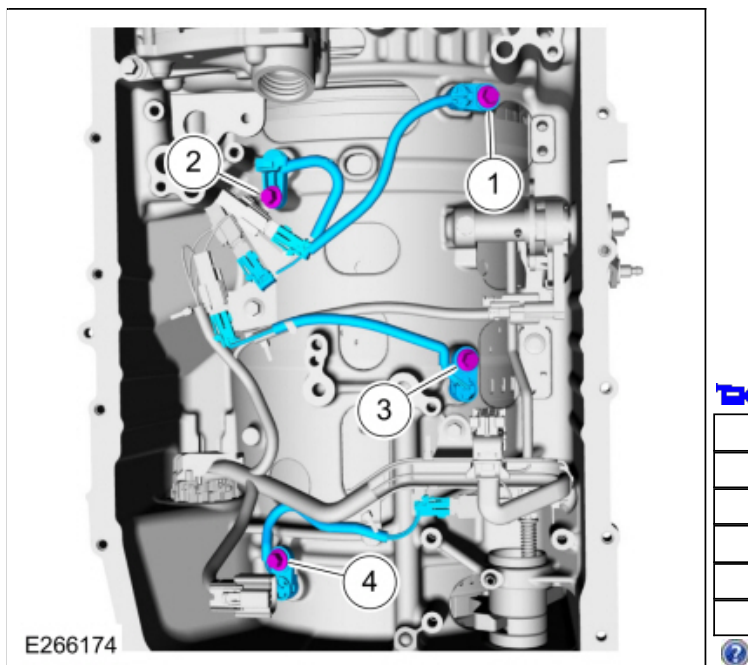


37. Clean and inspect the main control for damage.
Refer to: [Main Control Valve Body](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Overhaul).
38. Unlock and disconnect the speed sensors.
1. Intermediate Speed Sensor A (ISSA)
 2. TSS sensor
 3. Intermediate Speed Sensor B (ISSB)
 4. OSS sensor

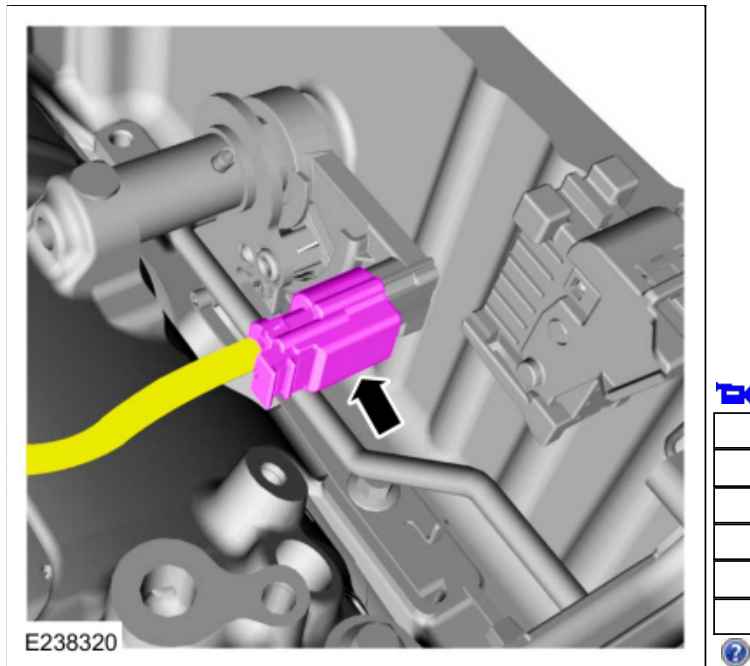


39. Remove the speed sensors.

1. Intermediate Speed Sensor A (ISSA)
2. TSS sensor
3. Intermediate Speed Sensor B (ISSB)
4. OSS sensor



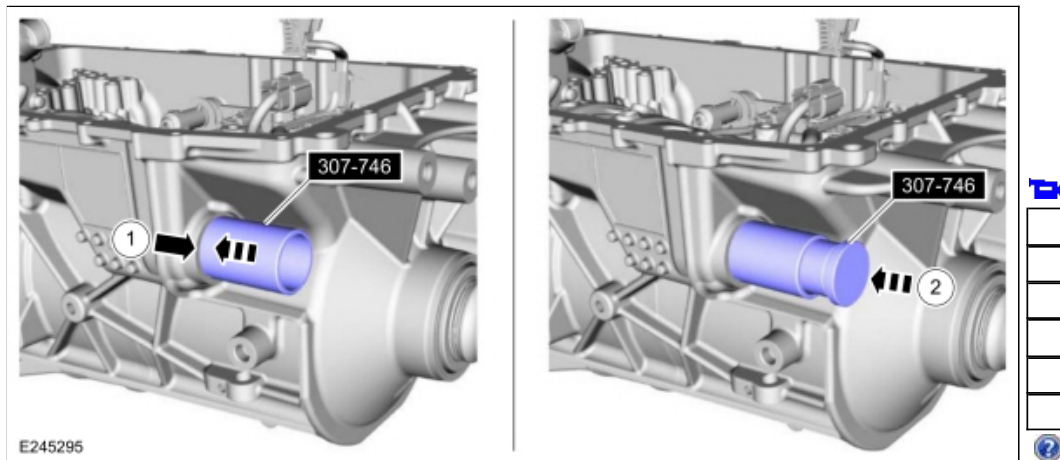
40. Disconnect the TR sensor electrical connector.



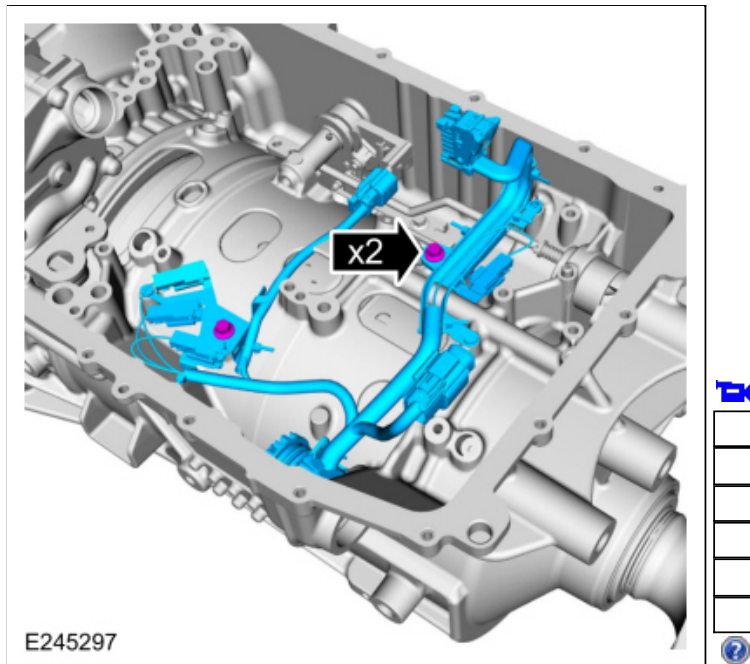
41.

Using the special tool, disconnect the transmission internal wiring harness connector from the transmission case.

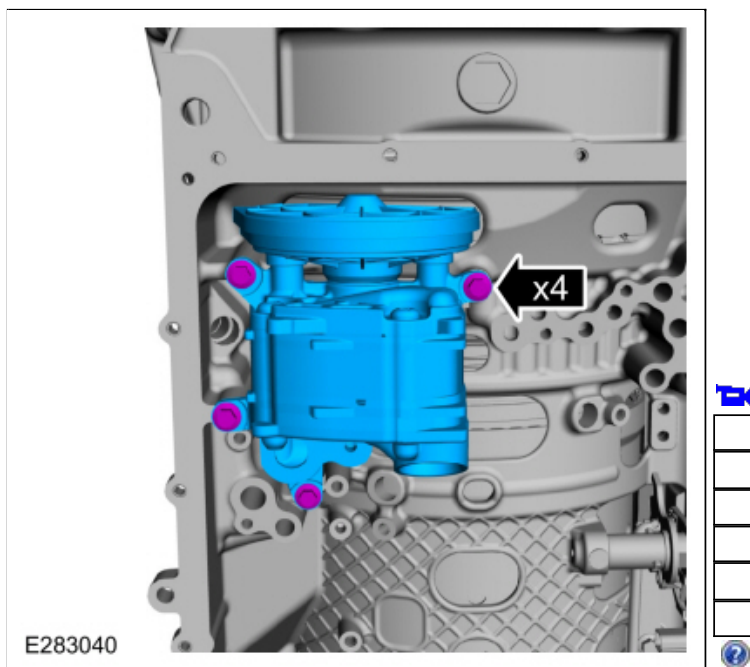
1. Slide the special tool over the connector flush with the transmission case.
Use Special Service Tool: [307-746 Remover, Transmission Wiring Harness Connector](#).
2. Use the special tool to push the connector through the case.



42. Remove the bolts and the transmission internal wiring harness.

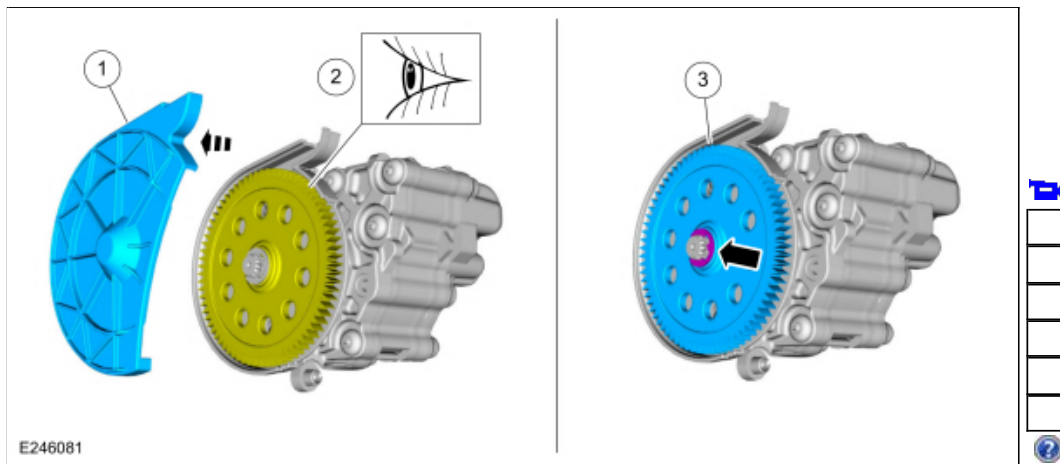


43. Remove the bolts and the transmission fluid pump.

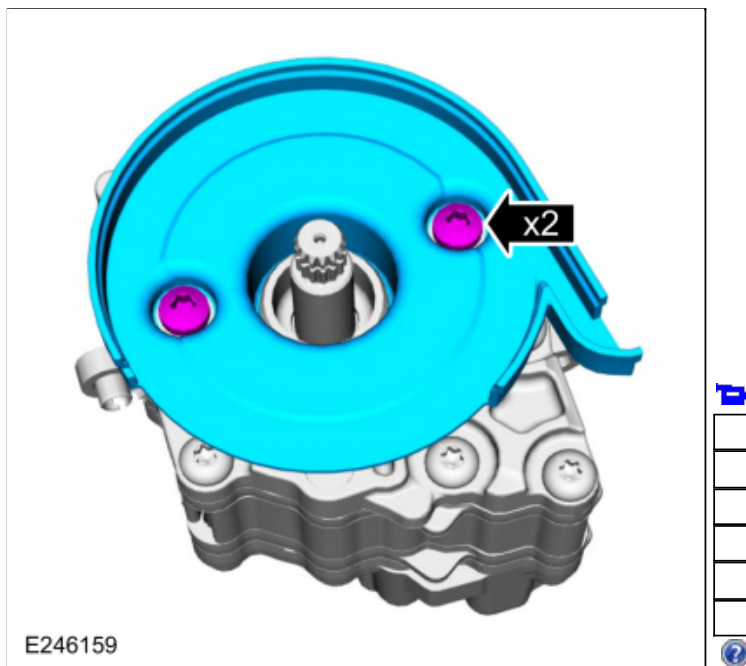


44.

1. Remove the transmission fluid pump driven gear outer cover.
2. Clean and inspect the transmission fluid pump driven gear.
3. If replacing the transmission fluid pump driven gear or transmission fluid pump driven gear inner cover, remove the retaining ring and the transmission fluid pump driven gear.

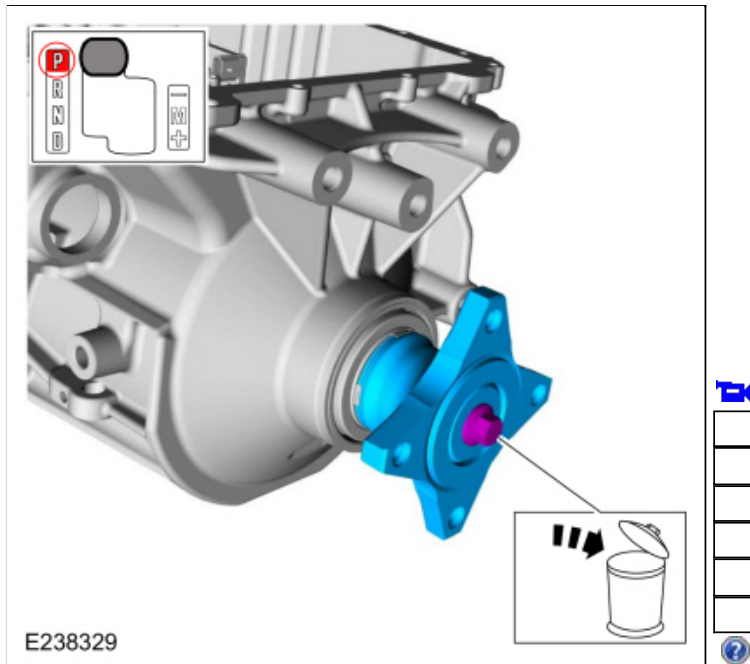


45. If necessary, remove the bolts and the transmission fluid pump driven gear inner cover.

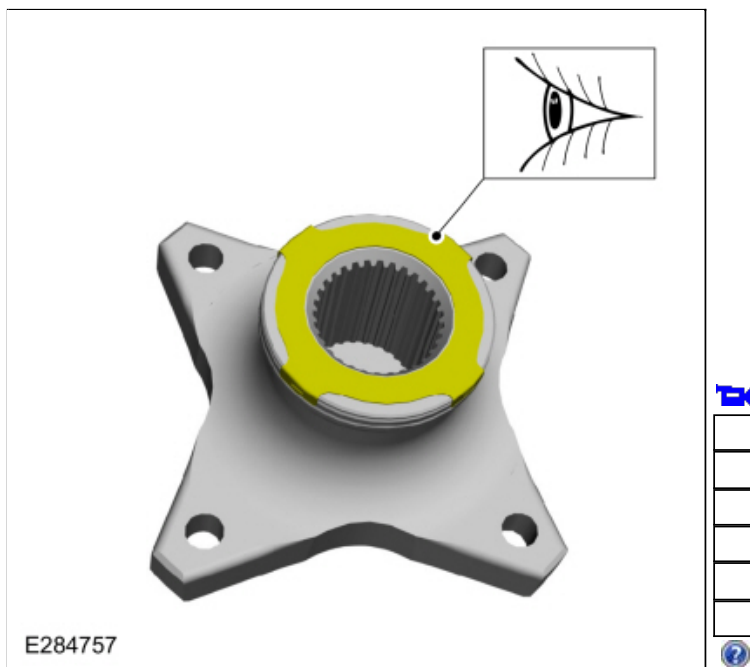


Rear Wheel Drive (RWD) vehicles

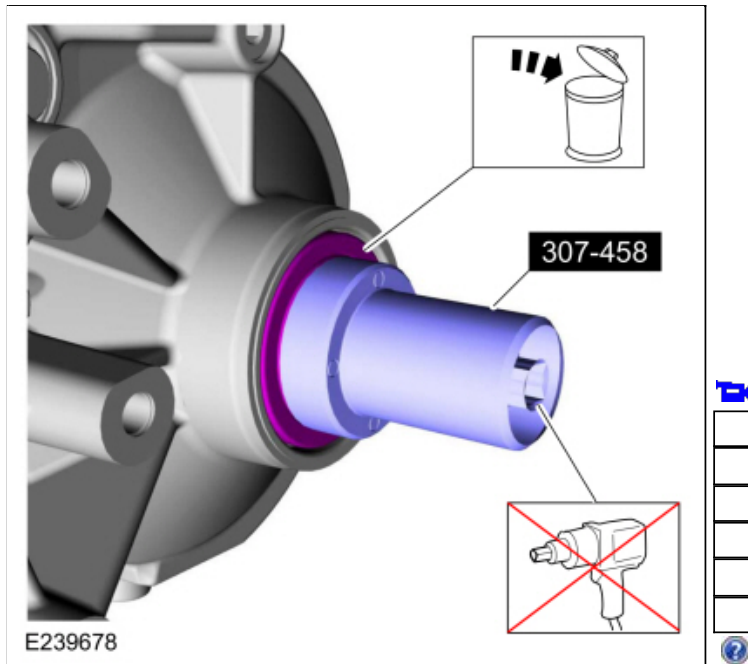
46. Rotate the manual control lever to P. Remove and discard the output shaft flange bolt. Remove the output shaft flange and anti-ting ring assembly.



47. Clean and inspect the anti-ting ring.

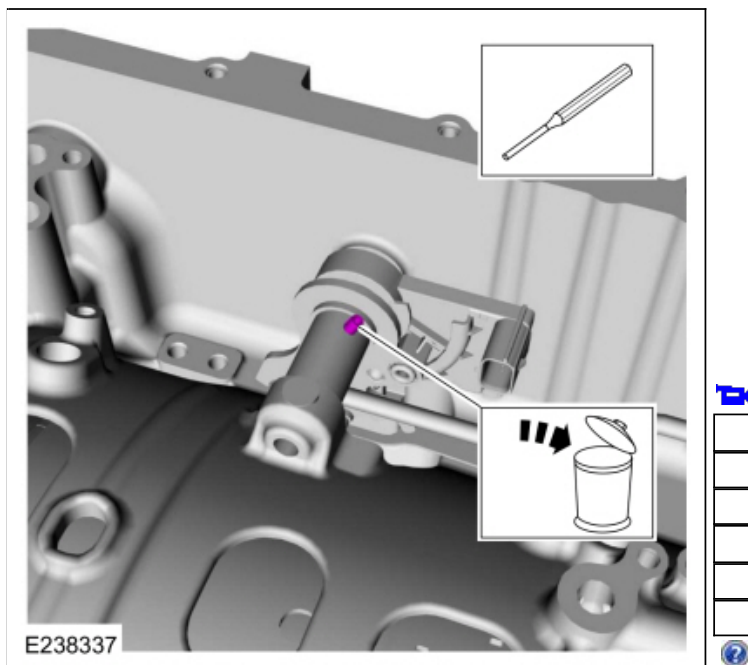


48. Using the special tool, remove and discard the output shaft nut.
Use Special Service Tool: [307-458 Socket, Output Shaft Locknut](#).

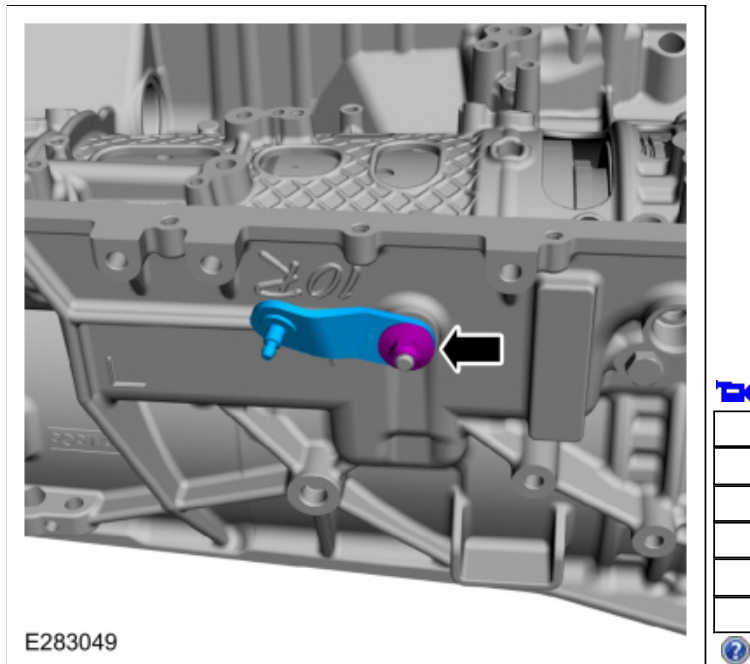


All vehicles

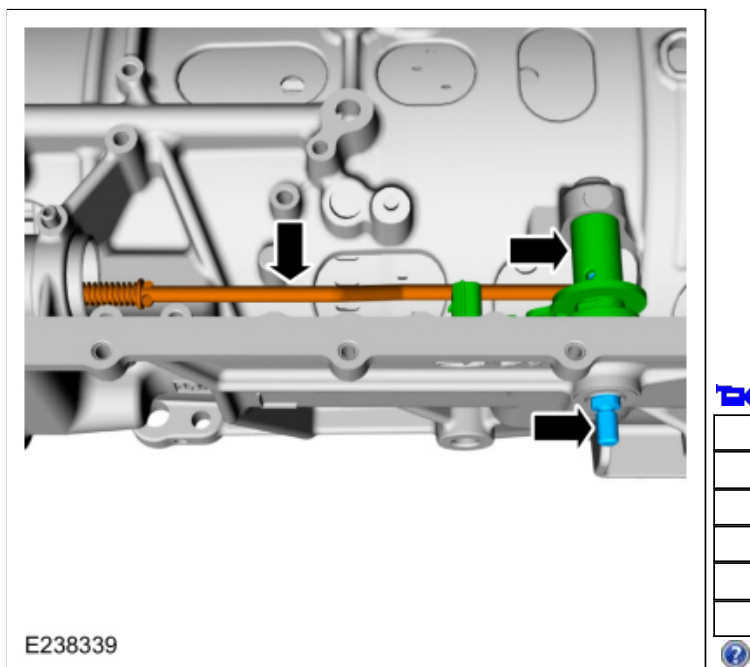
49. Remove and discard the manual control shaft-to-TR sensor roll pin.
Use the General Equipment: Punch



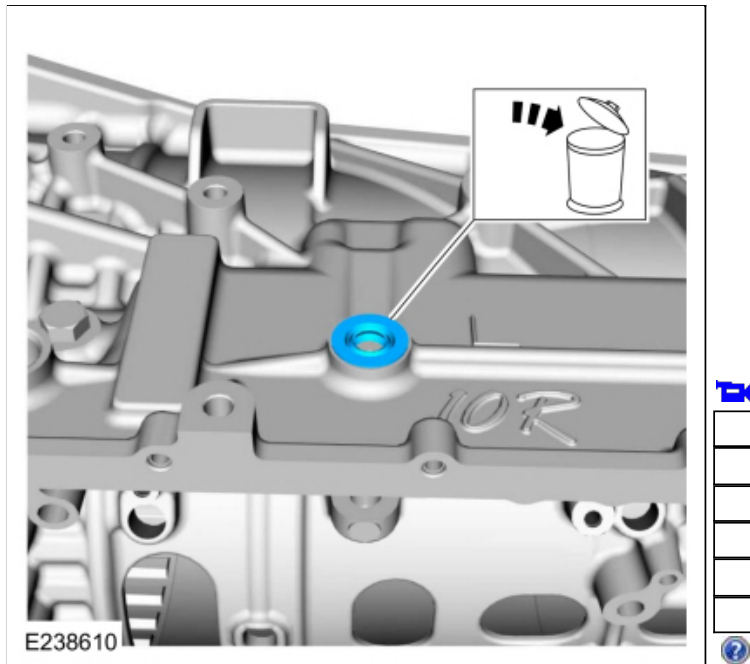
50. Remove the nut and the manual control lever.



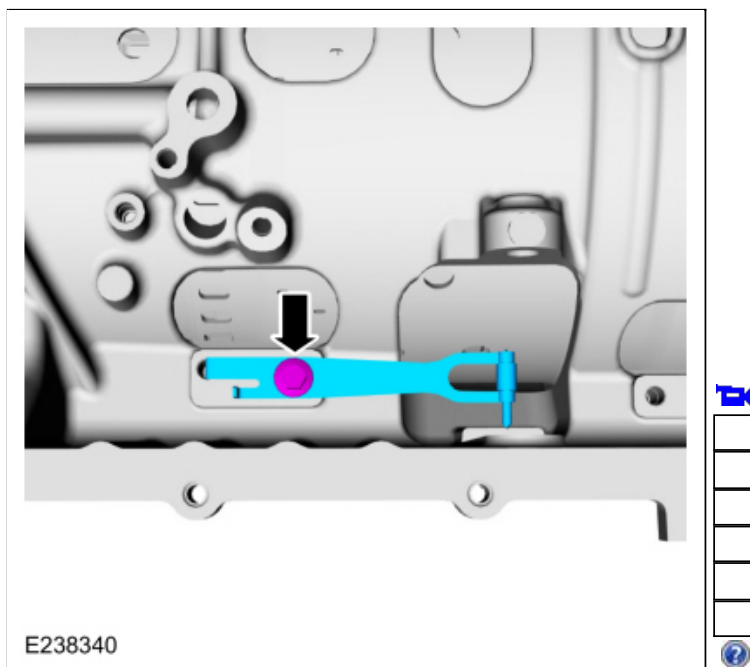
51. Remove the manual control shaft, the IR sensor and the park pawl actuator rod.



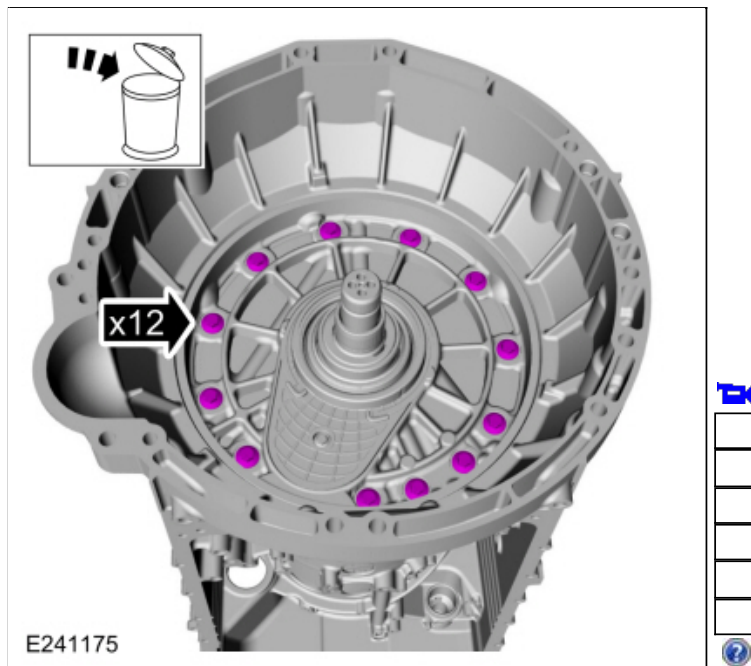
52. Remove and discard the manual control shaft seal.



53. Remove the bolt and the TR sensor detent spring.

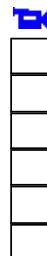


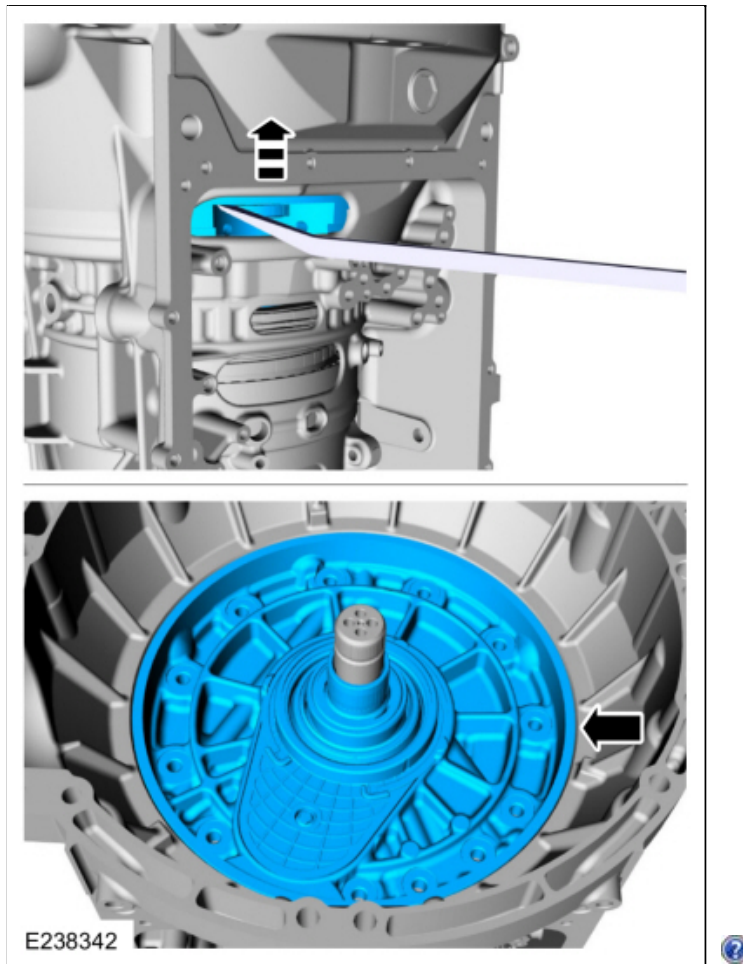
54. Rotate the transmission to a vertical position. Remove and discard the front support assembly bolts.



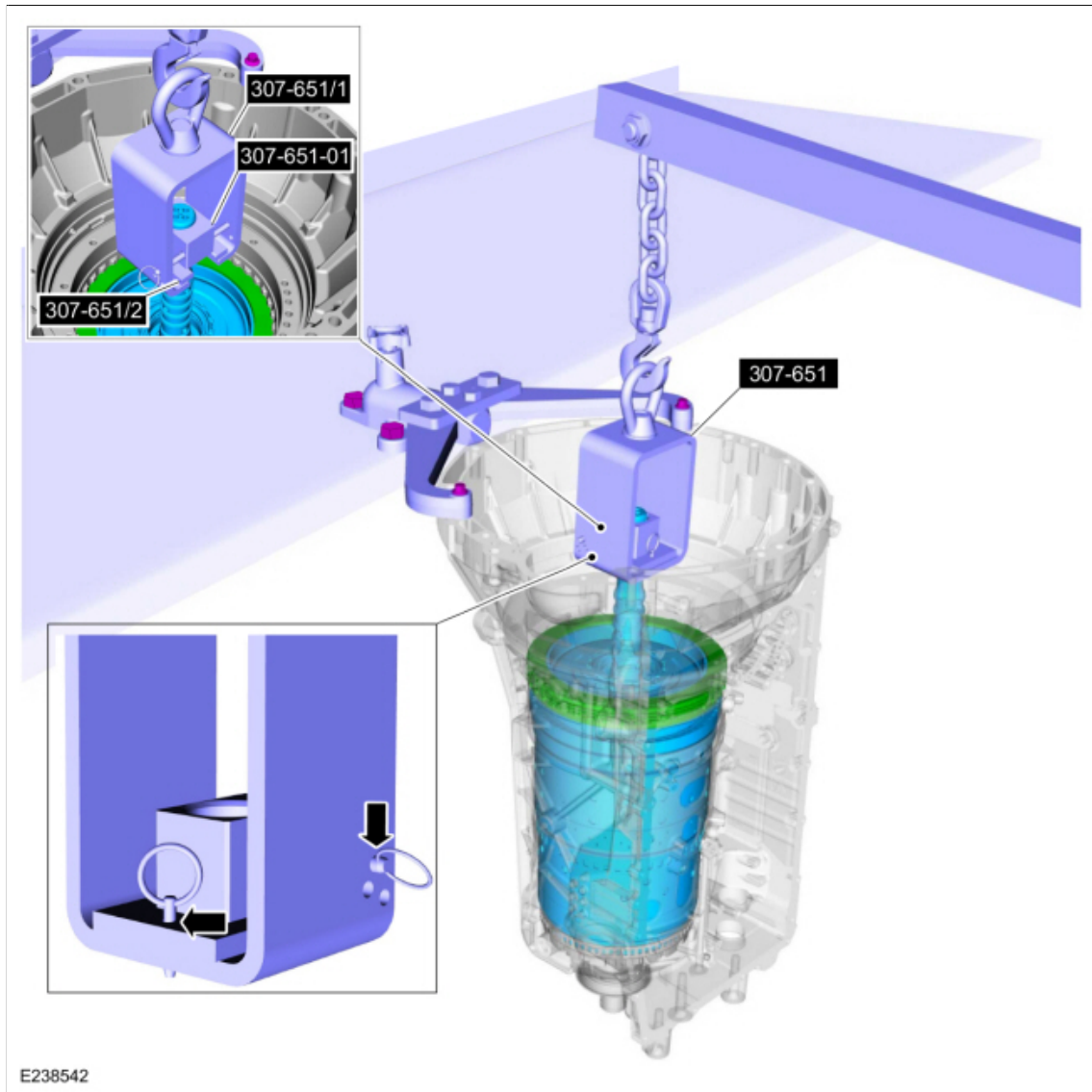
55. **NOTICE:** Be careful not to contact the transmission fluid pump drive gear, or damage to the gear can occur.

Using a prybar, pry the front support assembly out of the transmission case and remove the front support assembly.



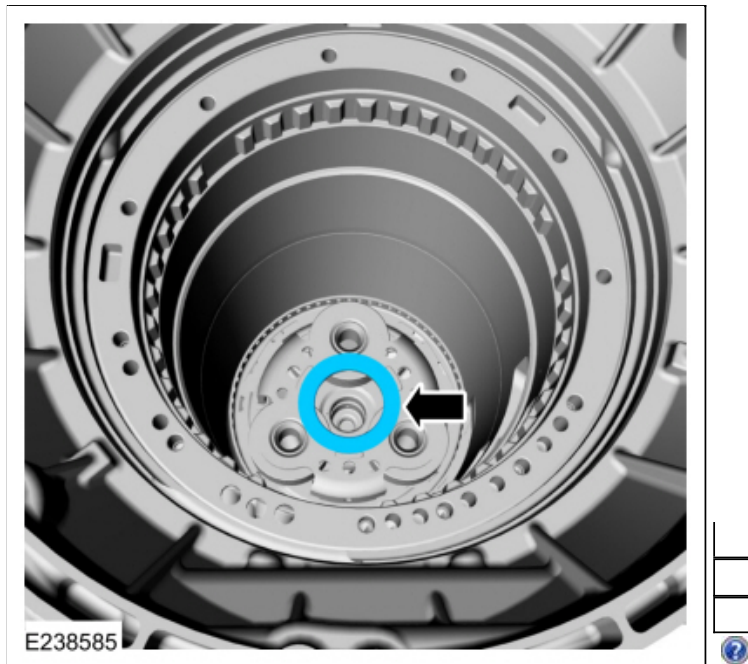


56. Using the special tools and a floor crane, remove the clutch and planetary assembly.
Use Special Service Tool: [307-651 Bracket, Pump Remover/Installer](#) , [307-651-01 Adapter for 307-651 \(Super Sub Assembly Lifting\)](#).

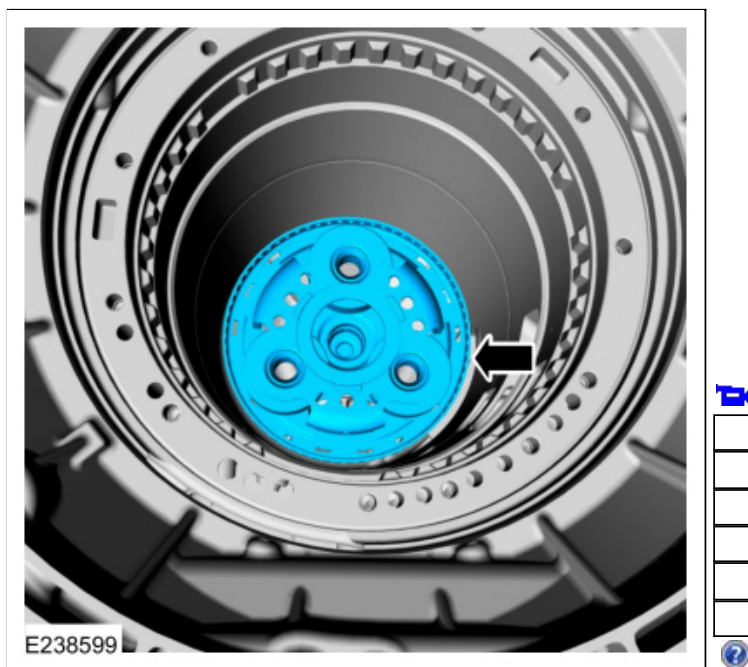


57. Remove the (T9) thrust bearing.

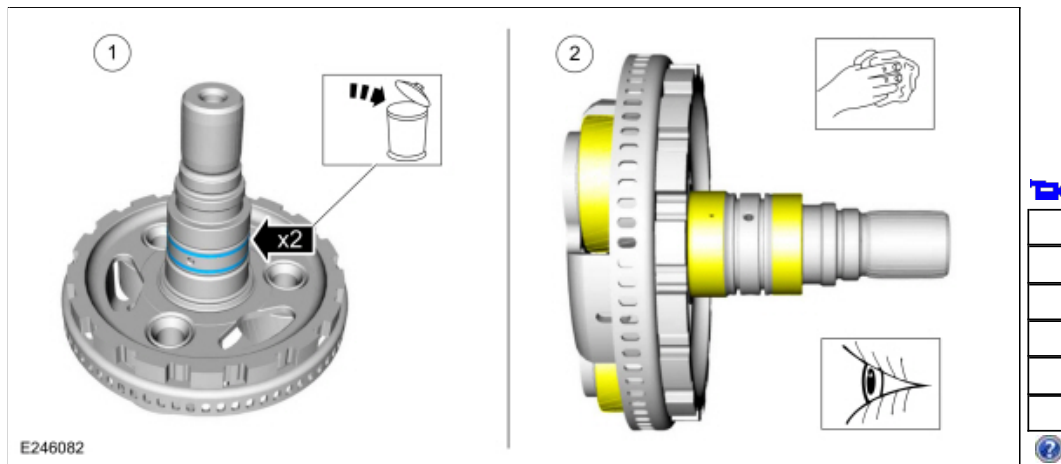




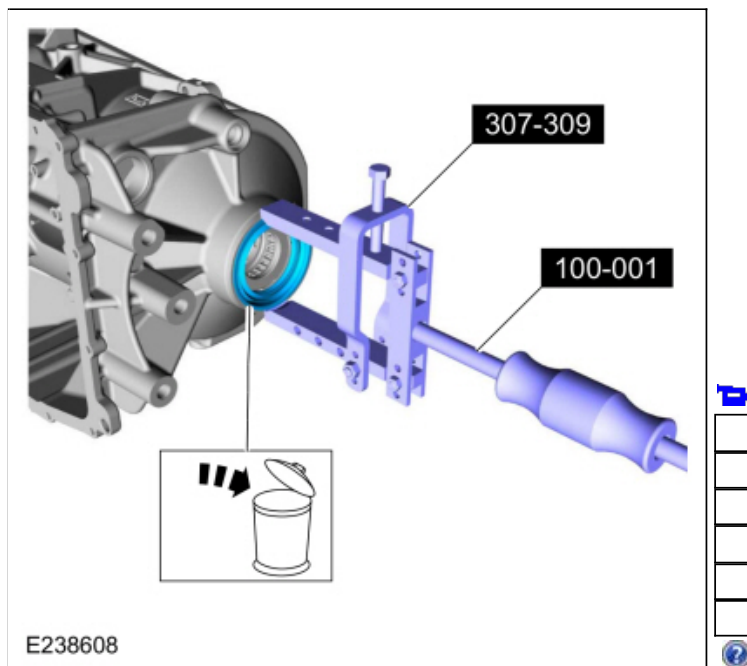
58. Remove the output shaft and planetary carrier No. 4 assembly.



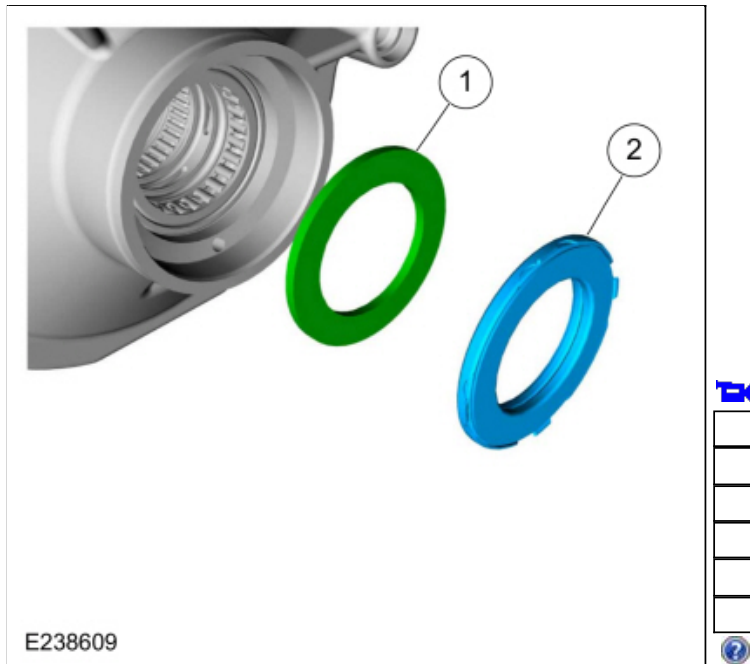
- 59.
1. Remove and discard the output shaft seals.
 2. Clean and inspect the output shaft and planetary carrier No. 4 assembly.



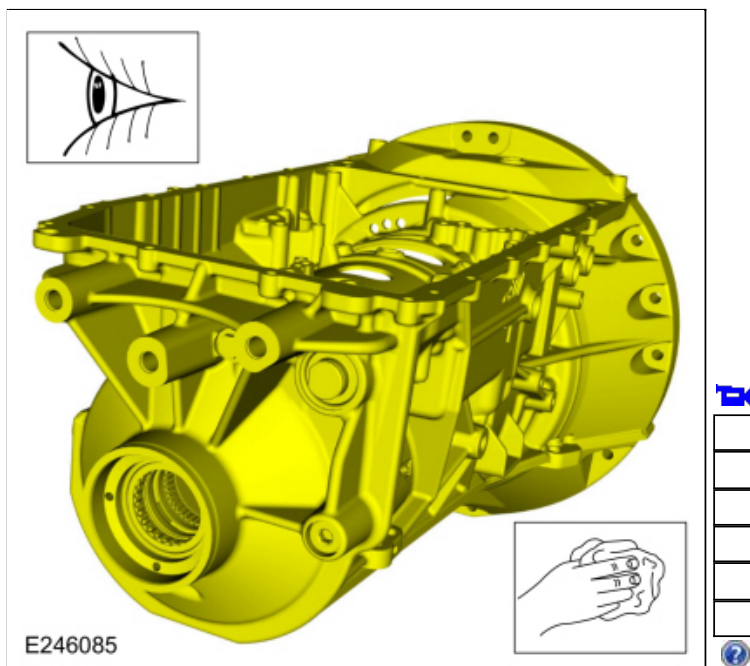
60. Using the special tools, remove and discard the output shaft seal.
 Use Special Service Tool: [100-001 \(T50T-100-A\) Slide Hammer](#), [307-309 Remover, Torque Converter Seal](#).



61. If equipped with 2WD, remove the (T11) thrust bearing and the thrust washer.
1. Thrust washer
 2. Thrust bearing (T11)

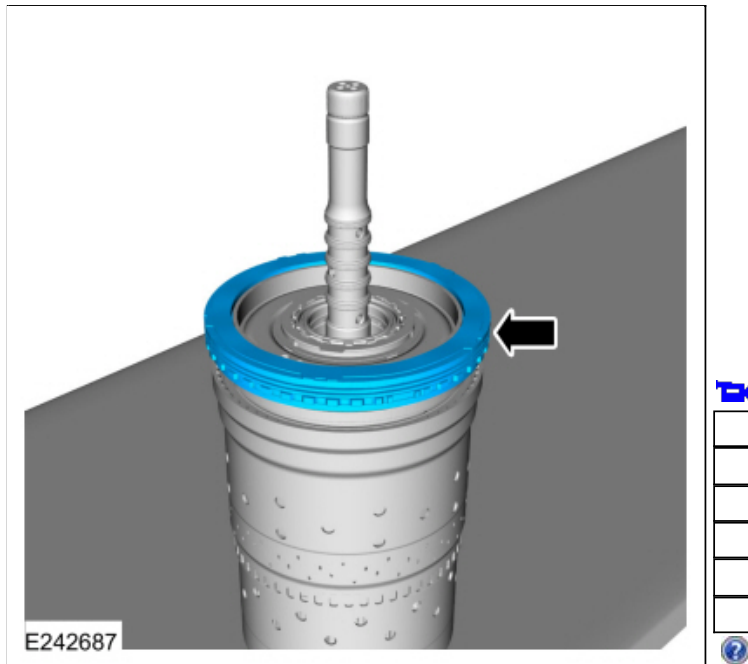


62. Clean and inspect the transmission case and bearings. Check for leaks from plugs and park pawl actuator rod sleeve. Repair or replace as necessary.
 Refer to: [Transmission Case](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Disassembly).

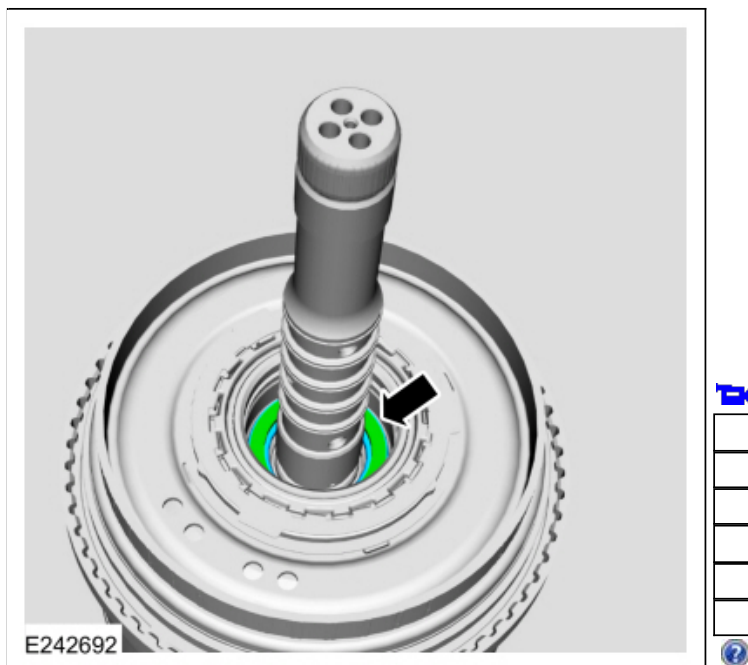


63. **NOTICE:** If replacing A clutch separating springs, all separating springs must be replaced as a matching set or damage can occur.

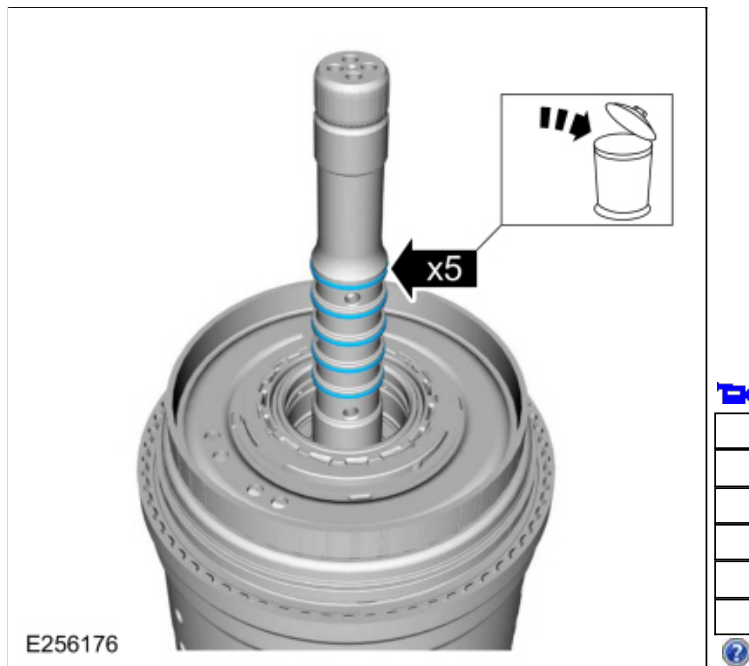
Remove the A clutch assembly. Inspect the clutch plates for excessive wear or damage. If the clutch plates are excessively worn or damaged replace as necessary. If the clutch plates are not excessively worn or damaged, they can be reused.



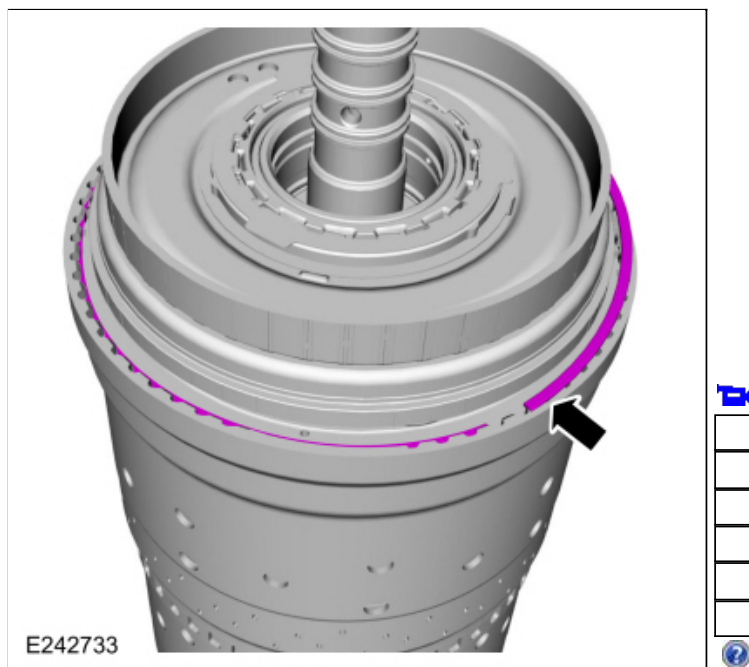
64. Using a magnet, remove the selective shim and the (T3) thrust bearing.
Use the General Equipment: Magnet



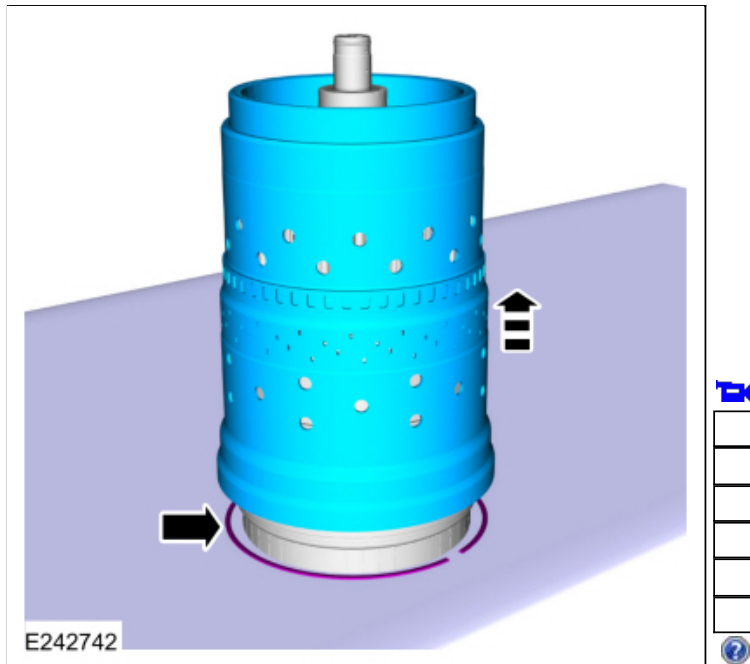
65. Remove and discard the input shaft front Teflon® seals.



66. Remove one side of the No. 1 planetary carrier snap ring.



67. Flip the clutch and planetary assembly over with the input shaft through a hole in the bench. Remove the No. 1 planetary carrier snap ring and remove the clutch and planetary container cylinder.

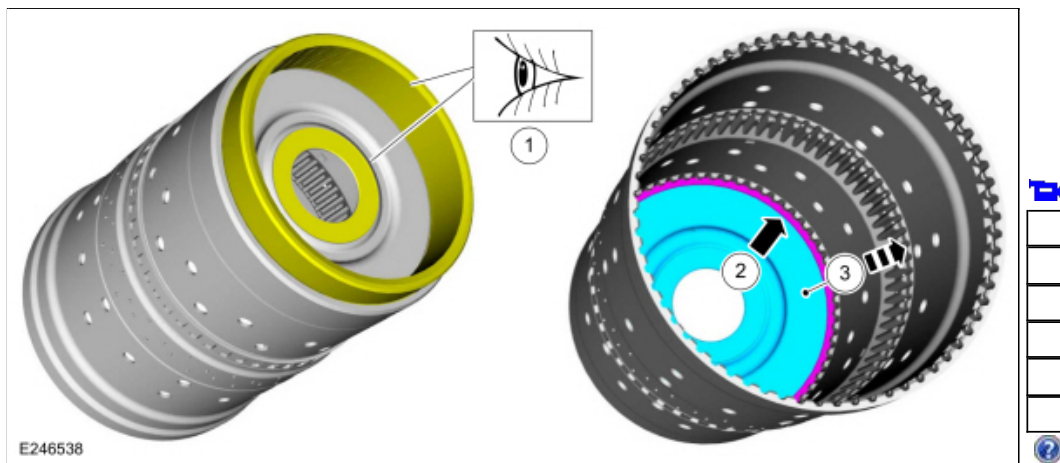


68.

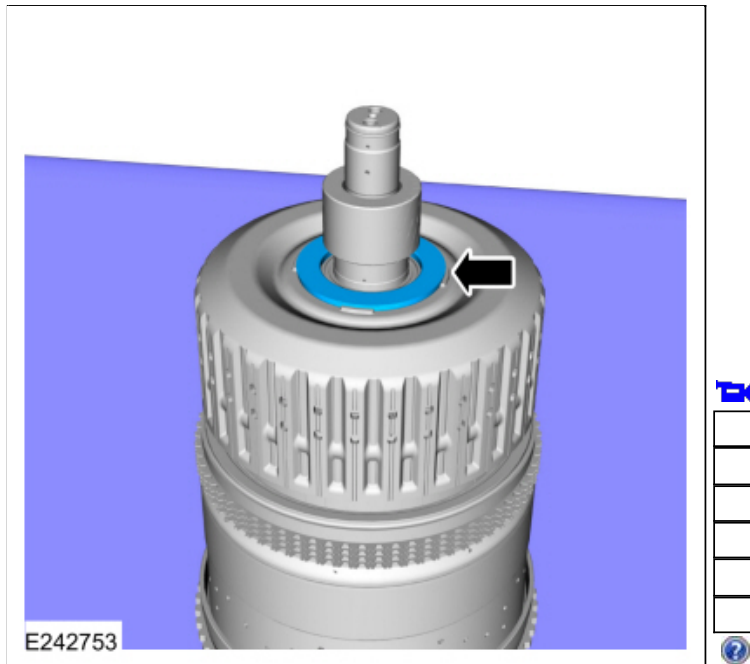
1. Inspect the No. 4 ring gear.
2. **NOTE:** Remove the ring gear when replacement is necessary.

If necessary, remove the ring gear snap ring.

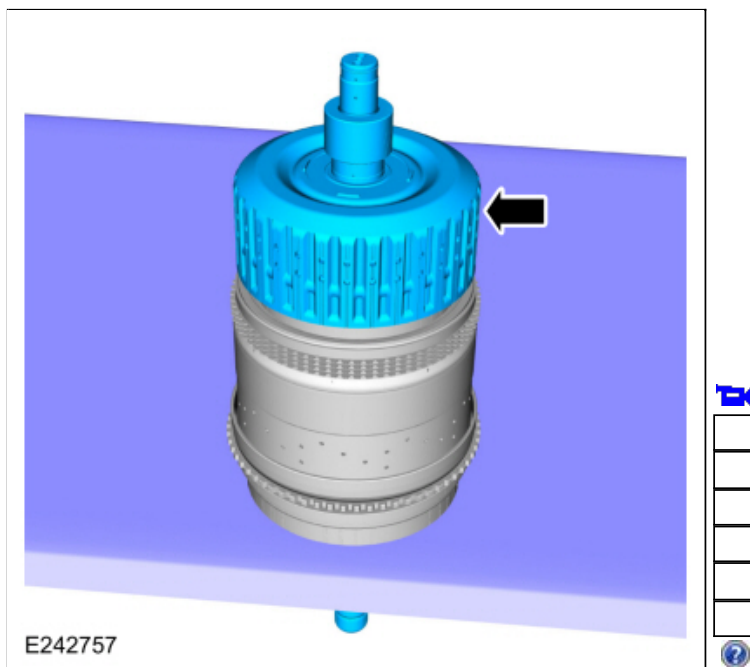
3. If necessary, remove the ring gear from the inside of the clutch and planetary container cylinder.



69. Remove the (T8) thrust bearing.



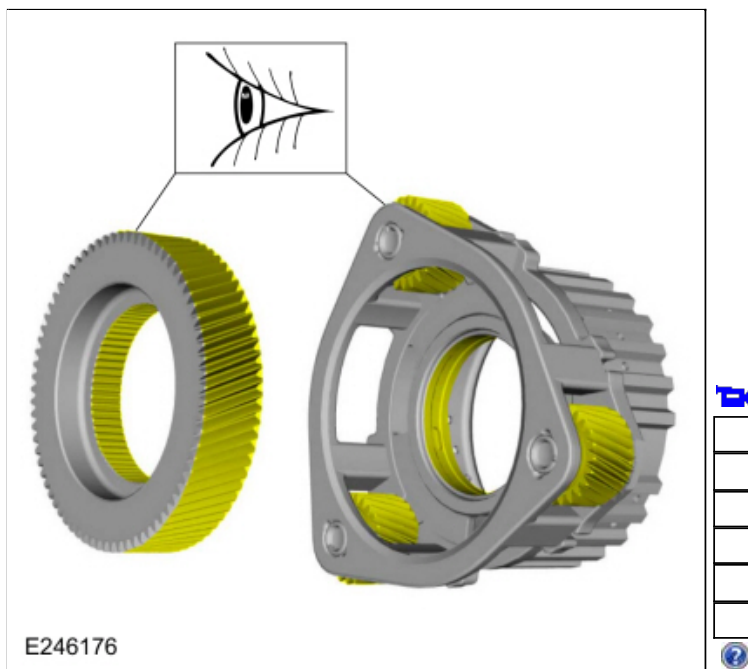
70. Remove the E clutch and input shaft assembly.



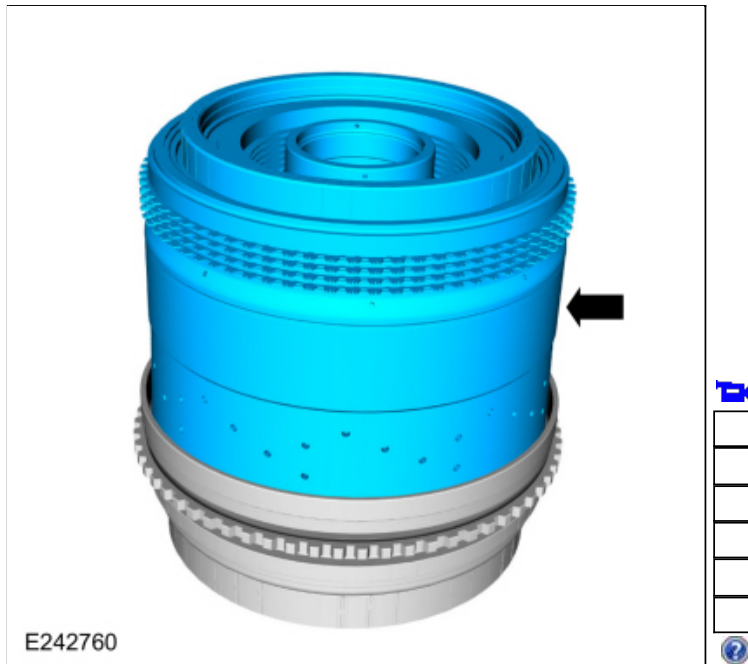
71. Remove the No. 3 planetary carrier and the No. 3 sun gear.



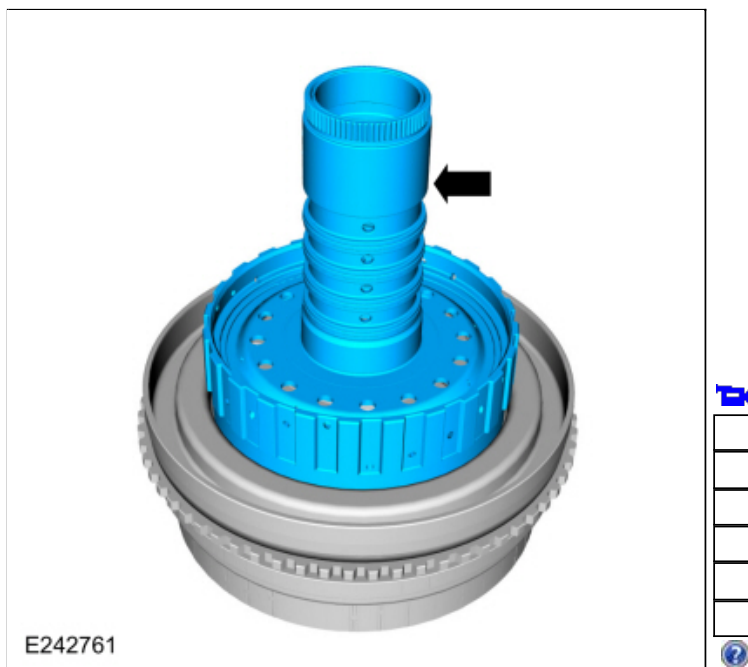
72. Inspect the No. 3 planetary carrier and the No. 3 sun gear.



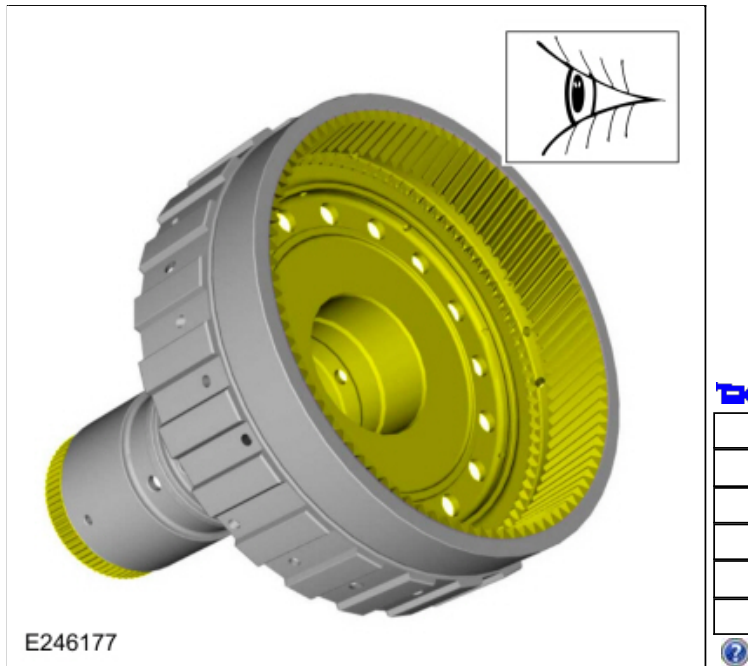
73. Remove the CDF clutch assembly from the planetary carrier assembly.



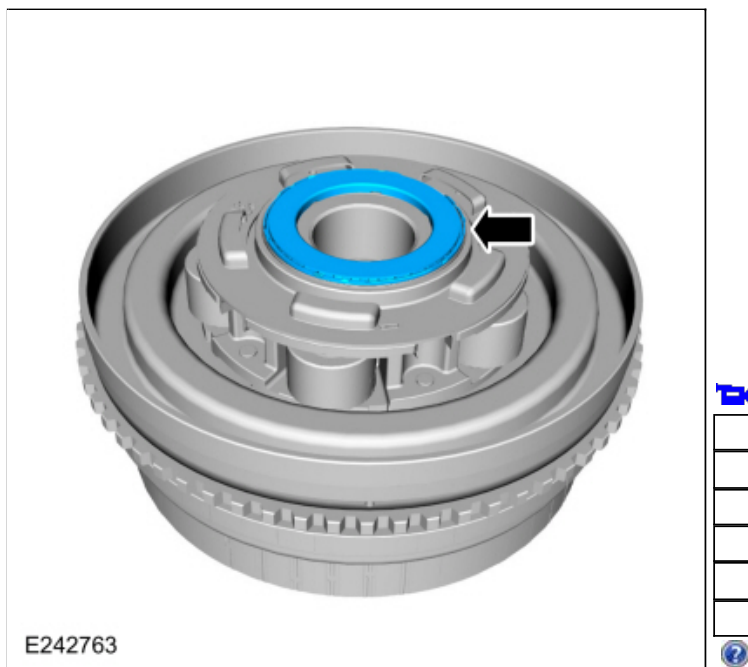
74. Remove the No. 3 sun gear shaft and No. 2 ring gear assembly.



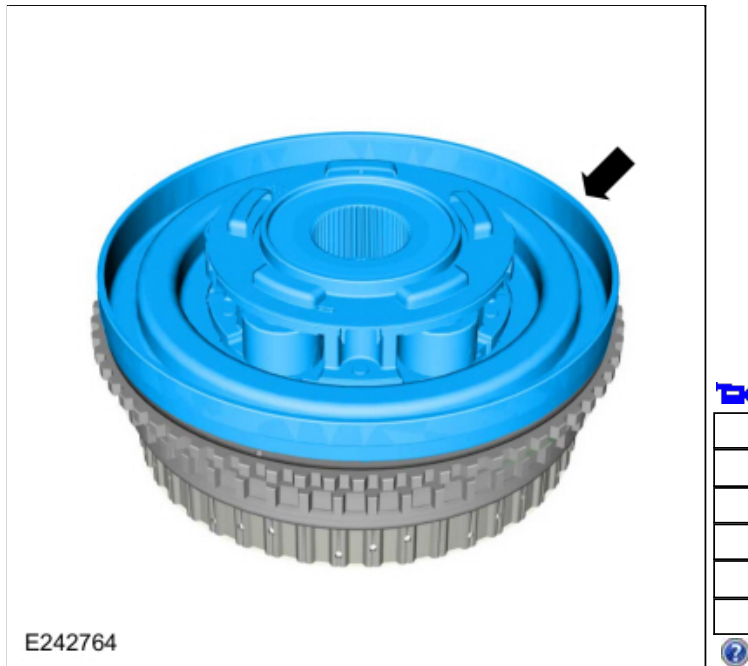
75. Inspect the No. 3 sun gear shaft and No. 2 ring gear assembly.



76. Remove the (T5) thrust bearing.



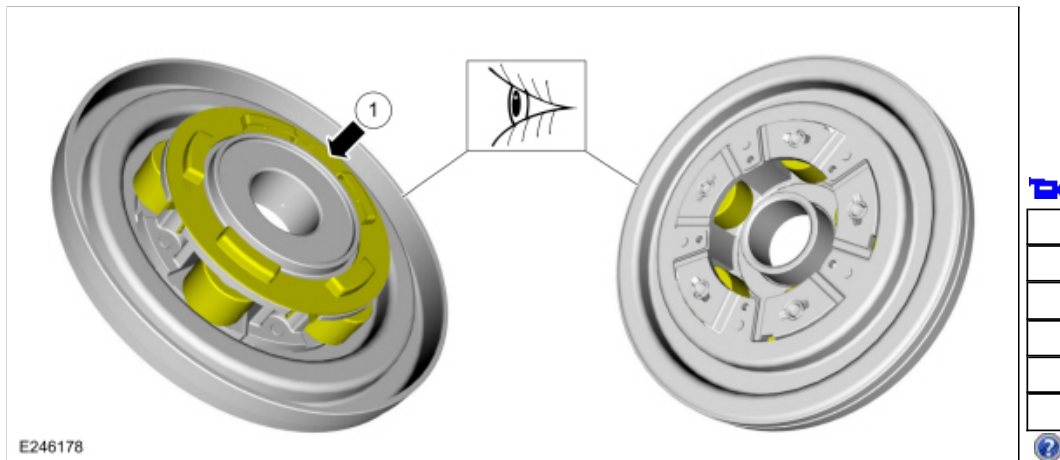
77. Remove the No. 2 planetary carrier.



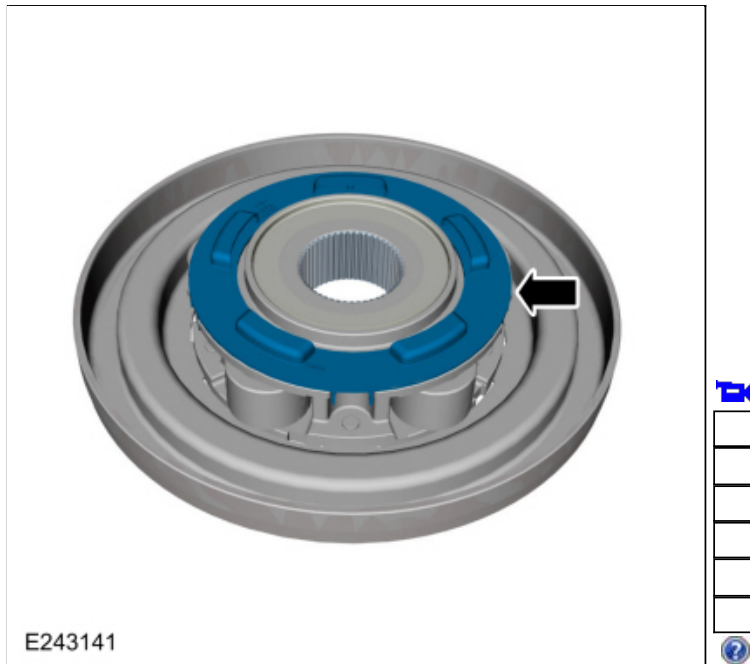
78. **NOTE:** It is not necessary to remove the fluid collector from the No. 2 planetary carrier.

Inspect the No. 2 planetary carrier and the fluid collector.

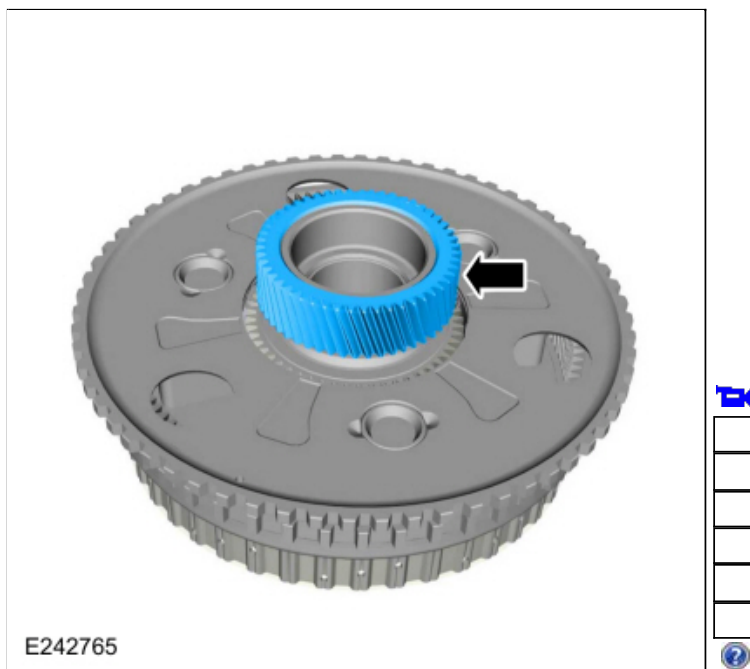
1. If the fluid collector is broken remove and discard.



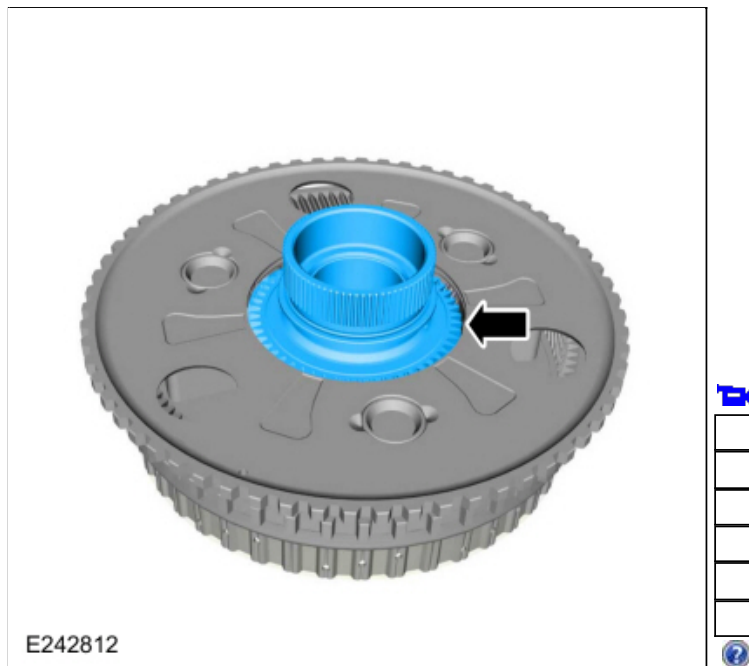
79. If necessary, install the new the fluid collector.



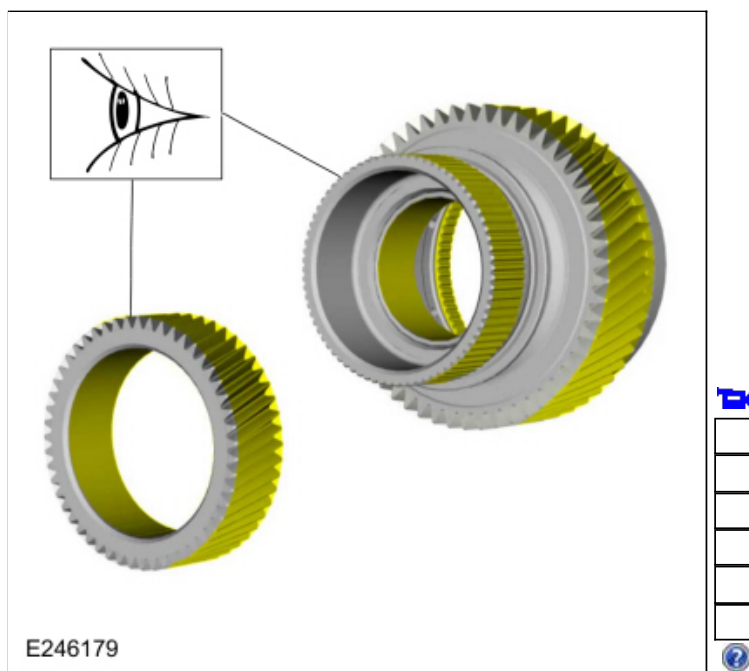
80. Remove the No. 2 sun gear.



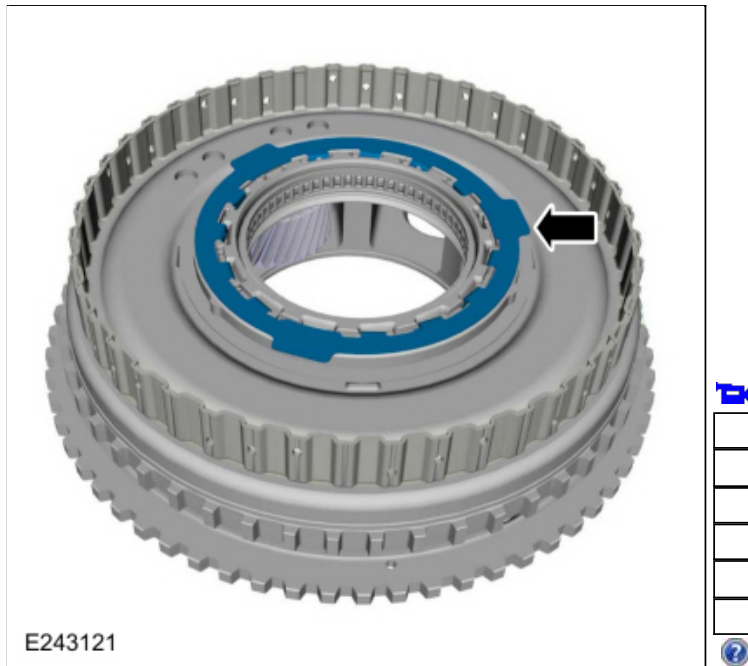
81. Remove the No. 1 sun gear.



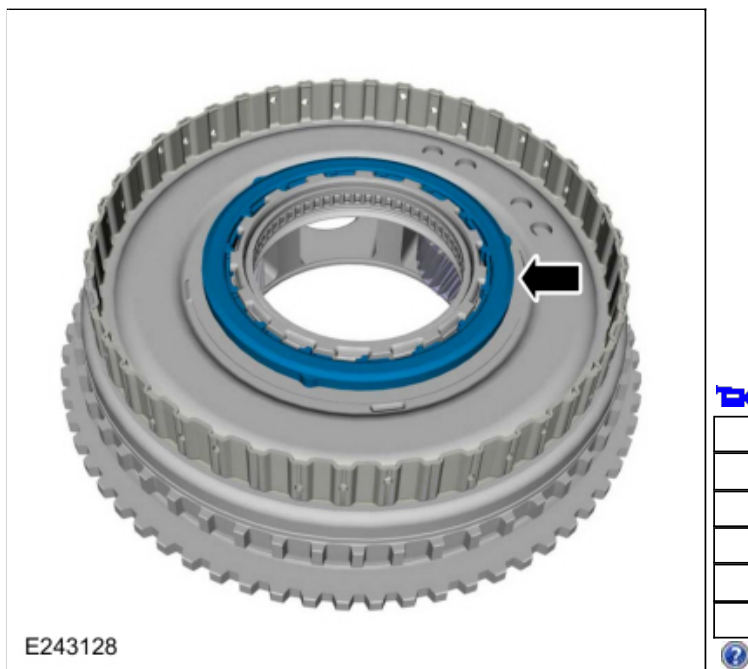
82. Inspect the No. 1 and No. 2 sun gears.



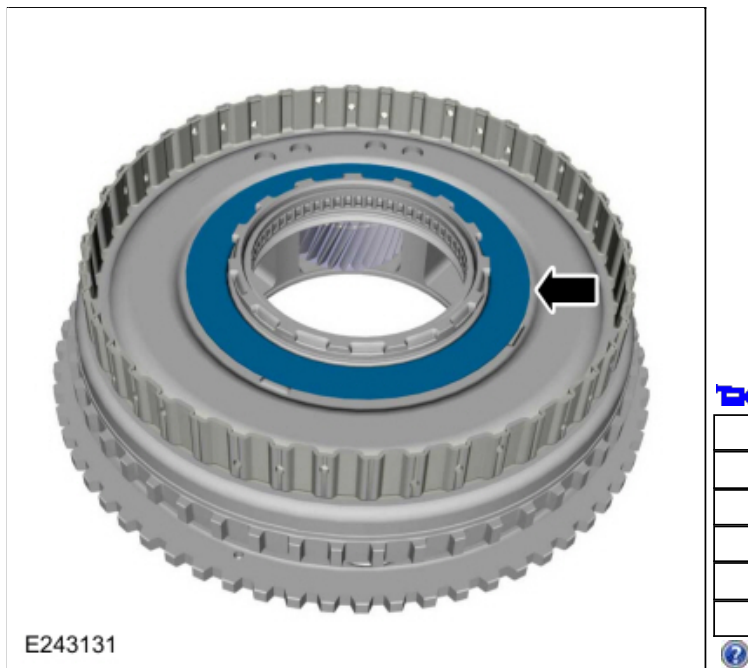
83. Gently pry up on the 3 tabs and remove the No. 1 bearing support locking ring.



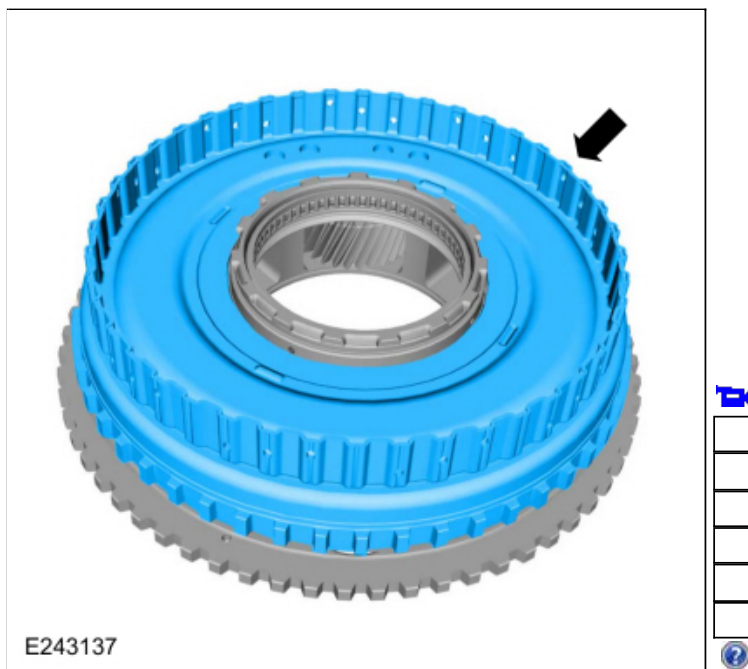
84. Rotate the No. 1 bearing support clockwise and remove the bearing support.



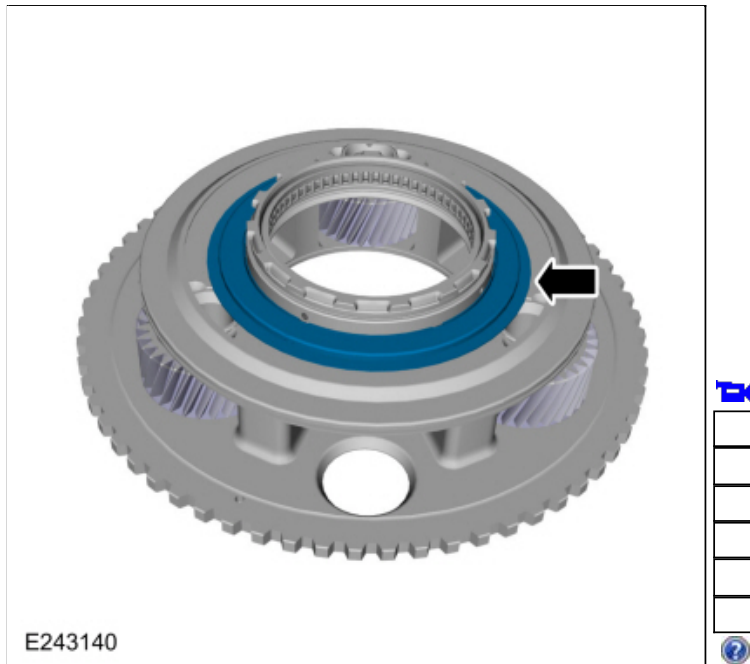
85. Remove the No. 1 ring gear bearing.



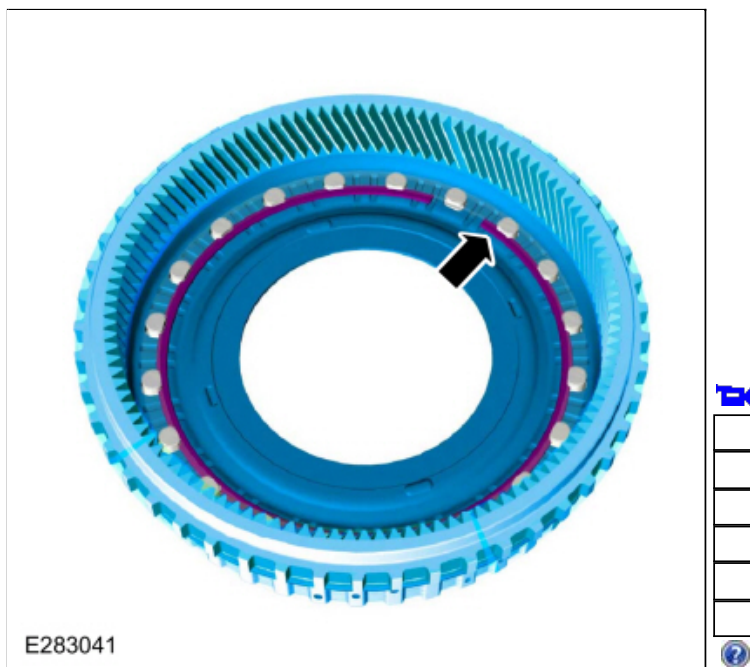
86. Remove the No. 1 ring gear.



87. Remove the ring gear No 1 bearing.

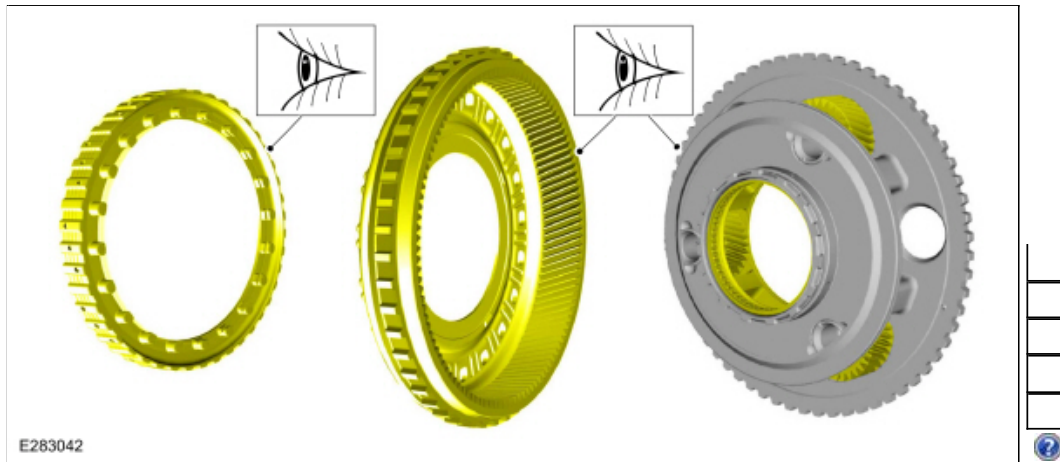


88. Remove the ring gear No 1 snap ring.

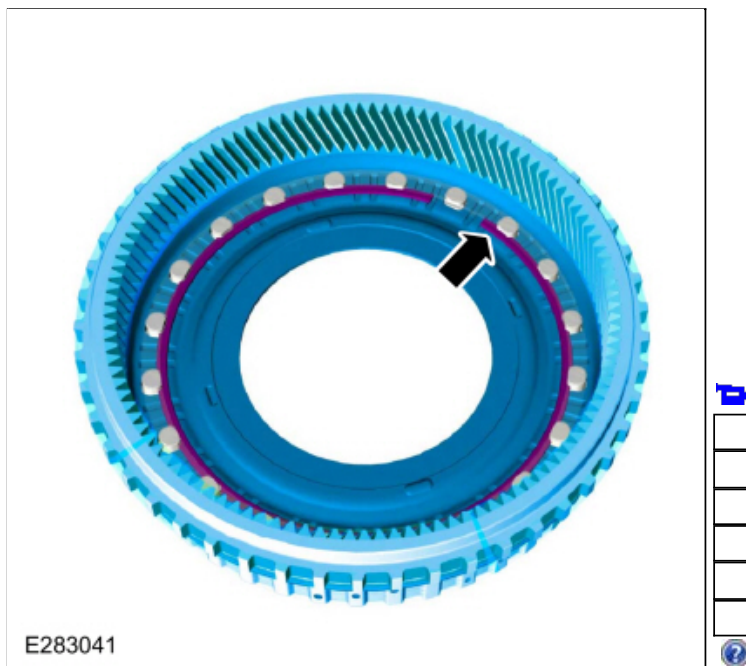


89. Inspect the A clutch hub, No. 1 ring gear and the No. 1 planetary carrier.



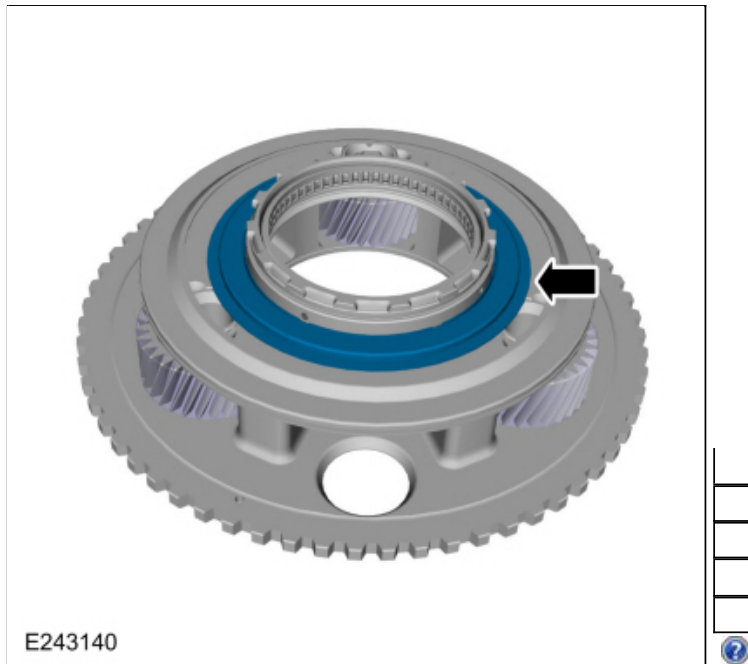


90. Install the ring gear No 1 snap ring.

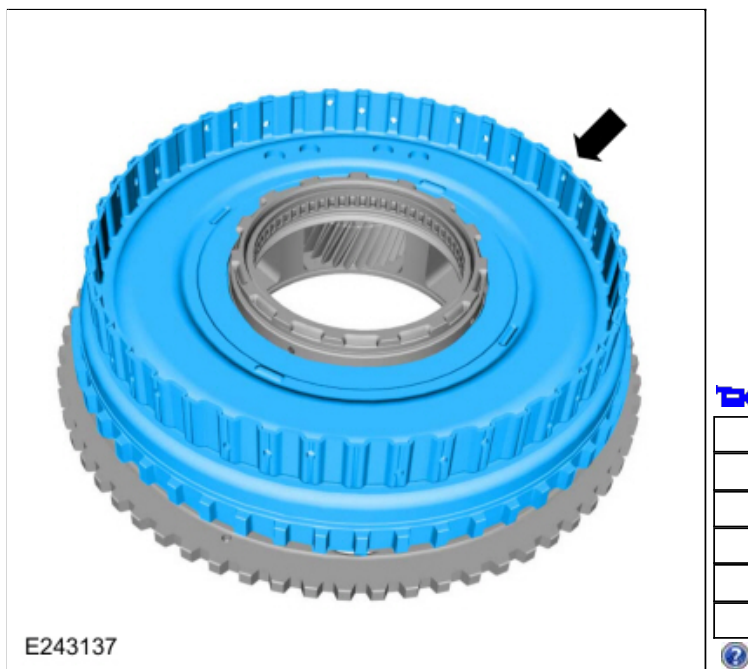


91. Install the ring gear No. 1 bearing.

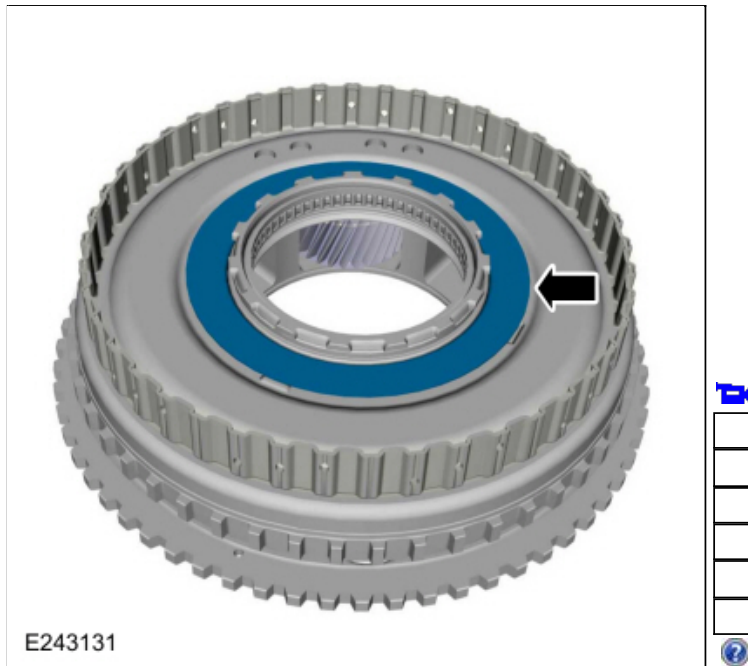




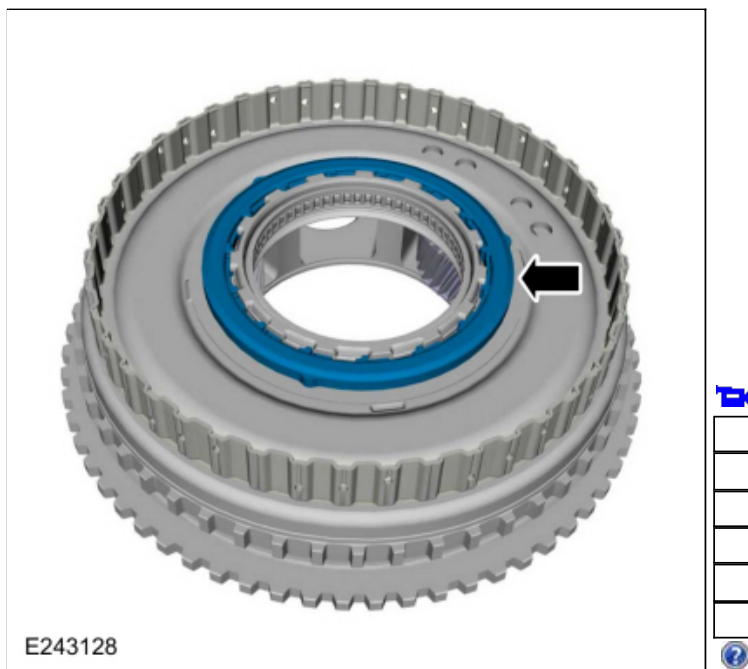
92. Install the No. 1 ring gear.



93. Install the No. 1 ring gear bearing.

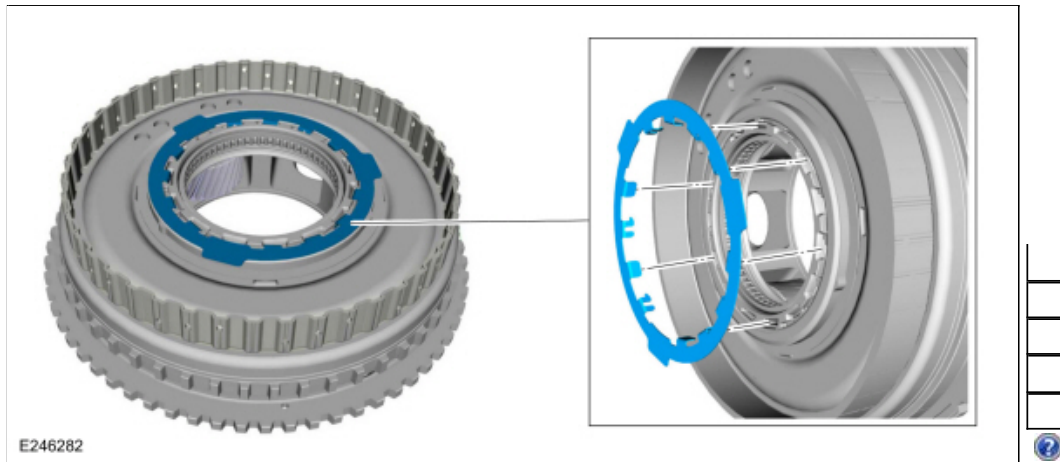


94. Install the ring gear No. 1 bearing support and rotate it counter clockwise to lock it.

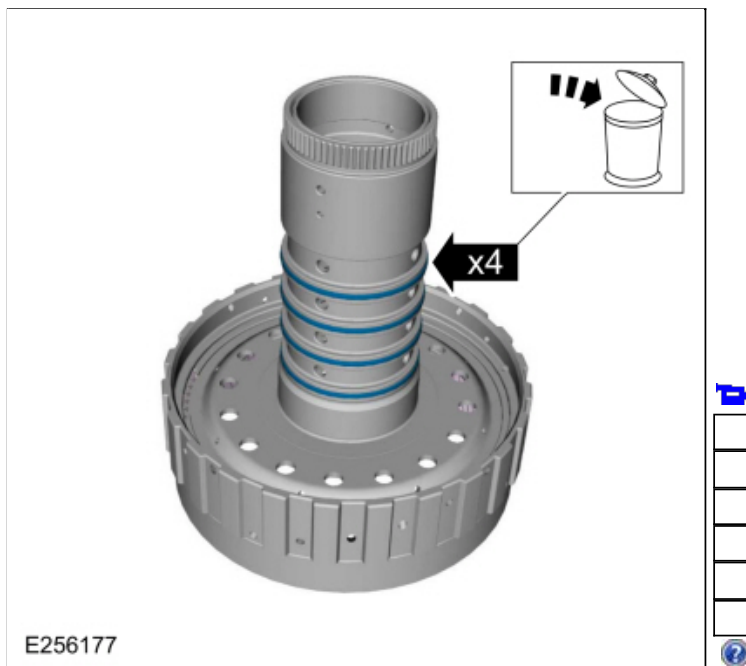


95. Align the tabs with the slots and install the No. 1 bearing support locking ring.

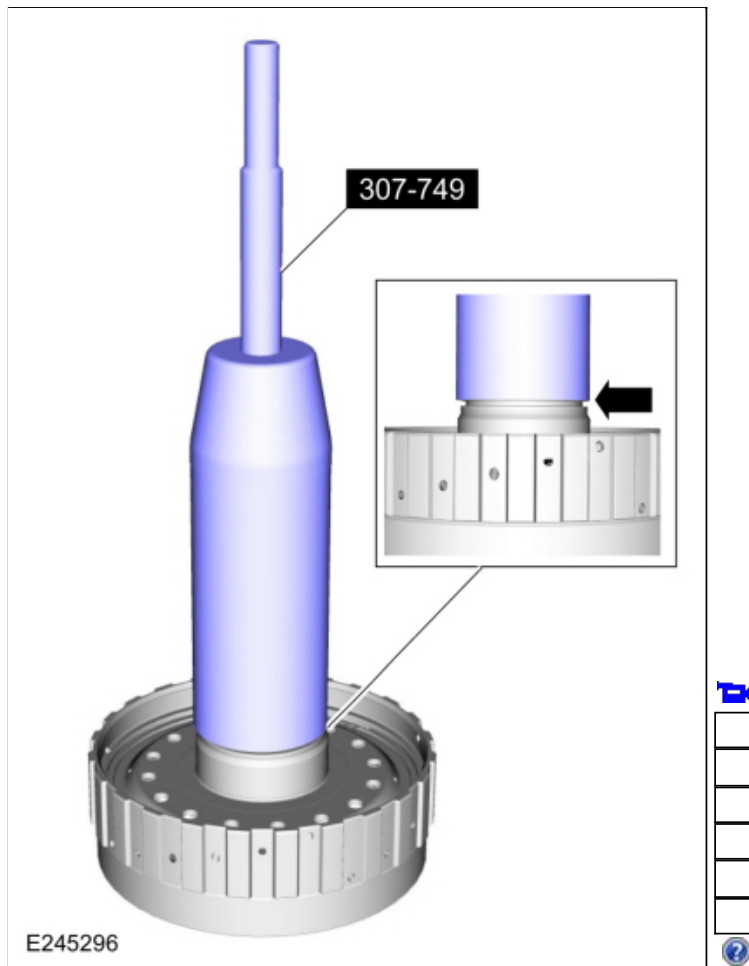




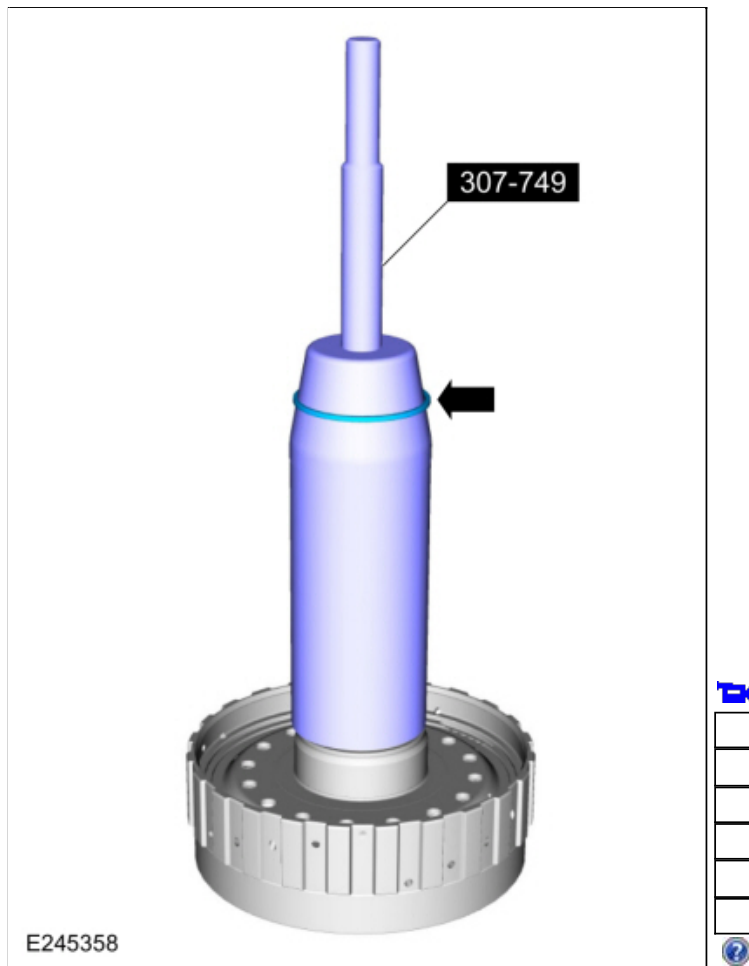
96. Remove and discard the sun gear No. 3 shaft Teflon® seals.



97. Install the special tool and adjust the special tool to align the bottom edge of the tool with the top edge of the bottom Teflon® seal groove.
Use Special Service Tool: [307-749 Installer/Sizer, R2-S3 Shaft Solid Seal](#).

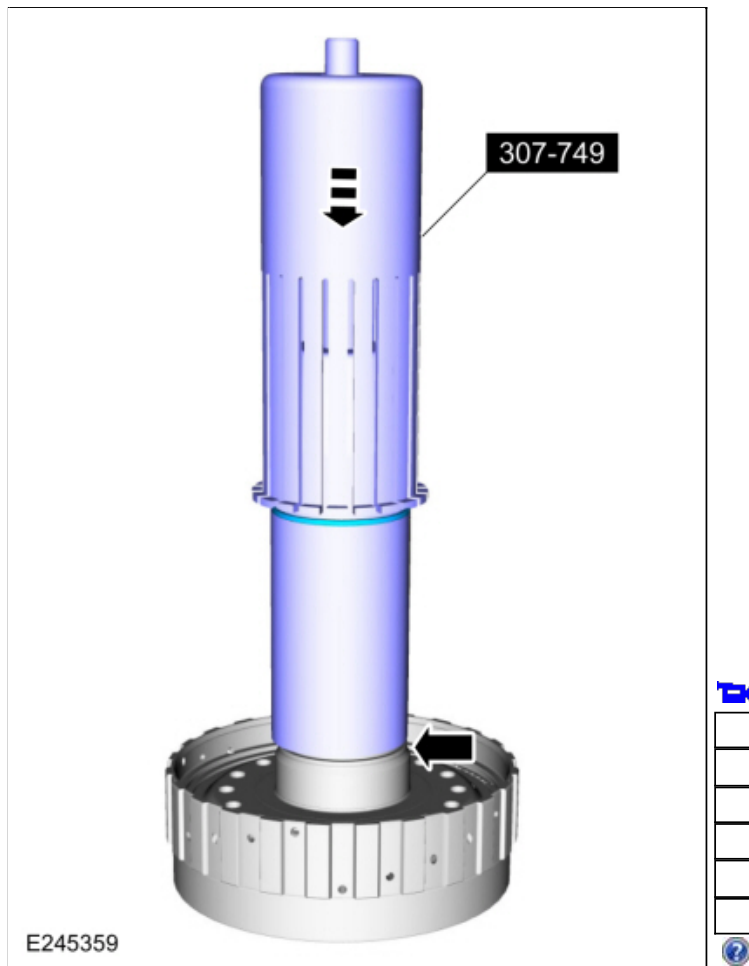


98. Install a new Teflon® seal on the special tool.
Use Special Service Tool: [307-749 Installer/Sizer, R2-S3 Shaft Solid Seal](#).

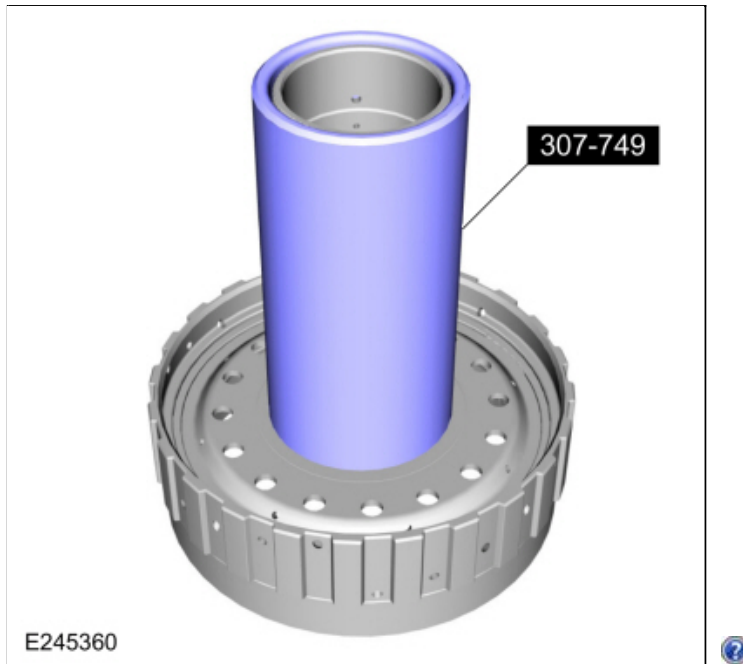


99. Using the top half of the special tool, slide the Teflon® seal into the groove. Remove the special tools and repeat the steps for the other 3 Teflon® seals.

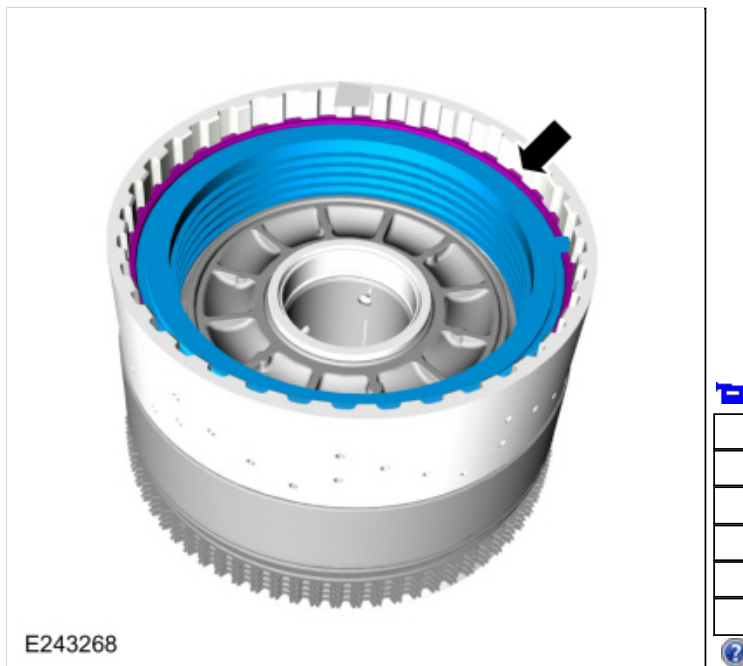
Use Special Service Tool: [307-749 Installer/Sizer, R2-S3 Shaft Solid Seal](#).



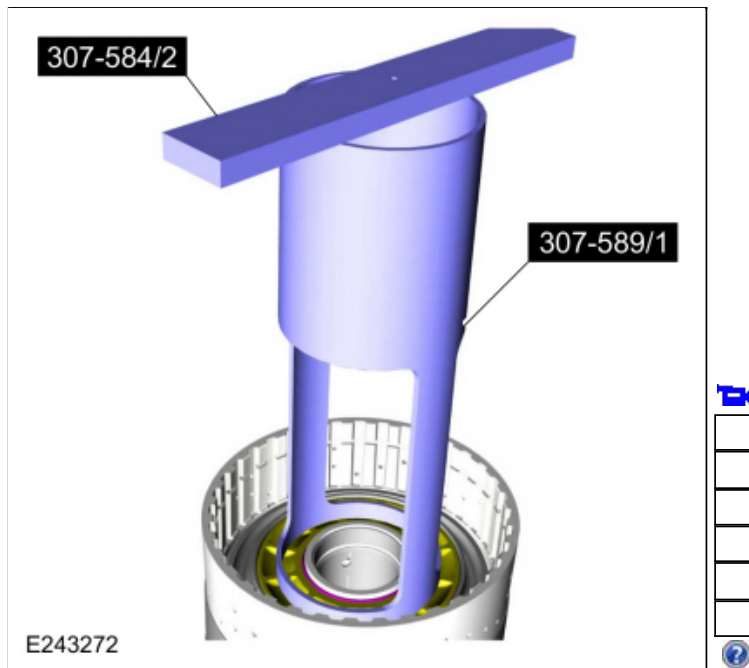
100. Install the special tool to size the 4 Teflon® seals. Allow the special tool to stay on the No 3 sun gear shaft for 5 minutes prior to final assembly.
Use Special Service Tool: [307-749 Installer/Sizer, R2-S3 Shaft Solid Seal](#).



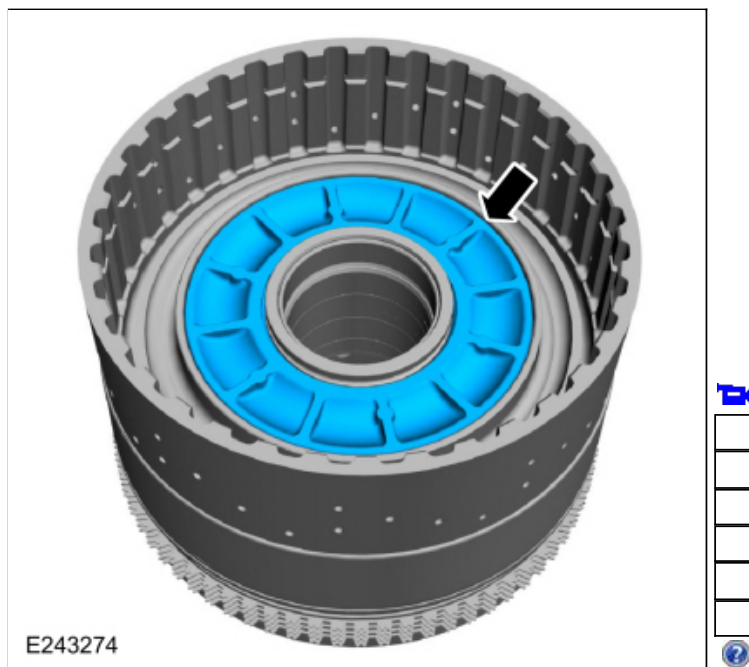
101. Remove the snap ring and the C clutch assembly. Inspect the clutch plates for excessive wear or damage. If the clutch plates are excessively worn or damaged replace as necessary. If the clutch plates are not excessively worn or damaged, they can be reused.



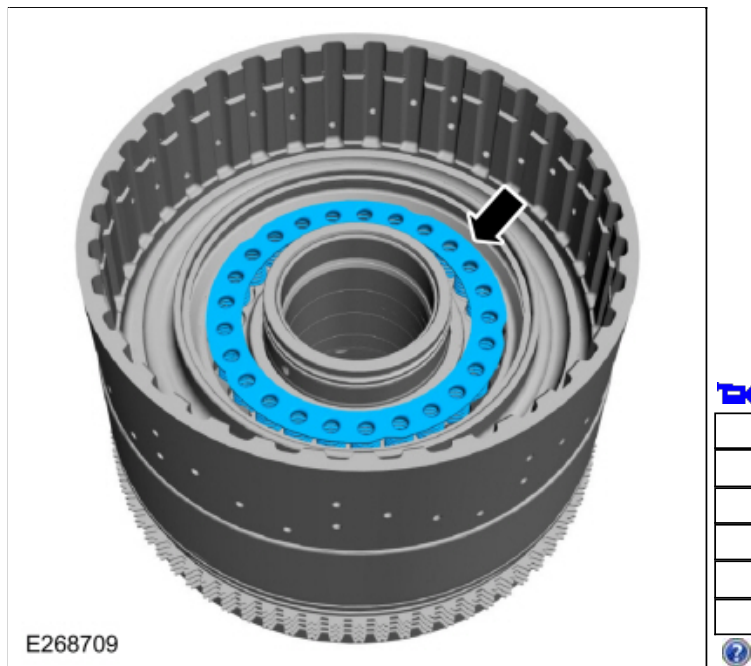
102. Using the special tools and a press, remove the C clutch balance dam retainer.
 Use Special Service Tool: [307-584 2-6 Spring Compressor](#). , [307-589 Overdrive clutch and balance piston service set](#).
 Use the General Equipment: Hydraulic Press



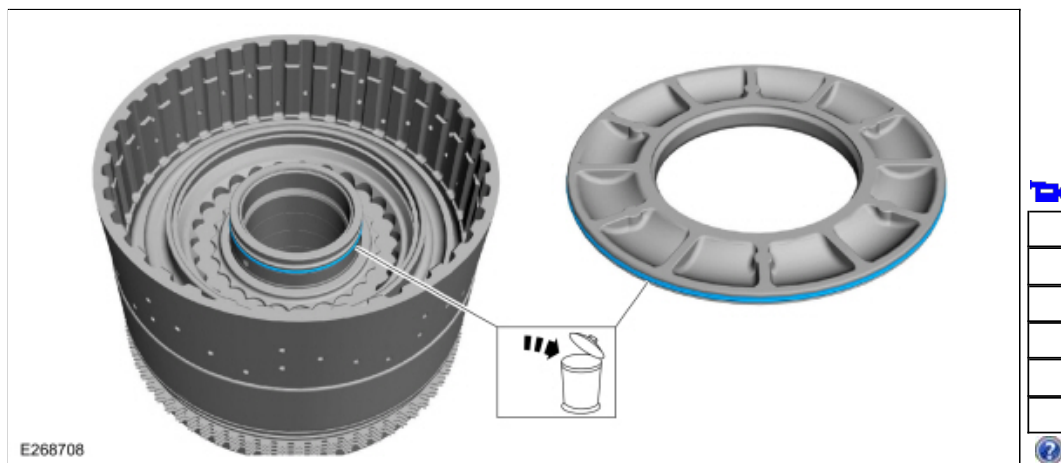
103. Remove the C clutch balance dam.



104. Remove the C clutch piston return spring.

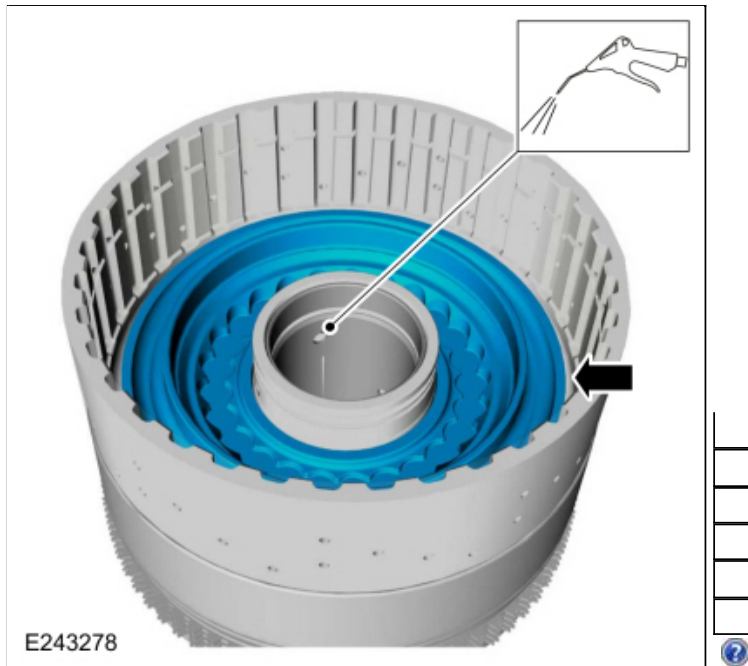


105. Remove and discard the C clutch balance dam inner and outer seals.

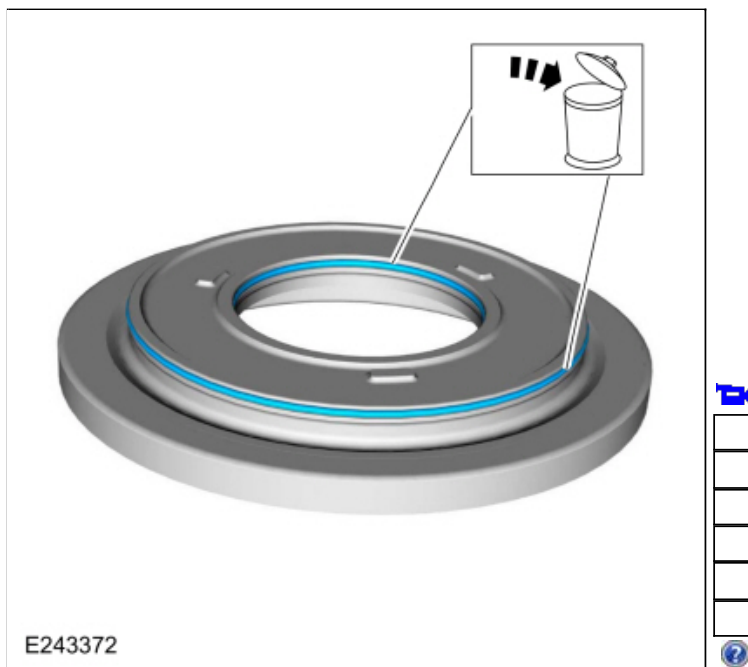


106. Remove the C clutch piston. Use compressed air into one oil passage hole while plugging the hole on the opposite side.

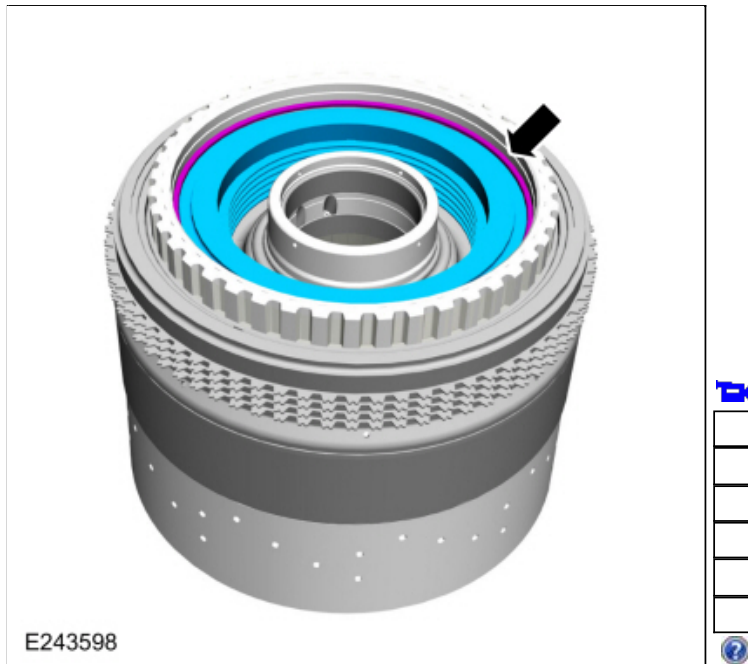




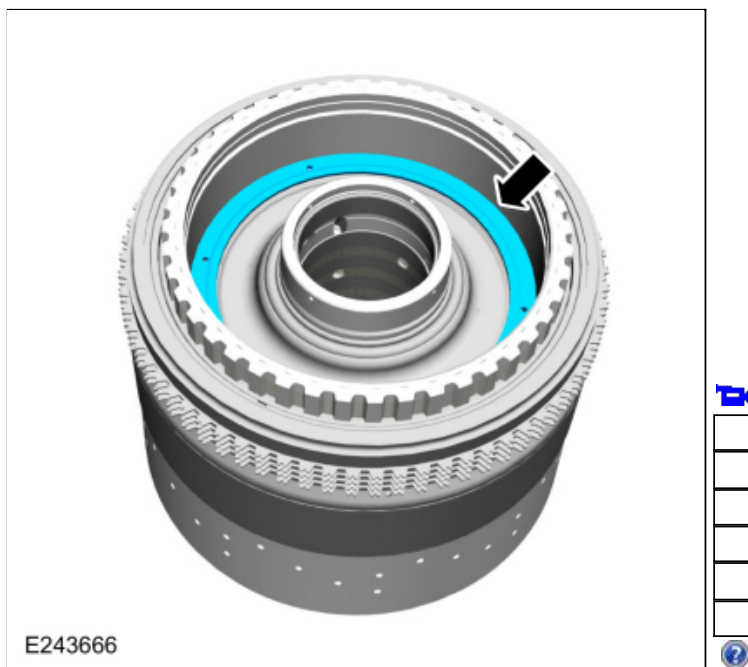
107. Remove and discard the C clutch piston inner and outer seals.



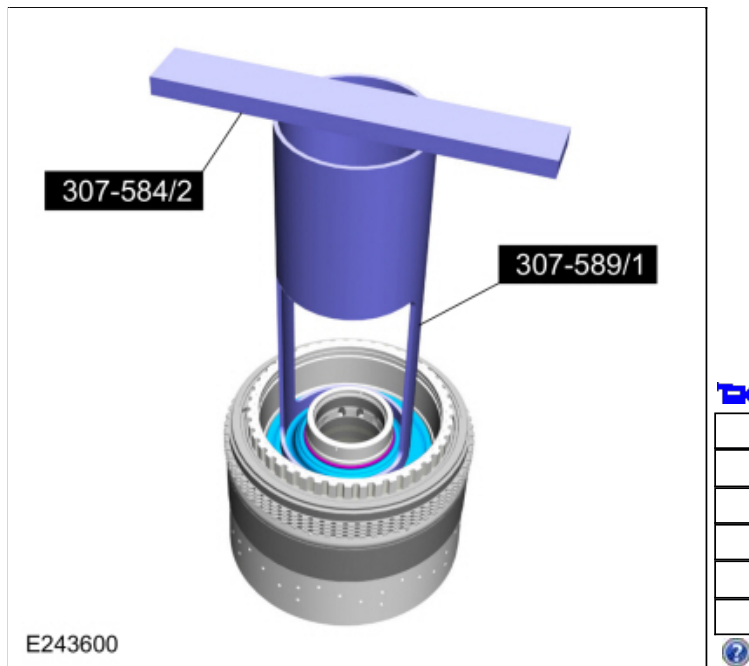
108. Remove the snap ring and the D clutch assembly. Inspect the clutch plates for excessive wear or damage. If the clutch plates are excessively worn or damaged replace as necessary. If the clutch plates are not excessively worn or damaged, they can be reused.



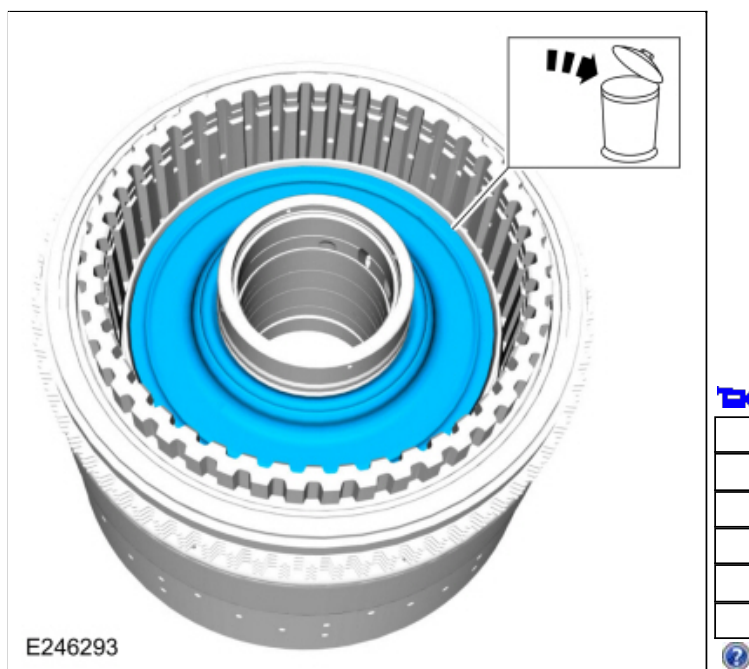
109. Remove the D clutch apply ring.



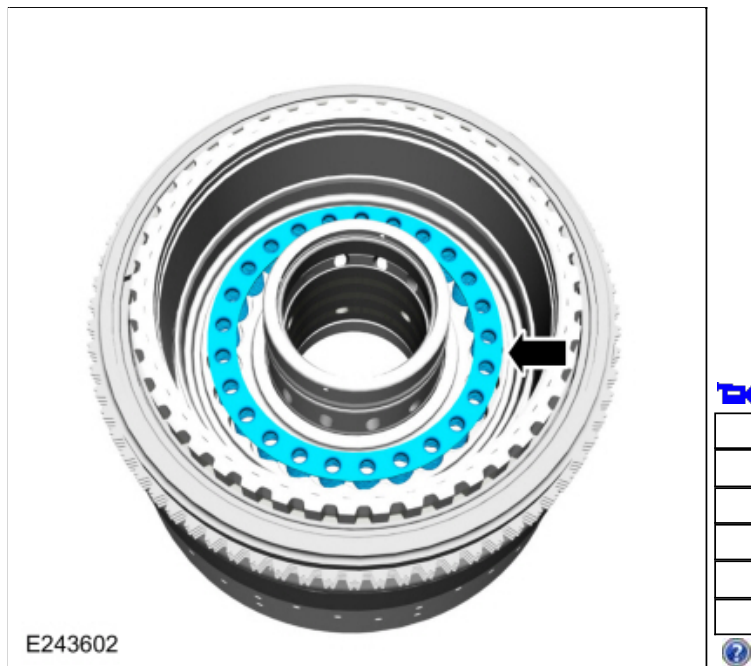
110. Using the special tools and a press, remove the D clutch balance dam retainer.
 Use Special Service Tool: [307-584 2-6 Spring Compressor](#) , [307-589 Overdrive clutch and balance piston service set](#).
 Use the General Equipment: Hydraulic Press



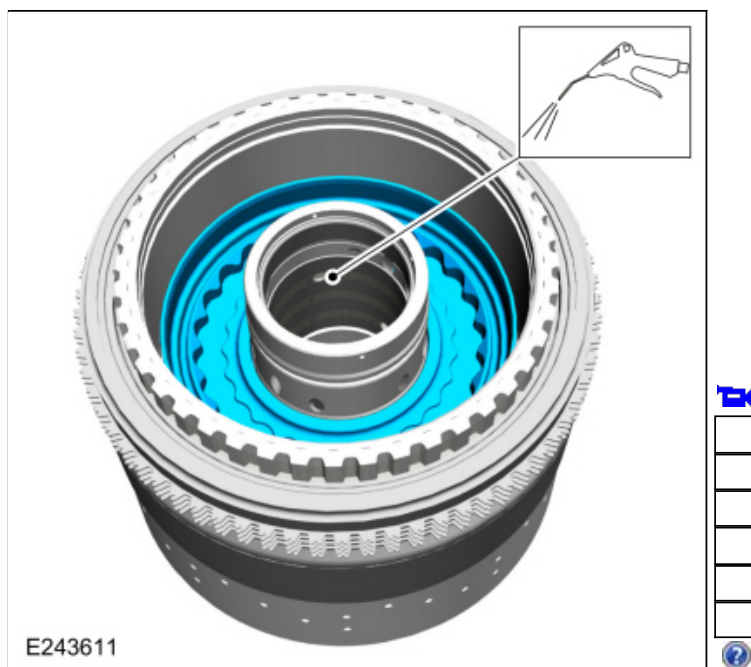
111. Remove and discard the balance dam.



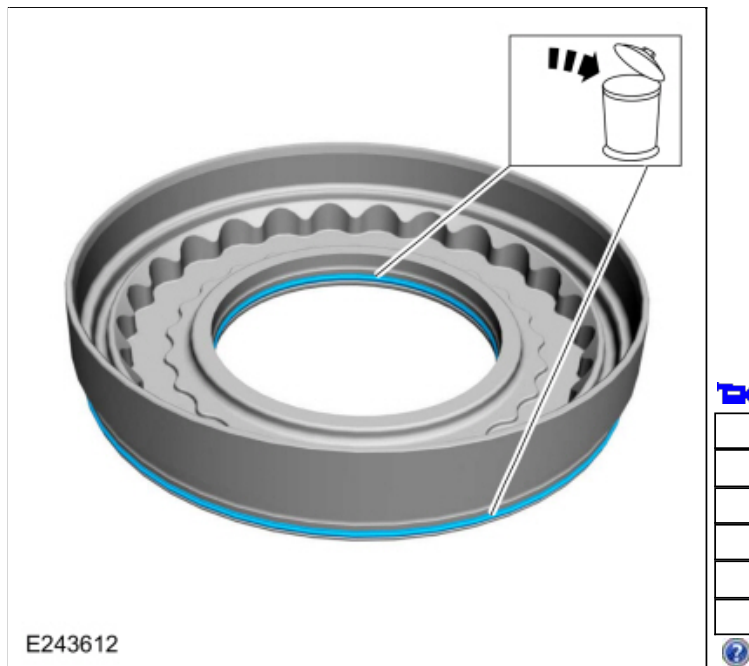
112. Remove the D clutch piston return spring.



113. Remove the D clutch piston. Use compressed air into one oil passage hole while plugging the hole on the opposite side.



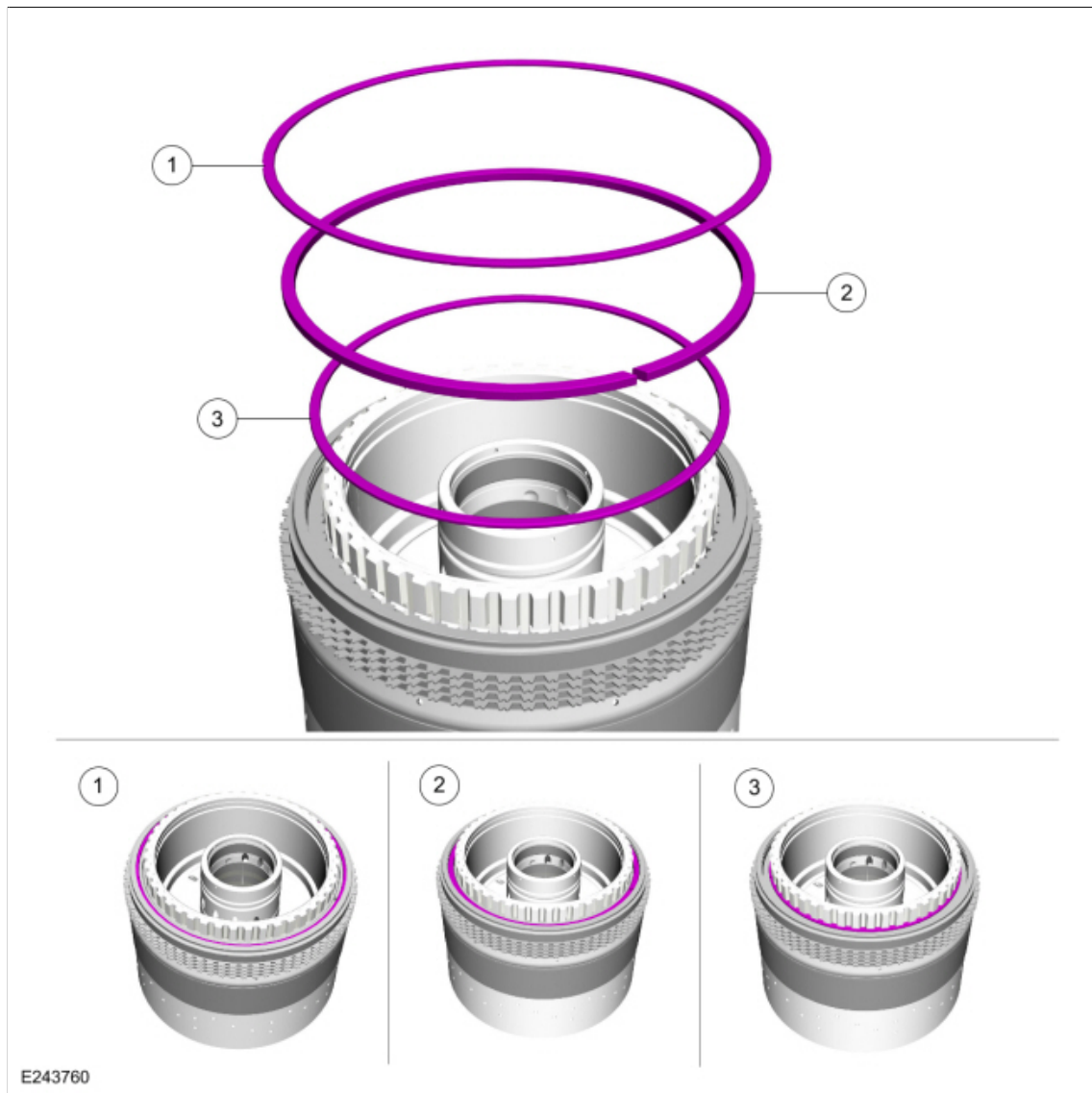
114. Remove and discard the D clutch piston inner and outer seals.



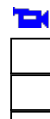
115. Remove the F clutch keeper snap ring, F clutch snap ring keeper and the F clutch snap ring.

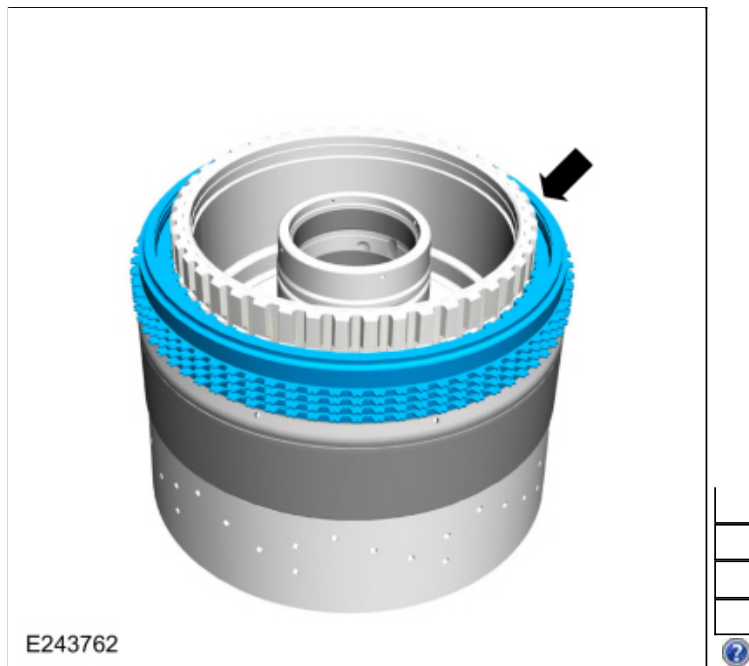
1. F clutch keeper snap ring
2. F clutch snap ring keeper
3. F clutch snap ring



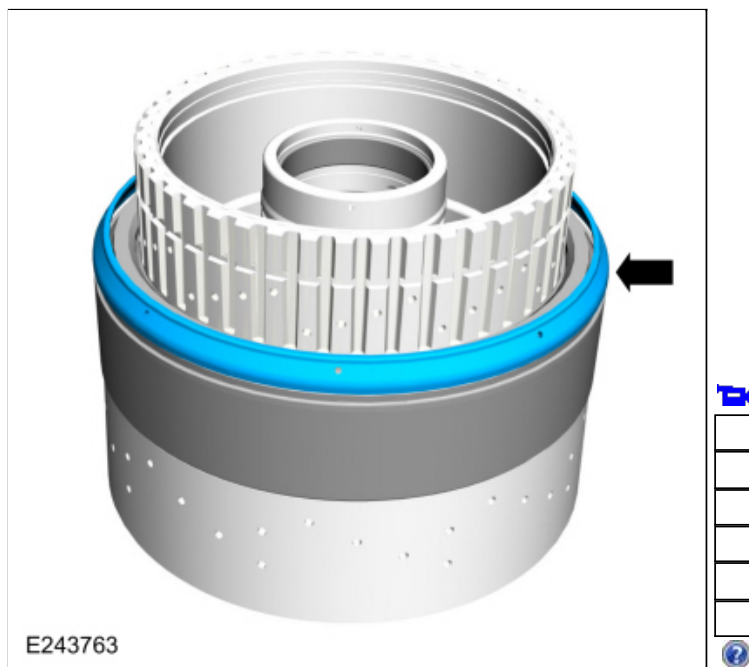


116. Remove the F clutch assembly. Inspect the clutch plates for excessive wear or damage. If the clutch plates are excessively worn or damaged replace as necessary. If the clutch plates are not excessively worn or damaged, they can be reused.

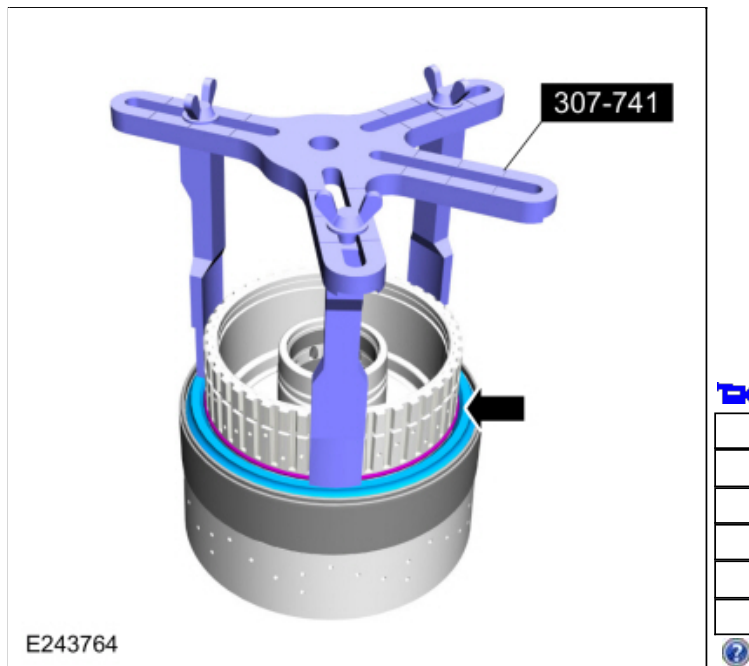




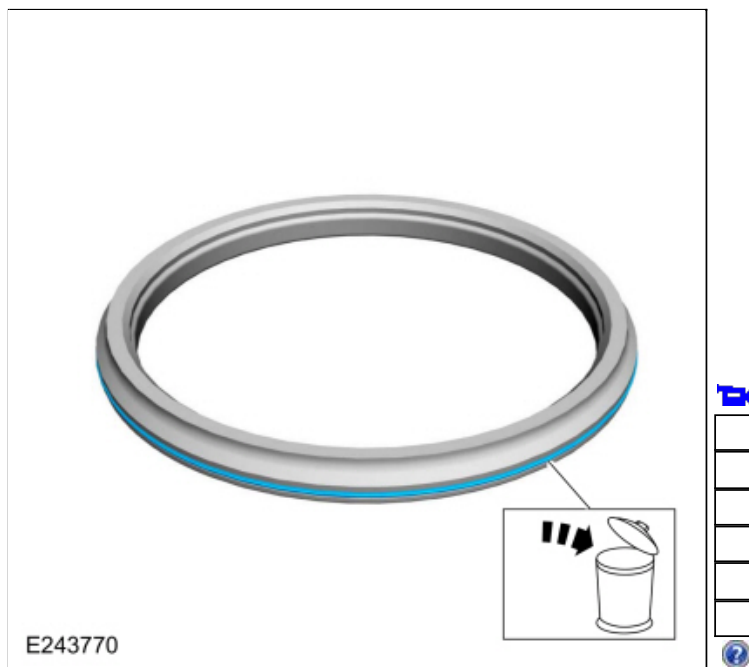
117. Remove the F clutch apply ring.



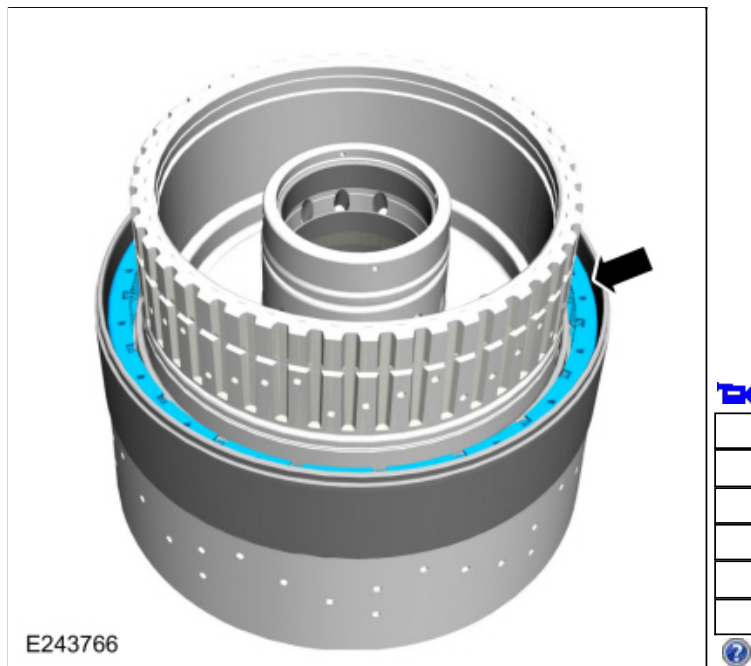
118. Using the special tools and a press, compress the F clutch balance dam and remove the retainer. Remove the F clutch balance dam.
 Use Special Service Tool: [307-741 Spring Compressor, F Clutch](#).
 Use the General Equipment: Hydraulic Press



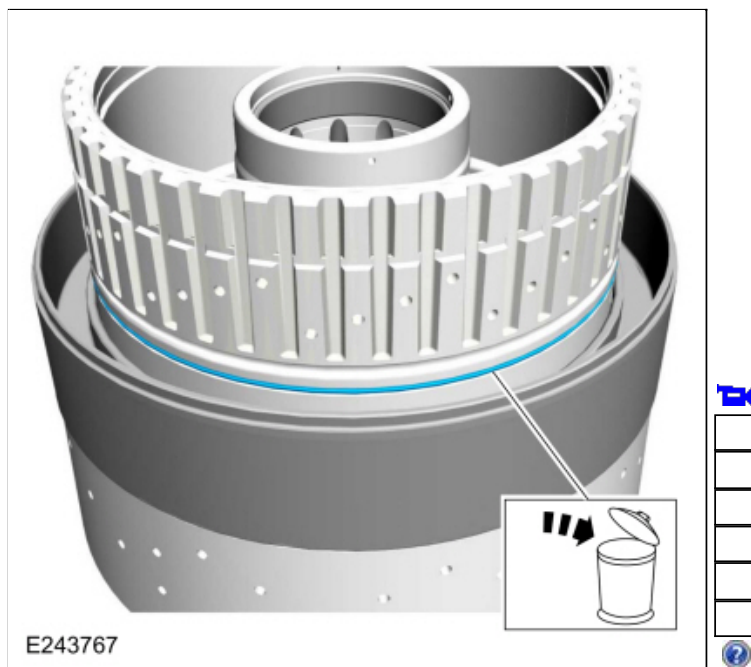
119. Remove and discard the F clutch balance dam outer seal.



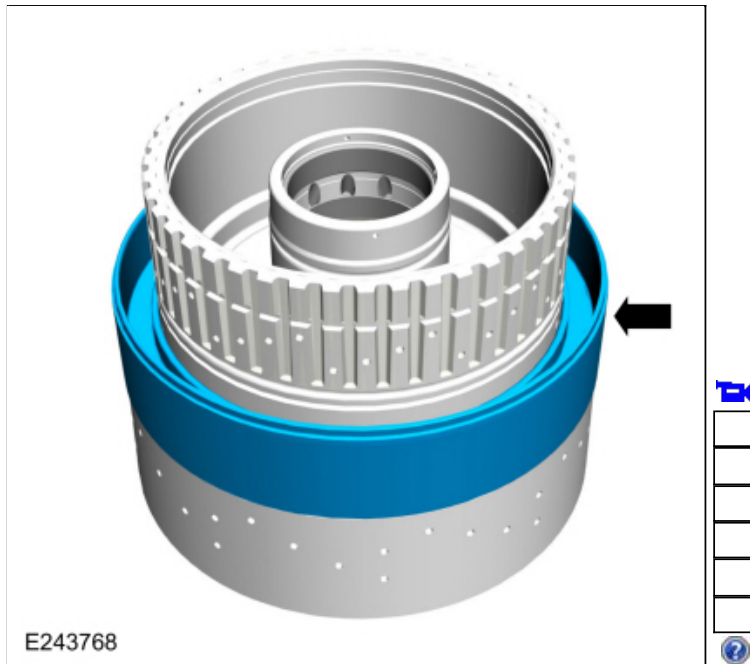
120. Remove the F clutch piston return spring.



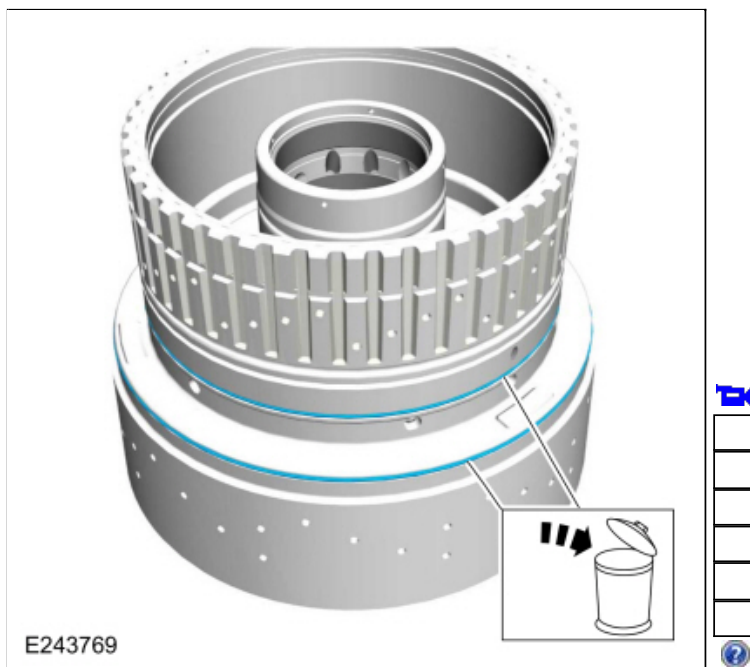
121. Remove and discard the F clutch balance dam inner seal.



122. Remove the F clutch piston.

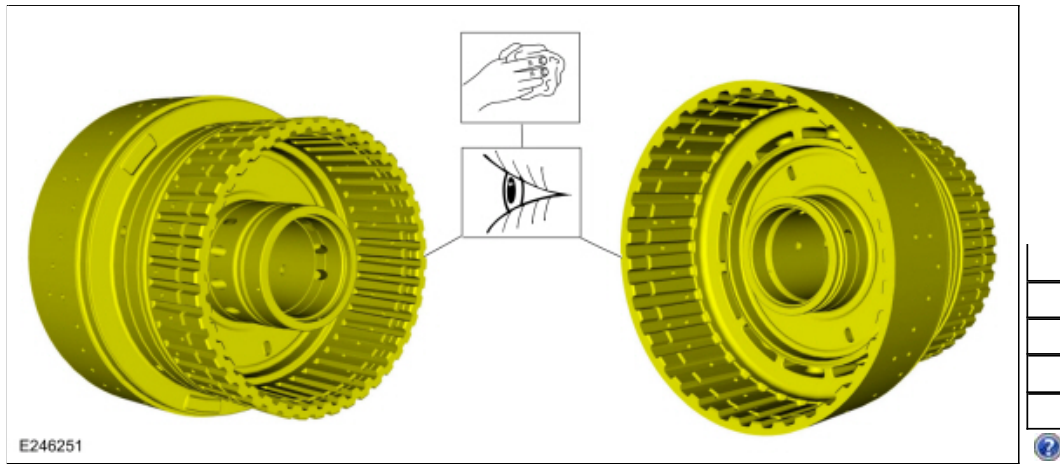


123. Remove and discard the F clutch piston seals.

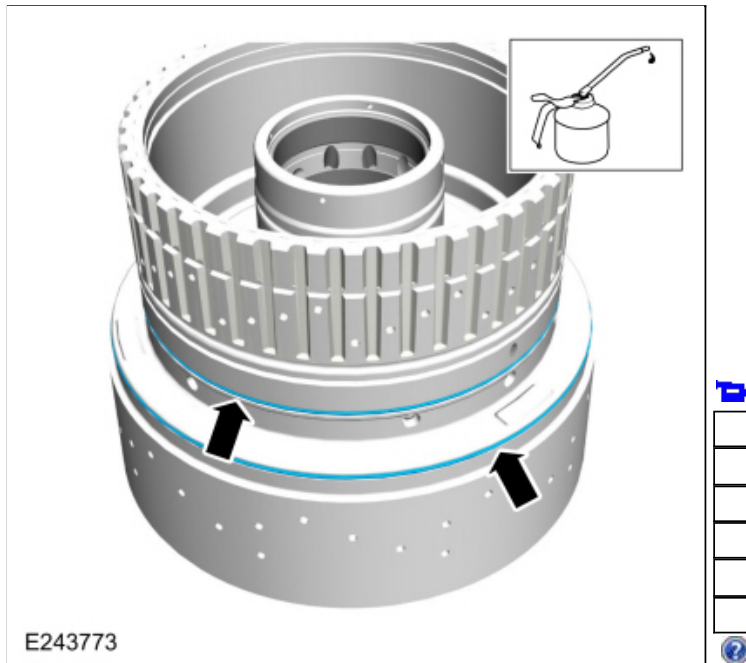


124. Clean and inspect the CDF clutch cylinder.



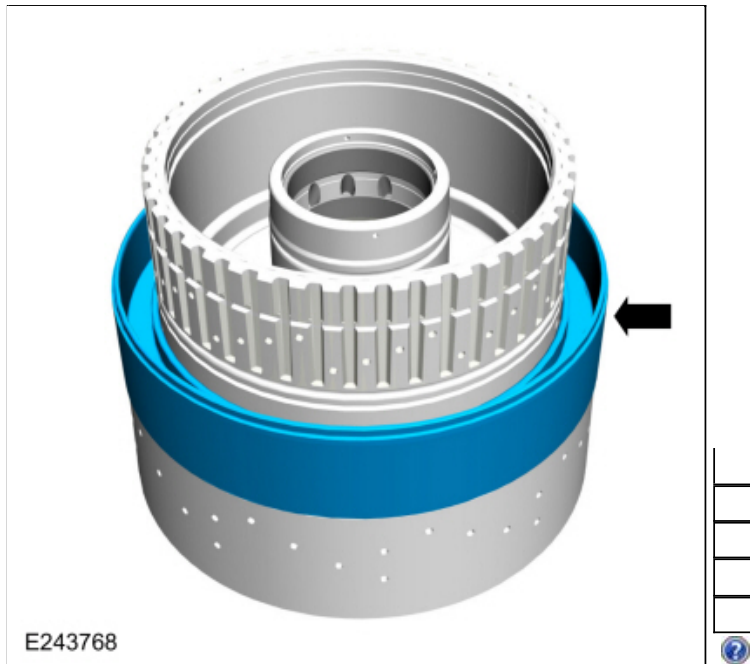


125. Install the new F clutch piston seals. Lubricate the seals with petroleum jelly.

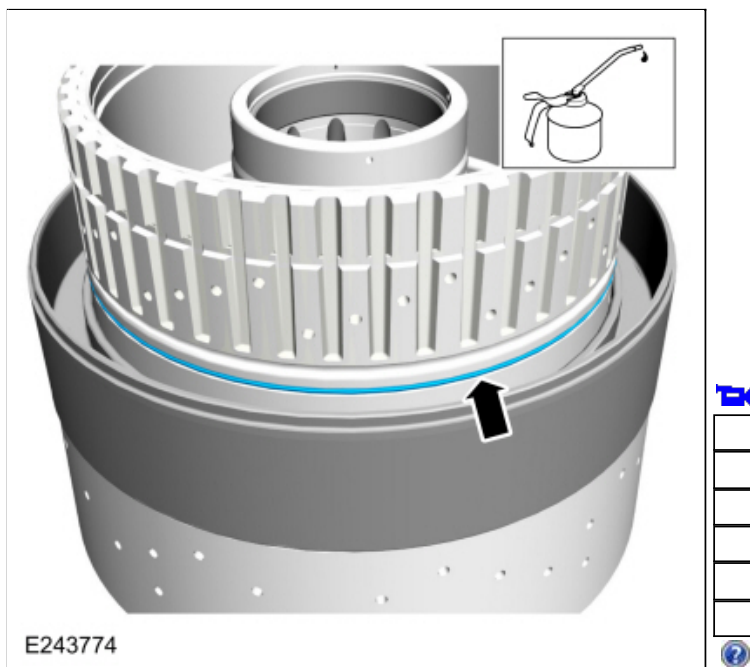


126. Install the F clutch piston.

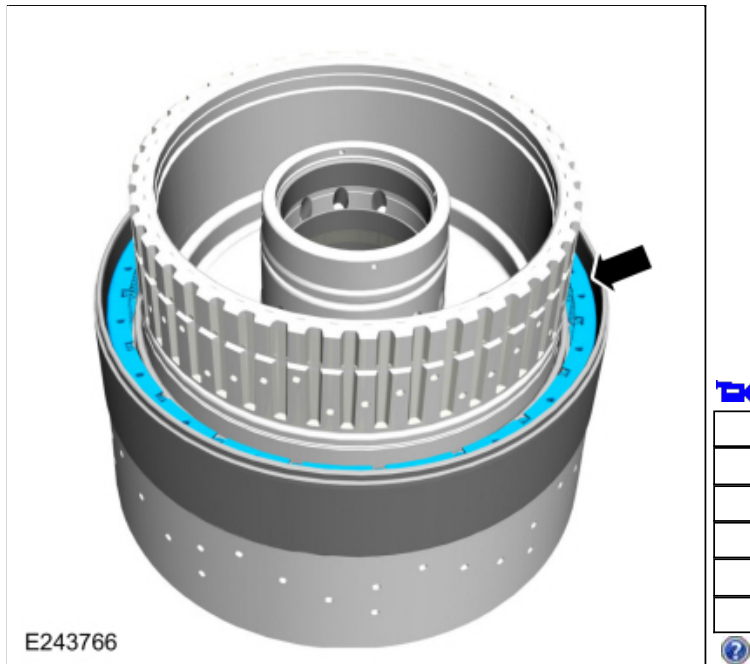




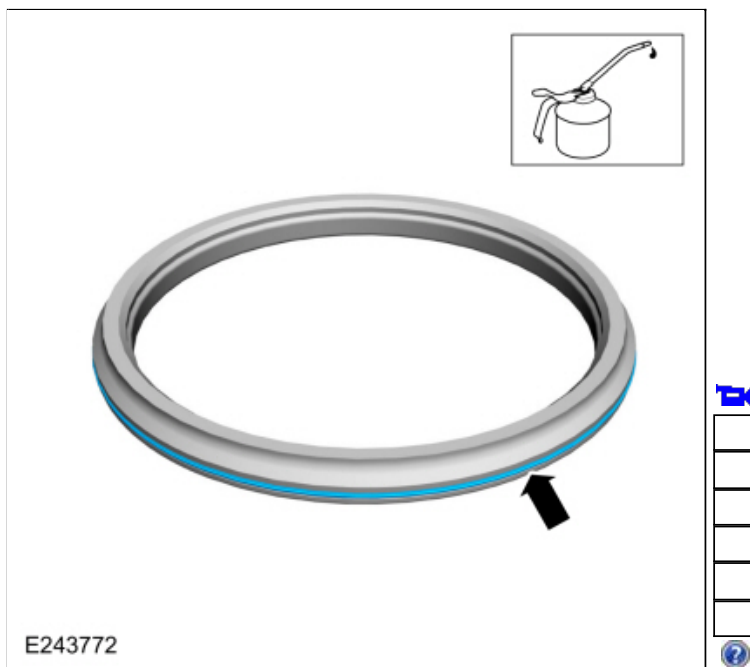
127. Install the new F clutch balance dam inner seal. Lubricate the seal with petroleum jelly.



128. Install the F clutch piston return spring.

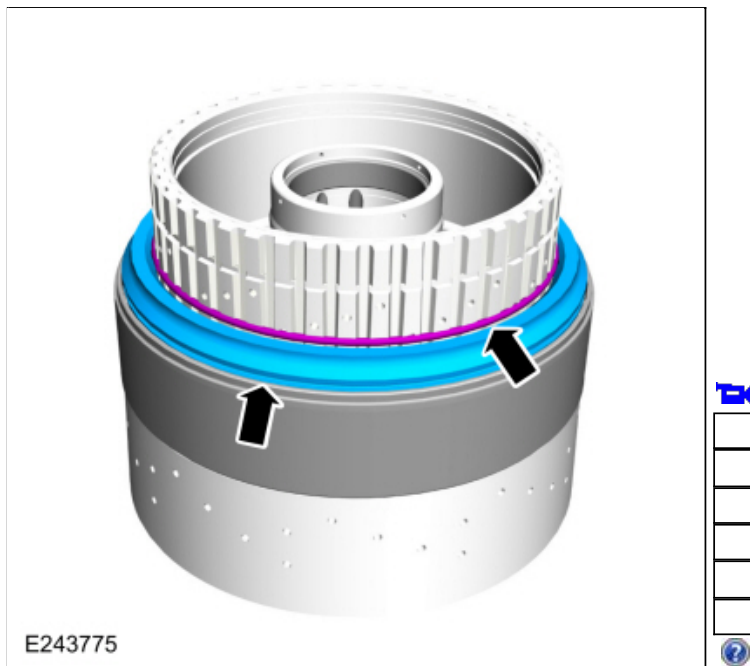


129. Install the new F clutch balance dam outer seal. Lubricate the seal with petroleum jelly.

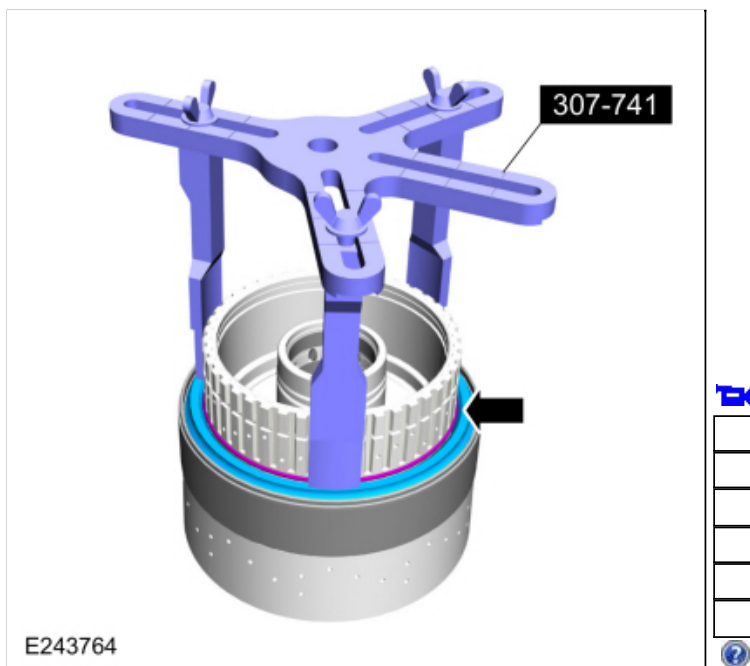


130. **NOTE:** The F clutch balance dam retainer will not be in the groove at this time.

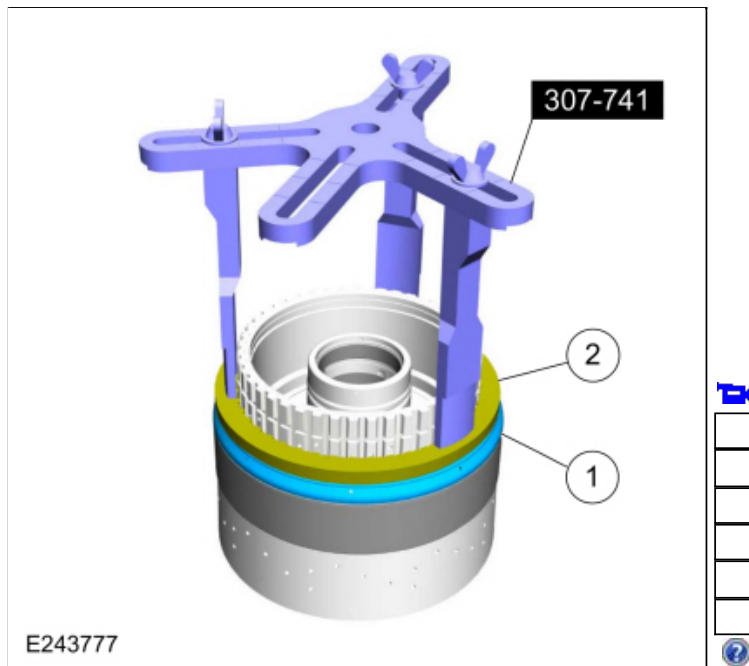
Install the F clutch balance dam and retainer on the CDF clutch cylinder.



131. Using the special tools and a press, compress the F clutch balance dam and install the retainer into the groove.
 Use Special Service Tool: [307-741 Spring Compressor, F Clutch](#).
 Use the General Equipment: Hydraulic Press



- 132.
1. Position the F clutch apply ring onto the F clutch piston.
 2. Position the F clutch pressure plate upside-down onto the apply ring. Using the special tools and a press, press the apply ring onto the F clutch piston.
 Use Special Service Tool: [307-741 Spring Compressor, F Clutch](#).
 Use the General Equipment: Hydraulic Press



133. **NOTE:** Clutch plate quantity is model dependant based on engine displacement.

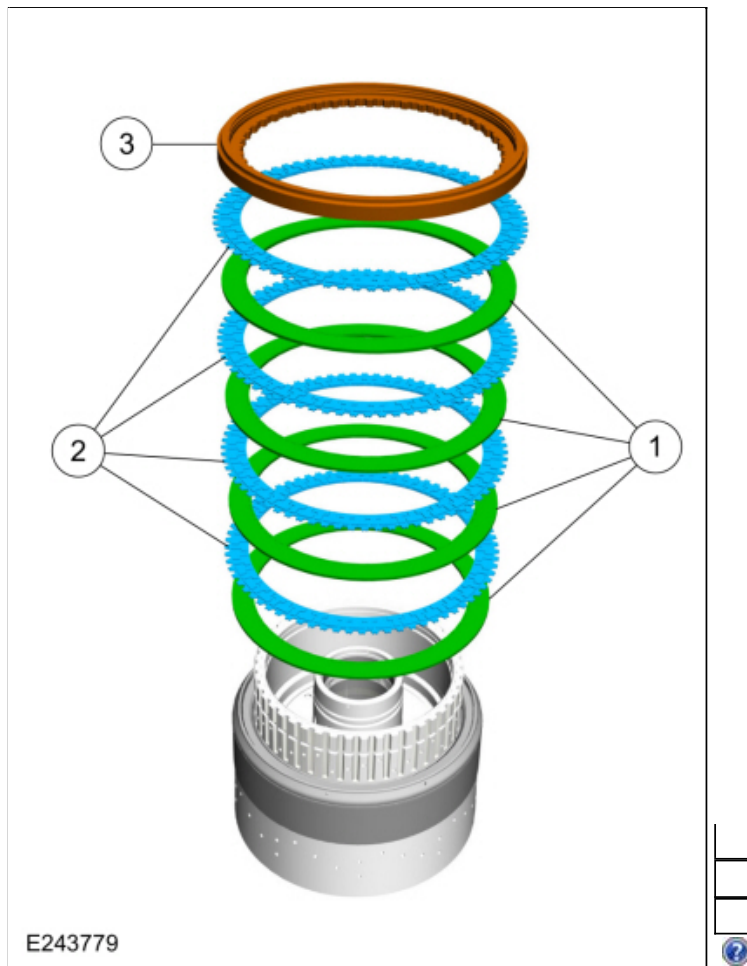
Soak the F clutch plates in clean transmission fluid. Install the F clutch assembly.

1. Steel plates
2. Friction plates

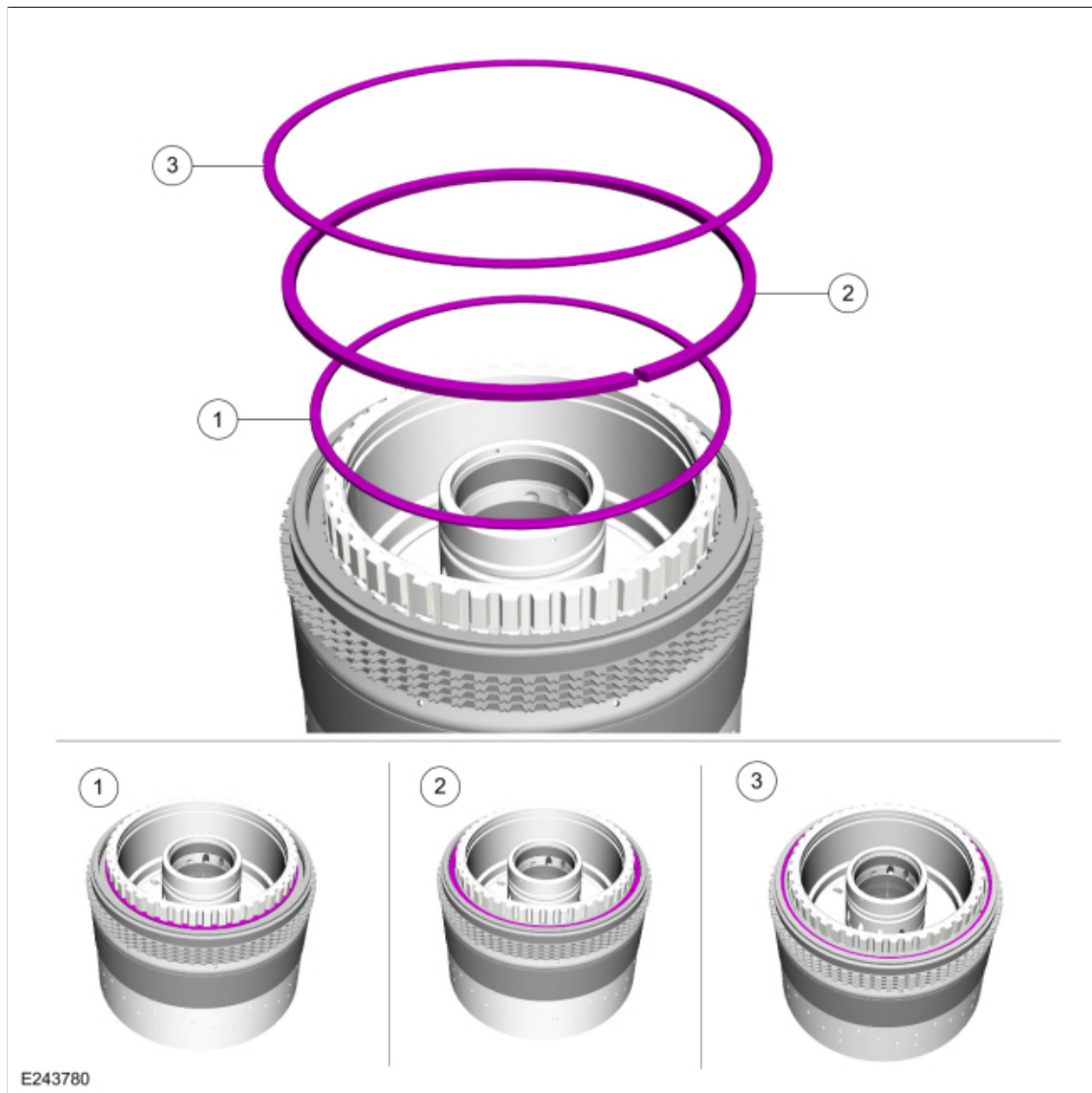
Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (WSS-M2C949-A)
(MERCON® ULV)

3. Pressure plate

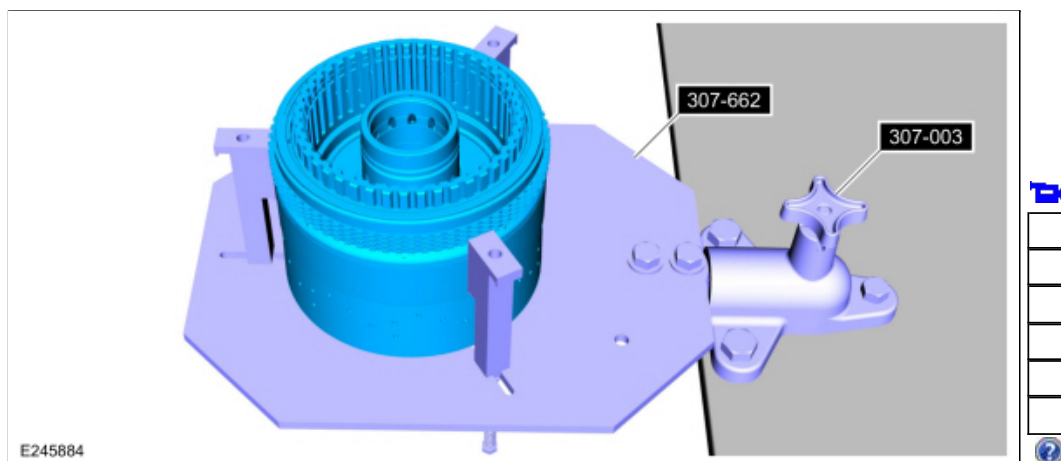




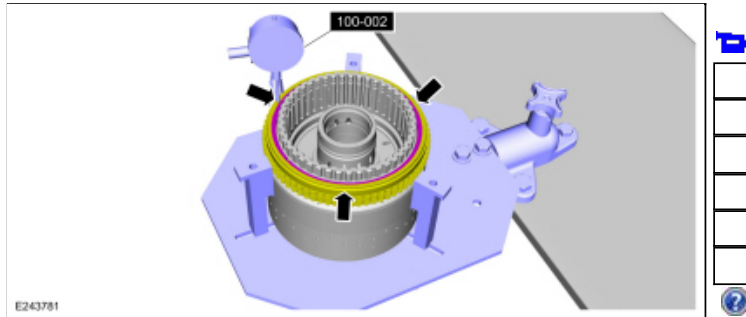
134. Install the F clutch snap ring, F clutch snap ring keeper and the F clutch keeper snap ring .
1. F clutch snap ring
 2. F clutch snap ring keeper
 3. F clutch keeper snap ring



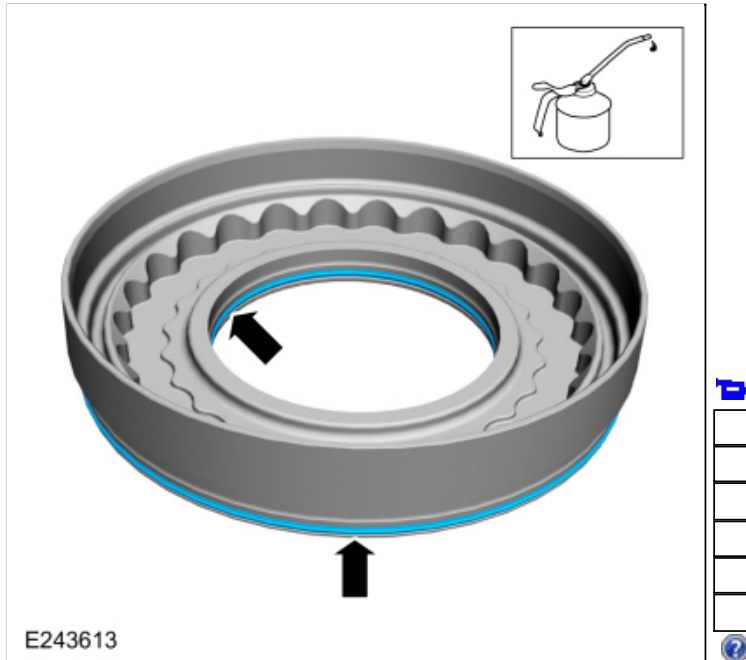
135. Assemble the special tools and position the CDF clutch cylinder with the F clutch facing up.
 Use Special Service Tool: [307-662 Gauge, Clutch Pack Endplay](#), [307-003 \(T57L-500-B\) Holding Fixture, Transmission](#).



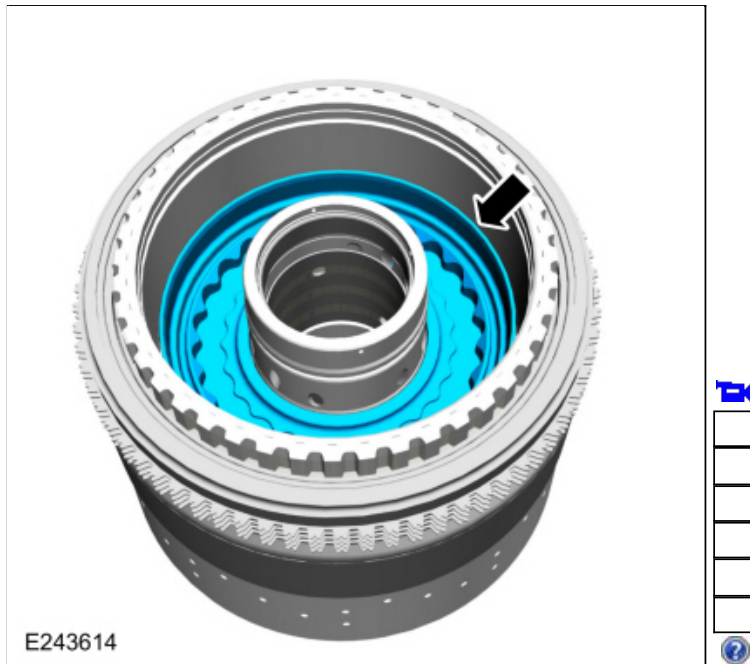
136. Using the special tool, measure the F clutch clearance. Position the plunger so it rests on the top surface of the pressure plate. Zero the dial indicator. Pull up on the pressure plate and measure and record the clutch clearance in 3 different places. Average the 3 recorded clutch clearance measurements and compare the measurement to the clutch clearance chart in specifications to determine the correct size snap ring. Install the correct F clutch snap ring. Refer to: [Specifications](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Specifications). Use Special Service Tool: [100-002 \(TOOL-4201-C\) Holding Fixture with Dial Indicator Gauge](#).



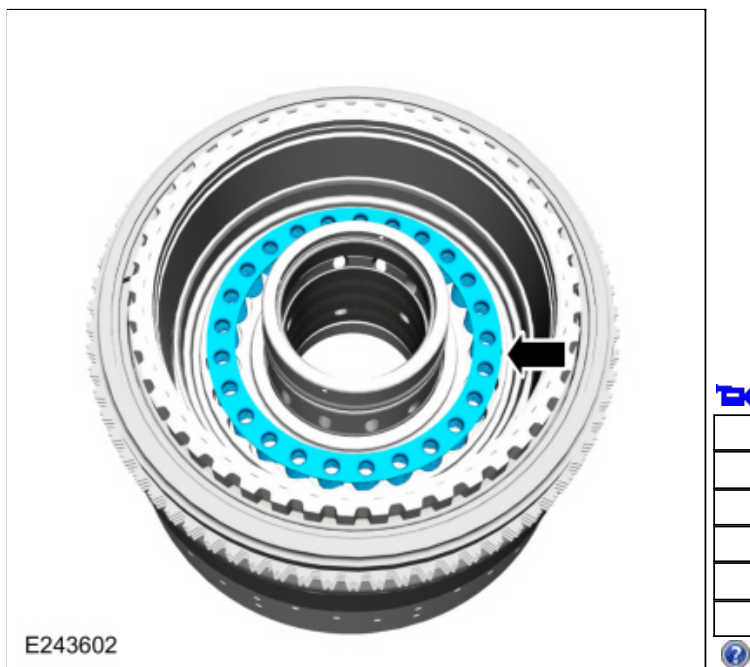
137. Install the new D clutch piston inner and outer seals. Lubricate the seals with petroleum jelly.



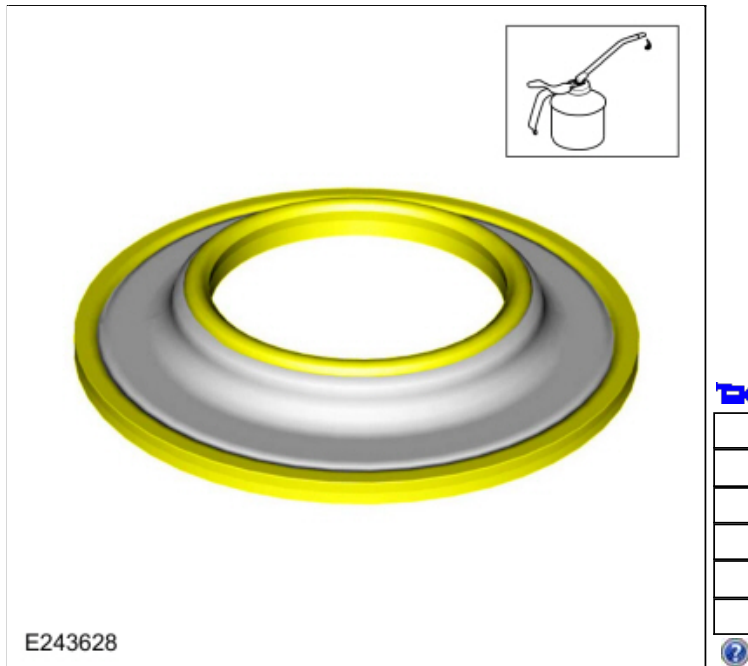
138. Install the D clutch piston.



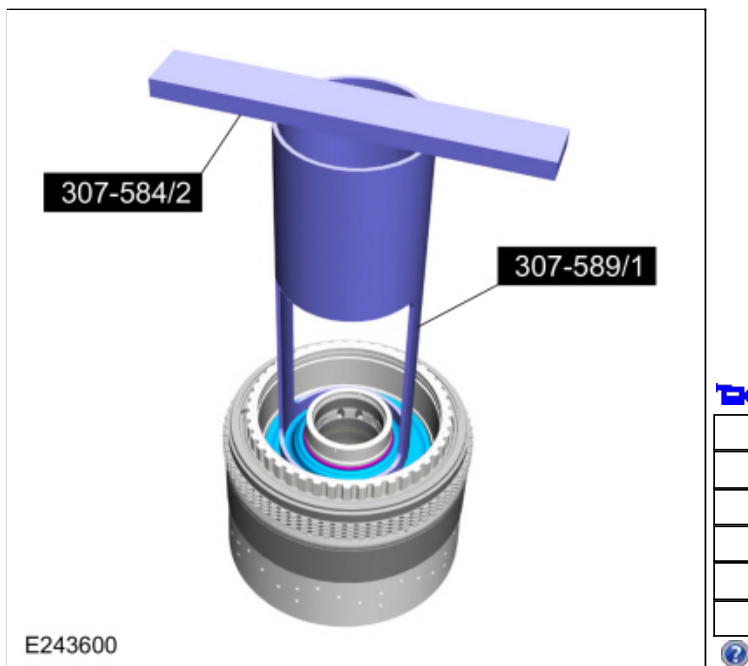
139. Install the D clutch piston return spring.



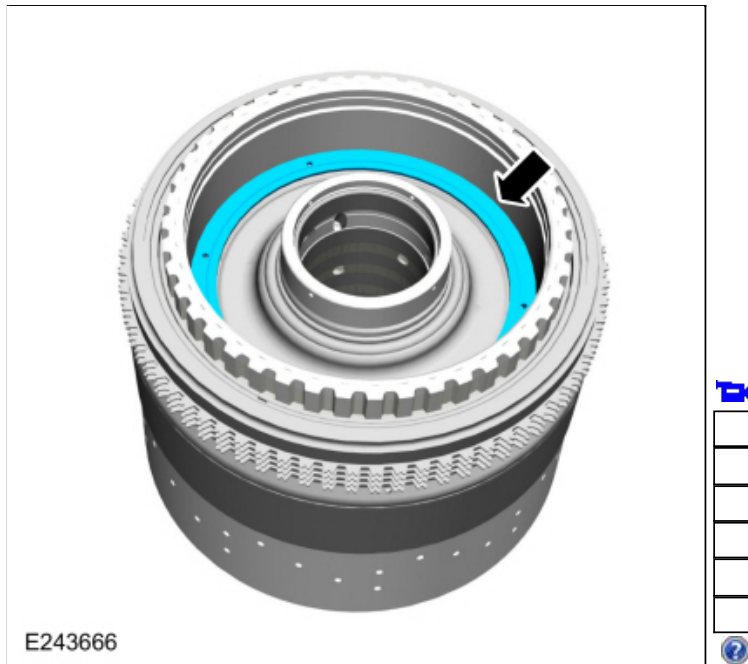
140. Lubricate the new D clutch balance dam seals with petroleum jelly.



141. Using the special tools and a press, Install the D clutch balance dam and install the retainer.
 Use Special Service Tool: [307-584 2-6 Spring Compressor](#) , [307-589 Overdrive clutch and balance piston service set](#).
 Use the General Equipment: Hydraulic Press



142. Install the D clutch apply ring.



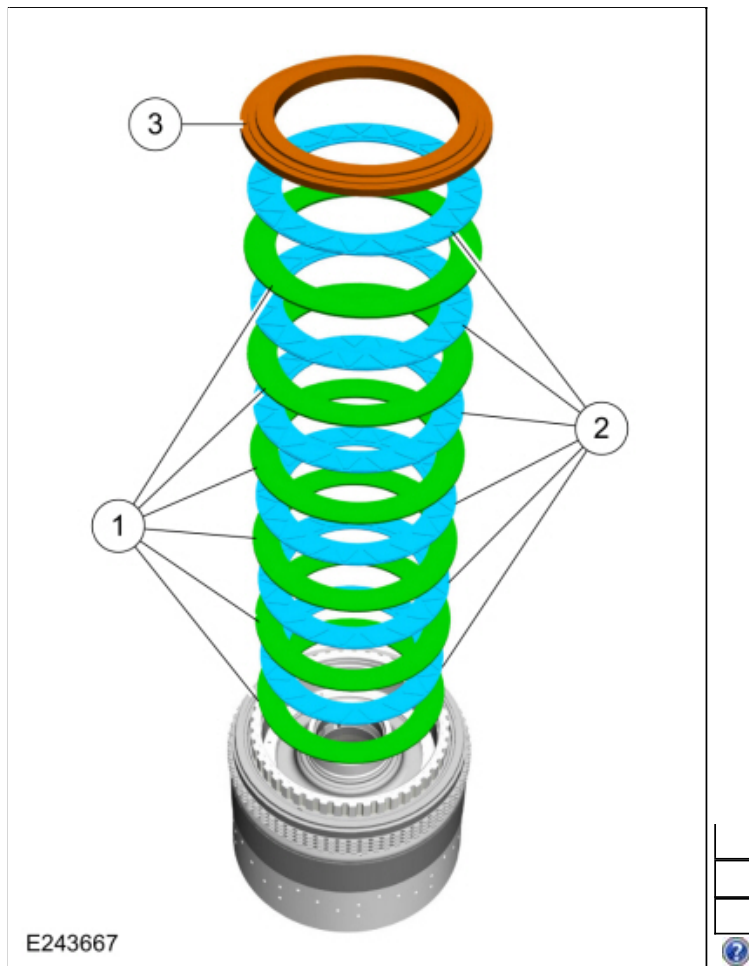
143. **NOTE:** *Clutch plate quantity is model dependant based on engine displacement.*

Soak the D clutch plates in clean transmission fluid. Install the D clutch assembly.

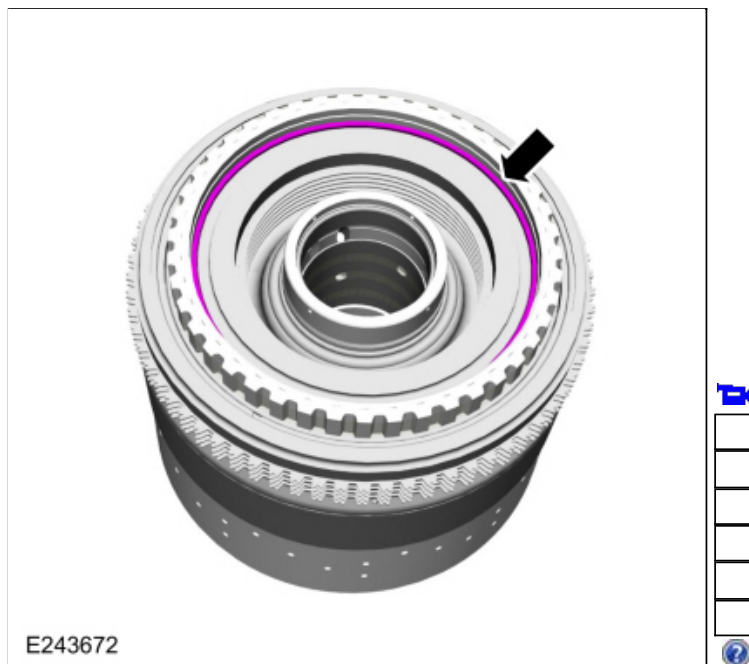
1. Steel plates
2. Friction plates

Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (WSS-M2C949-A)
(MERCON® ULV)

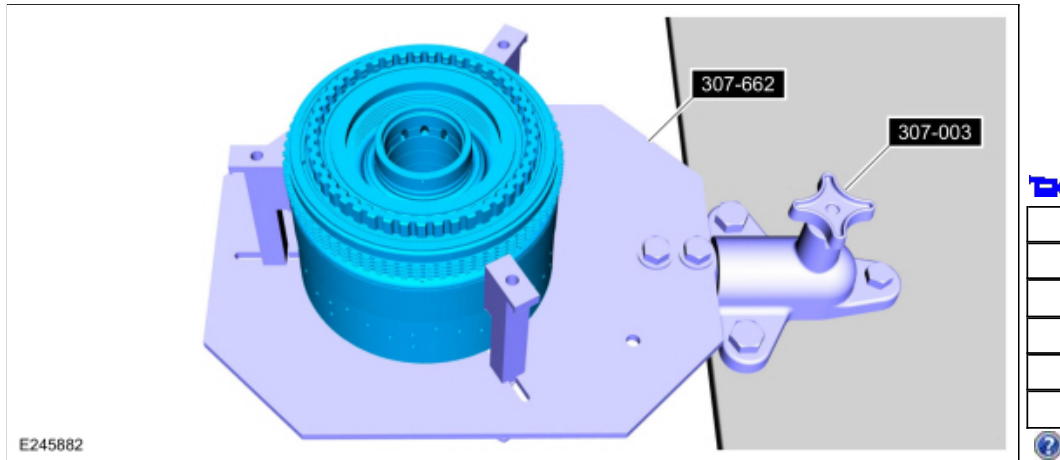
3. Pressure plate



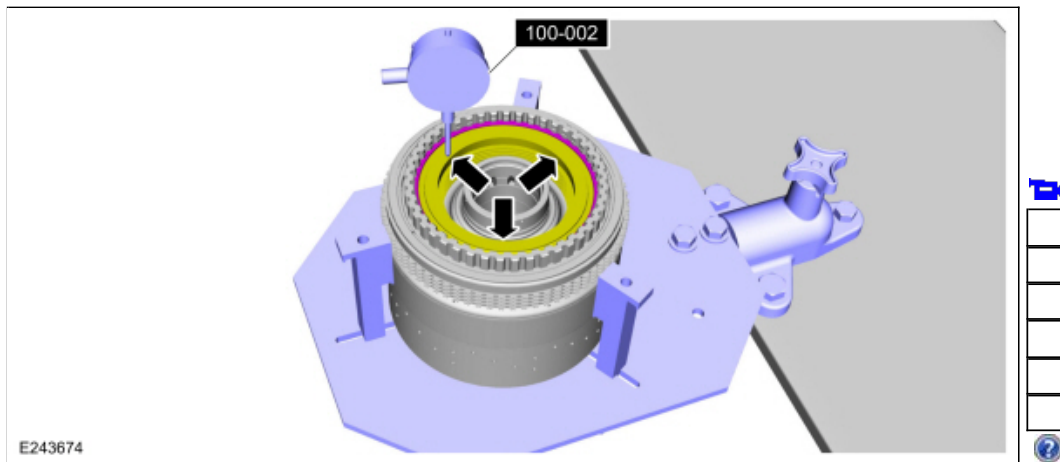
144. Install the D clutch snap ring.



145. Assemble the special tools and position the CDF clutch cylinder with the D clutch facing up.
Use Special Service Tool: [307-662 Gauge, Clutch Pack Endplay.](#) , [307-003 \(T57L-500-B\) Holding Fixture, Transmission.](#)

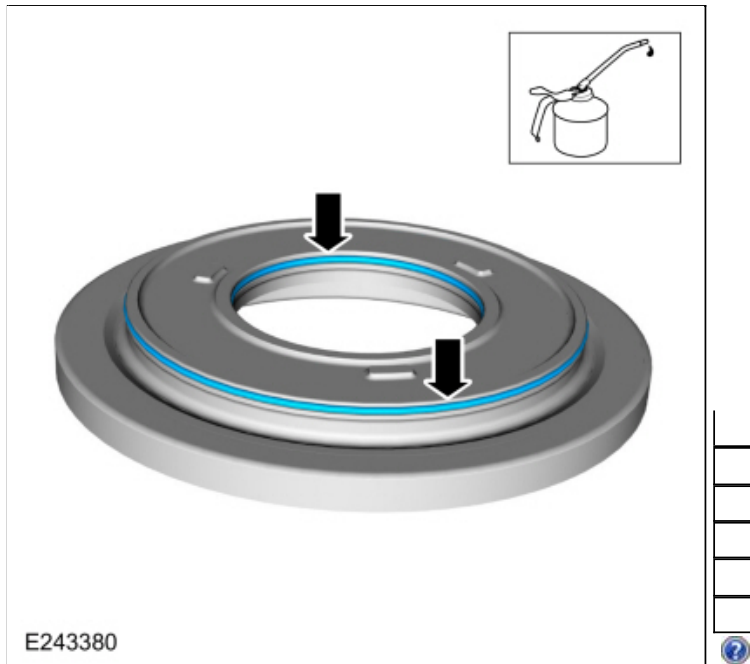


146. Using the special tool, measure the D clutch clearance. Position the plunger so it rests on the top surface of the pressure plate. Zero the dial indicator. Pull up on the pressure plate and measure and record the clutch clearance in 3 different places. Average the 3 recorded clutch clearance measurements and compare the measurement to the clutch clearance chart in specifications to determine the correct size snap ring. Install the correct D clutch snap ring. Refer to: [Specifications](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Specifications). Use Special Service Tool: [100-002 \(TOOL-4201-C\) Holding Fixture with Dial Indicator Gauge.](#)

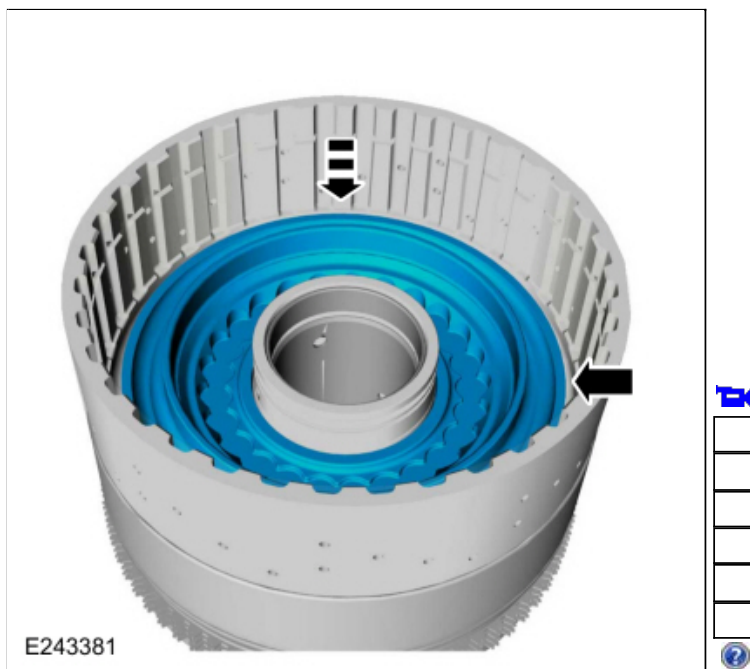


147. Install the new C clutch piston inner and outer seals. Lubricate the seals with petroleum jelly.



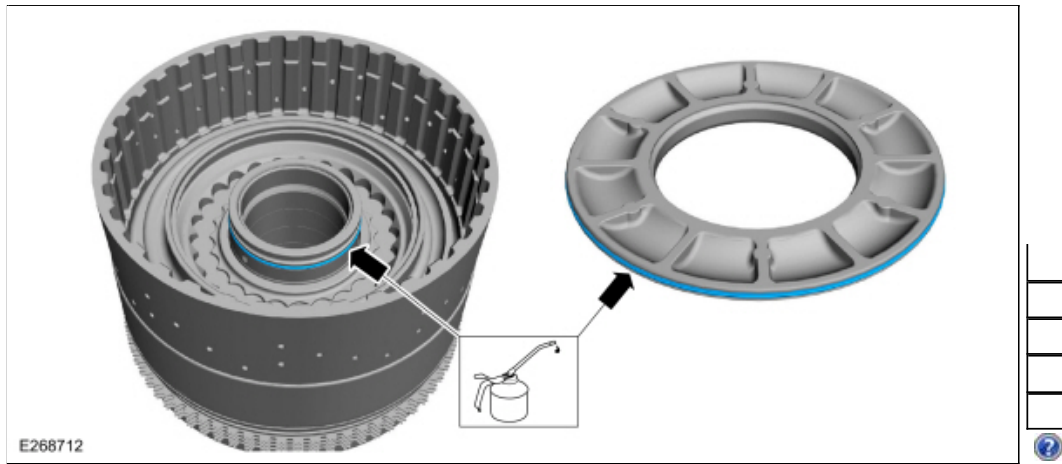


148. Install the C clutch piston.

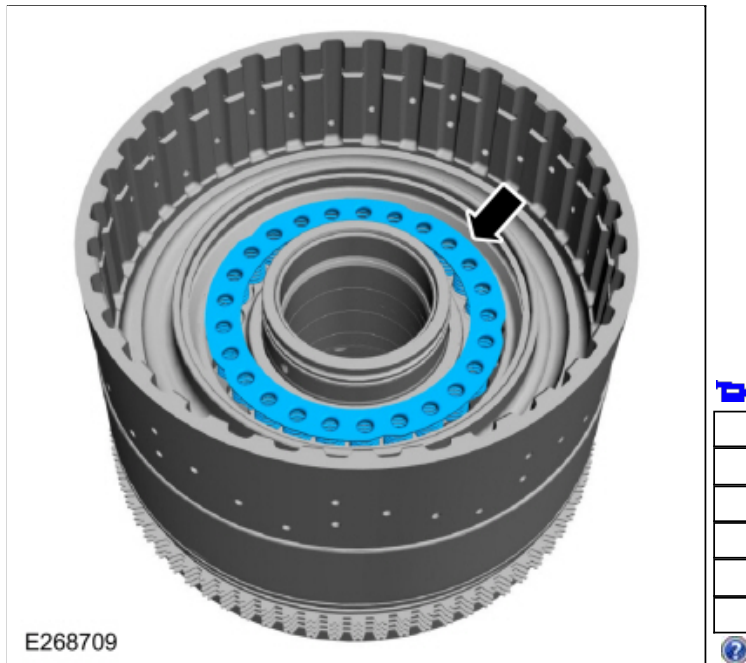


149. Install the new C clutch balance dam seals. Lubricate the seals with petroleum jelly.





150. Install the C clutch piston return spring.

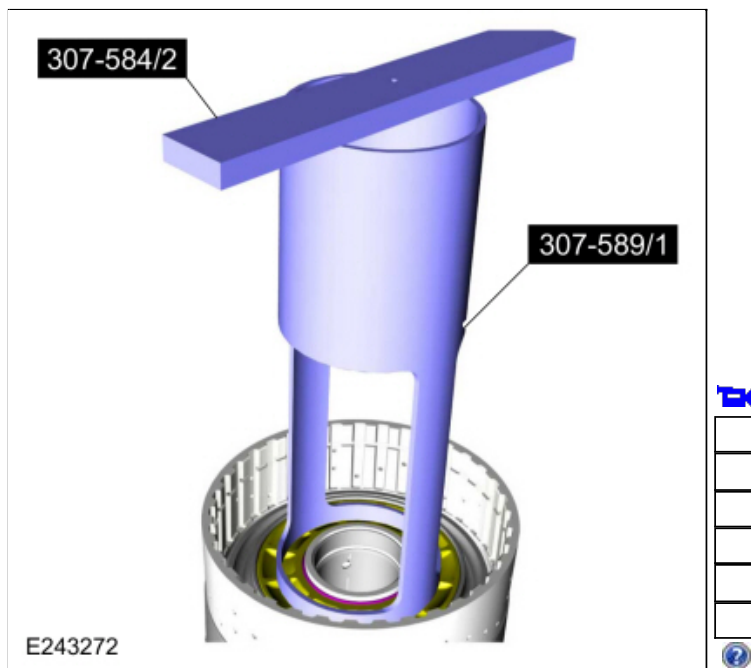


151. Install the C clutch balance dam.





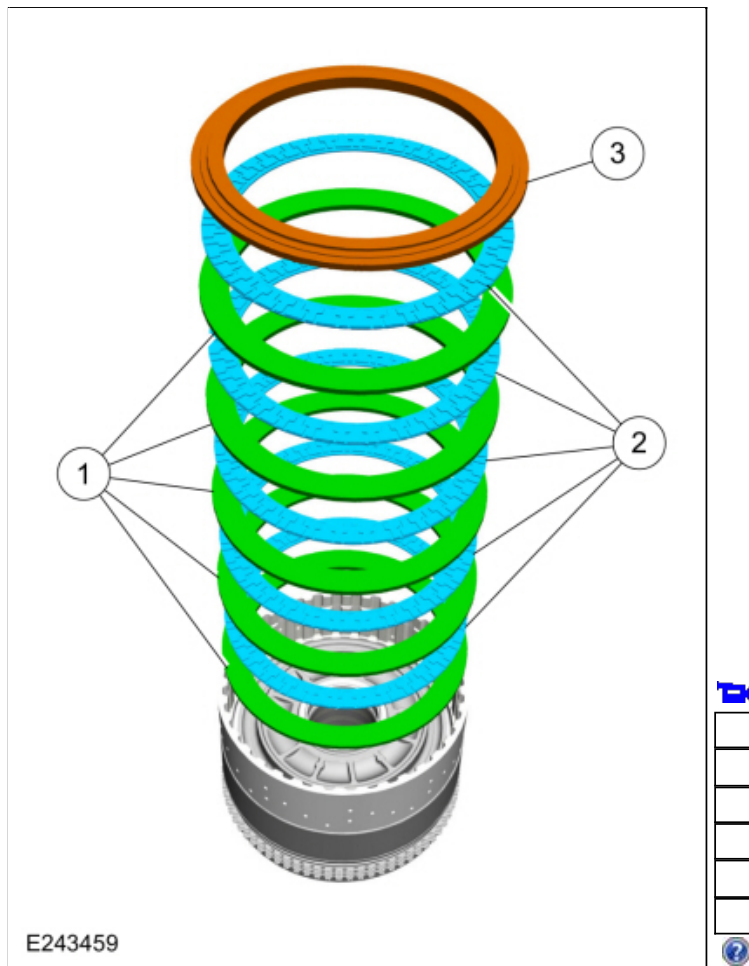
152. Using the special tools and a press, compress the C clutch balance dam and install the retainer.
 Use Special Service Tool: [307-584 2-6 Spring Compressor](#) , [307-589 Overdrive clutch and balance piston service set](#).
 Use the General Equipment: Hydraulic Press



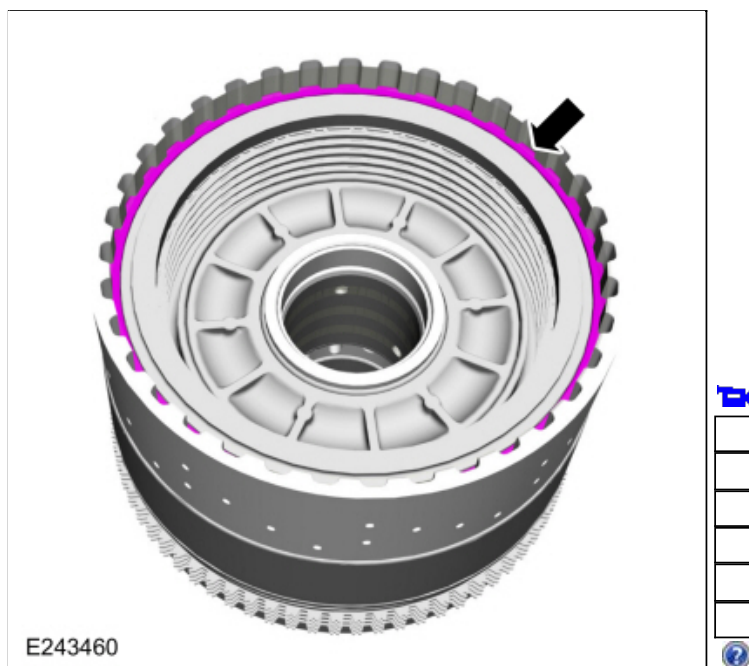
153. **NOTE:** Clutch plate quantity is model dependant based on engine displacement.

Soak the C clutch plates in clean transmission fluid. Install the C clutch assembly.

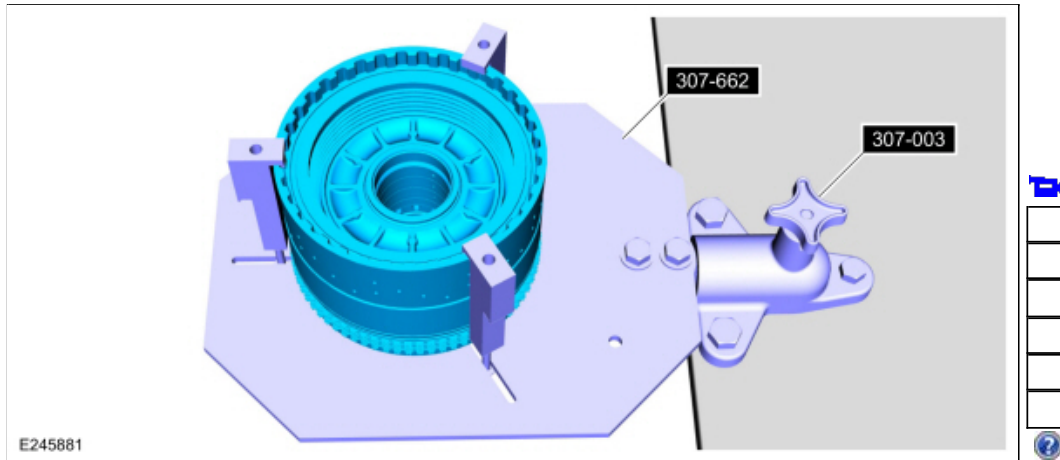
1. Steel plates
2. Friction plates
 Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (WSS-M2C949-A) (MERCON® ULV)
3. Pressure plate



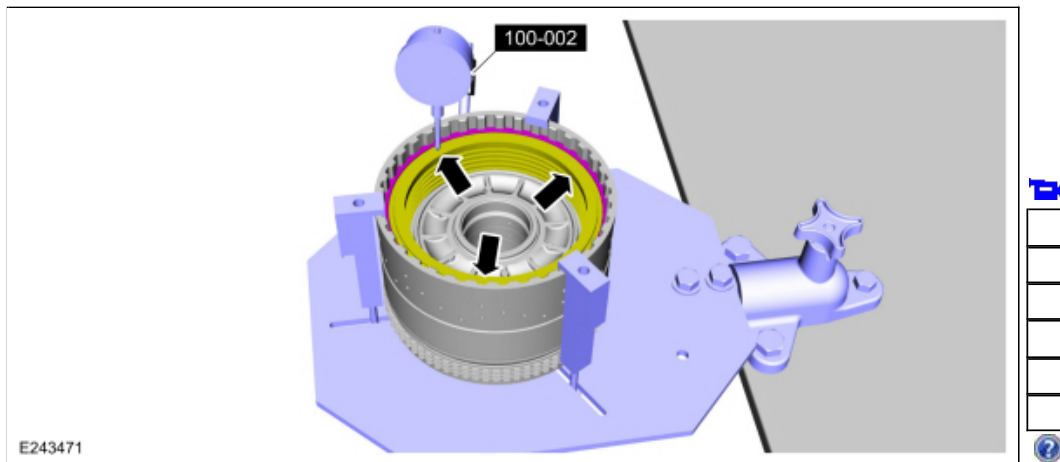
154. Install the C clutch snap ring.



155. Assemble the special tools and position the CDF clutch cylinder with the C clutch facing up.
Use Special Service Tool: [307-662 Gauge, Clutch Pack Endplay.](#) , [307-003 \(T57L-500-B\) Holding Fixture, Transmission.](#)

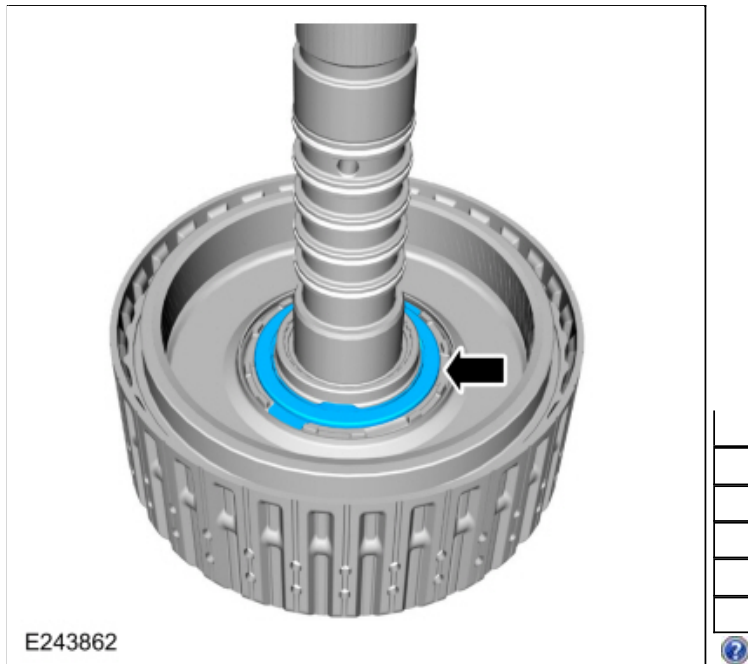


156. Using the special tool, measure the C clutch clearance. Position the plunger so it rests on the top surface of the pressure plate. Zero the dial indicator. Pull up on the pressure plate and measure and record the clutch clearance in 3 different places. Average the 3 recorded clutch clearance measurements and compare the measurement to the clutch clearance chart in specifications to determine the correct size snap ring. Install the correct C clutch snap ring. Refer to: [Specifications](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Specifications). Use Special Service Tool: [100-002 \(TOOL-4201-C\) Holding Fixture with Dial Indicator Gauge.](#)

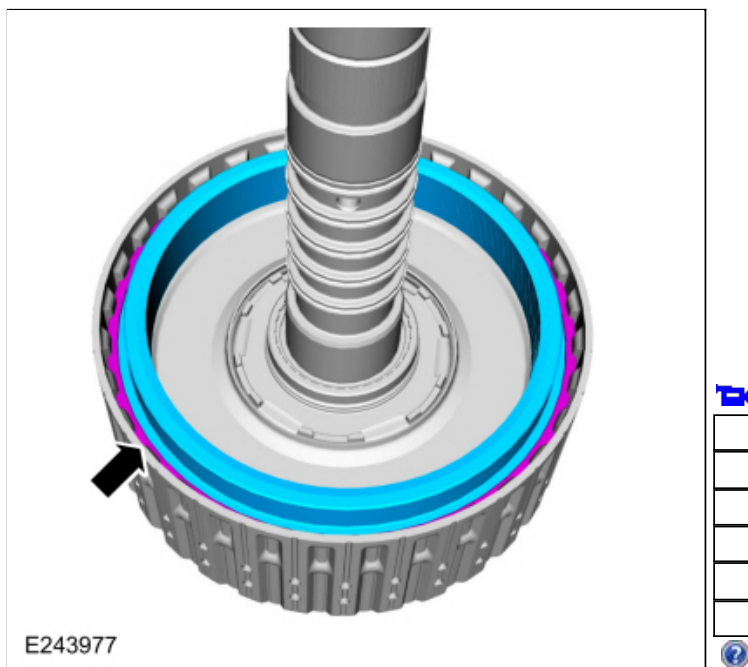


157. Remove the (T6) thrust bearing.

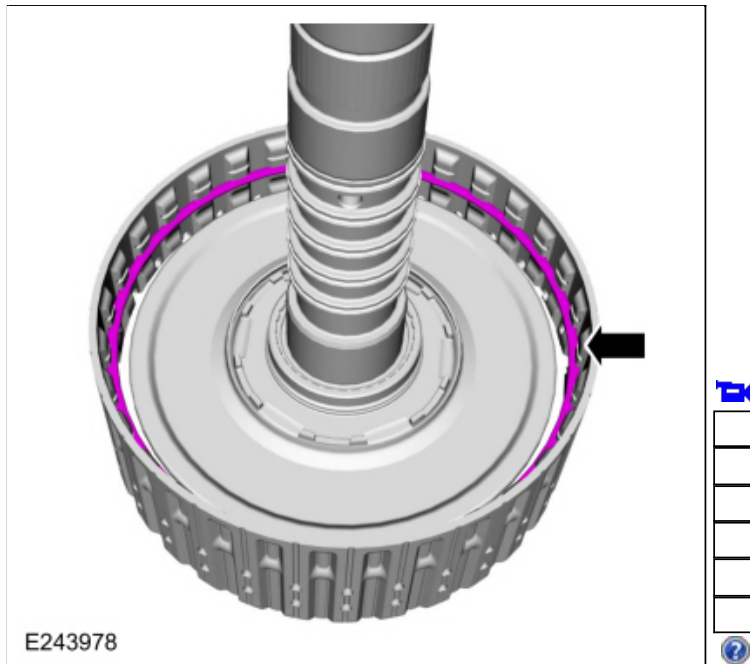




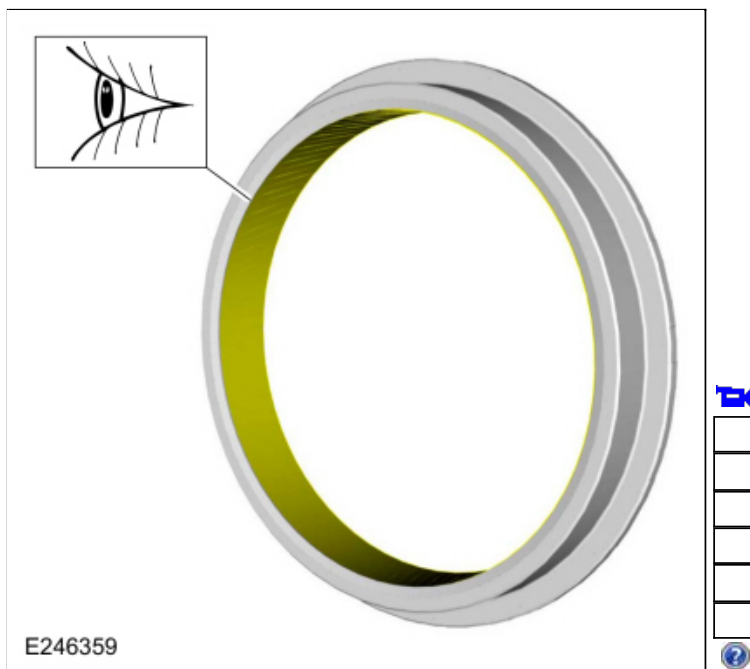
158. Remove the snap ring and the No. 3 ring gear.



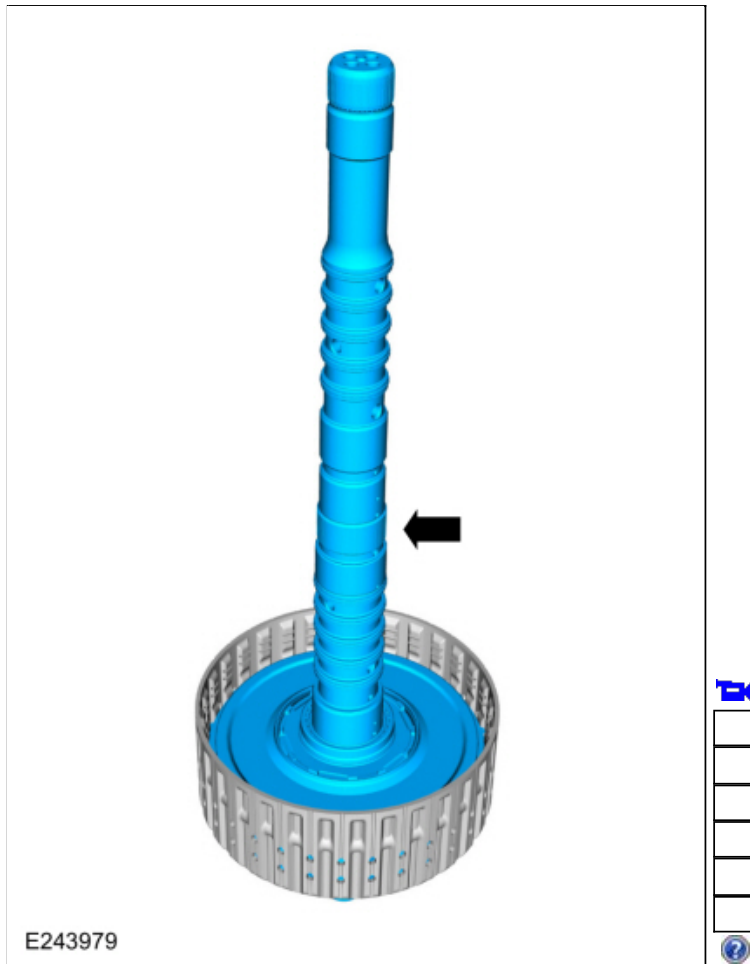
159. Remove the rear No. 3 ring gear snap ring.



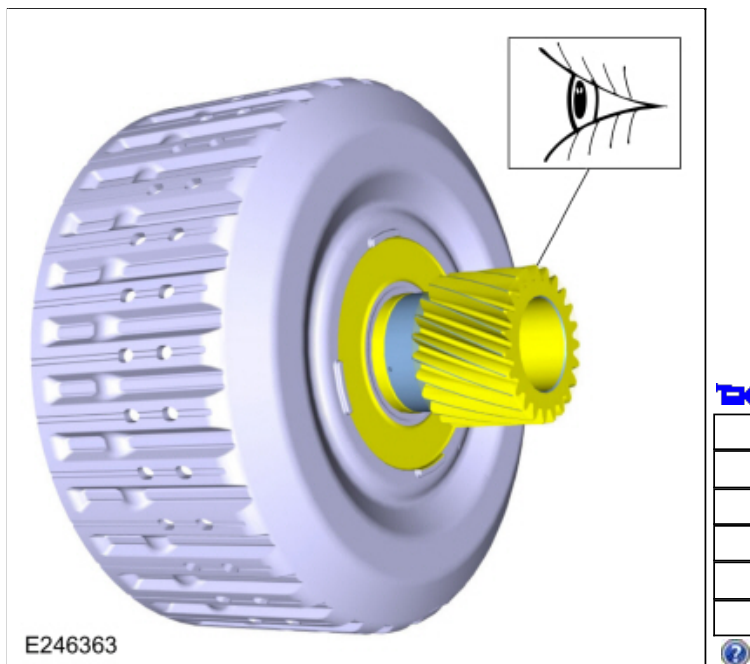
160. Inspect the No. 3 ring gear.



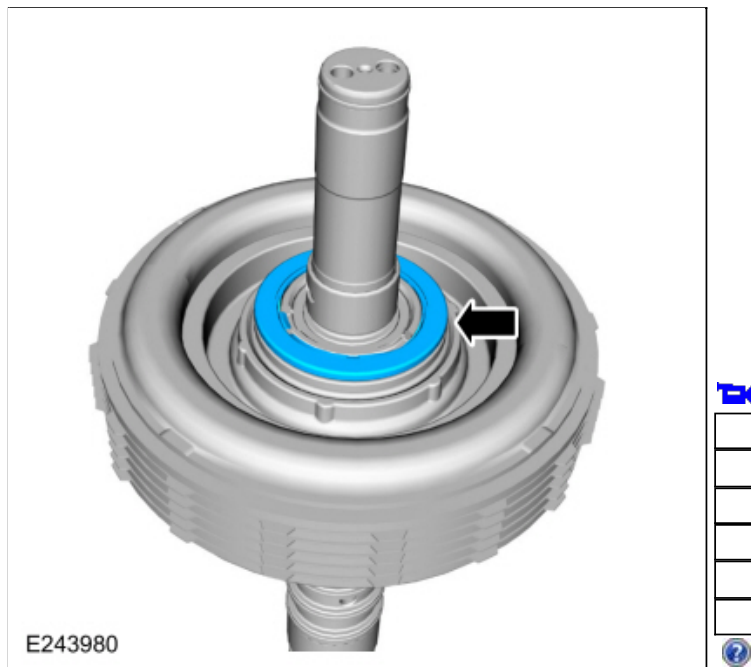
161. Remove the input shaft and the E clutch from No. 4 shell and sun gear.



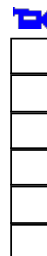
162. Inspect the No. 4 shell and sun gear.

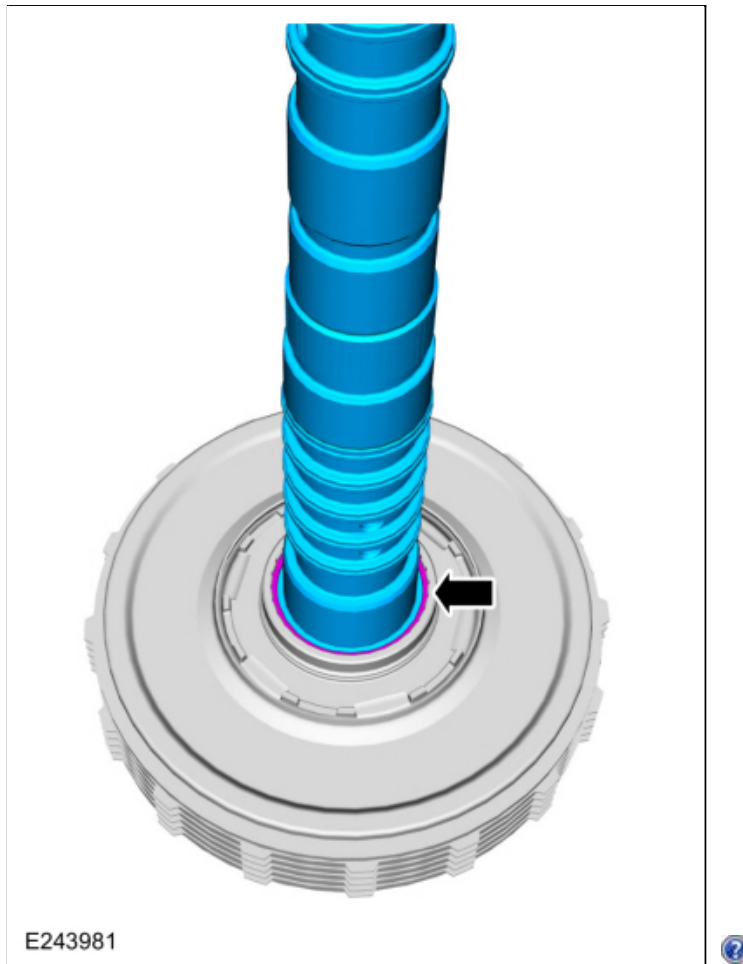


163. Remove the (T7) thrust bearing.

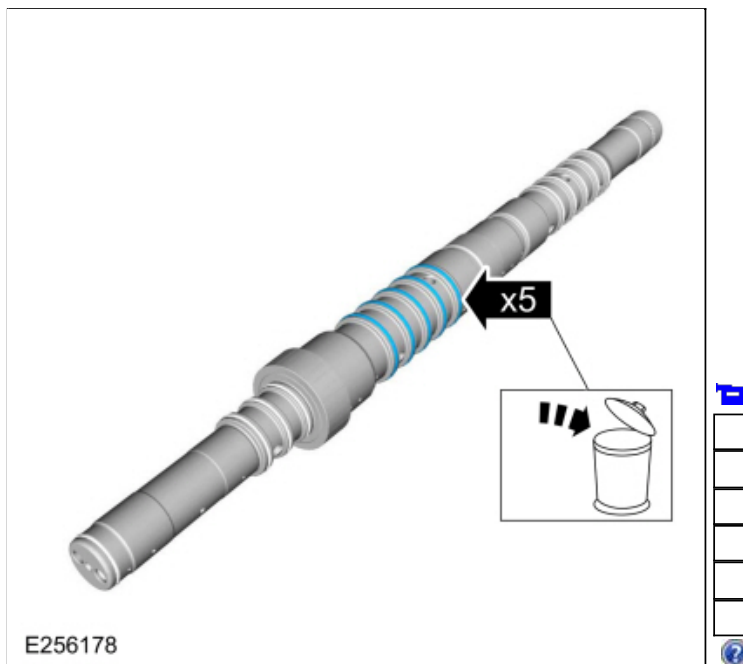


164. Remove the snap ring and remove the input shaft from the E clutch assembly.

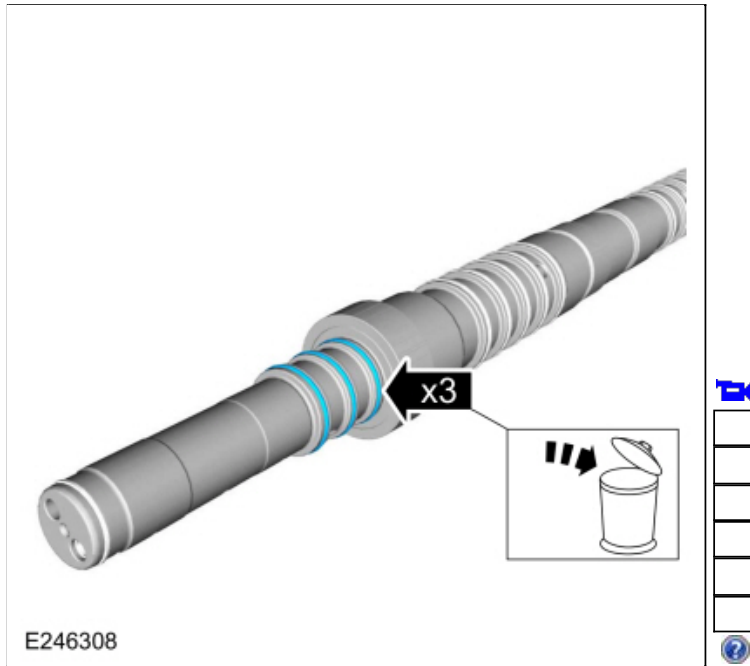




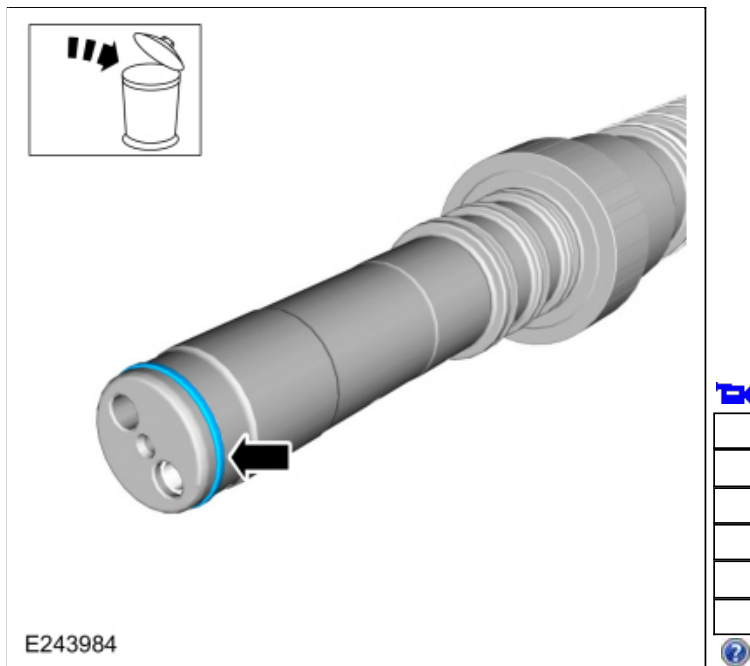
165. Remove and discard the input shaft-to-sun gear No. 3 shaft Teflon® seals.



166. Remove and discard the input shaft D-ring seals.



167. Remove and discard the input shaft Teflon® seal.



168. Clean and inspect the input shaft.

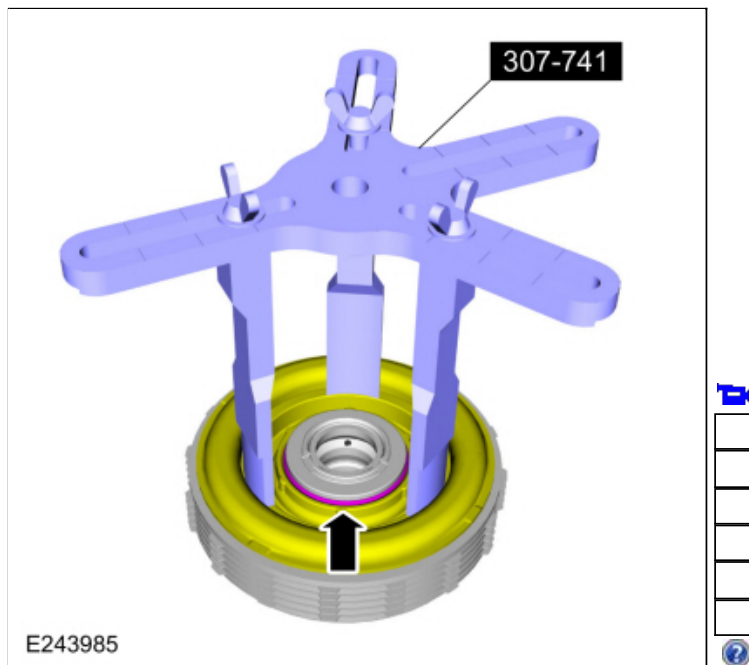


169. **NOTICE:** Do not compress the balance dam too far or damage to the E clutch hub can occur. Only compress the E clutch hub far enough to remove the retainer.

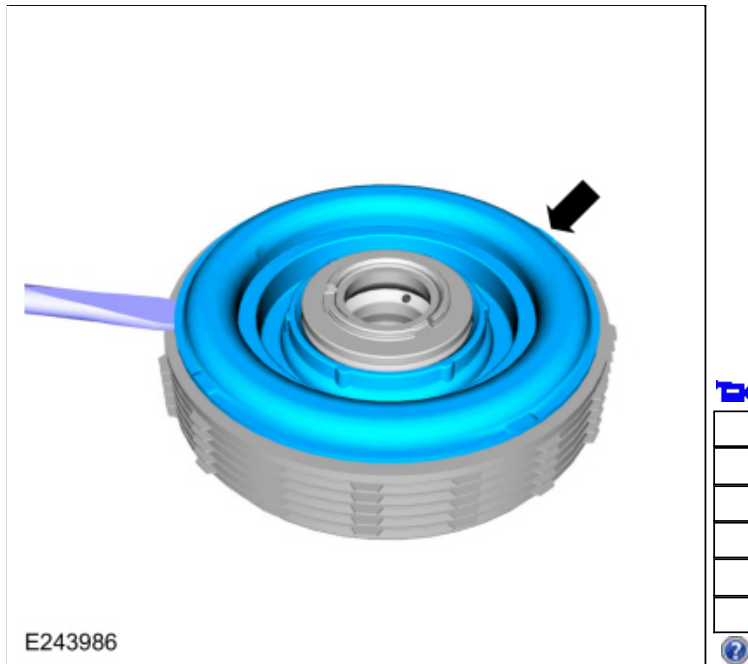
Using the special tool and a press, compress the E clutch balance dam and remove the retainer.

Use Special Service Tool: [307-741 Spring Compressor, F Clutch](#).

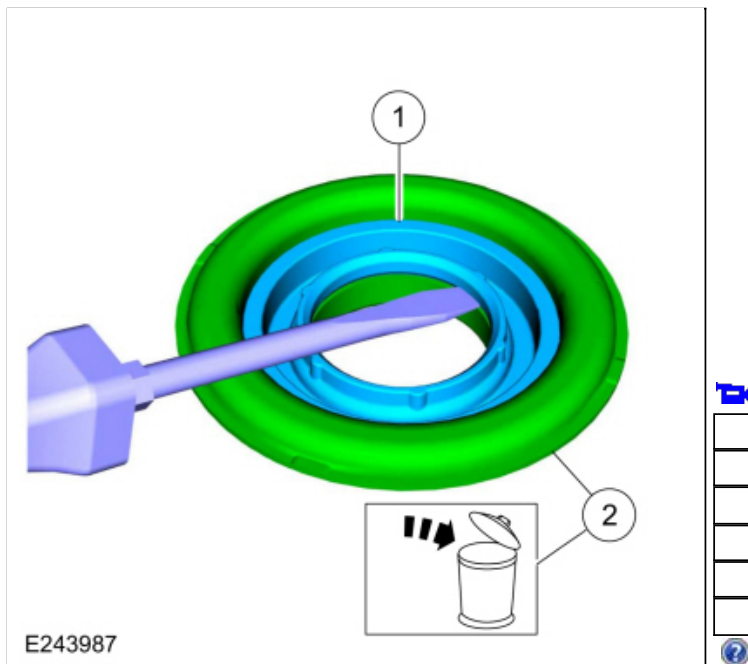
Use the General Equipment: Hydraulic Press



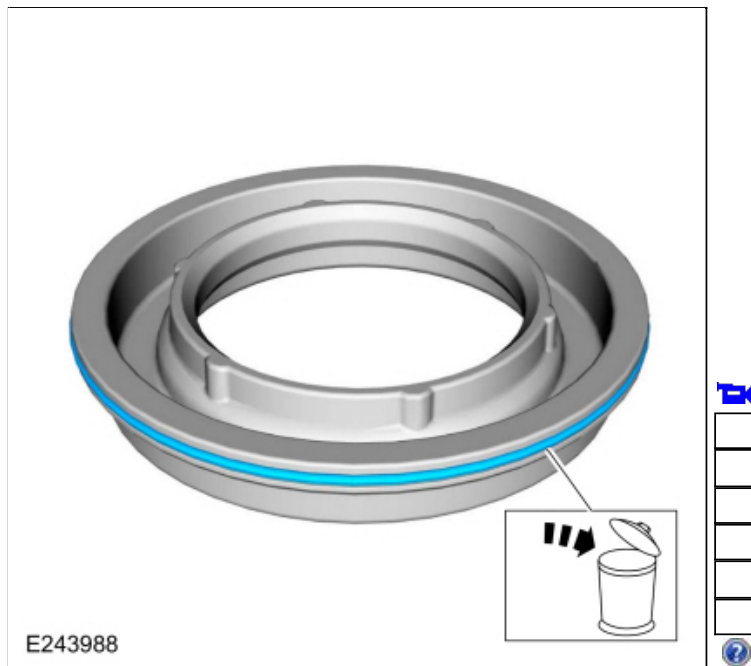
170. Pry the E clutch piston and balance dam upward and remove the piston and balance dam from the E clutch hub.



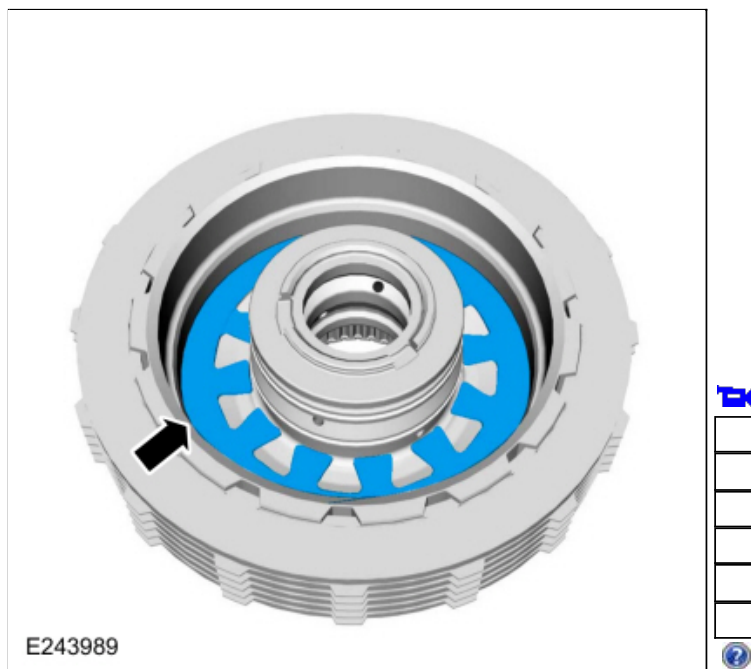
171. Remove the E clutch balance dam and discard the E clutch piston.
1. E clutch balance dam
 2. E clutch piston



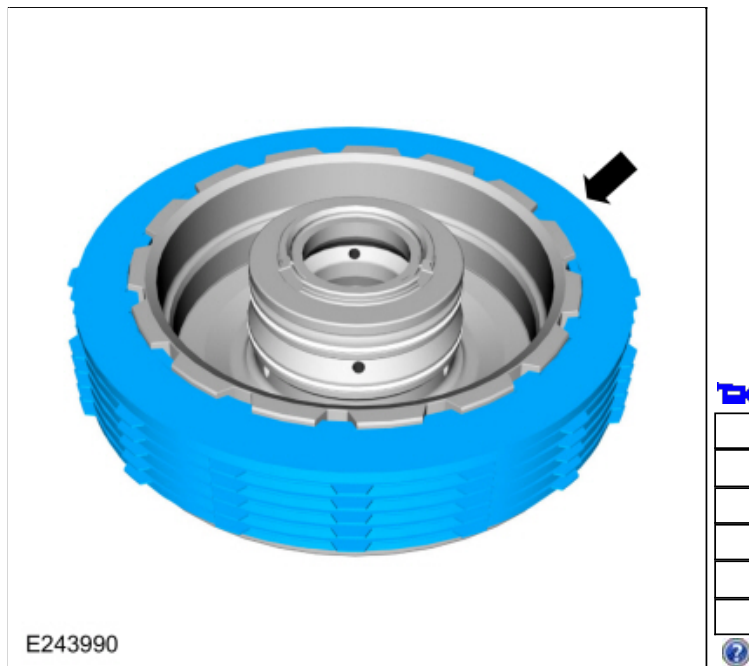
172. Remove and discard the E clutch balance dam outer seal.



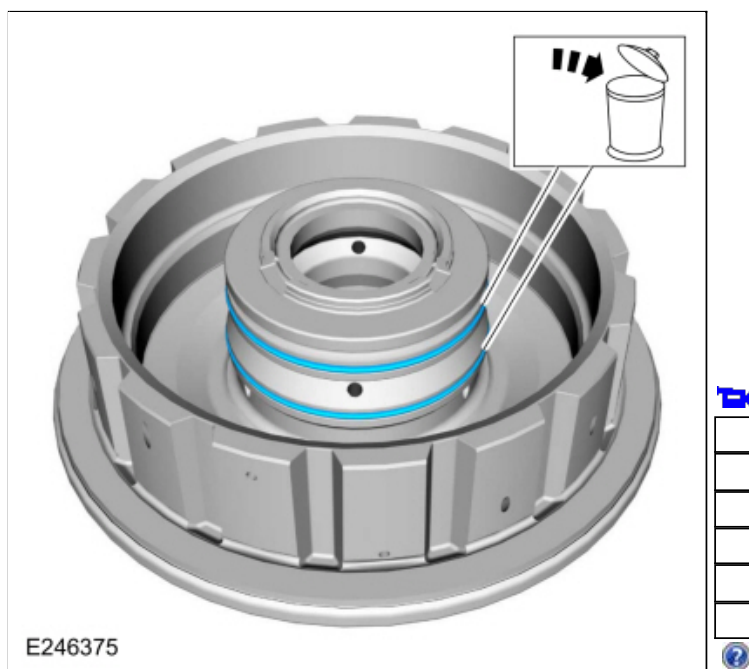
173. Remove the E clutch piston return spring.



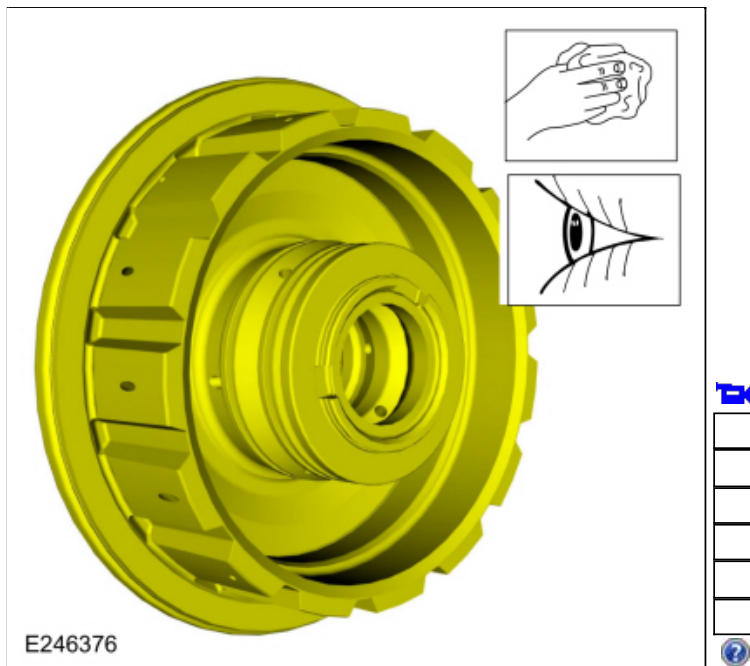
174. Remove the E clutch assembly. Inspect the clutch plates for excessive wear or damage. If the clutch plates are excessively worn or damaged replace as necessary. If the clutch plates are not excessively worn or damaged, they can be reused.



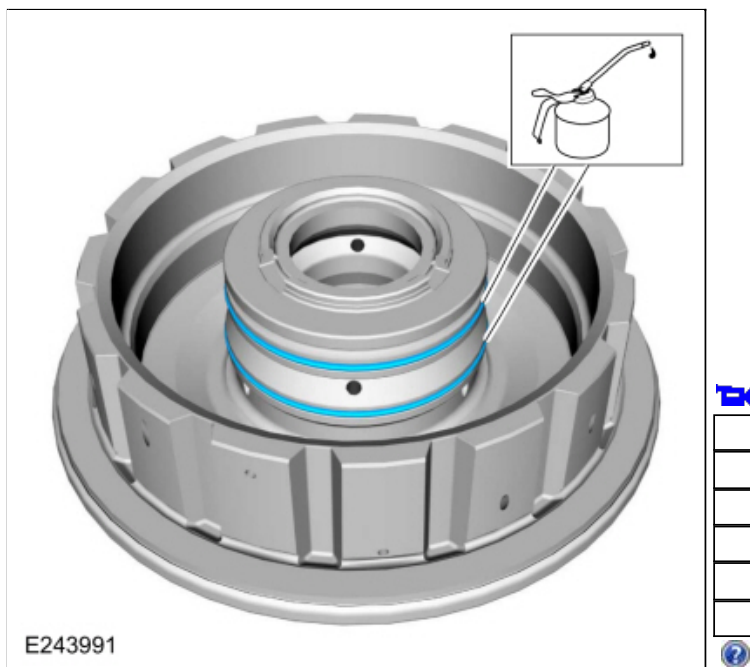
175. Remove and discard the E clutch piston and balance dam inner seals.



176. Clean and inspect the E clutch hub.



177. Install the new E clutch piston and balance dam inner seals. Lubricate the seals with petroleum jelly.



178. **NOTE:** Clutch plate quantity is model dependant based on engine displacement.

Soak the E clutch plates in clean transmission fluid. Install the E clutch assembly.

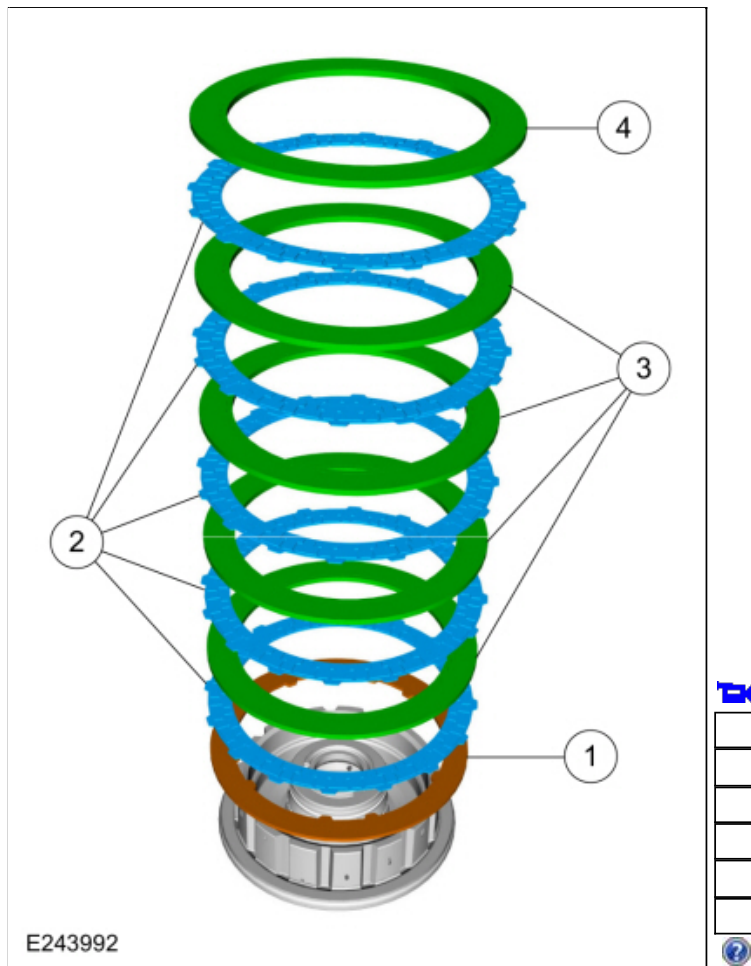
1. Pressure plate (select fit)
2. Friction plates

Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (WSS-M2C949-A) (MERCON® ULV)

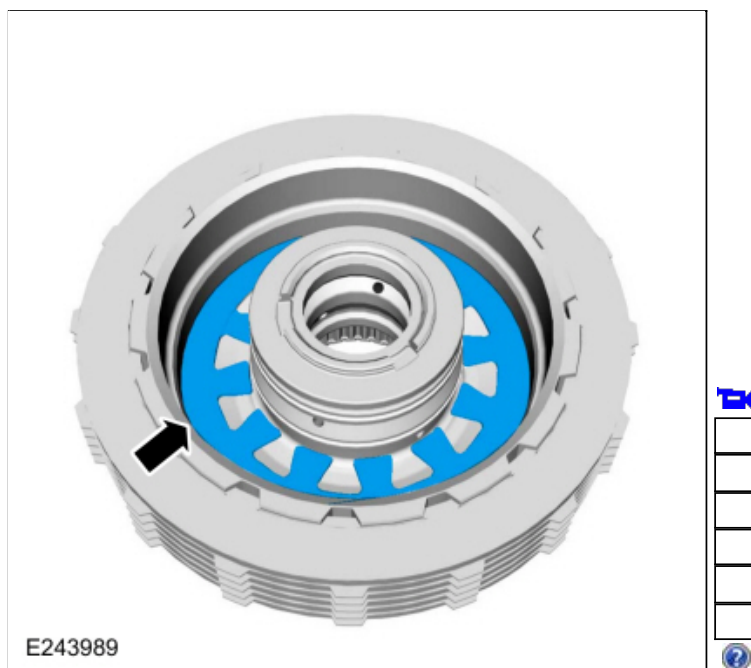
3. **NOTE:** Align the inner splines of the steel plates with the pressure plate internal splines.

Steel plates

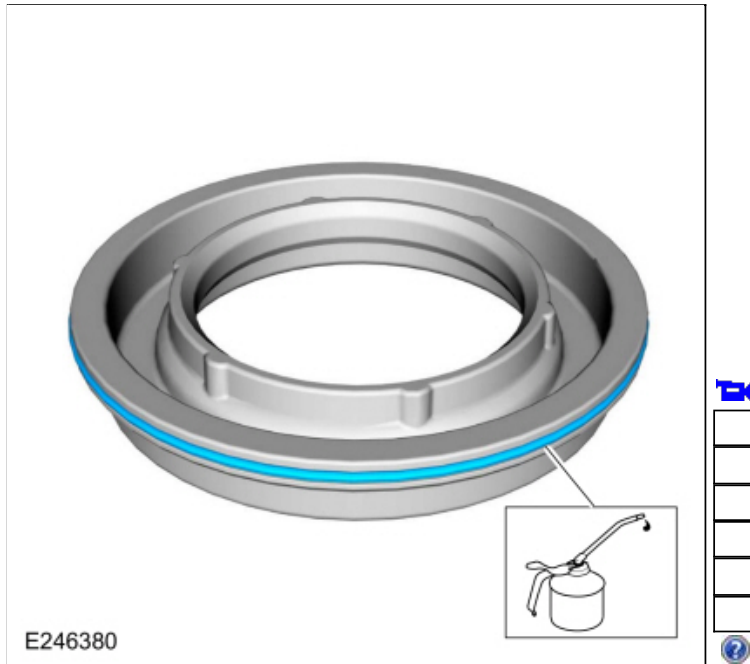
4. Apply plate (2.9-3.0 mm)



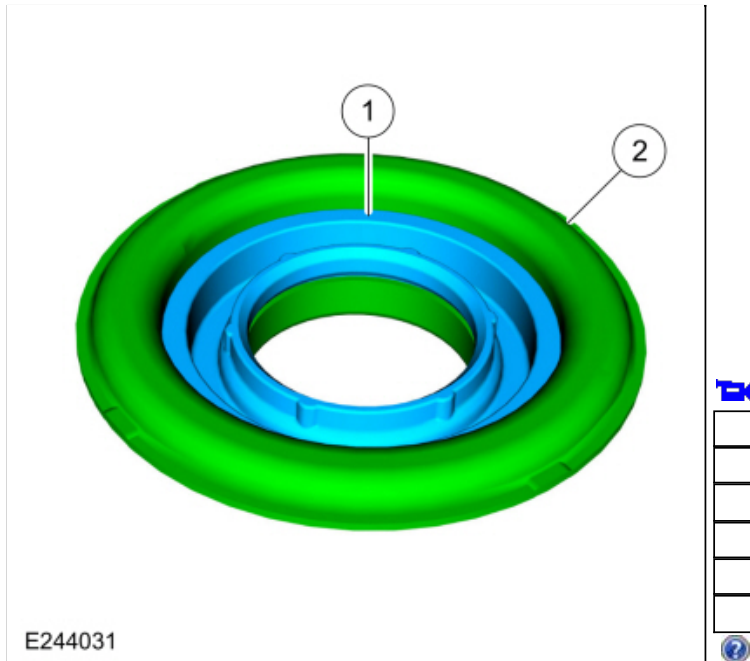
179. Install the E clutch piston return spring.



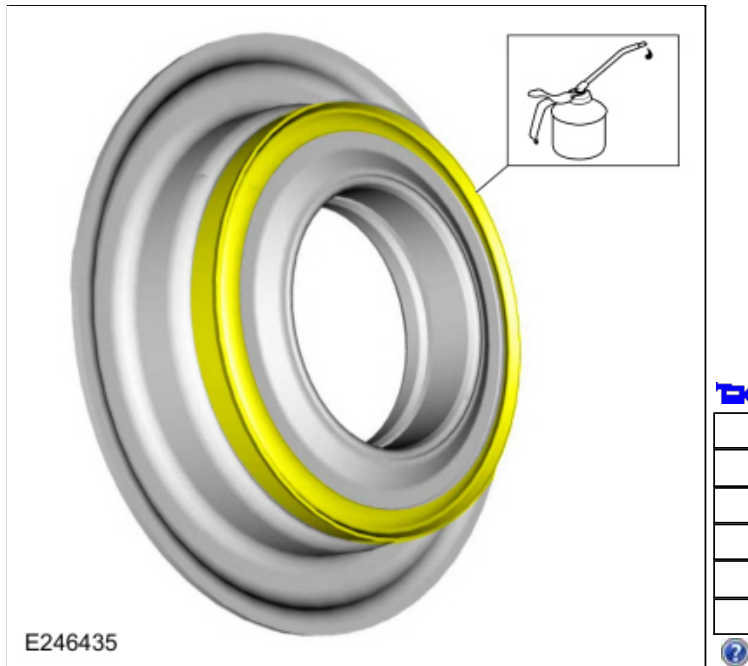
180. Install a new E clutch balance dam outer seal. Lubricate the seal with petroleum jelly.



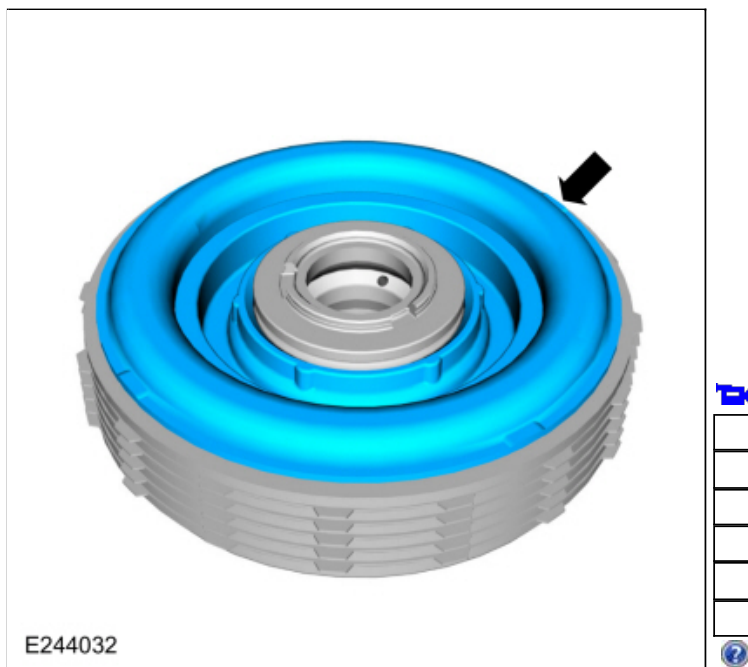
181. Install the E clutch balance dam in the new E clutch piston.
1. E clutch balance dam
 2. E clutch piston



182. Lubricate the new E clutch piston seal with petroleum jelly.

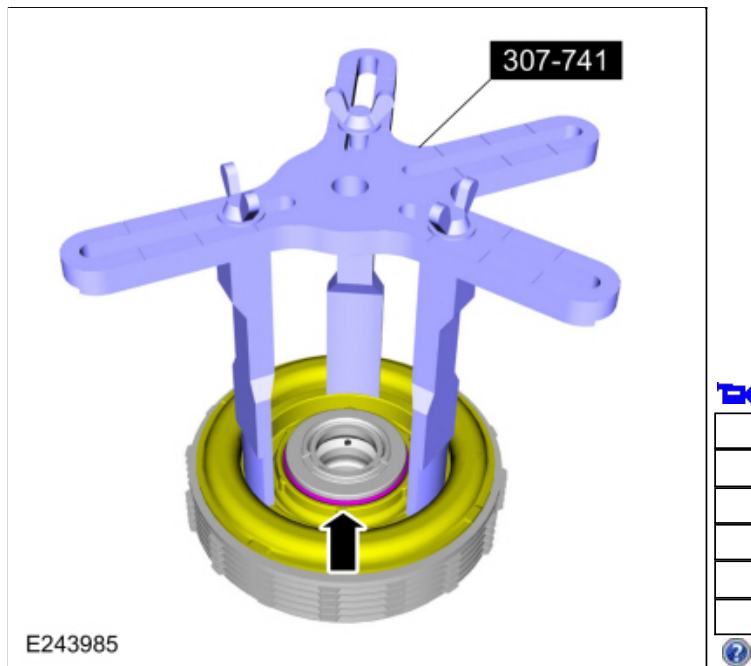


183. Install the new E clutch piston and balance dam in the E clutch hub.

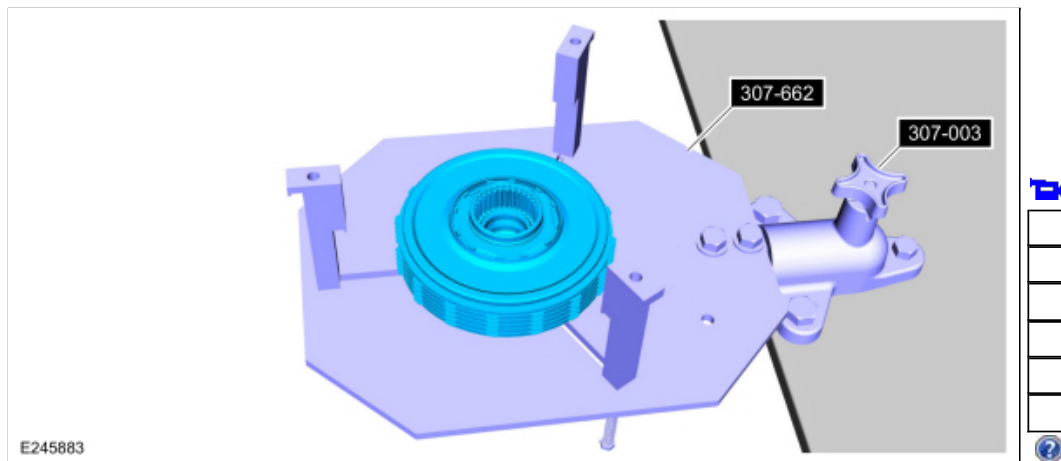


184. **NOTICE:** Do not compress the balance dam too far or damage to the E clutch hub can occur. Only compress the E clutch hub far enough to install the retainer.

Using the special tool and a press, compress the E clutch balance dam and install the retainer.
 Use Special Service Tool: [307-741 Spring Compressor, F Clutch](#).
 Use the General Equipment: Hydraulic Press



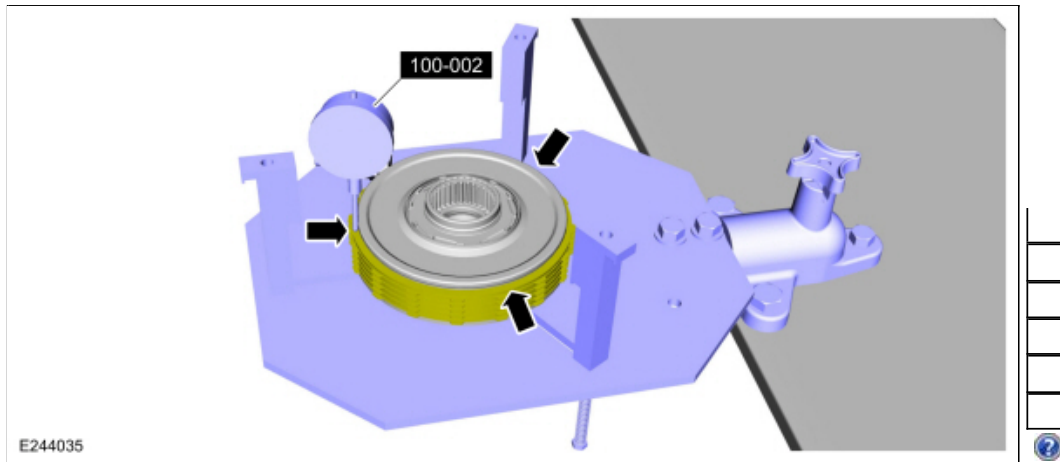
185. Assemble the special tools and position the E clutch assembly on the special tool.
Use Special Service Tool: [307-662 Gauge, Clutch Pack Endplay](#) , [307-003 \(T57L-500-B\) Holding Fixture, Transmission](#).



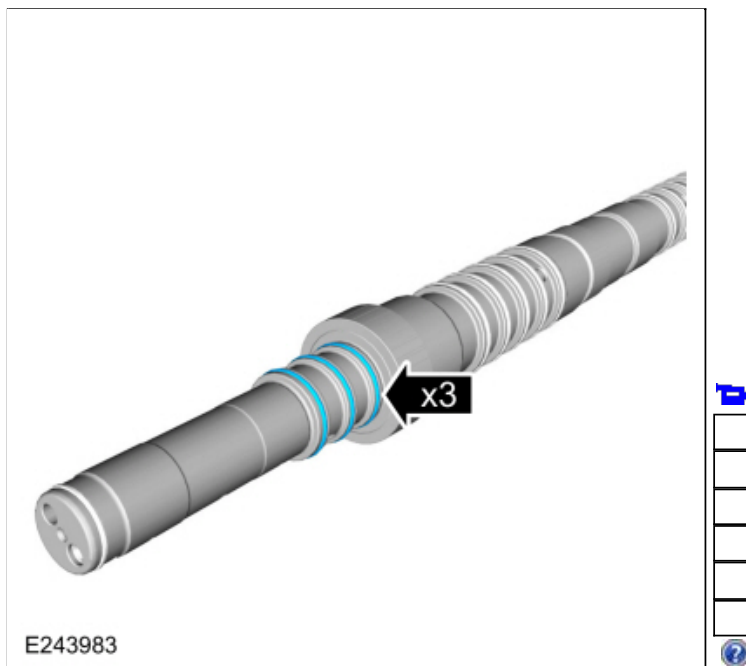
186. Using the special tool, measure the E clutch clearance. Position the plunger so it rests on the top surface of the pressure plate. Zero the dial indicator. Pull up on the pressure plate and measure and record the clutch clearance in 3 different places. Average the 3 recorded clutch clearance measurements and compare the measurement to the clutch clearance chart in specifications to determine the correct size pressure plate. Install the correct E clutch pressure plate.

Refer to: [Specifications](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Specifications).
Use Special Service Tool: [100-002 \(TOOL-4201-C\) Holding Fixture with Dial Indicator Gauge](#).

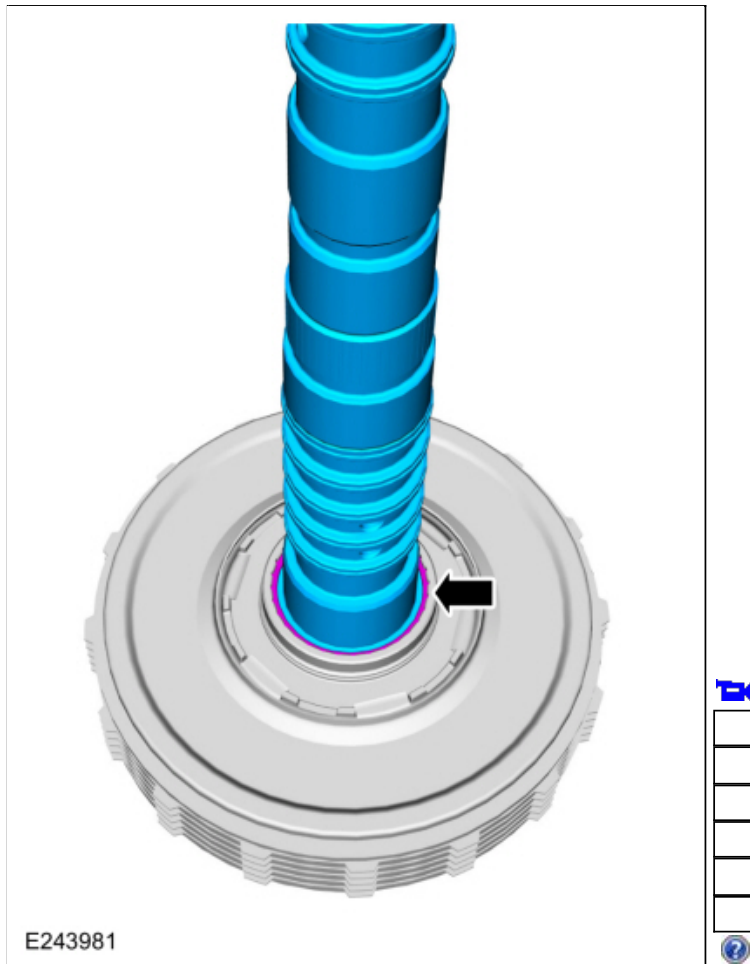




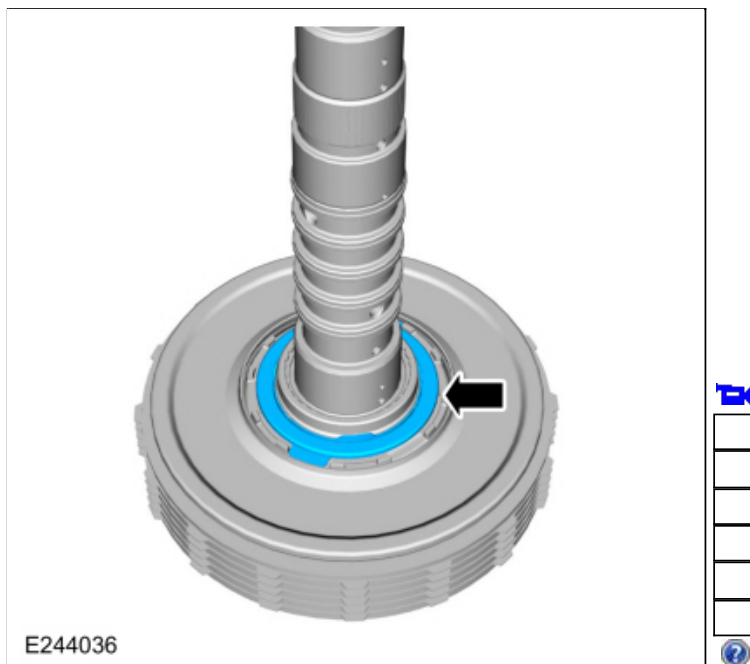
187. Install the new input shaft D-ring seals.



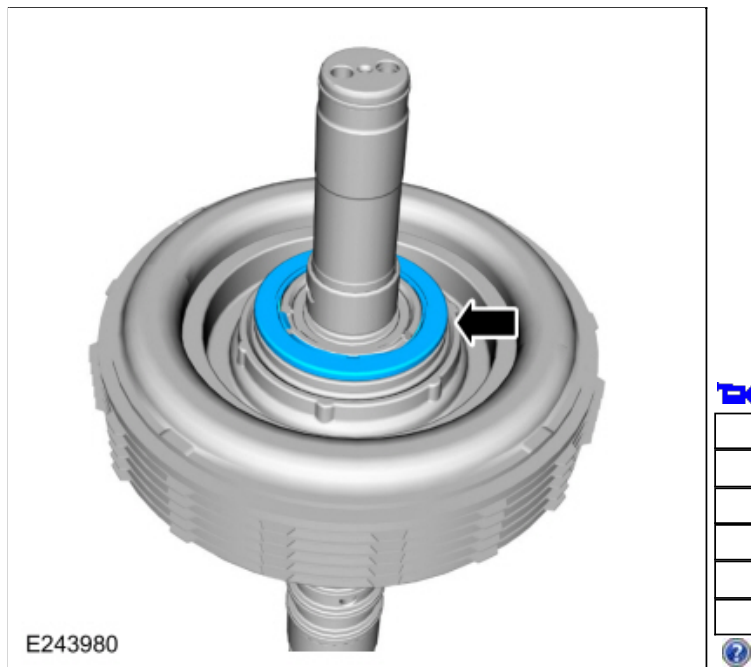
188. Install the input shaft in the E clutch and install the snap ring.



189. Install the (T6) thrust bearing onto the E clutch with the tab locators down. Snap the bearing into place.

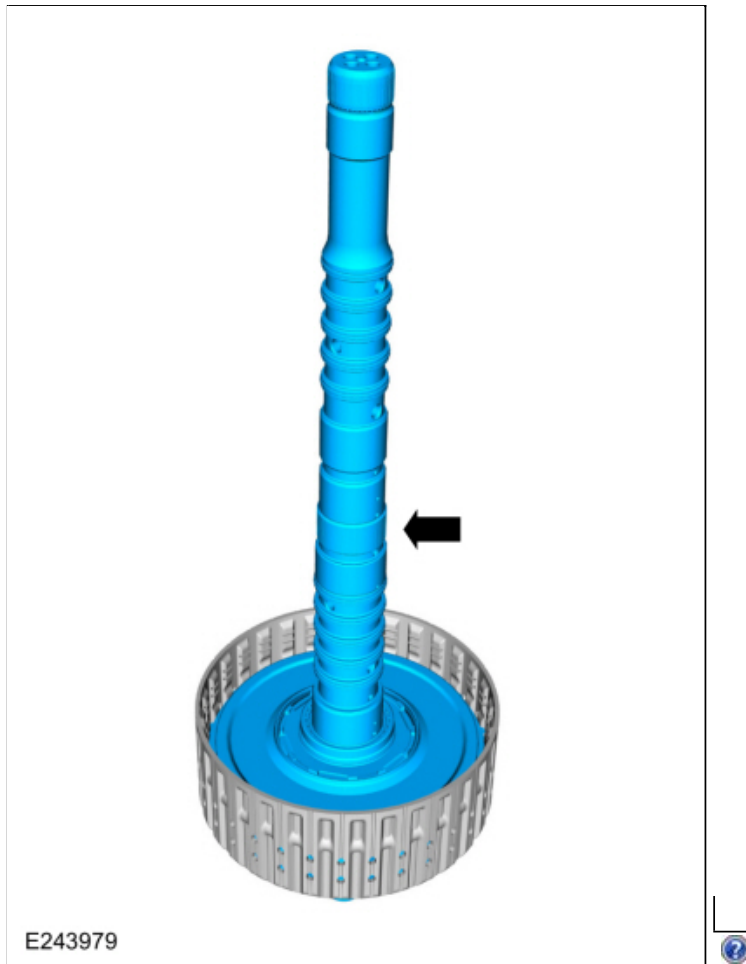


190. Install the (T7) thrust bearing onto the E clutch with the tab locators up. Snap the bearing into place.

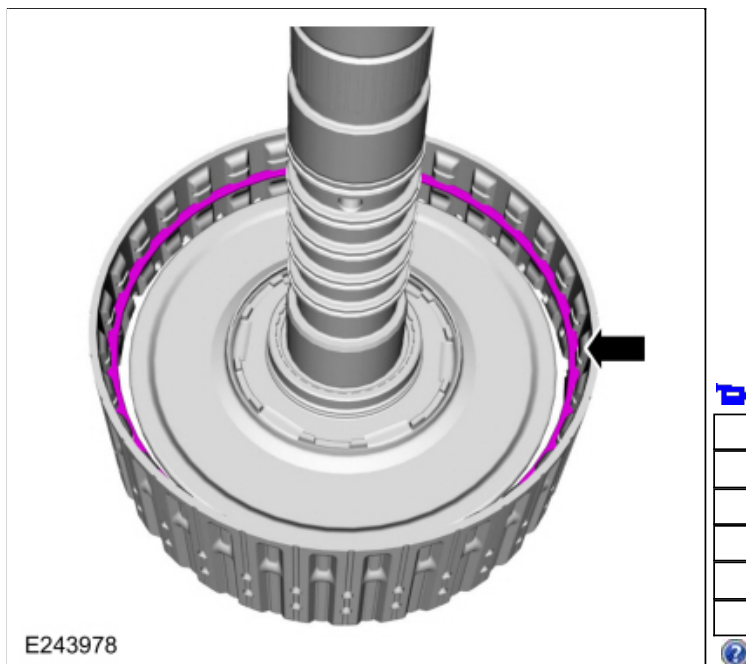


191. **NOTE:** Align the outer splines on the friction plates.

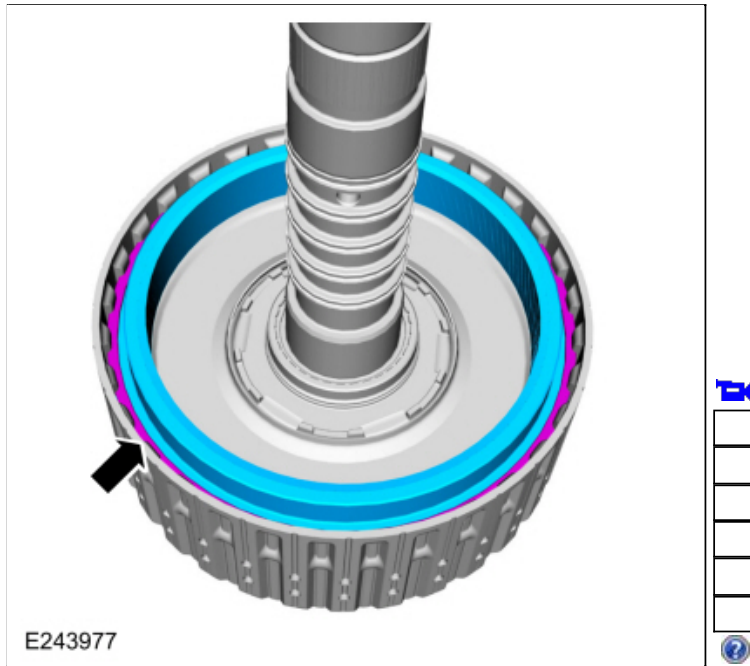
Install the input shaft and the E clutch into the No. 4 shell and sun gear.



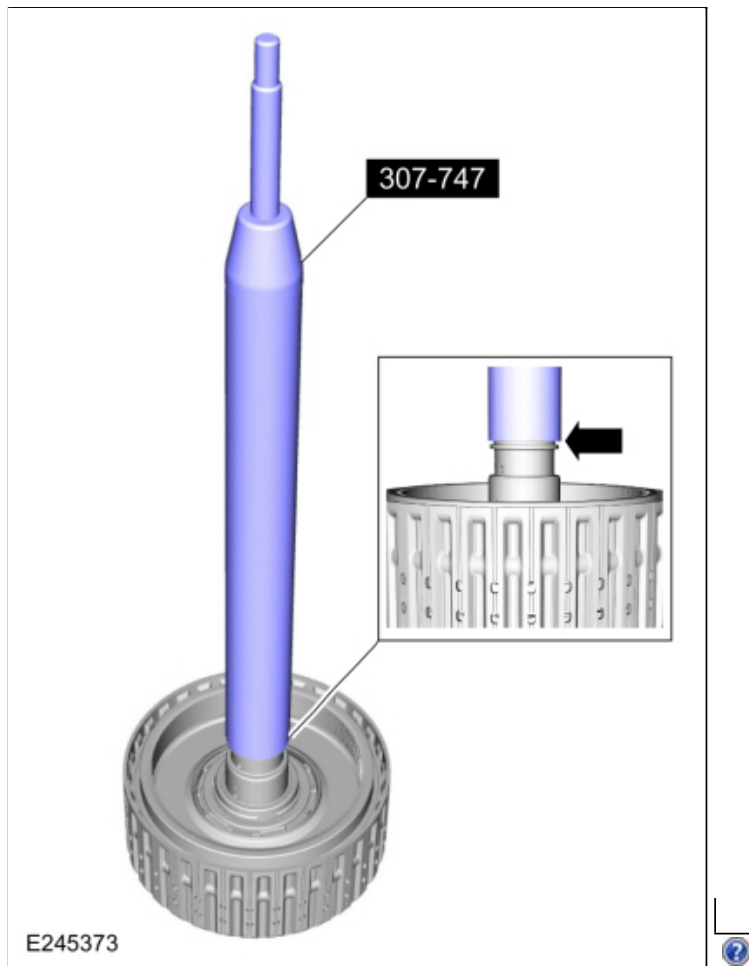
192. Install the lower rear No. 3 ring gear snap ring.



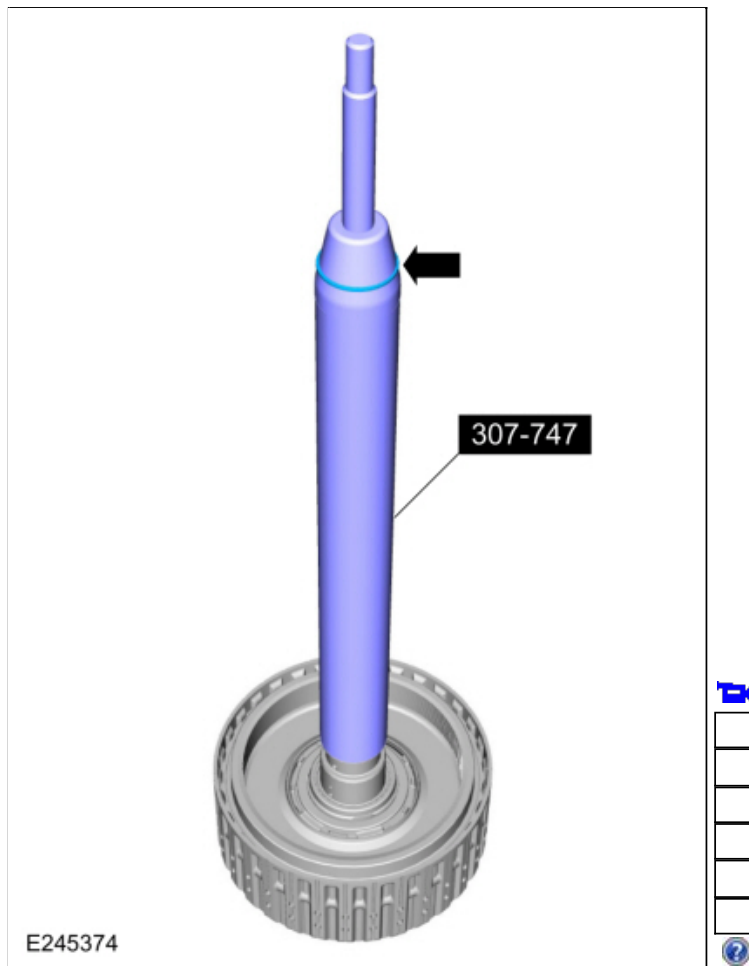
193. Install the No. 3 ring gear and the snap ring. Align the snap ring gap 180° from the bottom snap ring gap.



194. Install the special tool and adjust the special tool to align the bottom edge of the tool with the top edge of the bottom Teflon® seal groove.
Use Special Service Tool: [307-747 Installer/ Sizer , Input Shaft Solid Sealing Rings; Large.](#)

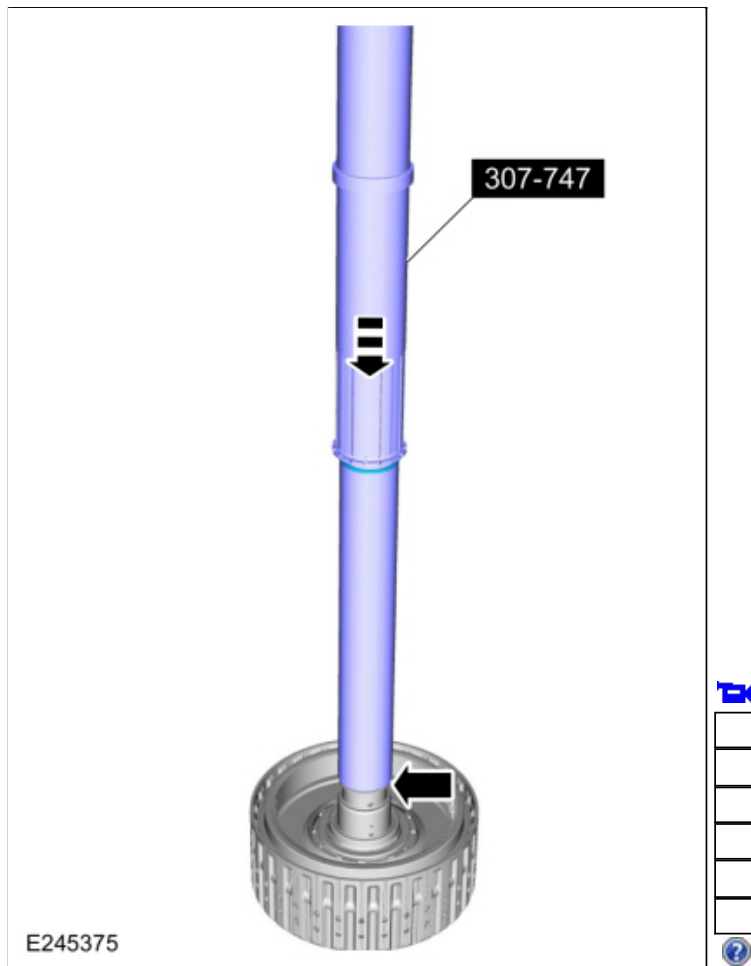


195. Install a new Teflon® seal on the special tool.
Use Special Service Tool: [307-747 Installer/ Sizer , Input Shaft Solid Sealing Rings; Large.](#)



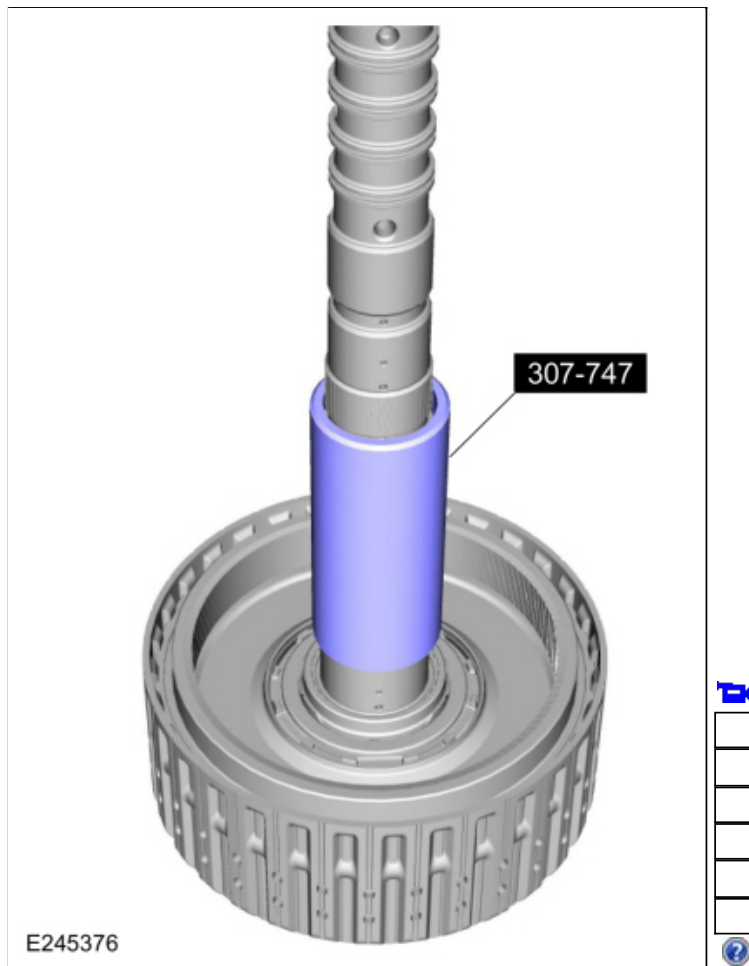
196. Using the top half of the special tool, slide the Teflon® seal into the groove. Remove the special tools and repeat the steps for the other 4 Teflon® seals.

Use Special Service Tool: [307-747 Installer/ Sizer , Input Shaft Solid Sealing Rings; Large.](#)

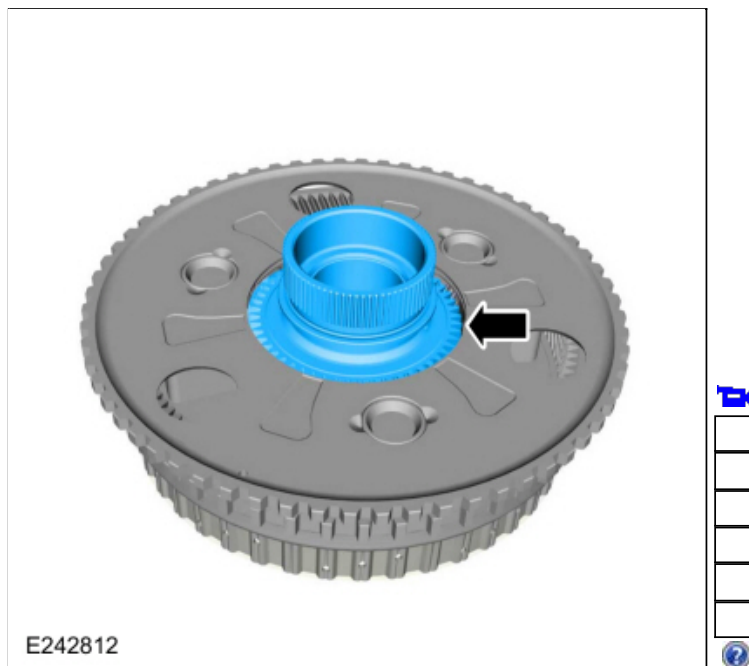


197. Install the special tool to size the 5 Teflon® seals. Allow the special tool to stay on the input shaft for 5 minutes prior to final assembly.

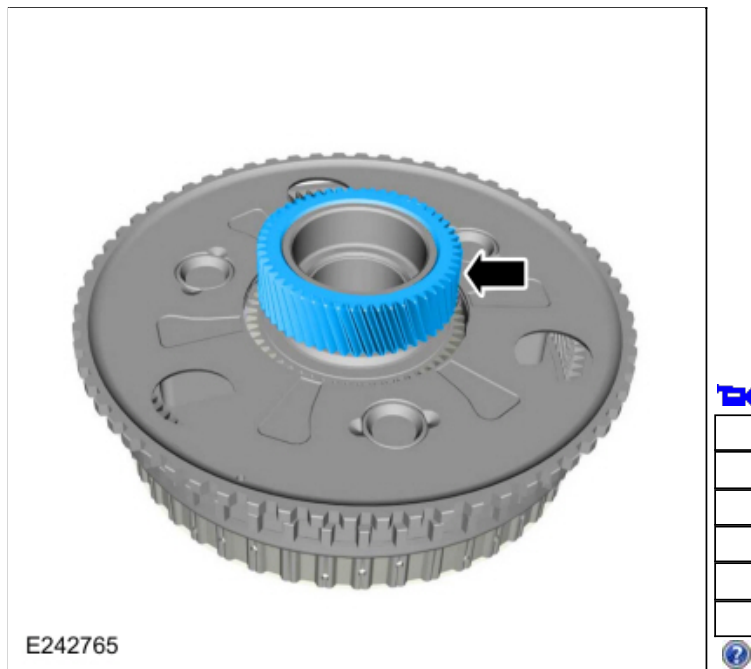
Use Special Service Tool: [307-747 Installer/ Sizer , Input Shaft Solid Sealing Rings; Large.](#)



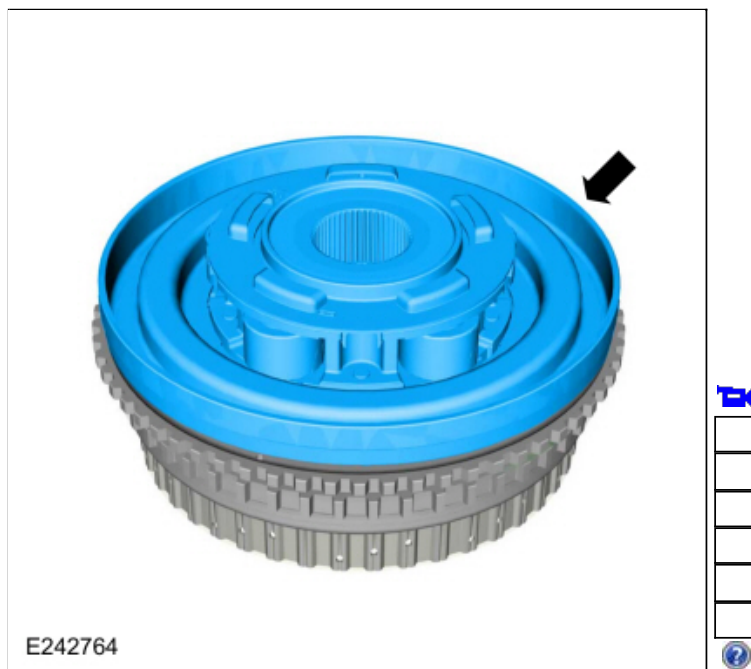
198. Install the No. 1 sun gear in the No. 1 planetary carrier.



199. Install the No. 2 sun gear.



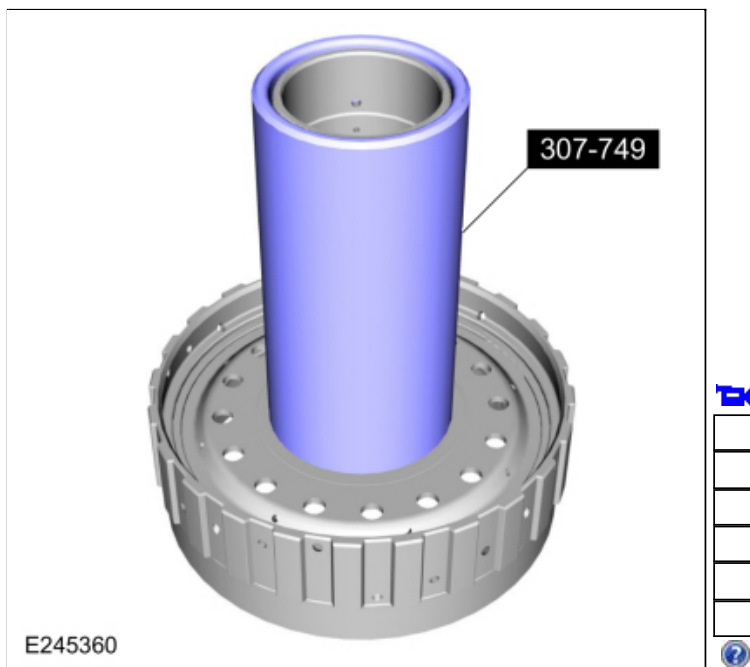
200. Install the No. 2 planetary carrier.



201. Install the (T5) bearing.



202. Remove Special Service Tool: [307-749 Installer/Sizer, R2-S3 Shaft Solid Seal](#).

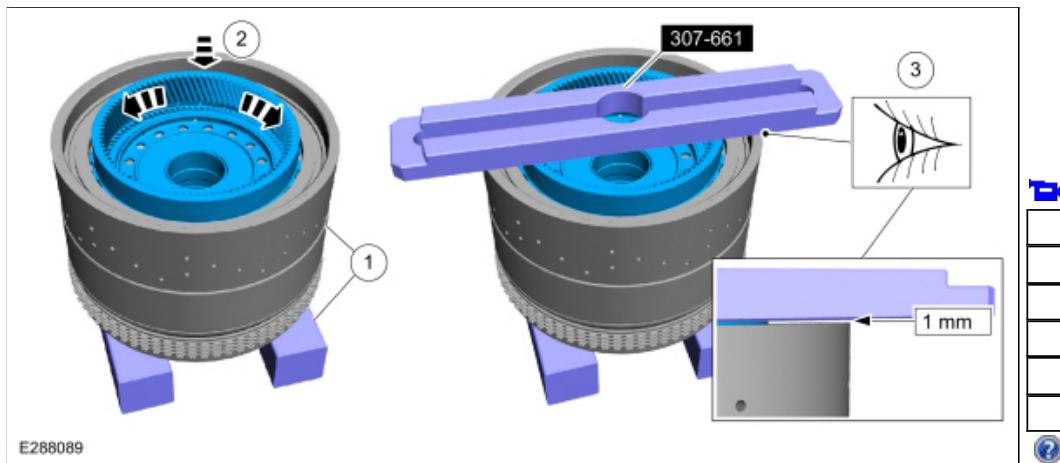


203. Install the No. 3 sun gear shaft into the CDF clutch assembly.
1. Position the CDF clutch assembly on 2 blocks of wood.
Use the General Equipment: Wooden Block
 2. Rotate the No. 3 sun gear shaft back and forth to install.
 3. **NOTE:** When the No. 3 sun gear shaft is correctly installed the clearance between CDF clutch assembly and the special tool is approximately 1 mm.

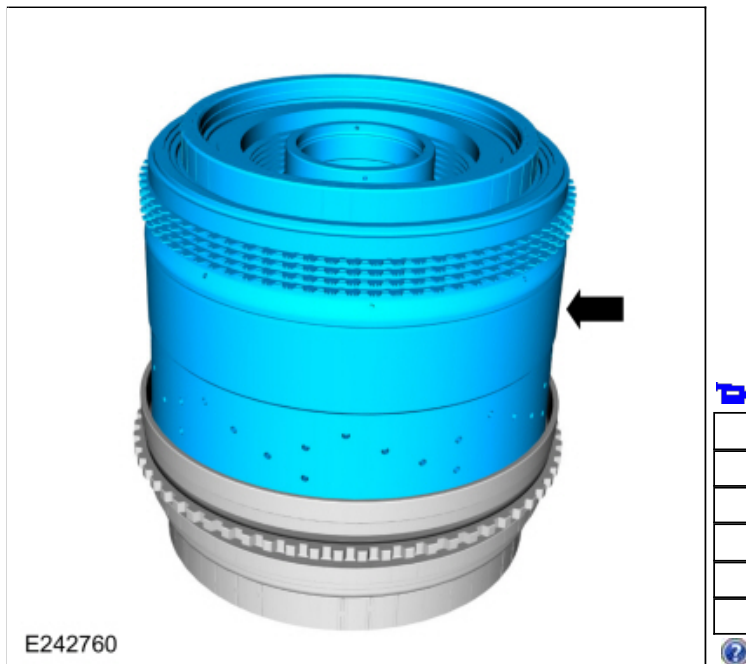
Using the special tool and a feeler gauge, check the clearance between the CDF clutch assembly and the special tool.

Use Special Service Tool: [307-661 Gauge, End Play](#).

Use the General Equipment: Feeler Gauge



204. While holding the sun gear No. 3 shaft, flip the CDF clutch assembly over and install it on to the No. 2 planetary carrier.



205. Install the No. 3 planetary carrier.

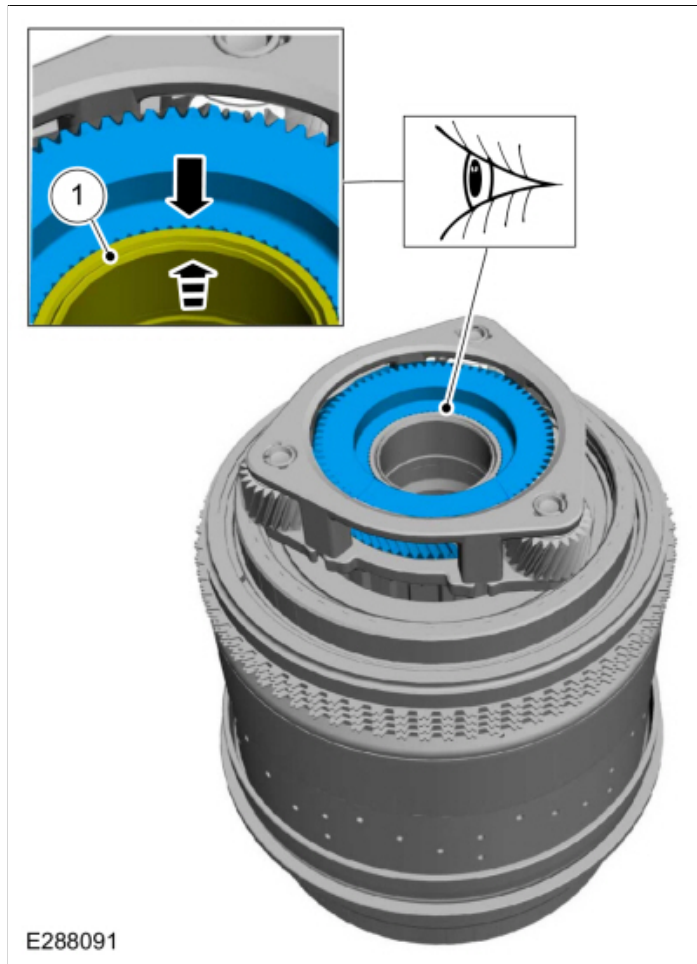


206.

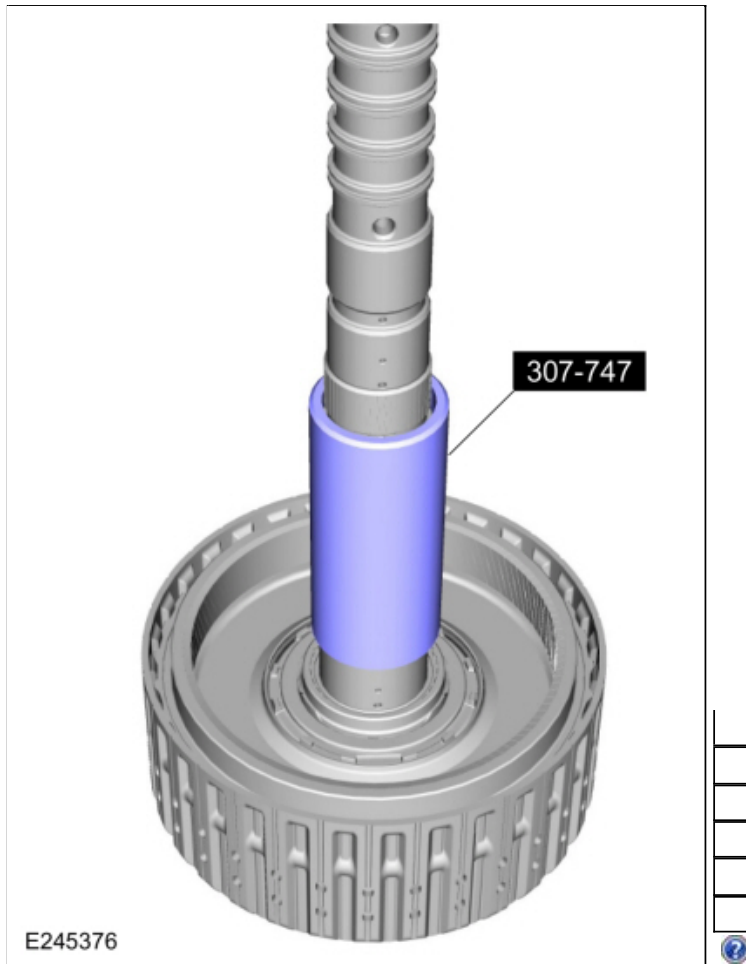
Install the No. 3 sun gear.

1. **NOTE:** *The No. 3 sun gear shaft splines will be flush with the No. 3 sun gear splines when correctly installed.*

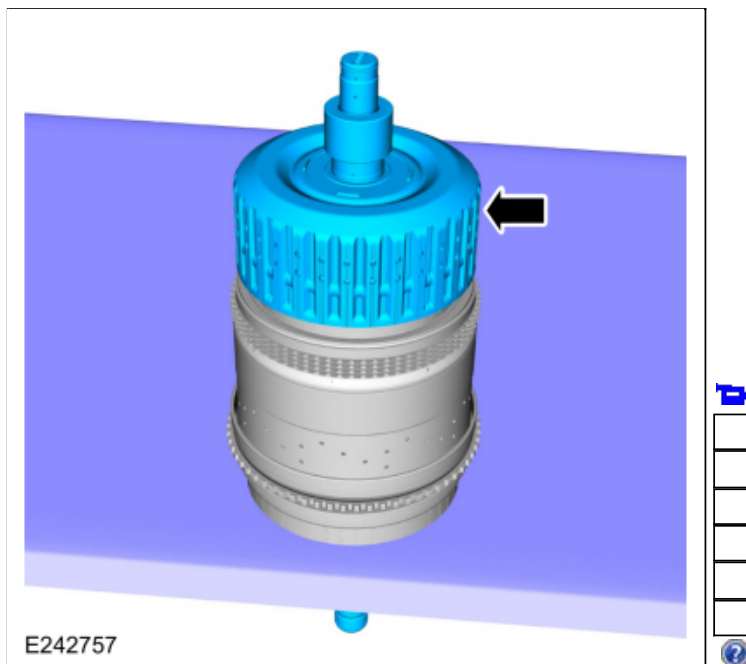
Check the No. 3 sun gear shaft for correct installation.



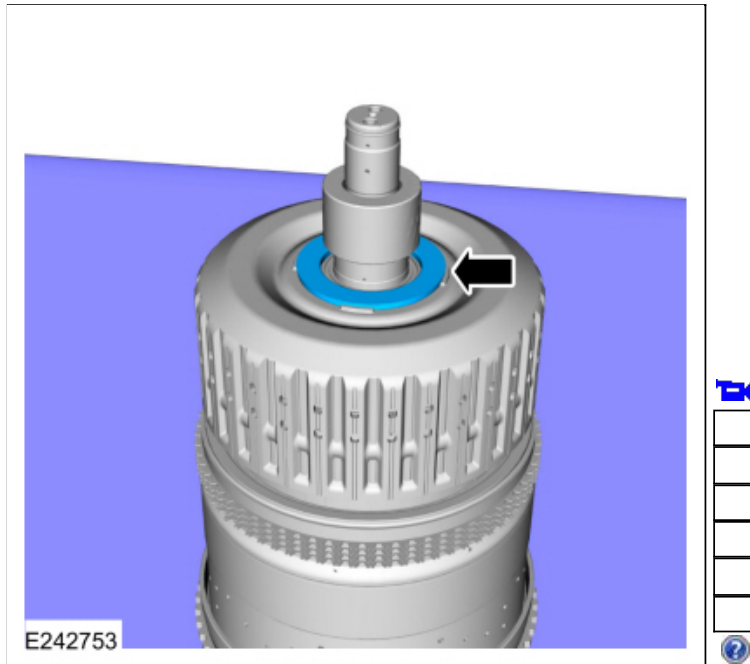
207. Remove Special Service Tool: [307-747 Installer/ Sizer , Input Shaft Solid Sealing Rings: Large.](#)



208. Install the E clutch and input shaft assembly.



209. Install the (T8) thrust bearing.



- 210.

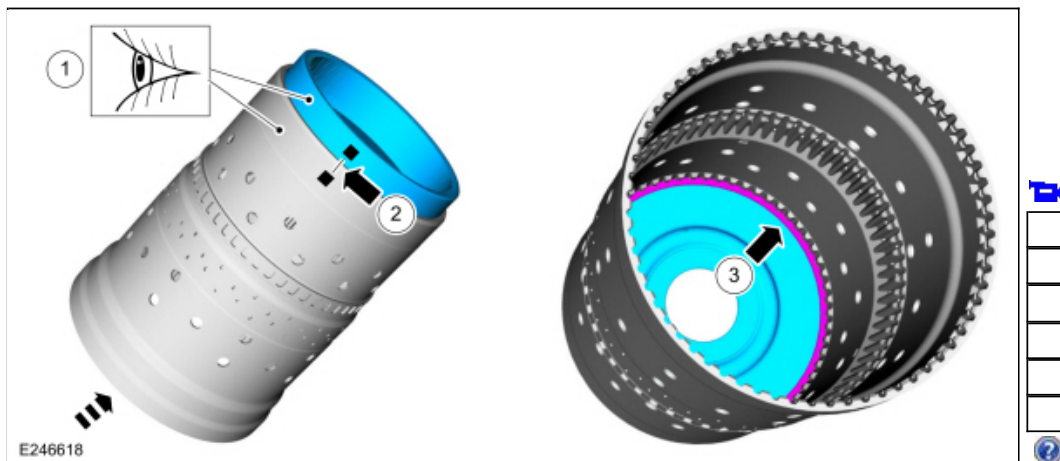
1. **NOTE:** Some early build transmissions are not equipped with lazer applied ink marks.

If the No. 4 ring gear was removed, inspect the ring gear and the clutch and planetary container cylinder for lazer applied ink marks.

2. **NOTICE:** If ink marks are present the marks must be aligned or a transmission vibration can occur.

If ink marks are present align the marks and install the No. 4 ring gear on the clutch and planetary container cylinder.

3. Install the No. 4 ring gear snap ring.



- 211.

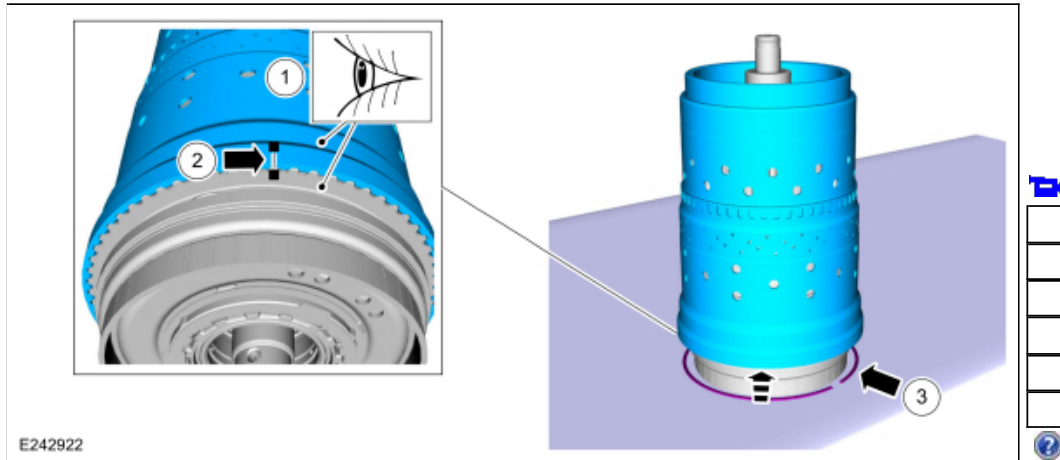
1. **NOTE:** Some early build transmissions are not equipped with lazer applied ink marks.

Inspect the No. 1 planetary carrier and the clutch and planetary container cylinder for lazer applied ink marks.

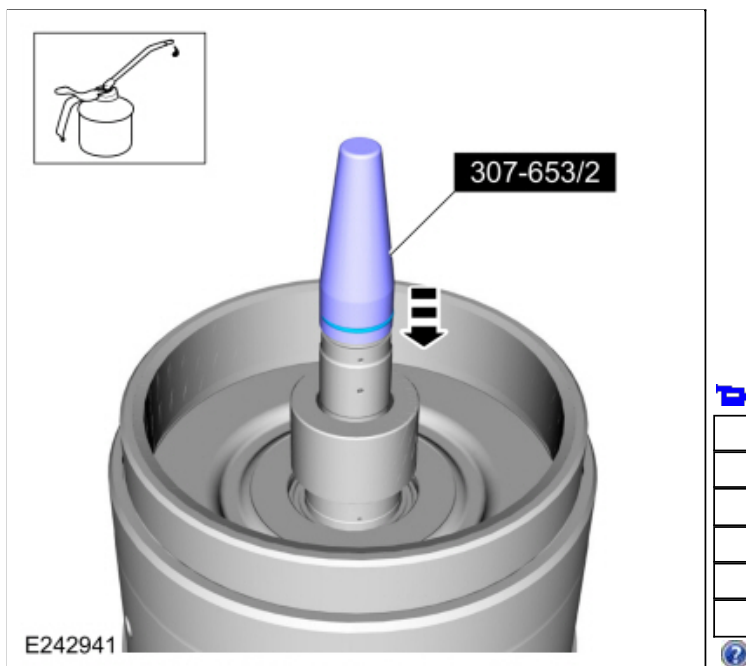
2. **NOTICE:** If ink marks are present the marks must be aligned or a transmission vibration can occur.

If ink marks are present align the marks and install the clutch and planetary container cylinder onto the No. 1

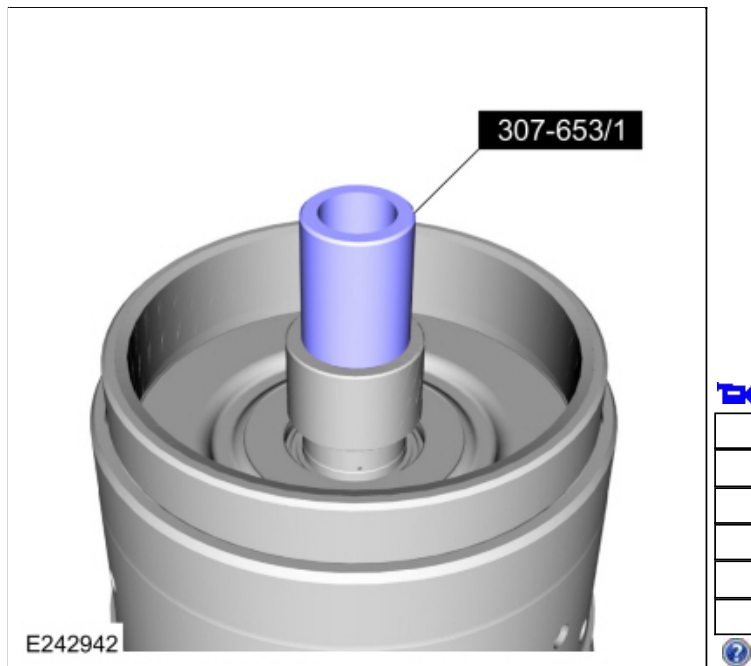
- planetary carrier and install the snap ring. Make sure the snap ring is seated.
3. Install the No. 1 planetary carrier snap ring. Make sure the snap ring is seated.



212. Using the special tool, install a new Teflon® seal in the groove on the input shaft. Use Special Service Tool: [307-653 Sizer, Input Shaft Teflon Seal](#).

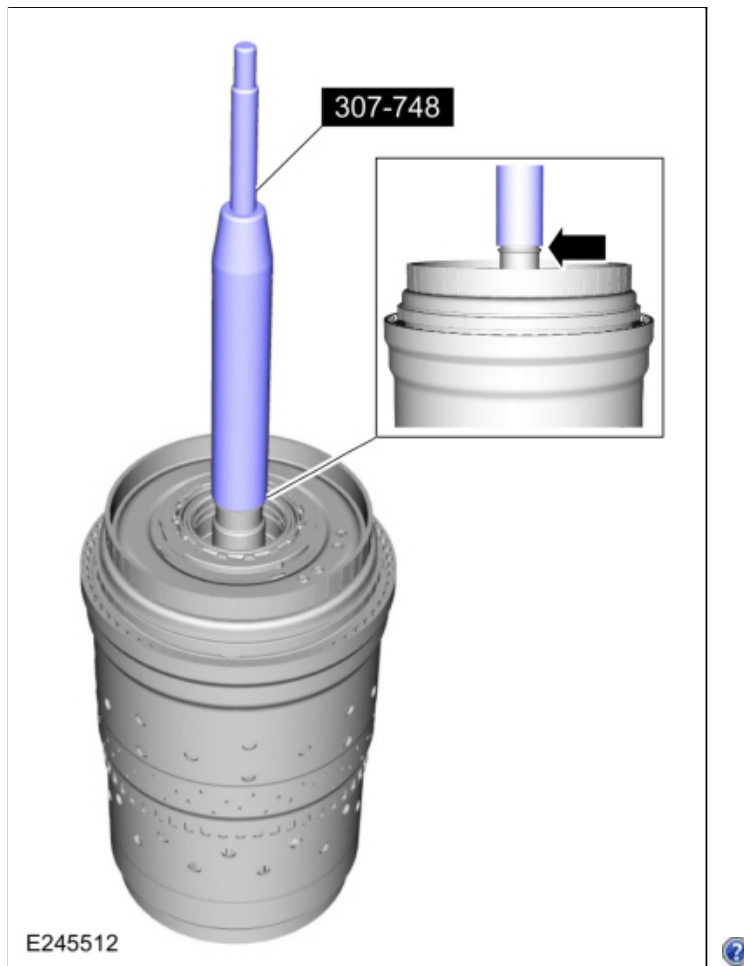


213. Using the special tool, size the Teflon® seal. Allow the special tool to stay on the input shaft for 5 minutes prior to final assembly. Use Special Service Tool: [307-653 Sizer, Input Shaft Teflon Seal](#).

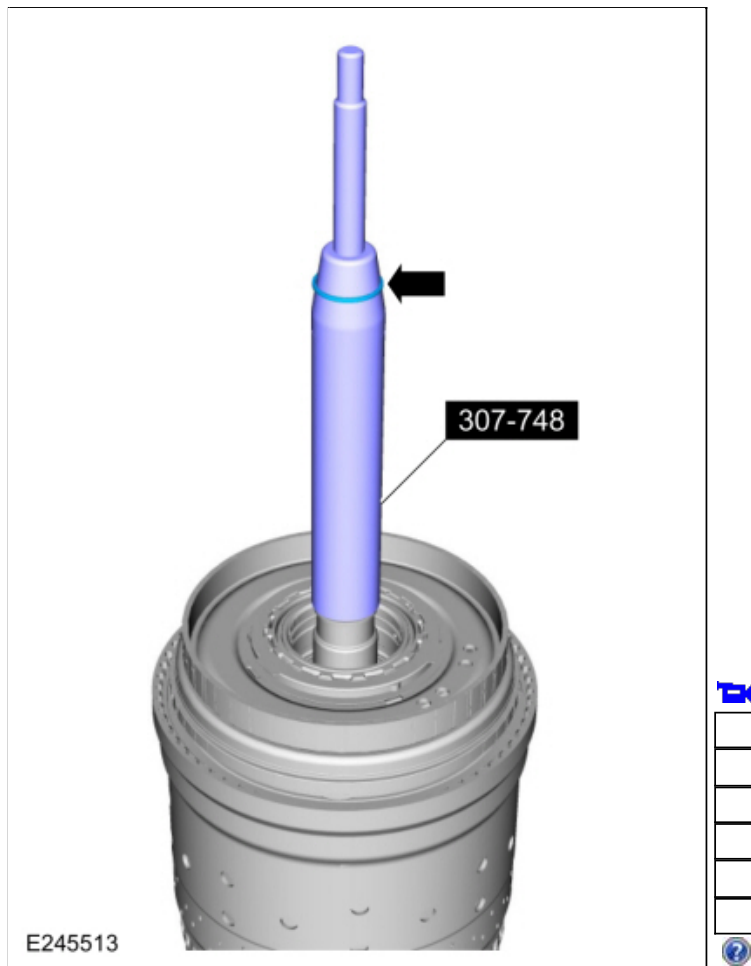


214. Install the special tool and adjust the special tool to align the bottom edge of the tool with the top edge of the bottom Teflon® seal groove.
Use Special Service Tool: [307-748 Installer/Sizer, Input Shaft Solid Sealing Rings; Small](#).



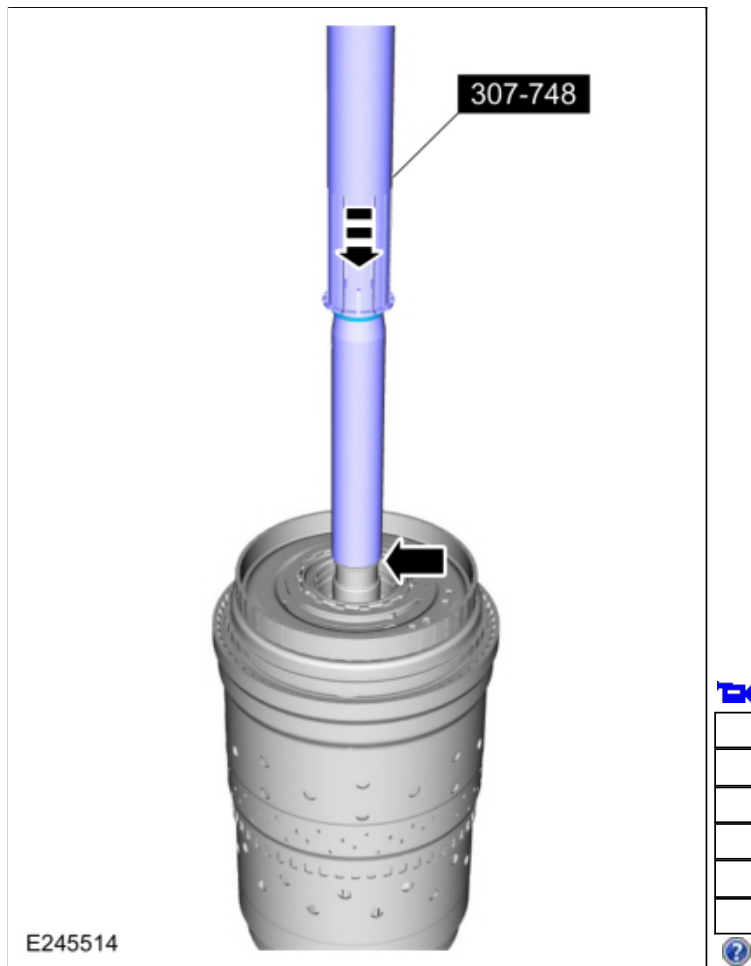


215. Install a new Teflon® seal on the special tool.
Use Special Service Tool: [307-748 Installer/Sizer, Input Shaft Solid Sealing Rings; Small](#).



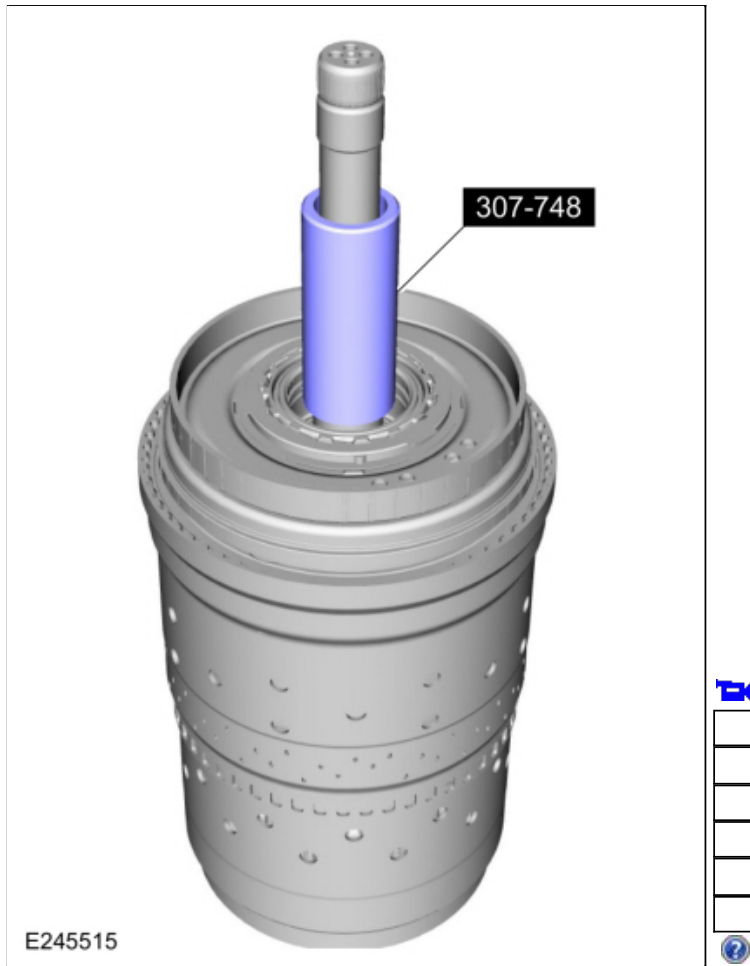
216. Using the top half of the special tool, slide the Teflon® seal into the groove. Remove the special tools and repeat the steps for the other 4 Teflon® seals.

Use Special Service Tool: [307-748 Installer/Sizer, Input Shaft Solid Sealing Rings; Small](#).

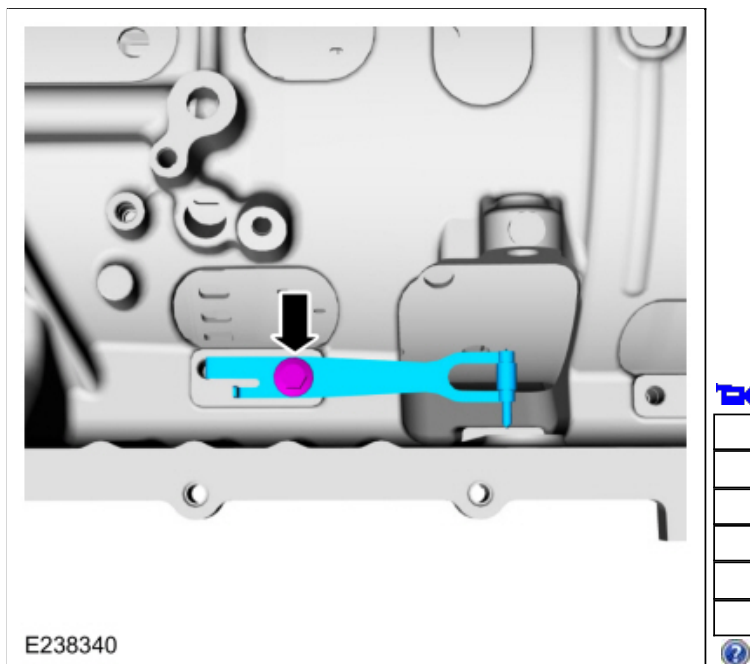


217. Install the special tool to size the 5 Teflon® seals. Allow the special tool to stay on the input shaft for 5 minutes prior to final assembly.

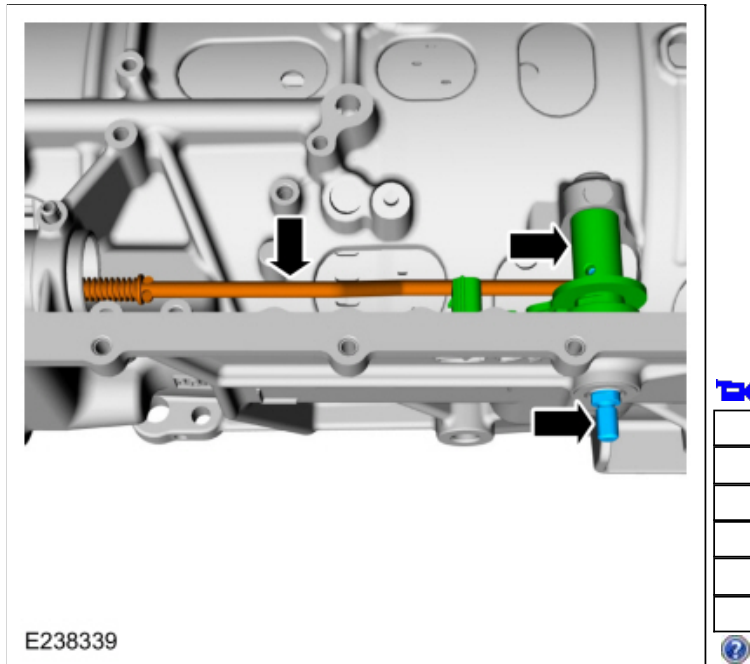
Use Special Service Tool: [307-748 Installer/Sizer, Input Shaft Solid Sealing Rings; Small](#).



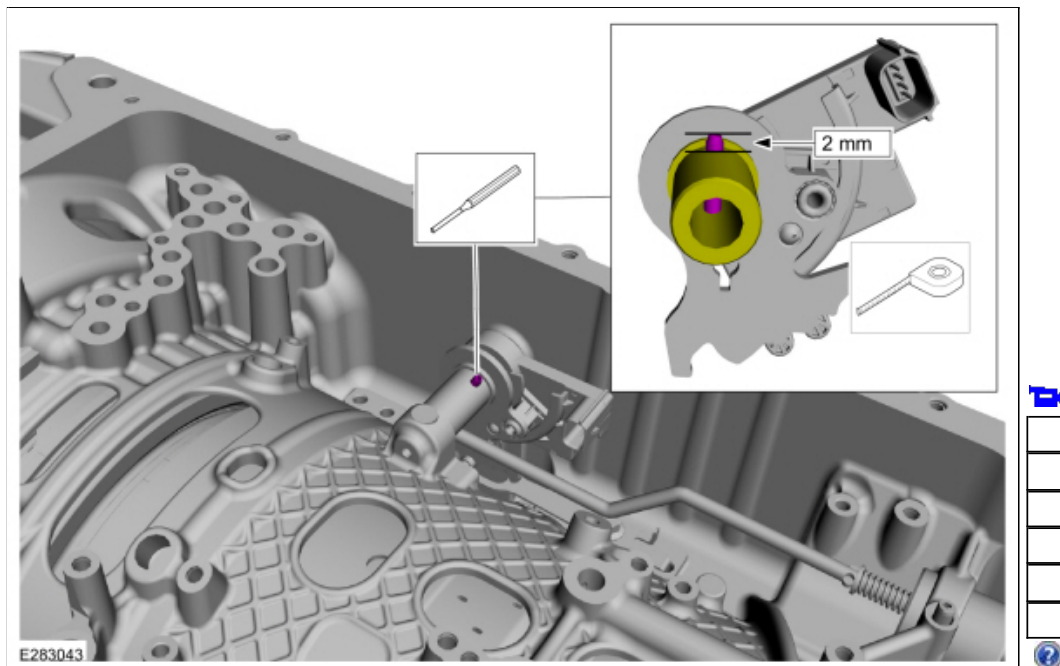
218. Install the IR sensor detent spring and loosely install the bolt.



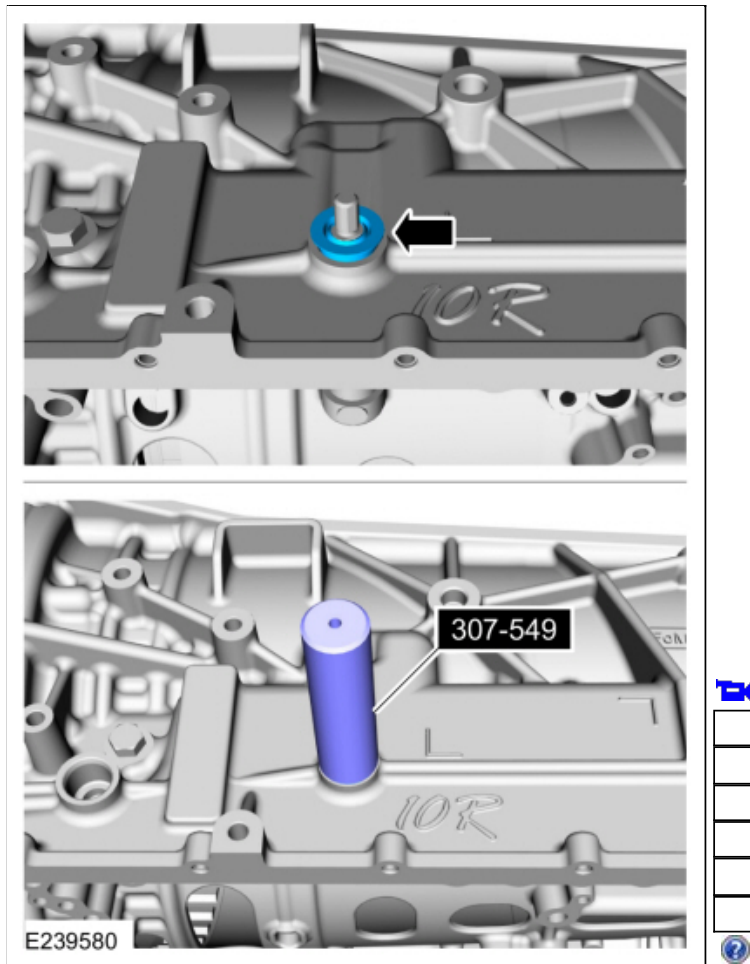
219. Install the park pawl actuator rod, manual shaft and the TR sensor.



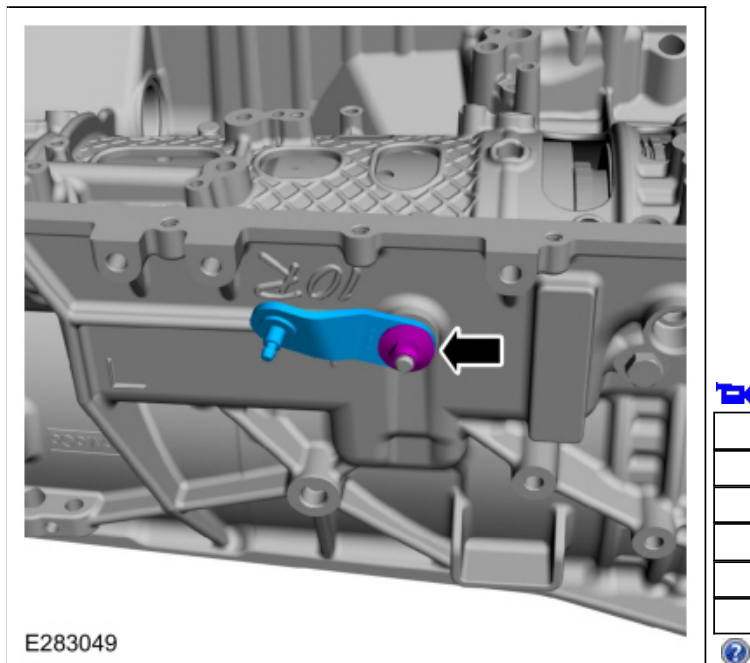
220. Install the new manual control shaft-to-TR sensor roll pin to the specified height.



221. Install the manual shaft seal on the manual shaft. Using the special tool install the manual shaft seal in the transmission case.
Use Special Service Tool: [307-549 Installer, Shift Shaft Fluid Seal](#).

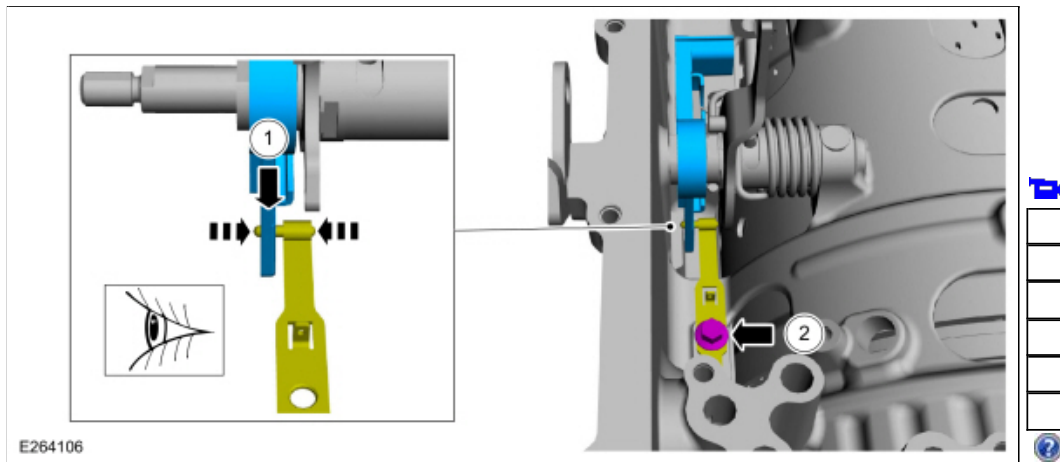


222. Install the selector lever and the nut.
Torque: 106 lb.in (12 Nm)

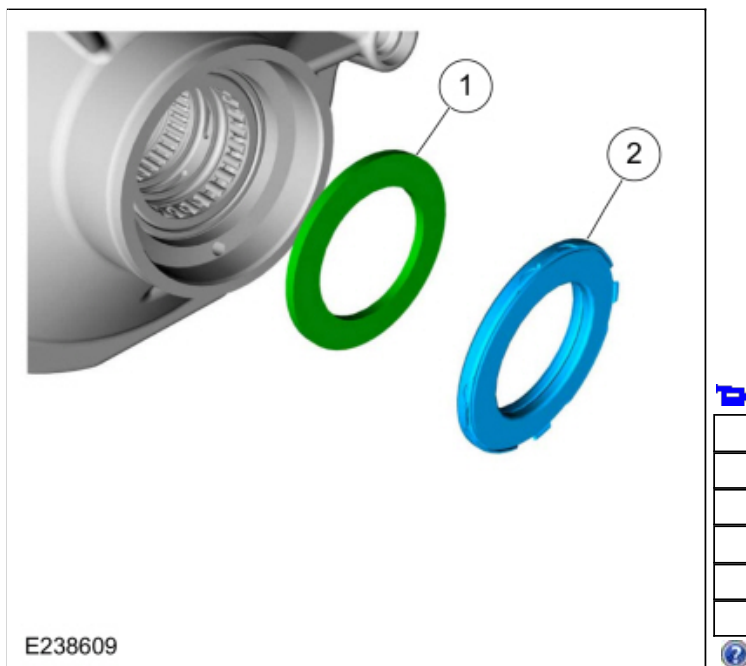


223.

1. Align the detent spring in the center of the TR sensor.
2. *Torque:* 97 lb.in (11 Nm)

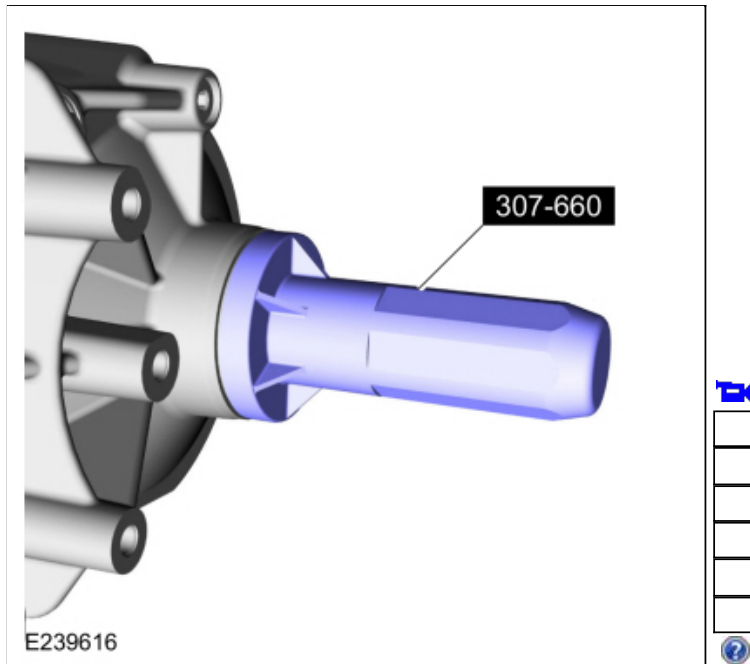
224. If equipped with 2WD, install the (T11) thrust bearing and thrust washer.

1. Thrust washer
2. Thrust bearing (T11)

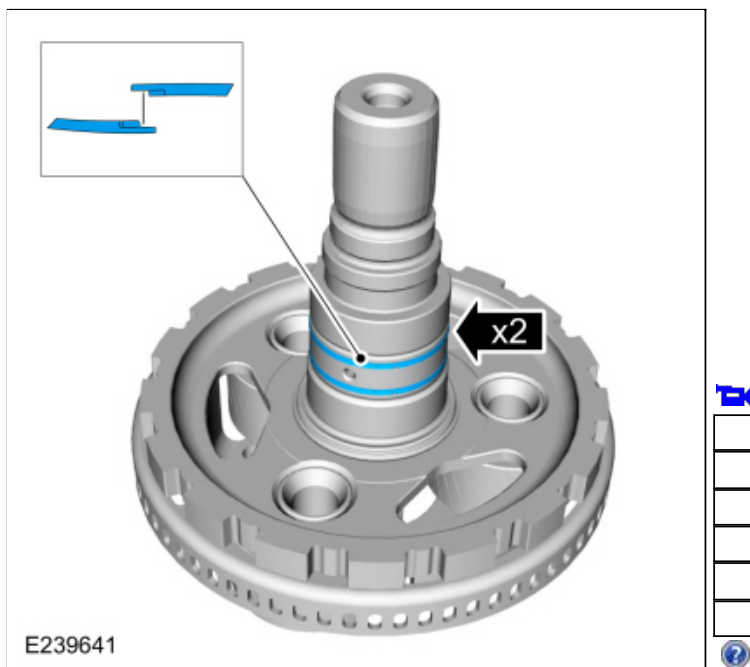


225. Using the special tool, install the output shaft seal.

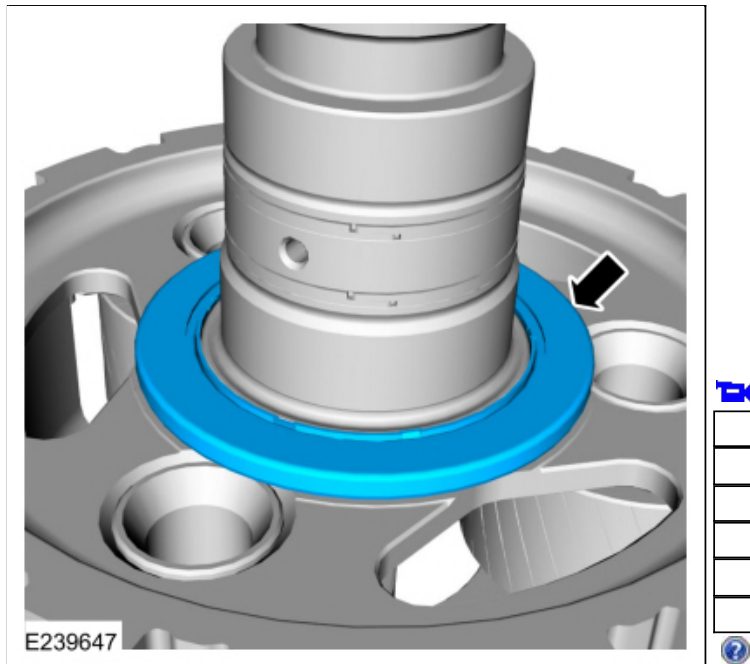
Use Special Service Tool: [307-660 Installer, Front Pump Seal](#).



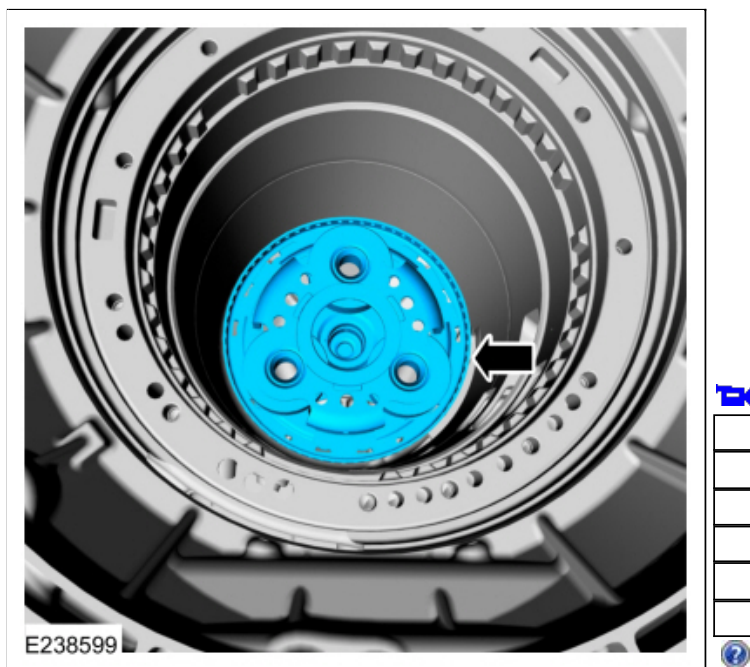
226. Install new seals on the output shaft.



227. Install the (T10) thrust bearing on the output shaft.

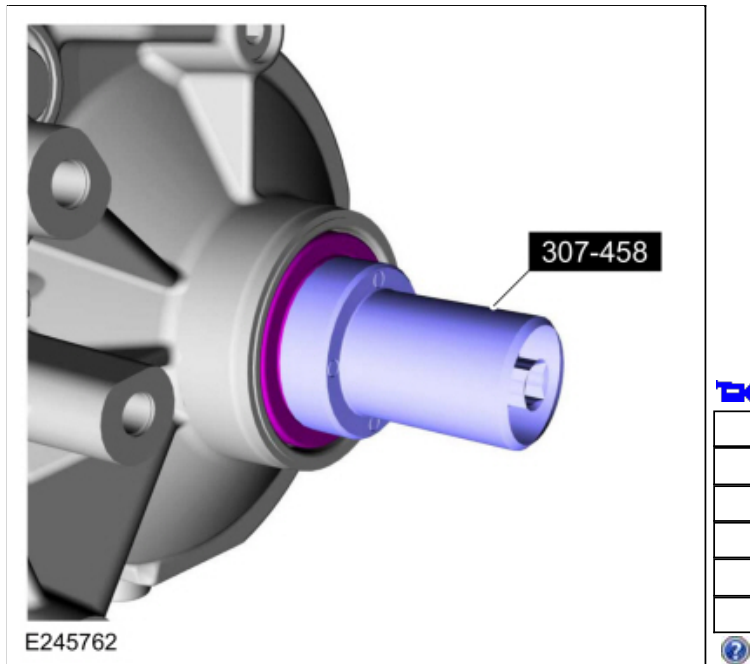


228. Rotate the manual lever to N. Install the output shaft and planetary carrier assembly No. 4.

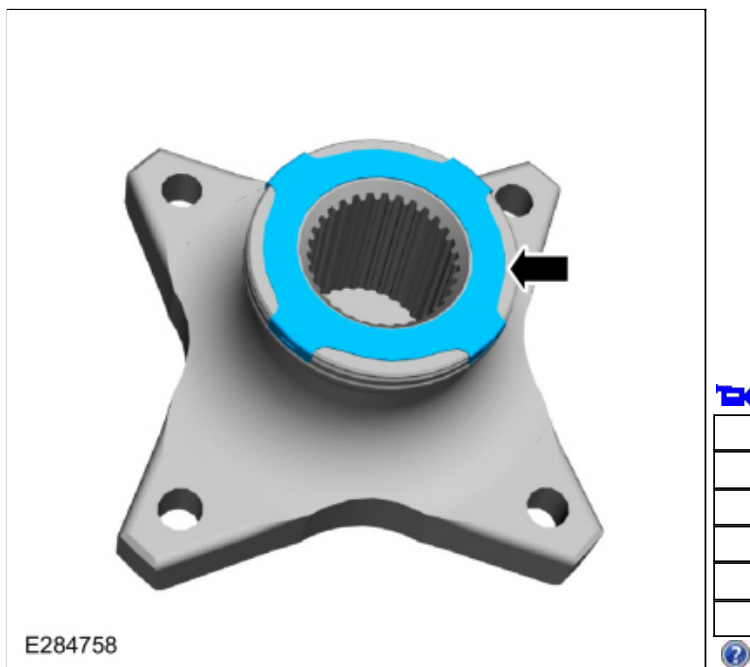


Rear Wheel Drive (RWD) vehicles

229. Rotate the manual lever to P. Using the special tool, install the new output shaft nut. Hold the output shaft and planetary carrier assembly No. 4 to the back of the transmission case while tightening.
 Use Special Service Tool: [307-458 Socket, Output Shaft Locknut](#).
 Torque: 148 lb.ft (200 Nm)



230. If removed, install the anti-ting ring.



231.

1. **NOTE:** Some early build transmissions are not equipped with lazer applied ink marks.

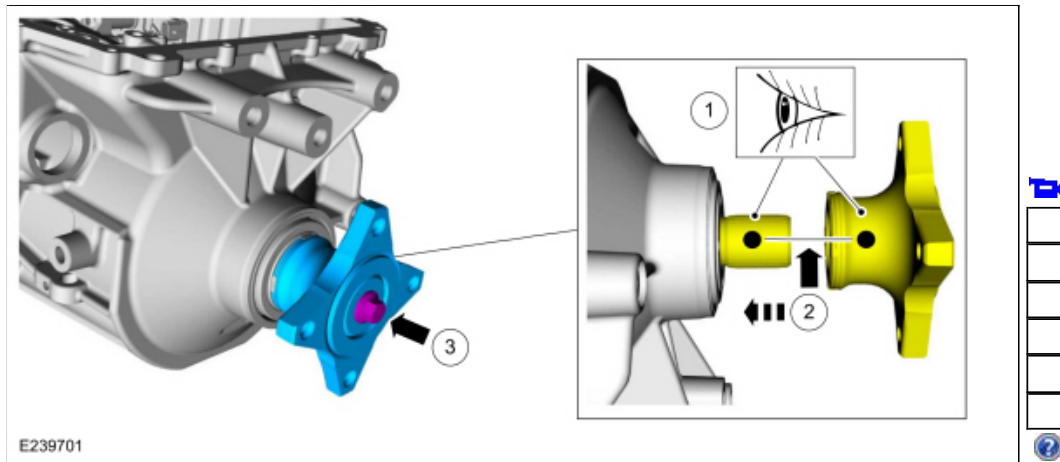
Inspect the output shaft and the output shaft flange for lazer applied ink marks.

2. **NOTICE:** If ink marks are present the marks must be aligned or a transmission vibration can occur.

If ink marks are present align the marks and install the output shaft flange on the output shaft.

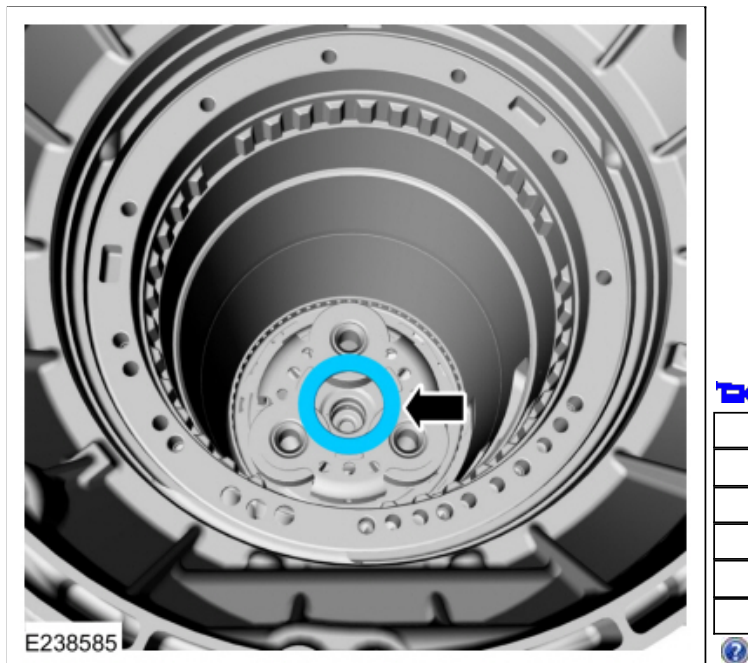
3. Install a new output shaft flange bolt.

Torque: 81 lb.ft (110 Nm)

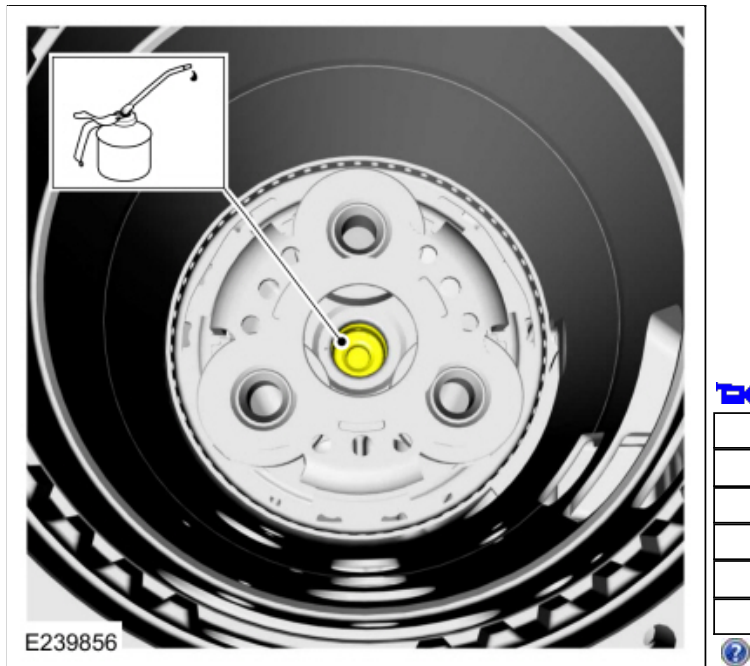


All vehicles

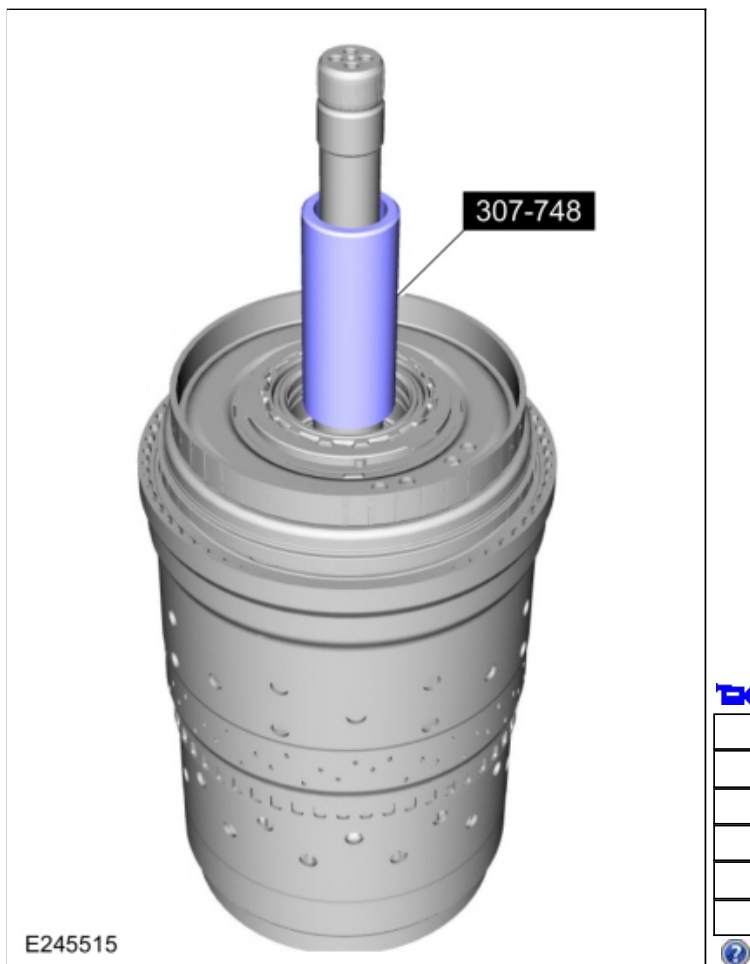
232. Install the (T9) thrust bearing.



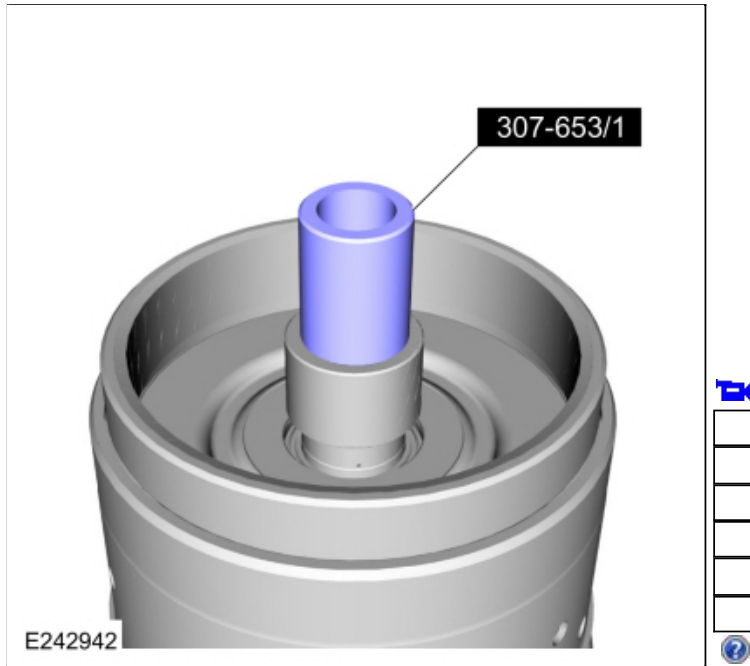
233. Lubricate the output shaft bushing with petroleum jelly.



234. Remove Special Service Tool: [307-748 Installer/Sizer, Input Shaft Solid Sealing Rings; Small](#).

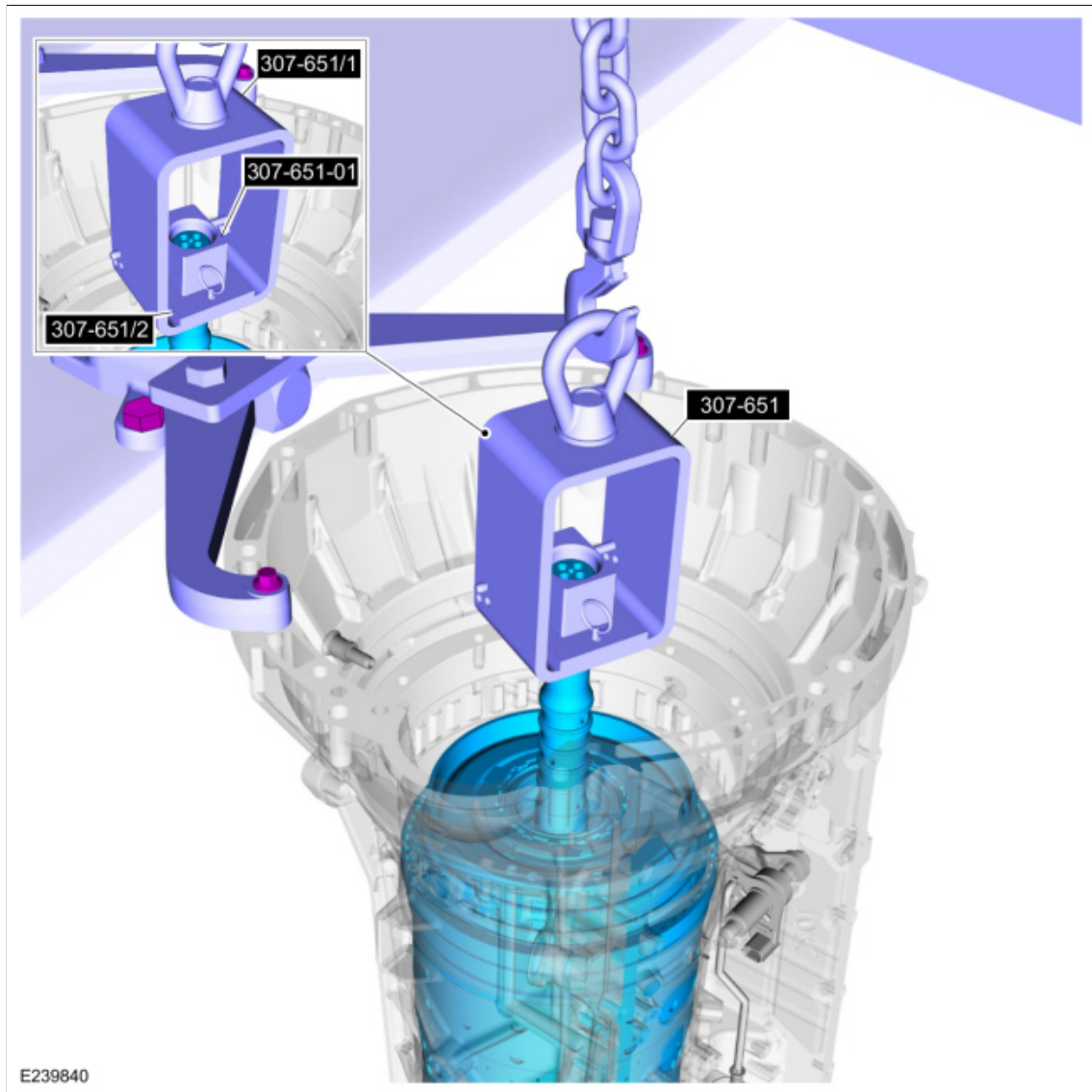


235. Remove Special Service Tool: [307-653 Sizer, Input Shaft Teflon Seal](#).



236. Using the special tools and a floor crane, install the clutch and planetary assembly.
Use Special Service Tool: [307-651 Bracket, Pump Remover/Installer](#) , [307-651-01 Adapter for 307-651 \(Super Sub Assembly Lifting\)](#).





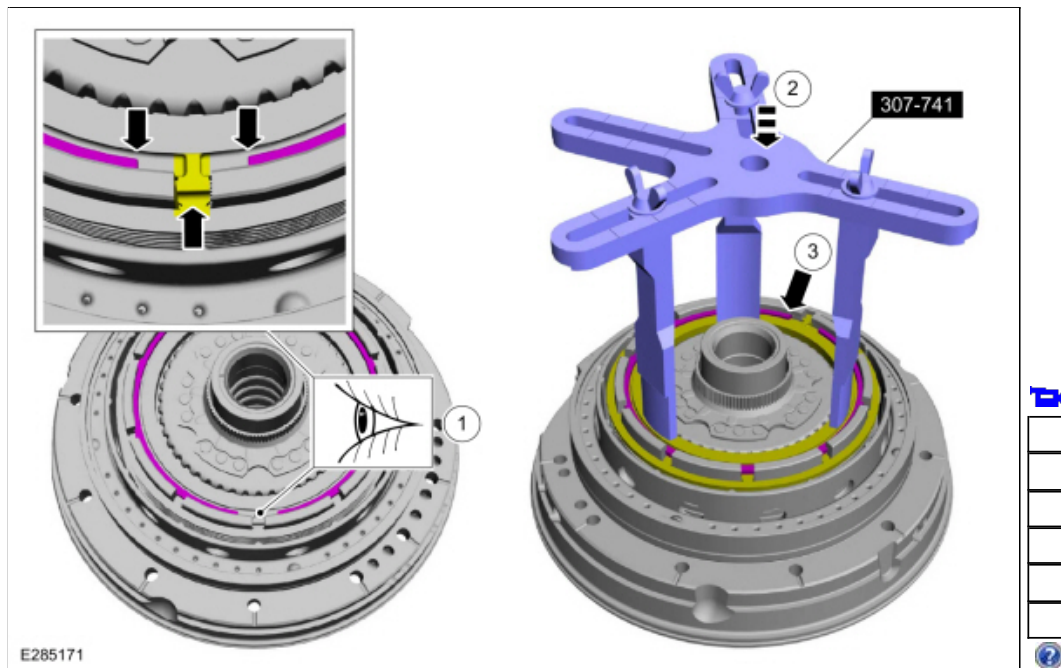
237.

Using the special tool, remove the B clutch snap ring.

1. **NOTE:** The B clutch snap ring ends are positioned in the opening of the B clutch pressure plate with a raised notch.

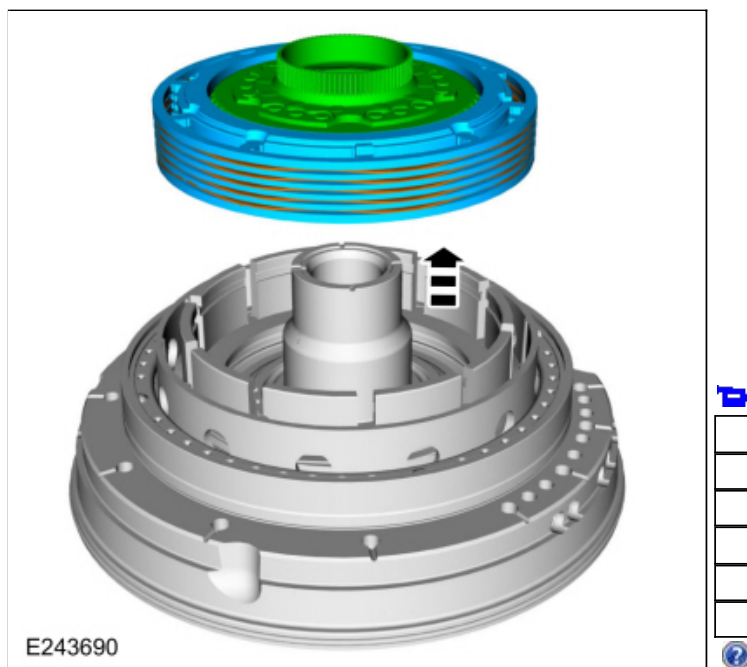
Note the position of the B clutch snap ring ends for assembly.

2. Using the special tools and a press, compress the B clutch assembly.
Use Special Service Tool: [307-741 Spring Compressor, F Clutch](#).
Use the General Equipment: Hydraulic Press
3. Remove the B clutch snap ring.



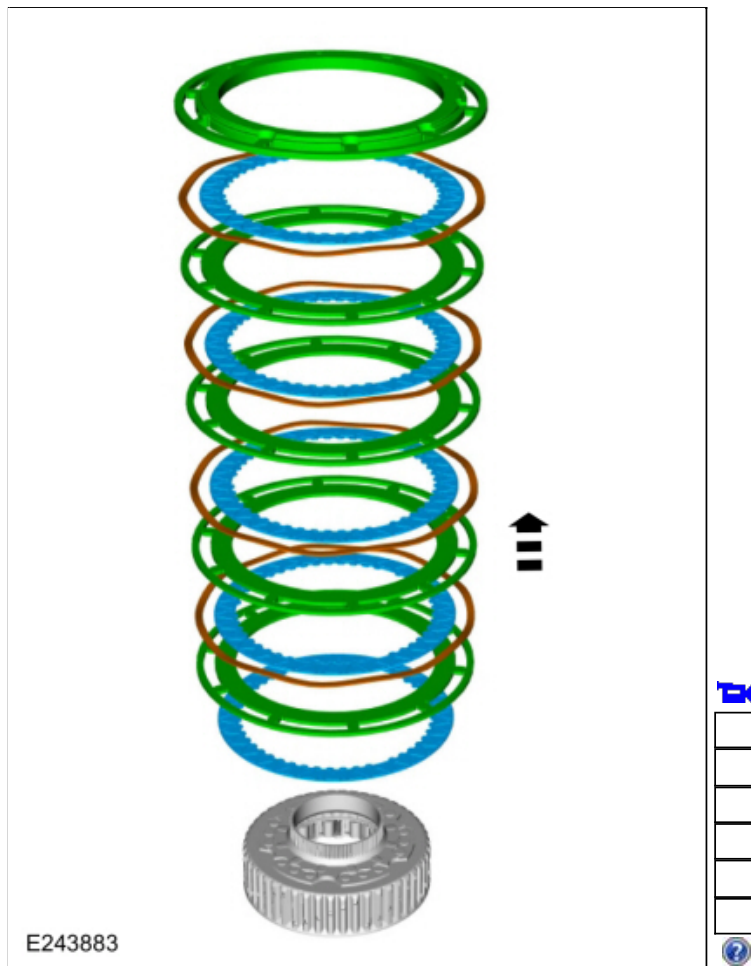
238. **NOTICE:** Remove the One-Way Clutch (OWC) and B clutch assembly gently, as the One-Way Clutch (OWC) rollers and springs could become dislodged.

Gently remove the One-Way Clutch (OWC) and B clutch assembly.



239. **NOTICE:** If replacing B clutch separating springs, all separating springs must be replaced as a matching set or damage can occur.

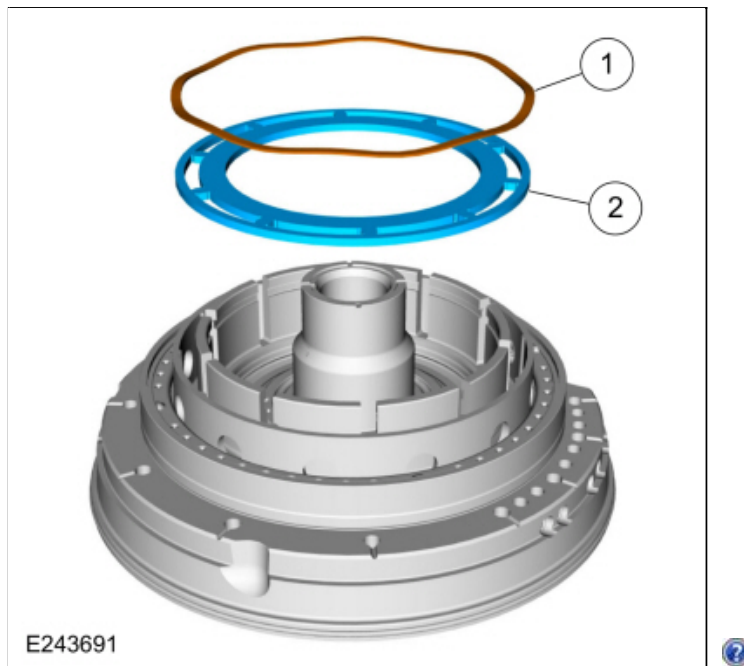
Remove the B clutch assembly from the One-Way Clutch (OWC). Inspect the clutch plates for excessive wear or damage. If the clutch plates are excessively worn or damaged replace as necessary. If the clutch plates are not excessively worn or damaged, they can be reused.



240.

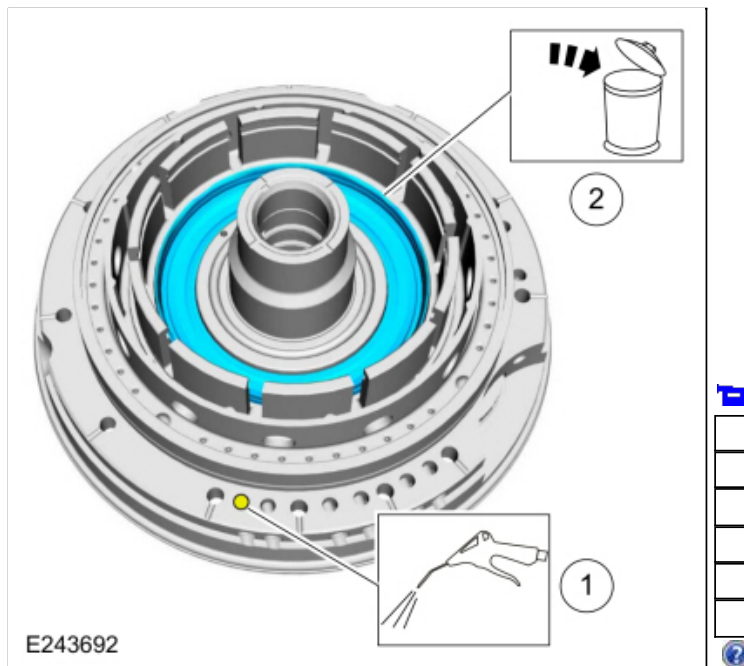
Remove the B clutch apply plate and the one remaining B clutch separating spring.

1. B clutch separating spring
2. B clutch apply plate



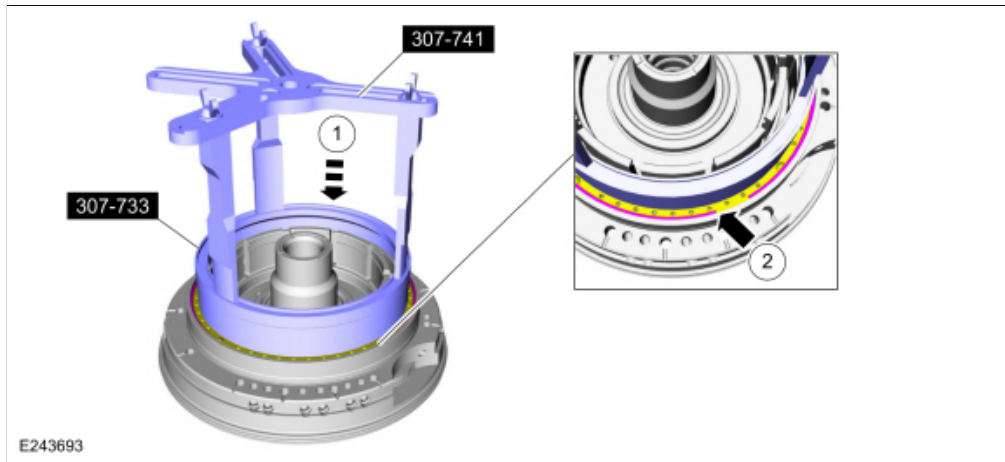
241.

1. Use compressed air into the oil passage hole.
2. Remove and discard the B clutch piston.

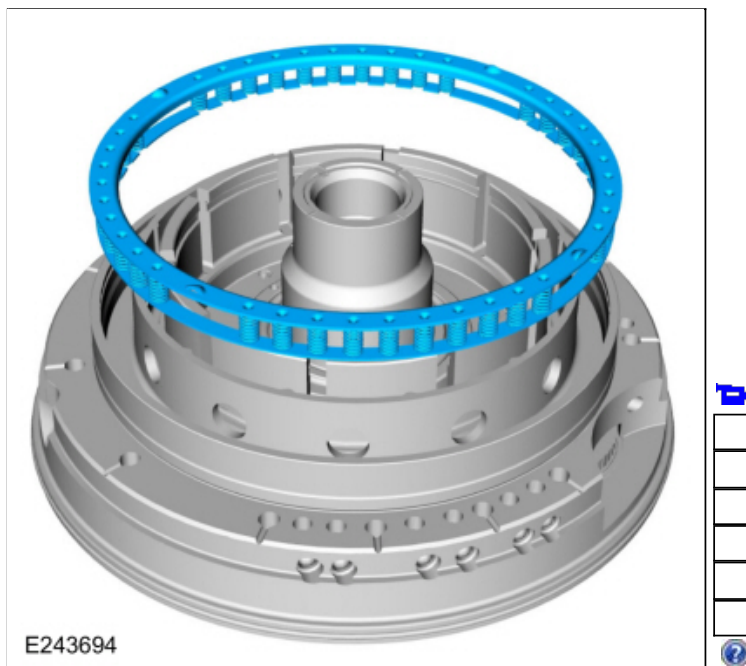


242.

1. Using the special tools and a press, compress the A clutch piston return spring.
Use Special Service Tool: [307-741 Spring Compressor, F Clutch](#), [307-733 Compressor, Clutch Piston](#).
Use the General Equipment: Hydraulic Press
2. Remove the A clutch piston return spring snap ring.

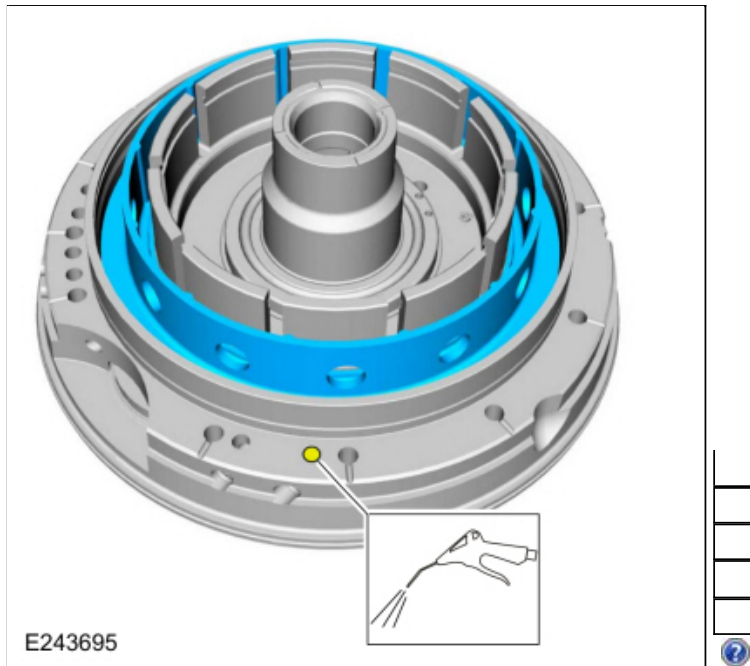


243. Remove the A clutch piston return spring.

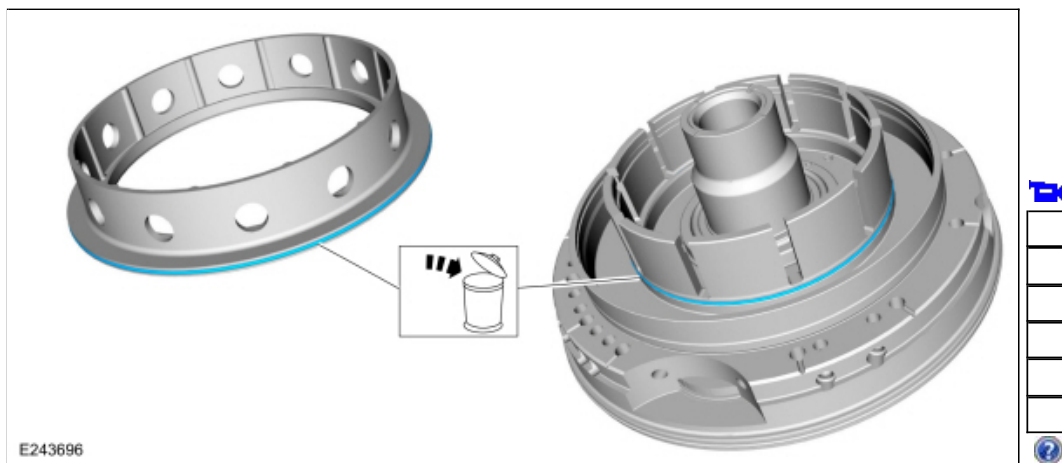


244. Use compressed air into the oil passage hole and remove the A clutch piston.



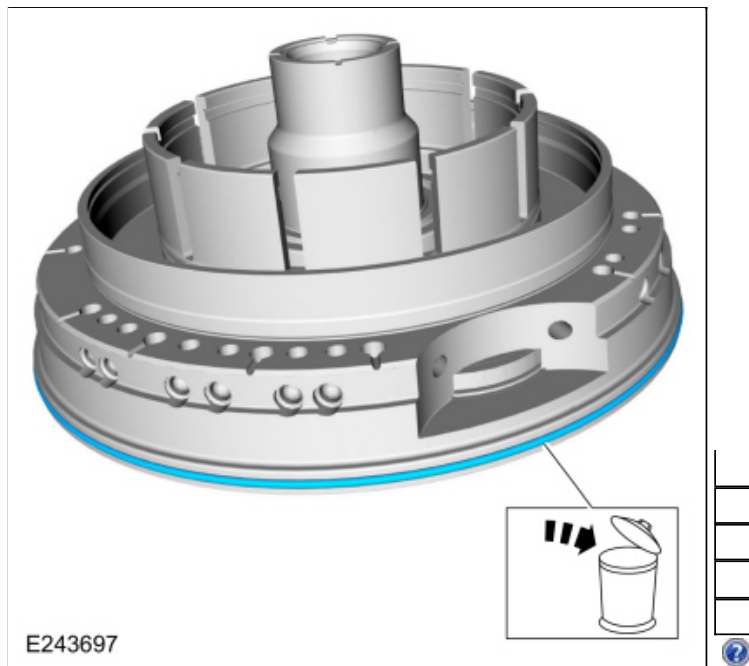


245. Remove and discard the A clutch piston outer seal and the A clutch piston inner seal.



246. Remove and discard the front support-to-case seal.

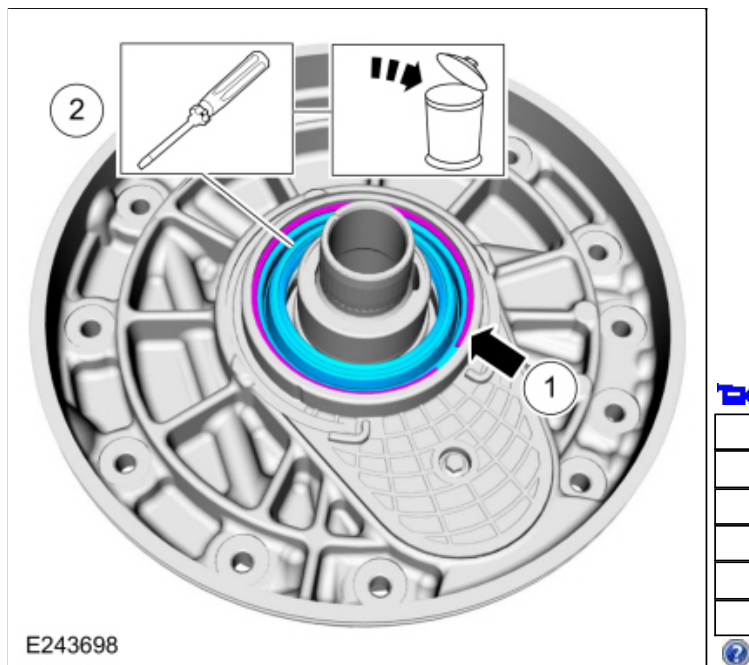




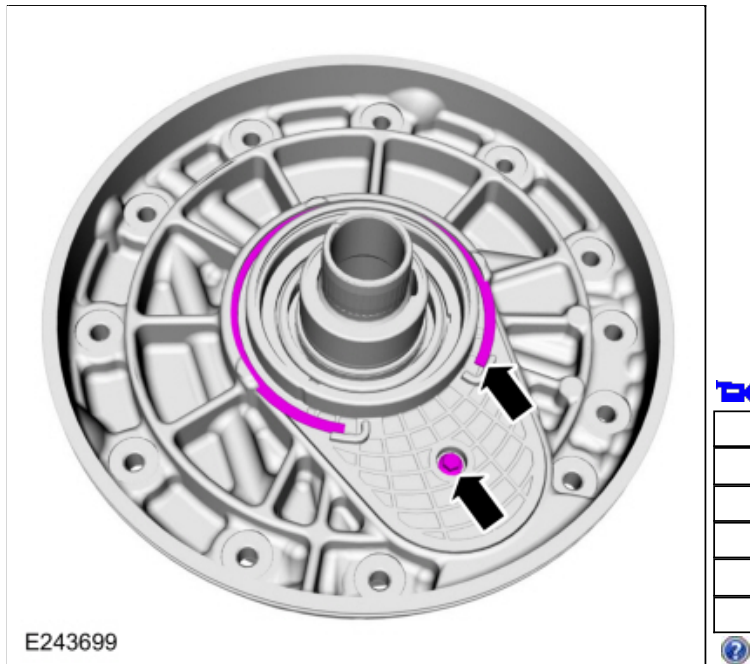
247.

1. Remove the torque converter hub seal snap ring.
2. **NOTE:** When removing the torque converter hub seal use care not to scratch the front support cover sealing surface.

Remove and discard the torque converter hub seal.

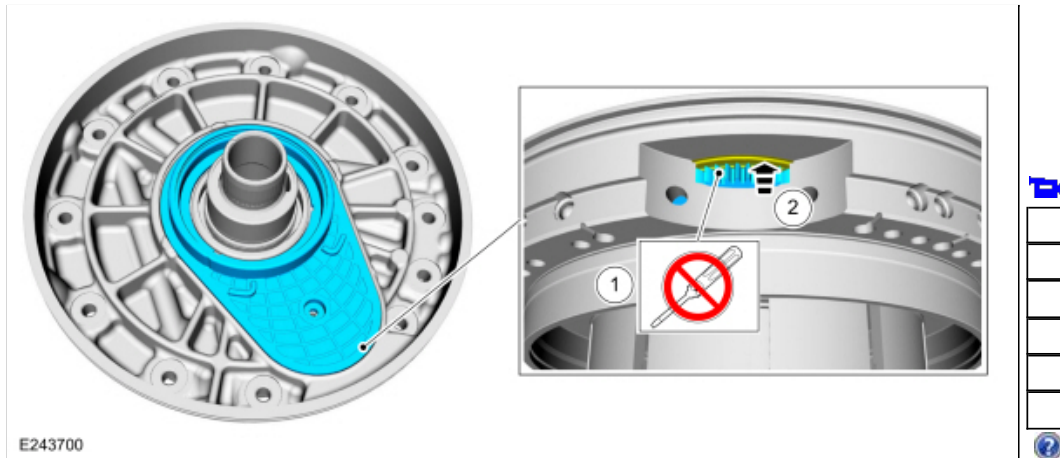


248. Remove the front support cover bolt and the front support cover snap ring.

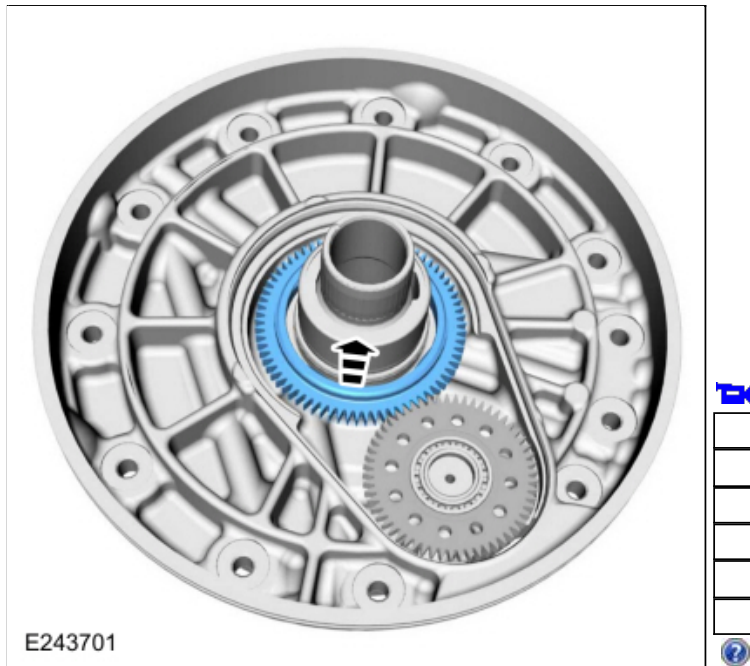


249.

1. **NOTICE:** Do not pry on the transmission fluid pump drive gear to remove the front support cover or damage to the transmission fluid pump drive gear can occur.
2. Push up on the back of the front support cover and remove the front support cover from the front support.

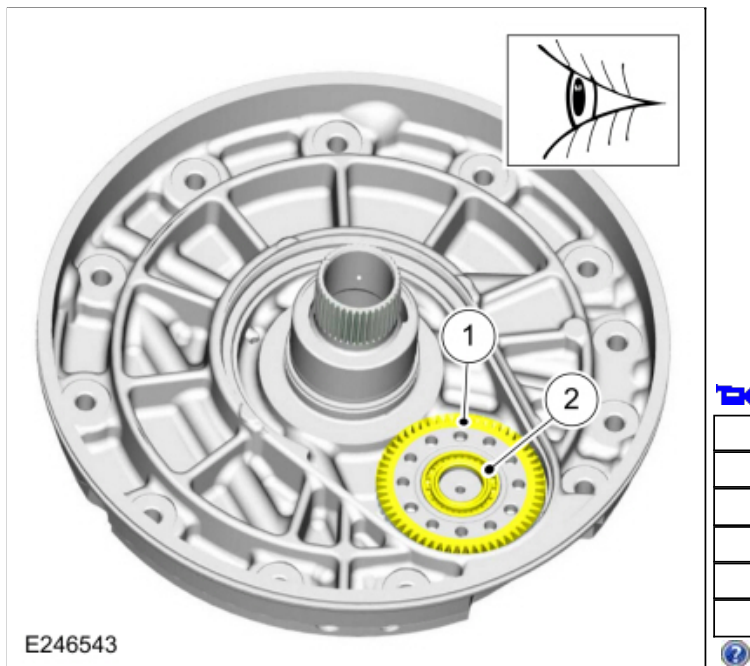


250. Remove the transmission fluid pump drive gear.



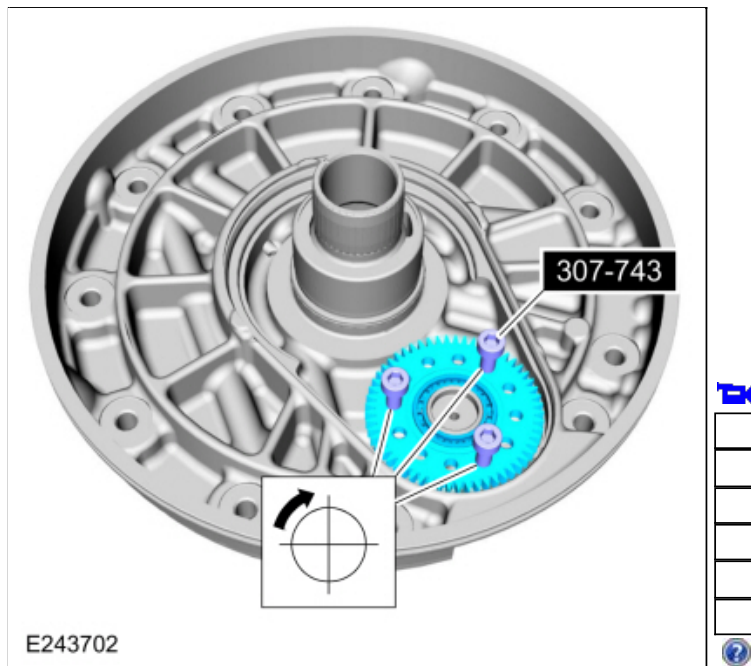
251.

1. Inspect the transmission fluid pump idler gear for damage.
2. Make sure the transmission fluid pump idler gear bearing spins freely and has no excessive end play.

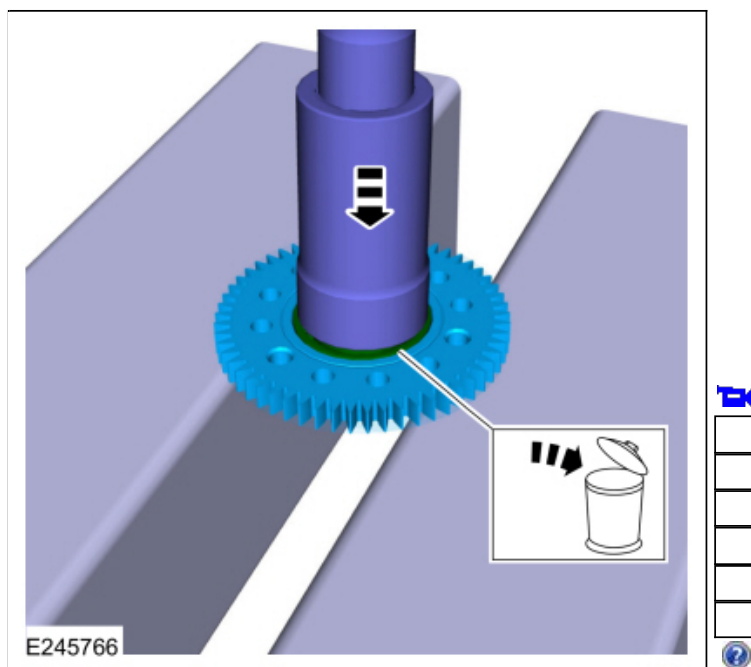


252. **NOTE:** Tighten the special tools evenly to remove the transmission fluid pump idler gear.

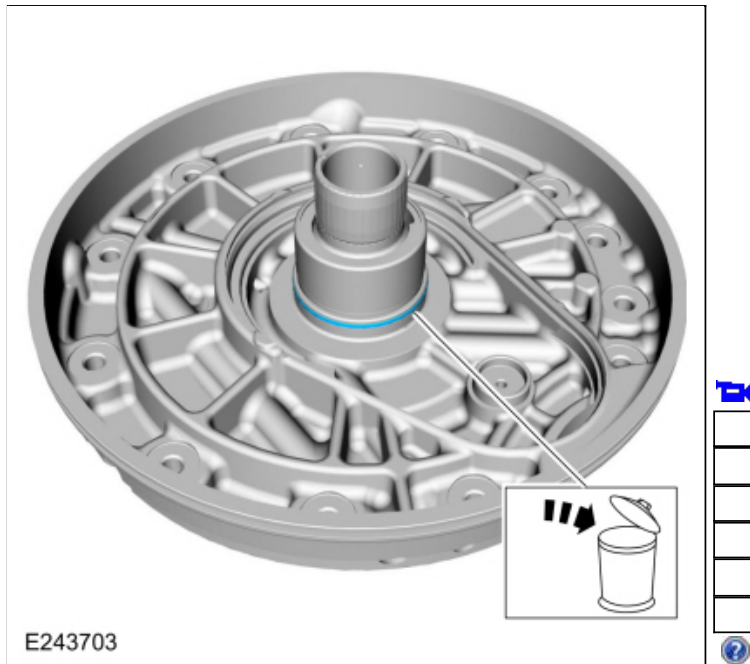
If necessary, use the special tools, to remove the transmission fluid pump idler gear and bearing.
Use Special Service Tool: [307-743 Remover, Pump Drive Gear](#).



253. Using a press, to remove and discard the transmission fluid pump idler gear bearing.
Use the General Equipment: Hydraulic Press



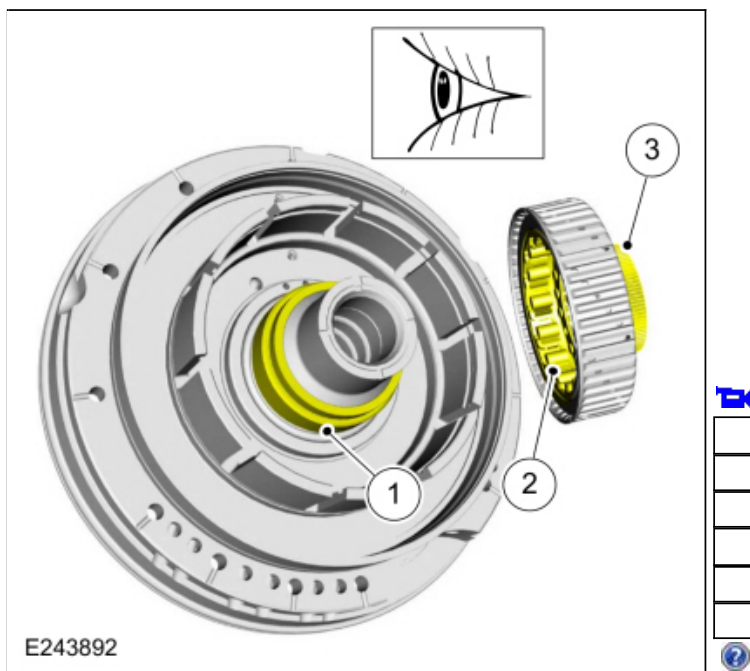
254. Remove and discard the stator support seal.



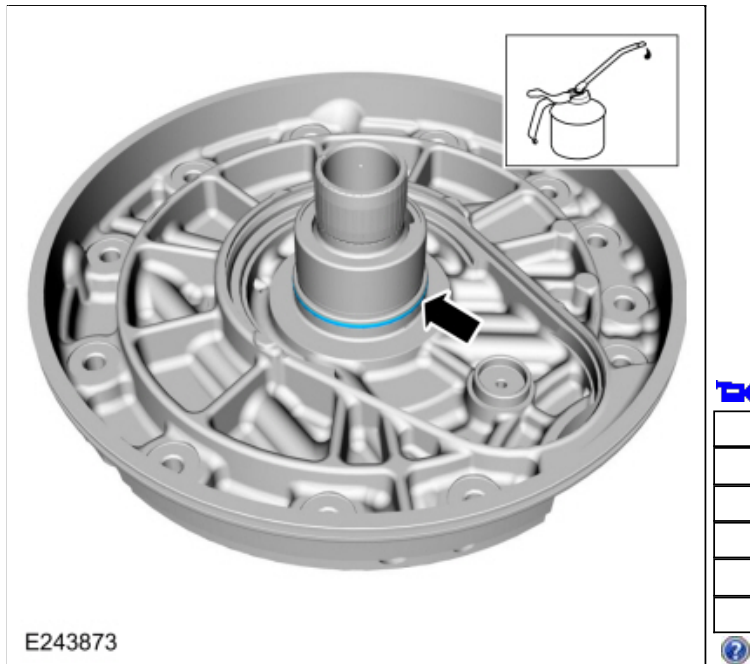
255. **NOTE:** If the One-Way Clutch (OWC) needs to be replaced the front support must be replaced.

Clean and inspect the components for damage or excessive wear.

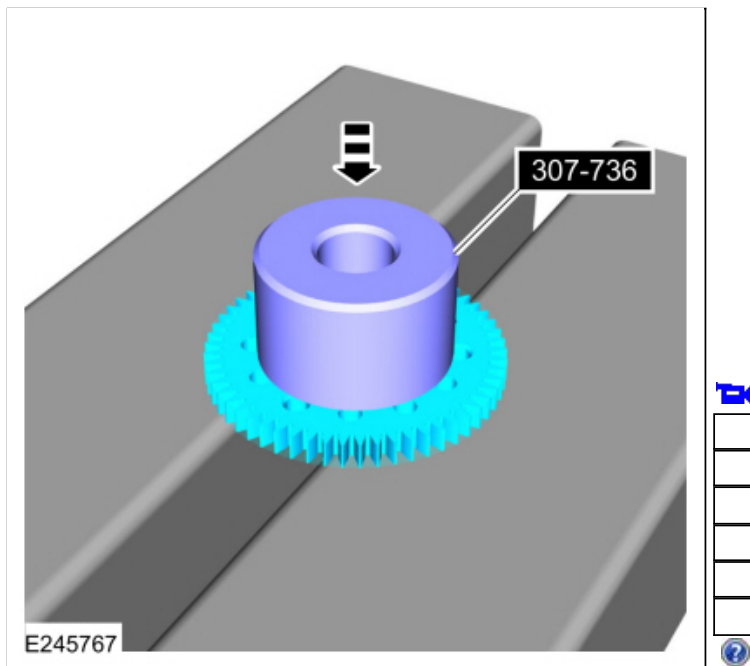
1. One-Way Clutch (OWC) inner race
2. One-Way Clutch (OWC) rollers
3. Gear splines



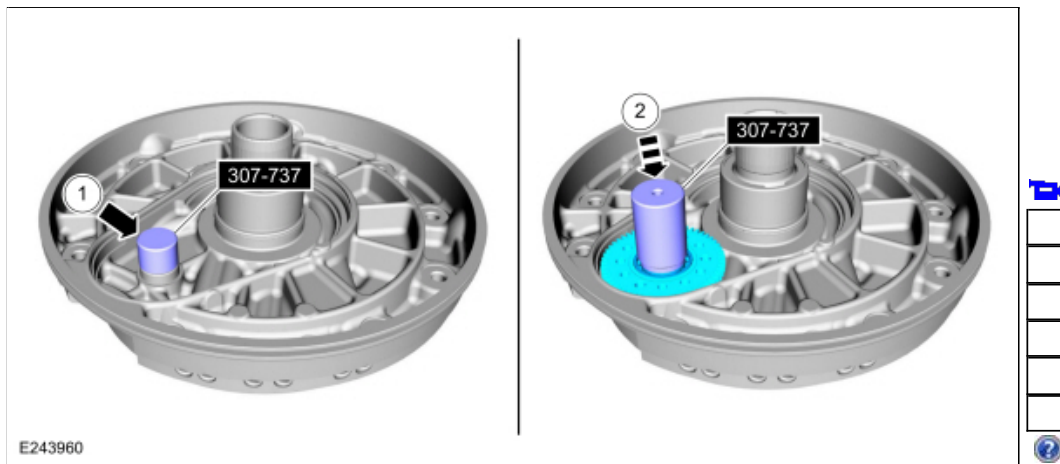
256. Install the new stator support seal on the front support. Lubricate the stator support seal with petroleum jelly.



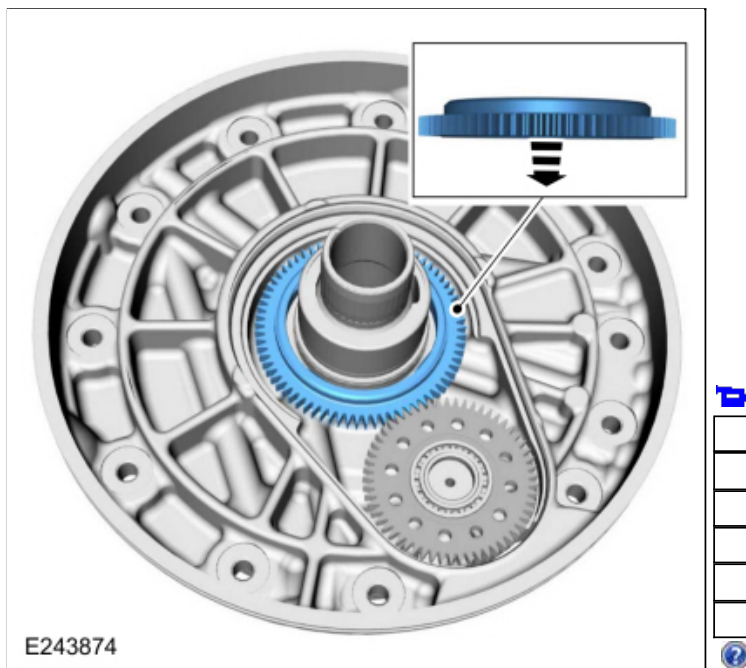
257. If removed, using the special tool and a press, install the new transmission fluid pump idler gear bearing.
 Use Special Service Tool: [307-736 Installer, Pump Drive Gear Bearing](#).
 Use the General Equipment: Hydraulic Press



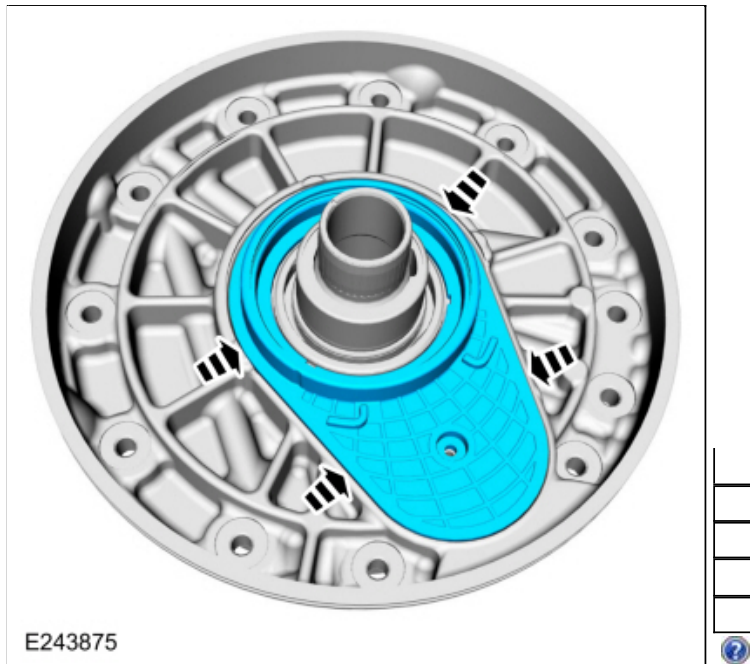
- 258.
1. Position the special tool on the front support.
 Use Special Service Tool: [307-737 Press Tool, Oil Pump Drive Idler Gear](#).
 2. Using the special tools and a press, install the transmission fluid pump idler gear and bearing.
 Use the General Equipment: Hydraulic Press



259. Install the transmission fluid pump drive gear with the flat side down.

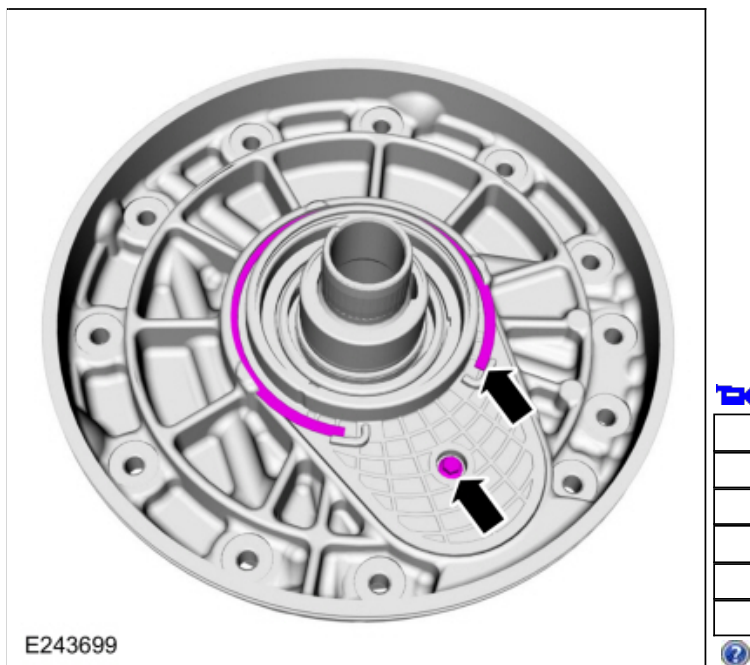


260. Install the front support cover by pressing down evenly by hand.

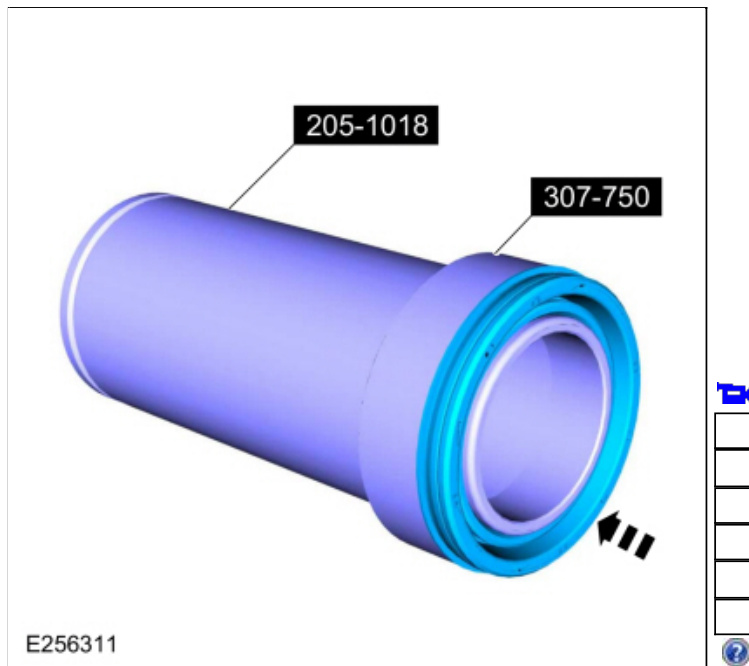


261. **NOTE:** The front support cover snap ring ends are located in the cover alignment features.

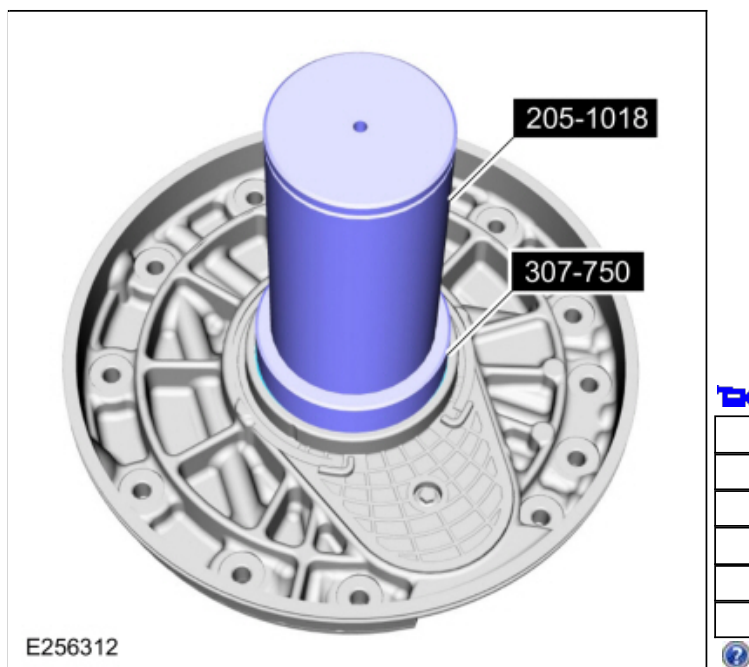
Install the front support cover bolt and the front support cover snap ring.
Torque: 62 lb.in (7 Nm)



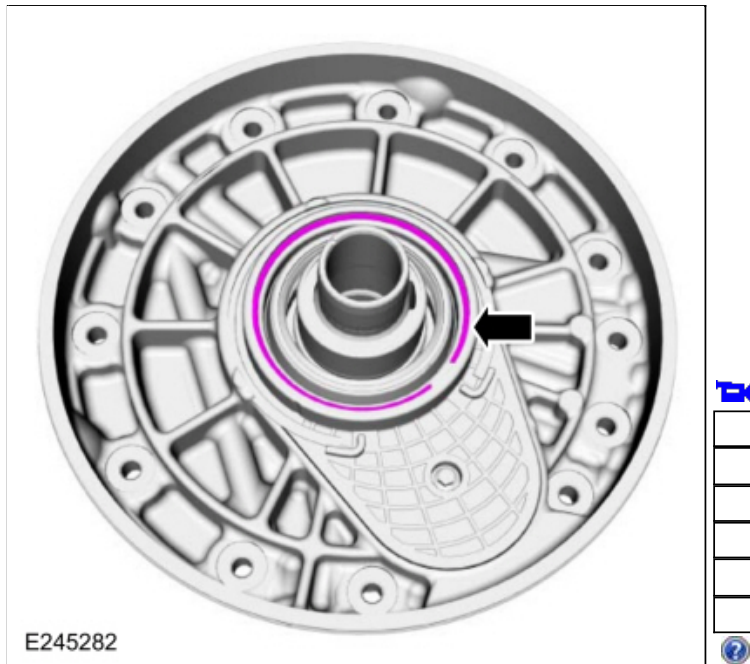
262. Install the new torque converter hub seal on the special tools.
Use Special Service Tool: [307-750 Installer, Converter Seal.](#) , [205-1018 Installation Tube.](#)



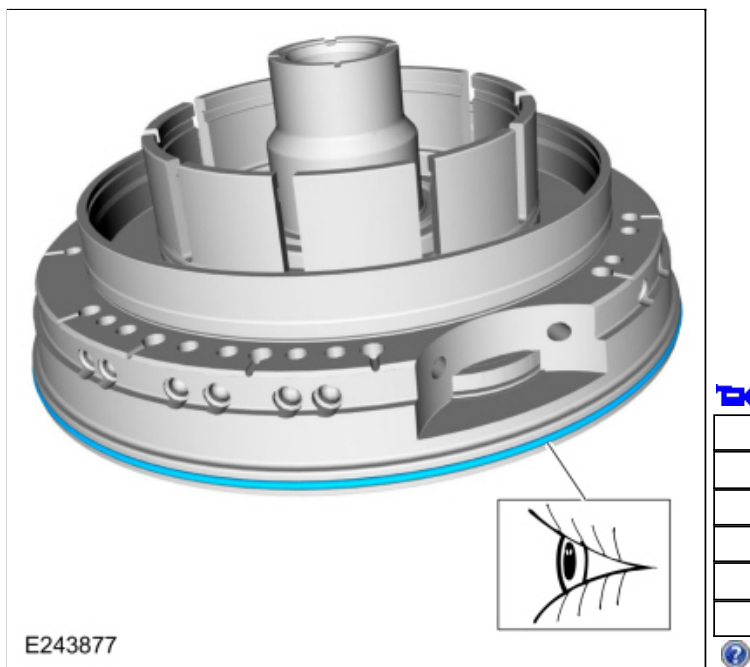
263. Using the special tools, install the new torque converter hub seal.
Use Special Service Tool: [307-750 Installer, Converter Seal.](#) , [205-1018 Installation Tube.](#)



264. Install the torque converter hub seal snap ring.

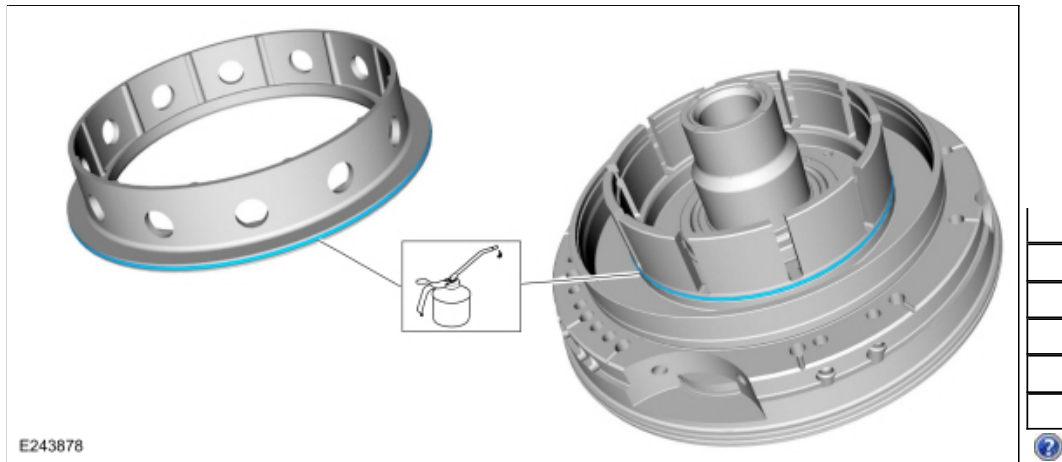


265. Install the new front support-to-case seal with the seal color visible from the outside.

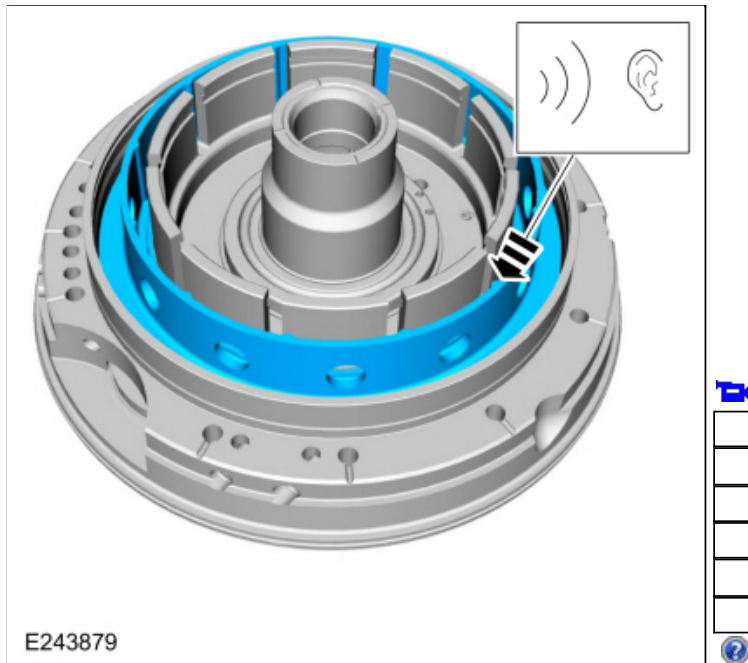


266. Install the new A clutch piston outer seal and the new A clutch piston inner seal. Lubricate the A clutch piston seals with petroleum jelly.



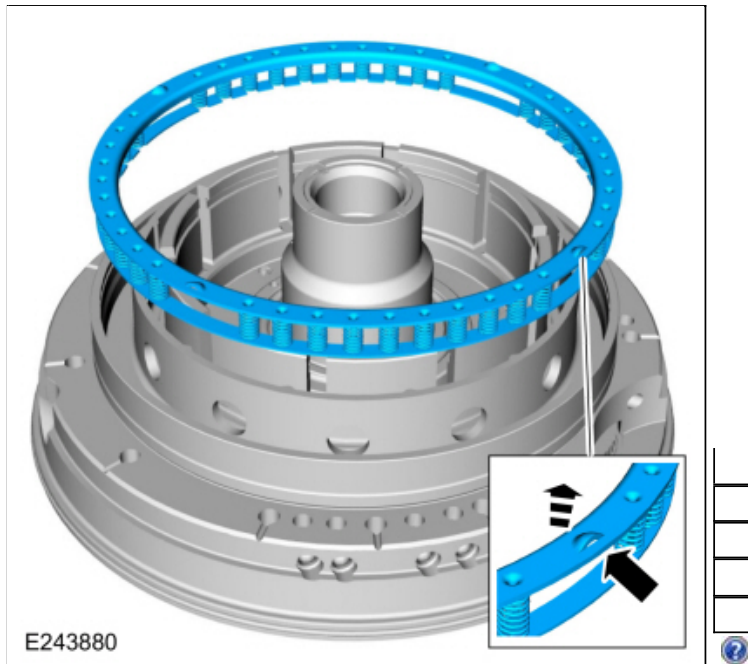


267. Install the A clutch piston by pushing down on the piston until an audible click is heard.



268. Install the A clutch piston return spring with the retaining tabs facing upward.

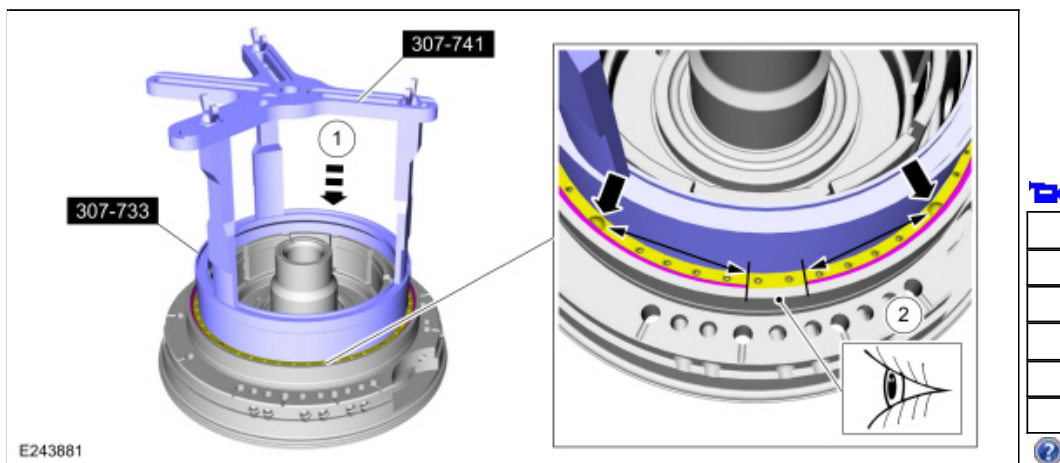




269.

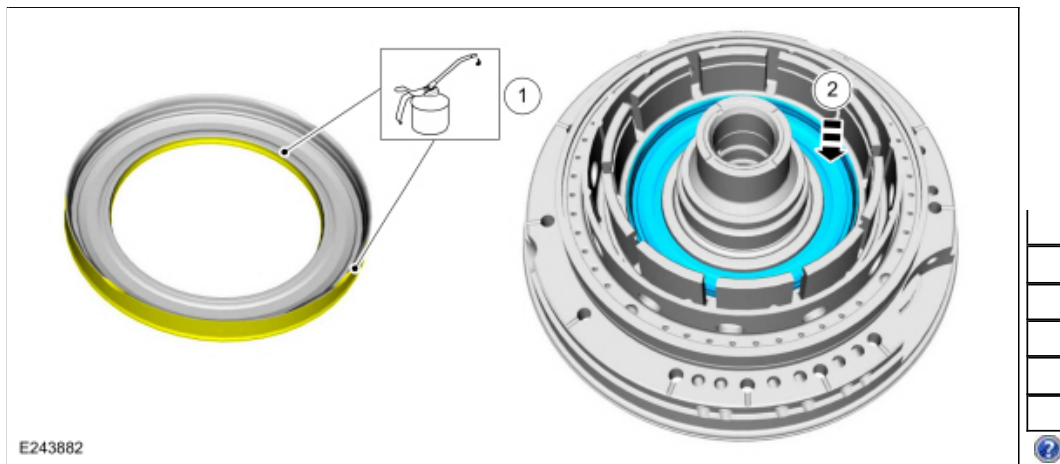
1. Using the special tools and a press, compress the A clutch piston return spring.
Use Special Service Tool: [307-741 Spring Compressor, F Clutch.](#) , [307-733 Compressor, Clutch Piston.](#)
Use the General Equipment: Hydraulic Press
2. **NOTE:** Be sure snap ring ends are not located on the A clutch piston return spring retaining tabs.

Install the A clutch piston return spring snap ring ends in the center of the return spring retaining tabs.

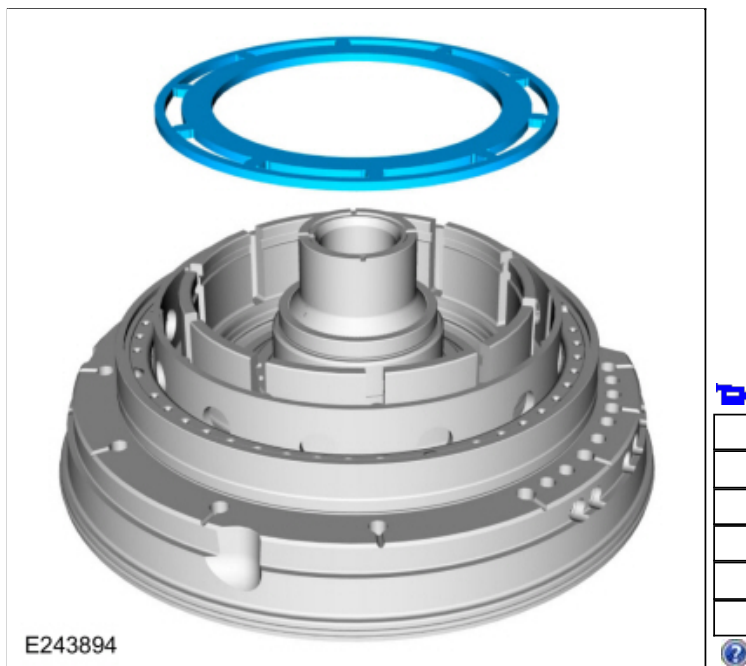


270.

1. Lubricate the B clutch piston seals with petroleum jelly.
2. Install the new B clutch piston.

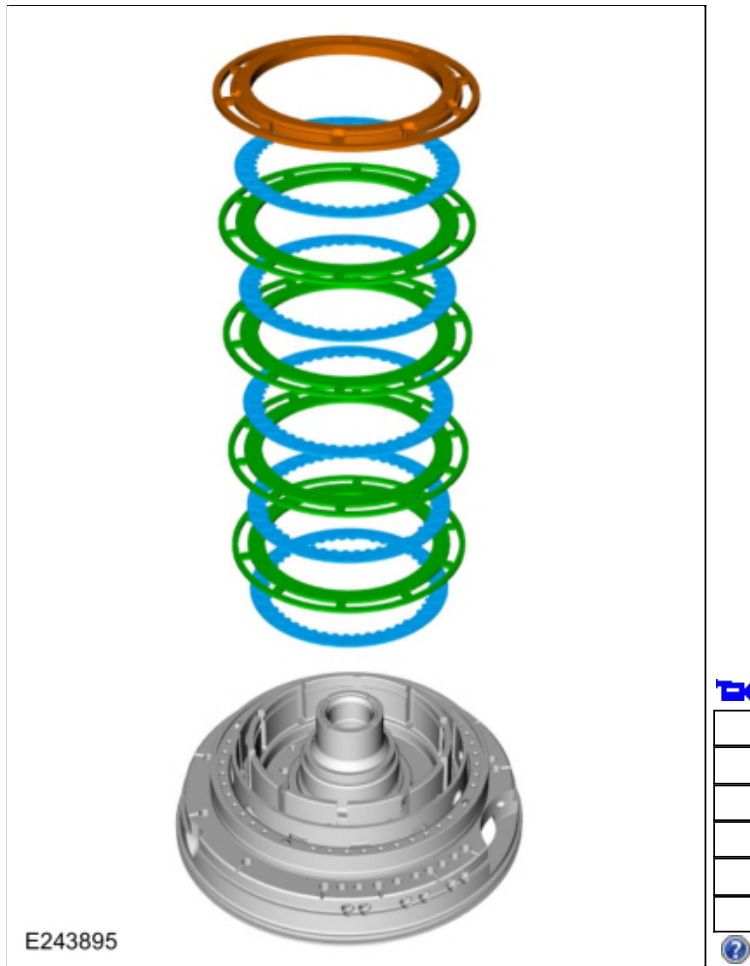


271. Install the B clutch apply plate.



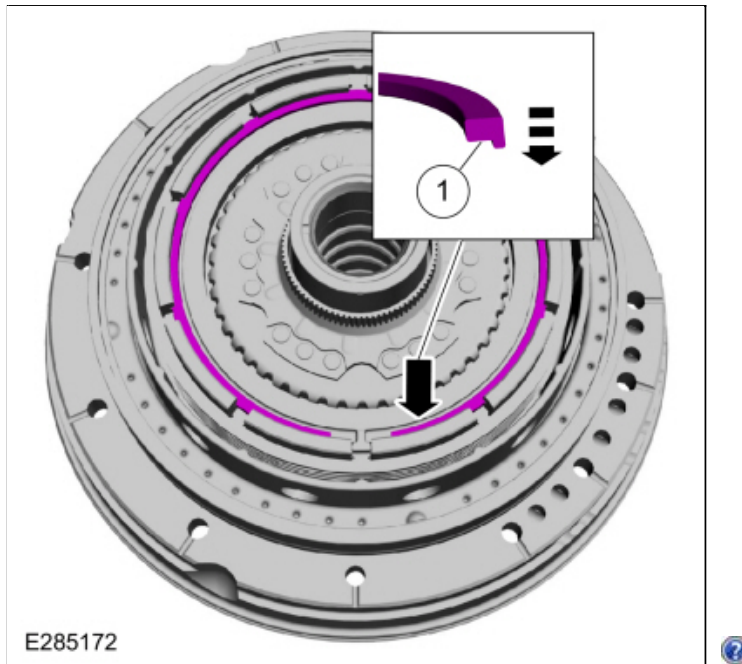
272. **NOTE:** The B clutch separating springs are not installed when measuring the B clutch clearance.

Temporarily install the B clutch friction plates, B clutch steel plates and the B clutch pressure plate to measure the B clutch clearance.

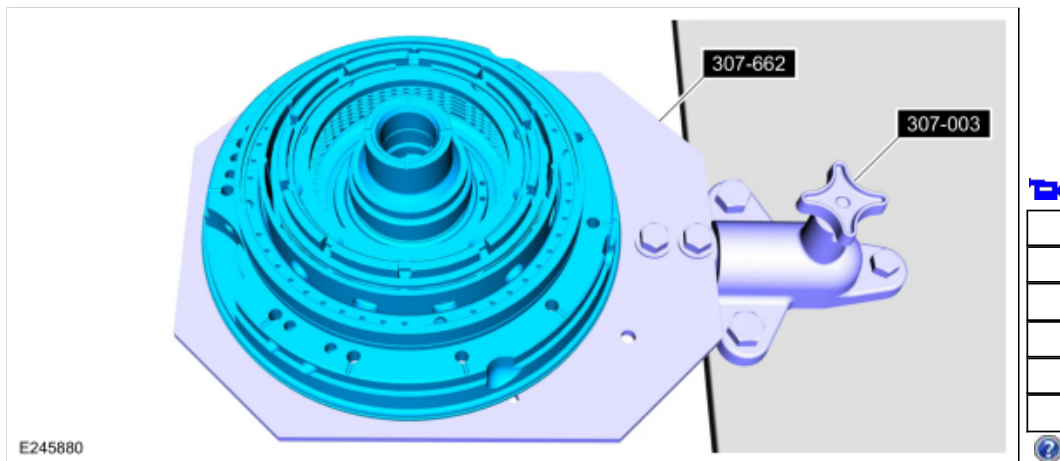


273. Install the B clutch snap ring with the grooved side down.
1. B clutch snap ring grooved side

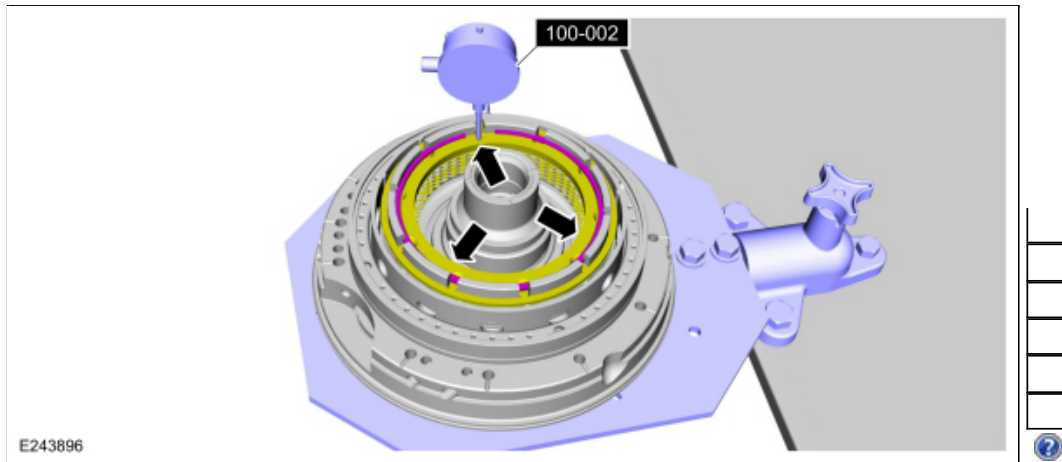




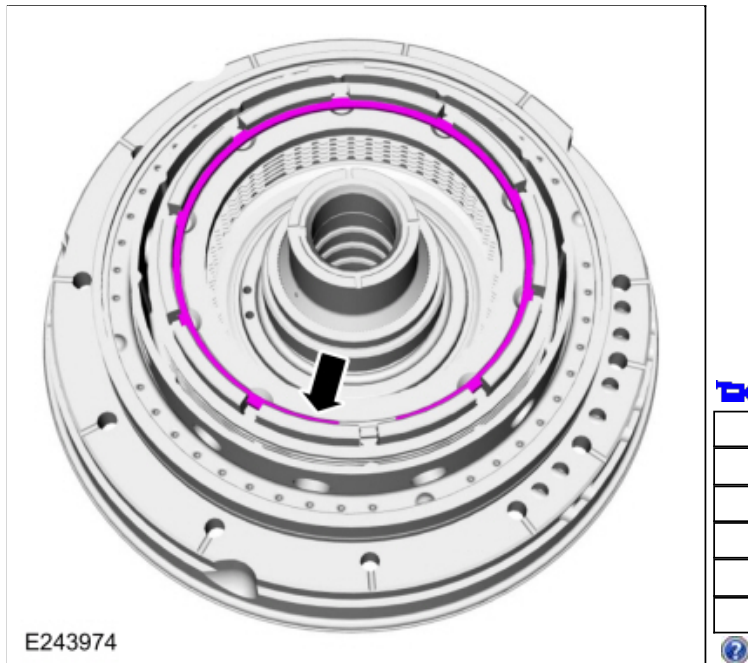
274. Assemble the special tools and position the front support assembly on the special tool.
Use Special Service Tool: [307-662 Gauge, Clutch Pack Endplay.](#) , [307-003 \(T57L-500-B\) Holding Fixture, Transmission.](#)



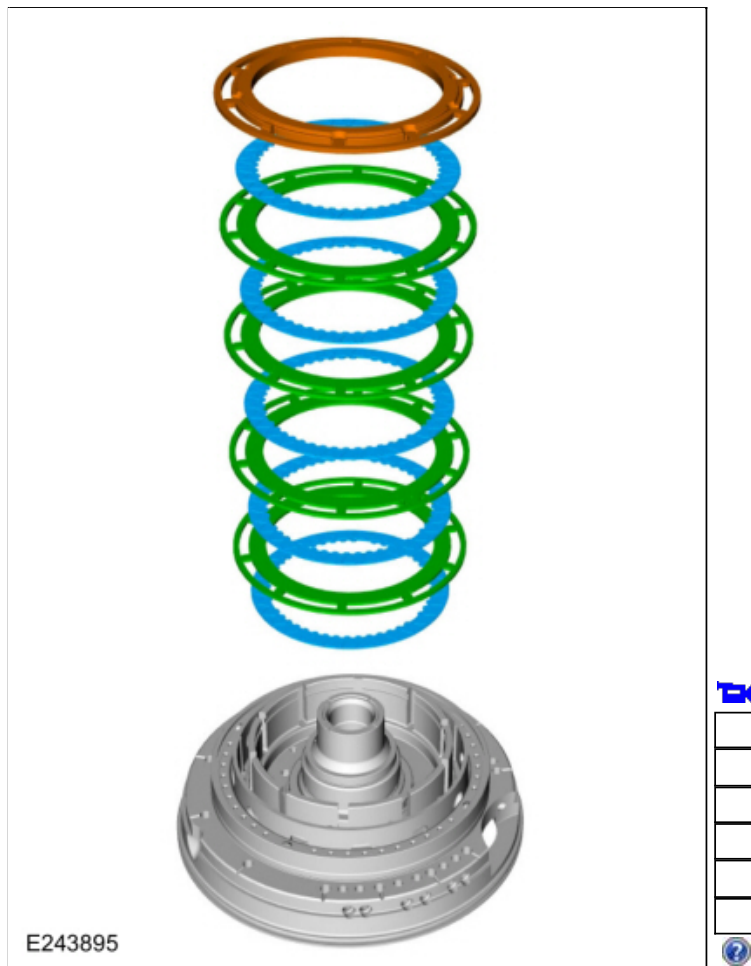
275. Using the special tool, measure the B clutch clearance. Position the plunger so it rests on the top surface of the pressure plate. Gently push down on the pressure plate to zero the dial indicator. Pull up on the pressure plate and measure and record the clutch clearance in 3 different places. Average the 3 recorded clutch clearance measurements and compare the measurement to the clutch clearance chart in specifications to determine the correct size snap ring. Install the correct B clutch snap ring.
Refer to: [Specifications](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Specifications).
Use Special Service Tool: [100-002 \(TOOL-4201-C\) Holding Fixture with Dial Indicator Gauge.](#)



276. Remove the B clutch snap ring.

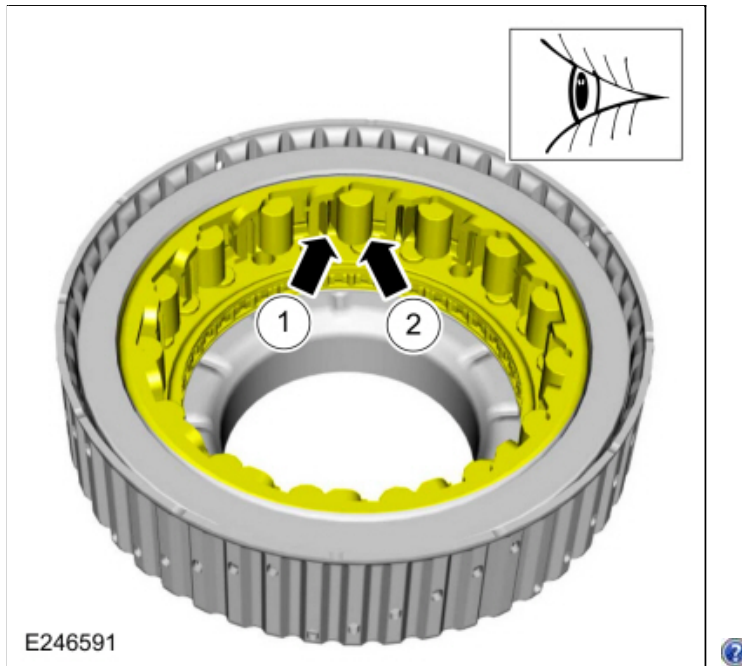


277. Remove the B clutch assembly.



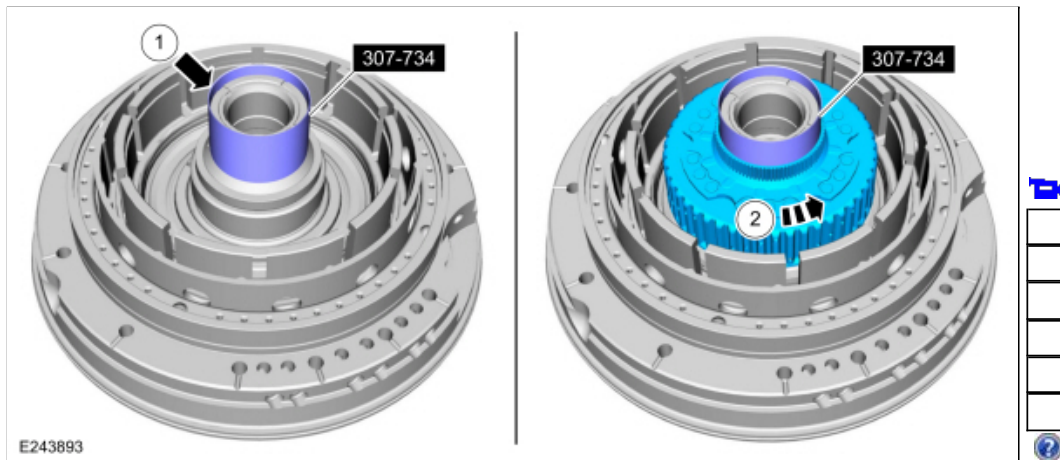
278. Verify that all the One-Way Clutch (OWC) rollers and springs are seated.

1. Springs
2. Rollers



279. **NOTE:** The One-Way Clutch (OWC) hub should rotate counter-clockwise freely when installed correctly.

1. Position the special tool on the front support.
Use Special Service Tool: [307-734 Tool, OWC Alignment](#).
2. With a counter-clockwise rotation gently install the One-Way Clutch (OWC) onto the front support.

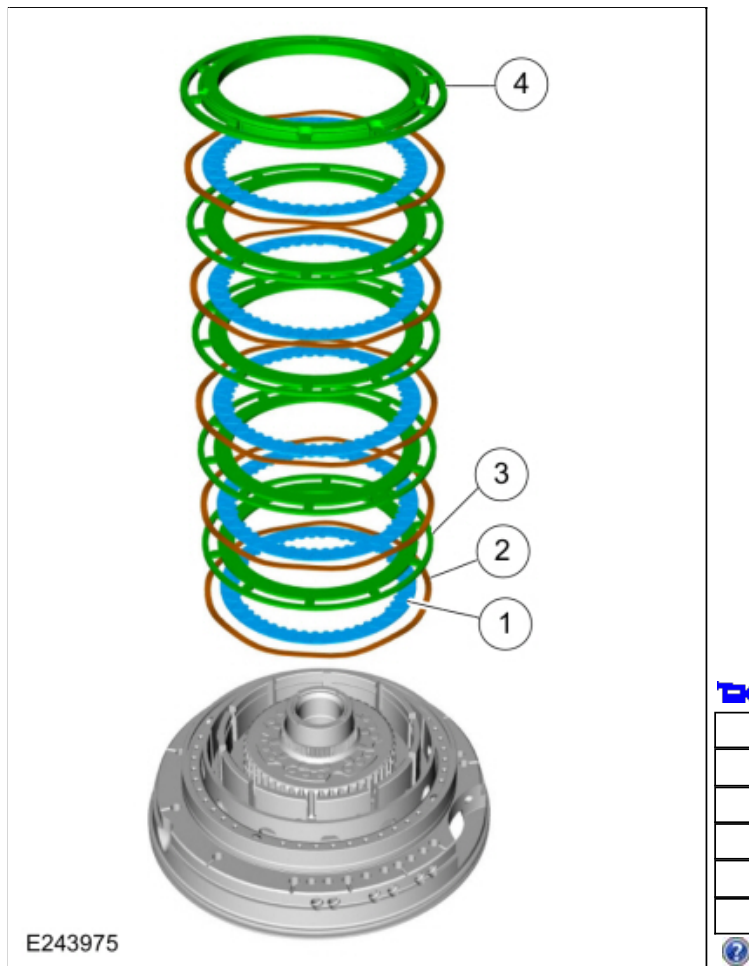


280. **NOTICE:** If replacing B clutch separating springs, all separating springs must be replaced as a matching set or damage can occur.

NOTE: Clutch plate quantity is model dependant based on engine displacement.

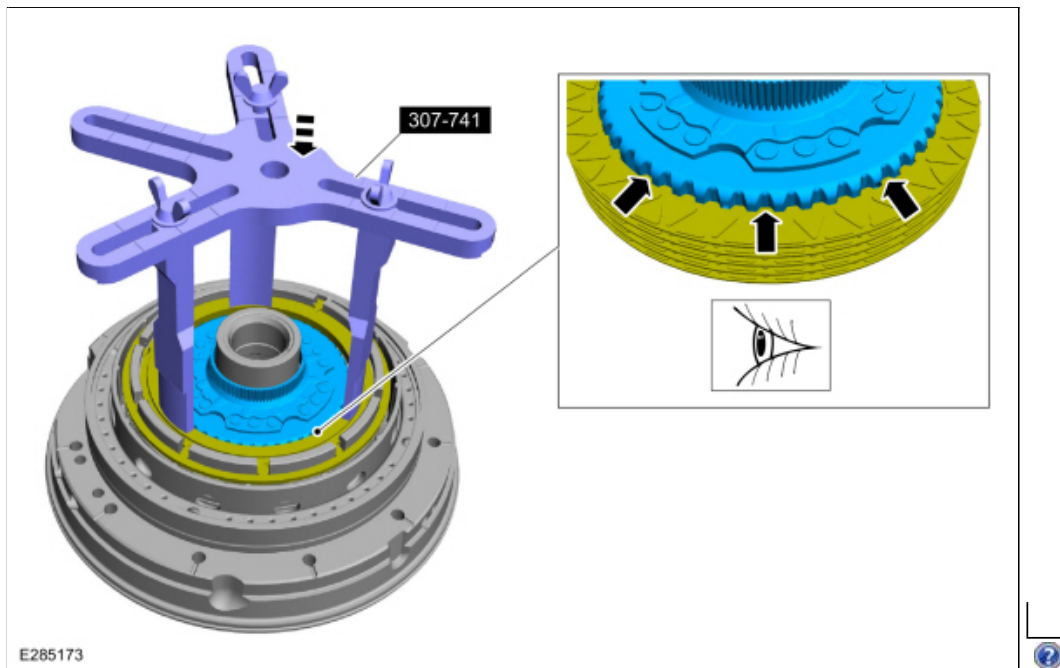
Soak the B clutch plates in clean transmission fluid. With the B clutch apply plate installed, correctly install the B clutch plates and springs.

1. B clutch friction plates
Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (WSS-M2C949-A) (MERCON® ULV)
2. B clutch separating springs
3. B clutch steel plates
4. B clutch pressure plate



281. **NOTICE:** Be sure to align the top B clutch friction to the One-Way Clutch (OWC) hub or damage can occur.

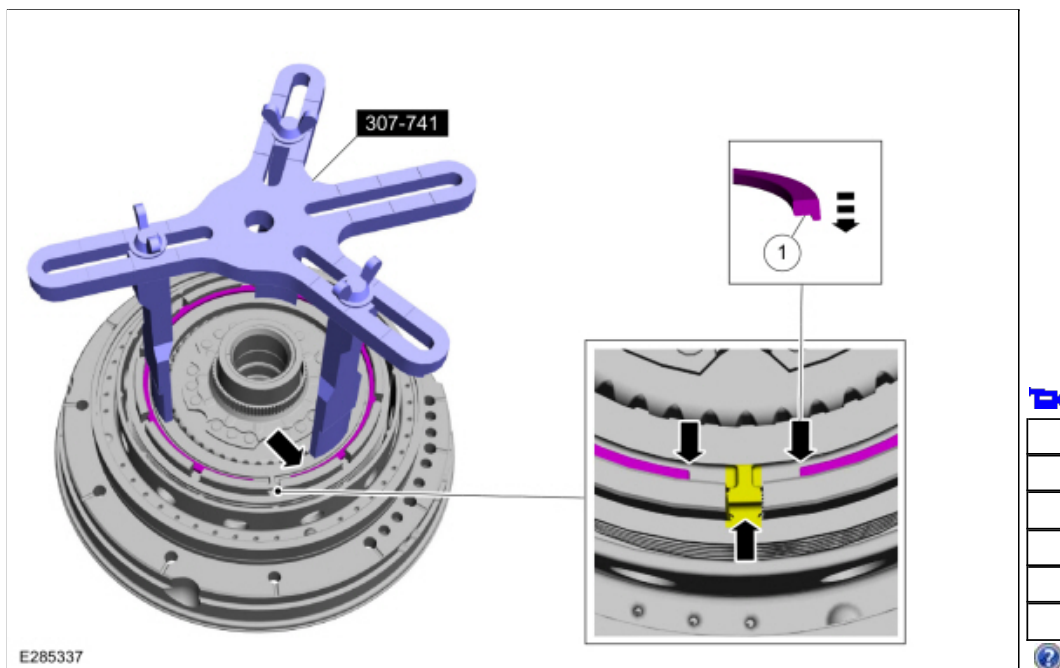
Use the special tools to compress the B clutch assembly.
 Use Special Service Tool: [307-741 Spring Compressor, F Clutch](#).
 Use the General Equipment: Hydraulic Press



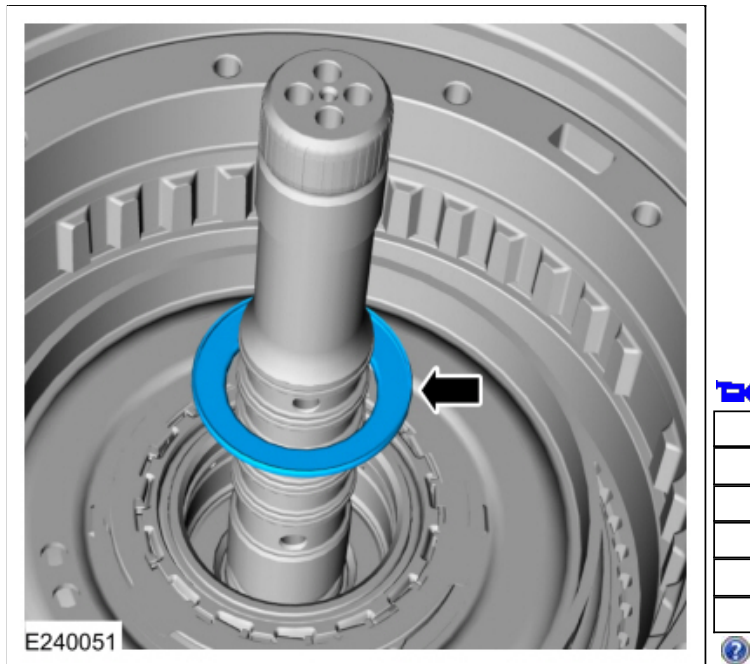
282.

Install the B clutch snap ring in the correct location with the grooved side down.

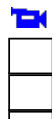
1. B clutch snap ring grooved side

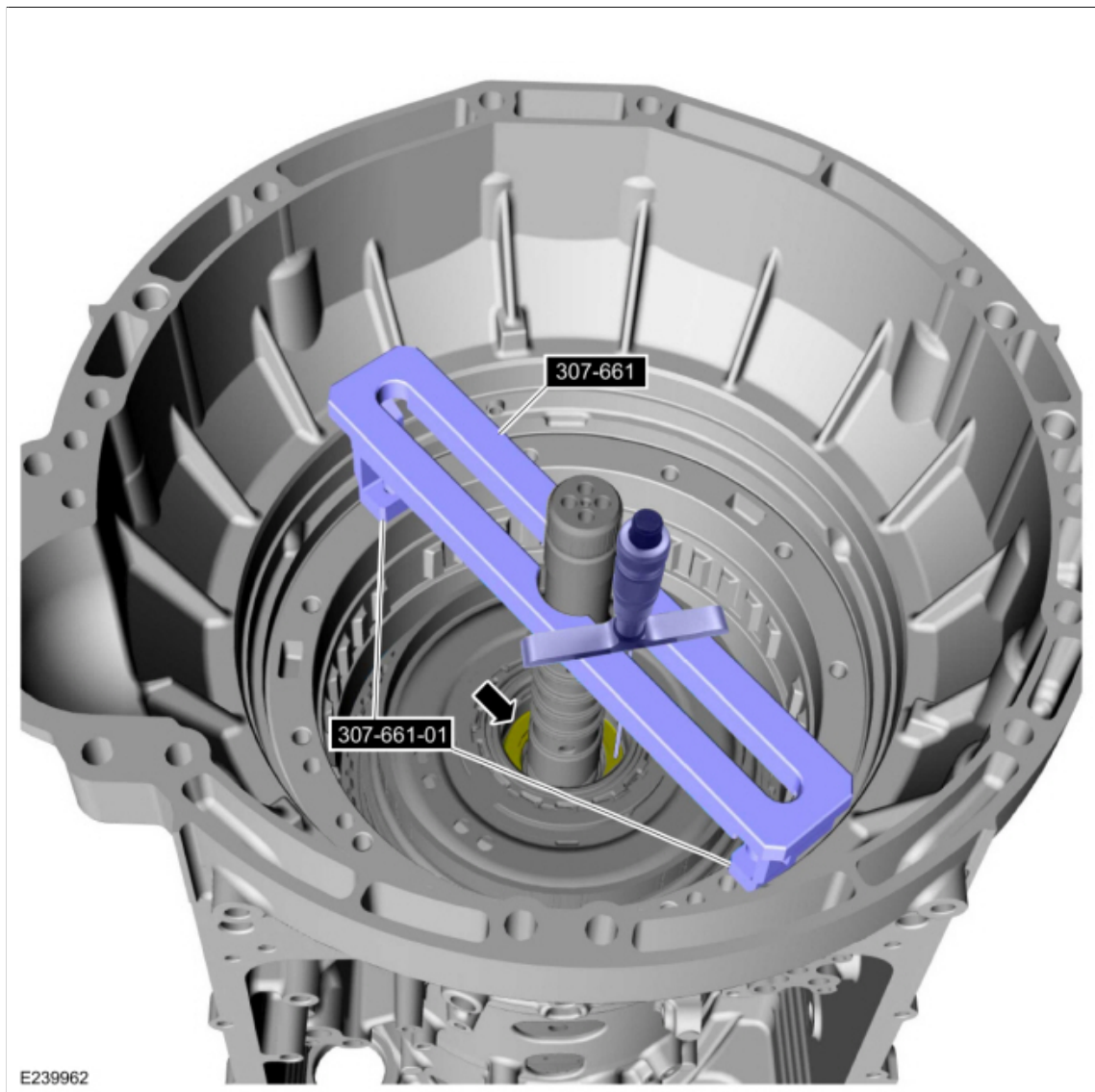


283. Install the (T3) thrust bearing.

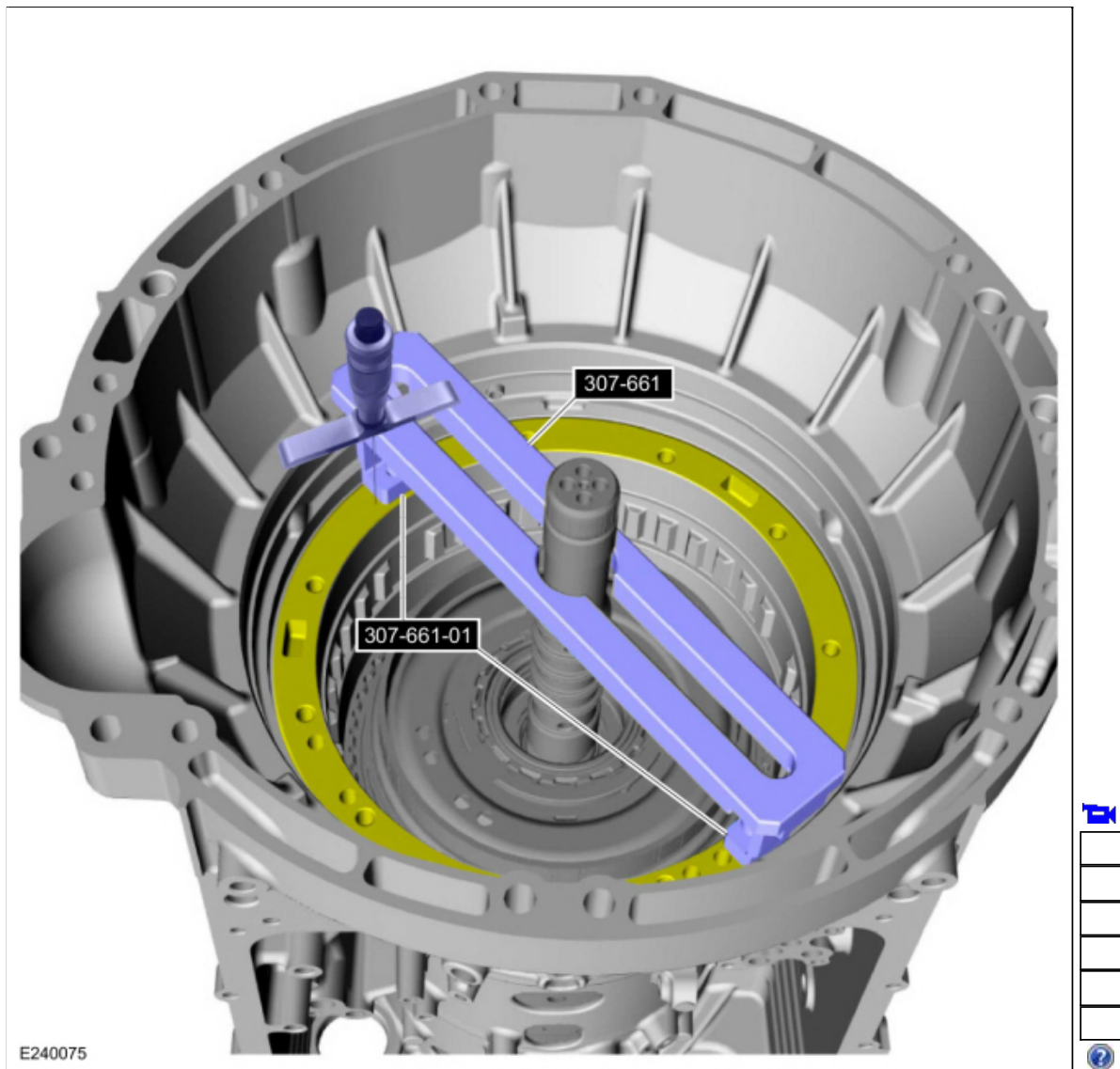


284. Using the special tools and a depth gauge, measure the distance from the top of the special tool to top of the (T3) thrust bearing in 2 different places. Average the measurements. Record this as measurement A.
Use Special Service Tool: [307-661 Gauge, End Play.](#)

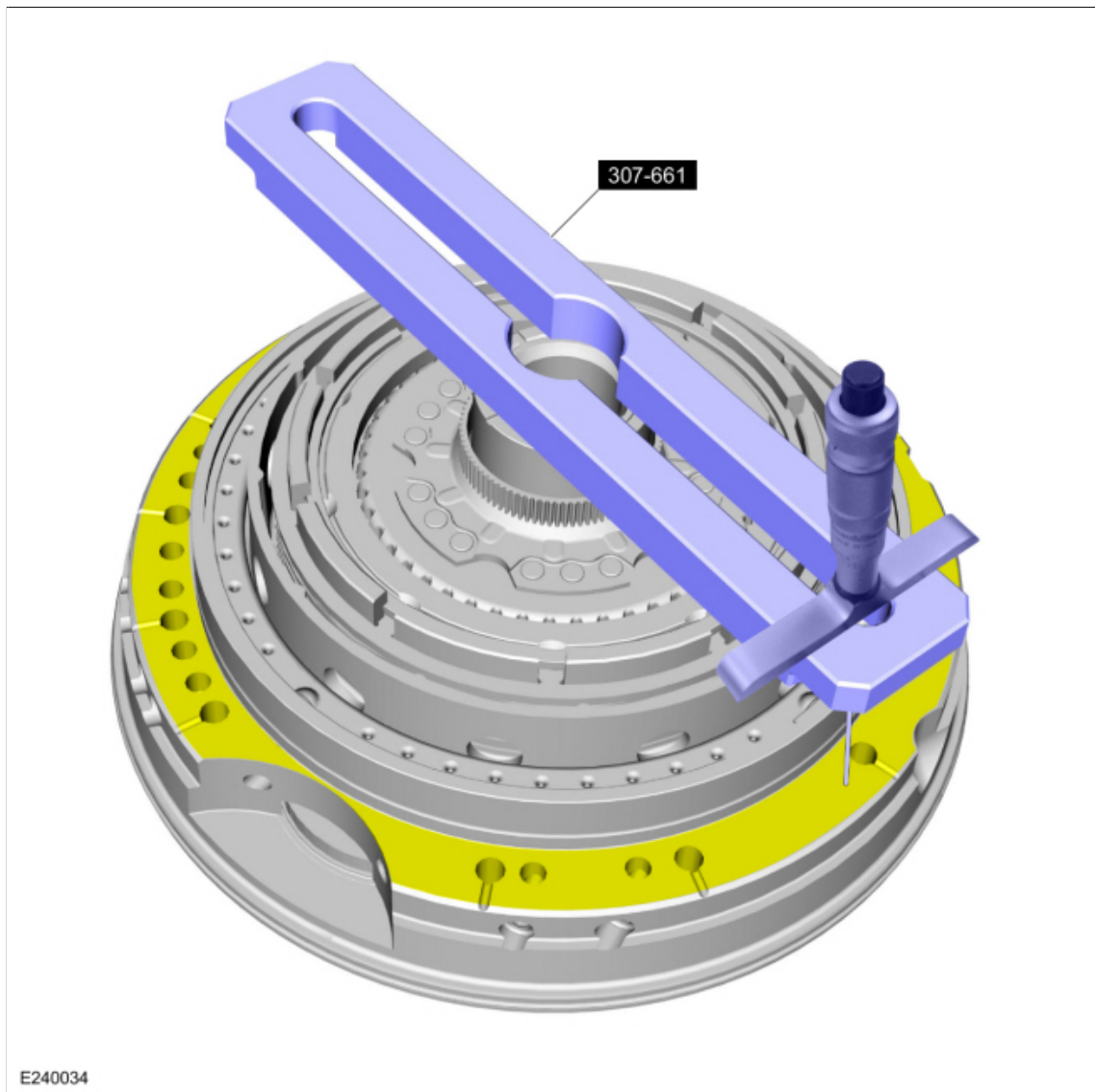




285. Using the special tools and a depth gauge, measure the distance from the top of the special tool to front support mating surface in 2 different places. Average the measurements. Record this as measurement B.
Use Special Service Tool: [307-661 Gauge, End Play](#).

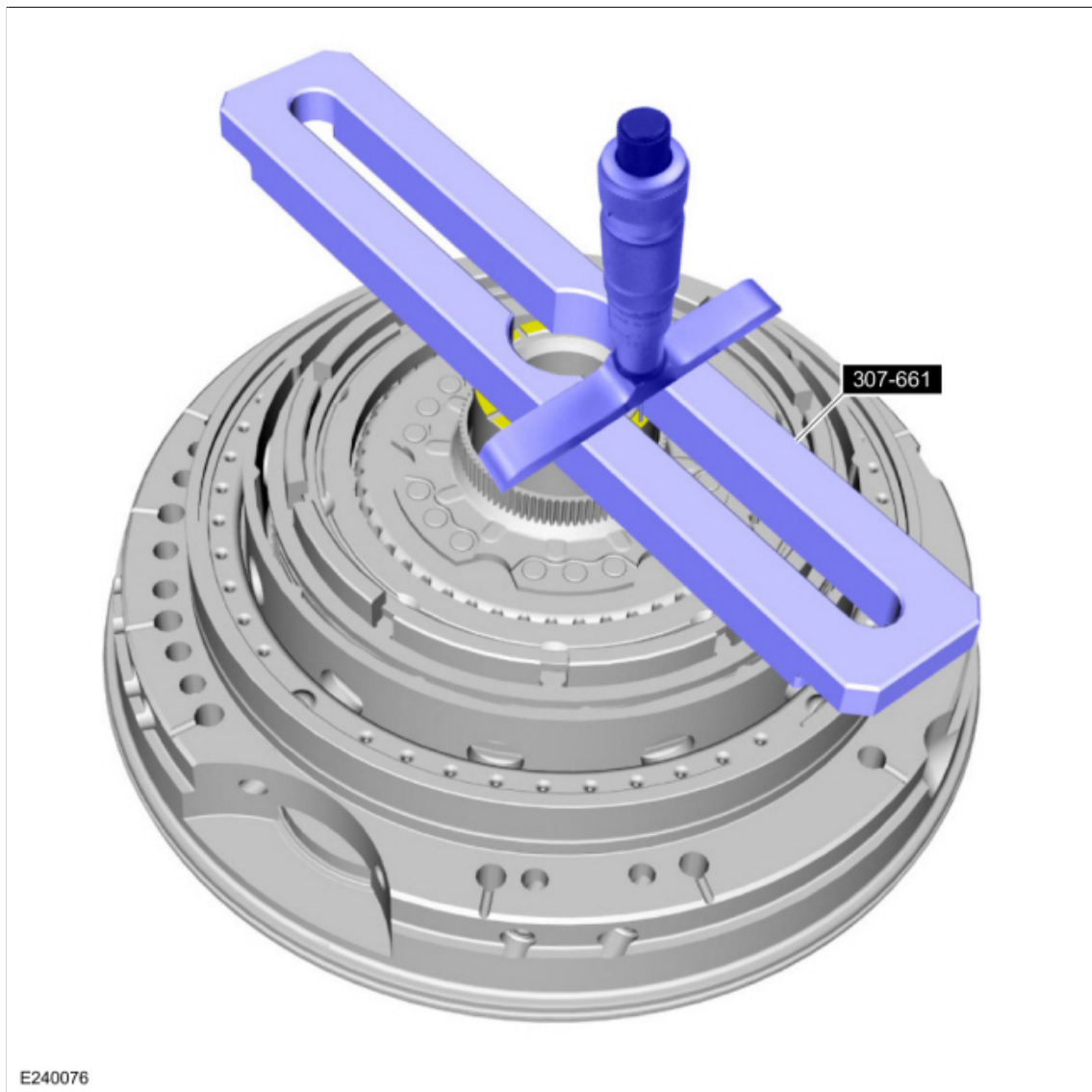


286. Using the special tool and a depth gauge, measure the distance from the top of the special tool to the transmission deck mating surface in 2 different places. Average the measurements. Record this measurement as measurement D. Use Special Service Tool: [307-661 Gauge, End Play](#).



287. Using the special tool and a depth gauge, measure the distance from the top of the special tool to (T3) thrust bearing surface in 2 different places. Average the measurements. Record this as measurement E.
Use Special Service Tool: [307-661 Gauge, End Play](#).



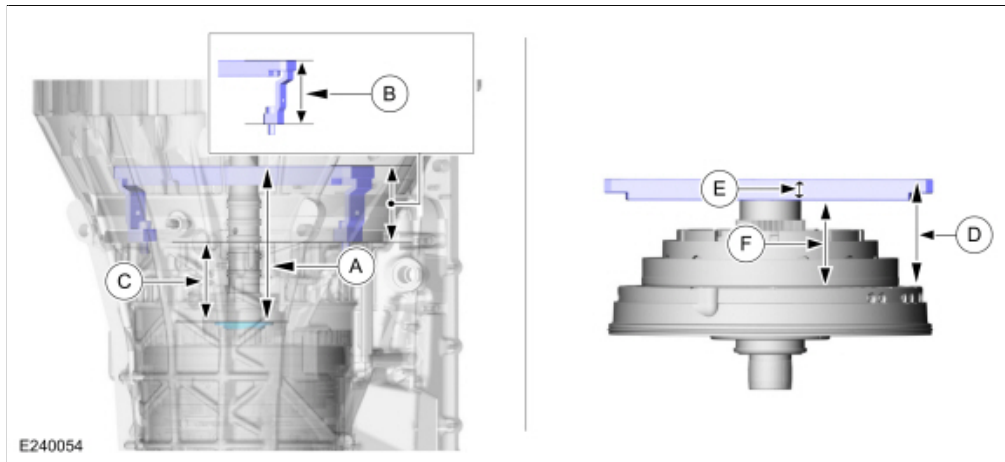


288. **NOTE:** Recorded measurements B and E are included to compensate for the difference in height of the special tool.

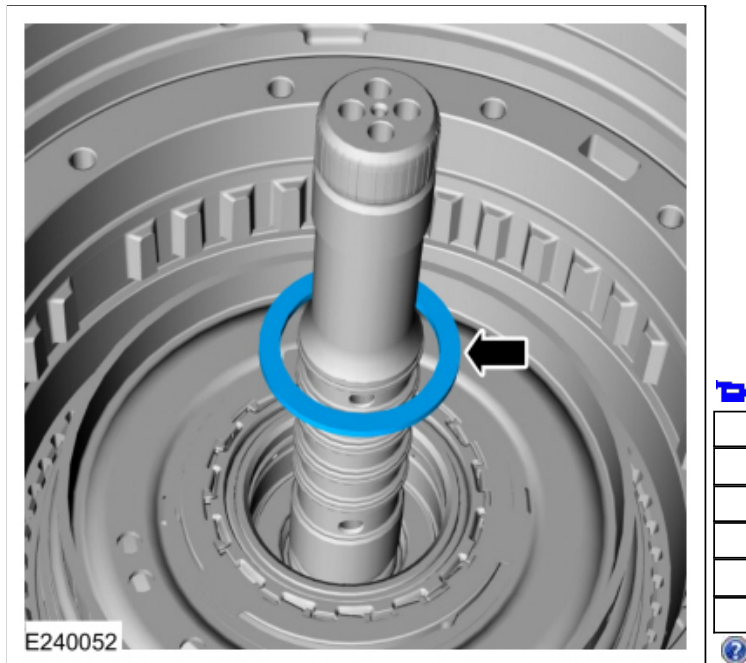
Calculate the correct shim thickness. Subtract measurement B from measurement A and record this as measurement C. Subtract measurement E from measurement D and record this as measurement F. Subtract measurement F from measurement C to get the clearance between the front support and the (T3) thrust bearing. Using the Selective Fit Shim Charts in specifications, select the correct shim.

Refer to: [Specifications](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Specifications).





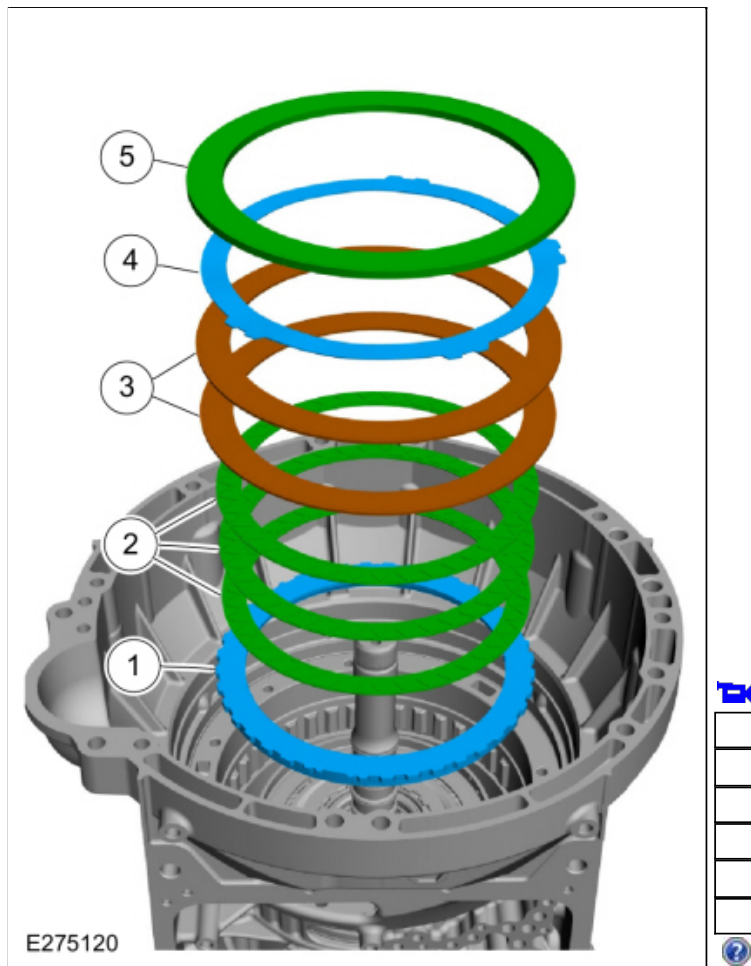
289. Install the selective shim.



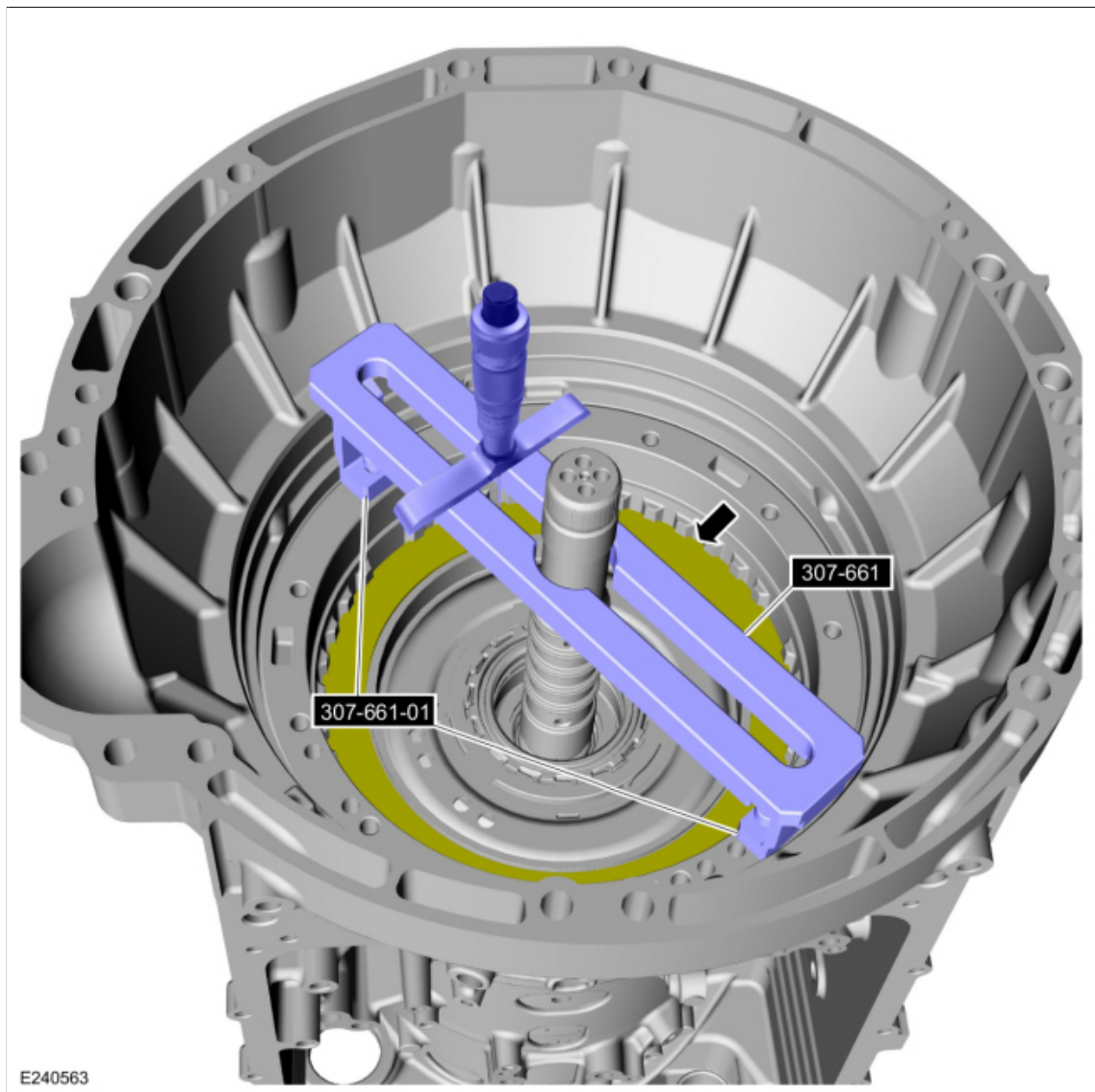
290. **NOTE:** The A clutch separating springs are not installed when measuring the A clutch clearance.

Temporarily install the A clutch into the transmission out of order to measure the A clutch clearance.

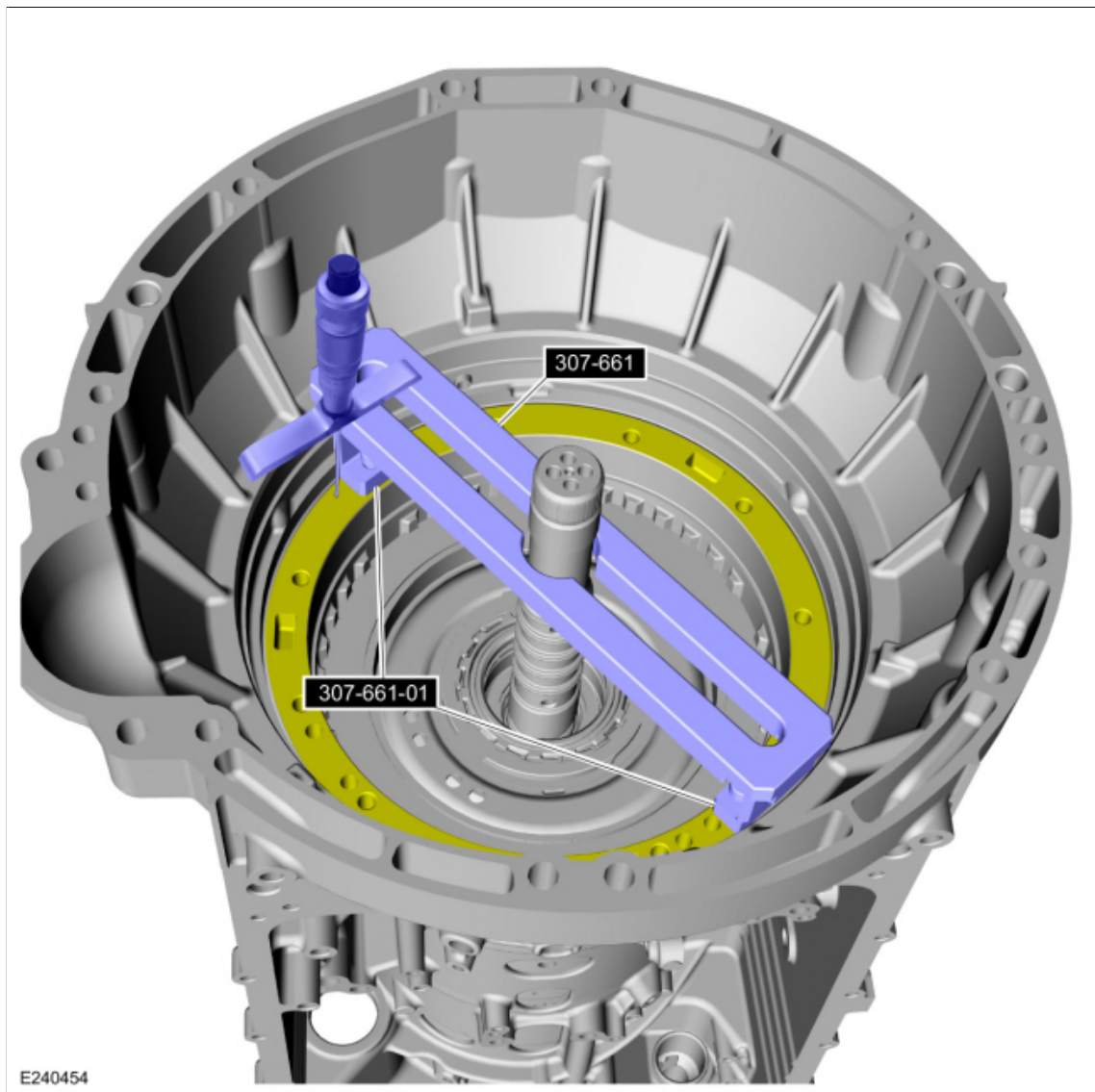
1. Install the pressure plate.
2. Install the friction plates.
3. Install the steel plates.
4. Install the wave spring.
5. Install the apply plate.



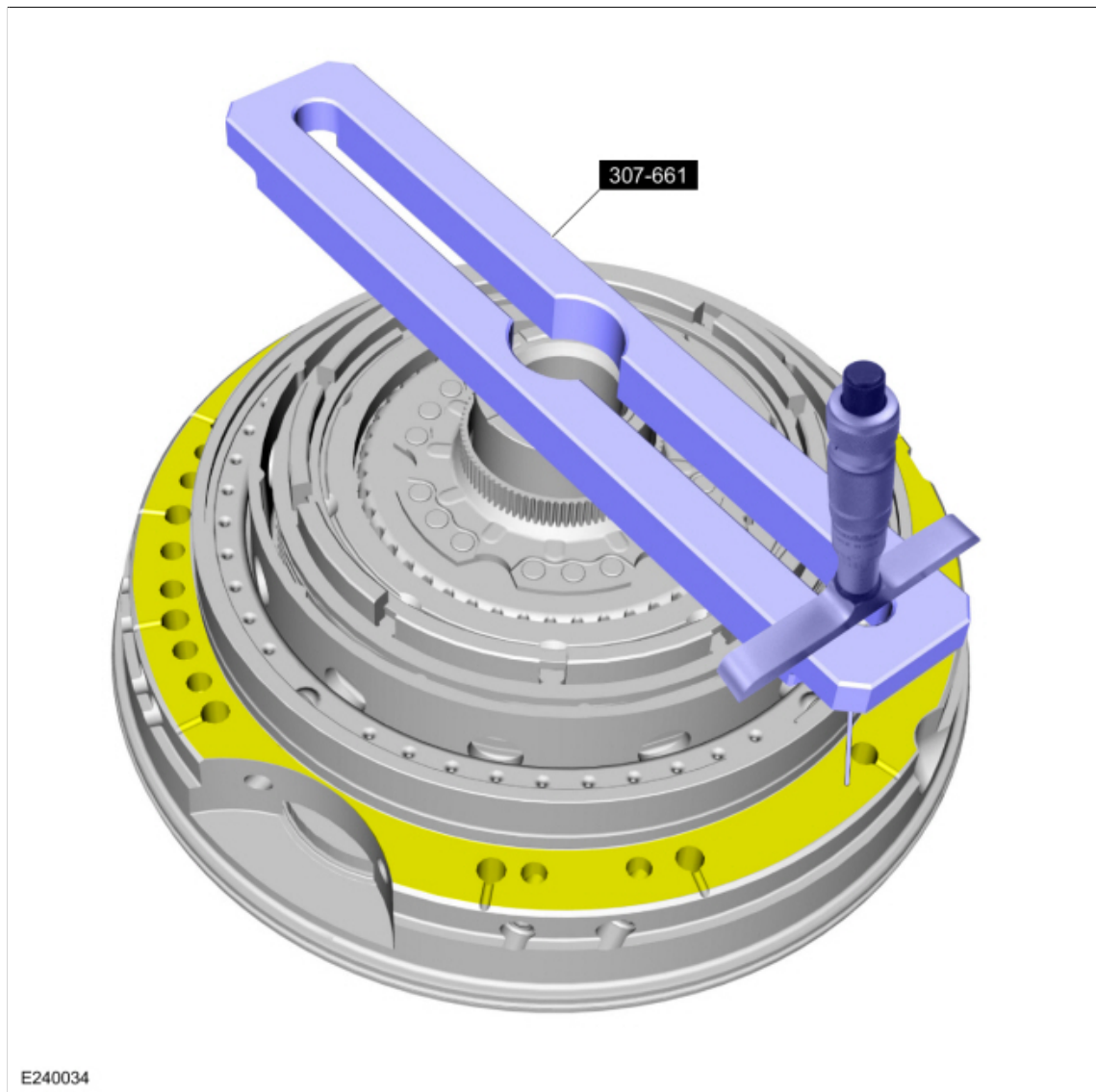
291. Using the special tools and a depth gauge, measure the distance from the top of the special tool to the top of the A clutch apply plate in 2 different places. Average the measurements. Record this as measurement A.
Use Special Service Tool: [307-661 Gauge, End Play](#).



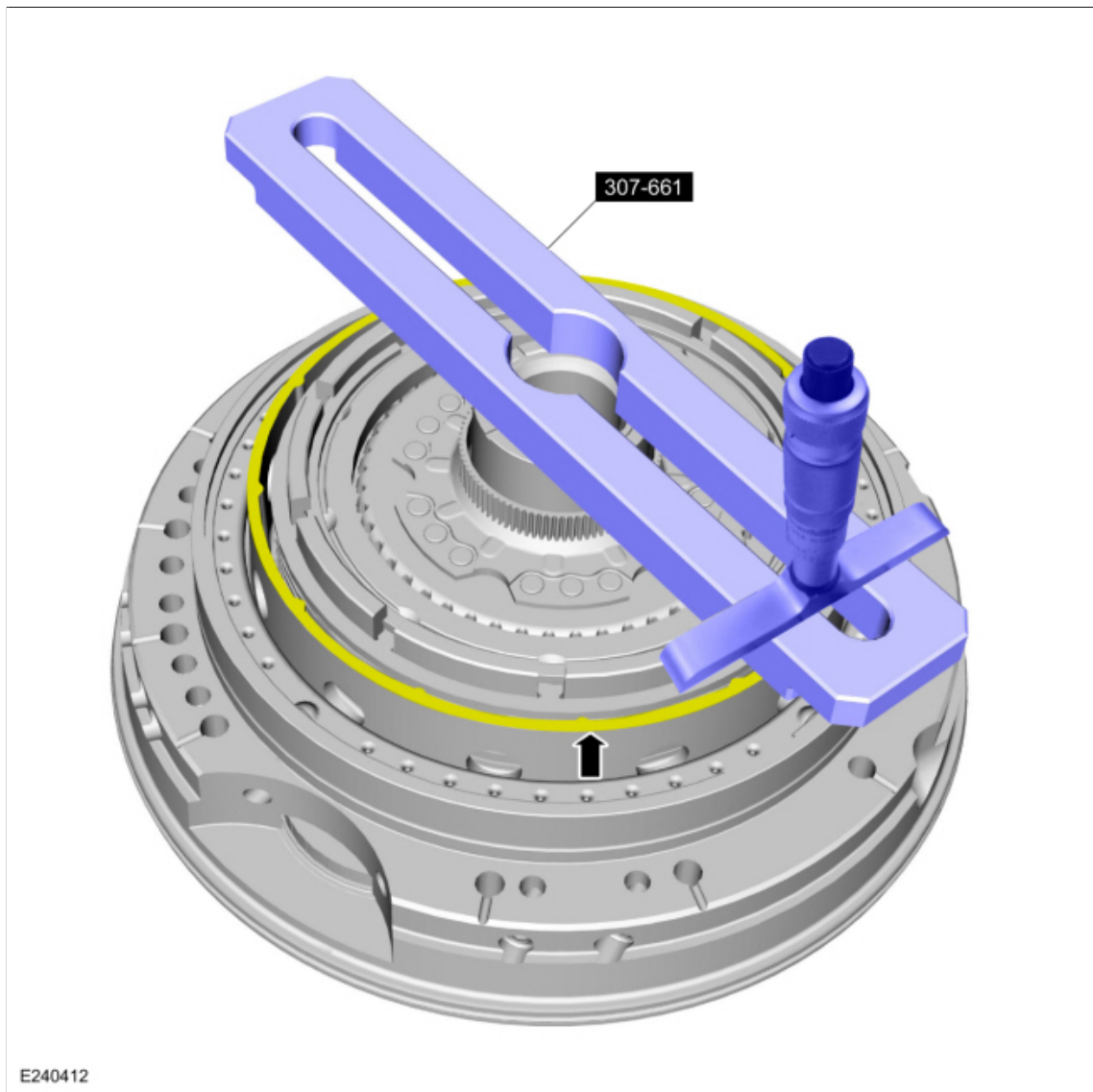
292. Using the special tools and a depth gauge, measure the distance from the top of the special tool to the front support mating surface in 2 different places. Average the measurements. Record this as measurement B.
Use Special Service Tool: [307-661 Gauge, End Play](#).



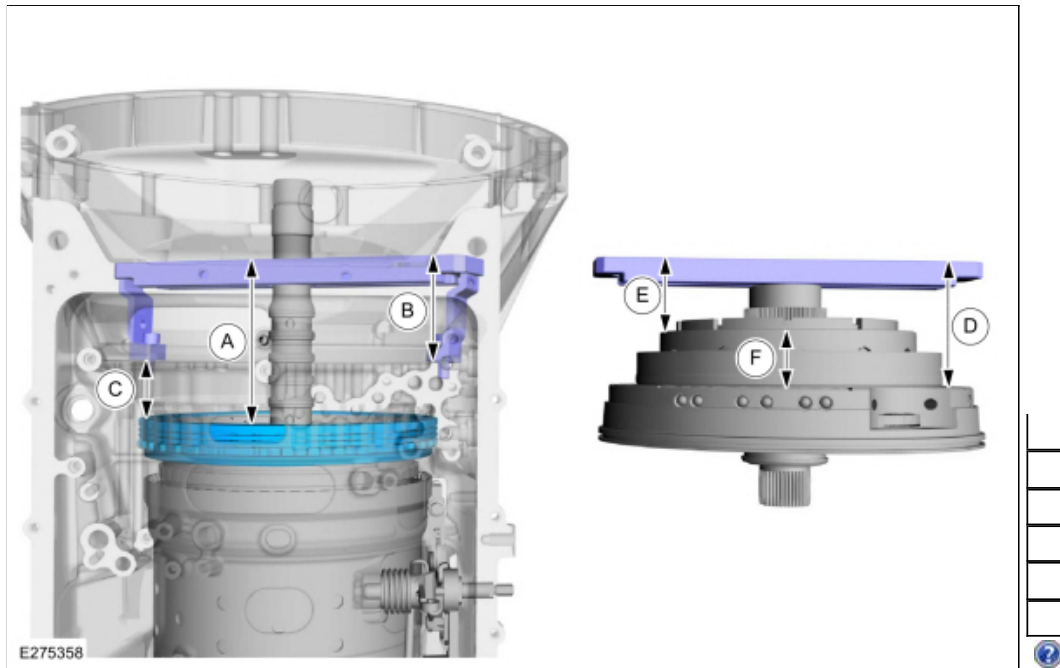
293. Using the special tool and a depth gauge, measure the distance from the top of the special tool to the transmission deck mating surface in 2 different places. Average the measurements. Record this as measurement D.
Use Special Service Tool: [307-661 Gauge, End Play](#).



294. Using the special tool and a depth gauge, measure the distance from the top of the special tool to the A clutch piston surface in 2 different places. Average the measurements. Record this as measurement E.
Use Special Service Tool: [307-661 Gauge, End Play](#).



295. Subtract measurement B from measurement A and record this as measurement C. Subtract measurement E from measurement D and record this as measurement F. Subtract measurement F from measurement C to get the A clutch clearance. Compare the A clutch clearance to the clutch specifications chart. If the A clutch clearance is not within the specification range select the correct A clutch apply plate.
Refer to: [Specifications](#) (307-01 Automatic Transmission - 10-Speed Automatic Transmission - 10R80, Specifications).

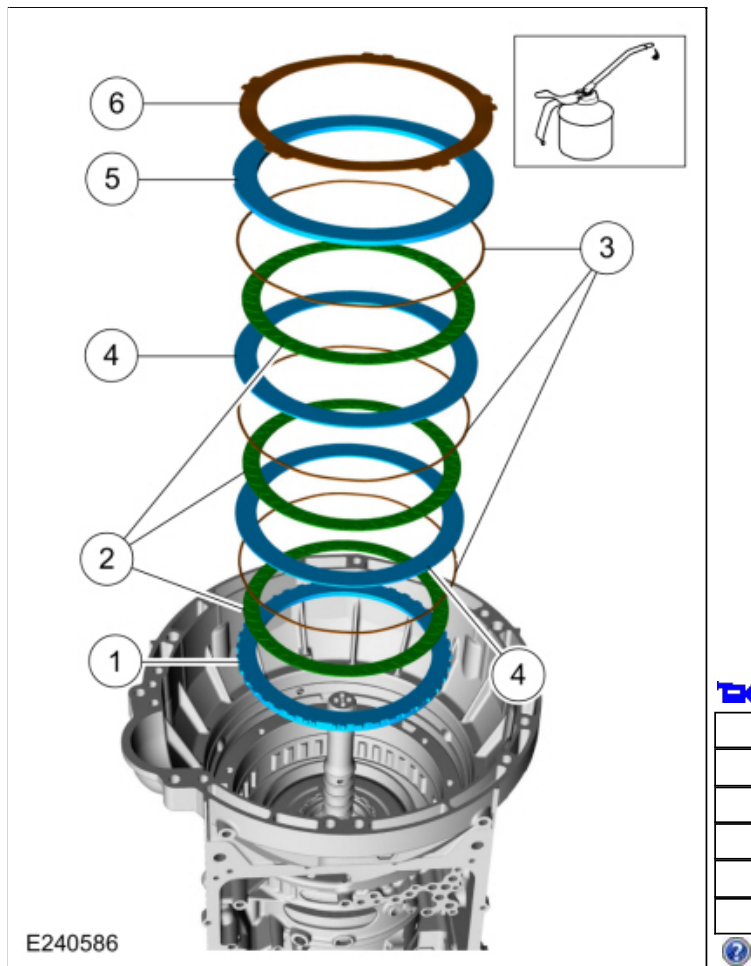


296. **NOTICE:** If replacing A clutch separating springs, all separating springs must be replaced as a matching set or damage can occur.

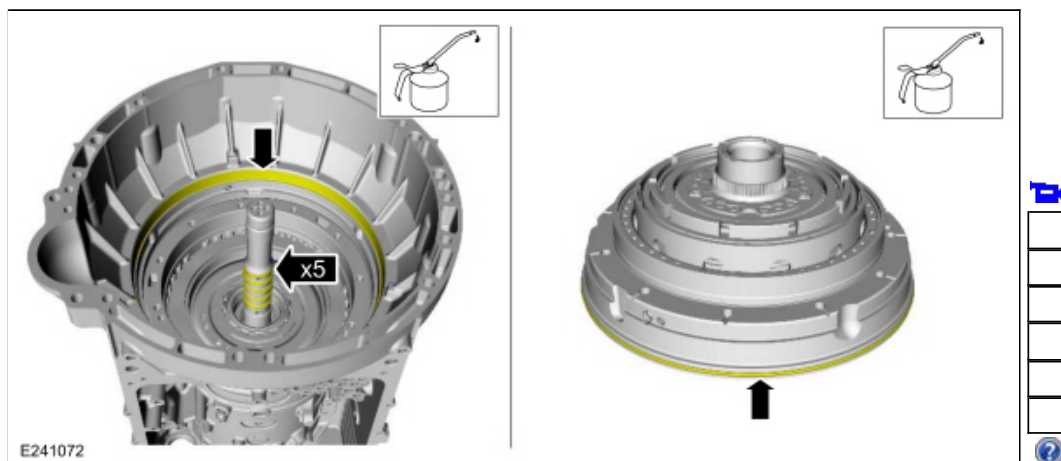
NOTE: Clutch plate quantity is model dependant based on engine displacement.

Soak the A clutch plates in clean transmission fluid. Install the A clutch assembly.

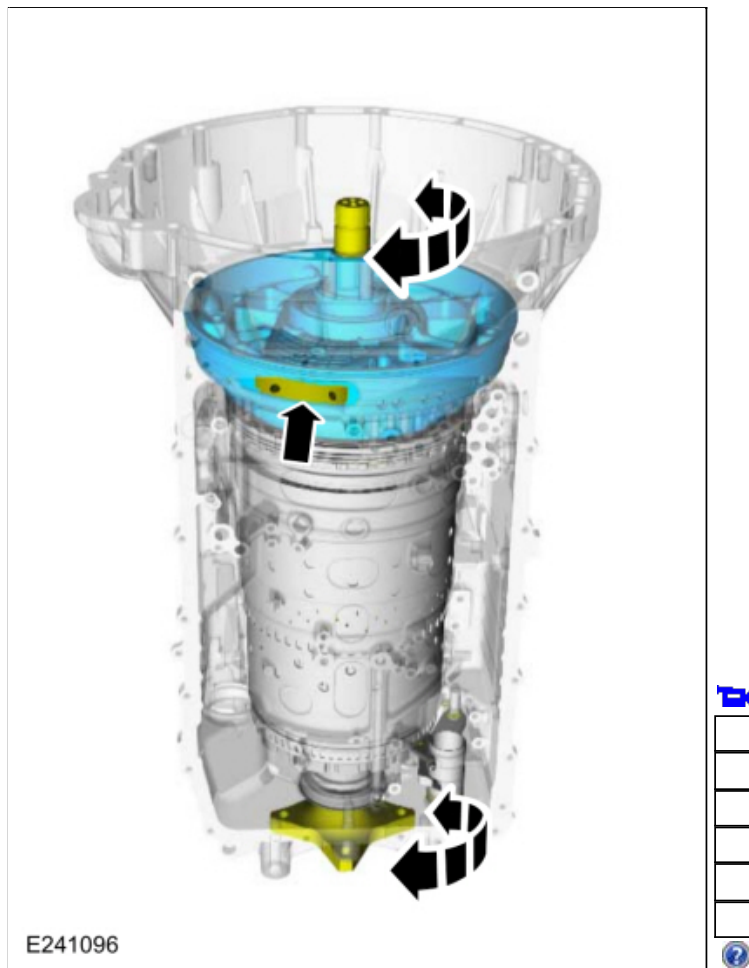
1. Pressure plate
2. Friction plates
Material: Motorcraft® MERCON® ULV Automatic Transmission Fluid / XT-12-QULV (WSS-M2C949-A) (MERCON® ULV)
3. Separator springs
4. Steel plates
5. Apply plate (select fit)
6. Wave spring



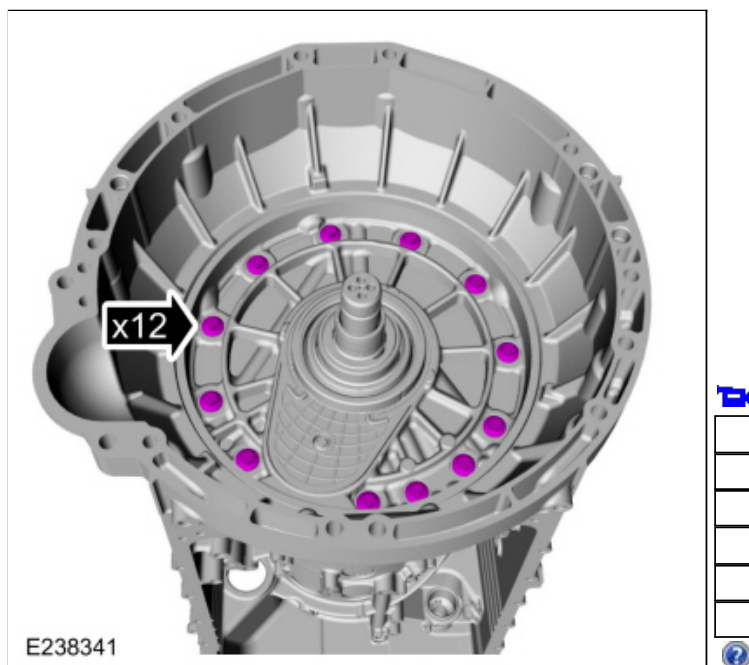
297. Lubricate the transmission case-to-front support sealing surface, the Teflon seals and the front support O-ring with petroleum jelly.



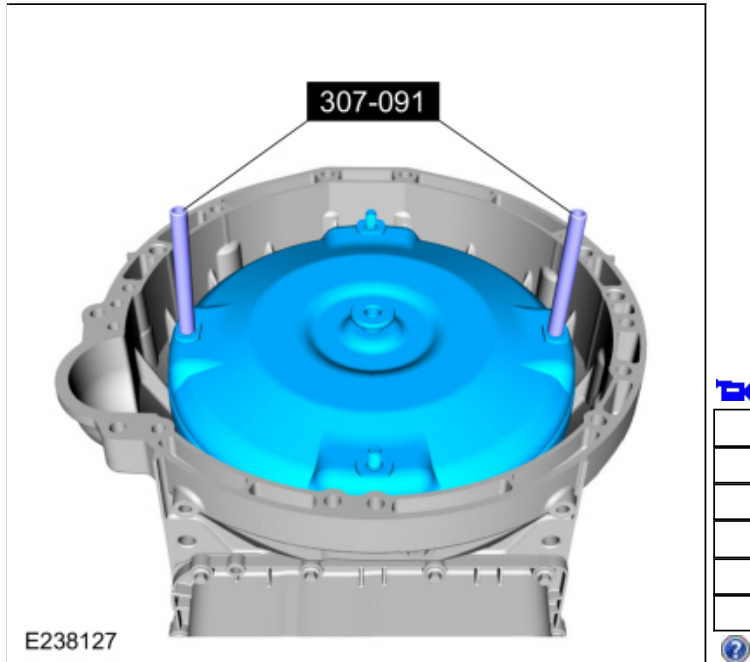
298. Install the front support into the transmission case. Align the pump gear to the pump drive gear pocket area. Rotate the input and output shafts to align the one-way clutch splines with the No. 1 sun gear.



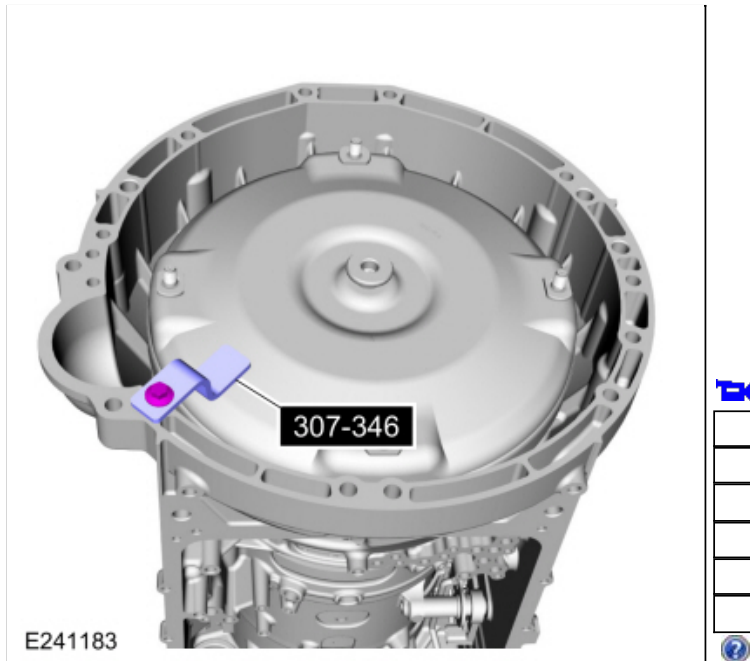
299. Install the new front support bolts. Tighten the bolts in a crisscross pattern.
Torque: 20 lb.ft (27 Nm)



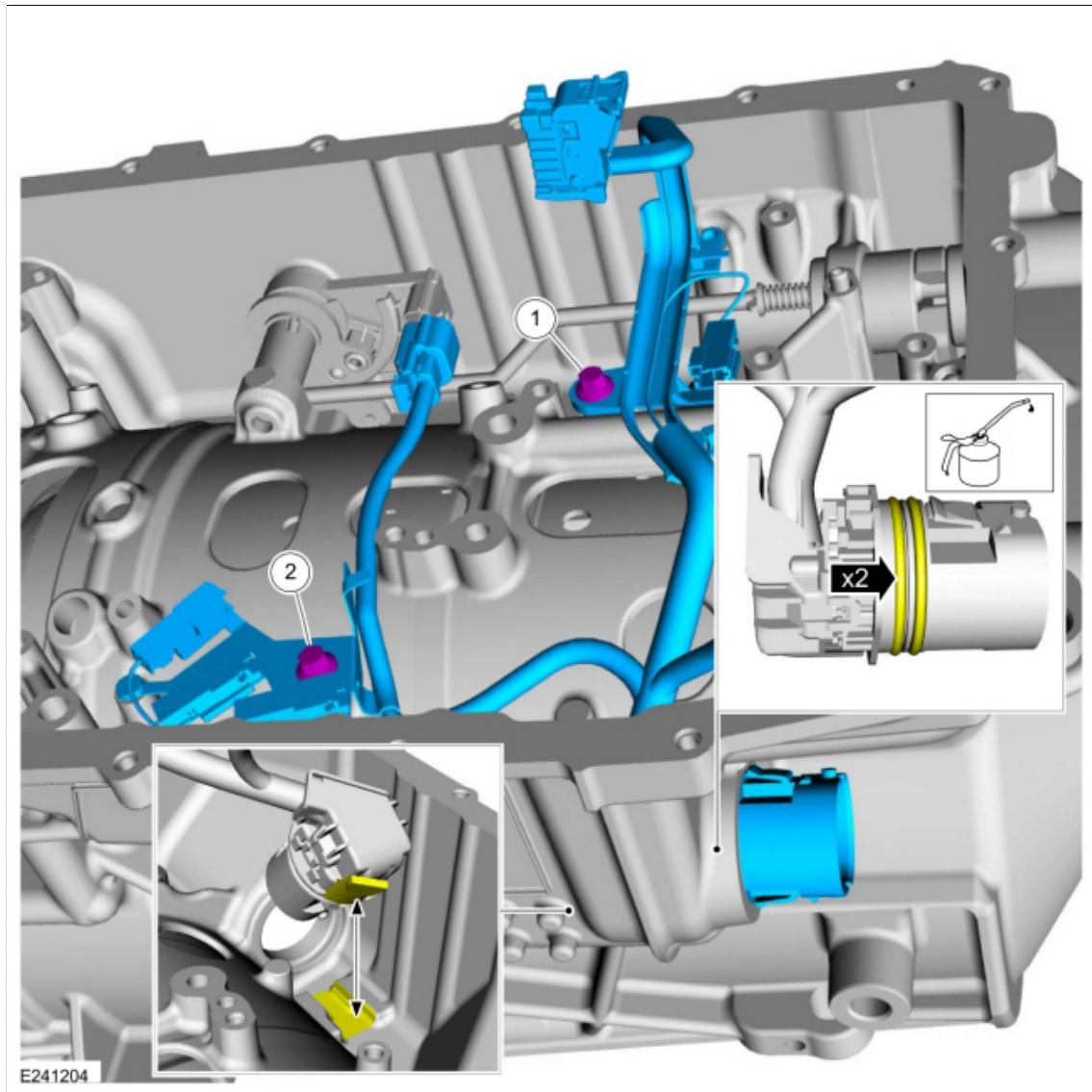
300. Using the special tool, install the torque converter.
Use Special Service Tool: [307-091 Handle, Torque Converter](#).



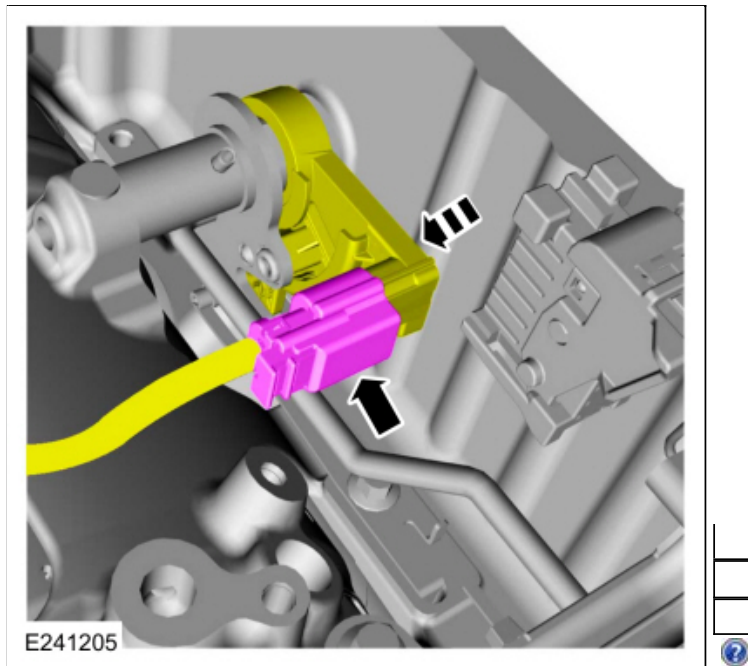
301. Install the special tool to hold the torque converter.
Use Special Service Tool: [307-346 \(T97T-7902-A\) Retainer, Torque Converter](#).



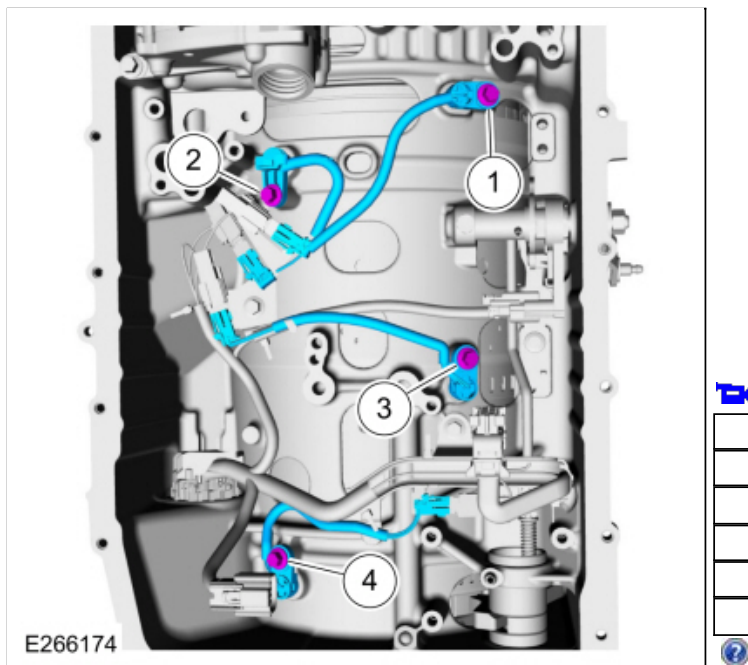
302. Install the wiring harness. Lubricate the O-ring seals with petroleum jelly. Align the tab on the electrical connector with the indentation in the transmission case and install the main electrical connector in the transmission case. Align the wiring harness and install the bolts.
1. *Torque:* 97 lb.in (11 Nm)
 2. *Torque:* 106 lb.in (12 Nm)



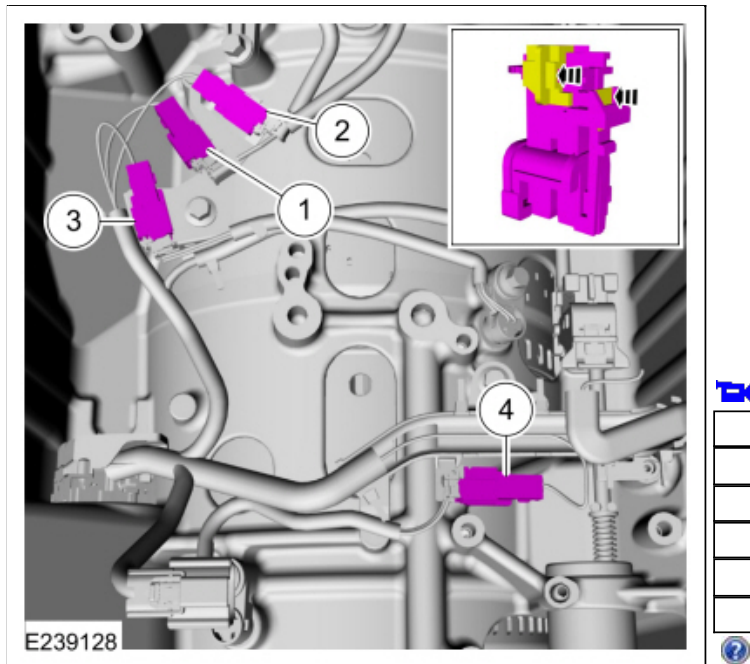
303. Support the opposite side of the TR sensor and connect the electrical connector.



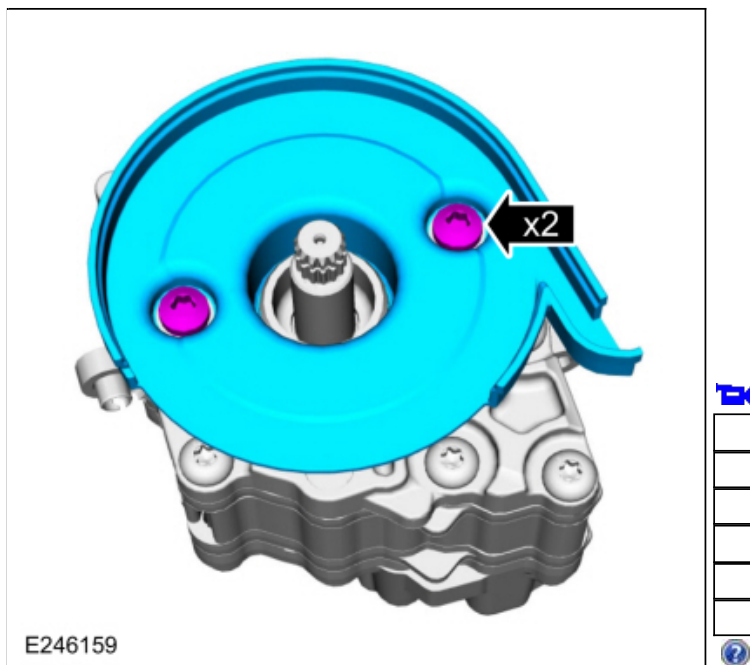
304. Install the speed sensors.
1. Intermediate Speed Sensor A (ISSA)
 2. TSS sensor
 3. Intermediate Speed Sensor B (ISSB)
 4. OSS sensor
- Torque: 62 lb.in (7 Nm)



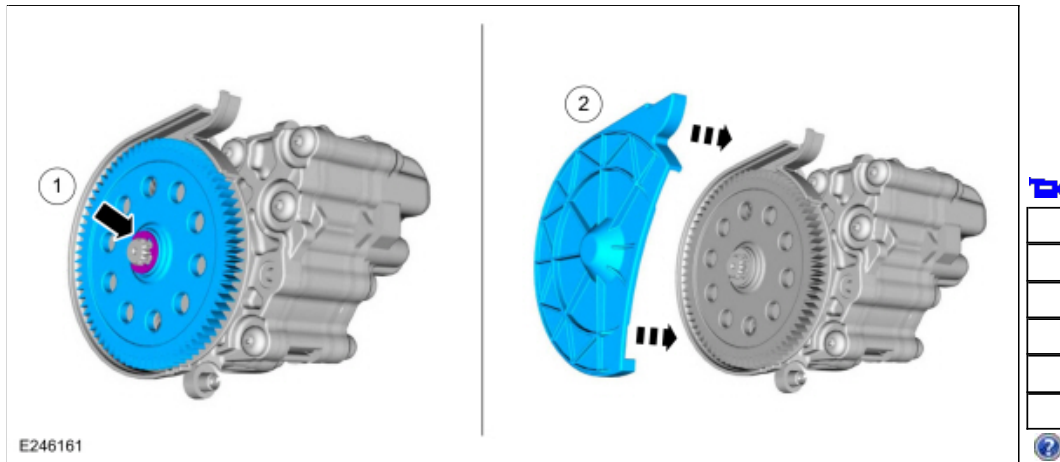
305. Connect and lock the speed sensors.
1. Intermediate Speed Sensor A (ISSA)
 2. TSS sensor
 3. Intermediate Speed Sensor B (ISSB)
 4. OSS sensor



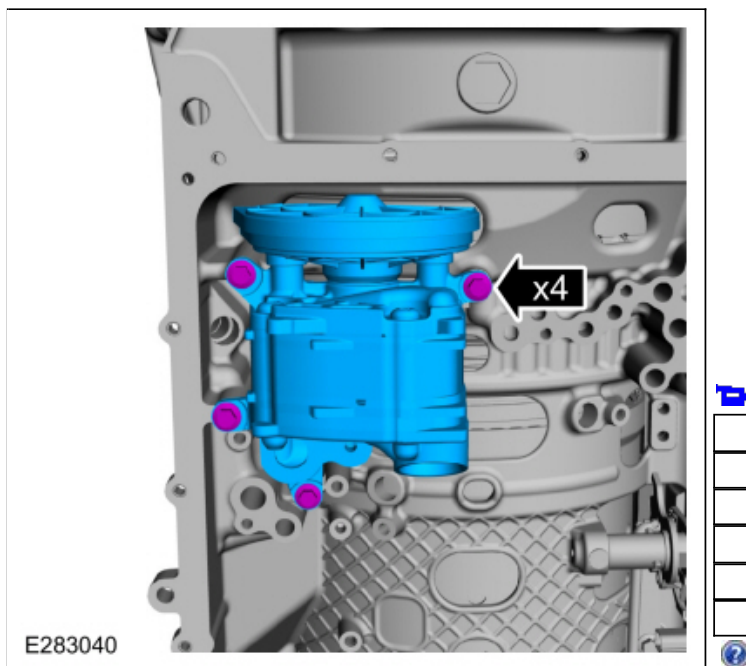
306. If removed, install the transmission fluid pump driven gear inner cover and the bolts.
Torque: 115 lb.in (13 Nm)



- 307.
1. If removed, install the transmission fluid pump driven gear and the retaining ring.
 2. Install the transmission fluid pump driven gear outer cover.



308. Install the transmission fluid pump and the bolts.
Torque: 71 lb.in (8 Nm)



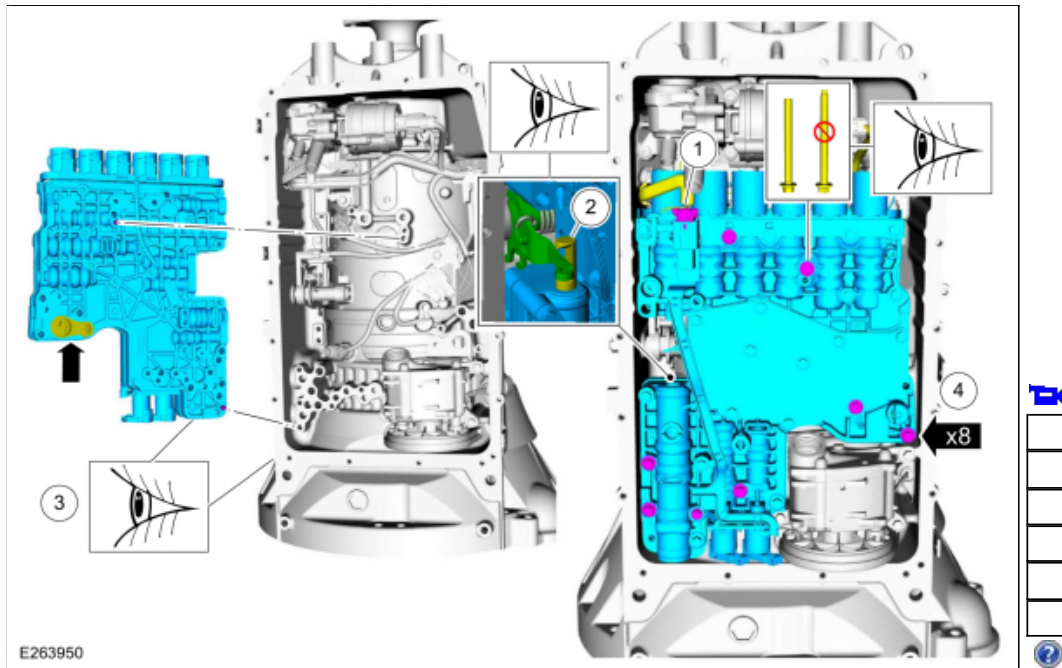
309. **NOTICE:** Do not install a 71 mm length bolt in the location shown or the transmission clutch and planetary container will be damaged and result in transmission failure.

Loosely install the main control valve body.

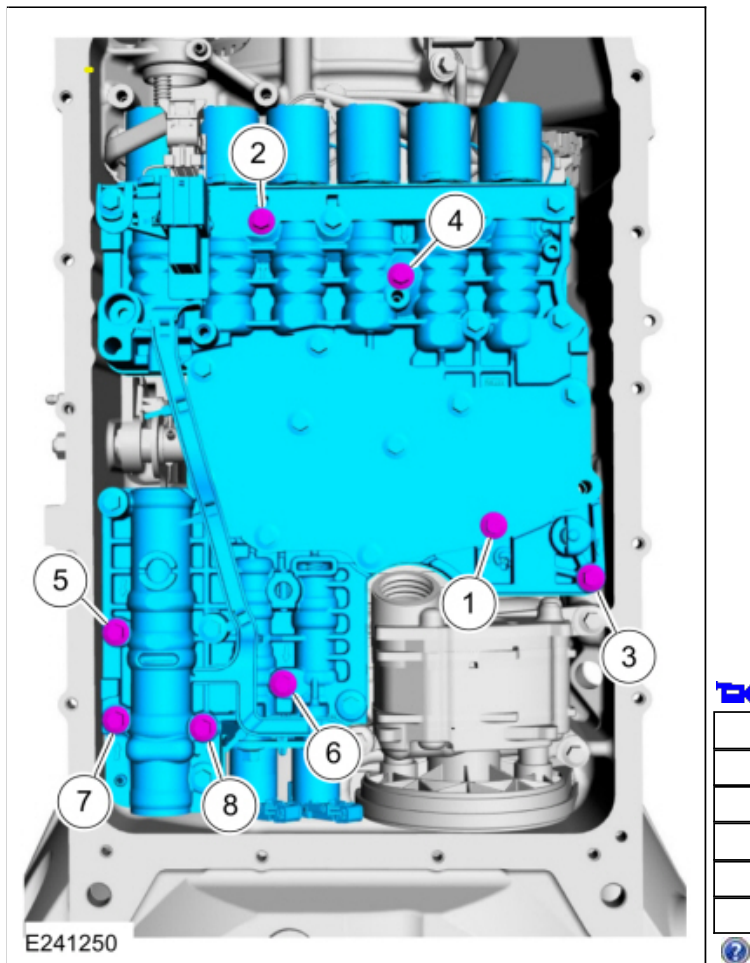
1. **NOTE:** Be sure the main control-to-case seal is attached to the main control.

Connect the internal wiring harness electrical connector while installing the main control valve body.

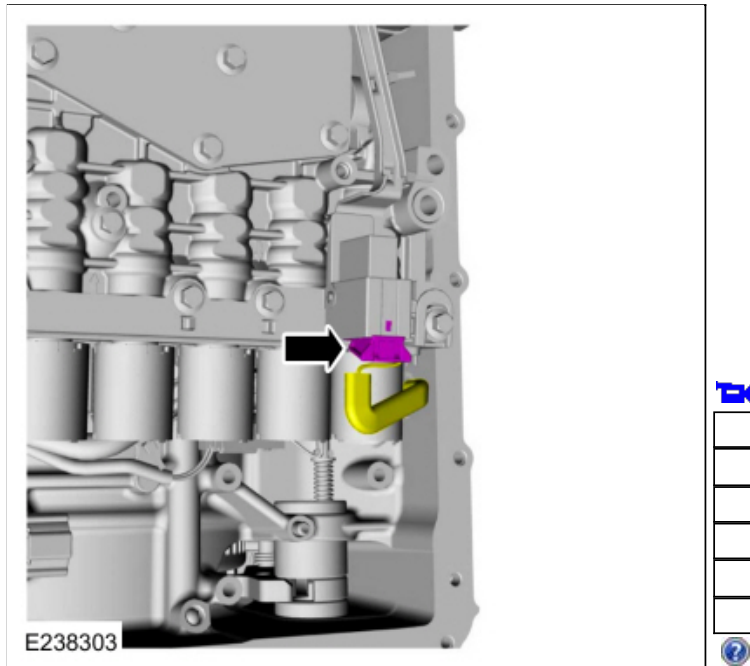
2. If equipped with a park pawl lock valve, align the TR sensor with the park pawl lock valve.
3. Align the guide pins on the main control valve body with the alignment holes in the transmission case.
4. Loosely install the 68 mm length main control-to-transmission case bolts.



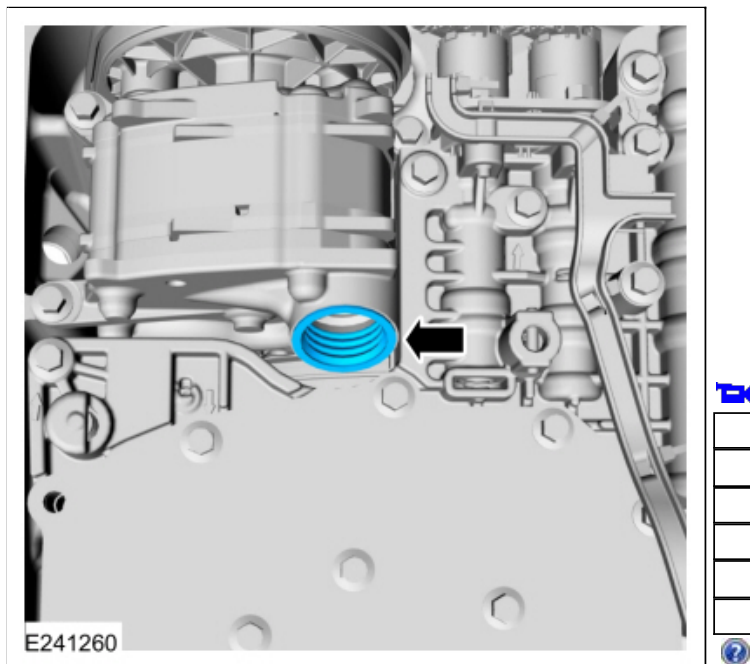
310. Tighten the bolts in the sequence shown.
Torque: 89 lb.in (10 Nm)



311. Lock the main control main electrical connector.



312. Install the filter seal in the pump.



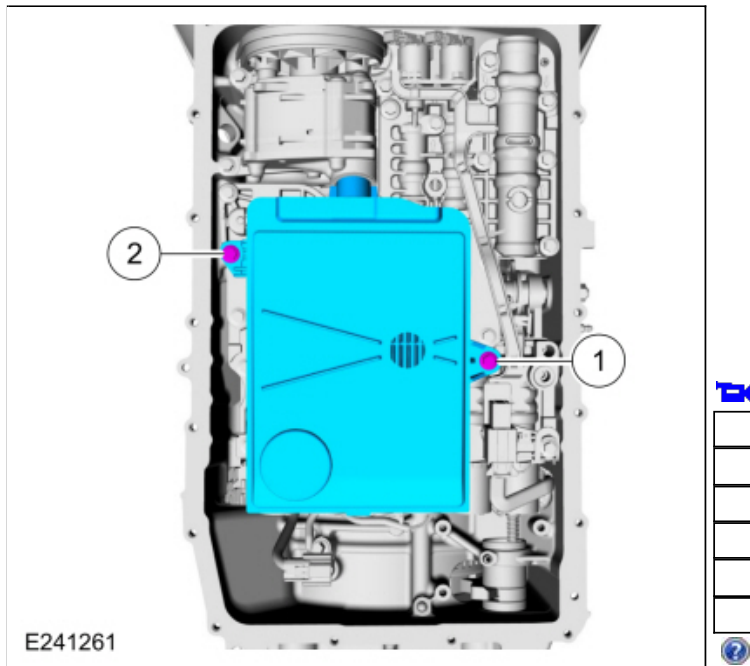
313. **NOTICE:** If the bolts are installed in the wrong locations, transmission damage will occur.

NOTE: The transmission fluid filter may be reused if no excessive contamination is indicated.

Install the filter and the bolts in the correct locations.

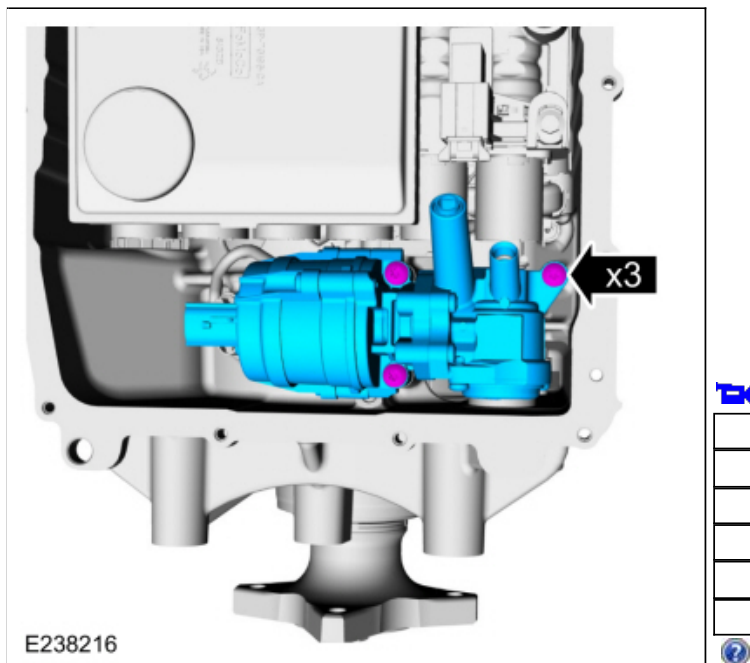
1. Short bolt 20 mm
2. Long bolt 71 mm

- *Torque:* 93 lb.in (10.5 Nm)

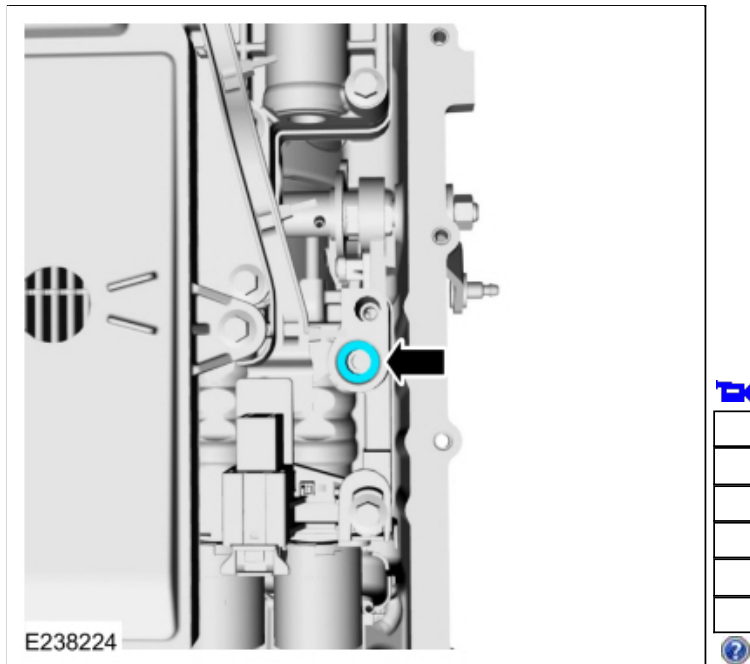


Auto-Start-Stop vehicles

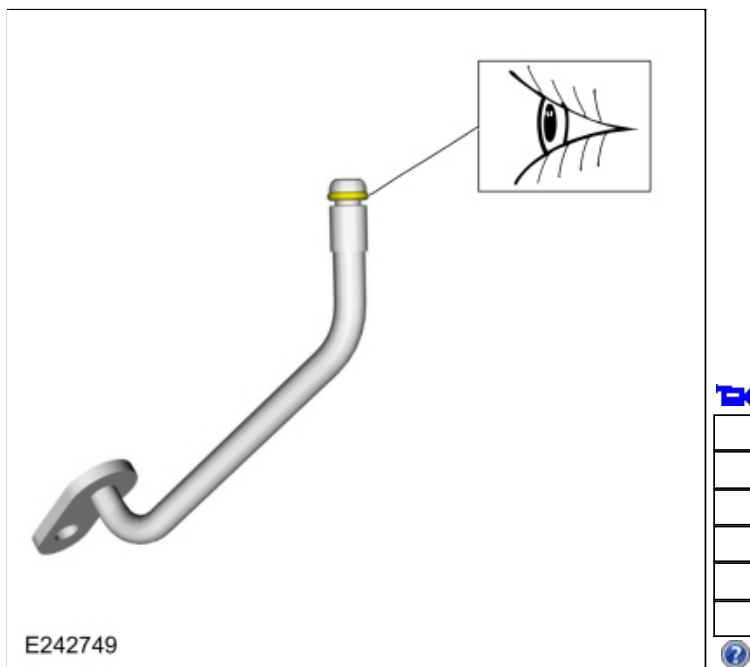
314. Install the transmission fluid auxiliary pump and loosely install the bolts.



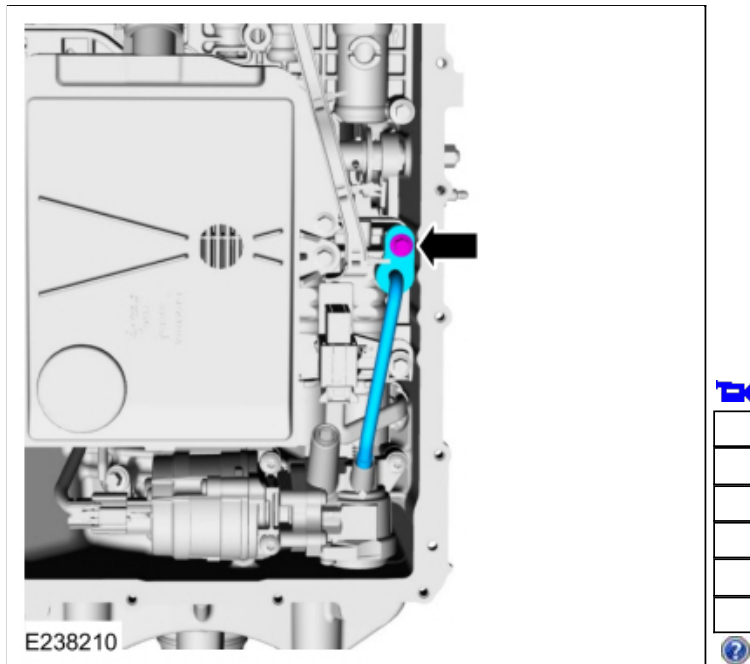
315. Install the new transmission fluid auxiliary pump tube seal.



316. Inspect the transmission fluid auxiliary pump tube O-ring.

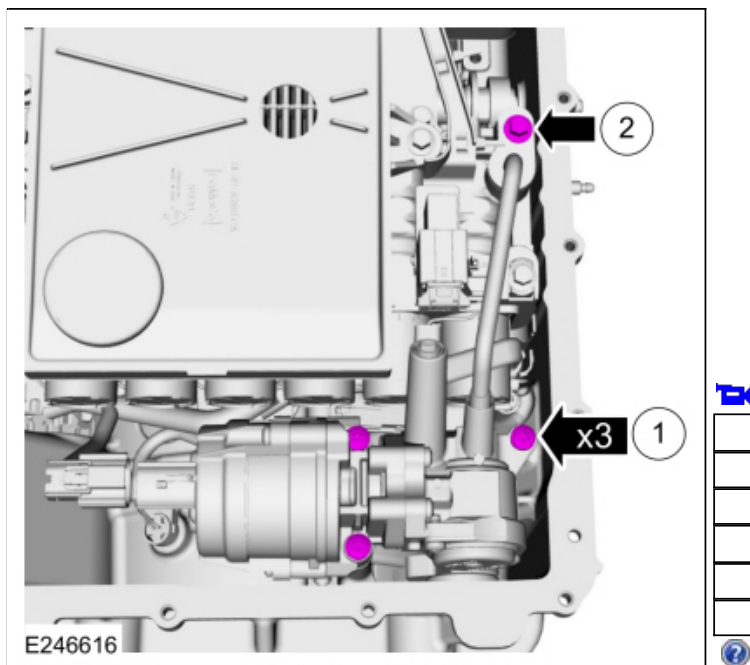


317. Install the transmission fluid auxiliary pump tube and loosely install the bolt.

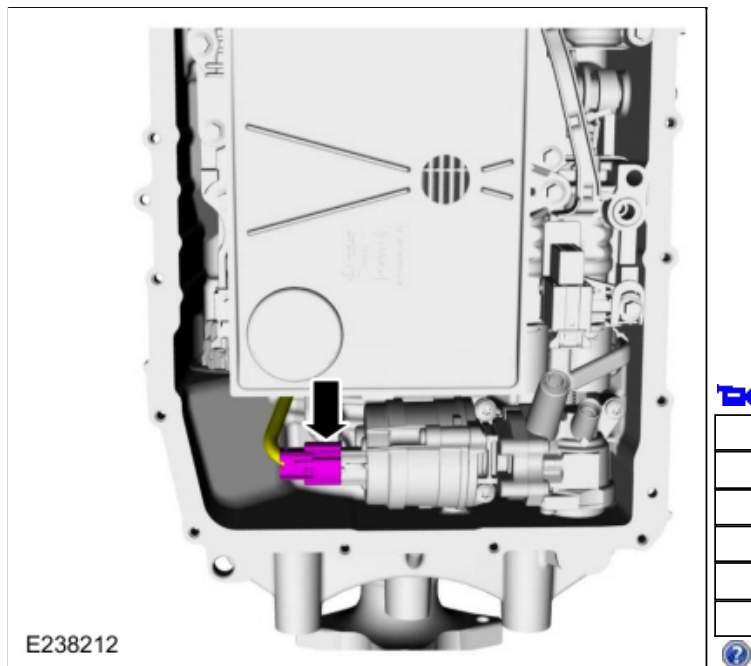


318.

1. Transmission fluid auxiliary pump bolts
Torque: 97 lb.in (11 Nm)
2. Transmission fluid auxiliary pump tube bolt
Torque: 106 lb.in (12 Nm)

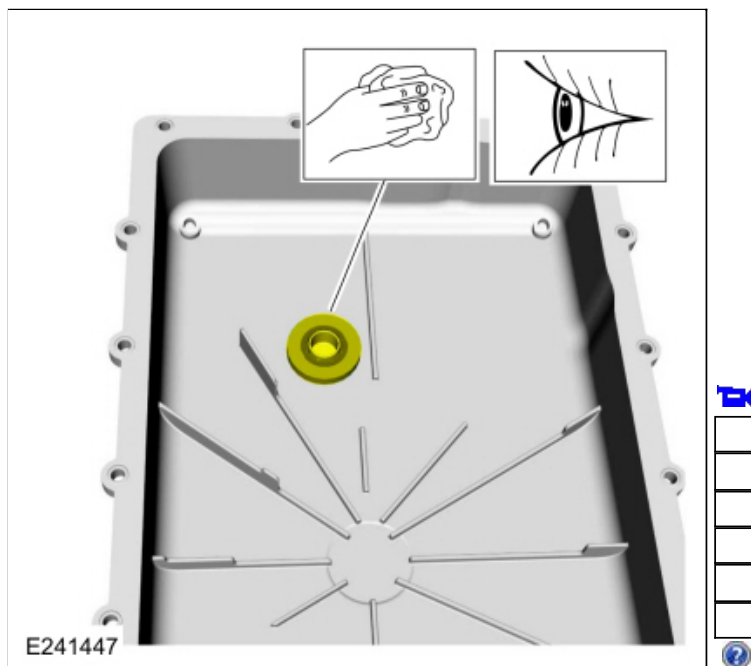


319. Connect the transmission fluid auxiliary pump electrical connector.



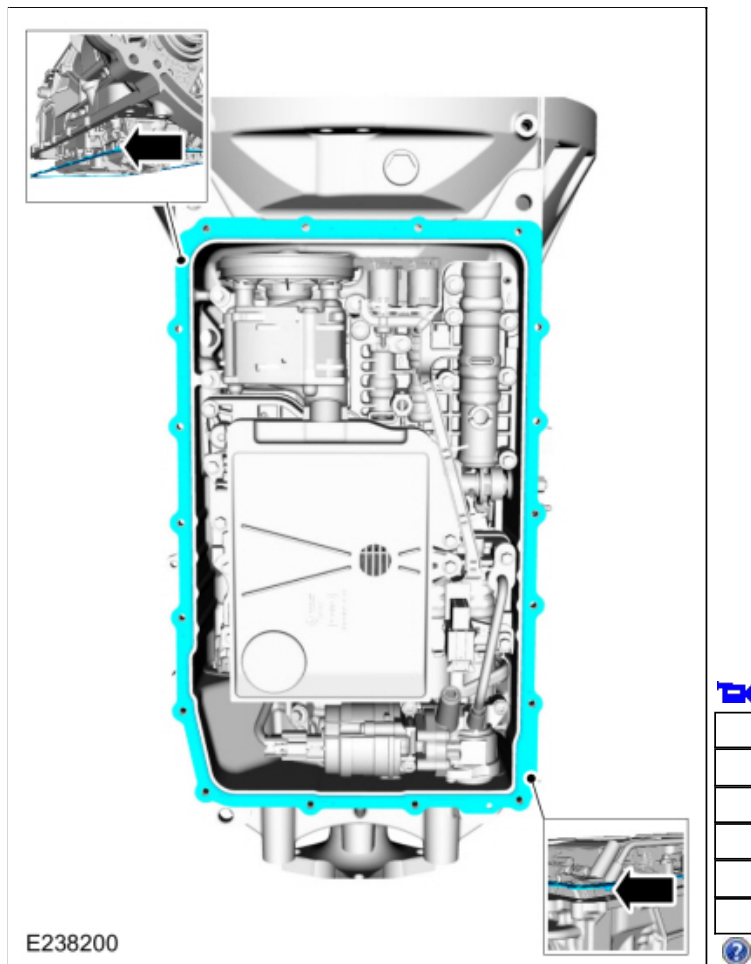
All vehicles

320. Clean and inspect the magnet and the retainer.



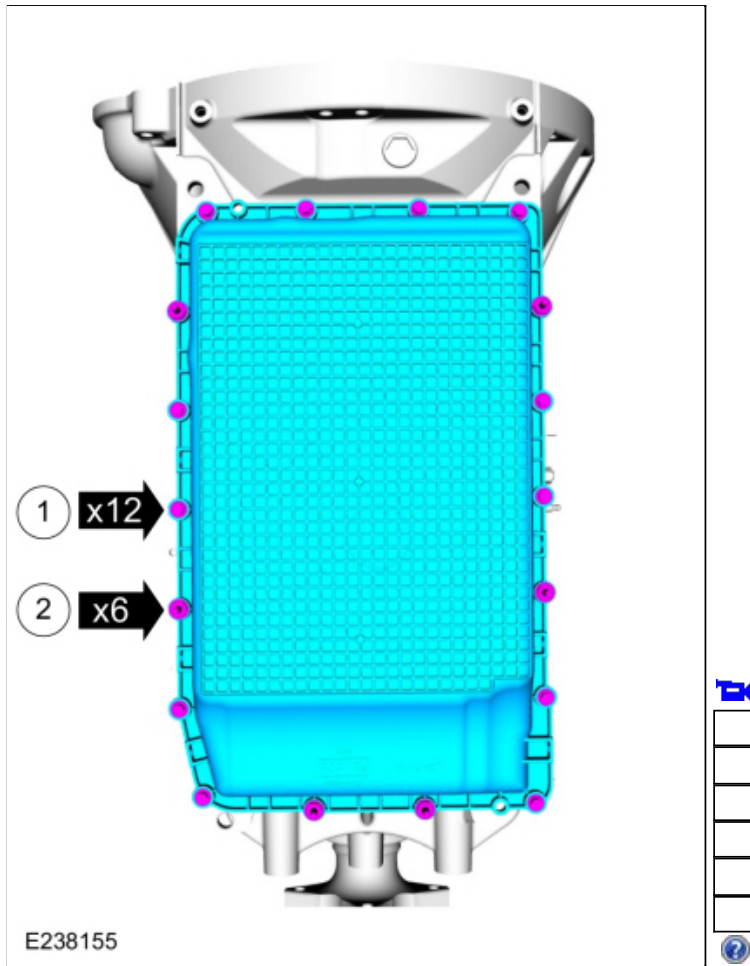
321. **NOTE:** The transmission fluid pan gasket can be reused if not damaged.

Align the tabs in the noted location and install the transmission fluid pan gasket.



322. Install the transmission fluid pan and tighten the bolts in a crisscross pattern.

1. Bolts
Torque: 89 lb.in (10 Nm)
2. Studbolts
Torque: 106 lb.in (12 Nm)



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