2003-06 TRANSMISSION

Manual Transmission - Element

MANUAL TRANSMISSION

SPECIAL TOOLS

Ref. No.	Tool Number	Description	Qty
*①	07GAJ-PG20110	Mainshaft Holder	1
*②	07GAJ-PG20130	Mainshaft Base	1
③	07JAB-001020B	Holder Handle	1
④	07JAD-PH80101	Oil Seal Driver Attachment	1
⑤	07JAD-PL90100	Oil Seal Driver	1
⑥	07JAF-SJ80110	Installer Shaft 14 x 165 mm	1
⑦	07JAF-SJ80120	Installer Nut 14 mm	1
⑧	07KAF-PS30120	Bearing Installer Attachment	1
⑨	07LAF-PZ70110	Bearing Installer Attachment	1
⑩	07NAD-P20A100	Oil Seal Driver Attachment	1
⑪	07RAB-TB4010A or 07RAB-TB4010B	Companion Flange Holder	1
**⑫	07736-A01000B	Adjustable Bearing Puller, 20—40 mm	1
⑬	07746-0010200	Attachment, 37 x 40 mm	1
⑭	07746-0010300	Attachment, 42 x 47 mm	1
⑮	07746-0010600	Attachment, 72 x 75 mm	1
⑯	07746-0030100	Driver Handle	1
⑰	07746-0030300	Attachment, 30 mm I.D.	1
⑱	07746-0030400	Attachment, 35 mm I.D.	1
⑲	07749-0010000	Driver	1
⑳	07947-SD90101	Oil Seal Driver Attachment	1

* Part of Mainshaft Inspection Tool Set, 07GAJ-PG20102.
* * Must be used with commercially available 3/8 "-16 Slide Hammer.

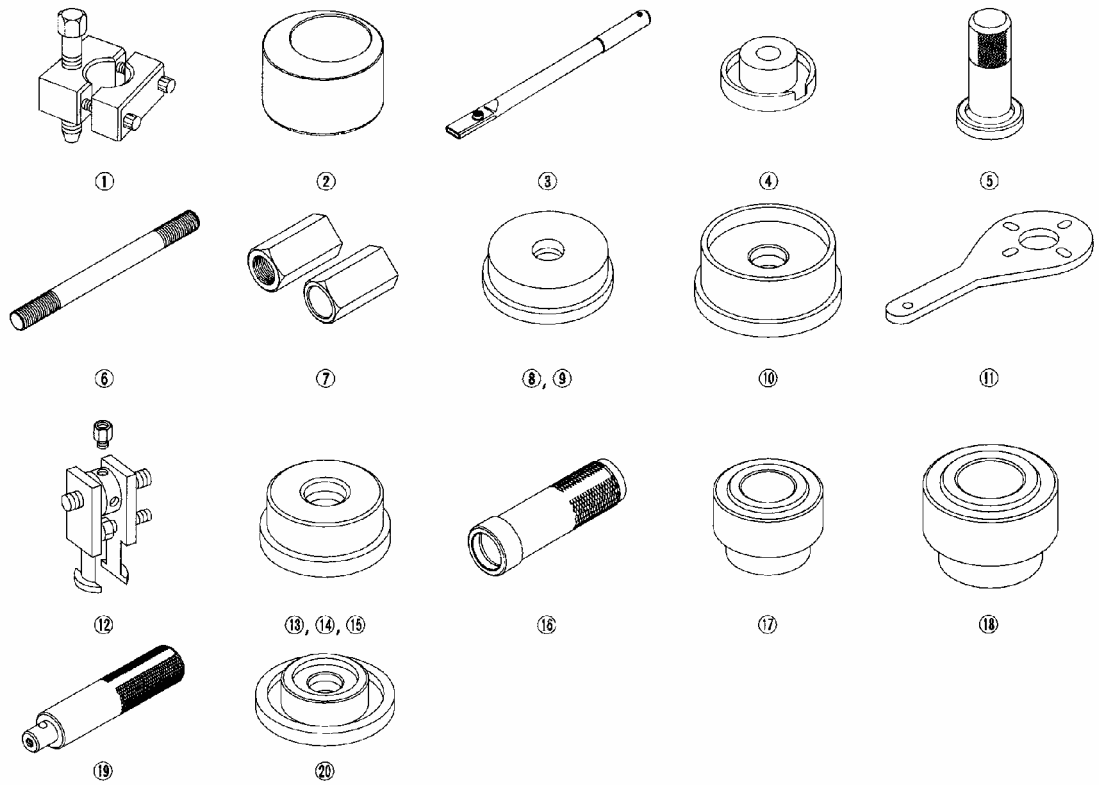

Fig. 1: Special Tools Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSMISSION FLUID INSPECTION AND REPLACEMENT

1. Park the vehicle on level ground, and turn the ignition switch to LOCK (0).
2. Remove the oil filler plug (A) and washer (B), check the condition of the fluid, and make sure it is at the proper level (C).

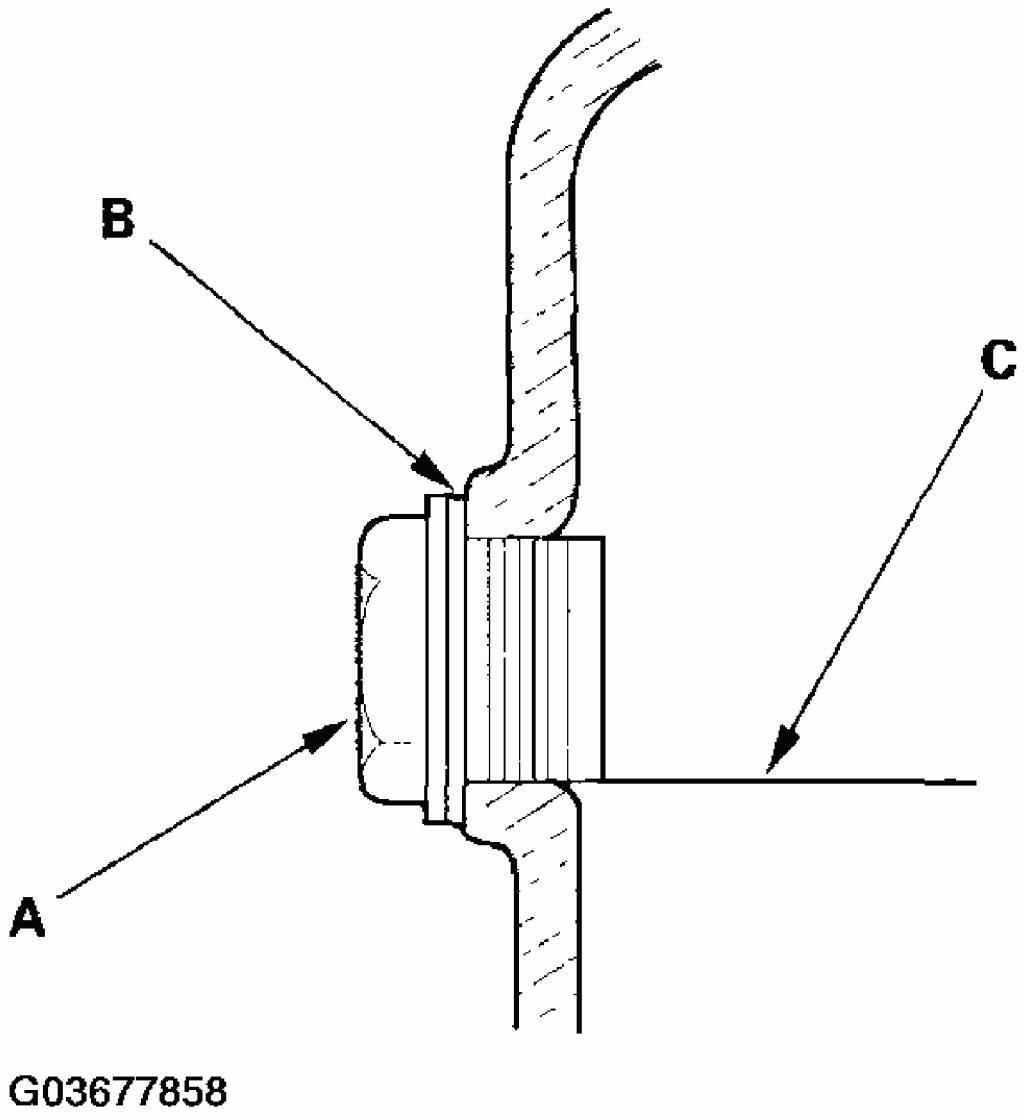

Fig. 2: Checking Transmission Fluid Condition
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. If the fluid is dirty, remove the drain plug (D) and drain the fluid.

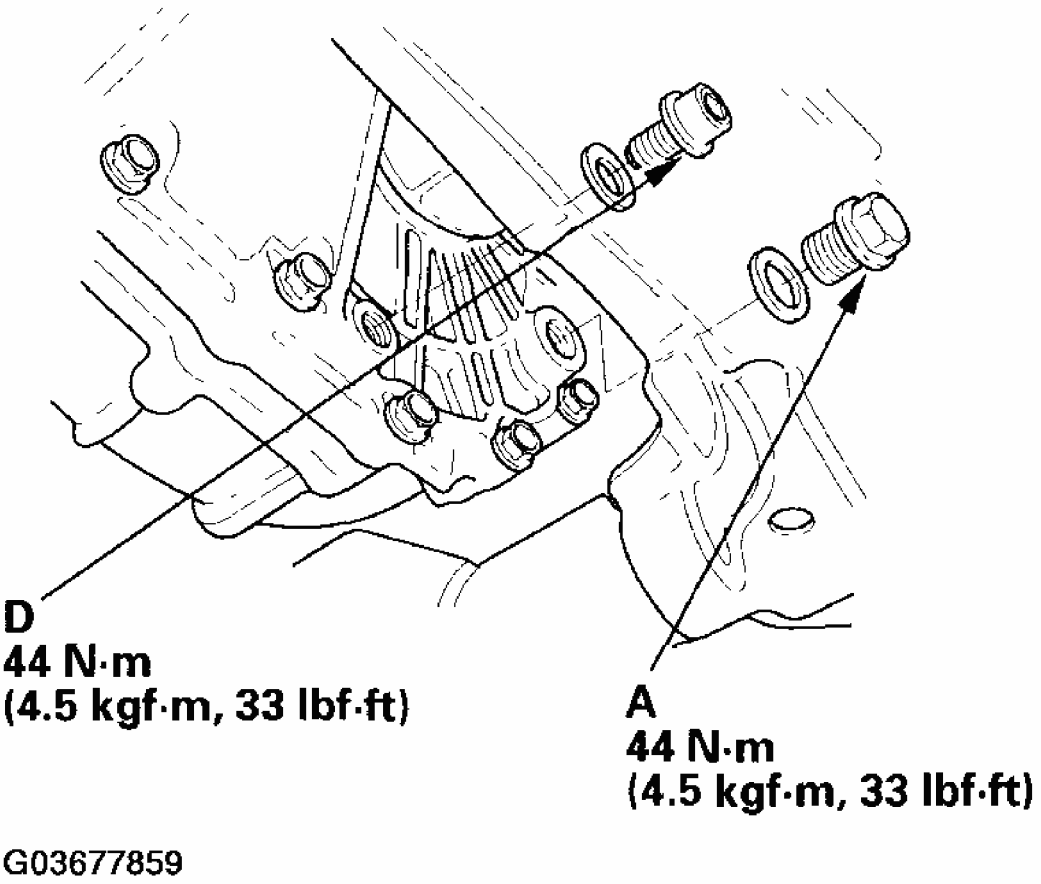

Fig. 3: Removing Drain Plug And Fluid With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the drain plug with a new washer, and refill the transmission fluid to the proper level.

Fluid Capacity

4WD model:

1.9 L (2.0 US qt) at fluid change

2.25 L (2.4 US qt) at overhaul

2WD model:

1.9 L (2.0 US qt) at fluid change

2.15 L (2.3 US qt) at overhaul

Use only Honda Manual Transmission Fluid (MTF). Using engine oil can cause stiffer shifting because it does not contain the proper additives.

5. Install the oil filler plug with a new washer.

BACK-UP LIGHT SWITCH TEST

1. Disconnect the back-up light switch connector.

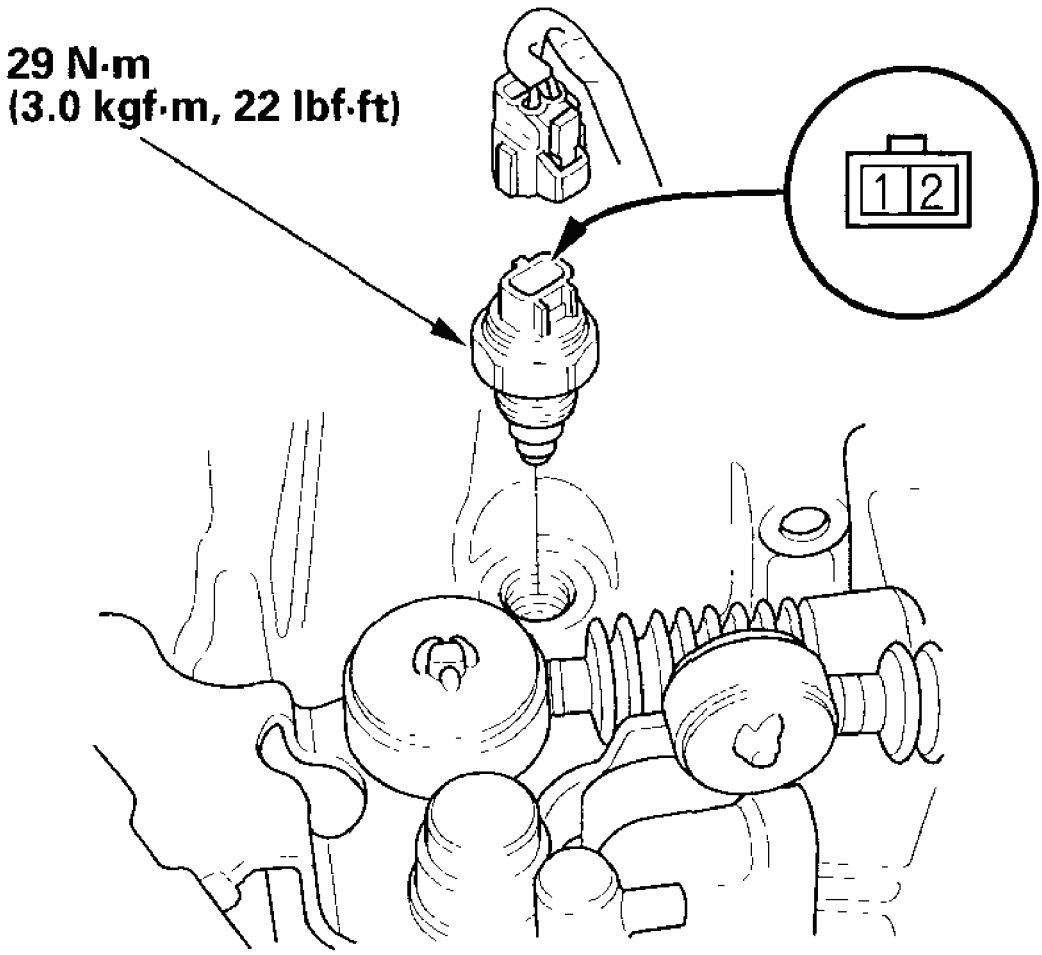

Fig. 4: Disconnecting Back-Up Light Switch Connector And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Check for continuity between the No. 1 and No. 2 terminals of the back-up light switch 2P connector. There should be continuity when the shift lever is in reverse.
3. If necessary, replace the back-up light switch. Apply liquid gasket (P/N 08718-0001 or

08718-0002) to the switch threads, and install the switch on the transmission housing.

NOTE: Do not install the components if too much time has passed after applying the liquid gasket (for P/N 08718-0002, no more than 4 minutes, for all others, no more than 5 minutes). Instead, remove the old residue, and reapply the liquid gasket.

TRANSMISSION REMOVAL

Special Tools Required

- Engine hanger/adapter VSB02C000015 *
- Engine support hanger, A & Reds AAR-T-12566 *
- Front subframe adapter VSB02C000016 *

* Available through the Honda Tool and Equipment Program 1-888-424-6857.

NOTE: Use fender covers to avoid damaging painted surfaces.

1. Make sure you have the anti-theft code for the radio, then write down the audio presets. Disconnect the negative cable from the battery first, then disconnect the positive cable. Remove the battery.
2. Secure the hood in its vertical position (A).

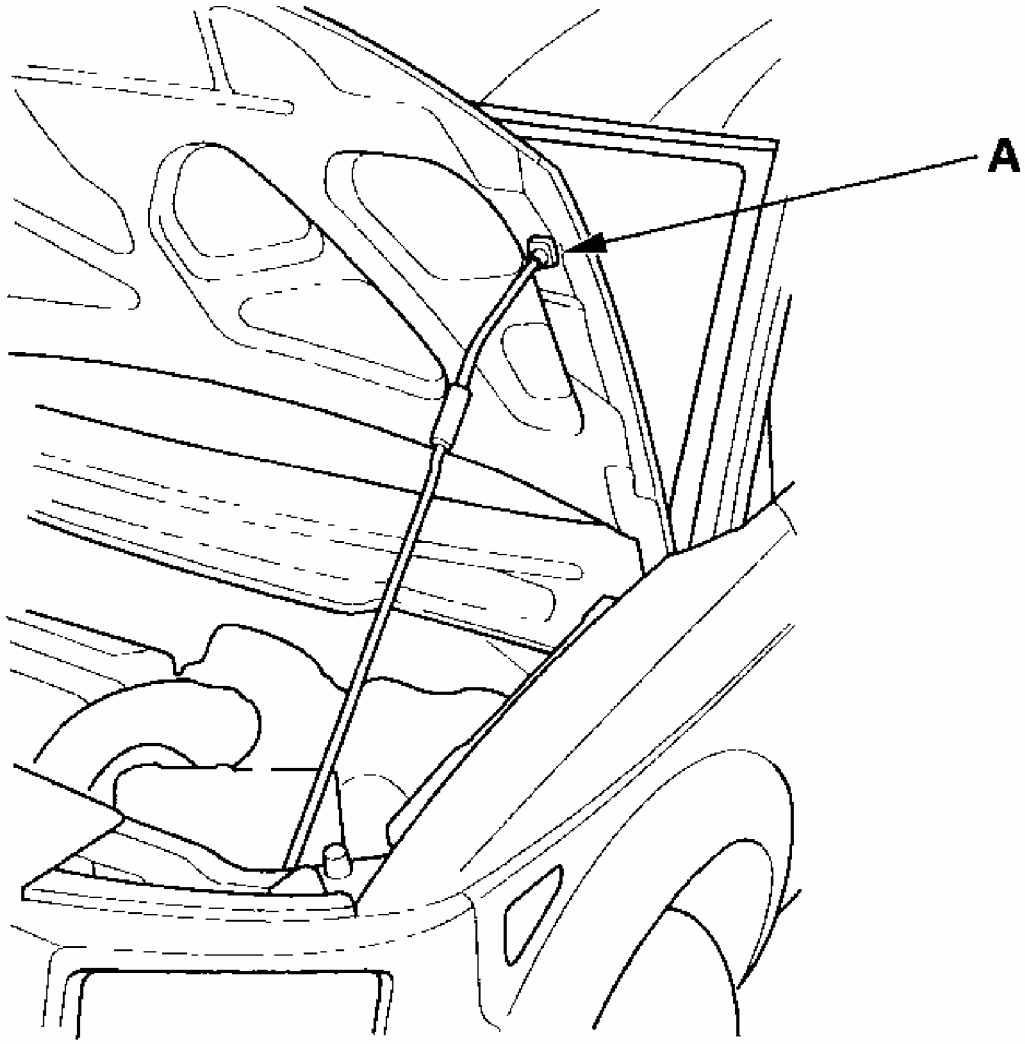

Fig. 5: Securing Hood In Vertical Position
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the air cleaner housing (see **AIR CLEANER REMOVAL/INSTALLATION**).
4. Remove the air intake duct (see step 5 on **ENGINE REMOVAL**).
5. Remove the battery base (A).

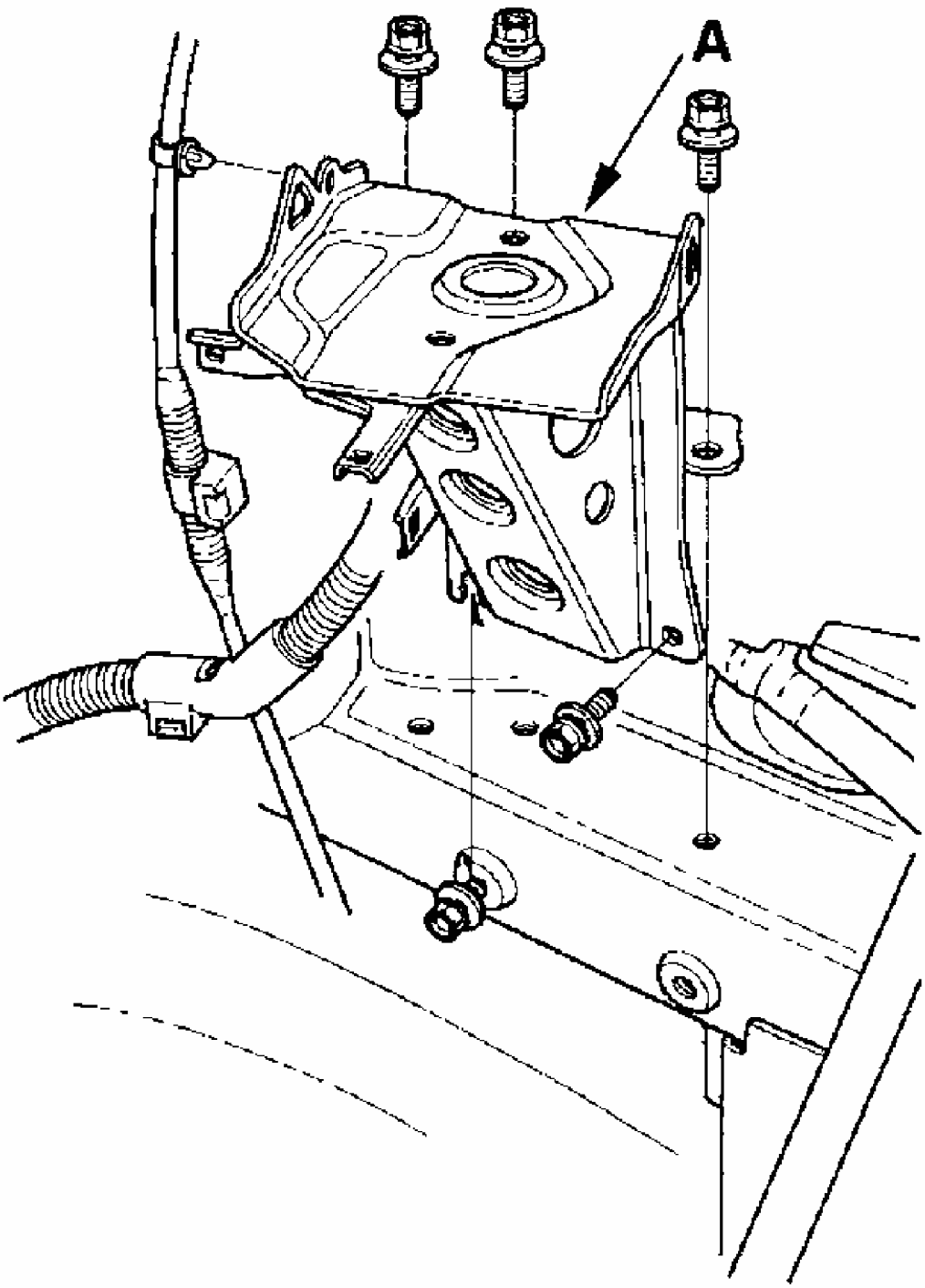

Fig. 6: Removing Battery Base
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the ground cable (A).

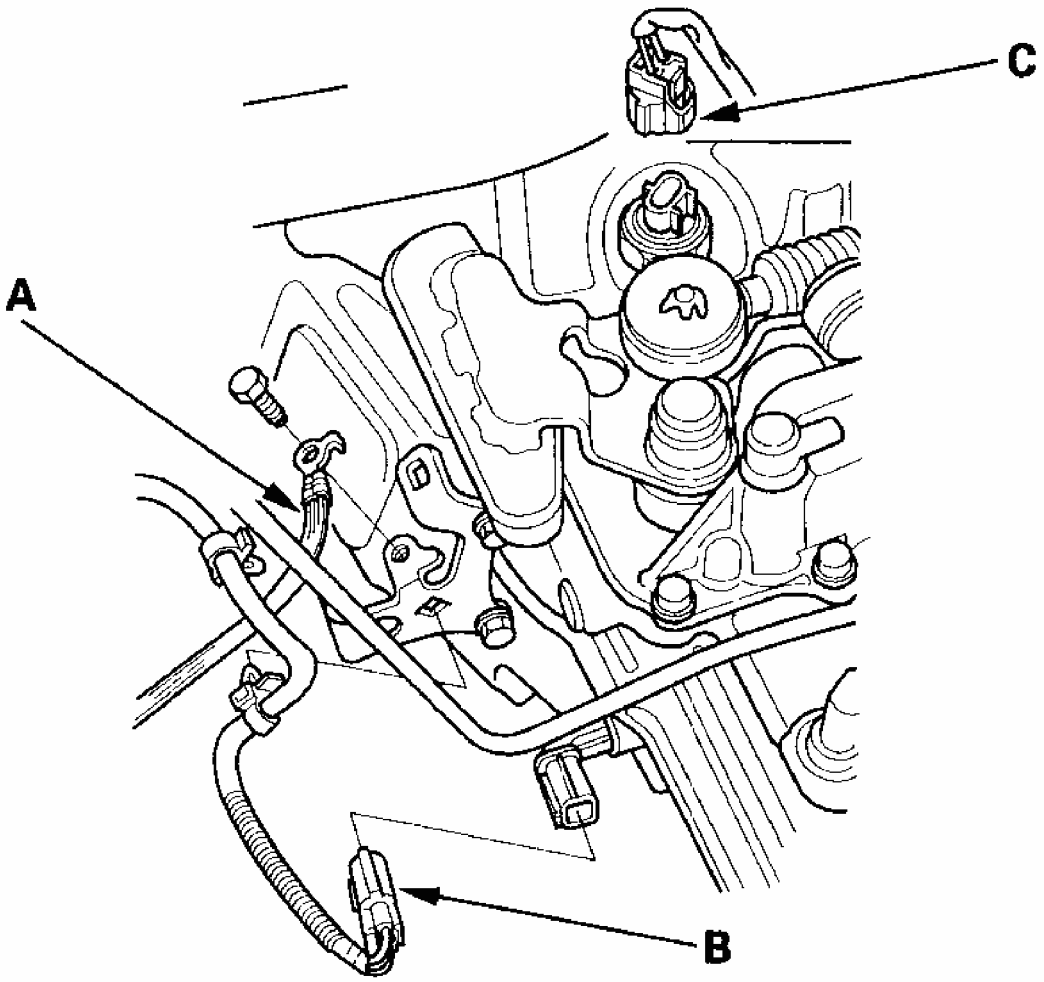

Fig. 7: Removing Ground Cable
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Disconnect the output shaft (countershaft) speed sensor connector (B) and back-up light switch connector (C).
8. Remove the cable bracket (A), then disconnect the cables (B) from the top of the transmission housing. Carefully remove both cables and the bracket together to avoid bending the cables.

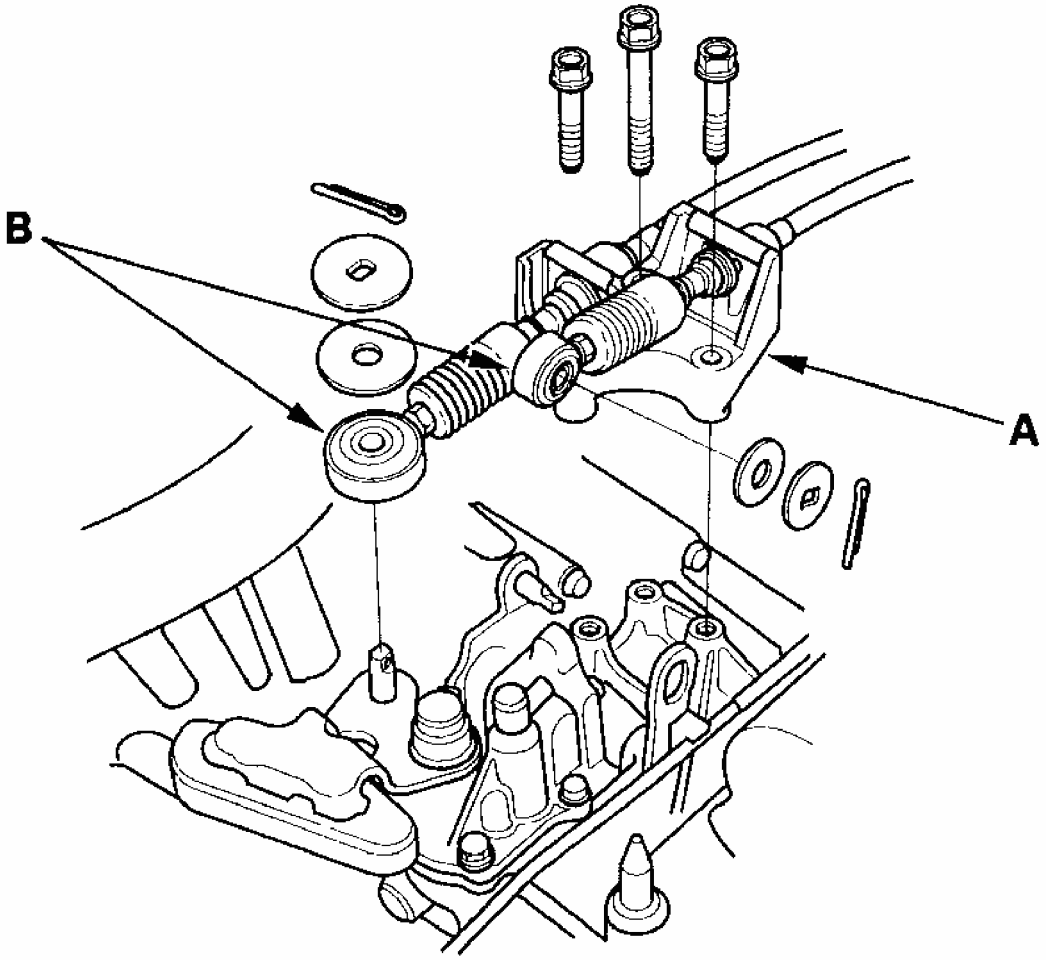

Fig. 8: Removing Battery Cable Brackets
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Carefully remove the slave cylinder (A) without bending the clutch line (B). Do not press the clutch pedal once the slave cylinder has been removed.

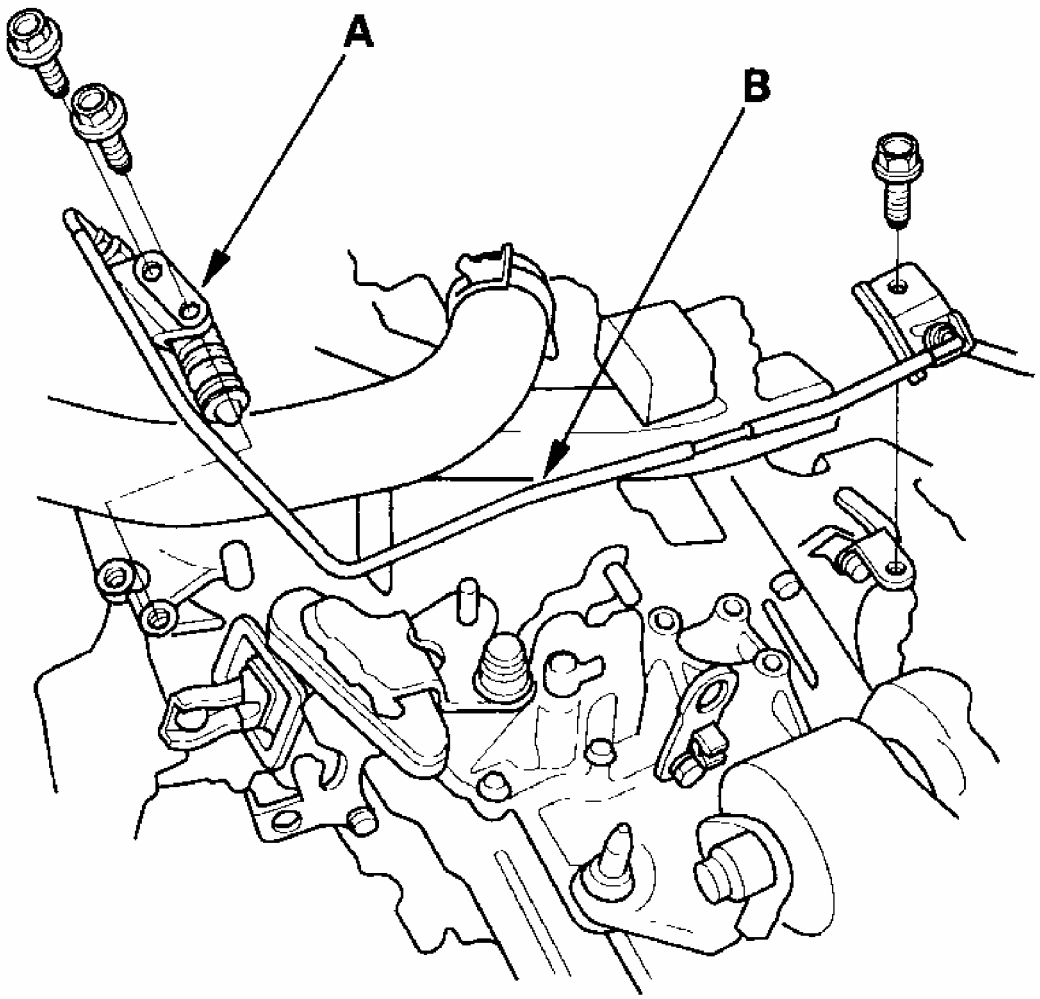

Fig. 9: Removing Slave Cylinder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Remove the two transmission upper mounting bolts (A).

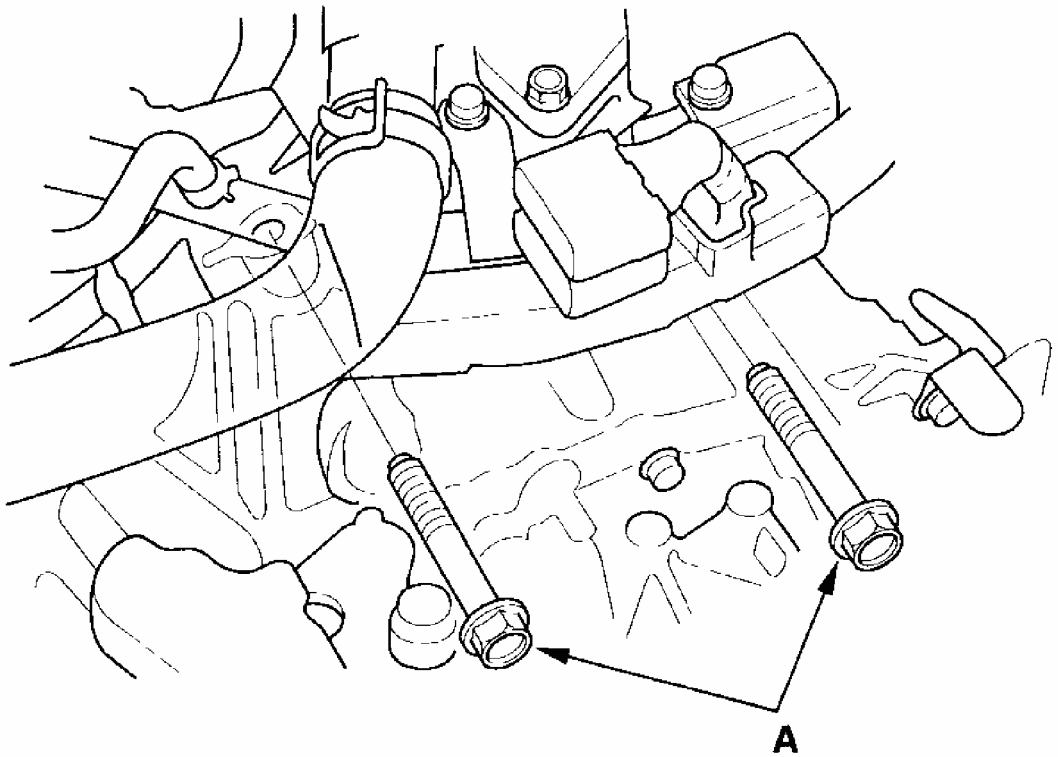

Fig. 10: Removing Transmission Upper Mounting Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Attach the engine hanger/adapter (A) to the threaded holes in the cylinder head.

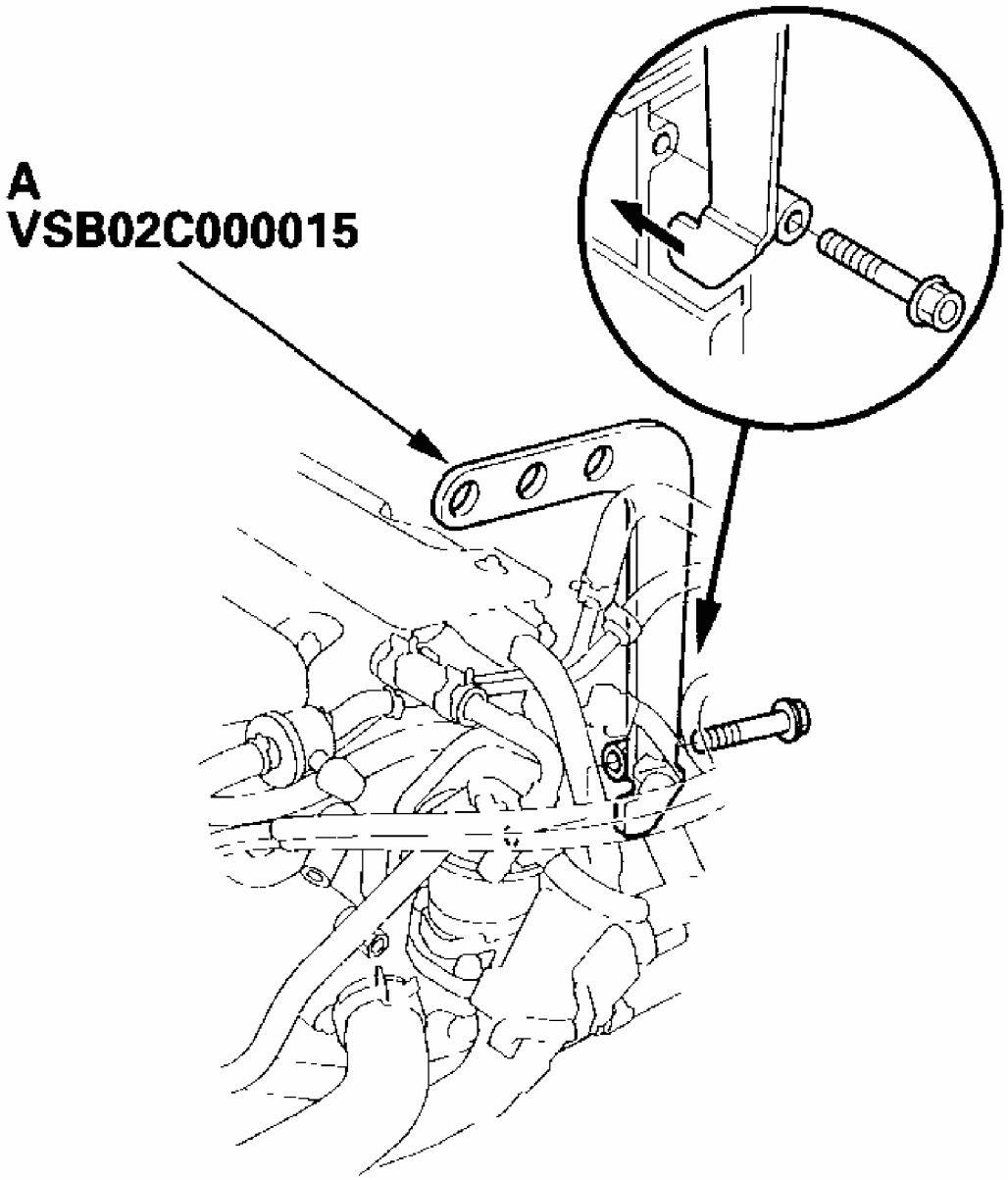

Fig. 11: Attaching Engine Hanger/Adapter To Threaded Holes In Cylinder Head
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Install the engine support hanger (A) to the vehicle, then attach the hook to the engine hanger/adapter (B).

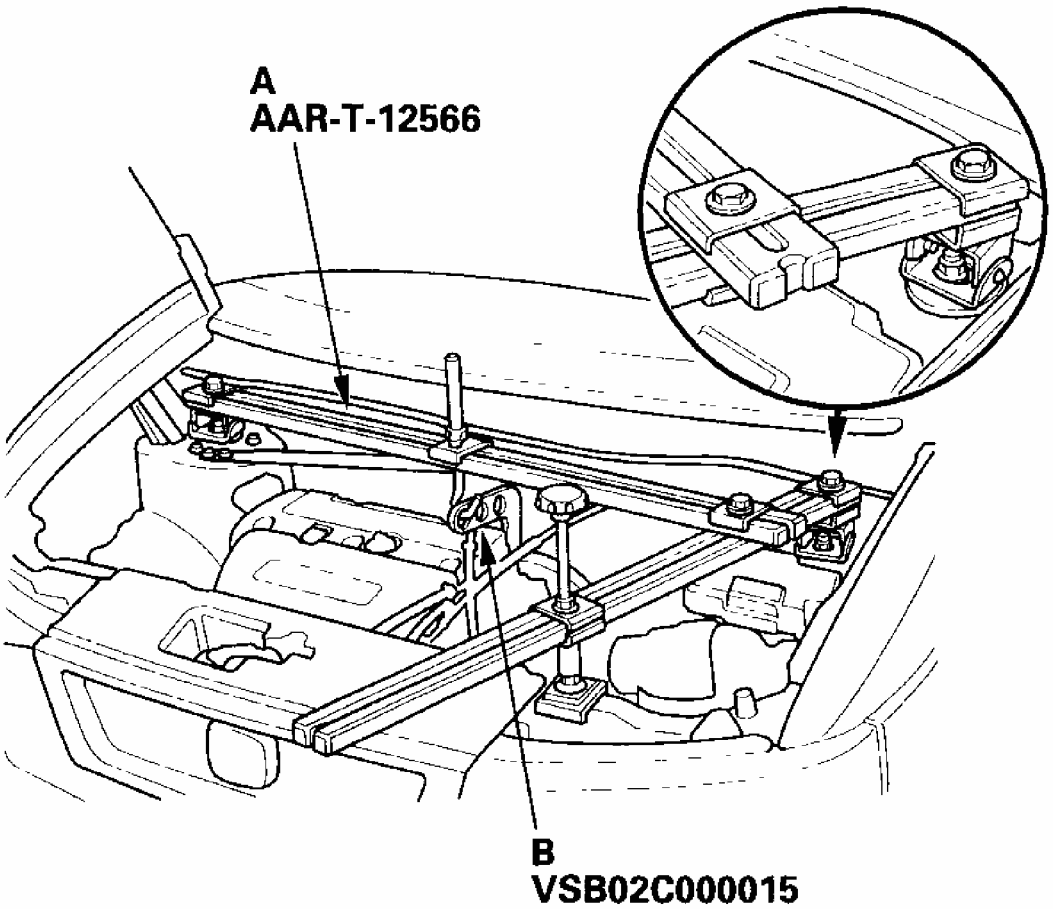

Fig. 12: Installing Engine Support Hanger To Vehicle
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Remove the transmission mount bracket (A) and transmission mounting bolt (B).

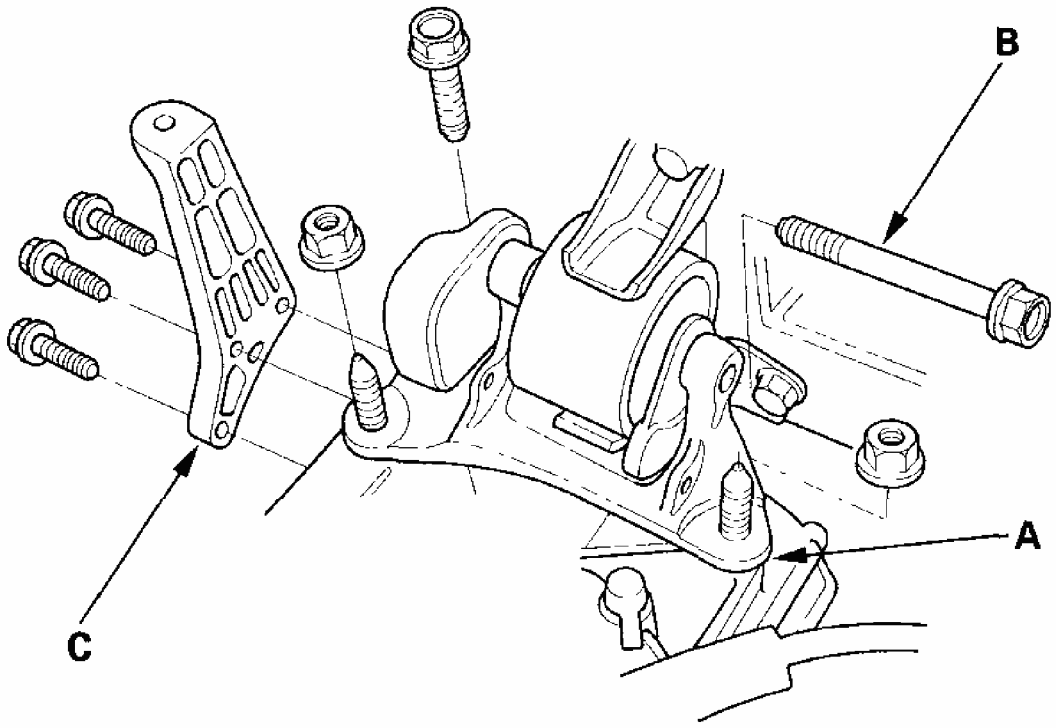

Fig. 13: Removing Transmission Mount Bracket And Transmission Mounting Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove the air cleaner bracket (C).
15. Raise the vehicle, and make sure it is securely supported.
16. Drain the transmission fluid. Install the drain plug with a new washer (see **TRANSMISSION FLUID INSPECTION AND REPLACEMENT**).
17. Remove the splash shield (A).

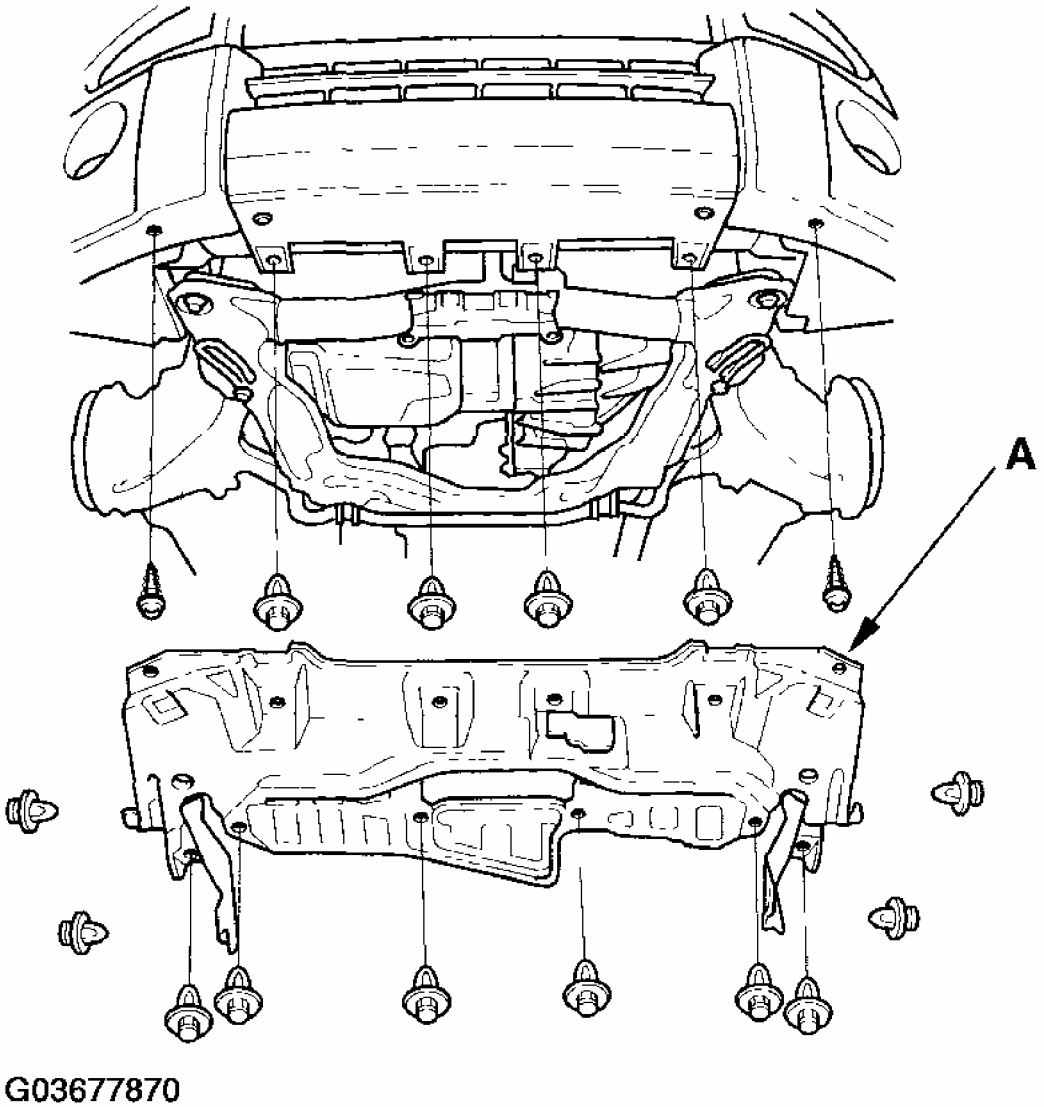

Fig. 14: Removing Splash Shield
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Remove the front driveshafts (see **FRONT DRIVESHAFT REMOVAL**).
19. Remove the intermediate shaft (see **INTERMEDIATE SHAFT REMOVAL**).
20. 4WD model: Remove the propeller shaft (see **PROPELLER SHAFT REMOVAL**).
21. Remove the bolt (A) from the front engine mount bracket (B).

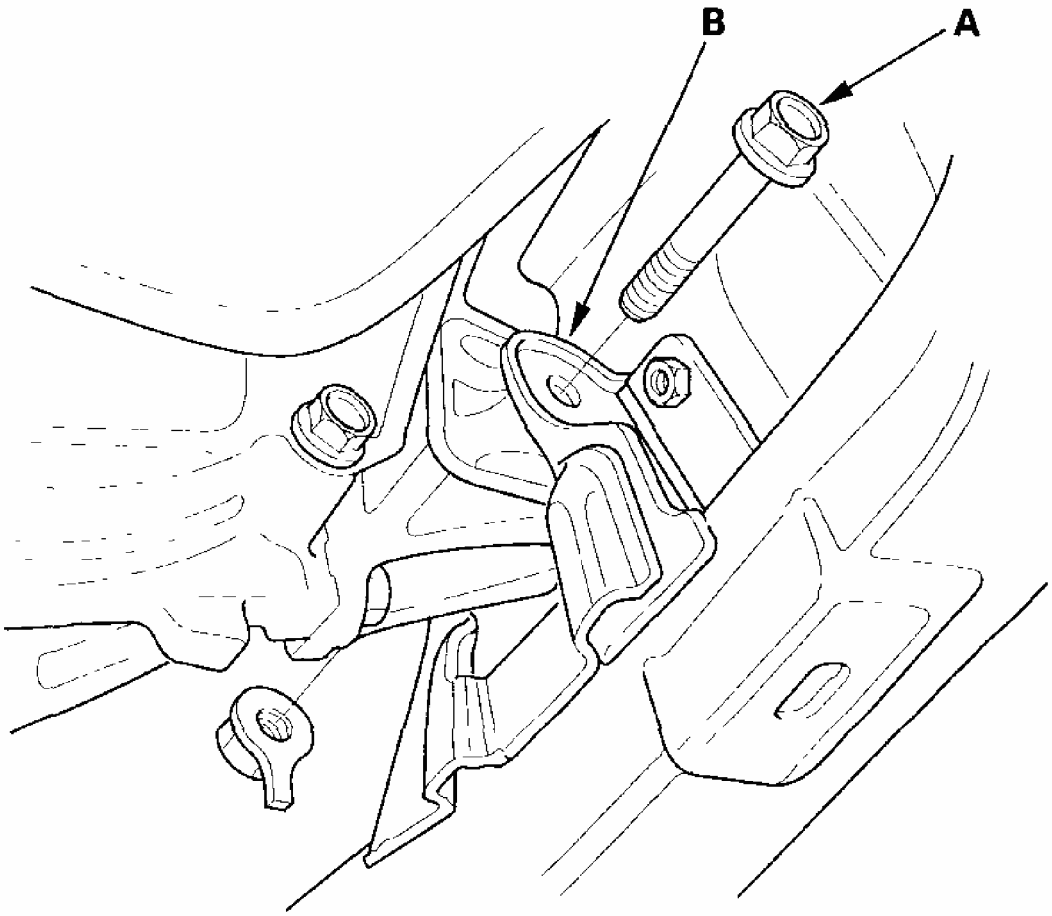

Fig. 15: Removing Bolt Front Engine Mount Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Remove the three bolts securing the transmission rear mount.

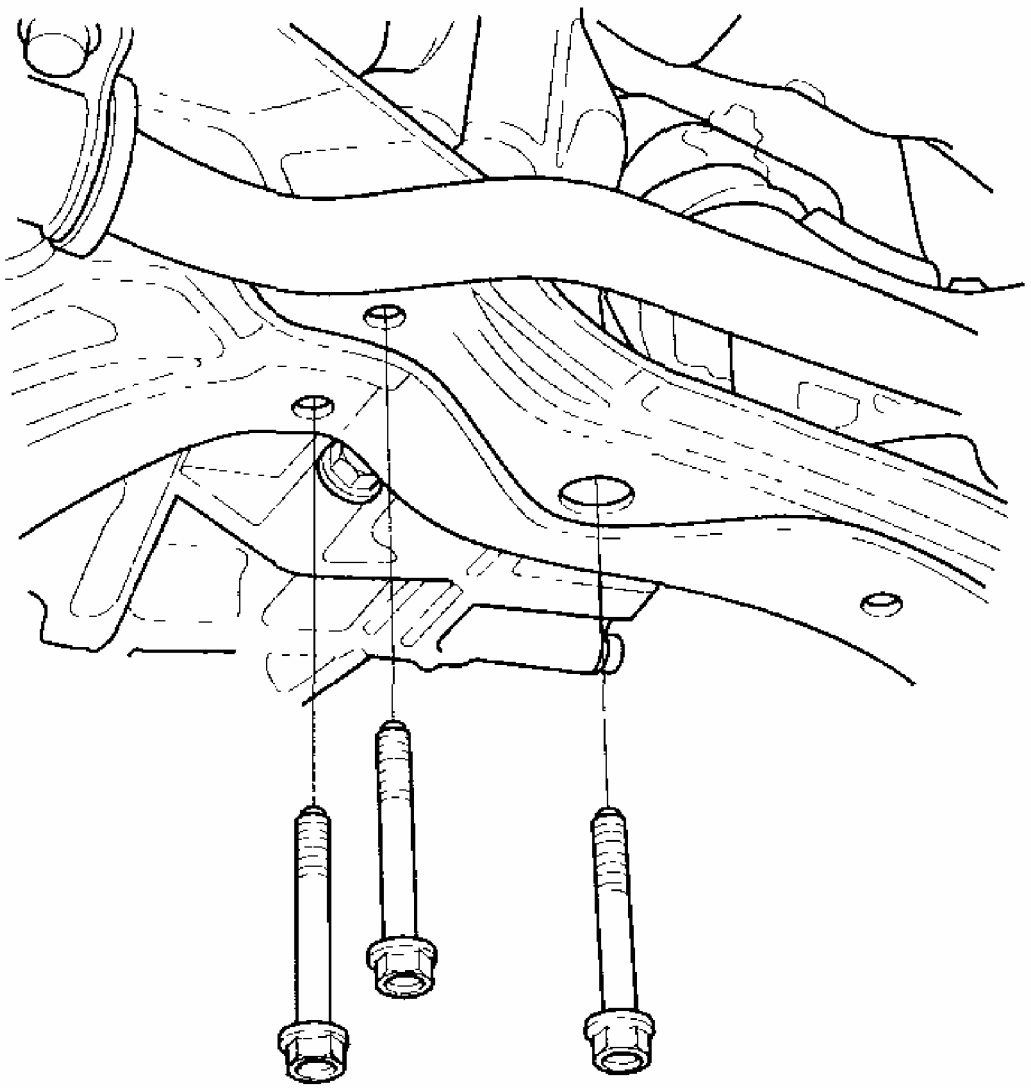

Fig. 16: Removing Transmission Rear Mount Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Support the front subframe (A) with the front subframe adapter (B) and a jack (C).

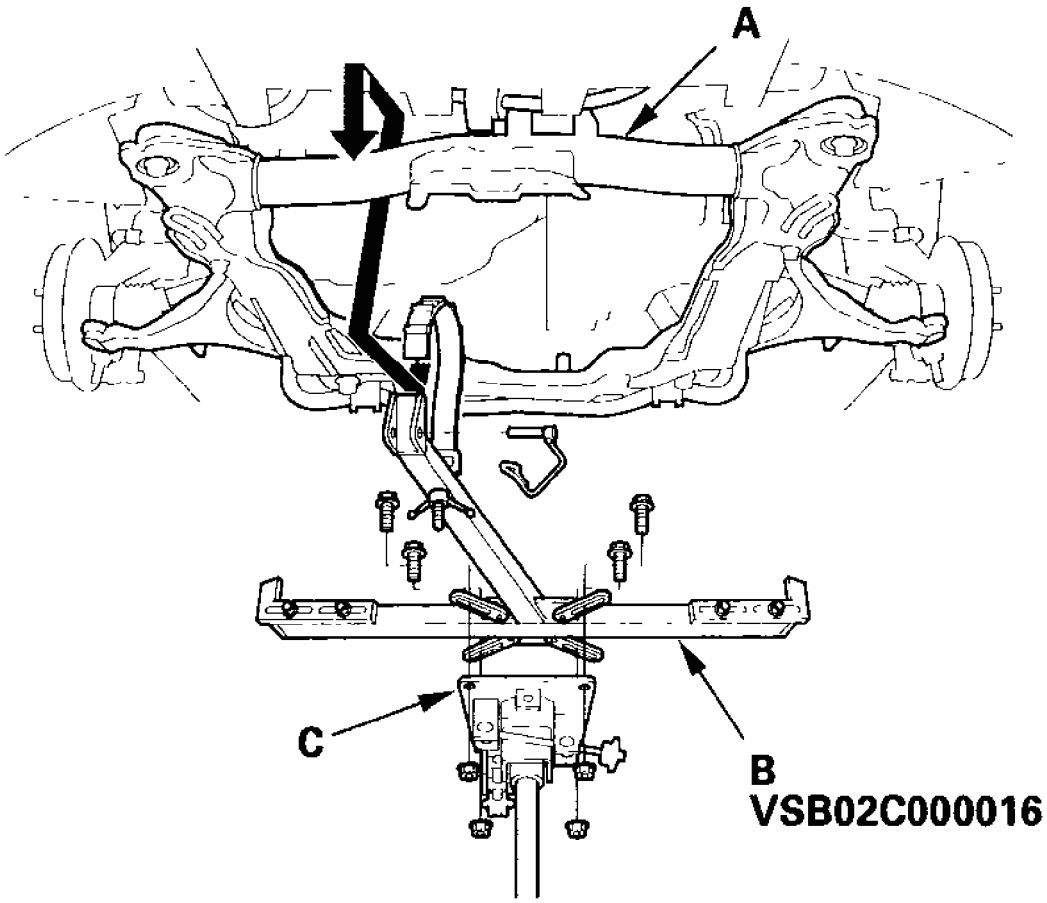

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Fig. 17: Supporting Front Subframe With Front Subframe Adapter And Jack
Courtesy of AMERICAN HONDA MOTOR CO., INC.

24. Make reference marks (A) on the front subframe (B) and mounting bolts (C), then remove the front subframe.

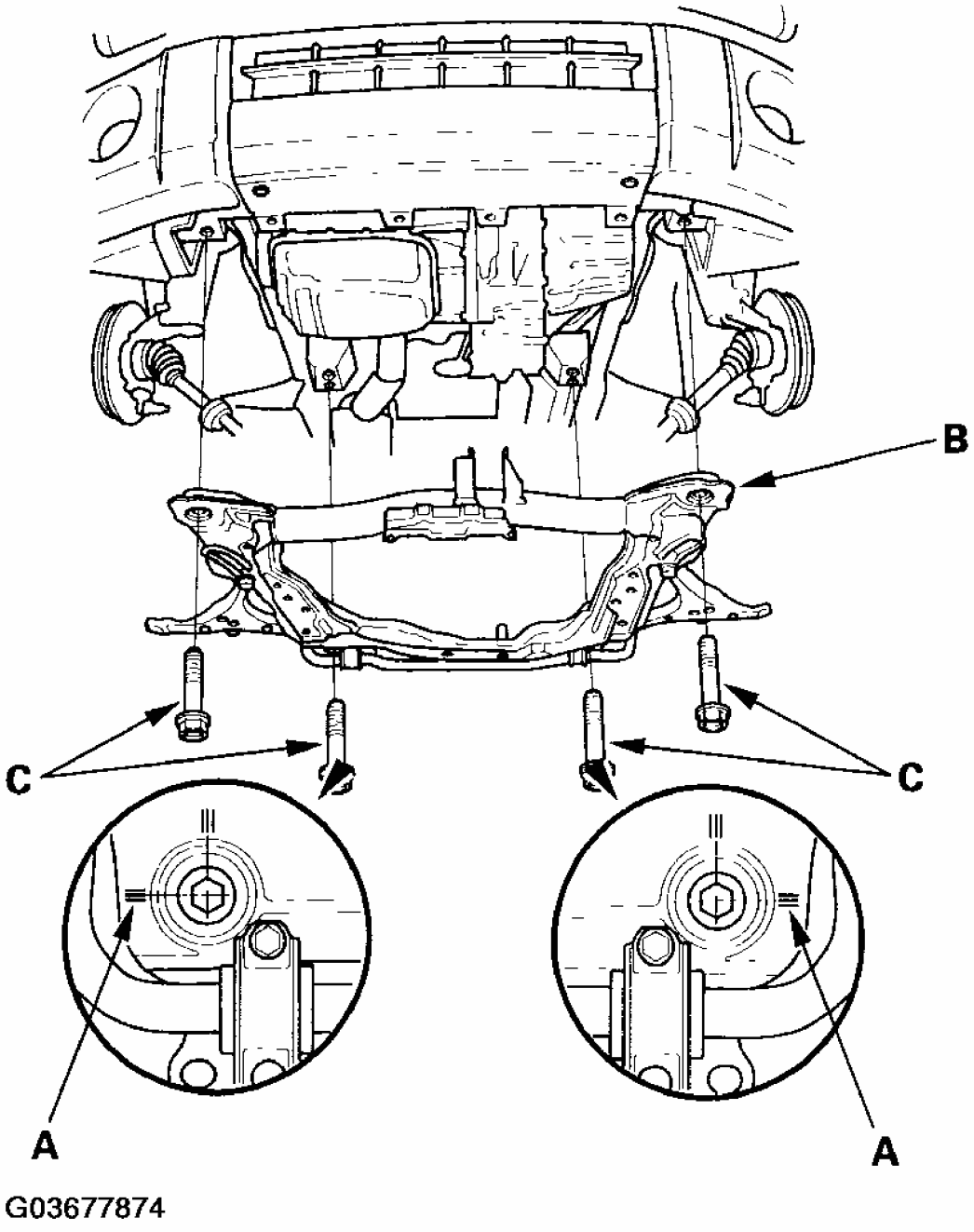


Fig. 18: Removing Front Subframe
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Remove the clutch cover (A).

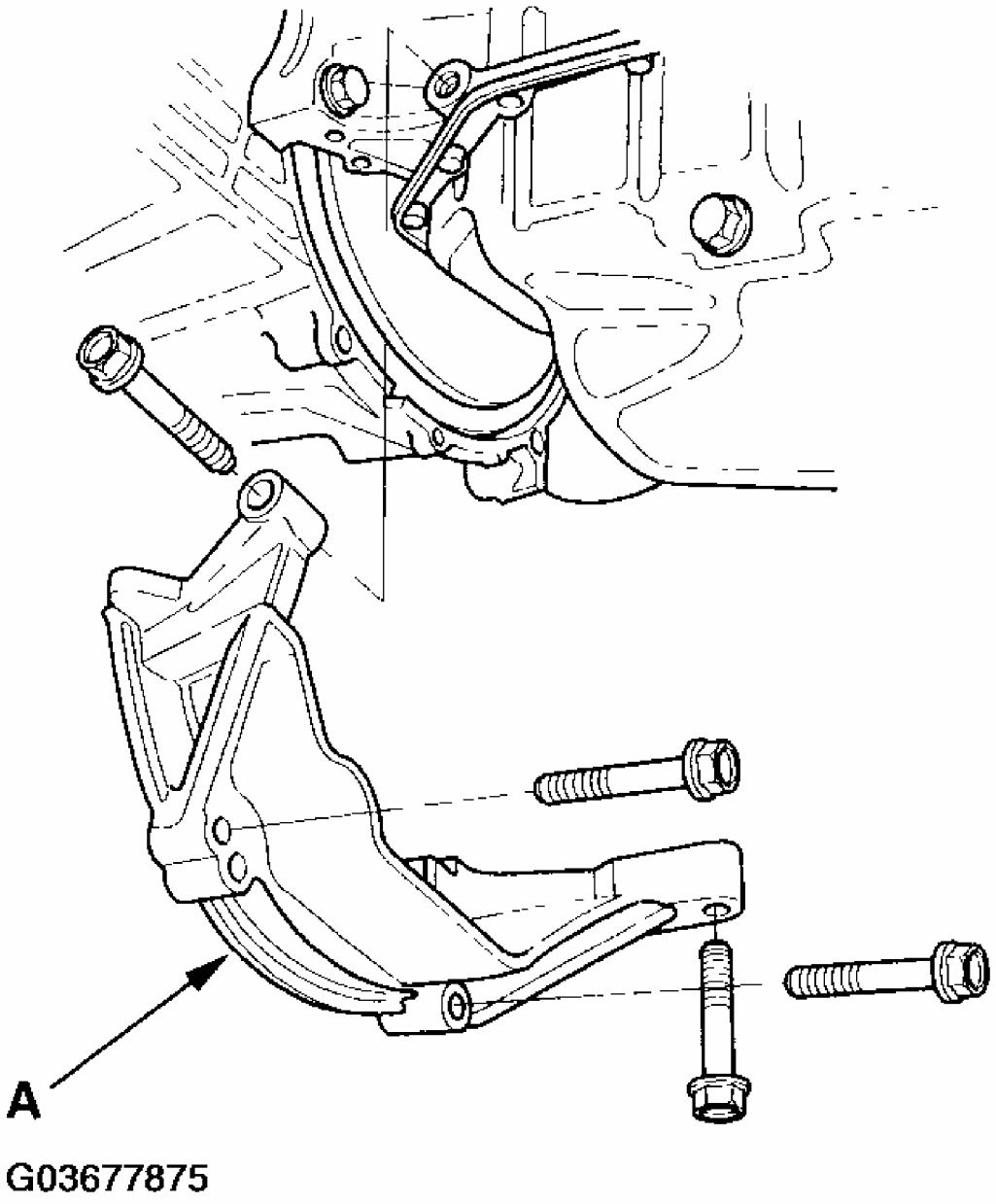


Fig. 19: Removing Clutch Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

26. Remove the front engine mount (A).

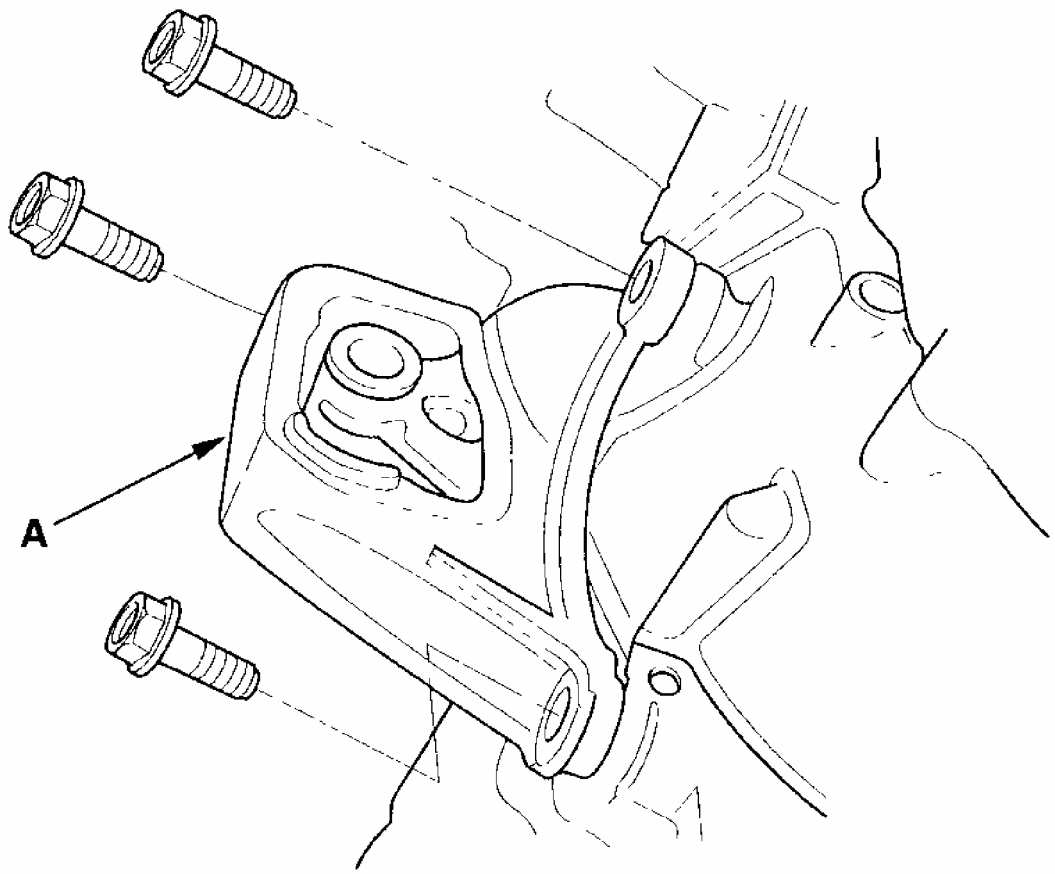


Fig. 20: Removing Front Engine Mount
Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. Place the transmission jack (A) under the transmission (B), and remove the four transmission lower mounting bolts (C).

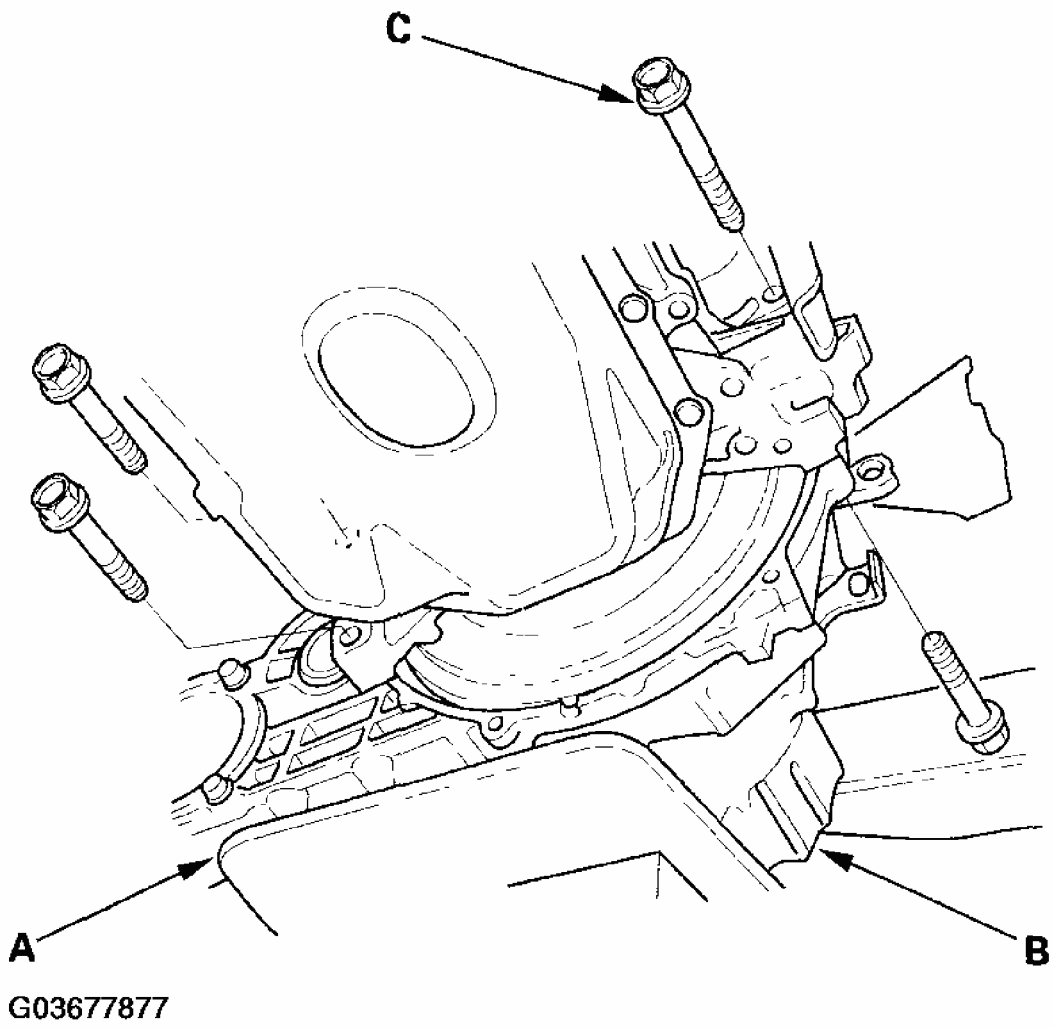


Fig. 21: Removing Transmission Lower Mounting Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

28. Pull the transmission away from the engine until the transmission mainshaft clears the clutch pressure plate, then lower the transmission on the transmission jack.
29. Remove the transmission rear mount (A) and the transmission rear mount bracket (B).

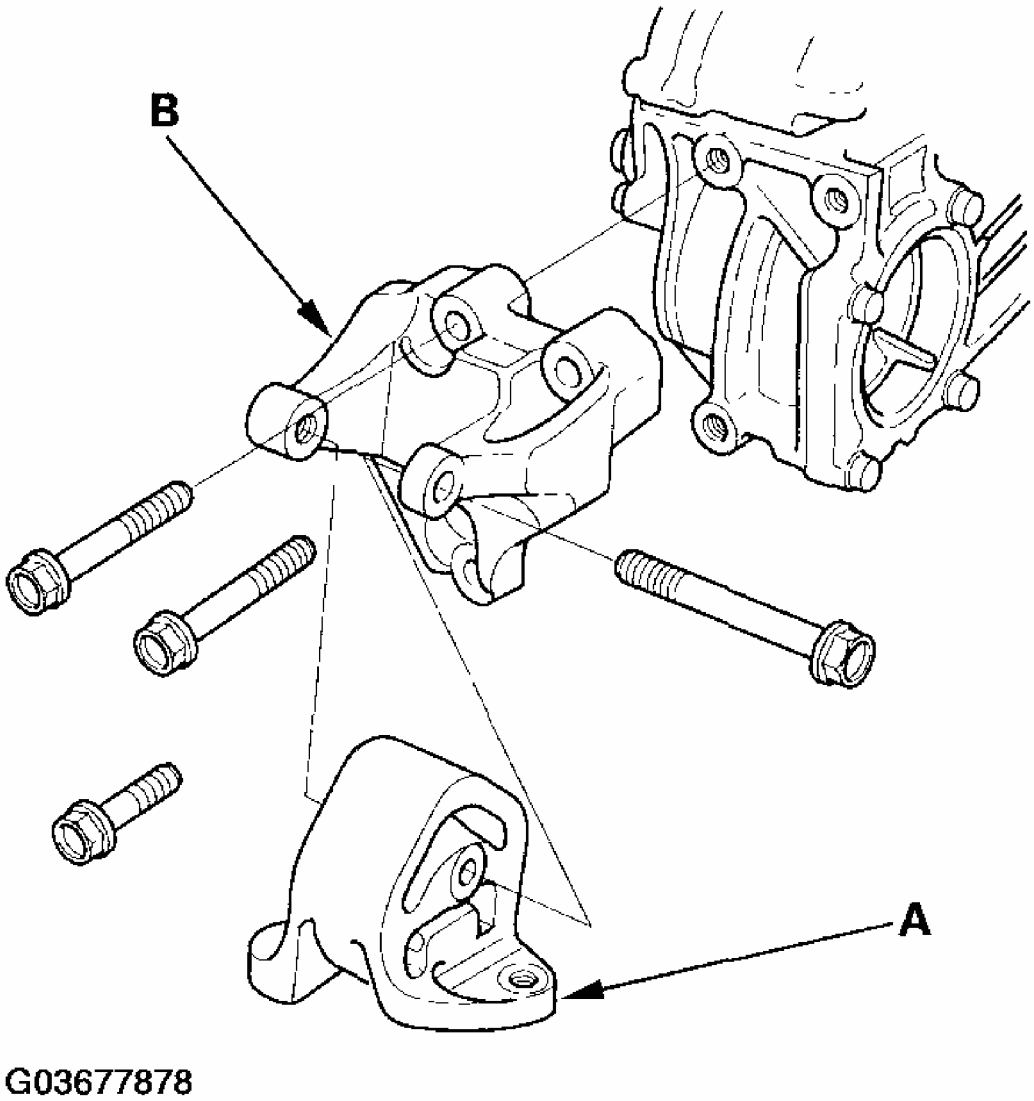


Fig. 22: Removing Transmission Rear Mount And Transmission Rear Mount Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

30. Remove the release fork boot (A) from the clutch housing (B).

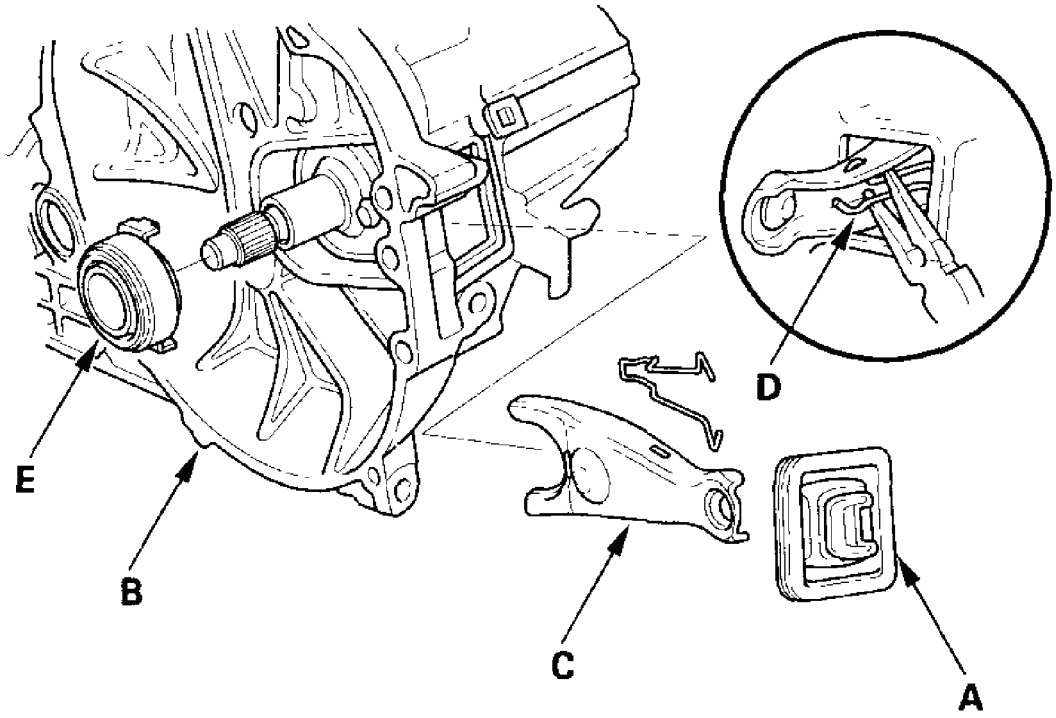


Fig. 23: Removing The Release Fork Boot From Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

31. Remove the release fork (C) from the clutch housing by squeezing the release fork set spring (D) with pliers. Remove the release bearing (E).

TRANSMISSION INSTALLATION

Special Tools Required

- Engine hanger/adapter VSB02C000015 *
- Engine support hanger, A & Reds AAR-T-12566 *
- Front subframe adapter VSB02C000016 *

* Available through the Honda Tool and Equipment Program 1-888-424-6857.

1. Make sure the two dowel pins are installed in the clutch housing.
2. Apply super high temp urea grease (P/N 08798-9002) to the release fork (A) and the release bearing (B). Install the release fork, the release bearing, and the boot (C).

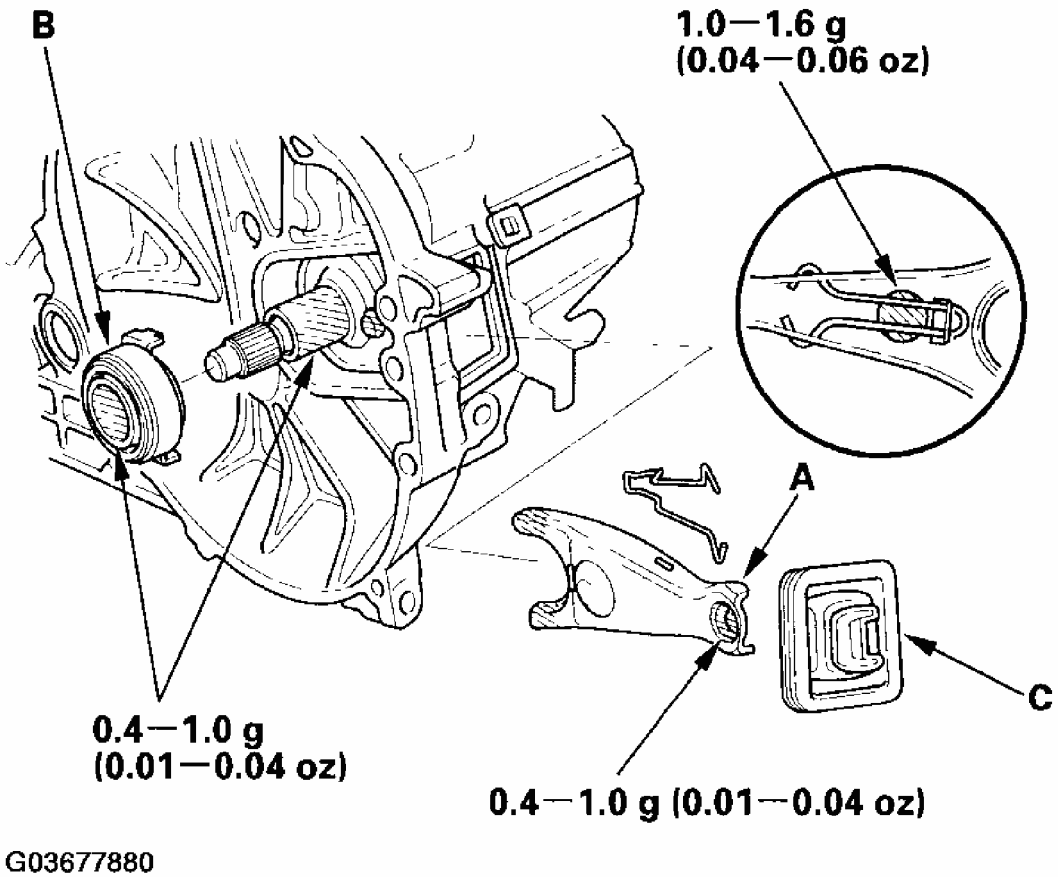


Fig. 24: Applying Grease To Release Fork And Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the transmission rear mount bracket (A) and the transmission rear mount (B).

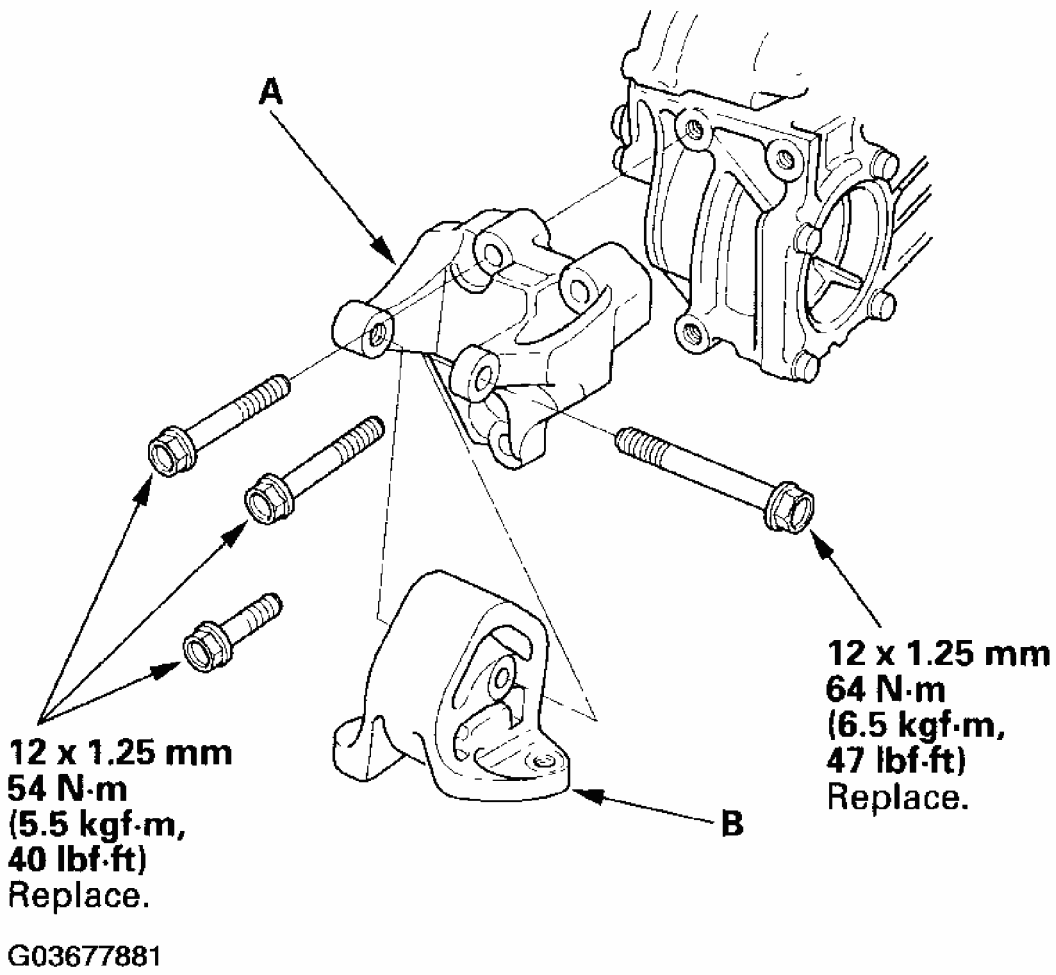


Fig. 25: Installing Transmission Rear Mount Bracket And Transmission Rear Mount With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Place the transmission on the transmission jack, and raise it to the engine level.
5. Install the four transmission lower mounting bolts.

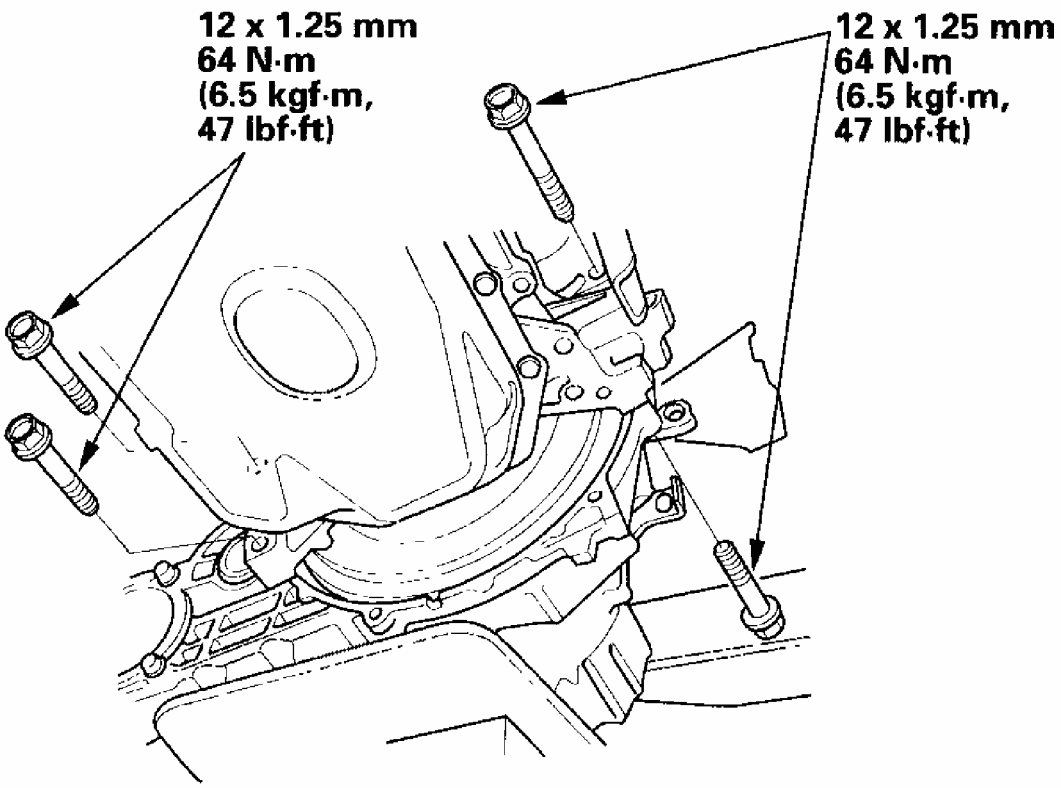


Fig. 26: Installing Transmission Lower Mounting Bolts And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the front engine mount (A).

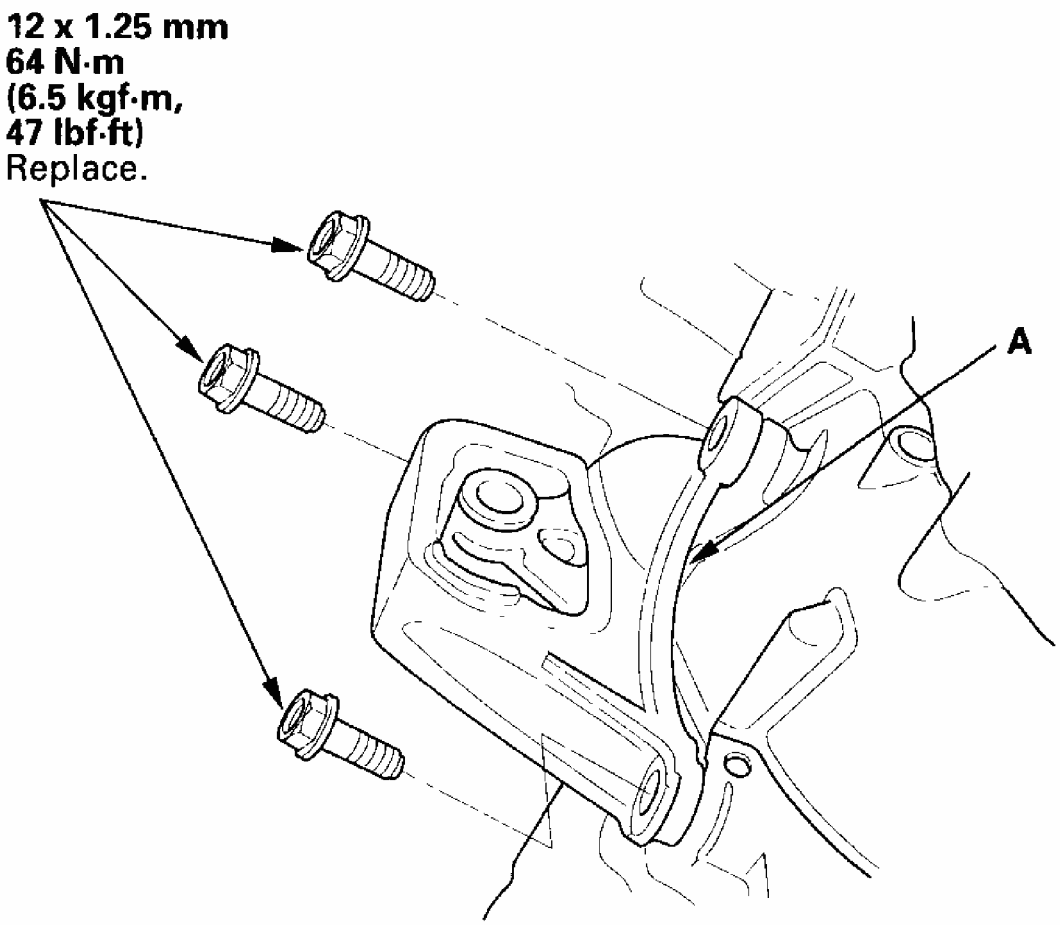


Fig. 27: Installing Front Engine Mount And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the clutch cover (A).

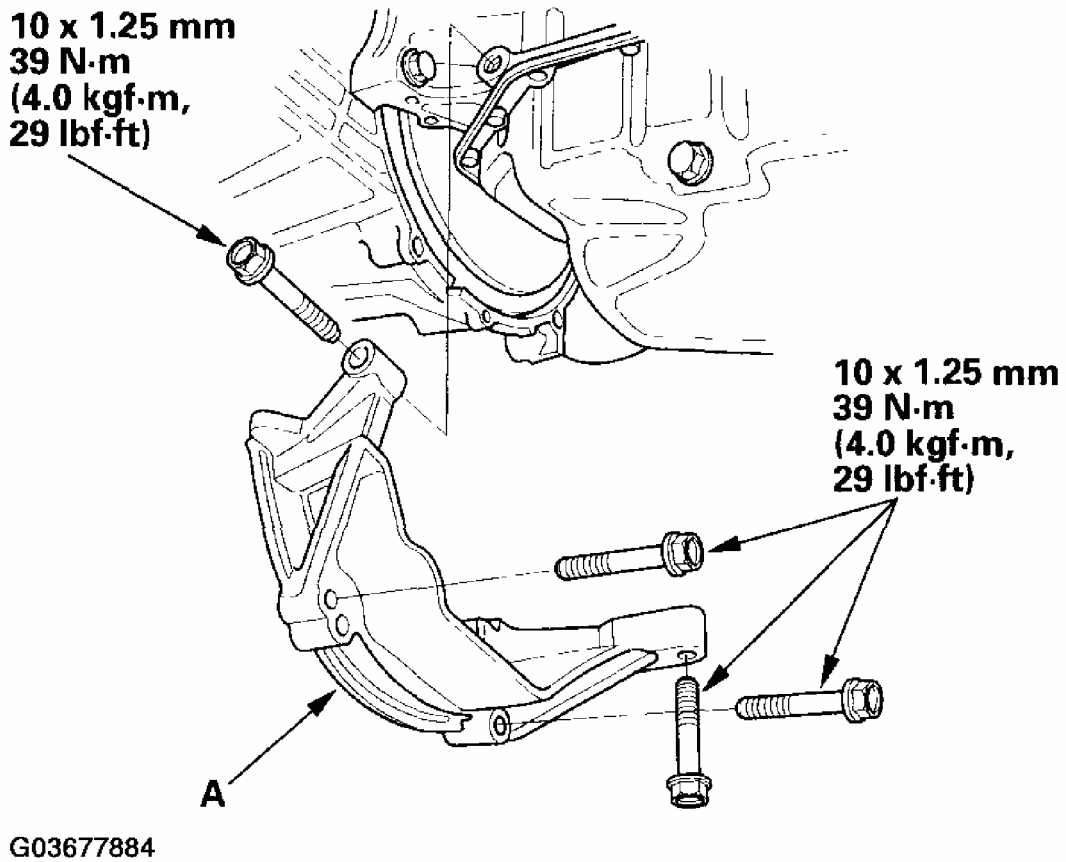


Fig. 28: Identifying Tightening Torque Of Clutch Cover Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Support the front subframe (A) with the front subframe adapter (B) and a jack (C).

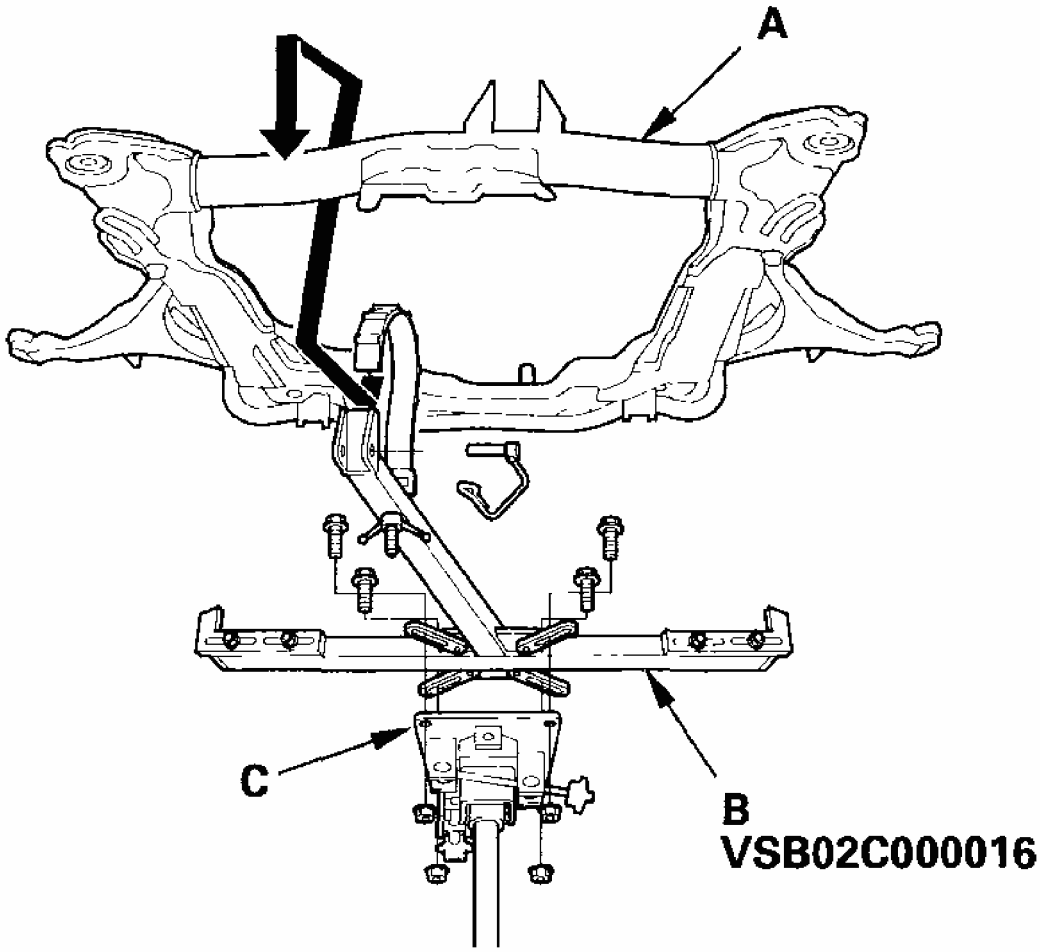


Fig. 29: Supporting Front Subframe With Front Subframe Adapter And Jack
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Install the front subframe (A) in its original position by aligning it with the marks (B) you made in the removal procedure.

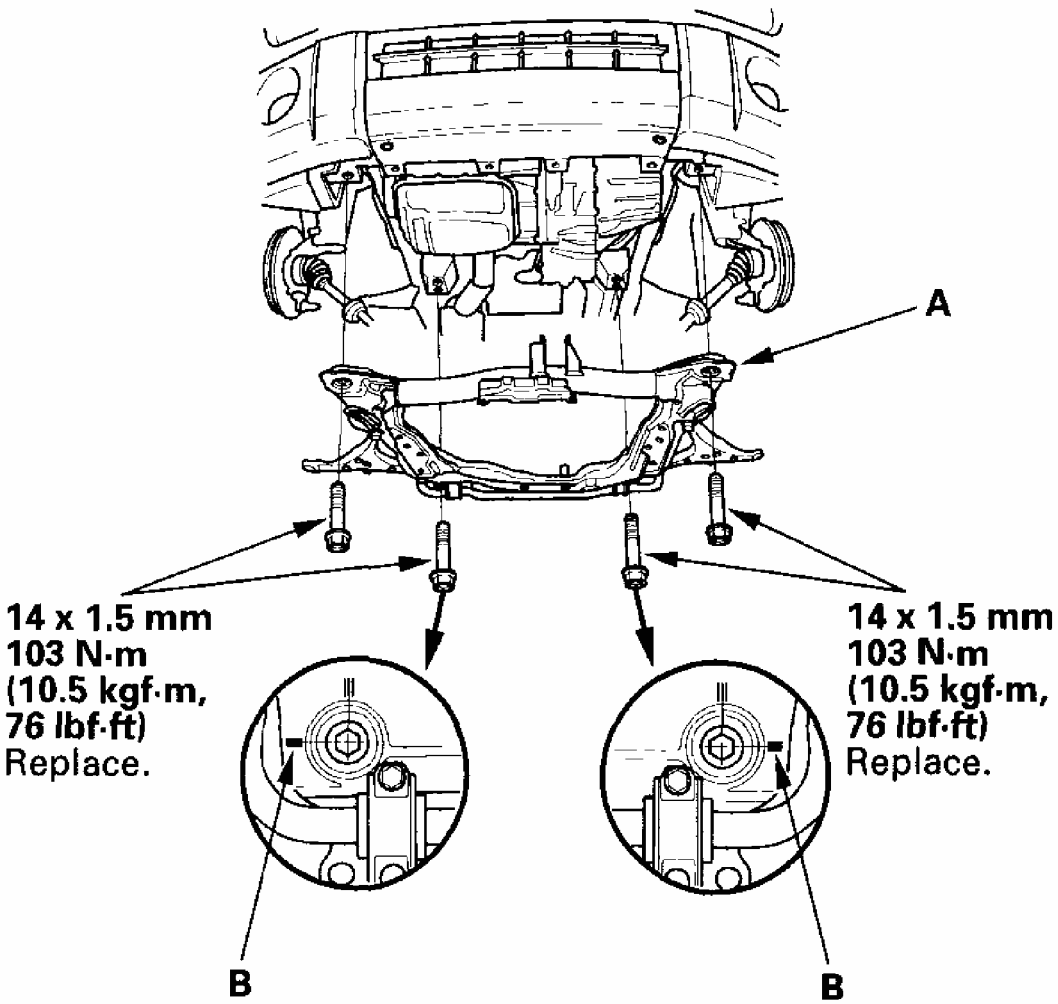


Fig. 30: Installing Front Subframe And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the three bolts for the transmission rear mount.

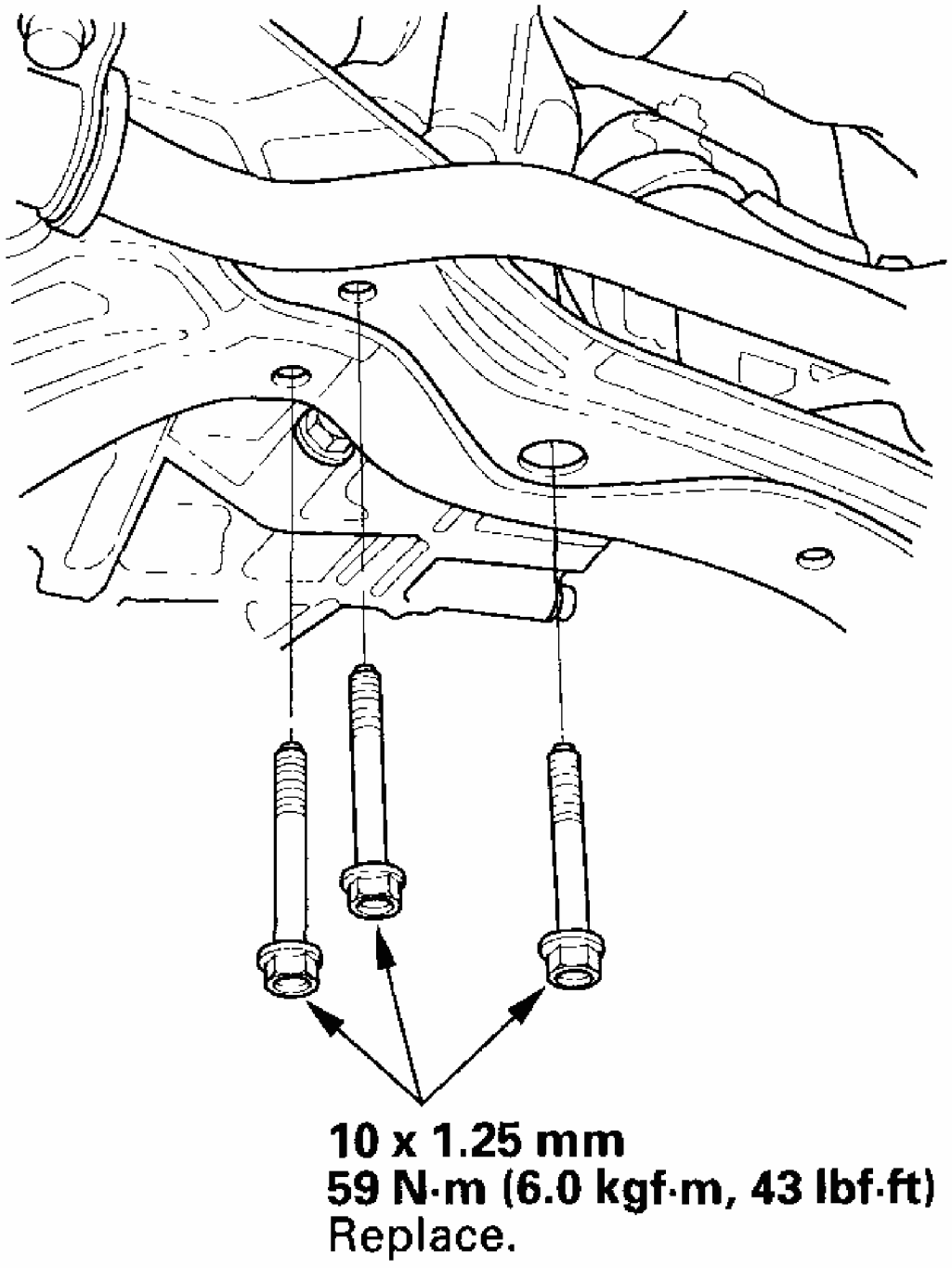


Fig. 31: Identifying Tightening Torque Of Transmission Rear Mount Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Loosely install the front engine mount bracket bolt (A).

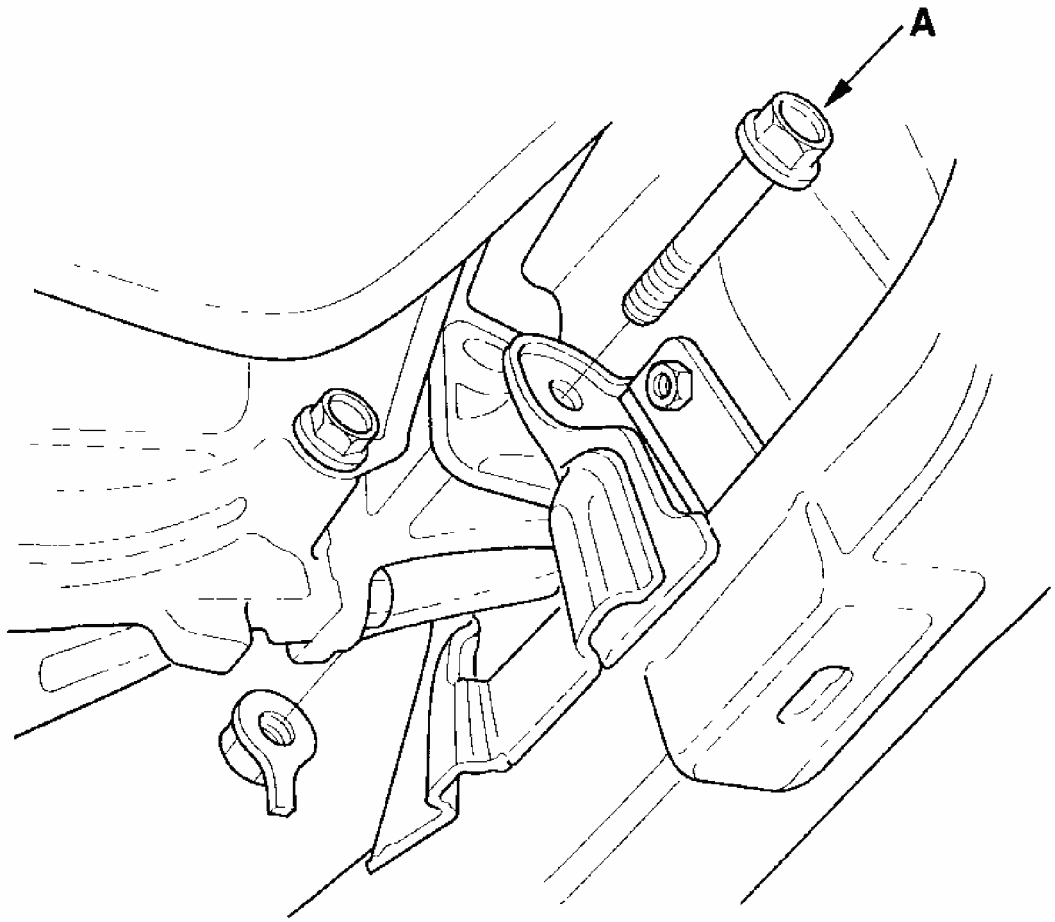


Fig. 32: Installing Front Engine Mount Bracket Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. 4WD model: Install the propeller shaft (see **PROPELLER SHAFT INSTALLATION**).
13. Install the intermediate shaft (see **INTERMEDIATE SHAFT INSTALLATION**).
14. Install the front driveshafts (see **FRONT DRIVESHAFT INSTALLATION**).
15. Install the transmission mount bracket (A) and the transmission mounting bolt (B).

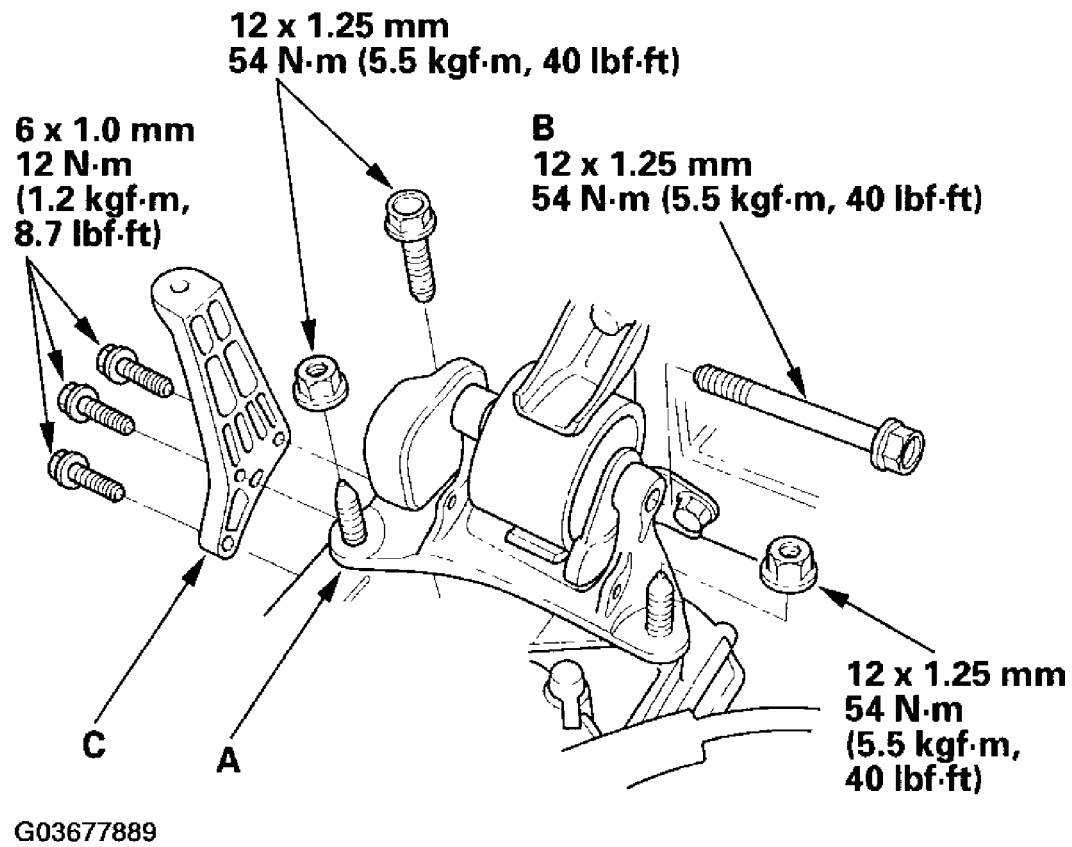


Fig. 33: Identifying Tightening Torque Of Transmission Mount Bracket And Transmission Mounting Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Install the air cleaner bracket (C).
17. Loosen the front engine mount bracket mounting bolt (A), then tighten the front engine mount bracket mounting bolt.

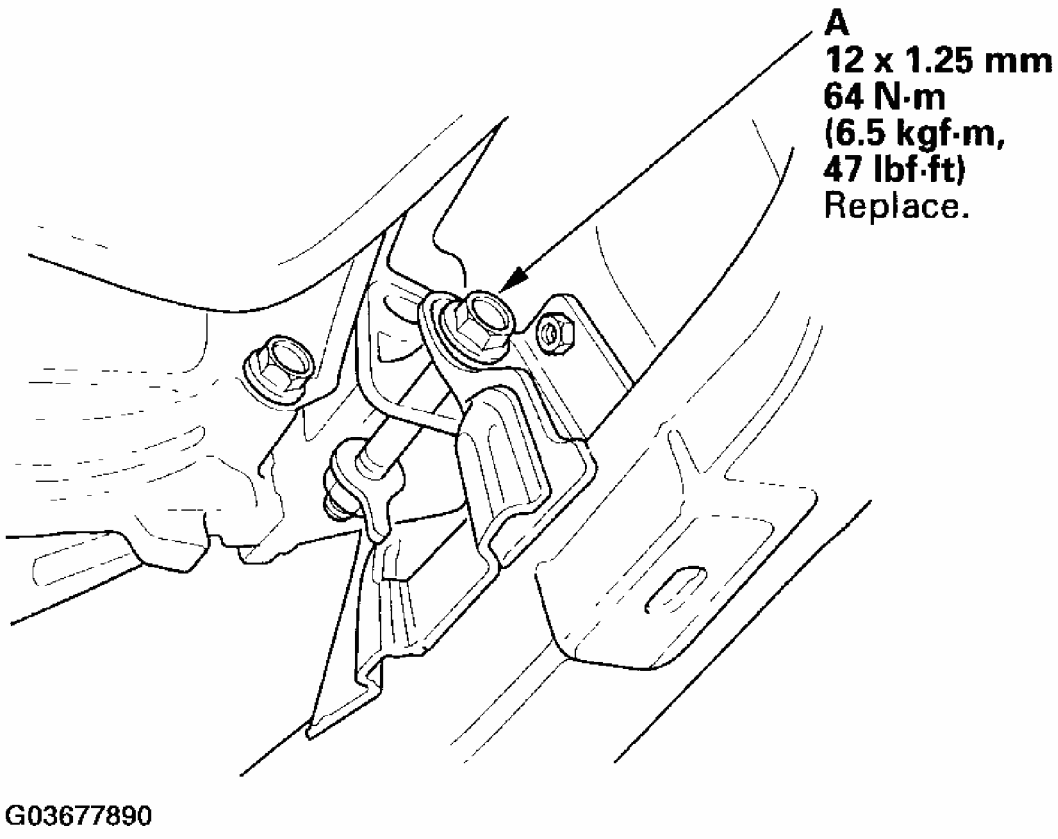


Fig. 34: Identifying Tightening Torque Of Front Engine Mount Bracket Mounting Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Install the splash shield (A).

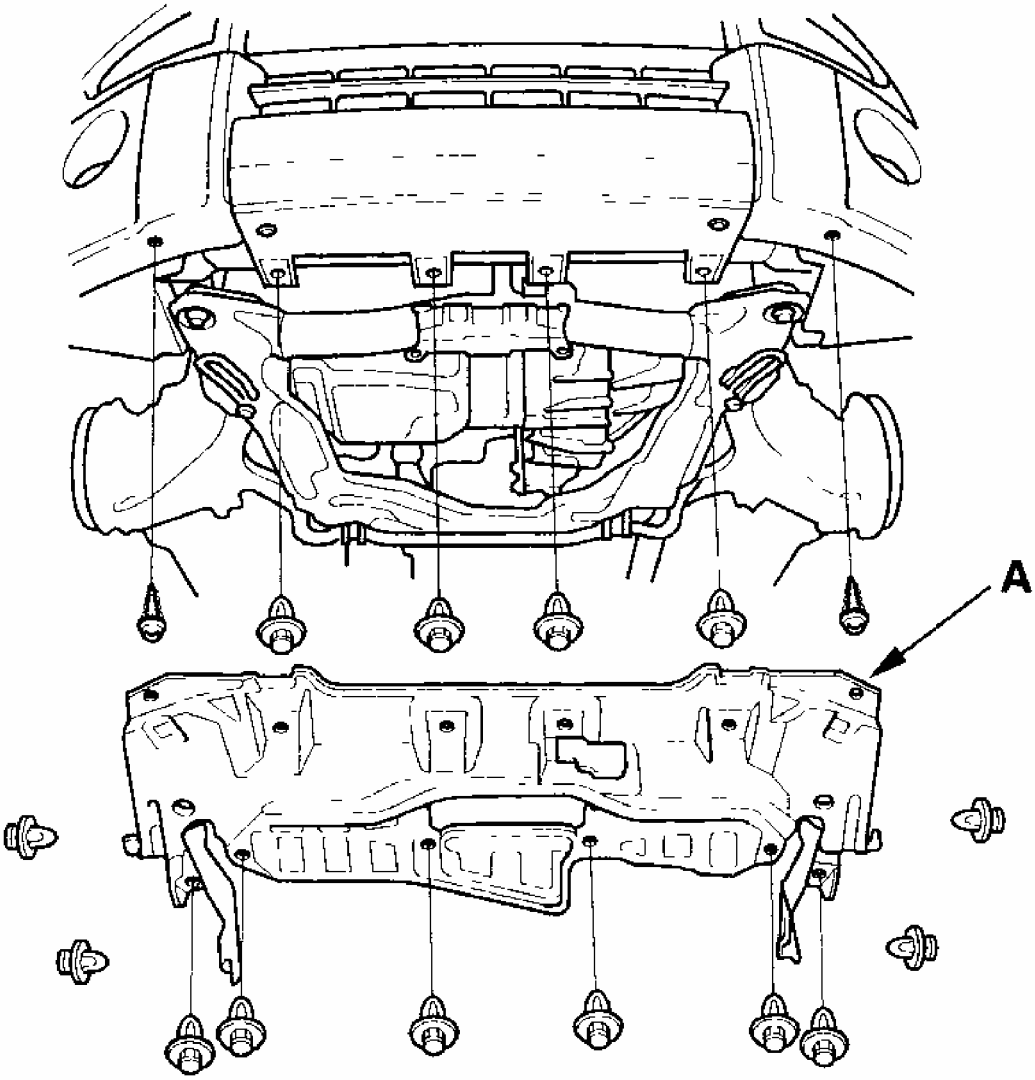


Fig. 35: Installing Splash Shield
Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Install the two transmission upper mounting bolts.

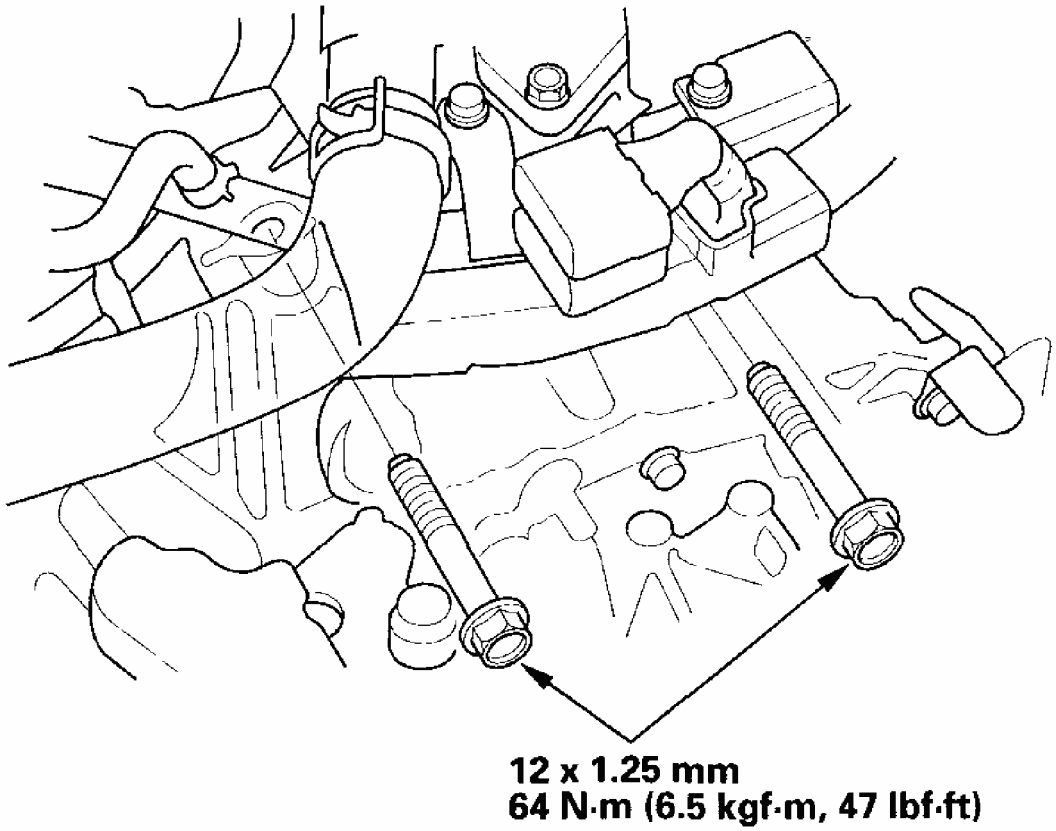


Fig. 36: Identifying Tightening Torque Of Transmission Upper Mounting Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Remove the engine support hanger and the engine hanger/adapter from the engine.
21. Apply super high temp urea grease (P/N 08798-9002) to the end of the cylinder rod. Install the slave cylinder (A). Be careful not to bend the clutch line (B).

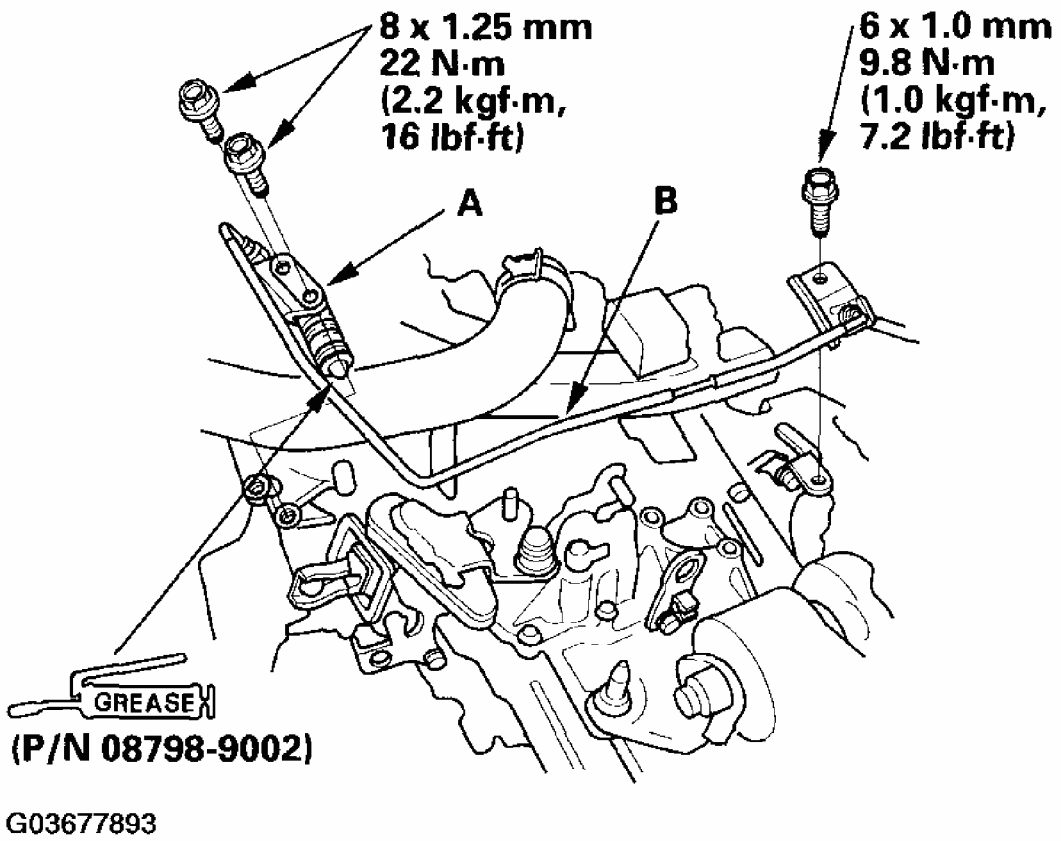


Fig. 37: Identifying Tightening Torque Of Slave Cylinder And Clutch Line Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Install the cable bracket (A) and cables (B).

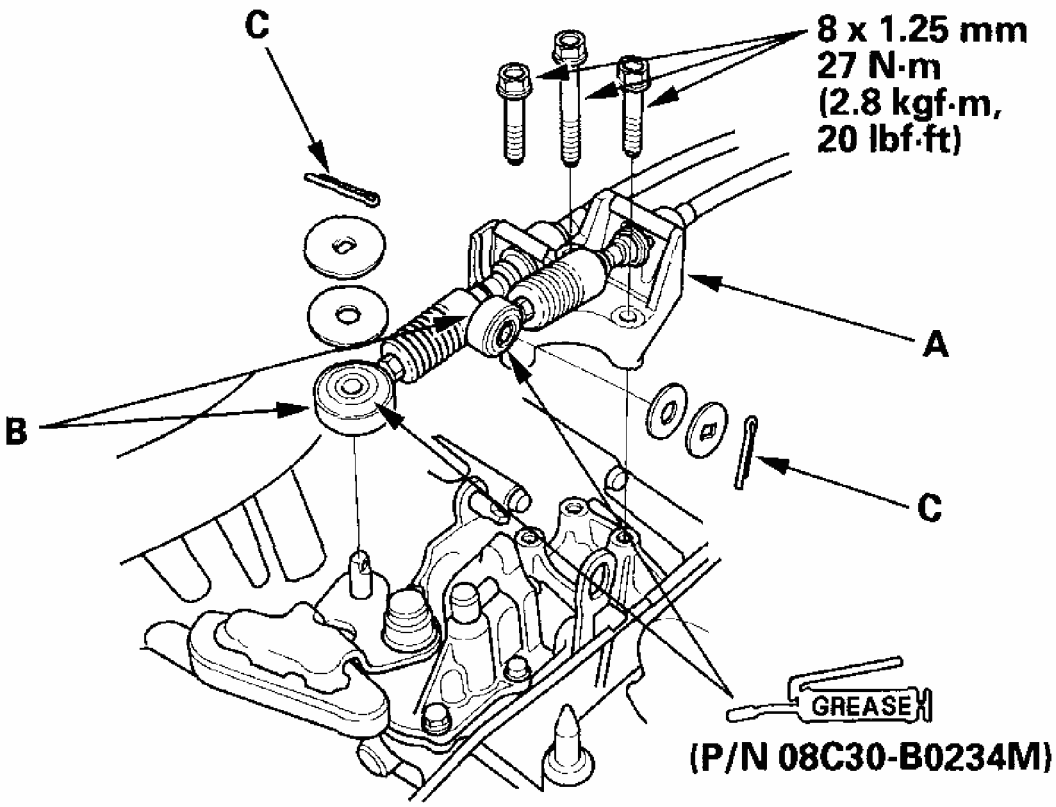


Fig. 38: Identifying Tightening Torque Of Cable Bracket And Cables
Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Apply a light coat of Honda silicone grease (P/N 08C30-B0234M) to the cable ends, and install new cotter pins (C).
24. Connect the output shaft (countershaft) speed sensor connector (A) and back-up light switch connector (B).

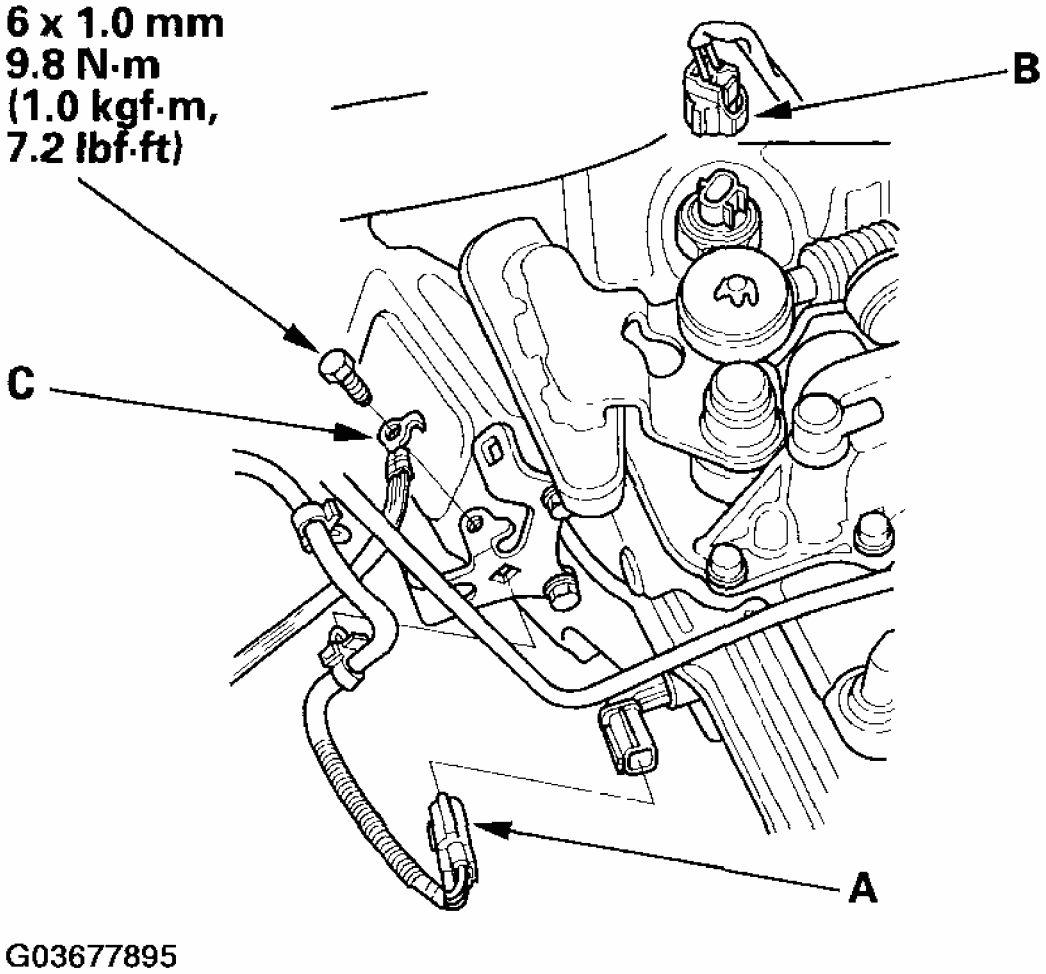


Fig. 39: Connecting Output Shaft (Countershaft) Speed Sensor Connector And Back-Up Light Switch Connector
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Install the ground cable (C).
26. Install the battery base (A).

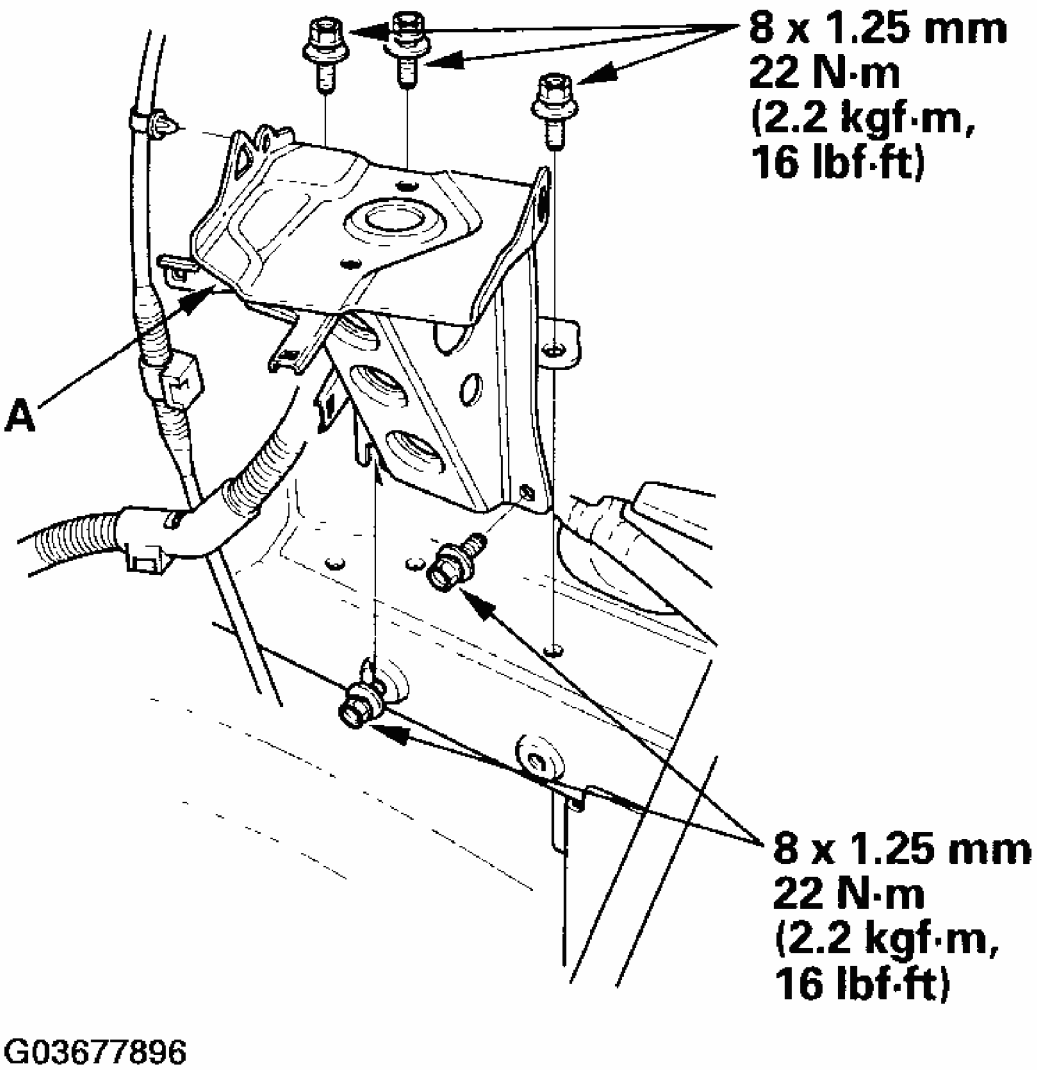


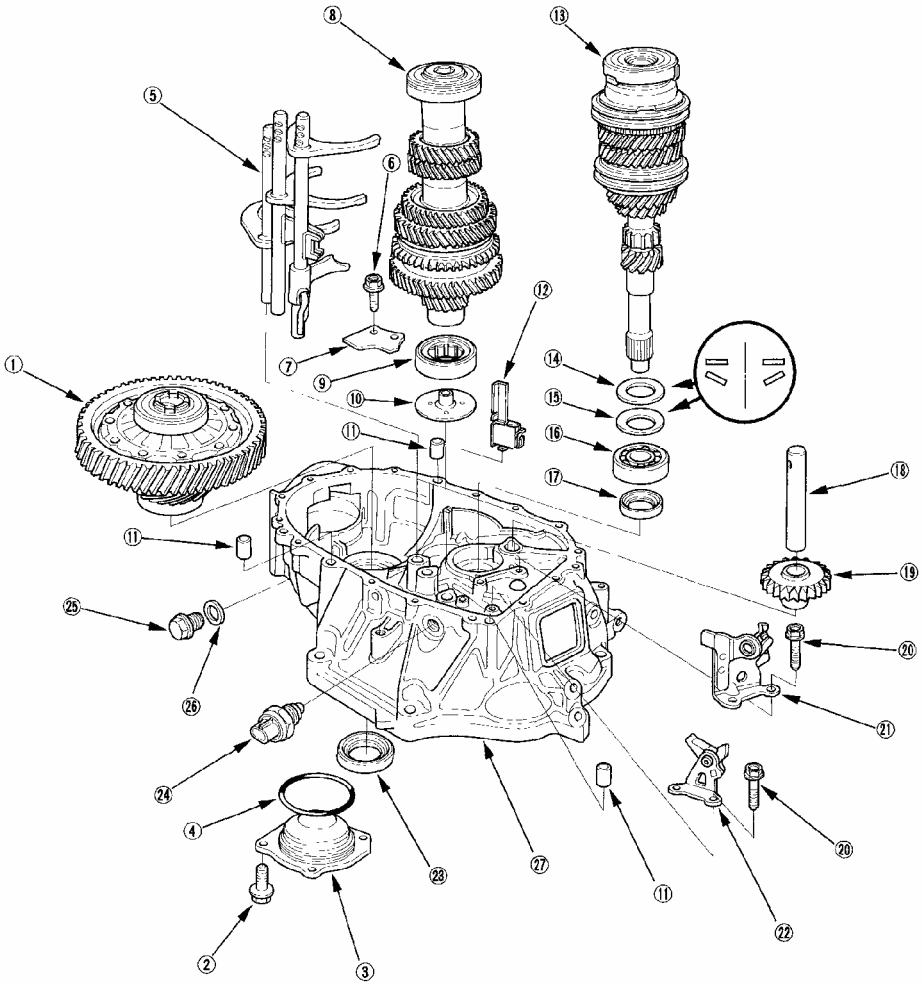
Fig. 40: Identifying Tightening Torque Of Battery Base Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. Install the air intake duct (see step 53 on **ENGINE INSTALLATION**).
28. Install the air cleaner housing (see **AIR CLEANER REMOVAL/INSTALLATION**).
29. Install the battery. Clean the battery posts and cable terminals with sandpaper. Connect the positive cable to the battery first, then connect the negative cable, and apply grease to prevent corrosion.
30. Refill the transmission fluid (see **TRANSMISSION FLUID INSPECTION AND REPLACEMENT**).
31. Check the shift lever and clutch operation.
32. Check the front wheel alignment (see **WHEEL ALIGNMENT**).

33. Enter the anti-theft code for the radio, then enter the audio presets. Set the clock.
34. Do the power window control unit reset procedure (see **RESETTING THE POWER WINDOW CONTROL UNIT**).
35. Test-drive the vehicle.

TRANSMISSION DISASSEMBLY

Exploded View - Clutch Housing: 2WD Model



① DIFFERENTIAL ASSEMBLY
② 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
③ SIDE COVER
④ O-RING
Replace.
⑤ SHIFT FORK ASSEMBLY
⑥ 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 9 lbf·ft)
⑦ BEARING SET PLATE
⑧ COUNTERSHAFT ASSEMBLY
⑨ NEEDLE BEARING
⑩ OIL GUIDE PLATE C
⑪ 14 x 20 mm DOWEL PIN
⑫ MAGNET
⑬ MAINSHAFT ASSEMBLY
⑭ 28 mm WASHER
⑮ 28 mm SPRING WASHER
⑯ BALL BEARING
⑰ 28 x 43 x 7 mm OIL SEAL
Replace.
⑱ REVERSE GEAR SHAFT
⑲ REVERSE IDLER GEAR
⑳ 6 mm SPECIAL BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)
㉑ REVERSE SHIFT FORK
㉒ REVERSE LOCK CAM
㉓ 35 x 58 x 8 mm OIL SEAL
Replace.
㉔ BACK-UP LIGHT SWITCH
29 N·m (3.0 kgf·m, 22 lbf·ft)
㉕ 20 mm BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
㉖ 20 mm WASHER
㉗ CLUTCH HOUSING

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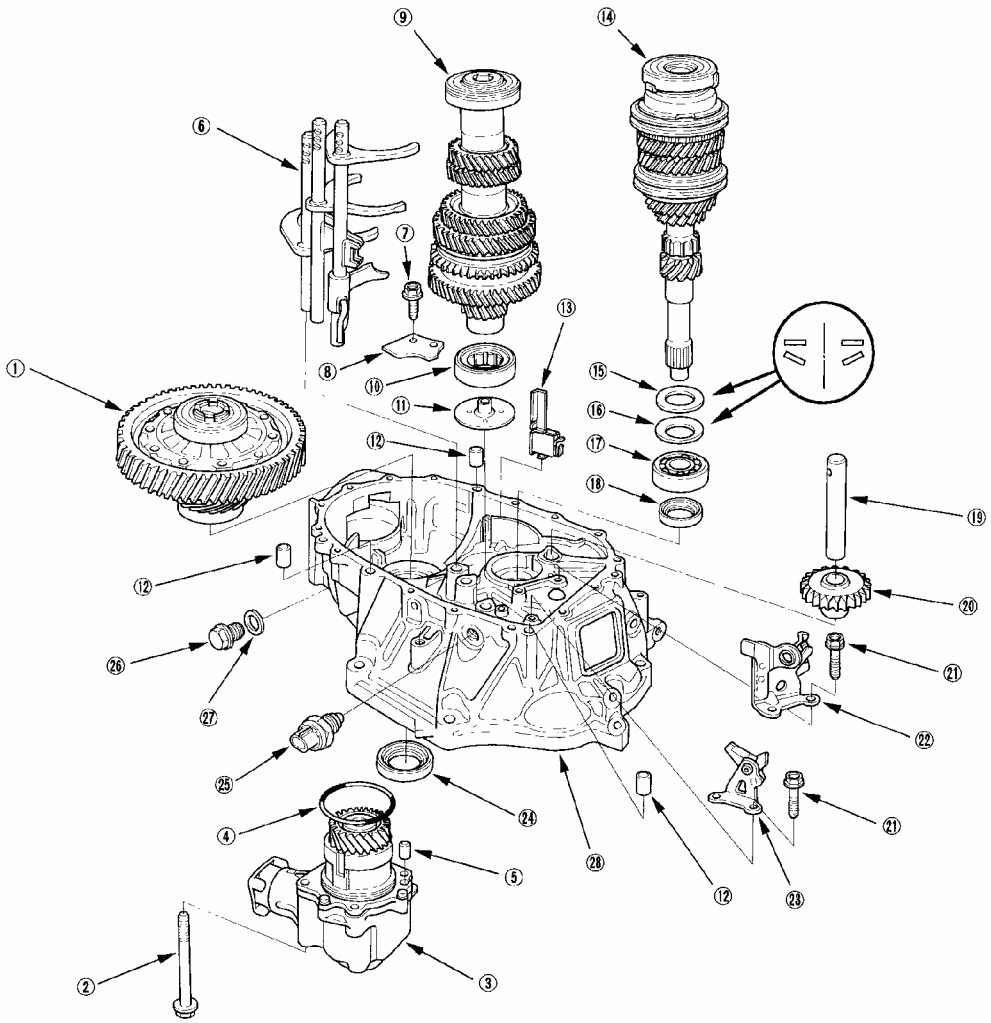
Fig. 41: Exploded View - Clutch Housing: 2WD Model

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Exploded View - Clutch Housing: 4WD Model

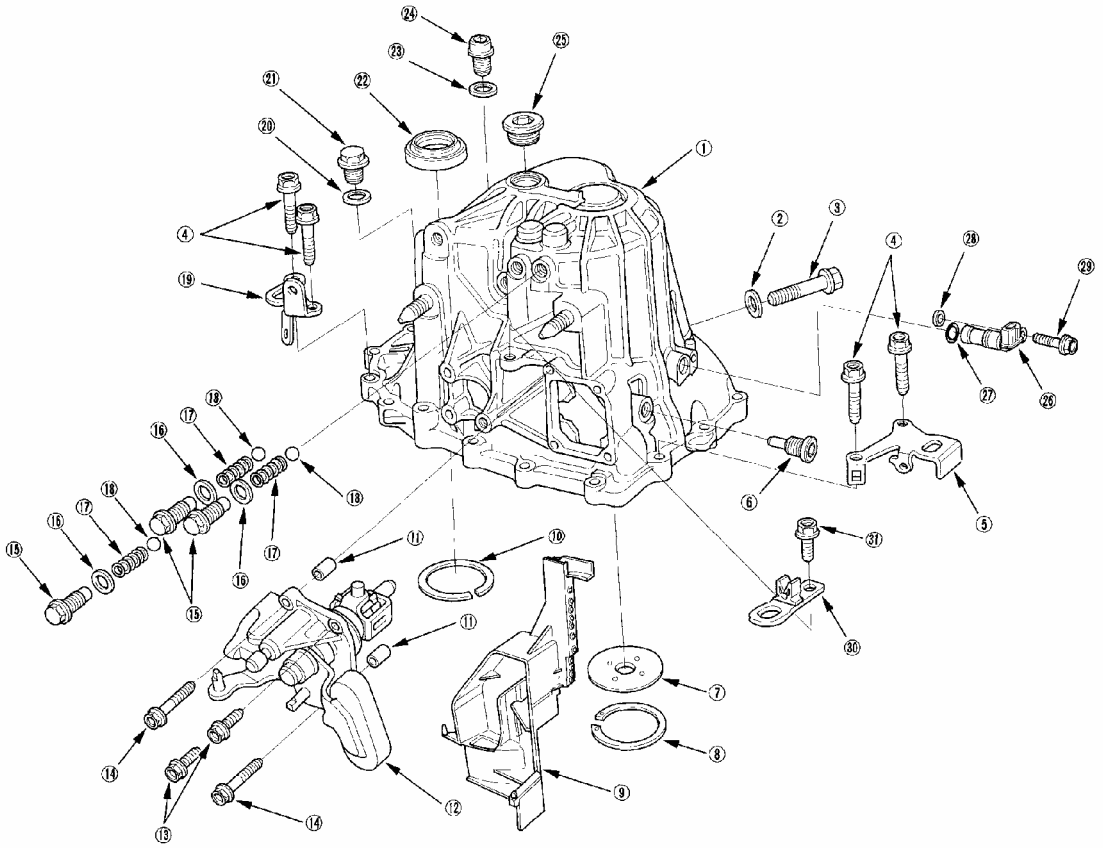


① DIFFERENTIAL ASSEMBLY
② 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
③ TRANSFER ASSEMBLY
④ O-RING
Replace.
⑤ 10 x 20 mm DOWEL PIN
⑥ SHIFT FORK ASSEMBLY
⑦ 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 9 lbf·ft)
⑧ BEARING SET PLATE
⑨ COUNTERSHAFT ASSEMBLY
⑩ NEEDLE BEARING
⑪ OIL GUIDE PLATE C
⑫ 14 x 20 mm DOWEL PIN
⑬ MAGNET
⑭ MAINSHAFT ASSEMBLY
⑮ 28 mm WASHER
⑯ 28 mm SPRING WASHER
⑰ BALL BEARING
⑱ 28 x 43 x 7 mm OIL SEAL
Replace.
⑲ REVERSE GEAR SHAFT
⑳ REVERSE IDLER GEAR
㉑ 6 mm SPECIAL BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)
㉒ REVERSE SHIFT FORK
㉓ REVERSE LOCK CAM
㉔ 35 x 58 x 8 mm OIL SEAL
Replace.
㉕ BACK-UP LIGHT SWITCH
29 N·m (3.0 kgf·m, 22 lbf·ft)
㉖ 20 mm BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
㉗ 20 mm WASHER
㉘ CLUTCH HOUSING

G03677898

Fig. 42: Exploded View - Clutch Housing: 4WD Model
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Exploded View - Transmission Housing



① TRANSMISSION HOUSING
② 10 mm WASHER
Replace.
③ 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
④ 8 mm FLANGE BOLT
27 N·m (2.8 kgf·m, 20 lbf·ft)
⑤ TRANSMISSION HANGER A
⑥ INTERLOCK BOLT
39 N·m (4.0 kgf·m, 29 lbf·ft)
⑦ OIL GUIDE PLATE M
⑧ 72 mm SHIM
⑨ OIL GUTTER PLATE
⑩ 80 mm SHIM
⑪ 8 x 14 mm DOWEL PIN
⑫ CHANGE LEVER ASSEMBLY
⑬ 6 x 20 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
⑭ 6 x 30 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
⑮ DETENT BOLT
22 N·m (2.2 kgf·m, 16 lbf·ft)
⑯ 12 mm WASHER
Replace.
⑰ SPRING
⑱ STEEL BALL
⑲ TRANSMISSION HANGER B
⑳ 20 mm WASHER
Replace.
㉑ FILLER PLUG
44 N·m (4.5 kgf·m, 33 lbf·ft)
㉒ 40 x 56 x 8 mm OIL SEAL
Replace.
㉓ 14 mm WASHER
Replace.
㉔ DRAIN PLUG
39 N·m (4.0 kgf·m, 29 lbf·ft)
㉕ 32 mm SEALING CAP
34 N·m (3.5 kgf·m, 25 lbf·ft)
㉖ OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR
㉗ O-RING
Replace.
㉘ PLAIN WASHER
㉙ 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
㉚ TRANSMISSION HANGER
㉛ 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)

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Fig. 43: Exploded View - Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

NOTE: Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from hitting the workbench.

1. 2WD model: Remove the side cover (A) and O-ring (B).

   4WD model: Remove the transfer assembly (C), O-ring (D), and 10 x 20 mm dowel pin (E).

   2WD Model:

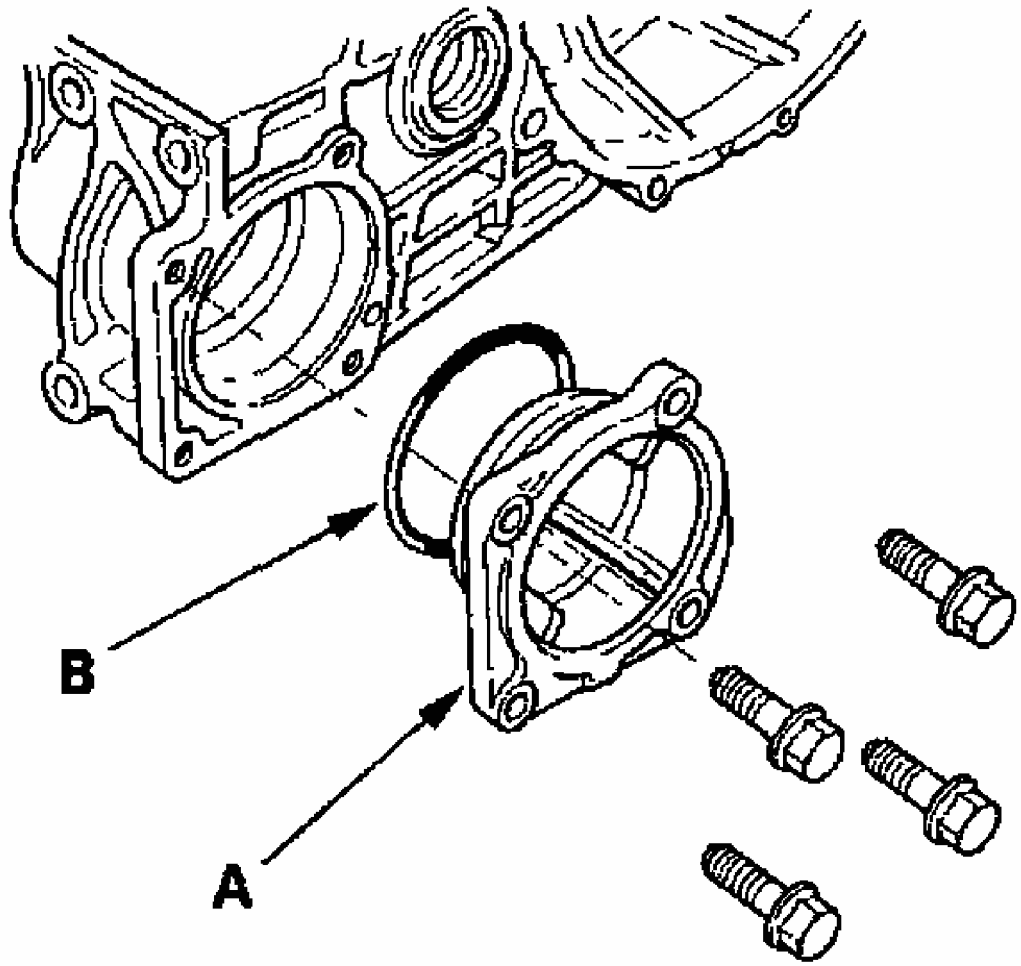

Fig. 44: Removing Clutch Housing Side Cover (2WD Model)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4WD Model:

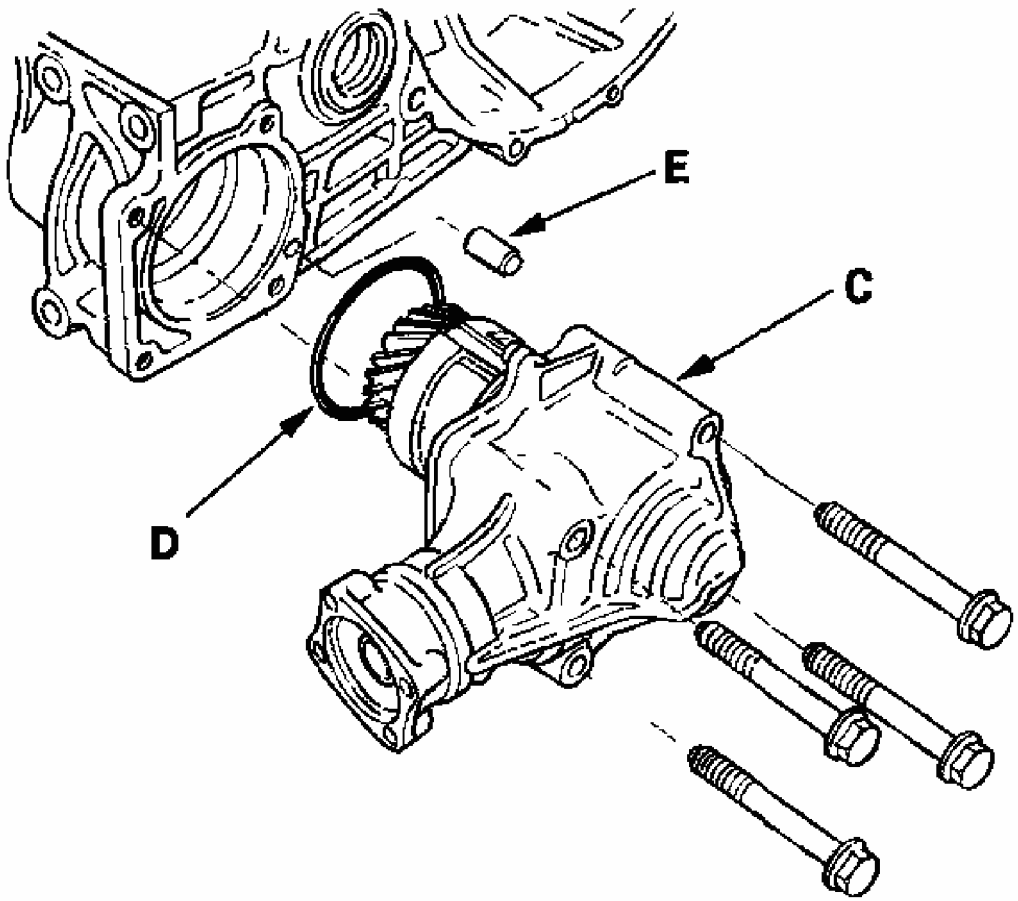

Fig. 45: Removing Clutch Housing Side Cover (4WD Model)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Remove the detent bolts (A), springs, steel balls and washers, the back-up light switch (B), and the transmission hanger (C).

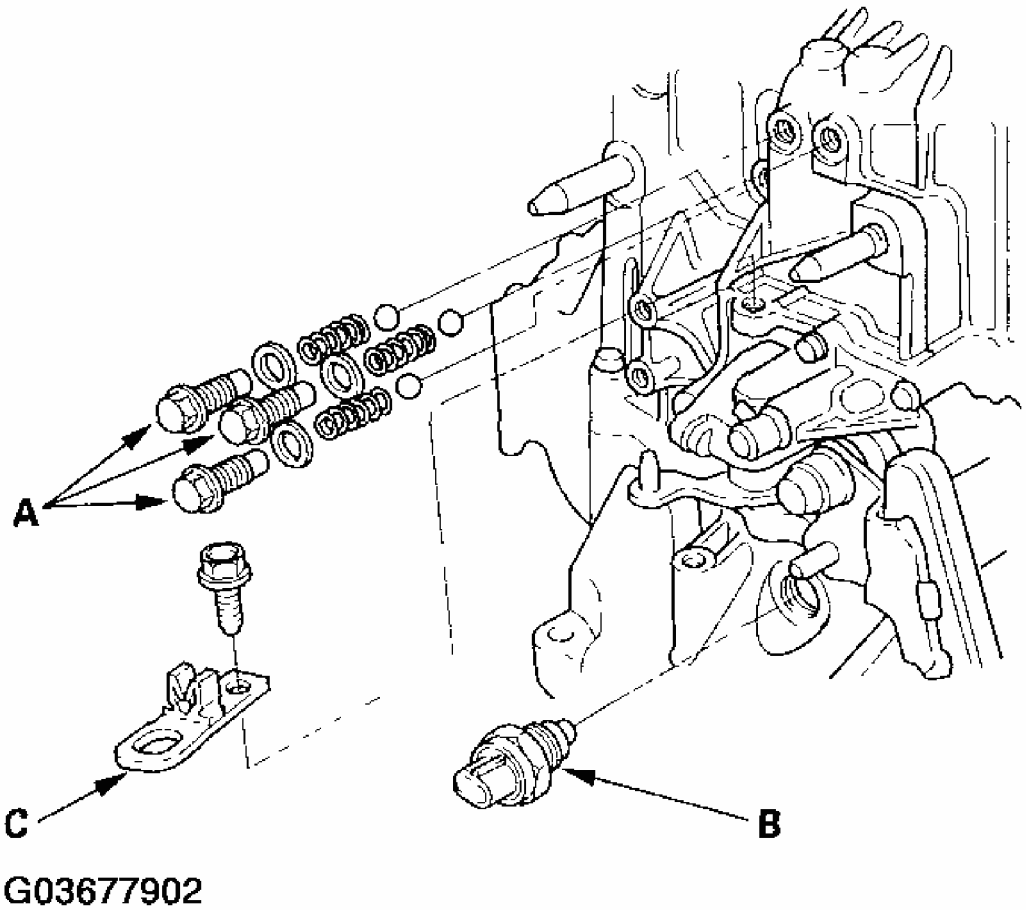

Fig. 46: Removing Detent Bolts, Springs, Steel Balls And Washers, Back-Up Light Switch, And Transmission Hanger
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the 20 mm bolt (A) and 20 mm washer (B).

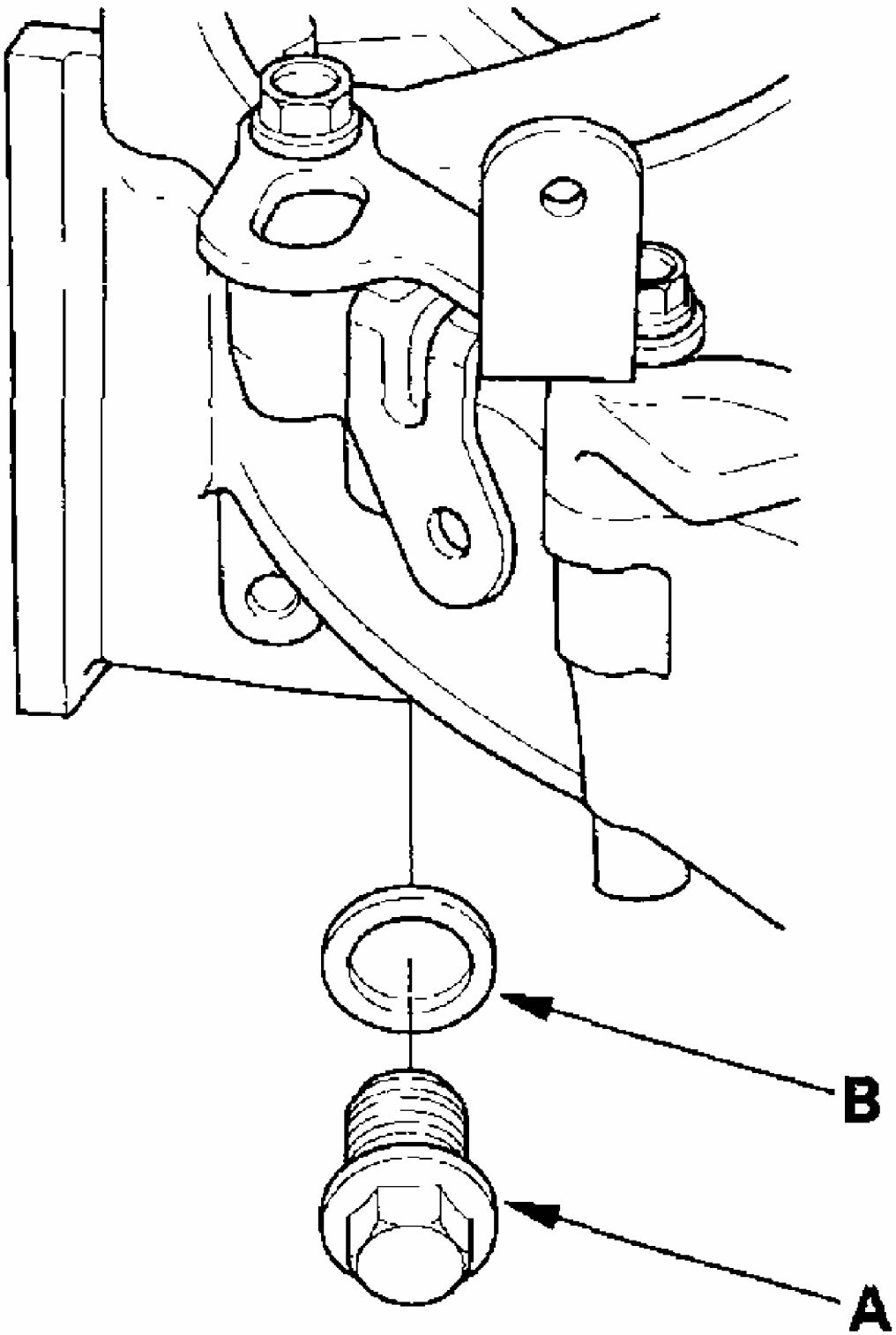

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Fig. 47: Removing 20mm Bolt And Washer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the change lever assembly (A), the 8 x 14 mm dowel pins (B), and the interlock bolt (C).

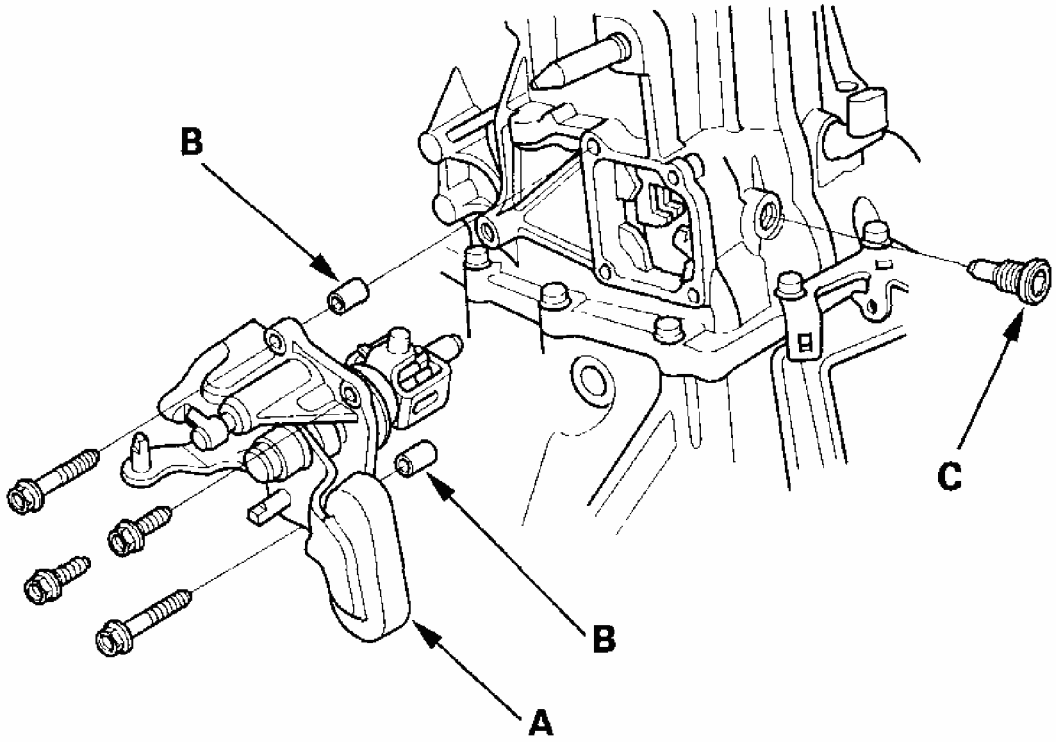

Fig. 48: Removing Change Lever Assembly, Dowel Pins, And Interlock Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the drain plug (A), the filler plug (B), and the 10 mm flange bolt (C).

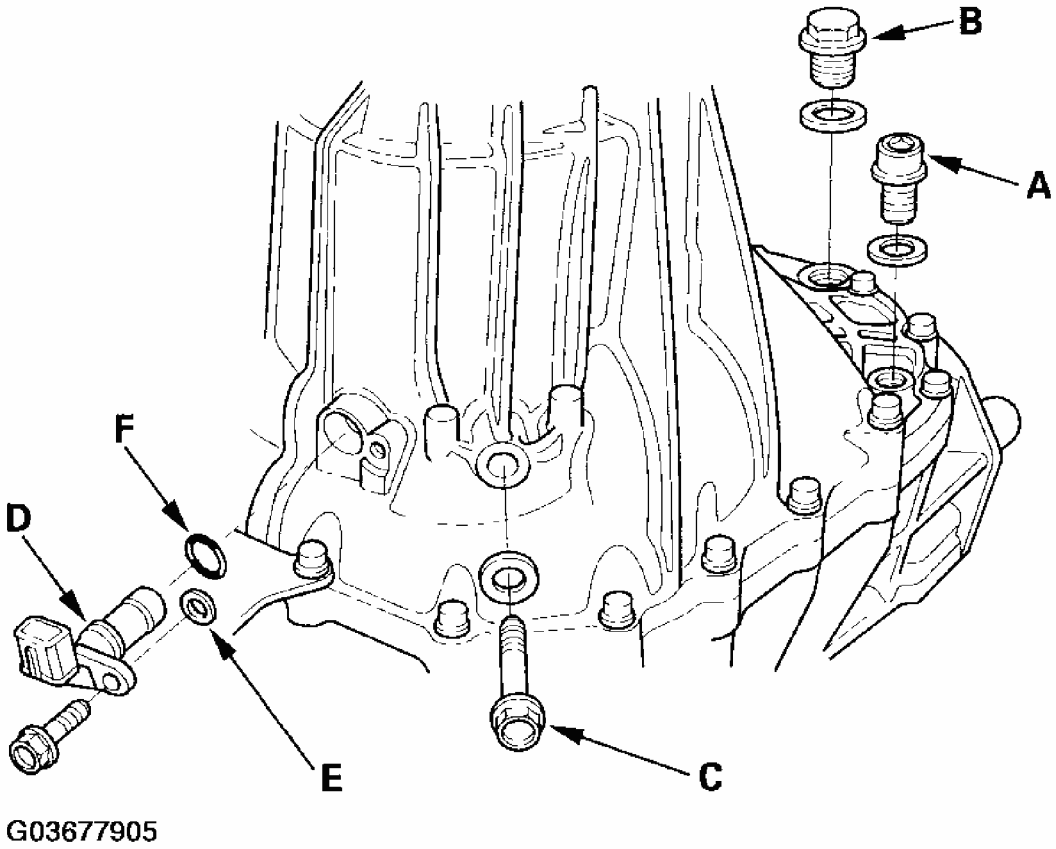

Fig. 49: Removing Drain Plug, Filler Plug, And Flange Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the output shaft (countershaft) speed sensor (D), the plain washer (E), and the O-ring (F).
7. Remove the 8 mm flange bolts in a crisscross pattern in several steps.
8. Remove transmission hanger A and transmission hanger B.

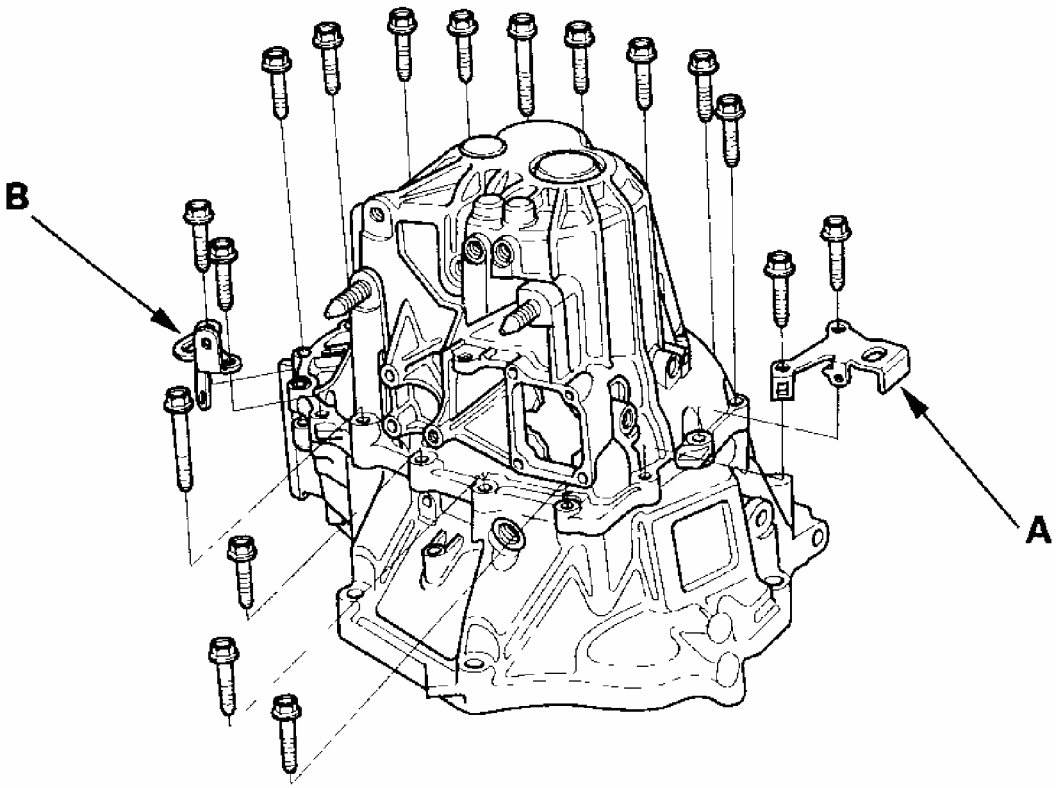

Fig. 50: Removing Transmission Hanger A And Transmission Hanger B
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Remove the 32 mm sealing cap (A).

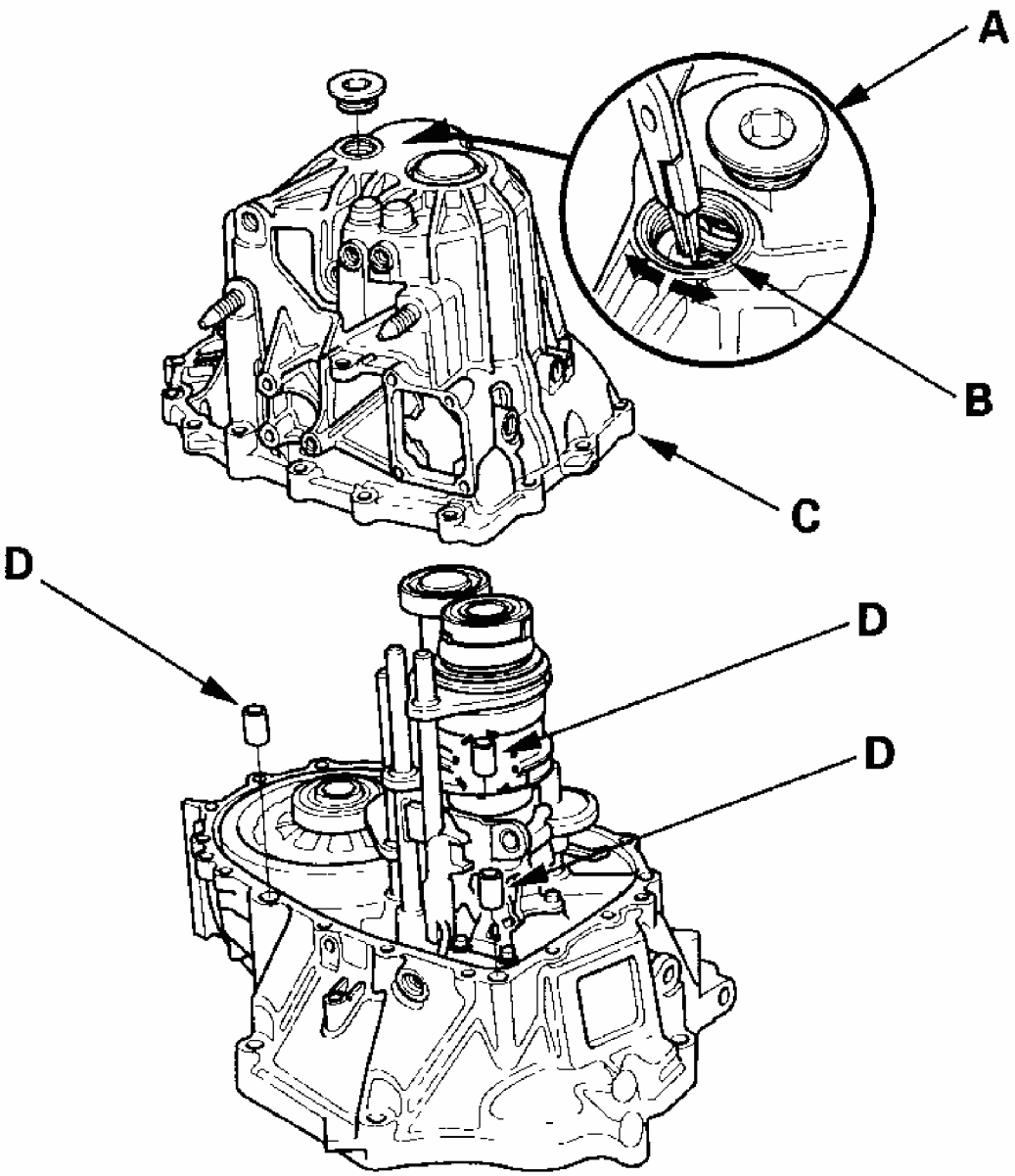

Fig. 51: Removing 32mm Sealing Cap
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Expand the 72 mm snap ring (B) on the countershaft ball bearing, and remove it from the groove with snap ring pliers.
11. Remove the transmission housing (C) and 14 x 20 mm dowel pins (D).
12. Remove the reverse lock cam (A).

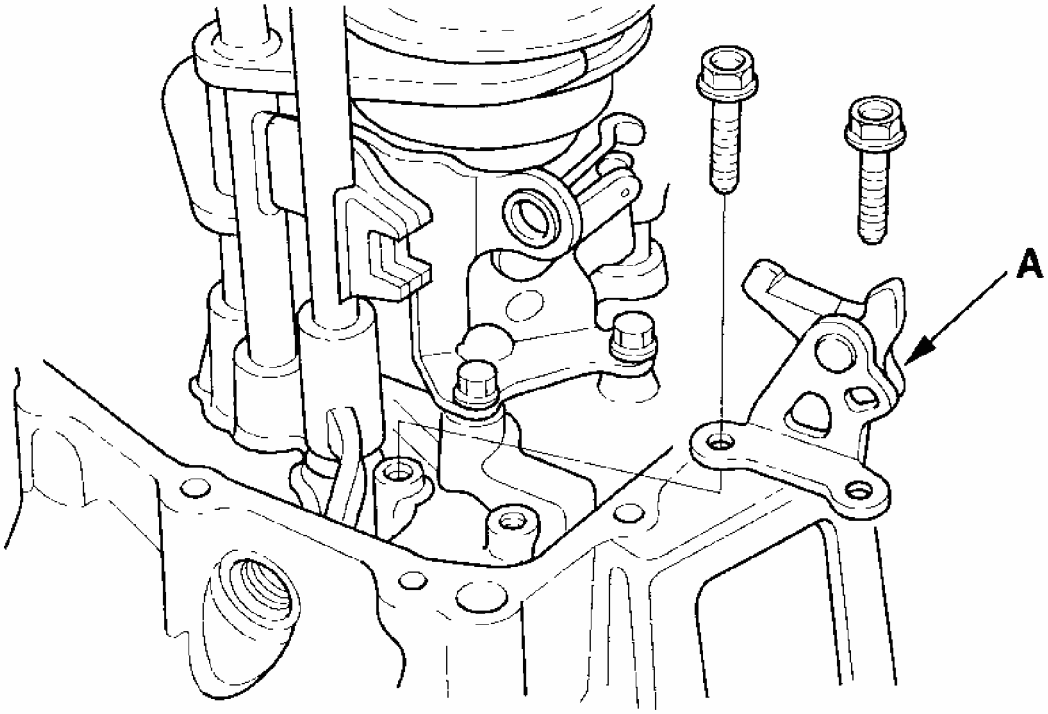

Fig. 52: Removing Reverse Lock Cam
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Remove the reverse idler gear (A) and reverse gear shaft (B).

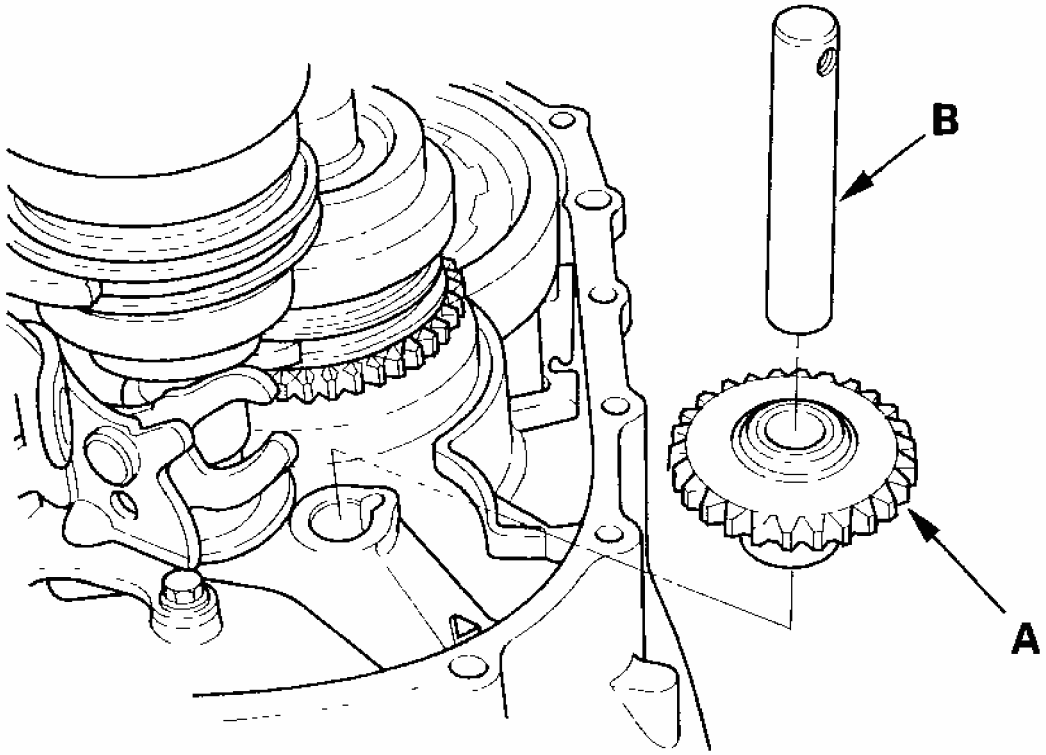

Fig. 53: Removing Reverse Idler Gear And Reverse Gear Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove the reverse shift fork (A).

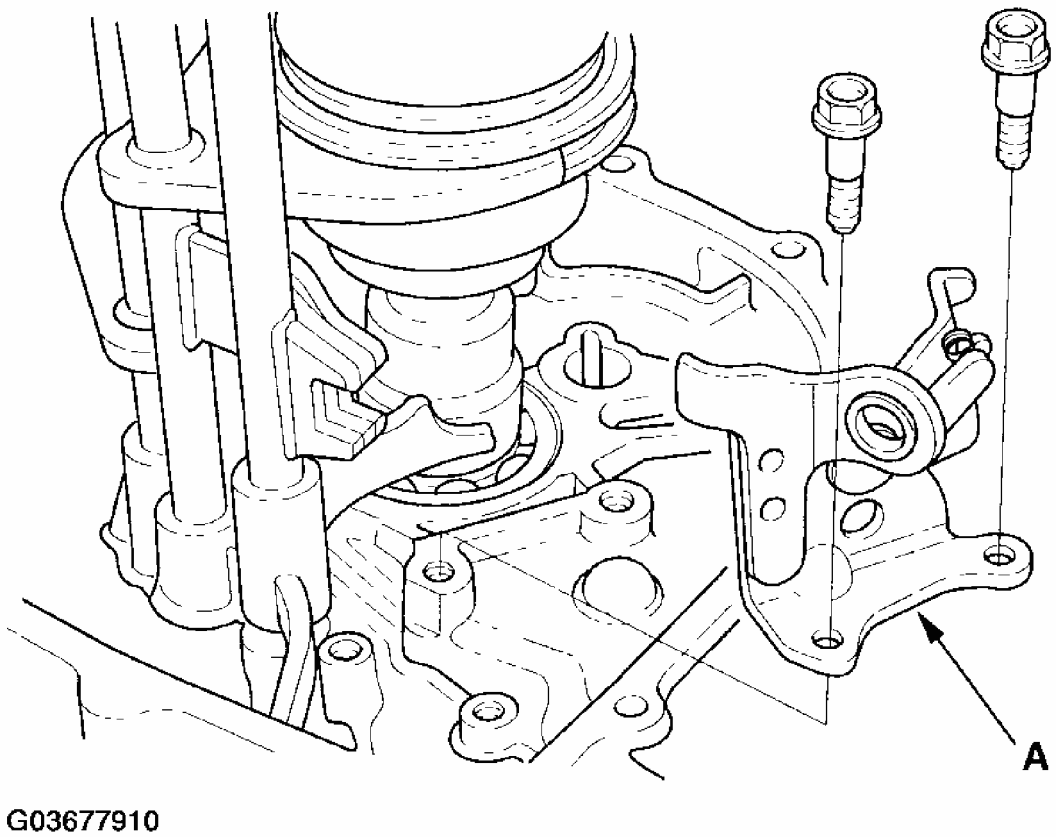

Fig. 54: Removing Reverse Shift Fork
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Apply tape to the mainshaft splines to protect the seal, then remove the mainshaft assembly (A) and countershaft assembly (B) with the shift forks (C) from the clutch housing (D).

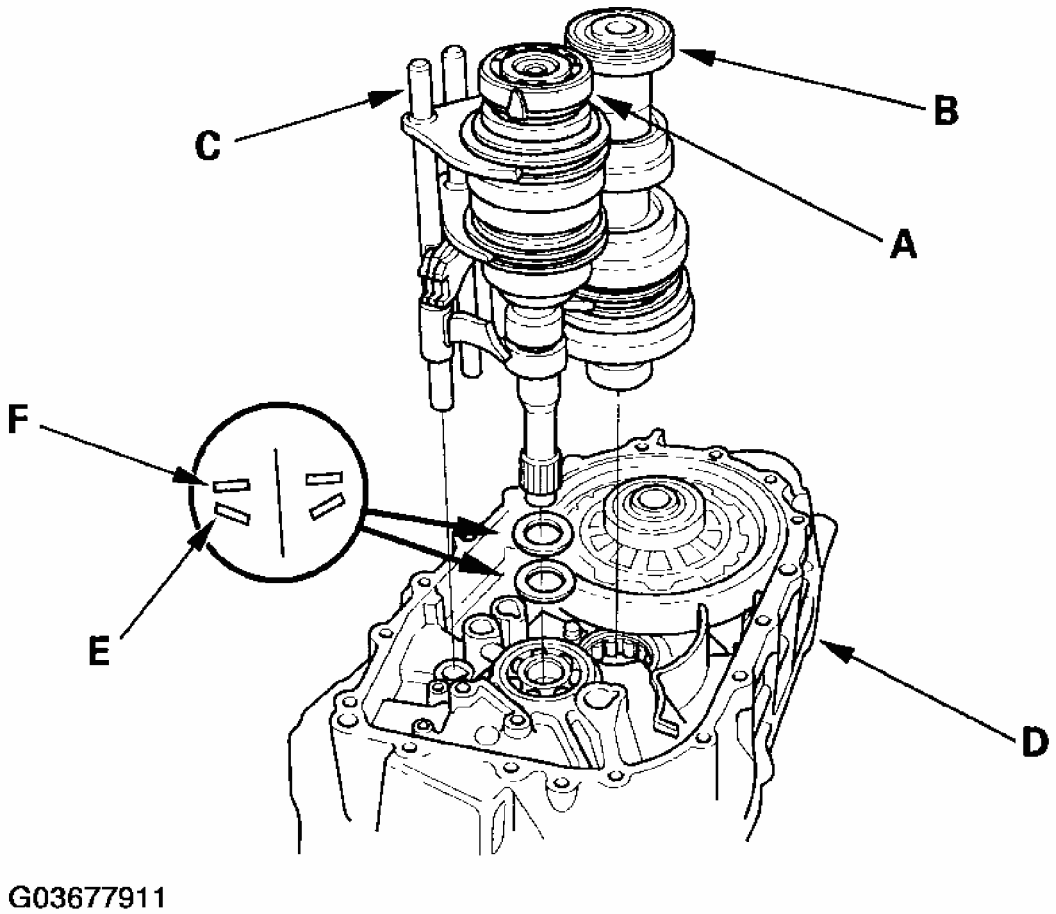

Fig. 55: Removing Mainshaft Assembly And Countershaft Assembly With Shift Forks From Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Remove the 28 mm spring washer (E) and 28 mm washer (F).
17. Remove the differential assembly (A) and magnet (B).

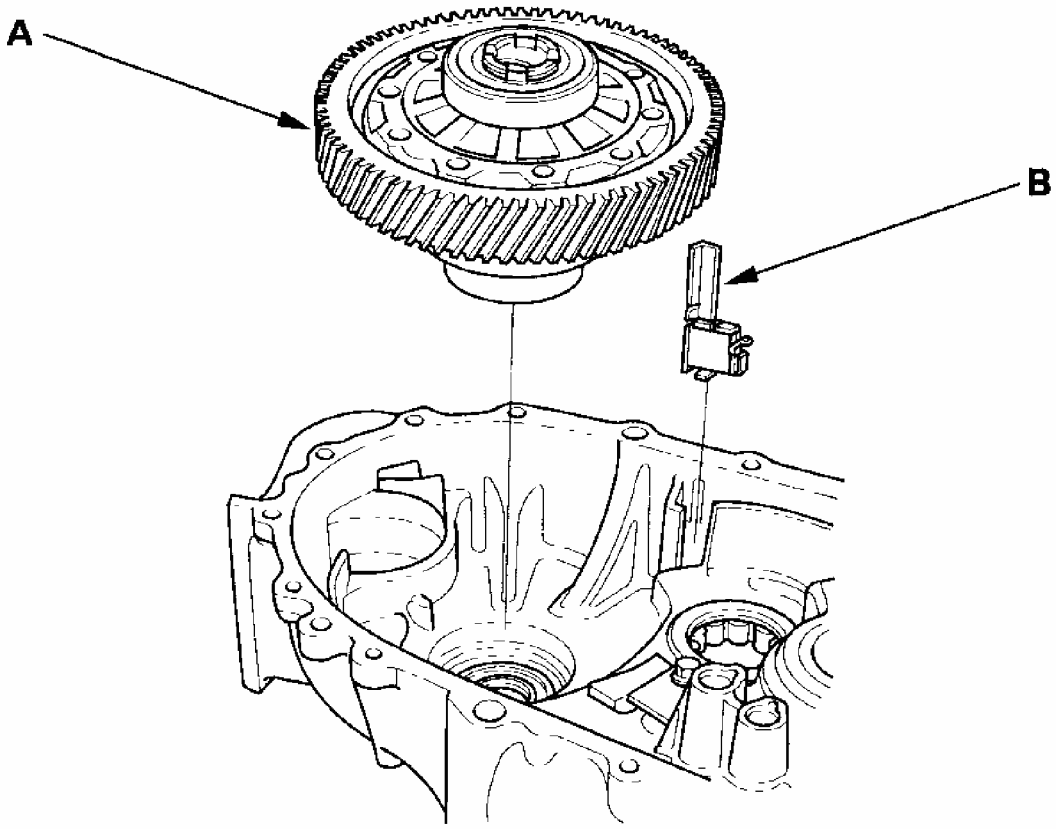

Fig. 56: Removing Differential Assembly And Magnet
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Remove the oil gutter plate (A), the 72 mm shim (B), and the oil guide plate M.

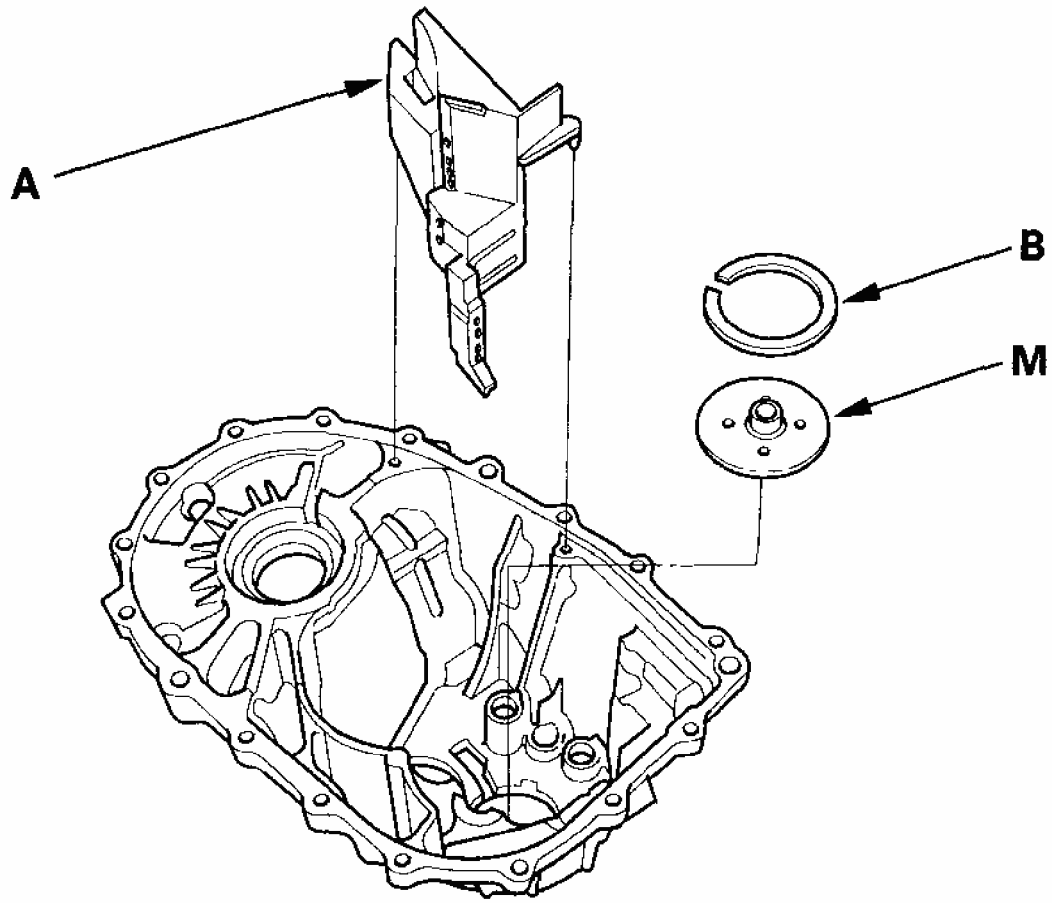

Fig. 57: Removing Oil Gutter Plate, Shim, And Oil Guide Plate
Courtesy of AMERICAN HONDA MOTOR CO., INC.

REVERSE SHIFT FORK CLEARANCE INSPECTION

1. Measure the clearance between the reverse idler gear (A) and the reverse shift fork (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

   Standard: 0.20-0.59 mm (0.007-0.024 in.)

   Service Limit: 1.2 mm (0.047 in.)

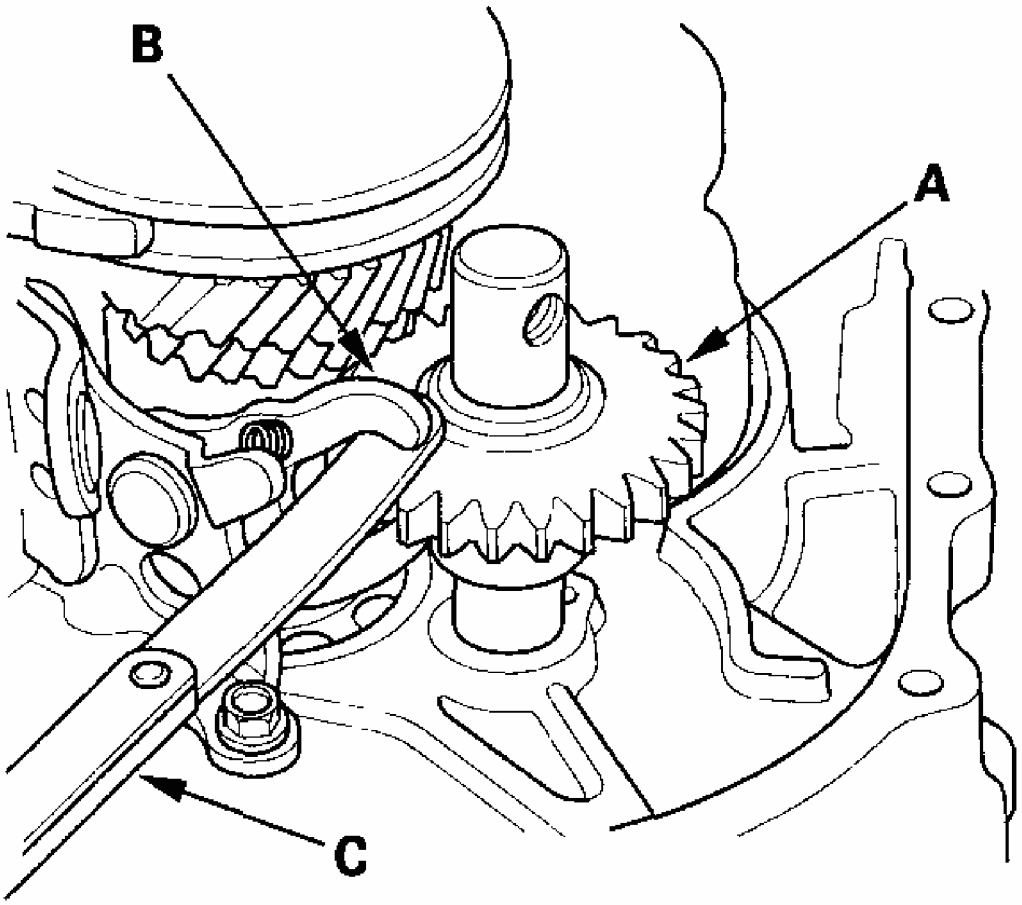

Fig. 58: Measuring Clearance Between Reverse Idler Gear And Reverse Shift Fork
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the width of the reverse shift fork.
   - If the width is not within the standard, replace the reverse shift fork.
   - If the width is within the standard, replace the reverse gear.

Standard: 13.4-13.7 mm (0.527-0.539 in.)

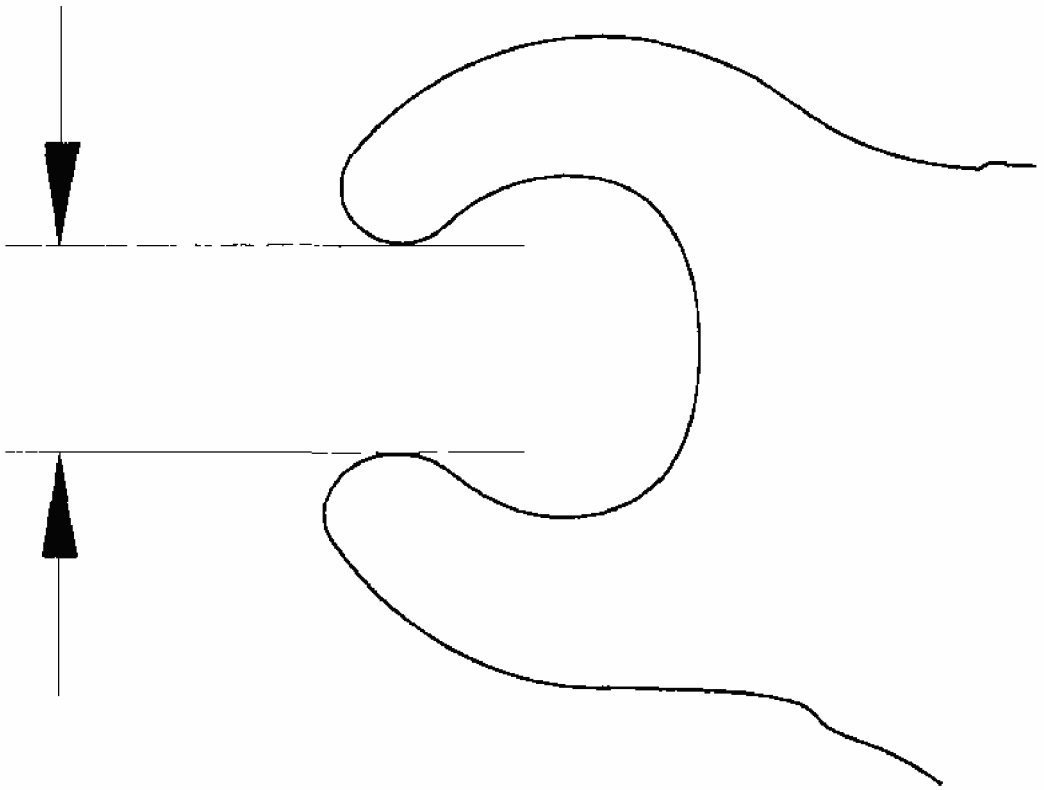

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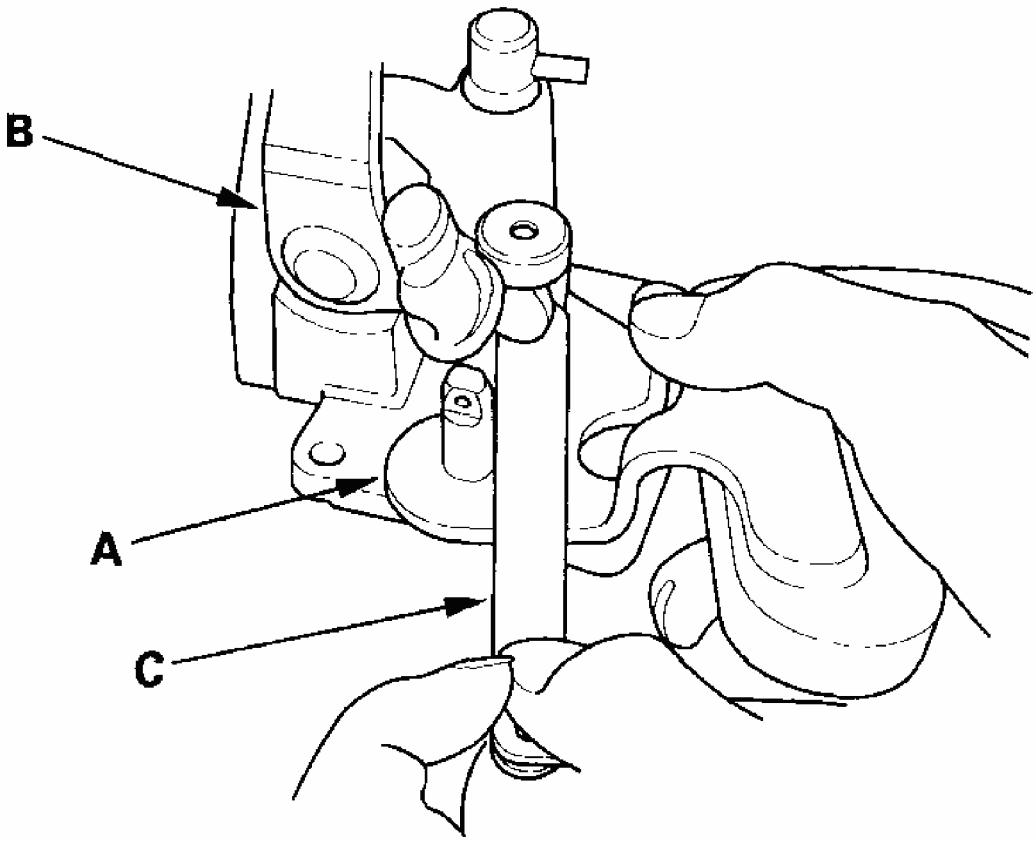
Fig. 59: Measuring Width Of Reverse Shift Fork
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CHANGE LEVER CLEARANCE INSPECTION

1. Measure the clearance between change lever (A) and the select lever (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

   Standard: 0.05-0.25 mm (0.002-0.010 in.)

   Service Limit: 0.5 mm (0.020 in.)



G03677916

Fig. 60: Measuring Clearance Between Change Lever And Select Lever
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the groove of the change lever.
   - If the groove is not within the standard, replace the change lever.
   - If the groove is within the standard, replace the select lever.

Standard: 15.00-15.10 mm (0.591-0.594 in.)

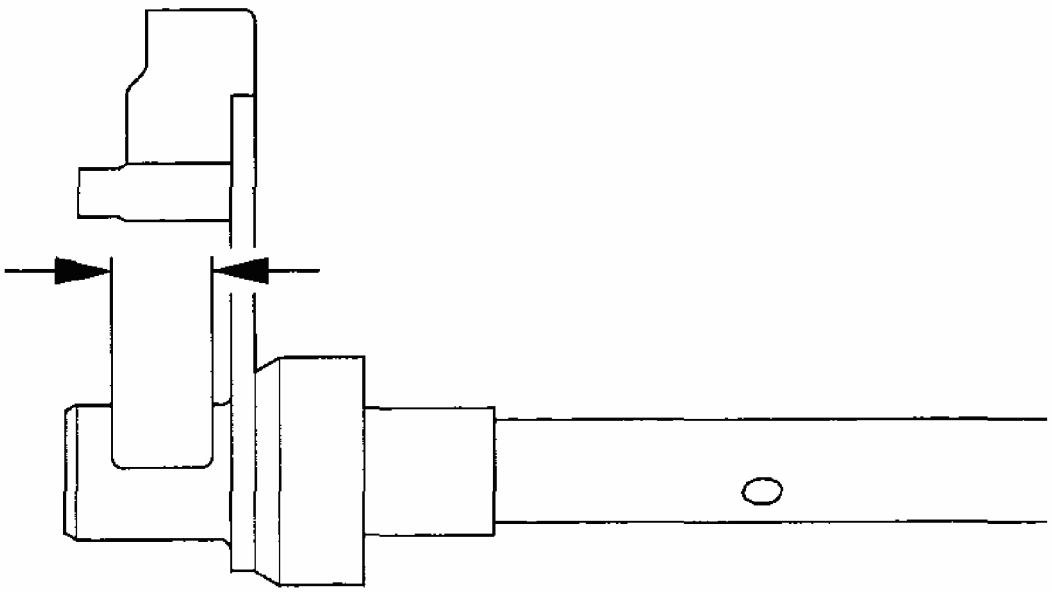


Fig. 61: Measuring Change Lever Groove
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CHANGE LEVER ASSEMBLY DISASSEMBLY/REASSEMBLY

Prior to reassembling, clean all parts in solvent, dry them, and apply grease to the contact surfaces as shown.

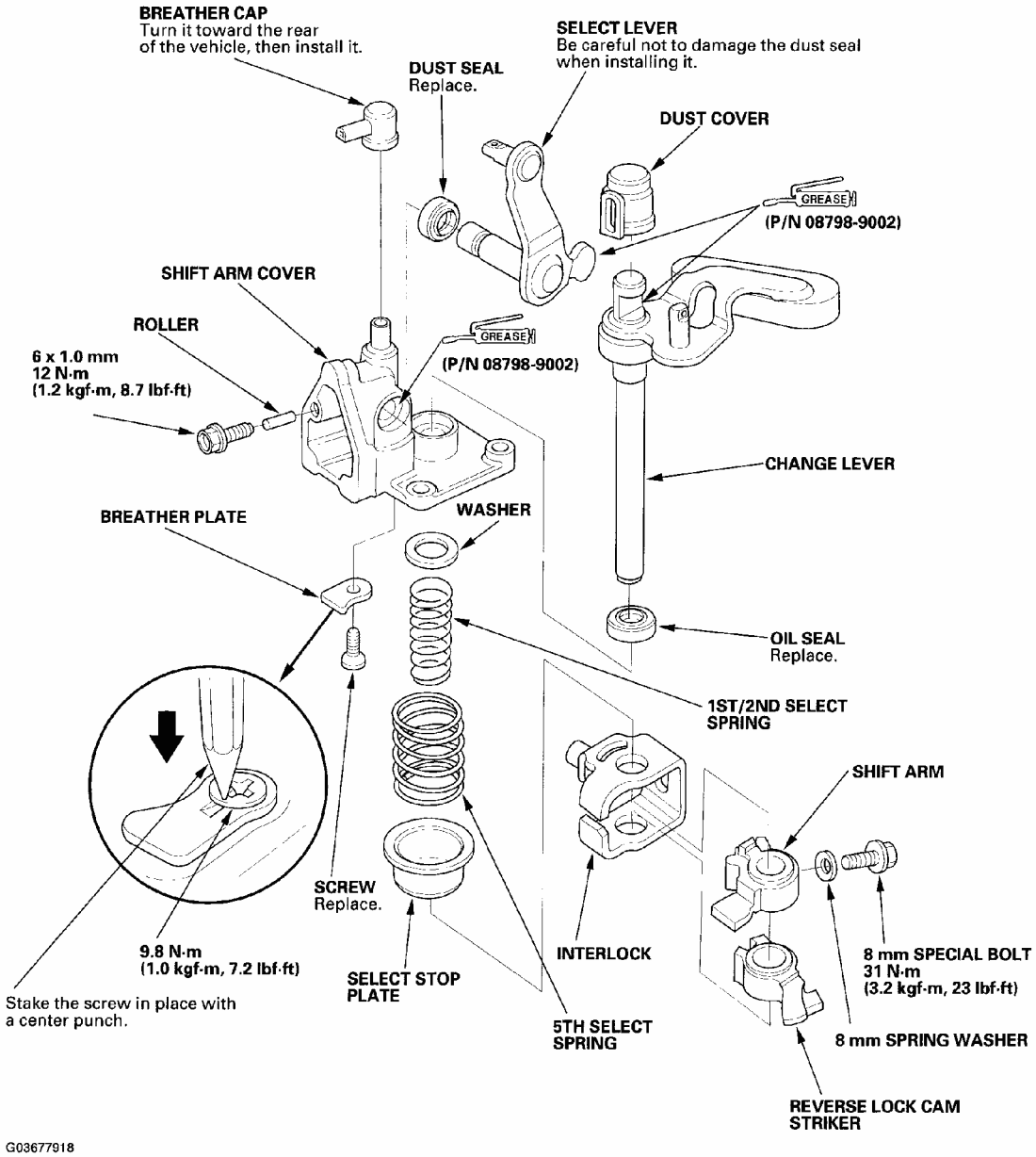


Fig. 62: Disassembly/Reassembly Of Change Lever Assembly And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

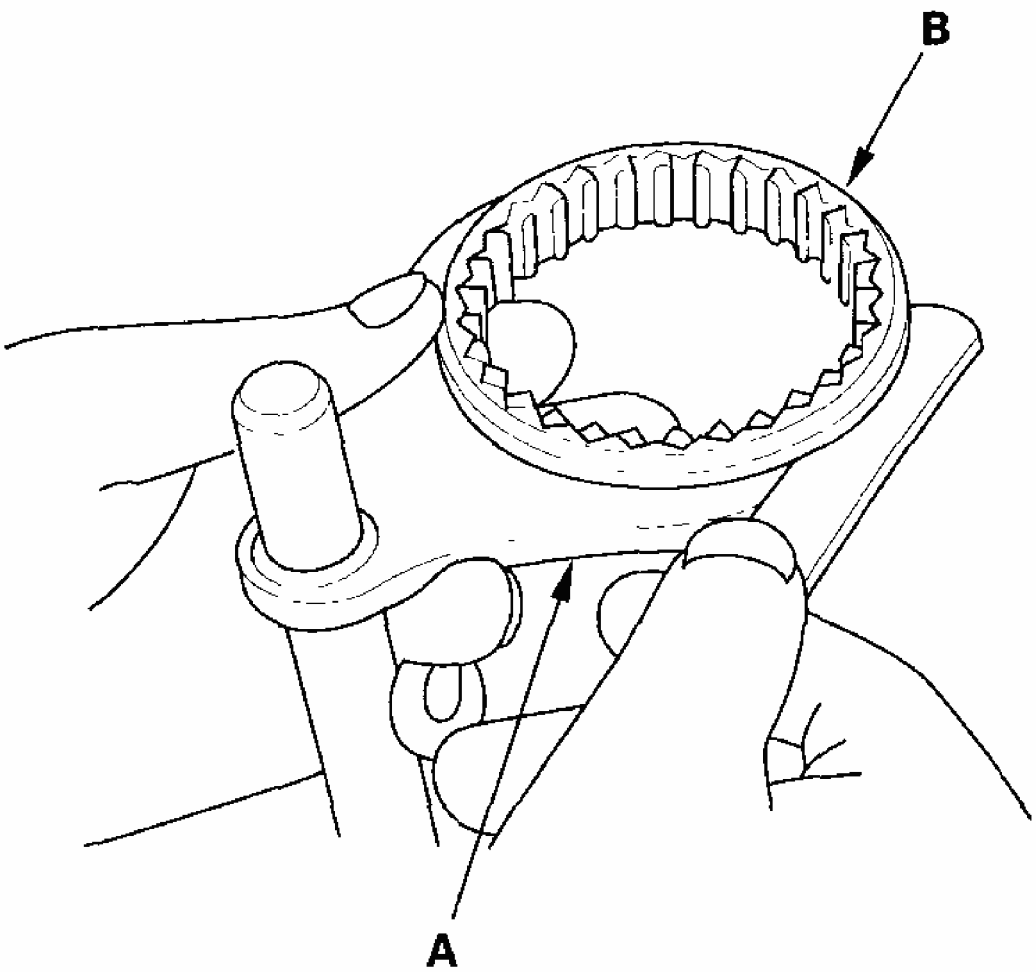
SHIFT FORK CLEARANCE INSPECTION

NOTE: The synchro sleeve and synchro hub should be replaced as a set.

1. Measure the clearance between each shift fork (A) and its matching synchro sleeve (B). If the clearance exceeds the service limit, go to step 2.

   Standard: 0.35-0.65 mm (0.014-0.026 in.)

Service Limit: 1.0 mm (0.039 in.)

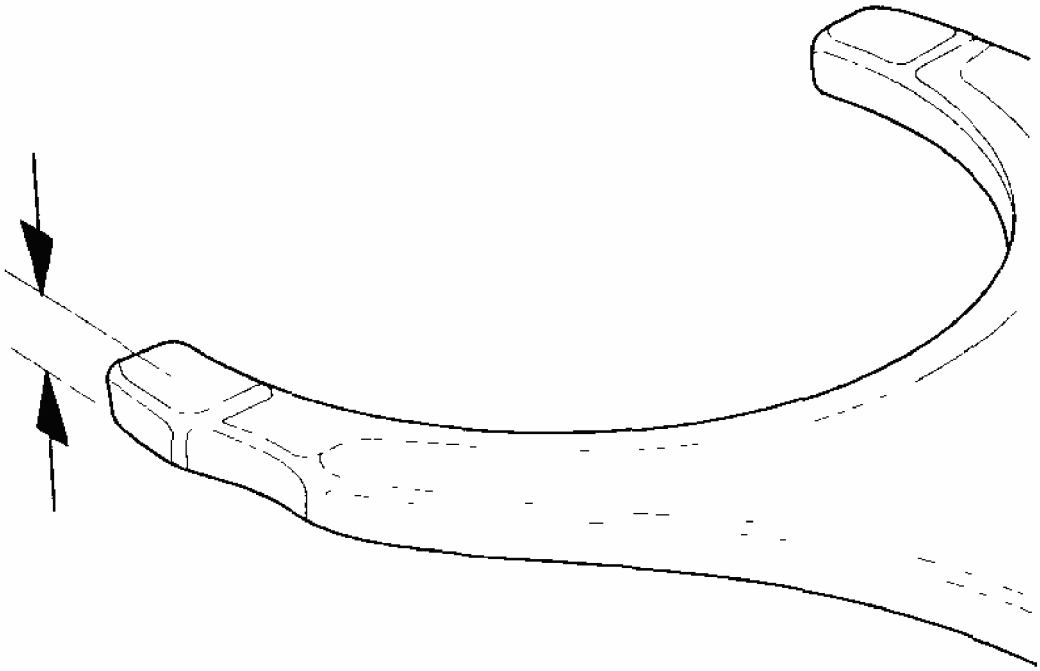


G03677919

Fig. 63: Measuring Shift Fork Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the thickness of the shift fork fingers.
   - If the thickness is not within the standard, replace the shift fork.
   - If the thickness is within the standard, replace the synchro sleeve and hub.

Standard: 7.4-7.6 mm (0.29-0.30 in.)



G03677920

Fig. 64: Measuring Shift Fork Fingers Thickness
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Measure the clearance between the shift fork (A) and the shift arm (B). If the clearance exceeds the service limit, go to step 4.

   Standard: 0.2-0.5 mm (0.008-0.020 in.)

   Service Limit: 0.6 mm (0.023 in.)

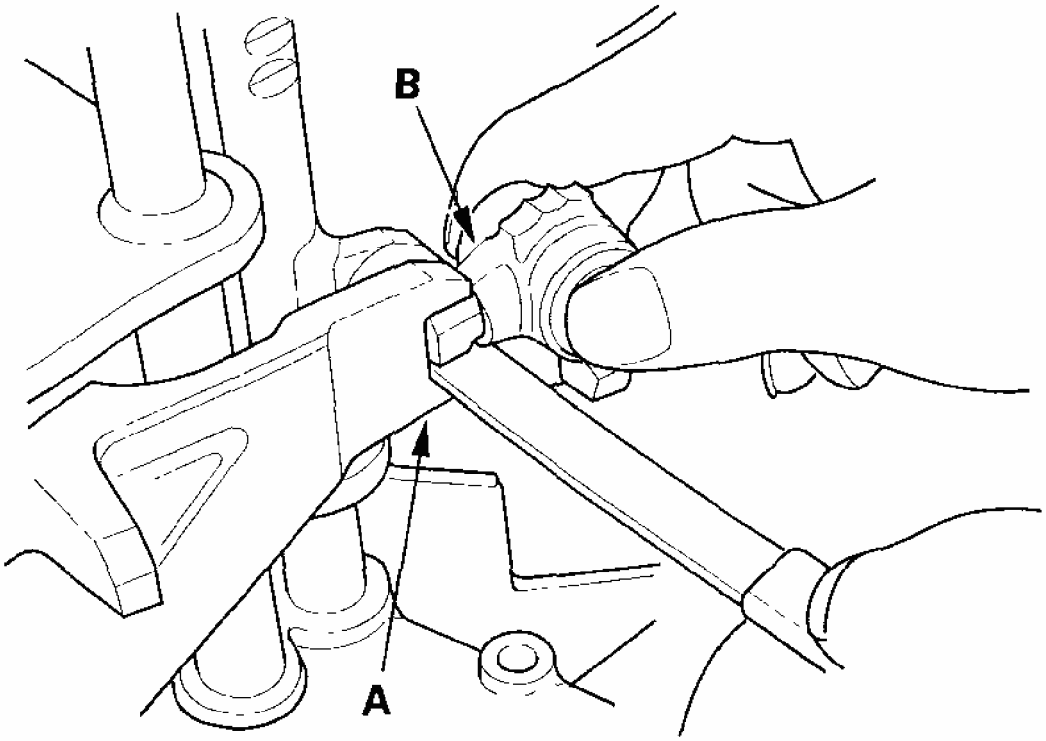


Fig. 65: Measuring Clearance Between Shift Fork And Shift Arm
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Measure the width of the shift arm.
   - If the width is not within the standard, replace the shift arm.
   - If the width is within the standard, replace the shift fork or the shift piece.

Standard: 16.9-17.0 mm (0.665-0.669 in.)

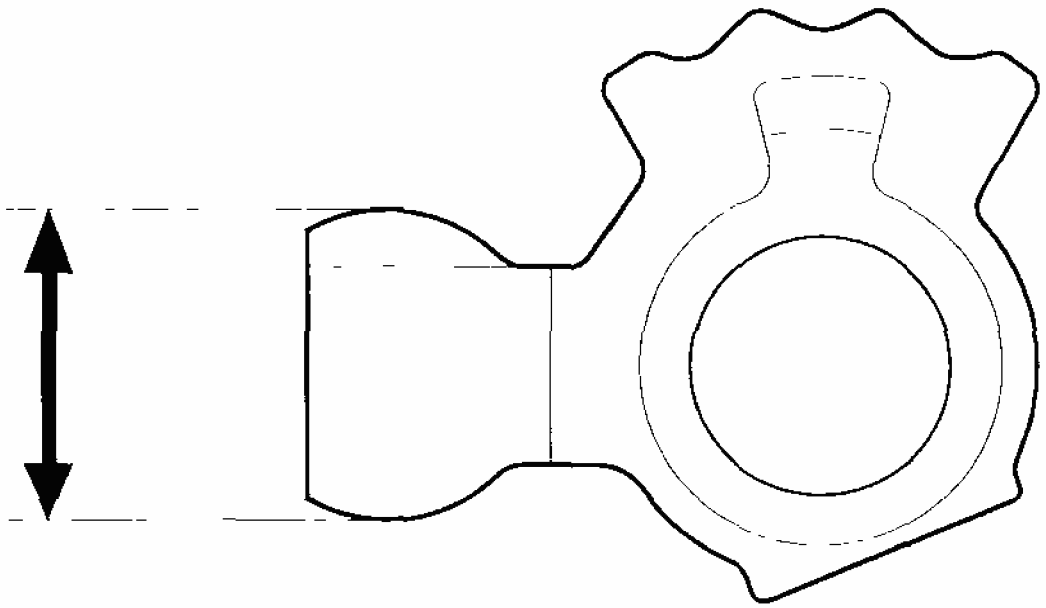


Fig. 66: Measuring Shift Arm Width
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SHIFT FORK DISASSEMBLY/REASSEMBLY

Prior to reassembling, clean all parts in solvent, dry them, and apply lubricant to all contact surfaces.

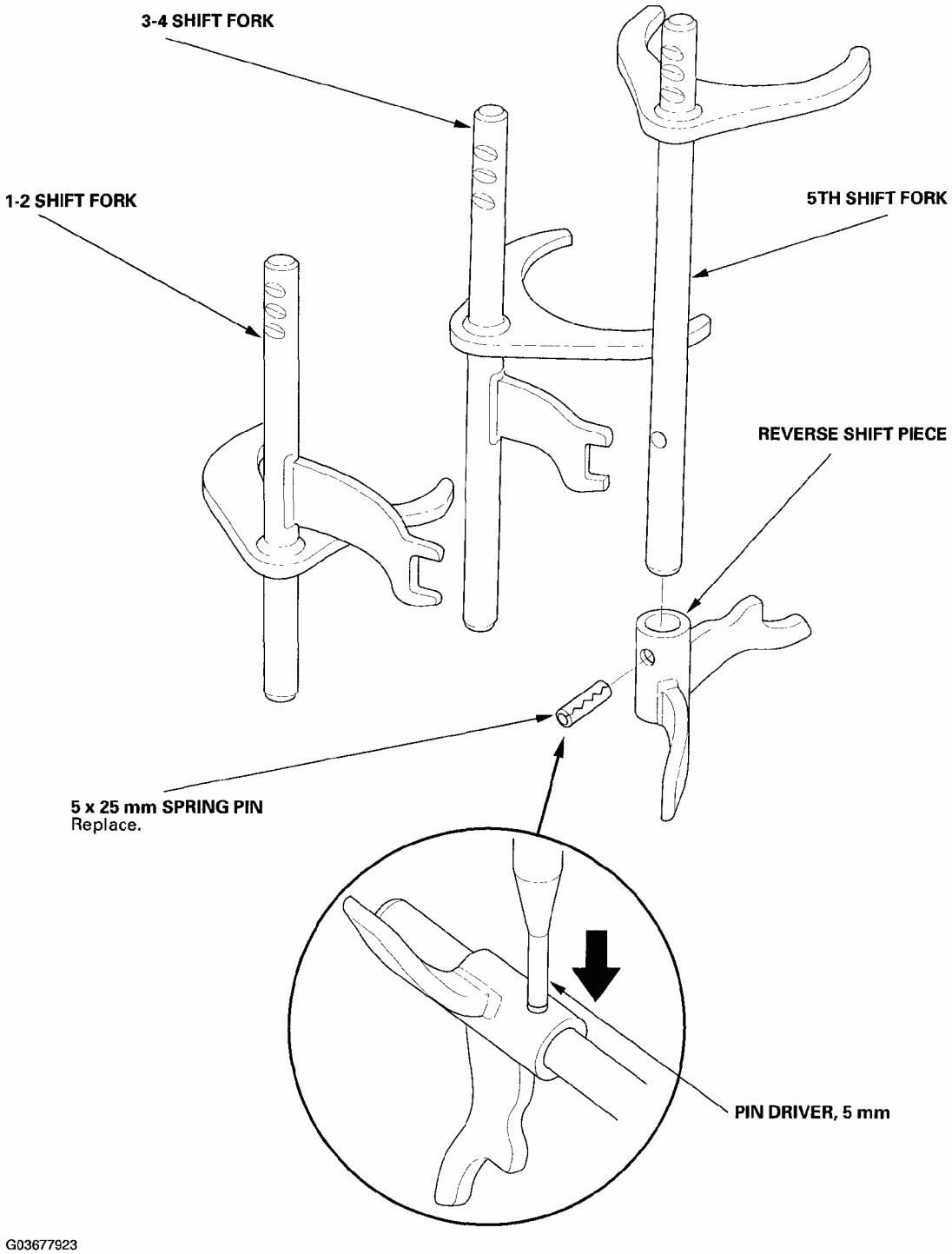


Fig. 67: Disassembly/Reassembly Of Shift Fork
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT ASSEMBLY CLEARANCE INSPECTION

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

1. Support the bearing inner race with an appropriate sized socket (A), and push down on the mainshaft (B).

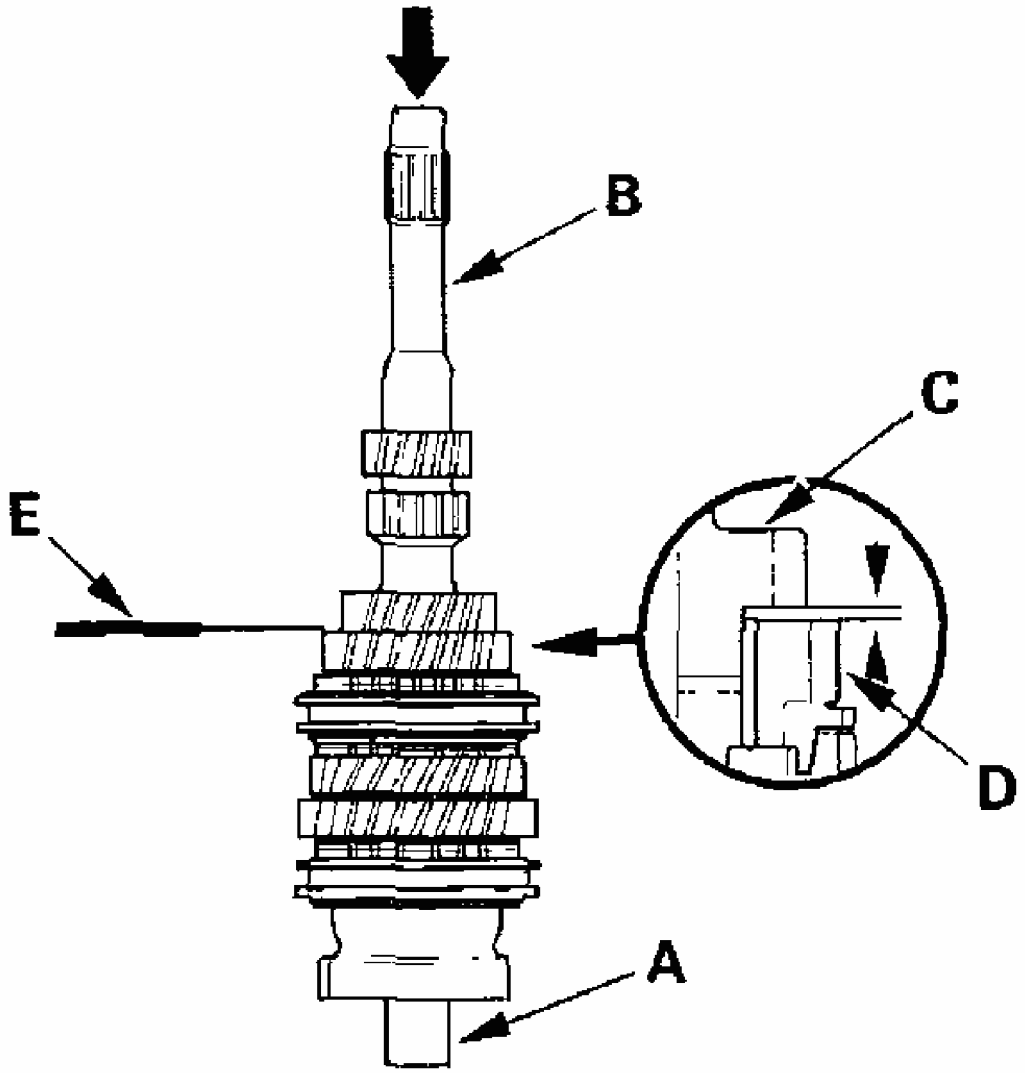


Fig. 68: Measuring Clearance Between Second Gear And Third Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the clearance between 2nd gear (C) and 3rd gear (D) with a feeler gauge (E).
   - If the clearance is more than the service limit, go to step 3.
   - If the clearance is within the service limit, go to step 4.

Standard: 0.06-0.16 mm (0.002-0.006 in.)

Service Limit: 0.25 mm (0.010 in.)

3. Measure the thickness of 3rd gear.
   - If the thickness is less than the service limit, replace 3rd gear.
   - If the thickness is within the service limit, replace the 3rd/4th synchro hub and sleeve.

Standard: 23.92-23.97 mm (0.941-0.944 in.)

Service Limit: 23.80 mm (0.937 in.)

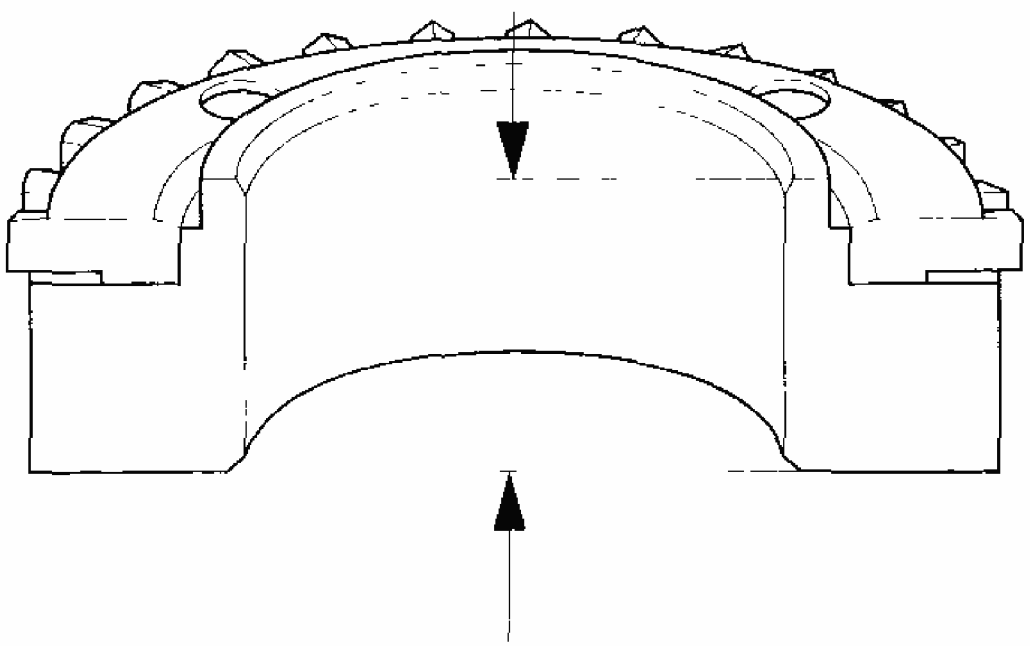


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Fig. 69: Measuring Third Gear Thickness
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Measure the clearance between 4th gear (A) and the distance collar (B) with a dial indicator (C). If the clearance is more than the service limit, go to step 5.

Standard: 0.06-0.16 mm (0.002-0.006 in.)

Service Limit: 0.25 mm (0.010 in.)

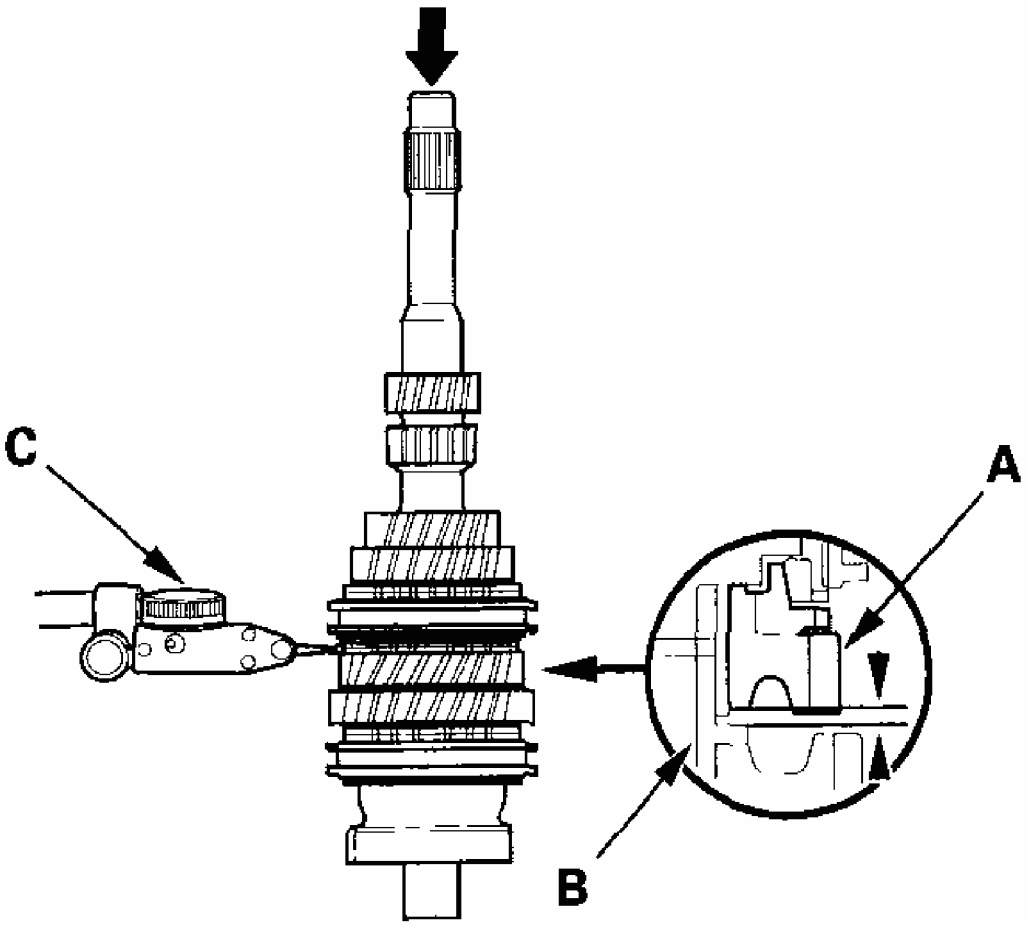

Fig. 70: Measuring Clearance Between Fourth Gear And Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Measure distance 1 on the distance collar.
   - If distance 1 is not within the standard, replace the distance collar.
   - If distance 1 is within the standard, go to step 6.

Standard: 24.03-24.08 mm (0.946-0.948 in.)

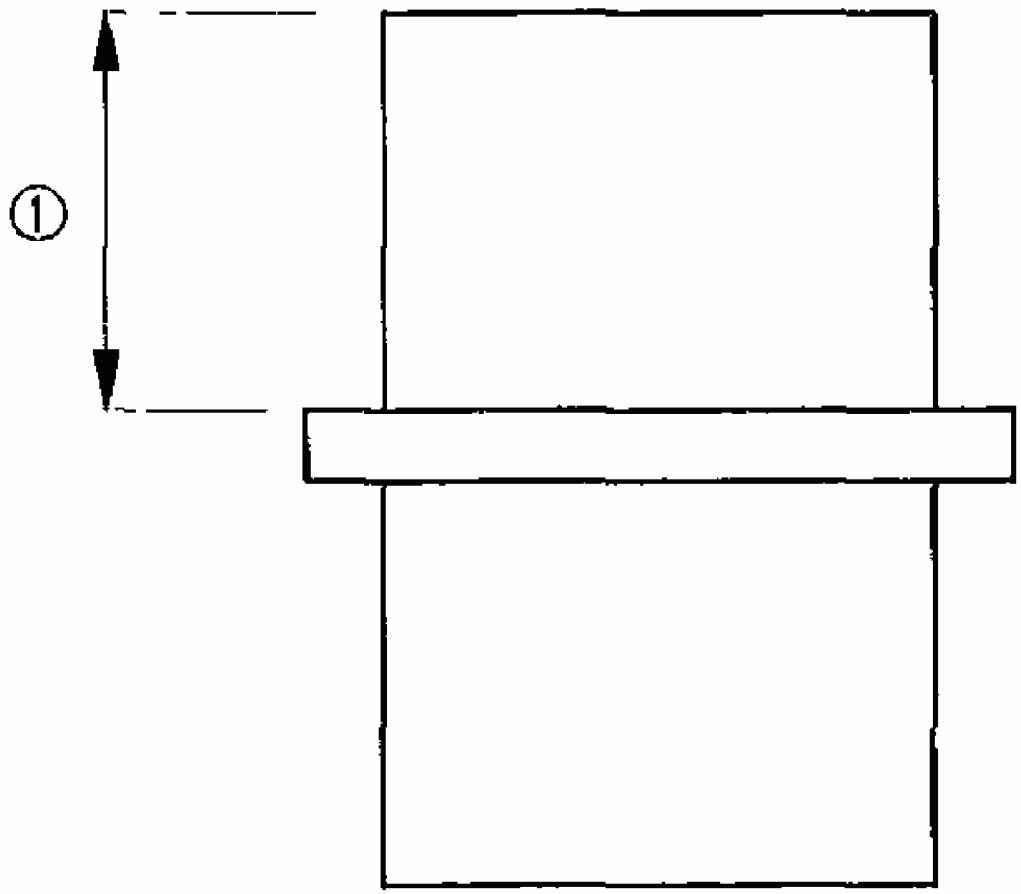

Fig. 71: Measuring Collar Distance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Measure the thickness of 4th gear.
   - If the thickness is less than the service limit, replace 4th gear.
   - If the thickness is within the service limit, replace the 3rd/4th synchro hub and sleeve.

Standard: 23.92-23.97 mm (0.941-0.944 in.)

Service Limit: 23.80 mm (0.937 in.)

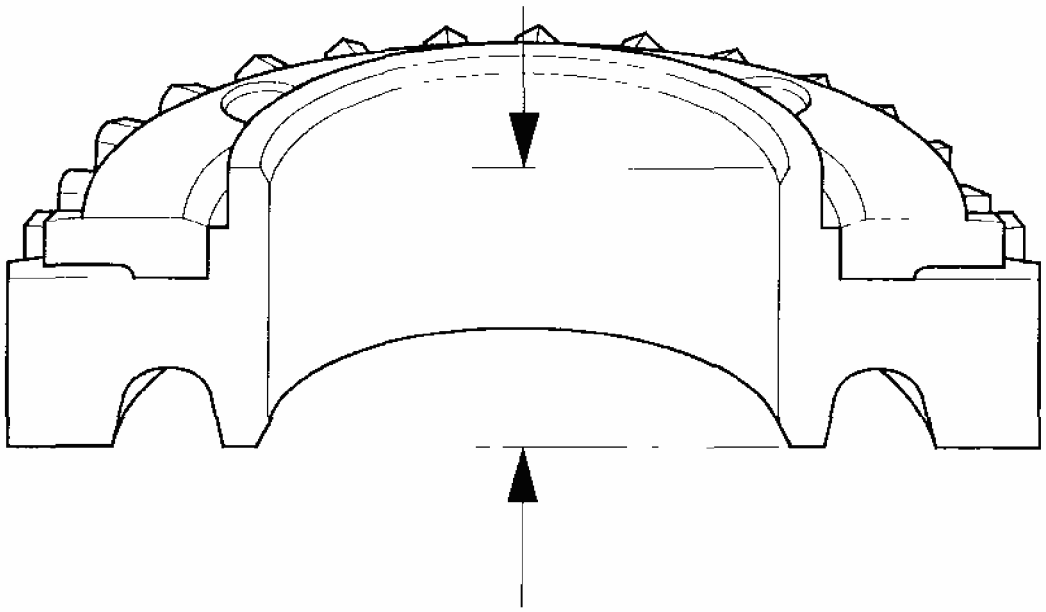

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Fig. 72: Measuring Fourth Gear Thickness
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Measure the clearance between the distance collar (A) and 5th gear (B) with a dial indicator (C). If the clearance is more than the service limit, go to step 8.

   Standard: 0.06-0.16 mm (0.002-0.006 in.)

   Service Limit: 0.25 mm (0.010 in.)

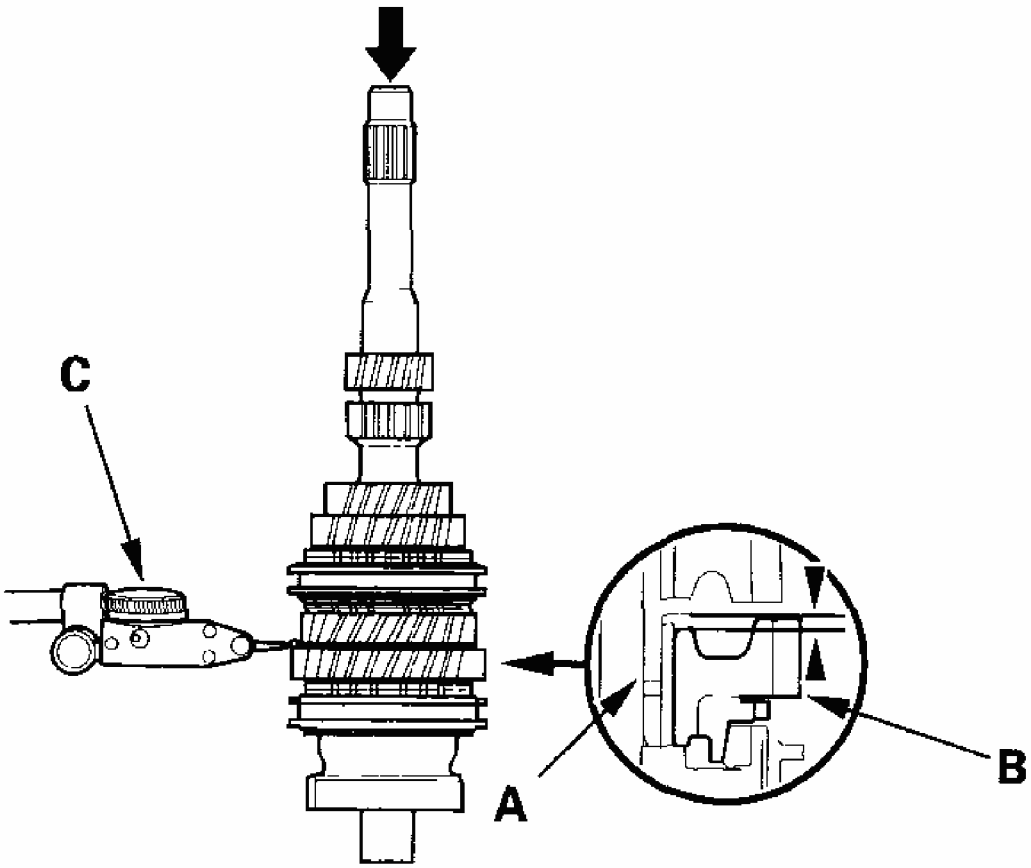

Fig. 73: Measuring Clearance Between Distance Collar And Fifth Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Measure distance (2) on the distance collar.
   - If distance (2) is not within the standard, replace the distance collar.
   - If distance (2) is within the standard, go to step 9.

Standard: 24.03-24.08 mm (0.946-0.948 in.)

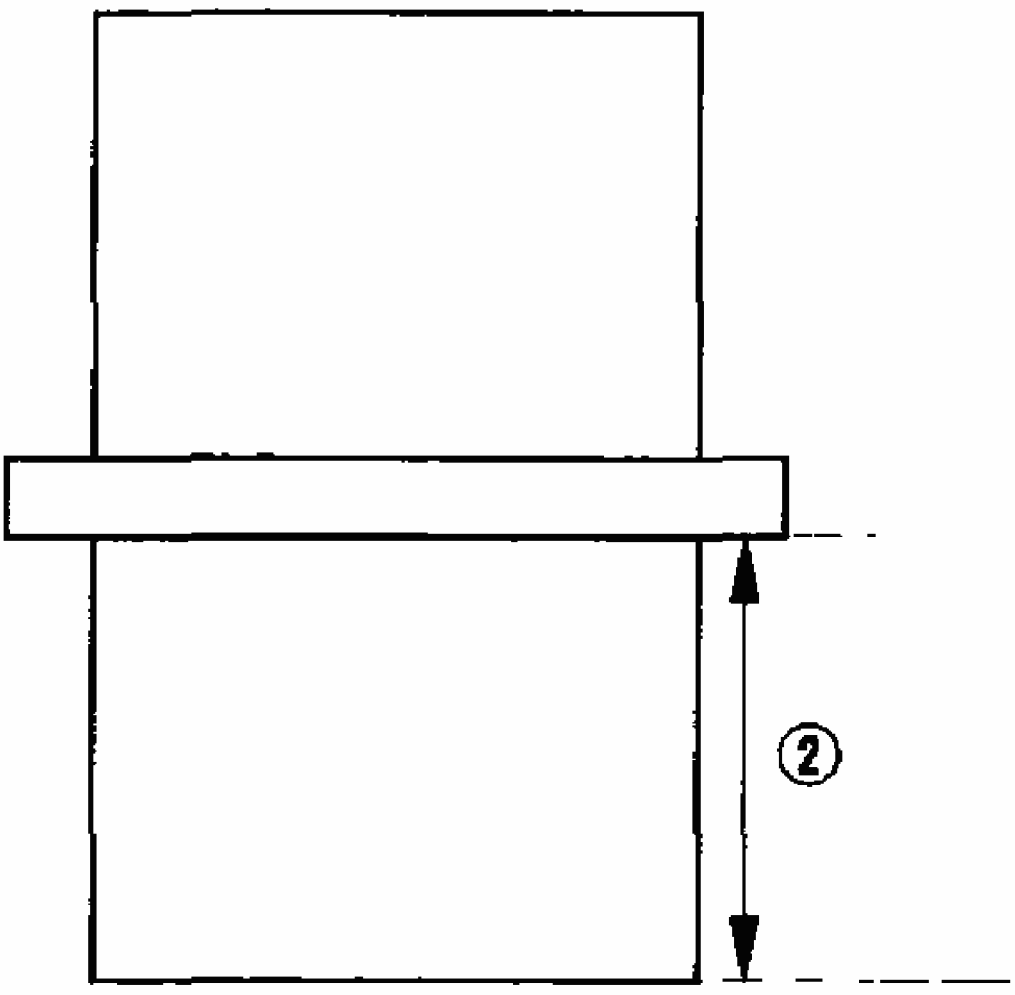

Fig. 74: Measuring Distance On Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Measure the thickness of 5th gear.
   - If the thickness is less than the service limit, replace 5th gear.
   - If the thickness is within the service limit, replace the 5th synchro hub and sleeve.

Standard: 23.92-23.97 mm (0.941-0.944 in.)

Service Limit: 23.80 mm (0.937 in.)

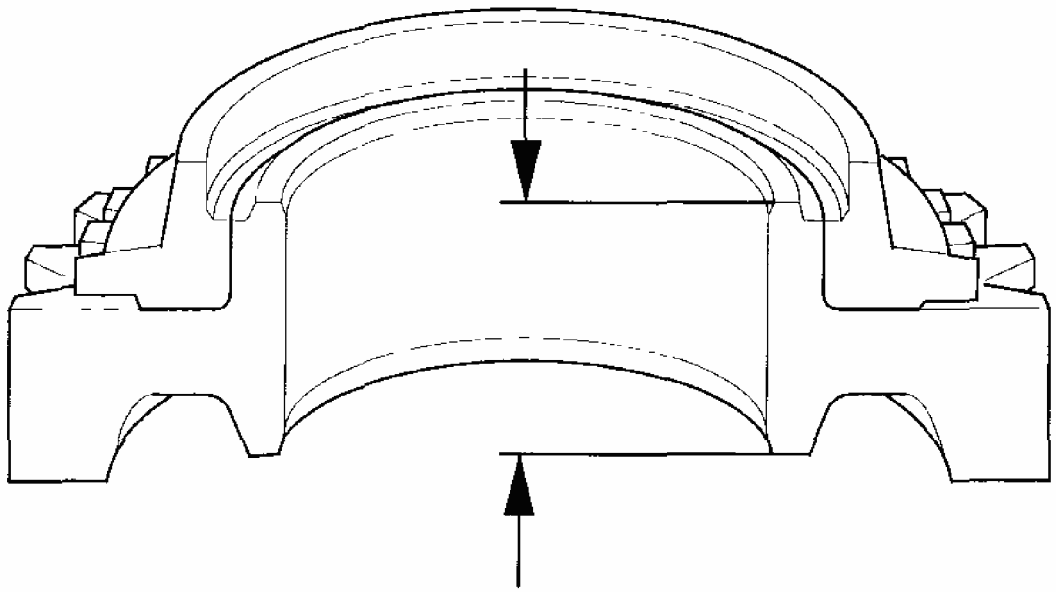

Fig. 75: Measuring Fifth Gear Thickness
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Measure the thickness of the MBS distance collar.

    If the thickness is not within standard, replace the MBS distance collar.

    Standard: 23.95-24.05 mm (0.943-0.947 in.)

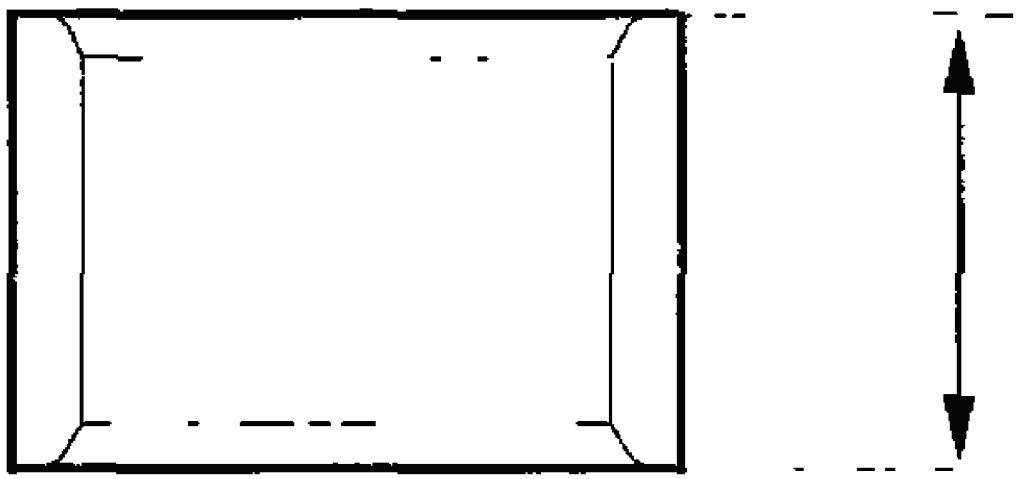

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Fig. 76: Measuring Thickness Of MBS Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT DISASSEMBLY

1. Remove the angular ball bearing (A) and the tapered cone ring using a commercially available bearing separator (B) and a commercially available bearing puller (C). Make sure the bearing separator is under the tapered cone ring.

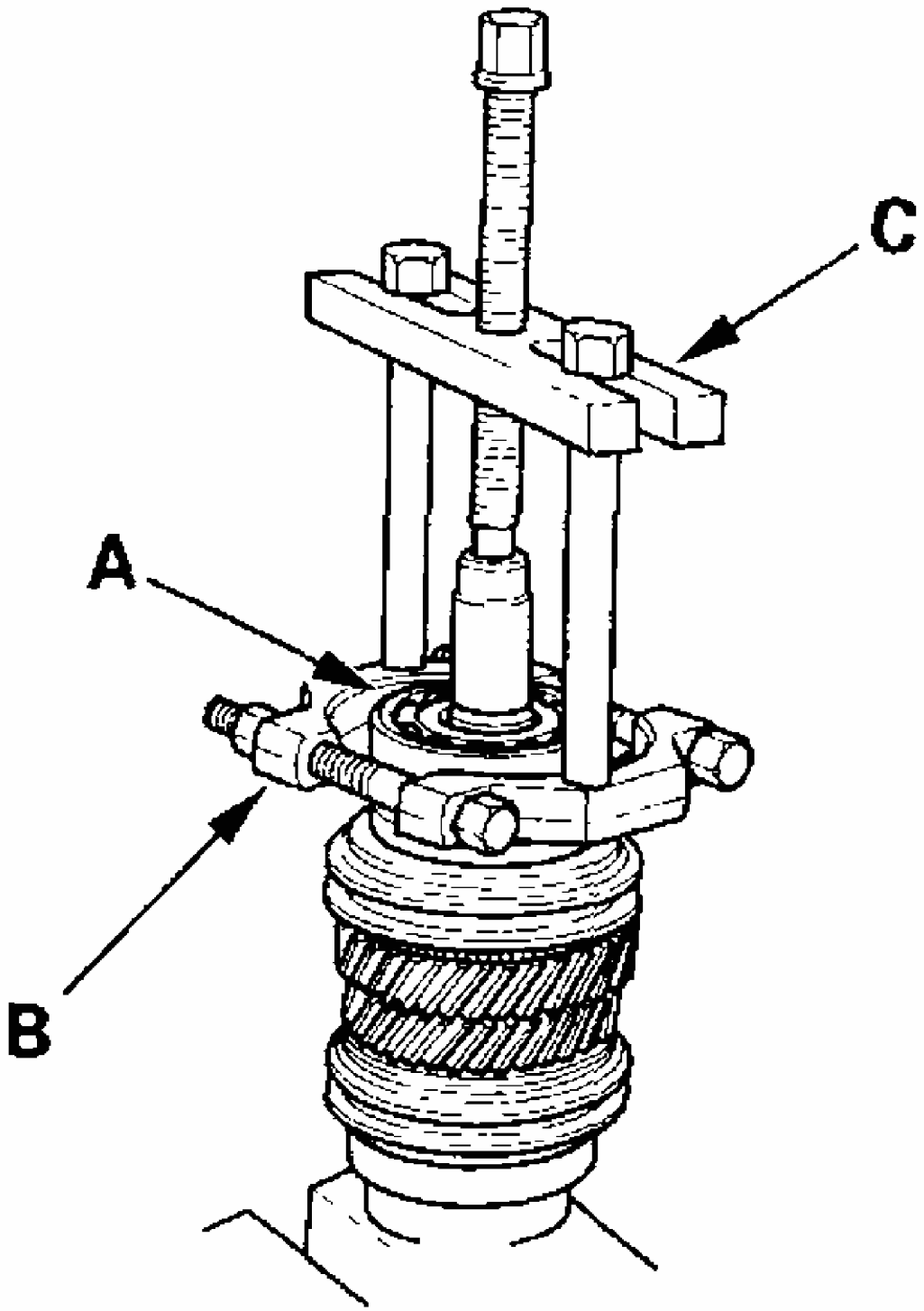

Fig. 77: Removing Angular Ball Bearing And Tapered Cone Ring

Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Support 5th gear (A) on steel blocks, and press the mainshaft out of the 5th synchro hub (B). Use of a jaw-type puller can damage the gear teeth.

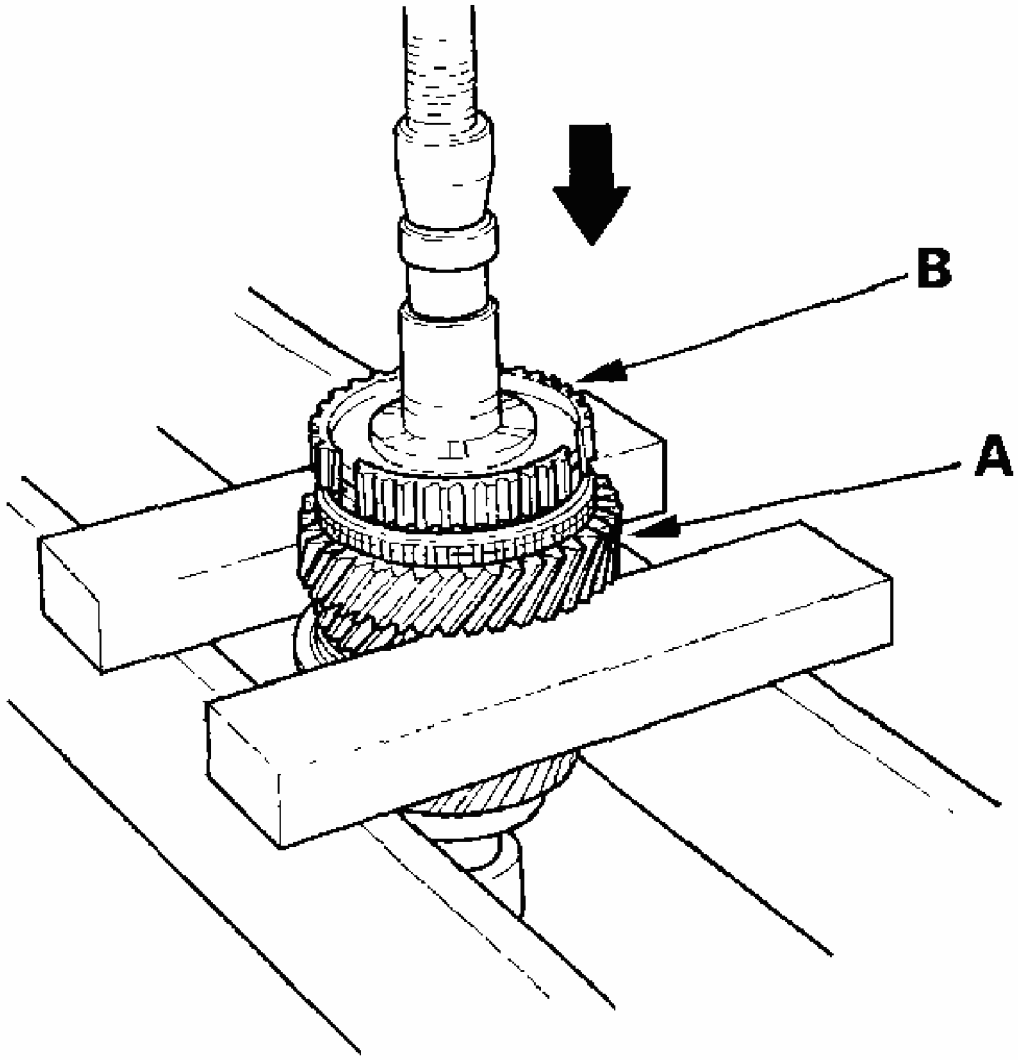

Fig. 78: Removing Mainshaft Out Of Fifth Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Support 3rd gear (A) on steel blocks, and press the mainshaft out of the 3rd/4th synchro hub (B). Use of a jaw-type puller can damage the gear teeth.

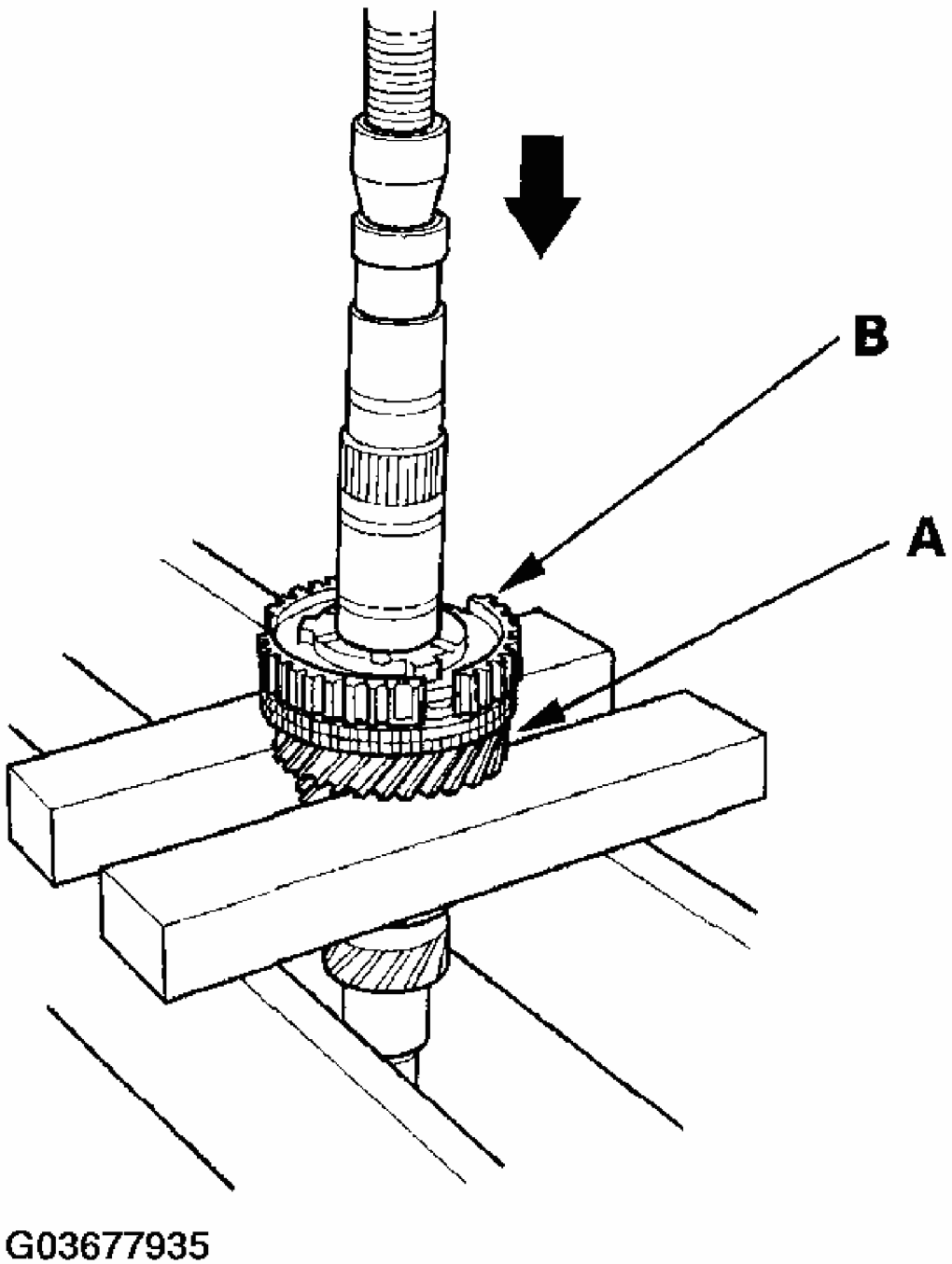

Fig. 79: Removing Mainshaft Out Of Third/Fourth Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT INSPECTION

1. Inspect the gear and bearing surfaces for wear and damage, then measure the mainshaft

at points A, B, C, D, and E. If any part of the mainshaft is less than the service limit, replace it.

Standard:

A Ball Bearing Surface (Transmission Housing Side):

27.987-28.000 mm (1.1019-1.1024 in.)

B Distance Collar Surface:

31.984-32.000 mm (1.2594-1.2598 in.)

C Needle Bearing Surface:

38.984-39.000 mm (1.5348-1.5354 in.)

D Ball Bearing Surface (Clutch Housing Side):

27.977-27.990 mm (1.1015-1.1020 in.)

E Bushing Surface:

20.80-20.85 mm (0.8189-0.8209 in.)

Service Limit:

A: 27.94 mm (1.100 in.)

B: 31.93 mm (1.257 in.)

C: 38.93 mm (1.533 in.)

D: 27.94 mm (1.100 in.)

E: 20.75 mm (0.817 in.)

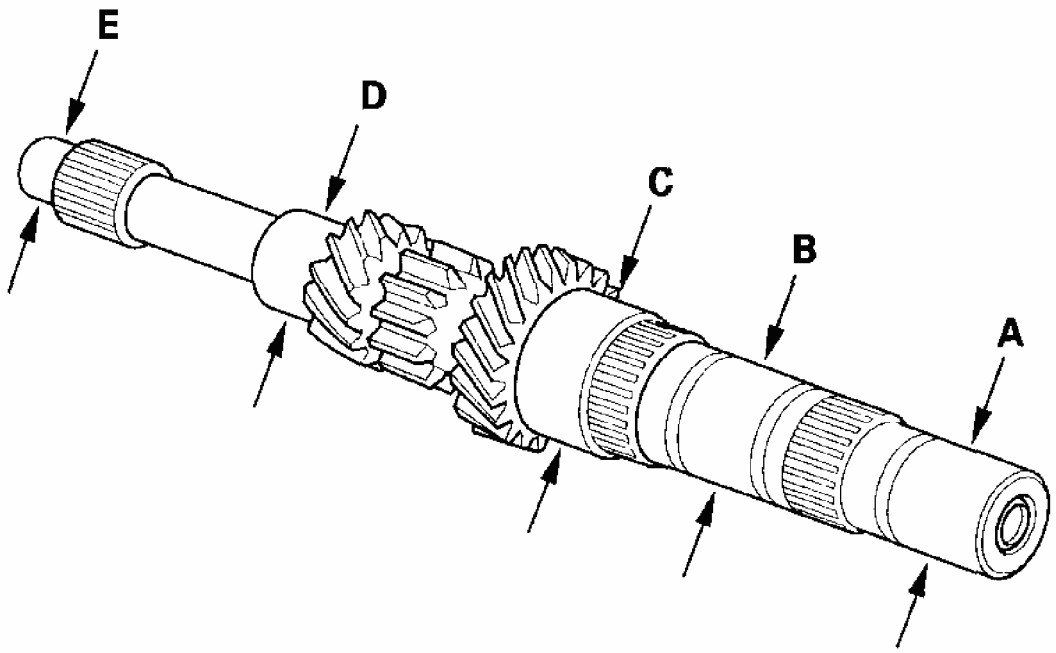

Fig. 80: Inspecting Mainshaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Inspect the runout by supporting both ends of the mainshaft. Then rotate the mainshaft two complete turns while measuring with a dial gauge. If the runout is more than the service limit, replace the mainshaft.

   Standard: 0.02 mm (0.001 in.) max.

   Service Limit: 0.05 mm (0.002 in.)

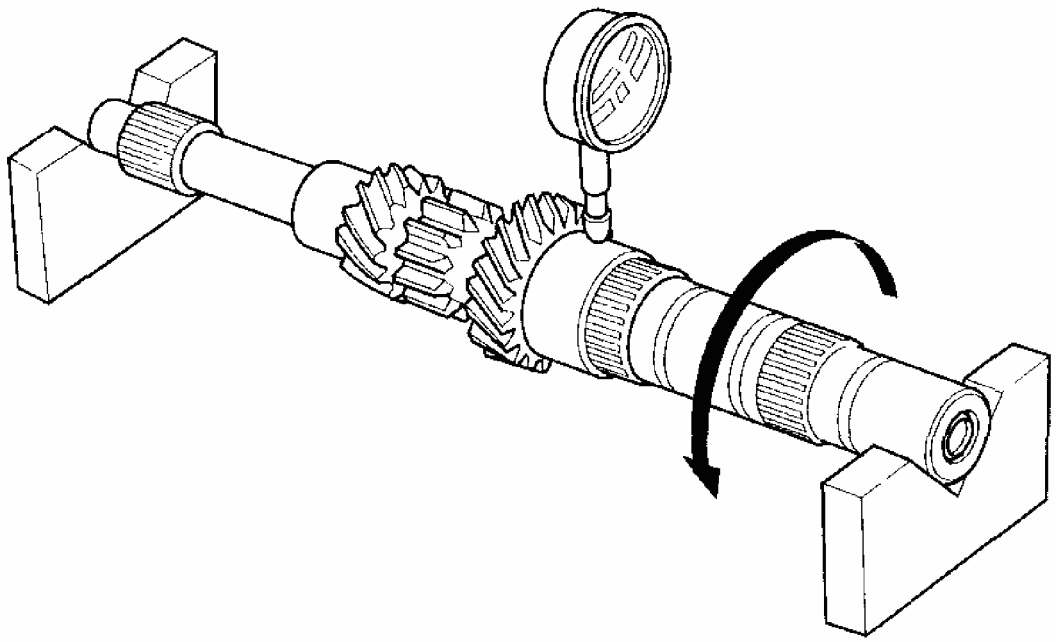

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Fig. 81: Measuring Mainshaft Runout
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT REASSEMBLY

Exploded View

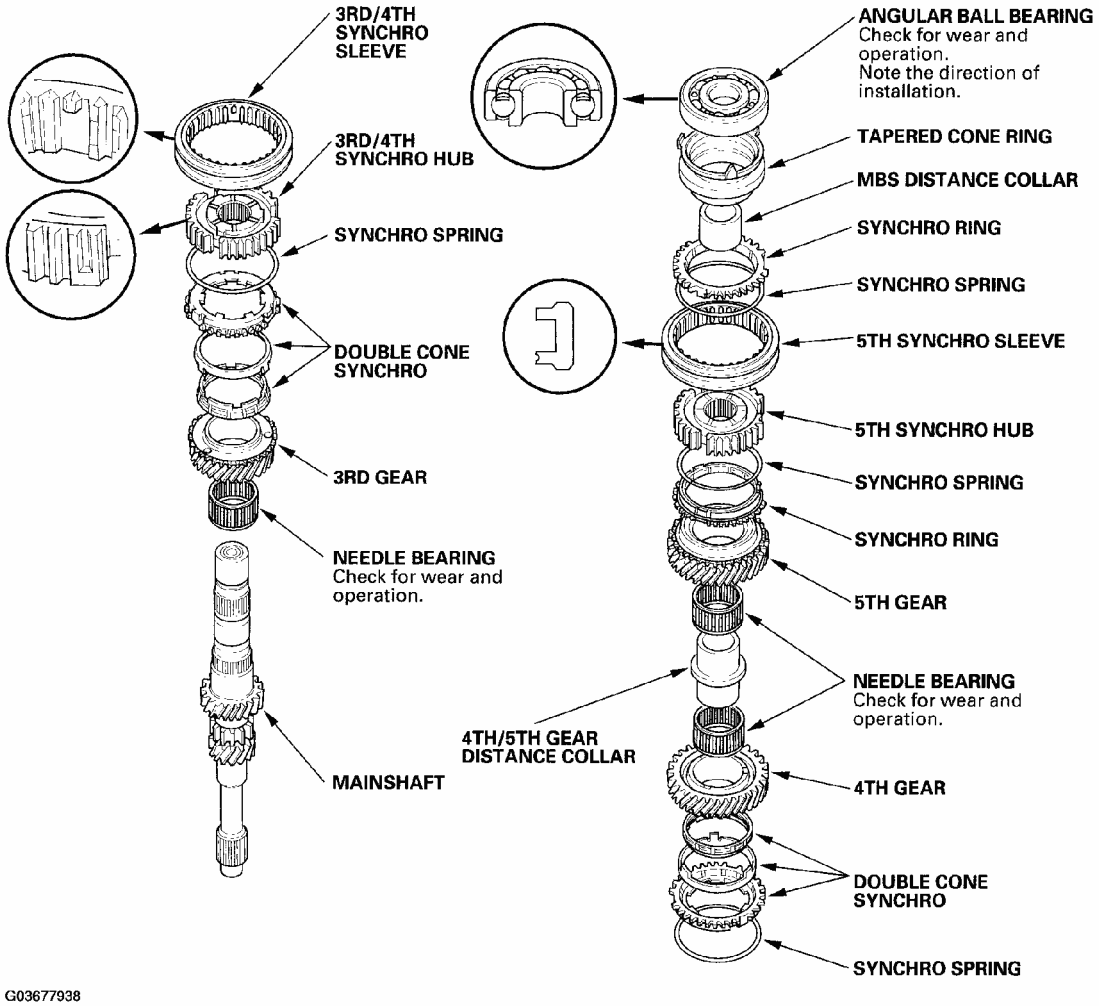

Fig. 82: Exploded View Of Mainshaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Special Tools Required

- Driver handle 07746-0030100
- Attachment, 30 mm I.D. 07746-0030300

NOTE: Refer to the EXPLODED VIEW as needed during this procedure.

1. Clean all parts in solvent, dry them, and apply lubricant to all contact surfaces except the 3rd/4th and 5th synchro hubs.
2. Install the needle bearing and 3rd gear on the mainshaft.
3. Install the double cone synchro assembly (A) by aligning the synchro cone fingers (B) with the holes in 3rd gear (C), then install the synchro spring (D).

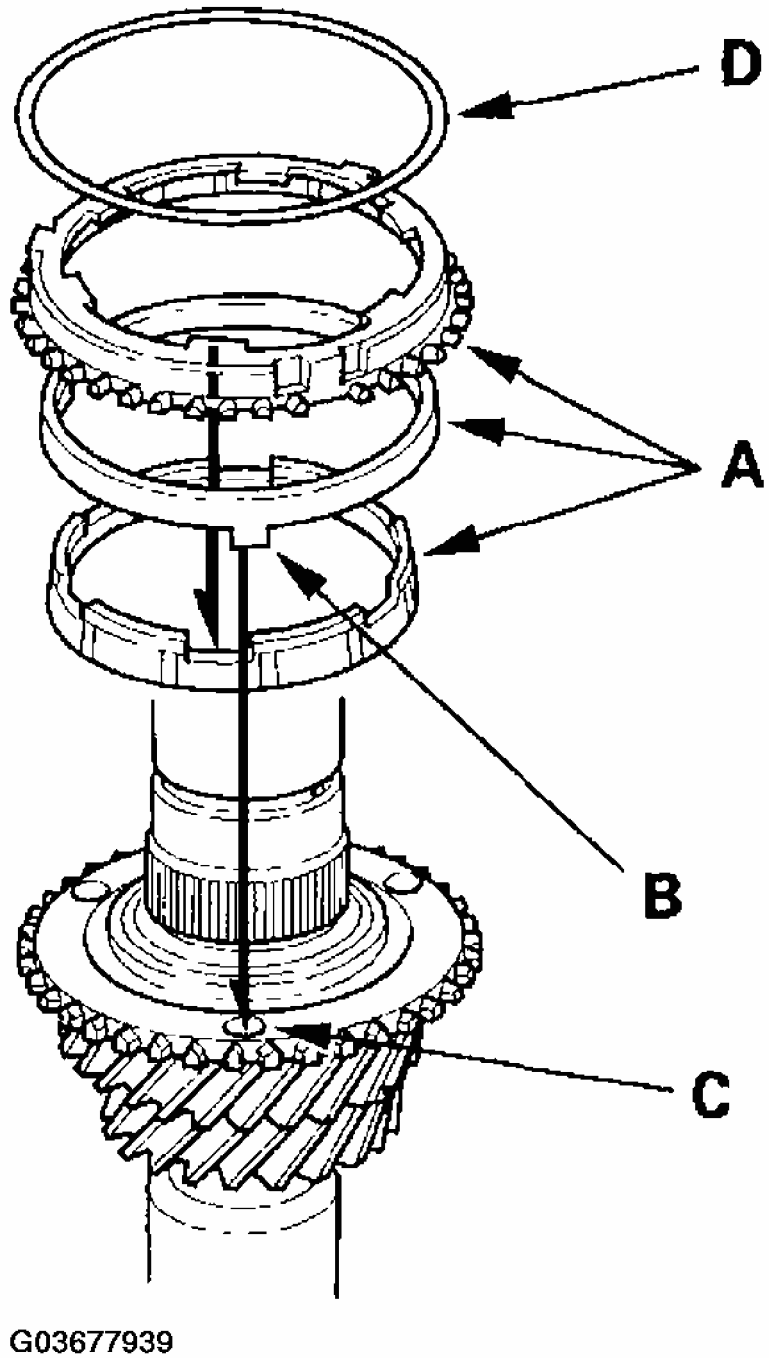

Fig. 83: Installing Double Cone Synchro Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the 3rd/4th synchro hub (A) by aligning the synchro ring fingers (B) with the grooves in the 3rd/4th synchro hub (C).

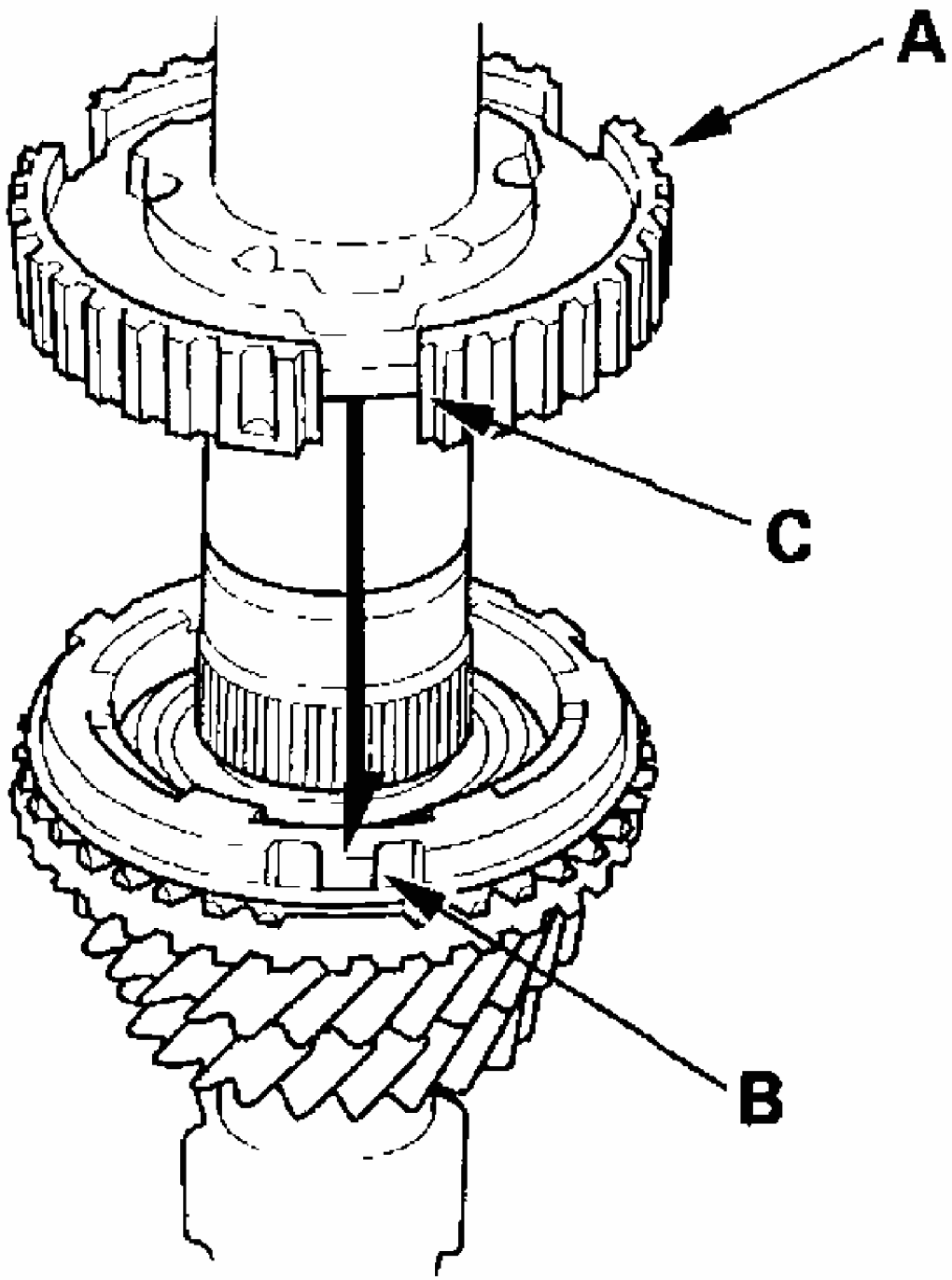

Fig. 84: Installing Third/Fourth Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the 3rd/4th synchro hub (A) using the special tool.

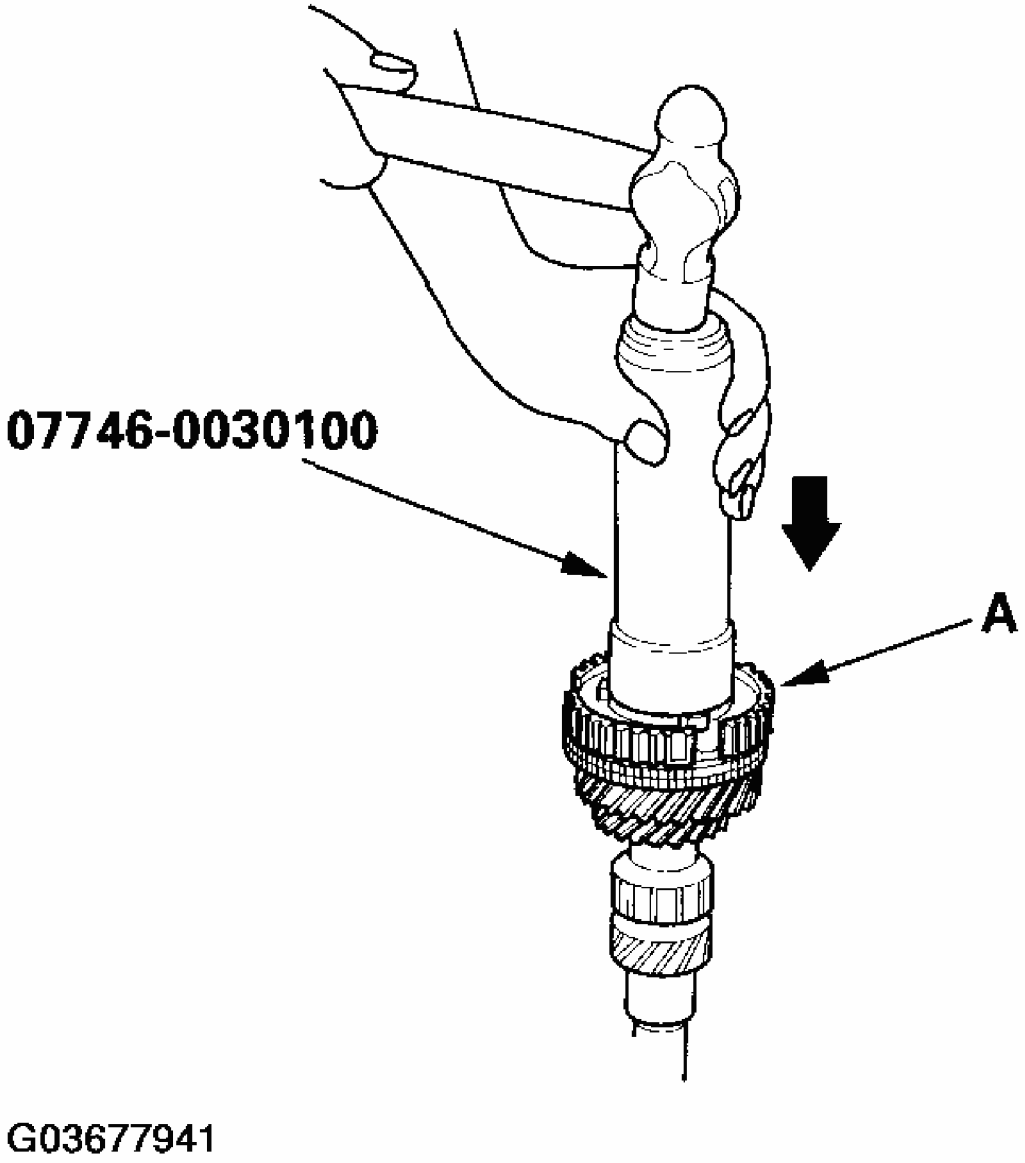

Fig. 85: Installing Third/Fourth Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the 3rd/4th synchro sleeve (A) by aligning the stops (B) with the 3rd/4th synchro sleeve and hub. After installing, check the operation of the 3rd/4th synchro hub set.

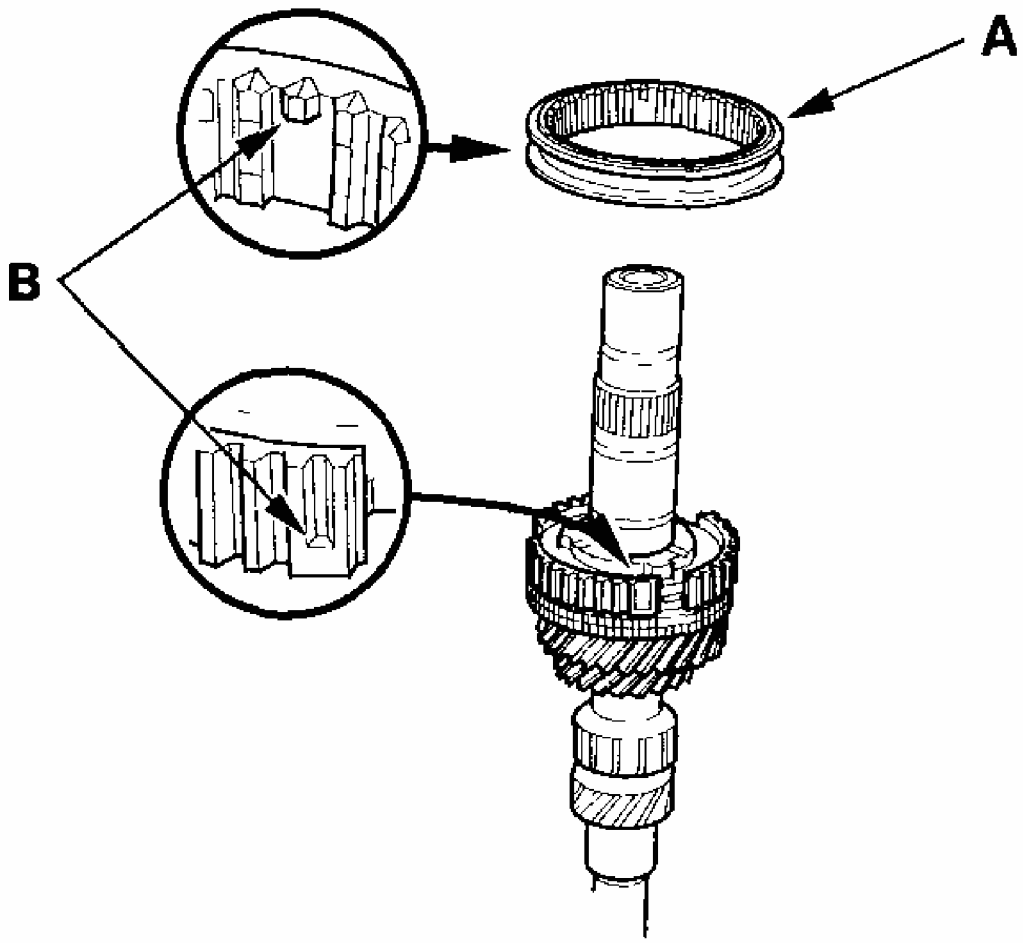

Fig. 86: Installing Third/Fourth Synchro Sleeve
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the synchro spring (A).

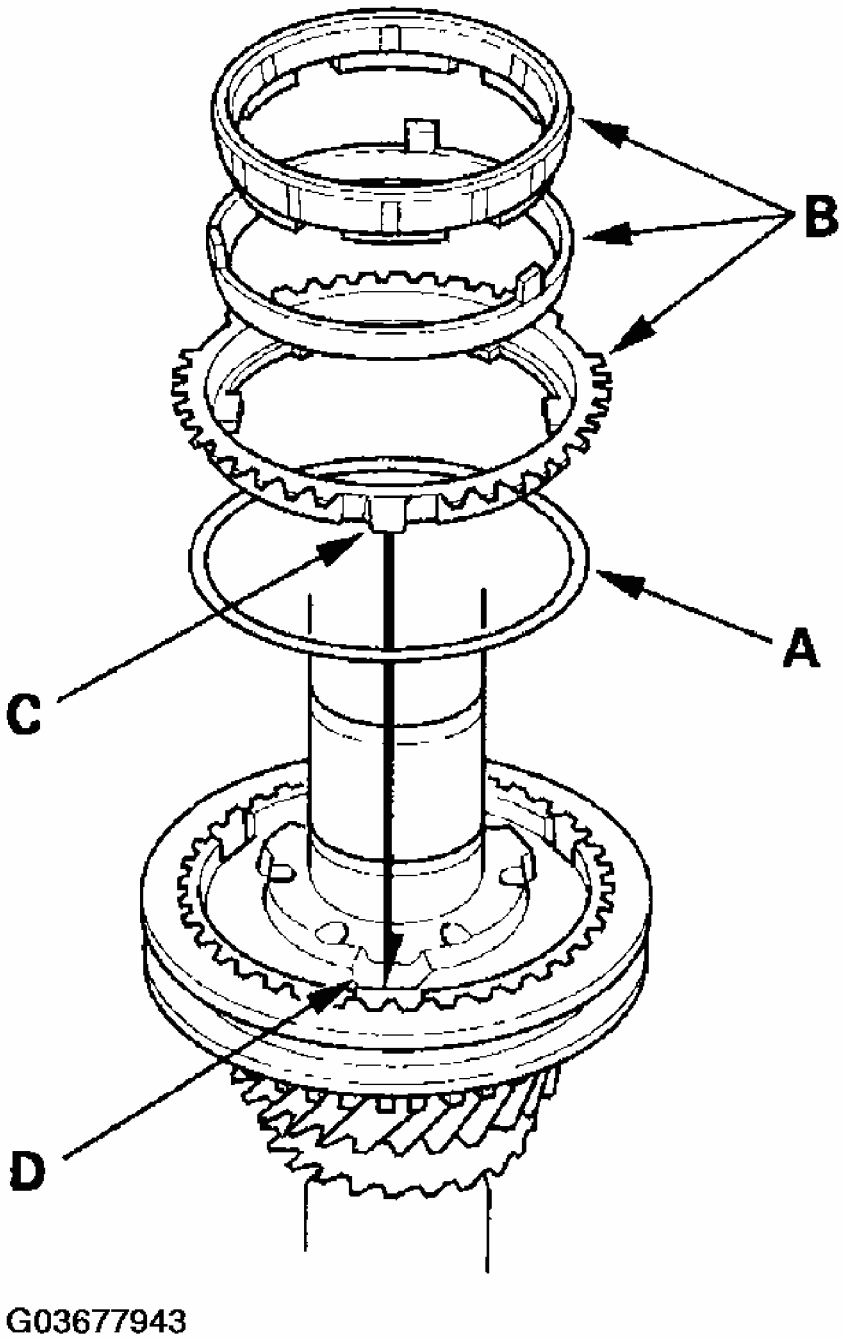

Fig. 87: Installing Synchro Spring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Install the double cone synchro assembly (B) by aligning the synchro ring fingers (C) with the grooves in the 3rd/4th synchro hub (D).
9. Install 4th gear (A) by aligning the synchro cone fingers (B) with holes in 4th gear (C).

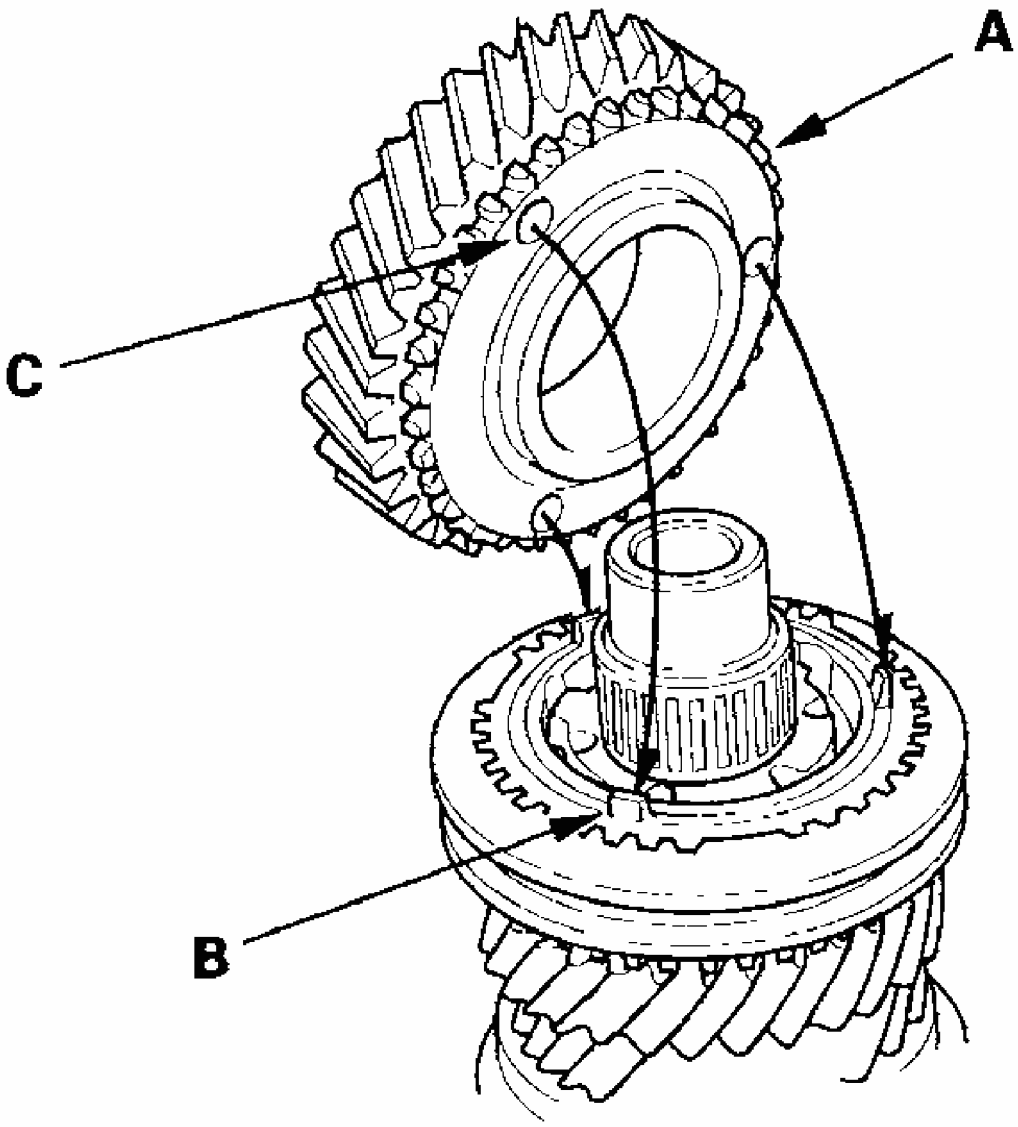

Fig. 88: Installing Fourth Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the needle bearings, distance collar, 5th gear, and 5th gear synchro spring and ring.
11. Install the 5th synchro hub (A) by aligning the synchro ring fingers (B) with the grooves in the 5th synchro hub (C).

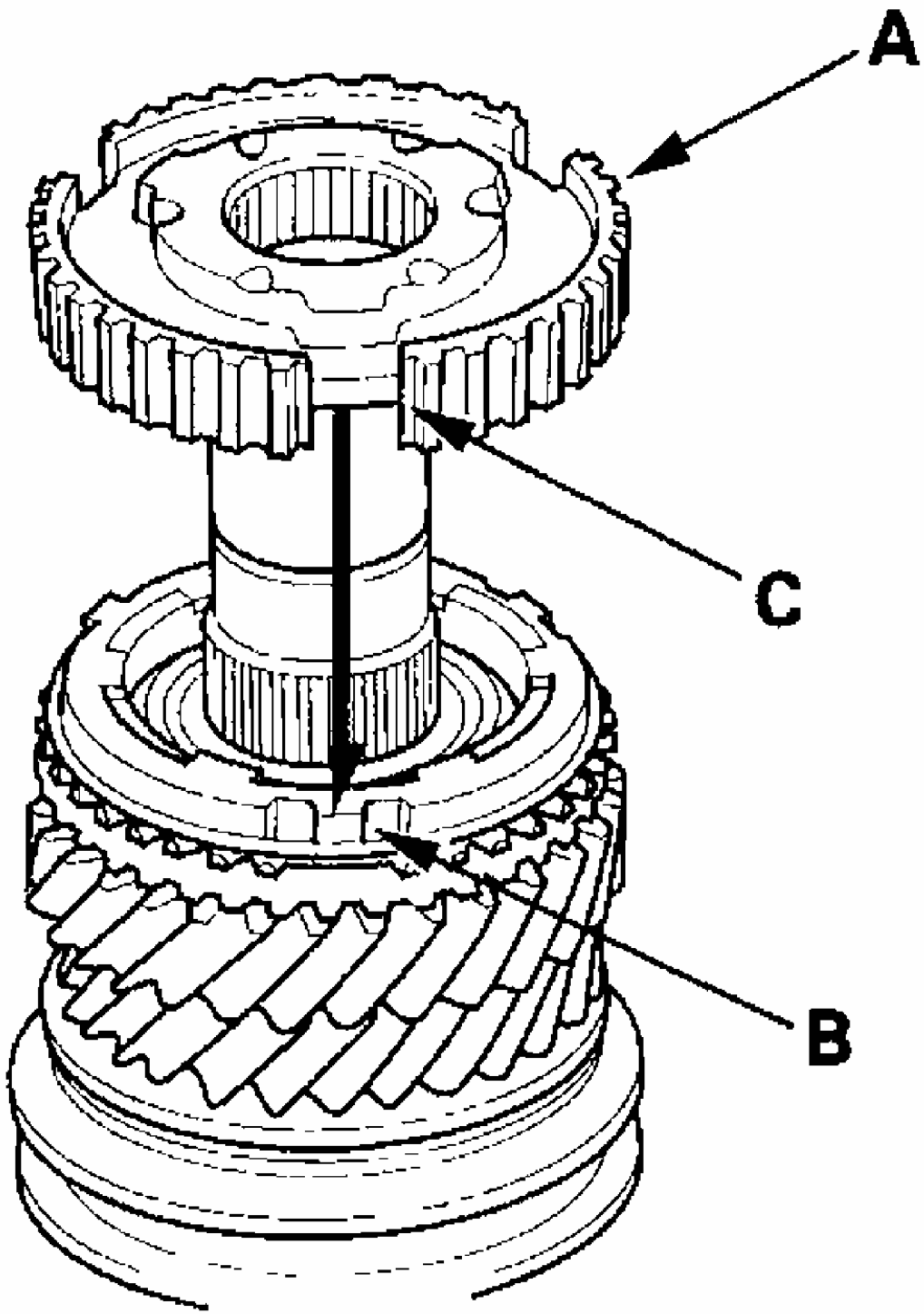

Fig. 89: Installing Fifth Synchro Hub

Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Install the 5th synchro hub (A) using the special tools.

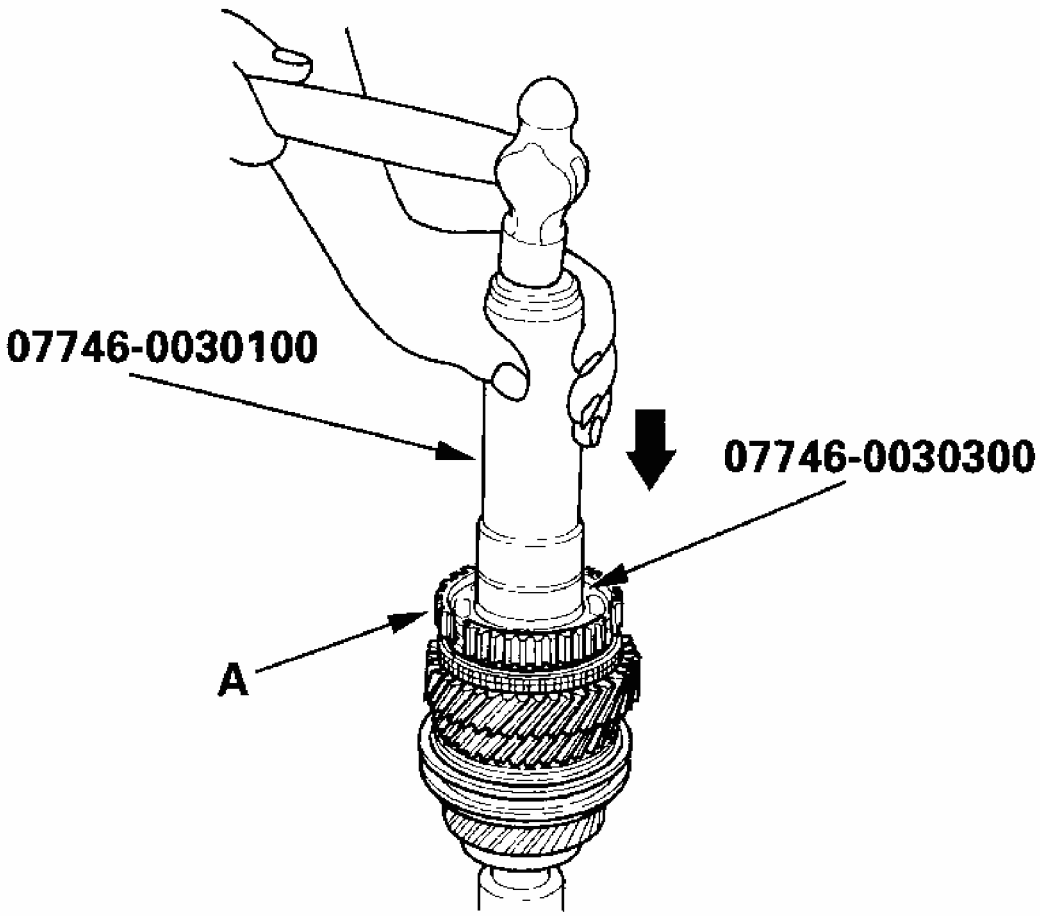

Fig. 90: Installing Fifth Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Install the 5th synchro sleeve.
14. Install the synchro spring (A).

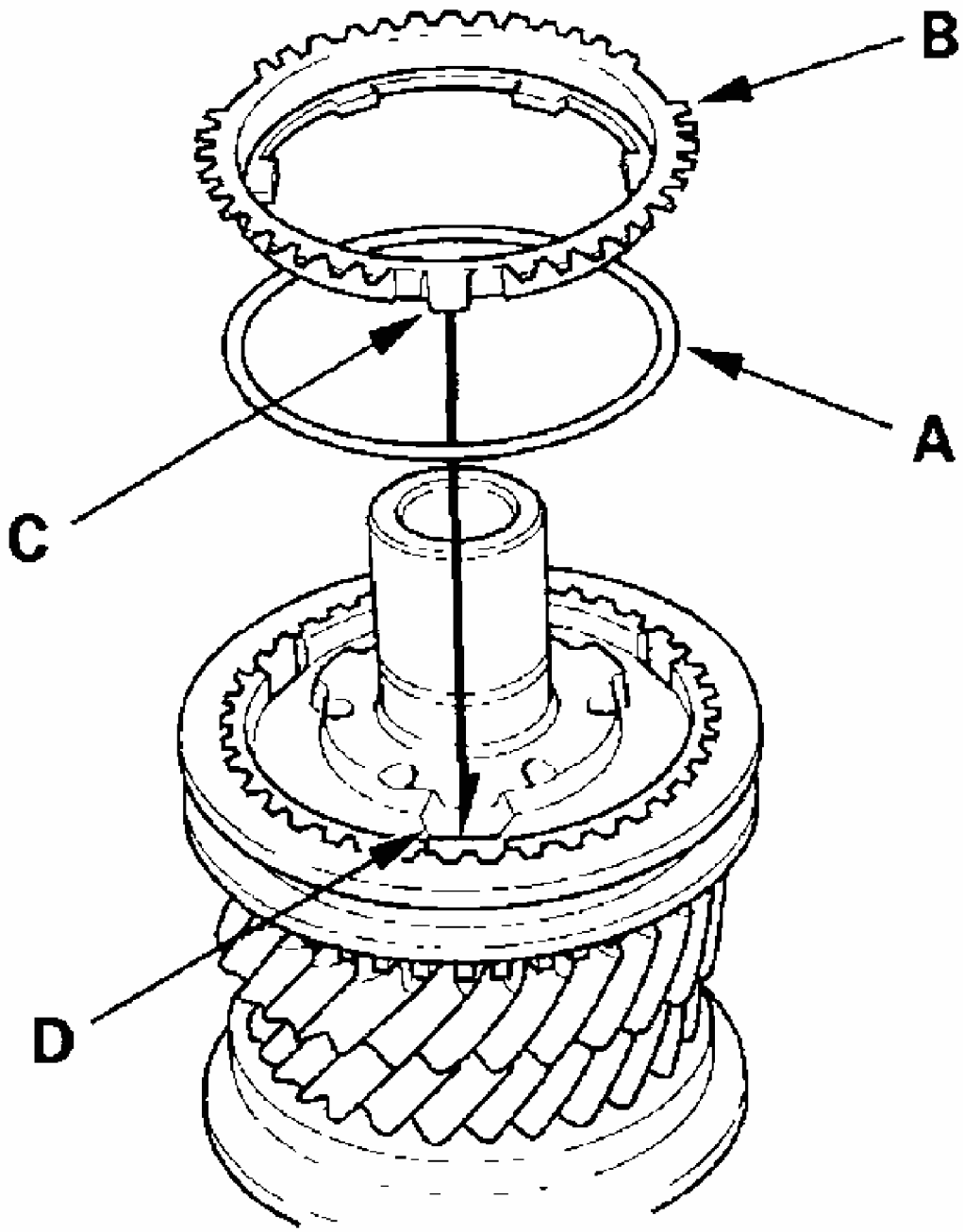

Fig. 91: Installing Synchro Spring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Install the synchro ring (B) by aligning the synchro ring fingers (C) with the grooves in the 5th synchro hub (D).

16. Install the MBS distance collar and the tapered cone ring.
17. Install the new ball bearing (A) using the special tools and a press (B).

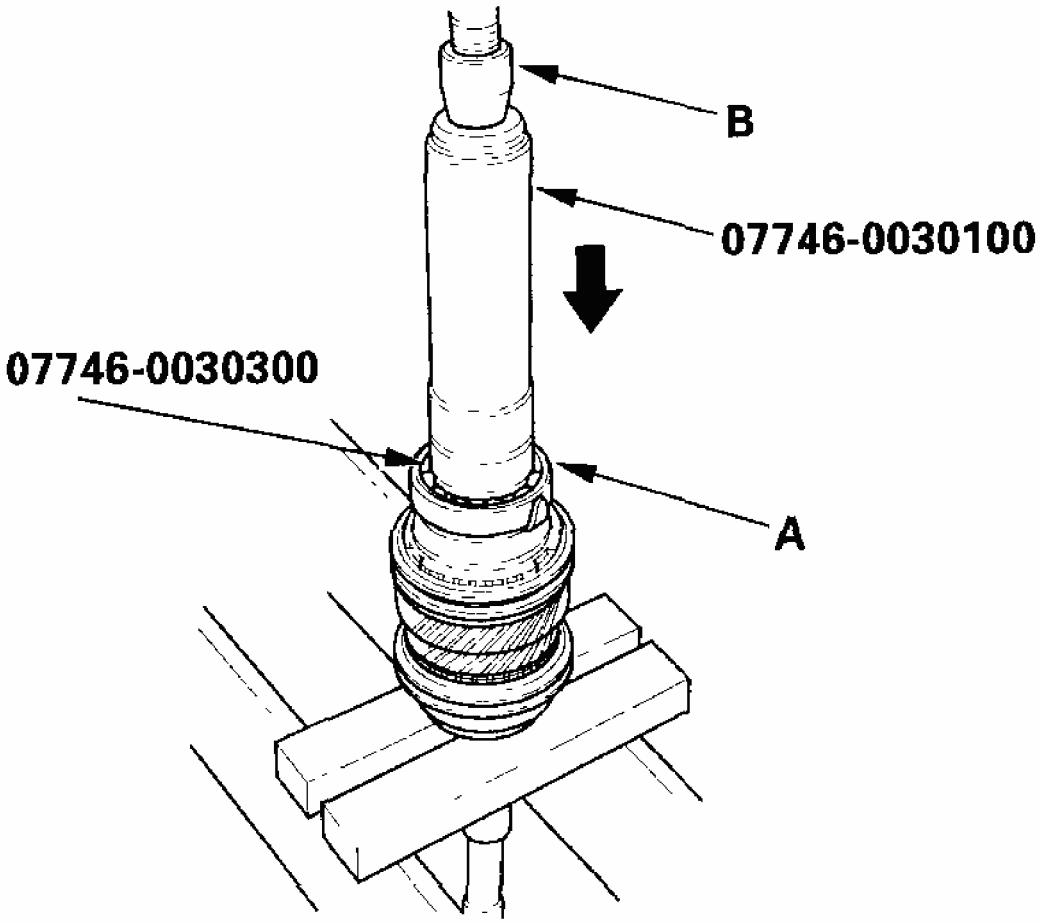

Fig. 92: Installing Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT ASSEMBLY CLEARANCE INSPECTION

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

1. Measure the clearance between 1st gear (A) and the distance collar (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

   Standard: 0.06-0.16 mm (0.002-0.006 in.)

Service Limit: 0.25 mm (0.010 in.)

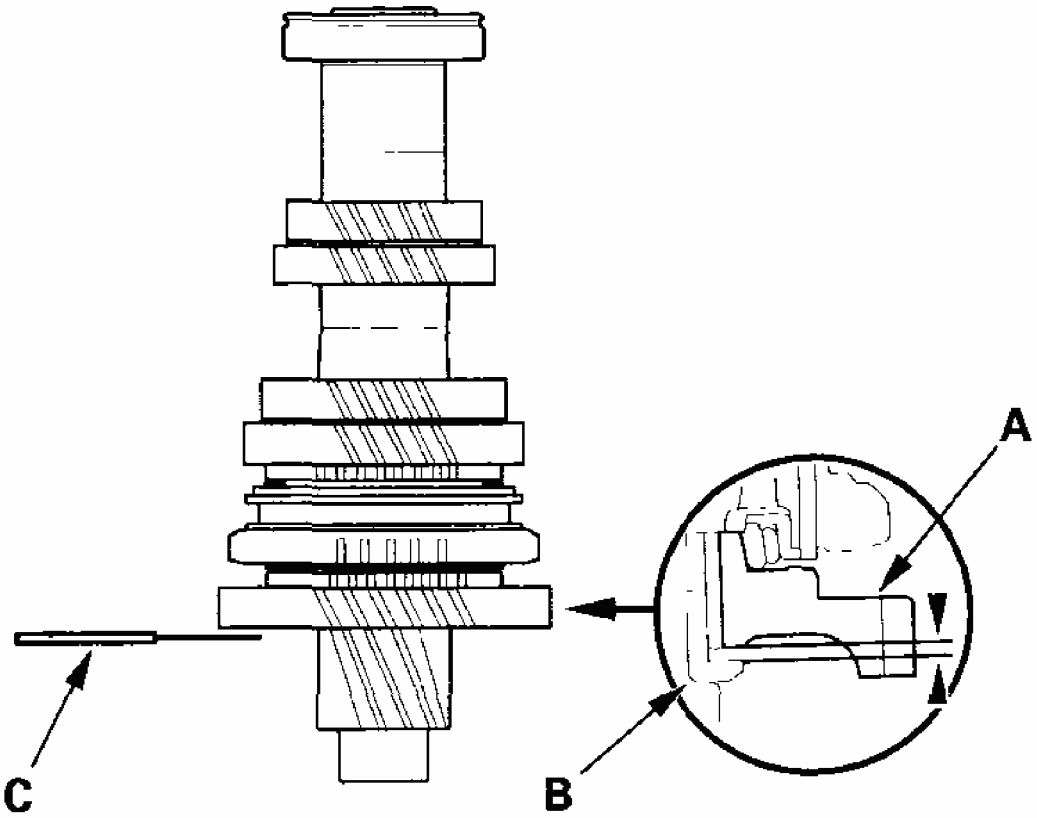

Fig. 93: Measuring Clearance Between First Gear And Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the thickness of the distance collar.
   - If the thickness is not within the standard, replace the distance collar.
   - If the thickness is within the standard, go to step 3.

Standard: 23.03-23.08 mm (0.907-0.909 in.)

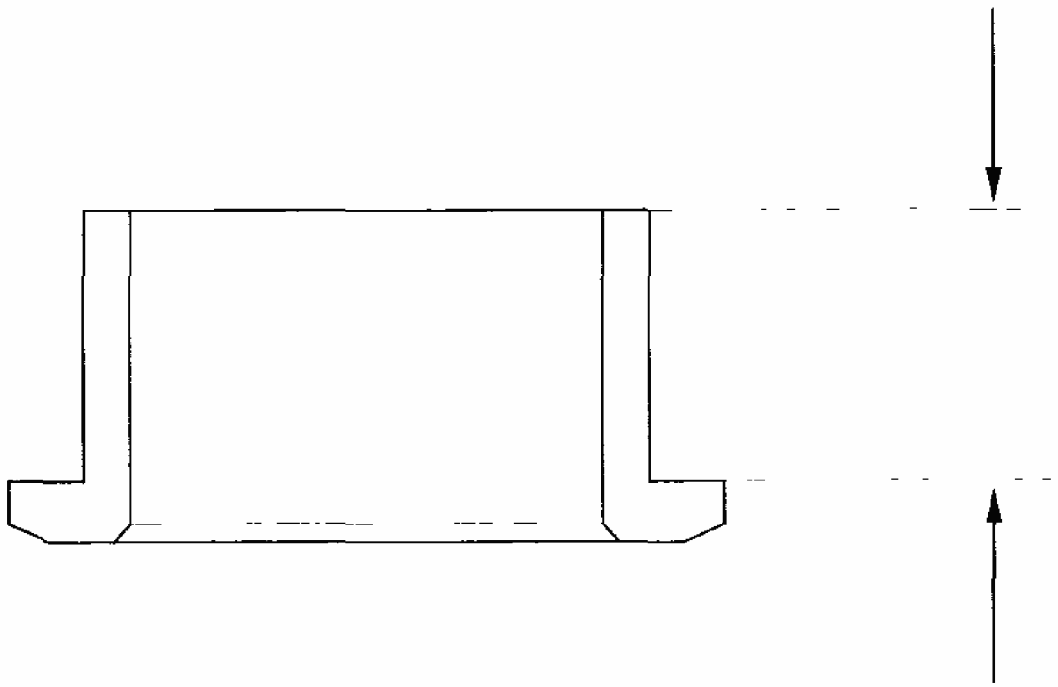

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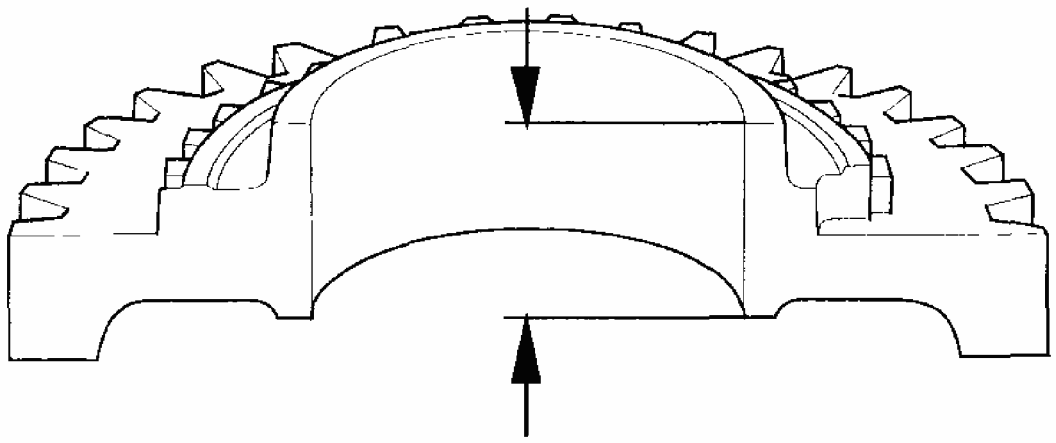
Fig. 94: Measuring Thickness Of Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Measure the thickness of 1st gear.
   - If the thickness is less than the service limit, replace 1st gear.
   - If the thickness is within the service limit, replace the 1st/2nd synchro hub and sleeve.

Standard: 22.92-22.97 mm (0.902-0.904 in.)

Service Limit: 22.87 mm (0.900 in.)



G03677951

Fig. 95: Measuring Thickness Of First Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Measure the clearance between 2nd gear (A) and 3rd gear (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 5.

   Standard: 0.06-0.16 mm (0.002-0.006 in.)

   Service Limit: 0.25 mm (0.010 in.)

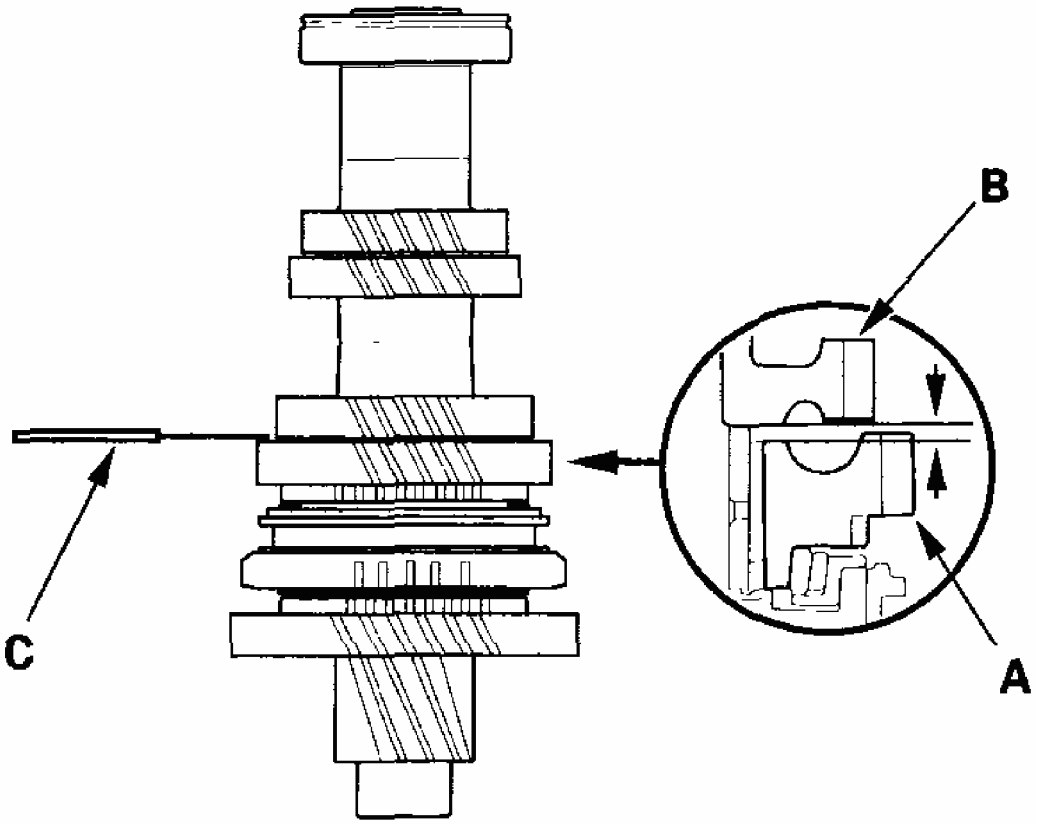
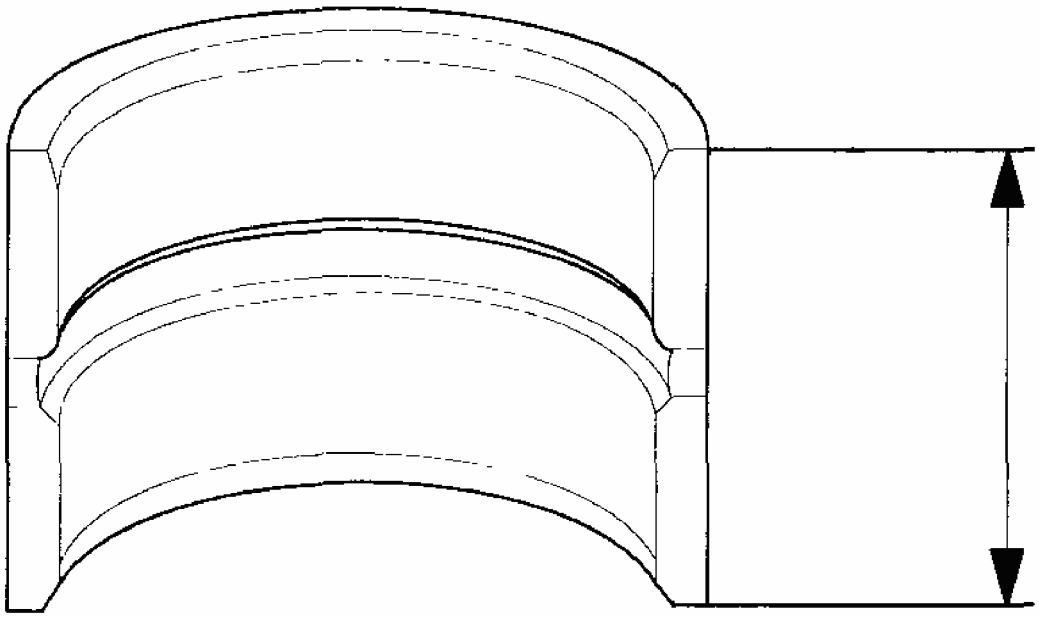


Fig. 96: Measuring Clearance Between Second And Third Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Measure the thickness of the distance collar.
   - If the thickness is not within the standard, replace the distance collar.
   - If the thickness is within the standard, go to step 6.

Standard: 28.03-28.08 mm (1.104-1.106 in.)



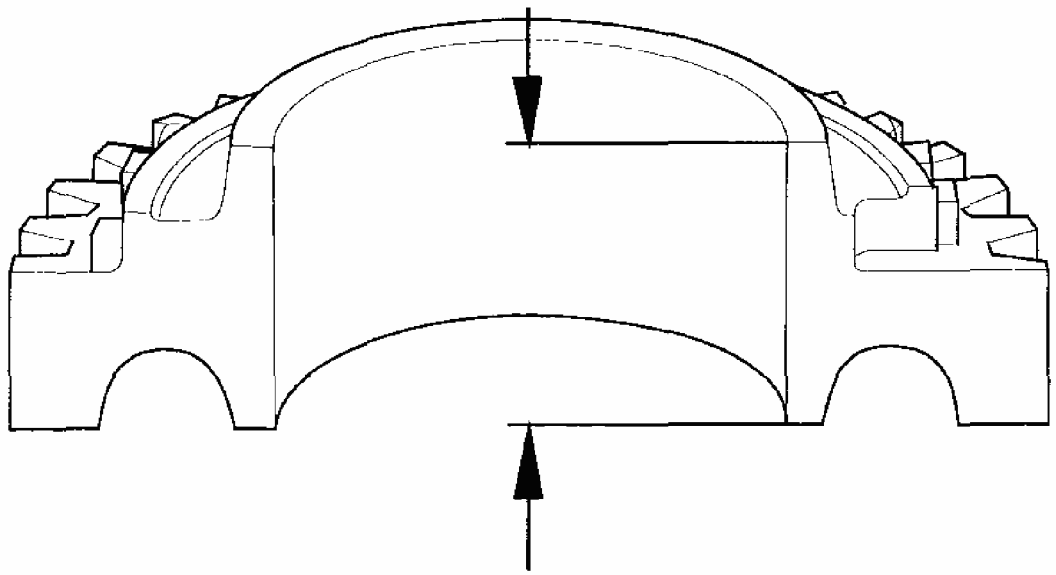
G03677953

Fig. 97: Measuring Thickness Of Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Measure the thickness of 2nd gear.
   - If the thickness is less than the service limit, replace 2nd gear.
   - If the thickness is within the service limit, replace the 1st/2nd synchro hub and sleeve.

Standard: 27.92-27.97 mm (1.099-1.101 in.)

Service Limit: 27.87 mm (1.097 in.)

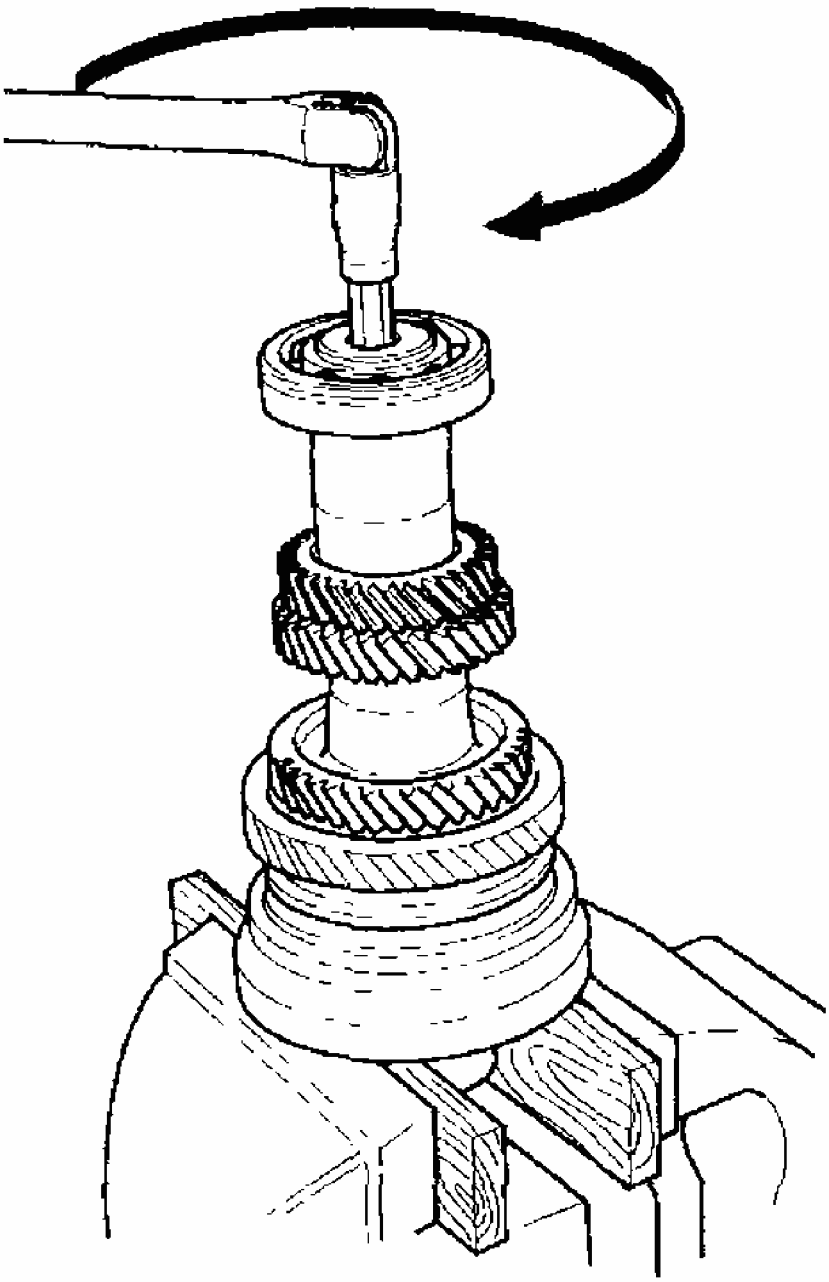


G03677954

Fig. 98: Measuring Thickness Of Second Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT DISASSEMBLY

1. Securely clamp the countershaft assembly in a bench vise with wood blocks.



G03677955

Fig. 99: Removing Countershaft Assembly Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Remove the special bolt (left-hand threads).
3. Support the ball bearing (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft out of the ball bearing.

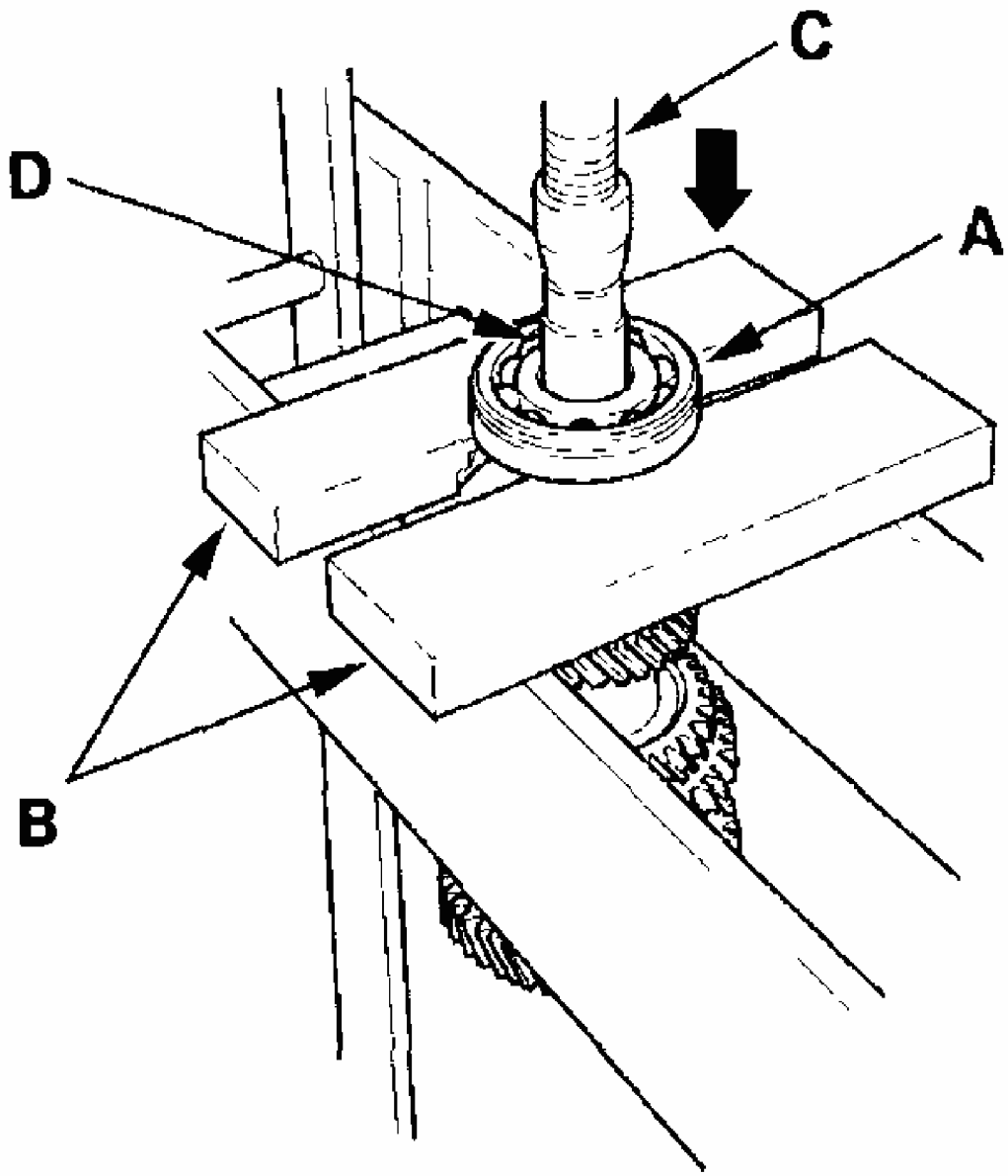


Fig. 100: Pressing Countershaft Out Of Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the 35 mm shim and distance collar.
5. Support 4th gear (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of 5th gear.

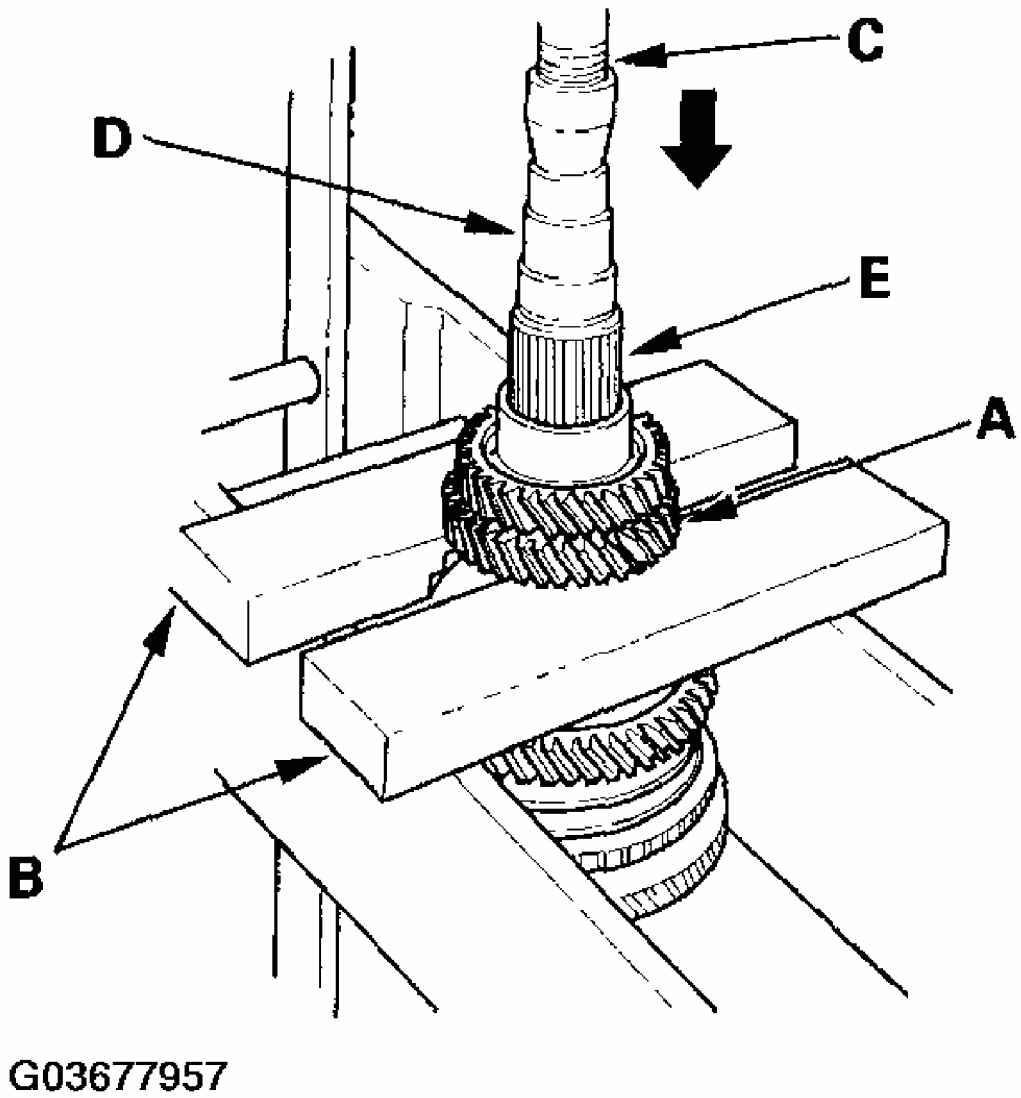


Fig. 101: Removing Countershaft Out Of Fifth Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Support 2nd gear (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of 3rd gear.

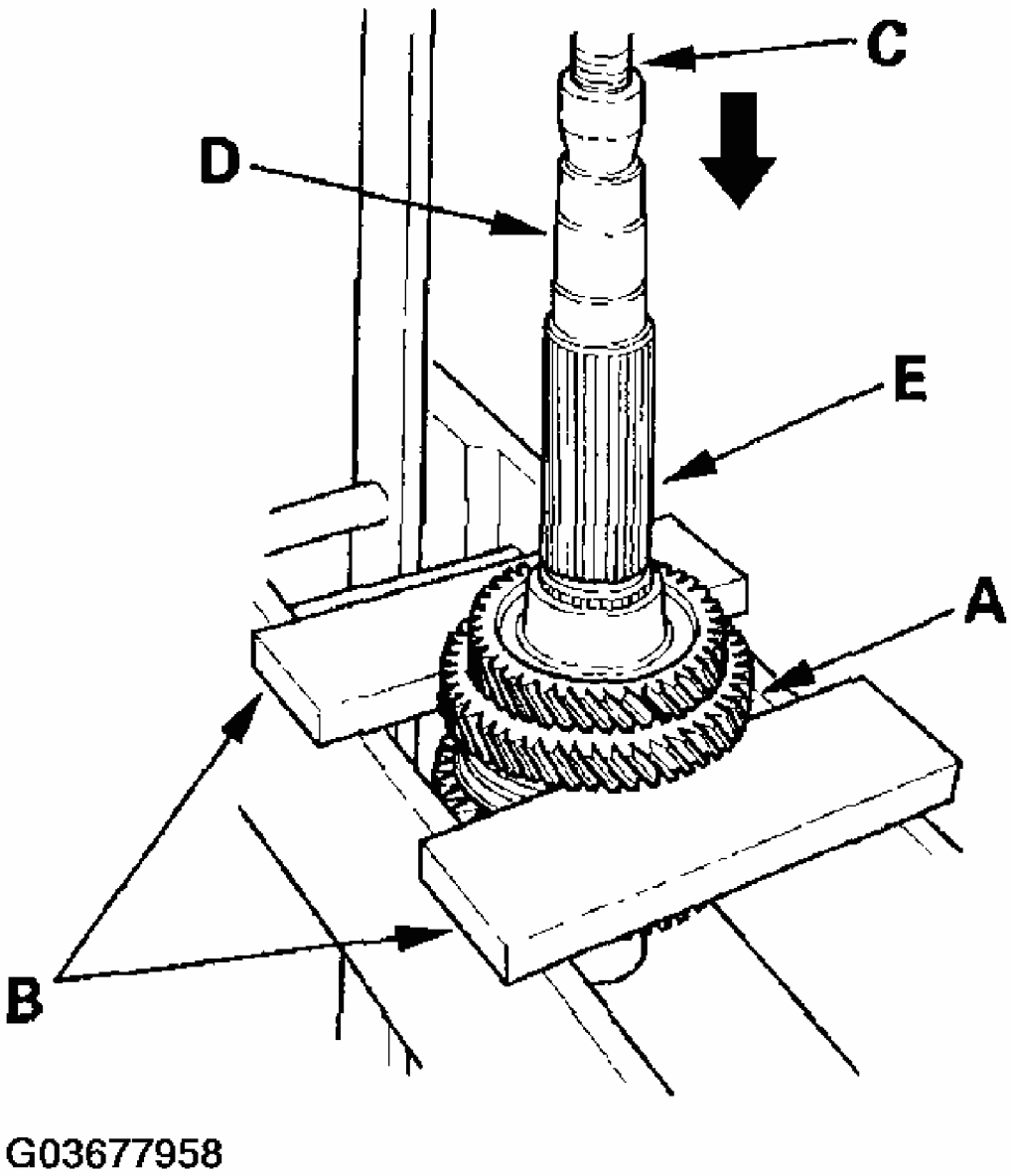


Fig. 102: Removing Countershaft Out Of Third Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT INSPECTION

1. Inspect the gear and bearing surfaces for wear and damage, then measure the countershaft at points A, B, and C. If any part of the countershaft is less than the service limit, replace it.

   Standard:

A Ball Bearing Surface (Transmission Housing Side): 30.020-30.033 mm (1.1819-1.1824 in.)

B Distance Collar Surface: 39.937-39.950 mm (1.5723-1.5728 in.)

C Needle Bearing Surface (Clutch Housing Side): 35.000-35.015 mm (1.3780-1.3785 in.)

Service Limit:

A: 29.97 mm (1.180 in.)

B: 39.88 mm (1.570 in.)

C: 34.95 mm (1.376 in.)

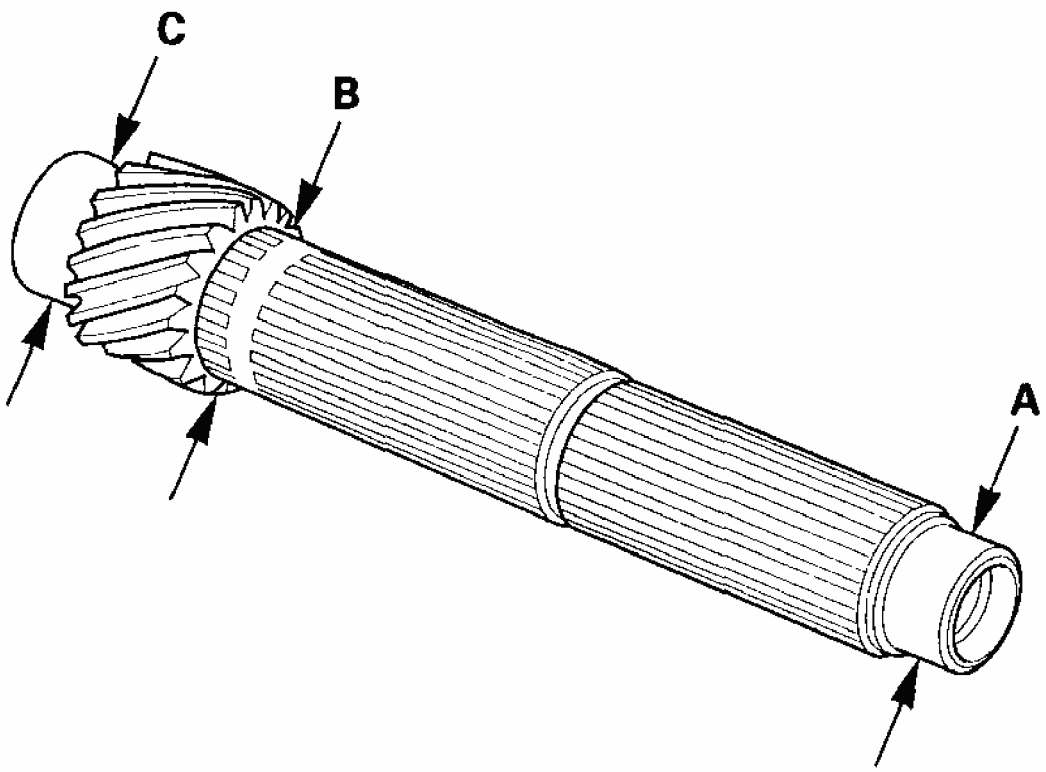


Fig. 103: Inspecting Countershaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Inspect the runout by supporting both ends of the countershaft. Then rotate the

countershaft two complete turns while measuring with a dial gauge. If the runout exceeds the service limit, replace the countershaft.

Standard: 0.02 mm (0.001 in.) max.

Service Limit: 0.05 mm (0.002 in.)

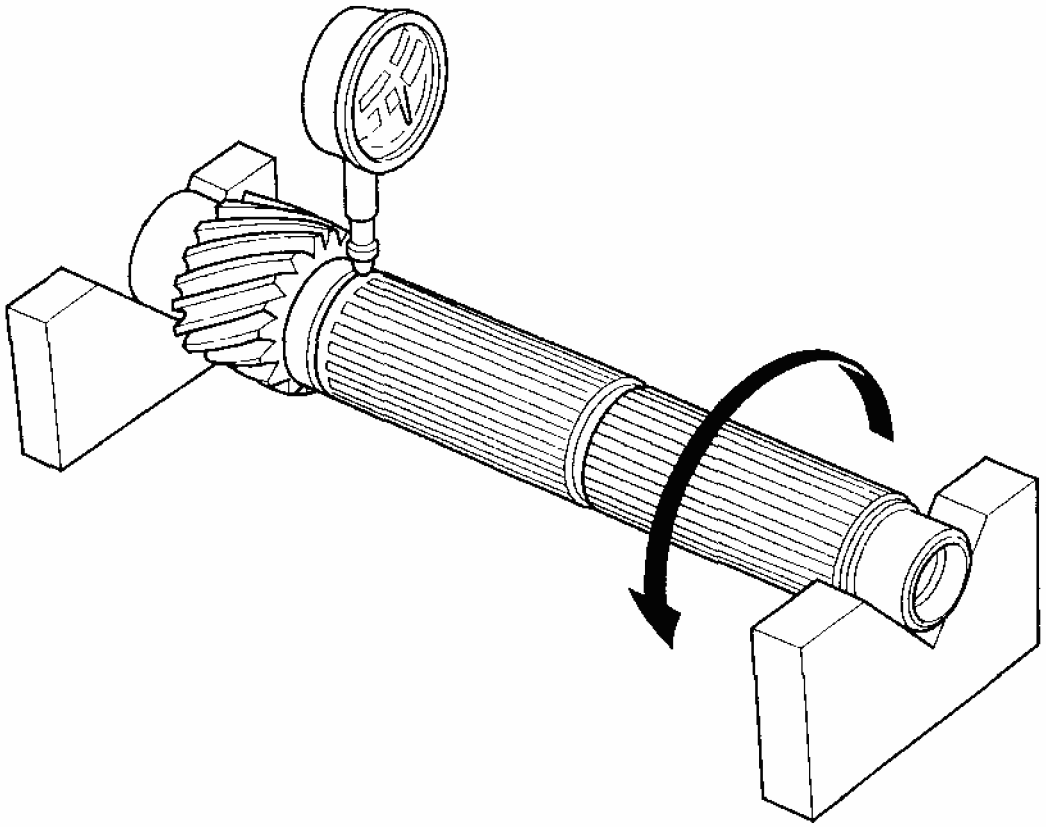


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Fig. 104: Measuring Countershaft Runout
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT REASSEMBLY

Exploded View

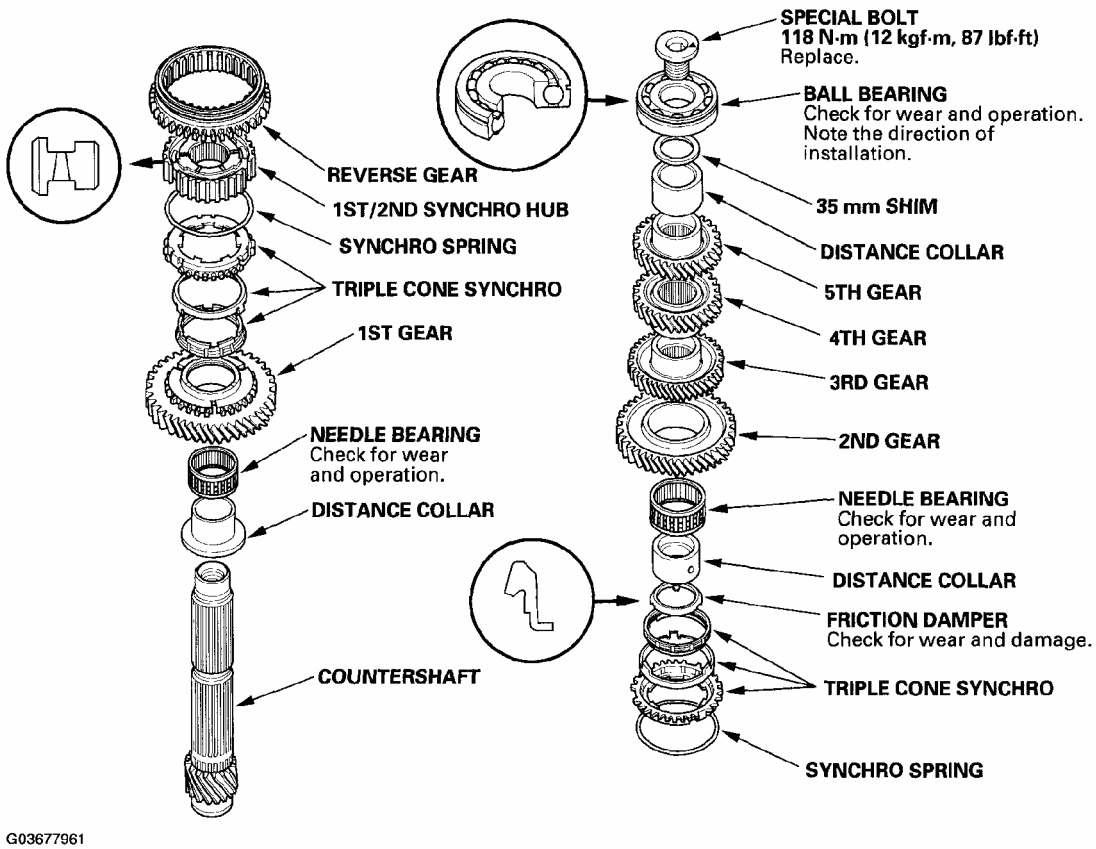

Fig. 105: Exploded View Of Countershaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Special Tools Required

- Driver handle 07746-0030100
- Attachment, 30 mm I.D. 07746-0030300

NOTE: Refer to the EXPLODED VIEW as needed during this procedure.

1. Clean all parts in solvent, dry them, and apply lubricant to all contact surfaces.
2. Install the distance collar, needle bearing, and 1st gear onto the countershaft.
3. Install the triple cone synchro assembly (A) by aligning the synchro cone fingers (B) with the grooves in 1st gear (C), then install the synchro spring (D).

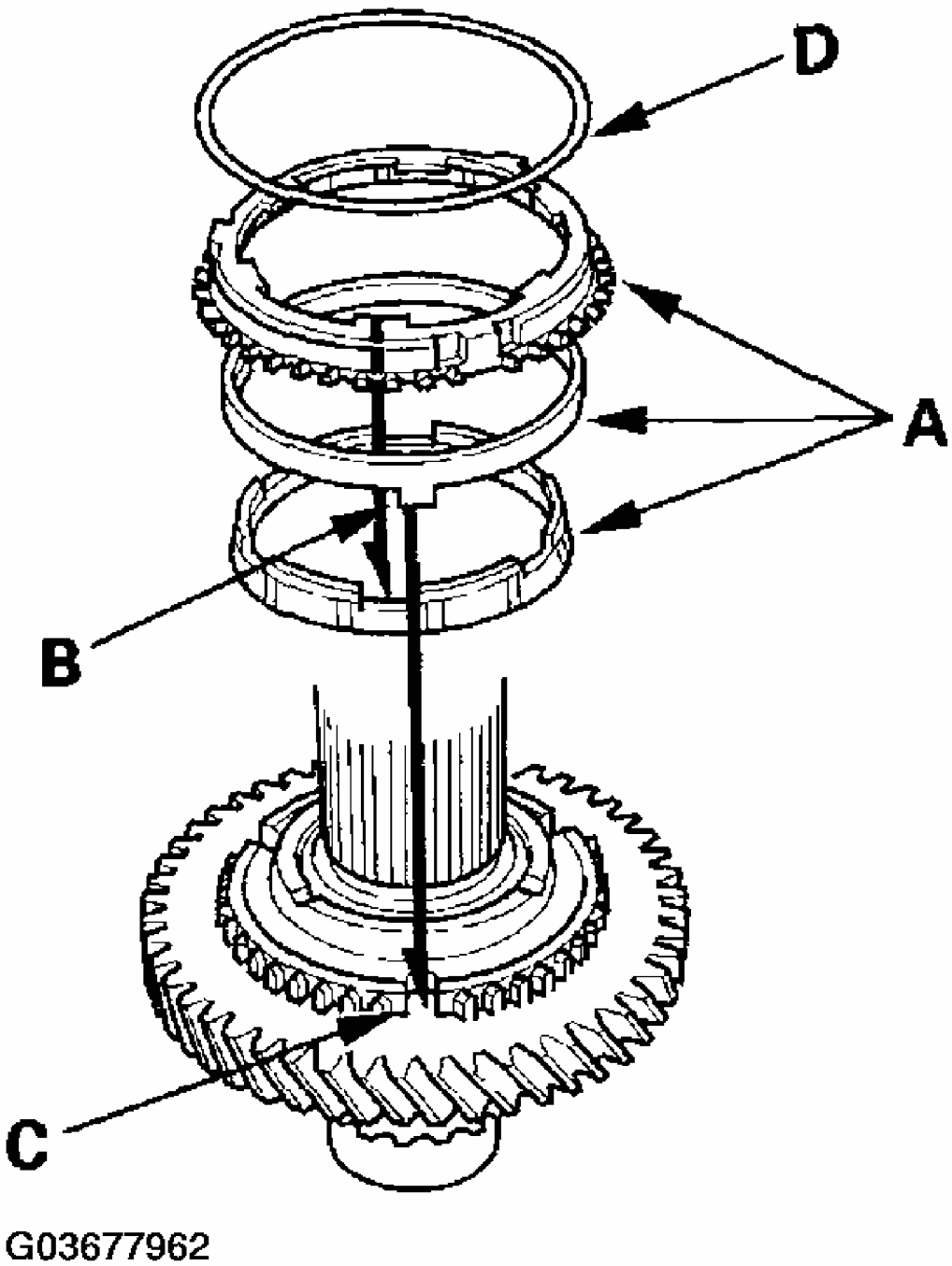

Fig. 106: Installing Triple Cone Synchro Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the 1st/2nd synchro hub (A) by aligning the synchro ring fingers (B) with the grooves in the 1st/2nd synchro hub (C).

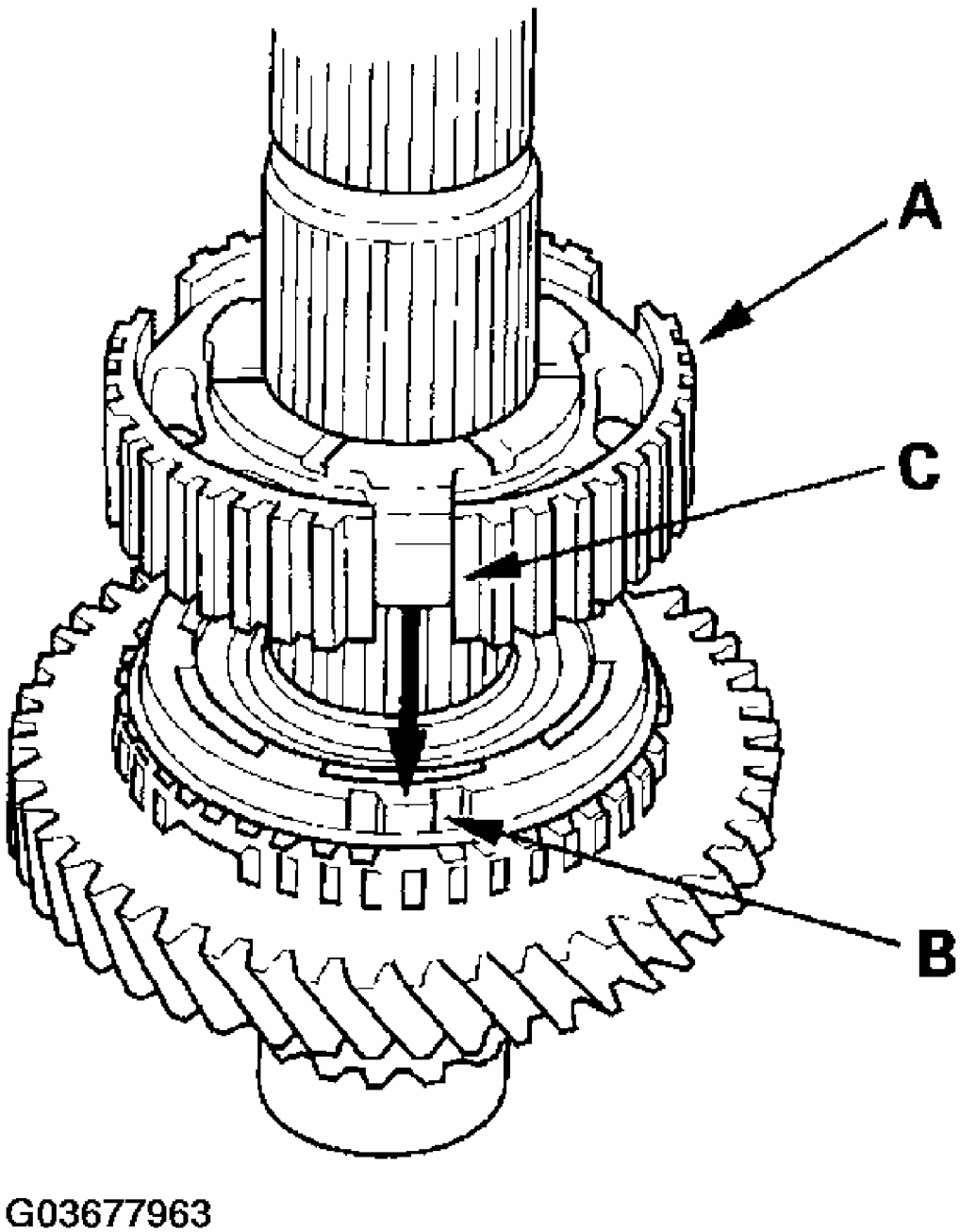

Fig. 107: Installing First/Second Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the reverse gear.
6. Install the synchro spring (A).

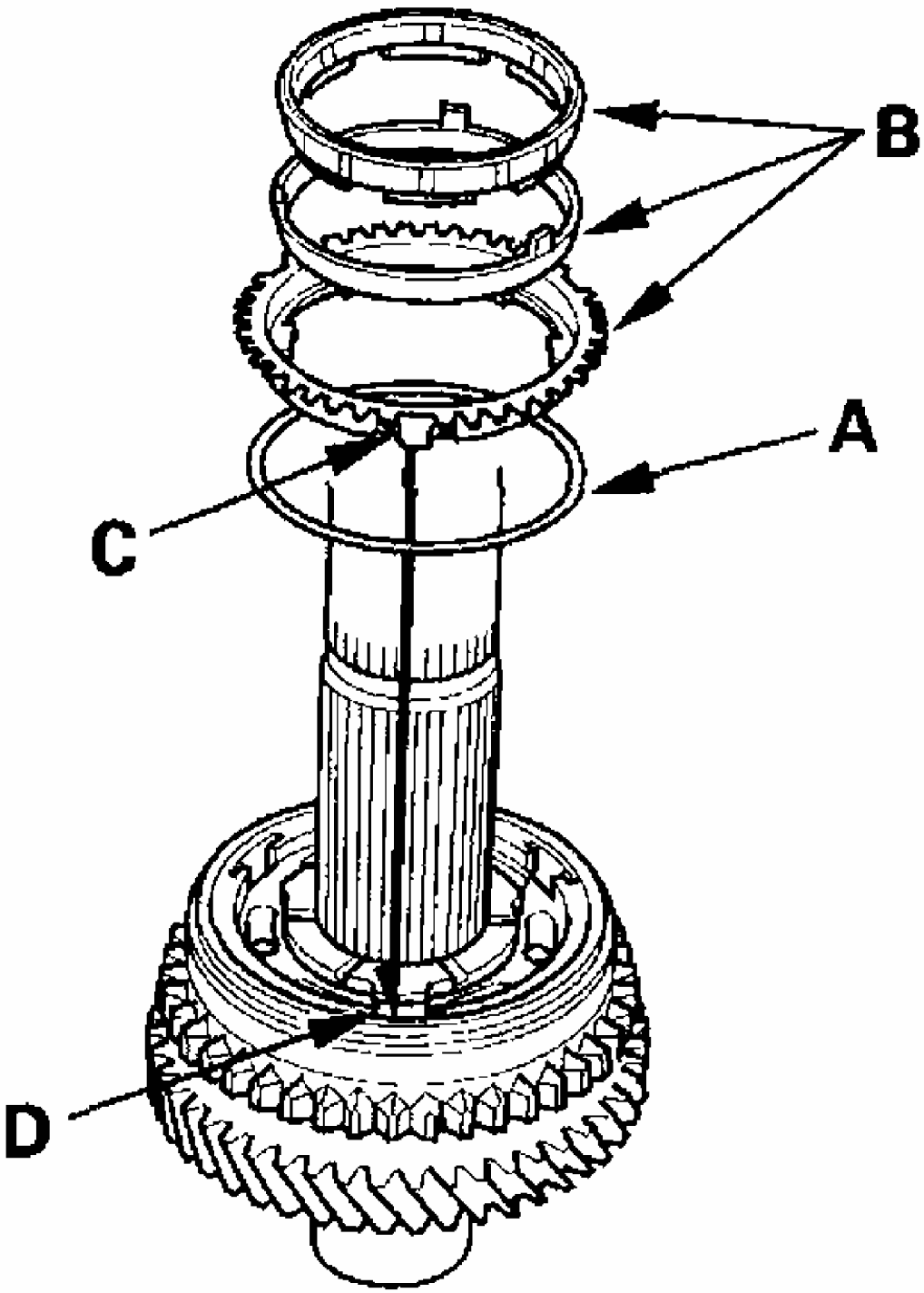

Fig. 108: Installing Synchro Spring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the triple cone synchro assembly (B) by aligning the synchro ring fingers (C) with the grooves in the 1st/2nd synchro hub (D).
8. Install the distance collar (A) and friction damper (B) by aligning the friction damper fingers (C) with the grooves in the 1st/2nd synchro hub (D).

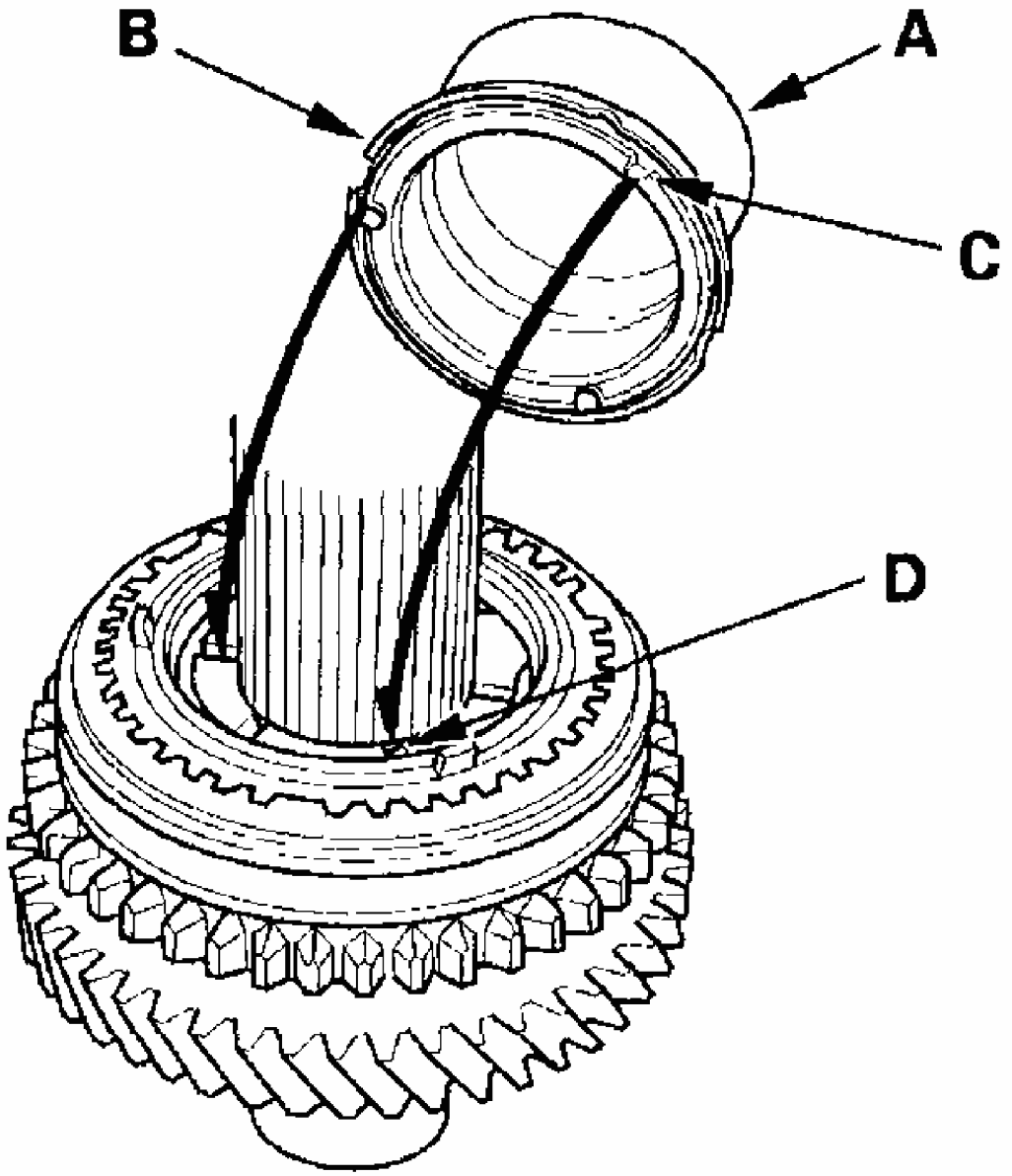

Fig. 109: Installing Distance Collar And Friction Damper
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Install the needle bearing.
10. Install 2nd gear (A) by aligning the synchro cone fingers (B) with the grooves in 2nd gear (C).

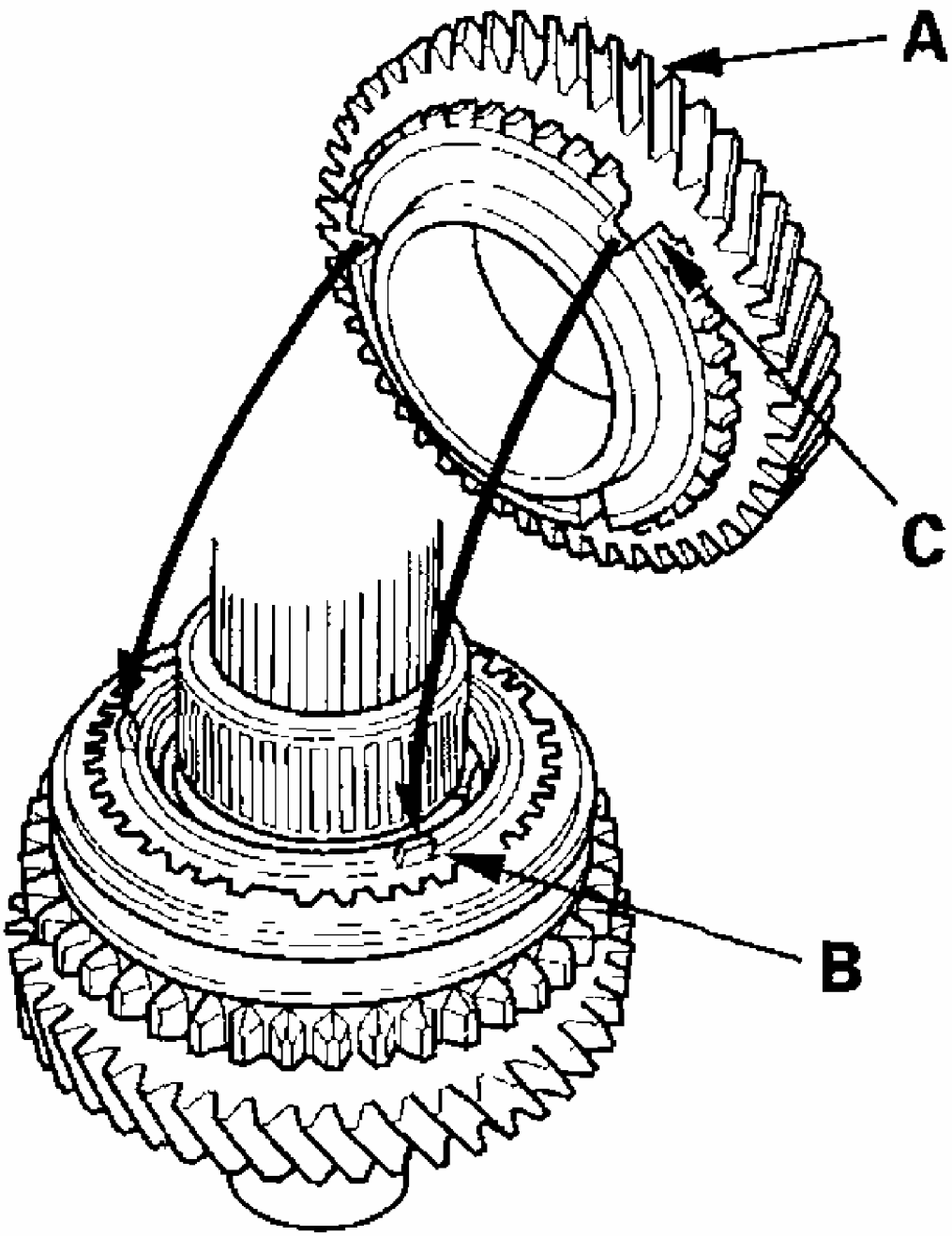

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Fig. 110: Installing Second Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Support the countershaft (A) on steel blocks, then install 3rd gear (B) using the special tool and a press (C). Do not exceed the maximum pressure.

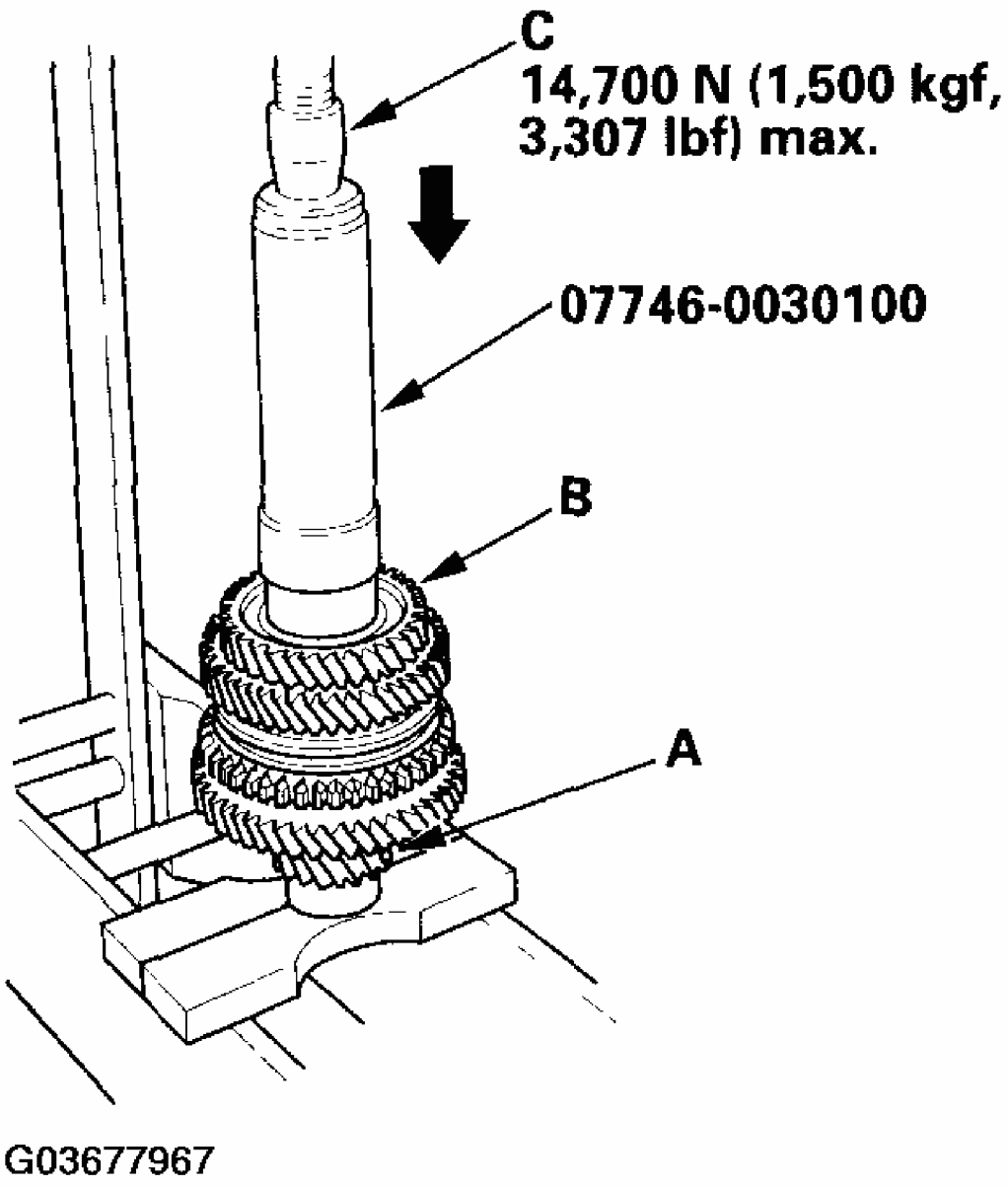

Fig. 111: Installing Third Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Install 4th gear (A) using the special tool and a press (B). Do not exceed the maximum

pressure.

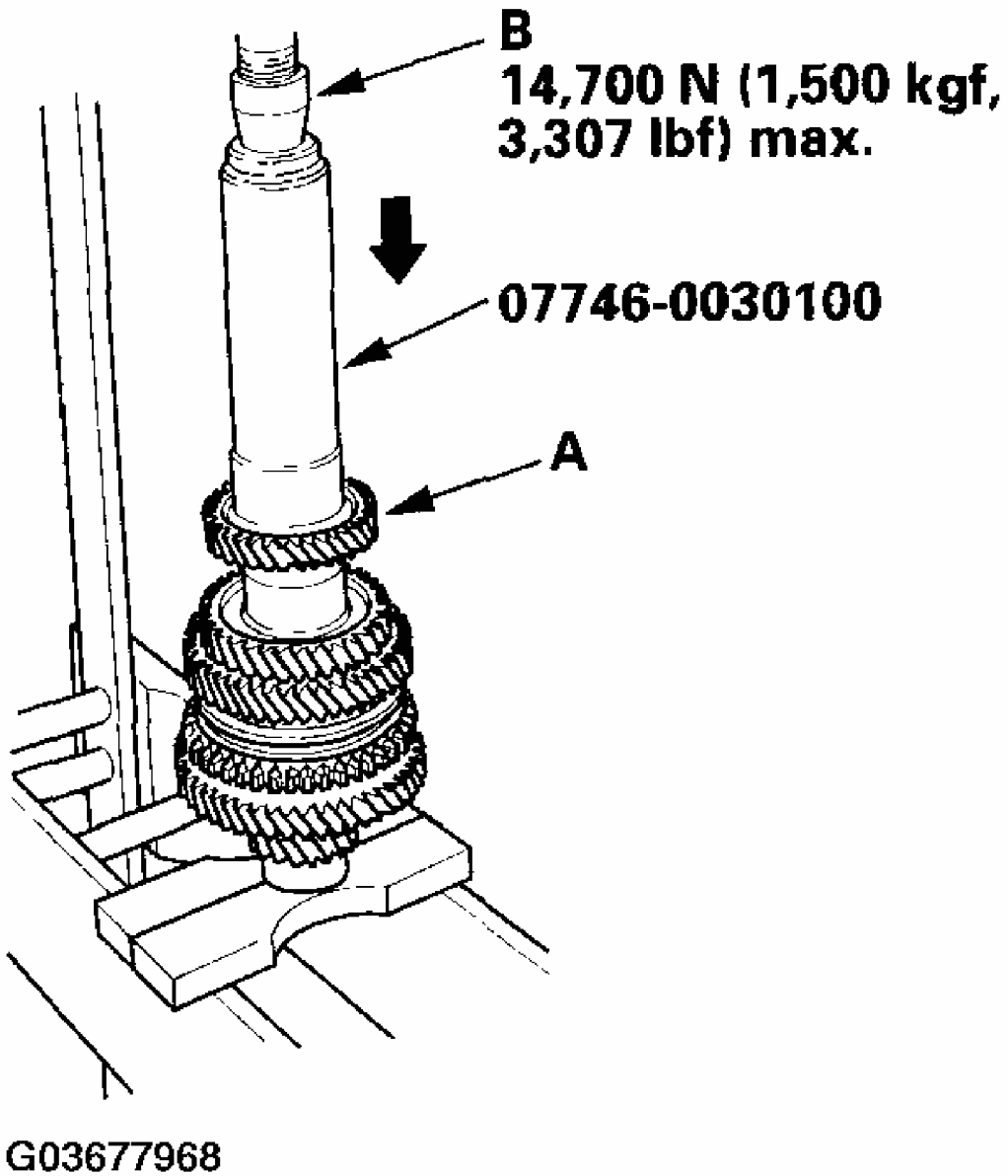

Fig. 112: Installing Fourth Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Install 5th gear (A) using the special tool and a press (B). Do not exceed the maximum pressure.

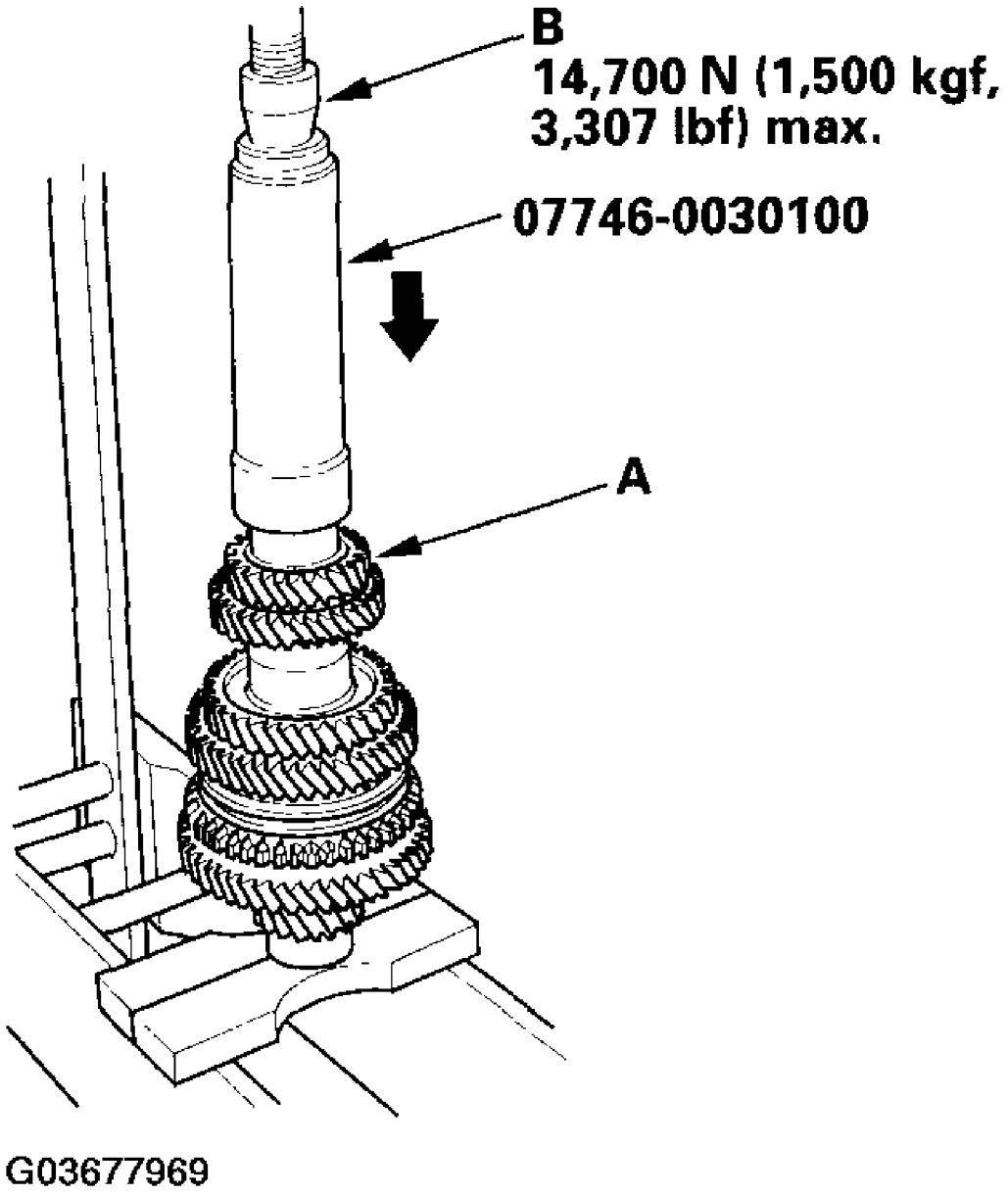

Fig. 113: Installing Fifth Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Install the distance collar (A), 35 mm shim, and old ball bearing (B) using the special tools and a press (C).

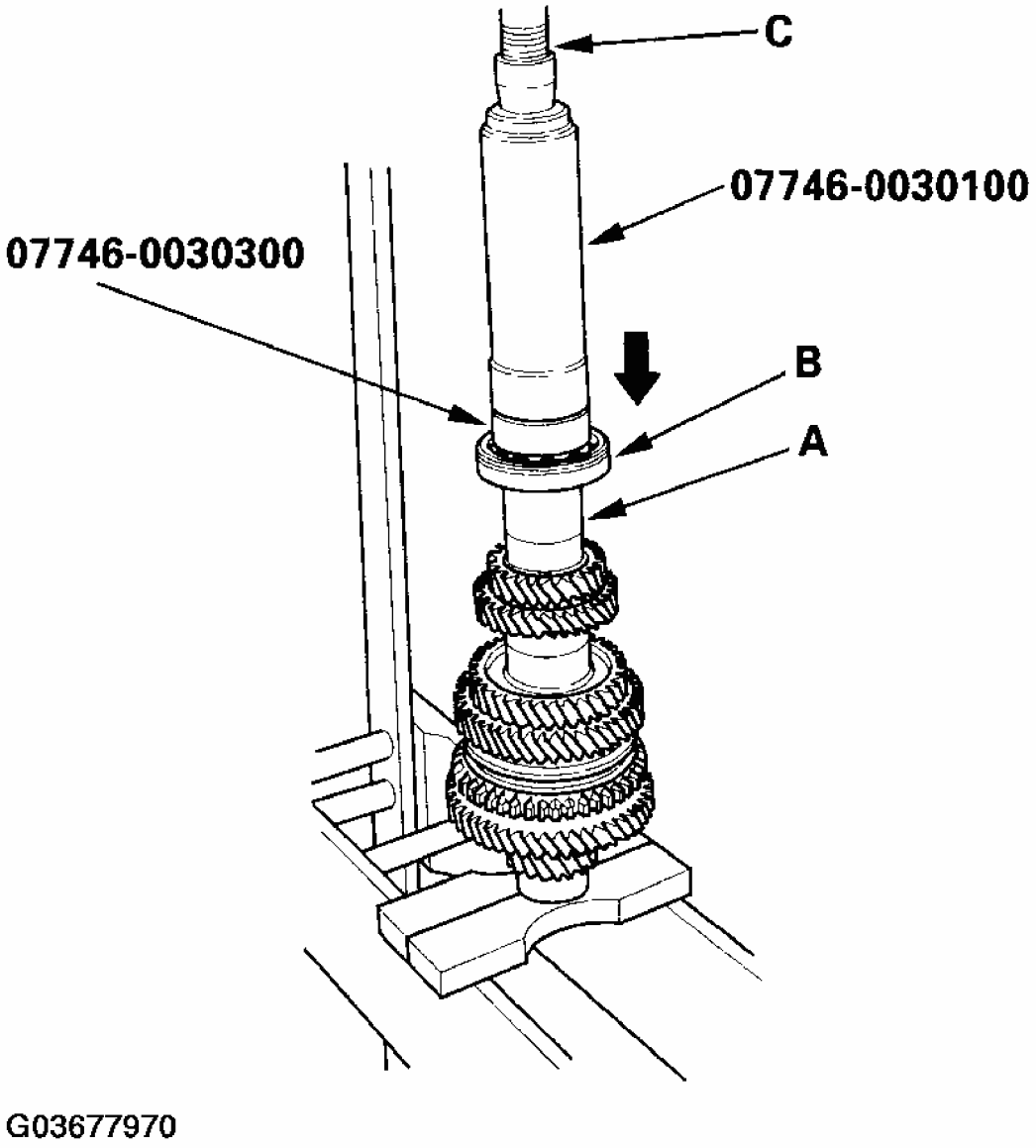

Fig. 114: Installing Distance Collar, 35mm Shim And Old Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Measure the clearance between the old bearing (A) and the 35 mm shim (B) with a feeler gauge (C).

    Standard: 0.04-0.10 mm (0.0016-0.0039 in.)

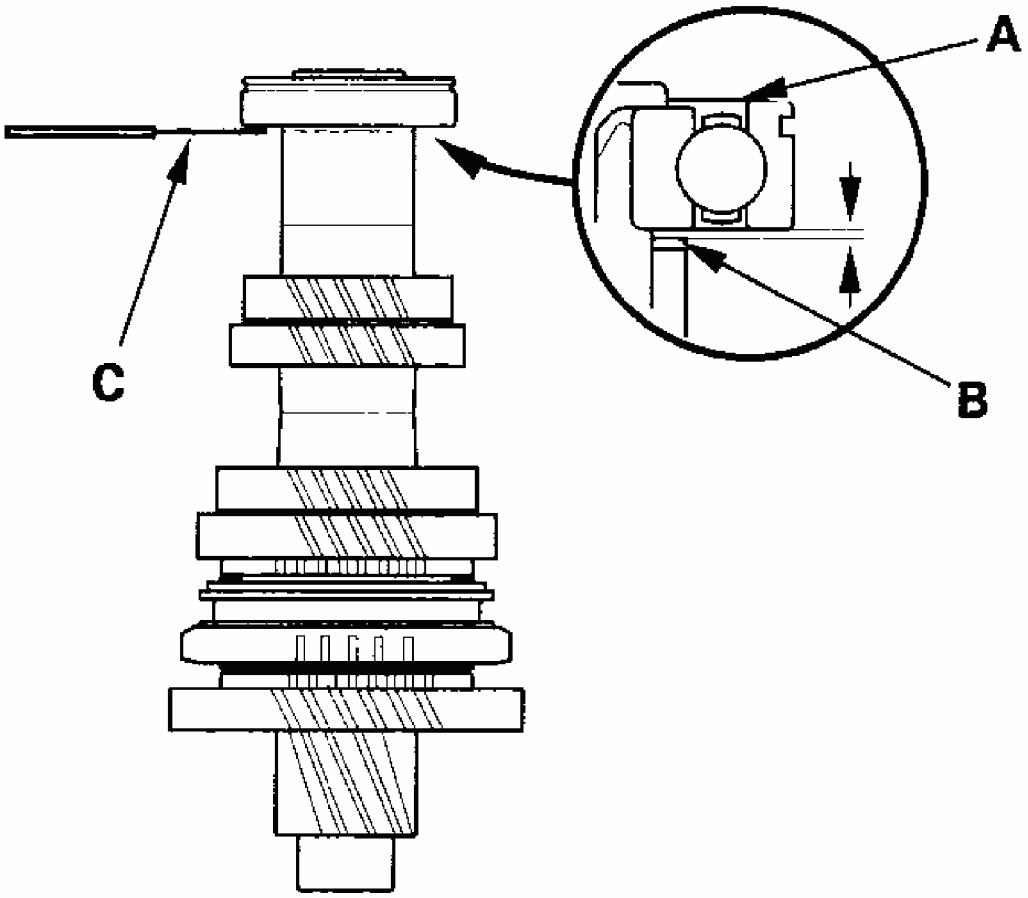

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Fig. 115: Measuring Clearance Between Old Bearing And Shim
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. If the clearance is more than the standard, select a new shim from the following table. If the clearance measured in step 15 is within the standard, replace only the ball bearing.

35 MM SHIM SPECIFICATIONS

	Part Number	Thickness
A	23981-PPP-000	0.87 mm (0.034 in.)
AA	23981-PPP-900	0.91 mm (0.036 in.)
B	23982-PPP-000	0.95 mm (0.037 in.)
AB	23982-PPP-900	0.99 mm (0.039 in.)
C	23983-PPP-000	1.03 mm (0.041 in.)

AC	23983-PPP-900	1.07 mm (0.042 in.)
D	23984-PPP-000	1.11 mm (0.044 in.)
AD	23984-PPP-900	1.15 mm (0.045 in.)
E	23985-PPP-000	1.19 mm (0.047 in.)
AE	23985-PPP-900	1.23 mm (0.048 in.)
F	23986-PPP-000	1.27 mm (0.050 in.)
AF	23986-PPP-900	1.31 mm (0.052 in.)
G	23987-PPP-000	1.35 mm (0.053 in.)
AG	23987-PPP-900	1.39 mm (0.055 in.)
H	23988-PPP-000	1.43 mm (0.056 in.)
AH	23988-PPP-900	1.47 mm (0.058 in.)
J	23989-PPP-000	1.51 mm (0.060 in.)
AJ	23989-PPP-900	1.55 mm (0.061 in.)
K	23990-PPP-000	1.59 mm (0.063 in.)
AK	23990-PPP-900	1.63 mm (0.064 in.)
L	23991-PPP-000	1.67 mm (0.066 in.)
AL	23991-PPP-900	1.71 mm (0.067 in.)
M	23992-PPP-000	1.75 mm (0.069 in.)
AM	23992-PPP-900	1.79 mm (0.070 in.)
N	23993-PPP-000	1.83 mm (0.072 in.)
AN	23993-PPP-900	1.87 mm (0.074 in.)
P	23994-PPP-000	1.91 mm (0.075 in.)
AP	23994-PPP-900	1.95 mm (0.077 in.)
Q	23995-PPP-000	1.99 mm (0.078 in.)

17. Support the ball bearing (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of the ball bearing.

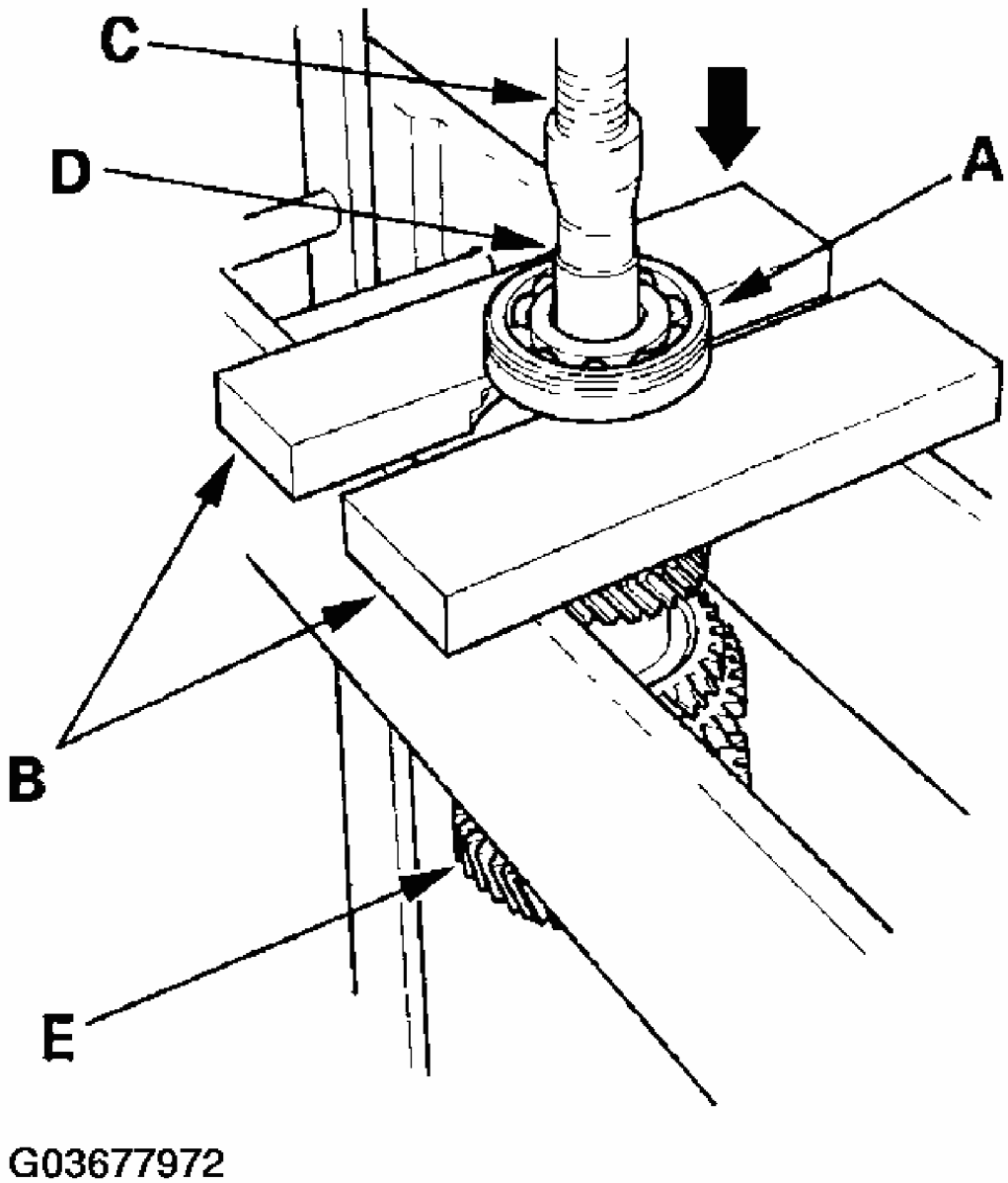


Fig. 116: Removing Countershaft Out Of Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. If necessary, install the 35 mm shim selected in step 16, then recheck the clearance.
19. Install the distance collar (A), 35 mm shim, and new ball bearing (B) using the special tools and a press (C).

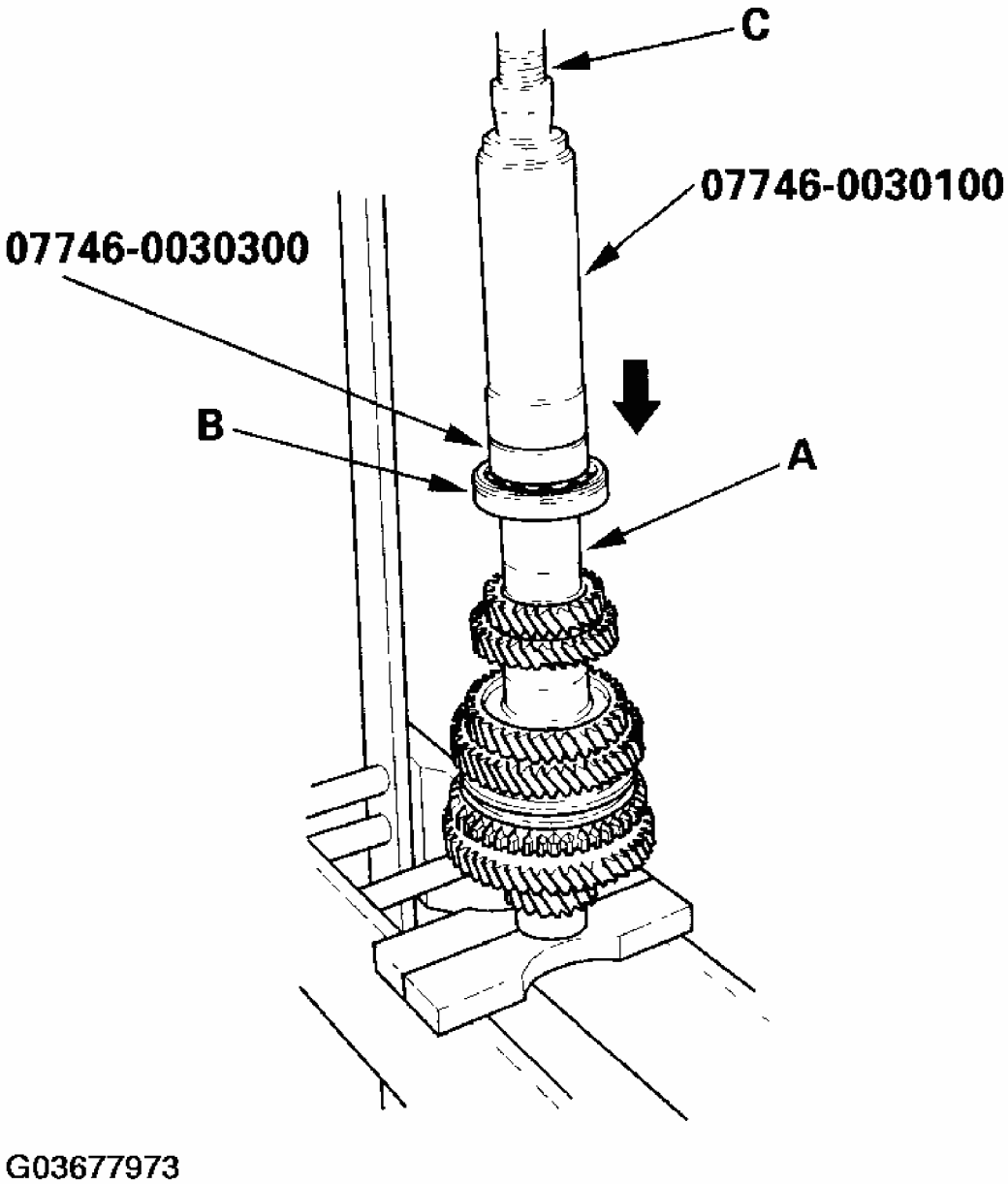


Fig. 117: Installing Distance Collar, 35mm Shim, And New Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Securely clamp the countershaft assembly in a bench vise with wood blocks (A).

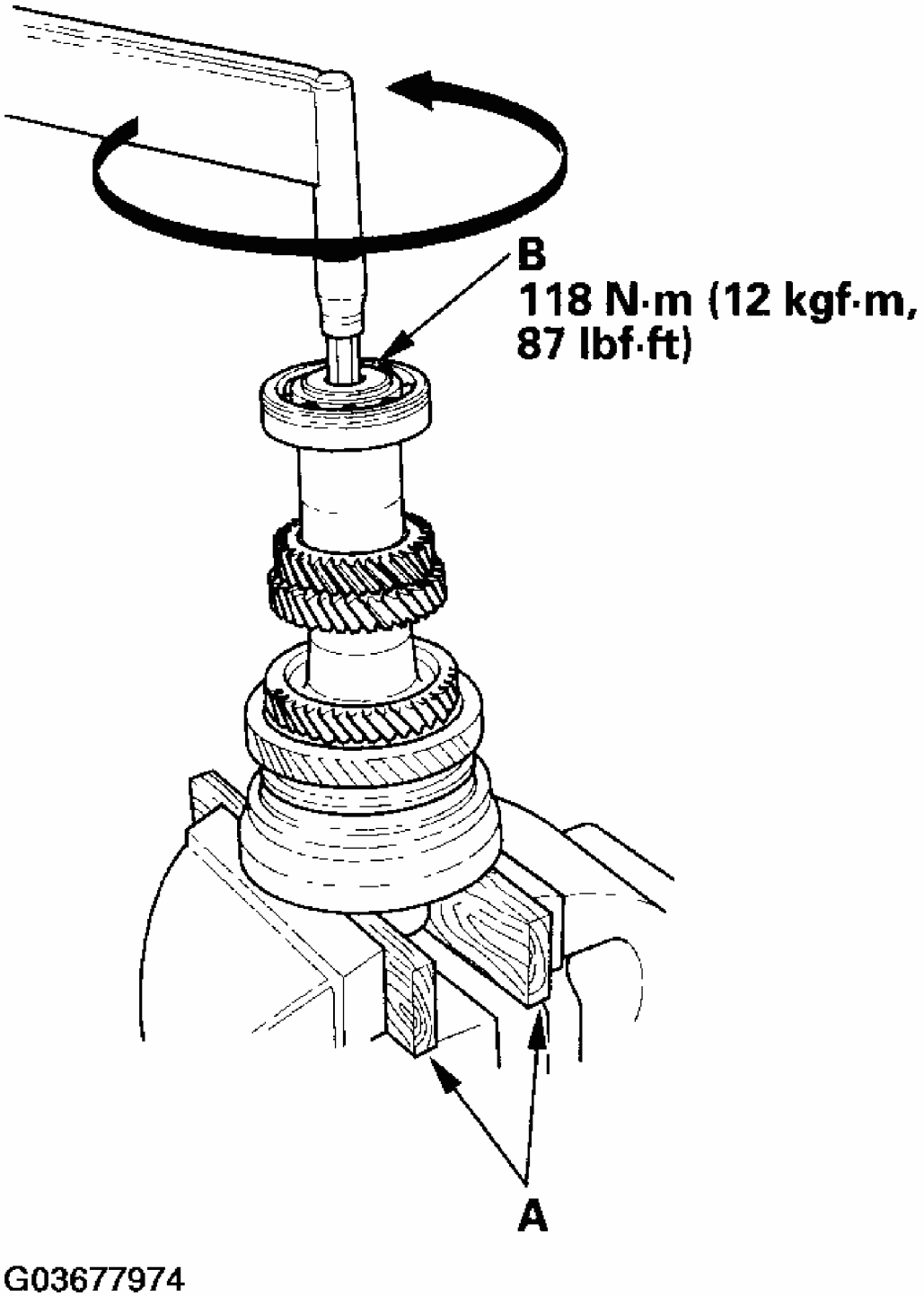


Fig. 118: Identifying Tightening Torque Of Countershaft Assembly Bolt
Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. Tighten the new special bolt (B) (left-hand threads).

SYNCHRO SLEEVE AND HUB INSPECTION AND REASSEMBLY

1. Inspect gear teeth on all synchro hubs and synchro sleeves for wear (rounded off corners).
2. Install each synchro hub (A) in its mating synchro sleeve (B), and check for free movement. Make sure you match the three sets of longer teeth (C) (120 degrees apart) on the synchro sleeve with the three sets of deeper grooves (D) in the synchro hub. Do not install the synchro sleeve with its longer teeth in the 1st/2nd synchro hub slots (E) because it will damage the spring ring.

NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.

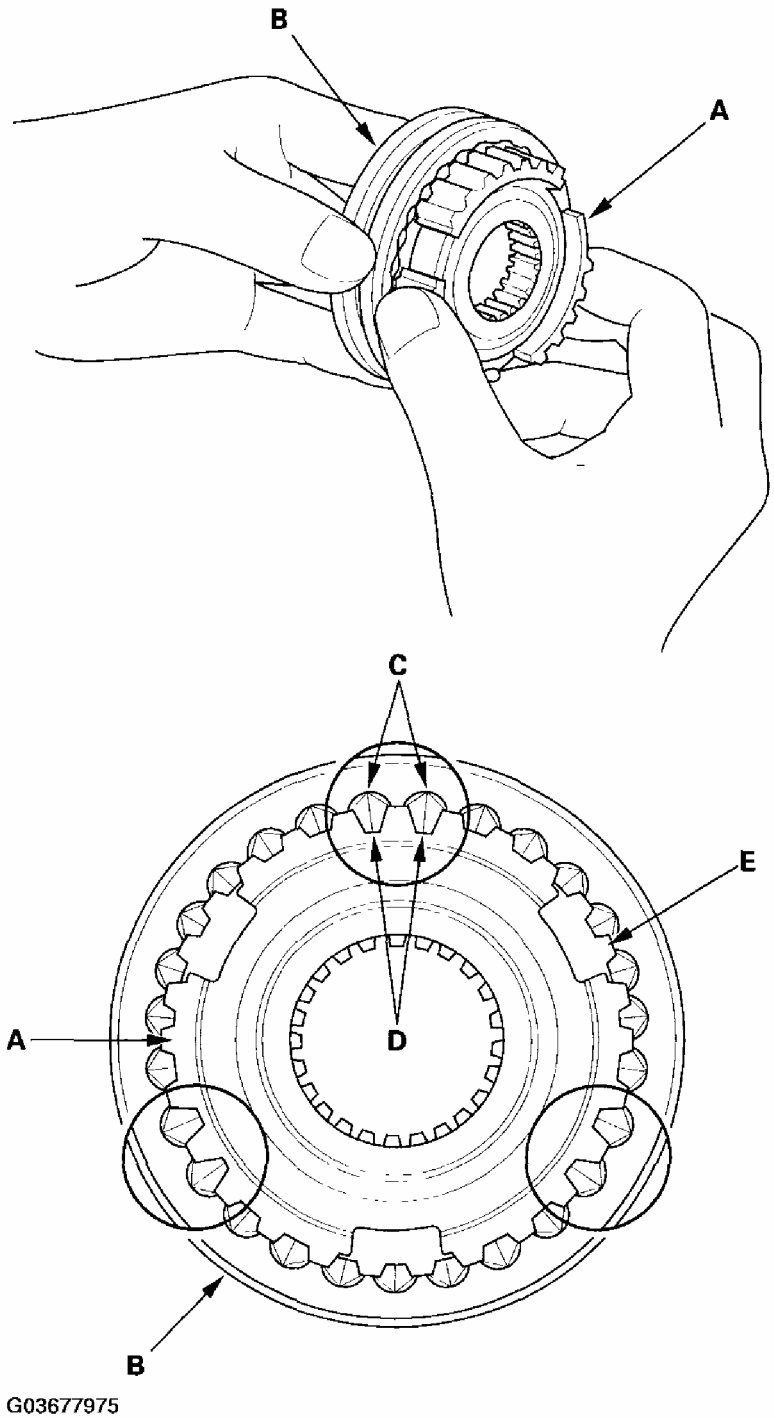
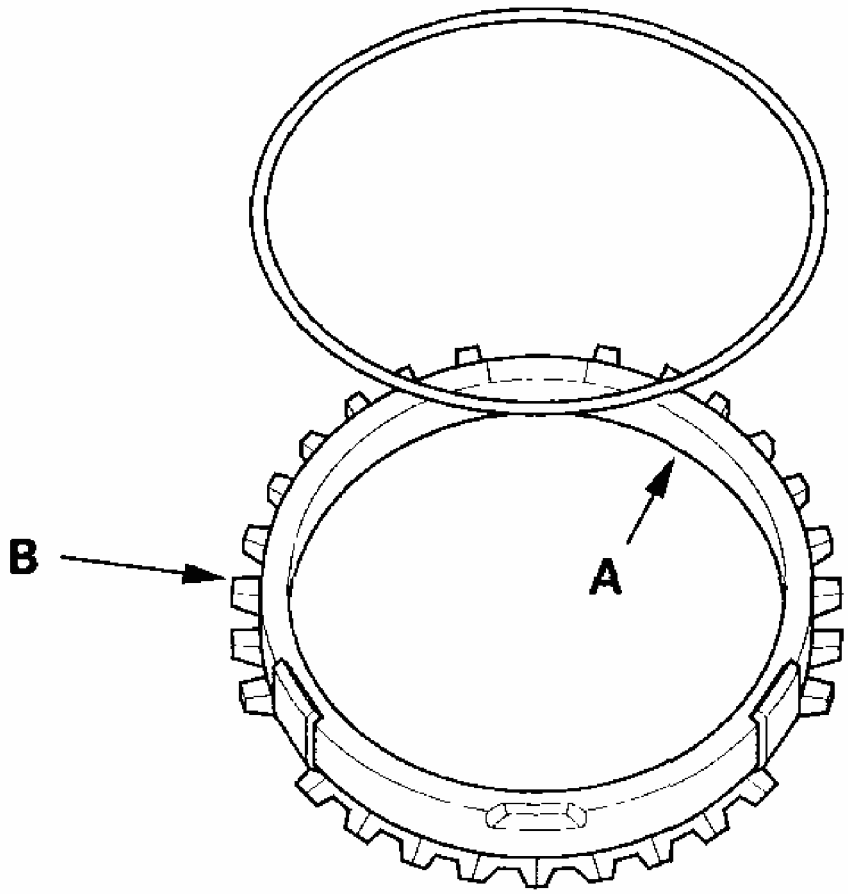


Fig. 119: Installing Synchro Hub In Mating Synchro Sleeve
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SYNCHRO RING AND GEAR INSPECTION

1. Inspect the inside of each synchro ring (A) for wear. Inspect the teeth (B) on each synchro ring for wear (rounded off).



Example of synchro ring teeth

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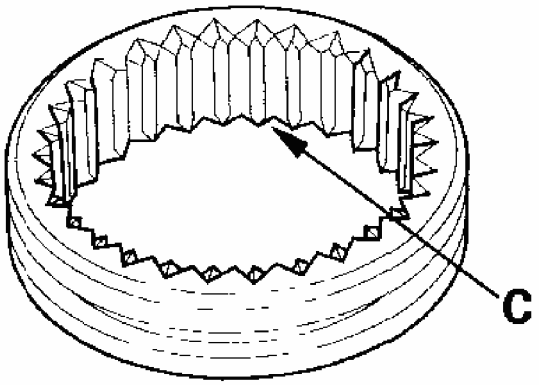
Fig. 120: Inspecting Inside Of Each Synchro Ring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Inspect the teeth (C) on each synchro sleeve and matching teeth on each gear for wear (rounded off).



Example of synchro sleeve teeth and gear teeth

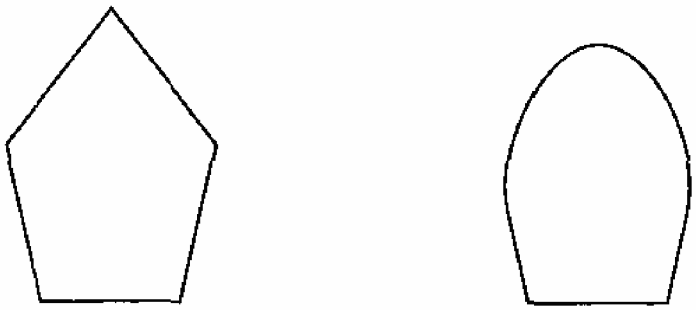


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Fig. 121: Inspecting Teeth On Each Synchro Sleeve And Matching Teeth On Each Gear For Wear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Inspect the thrust surface (D) on each gear hub for wear.

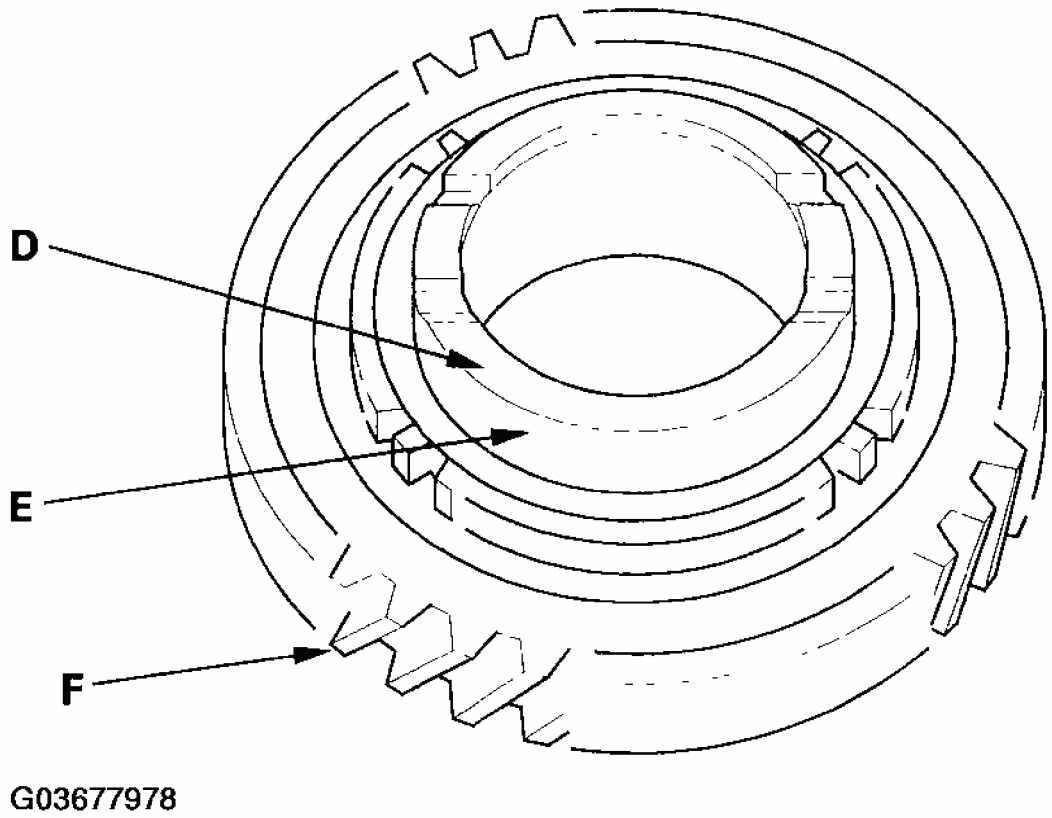

Fig. 122: Inspecting Thrust Surface On Each Gear Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Inspect the cone surface (E) on each gear hub for wear and roughness.
5. Inspect the teeth on all gears (F) for uneven wear, scoring, galling, and cracks.
6. Coat the cone surface of each gear (E) with the recommended fluid (MTF), and place its synchro ring on it. Rotate the synchro ring, making sure that it does not slip.
7. Measure the clearance between each gear (A) and its synchro ring (B) all around the gear. Hold the synchro ring against the gear evenly while measuring the clearance. If the clearance is less than the service limit, replace the synchro ring and gear.

Synchro Ring-to-Gear Clearance

Standard: 0.70-1.49 mm (0.028-0.059 in.)

Service Limit: 0.4 mm (0.016 in.)

Double Cone Synchro and Triple Cone Synchro-to-Gear Clearance

Standard:

(1) : Outer Synchro Ring (B) to Synchro Cone (C) 0.70-1.19 mm (0.028-0.047 in.)

(2) : Synchro Cone (C) to Gear (A) 0.50-1.04 mm (0.020-0.041 in.)

(3) : Outer Synchro Ring (B) to Gear (A) 0.95-1.68 mm (0.037-0.066 in.)

Service Limit:

(1) : 0.3 mm (0.012 in.)

(2) : 0.3 mm (0.012 in.)

(3) : 0.6 mm (0.024 in.)

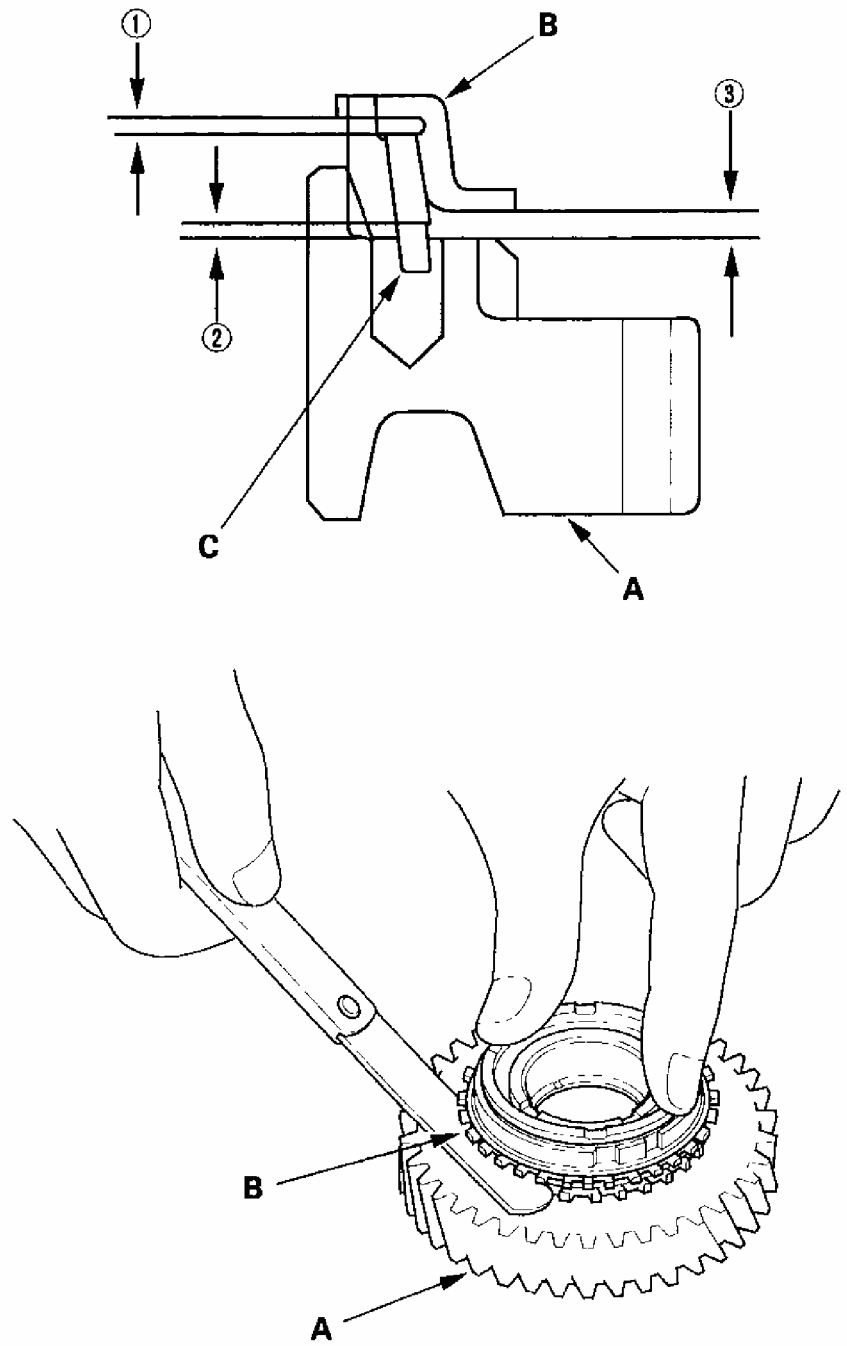

Fig. 123: Measuring Clearance Between Each Gear And Its Synchro Ring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT BEARING AND OIL SEAL REPLACEMENT

Special Tools Required

- Oil seal driver 07JAD-PL90100
- Adjustable bearing puller, 20-40 mm 07736-A01000B
- Attachment, 42 x 47 mm 07746-0010300
- Driver 07749-0010000
- Slide hammer, commercially available

1. Remove the differential assembly.
2. Remove the ball bearing (A) from the clutch housing (B) using the special tool and a commercially available 3/8"-16 slide hammer (C).

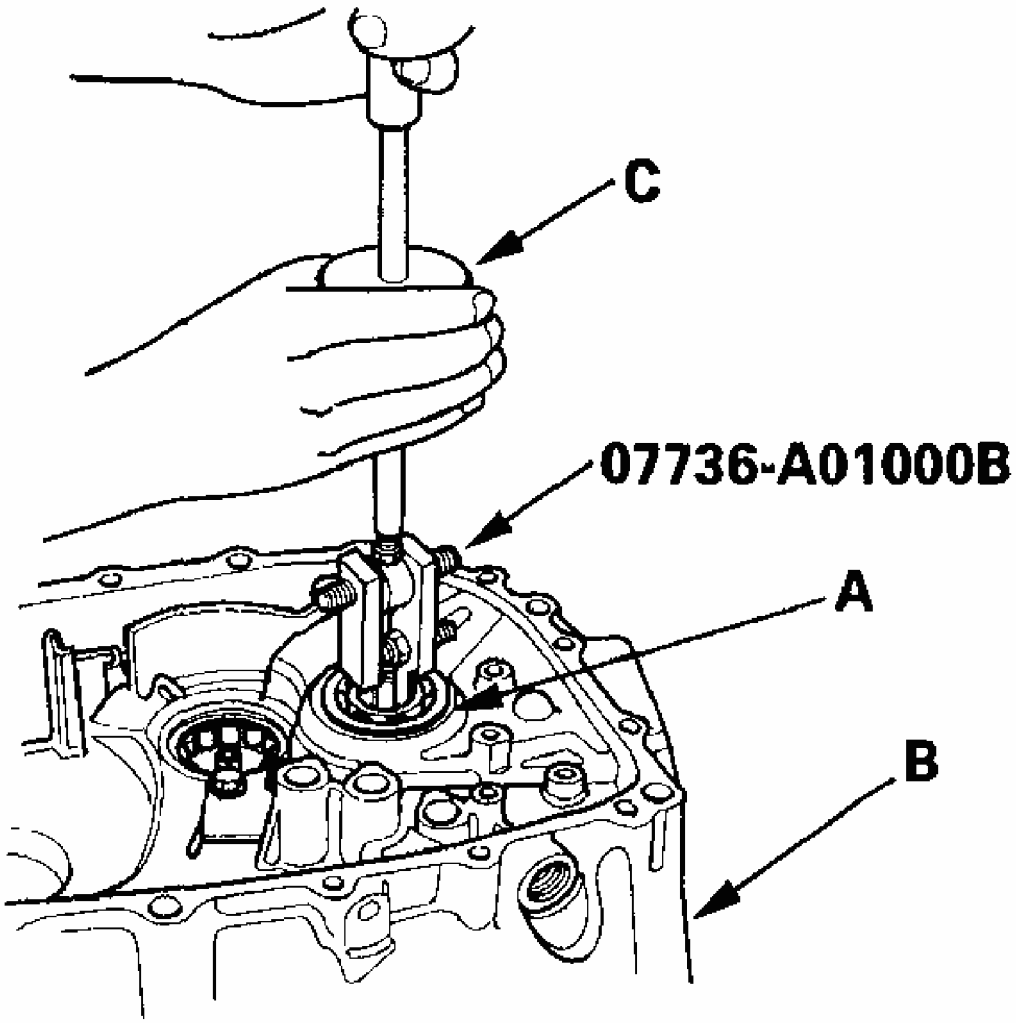

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Fig. 124: Removing Ball Bearing From Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the oil seal (A) from the clutch side. Be careful when removing the seal so the clutch housing is not damaged.

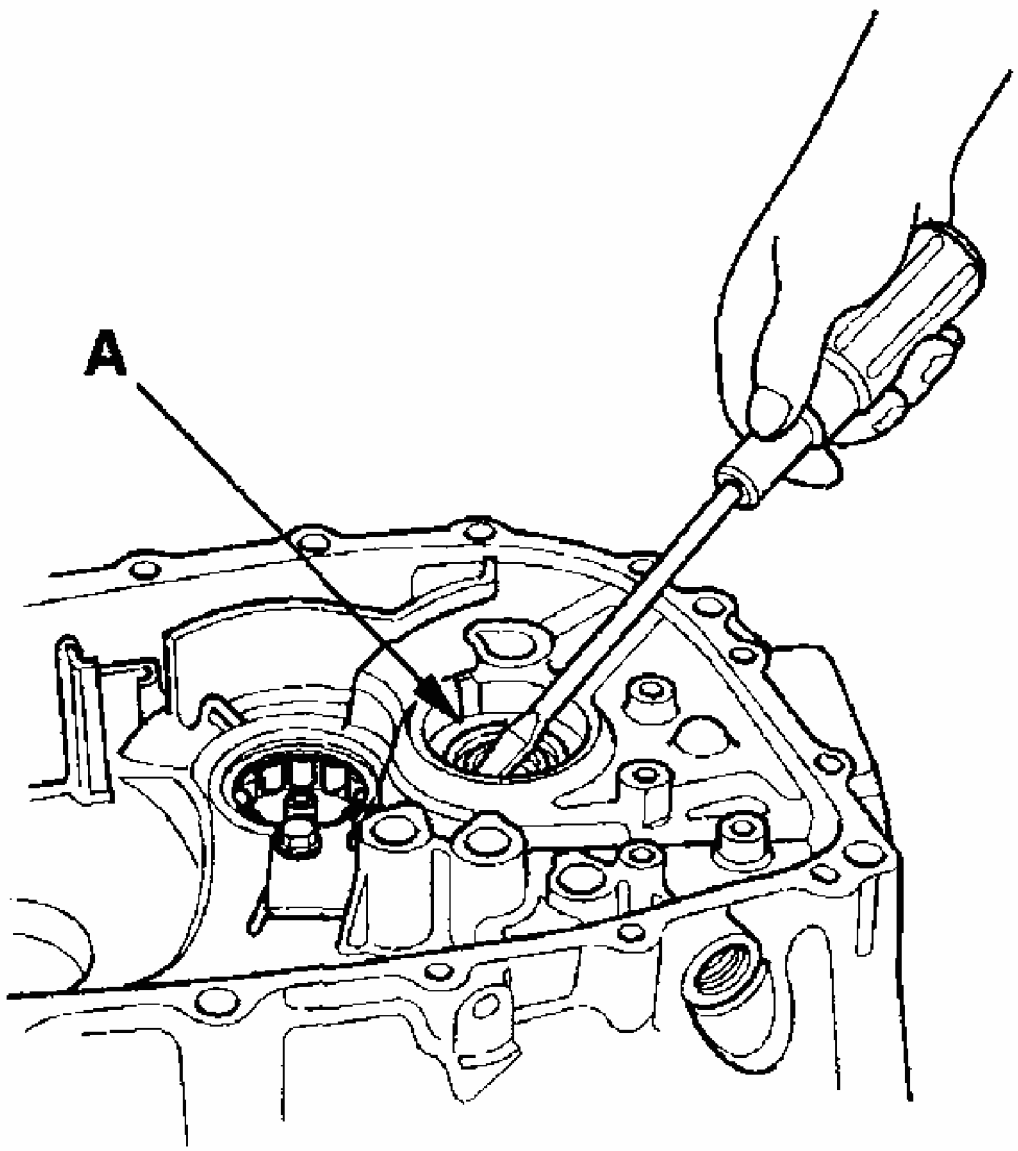

Fig. 125: Removing Oil Seal From Clutch Side
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Drive in the new oil seal from the transmission side using the special tools.

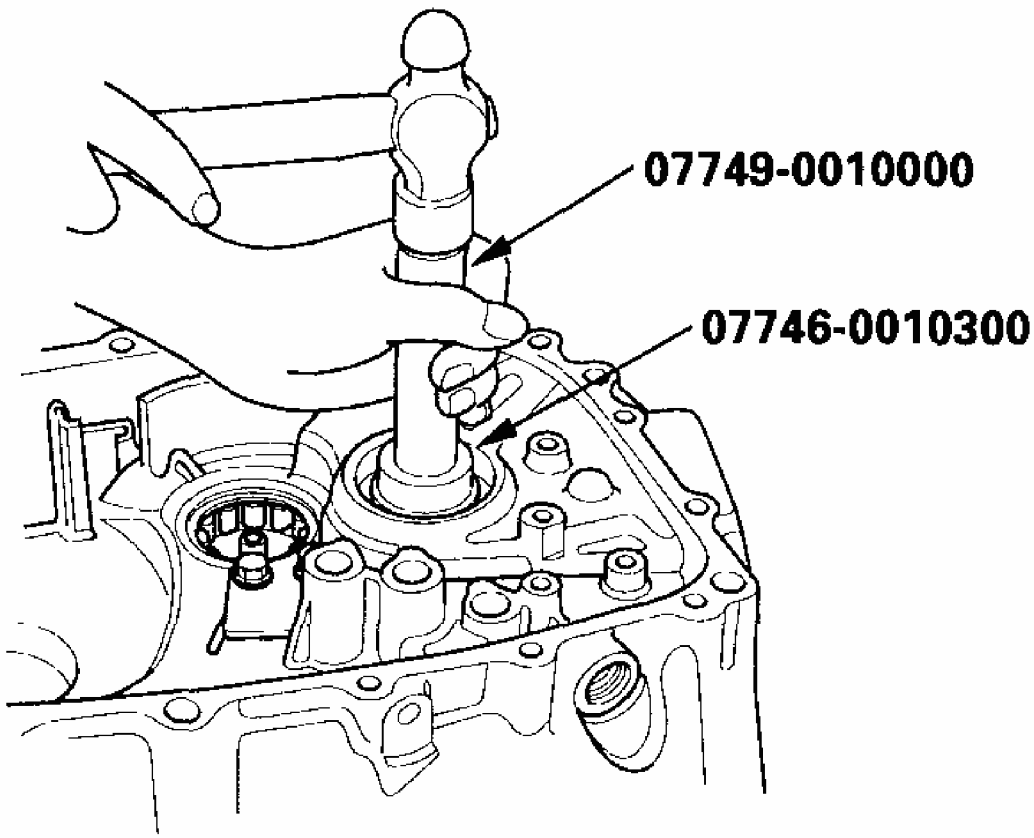

Fig. 126: Installing Oil Seal From Transmission Side
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Drive in the new ball bearing (A) from the transmission side using the special tool.

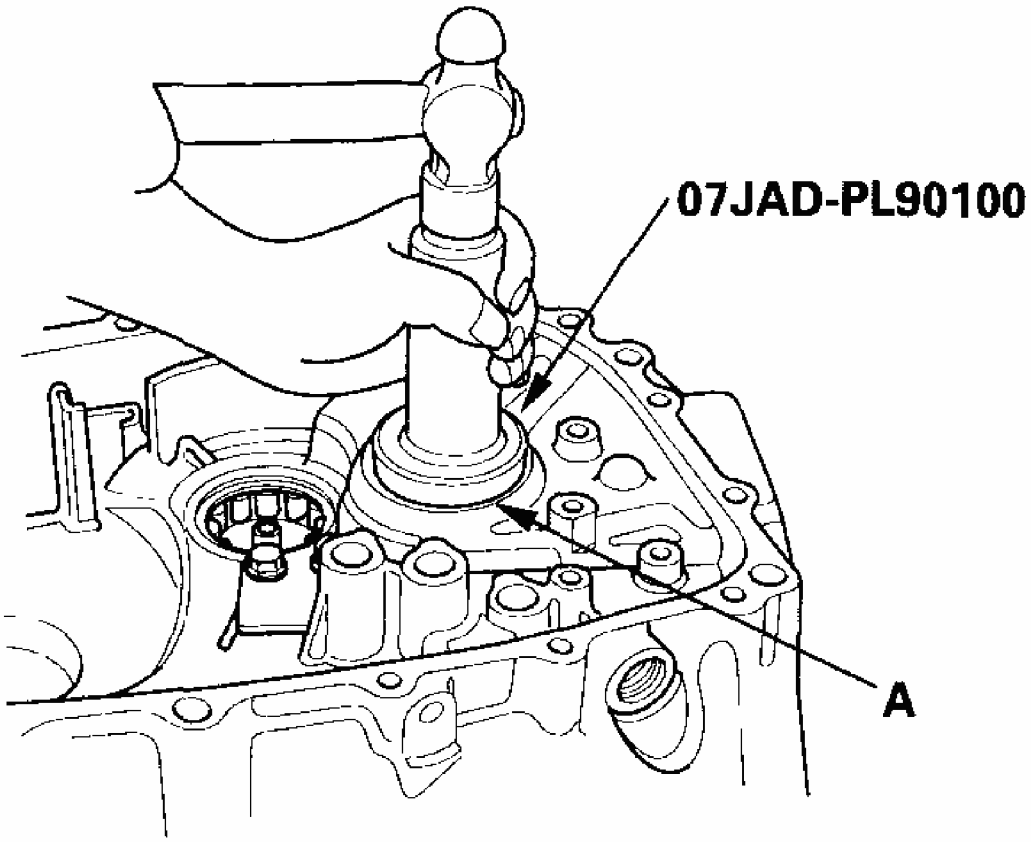

Fig. 127: Driving In New Ball Bearing From Transmission Side
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT BEARING REPLACEMENT

Special Tools Required

- Oil seal driver 07JAD-PL90100
- Adjustable bearing puller, 20-40 mm 07736-A01000B
- Slide hammer, commercially available

1. Remove the bearing set plate (A) from the clutch housing (B).

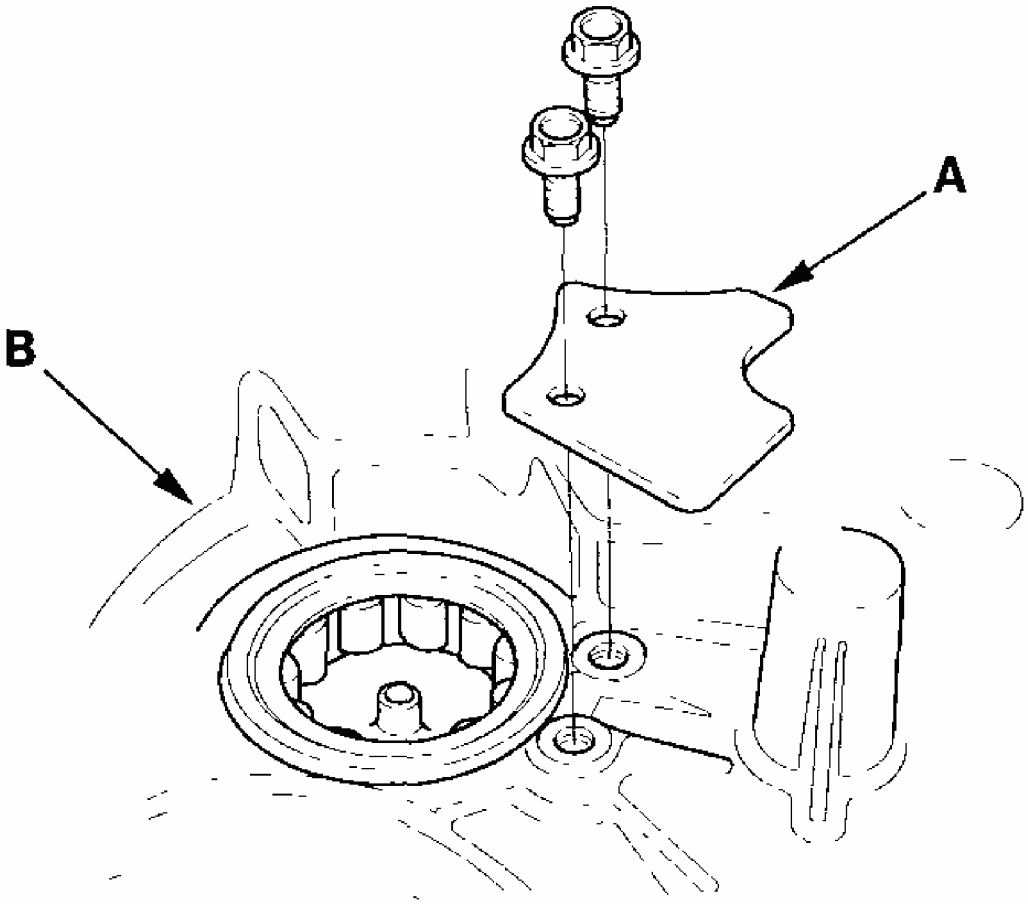

Fig. 128: Removing Bearing Set Plate From Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Remove the needle bearing (A) using the special tool and a commercially available 3/8"-16 slide hammer (B), then remove the oil guide plate C.

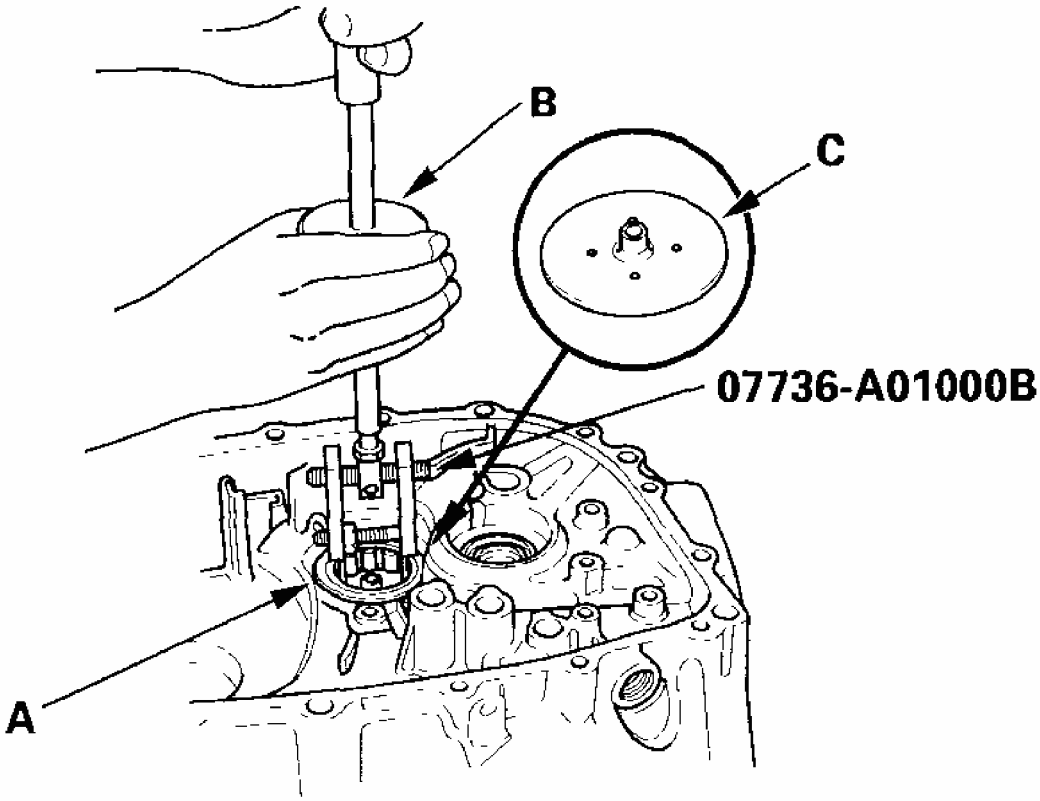

Fig. 129: Removing Needle Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Position the oil guide plate C and new needle bearing (A) in the bore of the clutch housing (B).

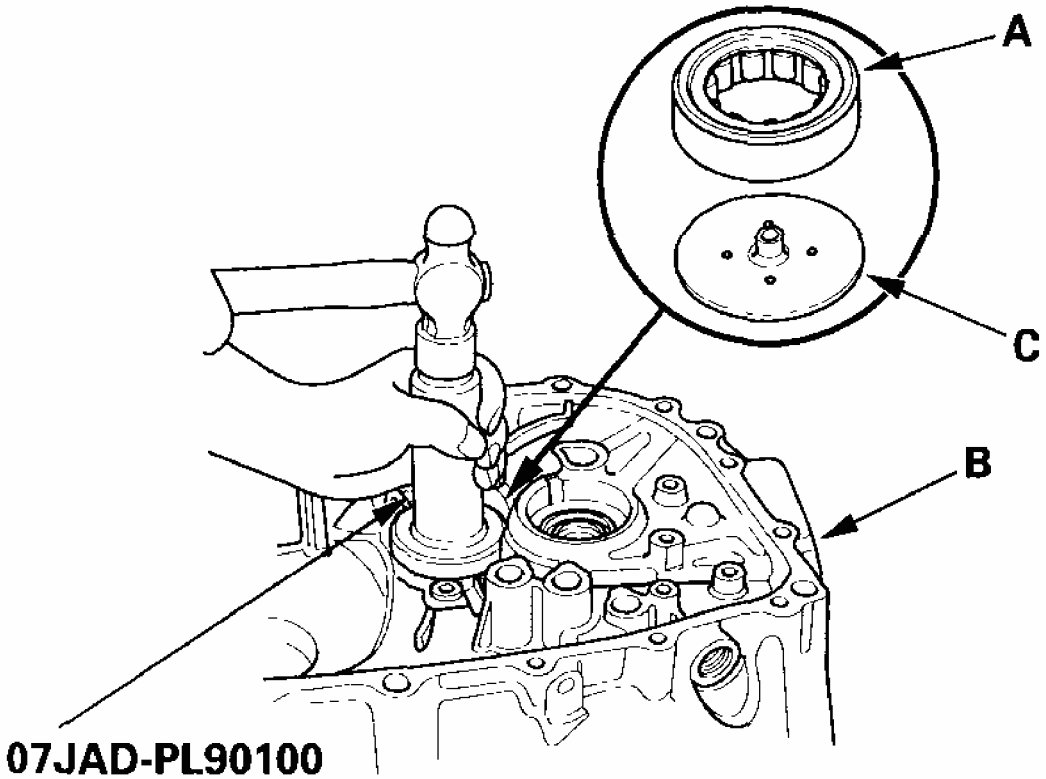

Fig. 130: Positioning Oil Guide Plate And Needle Bearing In Bore Of Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the needle bearing using the special tool.
5. Install the bearing set plate (A) with bolts (B).

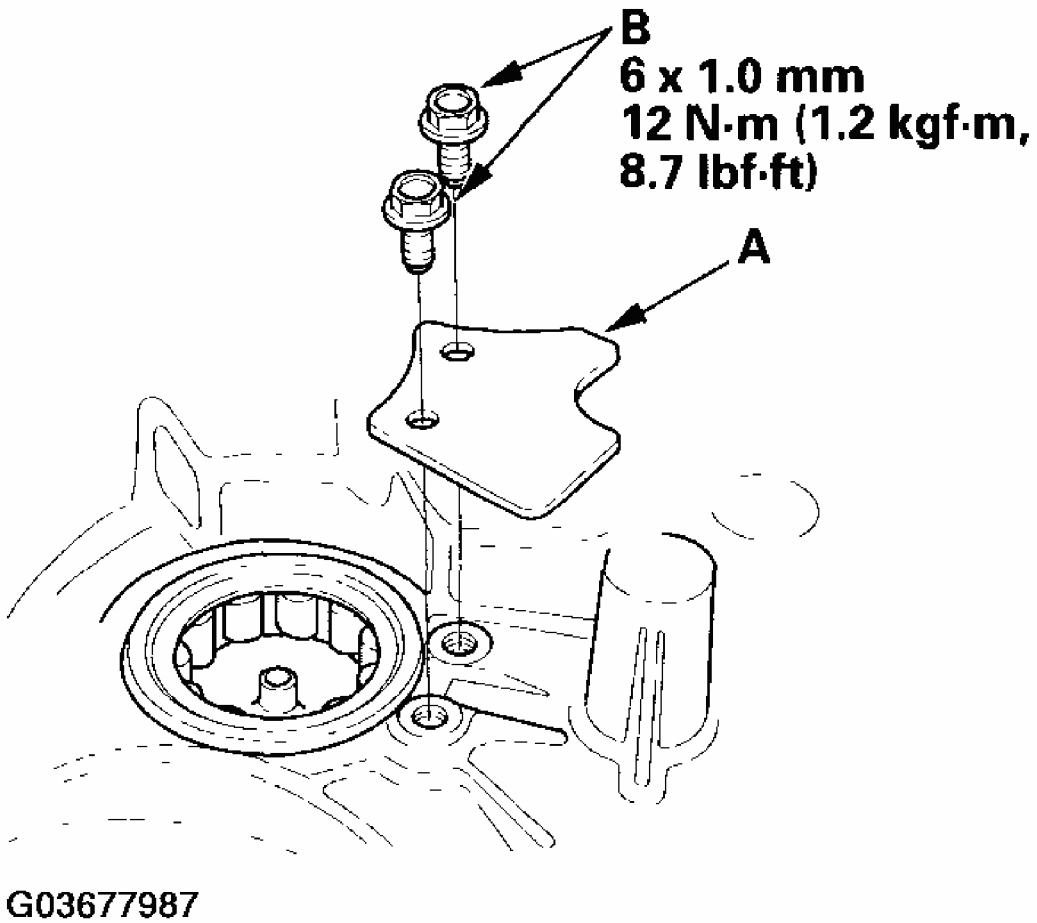

Fig. 131: Installing Bearing Set Plate With Bolts And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT THRUST CLEARANCE ADJUSTMENT

Special Tools Required

- Mainshaft holder 07GAJ-PG20110
- Mainshaft base 07GAJ-PG20130

1. Remove the 72 mm shim (A) and oil guide plate M from the transmission housing (B).

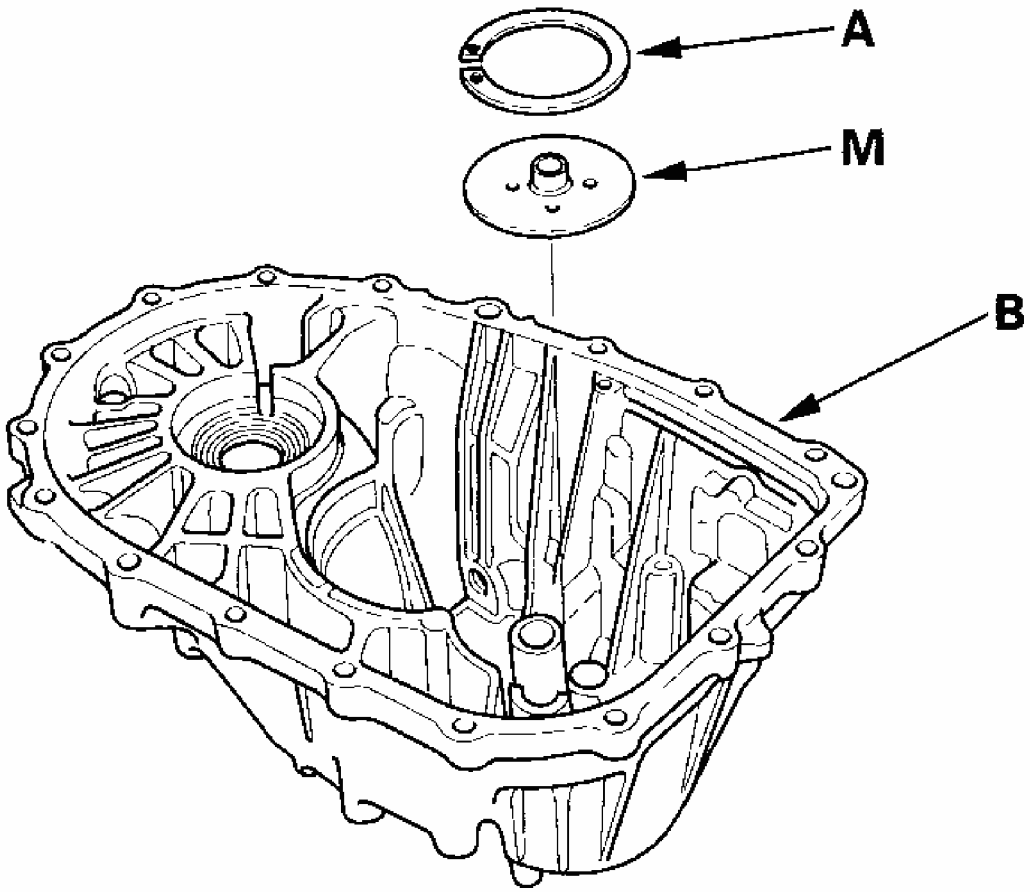

Fig. 132: Removing 72mm Shim And Oil Guide Plate From Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Thoroughly clean the spring washer (A) and washer (B) before installing them on the clutch housing side ball bearing (C). Note the installation direction of the spring washer.

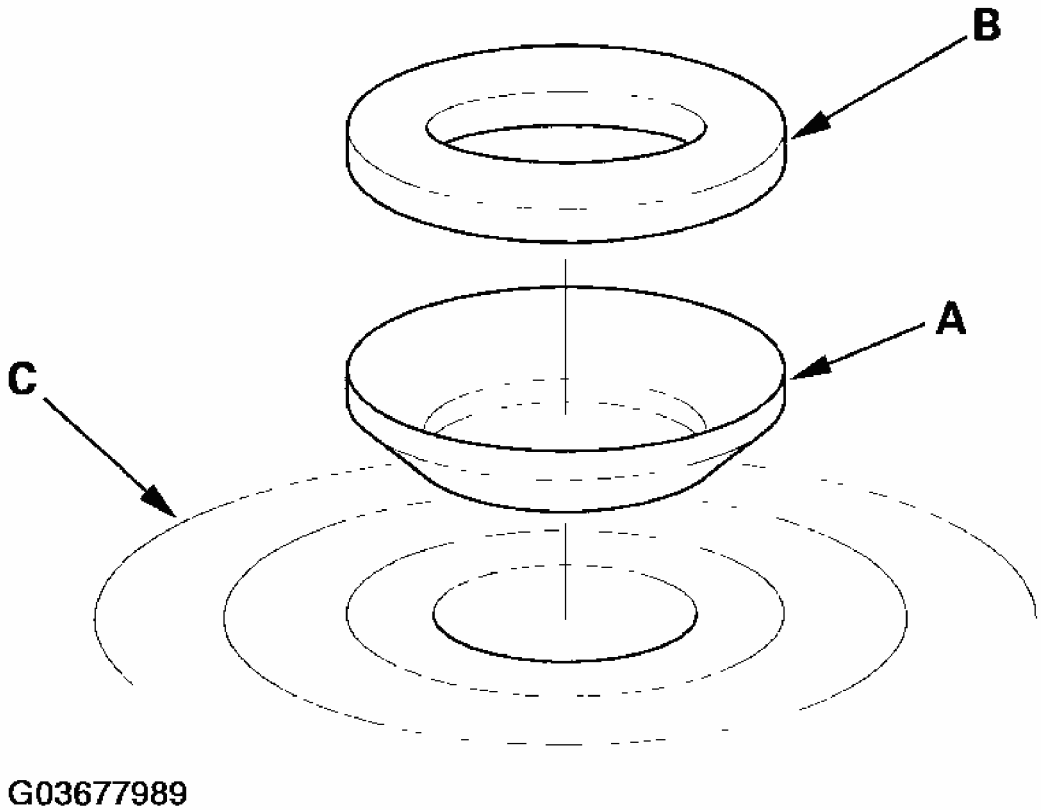

Fig. 133: Installing Spring Washer And Washer On Clutch Housing Side Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the 3rd/4th synchro hub, the distance collar, the 5th synchro hub, the distance collar, and the ball bearing on the mainshaft.

NOTE: Refer to the mainshaft reassembly Exploded View (see MAINSHAFT REASSEMBLY).

4. Install the mainshaft in the clutch housing.
5. Place the transmission housing over the mainshaft and onto the clutch housing.
6. Secure the clutch and transmission housings with several 8 mm bolts.

NOTE: It is not necessary to use sealing agent between the housing for this procedure.

7. Lightly tap on the mainshaft with a plastic hammer.
8. Attach the special tools to the mainshaft as follows:

- Back-out the mainshaft holder bolt (A), and loosen the two hex bolts (B).
- Fit the holder over the mainshaft so its lip is towards the transmission.
- Align the mainshaft holder lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.

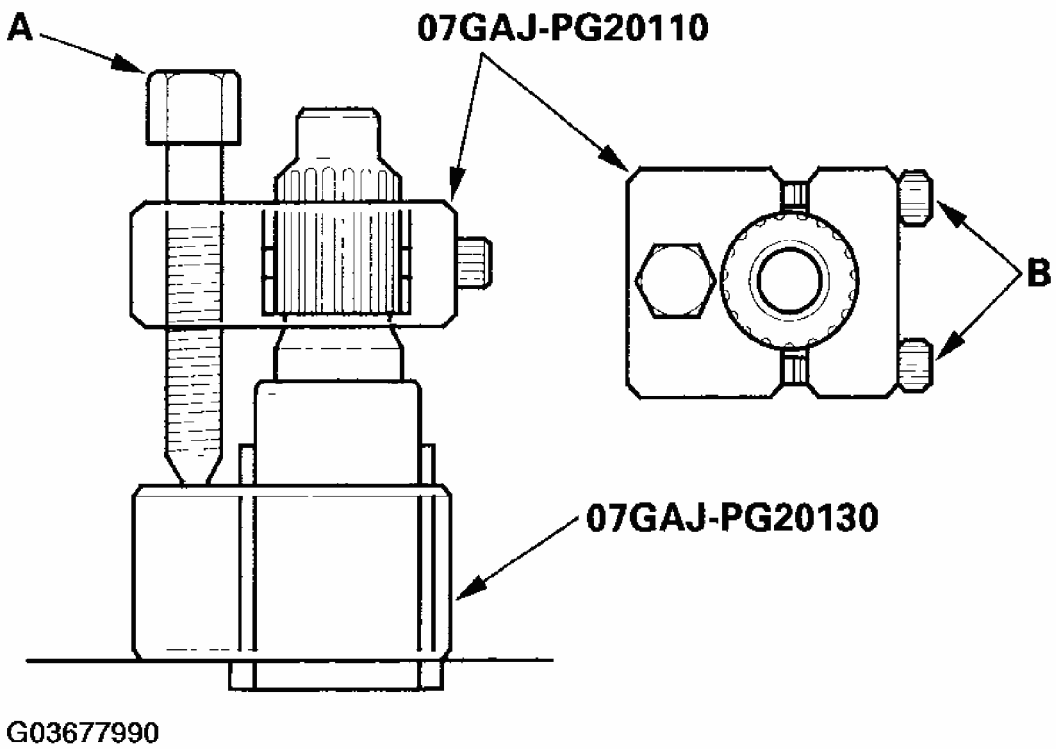

Fig. 134: Attaching Special Tools To Mainshaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Seat the mainshaft fully by tapping its end with a plastic hammer.
10. Thread in the mainshaft holder bolt until it just contacts the wide surface of the mainshaft base.
11. Zero a dial gauge (A) on the end of the mainshaft.

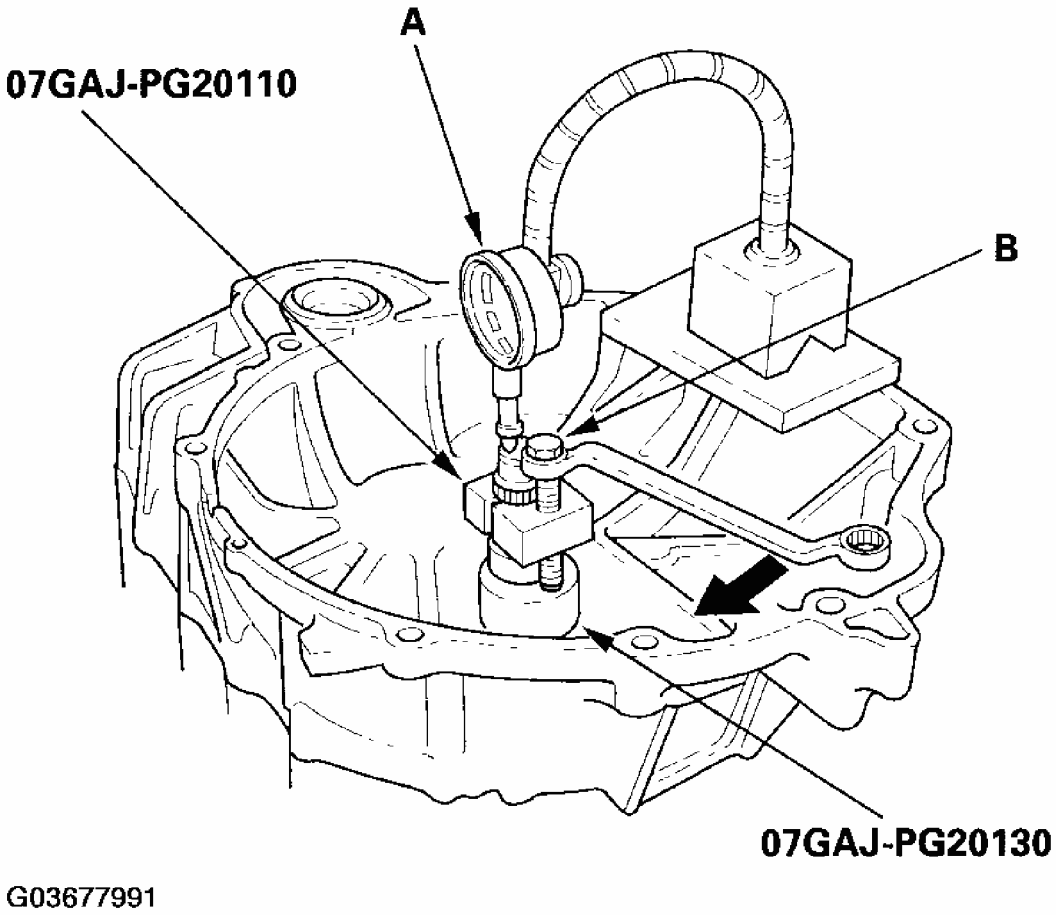

Fig. 135: Measuring Mainshaft Thrust Clearance
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Turn the mainshaft holder bolt (B) clockwise; stop turning when the dial gauge (A) has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft thrust clearance.

NOTE: Do not turn the mainshaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving. Applying more pressure with the mainshaft holder bolt could damage the transmission.

13. If the reading is within the standard, the clearance is correct. If the reading is not within the standards, select the appropriate shim needed from the table, and recheck the thrust clearance.

Standard: 0.11-0.17 mm (0.004-0.007 in.)

(Example)

Measure reading: 1.93 mm (0.0759 in.)

Subtract the total clearance measurement from the middle of the clearance standard 0.14 mm (0.0056 in.)

1.93-0.14 = 1.79 mm (0.0704 in.)

Select the shim closest to the amount calculated, for example the 1.80 mm (0.0709 in.) shim.

14. With oil guide plate M and the appropriate size shim installed in the transmission housing, check the thrust clearance again to verify the clearance is within the standard.

72 mm Shim

72 MM SHIM SPECIFICATIONS

	Part Number	Thickness
A	23931-P21-000	0.60 mm (0.024 in.)
B	23932-P21-000	0.63 mm (0.025 in.)
C	23933-P21-000	0.66 mm (0.026 in.)
D	23934-P21-000	0.69 mm (0.027 in.)
E	23935-P21-000	0.72 mm (0.028 in.)
F	23936-P21-000	0.75 mm (0.030 in.)
G	23937-P21-000	0.78 mm (0.031 in.)
H	23938-P21-000	0.81 mm (0.032 in.)
I	23939-P21-000	0.84 mm (0.033 in.)
J	23940-P21-000	0.87 mm (0.034 in.)
K	23941-P21-000	0.90 mm (0.035 in.)
L	23942-P21-000	0.93 mm (0.037 in.)
M	23943-P21-000	0.96 mm (0.038 in.)
N	23944-P21-000	0.99 mm (0.039 in.)
O	23945-P21-000	1.02 mm (0.040 in.)
P	23946-P21-000	1.05 mm (0.041 in.)
Q	23947-P21-000	1.08 mm (0.043 in.)
R	23948-P21-000	1.11 mm (0.044 in.)
S	23949-P21-000	1.14 mm (0.045 in.)
T	23950-P21-000	1.17 mm (0.046 in.)
U	23951-P21-000	1.20 mm (0.047 in.)
V	23952-P21-000	1.23 mm (0.048 in.)

X	23954-P21-000	1.29 mm (0.051 in.)
Y	23955-P21-000	1.32 mm (0.052 in.)
Z	23956-P21-000	1.35 mm (0.053 in.)
AA	23957-P21-000	1.38 mm (0.054 in.)
AB	23958-P21-000	1.41 mm (0.056 in.)
AC	23959-P21-000	1.44 mm (0.057 in.)
AD	23960-P21-000	1.47 mm (0.058 in.)
AE	23961-P21-000	1.50 mm (0.059 in.)
AF	23962-P21-000	1.53 mm (0.060 in.)
AG	23963-P21-000	1.56 mm (0.061 in.)
AH	23964-P21-000	1.59 mm (0.063 in.)
AI	23965-P21-000	1.62 mm (0.064 in.)
AJ	23966-P21-000	1.65 mm (0.065 in.)
AK	23967-P21-000	1.68 mm (0.066 in.)
AL	23968-P21-000	1.71 mm (0.067 in.)
AM	23969-P21-000	1.74 mm (0.069 in.)
AN	23970-P21-000	1.77 mm (0.070 in.)
AO	23971-P21-000	1.80 mm (0.071 in.)
AP	23972-PPP-J000	1.83 mm (0.072 in.)
AQ	23973-PPP-J000	1.86 mm (0.073 in.)
AR	23974-PPP-J000	1.89 mm (0.074 in.)
AS	23975-PPP-J000	1.92 mm (0.075 in.)
AT	23976-PPP-J000	1.95 mm (0.076 in.)
AV	23977-PPP-J000	1.98 mm (0.077 in.)
AW	23978-PPP-J000	2.01 mm (0.079 in.)
AX	23979-PPP-J000	2.04 mm (0.080 in.)
AY	23980-PPP-J000	2.07 mm (0.081 in.)
AZ	23981-PPP-J000	2.10 mm (0.082 in.)
BA	23982-PPP-J000	2.13 mm (0.083 in.)
BB	23983-PPP-J000	2.16 mm (0.085 in.)
BC	23984-PPP-J000	2.19 mm (0.086 in.)
BD	23985-PPP-J000	2.22 mm (0.087 in.)
BE	23986-PPP-J000	2.25 mm (0.088 in.)

TRANSMISSION REASSEMBLY

NOTE: Prior to reassembling, clean all parts in solvent, dry them, and apply lubricant to any contact surfaces.

1. Install the magnet (A) and differential assembly (B).

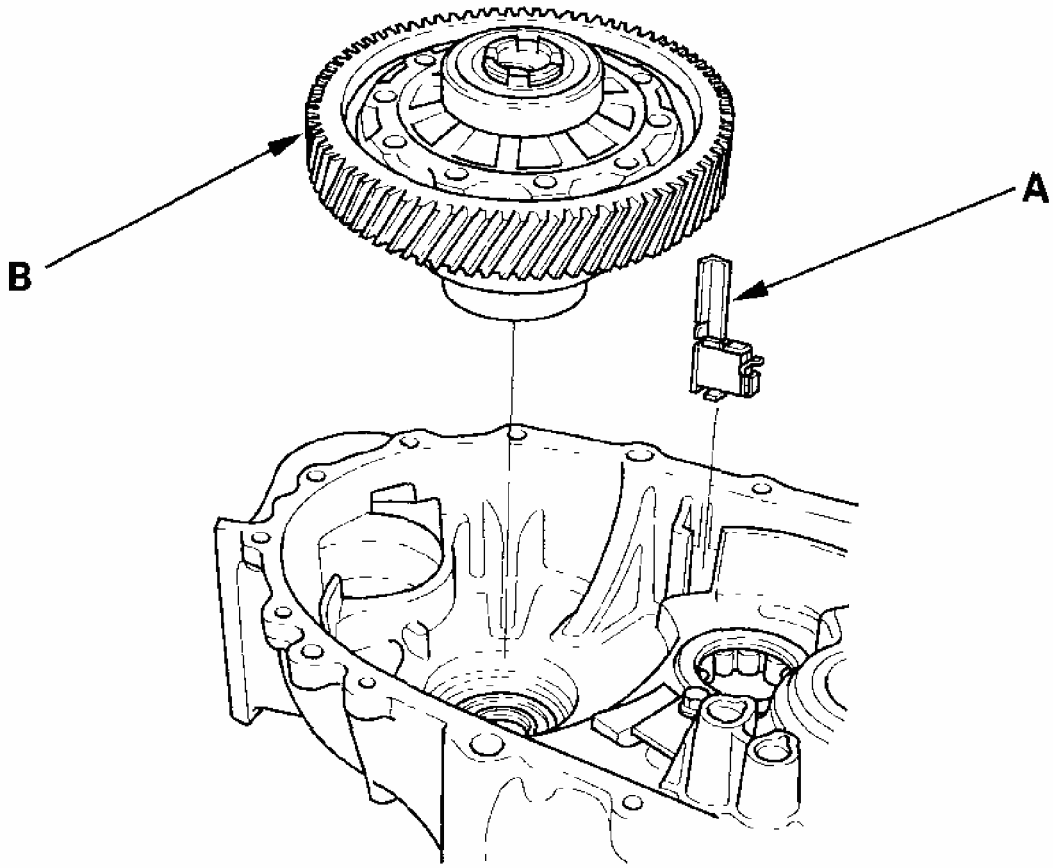

Fig. 136: Installing Magnet And Differential Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the 28 mm spring washer (A) and 28 mm washer (B) over the ball bearing (C). Note the installation direction of the spring washer (A).

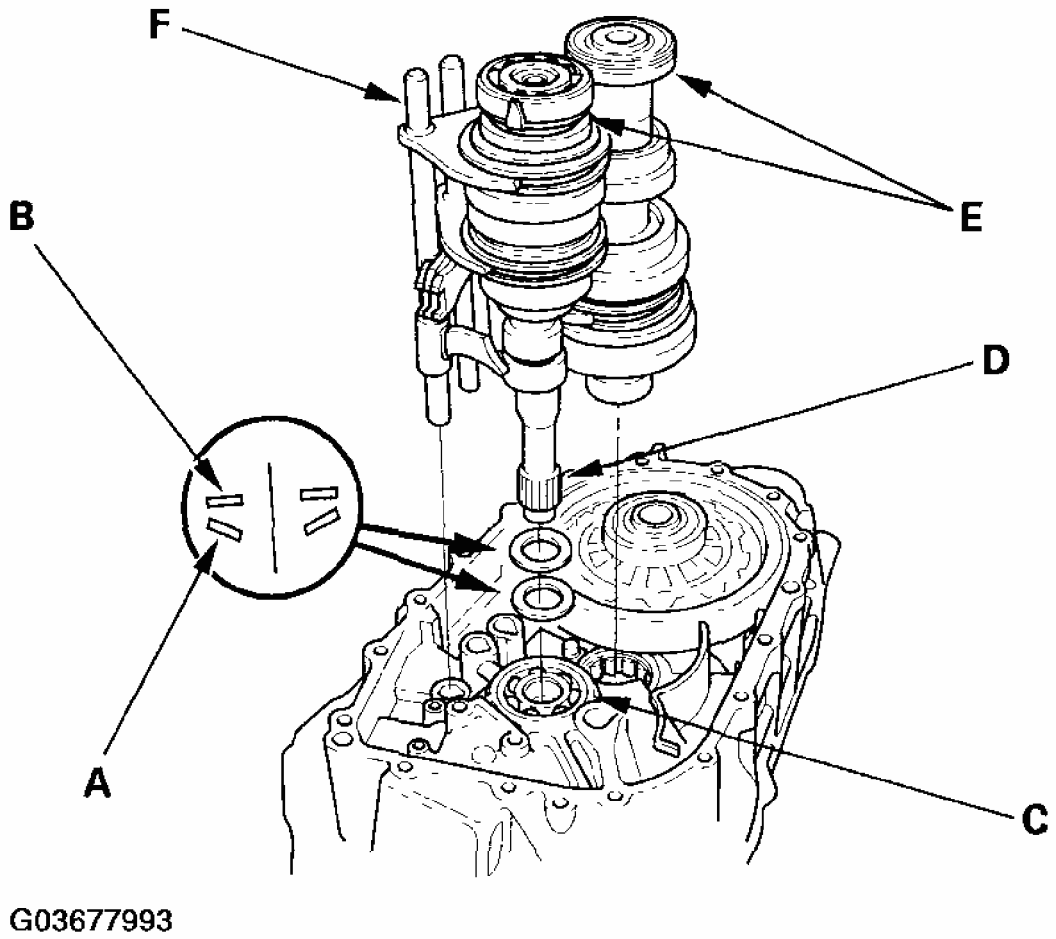

Fig. 137: Installing 28mm Spring Washer And 28mm Washer Over Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Apply vinyl tape to the mainshaft splines (D) to protect the seal. Install the mainshaft and countershaft (E) into the shift forks (F), as an assembly.
4. Install the reverse shift fork (A).

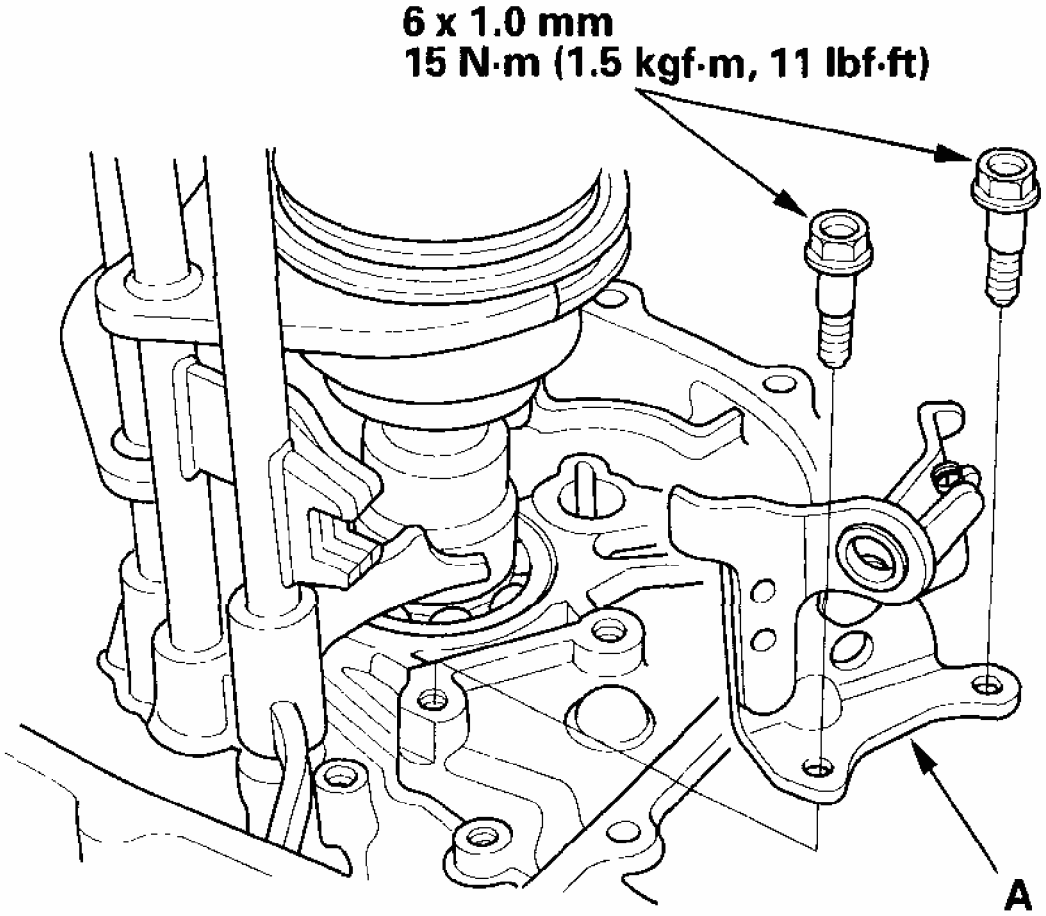

Fig. 138: Installing Reverse Shift Fork And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the reverse idler gear (A) and reverse gear shaft (B) by aligning the mark (C) with the reverse gear shaft hole (D).

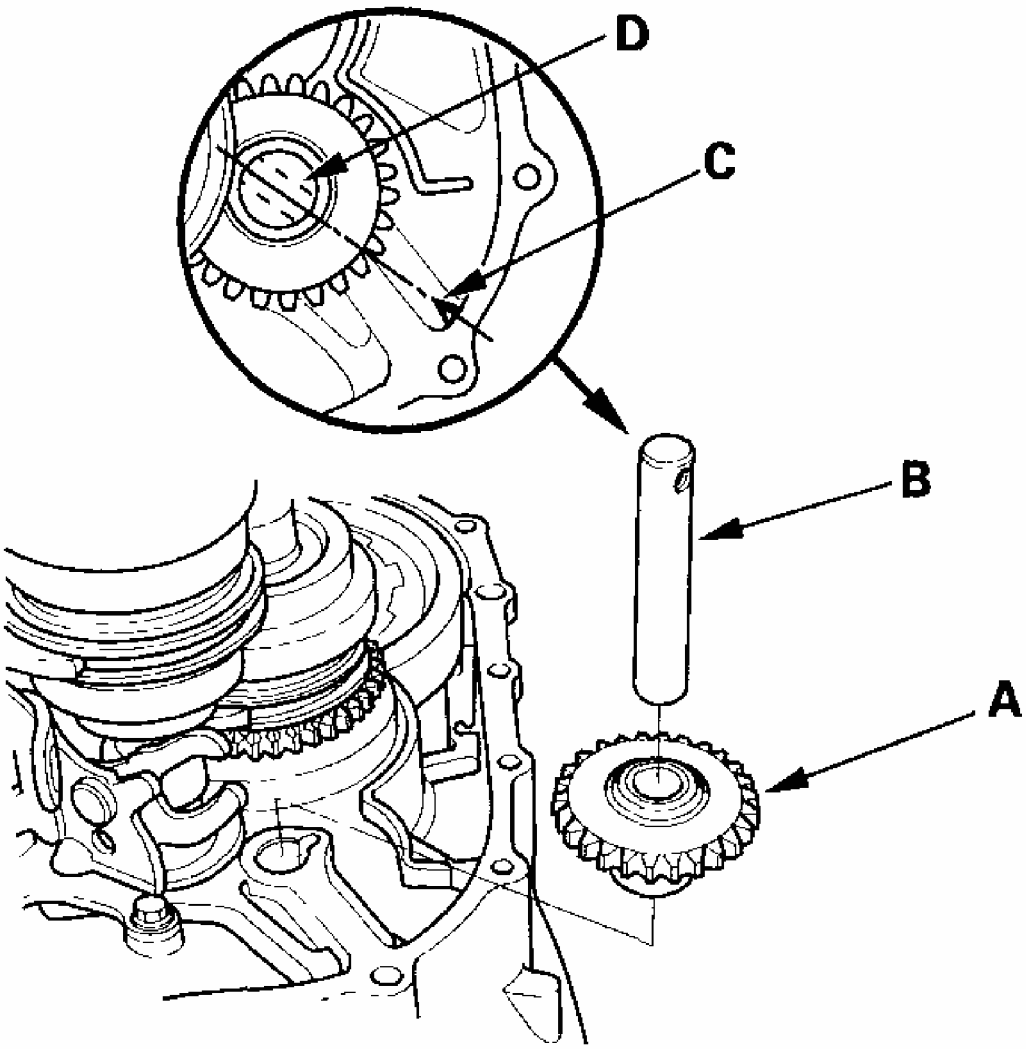

Fig. 139: Installing Reverse Idler Gear And Reverse Gear Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the reverse lock cam (A).

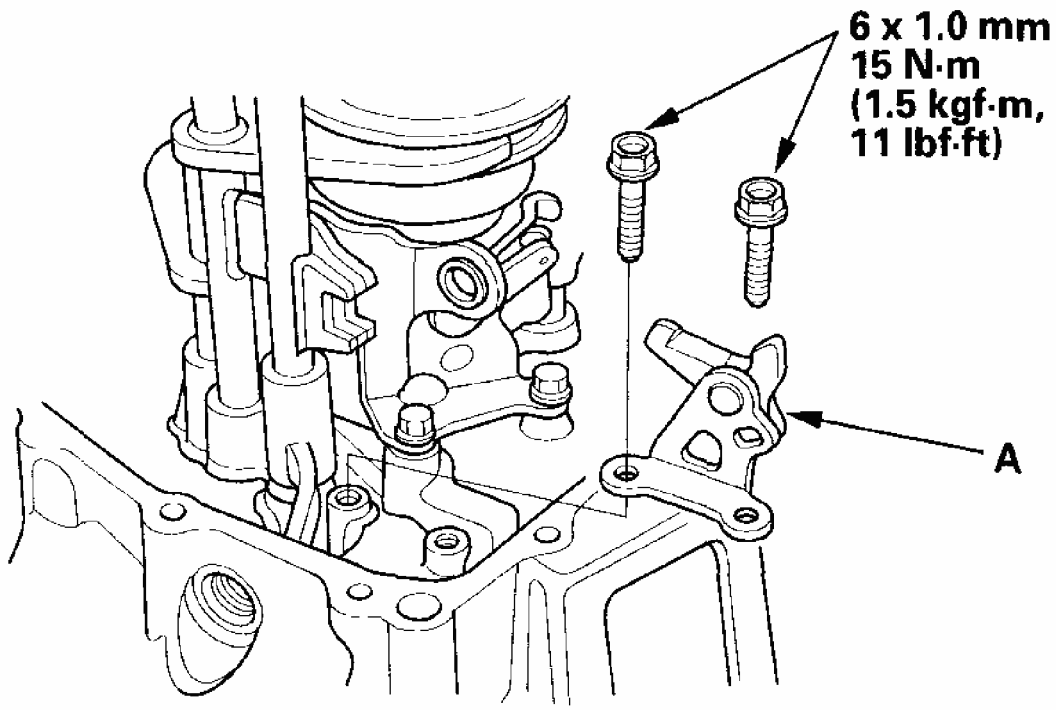

Fig. 140: Identifying Tightening Torque Of Reverse Lock Cam Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Select the proper size 72 mm shim (A) according to the measurements made during the Mainshaft Thrust Clearance Adjustment (see **MAINSHAFT THRUST CLEARANCE ADJUSTMENT**). Install the oil gutter plate (B), oil guide plate M, and 72 mm shim into the transmission housing (C).

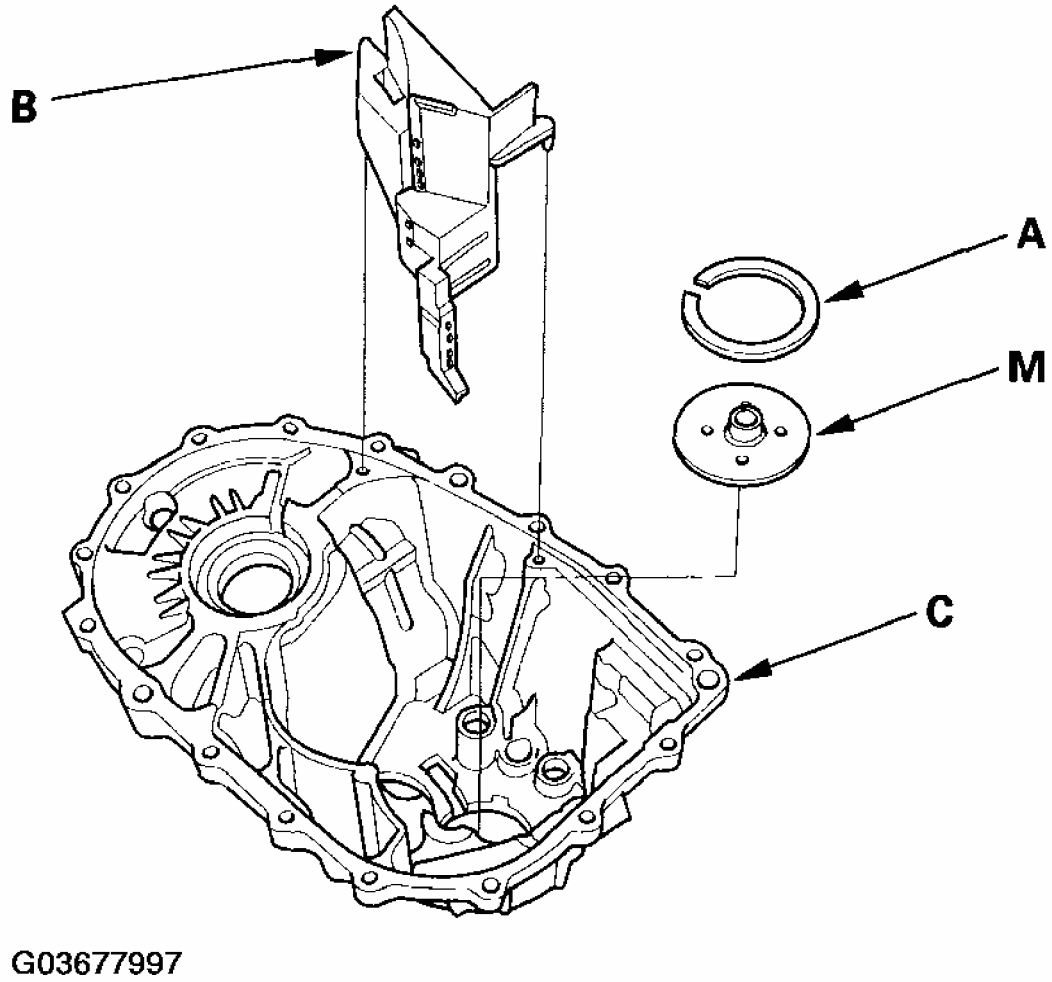

Fig. 141: Installing Oil Gutter Plate, Oil Guide Plate, And Shim Into Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Remove any dirt or oil from the transmission housing sealing surface. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to the sealing surface. Make sure you seal the entire circumference of the bolt holes to prevent fluid leakage.

NOTE: Do not install the components if too much time has passed after applying the liquid gasket (for P/N 08718-0002, no more than 4 minutes, for all others, no more than 5 minutes). Instead, remove the old residue, and reapply the liquid gasket. Allow it to cure at least 30 minutes after assembly before filling the transmission with MTF.

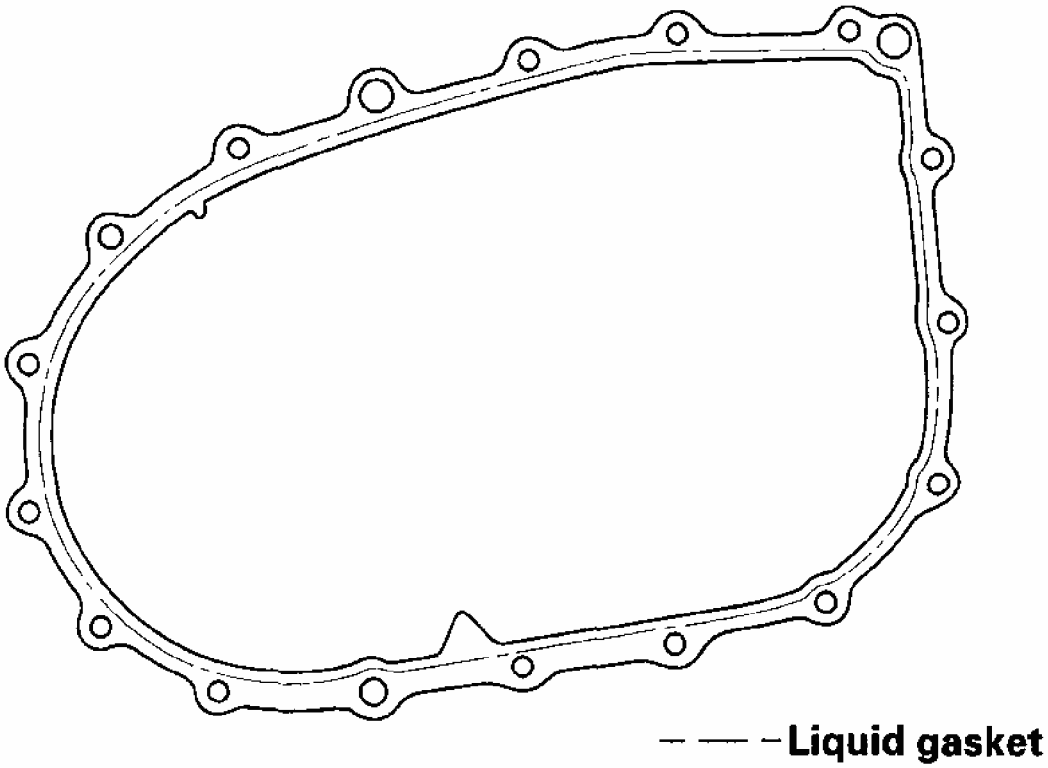

Fig. 142: Applying Liquid Gasket To Sealing Surface
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Install the 14 x 20 mm dowel pins (A).

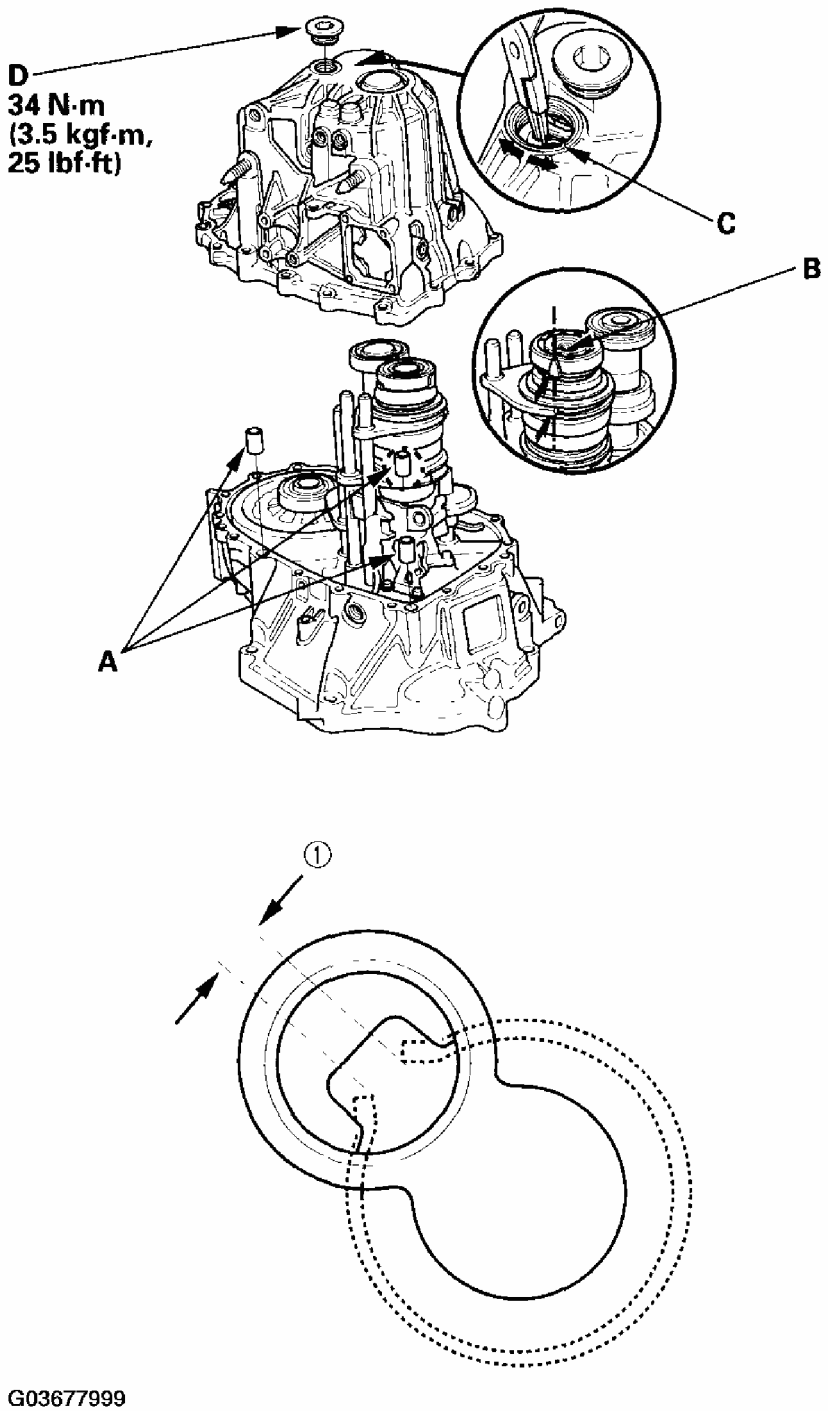

Fig. 143: Installing 14x20mm Dowel Pins
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Set the tapered cone ring (B) as shown. Place the transmission housing over the clutch housing, being careful to line up the shafts.
11. Lower the transmission housing the rest of the way as you expand the 72 mm snap ring (C). Release the snap ring so it seats in the groove of the countershaft bearing.

12. Make sure the 72 mm snap ring is securely seated in the groove of the countershaft bearing.

    Dimension (1) as installed: 3.3-6.0 mm (0.13-0.24 in.)

13. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to the threads of the 32 mm sealing cap (D), and install it on the transmission housing.

    NOTE: Do not install the components if too much time has passed after applying the liquid gasket (for P/N 08718-0002, no more than 4 minutes, for all others, no more than 5 minutes). Instead, remove the old residue, and reapply the liquid gasket.

14. Install transmission hangers A, B, and the 8 mm flange bolts, finger-tight.

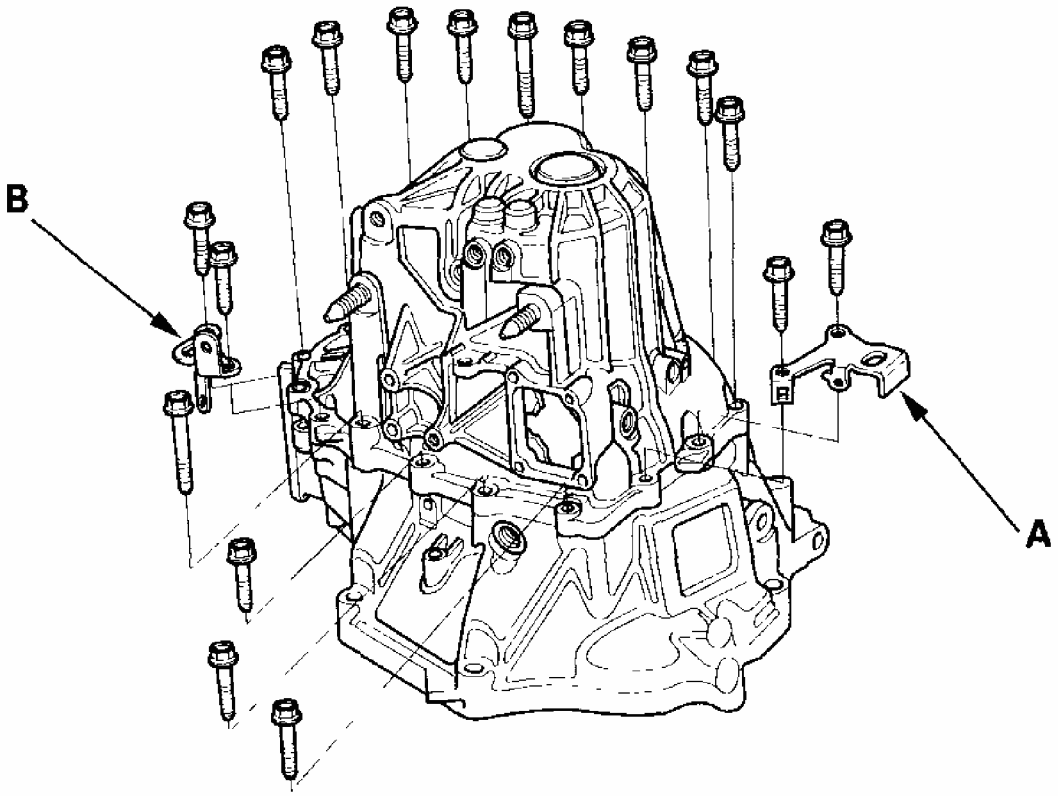

Fig. 144: Installing Transmission Hangers And 8mm Flange Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Tighten the 8 mm flange bolts in a crisscross pattern in several steps.

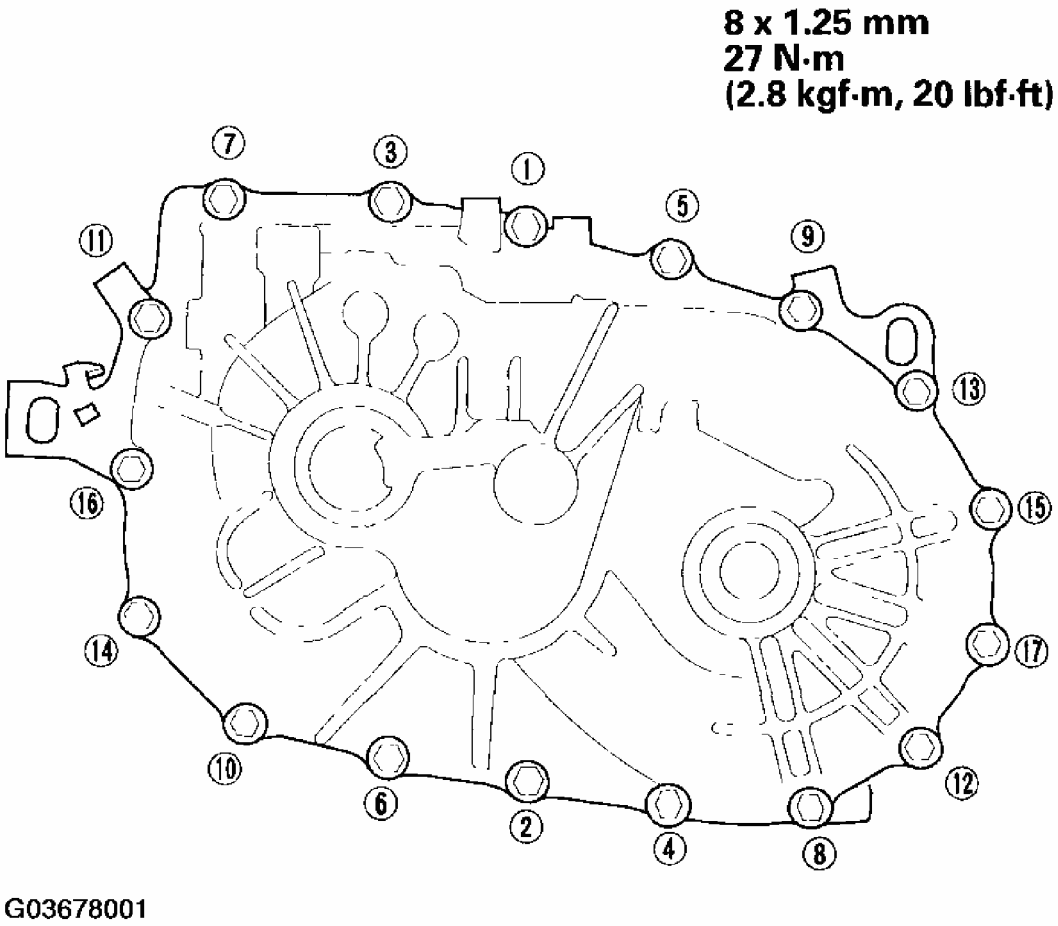

Fig. 145: Identifying Tightening Sequence Of 8mm Flange Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Remove any dirt or oil from the change lever cover sealing surface. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to the sealing surface.

NOTE: Do not install the components if too much time has passed after applying the liquid gasket (for P/N 08718-0002, no more than 4 minutes, for all others, no more than 5 minutes). Instead, remove the old residue, and reapply the liquid gasket. Allow it to cure at least 30 minutes after assembly before filling the transmission with MTF.

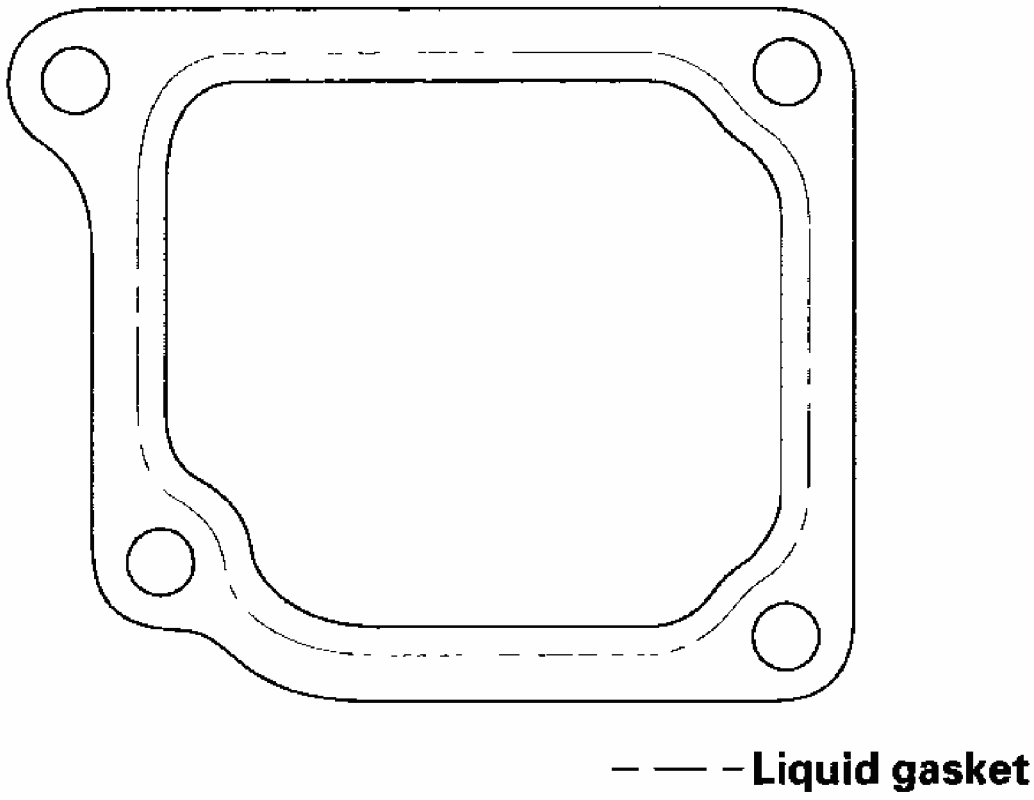

Fig. 146: Applying Liquid Gasket On Change Lever Cover Sealing Surface
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Install the 8 x 14 mm dowel pins (A) and the change lever assembly (B).

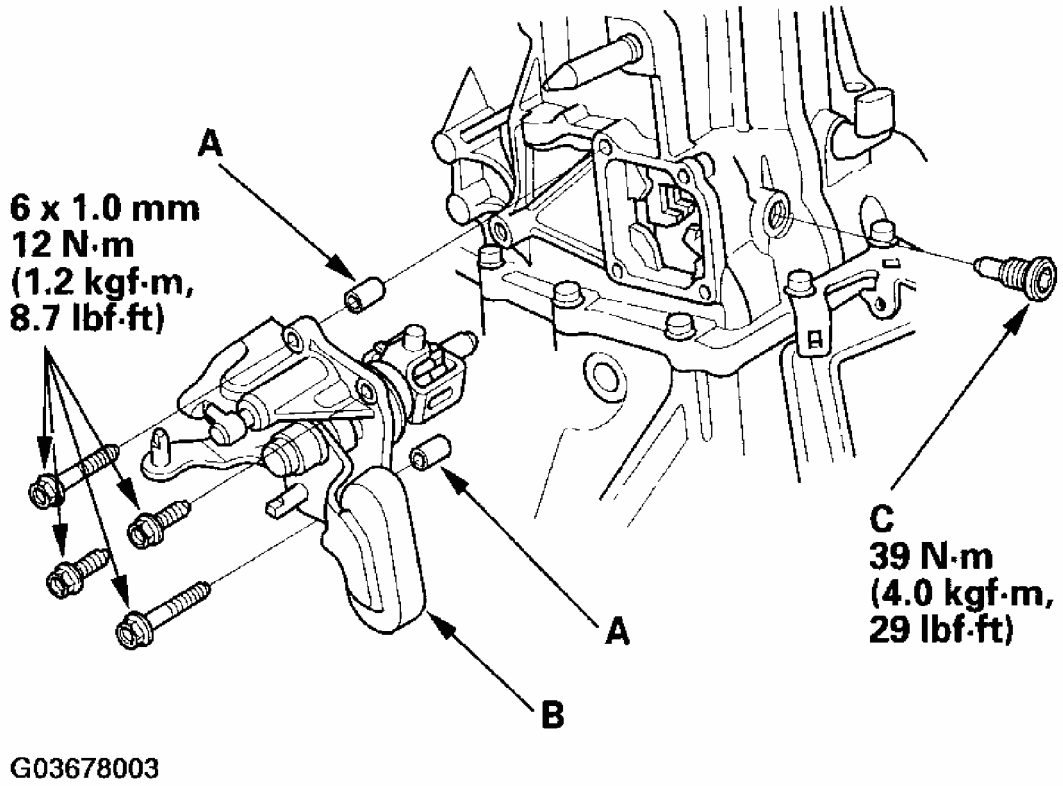

Fig. 147: Installing 8x14mm Dowel Pins And Change Lever Assembly With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to the threads of the interlock bolt (C), and install it on the transmission housing.

NOTE: Do not install the components if too much time has passed after applying the liquid gasket (for P/N 08718-0002, no more than 4 minutes, for all others, no more than 5 minutes). Instead, remove the old residue, and reapply the liquid gasket.

19. Install the drain plug (A), filler plug (B), and 10 mm flange bolt (C) with new washers.

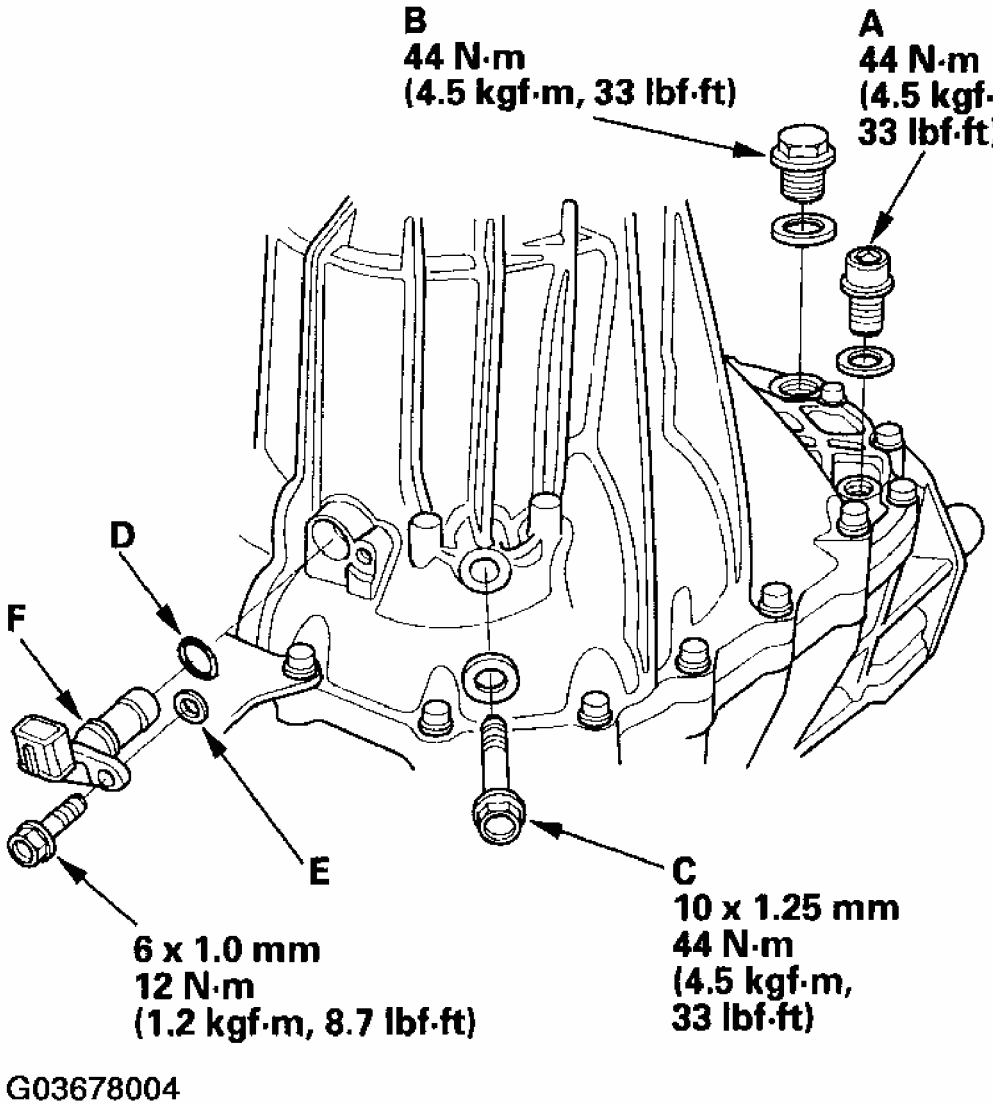

Fig. 148: Installing Drain Plug, Filler Plug, And 10mm Flange Bolt With Washers And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Install the new O-ring (D), the plain washer (E), and the output shaft (countershaft) speed sensor (F).
21. Install the detent bolts, springs, and steel balls (A) with new washers (B).

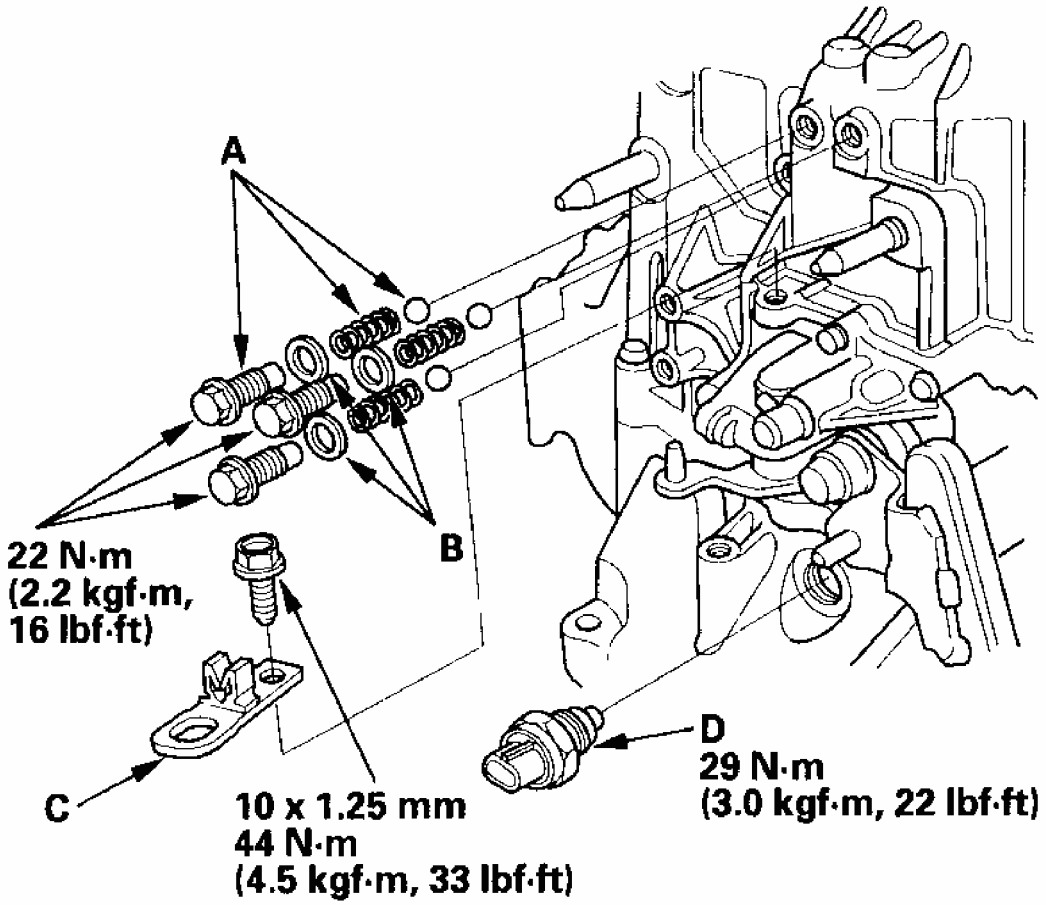

Fig. 149: Identifying Tightening Torque Of Detent Bolts, Springs, And Steel Balls Washers
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to the threads of the back-up light switch (D), and install the switch on the transmission housing.

NOTE: Do not install the components if too much time has passed after applying the liquid gasket (for P/N 08718-0002, no more than 4 minutes, for all others, no more than 5 minutes). Instead, remove the old residue, and reapply the liquid gasket.

23. Install the transmission hanger (C).
24. Install the 20 mm bolt (A) and 20 mm washer (B).

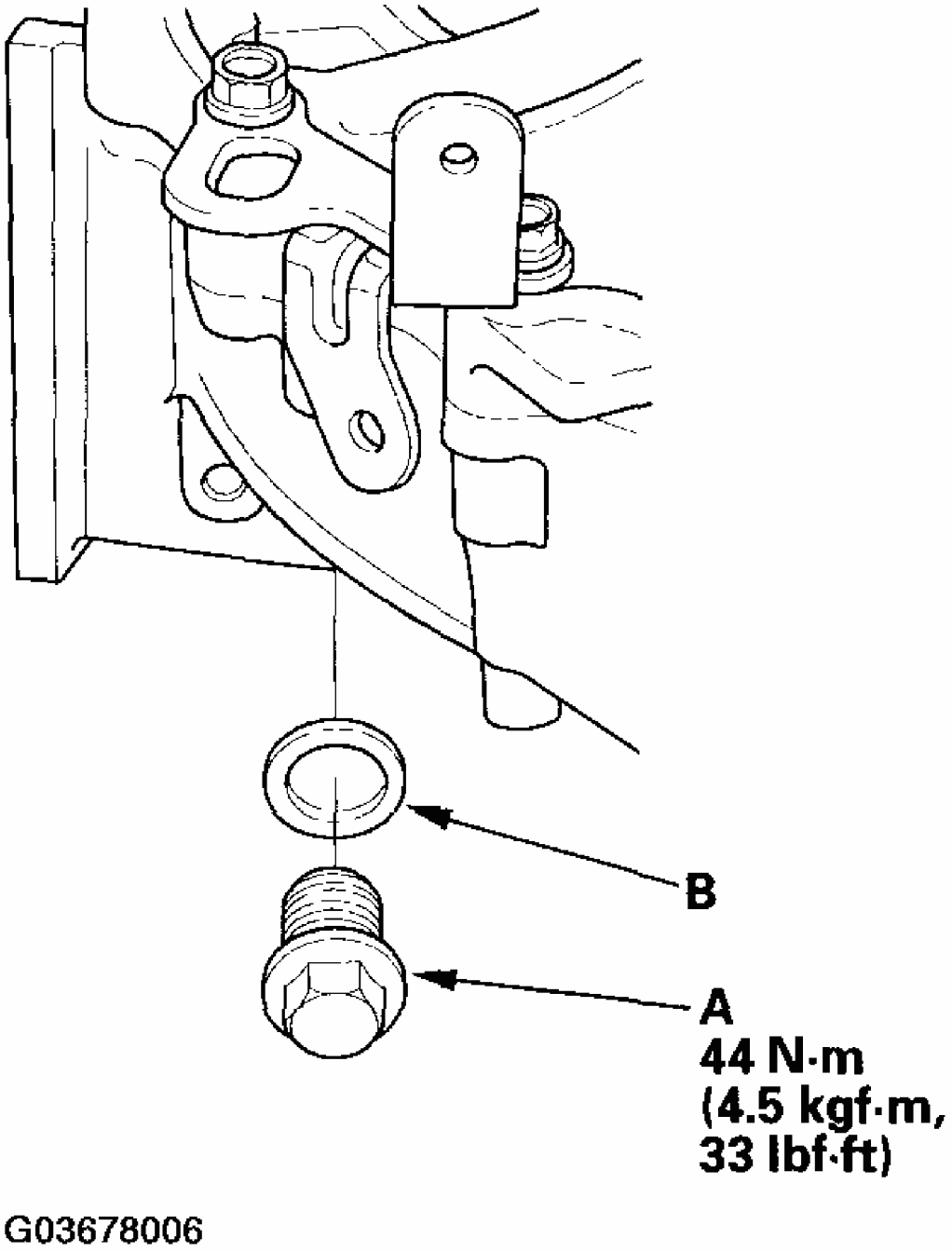

Fig. 150: Identifying Tightening Torque Of 20mm Bolt And Washer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. 2WD model: Install the new O-ring (A) and the side cover (B).

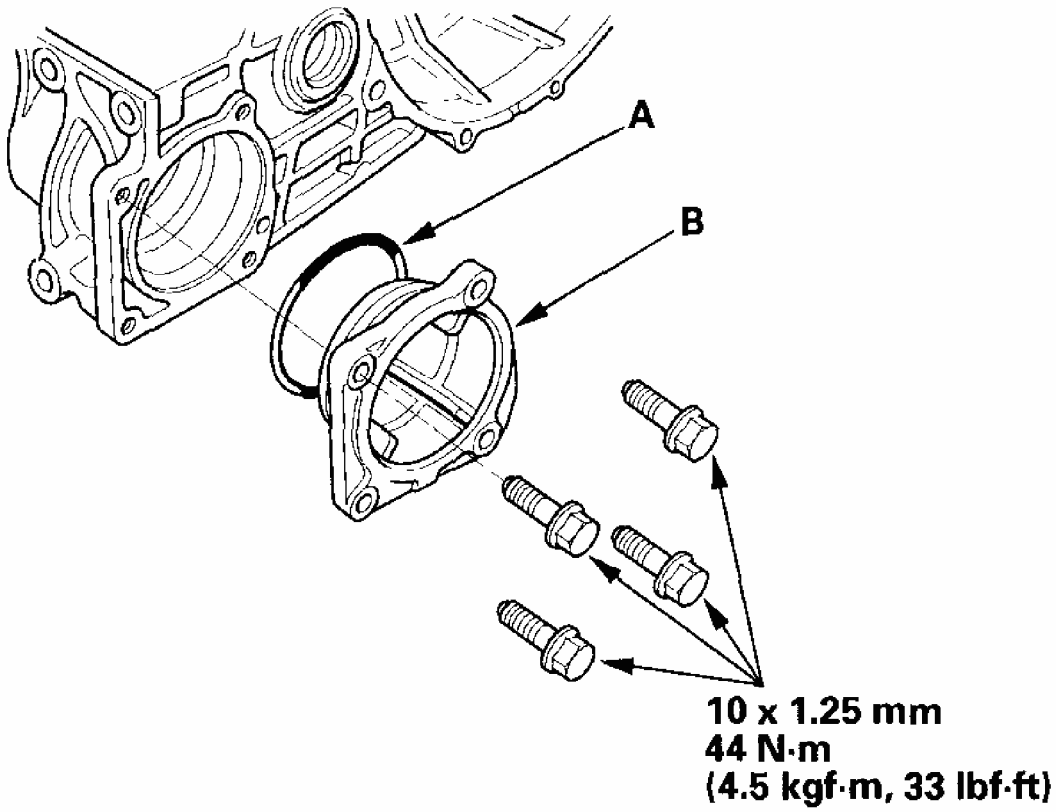

Fig. 151: Identifying Tightening Torque Of Side Cover Bolts (2WD Model)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

26. 4WD model: Install the new O-ring (C), 10 x 20 mm dowel pin (D), and the transfer assembly (E).

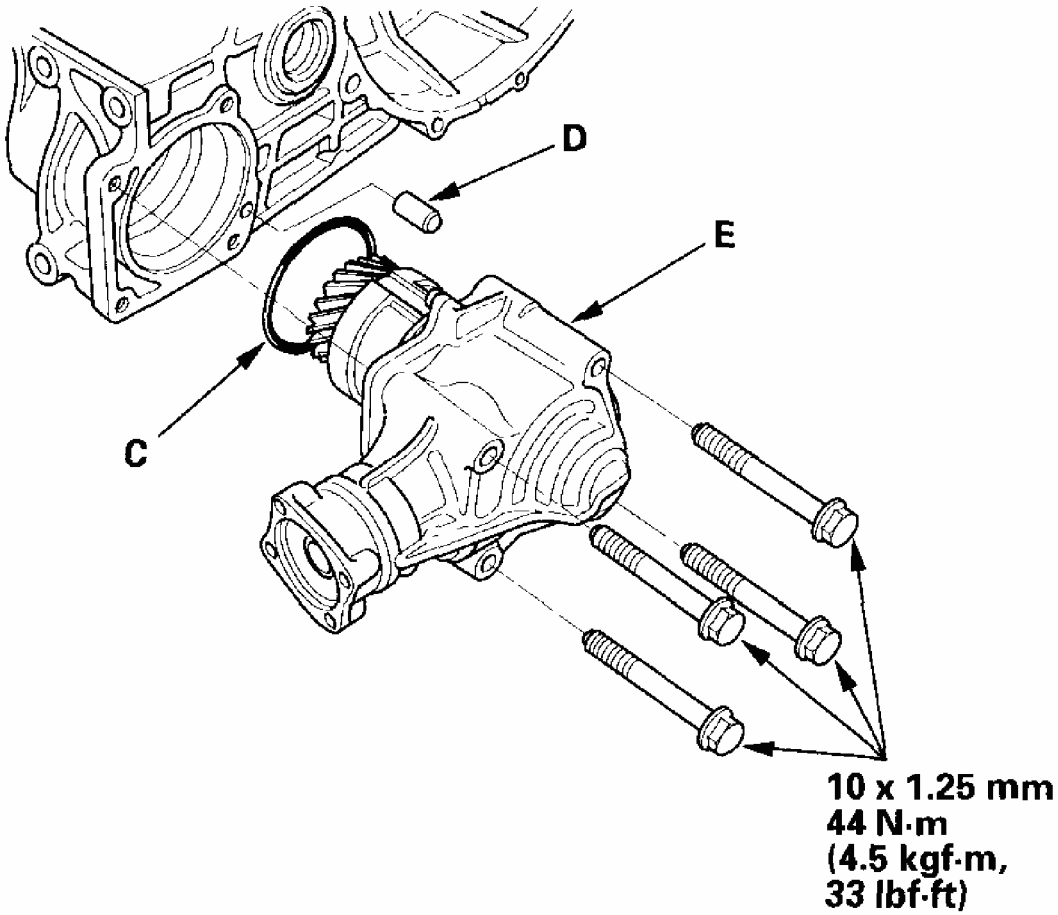

Fig. 152: Installing New O-Ring, 20mm Dowel Pin And Transfer Assembly With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MANUAL TRANSMISSION

GEARSHIFT MECHANISM REPLACEMENT

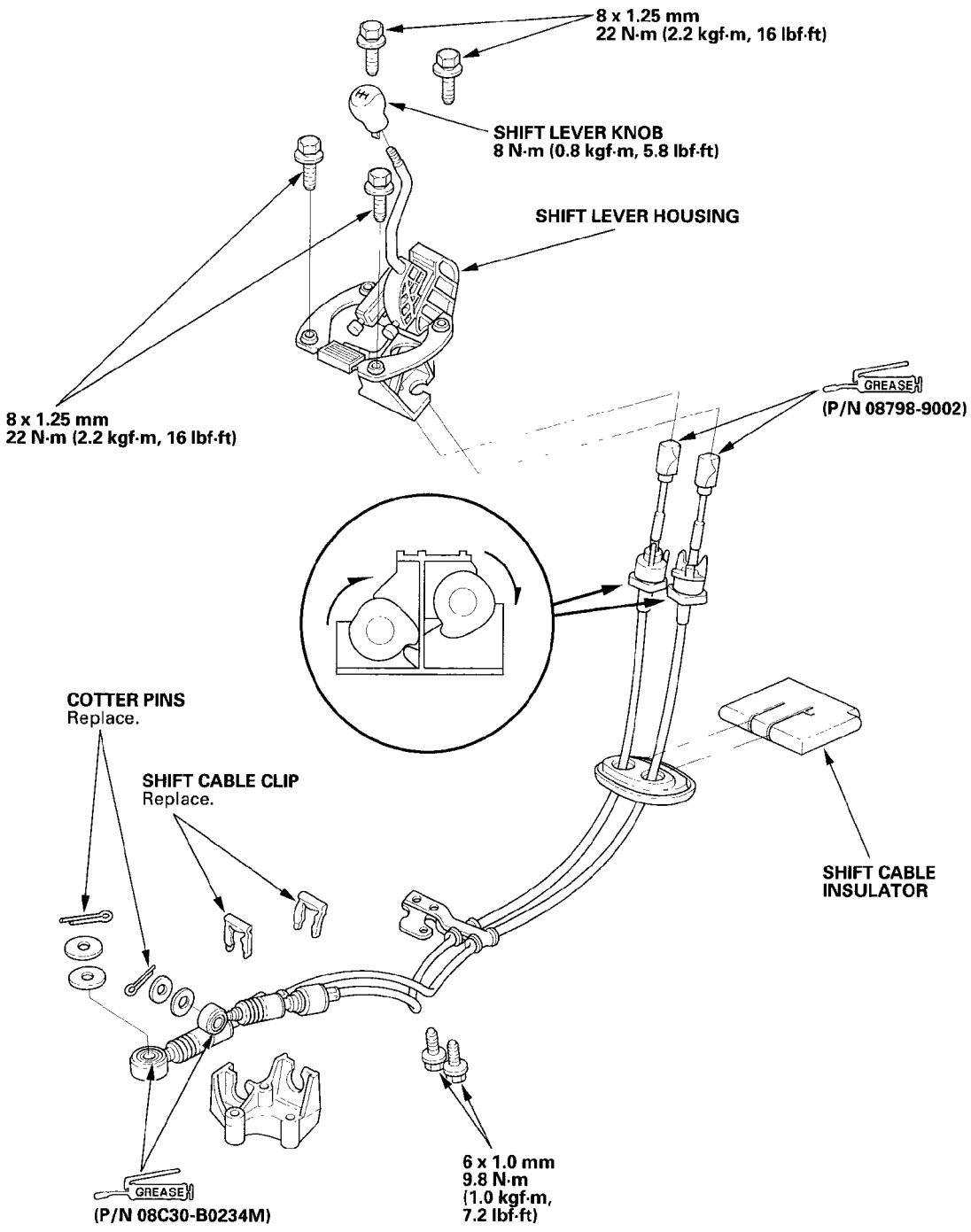

Fig. 153: Replacing Gearshift Mechanism And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COMPONENT LOCATION INDEX

4WD Model

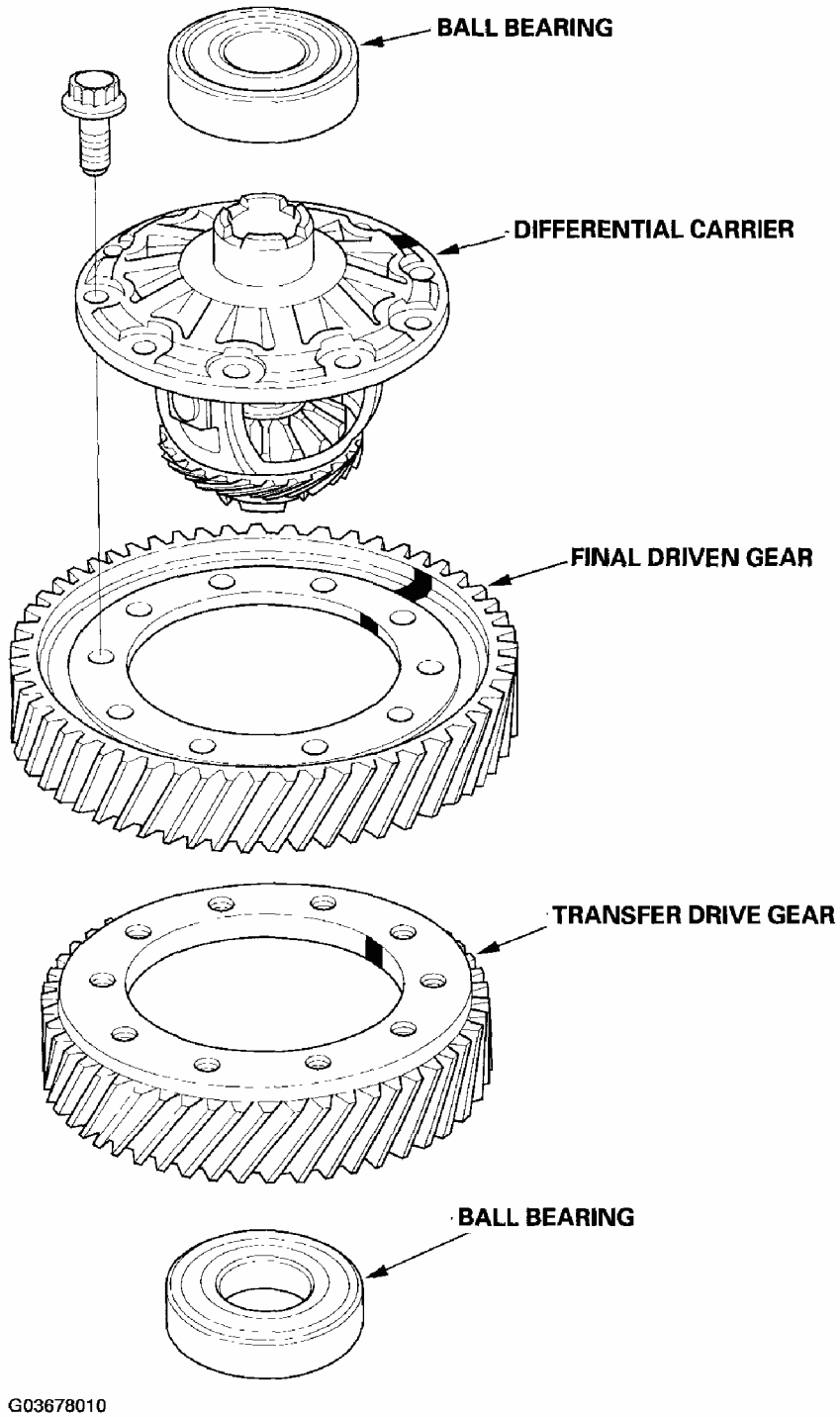

Fig. 154: Component Location Index M/T Differential (4WD Model)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2WD Model

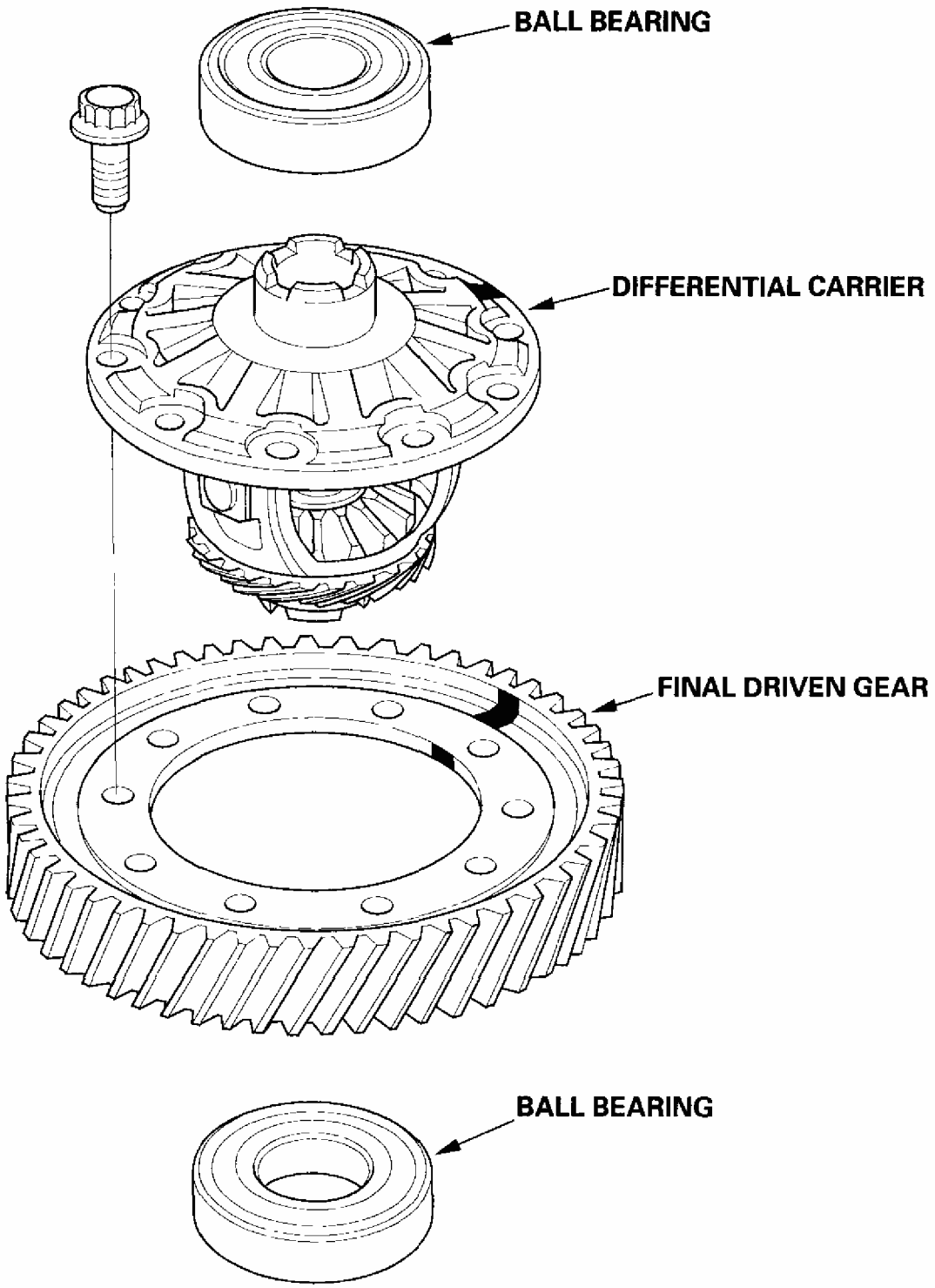

Fig. 155: Component Location Index M/T Differential (2WD Model)
Courtesy of AMERICAN HONDA MOTOR CO., INC.

BACKLASH INSPECTION

1. Place the differential assembly on V-blocks (A), and install both axles.

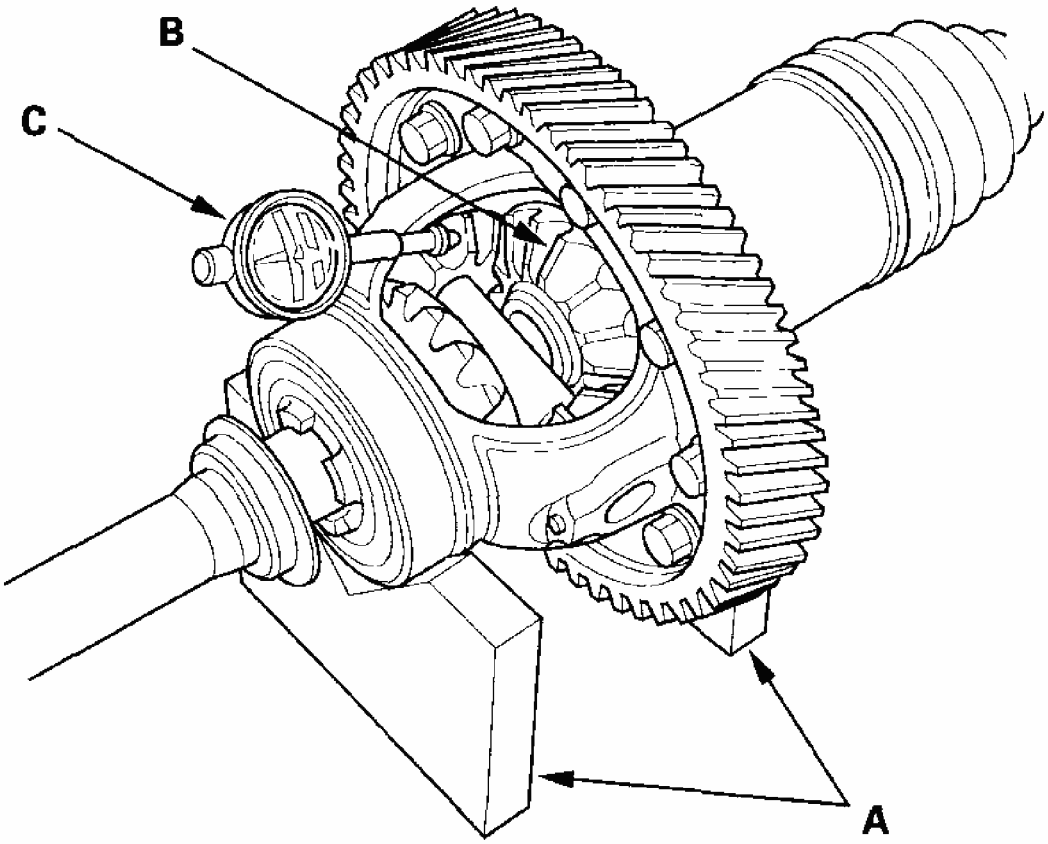

Fig. 156: Installing Axles And Measuring Backlash Of Both Pinion Gears With Dial Indicator
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the backlash of both pinion gears (B) with a dial indicator (C). If the backlash is not within the standard, replace the differential carrier.

Standard (New): 0.05-0.15 mm (0.002-0.006 in.)

DIFFERENTIAL CARRIER, FINAL DRIVEN GEAR, TRANSFER DRIVE GEAR REPLACEMENT

4WD Model

1. Remove the bolts (left-hand threads) in a crisscross pattern in several steps, then remove the transfer drive gear (A) and final driven gear (B) from the differential carrier (C).

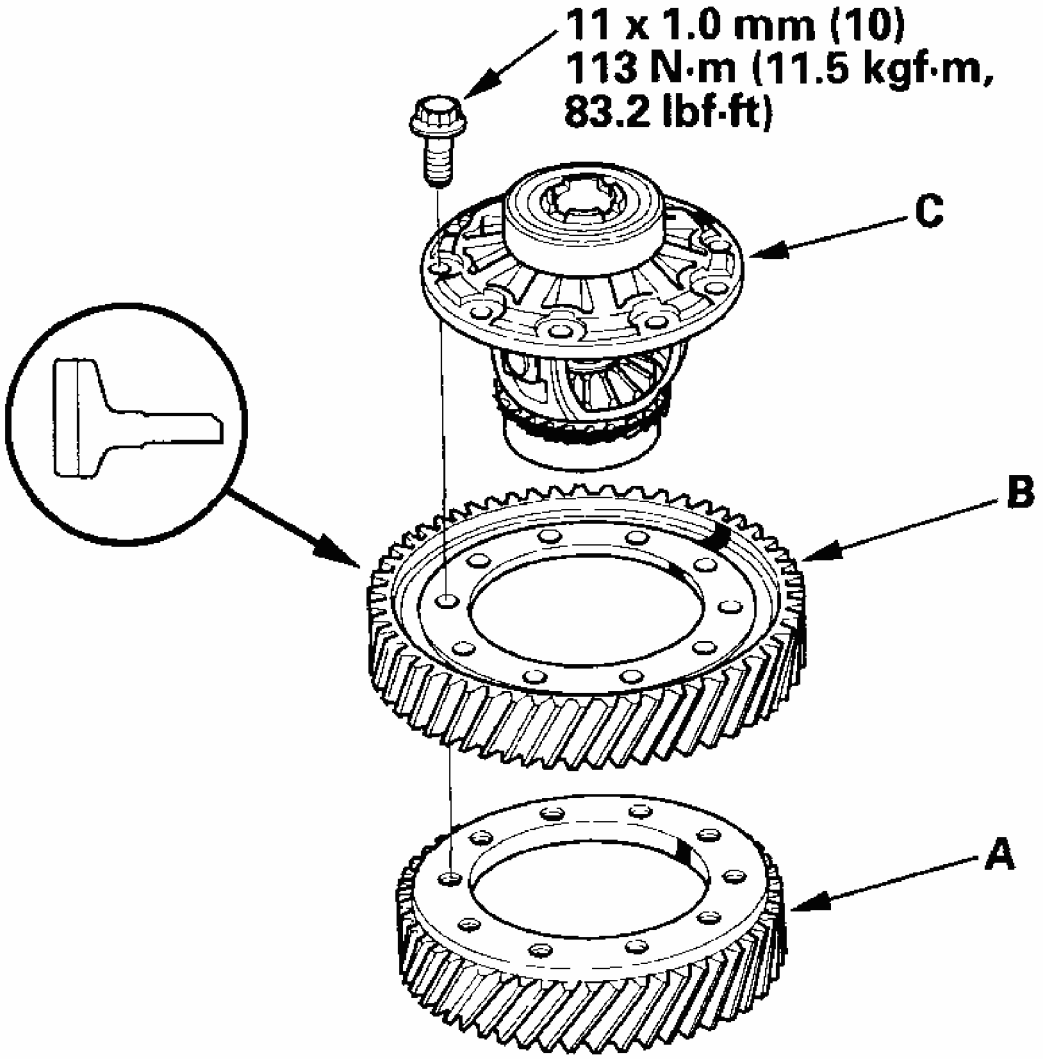

Fig. 157: Removing Transfer Drive Gear And Final Driven Gear From Differential Carrier (4WD Model) With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the final driven gear with the chamfer on the inside diameter facing the carrier. Align the marks on the driven gear and the carrier. Tighten the bolts in a crisscross pattern in several steps.

DIFFERENTIAL CARRIER, FINAL DRIVEN GEAR REPLACEMENT

2WD Model

1. Remove the bolts (left-hand threads) in a crisscross pattern in several steps, then

remove the final driven gear (A) from the differential carrier (B).

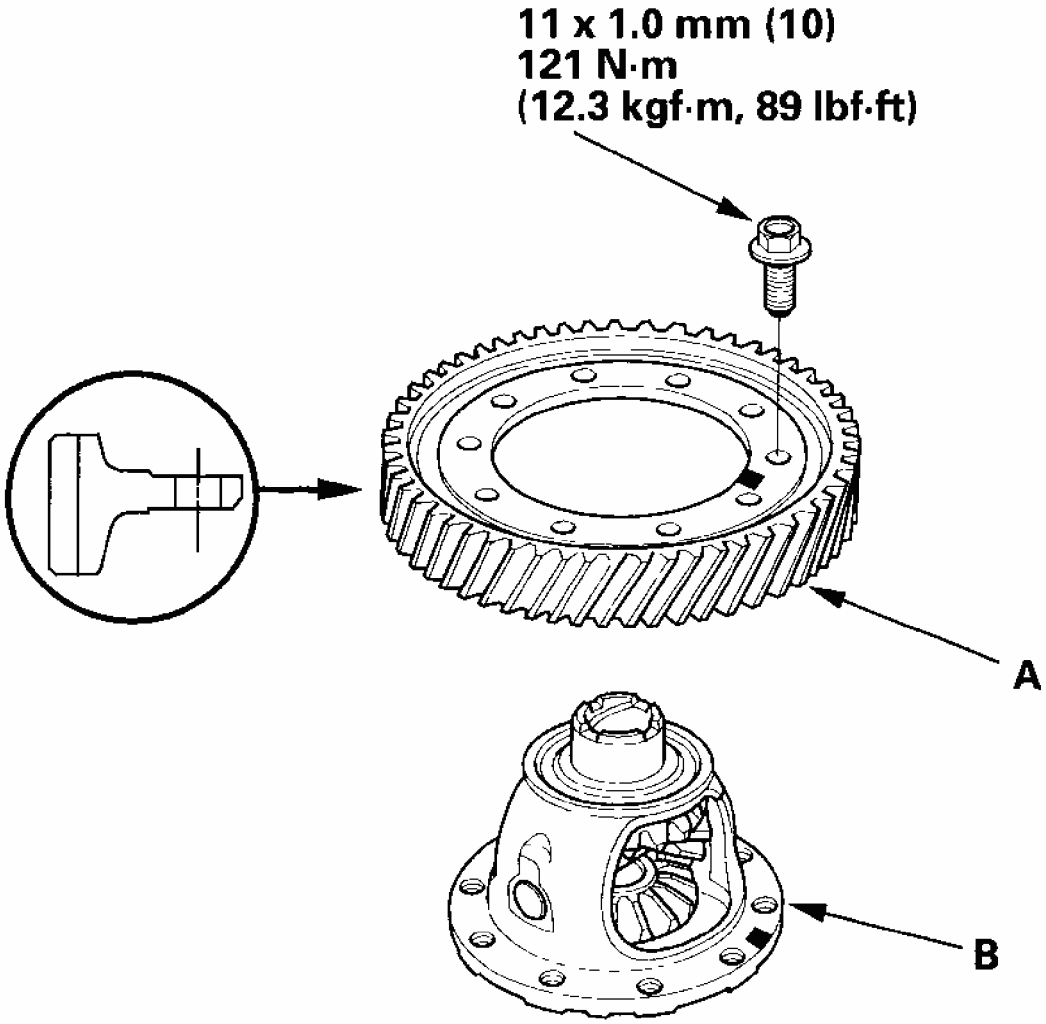

Fig. 158: Removing Final Driven Gear From Differential Carrier (2WD Model) And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the final driven gear with the chamfer on the inside diameter facing the carrier. Align the marks on the driven gear and the carrier. Tighten the bolts in a crisscross pattern in several steps.

CARRIER BEARING REPLACEMENT

Special Tools Required

Driver, 40 mm I.D. 07746-0030100

1. Check the carrier bearings for wear and rough rotation. If they rotate smoothly and their rollers show no signs of wear, the bearings are OK.
2. Remove the carrier bearing (A) with a commercially available bearing puller (B).

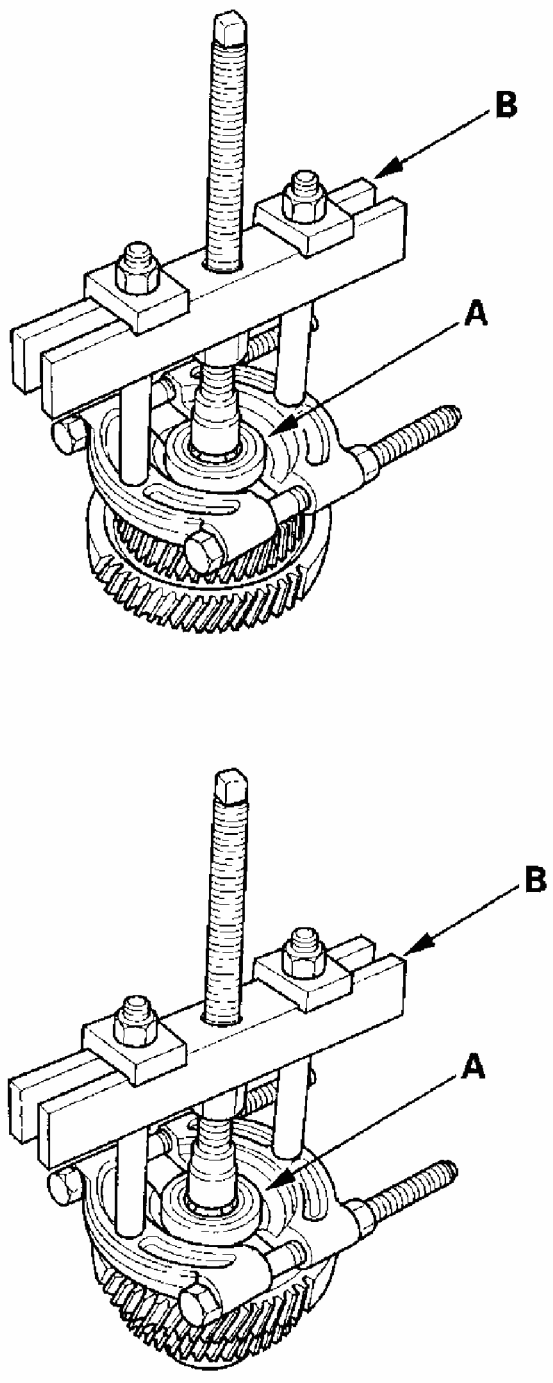

Fig. 159: Removing Carrier Bearing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the new bearings (A) with the special tool and a press. Press each bearing on until it bottoms. There should be no clearance between the bearings and the carrier.

NOTE: Place the seal part of the bearing (B) toward the outside of the differential, then install it.

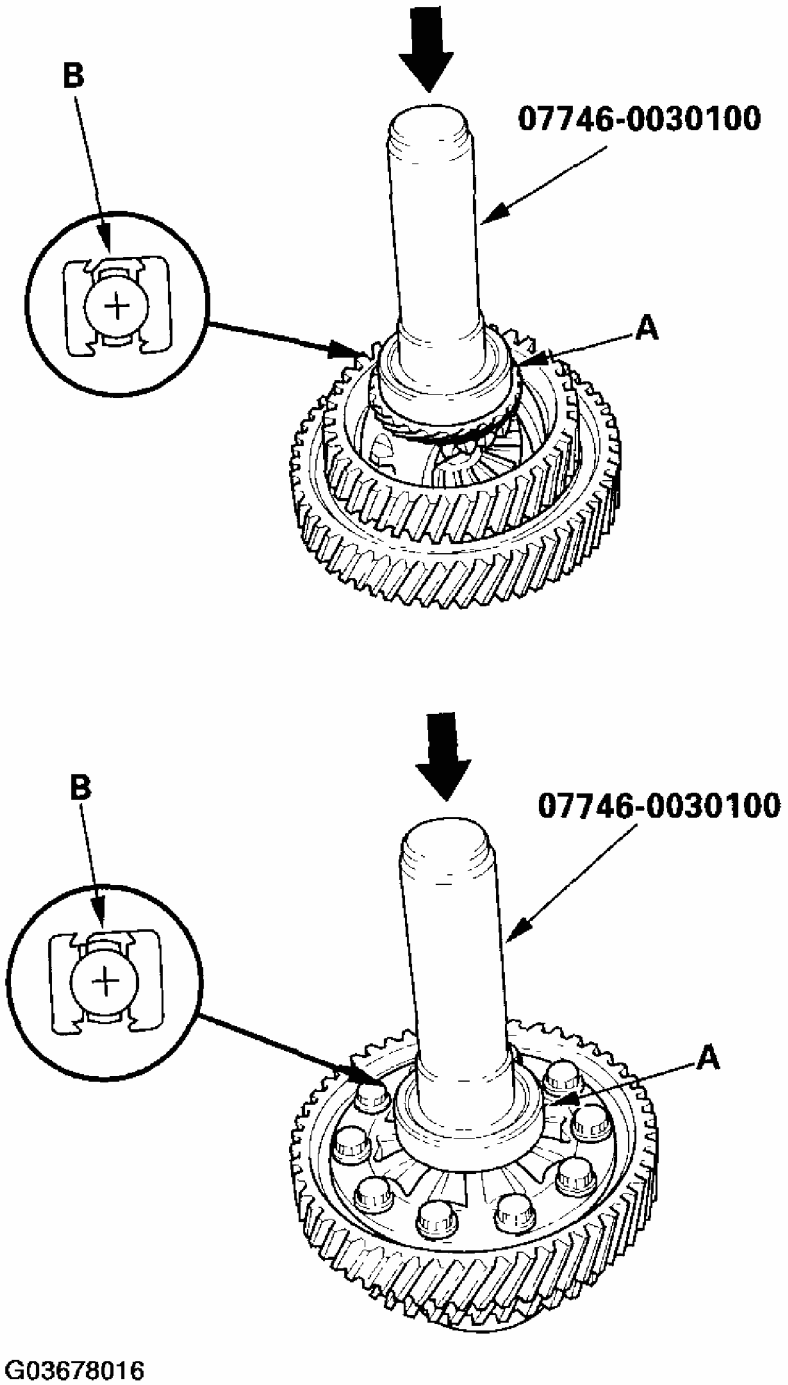

Fig. 160: Installing Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

OIL SEAL REPLACEMENT

Special Tools Required

- Oil seal driver attachment 07NAD-P20A100
- Driver 07749-0010000

1. Remove the differential assembly.
2. Remove the oil seal (A) from the transmission housing (B).

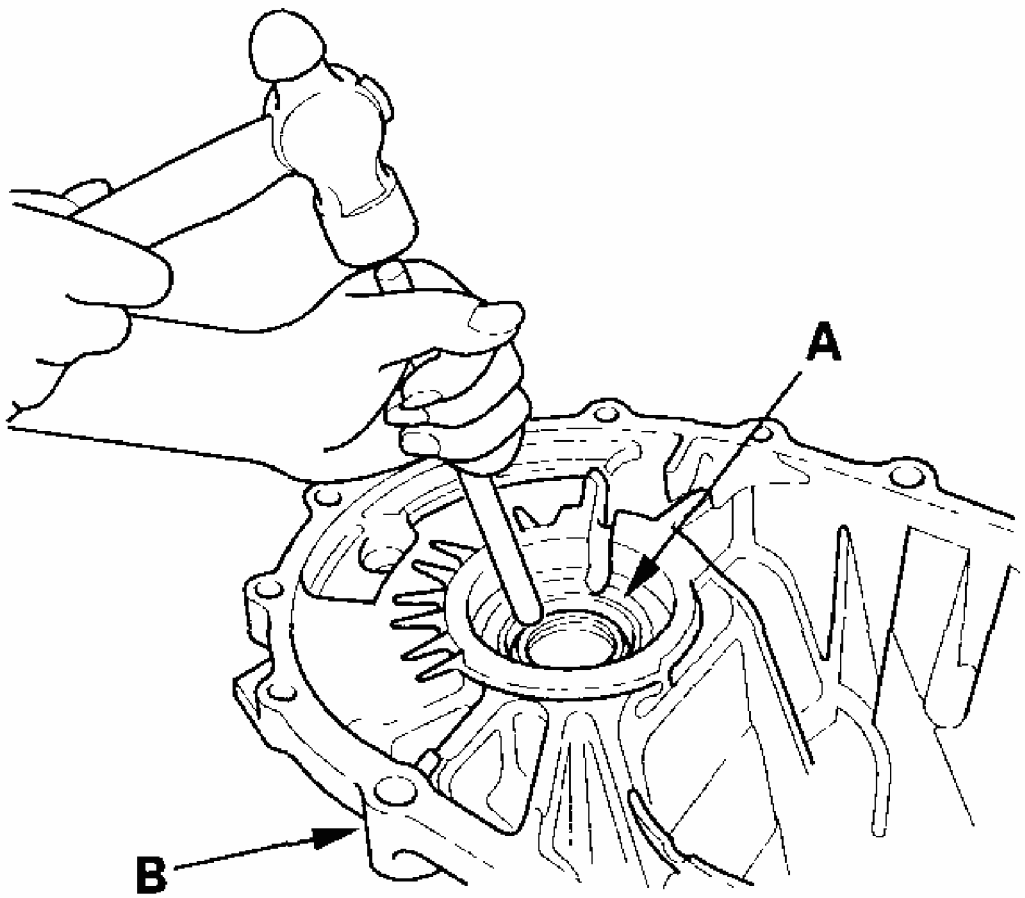

Fig. 161: Removing Oil Seal From Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the oil seal (A) from the clutch housing (B).

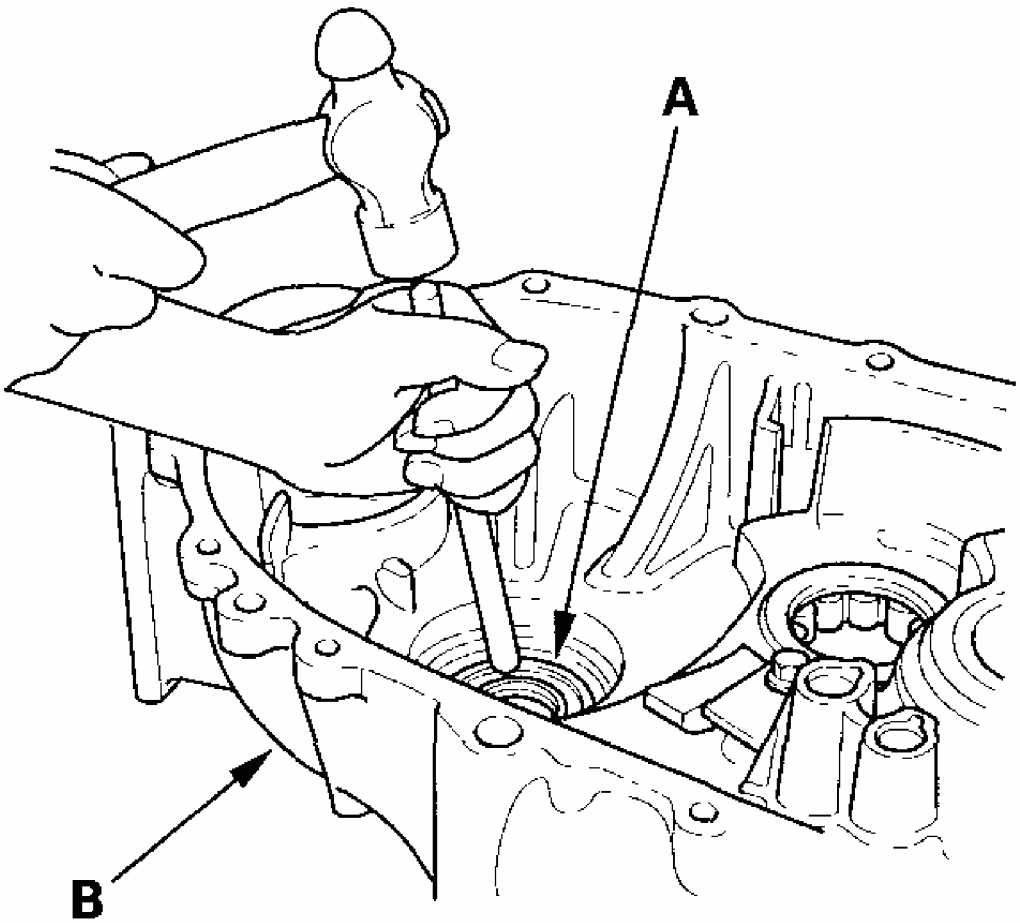

Fig. 162: Removing Oil Seal From Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the new oil seal in the transmission housing with the special tools.

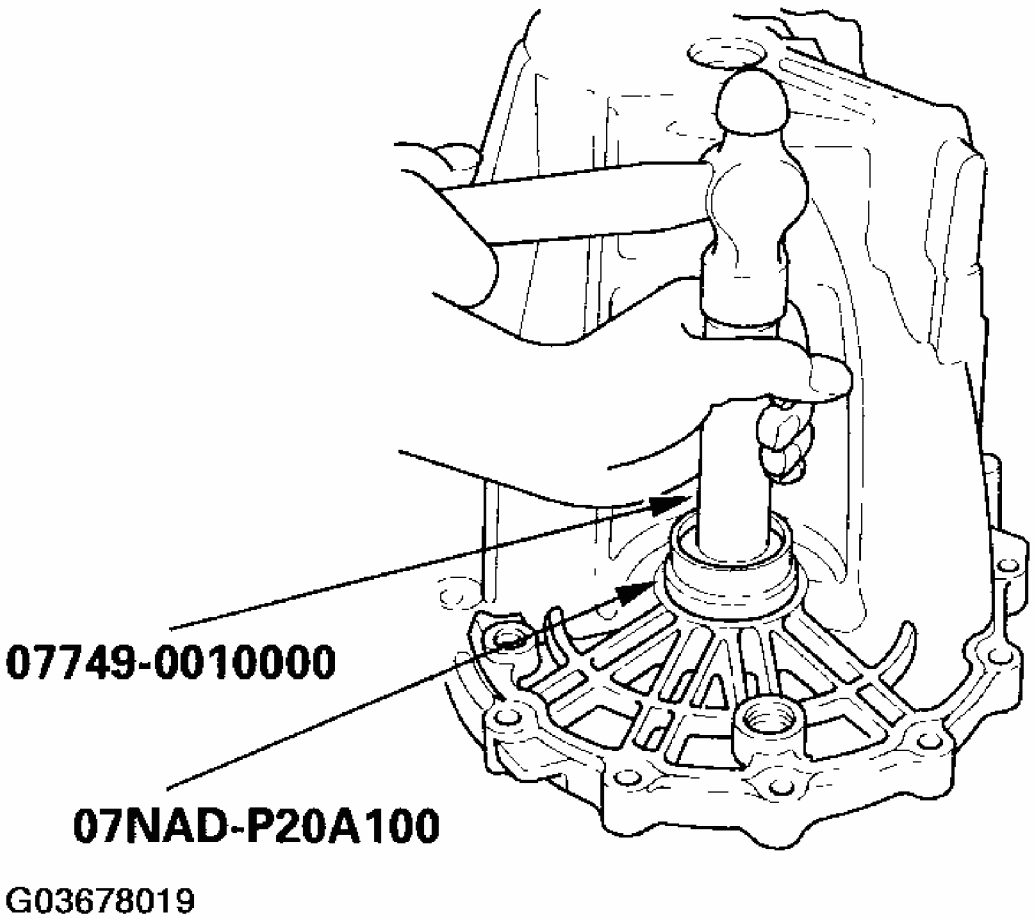

Fig. 163: Installing Oil Seal In Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the new oil seal in the clutch housing with the special tools.

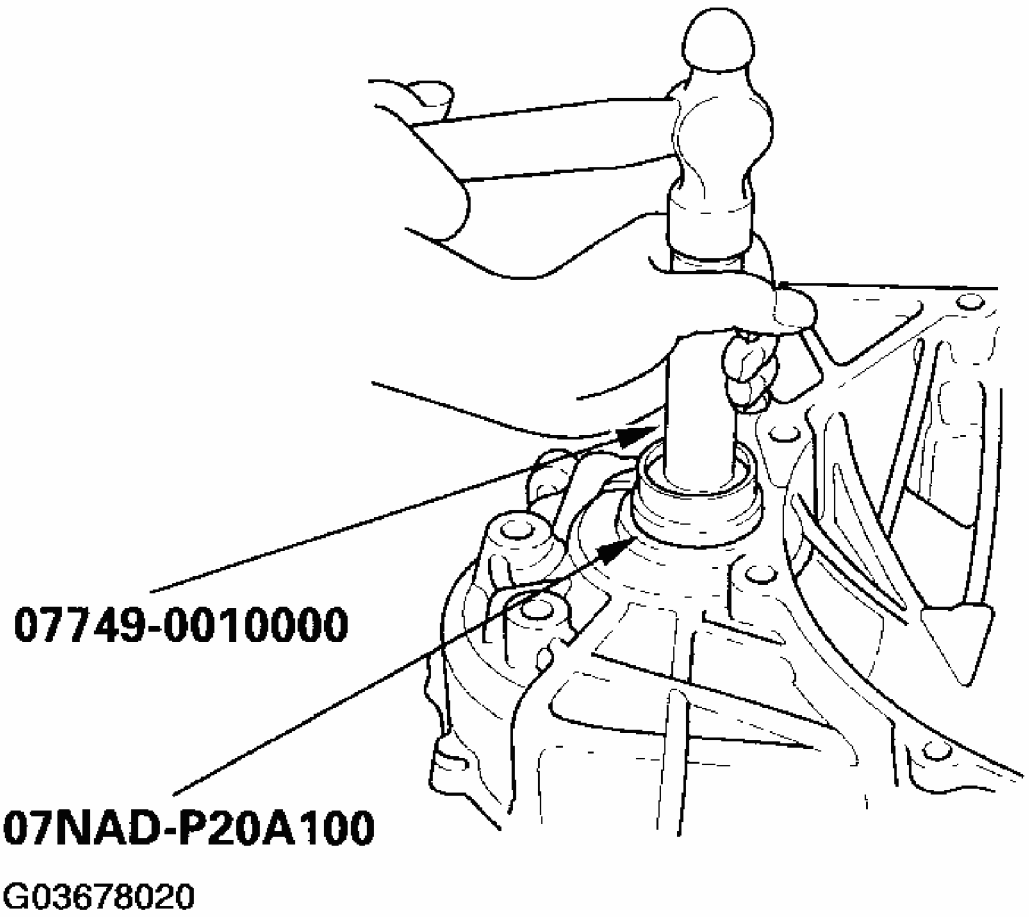

Fig. 164: Installing Oil Seal In Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

DIFFERENTIAL THRUST CLEARANCE ADJUSTMENT

Special Tools Required

Driver, 40 mm I.D. 07746-0030100

1. If you removed the 80 mm shim (A) from the transmission housing (B), reinstall the same sized shim.

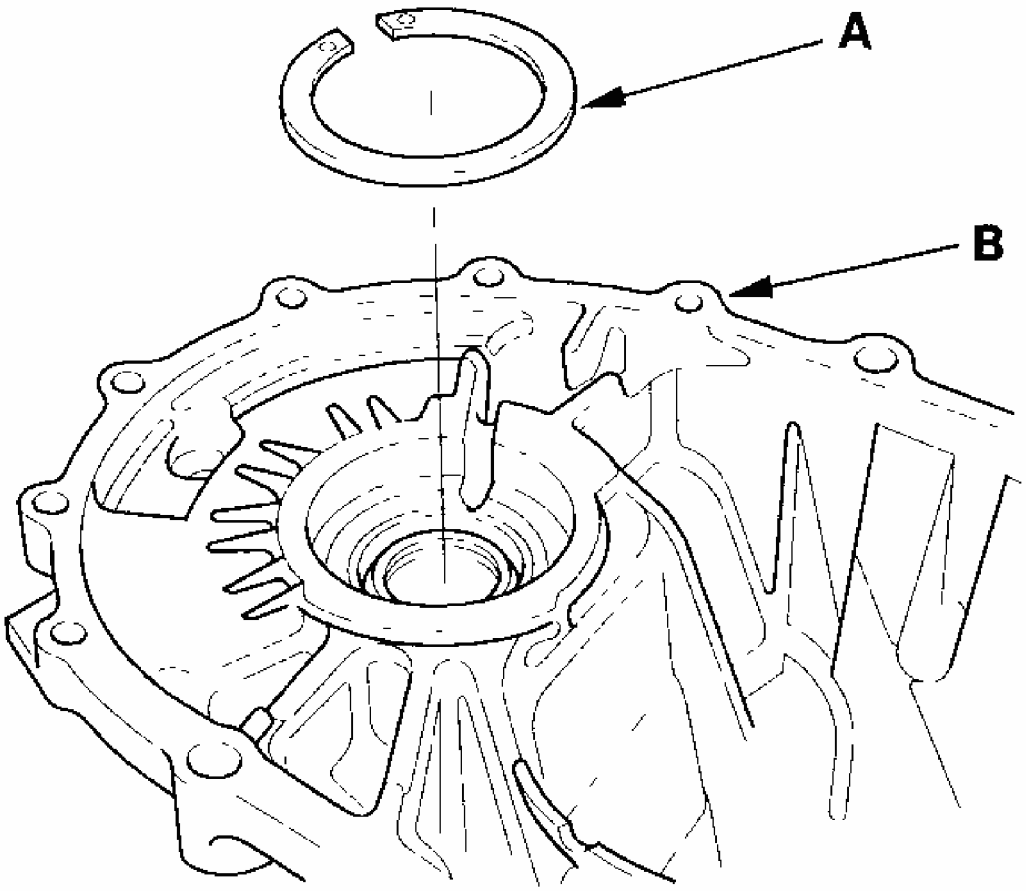

Fig. 165: Installing 80mm Shim From Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the differential assembly (A) into the clutch housing (B).

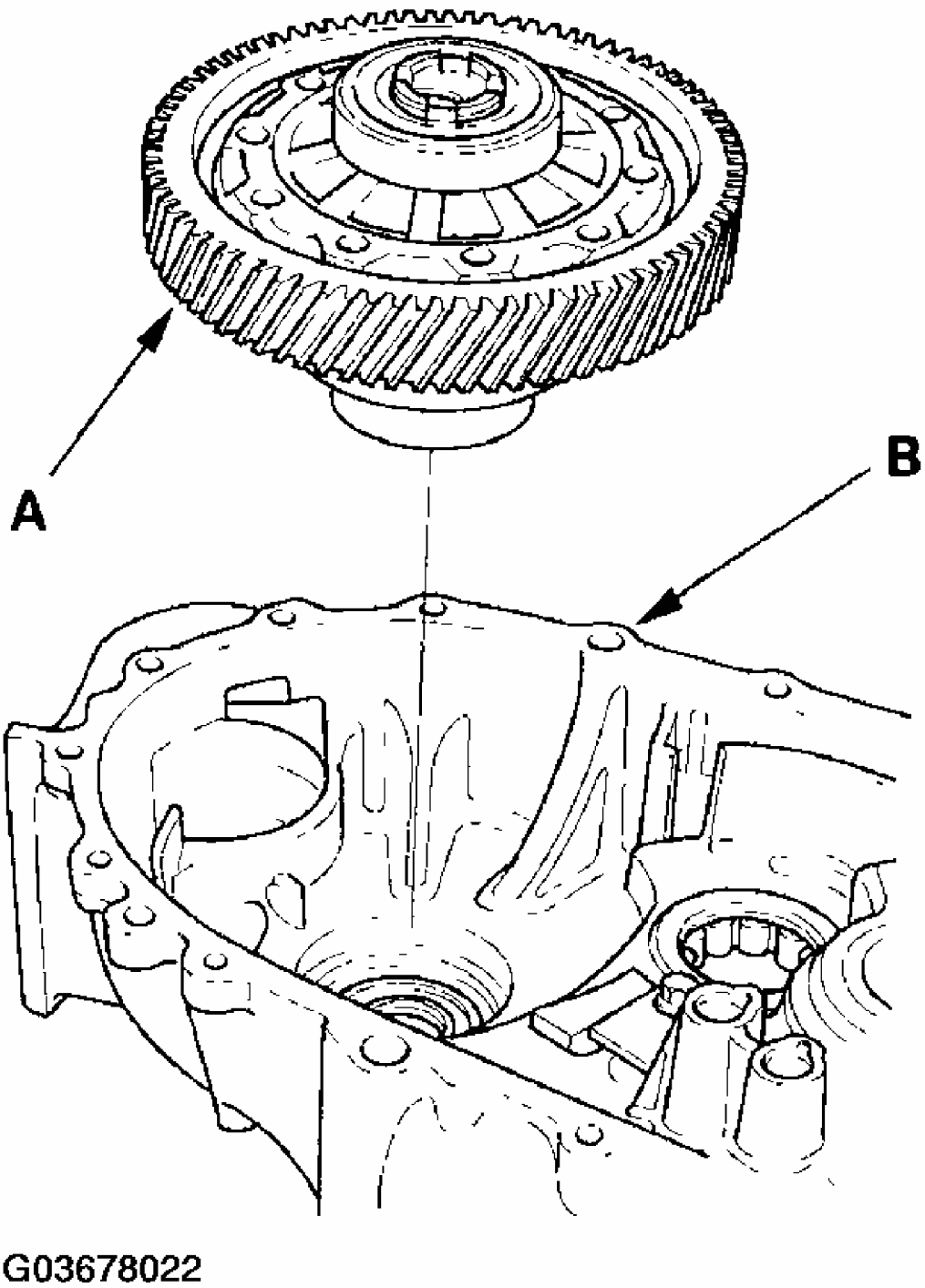

Fig. 166: Installing Differential Assembly Into Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the transmission housing onto the clutch housing, then tighten the 8 mm flange

bolts in a crisscross pattern in several steps (see step 15).

8 x 1.25 mm

27 N.m (2.8 kgf.m, 20 lbf.ft)

4. Use the special tool (A) to bottom the differential assembly in the clutch housing (B).

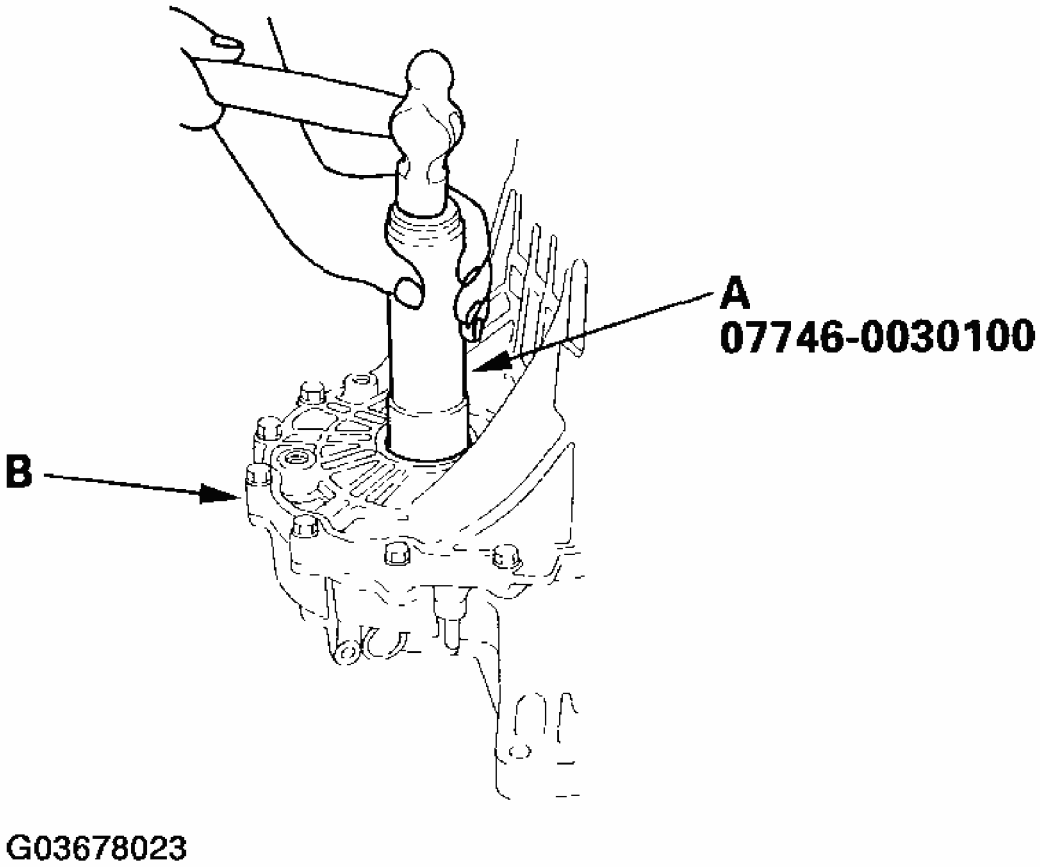

Fig. 167: Installing Differential Assembly In Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Measure clearance between the 80 mm shim and the bearing outer race in the transmission housing.

Standard: 0-0.10 mm (0-0.0039 in.)

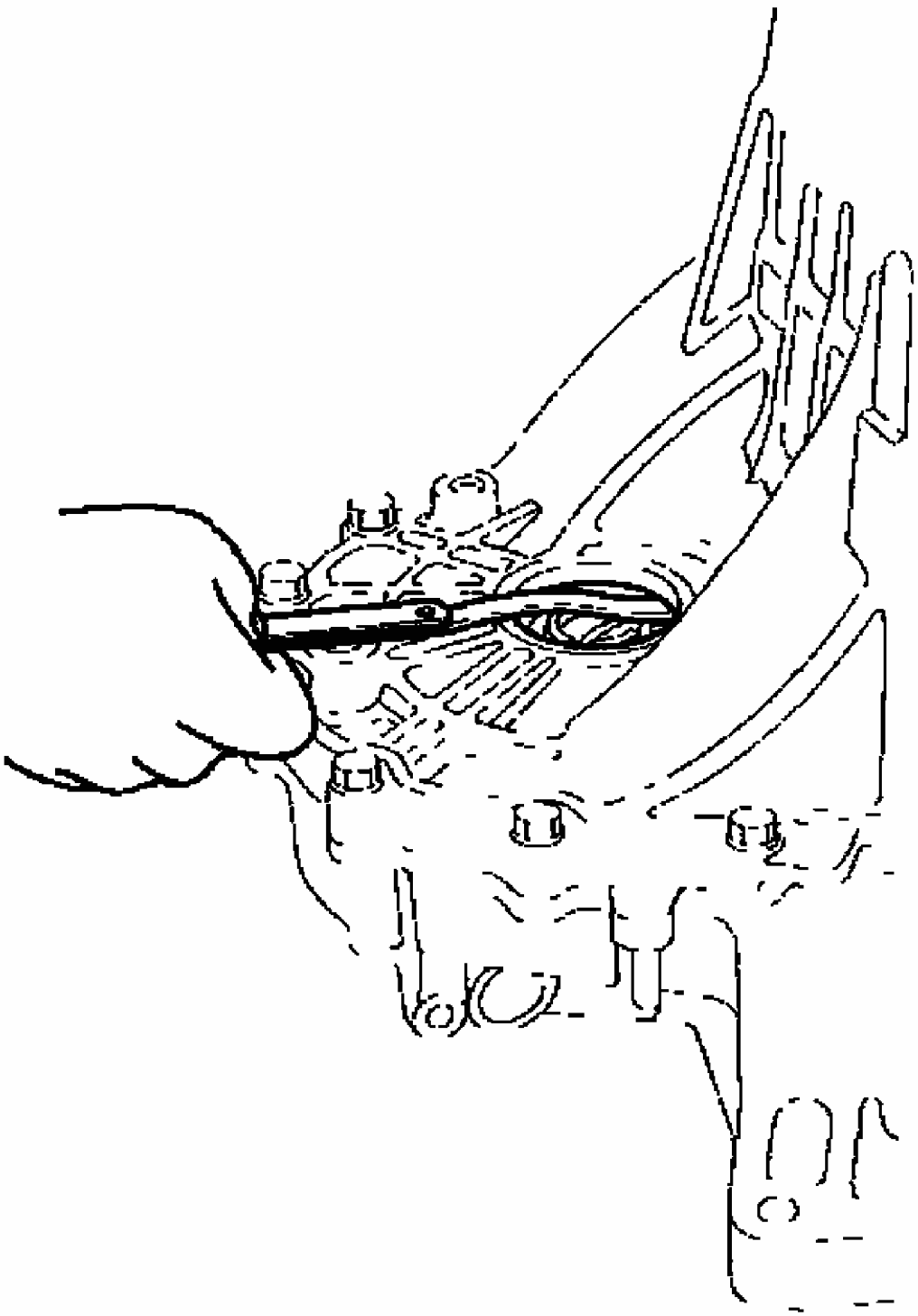

Fig. 168: Measuring Clearance Between Shim And Bearing Outer Race In

Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. If the clearance is more than the standard, select a new shim from the following table. If the clearance measured in step 5 is within the standard, go to step 9

80 mm Shim

80 MM SHIM SPECIFICATIONS

	Part Number	Thickness
A	41441-PL3-B00	1.0 mm (0.039 in.)
B	41442-PL3-B00	1.1 mm (0.043 in.)
C	41443-PL3-B00	1.2 mm (0.047 in.)
D	41444-PL3-B00	1.3 mm (0.051 in.)
E	41445-PL3-B00	1.4 mm (0.055 in.)
F	41446-PL3-B00	1.5 mm (0.059 in.)
G	41447-PL3-B00	1.6 mm (0.063 in.)
H	41448-PL3-B00	1.7 mm (0.067 in.)
J	41449-PL3-B00	1.8 mm (0.071 in.)
K	41450-PL3-B00	1.05 mm (0.041 in.)
L	41451-PL3-B00	1.15 mm (0.045 in.)
M	41452-PL3-B00	1.25 mm (0.049 in.)
N	41453-PL3-B00	1.35 mm (0.053 in.)
P	41454-PL3-B00	1.45 mm (0.057 in.)
Q	41455-PL3-B00	1.55 mm (0.061 in.)
R	41456-PL3-B00	1.65 mm (0.065 in.)
S	41457-PL3-B00	1.75 mm (0.069 in.)

7. Remove the bolts and the transmission housing.
8. Replace the thrust shim selected in step 6, then recheck the clearance.
9. Reinstall the transmission.

M/T TRANSFER ASSEMBLY

BACKLASH INSPECTION ON VEHICLE

1. Raise the front of the vehicle, and support it with safety stands (see **SAFETY STANDS**).
2. Apply the parking brake, and block both rear wheels securely.
3. Shift to neutral.
4. Make a reference mark (A) across the propeller shaft (B) and the transfer companion

flanges (C).

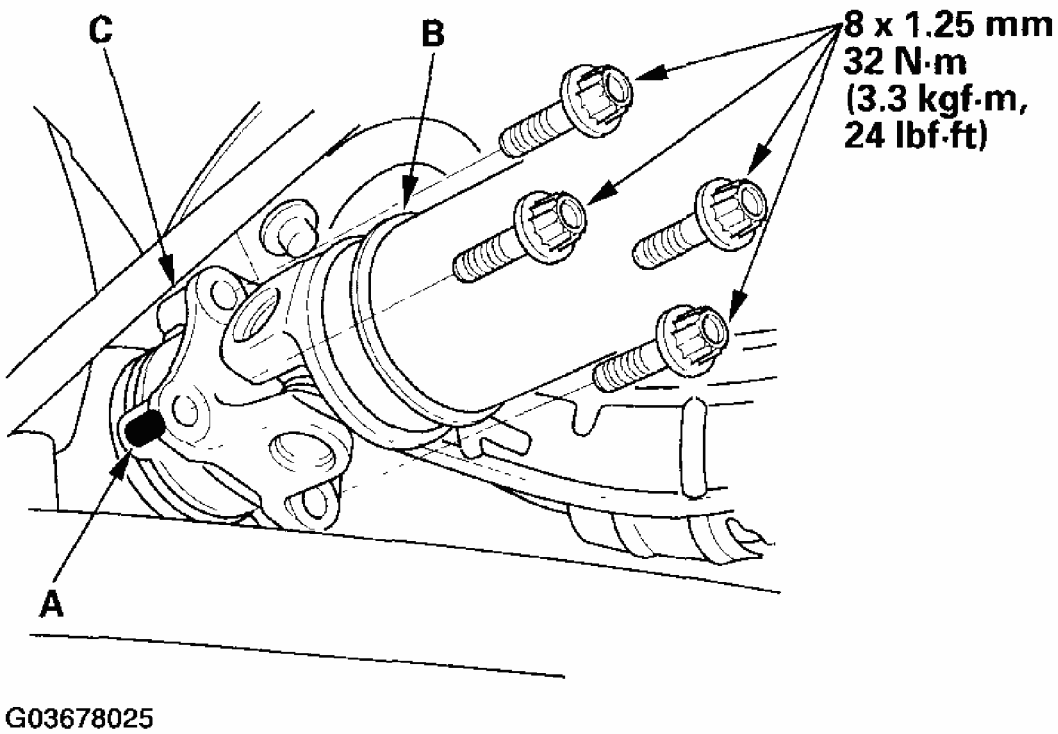

Fig. 169: Identifying Tightening Torque Of Propeller Shaft Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Separate the propeller shaft from the transfer assembly.
6. Set a dial indicator (A) on the transfer companion flange (B), then measure the transfer gear backlash.

Standard: 0.06-0.16 mm (0.002-0.006 in.)

Standard: 0.06—0.16 mm (0.002—0.006 in.)

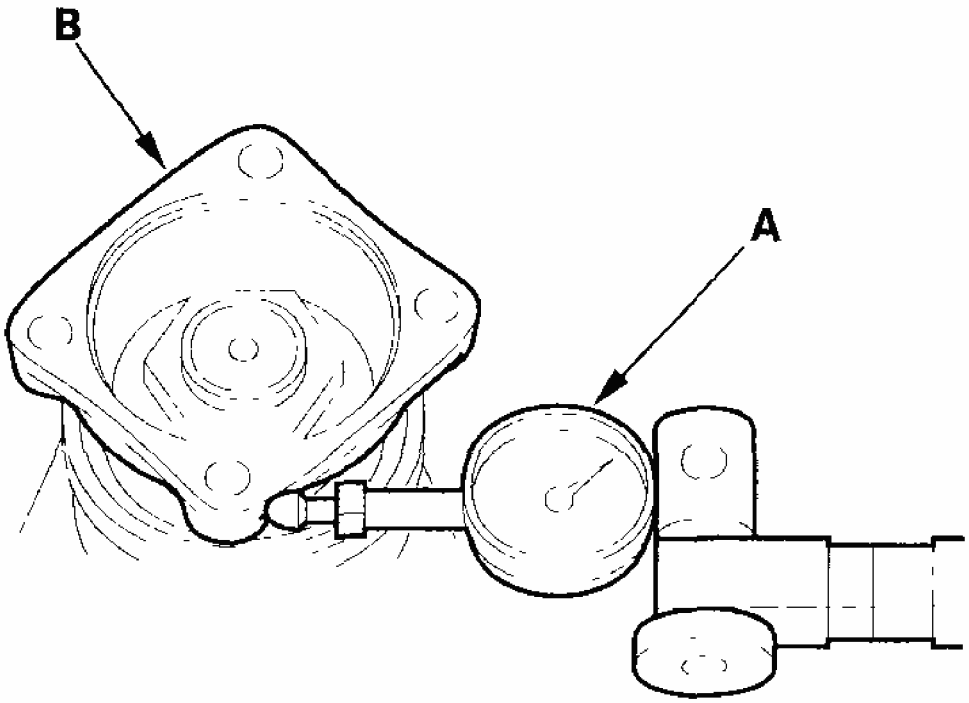

Fig. 170: Measuring Transfer Gear Backlash
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. If the measurement is out of specification, remove the transfer assembly (see **TRANSFER ASSEMBLY REMOVAL**) and inspect the transfer assembly (see **TRANSFER ASSEMBLY INSPECTION**).
8. Before reinstalling the propeller shaft, check the transfer assembly oil seal for damage and fluid leaks.
   - If the seal is leaking, remove the transfer assembly (see **TRANSFER ASSEMBLY REMOVAL**), replace the oil seal, and adjust the total starting torque. Do not replace the oil seal with the transfer assembly installed on the transmission.
   - If the seal is OK, reinstall the propeller shaft.

TRANSFER ASSEMBLY REMOVAL

1. Raise the front of the vehicle, and support it with safety stands (see **SAFETY**

STANDS).

2. Apply the parking brake, and block both rear wheels securely.
3. Drain the manual transmission fluid (MTF).

   Reinstall the drain plug with a new sealing washer (see **TRANSMISSION FLUID INSPECTION AND REPLACEMENT**).

4. Make reference marks (A) across the propeller shaft (B) and the companion flanges (C).

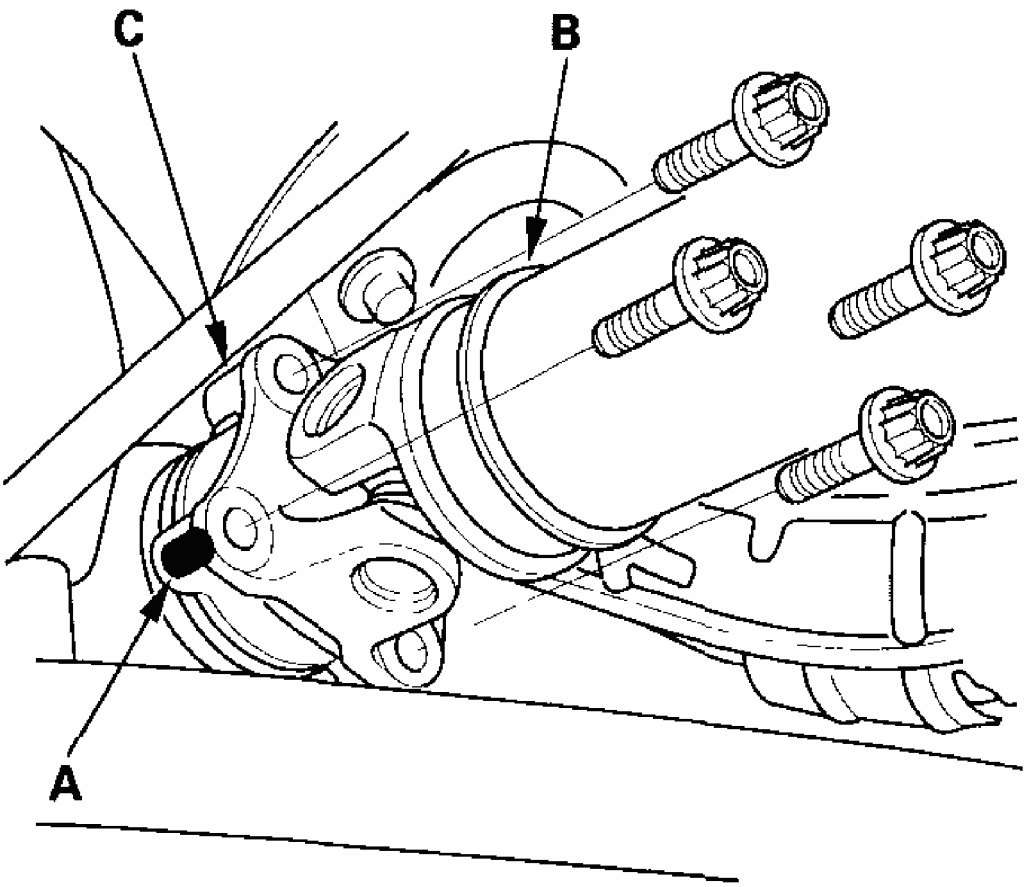

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Fig. 171: Separating Propeller Shaft And Companion Flanges From Transfer Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Separate the propeller shaft from the transfer assembly.

6. Remove the transfer assembly (A), dowel pin (B), and O-ring (C).

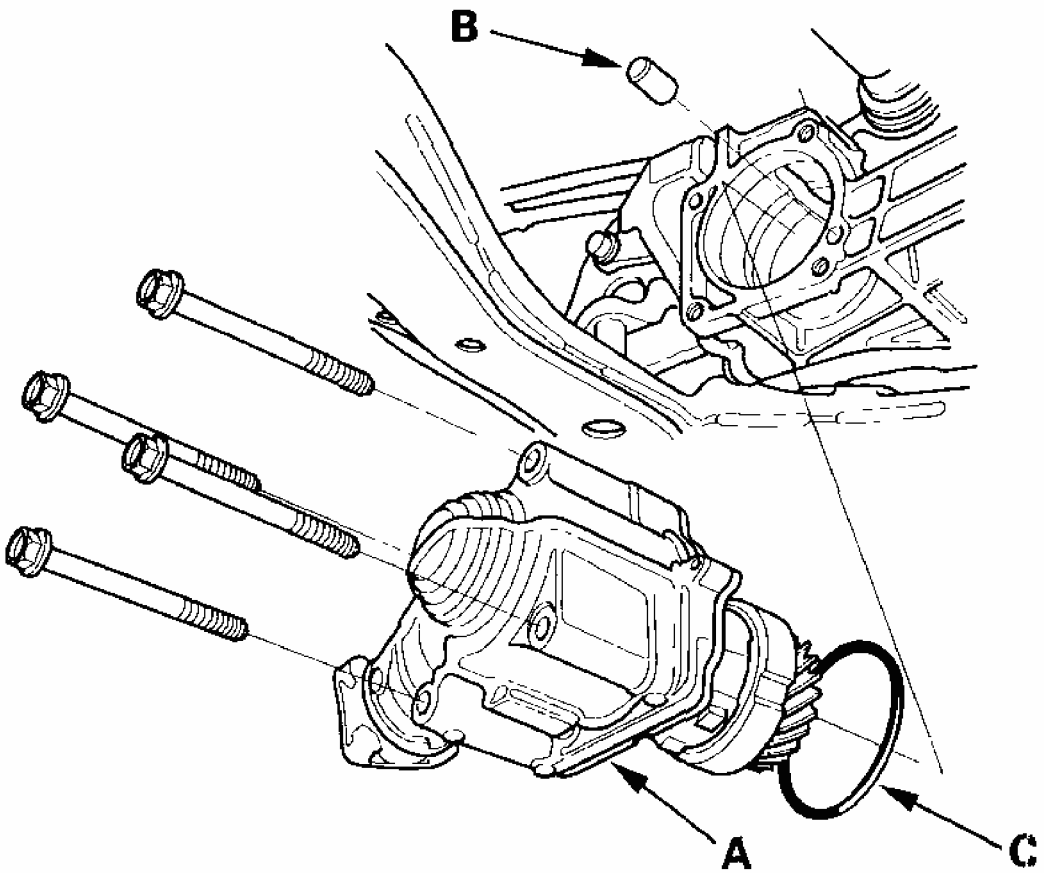

Fig. 172: Removing Transfer Assembly, Dowel Pin, And O-Ring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSFER ASSEMBLY INSTALLATION

NOTE:

- **While installing the transfer assembly on the transmission, do not allow dust or other foreign particles to enter the transmission.**
- **Be careful not to damage the clutch housing with transfer driven gear.**

1. Install a new O-ring (A) on the transfer assembly (B), then install the dowel pin (C) on the transmission.

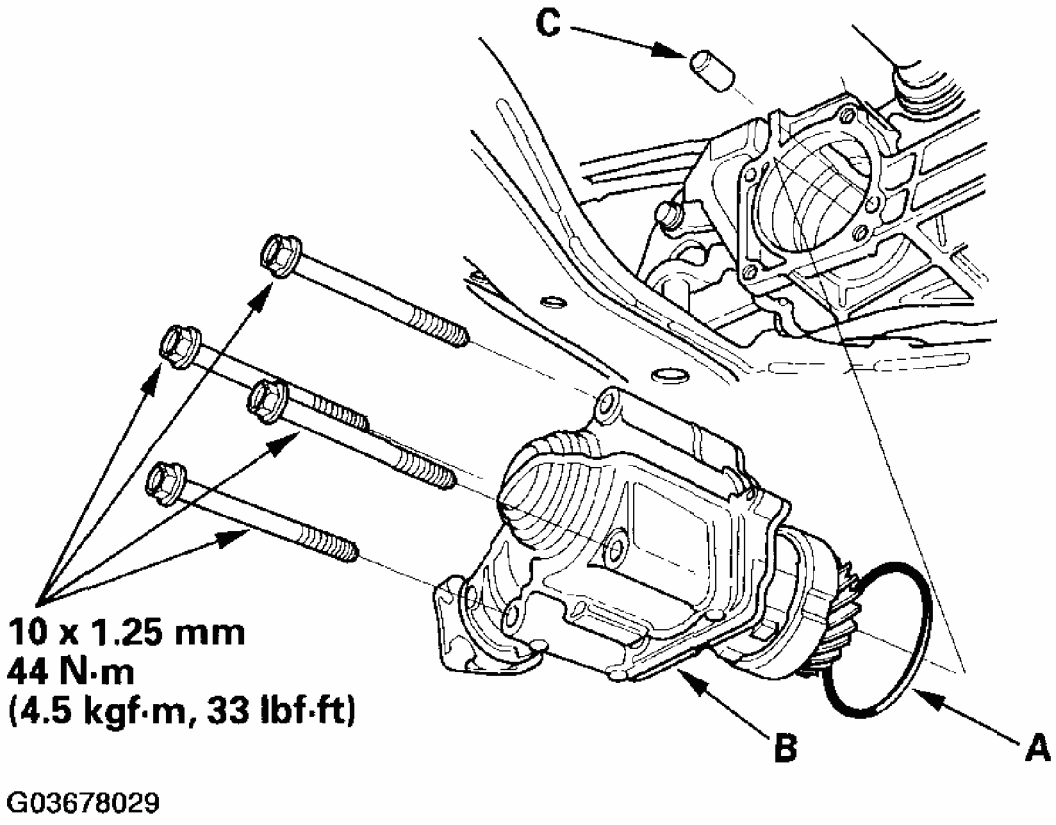

Fig. 173: Installing New O-Ring On Transfer Assembly And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Apply manual transmission fluid (MTF) to the transfer driven gear and transmission contact area, then install the transfer assembly on the transmission.
3. Install the propeller shaft (A) on the transfer assembly (B) by aligning the reference marks (C).

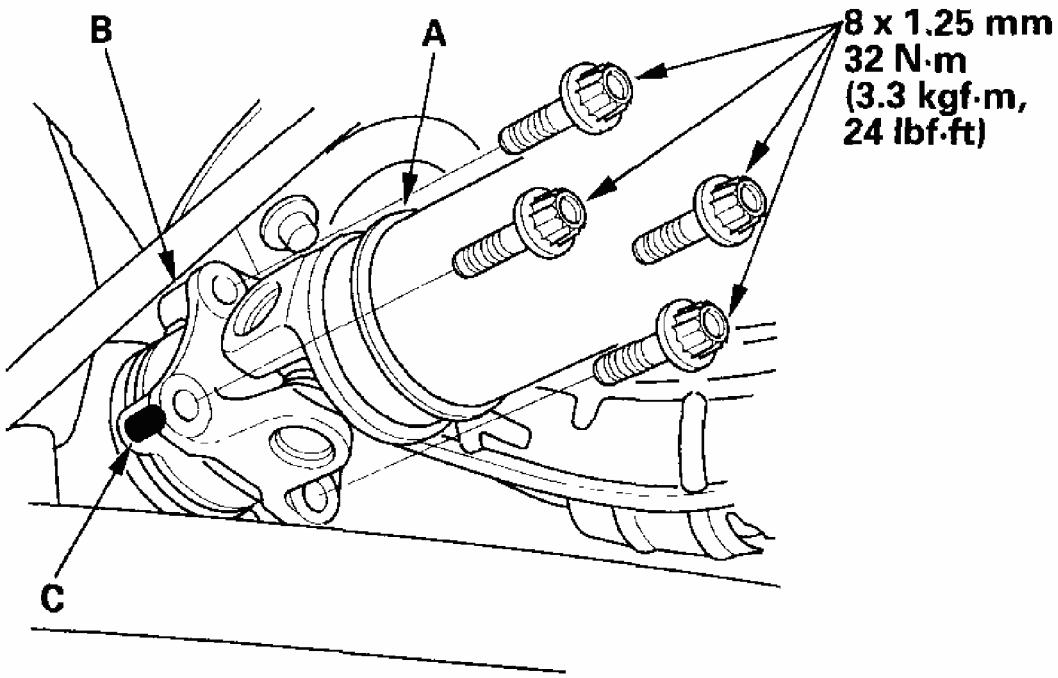

Fig. 174: Installing Propeller Shaft On Transfer Assembly And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Refill the transmission with MTF (see **TRANSMISSION FLUID INSPECTION AND REPLACEMENT**).
5. Start the engine, and run it to normal operating temperature (the radiator fan comes on). Turn the engine off, and check the fluid level.

TRANSFER ASSEMBLY INSPECTION

Transfer Gear (Hypoid Gear) Backlash Measurement

1. Set a dial indicator (A) on the companion flange (B) as shown.

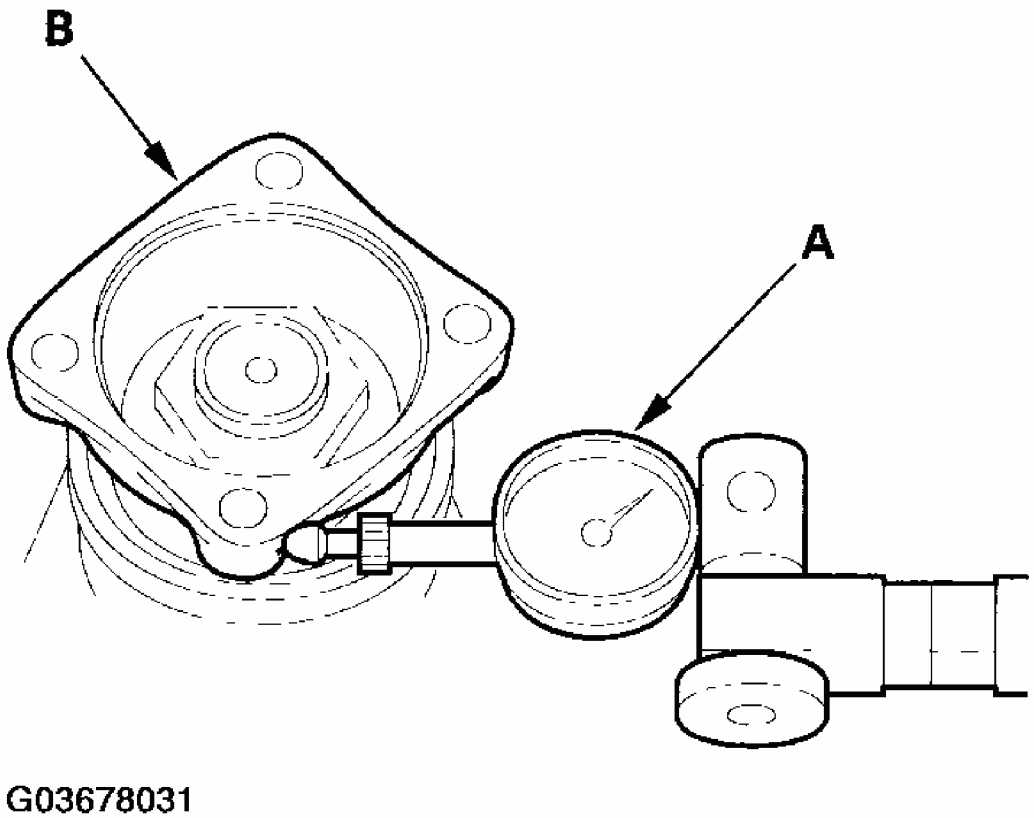

Fig. 175: Setting Dial Indicator On Companion Flange
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the transfer gear backlash.

Standard: 0.06-0.16 mm (0.002-0.006 in.)

Total Starting Torque Measurement

3) Rotate the companion flange several times to seat the tapered roller bearing.
4. Measure the starting torque (companion flange side) using a torque wrench.

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

Standard:

2.16-3.57 N.m

(22.0-36.4 kgf.cm, 19.1-31.6 lbf.in)

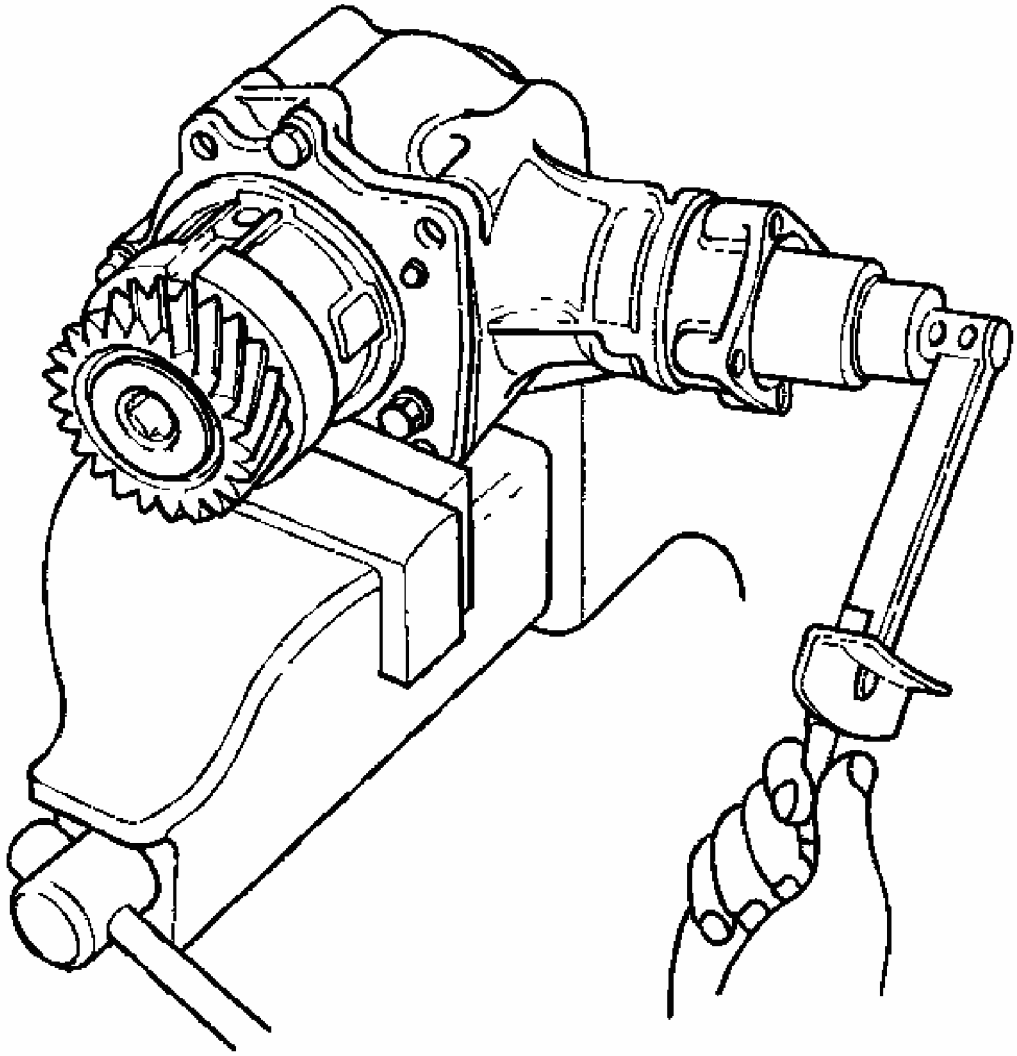

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Fig. 176: Measuring Companion Flange Starting Torque
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Transfer Drive Gear Tooth Contact Inspection

5) Remove the transfer from the vise.

6) Remove the transfer holder assembly (A) from the transfer housing (B), then remove the dowel pin (C) and O-ring (D).

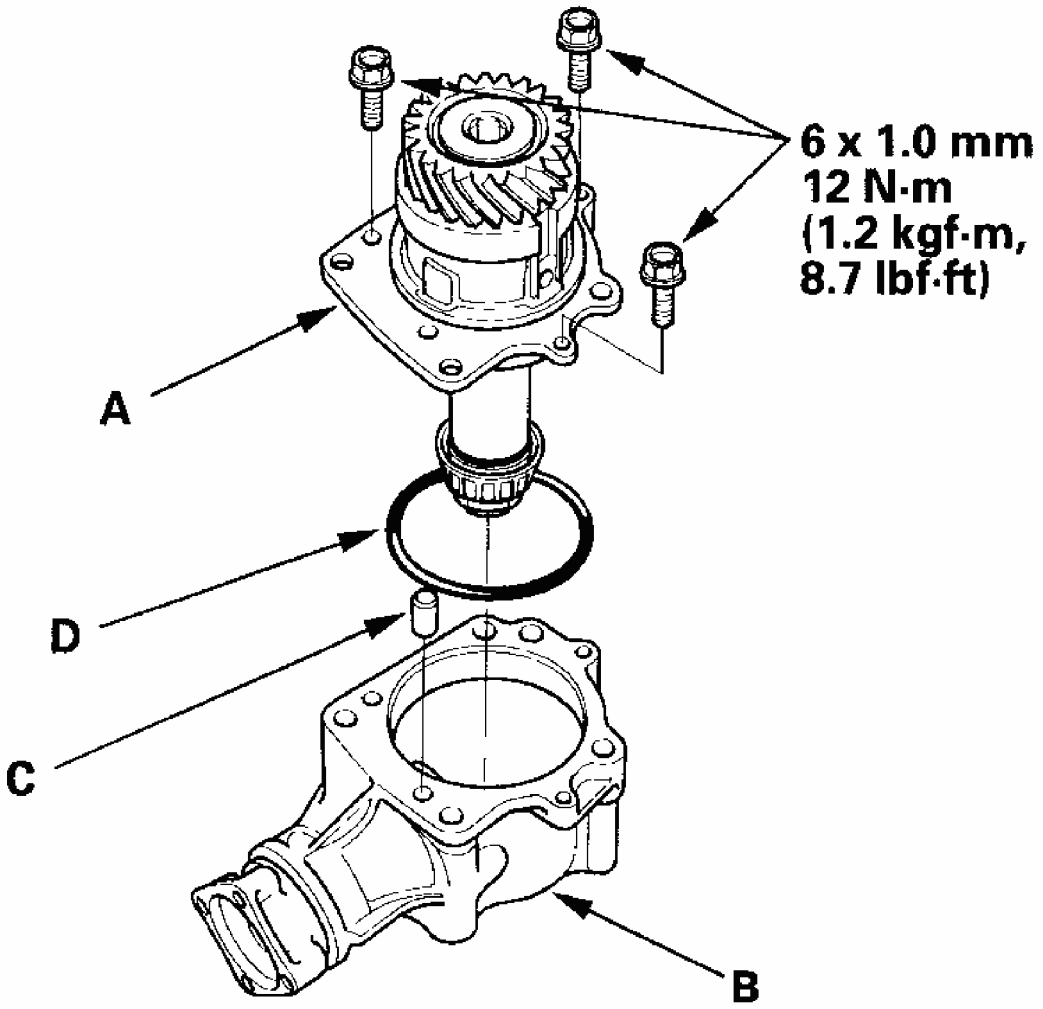


Fig. 177: Removing Transfer Holder Assembly From Transfer Housing And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7) Apply Prussian Blue to the transfer drive gear teeth lightly and evenly.

8) Install the transfer holder assembly to the transfer housing, then tighten the bolts.

9) Rotate the companion flange in both directions until the transfer gear rotates one full turn in both directions.

10) Check the transfer gear tooth contact pattern.

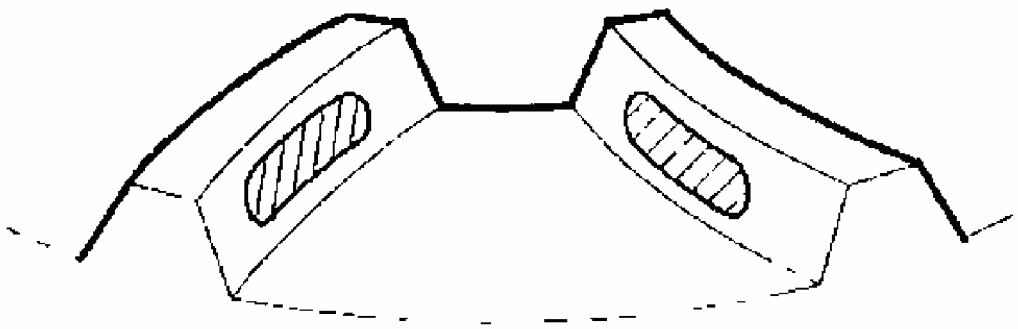
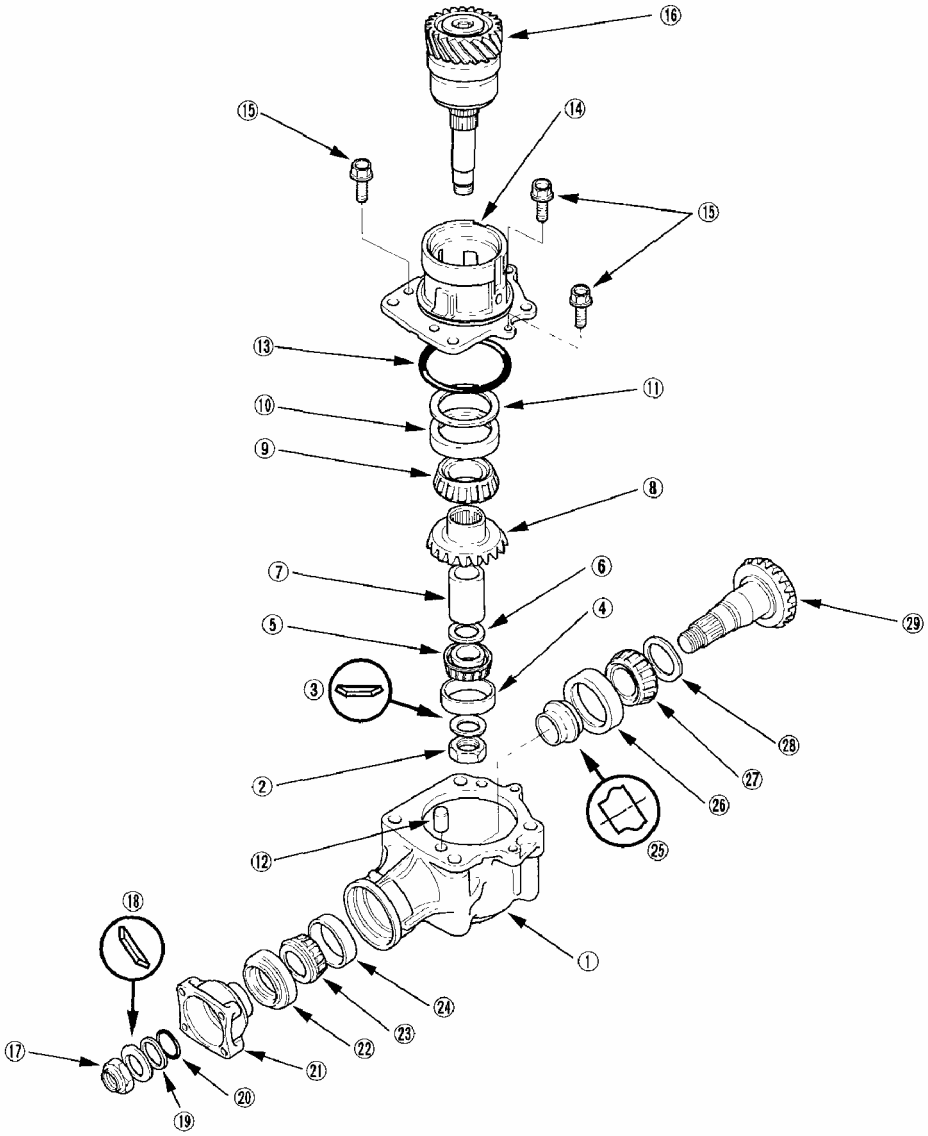


Fig. 178: Checking Transfer Gear Tooth Contact Pattern
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11) If the measurements or the tooth contact pattern are not within the standard, disassemble the transfer assembly, replace worn or damaged parts, and reassemble it.

TRANSFER ASSEMBLY DISASSEMBLY

Exploded View



① TRANSFER HOUSING
② 22 mm LOCKNUT
Replace.
③ CONICAL SPRING WASHER
Replace.
④ TAPERED ROLLER BEARING OUTER RACE
⑤ TAPERED ROLLER BEARING
⑥ 25 mm THRUST SHIM
⑦ TRANSFER COLLAR
⑧ TRANSFER DRIVE GEAR (HYPOID GEAR)
⑨ TAPERED ROLLER BEARING
⑩ TAPERED ROLLER BEARING OUTER RACE
⑪ 76 mm THRUST SHIM
⑫ DOWEL PIN
⑬ O-RING
Replace.
⑭ TRANSFER HOLDER
⑮ 6 mm FRANGE BOLTS
⑯ TRANSFER SHAFT ASSEMBLY
⑰ 22 mm LOCKNUT
Replace.
⑱ CONICAL SPRING WASHER
Replace.
⑲ BACK-UP RING
⑳ O-RING
Replace.
㉑ COMPANION FLANGE
㉒ OIL SEAL
Replace.
㉓ TAPERED ROLLER BEARING
㉔ TAPERED ROLLER BEARING OUTER RACE
㉕ TRANSFER SPACER
Replace.
㉖ TAPERED ROLLER BEARING OUTER RACE
㉗ TAPERED ROLLER BEARING
㉘ 35 mm THRUST SHIM
㉙ TRANSFER OUTPUT SHAFT (HYPOID GEAR)

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Fig. 179: Exploded View Of Transfer Assembly
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Special Tools Required

- Holder handle 07JAB-001020B
- Companion flange holder 07RAB-TB4010A or 07RAB-TB4010B

1. Remove the transfer holder assembly (A) from the transfer housing (B).

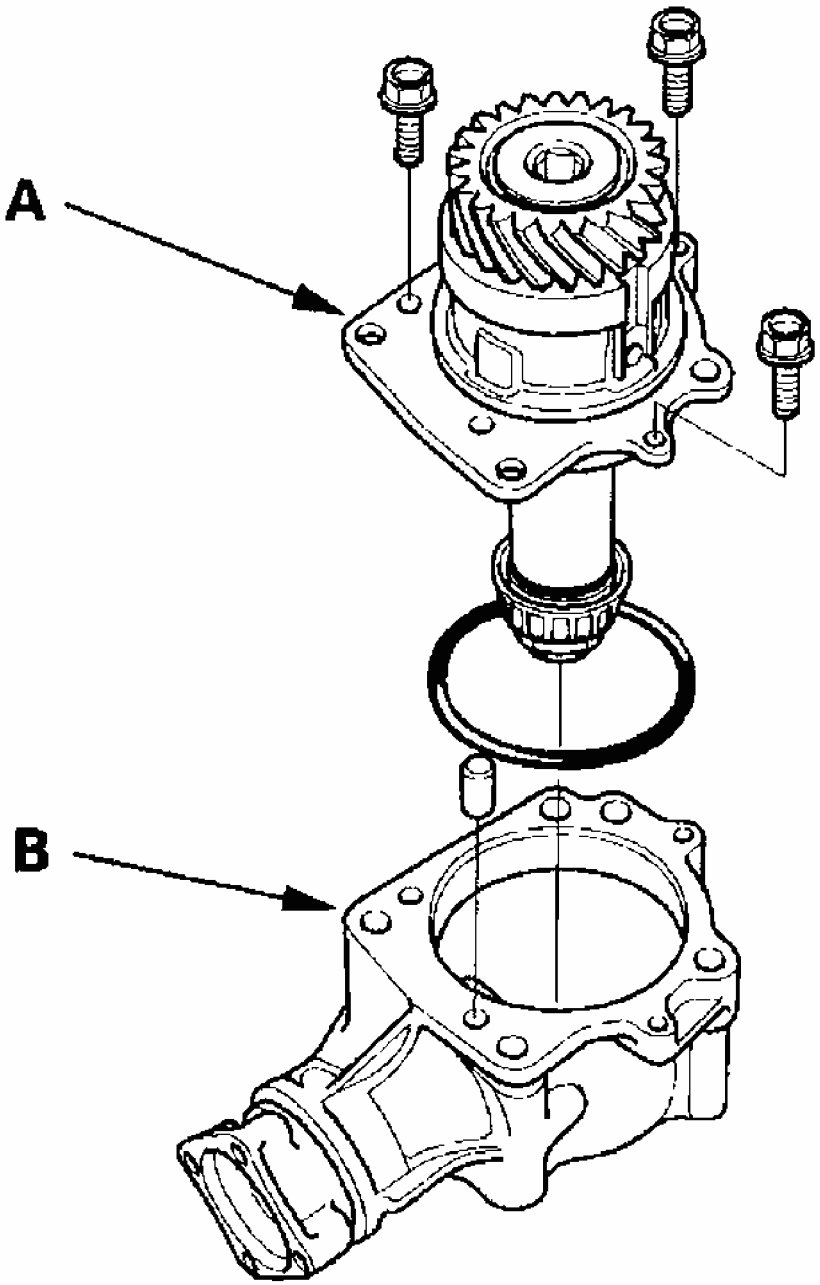

Fig. 180: Removing Transfer Holder Assembly From Transfer Housing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Cut the lock tabs of the locknut using a chisel. Keep all of the chiseled particles out of the transfer driven gear.

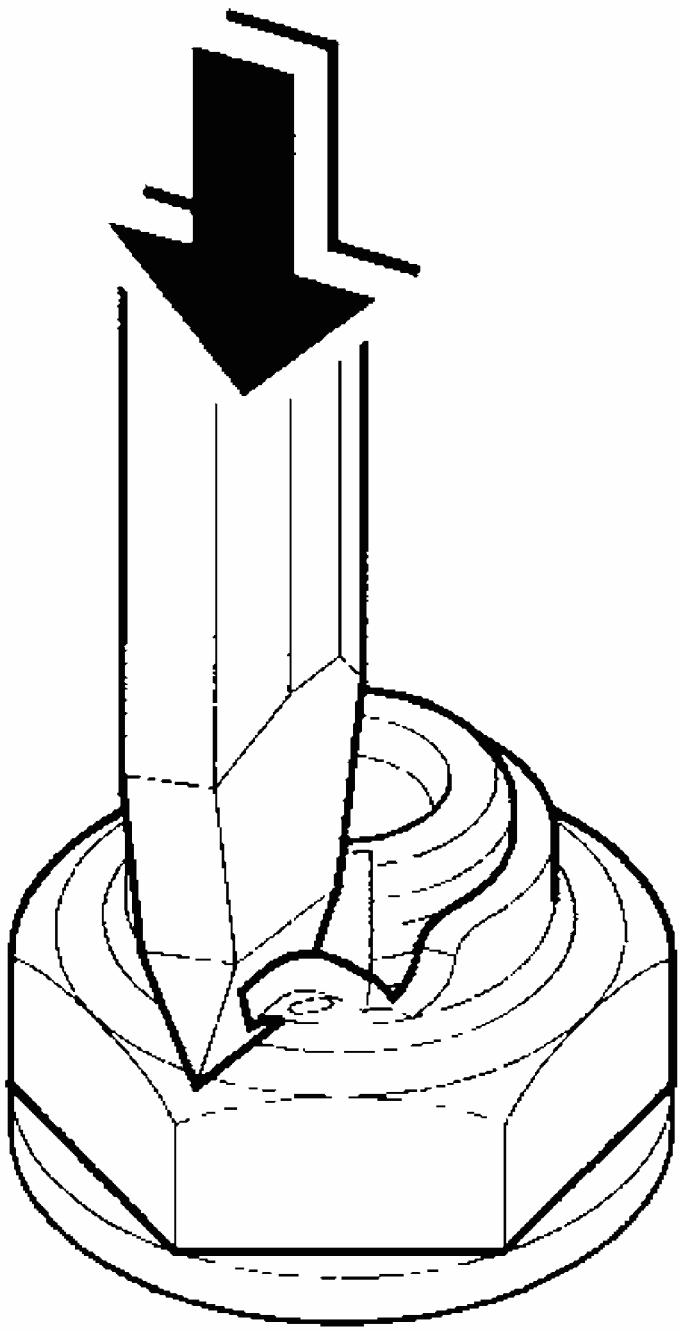

Fig. 181: Cutting Lock Tabs Of Locknut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Secure the transfer housing (A) in a bench vise (B) with soft jaws.

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

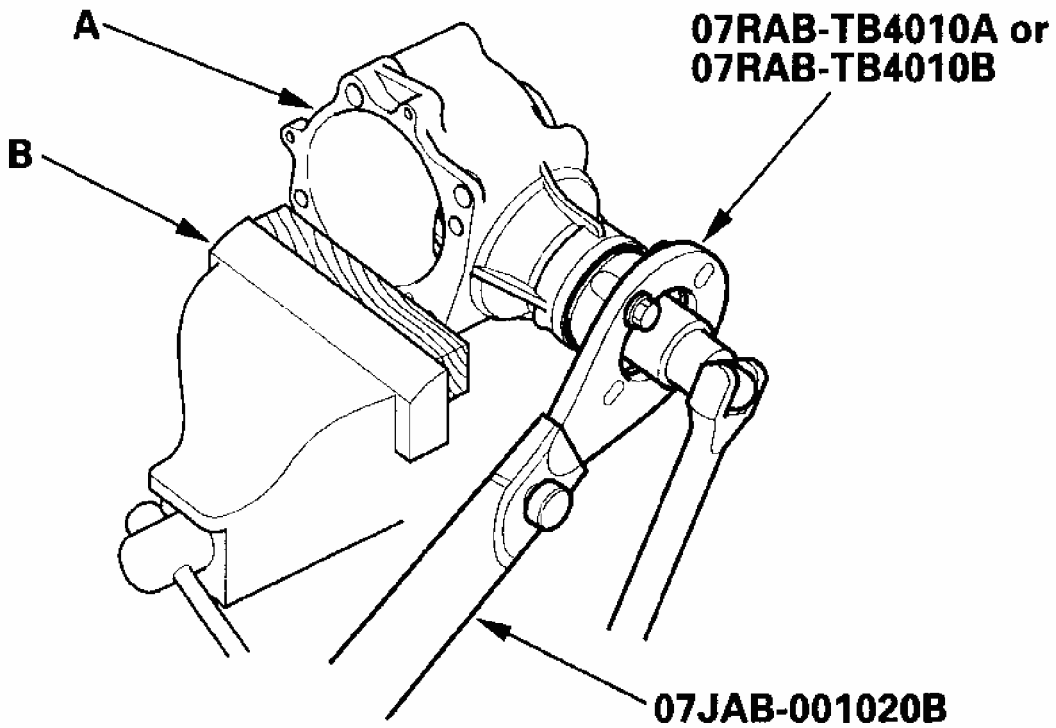

Fig. 182: Loosening Transfer Driven Gear Shaft Locknut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the special tools on the companion flange, then loosen the transfer driven gear shaft locknut.
5. Remove the transfer driven gear locknut (A), conical spring washer (B), back-up ring (C), O-ring (D), and companion flange (E).

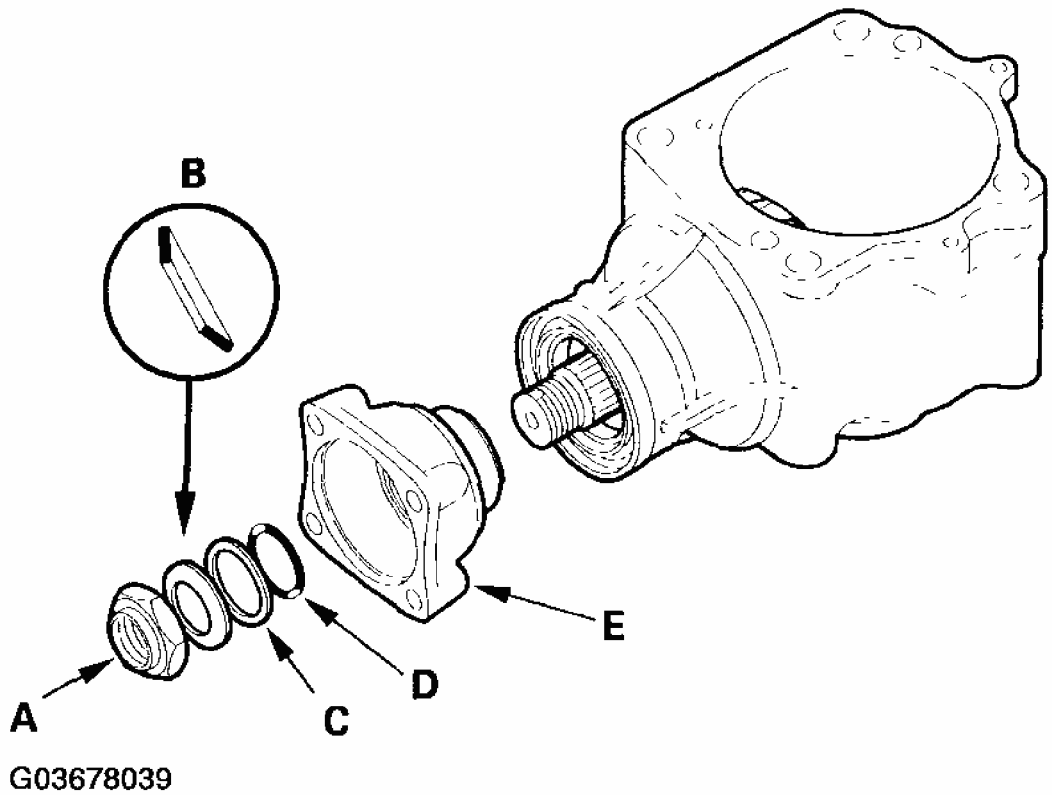

Fig. 183: Removing Transfer Driven Gear Locknut, Conical Spring Washer, Back-Up Ring, O-Ring, And Companion Flange
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove the transfer driven gear (A), then remove the transfer spacer (B) from the transfer driven gear.

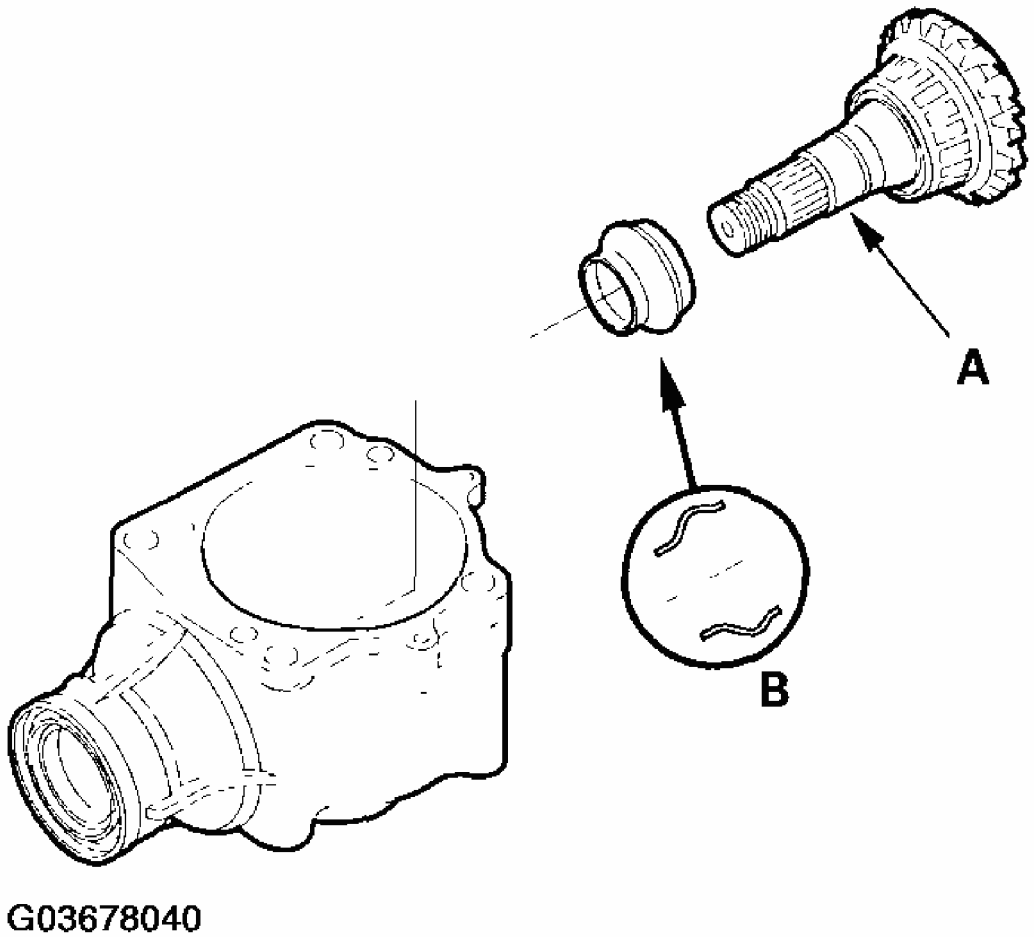

Fig. 184: Removing Transfer Driven Gear, Transfer Spacer From Transfer Driven Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Remove the oil seal (A) and the tapered roller bearing (B) from the transfer housing (C).

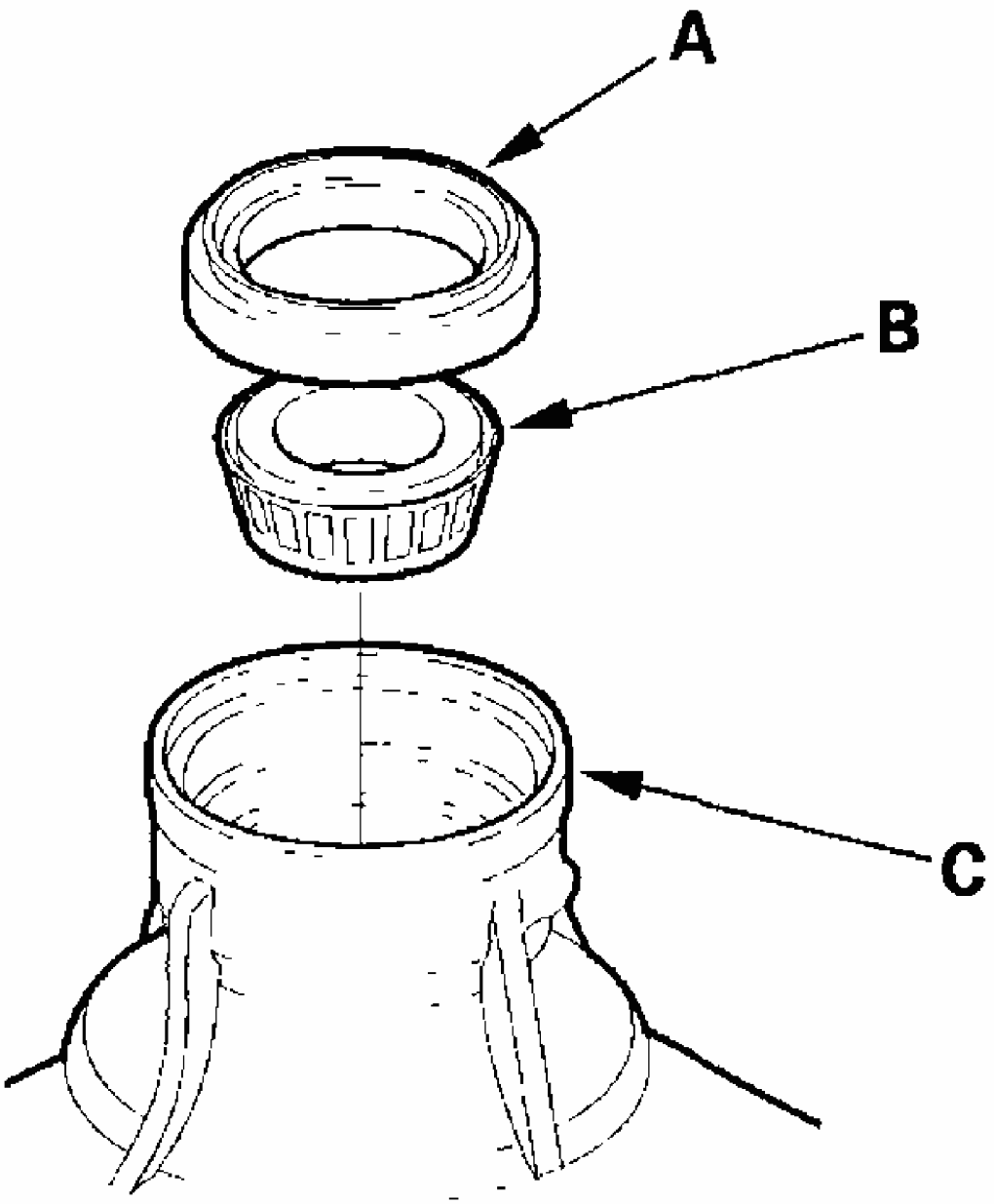

Fig. 185: Removing Oil Seal And Tapered Roller Bearing From Transfer Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSFER HOLDER DISASSEMBLY

1. Cut the lock tabs of the locknut using a chisel. Keep all of the chiseled particles out of the transfer shaft.

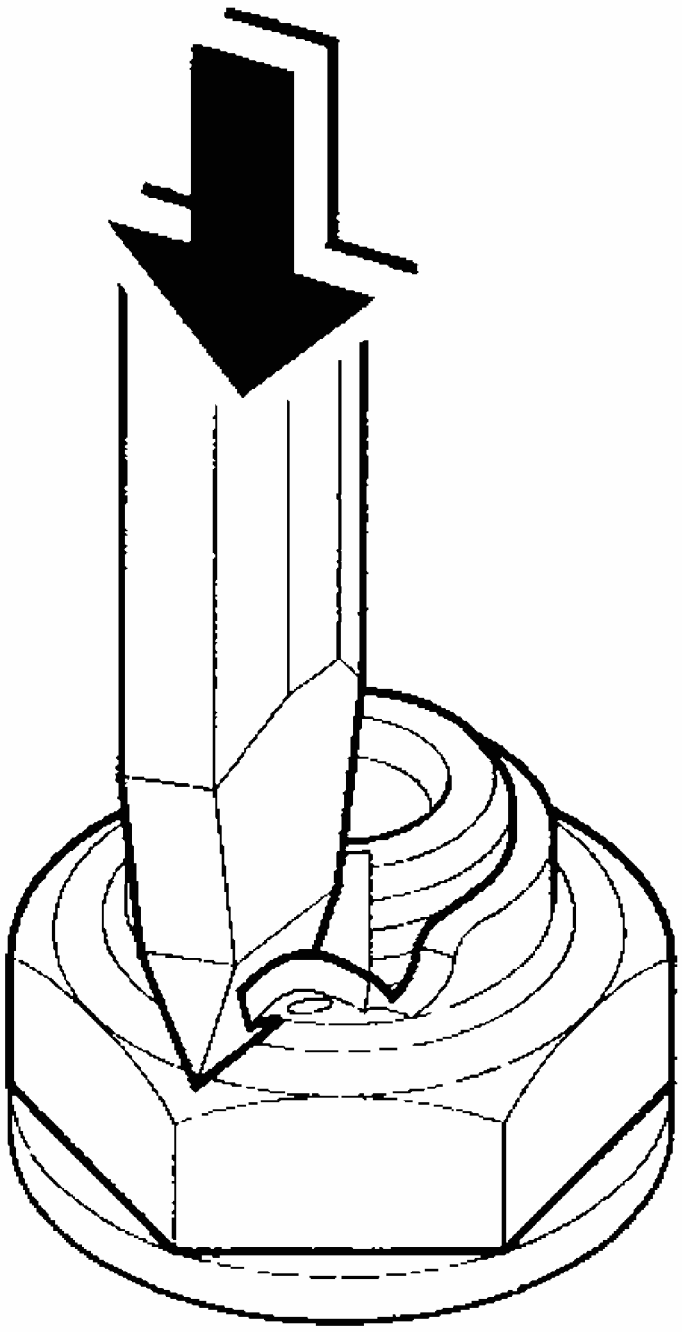

Fig. 186: Cutting Lock Tabs Of Locknut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Hold the transfer shaft (A) with a 14 mm hex wrench (B) clamped in a bench vise, then loosen the locknut.

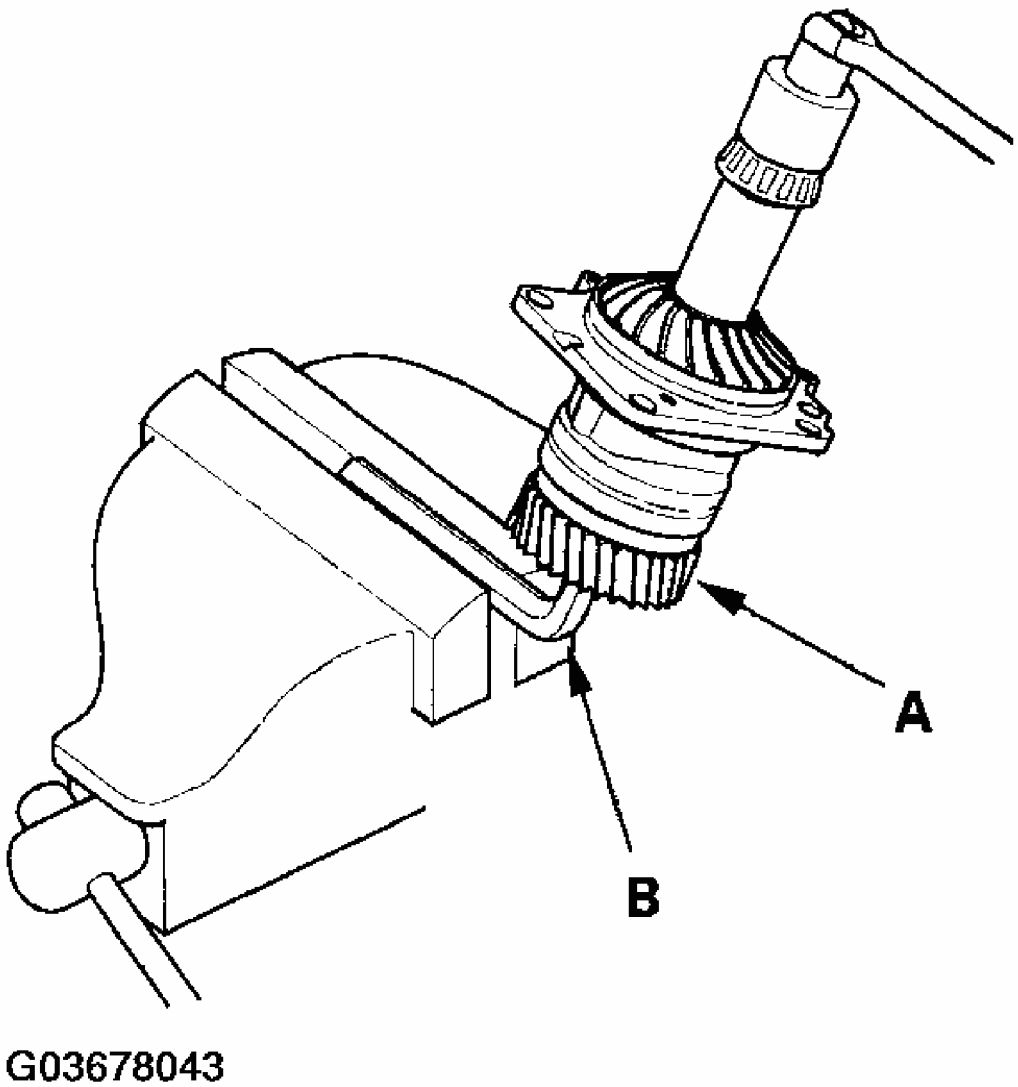

Fig. 187: Loosening Transfer Shaft Locknut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the locknut (A), conical spring washer (B), tapered roller bearing (C), 25 mm thrust shim (D), transfer shaft collar (E), transfer drive gear (F), and transfer shaft assembly (G) from the transfer holder (H).

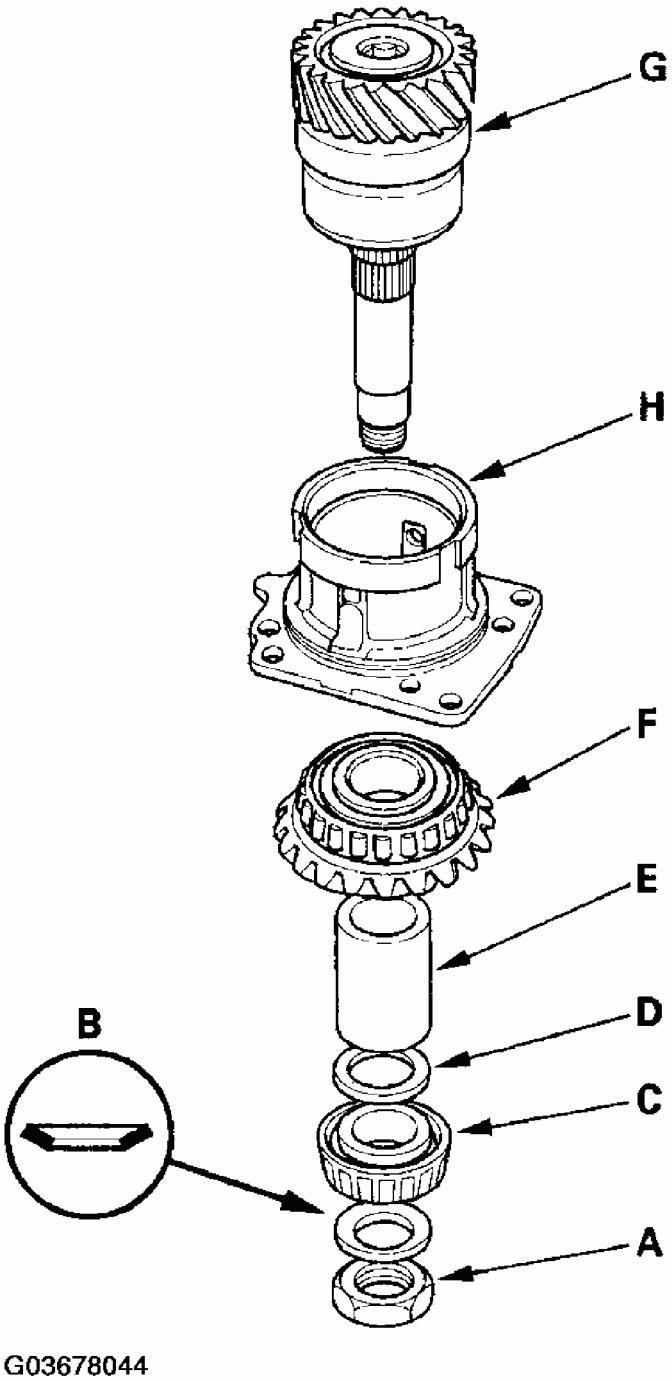

Fig. 188: Removing Locknut, Conical Spring Washer, Tapered Roller Bearing, Thrust Shim, Transfer Shaft Collar, Transfer Drive Gear, And Transfer Shaft Assembly From The Transfer Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSFER HOLDER TAPERED ROLLER BEARING OUTER RACE REMOVAL/INSTALLATION

Special Tools Required

- Attachment, 72 x 75 mm 07746-0010600
- Driver 07749-0010000

NOTE: Coat all parts with manual transmission fluid (MTF) during reassembly.

1. Remove the tapered roller bearing outer race (A) and 76 mm thrust shim (B) from the transfer holder.

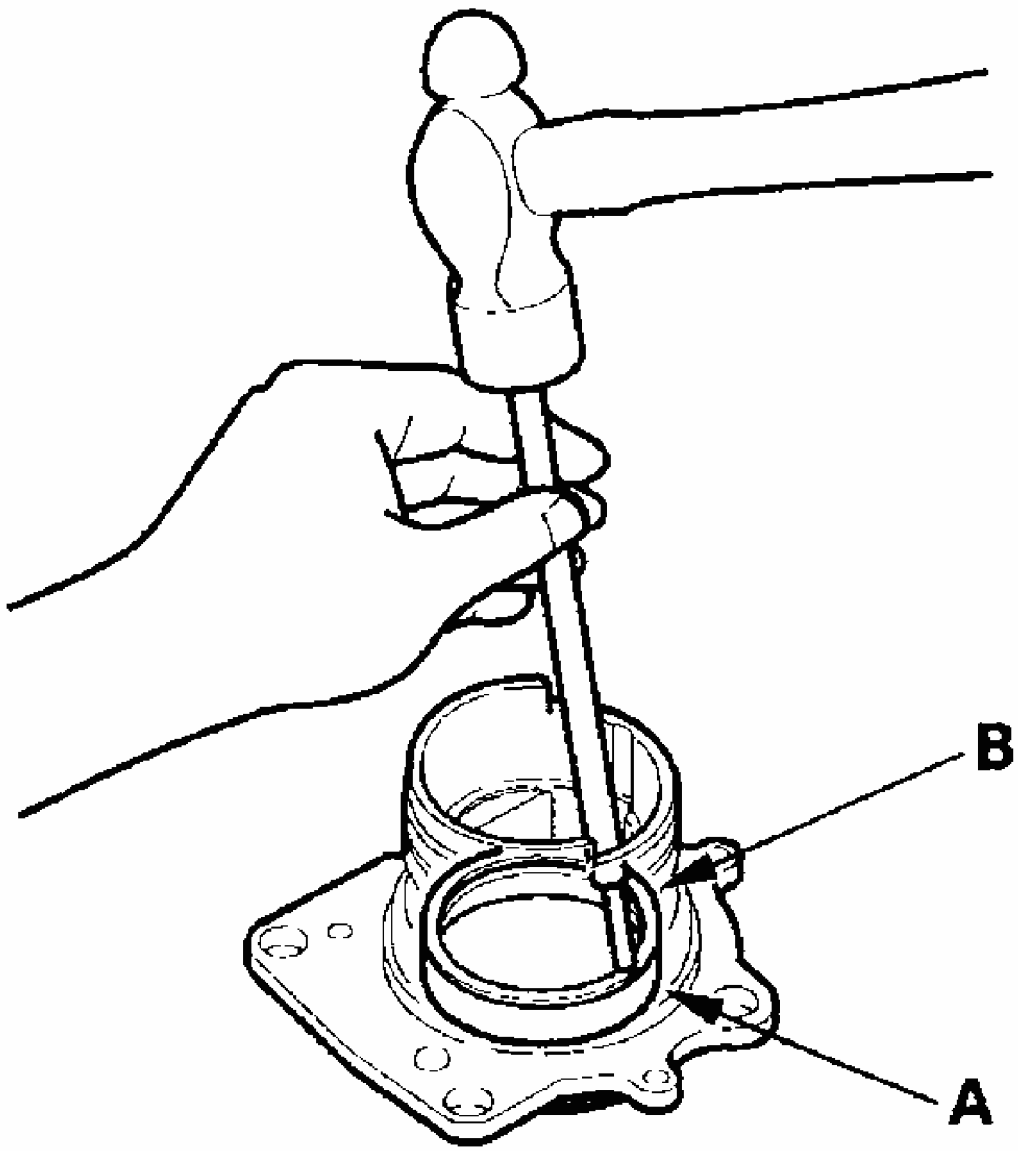

Fig. 189: Removing Tapered Roller Bearing Outer Race And 76mm Thrust Shim From Transfer Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the 76 mm thrust shim (A) in the transfer holder.

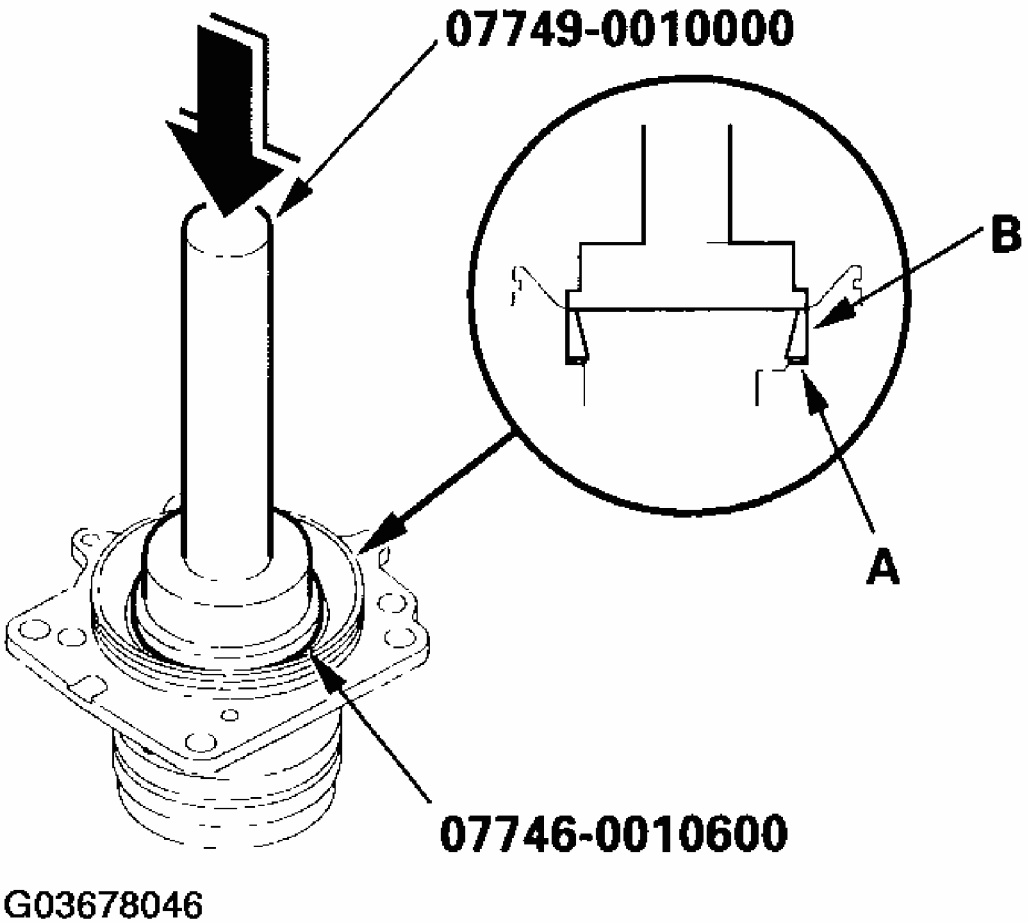

Fig. 190: Installing 76mm Thrust Shim Into Transfer Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the tapered roller bearing outer race (B) using the special tools and a press.

TRANSFER DRIVE GEAR BEARING REPLACEMENT

Special Tools Required

- Attachment, 37 x 40 mm 07746-0010200
- Attachment, 42 x 47 mm 07746-0010300
- Driver 07749-0010000

NOTE: Coat all parts with manual transmission fluid (MTF) during reassembly.

1. Remove the tapered roller bearing (A) from the transfer drive gear (B) using a commercially available bearing separator (C), the special tools, and a press.

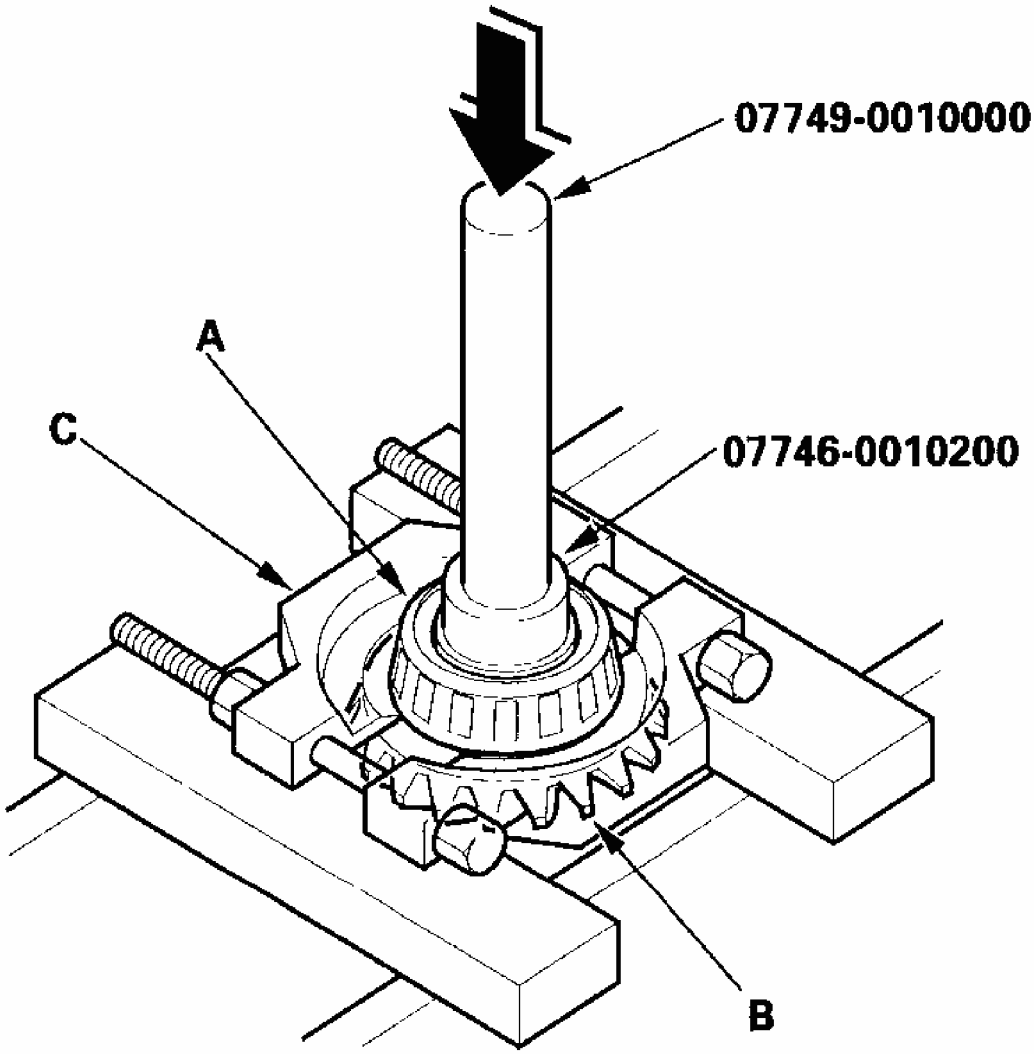

Fig. 191: Removing Tapered Roller Bearing From Transfer Drive Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the new tapered roller bearing (A) on the transfer drive gear (B) using the special tools and a press.

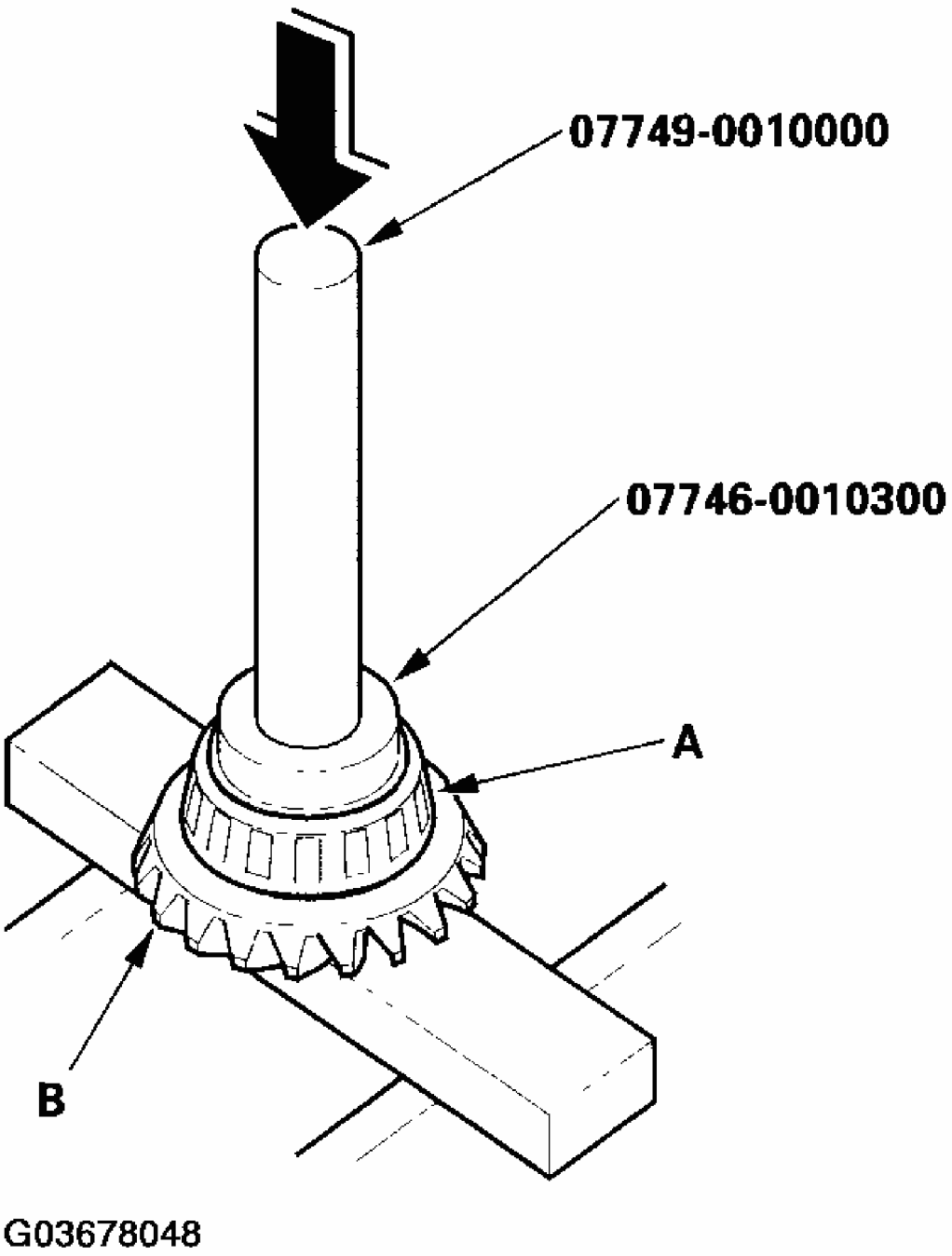

Fig. 192: Installing Tapered Roller Bearing On Transfer Drive Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSFER OUTPUT SHAFT BEARING REMOVAL/INSTALLATION

Special Tools Required

- Driver handle 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400

NOTE: Coat all parts with manual transmission fluid (MTF) during reassembly.

1. Remove the tapered roller bearing (A) from the transfer driven gear (B) using a commercially available bearing separator (C), an adapter (D), and a press.

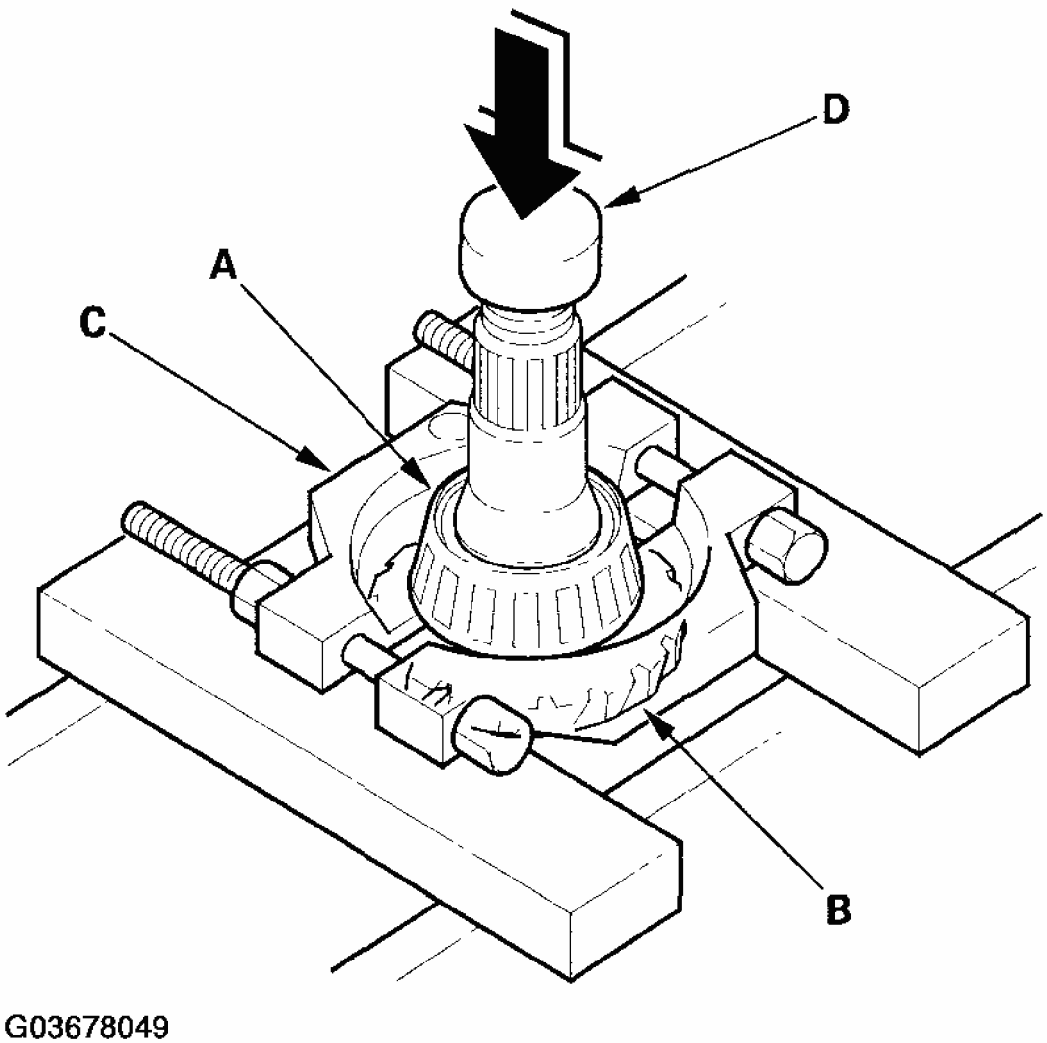

Fig. 193: Removing Tapered Roller Bearing From Transfer Driven Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the new tapered roller bearing (A) on the transfer driven gear (B) using the special tools and a press.

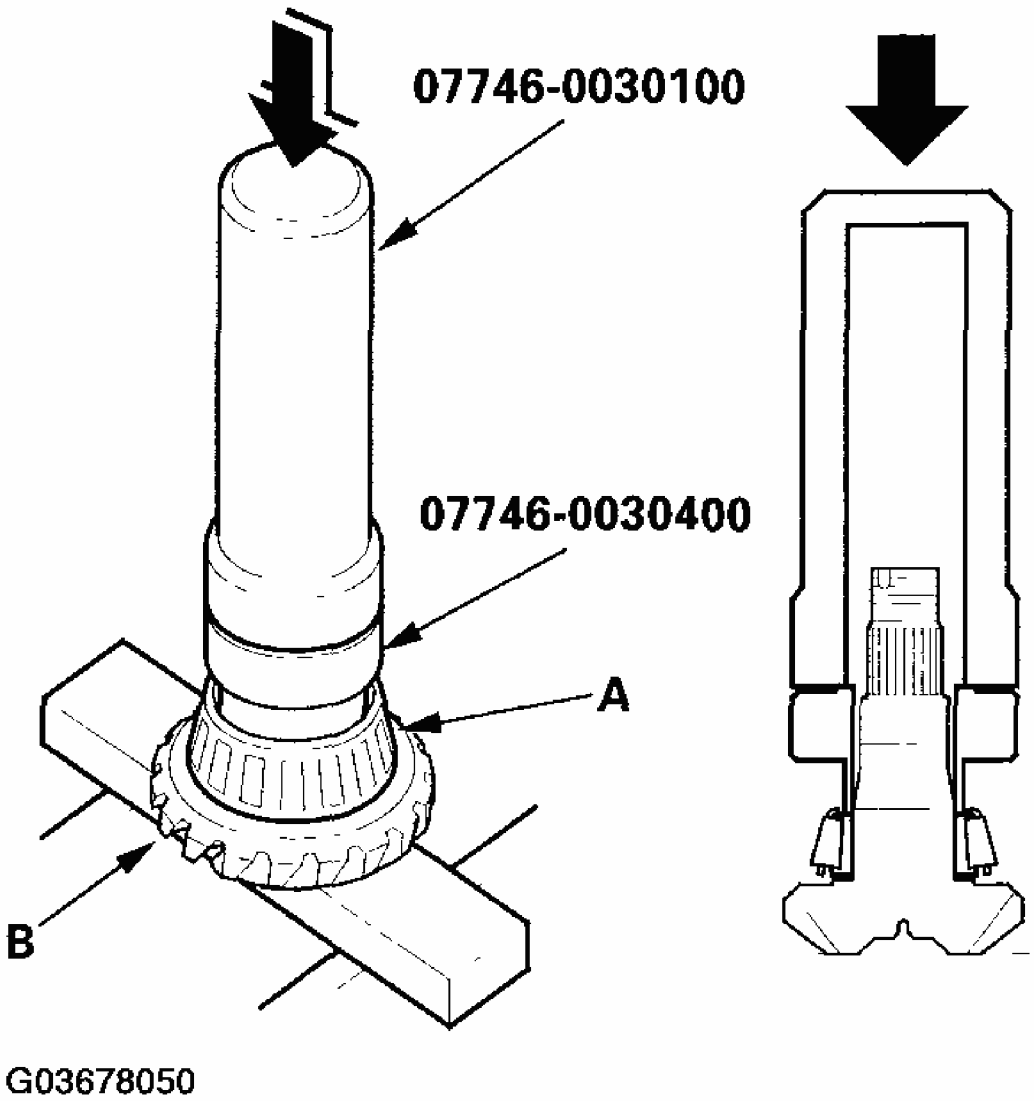

Fig. 194: Installing Tapered Roller Bearing On Transfer Driven Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSFER HOUSING TAPERED ROLLER BEARING OUTER RACE REPLACEMENT

Special Tools Required

- Installer shaft, 14 x 165 mm 07JAF-SJ80110
- Installer nut, 14 mm 07JAF-SJ80120
- Bearing installer attachment 07KAF-PS30120
- Bearing installer attachment 07LAF-PZ70110
- Oil seal driver attachment 07947-SD90101

- Driver 07749-0010000

NOTE:

- **Coat all parts with manual transmission fluid (MTF) during reassembly.**
- **Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.**

1. Remove the tapered roller bearing outer race (A) from transfer housing (B) by heating the housing to almost 212°F (100°C) using a heat gun (C). Do not heat the housing over 212°F (100°C).

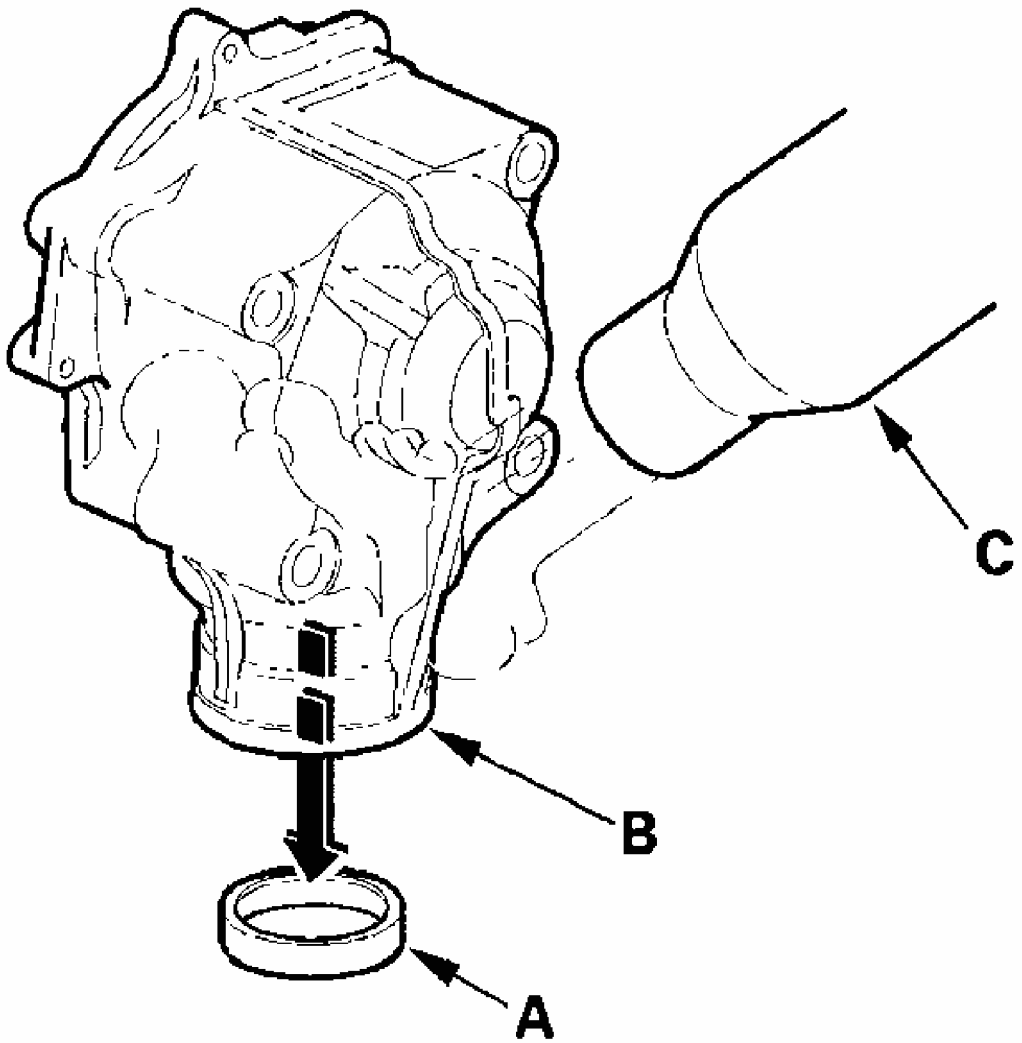

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Fig. 195: Removing Tapered Roller Bearing Outer Race From Transfer Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Bearing Outer Race Locations

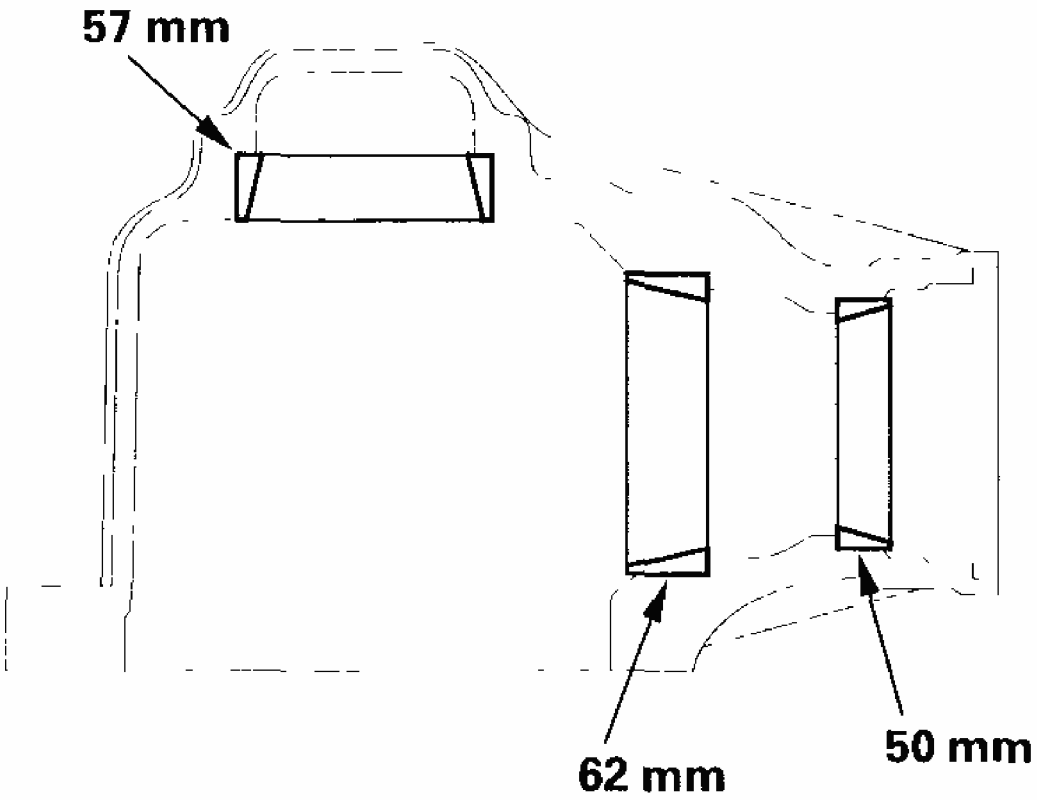


Fig. 196: Identifying Bearing Outer Race Locations
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the 57 mm tapered roller bearing outer race using the special tools.

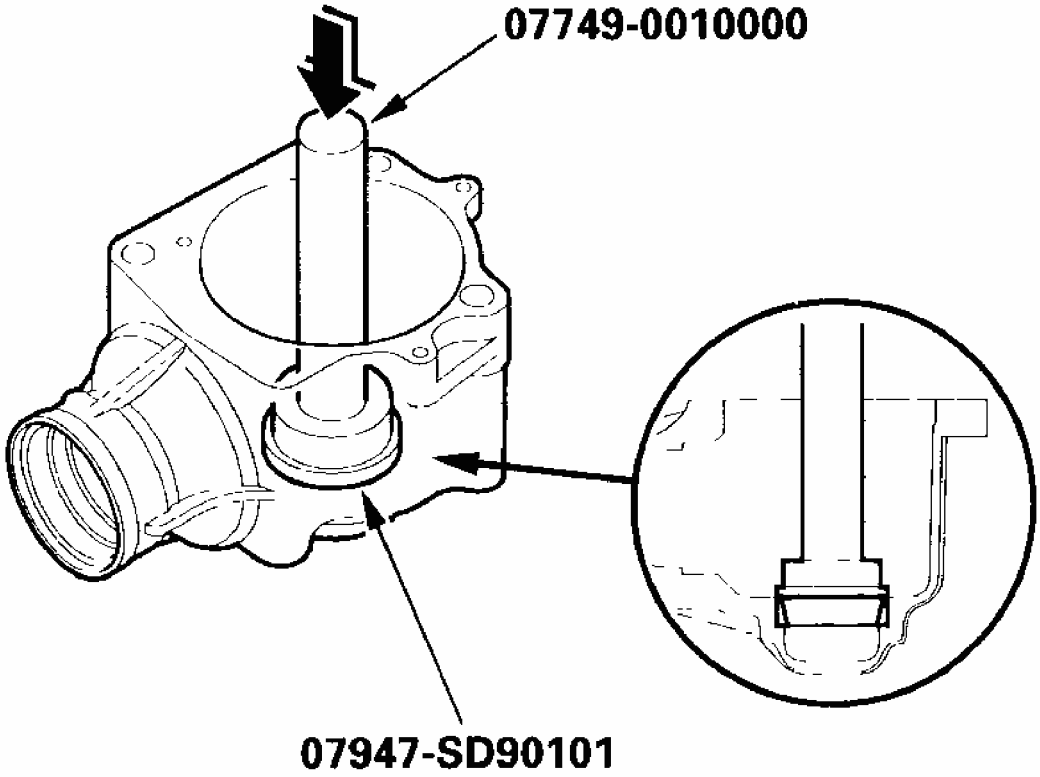


Fig. 197: Installing 57mm Tapered Roller Bearing Outer Race
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the 62 mm tapered roller bearing outer race and 50 mm tapered roller bearing outer race using the special tools.

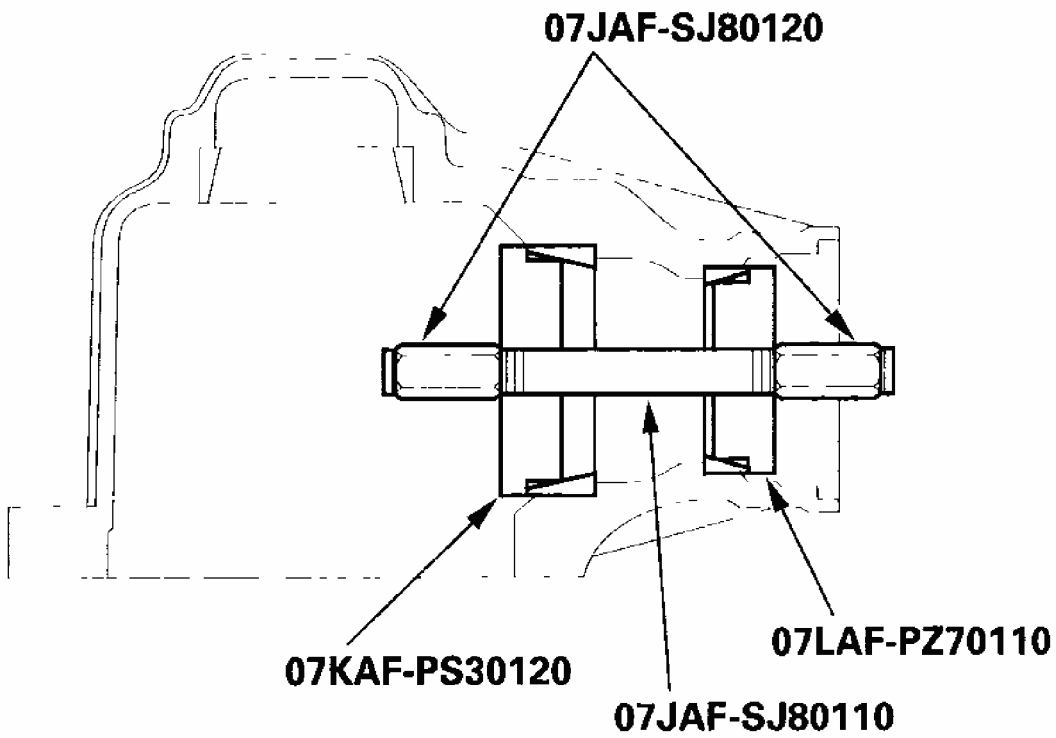


Fig. 198: Installing 62mm Tapered Roller Bearing Outer Race And 50mm Tapered Roller Bearing Outer Race
Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSFER ASSEMBLY REASSEMBLY

Special Tools Required

- Holder handle 07JAB-001020B
- Oil seal driver attachment 07JAD-PH80101
- Companion flange holder 07RAB-TB4010A or 07RAB-TB4010B
- Attachment, 72 x 75 mm 07746-0010600
- Driver handle 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400
- Driver 07749-0010000

Note these items during reassembly:

- 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 manual transmission fluid (MTF) 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 shaft as a set if either part is replaced.

Outline of Assembly

1. Select the 35 mm thrust shim. Do this procedure if the transfer driven gear shaft or the tapered roller bearing on the transfer driven gear shaft is replaced.
2. Preassemble the parts to check and adjust transfer gear backlash and transfer gear tooth contact.
3. Disassemble the parts, then assemble the transfer driven gear shaft and its related parts.
4. Measure and adjust the starting torque of the transfer driven gear shaft tapered roller bearing.
5. Assemble the transfer shaft and its related parts.
6. Measure and adjust the total starting torque.

35 mm Thrust Shim Selection

1. Select the 35 mm thrust shim if the transfer driven gear shaft or the tapered roller bearing on the transfer driven gear shaft is replaced.

   Calculate the thickness of the 35 mm thrust shim using the formula.

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

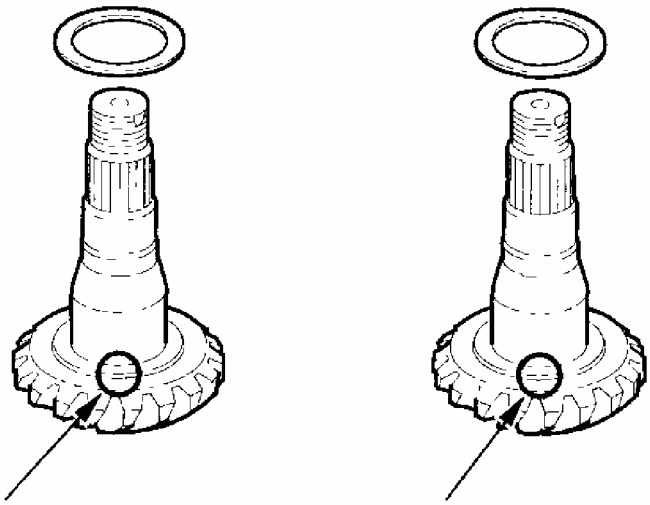
A: Number on the existing transfer driven gear shaft.
B: Number on the replacement transfer driven gear shaft.
C: Thickness of the existing 35 mm thrust shim.
X: Thickness needed for the replacement 35 mm thrust shim.

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 35 mm THRUST SHIM
Thickness: X= ? ? mm



Number: A=+2

Number: B=−1

A: EXISTING TRANSFER DRIVEN GEAR SHAFT

B: REPLACEMENT TRANSFER DRIVEN GEAR SHAFT

$$X = \frac{A}{100} - \frac{B}{100} + C = \frac{2}{100} - \frac{-1}{100} + 1.05$$

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

G03678055

Fig. 199: Selecting 35mm Thrust Shim
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Select 35 mm thrust shim thickness of 1.08 mm (0.043 in.).

If the tapered roller bearing on the transfer driven gear 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 of the existing 35 mm thrust shim by the amount of difference in bearing thickness, and select the replacement 35 mm thrust shim. Do not use more than one 35 mm thrust shim to adjust the transfer gear backlash.

35 mm Thrust Shim

35 MM THRUST SHIM SPECIFICATIONS

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.)

Transfer Gear Backlash Inspection and Transfer Gear Tooth Contact Inspection

2) Install the 35 mm thrust shim (A) on the transfer driven gear (B), then install the tapered roller bearing (C) using the special tools and a press.

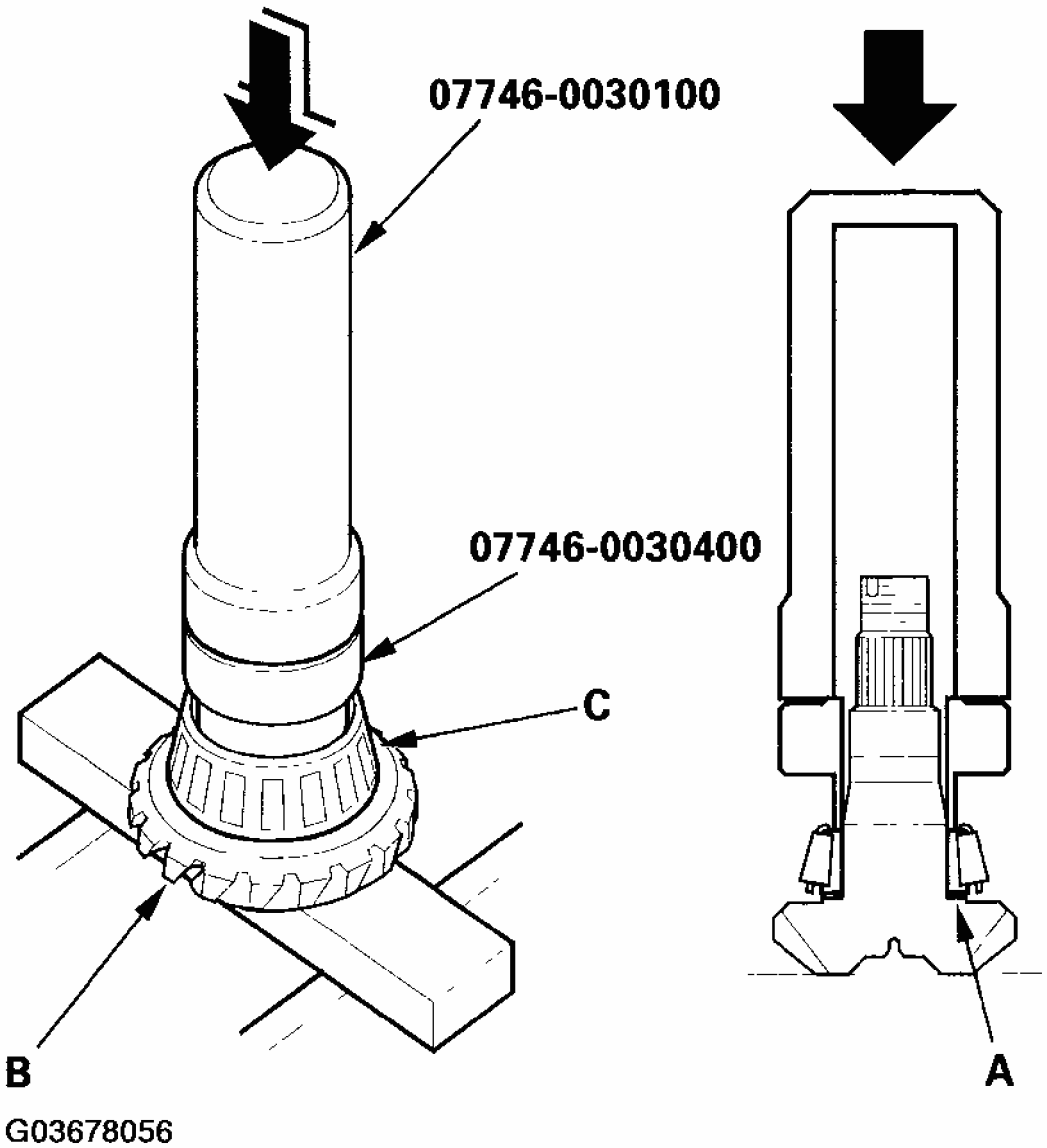


Fig. 200: Installing 35mm Thrust Shim On Transfer Driven Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3) Install the bearing outer race, then install the tapered roller bearing (A) in the companion flange side of the transfer housing.

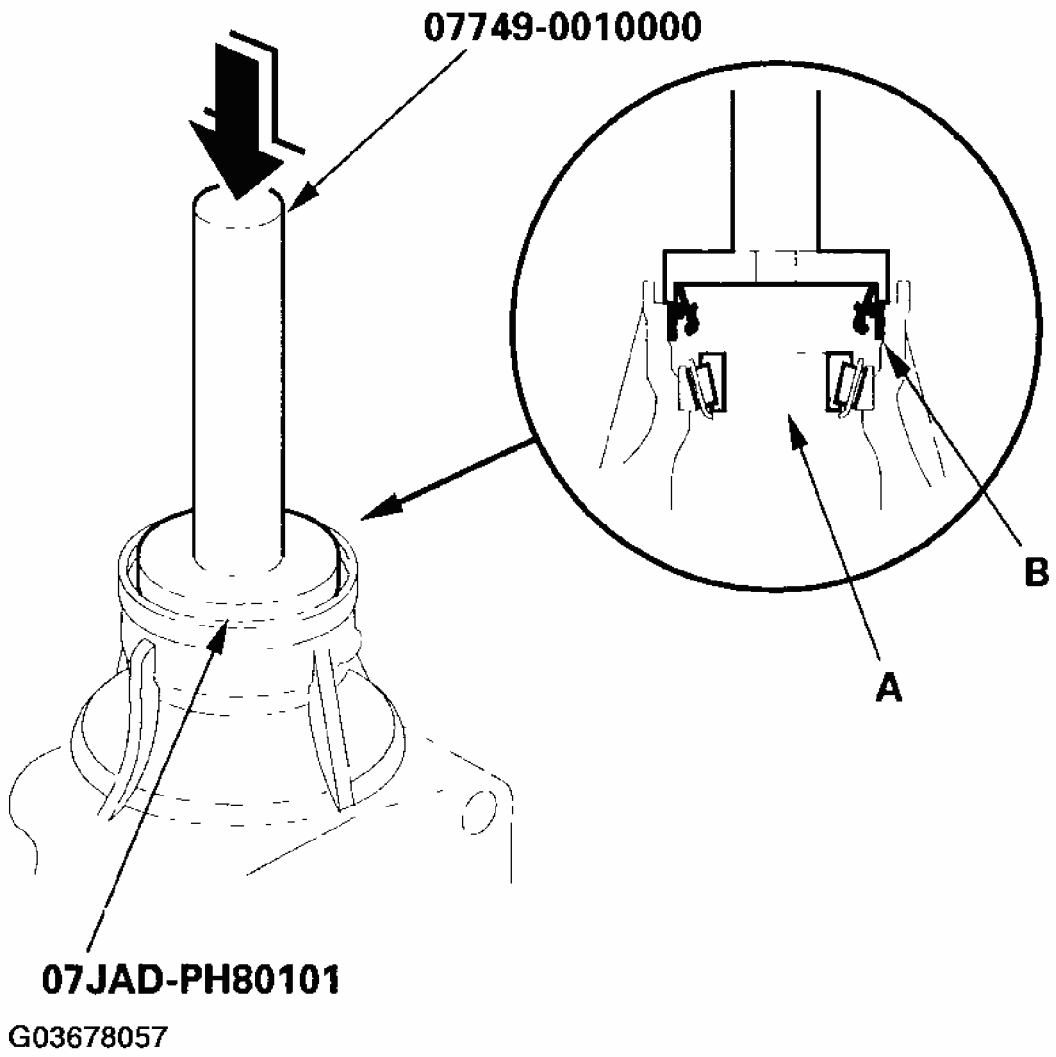


Fig. 201: Installing Bearing Outer Race, Tapered Roller Bearing In Companion Flange Side Of Transfer Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4) Install the new oil seal (B) in the transfer housing using the special tools.

5) Install the transfer driven gear (A) in the transfer housing (B). Do not install the transfer spacer on the transfer driven gear shaft in this step.

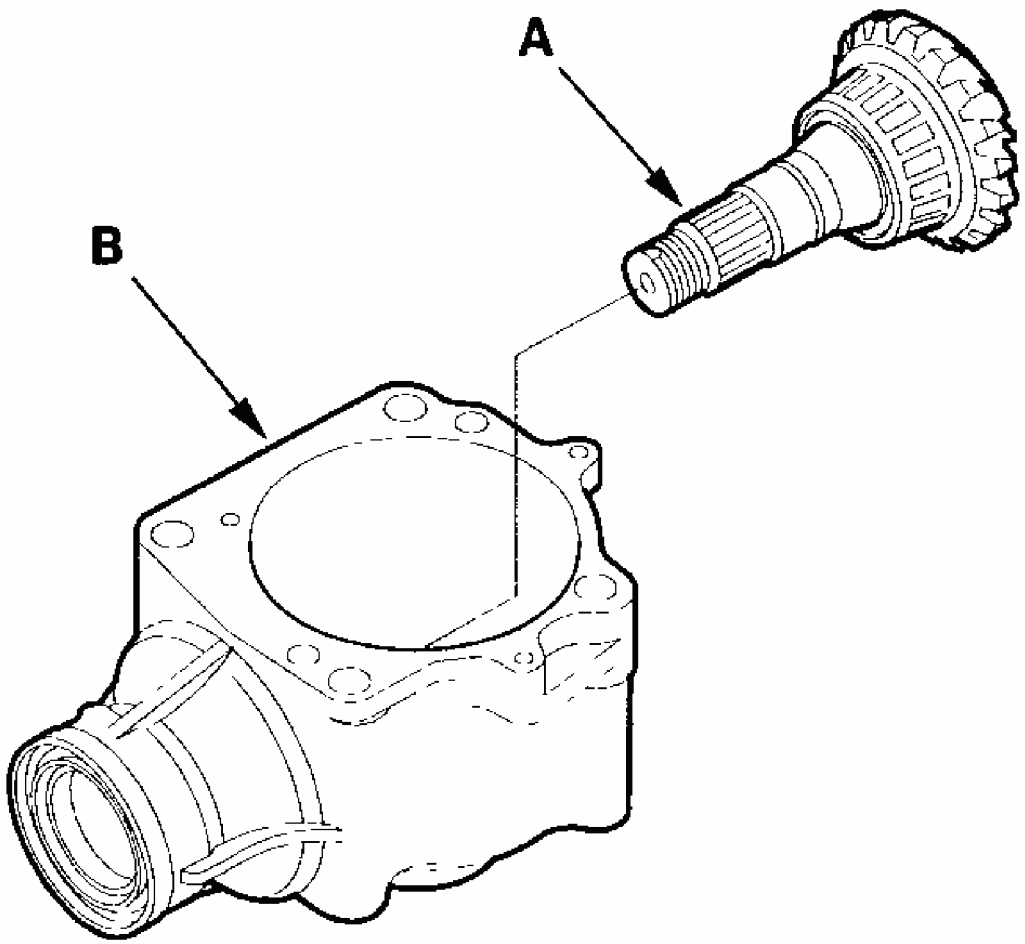


Fig. 202: Installing Transfer Driven Gear In Transfer Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6) Install the companion flange (A), conical spring washer (B), and locknut (C) on the transfer driven gear (D). Do not install the O-ring and the back-up ring on the transfer gear shaft in this step.

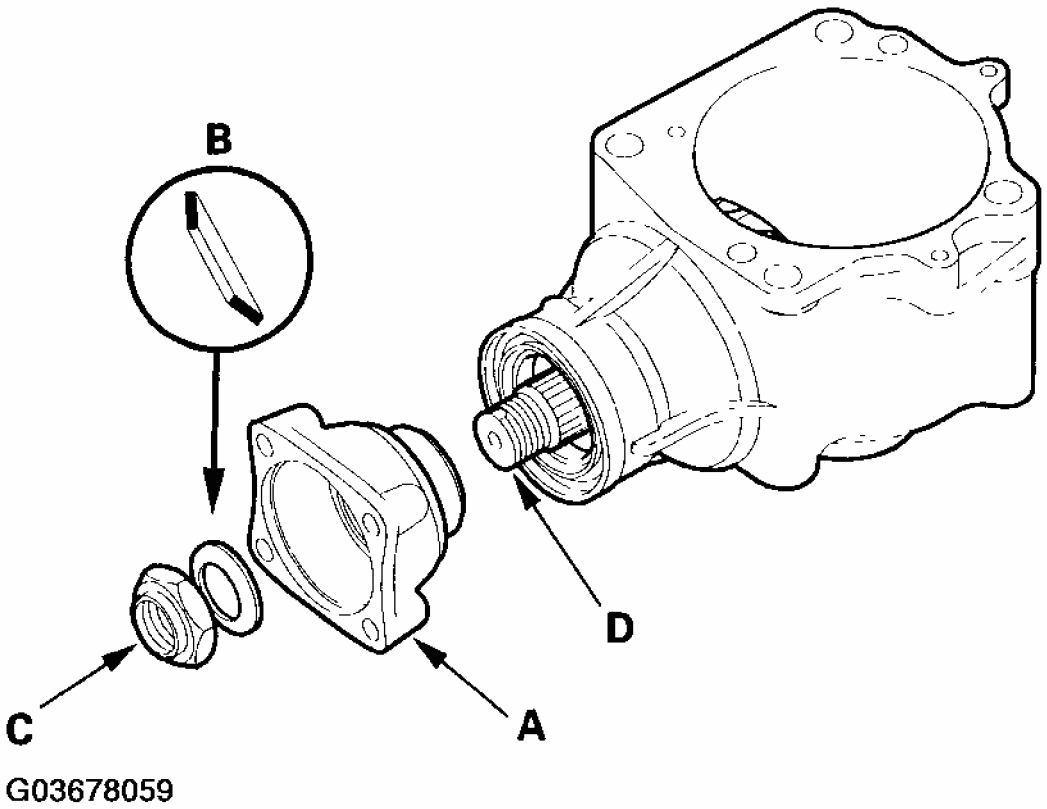


Fig. 203: Installing Companion Flange, Conical Spring Washer, And Locknut On Transfer Driven Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7) Secure the transfer housing (A) in a bench vise (B) with soft jaws, then install the special tools on the companion flange.

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

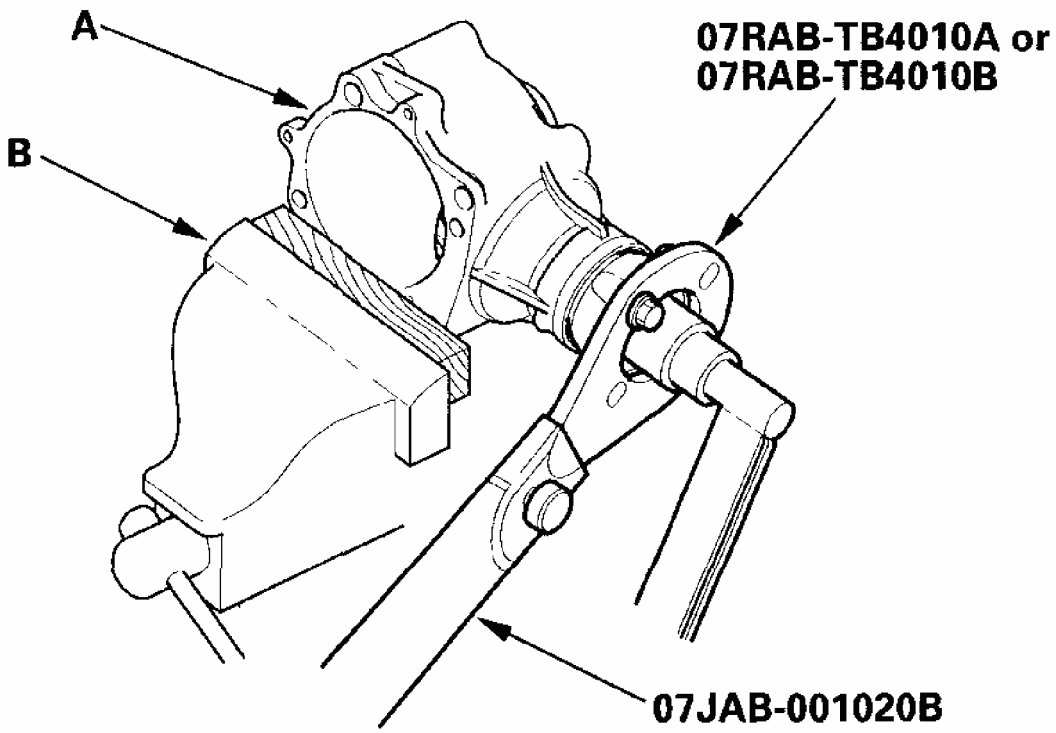


Fig. 204: Securing Transfer Housing In Bench Vise With Soft Jaws
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8) Tighten the locknut while measuring the starting torque so the starting torque is within 0.98-1.39 N.m (10.0-14.2 kgf.cm, 8.7-12.3 lbf.in).

NOTE:

- **Coat the threads of the locknut and the shaft with manual transmission fluid (MTF) before installing the locknut.**
- **Do not stake the locknut in this step.**

Starting Torque:

0.98-1.39 N.m

(10.0-14.2 kgf.cm, 8.7-12.3 lbf.in)

9) Install the transfer shaft assembly (A) in the transfer holder (B), then install the transfer drive gear (C), transfer collar (D), 25 mm thrust shim (E), tapered roller bearing (F), conical spring washer (G), and locknut (H) on the transfer shaft assembly.

NOTE:

- **Coat the threads of the locknut and the shaft with MTF before installing the locknut.**
- **Do not stake the locknut in this step.**

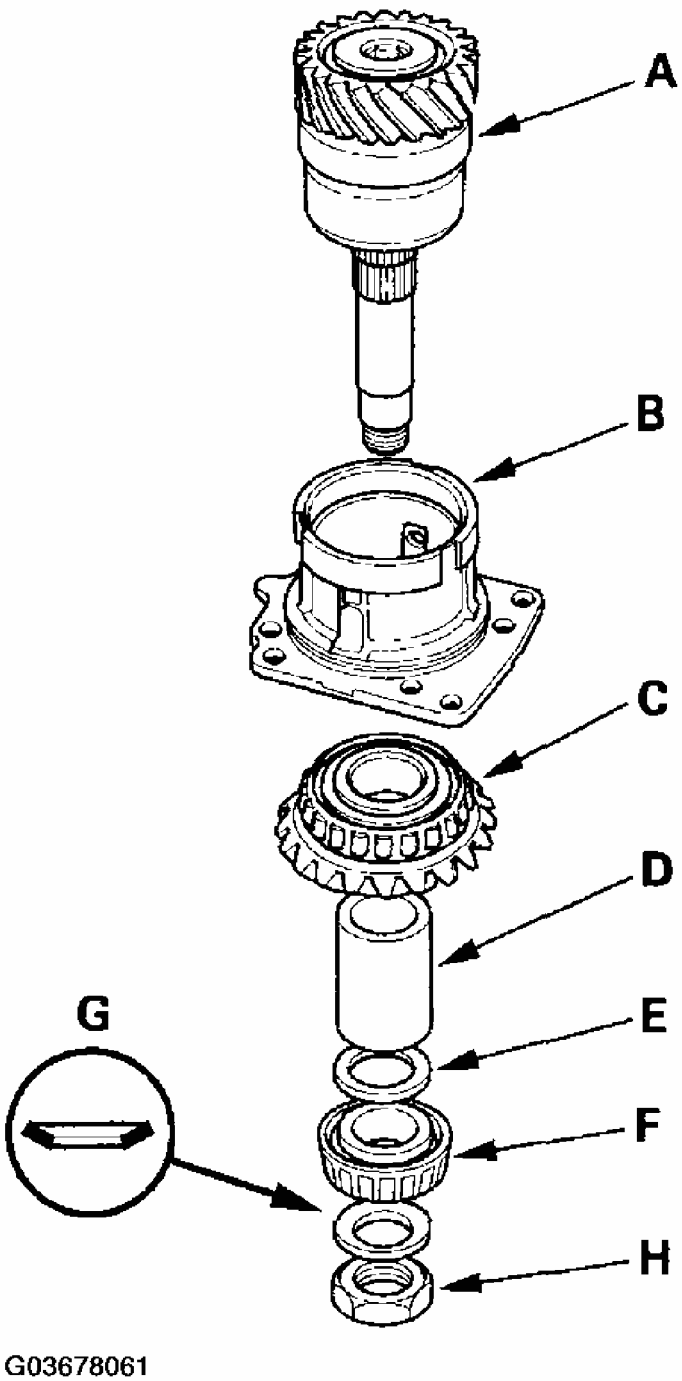


Fig. 205: Installing Transfer Shaft Assembly In Transfer Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10) Hold the transfer shaft (A) with a 14 mm hex wrench (B) clamped in a bench vise, and tighten the locknut.

NOTE: Do not stake the locknut in this step.

Torque: 118 N.m (12.0 kgf.m, 86.8 lbf.ft)

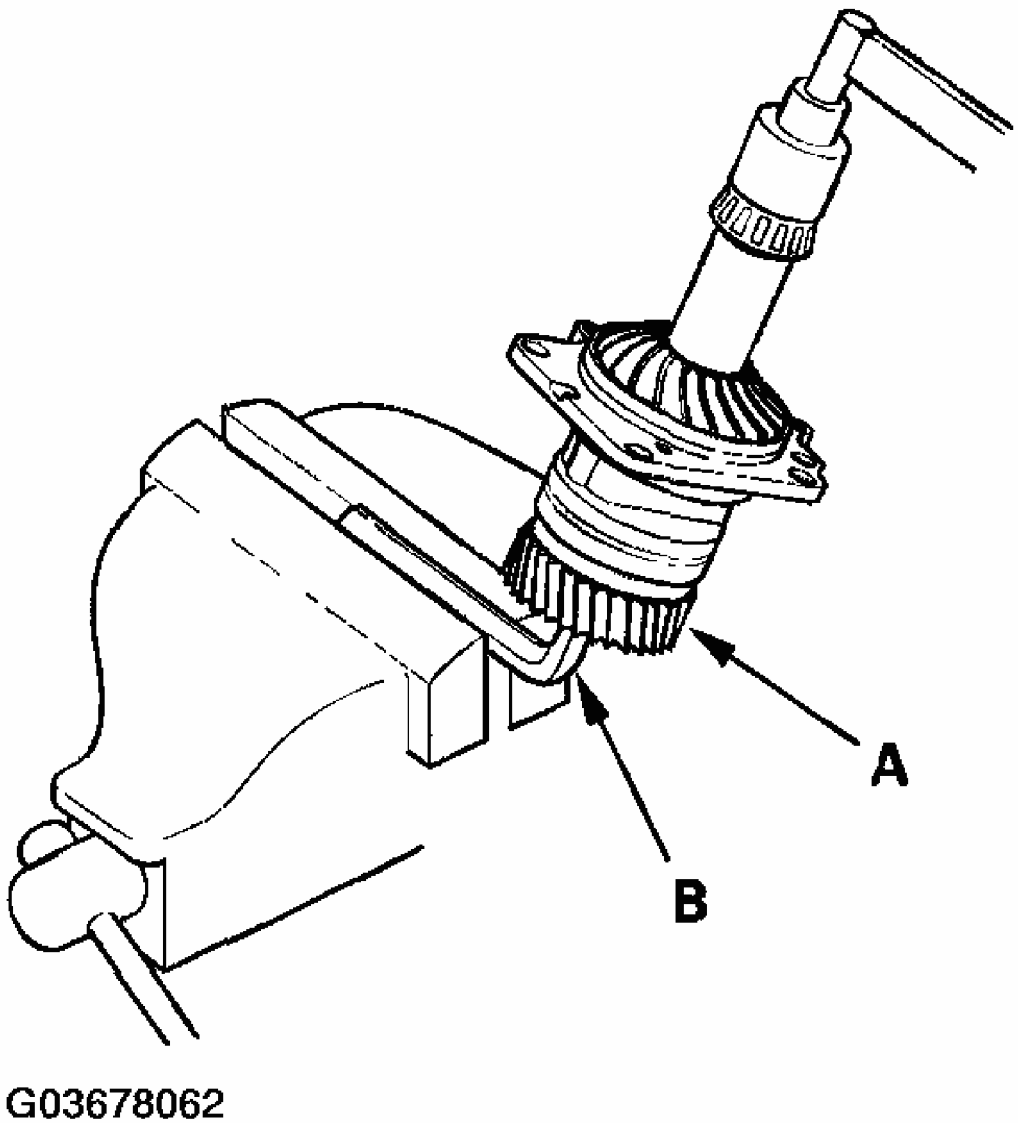


Fig. 206: Tightening Lock Nut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11) Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.

12) Install the dowel pin (A) and transfer holder assembly (B) in the transfer housing (C).

NOTE: Temporarily install the transfer holder assembly without the O-ring.

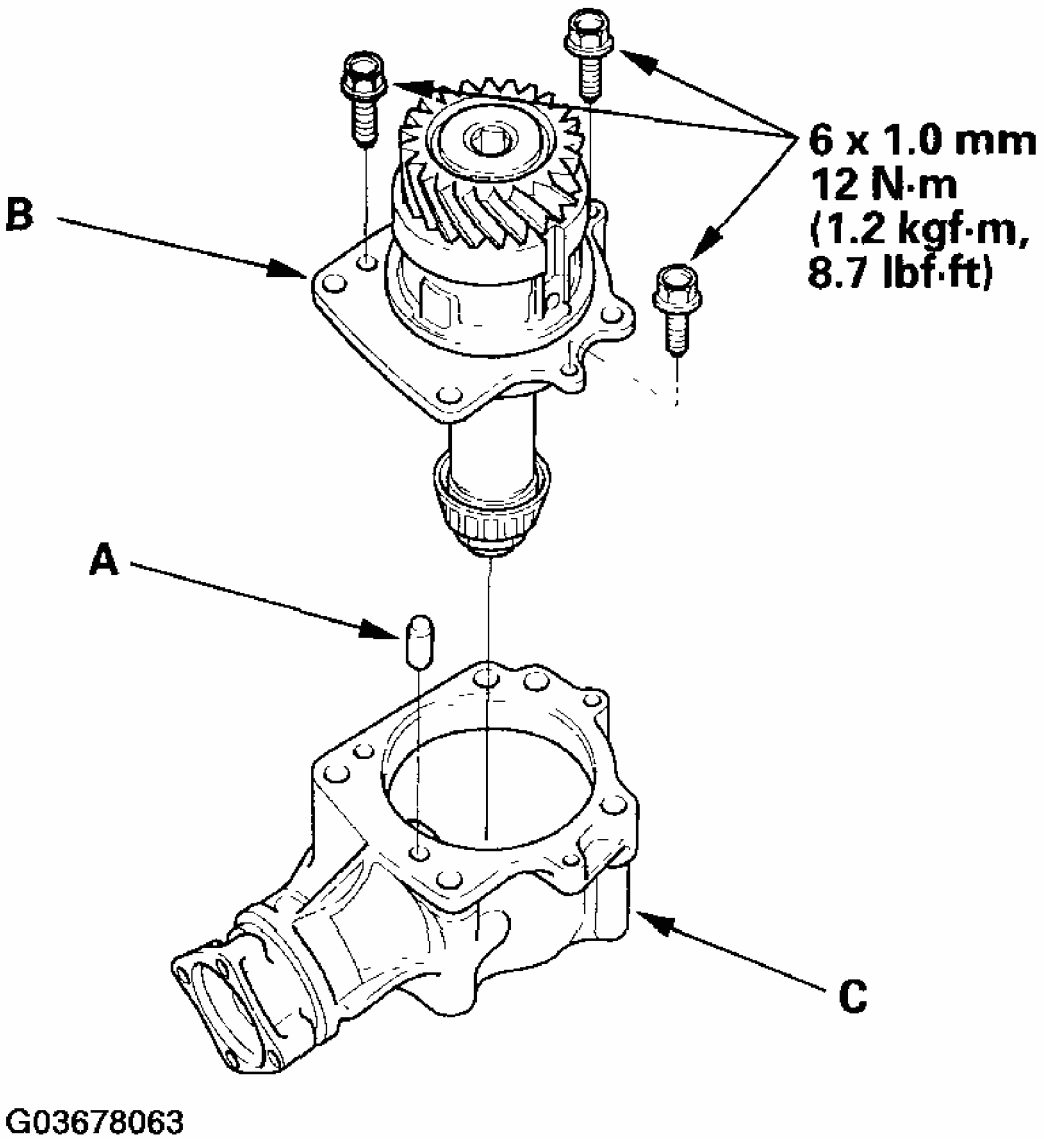


Fig. 207: Installing Dowel Pin And Transfer Holder Assembly In Transfer Housing With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13) Rotate the companion flange several times to seat the tapered roller bearing.

14) Set a dial indicator (A) on the companion flange (B), then measure the transfer gear backlash.

Standard: 0.06-0.16 mm (0.002-0.006 in.)

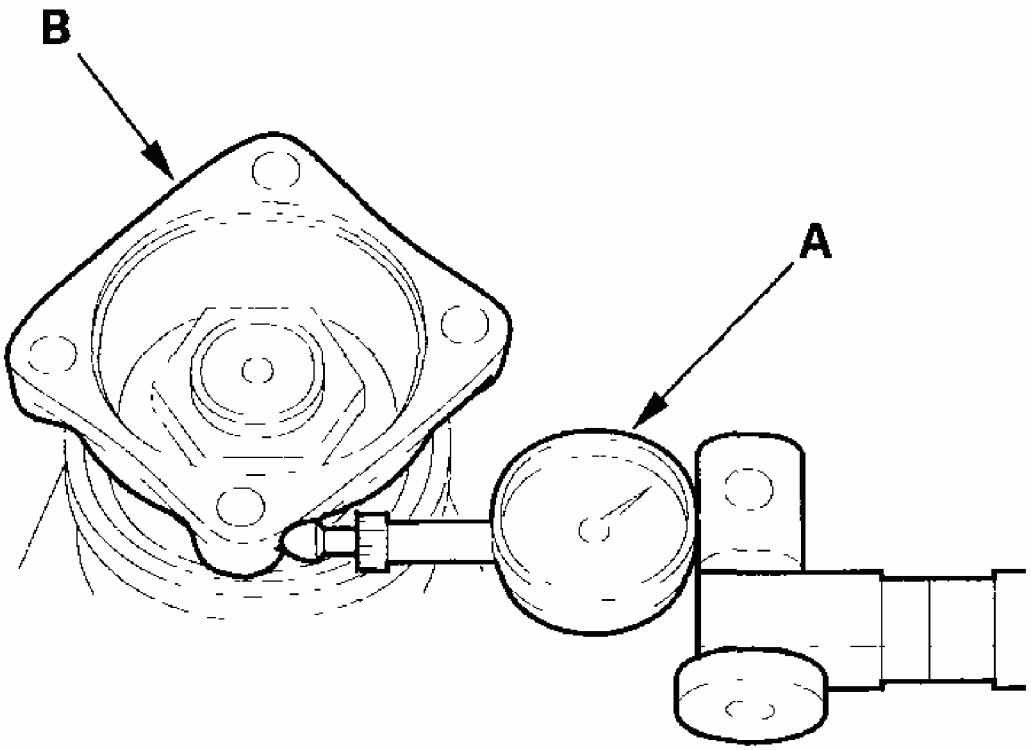


Fig. 208: Measuring Transfer Gear Backlash
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15) Check the transfer gear tooth contact pattern.

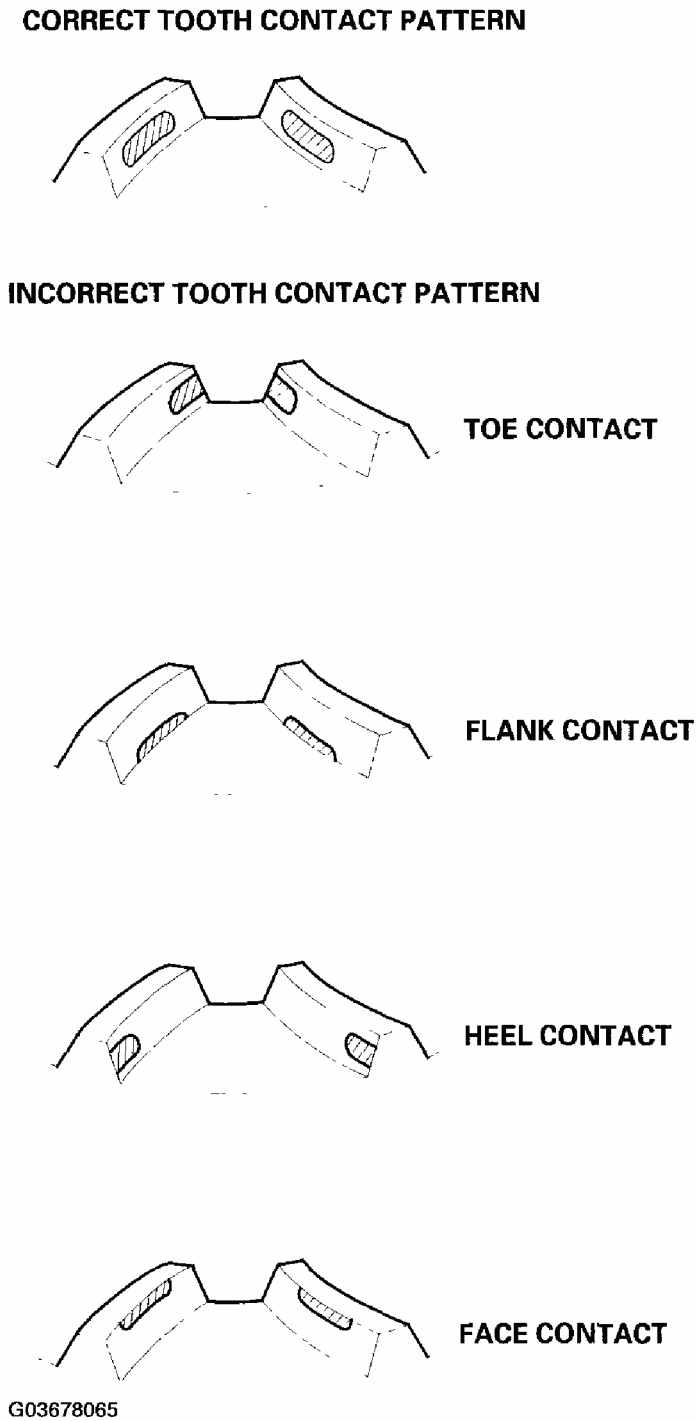


Fig. 209: Checking Transfer Gear Tooth Contact Pattern
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16) If the transfer gear tooth contact is incorrect, adjust the transfer gear tooth contact with a 35 mm or 25 mm thrust shim. If the gear tooth contact is correct, go to step 17

NOTE:

- **To select a 35 mm thrust shim.**
- **Do not use more than one 35 mm shim to adjust the transfer gear tooth contact.**
- **To select the 25 mm thrust shim.**
- **Do not use more than one 25 mm shim to adjust the transfer gear tooth contact.**

- **Toe Contact**

  Use a thicker 35 mm thrust shim to move the transfer driven gear shaft toward the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear away from the transfer driven gear shaft to adjust the transfer gear backlash as follows:

  - Increase the thickness of the 25 mm thrust shim.
  - Reduce the thickness of the 76 mm thrust shim by the amount you increased the thickness of the 25 mm thrust shim.

- **Flank Contact**

  Use a thinner thrust shim to move the transfer drive gear toward the transfer driven gear 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.

- **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 driven gear shaft to adjust the transfer gear backlash as follows:

  - Reduce the thickness of the 25 mm thrust shim.
  - Increase the thickness of the 76 mm thrust shim by the amount you reduced the thickness of the 25 mm thrust shim.

- **Face Contact**

  Use a thicker thrust shim to move the transfer drive gear away from the transfer driven gear 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.

25 mm Thrust Shim

25 MM THRUST SHIM SPECIFICATIONS

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.)

17) Remove the transfer holder assembly (A) from the transfer housing (B).

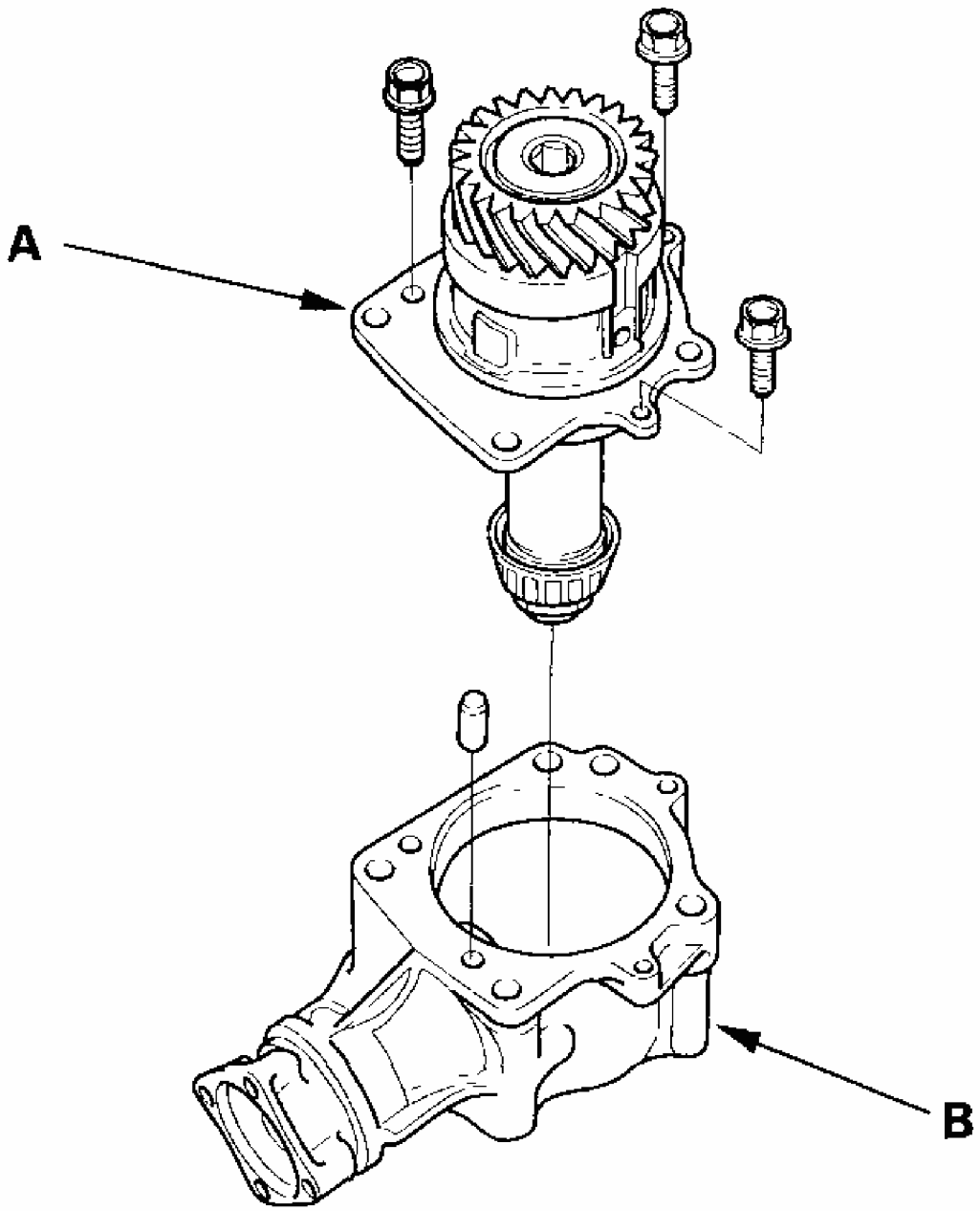


Fig. 210: Removing Transfer Holder Assembly From Transfer Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18) Secure the transfer housing (A) in a bench vise (B) with soft jaws.

NOTE: To prevent damage to the transfer housing, always use soft

jaws or equivalent materials between the transfer housing and the vise.

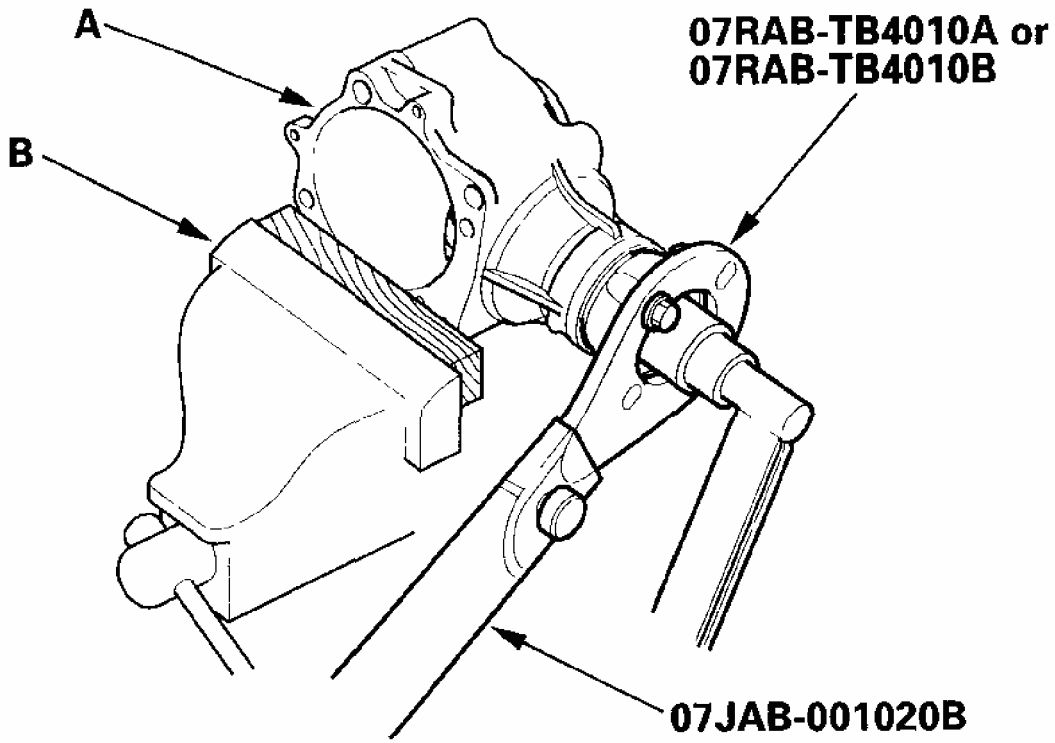


Fig. 211: Securing Transfer Housing In Bench Vise With Soft Jaws
Courtesy of AMERICAN HONDA MOTOR CO., INC.

19) Install the special tools on the companion flange, then loosen the locknut.

20) Remove the locknut (A), conical spring washer (B), and companion flange (C) from the transfer driven gear (D).

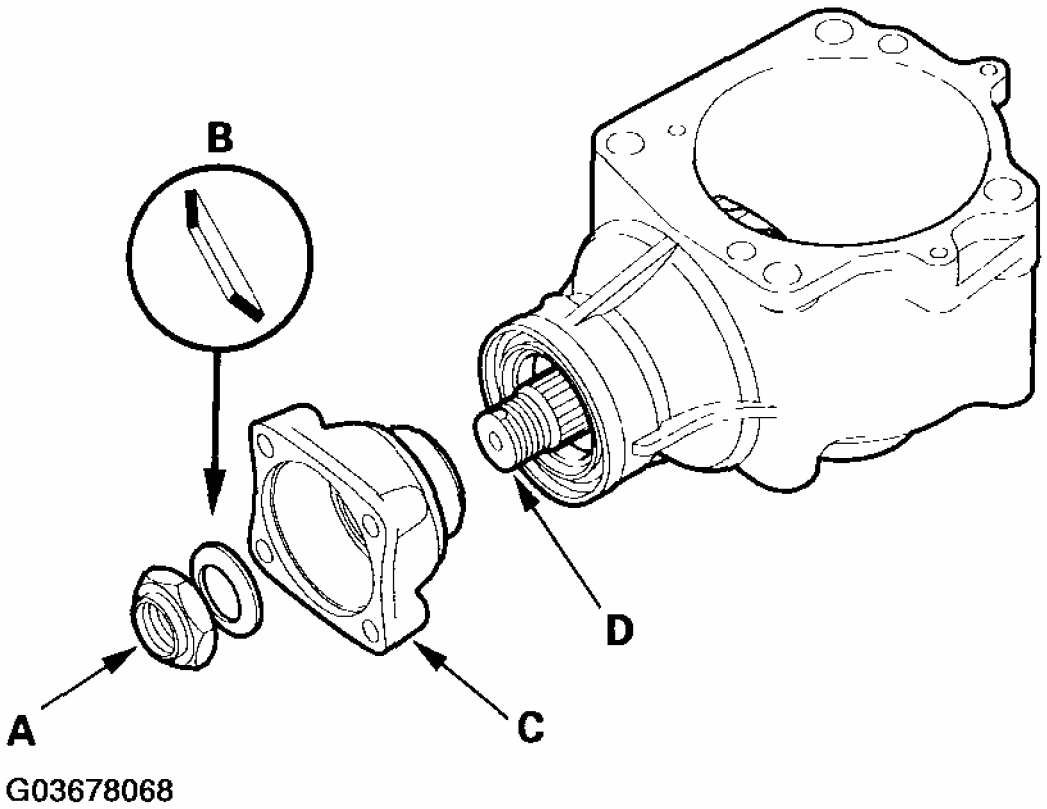


Fig. 212: Removing Locknut, Conical Spring Washer, And Companion Flange From Transfer Driven Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

21) Remove the transfer driven gear (A) from the transfer housing (B).

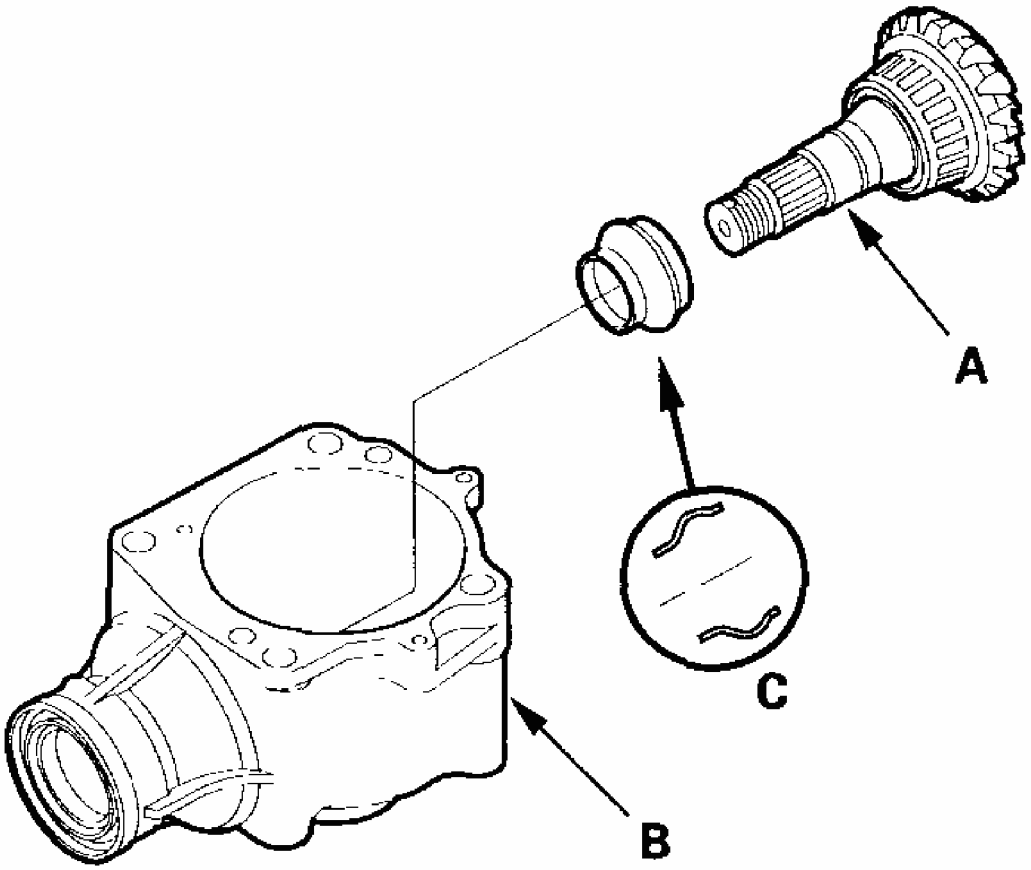


Fig. 213: Removing Transfer Driven Gear From Transfer Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22) Install the new transfer spacer (C) on the transfer driven gear, then install them in the transfer housing.

23) Install the companion flange (A), O-ring (B), back-up ring (C), conical spring washer (D), and locknut (E) on the transfer driven gear (F).

NOTE:

- **Coat the threads of the locknut, O-ring, and transfer shaft with MTF before installing the locknut.**
- **Install the conical spring washer in the direction shown.**

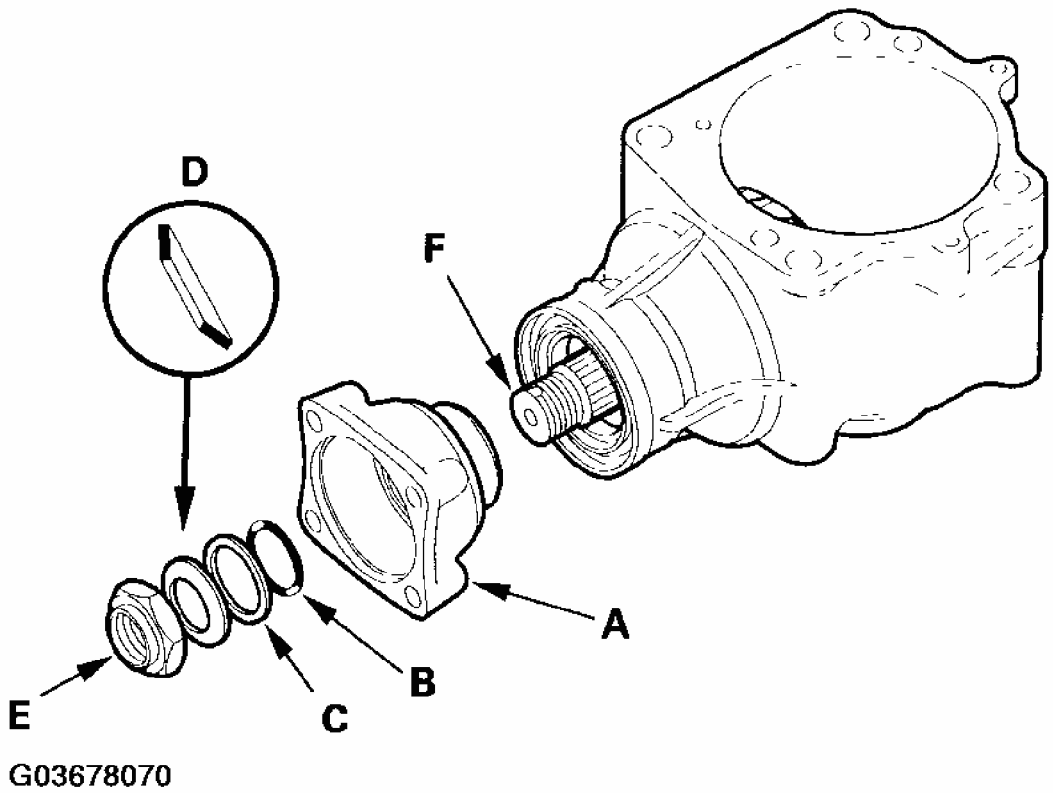


Fig. 214: Installing Conical Spring Washer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

24) Secure the transfer housing (A) in a bench vise (B) with soft jaws.

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

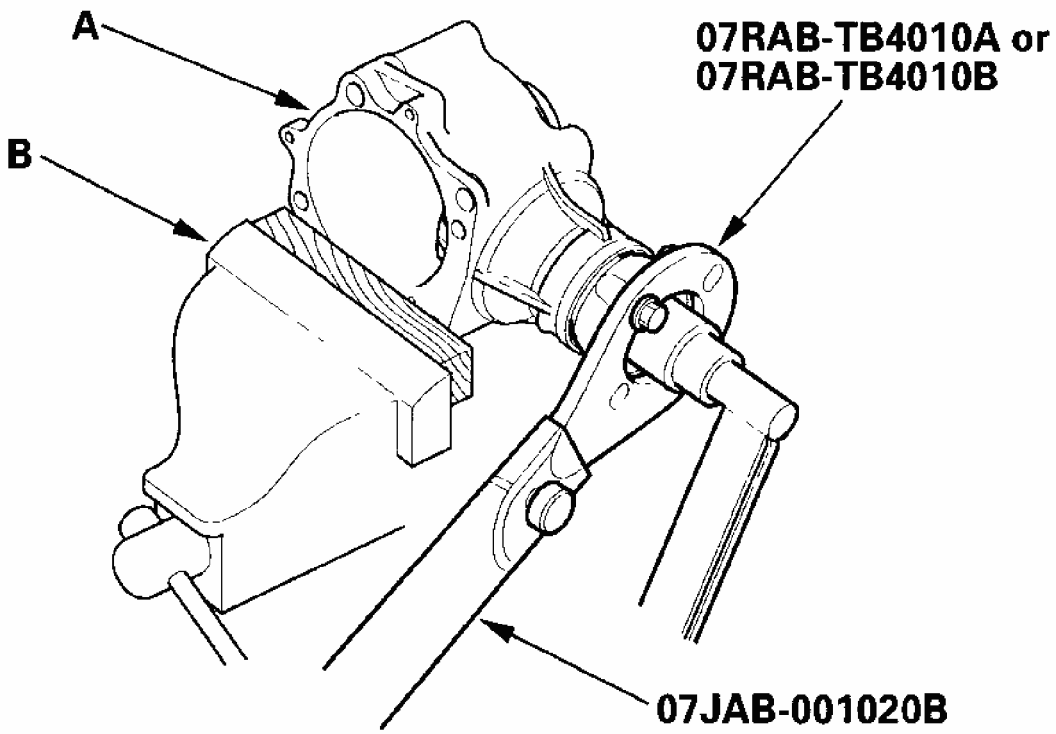


Fig. 215: Securing Transfer Housing In Bench Vise With Soft Jaws
Courtesy of AMERICAN HONDA MOTOR CO., INC.

25) Install the special tools on the companion flange, then tighten the transfer driven gear shaft locknut while measuring the starting torque of the transfer driven gear shaft.

Starting Torque:

0.98-1.39 N.m

(10.0-14.2 kgf.cm, 8.7-12.3 lbf.in)

Tightening Torque:

132-260 N.m

(13.5-26.5 kgf.m, 97.6-192 lbf.ft)

NOTE:

- **Rotate the companion flange several times to seat the tapered roller bearing, then measure the starting torque.**
- **If the starting torque exceeds 1.39 N.m (14.2 kgf.cm, 12.3**

lbf.in), replace the transfer spacer and reassemble the parts. Do not adjust the torque with the locknut loose.

- **If the tightening torque exceeds 260 N.m (26.5 kgf.m, 192 lbf.ft), replace the transfer spacer and reassemble the parts.**
- **Write down the measurement of the starting torque; it is used to measure the total starting torque.**

26) Stake the locknut into the transfer driven gear shaft using a 3.5 mm punch.

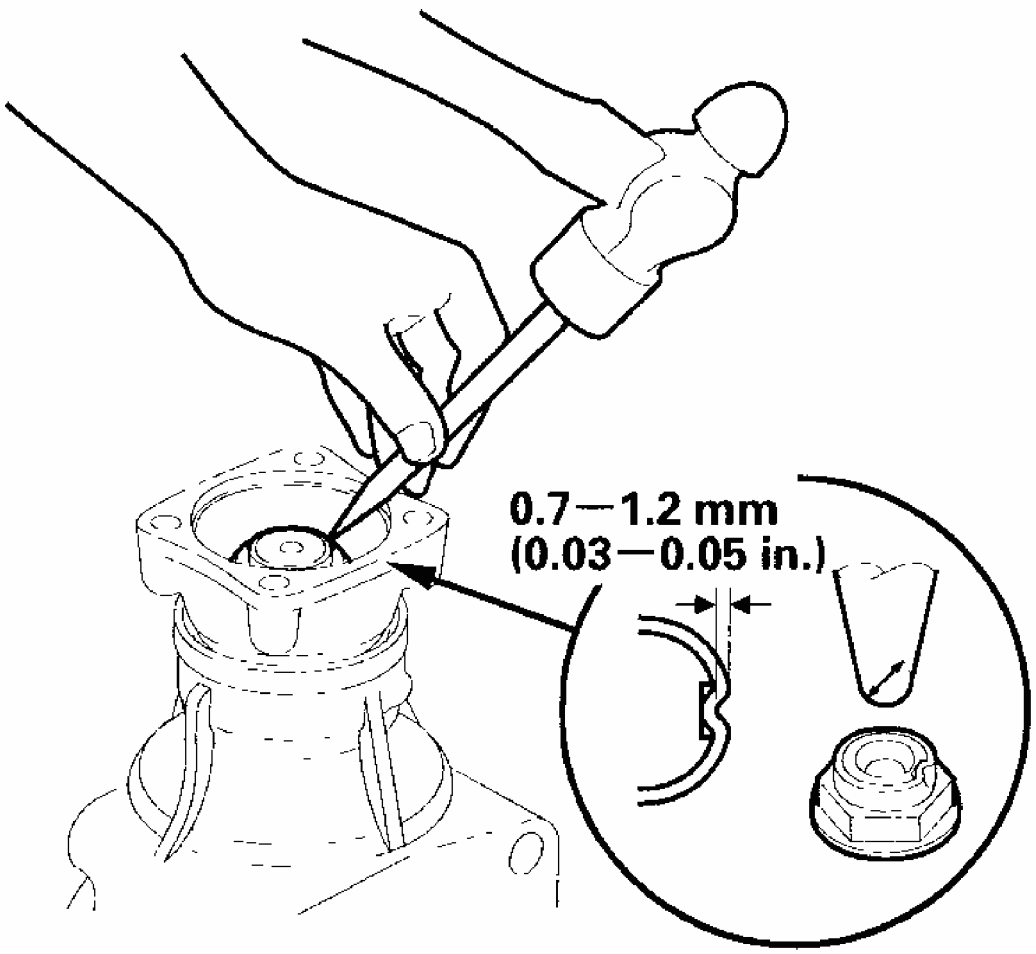


Fig. 216: Staking Locknut Into Transfer Driven Gear Shaft Using 3.5mm Punch
Courtesy of AMERICAN HONDA MOTOR CO., INC.

27) Install the dowel pin (A) in the transfer housing (B), then install the transfer holder

assembly (C).

NOTE: Temporarily install the transfer holder assembly without the O-ring.

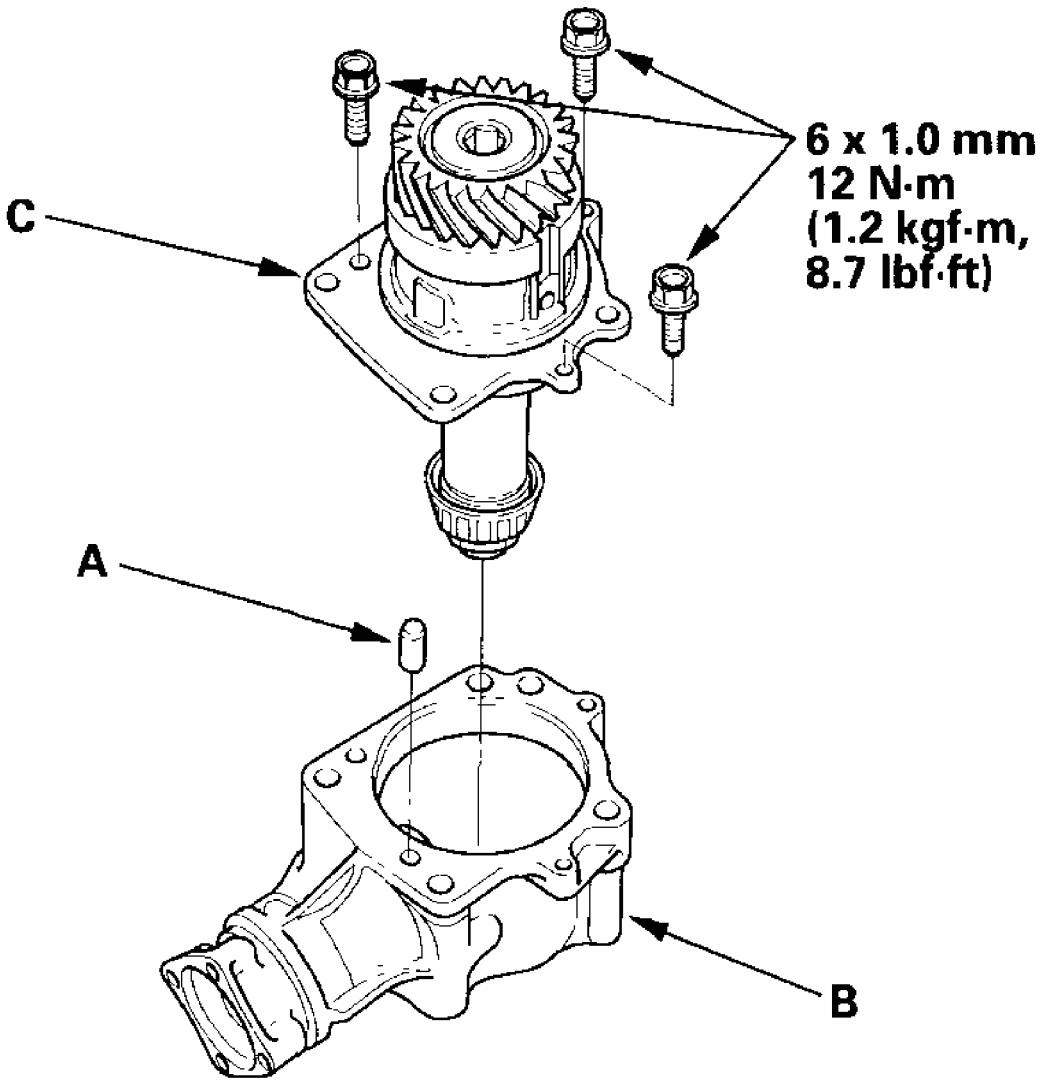


Fig. 217: Installing Dowel Pin In Transfer Housing And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

28) Secure the transfer housing (A) in a bench vise (B) with soft jaws, then rotate the companion flange several times to seat the tapered roller bearing.

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

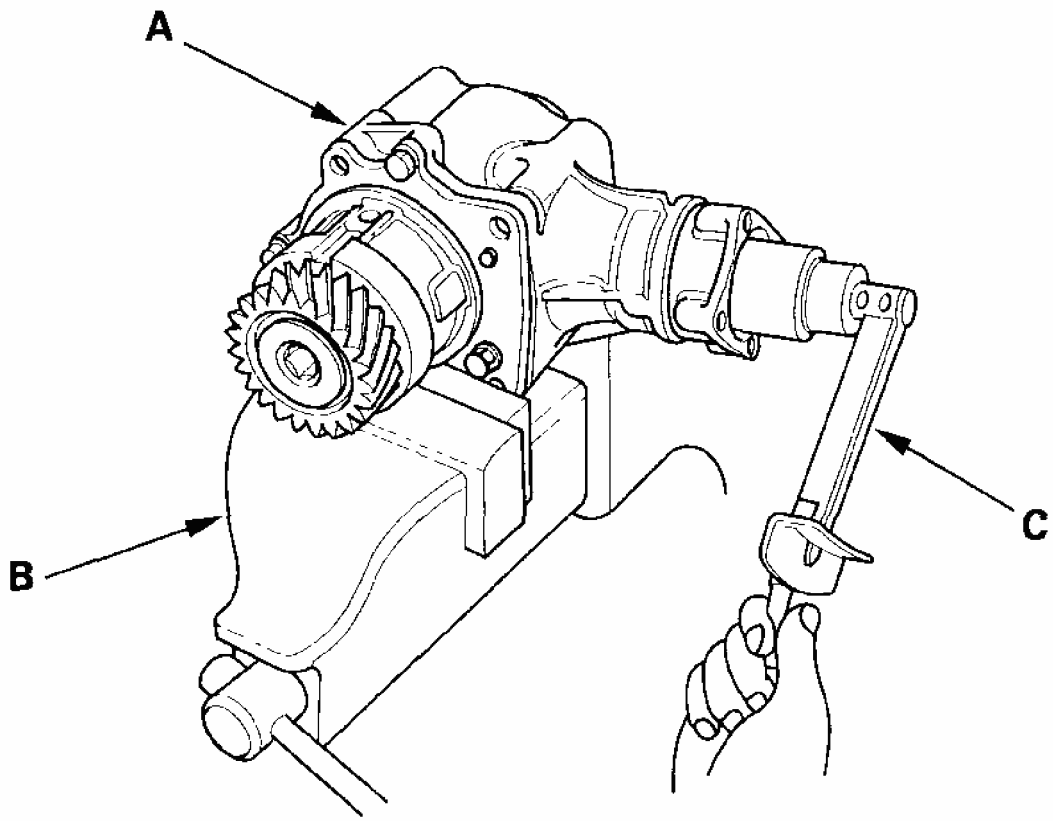


Fig. 218: Securing Transfer Housing In Bench Vise With Soft Jaws
Courtesy of AMERICAN HONDA MOTOR CO., INC.

29) Measure the total starting torque using the torque wrench (C).

Total Starting Torque:

1.30-2.47 N.m (13.3-25.2 kgf.cm, 11.5-21.9 lbf.in) + Transfer Driven Gear Shaft Starting Torque Value (written down in step 25).

30) Remove the transfer holder assembly from the transfer housing.
31) If the measurement is not within the specification, go to step 32.

If the measurement is within the specification, go to step 43

32) Hold the transfer shaft (A) with a 14 mm hex wrench (B) clamped in a bench vise then loosen the locknut

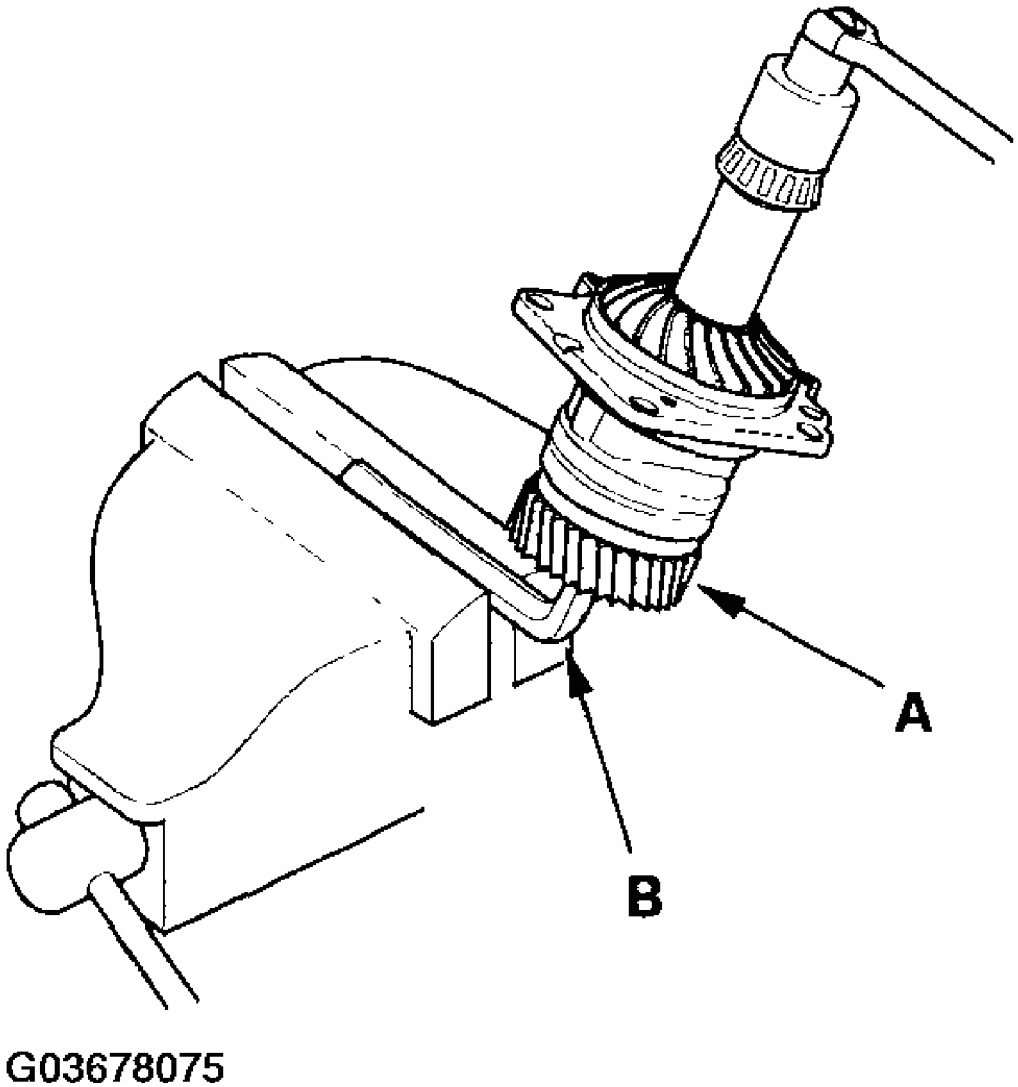


Fig. 219: Loosening Locknut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

33) Remove the locknut (A) and transfer shaft assembly (B) from the transfer holder (C).

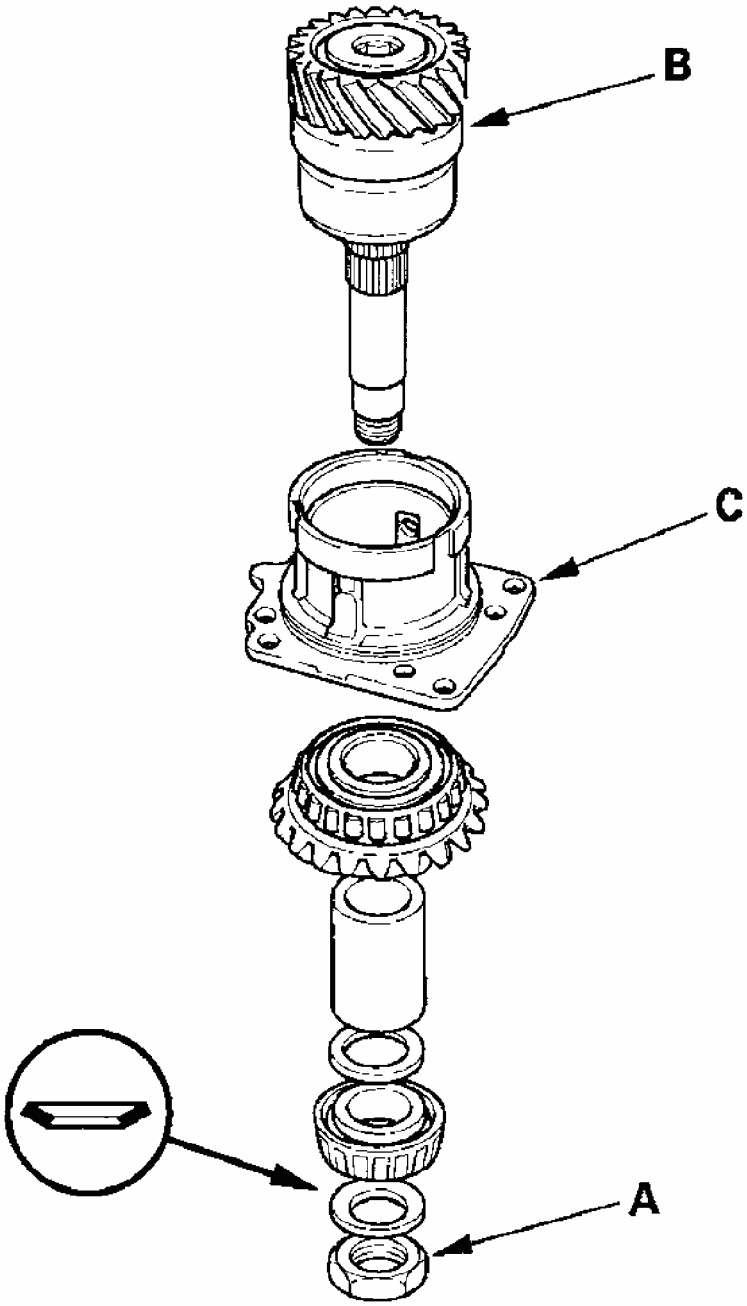


Fig. 220: Removing Locknut And Transfer Shaft Assembly From Transfer Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

34) Remove the tapered roller bearing outer race (A) and 76 mm thrust shim (B) from the transfer holder (C).

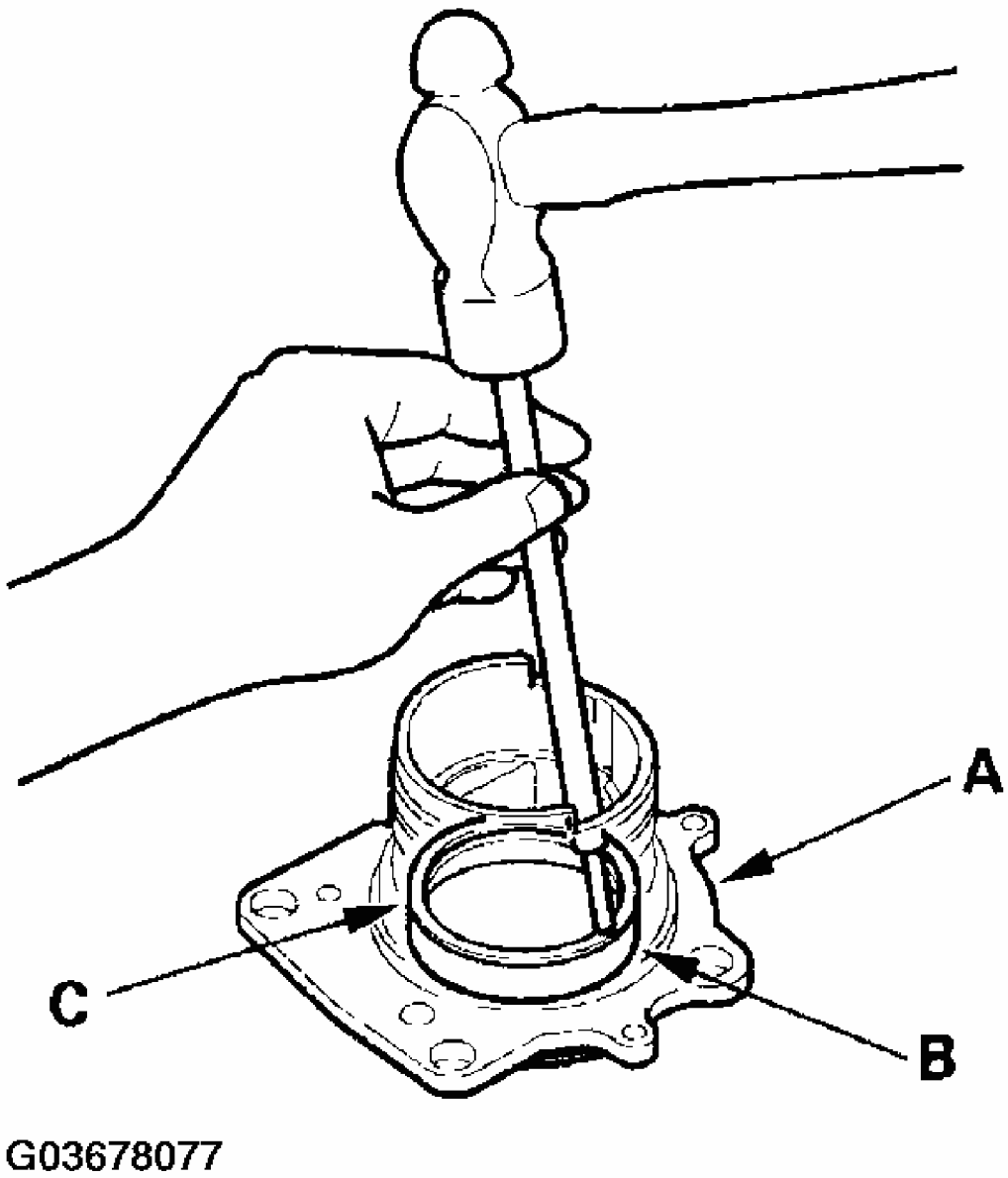


Fig. 221: Removing Tapered Roller Bearing Outer Race And 76mm Thrust Shim From Transfer Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

35) Measure the thickness of the removed 76 mm thrust shim, and select a new 76 mm shim.

76 mm Thrust Shim

76 MM THRUST SHIM SPECIFICATIONS

	Part Number	Thickness
A	41361-PPS-000	1.20 mm (0.047 in.)
B	41362-PPS-000	1.23 mm (0.048 in.)
C	41363-PPS-000	1.26 mm (0.049 in.)
D	41364-PPS-000	1.29 mm (0.050 in.)
E	41365-PPS-000	1.32 mm (0.052 in.)
F	41366-PPS-000	1.35 mm (0.053 in.)
G	41367-PPS-000	1.38 mm (0.054 in.)
H	41368-PPS-000	1.41 mm (0.055 in.)
J	41369-PPS-000	1.44 mm (0.057 in.)
K	41370-PPS-000	1.47 mm (0.058 in.)
L	41371-PPS-000	1.50 mm (0.059 in.)
M	41372-PPS-000	1.53 mm (0.060 in.)
N	41373-PPS-000	1.56 mm (0.061 in.)
P	41374-PPS-000	1.59 mm (0.062 in.)
R	41375-PPS-000	1.62 mm (0.064 in.)
S	41376-PPS-000	1.65 mm (0.065 in.)
T	41377-PPS-000	1.68 mm (0.066 in.)
U	41378-PPS-000	1.71 mm (0.067 in.)
W	41379-PPS-000	1.74 mm (0.068 in.)
X	41380-PPS-000	1.77 mm (0.070 in.)
Y	41381-PPS-000	1.80 mm (0.071 in.)
Z	41382-PPS-000	1.83 mm (0.072 in.)
AA	41383-PPS-000	1.86 mm (0.073 in.)
AB	41384-PPS-000	1.89 mm (0.074 in.)
AC	41385-PPS-000	1.92 mm (0.076 in.)
AD	41386-PPS-000	1.95 mm (0.077 in.)
AE	41387-PPS-000	1.98 mm (0.078 in.)
AF	41388-PPS-000	2.01 mm (0.079 in.)
AG	41389-PPS-000	2.04 mm (0.080 in.)
AH	41390-PPS-000	2.07 mm (0.081 in.)
AJ	41391-PPS-000	2.10 mm (0.083 in.)
AK	41392-PPS-000	2.13 mm (0.084 in.)
AL	41393-PPS-000	2.16 mm (0.085 in.)
AM	41394-PPS-000	2.19 mm (0.086 in.)
AN	41395-PPS-000	2.22 mm (0.087 in.)
AP	41396-PPS-000	2.25 mm (0.089 in.)
AR	41397-PPS-000	2.28 mm (0.090 in.)
AS		

	41398-PPS-000	2.31 mm (0.091 in.)
AT	41399-PPS-000	2.34 mm (0.092 in.)
AU	41400-PPS-000	2.37 mm (0.093 in.)
AW	41401-PPS-000	2.40 mm (0.094 in.)
AX	41402-PPS-000	2.43 mm (0.096 in.)
AY	41403-PPS-000	2.46 mm (0.097 in.)
AZ	41404-PPS-000	2.49 mm (0.098 in.)
BA	41405-PPS-000	2.52 mm (0.099 in.)
BB	41406-PPS-000	2.55 mm (0.100 in.)
BC	41407-PPS-000	2.58 mm (0.102 in.)
BD	41408-PPS-000	2.61 mm (0.103 in.)
BE	41409-PPS-000	2.64 mm (0.104 in.)
BF	41410-PPS-000	2.67 mm (0.105 in.)

36) Install the 76 mm thrust shim (A) in the transfer holder (B).

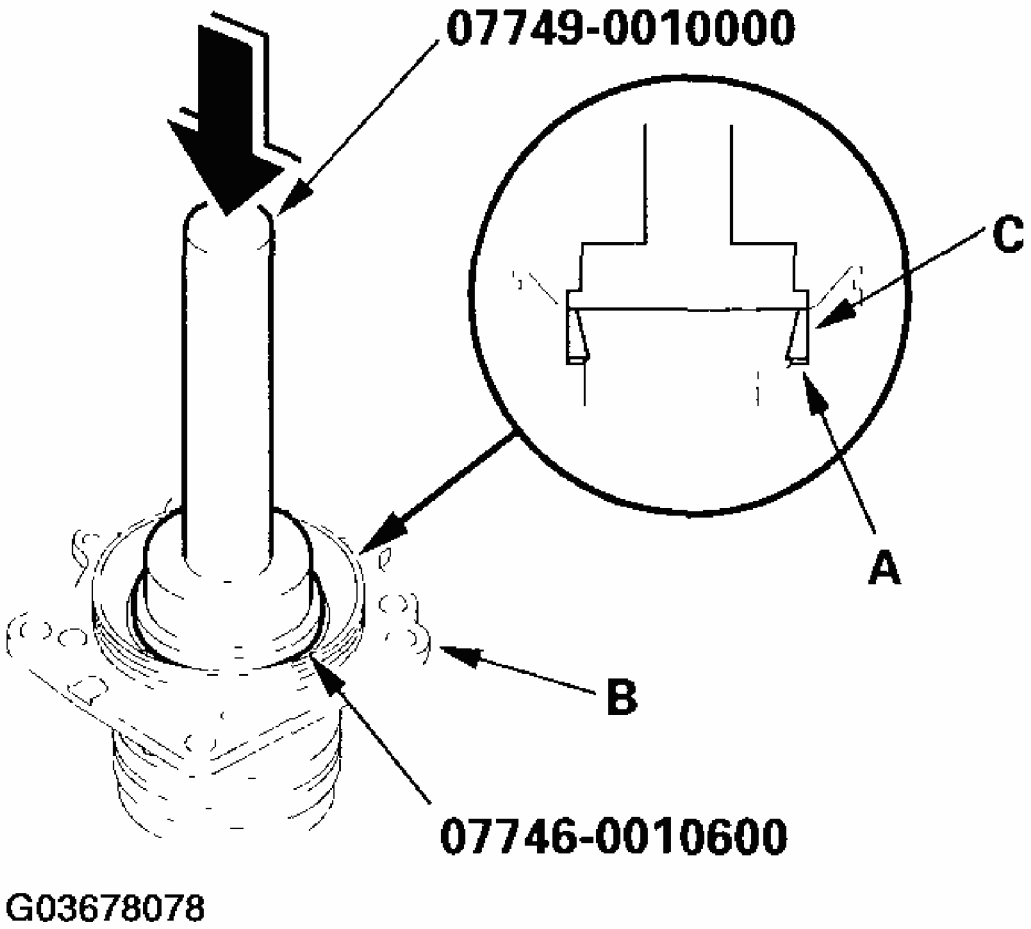


Fig. 222: Installing 76mm Thrust Shim In Transfer Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

37) Install the tapered roller bearing outer race (C) using the special tools and a press.

38) Install the transfer shaft assembly (A), transfer drive gear (B), transfer shaft collar (C), 25 mm thrust shim (D), tapered roller bearing (E), conical spring washer (F), and locknut (G) in the transfer holder (H).

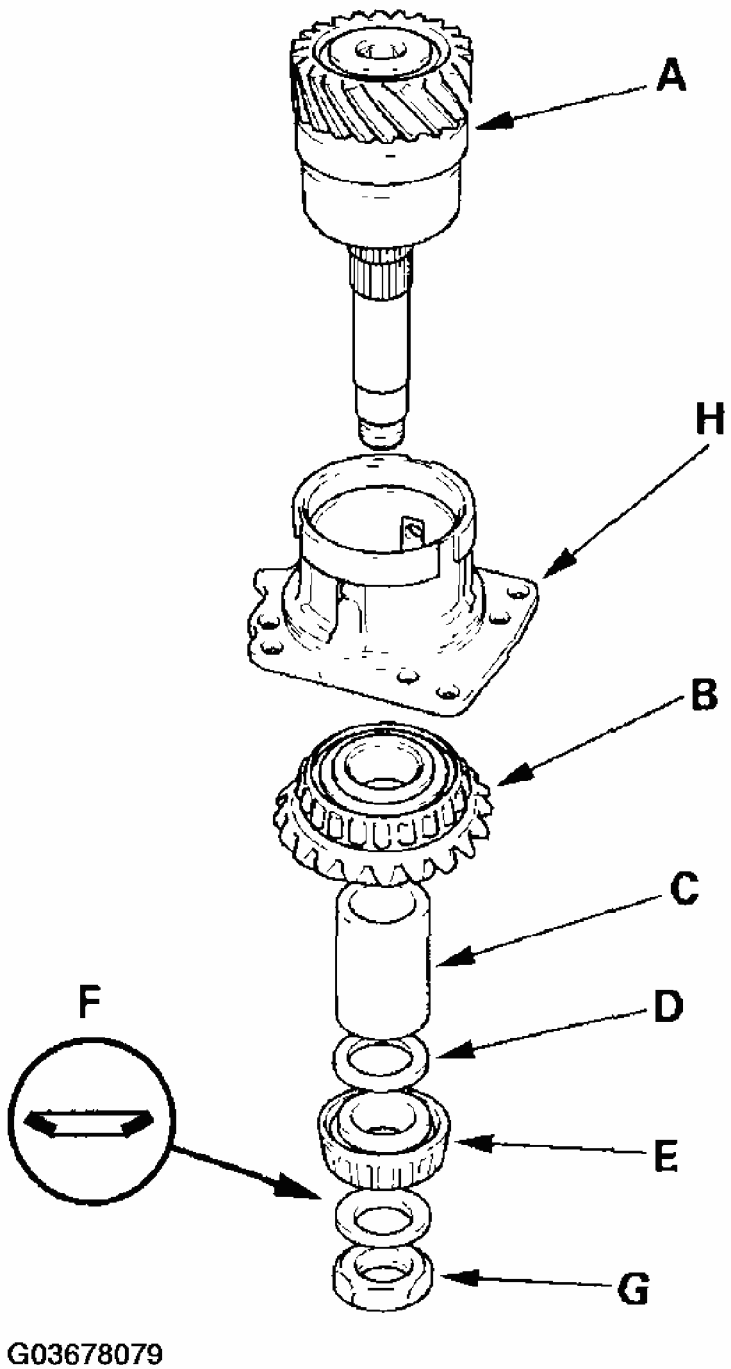


Fig. 223: Installing Transfer Shaft Assembly, Transfer Drive Gear, Transfer Shaft Collar, 25mm Thrust Shim, Tapered Roller Bearing, Conical Spring Washer, And Locknut In Transfer Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

39) Hold the transfer shaft (A) with a 14 mm hex wrench (B) clamped in a bench vise, then tighten the locknut.

NOTE: Do not stake the locknut in this step.

Tightening Torque:

118 N.m (12.0 kgf.m, 86.8 lbf.ft)

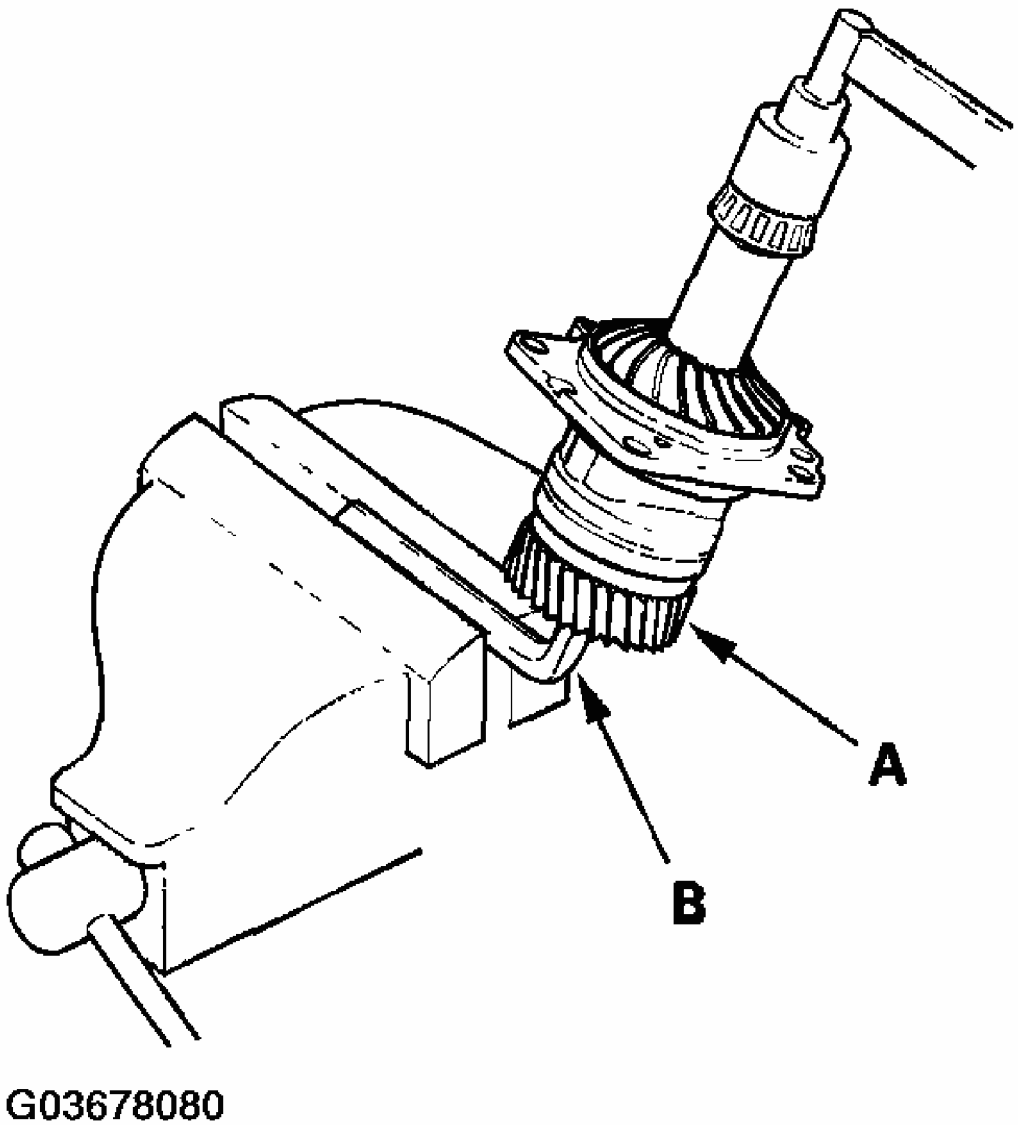


Fig. 224: Tightening Locknut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

40) Install the dowel pin (A) in the transfer housing (B), then install the transfer holder

assembly (C).

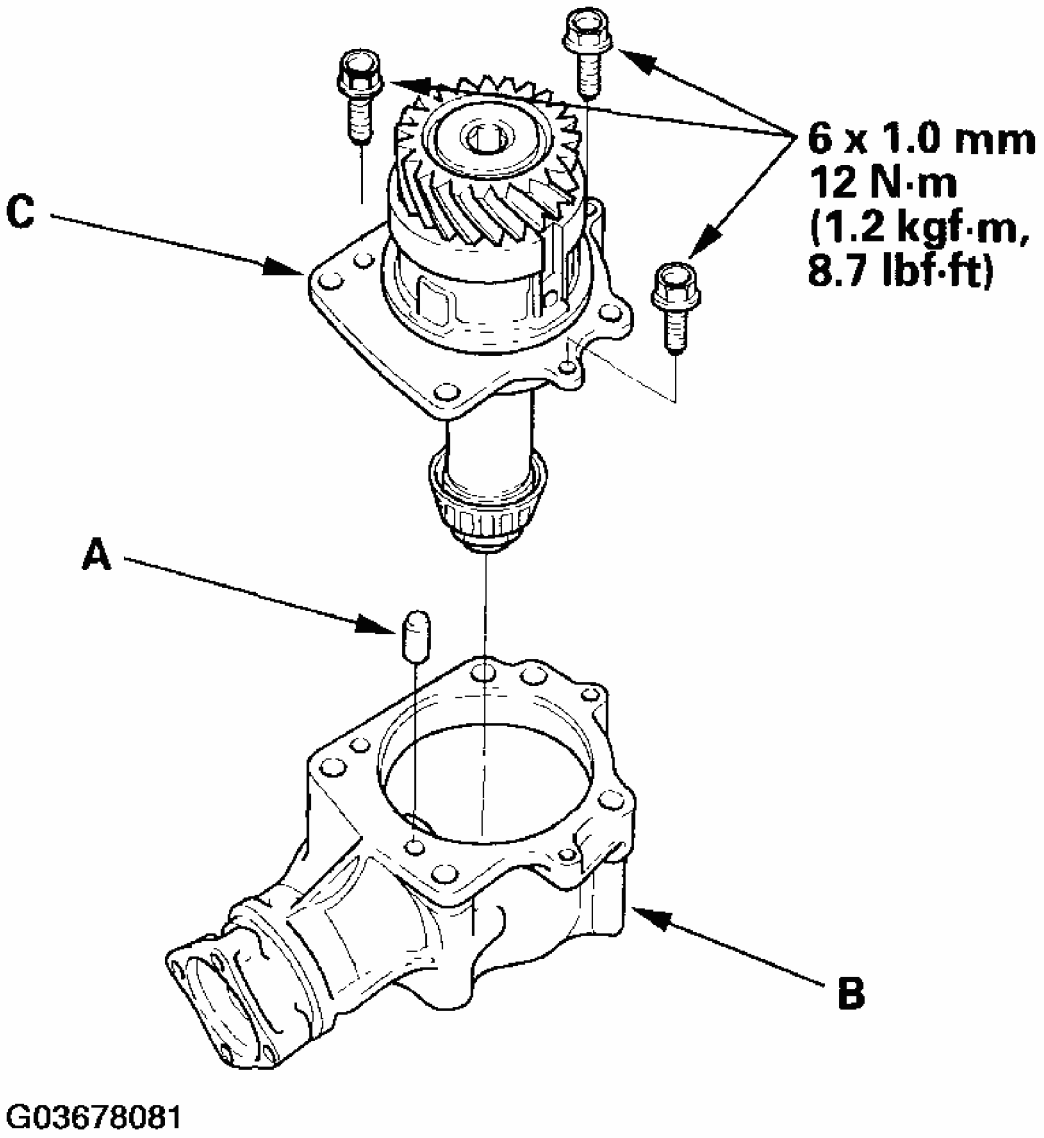


Fig. 225: Installing Dowel Pin In Transfer Housing And Transfer Holder Assembly With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.

41) Recheck and make sure the total starting torque is within the specification.
42) Remove the transfer holder assembly from the transfer housing.
43) Stake the locknut on the transfer shaft using a 3.5 mm punch.

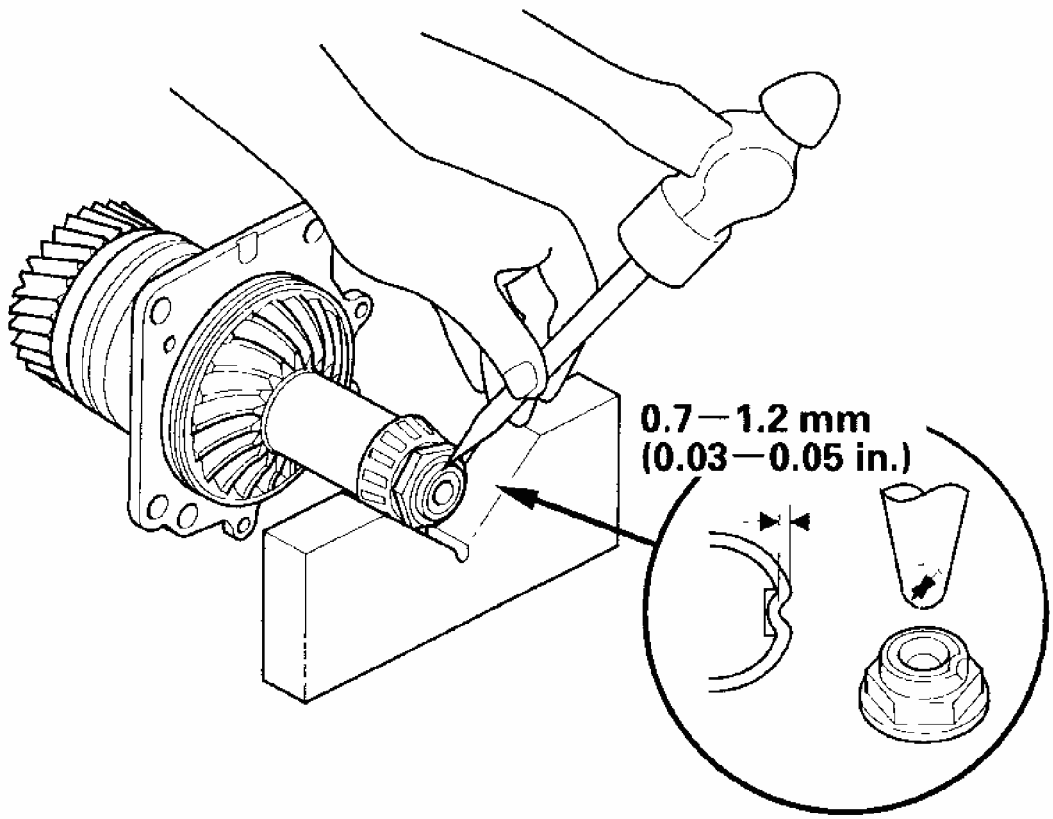


Fig. 226: Staking Locknut On Transfer Shaft Using 3.5mm Punch
Courtesy of AMERICAN HONDA MOTOR CO., INC.

44) Coat the new O-ring (A) with MTF, install it on the transfer holder, then install the dowel pin (B) and transfer holder assembly (C) in the transfer housing (D).

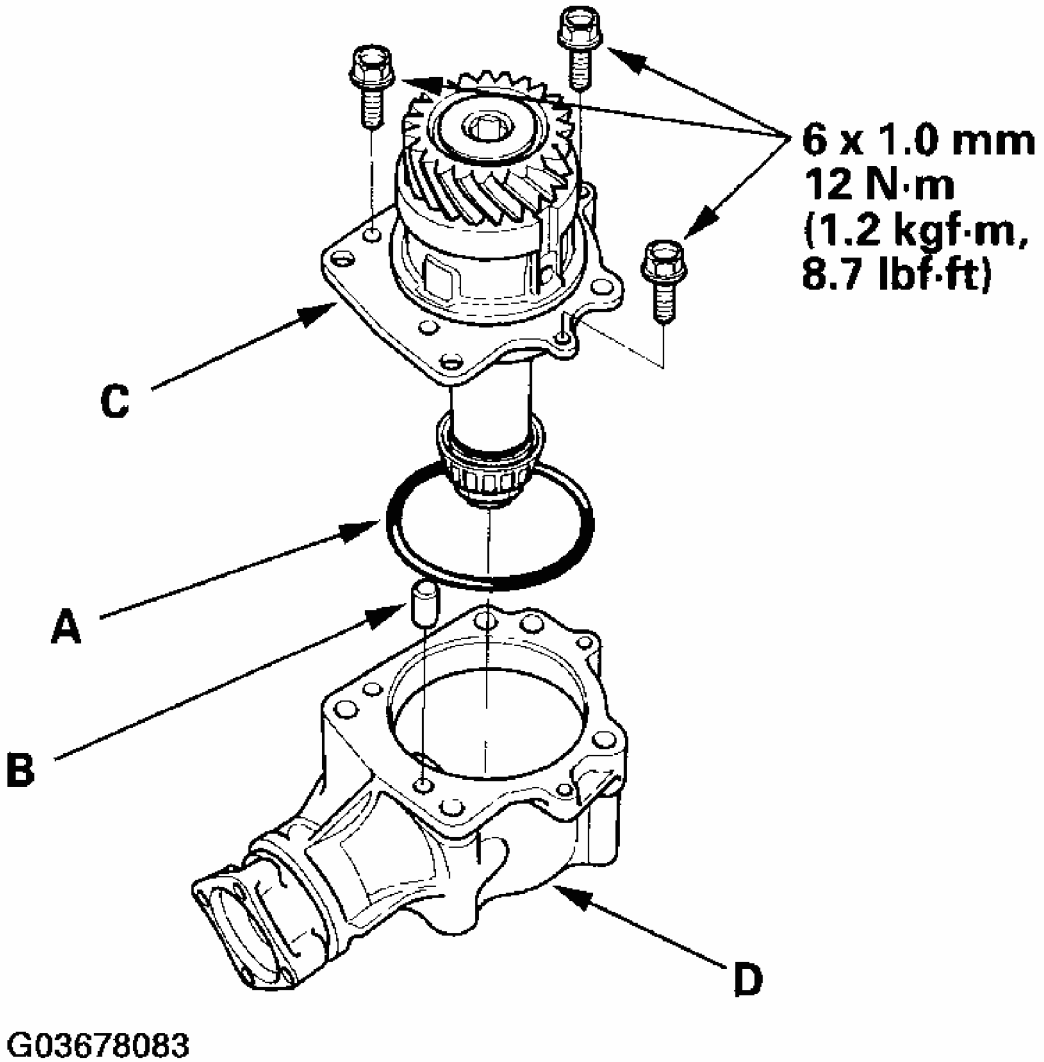


Fig. 227: Coating New O-Ring With MTF, Install On Transfer Holder, Dowel Pin And Transfer Holder Assembly In Transfer Housing With Specified Torques
Courtesy of AMERICAN HONDA MOTOR CO., INC.