



## FORD FIVE HUNDRED/FREESTYLE/MONTEGO CFT30/CVT TRANSMISSION VARIOUS NOISES FROM THE CVT TRANSAXLE

**COMPLAINT:** Before or after overhaul, Ford Five Hundred/Freestyle/Montego vehicles equipped with the CVT transaxle may exhibit various noises as related to **FORD Technical Service Bulletin TSB 06-11-4**.

**COMPLAINT #1:** Vehicle may exhibit whining/thumping/knocking noise in park or neutral. Noise may also be apparent during driving. Refer to **CAUSE #1**.

**COMPLAINT #2:** Vehicle may exhibit a ticking noise on deceleration from approximately 20 MPH (32 Km/h) to a stop. Refer to **CAUSE #2**.

**COMPLAINT #3:** Vehicle may exhibit a whining noise on deceleration. Refer to **CAUSE #3**.

**CAUSE #1:** Whining/thumping/knocking noise in Park and Neutral or while driving, may be caused by mis-machining of the input shaft/front planetary carrier or flat spots on the input shaft/front planetary carrier roller bearing.

If noise is isolated to transaxle area, monitor the RPM of the turbine shaft speed sensor in PID (TSS\_SRC) using an appropriate scan tool. In Park and Neutral, (TSS\_SRC) should indicate RPM. When the transaxle is placed into either Reverse or Drive with brake applied, the (TSS\_SRC) RPM should drop to 0. If the noise is eliminated as the RPM drops to 0, proceed to **CORRECTION #1**.

**CAUSE #2:** A ticking noise on deceleration from approximately 20 MPH (32 Km/h) to a stop may be caused by the differential ring gear. On Front Wheel Drive (FWD) vehicles, if noise is isolated to the transaxle, proceed to **CORRECTION #2**. On All Wheel Drive (AWD) vehicles it may be necessary to isolate noise to the AWD or CVT system.

To isolate the CVT system, (*referring to appropriate factory manual*), remove the Power Transfer Unit (PTU) assembly, reinstall the halfshafts, disconnect the Differential Electronic Module (DEM) and road test vehicle. If the noise is eliminated, the noise is isolated to the All Wheel Drive (AWD) system. If noise is still present, proceed to **CORRECTION #2**.

*Special thanks to Sam  
at Powers Transmissions.*



# Technical Service Information

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**CAUSE #3:** Gear whining noise during deceleration may be caused by the transfer gear assembly. Check for noise during following driving conditions:

Noise during deceleration 42 - 35 MPH (68 - 56 Km/h). *Noise loudest approximately 37 MPH (59 Km/h).*

Noise during deceleration 32 - 25 MPH (51 - 40 Km/h). *Noise loudest approximately 27 MPH (43 Km/h).*

Noise during deceleration 11 - 16 MPH (18 - 26 Km/h). *Noise loudest approximately 15 MPH (24 Km/h).*

If noise falls into one of the above categories, proceed to **CORRECTION #3**.

**CORRECTION #1:** Replace the input shaft roller bearing and related parts shown in figures 20-21. Refer to the disassembly and reassembly procedure on the following pages to properly disassemble and reassemble the Ford CVT transaxle for input shaft bearing replacement.

**CORRECTION #2:** Replace the differential assembly. The ring gear is not sold or serviced separately. Use the disassembly and reassembly procedure and refer to Figure 13 for proper disassembly and reassembly of the Ford CVT transaxle for the differential assembly. Refer to factory manual section 307-01A for proper shim and pre-load procedures for the differential assembly.

**Note:** *Inspect the mating surface of the transfer gear if the differential assembly is to be replaced. Replace as necessary.*

**CORRECTION #3:** Replace transfer gear assembly as shown in figure 18. Refer to the disassembly and reassembly procedure on the following pages to properly disassemble and reassemble the Ford CVT transaxle for transfer gear assembly.

## SERVICE INFORMATION:

Input Shaft/Front Planetary.....	7F9Z-7015-A
Input Bearing (Caged Needle Bearing).....	5F9Z-7N168-C
Input Bearing (Flat Needle Bearing).....	5F9Z-7D090-B
Thrust Washer (2.8 mm, Selective).....	5F9Z-7D014-B
Sun Gear (Front Planetary).....	5F9Z-7D063-AA
Snap Ring (Sun Gear).....	5F9Z-7C122-C
Washer (Sun Gear).....	5F9Z-7D090-AA
Differential Assembly AWD.....	5F9Z-7F465-AA
Differential Assembly FWD.....	5F9Z-7F465-BA
Differential Bearing Race.....	5F9Z-4222-BA
Differential Bearing Race.....	5F9Z-4222-CA
Side Shaft Gear Assembly 5.19 (Transfer Gear).....	7F9Z-7H348-A
Side Shaft Gear Assembly 5.24 (Transfer Gear).....	7F9Z-7H348-B
Dust Cap.....	5F9Z-7J309-AA
O-Ring.....	5F9Z-7L280-CA
Case Gasket.....	5F9Z-7B353-AA
Oil Pan Gasket.....	5F9Z-7A191-AA
Oil Filter.....	5F9Z-7A098-B

## SAFETY PRECAUTIONS

*Service information provided in this procedure by ATSG is intended for use by professional qualified technicians. Attempting repairs or service without the appropriate training, tools and equipment could cause injury to you or to others.*

*The service procedures we recommend and describe herein are effective methods of performing service and repair on this transmission. Some of the procedures require the use of special tools that are designed for specific purposes.*

**CAUTIONS** are provided in this procedure that you must observe carefully in order to reduce the risk of injury to yourself or to others. This procedure also contains **NOTES** that must be carefully followed in order to avoid improper service that may damage the vehicle, tools and/or equipment.

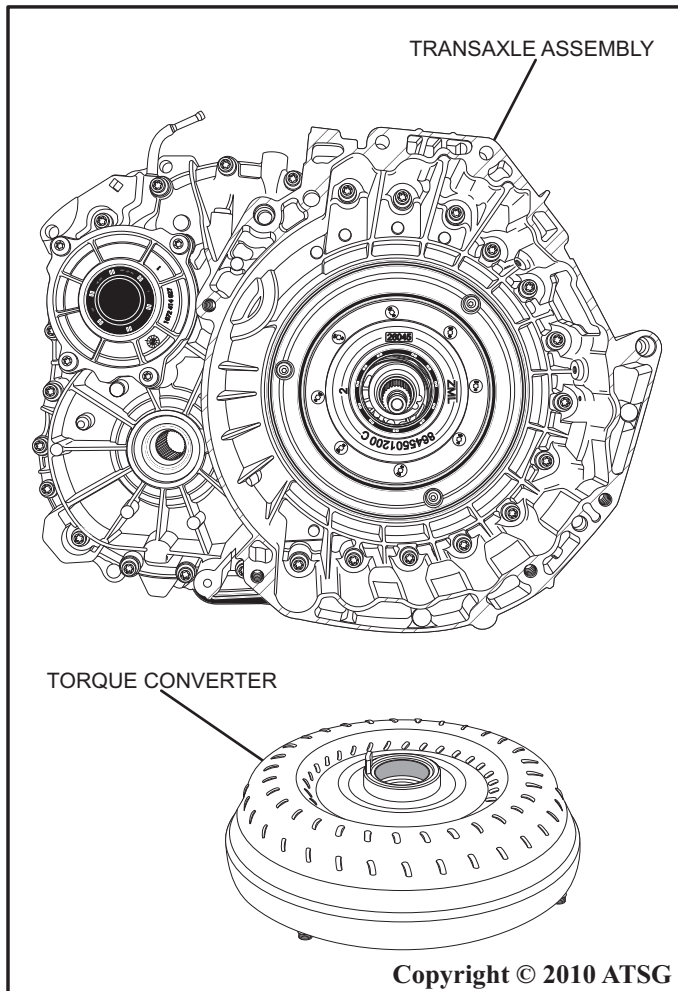


Figure 1

## TRANSAXLE DISASSEMBLY

### EXTERNAL COMPONENTS

1. This transaxle can be disassembled quite easily on a suitable workbench without the aid of any holding fixture for rotation, however the technician may prefer to utilize the transaxle holding fixture Ford Special Tool # 307-003 (T57L-500-B).
2. Remove the torque converter from transaxle as shown in figure 1.  
**Caution: The torque converter is heavy, use caution when removing to avoid personal injury or damage to torque converter.**
3. Using a #40 Torx bit, remove the transfer gear assembly attaching bolts (4 required) as shown in figure 2.
4. Remove the transfer gear assembly from the transaxle case by lifting straight up as shown in figure 2.

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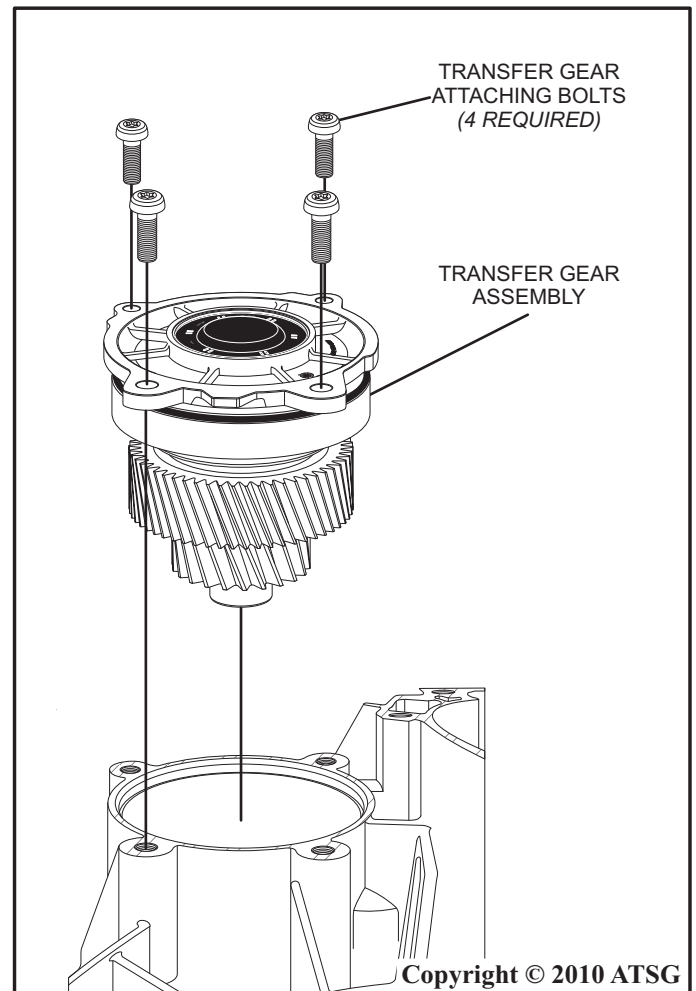


Figure 2

## TRANSAXLE DISASSEMBLY

### EXTERNAL COMPONENTS

5. Remove the outer shell hold down bolt from the transaxle case using a #27 Torx bit as shown in figure 3.
6. Rotate the outer shell in the direction of the arrow to unlock it from the mechatronic unit assembly as shown in figure 4.

**Note:** Use care to not damage the pins of the mechatronic unit assembly or touch them when removing the outer shell. This could create electrostatic discharge and can cause damage to the mechatronic unit assembly.

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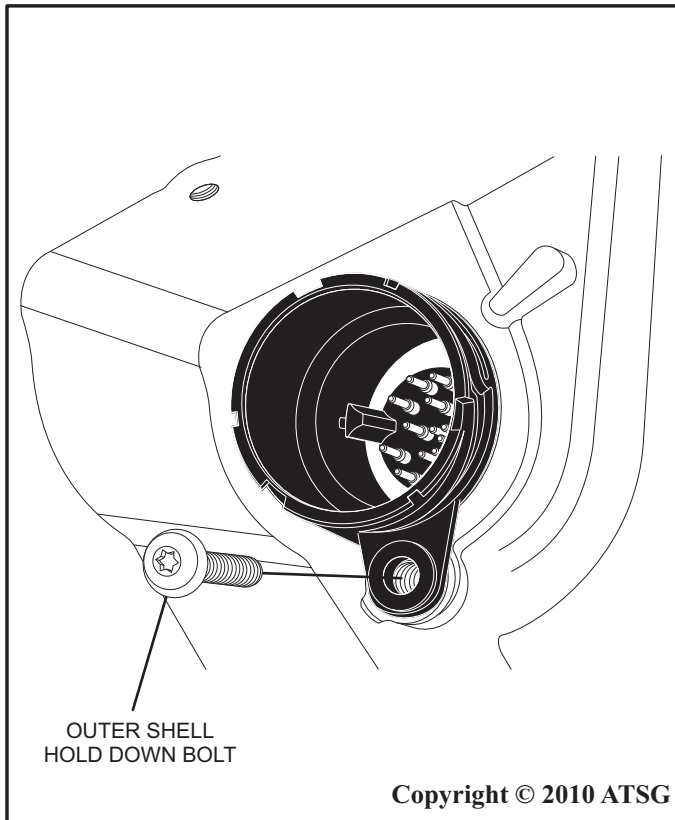


Figure 3

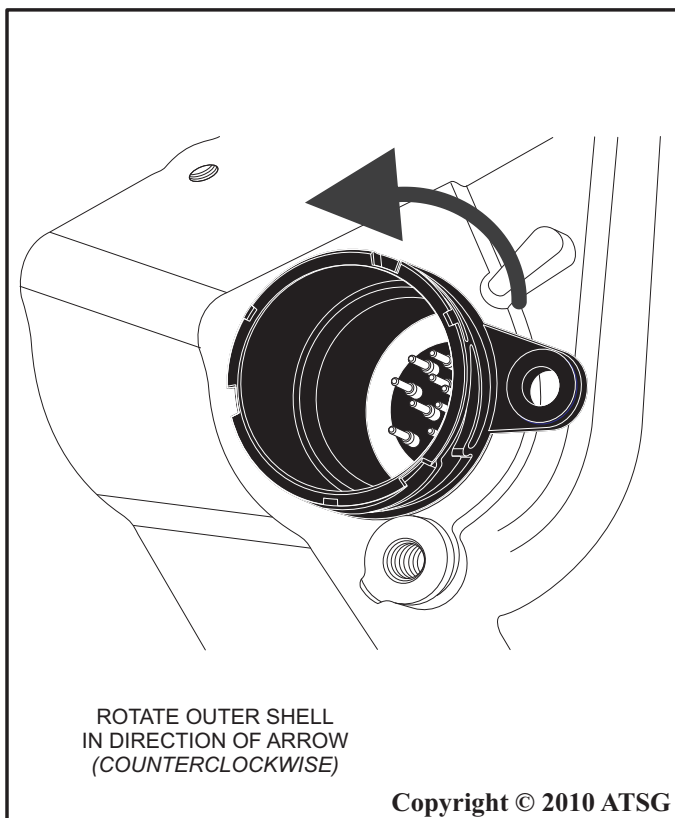


Figure 4



## TRANSAXLE DISASSEMBLY CONT'D

### INTERNAL COMPONENTS

7. Using a 5/16 socket, and suitable air wrench, remove the transaxle oil pan attaching bolts (22 required) as shown in figure 5.
8. Remove the transaxle oil pan by lifting straight up as shown in figure 5.
9. Remove the transaxle oil pan gasket and discard as shown in figure 5.
10. Remove the transaxle oil filter by twisting and lifting straight up and discard filter as shown in figure 6.
11. If filter seal remains in the case, carefully remove using a small scribe or screwdriver using care to not scratch the case surface, and discard the seal.

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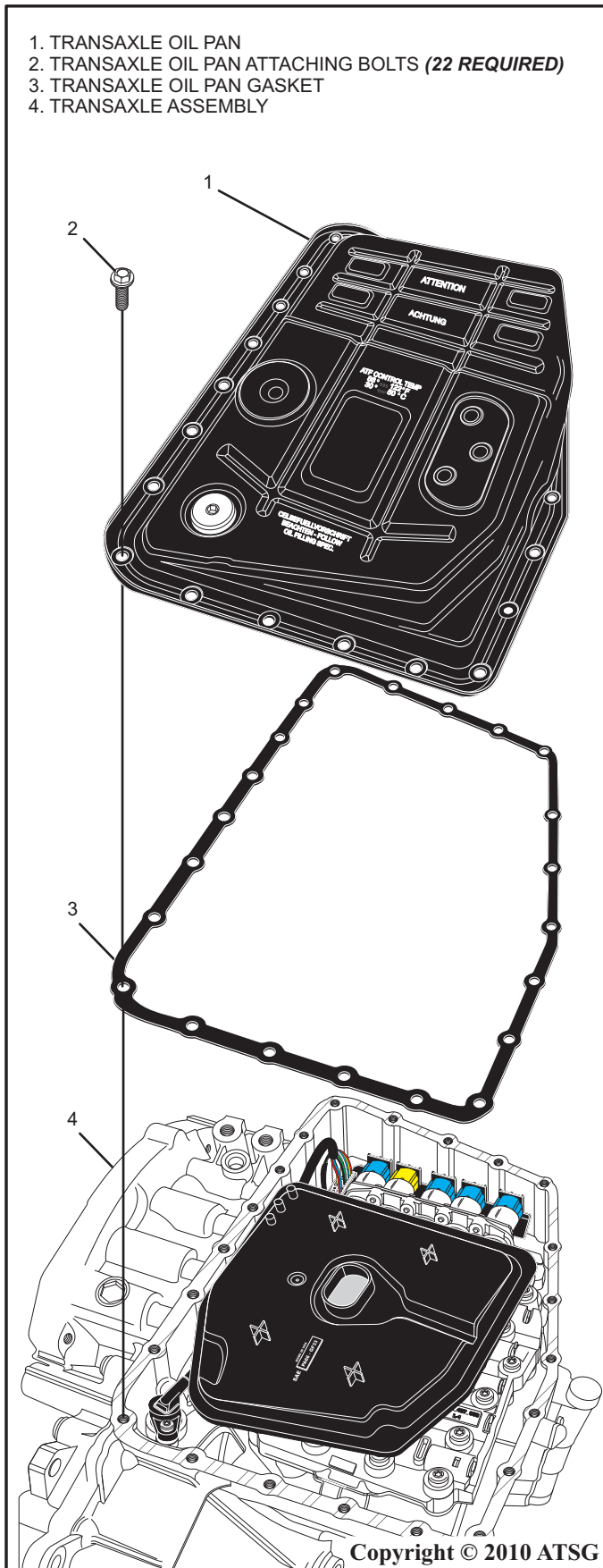


Figure 5

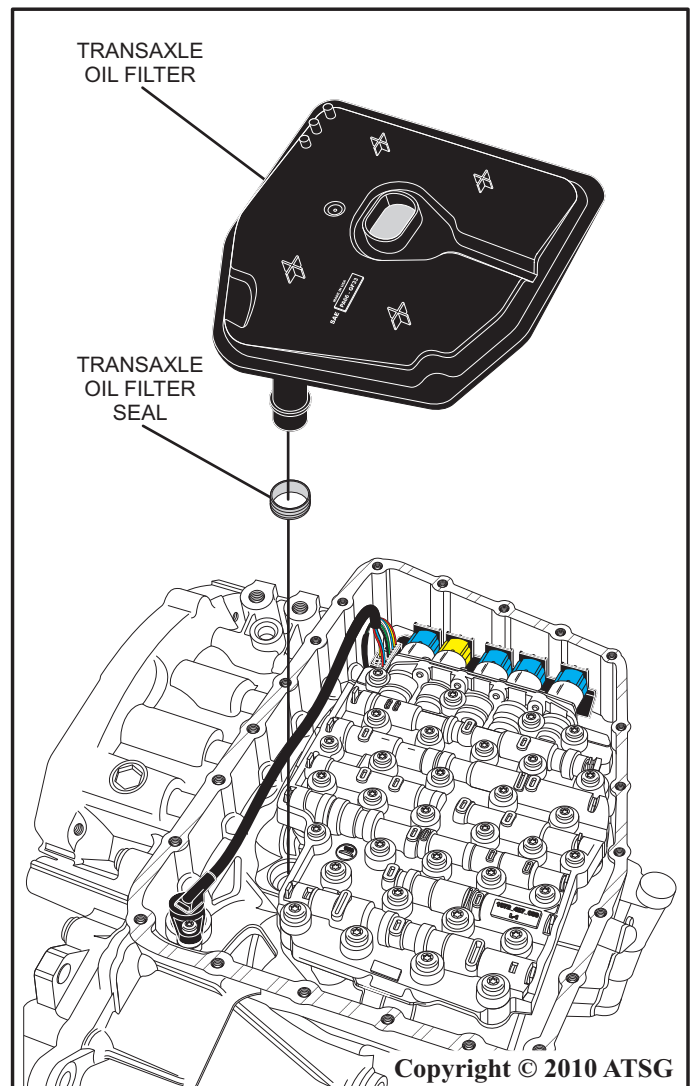


Figure 6

## TRANSAXLE DISASSEMBLY CONT'D

### INTERNAL COMPONENTS

12. Depress the locking tab for the output shaft speed sensor connector by pressing in toward the connector gently and carefully remove the connector by lifting straight up as shown in figure 7.
13. Depress the locking tab for the transmission range sensor by pressing toward the connector gently and carefully remove the connector by lifting straight up as shown in figure 8.
14. Remove the output speed sensor hold down bolt using a #27 Torx bit as shown in figure 9.
15. Remove the output speed sensor with a twisting motion lifting upward and remove the output speed sensor spacer as shown in figure 9.

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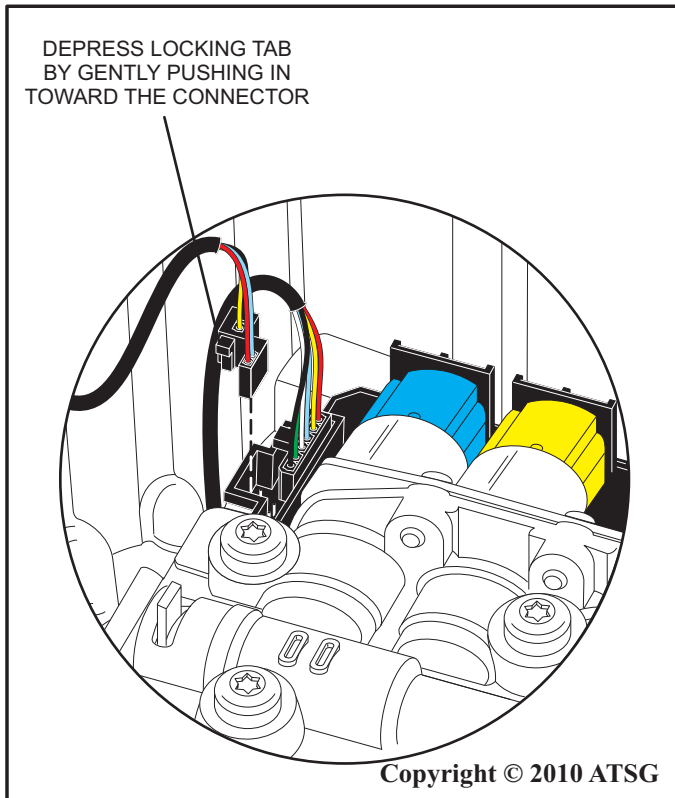


Figure 7

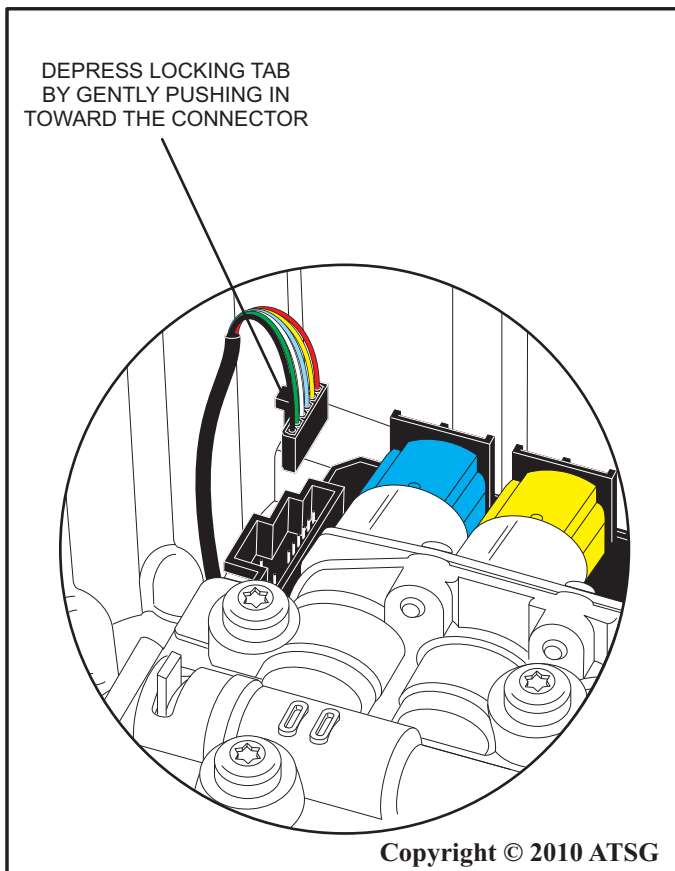


Figure 8

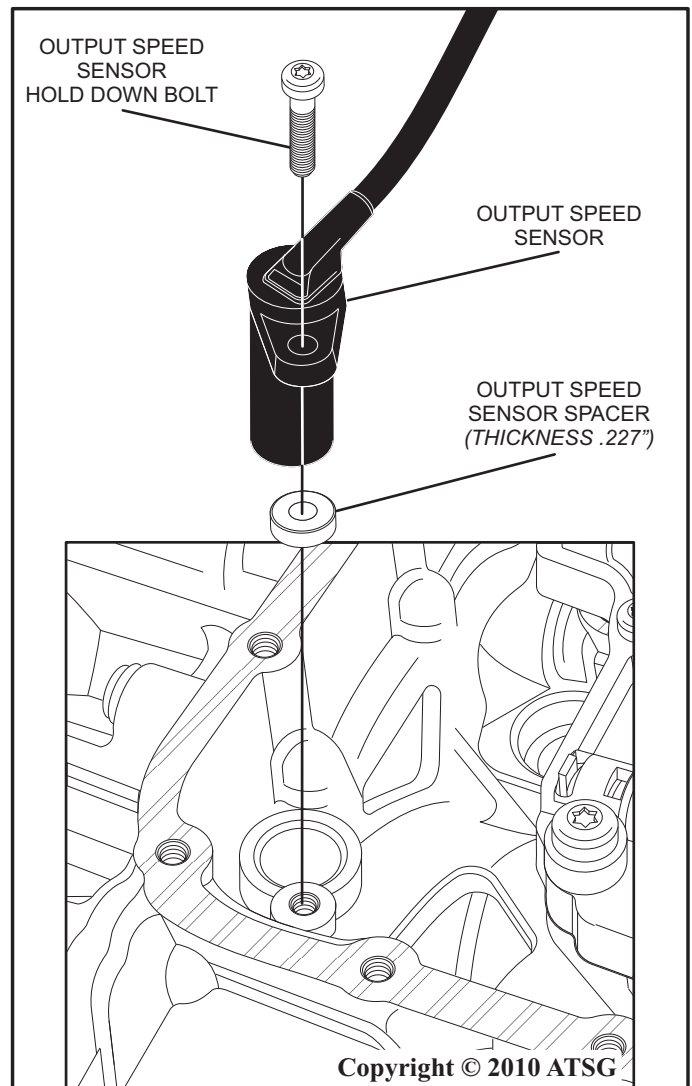


Figure 9

## TRANSAXLE DISASSEMBLY CONT'D

### INTERNAL COMPONENTS

16. Using a #40 Torx bit, remove the mechatronic unit assembly attaching bolts (8 required) as shown in figure 10.
17. Remove the torque converter clutch feed tube from the case as shown in figure 11.
18. Remove the main pump pressure feed tube from the case as shown in figure 11.
19. Remove the secondary pressure feed tube from the case as shown in figure 11.
20. Remove the primary pressure feed tube from the case as shown in figure 11.
21. Remove the manual valve supply feed tube from the case as shown in figure 11.

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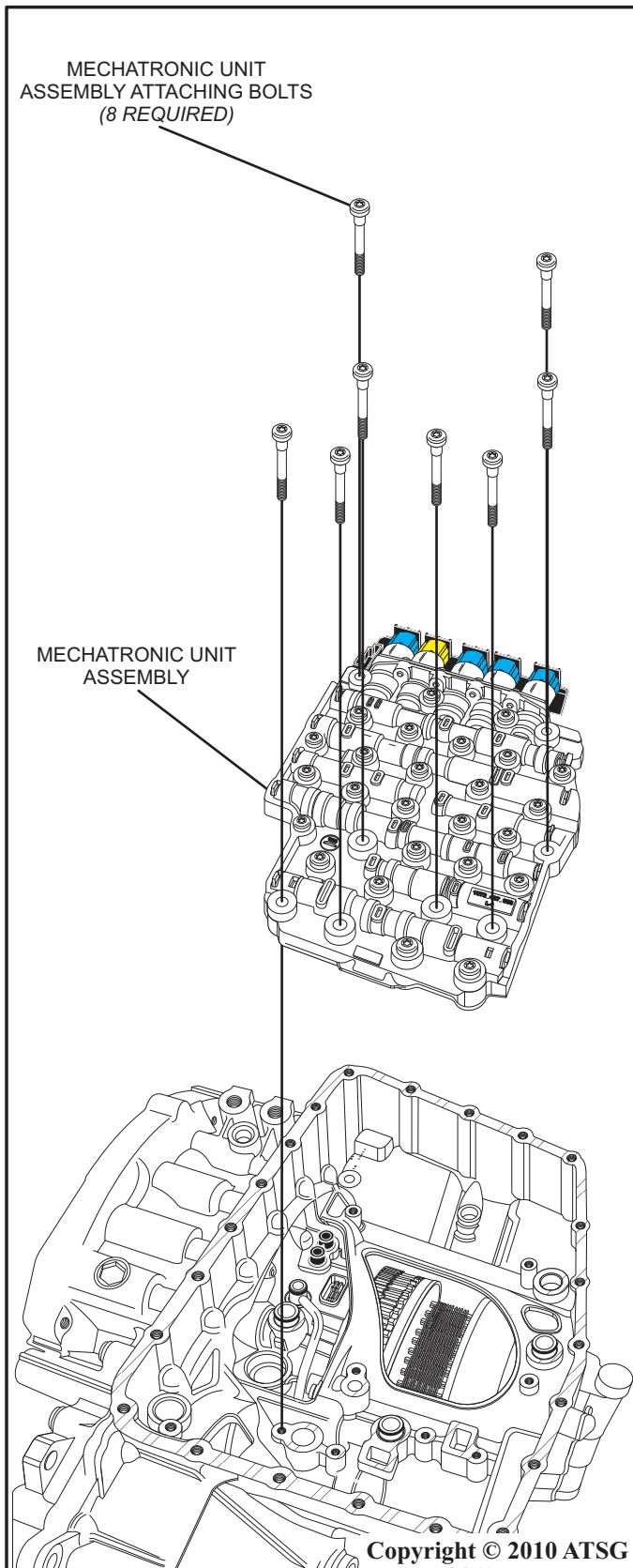


Figure 10

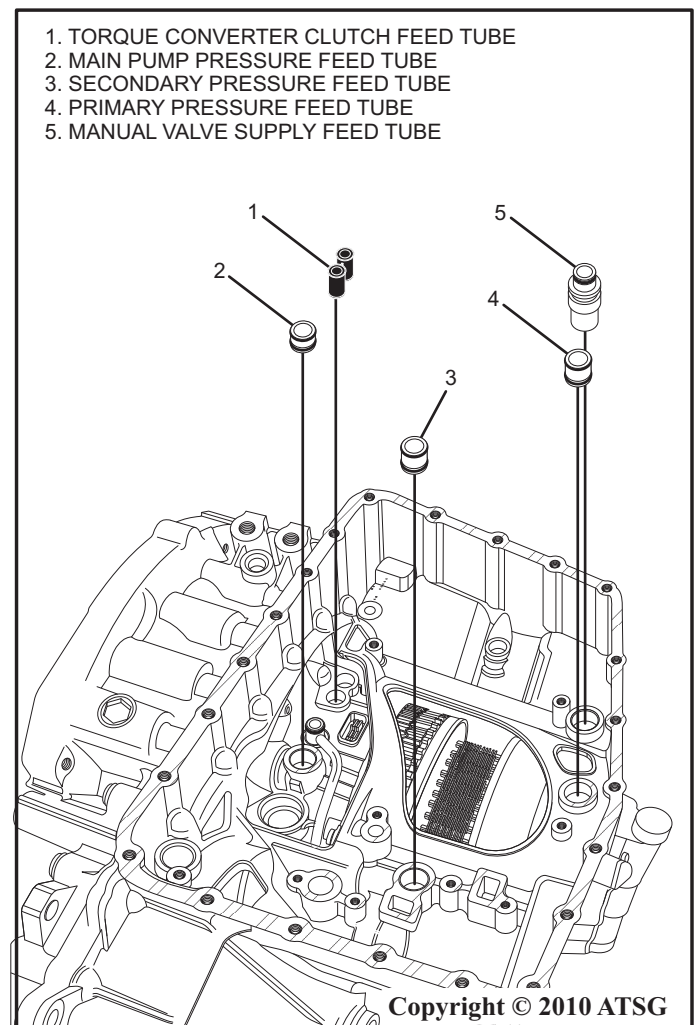


Figure 11

## TRANSAXLE DISASSEMBLY CONT'D

### INTERNAL COMPONENTS

22. Using a #45 Torx bit, remove the transaxle converter housing attaching bolts (26 required) as shown in figure 12.
23. Using two screwdrivers, remove the transaxle converter housing from the transaxle by lifting straight up.
24. Remove the differential carrier assembly by lifting straight up as shown in figure 13.

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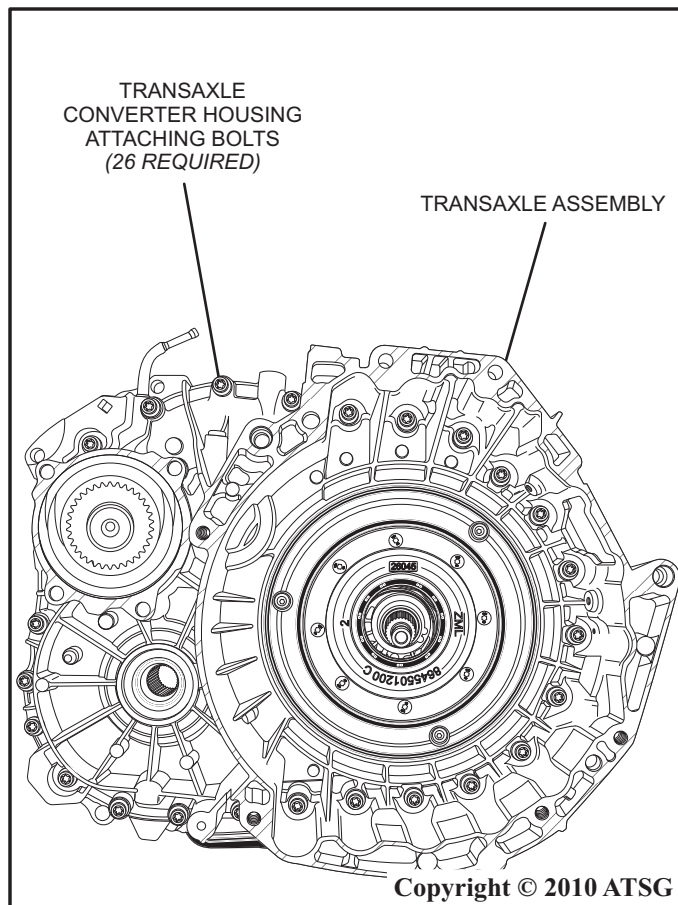


Figure 12

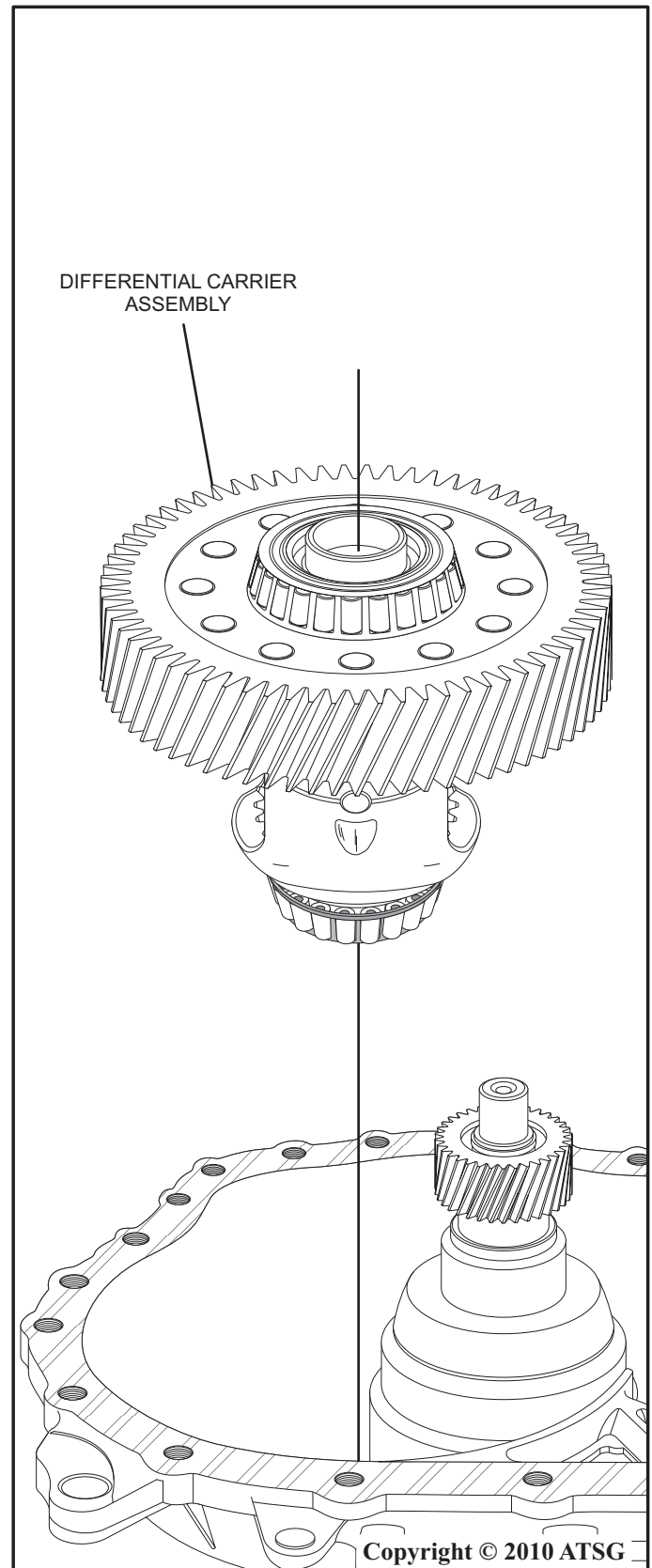


Figure 13



## TRANSAXLE DISASSEMBLY CONT'D

### INTERNAL COMPONENTS

1. INPUT SHAFT/FRONT PLANETARY THRUST WASHER
2. INPUT SHAFT/FRONT PLANETARY CARRIER ASSEMBLY
3. INPUT BEARING (CAGED NEEDLE BEARING)
4. INPUT BEARING (FLAT NEEDLE BEARING)
5. THRUST WASHER (SELECTIVE)

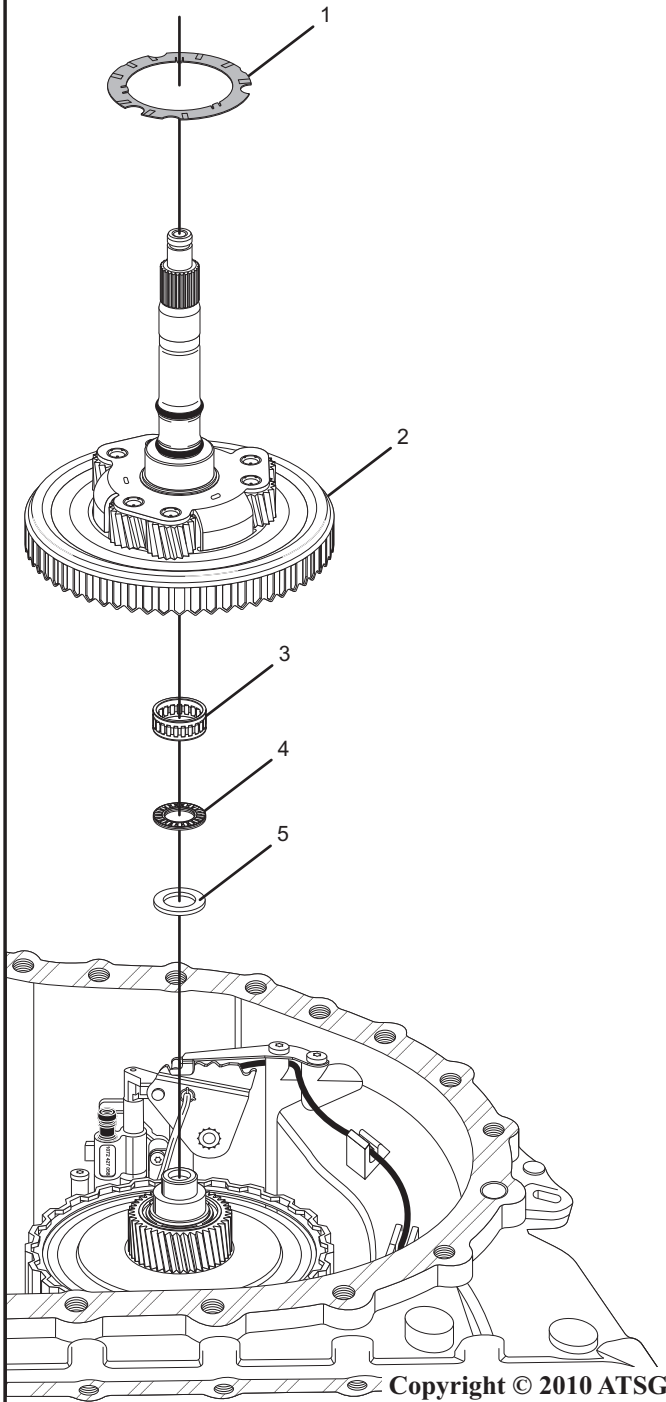


Figure 14

25. Remove the input shaft/front planetary carrier thrust washer as shown in figure 14.
26. Remove the input shaft/front planetary carrier as shown in figure 14.
27. Remove the input bearing (*caged needle bearing*) as shown in figure 14.
28. Remove the input bearing (*flat needle bearing*) as shown in figure 14.
29. Remove the thrust washer (*selective*) as shown in figure 14.
30. Using a suitable pair of snap ring pliers, remove the front planetary sun gear retaining snap ring as shown in figure 15.
31. Remove the front planetary spacer as shown in figure 15.
32. Remove the front planetary sun gear as shown in figure 15.

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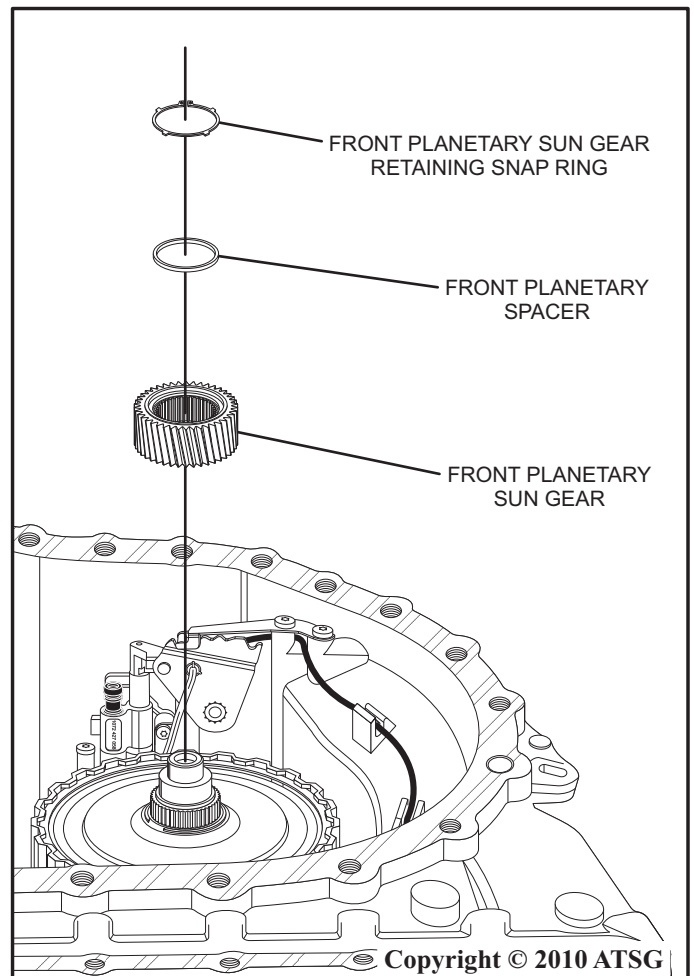


Figure 15

## COMPONENT DISASSEMBLY/INSPECTION INPUT SHAFT/FRONT PLANETARY

33. Thoroughly wash the input shaft/front planetary carrier assembly with solvent and inspect the bearing contact area as shown in figure 16. Replace the input shaft/front planetary carrier as necessary.
34. Inspect the input bearing (*caged needle bearing*) and replace as necessary as shown in figure 17.
35. Inspect the input bearing (*flat needle bearing*) and replace as necessary as shown in figure 17.
36. Inspect the thrust washer (*selective*) and replace as necessary as shown in figure 17.
37. Set input shaft/front planetary assembly aside for final assembly.

**Note:** install bearings and thrust washers using the diagram in figure 21.

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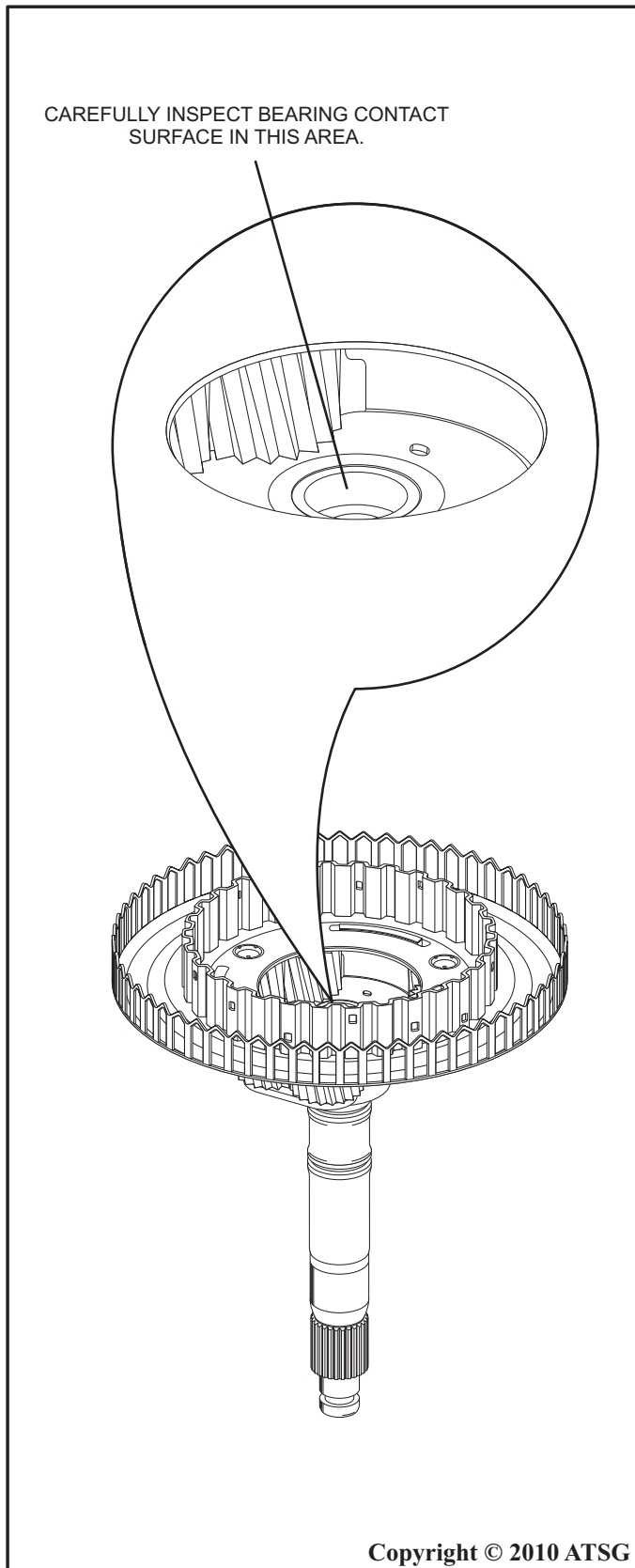


Figure 16

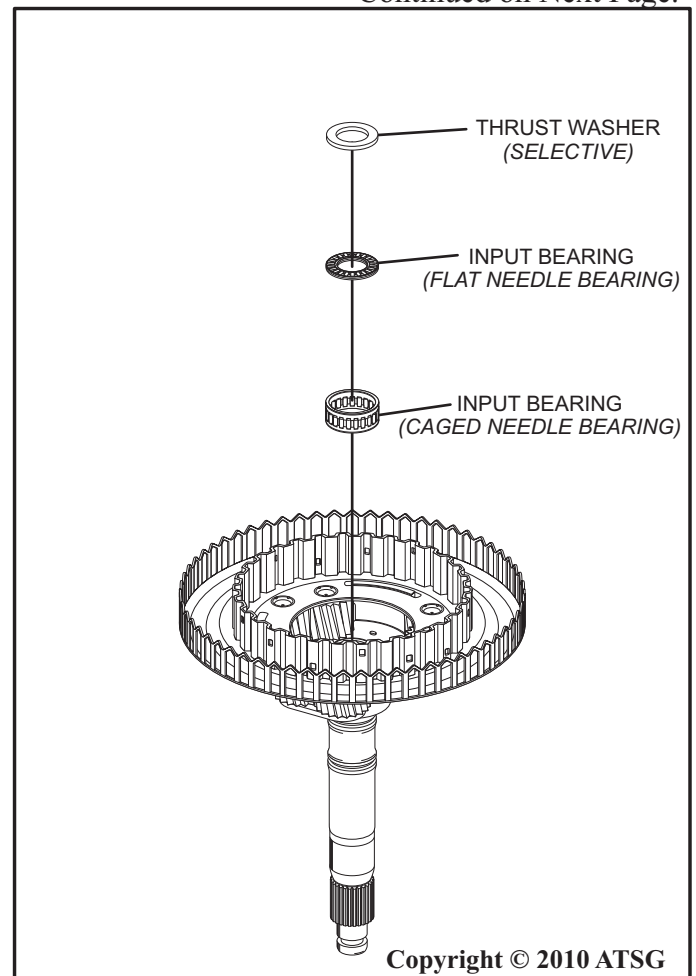
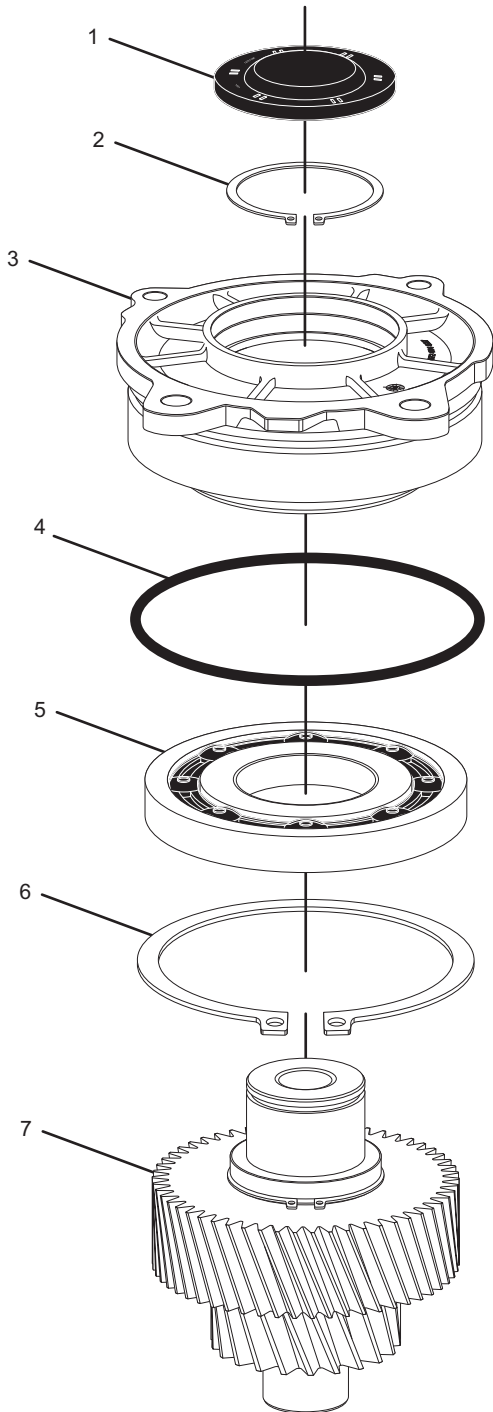


Figure 17

## TRANSFER GEAR ASSEMBLY EXPLODED VIEW



1. DUST COVER
2. TRANSFER GEAR RETAINING SNAP RING
3. TRANSFER GEAR BEARING HOUSING
4. TRANSFER GEAR BEARING HOUSING O-RING
5. TRANSFER GEAR BALL BEARING
6. TRANSFER GEAR BALL BEARING RETAINING SNAP RING
7. TRANSFER GEAR ASSEMBLY

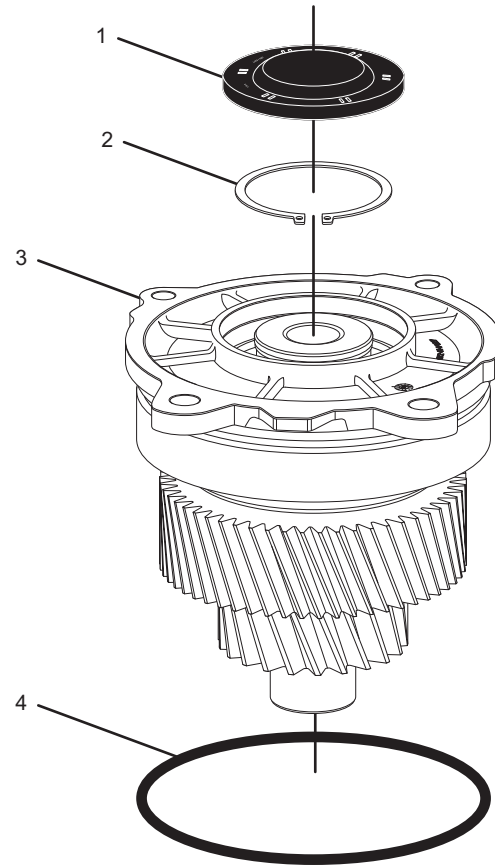
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Figure 18

## COMPONENT DISASSEMBLY/INSPECTION TRANSFER GEAR ASSEMBLY

38. Disassemble the transfer gear assembly using the diagram in figure 18 as a reference.
39. Clean all transfer gear assembly parts with good solvent and dry thoroughly with compressed air.
40. Using a suitable press, install a new transfer gear ball bearing, as necessary, into the transfer gear bearing housing and install the roller bearing retaining snap ring using figure 18 as a reference. Using the press, press the transfer gear assembly
41. into the transfer gear bearing housing and install the retaining snap ring as shown in figure 19.
42. Install a new transfer gear bearing housing o-ring as shown in figure 19.
43. Install a new dust cover as shown in figure 19.
44. Set the completed transfer gear assembly aside for final assembly.

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1. DUST COVER
2. TRANSFER GEAR RETAINING SNAP RING
3. TRANSFER GEAR BEARING HOUSING
4. TRANSFER GEAR BEARING HOUSING O-RING

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Figure 19

## TRANSAXLE REASSEMBLY

### INTERNAL COMPONENTS

44. Install the front planetary sun gear as shown in figure 20.
45. Install the front planetary spacer as shown in figure 20.
46. Install the front planetary sun gear retaining snap ring as shown in figure 20.
47. Coat the thrust washer (selective) with a small amount of Trans-Jel® and install onto the variator shaft as shown in figure 21.
48. Coat the input bearing (flat needle bearing) with a small amount of Trans-Jel® and install onto the variator shaft as shown in figure 21.
49. Coat the input bearing (caged needle bearing) with a small amount of Trans-Jel® and install onto the variator shaft as shown in figure 21.
50. Install the input shaft/front planetary with a twisting motion as shown in figure 21.
51. Coat the input shaft/front planetary thrust washer with a small amount of Trans-Jel® and install onto the input shaft as shown in figure 21.

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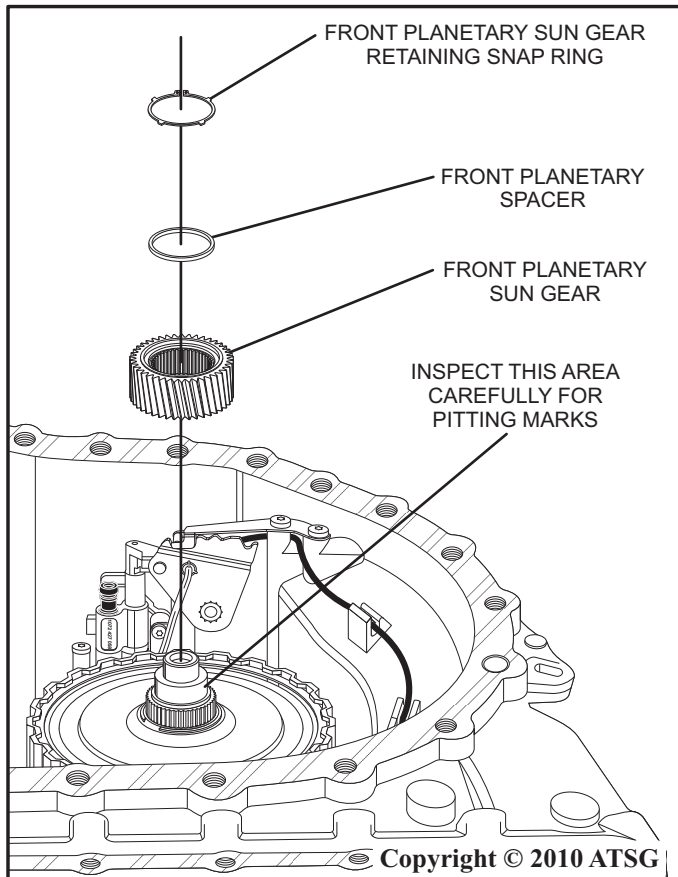


Figure 20

1. INPUT SHAFT/FRONT PLANETARY THRUST WASHER
2. INPUT SHAFT/FRONT PLANETARY CARRIER ASSEMBLY
3. INPUT BEARING (CAGED NEEDLE BEARING)
4. INPUT BEARING (FLAT NEEDLE BEARING)
5. THRUST WASHER (SELECTIVE)

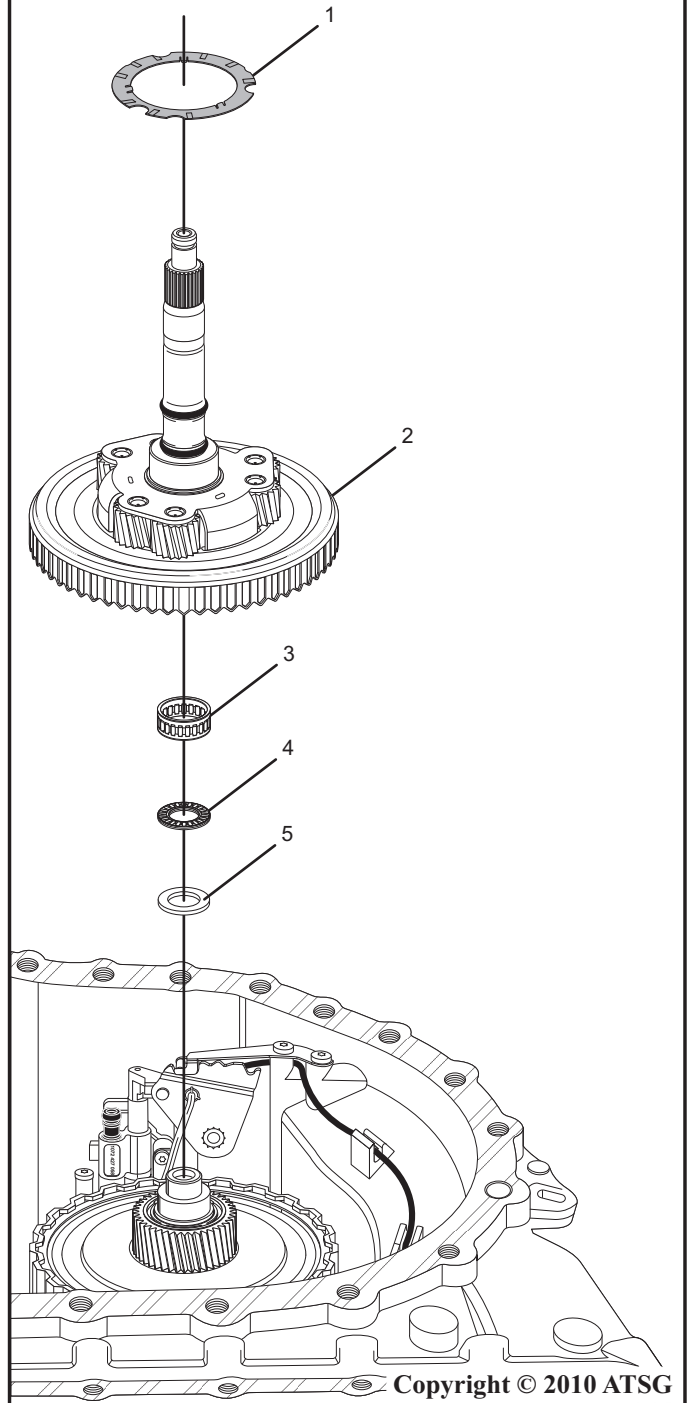


Figure 21



## TRANSAXLE REASSEMBLY CONT'D

### INTERNAL COMPONENTS

52. Clean the differential carrier assembly with solvent and dry thoroughly with compressed air.
53. Inspect and replace the differential carrier assembly or the bearings as necessary.
54. Lubricate the differential carrier bearings with a small amount of ATF.
55. Install the differential carrier assembly into the transaxle case as shown in figure 22.
56. Install a new converter housing to case gasket.
57. Install new converter housing attaching bolts (26 required) as shown in figure 23.
58. Tighten the bolts evenly in a side to side/criss cross manner. Tighten all bolts to 71 in. lb. (8 Nm).

**Note:** After all bolts are tightened to proper torque, tighten 1/4 turn more, using the same side to side/criss cross manner.

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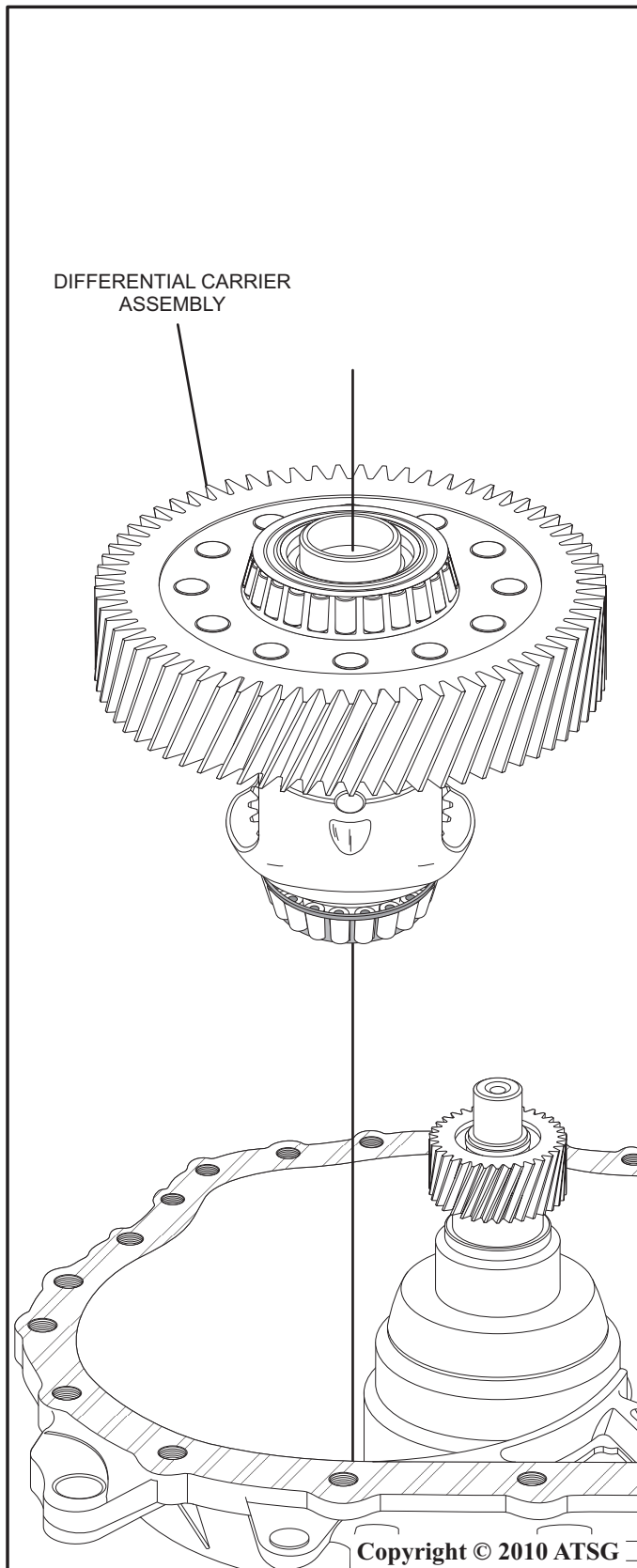


Figure 22

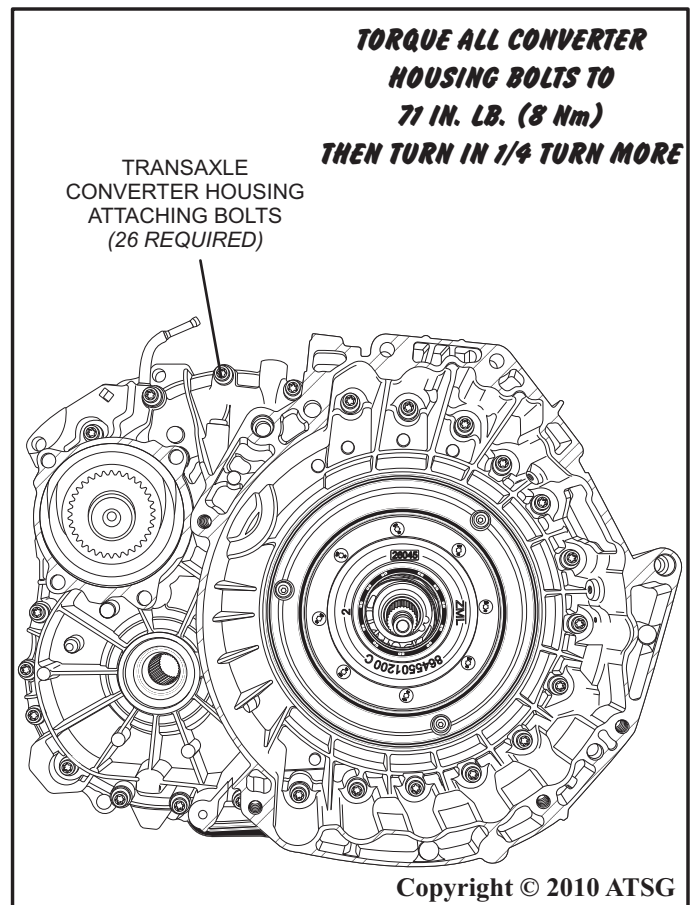


Figure 23

## TRANSAXLE REASSEMBLY CONT'D

### INTERNAL COMPONENTS

59. Coat the transfer gear bearing housing o-ring with a small amount of ATF and carefully install the transfer gear into the transmission by twisting until the cover sits flush with the case as shown in figure 24.
60. Install the 4 transfer gear attaching bolts as shown in figure 24.
61. Torque the 4 bolts to 17 ft. lb. (23 N m) as shown in figure 25.
62. Coat the o-rings on the feed tubes with a small amount of atf and install into the case as shown in figure 26.
63. Install the torque converter clutch feed tube into the case as shown in figure 26.
64. Install the main pump pressure feed tube into the case as shown in figure 26.
65. Install the secondary pressure feed tube into the case as shown in figure 26.
66. Install the primary pressure feed tube into the case as shown in figure 26.
67. Install the manual valve supply feed tube into the case as shown in figure 26.

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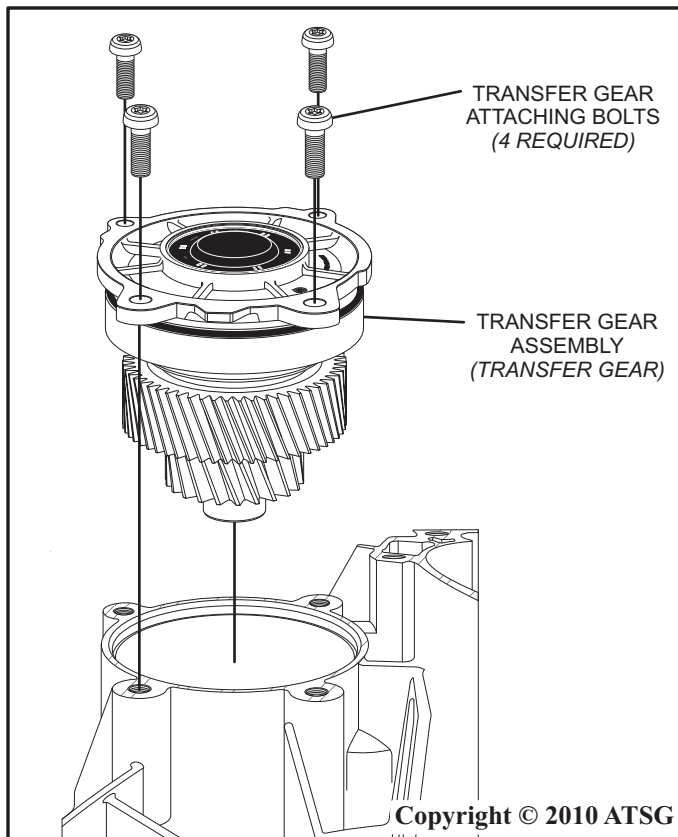


Figure 24

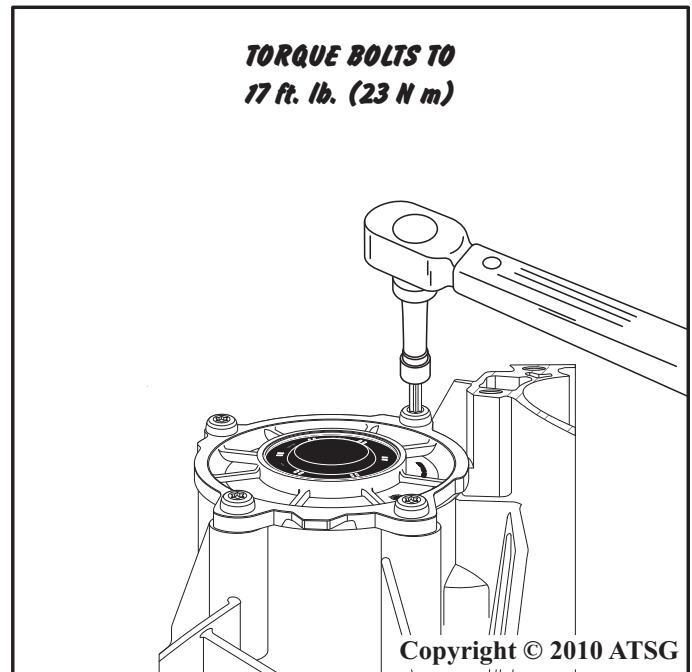


Figure 25

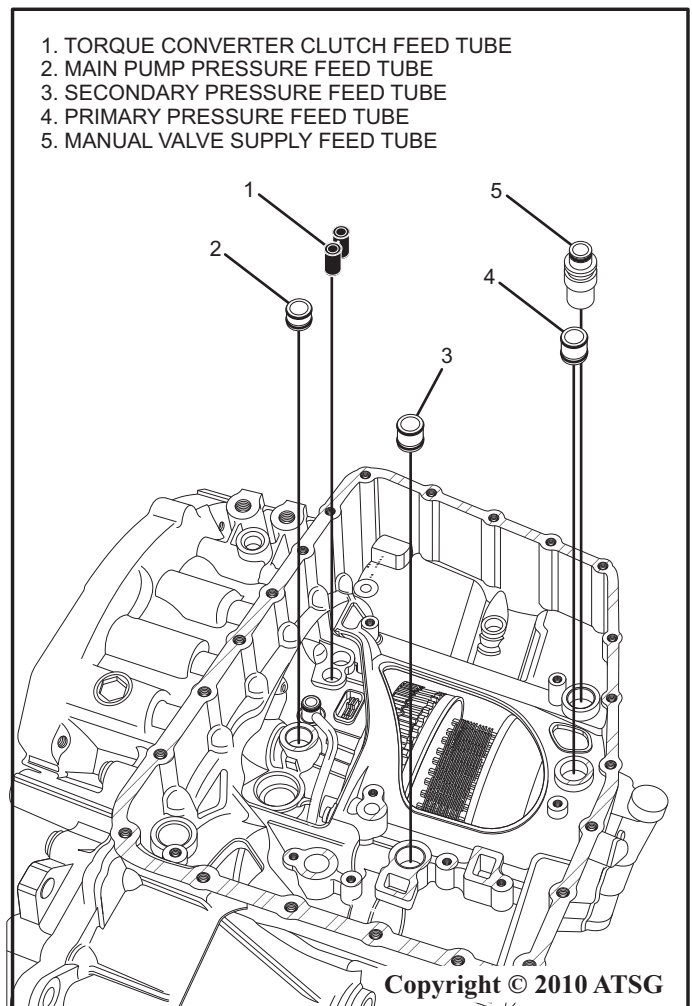


Figure 26

## TRANSAXLE REASSEMBLY CONT'D

### INTERNAL COMPONENTS

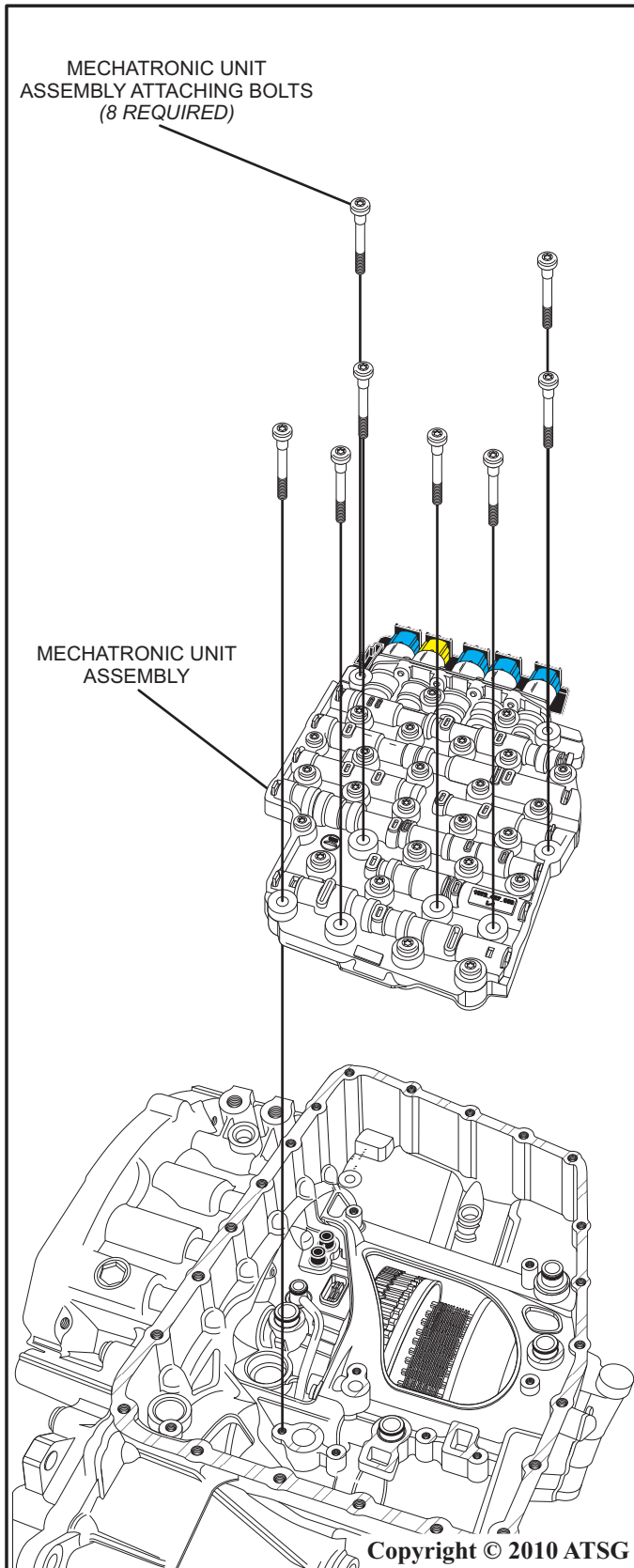


Figure 27

68. Install the mechatronic unit assembly onto the transaxle case as shown in figure 27. Use care to not cut the o-rings on the feed tubes as the mechatronic unit assembly is placed down.
69. Install the mechatronic unit assembly attaching bolts (8 required) as shown in figure 27.
70. Torque the mechatronic unit assembly attaching bolts in the numerical sequence pattern shown in figure 28.
71. Bolt torque is 44 in. lb. (5 N m), then turn the bolts following the same numerical sequence 1/8 turn more.

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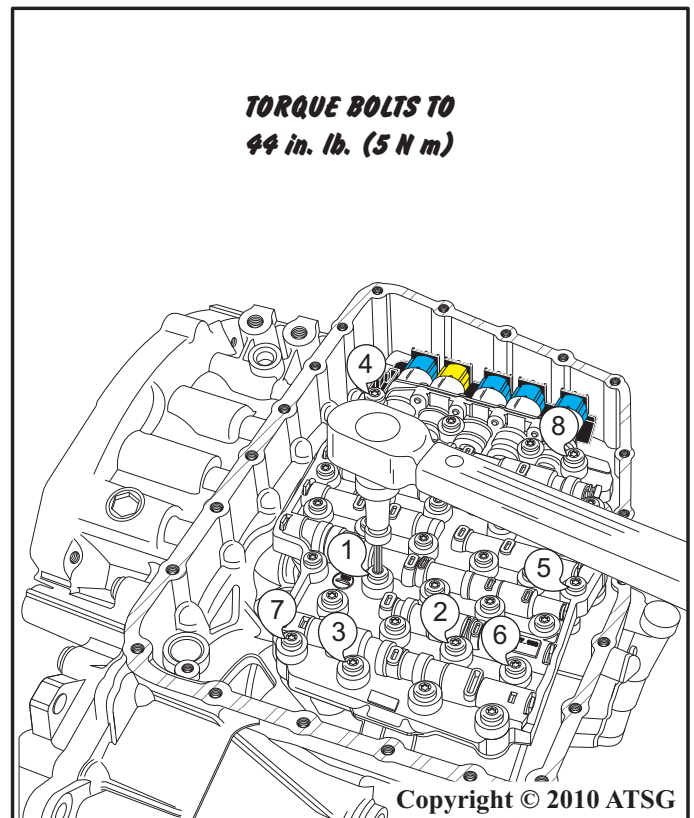


Figure 28

## TRANSAXLE REASSEMBLY CONT'D

### INTERNAL COMPONENTS

72. Install the output speed sensor into the case as shown in figure 29.
73. Install the output speed sensor spacer under the speed sensor as shown in figure 29.
74. Install the output speed sensor hold down bolt as shown in figure 29.
75. Tighten the output speed sensor hold down bolt and torque to 71 in. lb. (8 N m) as shown in figure 30.
76. Install the output speed sensor connector into the mechatronic unit assembly connector as shown in figure 31.
77. Install the transmission range sensor connector into the mechatronic unit assembly connector as shown in figure 31.

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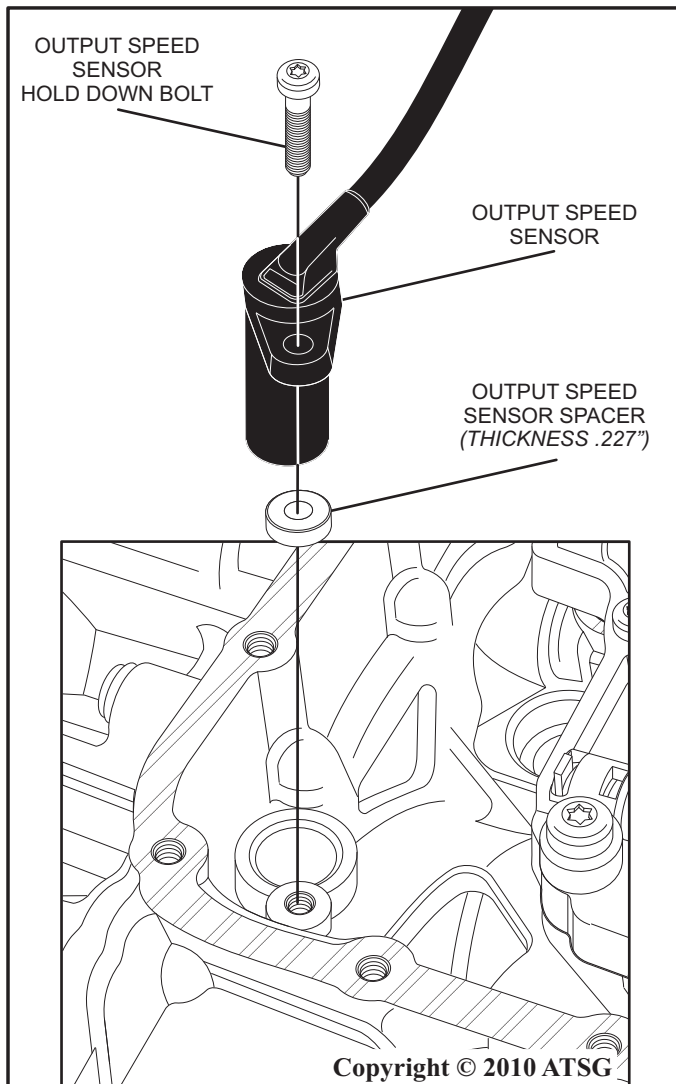


Figure 29

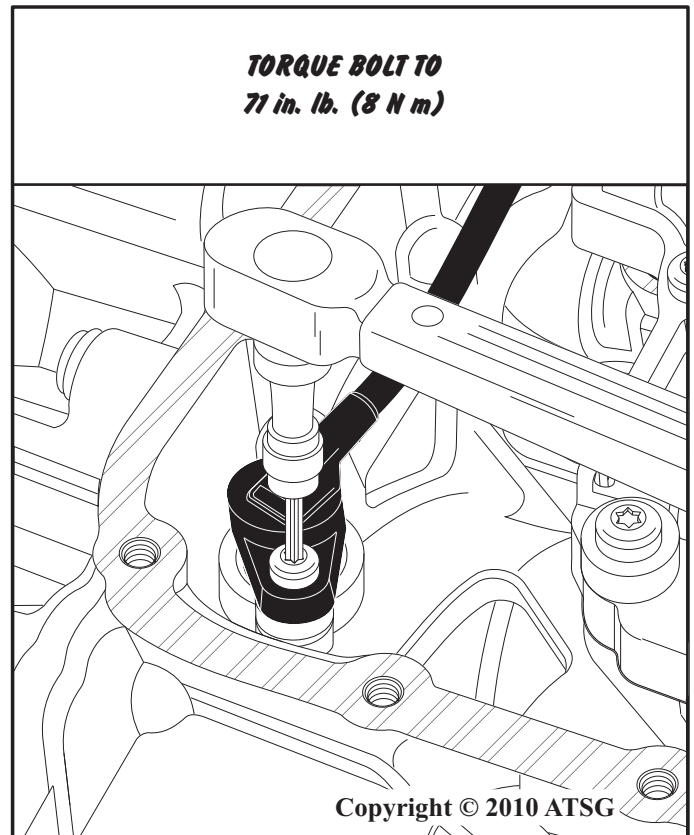


Figure 30

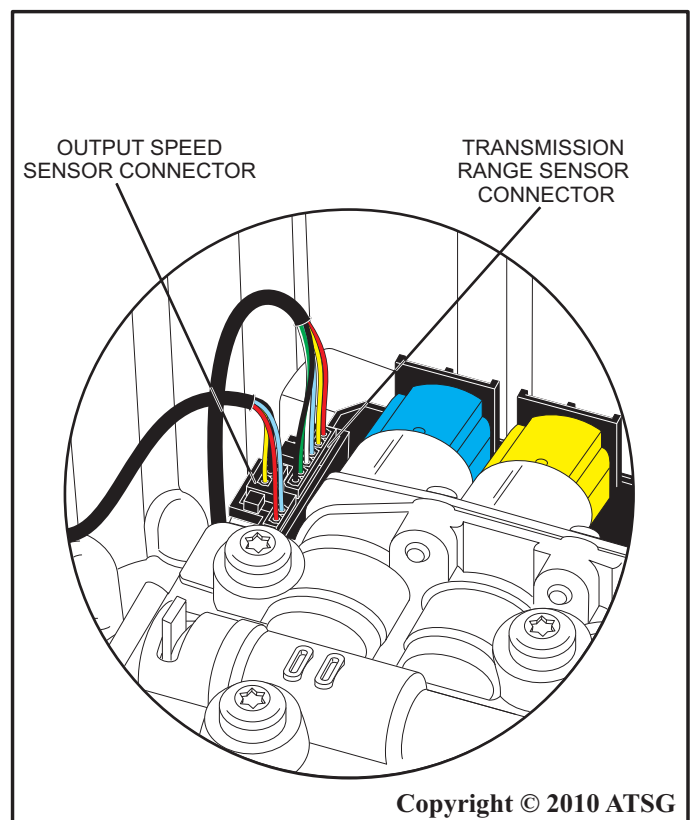


Figure 31



## TRANSAXLE REASSMBLY CONT'D

### INTERNAL COMPONENTS

78. Install a new transaxle oil filter and transaxle oil filter seal as shown in figure 32.
79. Install a new transaxle oil pan gasket onto the case as shown in figure 33.
80. Install the transaxle oil pan onto the case as shown in figure 33.
81. Install the transaxle oil pan attaching bolts (22 required) as shown in figure 33.

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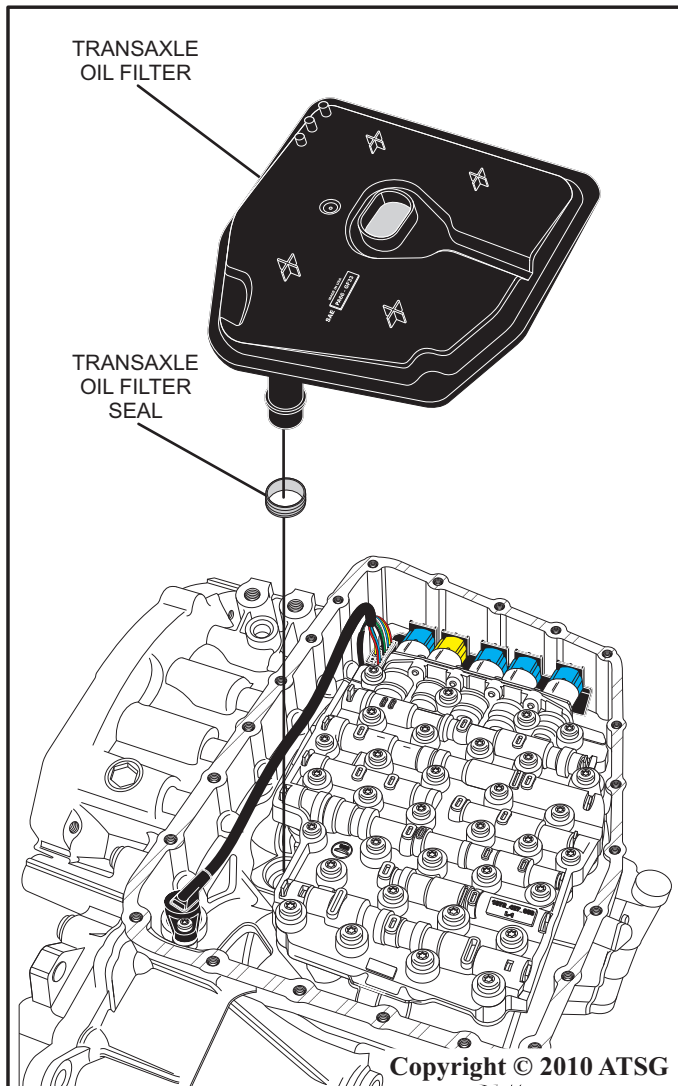


Figure 32

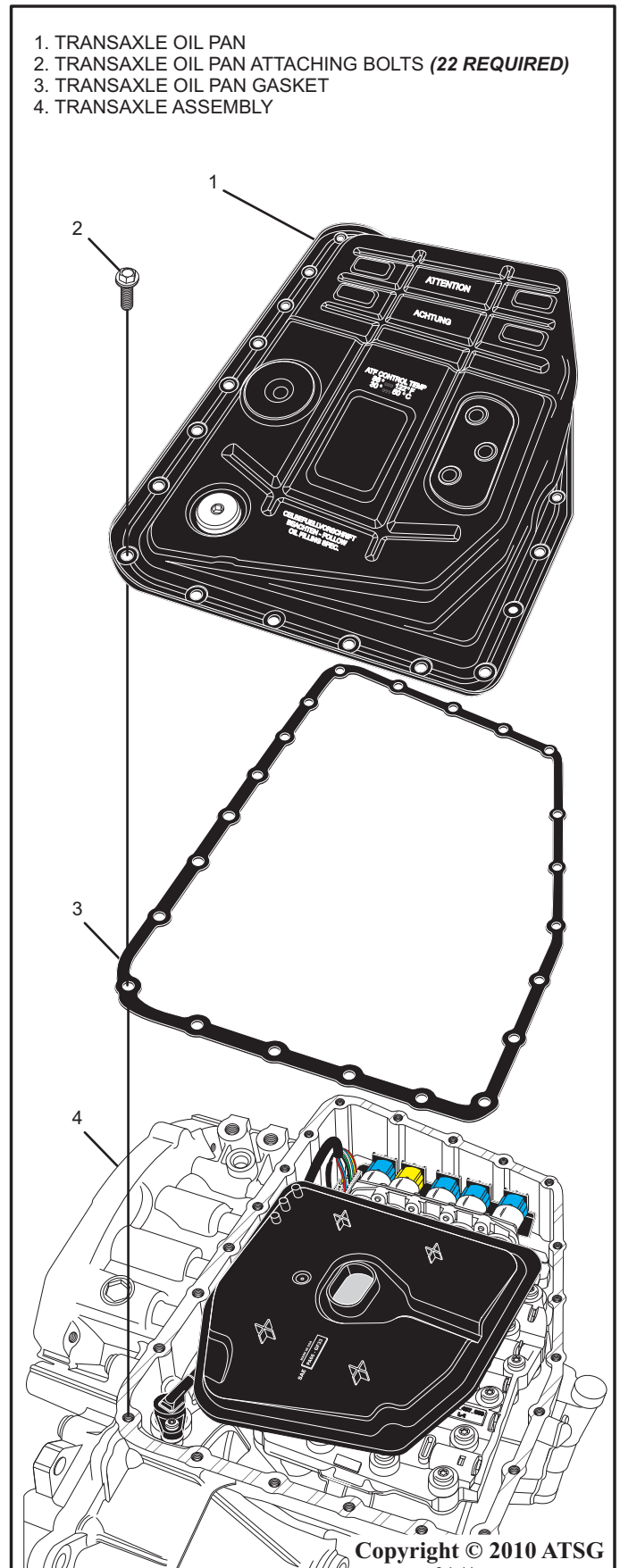


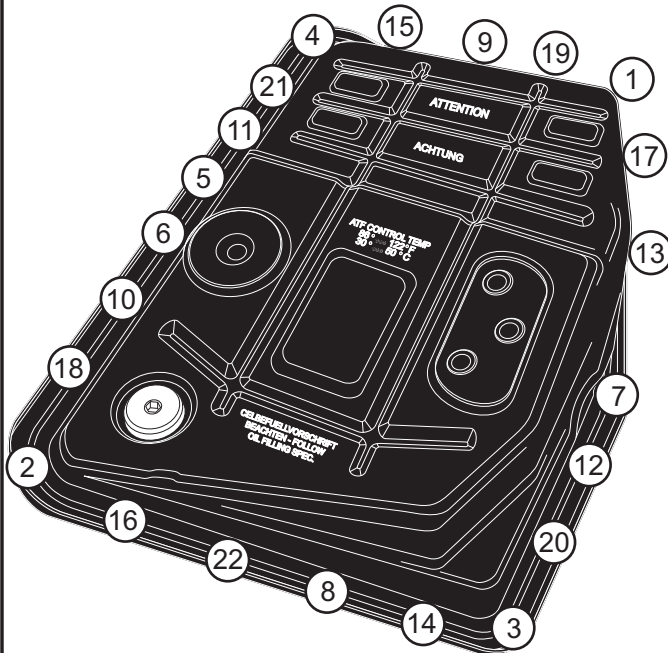
Figure 33

## TRANSAXLE REASSMBLY CONT'D

### INTERNAL COMPONENTS

82. Tighten all 22 oil pan attaching bolts using the numerical sequence shown in figure 34.
83. Torque all 22 oil pan attaching bolts to 9 ft. lb. (12 N m) using the numerical sequence shown in figure 34.
84. Install the outer shell into the transaxle case assembly and rotate clockwise to latch it into the case and lock it into the mechatronic unit assembly as shown in figure 35.  
*Note: Use care to not damage the pins of the mechatronic unit assembly or touch them when installing the outer shell. This could create electrostatic discharge and can cause damage to the mechatronic unit assembly.*
85. Install the outer shell hold down bolt and torque to 53 in. lb. (6 N m) as shown in figure 36.

**TORQUE THE OIL PAN  
ATTACHING BOLTS  
IN THE NUMERICAL SEQUENCE  
BELOW TO 9 ft. lb. (12 N m)**



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Figure 34

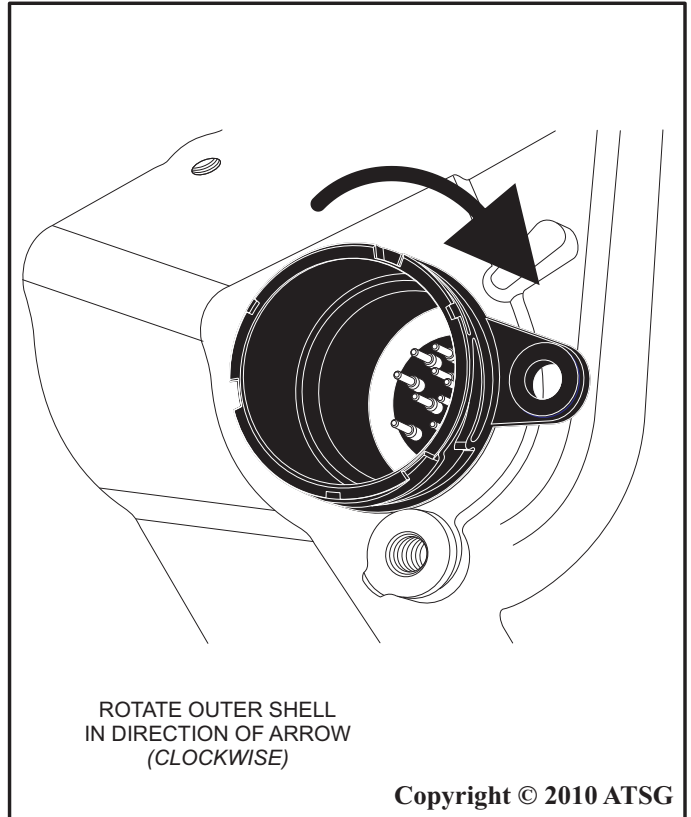


Figure 35

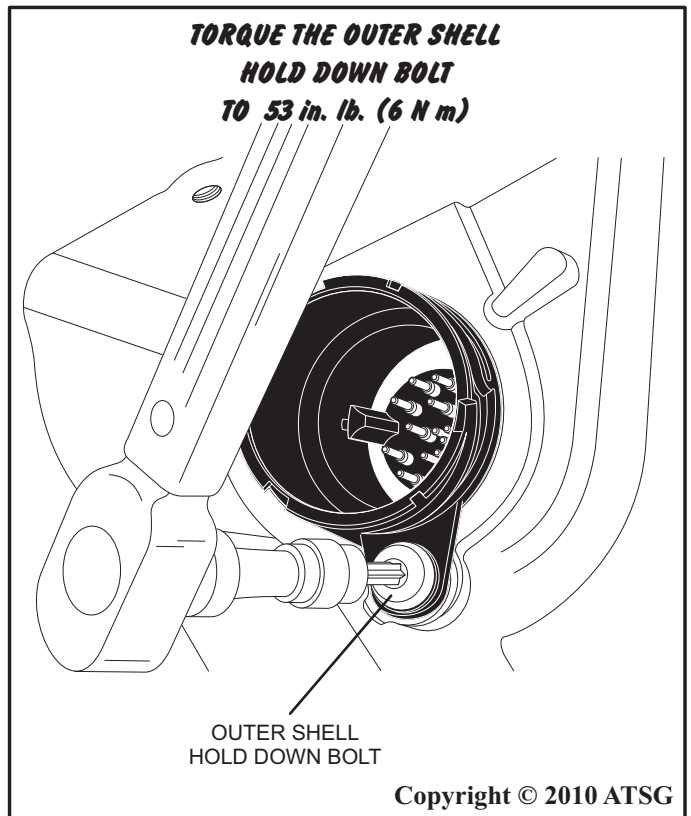


Figure 36