

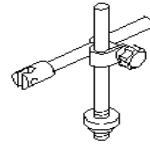
Automatic Transmission - Dismantle and Assemble (Transmission Removed) (17 214 8)

Special Tools



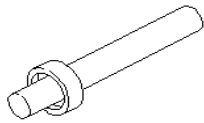
1403801

14-038-01Key, wheel hub



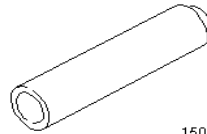
15022A

15-022 ADial gauge holding fixture



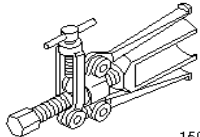
15025A

15-025 ADrift, fitting differential bearing



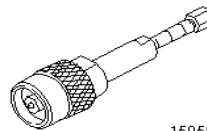
15042

15-042Drift, fitting drive pinion bearing



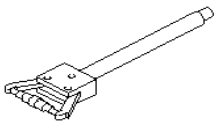
15048

15-048Puller, drive pinion oil seal



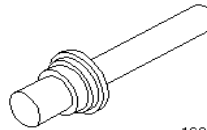
15050A

15-050 AMain tool remover



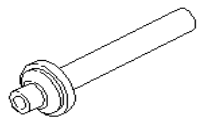
15074

15-074Drift, removing bearing cones



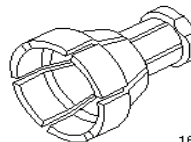
16018

16-018Drift, fitting driveshaft oil seal



16020

16-020Drift, fitting bearing cones



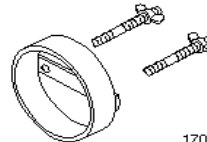
16062

16-062Collet for 15-050 A



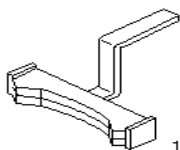
17032

17-032Mounting bracket



17034

17-034Oil pump remover



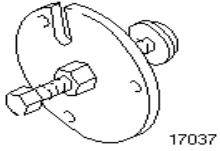
17035

17-035Primary unit locking tool

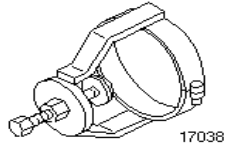


17036

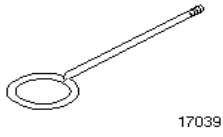
17-036Housing half remover (secondary unit)



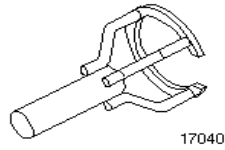
17-037 Housing half remover (primary unit)



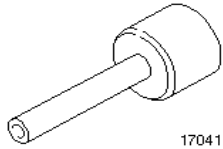
17-038 Secondary unit puller



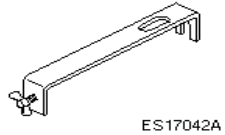
17-039 Sensor shaft remover



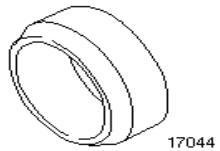
17-040 Spring washer compressor



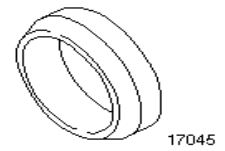
17-041 Installer, radial oil seal



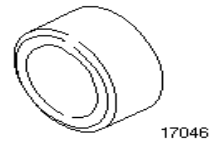
17-042 A Control piston holding clamp



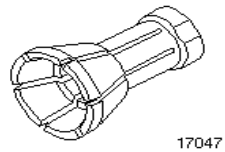
17-044 Forward clutch piston guide sleeve



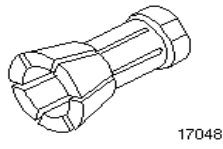
17-045 Reverse clutch piston guide sleeve



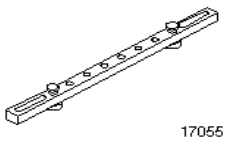
17-046 Secondary unit dummy spacer



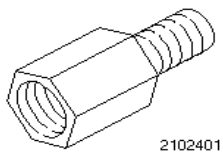
17-047 Collet for 15-050 A



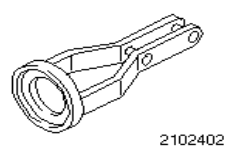
17-048 Collet for 15-050 A



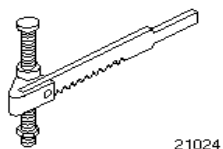
17-055 Measuring rail, determining shim thickness



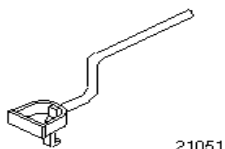
21-024-01 Adapter for 21-024



21-024-02 Adapter for 21-024



21-024 Valve spring compressor



21-051 Oil seal remover

Workshop Equipment

Description	
Assembly stand	

Materials

Description	Ford Specification
Tutela Universal CVT transmission fluid	WSD-M2C199-A
Cleaning agent	Paraffin
Cable ties	
Vaseline	
Sealant, transmission housing	SQM-4G9523-A

Proprietary Tools

Description
Dial indicator gauge
41 mm socket
46 mm socket
Internal extractor
Feeler gauge
Depth gauge
Calliper gauge

Dismantle

1. General notes:

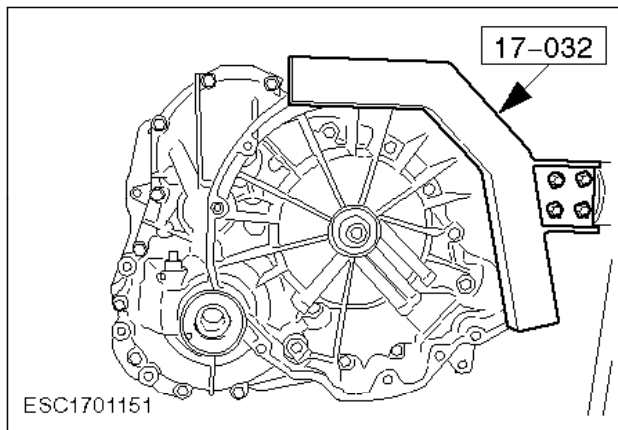
- Clean the transmission to stop dirt getting in during assembly.
- Always use vice jaw protectors when working with a vice.
- Only use paraffin to clean transmission components.
- Do not let the cleaning agent come into contact with the brake bands or the friction plates.
- Lay out the parts removed so they can be easily inspected for damage and in a way that will make assembly easy.
- If deposits (clutch debris or metal shavings) are detected in the transmission fluid during repairs, the transmission has to be completely dismantled and thoroughly cleaned.
- Also carefully clean the oil lines and oil cooler; replace them if dirt build-up is extremely heavy.



CAUTION:

In the case of abraded particles of metal, the valve body, the oil pipes and the oil cooler must be replaced.

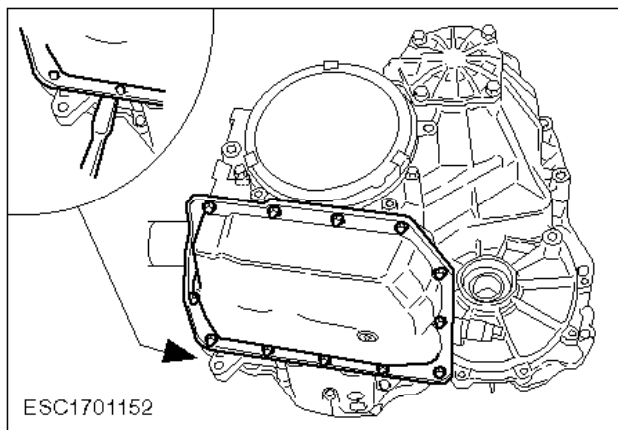
- All clutches at which end float is measured should be pressed together before taking a measurement so as to press out the fluid between the plates.
- When using new clutch plates, place these in automatic transmission fluid for 30 minutes prior to fitting.
- Lubricate all sliding components with automatic transmission fluid prior to assembly.
- Position the thrust washers and needle roller bearings with Vaseline during assembly.



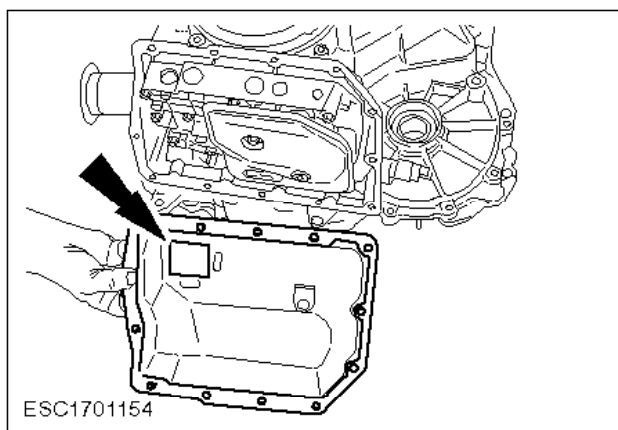
CAUTION:

Do not turn the transmission whilst it is mounted on the assembly stand.

2. Secure the transmission to the assembly stand.



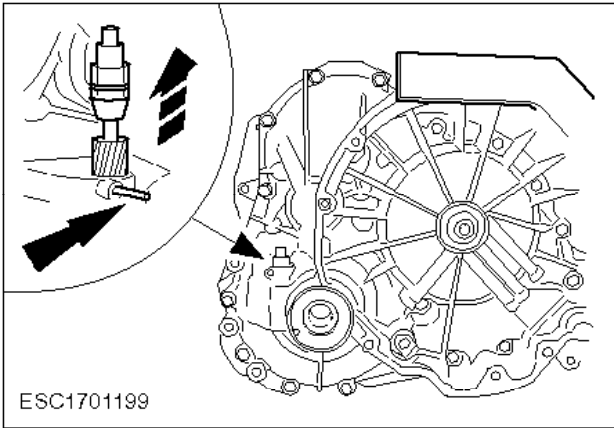
3. Detach the sump downwards.



Note:

Collect the deposits in the oil sump for fault diagnosis purposes. Also refer to the general notes.

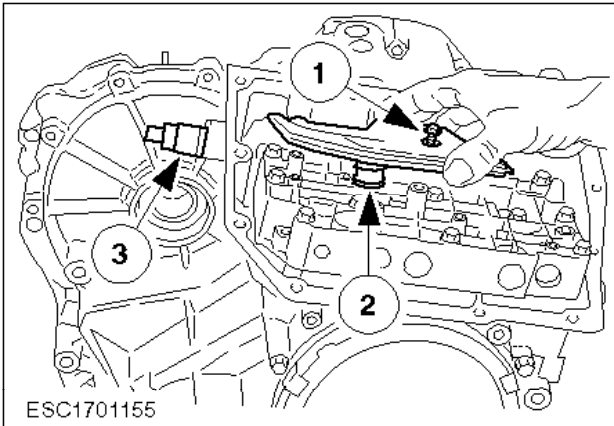
4. Deposits in the sump.
 - Remove the gasket.
 - Remove the permanent magnet.
 - Turn the transmission 90°.



⚠ CAUTION:

Only remove if necessary (leaks, defects).

- 5. Remove the speedometer drive gear.
 - Withdraw the roll pin.
 - Withdraw the sleeve with the drive gear.

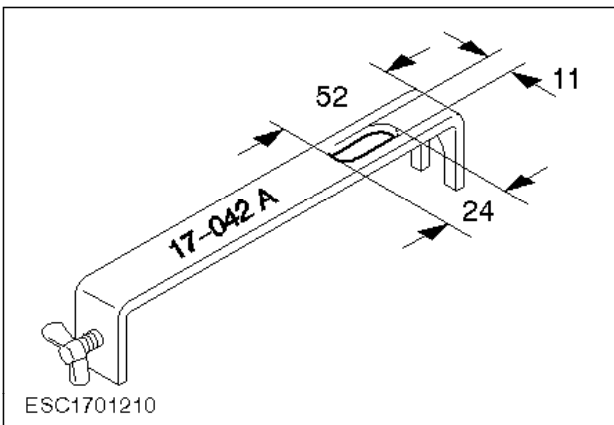


- 6. Remove the oil strainer and the start inhibitor N/D switch.
 - 1 Unscrew the bolt and remove the oil strainer.
 - 2 Remove the seal ring.

⚠ CAUTION:

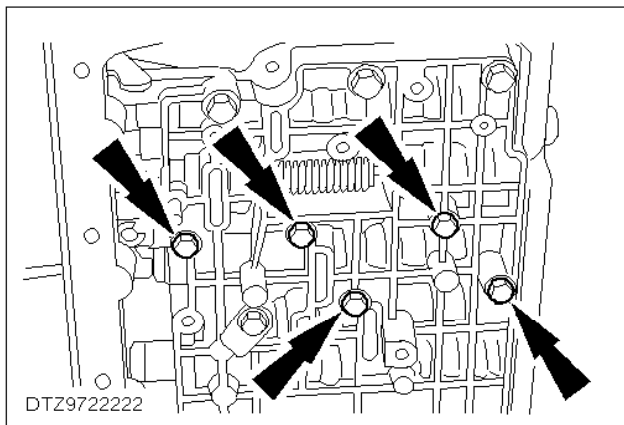
Only remove the start inhibit switch if necessary (leaks, defects).

- 3 Unscrew the start inhibit switch.



Remove the valve body

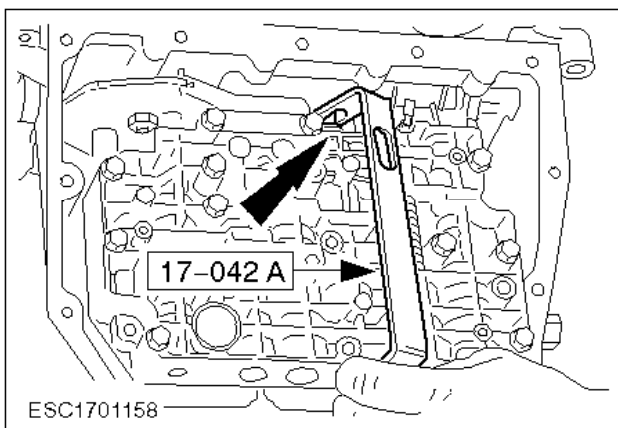
7. Rework Special Tool 17-042 and mark it with "A".



CAUTION:

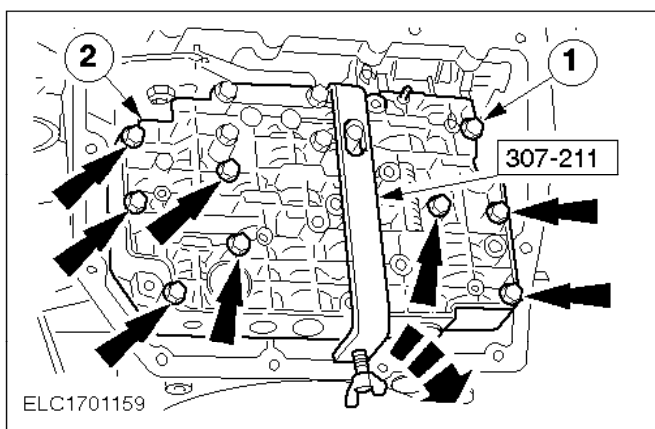
Only unscrew the bolts which are highlighted on the illustration.

8. Unscrew the bolts (x 5) in the valve body assembly.



9. Tension the spool valve.

- Fit the special tool and tighten the knurled screw until finger-tight.



CAUTION:

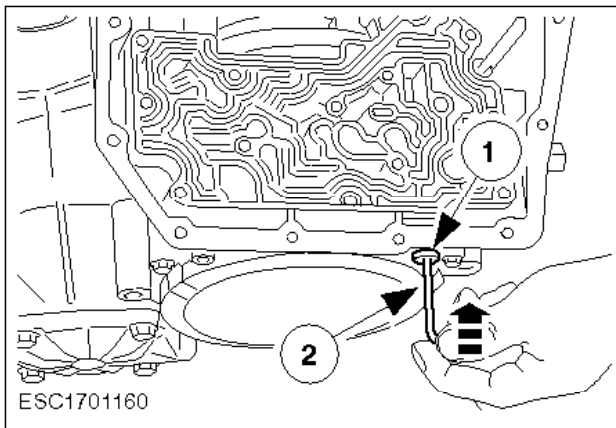
Only unscrew the bolts highlighted on the illustration.

Note:

The manual valve may fall out of the valve body assembly.

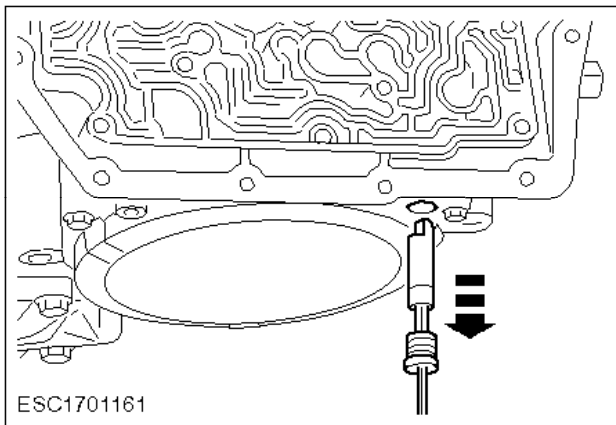
10. Remove the valve body.

- 1 Undo the bolts.
- Remove the valve body assembly.
- 2 Pull out the manual valve (fitted underneath the valve body assembly).



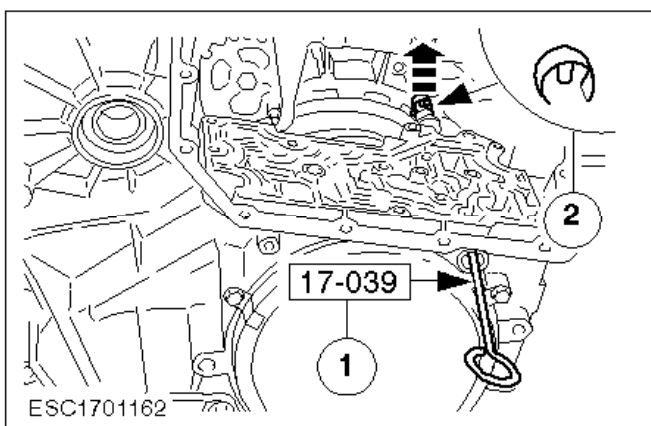
11. Remove secondary pressure adjusting sleeve.

- Remove the dust cap.
- 1 Slacken the blanking plug one turn.
- 2 Using a 4 mm Allen key, press the adjusting sleeve in against the spring pressure and hold it in position.
- Unscrew the blanking plug.



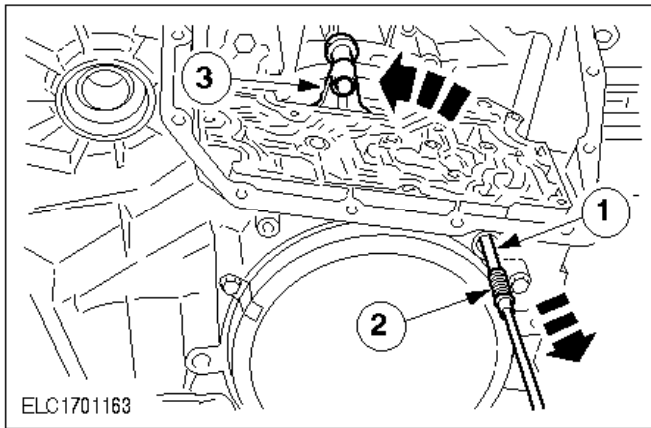
12. Remove adjusting sleeve (continued).

Withdraw the sleeve with the Allen key.



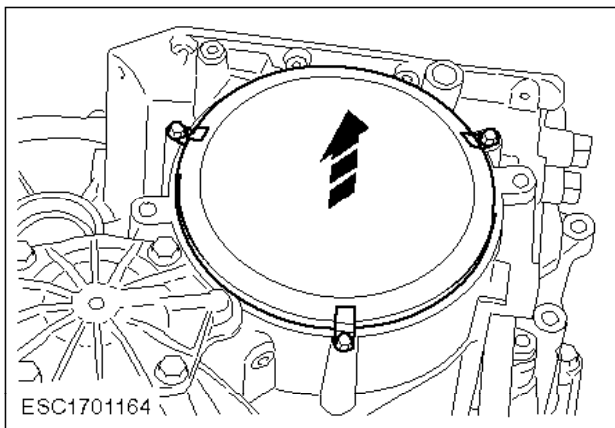
13. Remove the sensor shaft.

- 1 Insert the special tool.
- 2 Withdraw the locking clip.



14. Remove the gear ratio sensor.

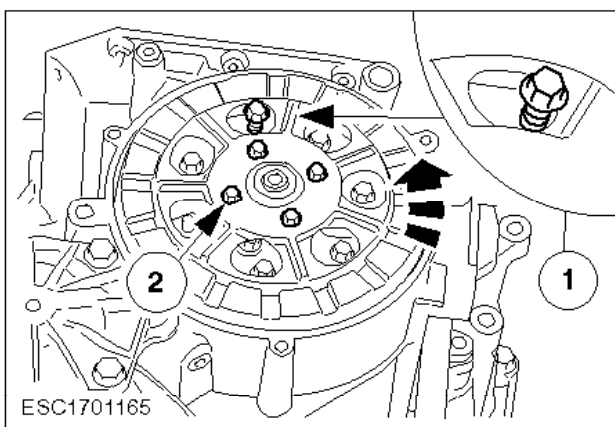
- 1 Withdraw the sensor shaft.
- 2 Remove spring.
- 3 Swivel the sensor towards the left and remove it.



Remove the engine pitot

15. Detach the primary unit blanking cover.

Remove O-ring.

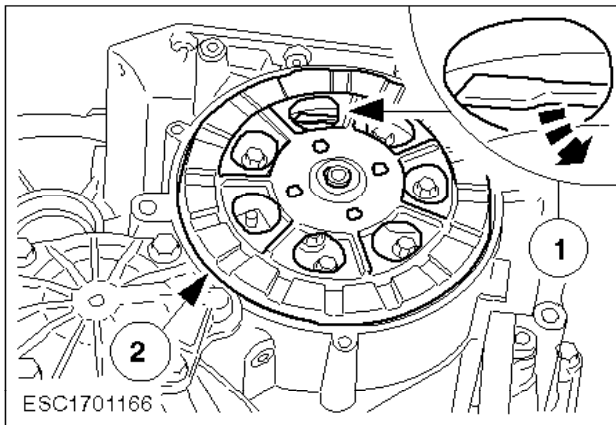


16. Remove the engine pitot.

Note:

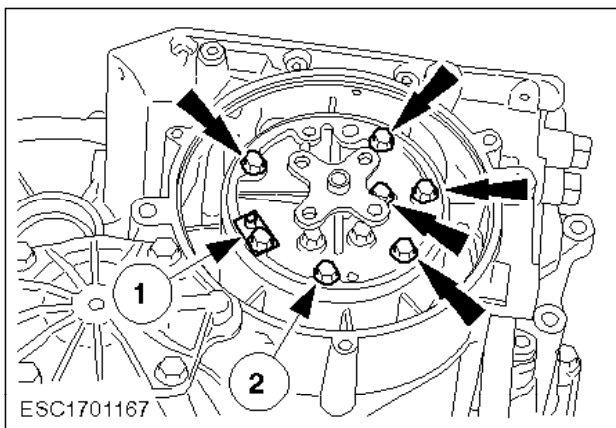
Do not unscrew the bolt.

- 1 Unscrew the engine pitot tube bolt approx. eight turns to block the engine pitot chamber.
- 2 Unscrew the engine pitot chamber bolts.
- Remove the engine pitot tube bolt.



17. Remove engine pitot (continued).

- 1 Turn the engine pitot tube anticlockwise as far as it will go.
- 2 Remove engine pitot chamber.
- Remove engine pitot tube.



Remove the oil pump

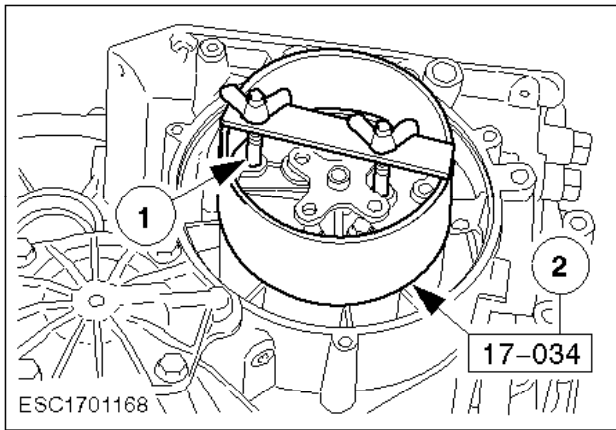


CAUTION:

Two engine pitot bolts remain in the oil pump.

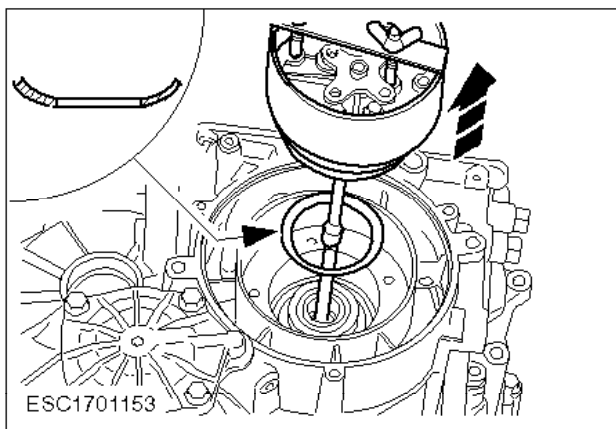
18. Release the oil pump.

- 1 Remove the oil filler pipe.
- 2 Undo the bolts.



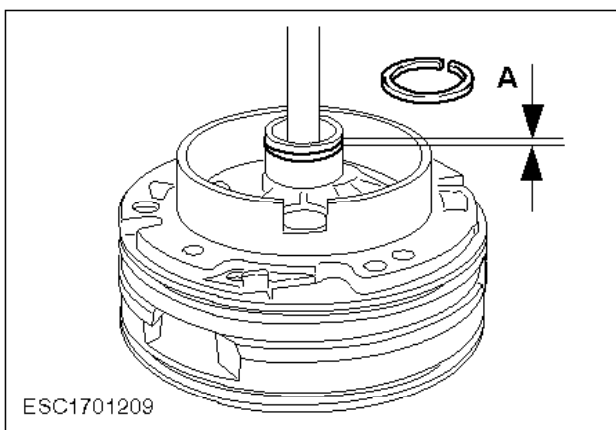
19. Remove the oil pump.

- 1 Screw in the threaded pins.
- 2 Evenly pull out the oil pump.



20. Remove the oil pump (continued)

- Remove the spring washer.
- Remove the special tool.



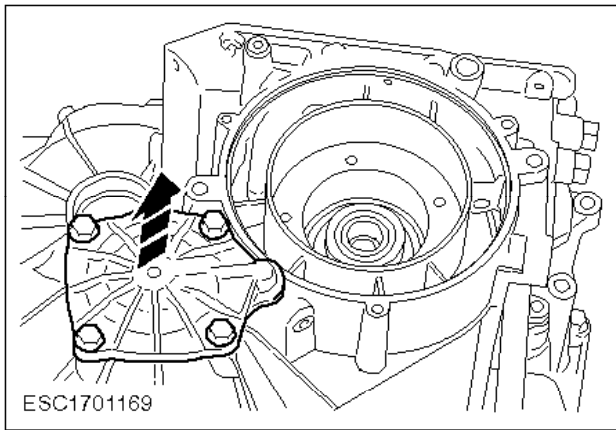
21. Check the oil pump.

- Remove the seal ring.

Note:

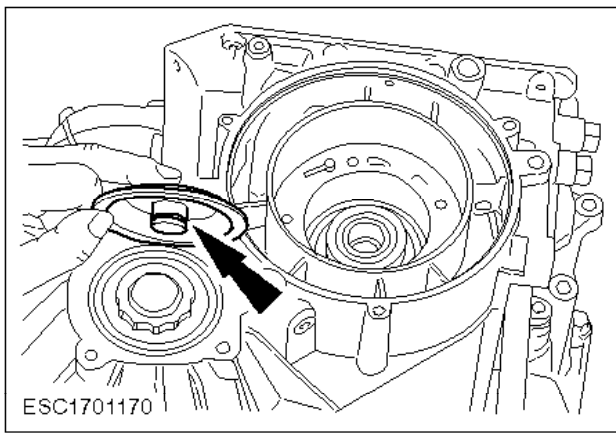
The oil pump must not be dismantled any further.

- Measure the width of the oil pump ring groove. Max: 2,6 mm.



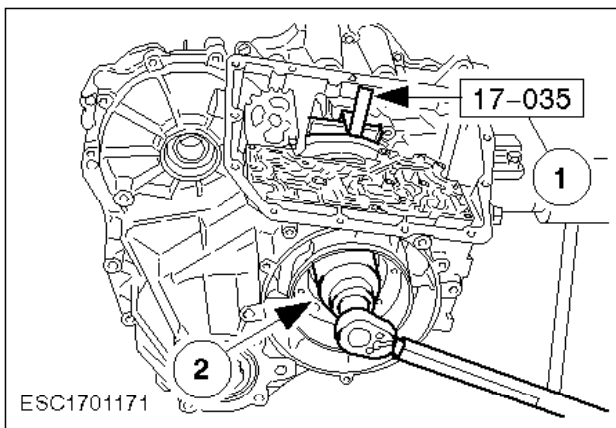
- ⬅ 22. Detach the secondary unit housing cover.

Remove the seal ring.



- ⬅ 23. Remove secondary unit inner cover.

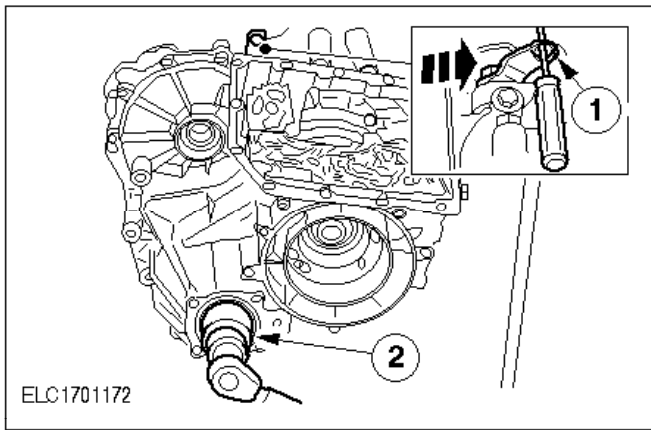
Take off secondary unit inner cover with permanent magnet.
Remove the Viton seal ring.



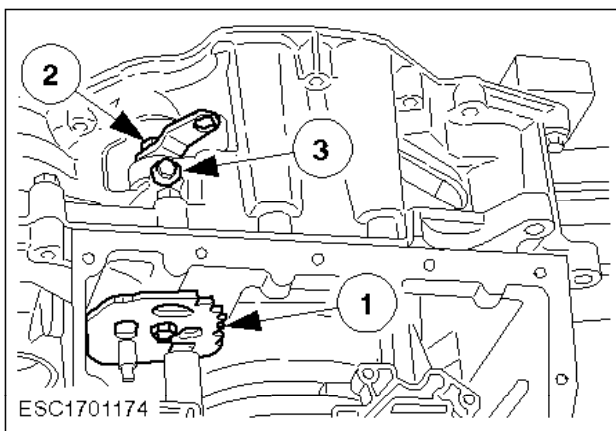
Release the primary unit and the secondary unit

- ⬅ 24. Unscrew the primary unit nut.

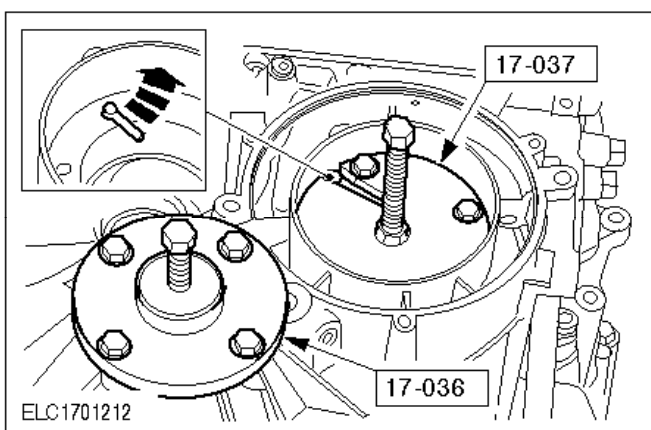
- 1 Insert special tool into forward clutch.
- 2 Unscrew the nut using a bihexagonal socket (46 mm).



- ⦿ 25. Unscrew the secondary unit nut.
 - 1 Engage the parking pawl.
 - 2 Unscrew the nut using a bihexagonal socket (41 mm).



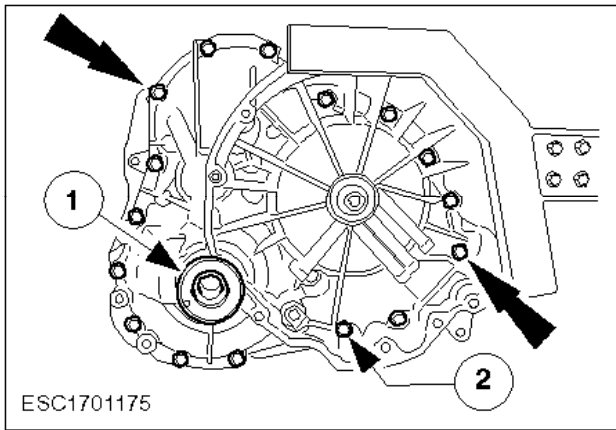
- ⦿ 26. Remove the selector shaft.
 - 1 Screw off notched disc and detach gear linkage.
 - 2 Remove selector lever.
 - 3 Unscrew locking screw and push out shaft towards valve body assembly/labyrinth.



Separate the transmission housing halves

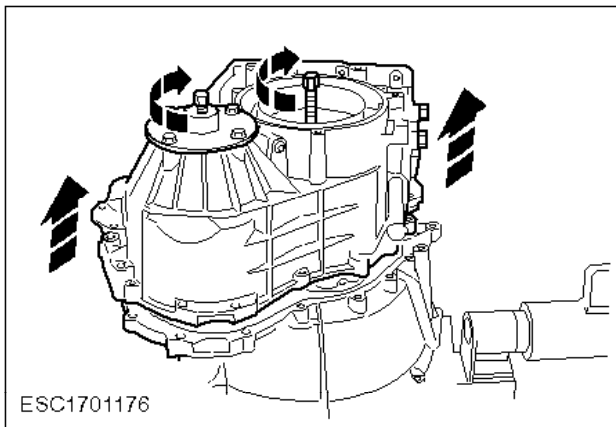
Note:
Turn the pitot tube anticlockwise as far as it will go.

- ⦿ 27. Attach the special tool.

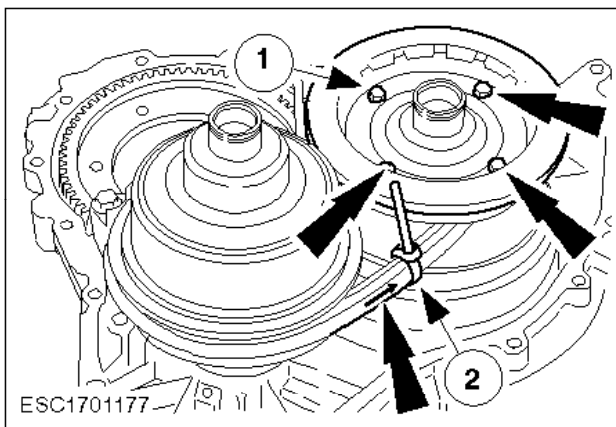


28. Remove the housing bolts.

- 1 Remove the differential auxiliary plugs.
- 2 Unscrew all the bolts apart from two opposite each other.
 - Turn transmission through 90° and unscrew the remaining bolts.



29. Separate the housing halves evenly.



Remove the drive belt

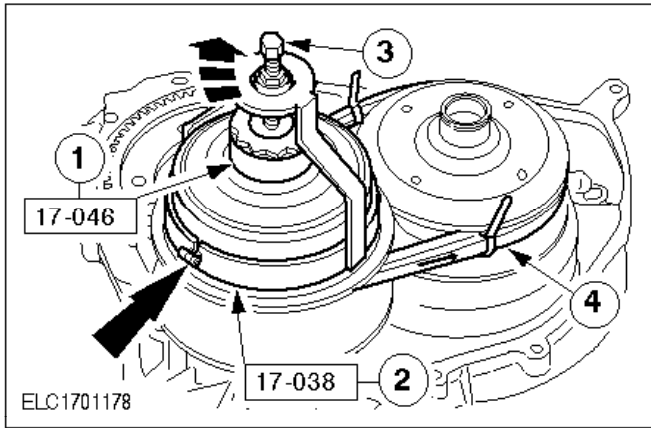


CAUTION:

Check that the mark showing the direction of travel of the belt is clearly visible, remark the belt if necessary.

30. Remove the transmission pitot.

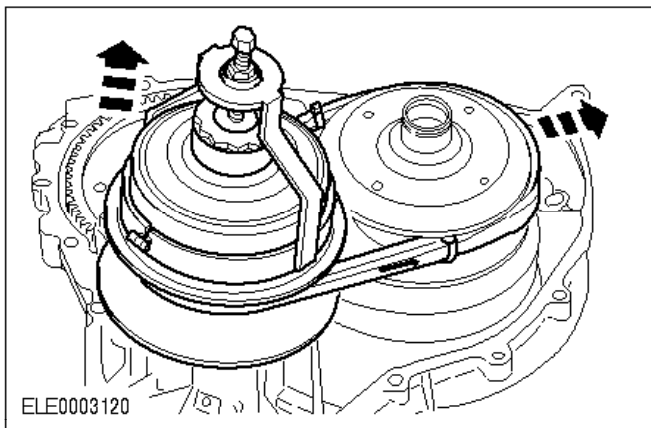
- 1 Unscrew bolts and remove transmission pitot.
- 2 Secure drive belt at two points (opposite facing) using cable ties.



Note:

Make sure the spacer and nut are removed.

- 31. Remove the drive belt.
 - 1 Fit spacer together with original nut.
 - 2 Insert pulling device in the groove of the secondary unit and clamp it in place.
 - 3 Prestress the secondary unit as far as possible.
 - 4 Push the drive belt onto the small end of the secondary unit.

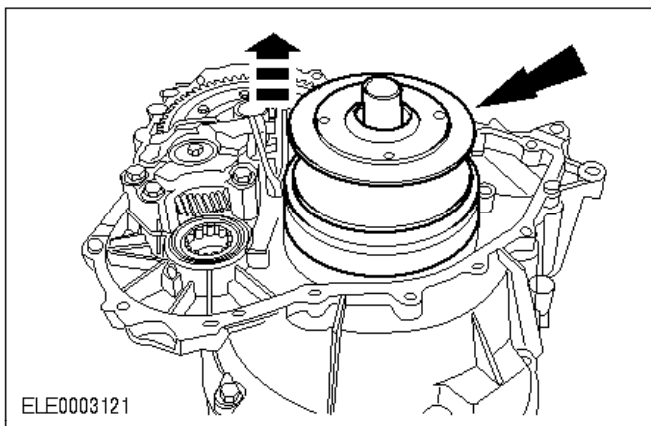


- 32. Remove drive belt (continued).
 - Raise the secondary unit with the drive belt.

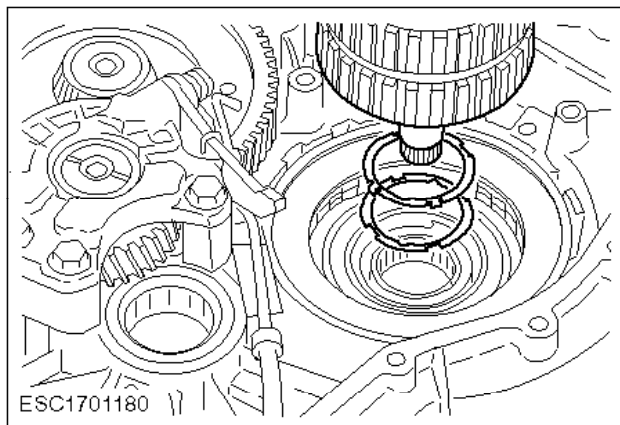
Note:

The secondary unit must not be dismantled any further.

- Move the secondary unit with drive belt towards the primary unit until it is possible to remove the drive belt from the primary unit.
- Remove the secondary unit together with the drive belt.

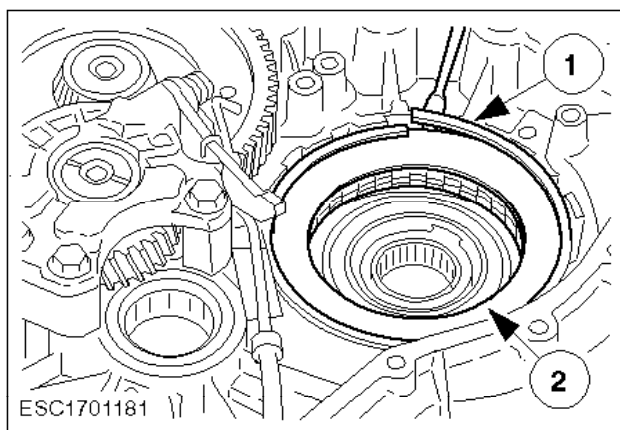


33. Remove the primary unit with forward gear clutch.



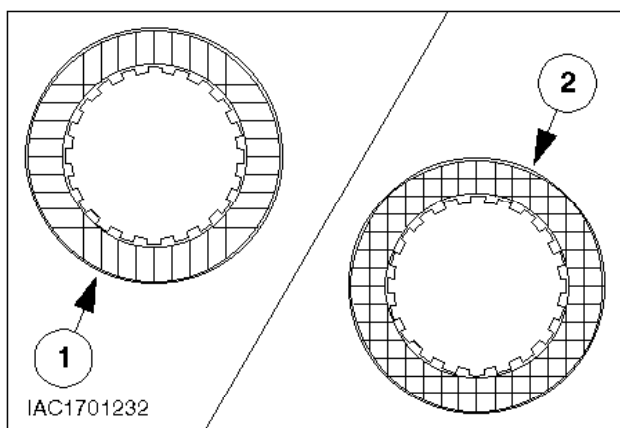
34. Remove the planetary gear carrier.

Remove the thrust washer and the adjusting shim.



35. Remove the reverse clutch.

- 1 Remove the snap ring.
- 2 Remove the plate pack.



Note:

Only fit the new type of clutch plates when servicing the vehicle.

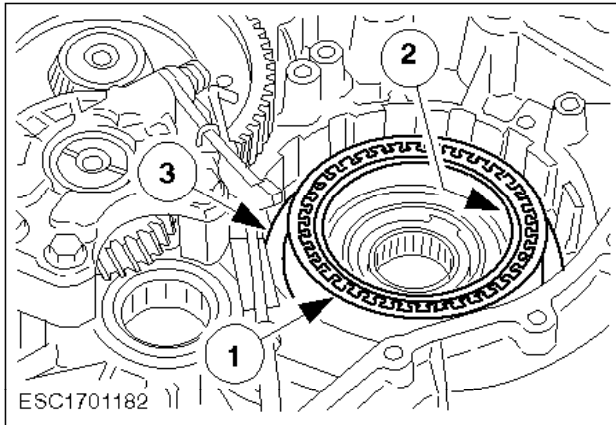
36. Clutch plate identification.

Note:

Immerse clutch plates in Tutela ATF (WSD-M2C199-A) for at least an hour before fitting them.

1 New pattern.

2 Old pattern.

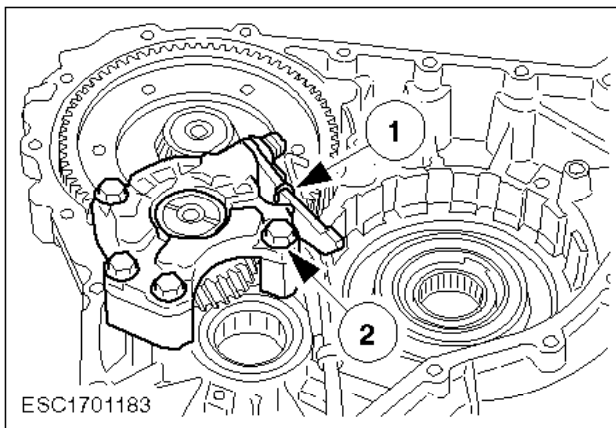


37. Remove the reverse clutch actuating piston.

1 Remove the snap ring.

2 Remove the spring washer.

3 Remove the piston.



38. Remove the reduction gear bearing cap.

1 Unhook the parking pawl spring and swing the parking pawl back.

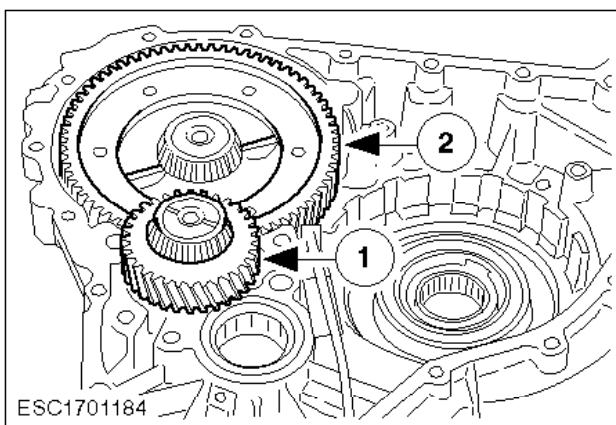
2 Undo the bolts.

● Prise off the bearing cap.

Note:

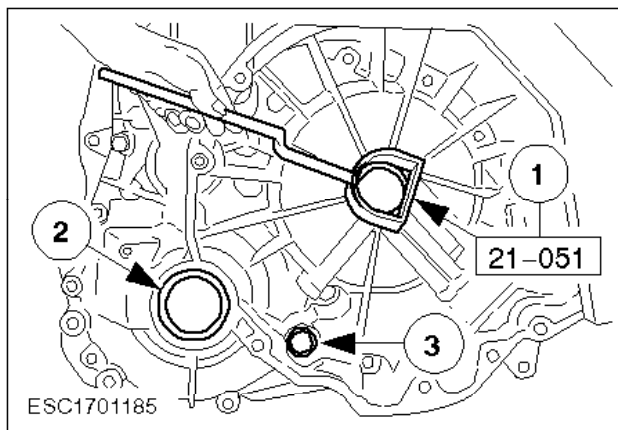
The bearing cup is a sliding fit in the bearing cap.

● Press the bearing cup out of the bearing cap.



- ⤵ 39. Remove the reduction gear and the differential.

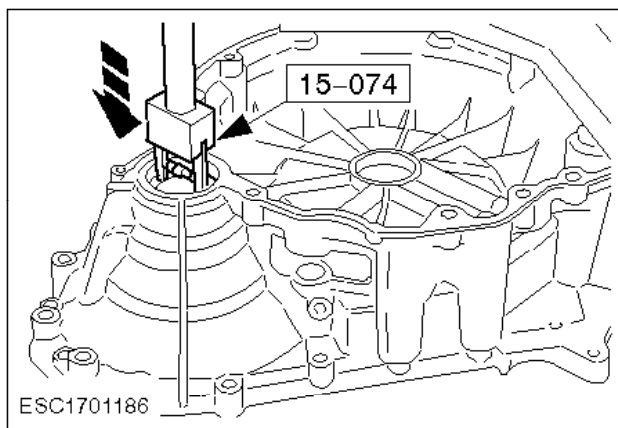
- 1 Reduction gear.
- 2 Differential.



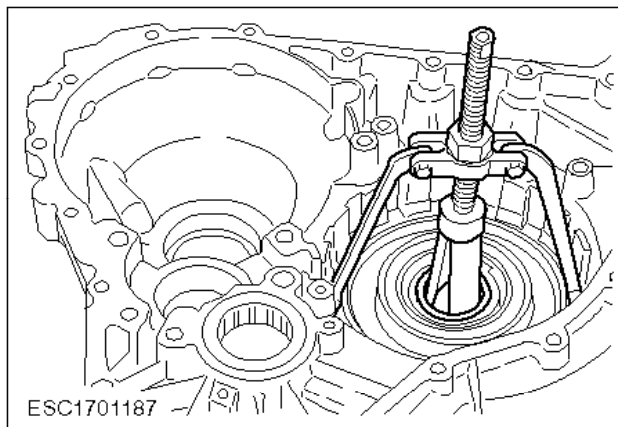
Dismantle the housing halves

- ⤵ 40. Remove the oil seals.

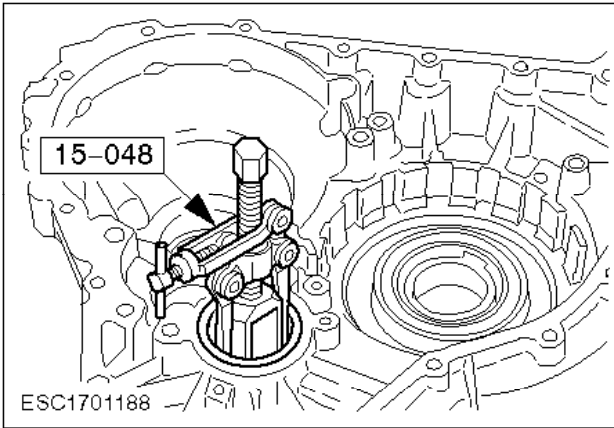
- 1 From the input shaft.
- 2 From the axle shaft.
- 3 From the selector shaft (lever them out with a screwdriver).



- ⤵ 41. Remove the differential bearing cup.



- ⤵ 42. Withdraw the input shaft needle roller bearing.
With a proprietary internal extractor.

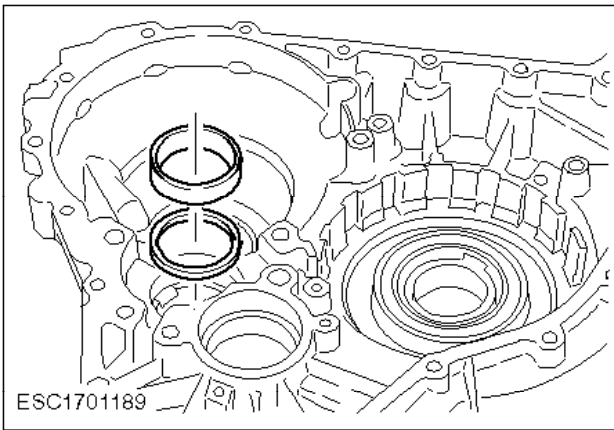


Note:

Only remove the secondary unit roller bearing (paired with bearing inner race, see operation) if it is damaged.

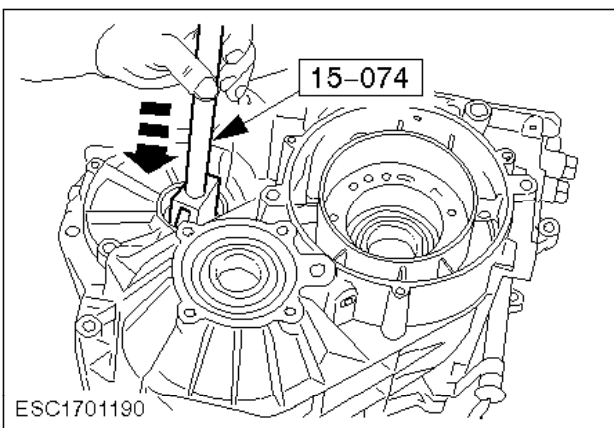
- 43. Remove the secondary unit roller bearing.

Remove the rollers and the bearing cage.



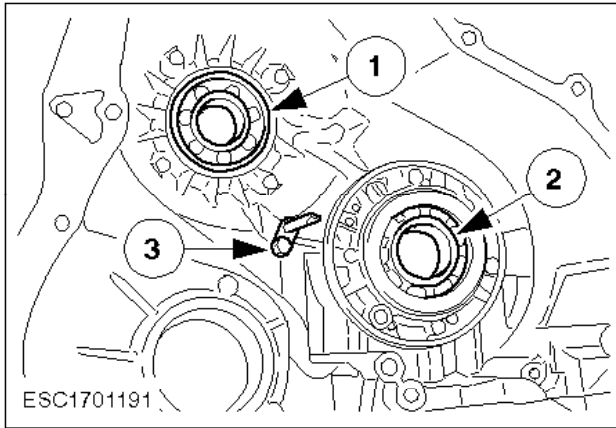
- 44. Remove the reduction gear bearing cup with the spacer.

The bearing cup is a sliding fit.

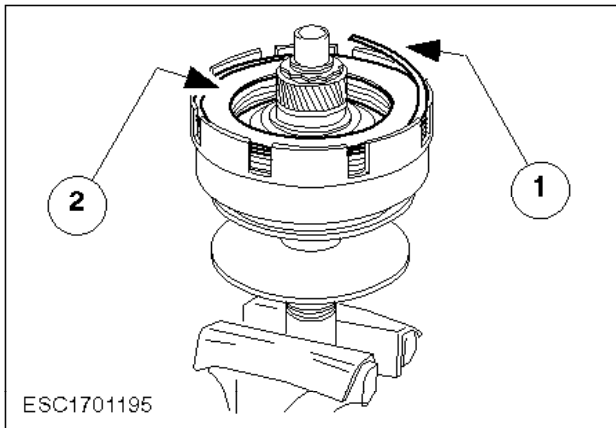


- 45. Remove the differential bearing cup with the adjusting shim.

Remove the differential bearing cup with the adjusting shim.

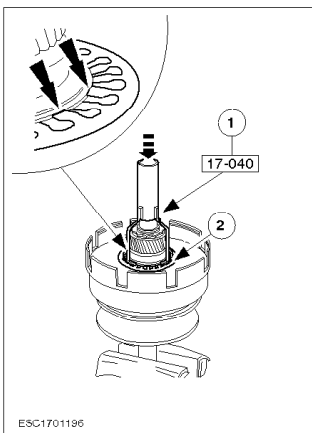


- 46. Remove the ball bearing and the splash tube.
 - 1 From the primary unit.
 - 2 From the secondary unit.
 - Remove the two bearings with a suitable drift.
 - 3 Slacken the pitot tube and remove it.

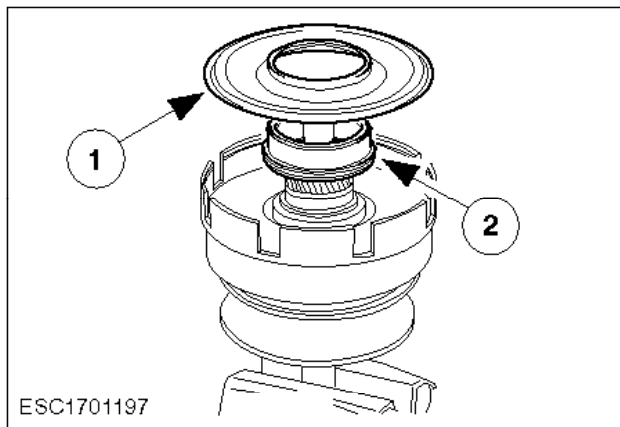


Dismantle the primary unit

- 47. Remove the forward clutch.
 - 1 Remove the snap ring.
 - 2 Remove the clutch pack.



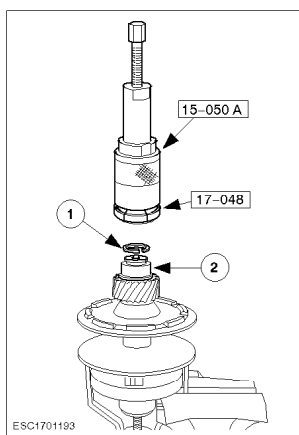
- 48. Remove the forward clutch actuating piston.
 - 1 Remove the snap ring.
 - 2 Remove the spring washer.



CAUTION:

The primary unit should only be dismantled as far as described.

- ⌚ 49. Remove the forward clutch actuating piston (continued).
 - 1 Remove the pressure plate and the actuating piston.
 - 2 Remove the seal rings.



Dismantle the secondary unit



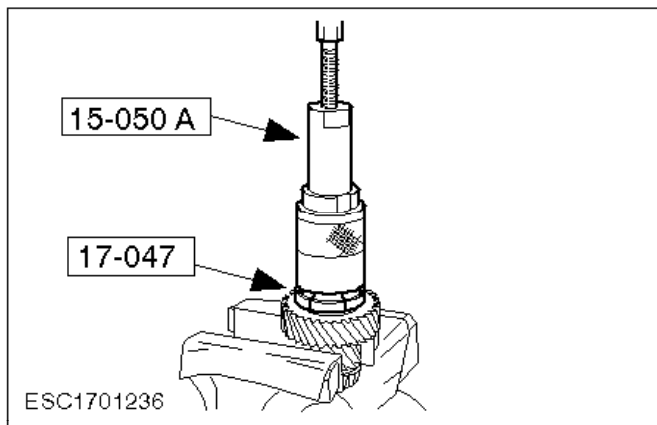
CAUTION:

The secondary unit should only be dismantled as far as described.

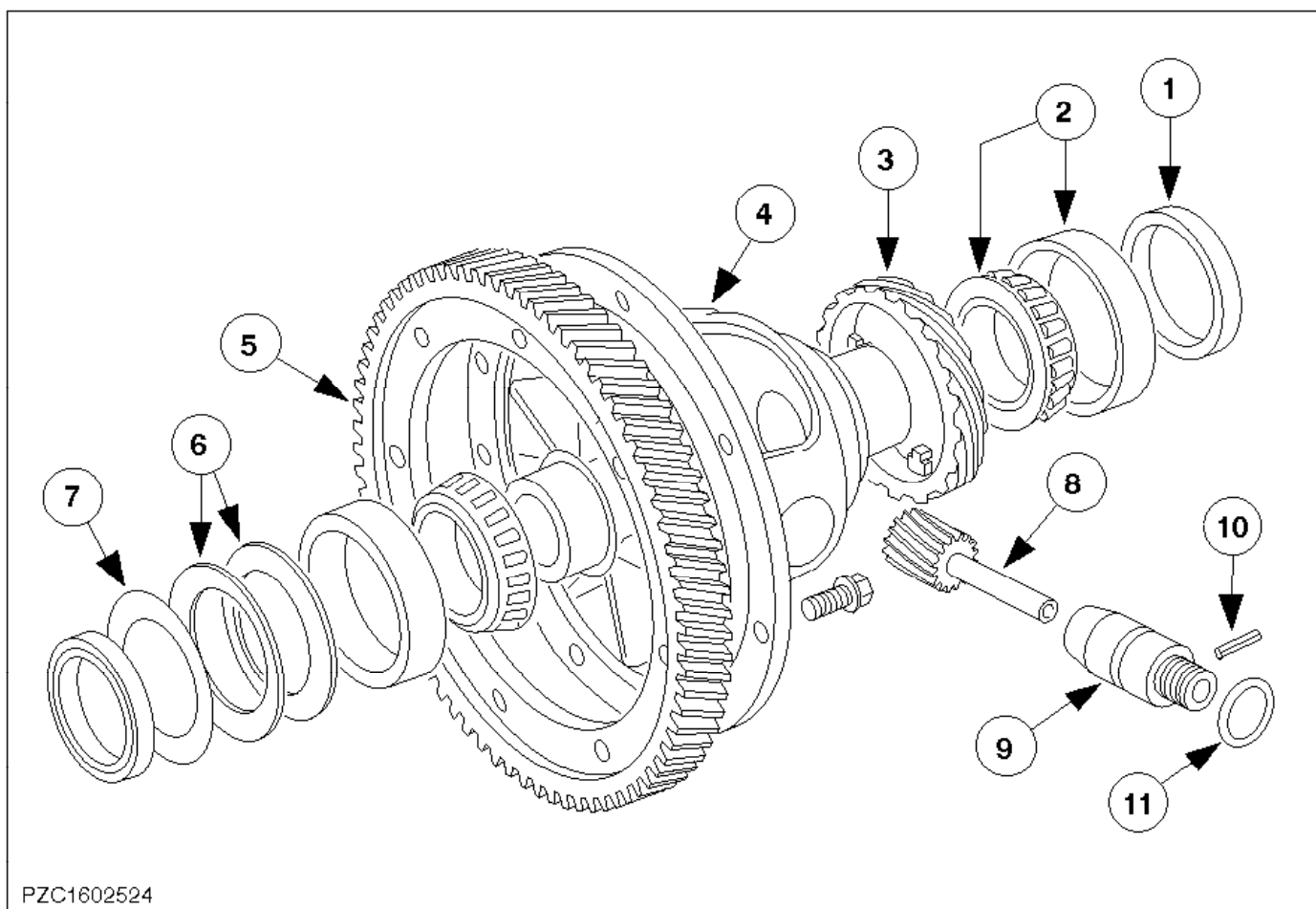
Note:

Only remove secondary unit roller bearing (paired with bearing inner race, see operation) if it is damaged.

- ⌚ 50. Pull off the secondary unit bearing inner race.
 - 1 Remove the snap ring.
 - 2 Pull off the bearing cup.

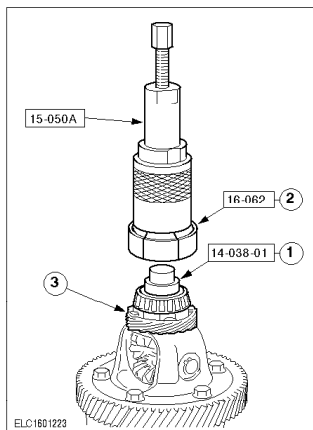


51. Dismantle the reduction gear.
Pull off the two bearings.



Item	Description
1	Radial oil seal
2	Taper roller bearing
3	Speedometer drive worm wheel
4	Differential case
5	Crown wheel
6	Belleville washers (x 2)

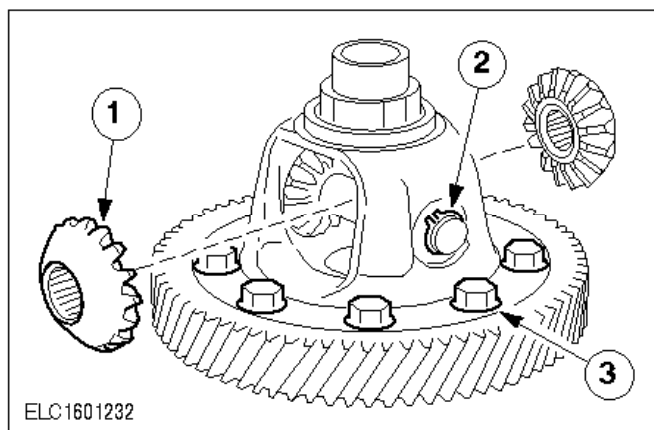
7	Adjusting shim
8	Speedometer drive pinion
9	Drive pinion bearing
10	Roll pin
11	O-ring



Dismantle the differential

52. Dismantle the differential.

- 1 Insert the thrust element.
- 2 Pull off the taper roller bearing.
- 3 Remove the speedometer worm gear.



53. Remove the differential pinions.

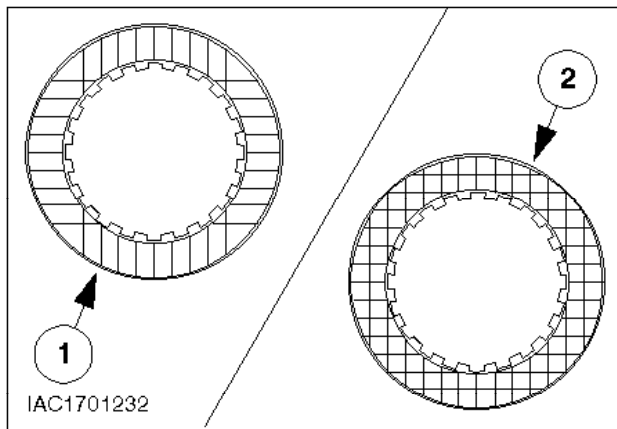
- 1 Turn the pinions 90° in the differential case and remove them.
- 2 Remove the retaining ring and drive out the shaft.
Remove the pinions and the plastic thrust washers.
- 3 Unscrew the bolts five turns and push the crown wheel down evenly off the differential by tapping on the bolt heads.

Assemble

54. General note.



- Only use Tutela Universal CVT (WSD-M2C199-A) Automatic Transmission Fluid.
- Clean all parts carefully and check them for wear and damage.
- The gaskets, oil seals, O-rings, snap rings and self-locking nuts must not be reused.
- Coat all moving parts and seals with Tutela ATF (WSD-M2C199-A) before assembly.
- Immerse lined discs in Tutela ATF (WSD-M2C199-A) for at least 15 minutes before fitting them.



Note:

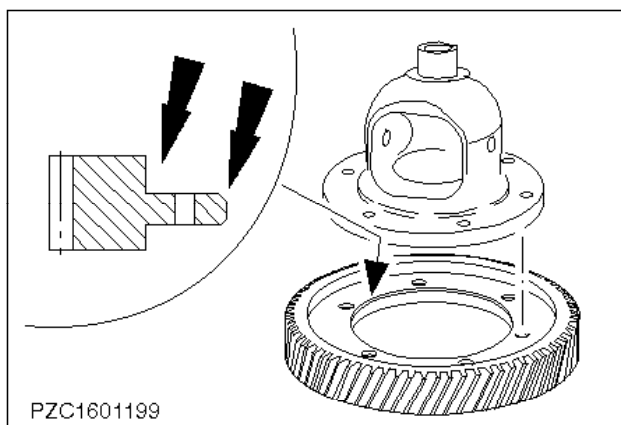
Use the new type of clutch plates when repairing the vehicle.

- ⑤ 55. Clutch plate identification.

Note:

Immerse the new type of clutch plates in Tutela ATF (WSD-M2C199-A) for at least an hour before fitting them.

- 1 New pattern.
- 2 Old pattern.

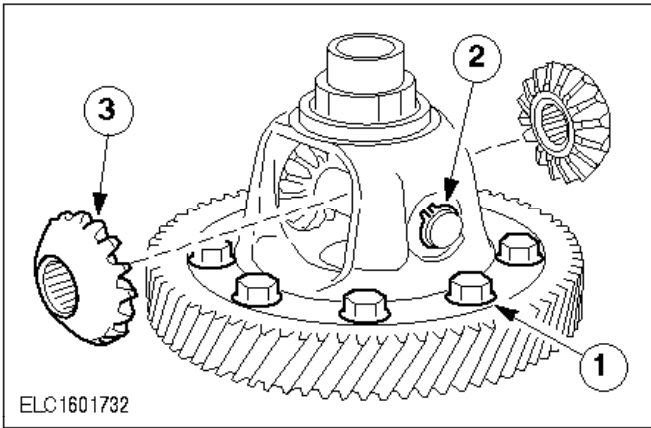


Assemble the differential

Note:

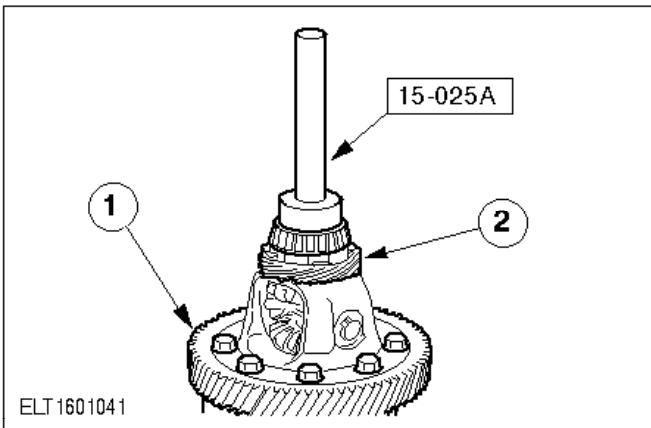
The spur gear is asymmetrical. Fit with the larger recess and the larger chamfer facing towards the differential housing.

- ⑤ 56. Fit the differential housing.



57. Fit the spur gear and install the differential pinions.

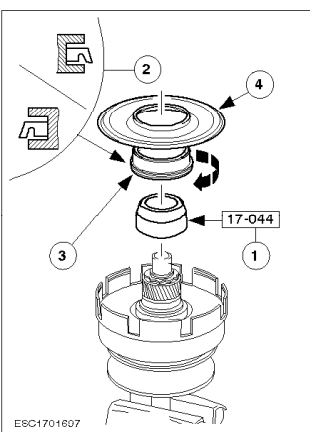
- 1 Pull the crown wheel on using the old bolts.
- Place the plastic thrust washers and both pinions in their installation positions.
- 2 Drive in the shaft and secure it in position.
- 3 Insert the pinions and turn them through 90° in the housing.



58. Install the taper roller bearing and tighten the crown wheel.

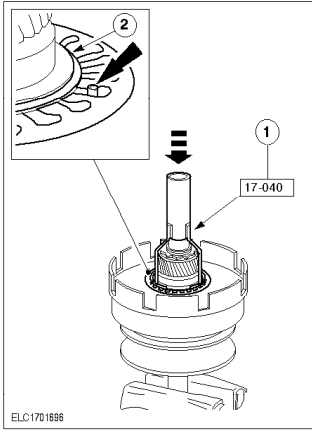
- 1 Fix the spur gear using new bolts.
Torques
Spur gear with six holes: 115 Nm
Spur gear with eight holes: 85 Nm
- 2 Insert the speedometer worm gear in the recesses.

Note:
Do not support the assembly on the lower taper roller bearing.
3 Press on the two taper roller bearings.



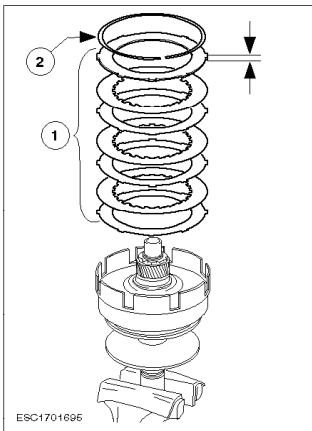
Assemble the primary unit

- ⦿ 59. Install the forward clutch actuating piston.
 - 1 Fit the guide sleeve.
 - 2 Fit the two oil seals to the actuating piston.
 - 3 Press the actuating piston in, turning it slightly until it meets the stop.
 - 4 Fit the pressure plate.
 - Remove the guide sleeve.



- ⦿ 60. Install the forward clutch actuating piston (continued).

- Fit the spring washer.
 - 1 Press the spring washer down.
 - 2 Fit the snap ring.

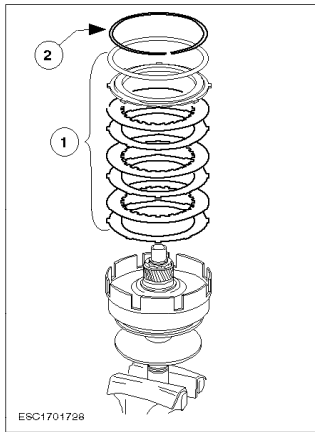


Model year before '96.

Note:

Thrust washer (thicker washer) facing upwards (also see operation).

- ⦿ 61. Install the forward clutch.
 - 1 Insert the clutch pack.
 - 2 Fit the snap ring.



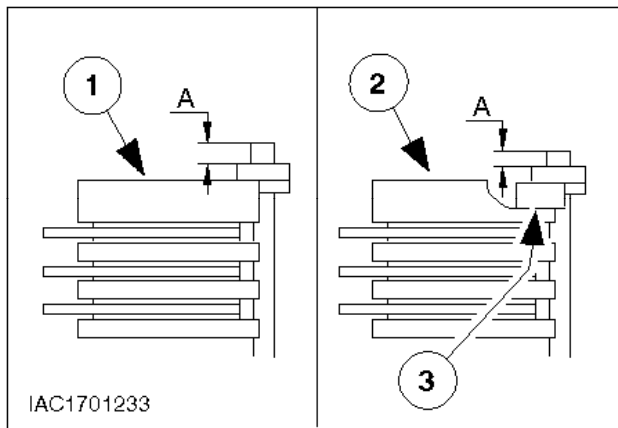
Model year '96 on.

Note:

Thrust washer (thicker washer) step must be facing upwards (also see operation).

62. Install the forward clutch.

- 1 Fit the set of clutch plates.
- 2 Fit the snap ring.

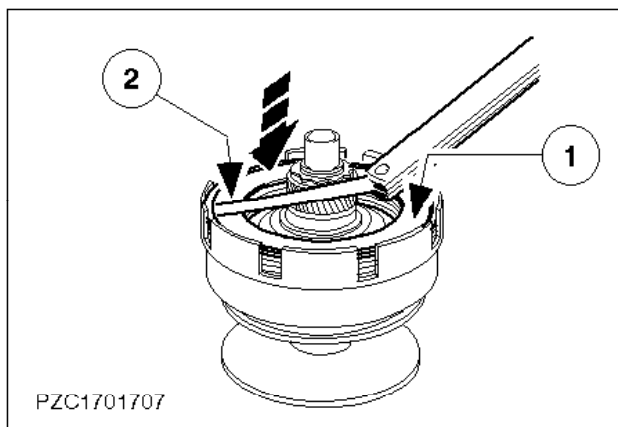


Note:

The ring groove for the snap ring is offset towards the top (measurement 'A').

63. Clutch assembly

- 1 Up to '96 model year; pressure plate without distance ring.
- 2 Model year '96 on; pressure plate with step and distance ring.
- 3 Distance ring

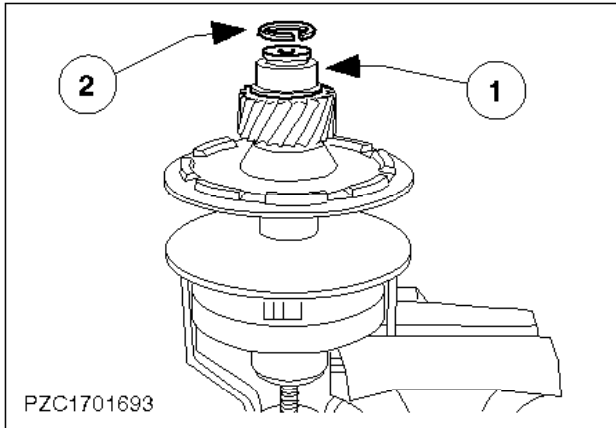


Note:

Required value: 0,7 - 2,1 mm. Check pack for completeness if required value is not obtained.

64. Determine forwards gear clutch end play.

- 1 Press the clutch plates together.
- 2 Measure the end float between the snap ring and the clutch plate assembly using feeler gauges.



Assemble the secondary unit

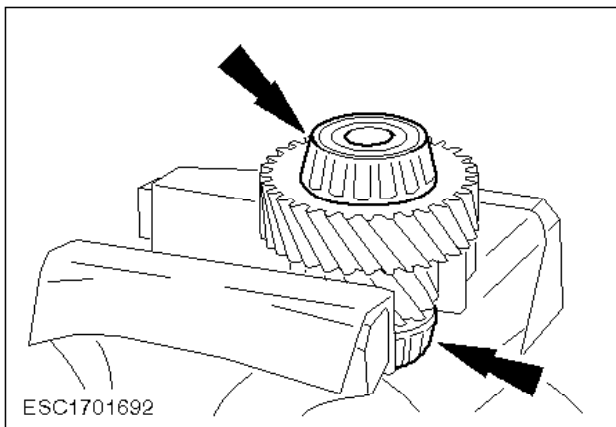
65. Fit secondary unit bearing inner race.

- 1 Heat bearing inner race to approx. 80°C and fit it.

Note:

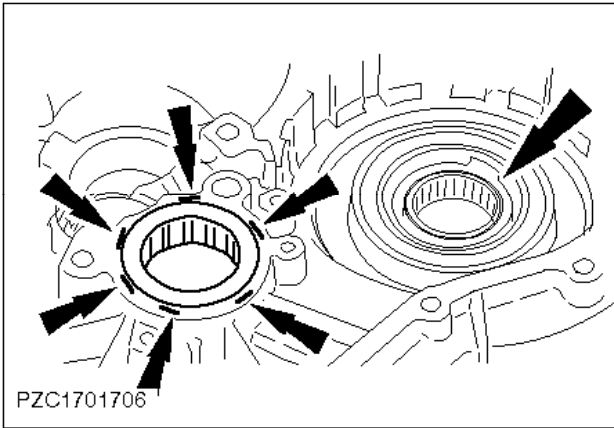
Determine snap ring gap. Insert the thickest possible snap ring (snap ring sizes supplied for servicing: 1,65 mm; 1,85 mm and 2,10 mm thick).

- 2 Fit the snap ring.



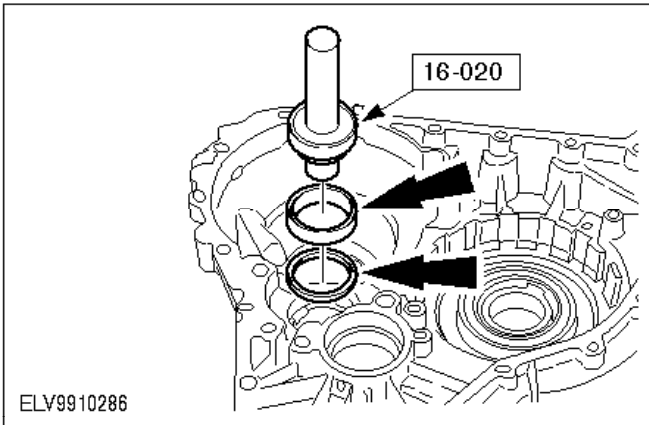
66. Assemble the reduction gear.

- Heat the taper roller bearing to approx. 80°C and install it.
- Make sure that the bearing is seated correctly using a suitable length of tubing. Do not tap directly on the bearing.



Fit the two housing sections together

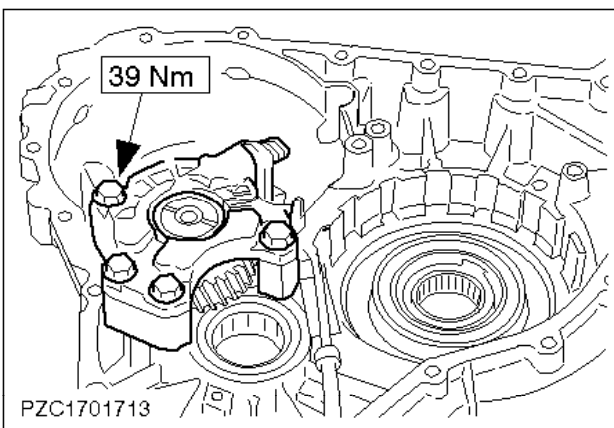
- ⦿ 67. Install the input shaft needle roller bearing and fit the secondary unit roller bearings.
 - Heat the bearing area to approx. 80°C.
 - Secure the roller bearing by staking it in place.



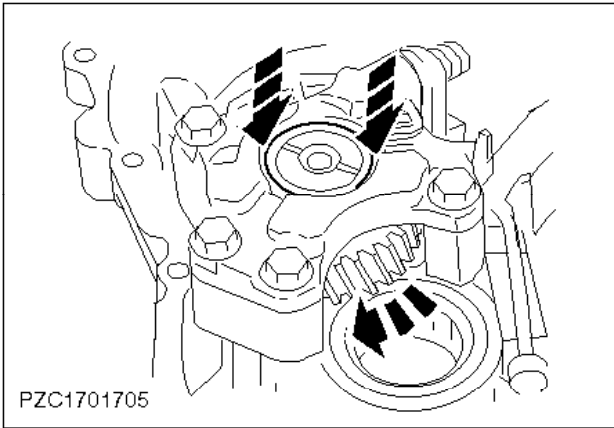
Measure the reduction gear end float

- ⦿ 68. Install the reduction gear bearing cup.

Fit the bearing cup with a "measuring shim" (2,10 mm or at least 0,3 mm thinner than the previously fitted shim).

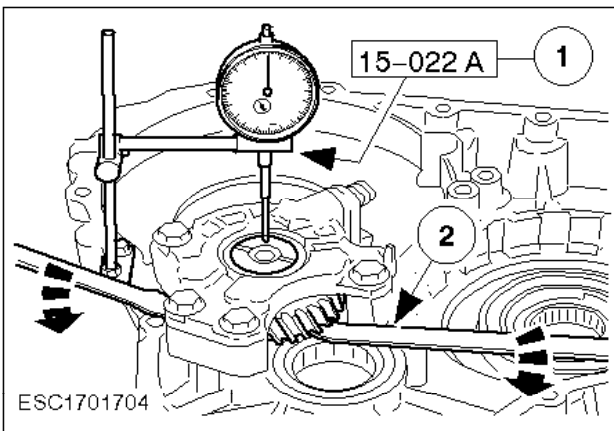


- ⦿ 69. Install the reduction gear bearing cap.
Fit the bearing cup in the bearing cap.



70. Prepare the reduction gear for measuring.

- Turn the reduction gear several times to settle the bearings.
- Make sure the bearing cup is seated correctly.



71. Measure the end float.

- 1 Set up the dial indicator gauge and zero it.
 - 2 Lift the reduction gear evenly using two levers and take a reading.
- Repeat the measurement following steps and Calculate an average value.
 - End float (e.g.): 0,32 mm.

72. Calculate the adjusting shim to be fitted.

Note:

The value should be rounded up or down by a maximum of 0,02 mm according to the adjusting shims available.

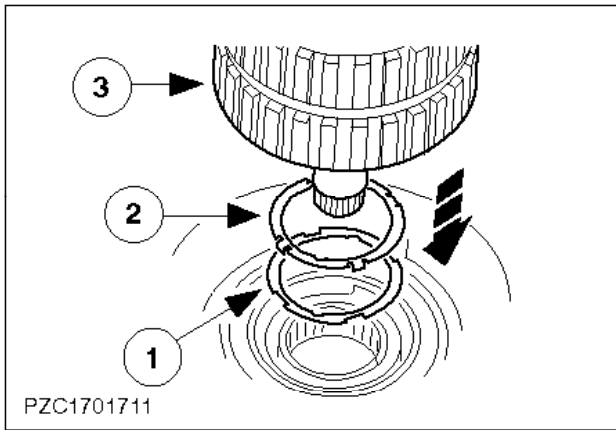
- Example of step
- Measuring shim: 2,10 mm
- Measured end float: + 0,32 mm
- Bearing preload: + 0,05 mm
- Calculated shim thickness: 2,47 mm

Note:

Shim sizes available range from 2,06 to 3,06 mm in 0,04 mm steps.

- Thickness of shim to be fitted: 2,46 mm

73. Remove the reduction gear again.

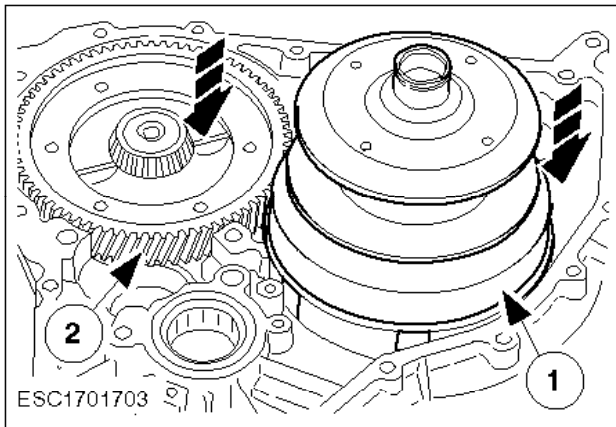


- 74. Install the planetary gear carrier.

Note:

Fit the planetary gear carrier with the previously fitted thrust washer and adjusting shim.

- 1 Adjusting shim.
- 2 Thrust washer.
- 3 Planetary gear carrier.



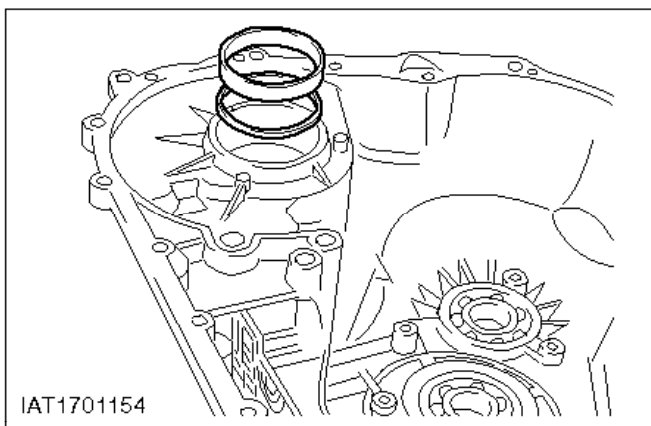
- 75. Fit the differential and the primary unit.

- 1 Primary unit.

Note:

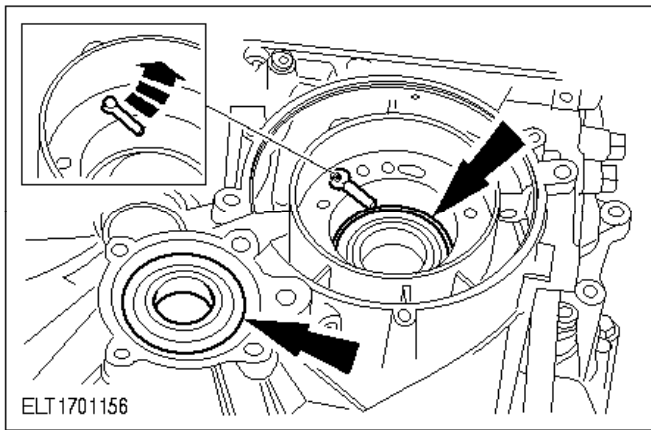
Do not oil the taper roller bearing.

- 2 Differential.



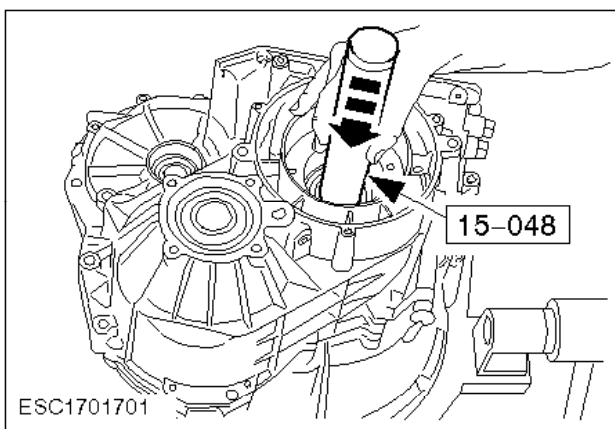
- 76. Fit the differential measuring shim.

Fit the measuring shim (3,80 mm thick) and the bearing cup.



77. Fit the primary and secondary unit ball bearings.

- Turn the pitot tube anticlockwise as far as it will go.

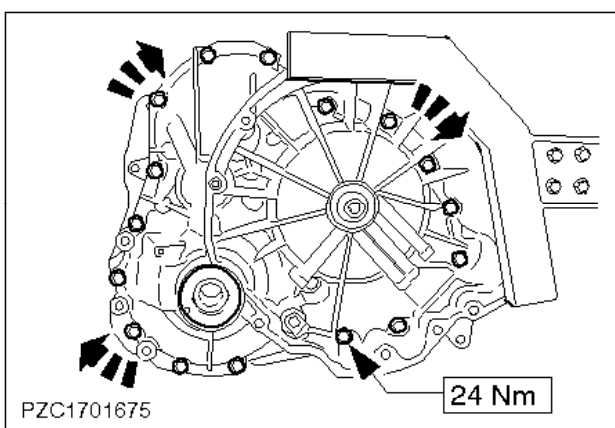


Note:

Carefully clean the mating faces on the two transmission housing sections.

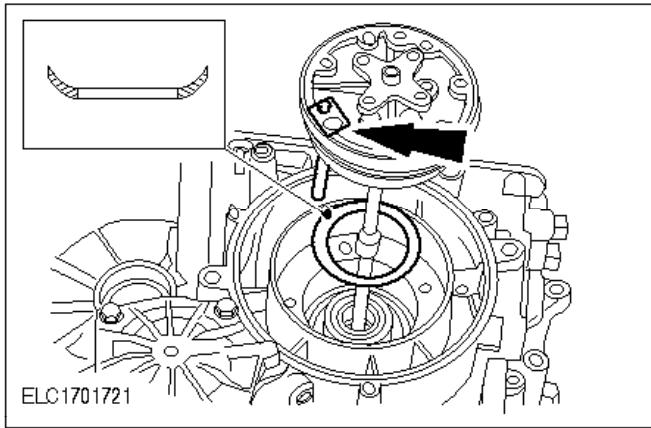
78. Fit the transmission housing.

- Tap the housing down using the installer, until the primary unit nut can be fitted.
- Pull on the transmission housing until it is flush using the primary unit nut.
- Screw in the two housing bolts.
- Turn the transmission.



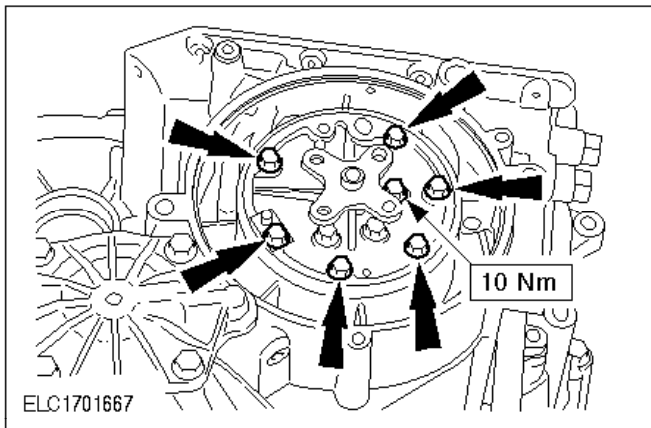
79. Tighten the housing uniformly.

- Fit the auxiliary plug.

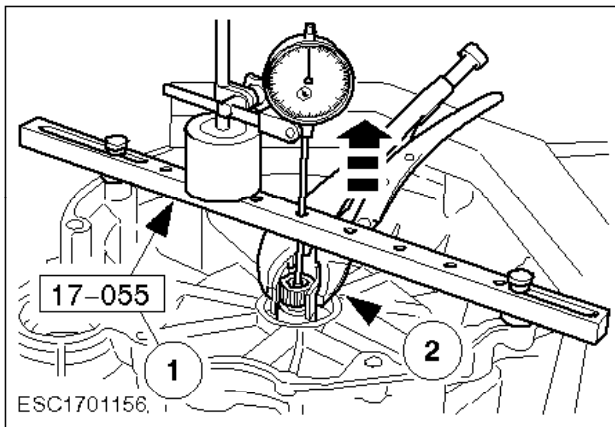


Note:
Pitot tube

- 80. Install the oil pump with the spring washer.
Install the oil pipe.



- 81. Evenly tighten the oil pump bolts working diagonally.



Measure the input shaft end float

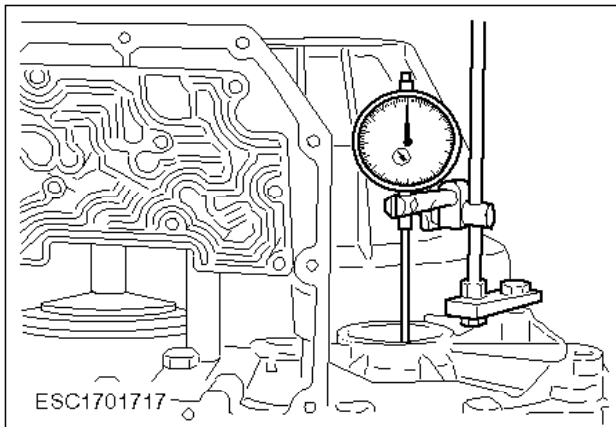
- 82. Measure the input shaft end float.
 - 1 Fit the gauge bar with the dial indicator gauge and zero it.

Note:
Use a support.

- 2 Lift the input shaft carefully with a pair of grips and read off the value on the dial indicator gauge.

- Required value: 0,05 - 0,20 mm.

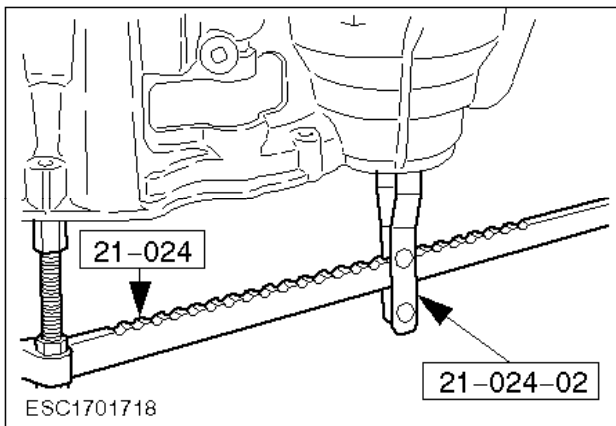
83. Adjusting shims are available in the following thicknesses (input shaft end float setting)
0,75 mm - 2,08 mm increasing by steps of 0,08 mm.



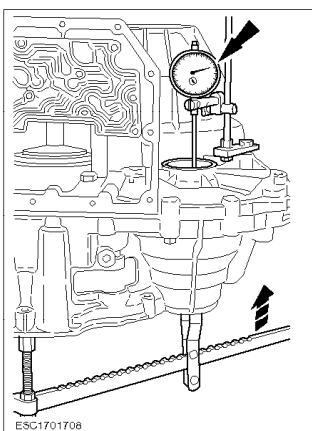
Measure the differential end float

84. Place dial gauge on differential.

- Turn the differential over several times to settle the bearings.
- Set up the dial indicator and set it to "0" with a preload of 1,0 mm.



85. Attach the special tool.



86. Measure the differential end float.

- Lift the differential and measure the end float.

Note:

Carry out the measurement three times and calculate the average value.

- Example:
- 1st measurement: 0,34 mm
- 2nd measurement: 0,33 mm
- 3rd measurement: 0,32 mm
- Average value: 0,33 mm

87. Calculate the adjusting shim to be fitted.

- Example of step
- Measuring shim: 4,20 mm
- Measured end float: + 0,33 mm
- Bearing preload: + 0,30 mm
- Calculated shim thickness: 4,83 mm

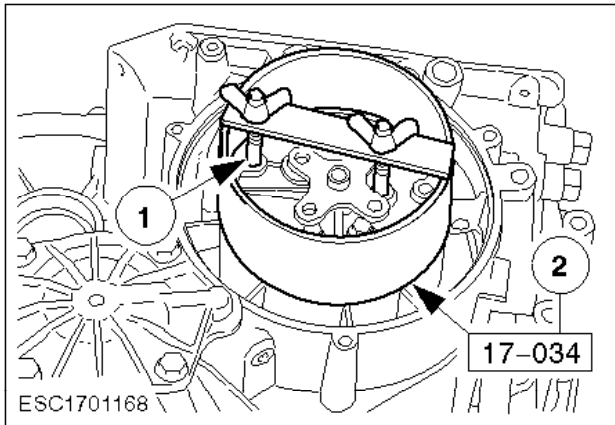
Note:

Assemble the pack until the shim thickness is reached. Round up the value each time.

- Thickness of shim to be fitted: 4,86 mm

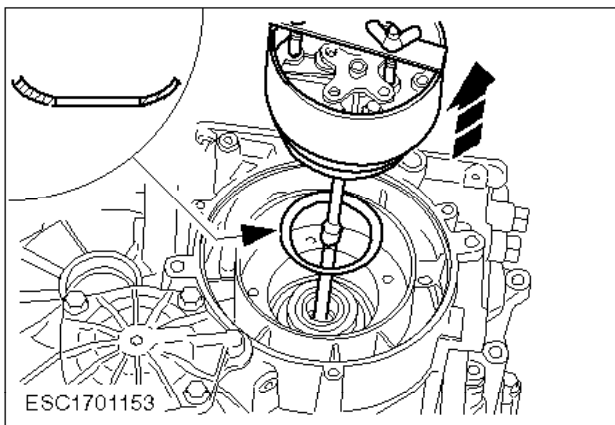
88. Adjusting shims are available in the following thicknesses (in mm)

- 0,06; 0,10; 0,20;
- 4,2; 4,6; 5,0



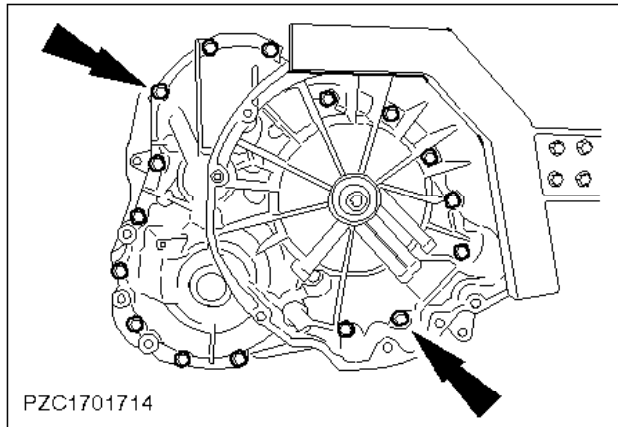
89. Remove the oil pump.

- Unscrew the bolts again (see Operation).
- 1 Screw in the studs.
- 2 Pull the oil pump uniformly out of the housing using the special tool.



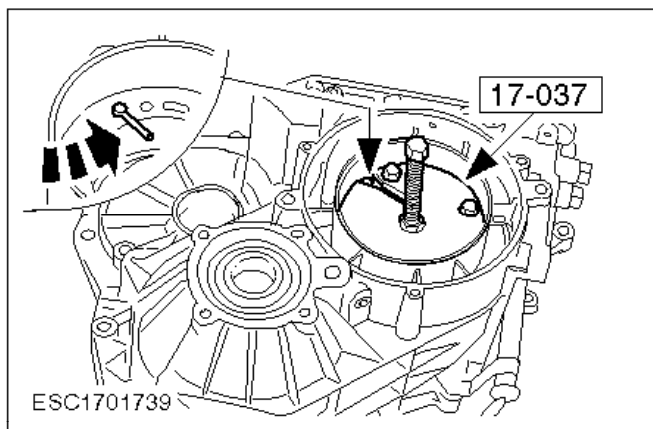
90. Remove oil pump (continued).

- Withdraw the oil pump complete with the special tool.
- Remove the spring washer.
- Remove the special tool.



91. Unscrew the housing bolts.

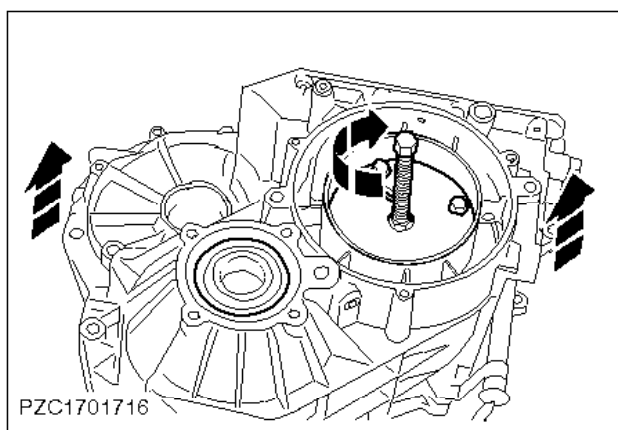
- Unscrew all the bolts apart from two opposite each other.
- Turn transmission through 90° and unscrew the remaining bolts.



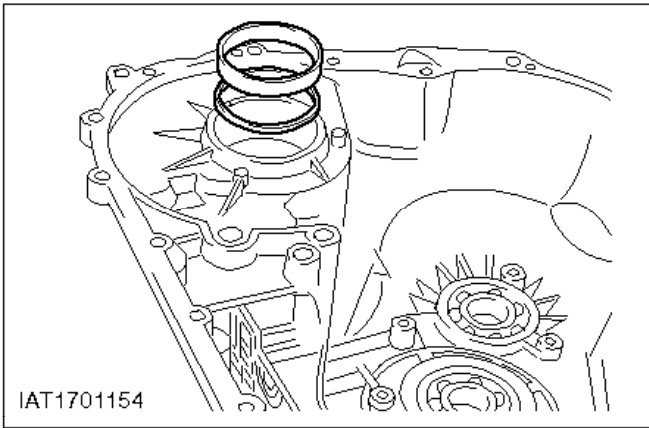
Note:

Turn the pitot tube anticlockwise as far as it will go.

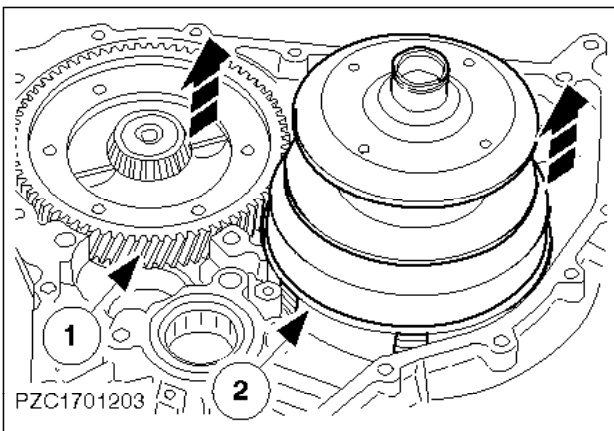
92. Fit the special tool.



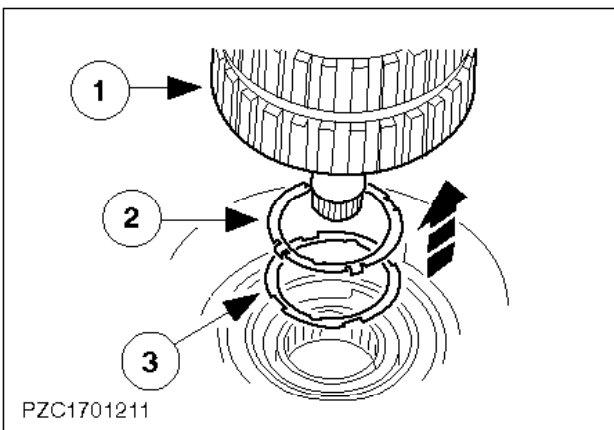
93. Separate the housing halves evenly.



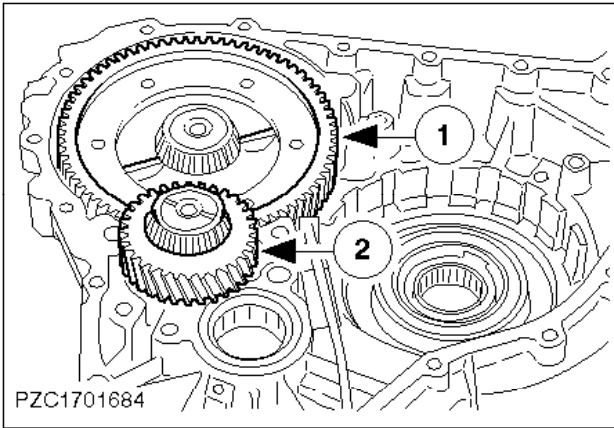
94. Fit the measured adjusting shim.
- Remove the measuring shim and replace it with the measured adjusting shim.
 - Fit the bearing cup.



95. Remove the differential and the primary unit.
- 1 Differential.
 - 2 Primary unit.

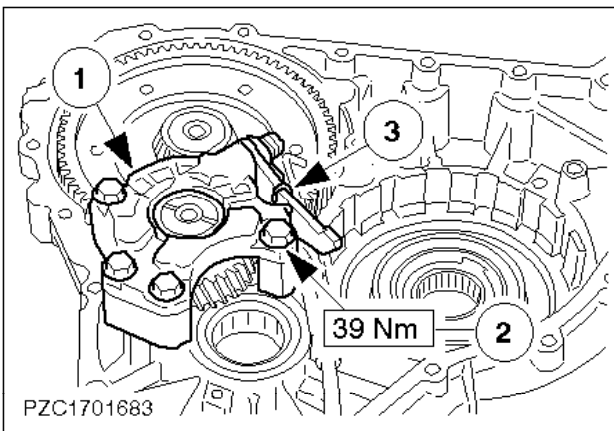


96. Remove the planetary gear carrier.
- 1 Planetary gear carrier.
 - 2 Adjusting shim.
 - 3 Thrust washer.



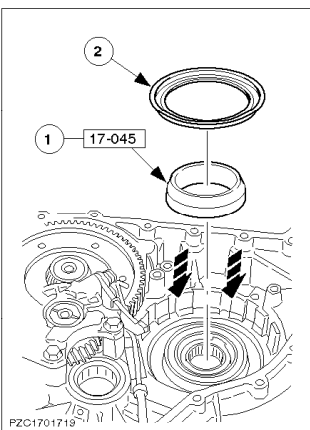
97. Install reduction gear and differential.

- 1 Differential.
- 2 Reduction gear.



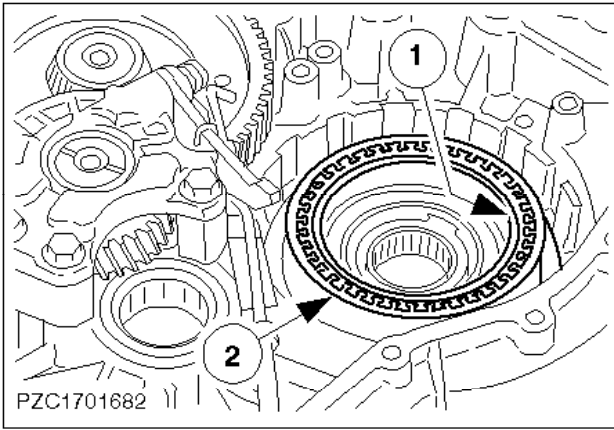
98. Install the reduction gear bearing cap.

- Fit the bearing cup in the bearing cap.
- 1 Fit the bearing cap.
- 2 Tighten the bolts.
- 3 Swing parking pawl forwards and attach parking pawl spring.



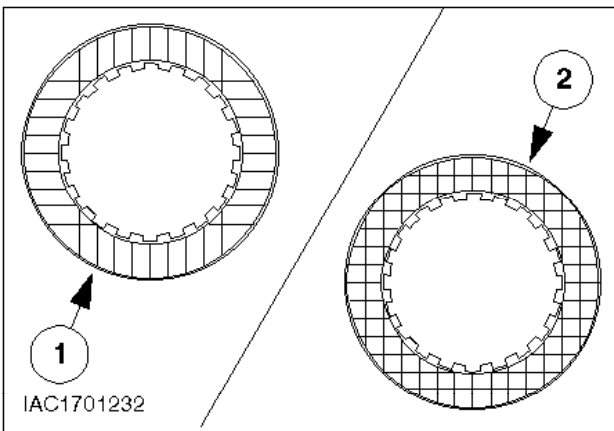
99. Install the reverse clutch actuating piston.

- 1 Insert guide sleeve.
- 2 Press the actuating piston in, turning it slightly, until it meets the stop.



100. Secure the actuating piston.

- 1 Fit the spring washer.
- 2 Fit the snap ring.



Note:

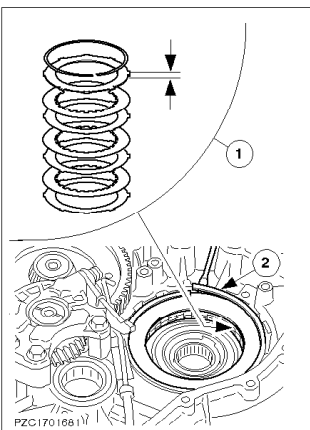
Fit the new type of clutch plates when servicing the vehicle.

101. Clutch plate identification.

Note:

Immerse the clutch plates in Tutela ATF (WSD-M2C199-A) for at least one hour before fitting them.

- 1 New pattern.
- 2 Old pattern.



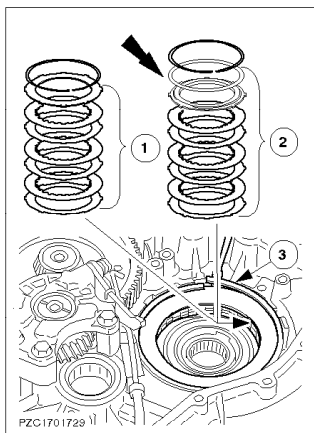
Model year before '96.

← 102. Install the reverse clutch.

Note:

The pressure plate (thicker plate) should be facing upwards.

- 1 Fit the set of clutch plates.
- 2 Fit the snap ring.



Note:

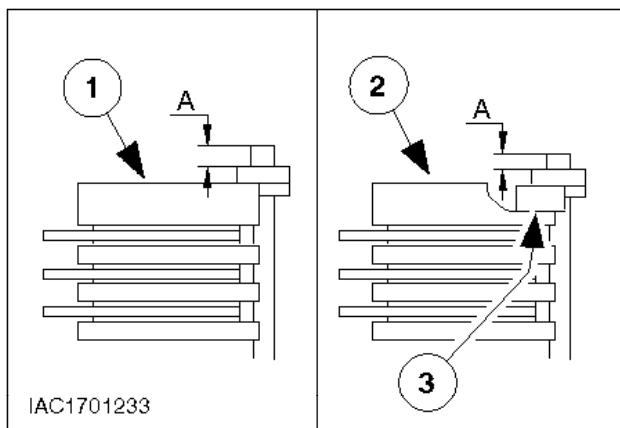
The clutch pack depends on the model year.

← 103. Install the reverse clutch.

Note:

The thrust washer (thicker washer) step must be facing upwards (also see operation).

- 1 Lay the clutch assembly in place (up to model year '96).
- 2 Lay the clutch assembly in place (from model year '96 with stepped pressure plate and distance ring).
- 3 Fit the snap ring.

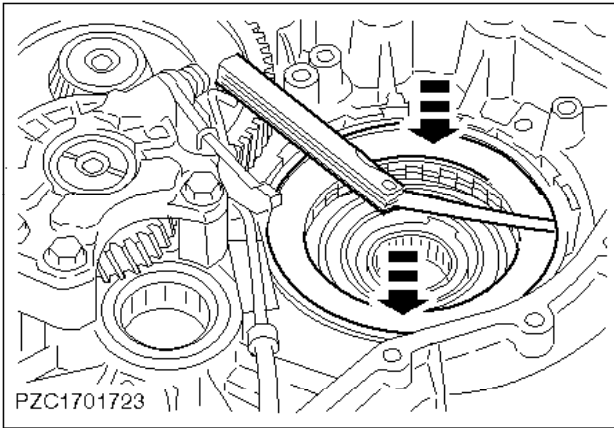


Note:

The ring groove for the snap ring is offset towards the top (measurement 'A').

← 104. Clutch assembly

- 1 Up to '96 model year; pressure plate without distance ring.
- 2 Model year '96 on; pressure plate with step and distance ring.
- 3 Distance ring

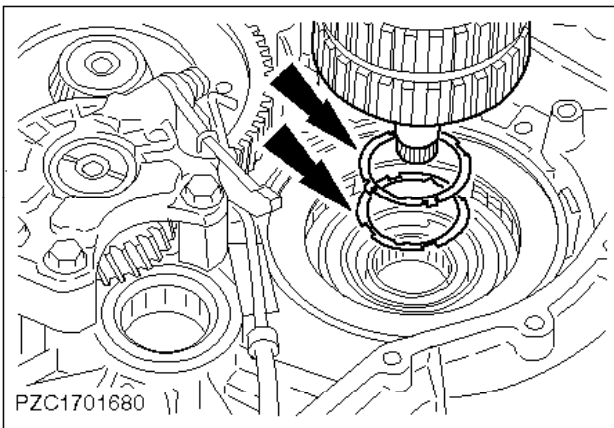


Note:

Required value: 0,7 - 2,1 mm. Check the pack for completeness if the required value is not obtained.

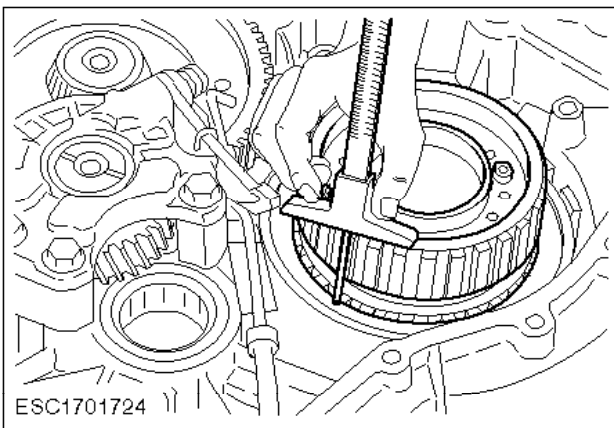
105. Measure the reverse clutch end float.

- Press the clutch plates together.
- Measure the end float between the snap ring and the clutch plate assembly using feeler gauges.



106. Install the planetary gear carrier.

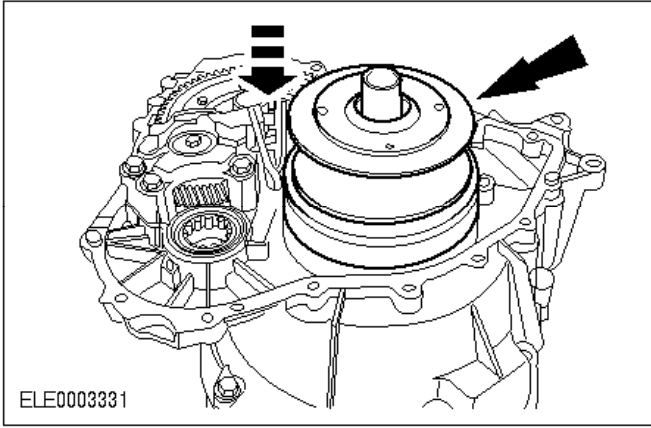
Position the thrust washer and the measured adjusting shim (from step).



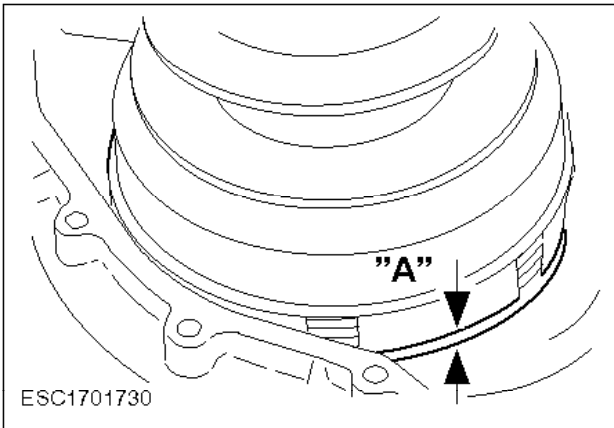
Note:

Required value: 31,0 - 33,5 mm. If the required value is exceeded, this indicates that the planet carrier has not been fitted correctly.

107. Check the installation depth using a sliding depth gauge.



- ④ 108. Install the primary unit with forward clutch.



- ④ 109. Check the primary unit installation depth.

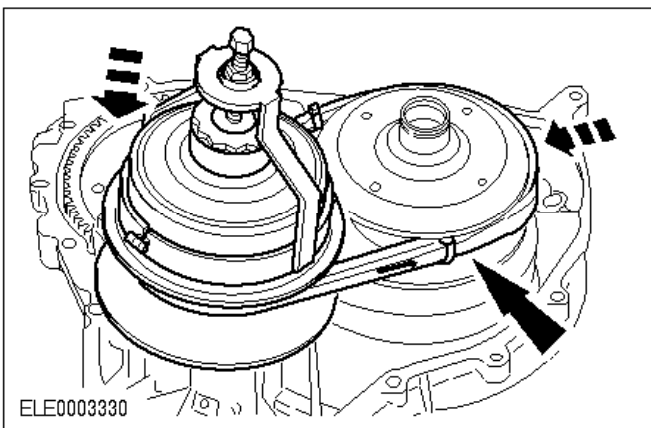
Note:

Measure the distance 'A' (The gap between the primary unit and the transmission housing).

Note:

If this value is exceeded then the clutch packet is not fully home.

- Primary unit installation depth: 2 mm



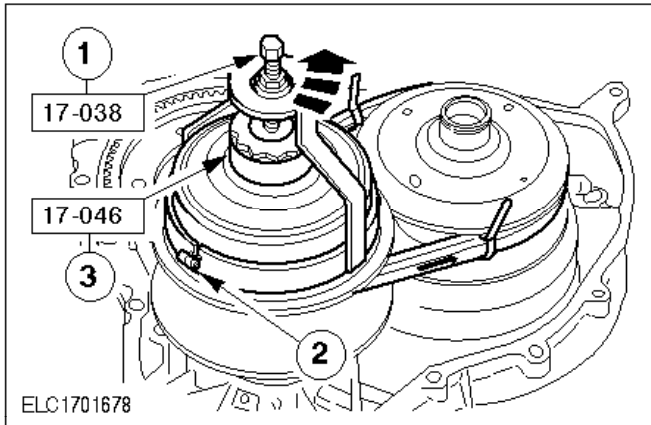
Install the drive belt

Note:

Drive belt direction arrow

- ④ 110. Install drive belt with secondary unit.

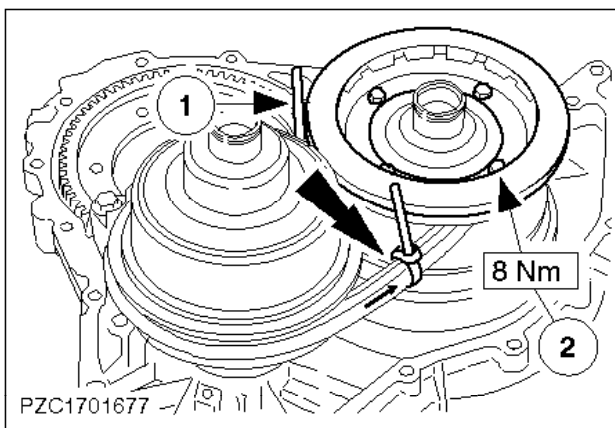
- Position secondary unit with drive belt so that drive belt can be placed onto primary unit.
- Finally position secondary unit with drive belt.



Secure the primary and secondary unit

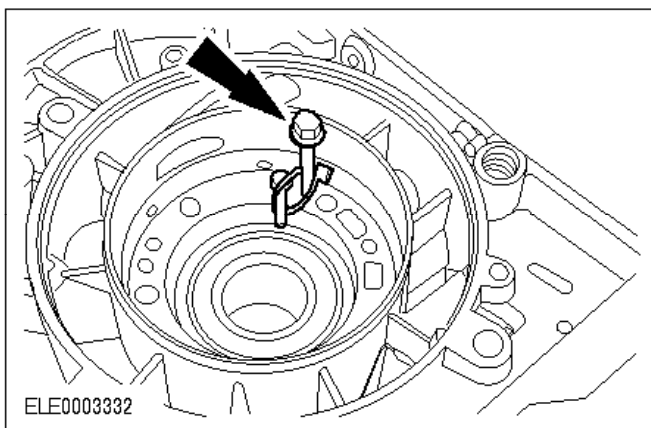
111. Install drive belt with secondary unit (continued)

- 1 Relieve the secondary unit.
- 2 Remove the special tool.
- 3 Remove nut and spacer.



112. Fit the transmission pitot.

- 1 Remove the cable ties.
- 2 Secure the transmission pitot.



Fit the transmission housing.

113. Fix the pitot tube using a cable tie.

Insert bolt (M6x30 mm).

Note:

Carefully clean the housing mating faces.

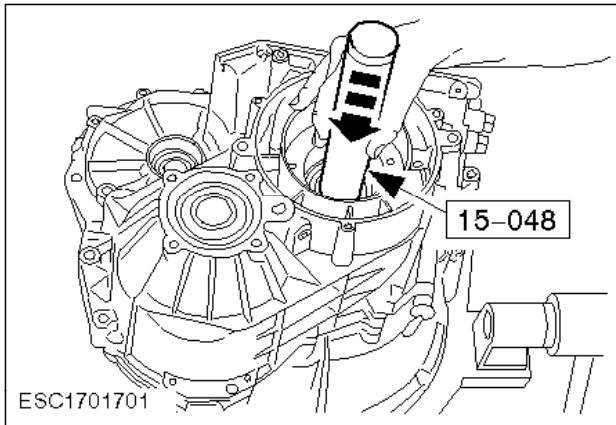


CAUTION:

Apply a thin layer of sealer using a foam roller. Sealer must not be allowed to enter the transmission.

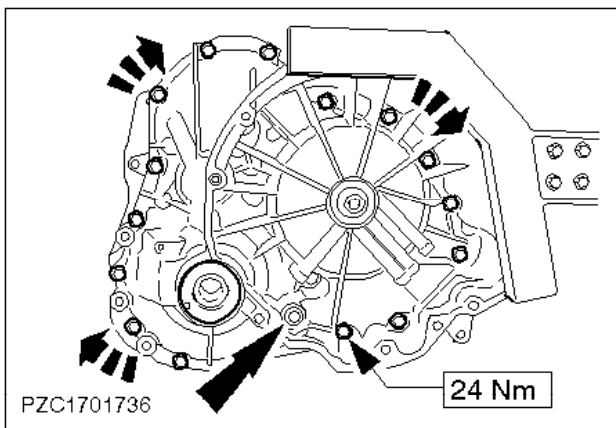
114. Apply sealer.

- The mating face must be dry.
- Apply sealer (ESK-4G269-A) and evenly spread it over the mating face.



115. Fit the transmission housing.

- Tap the housing down using the installer, until the primary unit nut can be fitted.
- Draw the housing halves together by turning the primary unit nut until the mating faces touch.



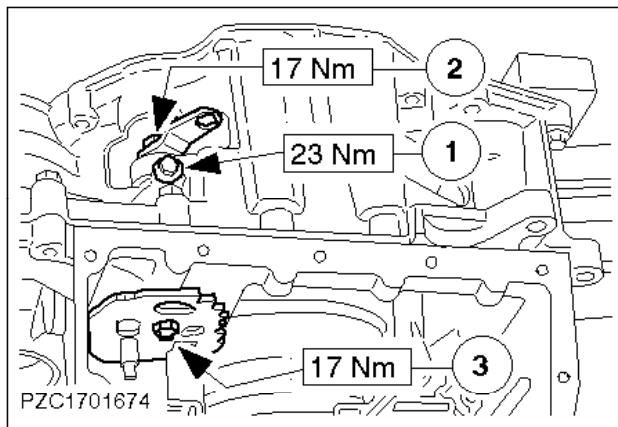
CAUTION:

The transmission housing must not be turned (viewed from below).

116. Tighten the housing bolts uniformly.

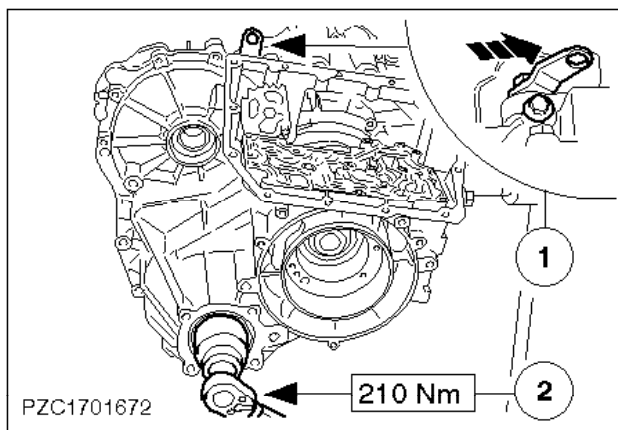
- Tighten the housing bolts.
- Fit the auxiliary plug.
- Remove the pitot tube cable tie(s) and unscrew the bolt concerned.

117. Fit the selector shaft oil seal.



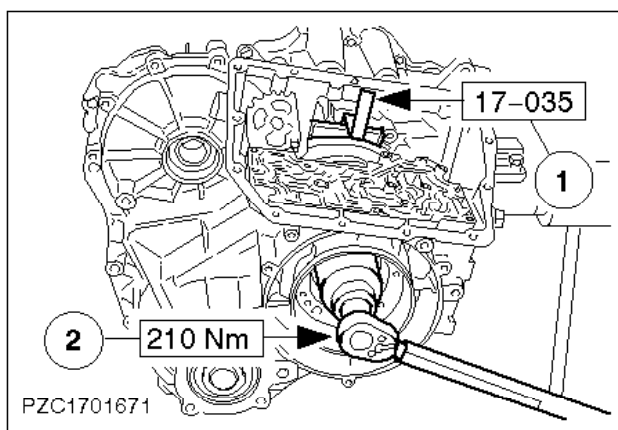
118. Install the selector shaft.

- 1 Slide in the selector shaft from the oil seal end and insert the locking screw.
- 2 Fit the selector lever.
- 3 Hook the selector linkage in place and tighten the engagement plate.



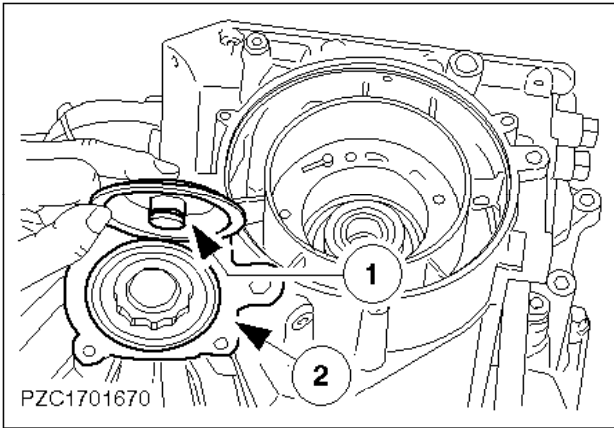
119. Tighten the secondary unit nut.

- 1 Engage the parking pawl.
- 2 Tighten the nut with a bihexagonal socket (41 mm).



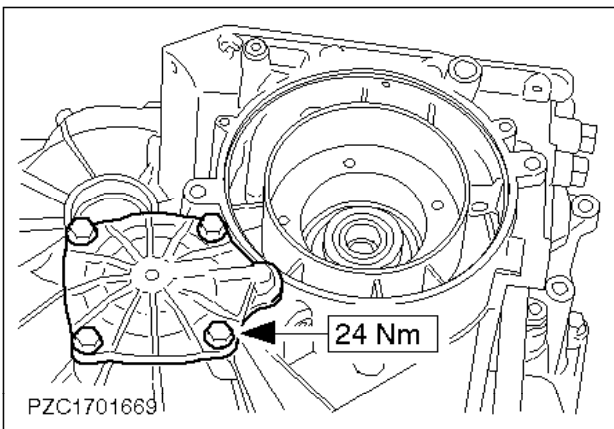
120. Tighten the primary unit nut.

- 1 Insert the special tool to immobilise the forward clutch.
- 2 Tighten the nut with a bihexagonal socket (46 mm).



⦿ 121. Fit the secondary unit inside cover.

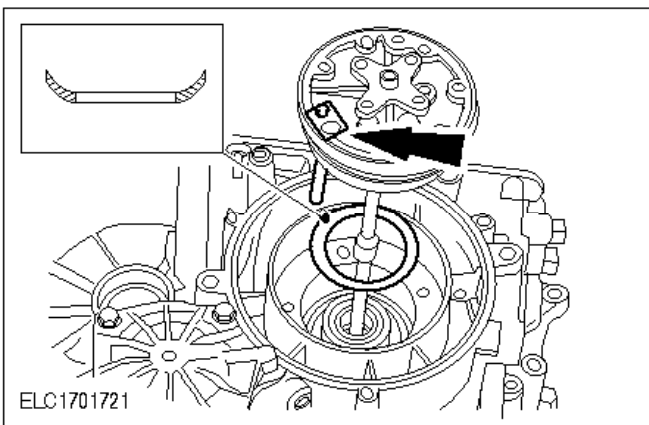
- 1 Fit the oil seal.
- 2 Fit the gasket.



Note:
Use new O-rings.

⦿ 122. Fit the secondary unit housing cover.

Note:
Apply a thin layer of Vaseline,
● Position O-ring with Vaseline.

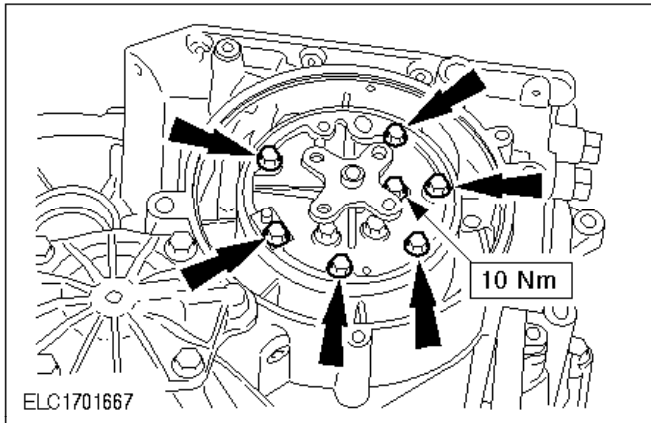


Install the oil pump

 **CAUTION:**

Turn the pitot tube clockwise as far as it will go.

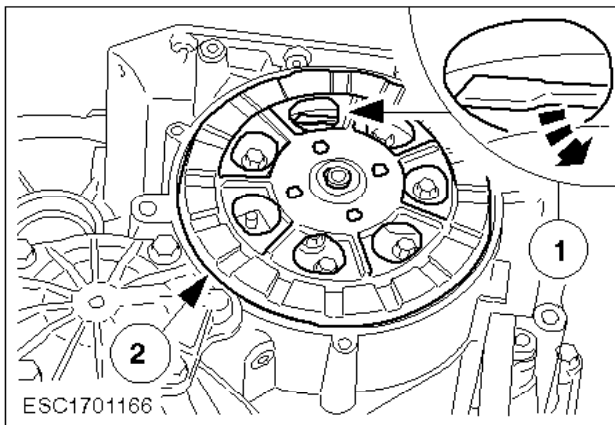
- ⦿ 123. Install the oil filler tube.
- 124. Install the oil pump with the spring washer.
 - Fit the oil seals and insert them with Vaseline.



CAUTION:

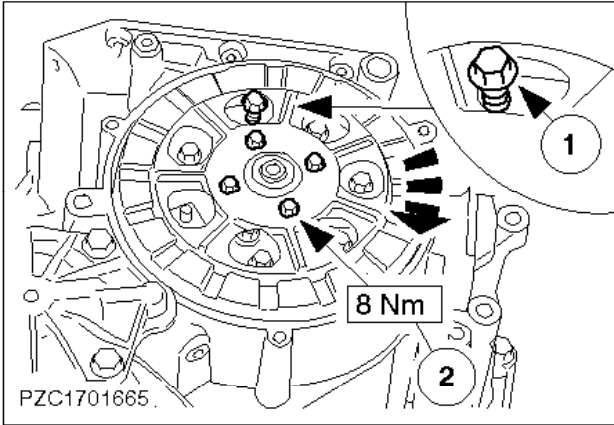
Before tightening the oil pump see that the upper oil seal remains only partially visible, to ensure that it seats correctly.

- ⦿ 125. Tighten the oil pump working diagonally.

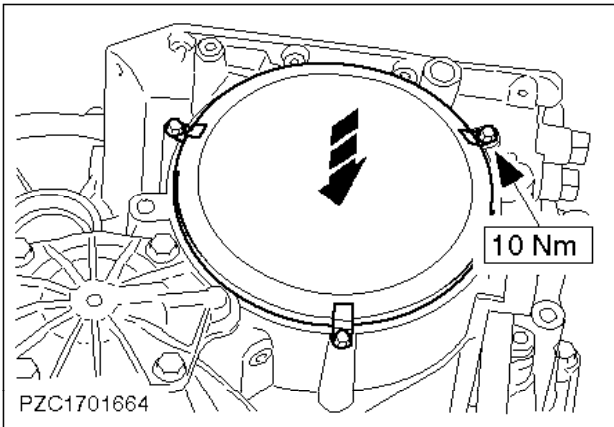


Install the engine pitot

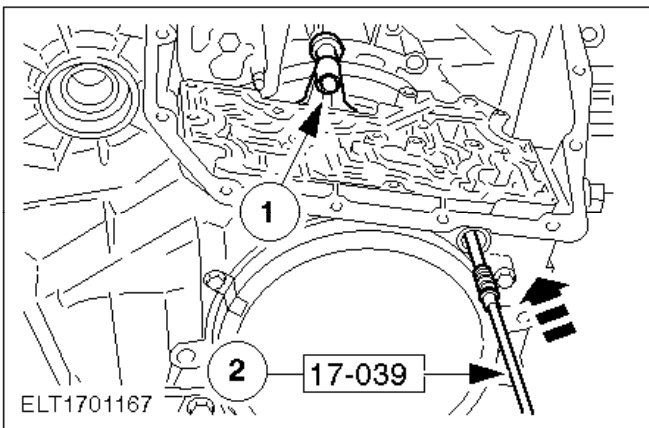
- ⦿ 126. Install the engine pitot.
 - 1 Fit the engine pitot tube and turn it anticlockwise as far as it will go.
 - 2 Fit the engine pitot.
 - Swing the engine pitot back.



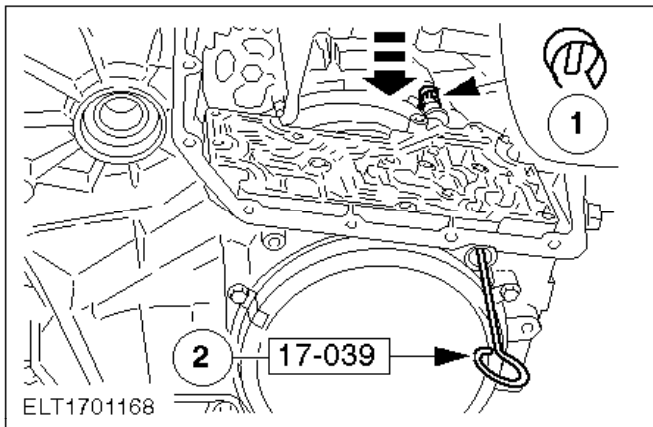
127. Install the engine pitot (continued).
- 1 Screw in the engine pitot tube bolt five turns.
 - 2 Secure the engine pitot.
 - Tighten the engine pitot tube bolt to 10 Nm.



128. Fit the primary unit blanking cover.
- Fit the O-ring in the housing.

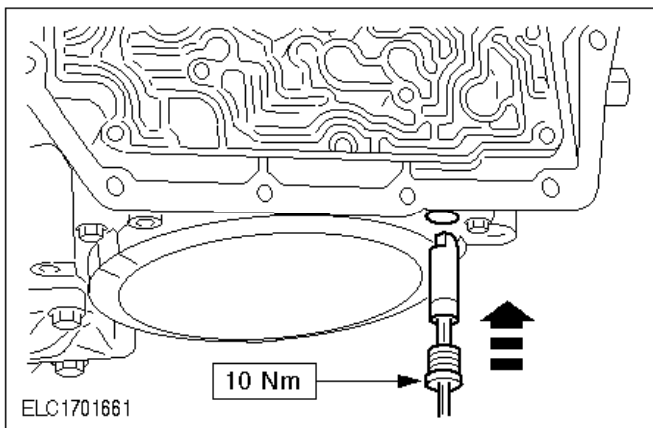


129. Install the gear ratio sensor.
- 1 Fit the sensor and swivel it to the right.
 - 2 Push in the sensor shaft (incl. spring) using special tool.



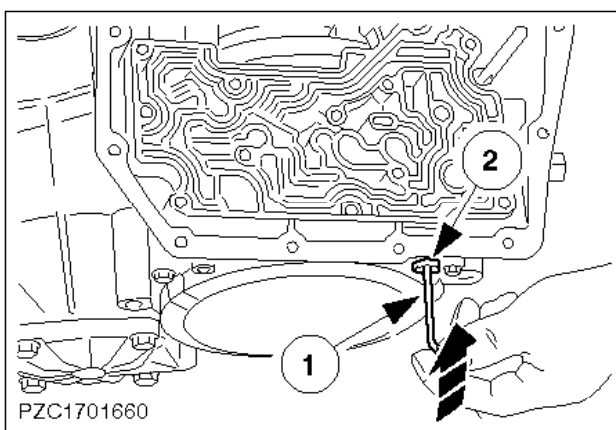
130. Install the sensor (continued).

- 1 Insert the retaining clip.
- 2 Remove the special tool.



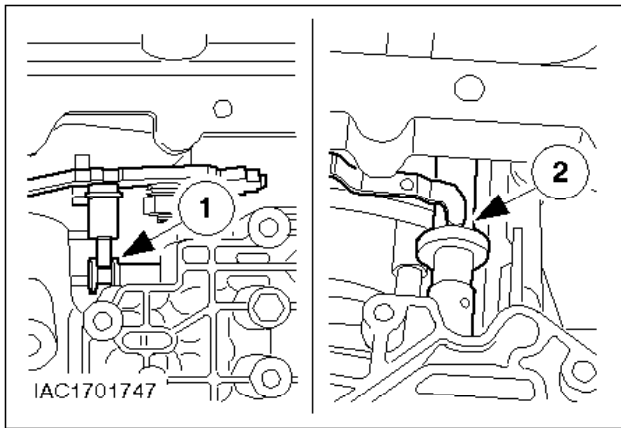
131. Install the adjusting sleeve.

- Using a 4 mm Allen key, press the adjusting sleeve in against the spring pressure and hold it in position.
- Tighten the blanking plug.



132. Set the adjusting sleeve (base adjustment).

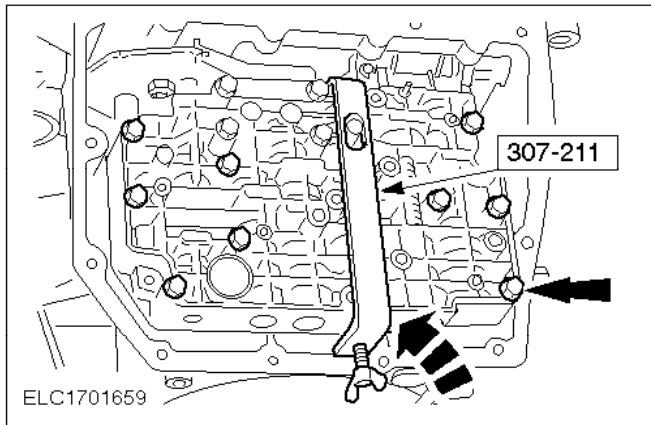
- 1 Insert the adjusting sleeve in clockwise direction until it is felt to reach the stop and then unscrew it six turns.
- 2 Fit the dust cap.



Install the valve body

133. Install the valve body

- 1 Attach the driving pin of the notched plate to the manual valve.
- 2 Insert the secondary lever behind the collar of the sensor sleeve.

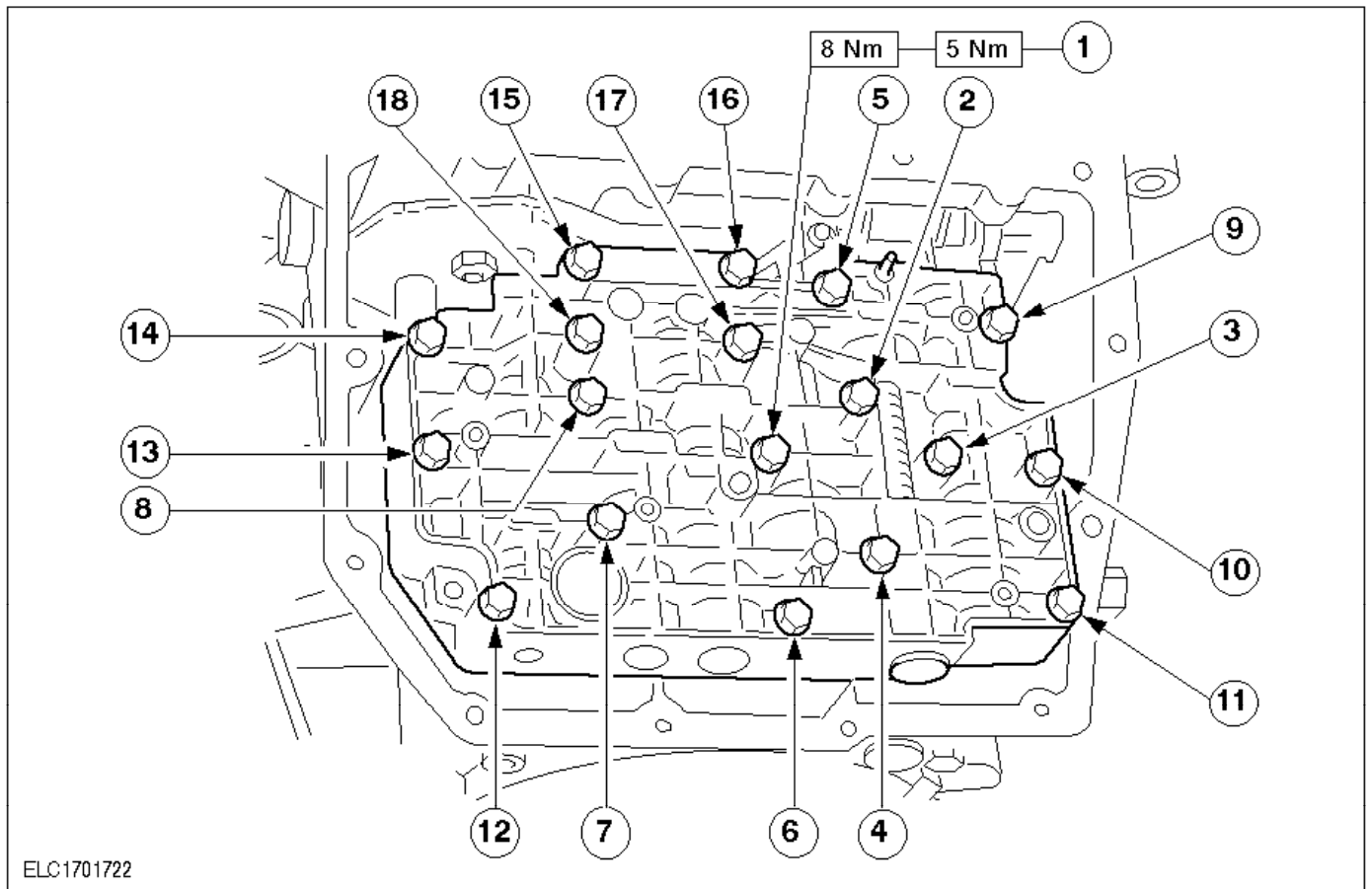


Note:

New bolts (order no.: 1 649 091) must be installed.

134. Install valve body assembly (continued)

- Insert the bolts until they start to take up.
- Remove the special tool.
- Insert the remaining bolts (x 5) until they start to take up.

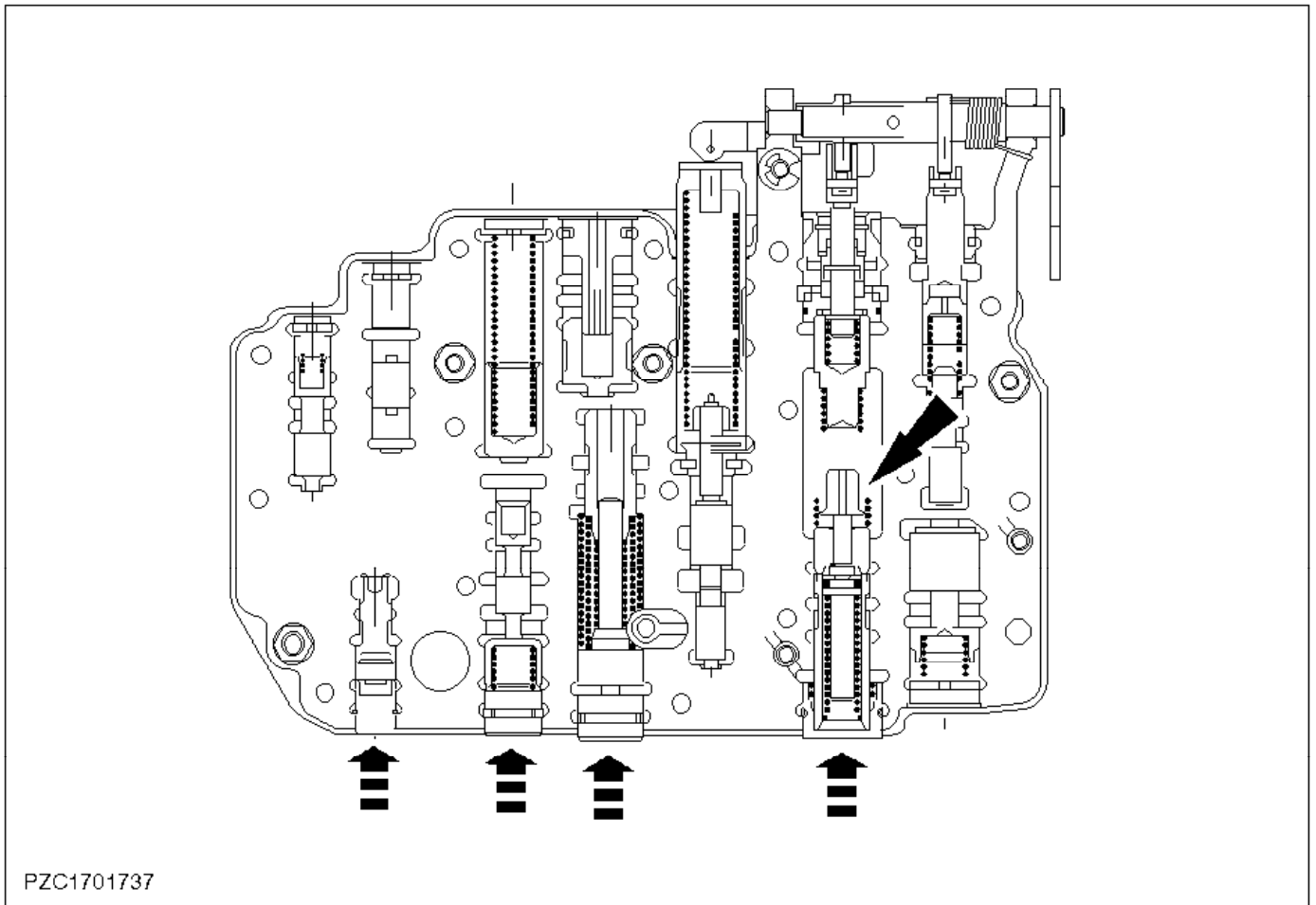


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Note:

Always follow the specified tightening sequence and tightening torque to prevent malfunctions in the valve body assembly.

135. Tighten the valve body assembly bolts in two stages.



136. Check that the pistons move freely.

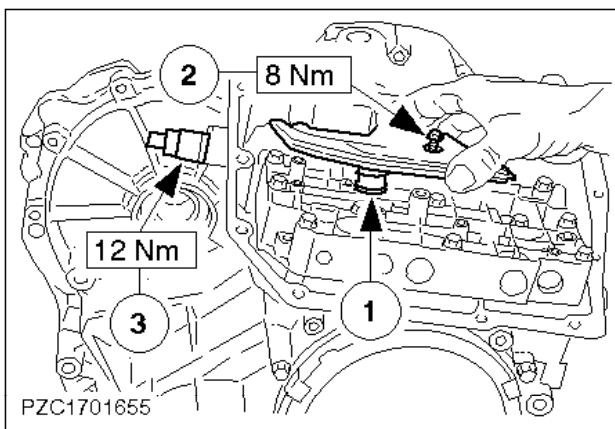
Note:

If the pistons do not move freely then loosen the valve body and repeat steps and

Note:

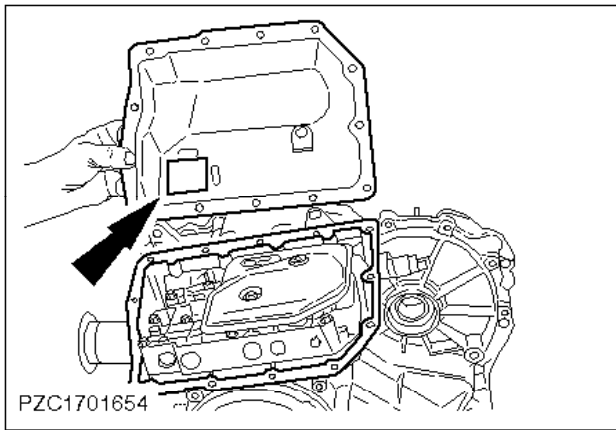
The valve cap must be seen to move at the same time.

Press the piston in as far as it will go (approx. 2 - 3 mm) by hand. The piston must automatically return to its starting position.



137. Install oil strainer and start inhibit switch.

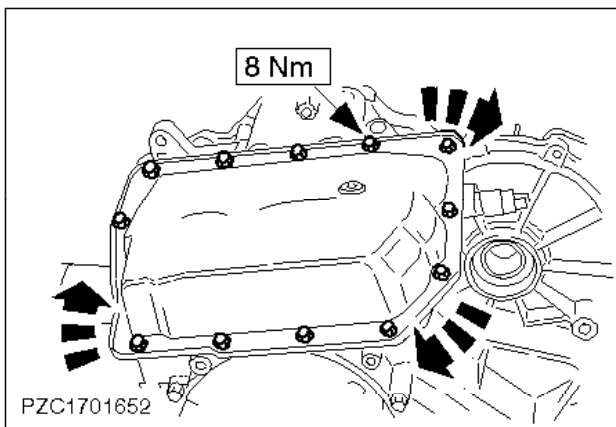
- 1 Fit the oil seal and the oil strainer.
- 2 Secure the oil strainer.
- 3 Screw in start inhibit switch with new seal.



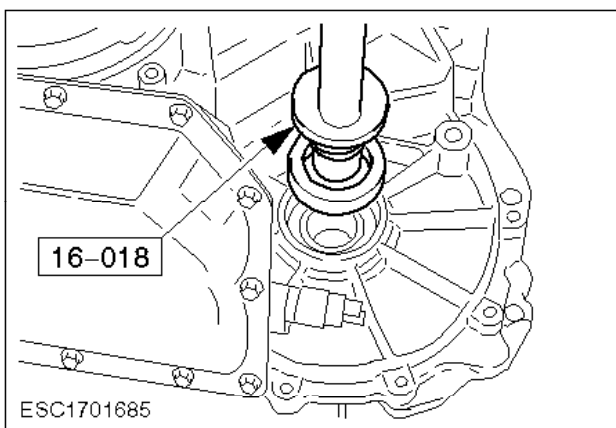
⚠ CAUTION:
Clean the permanent magnet before installation.

Note:
Permanent magnet installation position.

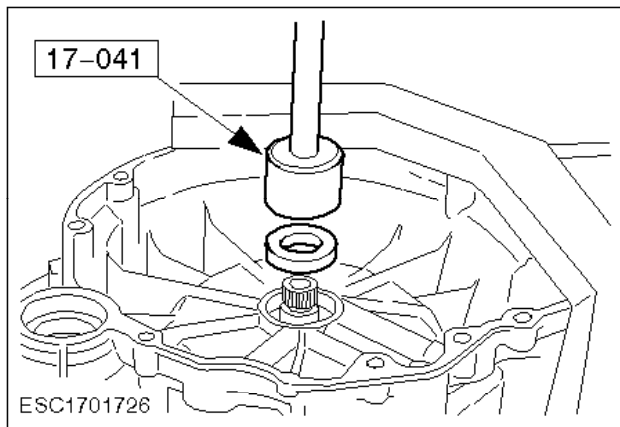
- ④ 138. Fit the sump.
 - Fit the gasket to the transmission.
 - Fit the sump.



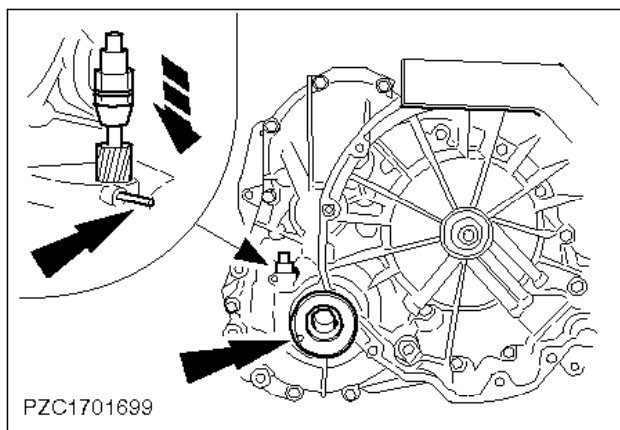
- ④ 139. Tighten the sump uniformly.



- ④ 140. Install the front axle driveshaft oil seals.



- ⌚ 141. Install the input shaft oil seal.



- ⌚ 142. Install the speedometer drive gear.
- Insert the sleeve with the drive gear.
 - Drive the roll pin in.
 - Insert the two auxiliary plugs.
143. Remove transmission from assembly stand.
-