2001-02 TRANSFER CASES

Overhaul - MDX

APPLICATION

NOTE: This article covers transfer assembly overhaul procedures for Acura MDX equipped with MGHA automatic transaxle.

DESCRIPTION & OPERATION

INTRODUCTION

Transfer assembly is a hypoid-type gear that is connected to final driven gear. Power is transmitted to final driven gear by transaxle differential assembly. Drive shaft from rear differential is connected to transfer assembly at companion flange.

OVERHAUL

TRANSFER ASSEMBLY

NOTE: Letter references in parenthesis are identified in following illustrations.

NOTE: Transfer output shaft may also be referred to as transfer driven gear shaft.

Disassembly

1. Remove the transfer cover. See **Fig. 1** .
2. Remove the transfer drive gear/shaft assembly, 25-mm thrust shim, and tapered roller bearing.
3. Cut the lock tab on the lock nut using a chisel. See **Fig. 2** .

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

4. Secure the transfer housing in a bench vise with soft jaws.
5. Install the holder (07XAB-0020100) on the companion flange, then loosen the lock nut. See **Fig. 3** .
6. Remove the companion flange holder.
7. Remove the lock nut, conical spring washer, back-up ring, "O" ring, and companion flange from the transfer output shaft.
8. Remove the transfer output shaft from the transfer housing, then remove the transfer spacer from the transfer output shaft.
9. Remove the oil seal and tapered roller bearing from the transfer housing.

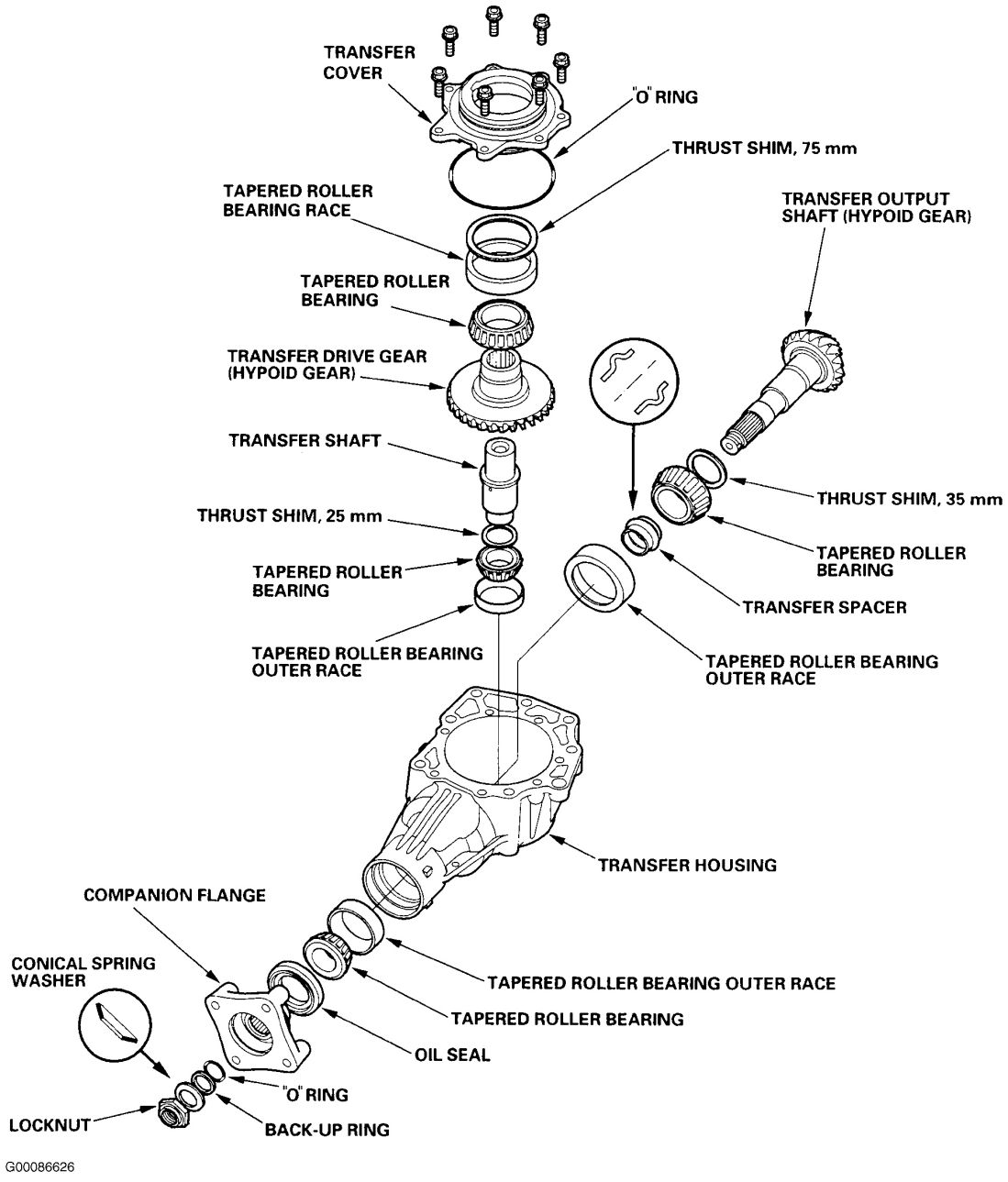


Fig. 1: Exploded View Of Transfer Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

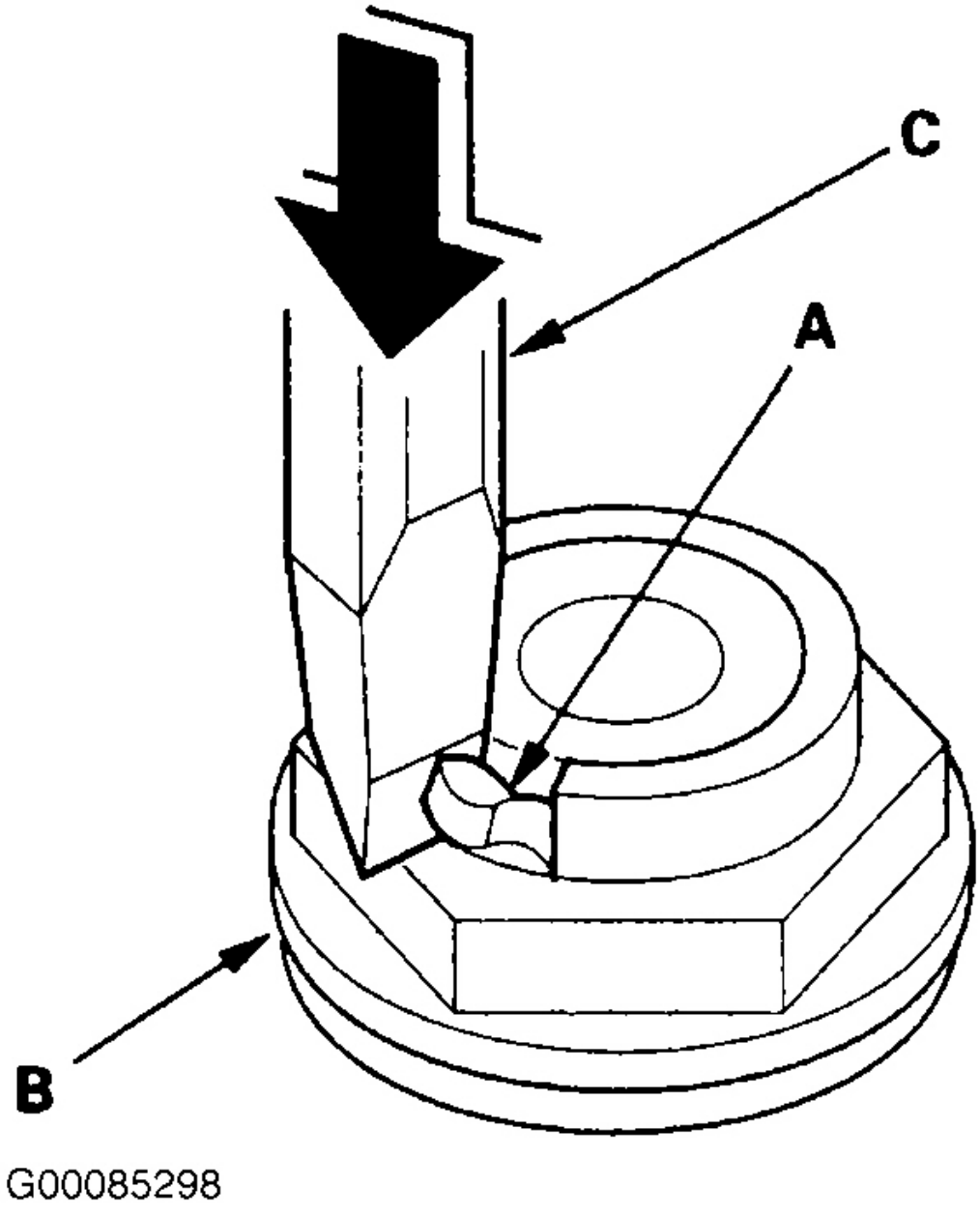


Fig. 2: Cutting Lock Nut Lock Tab
Courtesy of AMERICAN HONDA MOTOR CO., INC.

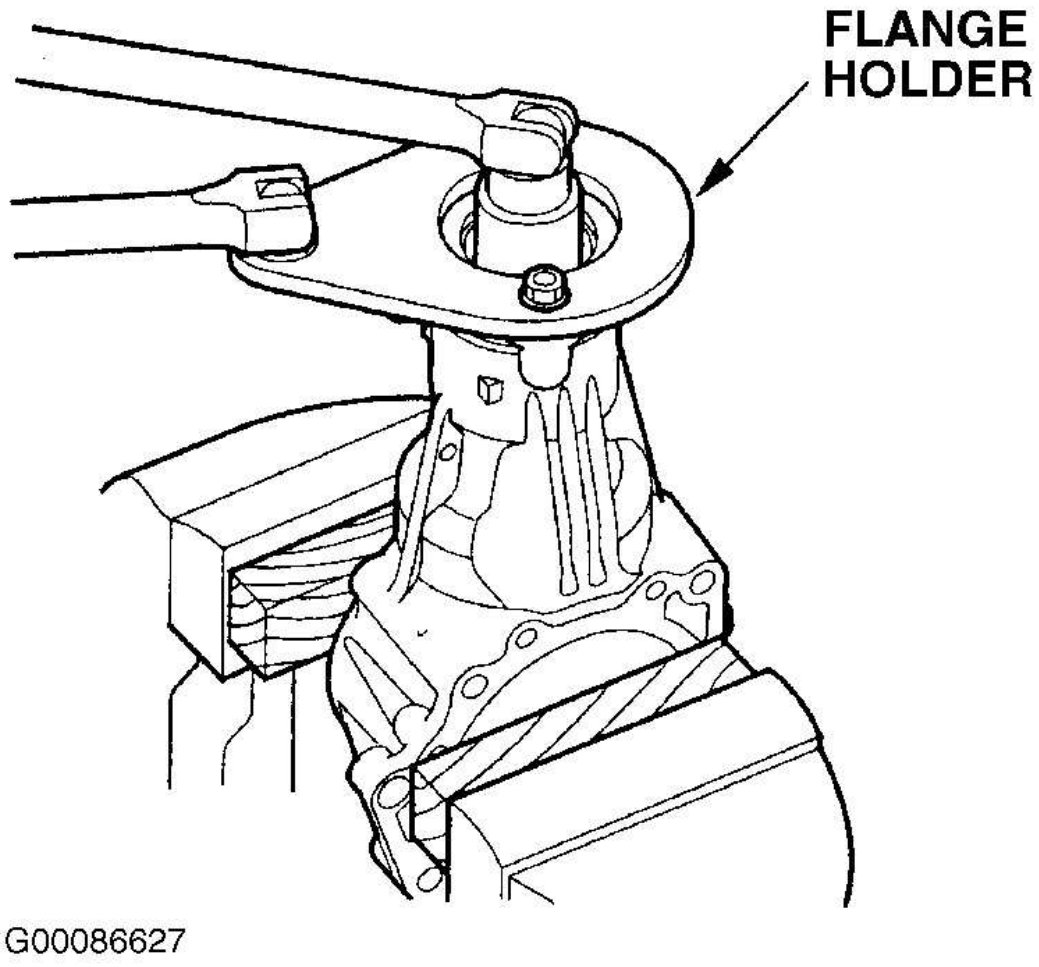


Fig. 3: Loosening/Tightening Companion Flange Lock Nut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Transfer Drive Gear Replacement

1. Remove the transfer shaft (A) from the transfer drive gear (B) with press adapter, bearing separator (C) and a press. See **Fig. 4** .
2. Install the new transfer drive gear (A) on the transfer shaft (B) with driver and a press. See **Fig. 5** .

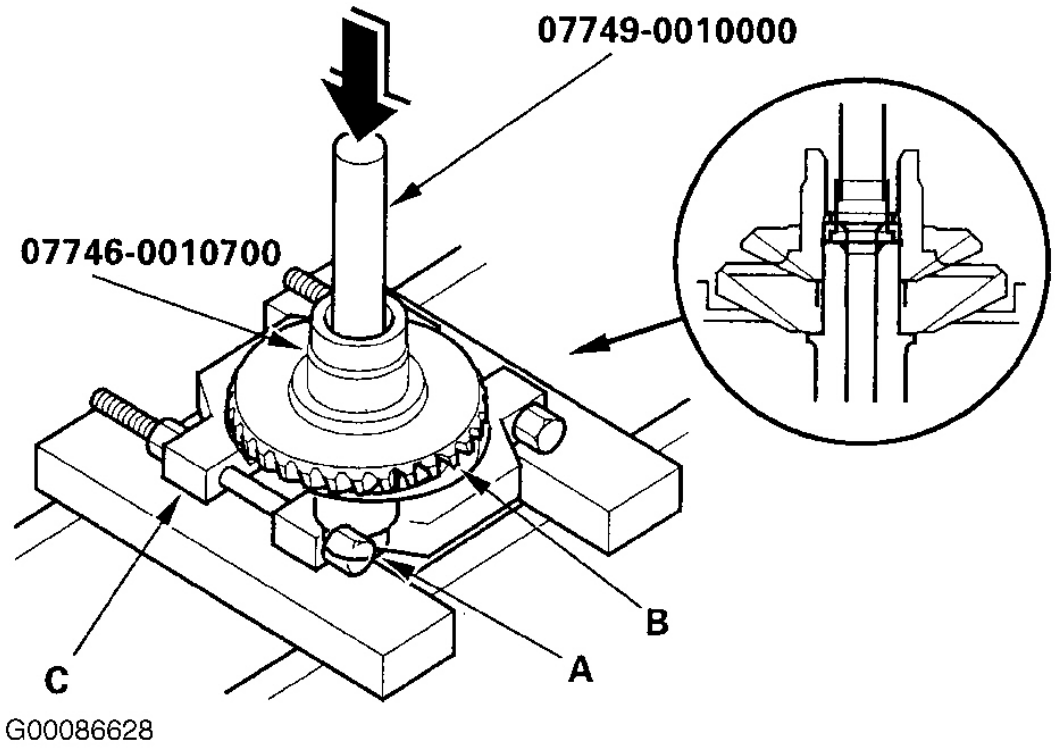


Fig. 4: Removing Transfer Shaft From Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

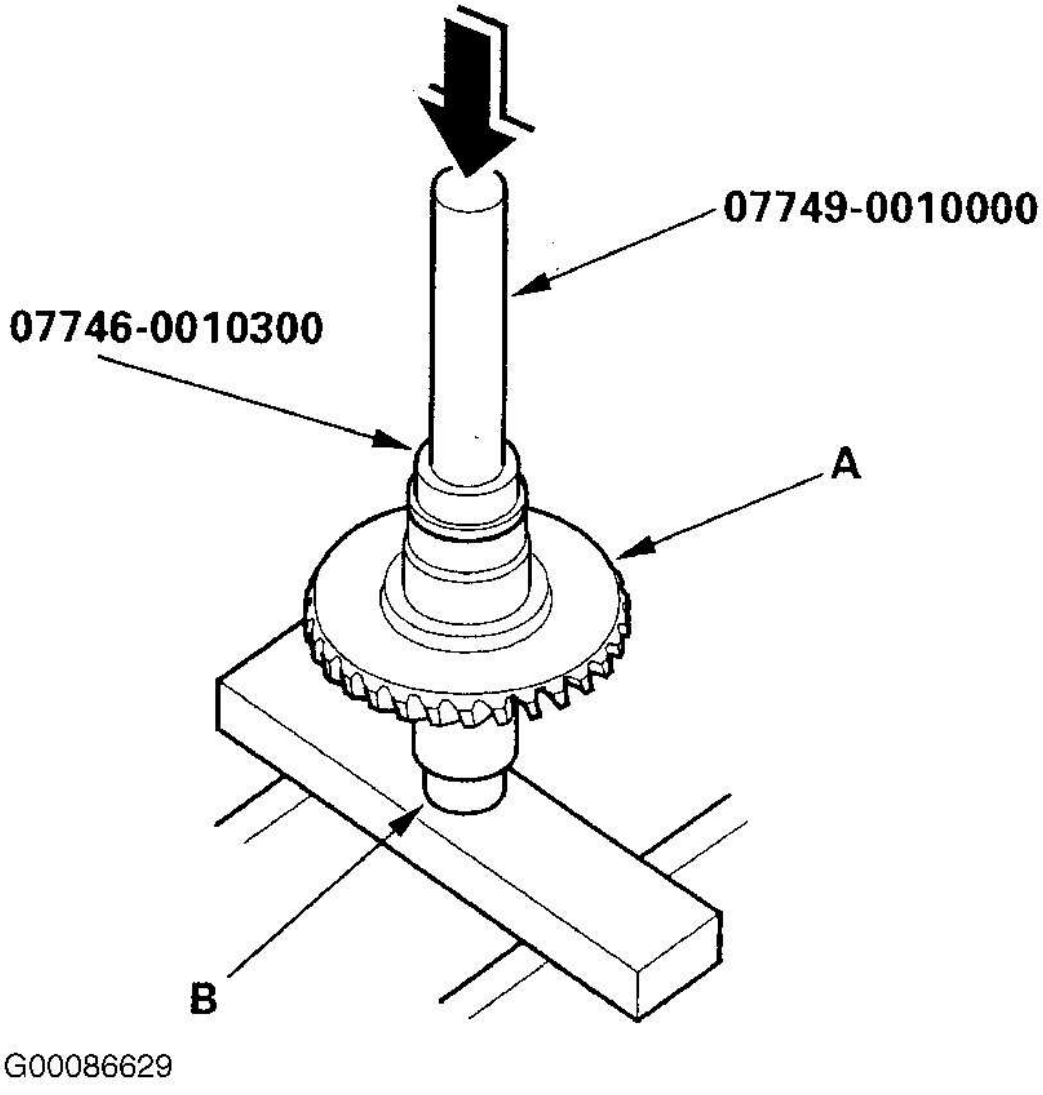


Fig. 5: Installing Transfer Gear On Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Transfer Drive Gear Bearing Replacement

1. Remove the tapered roller bearing (A) from the transfer drive gear (B) with driver, bearing separator (C) and a press. See **Fig. 6** .
2. Install the new tapered roller bearing (A) on the transfer drive gear (B) with driver and a press. See **Fig. 7** .

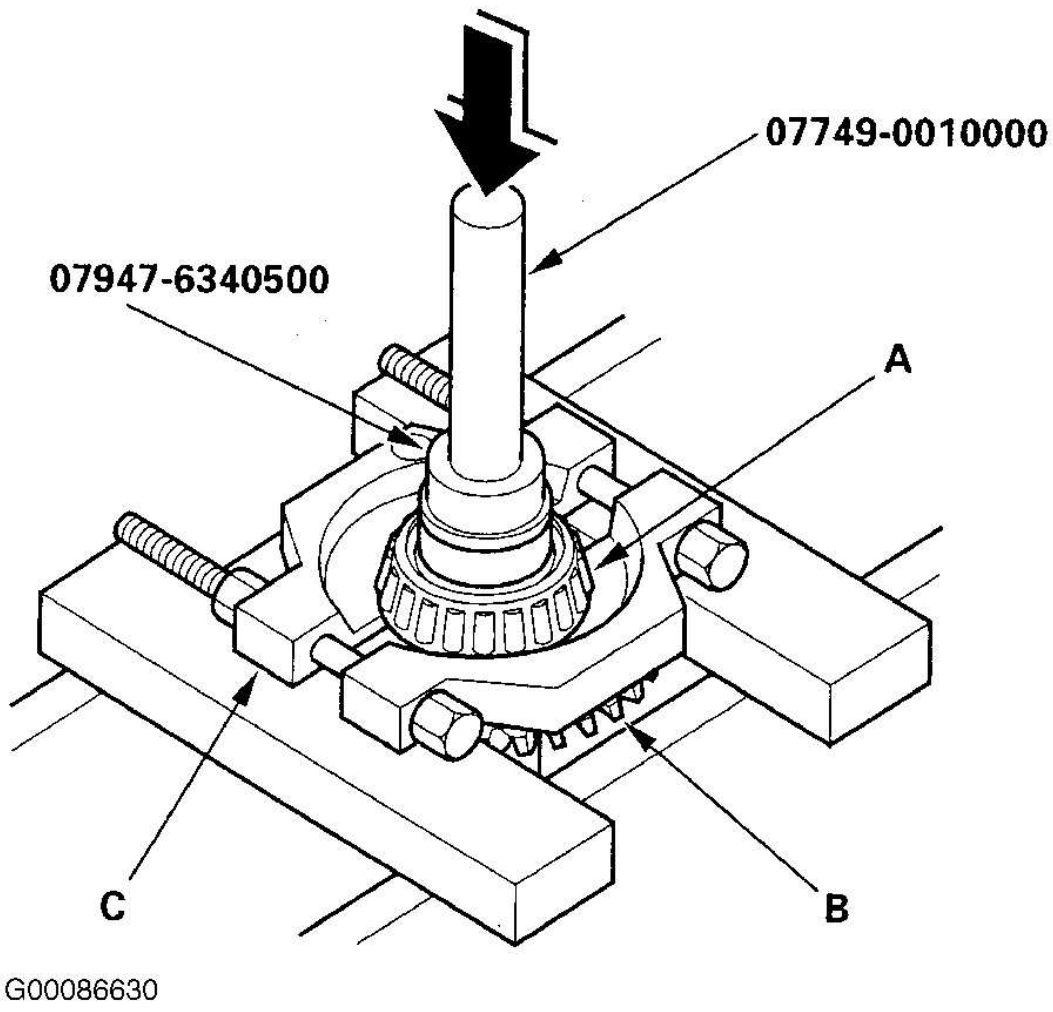


Fig. 6: Removing Transfer Drive Gear Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

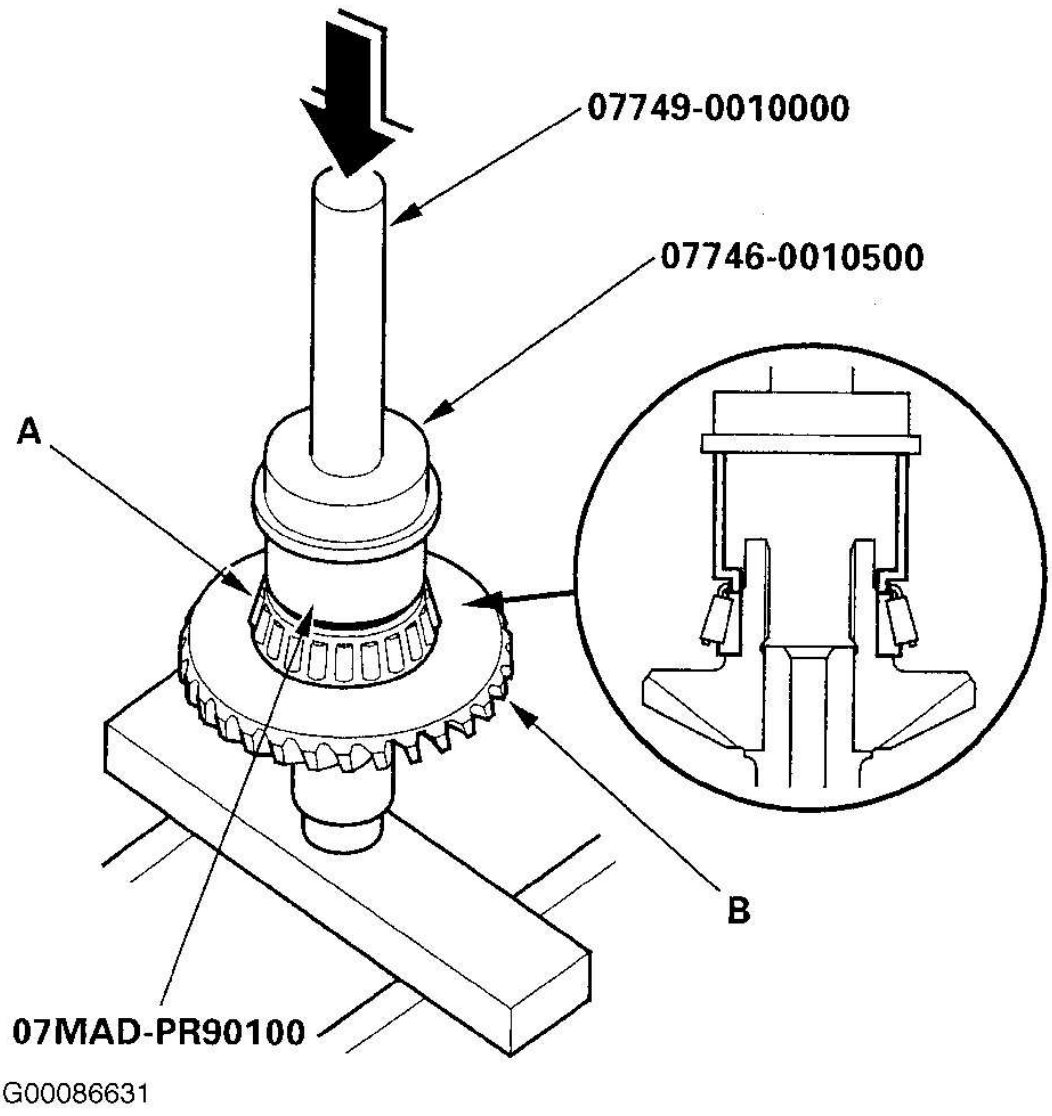


Fig. 7: Installing Transfer Drive Gear Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Transfer Output Shaft Bearing Replacement

1. Remove the tapered roller bearing (A) from the transfer output shaft (B) with a bearing separator (C) and a press. See **Fig. 8** . Place a shaft protector (D) between the transfer output shaft and a press to prevent damaging the shaft.
2. Install the 35-mm thrust shim (A) on the transfer output shaft (B).
3. Install the tapered roller bearing (C) on the transfer output shaft (B) with driver and a press. See **Fig. 9** .

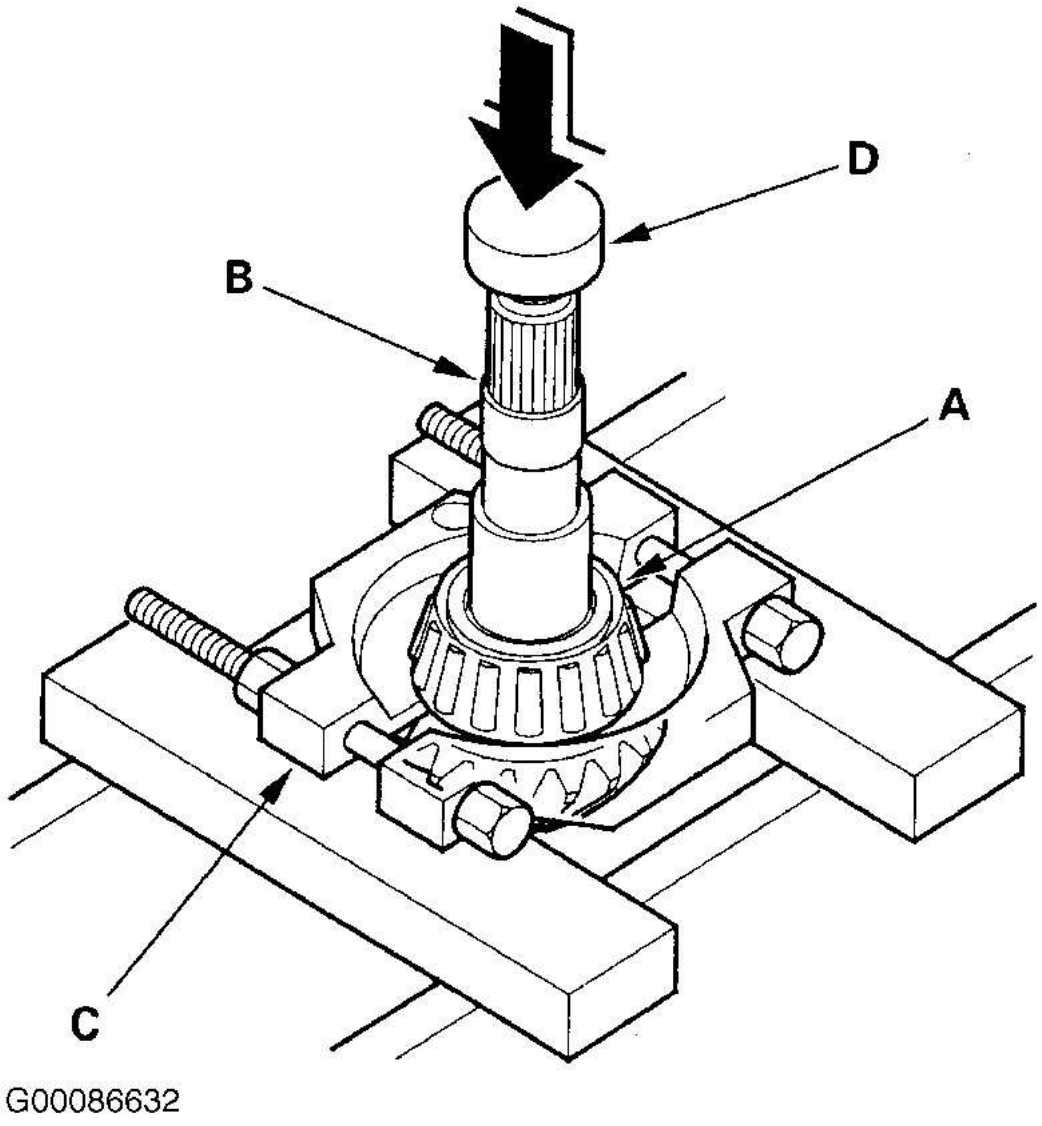


Fig. 8: Removing Transfer Output Shaft Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

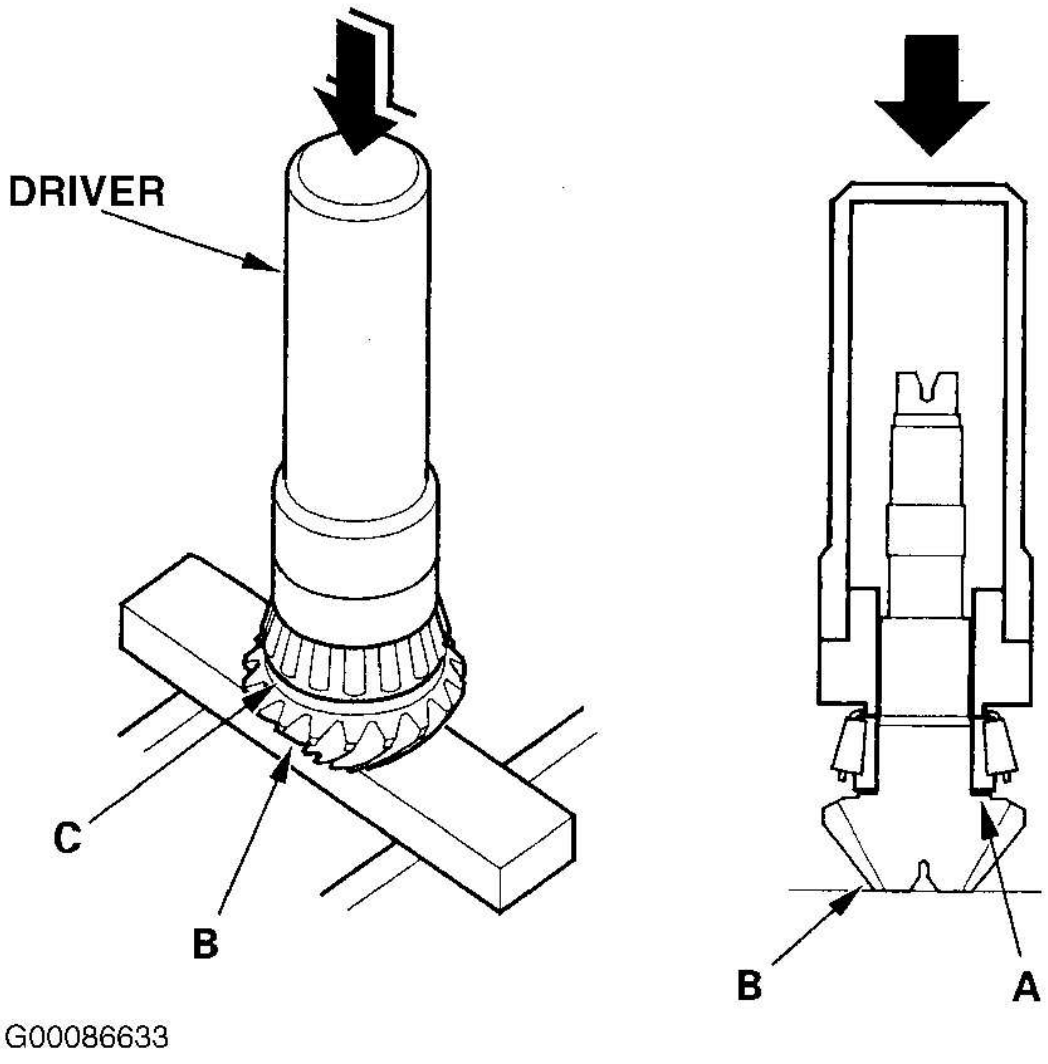


Fig. 9: Installing Transfer Output Shaft Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Transfer Housing Bearing Outer Race Replacement

NOTE: Replace the bearing whenever the outer race is replaced.

NOTE: Some bearing outer races (52-mm and 72-mm) are not press-fitted, and can be removed without heating the housing. See Fig. 10 .

1. Remove the bearing outer races from the transfer housing by heating the housing to about 212°F (100 °C) with a heat gun. Do not heat the housing more than 212°F (100°C).

2. Install the 52-mm bearing outer race (A) in the transfer housing (B) with appropriate race driver.
3. Install the 72-mm (A) and 58-mm (B) bearing outer races in the transfer housing with Race Installer (07MAF-SP0011A & 13A). See **Fig. 11** .

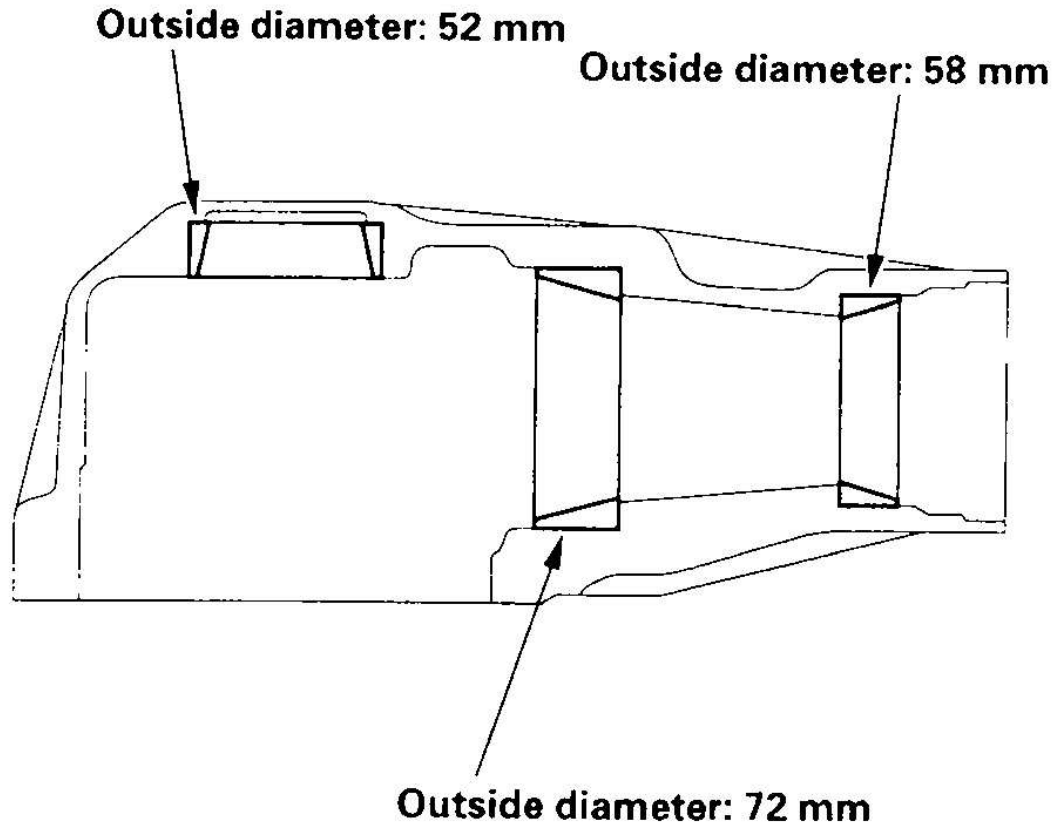


Fig. 10: Identifying Transfer Housing Bearing Outer Races
Courtesy of AMERICAN HONDA MOTOR CO., INC.

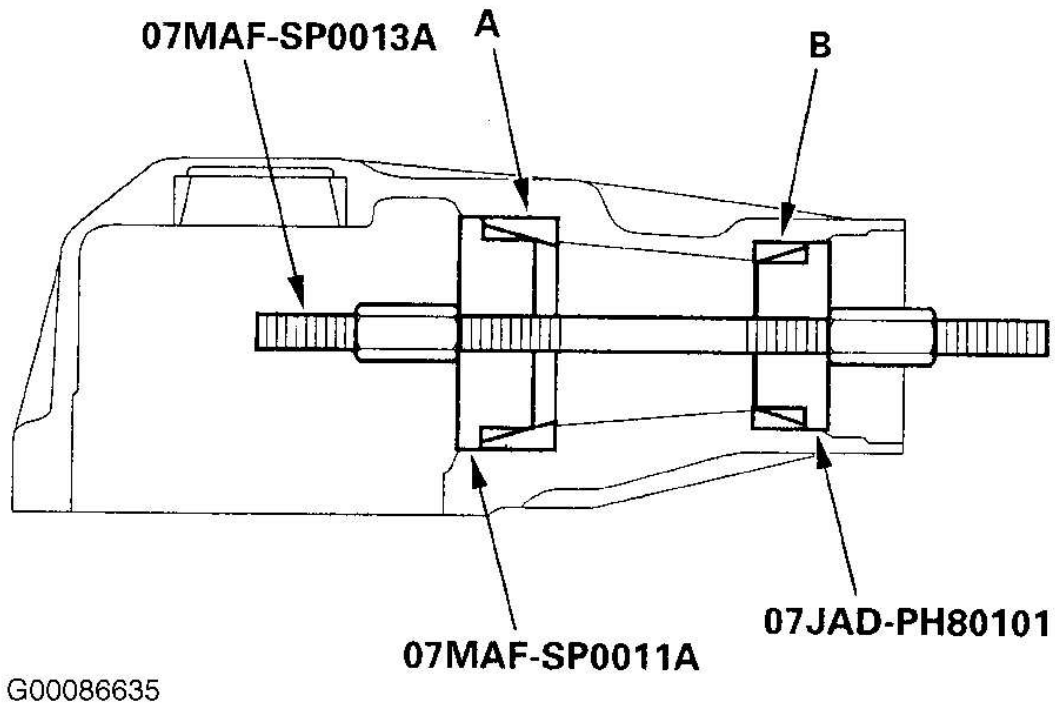


Fig. 11: Installing Transfer Output Shaft Bearing Race
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Transfer Cover Bearing Outer Race Replacement

NOTE: Replace the bearing whenever the outer race is replaced.

NOTE: Do not heat the cover more than 212°F (100°C).

1. Remove the bearing outer race and 75-mm thrust shim from the transfer cover. See **Fig. 1** . If the bearing outer race is press-fitted, remove the bearing outer race by heating the cover to about 212°F (100°C) with a heat gun (D).
2. Install the 75-mm thrust shim in the transfer cover.
3. Install the bearing outer race in the cover. If the outer race is press-fitted, use appropriate race driver.

Reassembly

NOTE: Transfer output shaft may also be referred to as transfer driven gear shaft.

NOTE: While reassembling the transfer assembly:

- **Check and adjust the transfer gear tooth contact.**
- **Measure and adjust the transfer gear backlash.**
- **Check and adjust the tapered roller bearing starting torque.**
- **Coat all parts with ATF during reassembly.**
- **Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.**
- **Replace the transfer drive gear and the transfer driven gear (output) shaft as a set if either part is replaced.**

1. Select the 35-mm thrust shim if the transfer driven gear shaft is replaced. Calculate the thickness of the 35-mm thrust shim using the formula and select the correct shim from the table. See **Fig. 12** .
2. Select the 35-mm thrust shim if the tapered roller bearing on the transfer output shaft is replaced. Measure the thickness of the replacement bearing and the existing bearing, and calculate the difference of the bearing thickness. Adjust the thickness of the existing 35-mm thrust shim by the amount of difference in bearing thickness, and select the replacement 35-mm thrust shim from thrust shim selection table. See **Fig. 12** .
3. Install the 35-mm thrust shim on the transfer output shaft, then install the tapered roller bearing with the appropriate driver and a press. See **TRANSFER OUTPUT SHAFT BEARING REPLACEMENT** .
4. Place the tapered roller bearing on the bearing outer race of the companion flange side of the transfer housing.
5. Install the new oil seal on the transfer housing with appropriate driver and a press.
6. Install the transfer output shaft (driven gear) in the transfer housing. See **Fig. 1** . Do not install the transfer spacer on the transfer output shaft.
7. Install the companion flange, conical spring washer, and lock nut on the transfer output shaft. Do not install the "O" ring and back-up ring on the transfer output shaft.

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

8. Secure the transfer housing in a bench vise with soft jaws, then install the holder on the companion flange. See **Fig. 3** .

NOTE: Do not stake the lock nut in following step.

9. Tighten the lock nut while measuring the starting torque so the starting torque is 10.2-15.1 INCH lbs. (1.15-1.71 N.m).
10. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.
11. Install the tapered roller bearing, 25-mm thrust shim, and transfer drive gear/shaft assembly in the transfer housing.
12. Install the transfer cover, and tighten the bolts. See **TORQUE SPECIFICATIONS** . Do not install the "O" ring on the transfer cover.
13. Rotate the companion flange several times to seat the tapered roller bearings.

14. Set the dial indicator on the companion flange, then measure the transfer gear backlash. See **Fig. 13** . Standard is .02-.06" (.06-.16 mm).
15. Remove the transfer cover, transfer drive gear/shaft assembly, and check the transfer drive gear tooth contact pattern.
16. If the measurement of the backlash is out of the standard, adjust the transfer gear backlash with the 35-mm thrust shim and recheck. Do not use more than two 35-mm thrust shims to adjust the transfer gear backlash.
17. If the transfer gear tooth contact is incorrect, adjust the transfer gear tooth contact with the 25-mm or 35-mm thrust shim. See **Fig. 14** . See GEAR TOOTH CONTACT PATTERN article in GENERAL INFORMATION. Do not use more than 2 shims of each thrust shim to adjust the tooth contact.
    - **Toe Contact** - Use a thicker 35-mm thrust shim to move the transfer output shaft toward the transfer drive gear. Because this movement causes the transfer backlash to change, move the transfer drive gear away from the transfer output shaft to adjust the transfer gear backlash. Increase the thickness of the 25-mm thrust shim and reduce the thickness of the 75-mm thrust shim by the amount of increase thickness of the 25-mm thrust shim.
    - **Heel Contact** - Use a thinner 35-mm thrust shim to move the transfer driven gear shaft away from the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear toward the transfer output shaft to adjust the transfer gear backlash. Reduce the thickness of the 25-mm thrust shim and increase the thickness of the 75-mm thrust shim by amount of reduce thickness of the 25-mm thrust shim.
    - **Flank Contact** - Use a thinner thrust shim to move the transfer output toward the transfer output shaft. Flank contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under HEEL CONTACT.
    - **Face Contact** - Use a thicker thrust shim to move the transfer output away from the transfer output shaft. Face contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under TOE CONTACT.
18. Remove the transfer cover, transfer drive gear/shaft assembly, 25-mm thrust shim, and tapered roller bearing from the transfer housing after adjusting the transfer gear backlash or transfer gear tooth contact.

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

19. Secure the transfer housing in a bench vise with soft jaws, then install the holder on the companion flange.
20. Remove the lock nut, conical spring washer, and companion flange from the transfer output shaft.
21. Remove the transfer output shaft from the transfer housing.
22. Install the new transfer spacer on the transfer output shaft, and install them in the transfer housing.
23. Coat the threads of the lock nut and transfer output shaft with ATF.
24. Install the companion flange, new "O" ring, back-up ring, new conical spring washer, and new lock nut on the transfer output shaft. Install the conical spring washer. See **Fig. 1** .

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

25. Secure the transfer housing in a bench vise with soft jaws, then install the holder on the companion flange.

NOTE: Rotate the companion flange several times to seat the tapered roller bearings, then measure the starting torque. If the starting torque exceeds 15.1 INCH lbs. (1.71 N.m), replace the transfer spacer and reassemble the parts. Do not adjust the torque with the lock nut loose. If the tightening torque exceeds 217 ft. lbs. (294 N.m), replace the transfer spacer and reassemble the parts. Record the measurement of the starting torque, it is used to measure the total starting torque.

26. Tighten the lock nut while measuring the starting torque of the transfer driven gear. Starting torque should be 10.2-15.1 INCH lbs. (1.15-1.71 N.m).
27. Remove the companion flange holder.
28. Stake the lock nut using a 3.5-mm punch.
29. Install the tapered roller bearing, 25-mm thrust shim, and transfer drive gear/shaft assembly in the transfer housing.
30. Temporarily install the transfer cover without the "O" ring and tighten the bolts.
31. Secure the transfer housing in a bench vise with soft jaws, then rotate the companion flange several times to seat the tapered roller bearings. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.
32. Measure the total starting torque. See **Fig. 15** . Total starting torque is 13.4-15.8 INCH lbs. (1.51-1.78 N.m) plus transfer output starting torque value measured in step 26 .
33. Remove the transfer cover.

NOTE: Do not heat the cover more than 212°F (100°C).

34. If the measurement is not within specification, remove the bearing outer race and 75-mm thrust shim from the transfer cover. If the bearing outer race is press-fitted, remove the bearing outer race by heating the cover to about 212°F (100°C) with a heat gun. If the measurement is within the standard, go to step 36 .
35. Measure the thickness of removed 75-mm thrust shim, and select the new 75-mm shim. Shims are available in thicknesses of .060-.105" (1.52-2.66 mm) in increments of .001" (.03 mm).
36. Install the 75-mm thrust shim in the transfer cover. See **Fig. 1** . If cover is heated, let it cool to room temperature before installing the thrust shim.
37. Install the bearing outer race in the cover.
38. After replacing the 75-mm thrust shim, recheck and ensure the total starting torque is within the specification.
39. Install the new "O" ring on the transfer cover, then install the cover on the transfer housing.

FORMULA: $\frac{A}{100} - \frac{B}{100} + C = X$

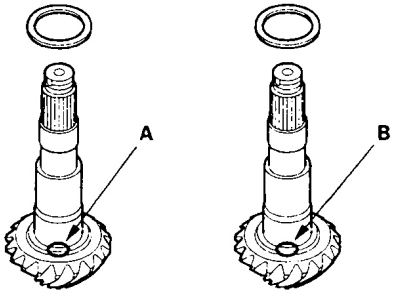
A: Number on the existing transfer driven gear shaft
B: Number on the replacement transfer driven gear shaft
C: Thickness of the existing 35 mm thrust shim
X: Thickness needed for the replacement 35 mm thrust shim

NOTE: The number on the transfer driven gear shaft is shown in 1/100 mm.

EXAMPLE:

C: EXISTING 35 mm THRUST SHIM Thickness: C=1.05 mm

X: REPLACEMENT 35mm THRUST SHIM Thickness: X= ? ? mm



A: EXISTING TRANSFER DRIVEN GEAR SHAFT Number: A=+2

B: REPLACEMENT TRANSFER OUTPUT SHAFT Number: B=−1

$$X = \frac{A}{100} - \frac{B}{100} + C$$

$$= \frac{2}{100} - \frac{-1}{100} + 1.05$$

$$= 0.02 + 0.01 + 1.05 = 1.08 \text{ (mm)}$$

Select No. M 35 mm thrust shim of 1.08 mm (0.043 in.).

THRUST SHIM, 35 mm

Shim No.	Part Number	Thickness
A	41361-PS3-000	0.72 mm (0.028 in.)
B	41362-PS3-000	0.75 mm (0.030 in.)
C	41363-PS3-000	0.78 mm (0.031 in.)
D	41364-PS3-000	0.81 mm (0.032 in.)
E	41365-PS3-000	0.84 mm (0.033 in.)
F	41366-PS3-000	0.87 mm (0.034 in.)
G	41367-PS3-000	0.90 mm (0.035 in.)
H	41368-PS3-000	0.93 mm (0.037 in.)
I	41369-PS3-000	0.96 mm (0.038 in.)
J	41370-PS3-000	0.99 mm (0.039 in.)
K	41371-PS3-000	1.02 mm (0.040 in.)
L	41372-PS3-000	1.05 mm (0.041 in.)
M	41373-PS3-000	1.08 mm (0.043 in.)
N	41374-PS3-000	1.11 mm (0.044 in.)

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Fig. 12: Determining Transfer Driven Gear (Output Shaft) Bearing Thrust Washer Thickness
Courtesy of AMERICAN HONDA MOTOR CO., INC.

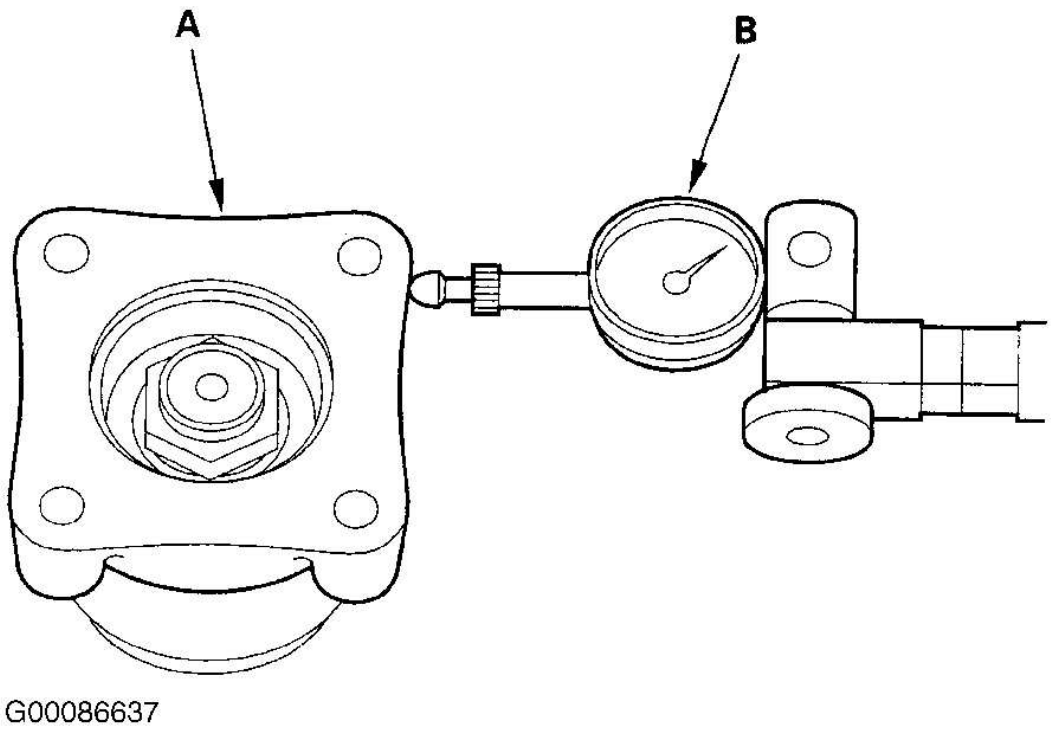

Fig. 13: Measuring Transfer Gear Backlash
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Shim No.	Part Number	Thickness
1.70	29411-P1C-000	1.70 mm (0.067 in.)
1.73	29412-P1C-000	1.73 mm (0.068 in.)
1.76	29413-P1C-000	1.76 mm (0.069 in.)
1.79	29414-P1C-000	1.79 mm (0.070 in.)
1.82	29415-P1C-000	1.82 mm (0.072 in.)
1.85	29416-P1C-000	1.85 mm (0.073 in.)
1.88	29417-P1C-000	1.88 mm (0.074 in.)
1.91	29418-P1C-000	1.91 mm (0.075 in.)
1.94	29419-P1C-000	1.94 mm (0.076 in.)
1.97	29420-P1C-000	1.97 mm (0.078 in.)
2.00	29421-P1C-000	2.00 mm (0.079 in.)
2.03	29422-P1C-000	2.03 mm (0.080 in.)
2.06	29423-P1C-000	2.06 mm (0.081 in.)
2.09	29424-P1C-000	2.09 mm (0.082 in.)
2.12	29425-P1C-000	2.12 mm (0.083 in.)
2.15	29426-P1C-000	2.15 mm (0.085 in.)
2.18	29427-P1C-000	2.18 mm (0.086 in.)
2.21	29428-P1C-000	2.21 mm (0.087 in.)
2.24	29429-P1C-000	2.24 mm (0.088 in.)

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Fig. 14: Thrust Shim (25-mm) Selection Table
Courtesy of AMERICAN HONDA MOTOR CO., INC.

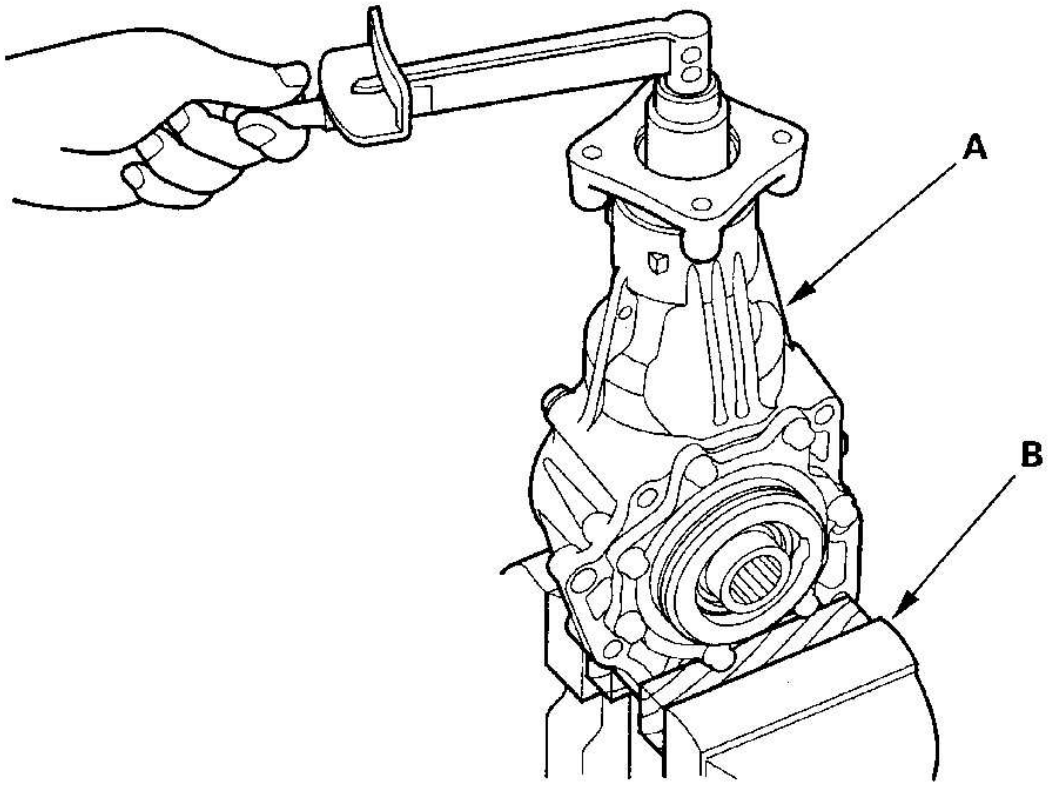

Fig. 15: Measuring Transfer Assembly Total Starting Torque
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Application	Ft. Lbs. (N.m)
Drive Shaft-To-Companion Flange Bolt	53 (72)
Exhaust Pipe Flange Bolt	25 (33)
Exhaust Pipe-To-Manifold Bolt	40 (54)
Sub-Frame Stiffener Bolt	40 (54)
Transfer Assembly-To-Transaxle Bolt	33 (44)
Transfer Cover Bolt	20 (26)
Transfer Output Shaft Lock Nut	80-217 (108-294)