# Authorized Field Change

**AFC G–04903 Revised**

**Date:** September, 2004

**Subject File:** TRANSMISSION

**Subject:** Replace Meritor® Transfer Case Oil Pump with New Design Oil Pump in 7300, 7400, 7500 4X4 and 6X6 Models Built Between September 27, 2001 and September 15, 2003

Model: 7300
Start Date: 09/27/2001 End Date: 09/15/2003

Model: 7400
Start Date: 09/27/2001 End Date: 09/15/2003

Model: 7500
Start Date: 09/27/2001 End Date: 09/15/2003

Unit Code: 13TKA

Unit Code: 13TKB

Unit Code: 13TKC

## DESCRIPTION

***THIS IS AN ISIS ONLY NOTIFICATION.***

**There will be no dealer mailing for this AFC revision.**

**REVISION DESCRIPTION**

**Steps 31 and 34 have been revised.**

The Meritor® transfer case oil pump in 7000 Models, built between September 27, 2001 and September 15, 2003 may not provide adequate lubrication to the transfer case input shaft resulting in input shaft bearing failure.

## PARTS INFORMATION

**Table 1**

| Part Number | Description | Quantity |
|---|---|---|
| Kit 2589 | Meritor® Oil Pump Kit<br><br>Kit Contains the Following: | 1 |
| | 3303G1047 Pump Assy. (1) | |
| | 3226Z1482 Input Brg. Cage (1) | |
| | HM813843 Taper Brg. Cone (1) | |
| | MS208045-1 Capscrew (6) | |
| | 1205R2592 Oil Seal (1) | |
| | 2203L9242 .005” Shim (3) | |
| | 2258Z1118 Spring (1) | |
| | 2297U5273 Relief Valve (1) | |
| | 1229E1669 Flat Washer (6) | |
| | 2203K9241 003” Shim (3) | |
| | 5X1327 O-Ring (1) | |
| | 5X1326 O-Ring (2) | |
| | 5X1290 O-Ring (2) | |
| | 5X1292 O-Ring (1) | |
| | 1229U4857 Snap Ring (2) | |
| | 1229J4950 Snap Ring (1) | |
| Meritor® Special Tool | Hex Socket (Special Tool), (See Tool Note Below) | 1 |

Tool Note: The tool should be fabricated (see Figure 22), however, a tool can be loaned, for a limited time, by contacting International Truck and Engine Corporation® at (260) 461–1947.

**NOTE – This campaign, AFC G-04903, is for parts and labor to replace the transfer case oil pump with an updated oil pump kit.**

**For any additional parts or labor needed to complete the transfer case update, please contact Meritor’s OnTrac service number at (866) 668–7221 for authorization. Additional parts and labor will require a separate repair order.**

## SERVICE PROCEDURE

**IMPORTANT – Upon completion of the repair call the ArvinMeritor Ontrac call center, (866) 668–7221, to register the repair and to obtain a repair authorization number and retrofit number. These numbers will need to be included on your claim to International Truck and Engine.**

## SERVICE PROCEDURE (CONT.)

**WARNING – To avoid possible property damage, personal injury, or death, park the vehicle on a level surface, set the parking brake, turn the engine off and chock the wheels.**

**NOTE – This transfer case service procedure is performed without removing the transfer case from the chassis.**

1. Drain the oil from the transfer case.

2. Install an air line fitting into the high range port (Figure 1 and Figure 2) and apply 100 PSI max. regulated shop air. Rotate the input shaft to lock the range gear.

**NOTE – Maintain air pressure during removal of the input shaft and during reinstallation Steps. This will aid alignment of the high range gear and rear input shaft bearing.**

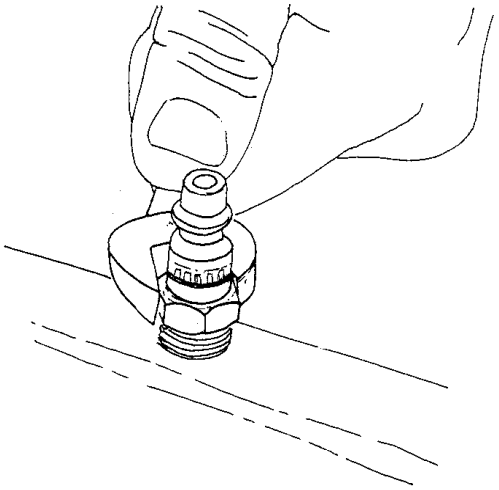


**Figure 1 Install Air Line Fitting**

## SERVICE PROCEDURE (CONT.)

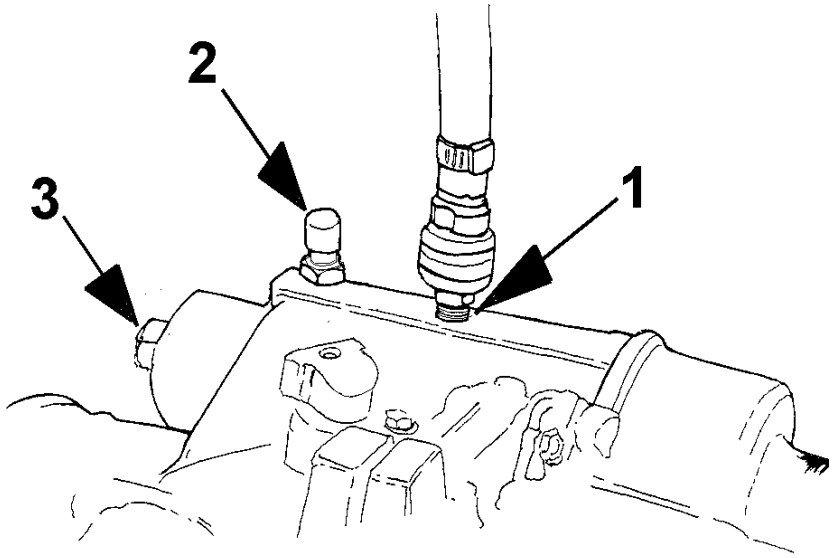



**Figure 2 Attach Regulated Shop Air (100 PSI Max.)**

1. High Range Port
2. Neutral Port
3. Low Range Port

3. **4208 (Code 13TKC) / 4210 (Code 13TKA) Models Only:** Remove bolts and cover from the transfer case rear cover (Figure 3).

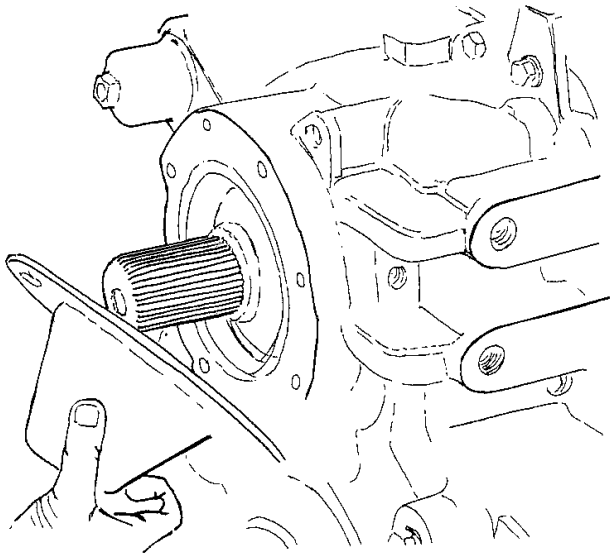


**Figure 3 Remove Rear Cover (4208/4210 Models Only)**

## SERVICE PROCEDURE (CONT.)

4. Remove hex lock nut with special hex socket tool (Figure 22) and washer from the range gear shaft (Figure 4).

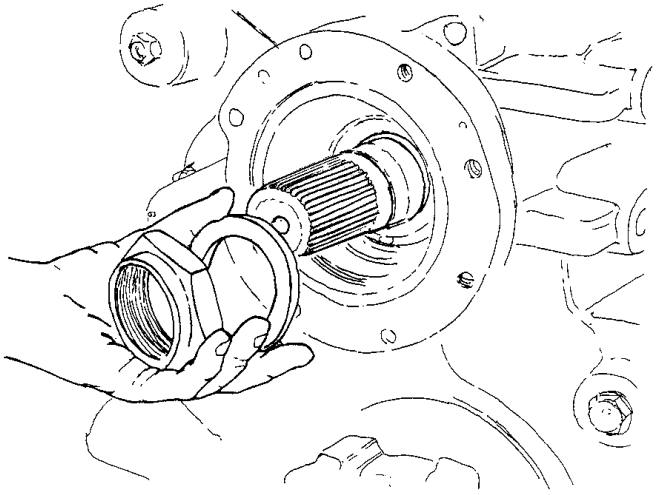


**Figure 4 Remove Hex Lock Nut and Washer**

5. Remove the propshaft from between the transfer case and the main transmission.

6. Disconnect the oil inlet tube fitting and move the oil tube out of position for clearance (Figure 5).

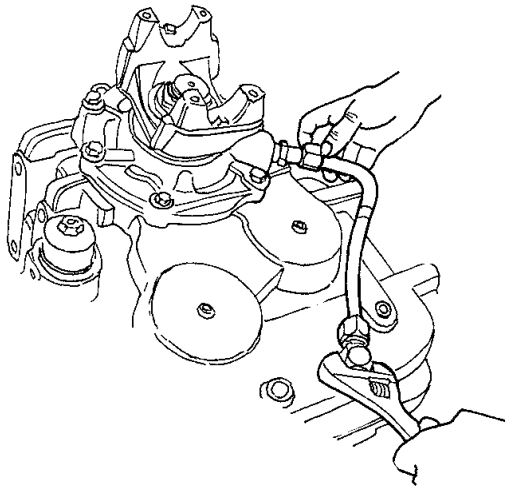


**Figure 5 Disconnect and Reposition Oil Tube**

7. Loosen input yoke nut (do not remove).

8. Remove bolts from the bearing cage on the front cover (Figure 6).

## SERVICE PROCEDURE (CONT.)

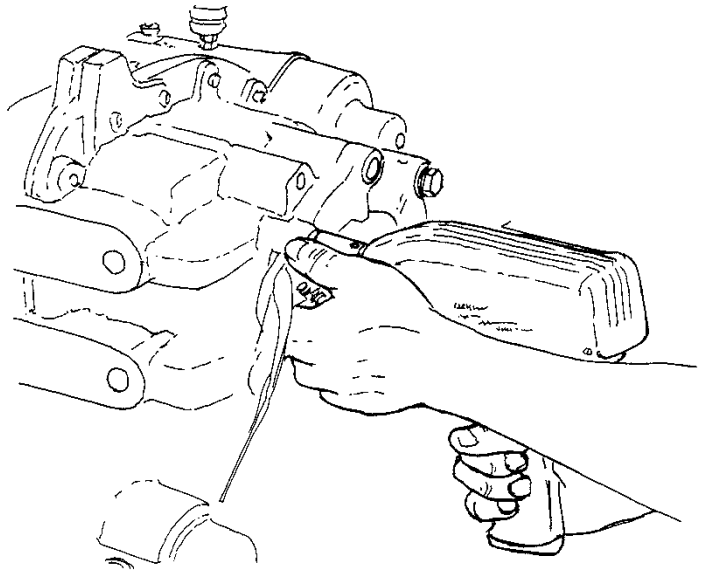


**Figure 6 Remove Bolts from Bearing Cage**

**NOTE – Use a dead blow hammer to aid removal in Step 9.**

9. Remove the input shaft with yoke, input bearing cage, and oil pump as an assembly (Figure 7).

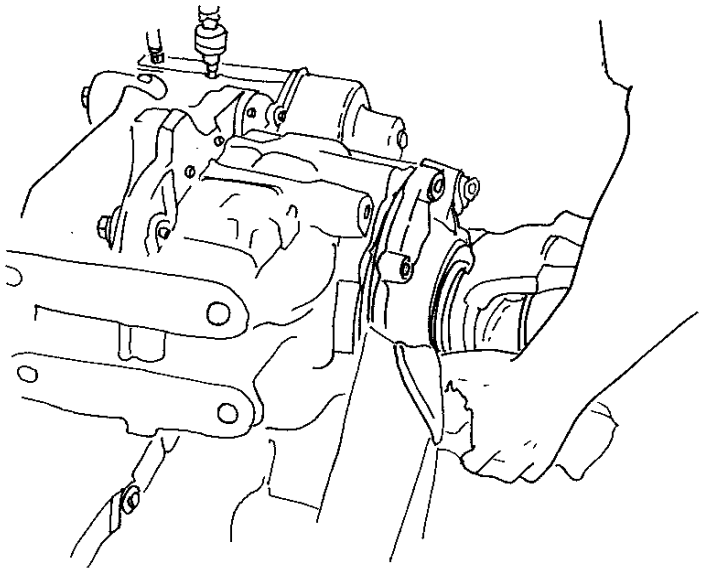


**Figure 7 Remove Input Shaft and Yoke Assembly**

10. Remove shims and put aside for re-assembly.

11. Place the input shaft assembly in a vise with jaw protection and remove the yoke with a puller (Figure 8).

## SERVICE PROCEDURE (CONT.)

12. Remove input shaft bearing cage and oil pump assembly from the input shaft (Figure 8).

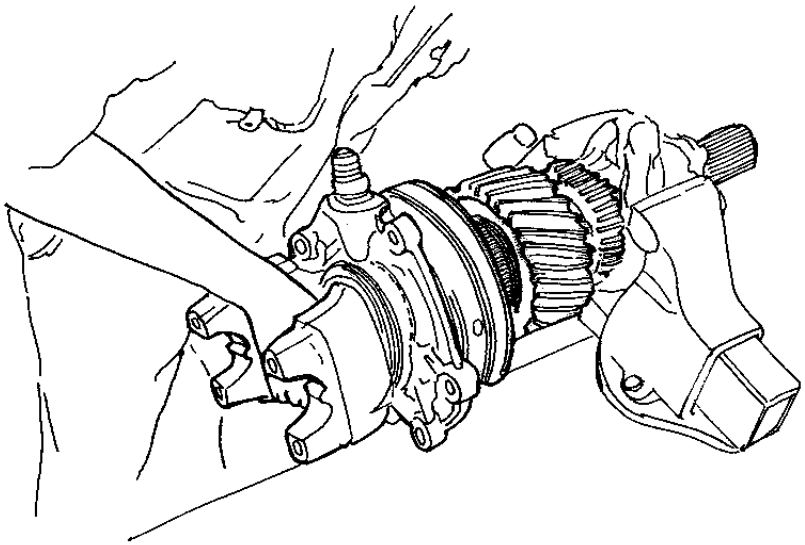


**Figure 8 Remove Bearing Cage and Oil Pump Assembly**

13. Inspect helical gear and shaft for damage. Replace if required.

14. Remove the spiral snap ring that retains the small helical gear on the input shaft (Figure 9) and replace it with the snap ring supplied in the kit. Ensure that the snap ring is fully seated in the snap ring groove.

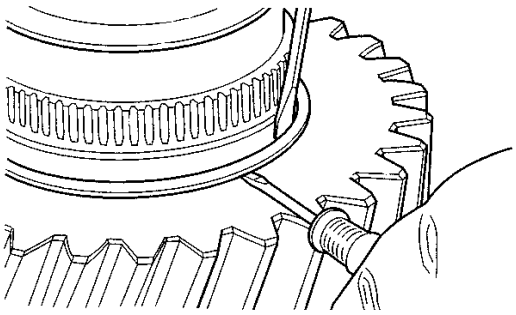


**Figure 9 Remove Snap Ring**

15. Install new input shaft seal, using Meritor oil seal driver Part Number R4422402, on the new input cage (Figure 10). Prelube with SAE 50 synthetic oil.

**NOTE – Cage part number A3226Z1482 must be used with pump part number A3303G1047.**

## SERVICE PROCEDURE (CONT.)

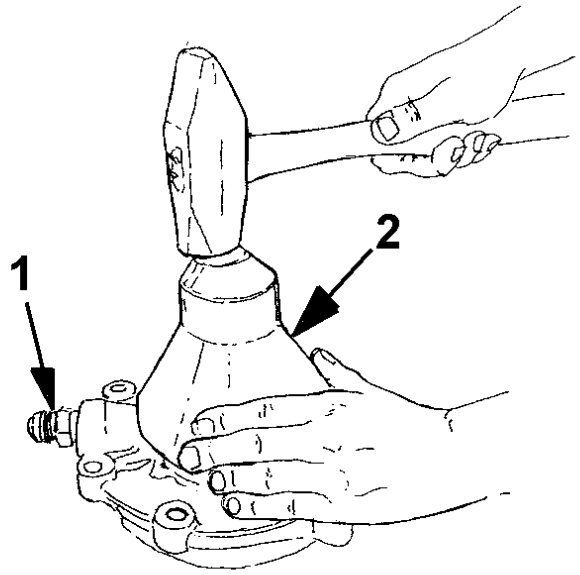



**Figure 10 Install New Input Shaft Seal**

1. Male Fitting (Inlet Oil Port)
2. Seal Driver

16. Remove male fitting from the old cage (Figure 10, Item 1), chase the threads if needed, apply appropriate pipe thread sealant to the first three threads and install in the new input cage. Tighten to 35 to 50 Lbf-ft (47 to 68 Nm).

17. Install new o-ring onto the groove along the input cage outside diameter. Prelube with SAE 50 synthetic oil (Figure 11).

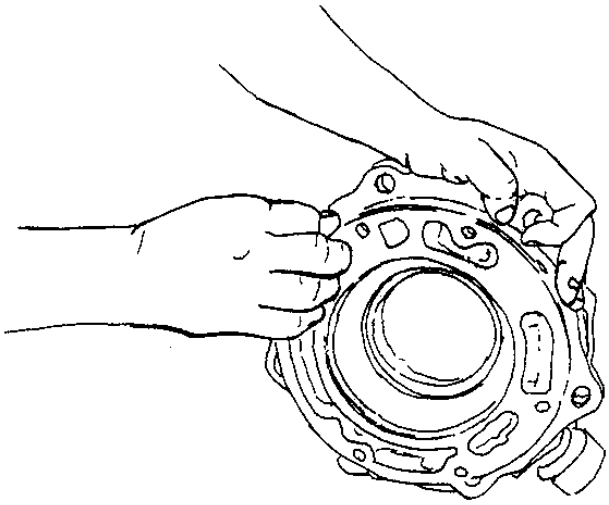


**Figure 11 Install New O-ring**

## SERVICE PROCEDURE (CONT.)

18. Install new bearing cone on the race in the bearing cage. Prelube with SAE 50 synthetic oil.

19. Install the relief valve and spring into correct (square) port location in the bearing cage (Figure 12).

**NOTE – The large end of the spring goes in first.**

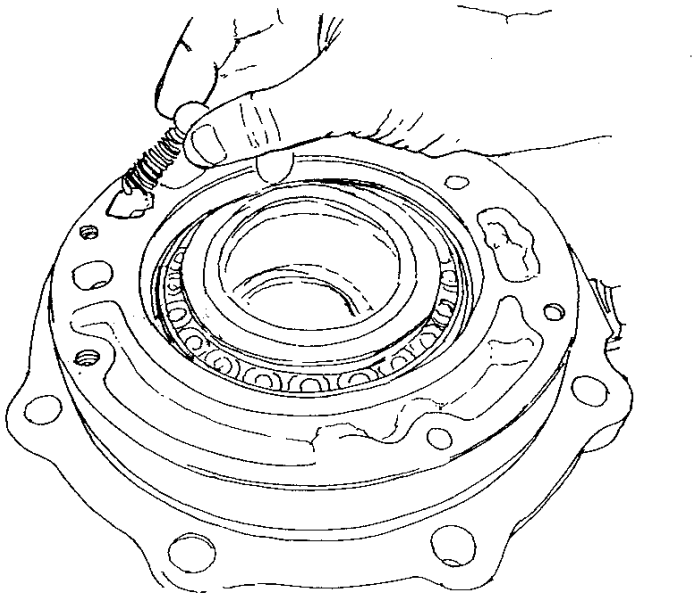


**Figure 12 Install Relief Valve Spring**

20. Align oil relief port and inlet port. Pour a generous amount of oil into the pump oil inlet port (Figure 13) while spinning the inner rotor by hand before assembling the oil pump to the input cage. Loosely install two, pump to cage, bolts to aid alignment during installation on the shaft (Figure 14).

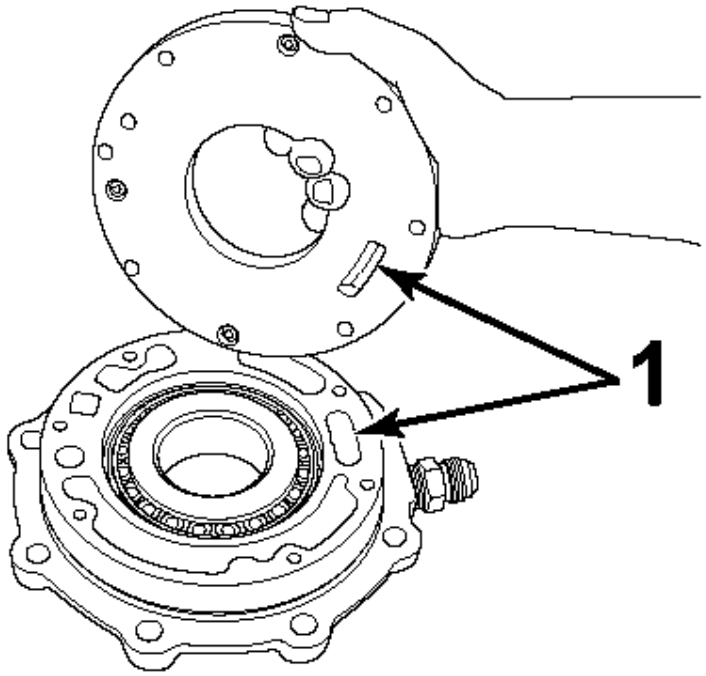



**Figure 13 Align New Oil Pump**

1. Oil Relief and Inlet Ports

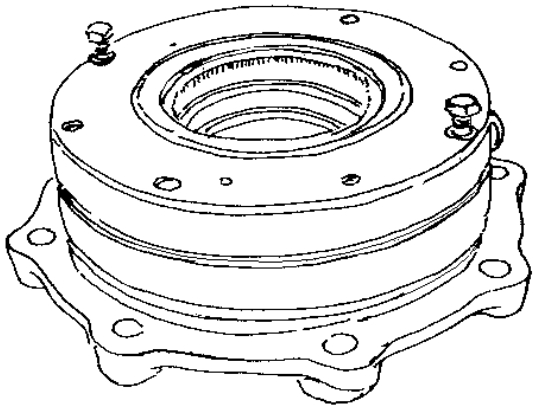


**Figure 14 Loosely Install Two Bolts**

21. Inspect the seal rings on the pump inner diameter and pre-lube with SAE 50 synthetic oil.

**NOTE – When performing the next Step, make sure the input cage and oil pump are aligned. Use bolts in the bolt holes to aid alignment.**

22. Pre-lube the input shaft with SAE 50 synthetic oil. **Use extreme care when guiding the oil pump assembly onto the input shaft.** Be sure to align the spline with the pump rotor. Do not force pump/cage

## SERVICE PROCEDURE (CONT.)

assembly if it hangs up. After bottoming the pump/cage assembly onto the shaft shoulder, apply Loctite 277 to the pump bolts and tighten to 22 to 29 Lbf-ft (29 to 39 Nm).

23. Pre-lube the yoke hub seal diameter with SAE 50 synthetic oil.

24. Install the yoke, washer, and nut onto the input shaft. Do not tighten at this time.

25. Before installing the input shaft assembly into the transfer case, inspect and clean the transfer case input shaft, cage to housing pilot surfaces and cage mounting surface. Remove any debris and Loctite sealant from mounting surfaces.

26. Position the old shim pack over the front input shaft opening with guide studs. The opening between the shim pack ends (split) should face downward.

27. Lubricate the rear input bearing race and range gear with SAE 50 synthetic lube.

28. Remove the speed sensor and install a screwdriver or equivalent into the speed sensor bore to hold and guide the range gear in position.

29. Install the input shaft assembly (Figure 15). Use an assistant to rotate the output yoke while holding pressure against the mating range gear with the screw driver to aid installation of the input shaft assembly (Figure 16).

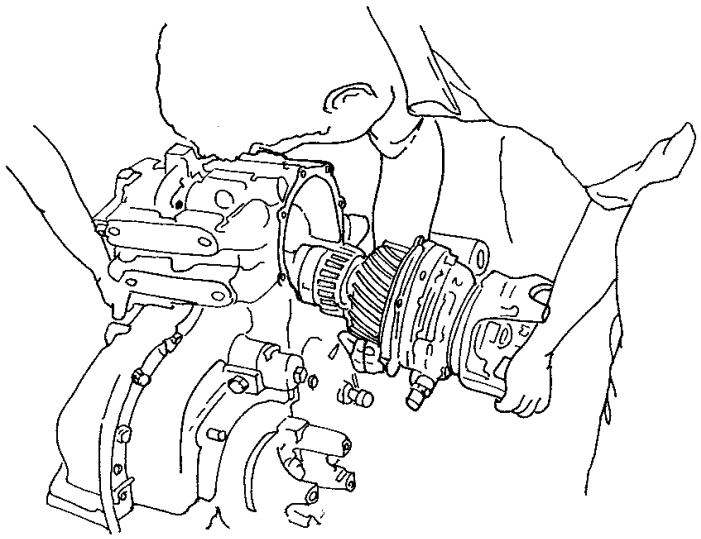


**Figure 15 Install Input Shaft Assembly**

## SERVICE PROCEDURE (CONT.)

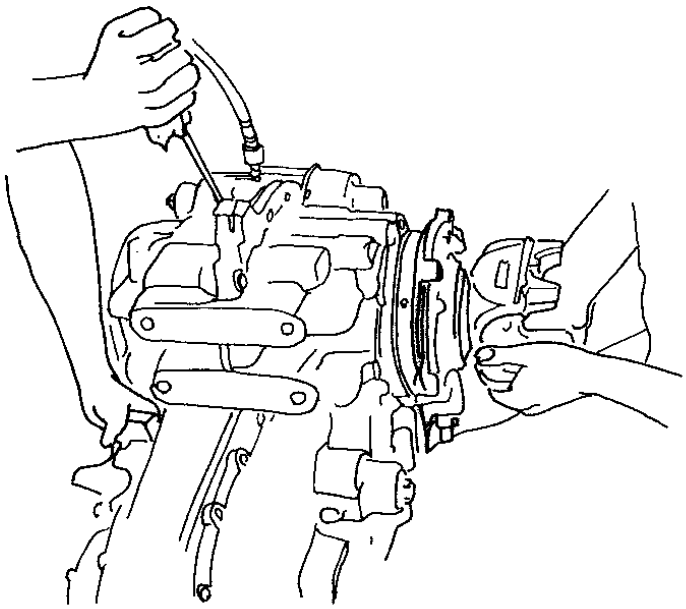


**Figure 16 Rotate Output Shaft Yoke and Apply Pressure with Screwdriver**

**NOTE – It may require several attempts to line up the input shaft assembly to the housing. It is possible for the shaft to hang up on the rear input bearing or high range gear.**

> ⚠ **WARNING – A jack must never be used alone to support a vehicle while under-chassis service is being performed. The jack may lower and property damage, personal injury or death could result. Always support the vehicle with floor stands.**

**NOTE – If necessary, raise the drive wheels off the floor, release the brakes and rotate the drive wheels to help align the input shaft to the housing.**

30. When the input shaft assembly is seated in the transfer case, install three (3) bolts, equally spaced, to attach the input shaft cage to the transfer case (Figure 17). Tighten to 85 to 115 lbf-ft (115 to 156 Nm). **Do not use an impact wrench.**

## SERVICE PROCEDURE (CONT.)

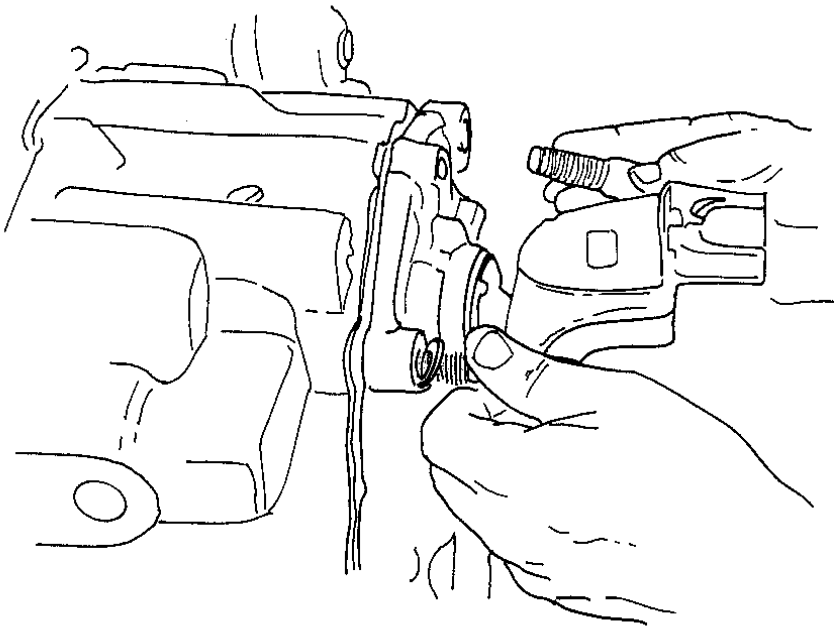


**Figure 17 Install Input Shaft Assembly**

31. At the rear of the transfer case install the washer and nut to the shaft. Tightened to 700 to 900 Lbf-ft (949 to 1220 Nm).

32. Check shaft end play (.001 to .005 inch) with a dial indicator.

33. Adjust the shim pack as required with shims provided. The final endplay must be .001 to .005 inch.

34. **A.**Install remaining mounting bolts into the input shaft bearing cage (Figure 17). Tighten to 85 to 115 Lbf-ft (115 to 156 Nm).

    **B.**Tighten the yoke to 700 to 900 Lbf-ft (949 to 1220 Nm).

35. **4208 (Code 13TKC) / 4210 (Code 13TKA) Models Only:** Clean rear cover mounting surface and cover flange.

36. **4208 (Code 13TKC) / 4210 (Code 13TKA) Models Only:** Apply Loctite 518 sealant to the rear cover mounting surface and install the rear cover. Tighten the bolts to 45 to 60 Lbf-ft (61 to 81 Nm).

37. Reconnect the oil inlet tube. Tighten to 79 to 88 Lbf-ft (107 to 119 Nm).

38. Disconnect the air line (Figure 2) and remove the air fitting from the high range port. Reconnect the high range line to the high range port.

39. Reinstall the speed sensor. Tighten the cap screws retaining the sensor to 96 to 120 Lbf-in (11 to 14 Nm).

## SERVICE PROCEDURE (CONT.)

40. Disconnect the air lines from the high/low range shift cylinder and remove the shift cylinder from the rear cover of the transfer case (Figure 18).

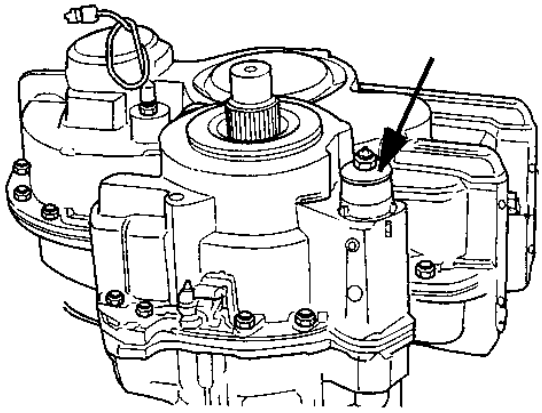


**Figure 18 Remove Shift Cylinder (Arrow)**

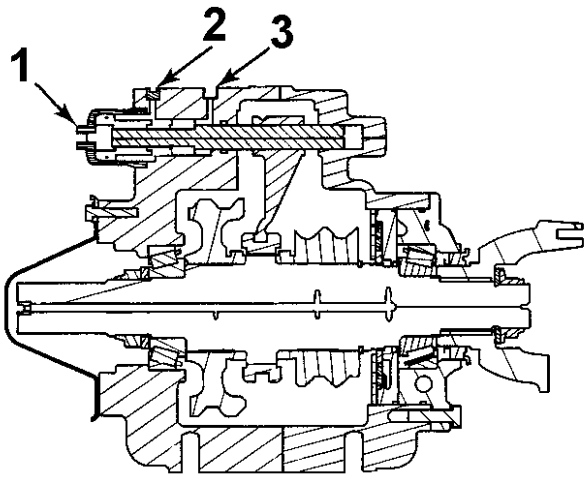



**Figure 19 Disconnect Air Lines**

1. Low Range Port
2. Neutral Port
3. High Range Port

41. Remove the outer shift piston snap ring from the shift shaft and remove the shift piston (Figure 20).

## SERVICE PROCEDURE (CONT.)

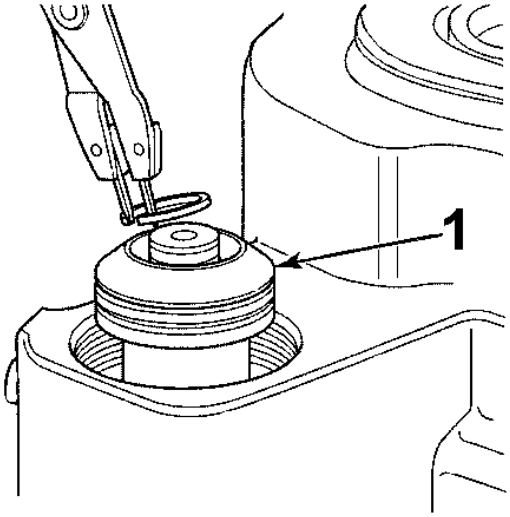



**Figure 20 Remove Outer Piston**

1. Outer Piston

42. Remove the inner shift piston snap ring from the shift shaft and remove the shift piston (Figure 21).

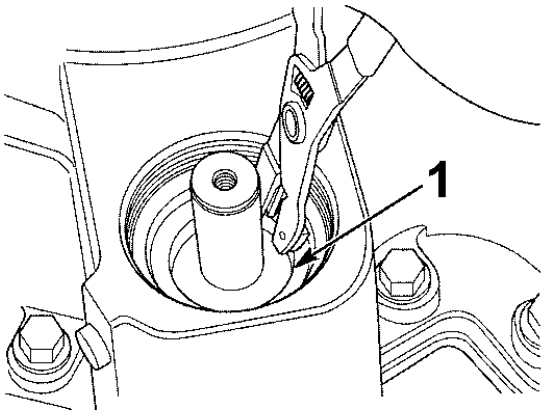



**Figure 21 Remove Inner Piston**

1. Inner Piston

43. Remove the inner and outer piston O-rings.

44. Grease all new replacement O-rings with a light coat of lithium grease meeting Meritor specification O-688.

45. Install O-rings onto the inner and outer diameter of the inner piston. Install the inner shift piston and snap ring onto the shift shaft (refer to Figure 21). Inner piston can be installed in either direction.

46. Install O-rings onto the inner and outer diameter of the outer piston. Install the inner shift piston and snap ring onto the shift shaft (refer to Figure 20).

## SERVICE PROCEDURE (CONT.)

47. Apply a 1/8 inch (3 mm) bead of Loctite® 277 sealant to the first three threads of the shift cylinder.

48. Install the high/low shift cylinder. Tighten the cylinder to 85 to 95 Lbf-ft (115 to 129 Nm).

49. Reinstall the air lines on the high/ low shift cylinder.

50. Fill the transfer case with 9.0 pints (4.26 Liters) of SAE 50 synthetic lubricant.

51. Reinstall the prop shaft between the transfer case and the main transmission.

52. Perform **Shifting Check** and **Assembly Test**. Refer to Meritor Maintenance Manual 0146 for details. These tests insure there are no housing or shift port leaks.

**NOTE – Meritor MTC-4208 (Code 13TKC), 4210 (13TKA) or 4213 (13TKB) transfer case is limited to 3250 RPM maximum. It is important to verify the vehicle configuration will not over speed the transfer case.**

**To establish maximum vehicle road speed allowed for a given vehicle, perform the following calculation:**

**195000 ÷ REAR AXLE RATIO ÷ REAR TIRE REVOLUTIONS PER MILE = MAXIMUM ROAD SPEED**

**Example: 195000 ÷ 5.57 ÷497 =70.4 MPH**

**In this example, 70.4 MPH is the maximum road speed that this vehicle can operate without exceeding the 3250 RPM transfer case limit. To exceed this limit may cause transfer case oil pump damage.**

### Special Tool

Meritor Part Number 3256Z1144 can be fabricated as shown in Figure 22.

## SERVICE PROCEDURE (CONT.)

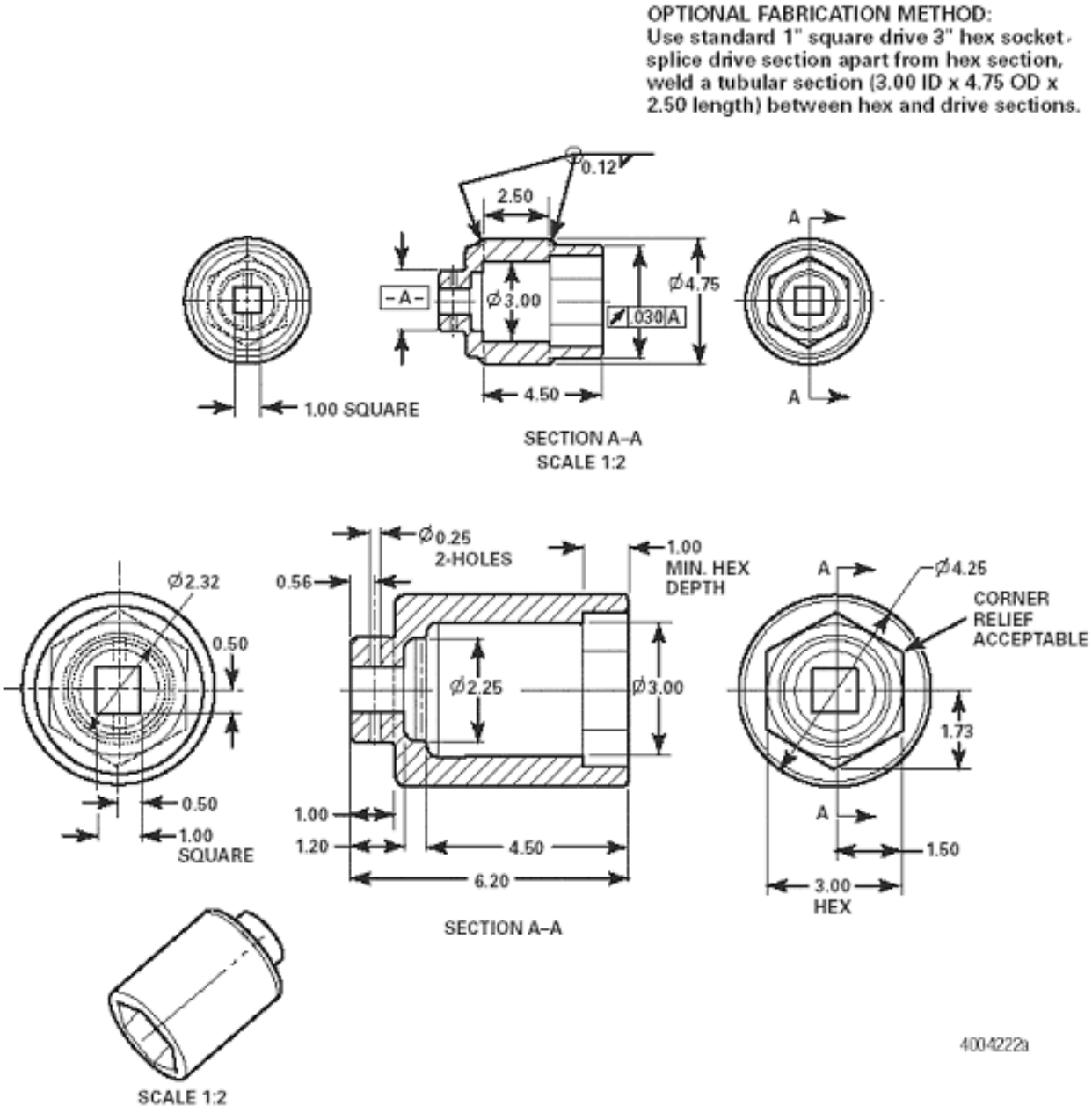



**Figure 22 Special Hex Socket Tool**

Operation number must appear on all claims.

**Table 2 Labor Information**

| Operation No. | Description | Time |
|---|---|---|
| A40–04903–1 | Replace Oil Pump | 4.5 Hrs. |

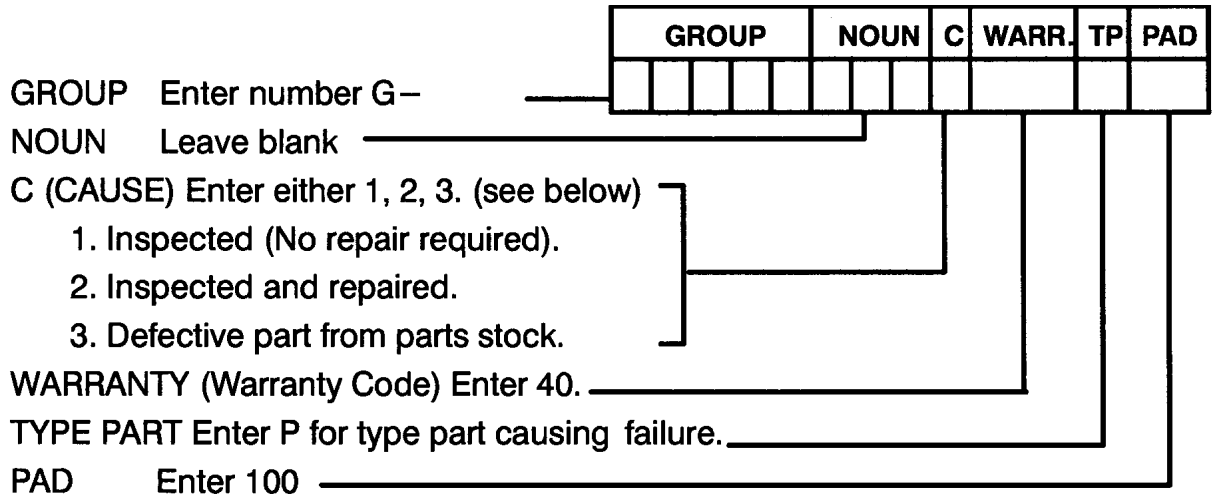
## ADMINISTRATIVE PROCEDURE

**Important: Upon completion of the repair call the ArvinMeritor Ontrac call center, (866) 668–7221, to register the repair and to obtain a repair authorization number and retrofit number. These numbers will need to be included on your claim to International Truck and Engine.**

Expense is to be charged to Warranty. Claims are to be submitted in the normal manner, making reference to Authorized Field Change Number G-04903.

It is important that the coding be completed properly to assist in processing the warranty claim. Complete instructions will be found in the Warranty Manual, Section 7–1. Special attention should be given to Items 39 through 44.

To assure this important improvement is made in a timely manner, all claims for G-04903 activity must be submitted by July 31, 2005 or within the normal warranty period for the vehicle, if after July 31, 2005.

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