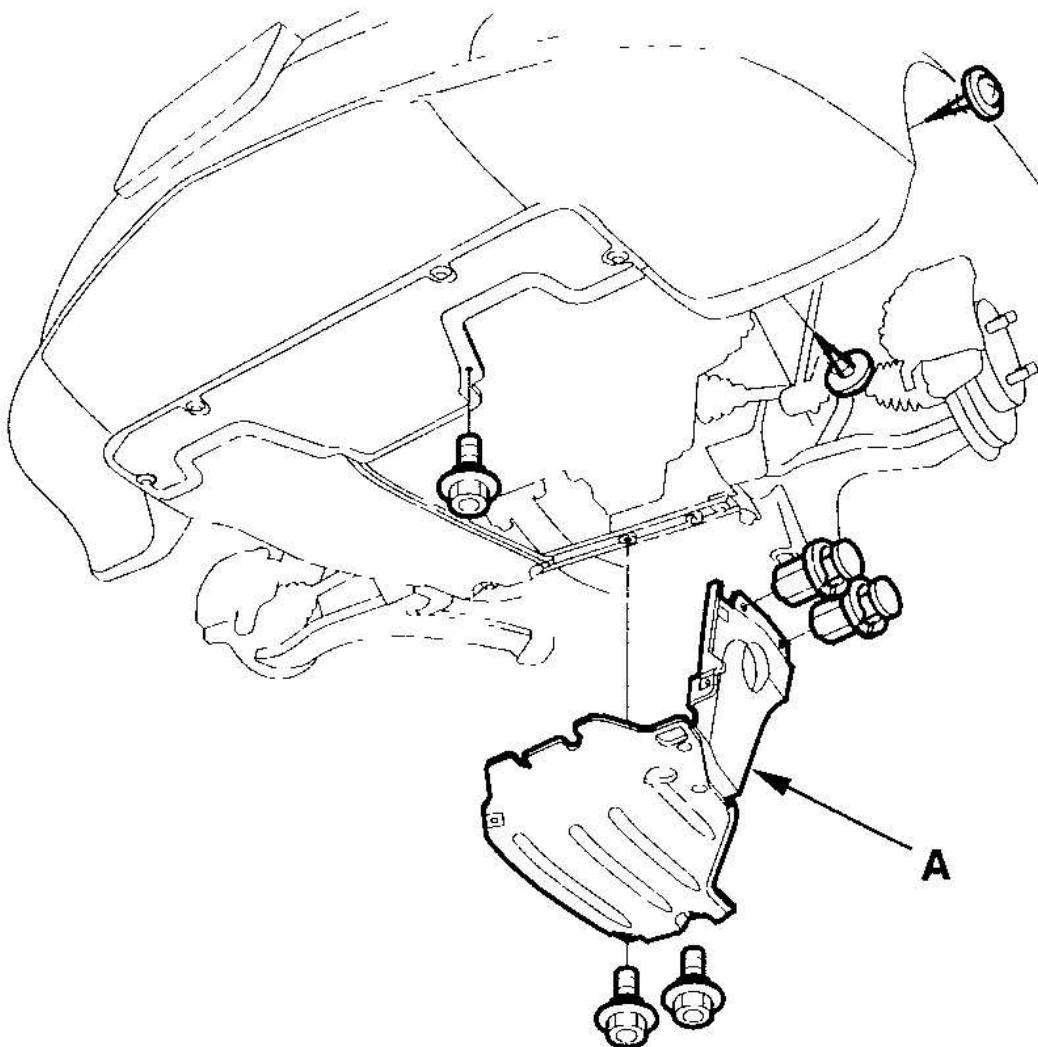


2000-06 TRANSMISSION

Manual Transmission - Insight

TRANSMISSION FLUID INSPECTION AND REPLACEMENT

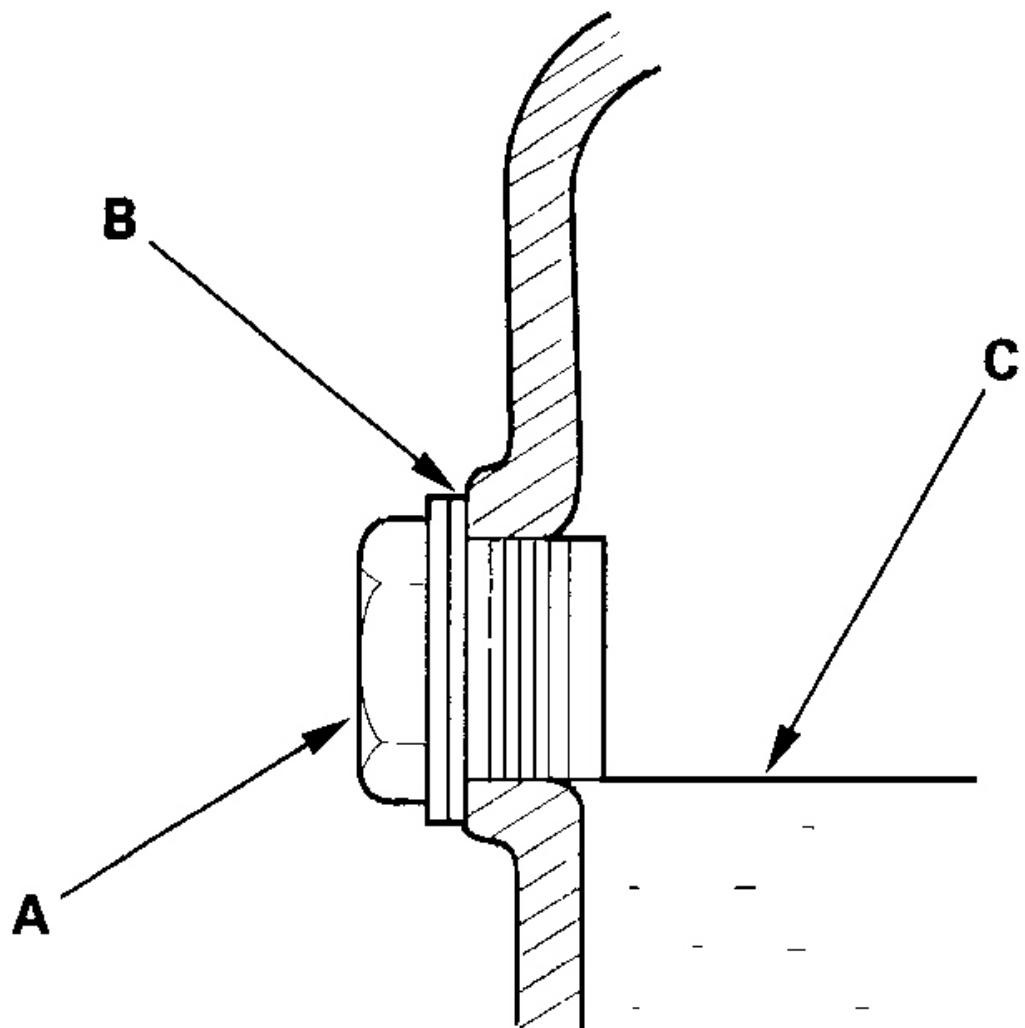
1. Park the vehicle on level ground, and turn the ignition switch to LOCK (0).
2. Remove the left engine under-cover (A).



G03681549

Fig. 1: Removing Left Engine Under-Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. 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).

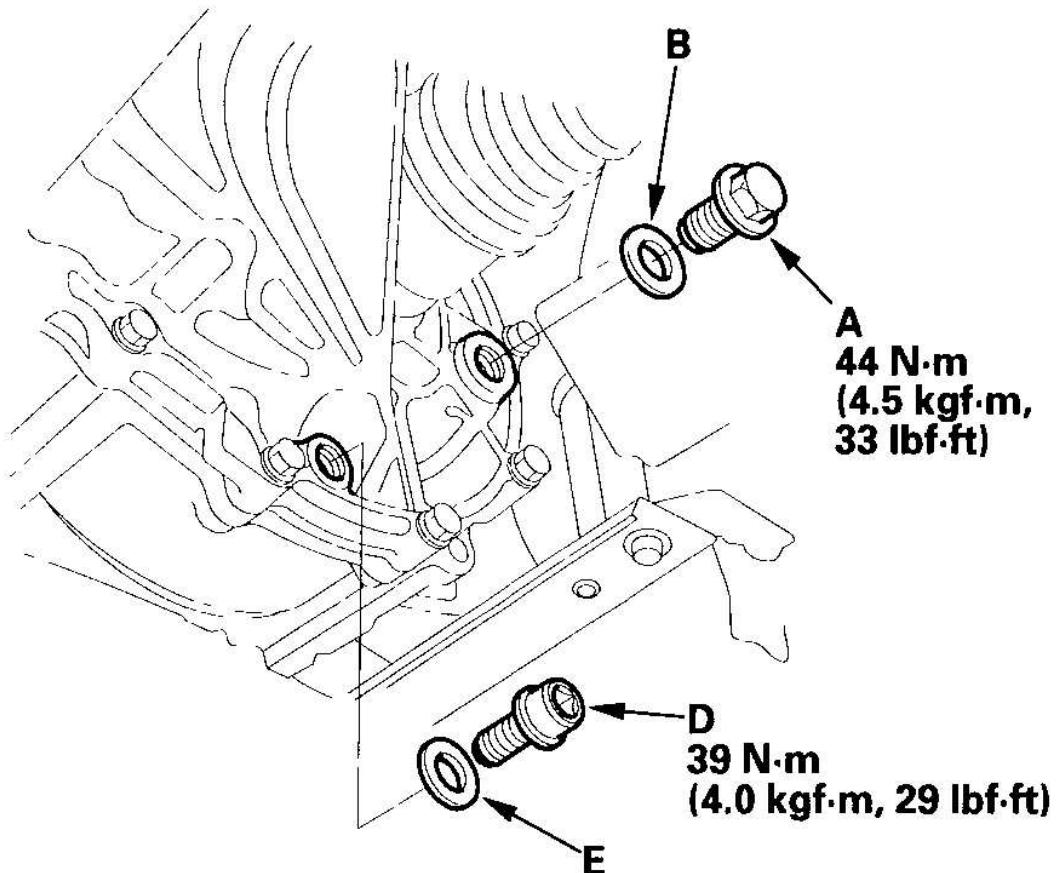


G03681550

Fig. 2: Checking Fluid Level

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. If the fluid is dirty, remove the oil filler plug and drain plug (D), and drain it.



G03681551

Fig. 3: Identifying Loosening Torque Of Drain Plug
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the drain plug with a new washer (E), and refill the transmission fluid to proper level.

Fluid Capacity

1.5 L (1.59 US qt) at fluid change

1.6 L (1.69 US qt) at overhaul

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

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

GEARSHIFT MECHANISM REPLACEMENT

NOTE: **IMA system wires are located in this area. Make sure you read the Service Precautions in the IMA system section before doing repairs or service (see SERVICE PRECAUTIONS).**

1. Turn the battery module switch OFF, and measure the voltage (see **TURNING OFF POWER TO THE HIGH VOLTAGE CIRCUIT** =).
2. Repair or replace the gearshift mechanism components as needed.

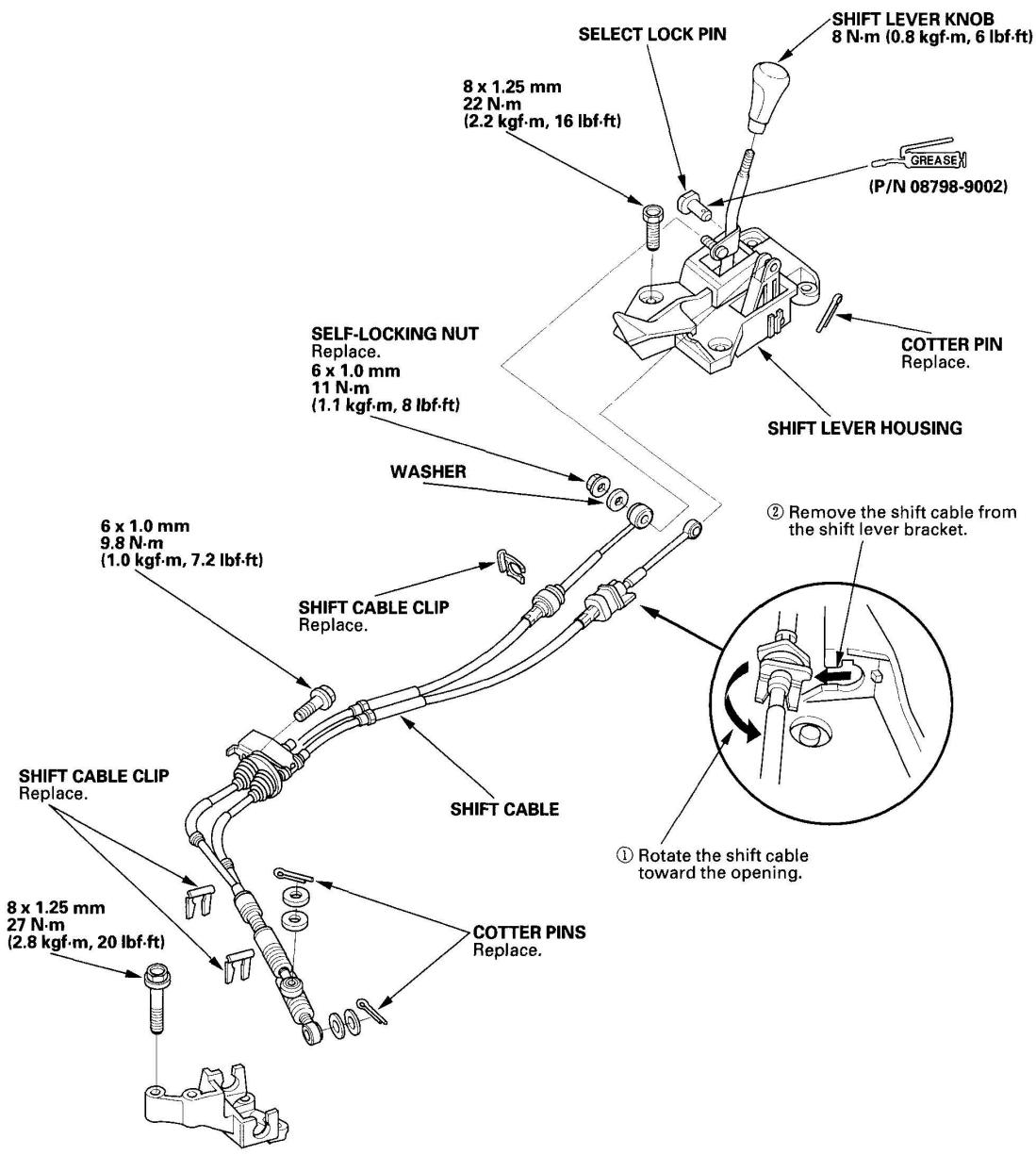
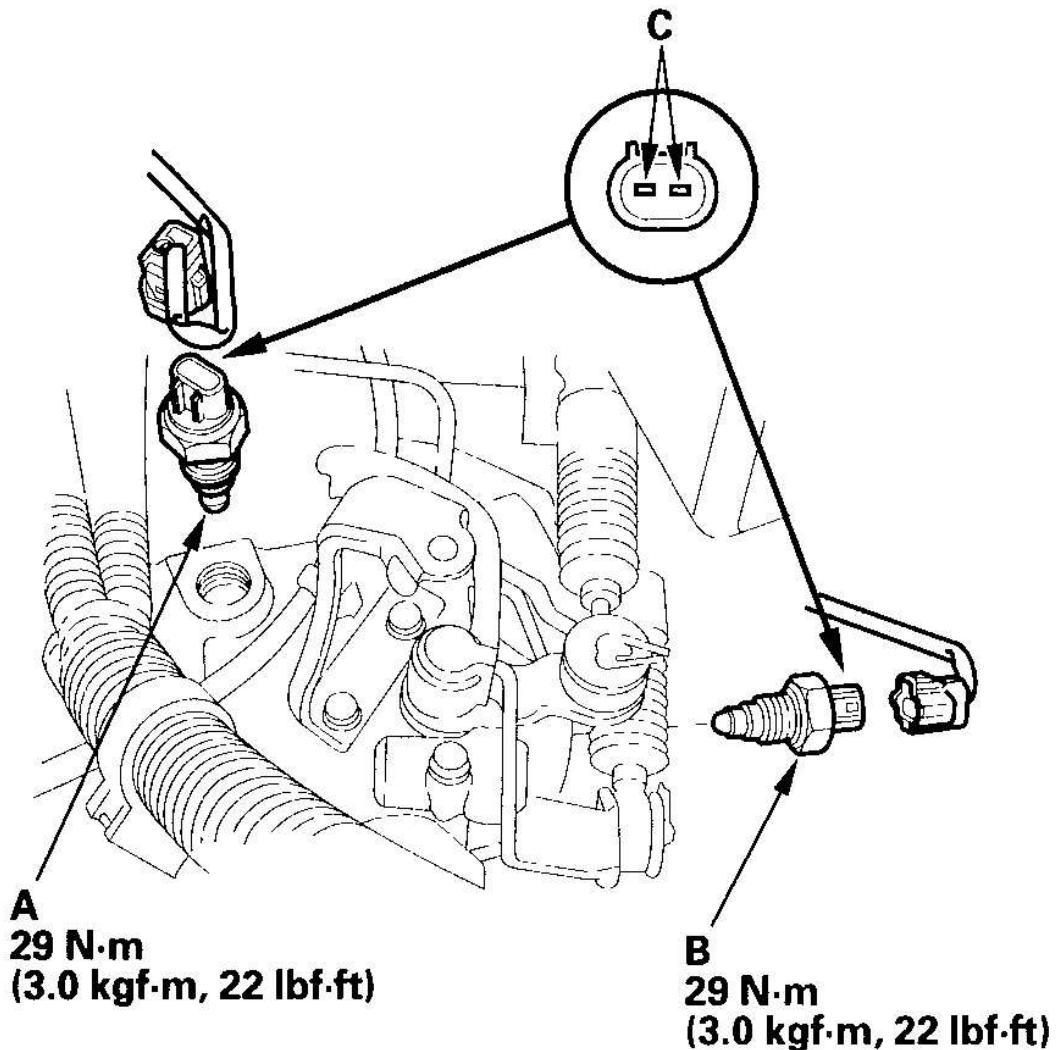


Fig. 4: Replacing Gearshift Mechanism And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

BACK-UP LIGHT AND NEUTRAL POSITION SWITCH TEST

1. Disconnect the back-up light (A) or neutral position switch (B) 2P connector.



G03681553

Fig. 5: Disconnecting Back-Up Light Or Neutral Position Switch 2P Connector And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Check the continuity between the terminals (C). There should be continuity when the shift lever is in reverse or neutral.
3. If necessary, replace the switch. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to thread of the switch, 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

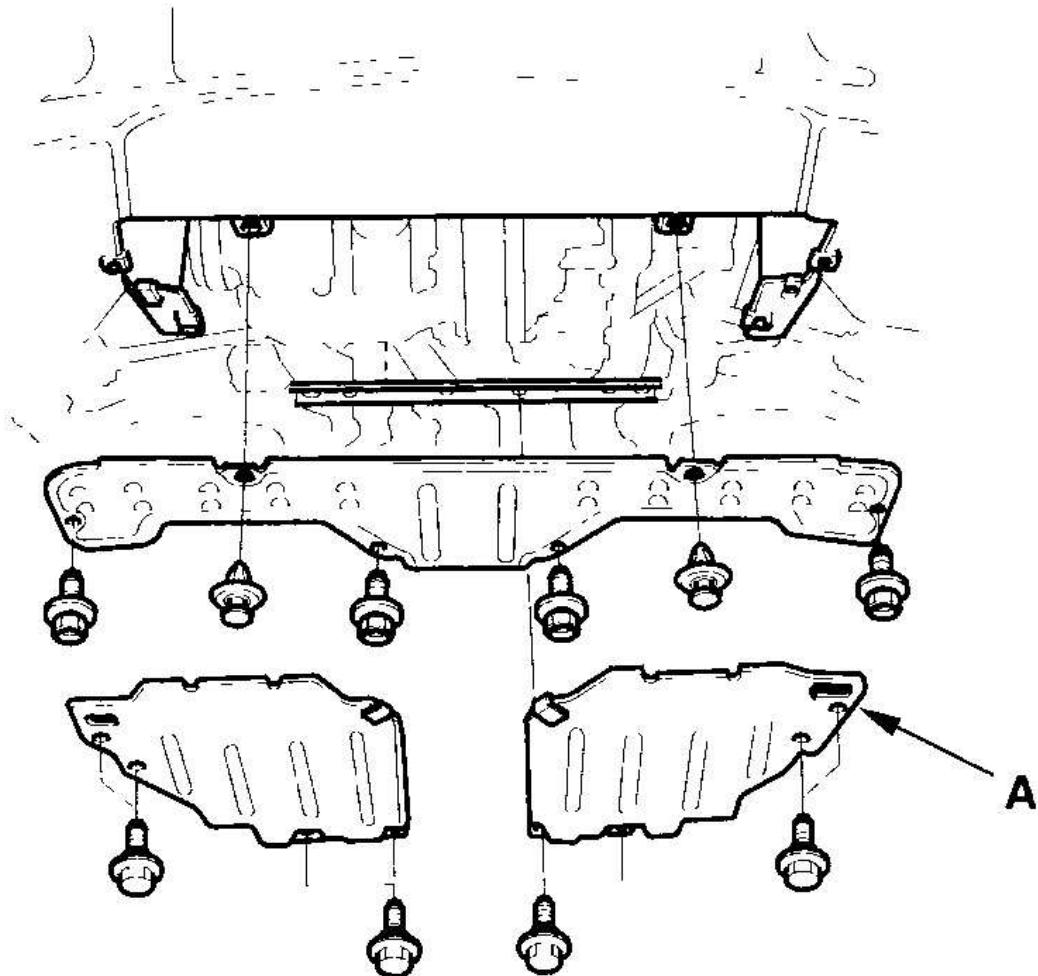
Engine support hanger, A & Reds AAR-T-12566 *

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

NOTE:

- **IMA system wires are located in this area. Make sure you read the Service Precautions in the IMA system section before doing repairs or service (see SERVICE PRECAUTIONS).**
- **Use fender covers to avoid damaging painted surfaces.**

1. Turn the battery module switch OFF, and measure the voltage (see **TURNING OFF POWER TO THE HIGH VOLTAGE CIRCUIT**).
2. 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.
3. Remove the engine cover, intake air duct, and air cleaner housing (see **ENGINE REMOVAL**).
4. Remove the splash shields (A).

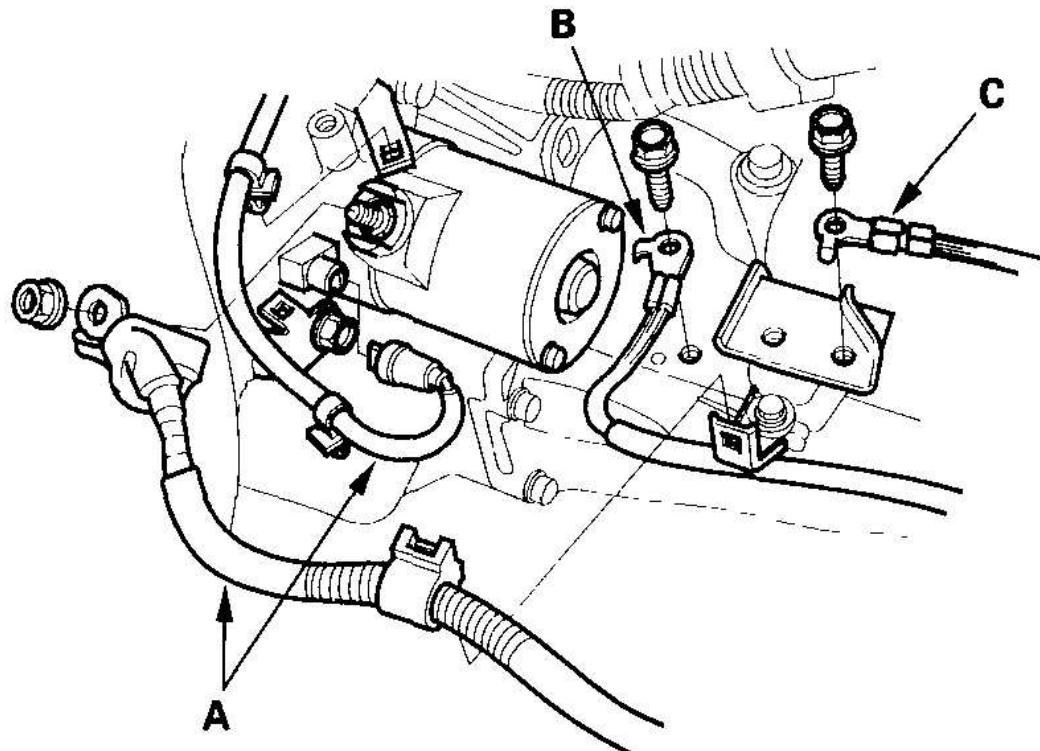


G03681554

Fig. 6: Removing Splash Shields

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Drain the transmission fluid (see **GEARSHIFT MECHANISM REPLACEMENT**).
6. Disconnect the starter motor cables (A), transmission ground cable (B), and engine ground cable (C).

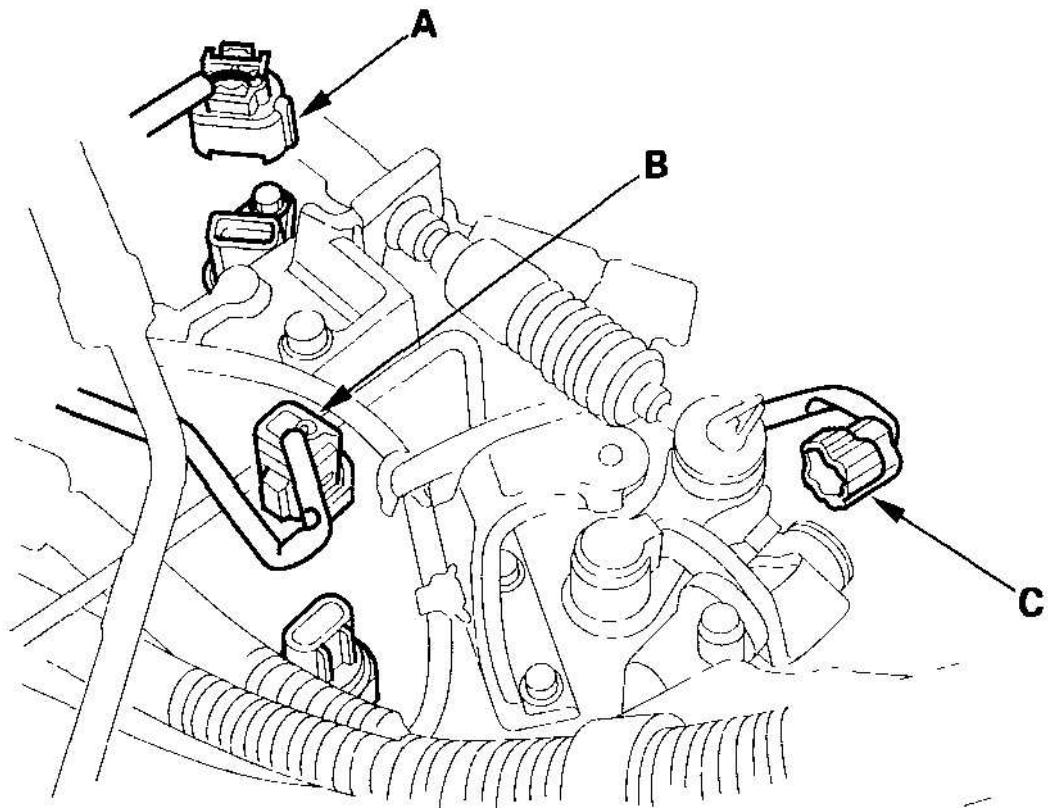


G03681555

Fig. 7: Disconnecting Starter Motor, Transmission Ground And Engine Ground Cables

Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Disconnect the vehicle speed sensor (VSS) (A), back-up light switch (B), and neutral position switch (C) connectors.

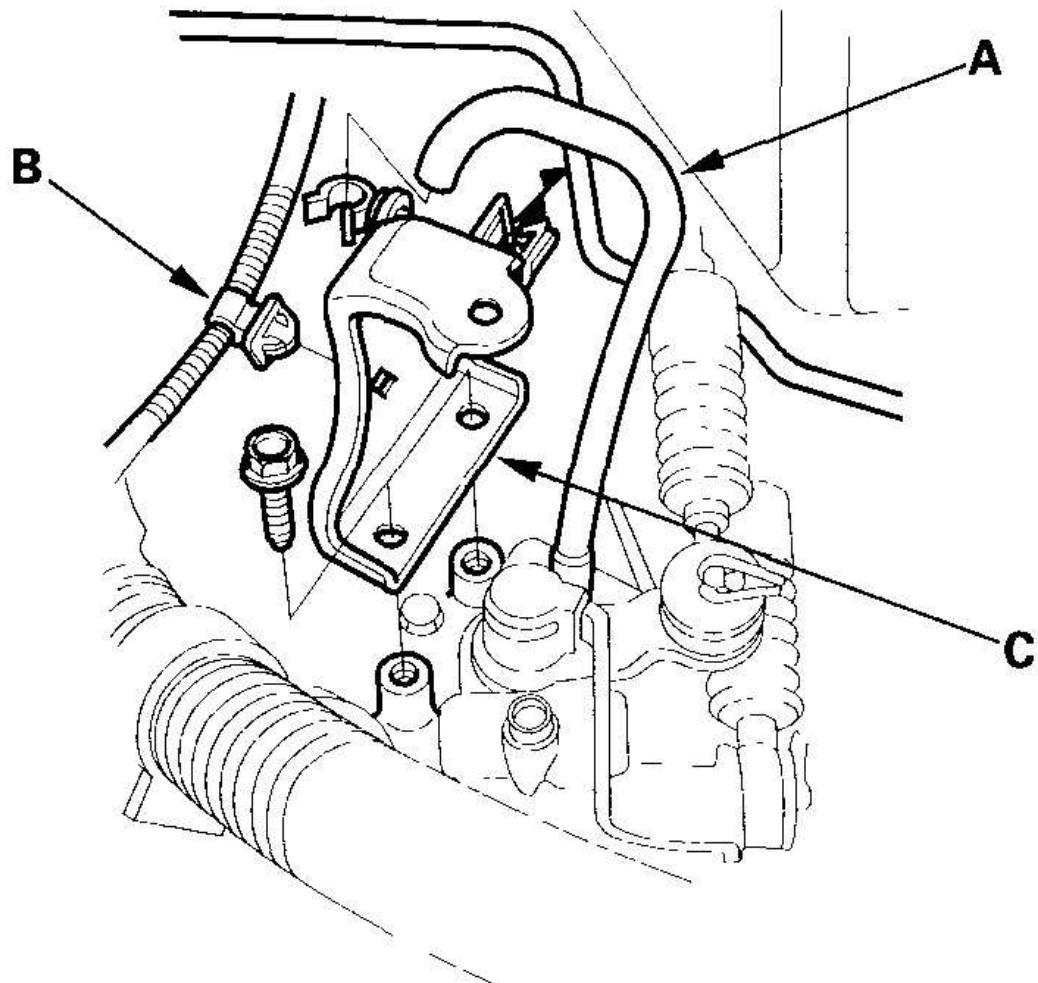


G03681556

Fig. 8: Disconnecting Vehicle Speed Sensor (VSS), Back-Up Light Switch, And Neutral Position Switch Connectors

Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Remove the breather tube (A) and harness clip (B), then remove the air cleaner bracket (C).



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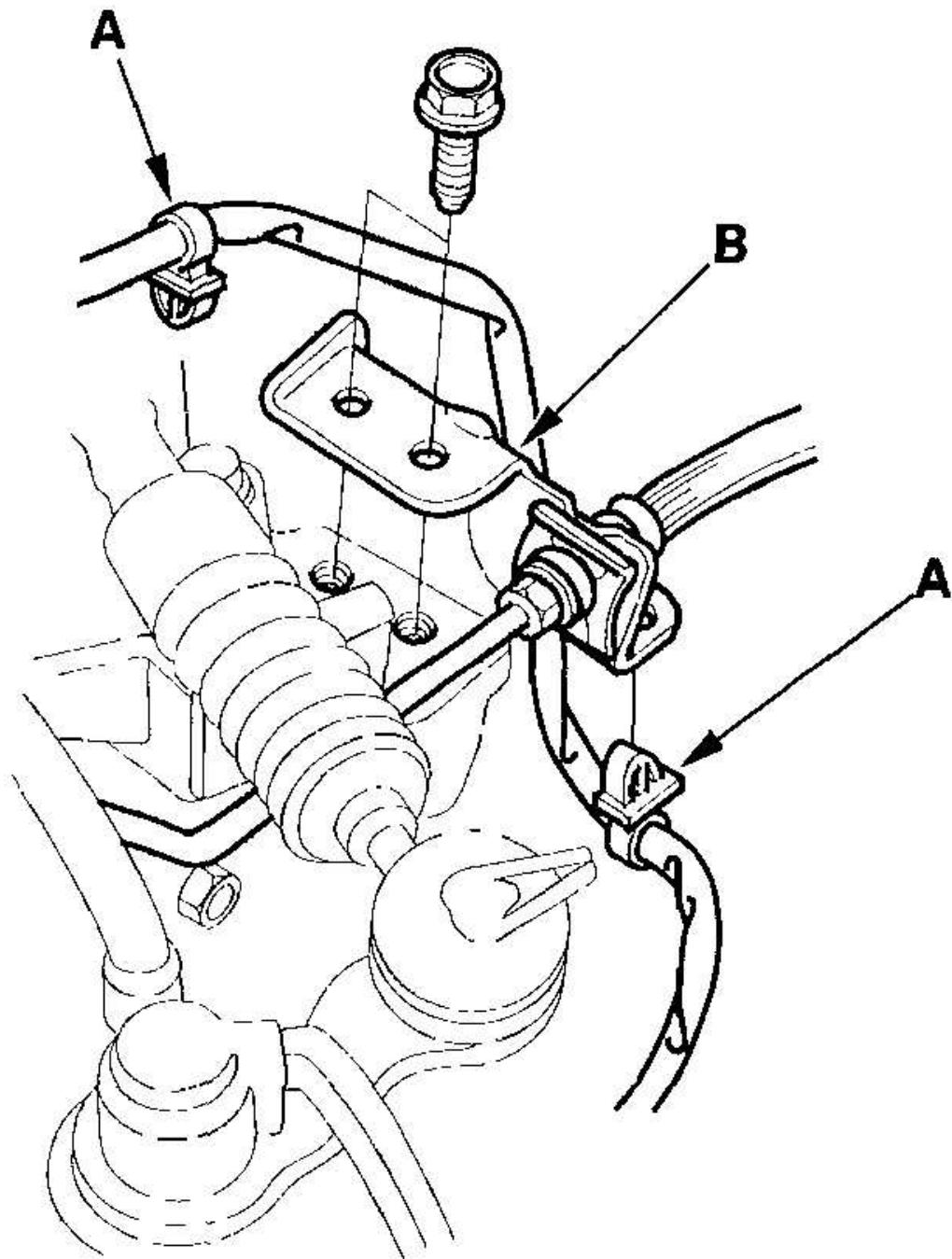
Fig. 9: Removing Air Cleaner Bracket

Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Remove the wire harness clamps (A) and clutch line bracket (B).

2006 Honda Insight

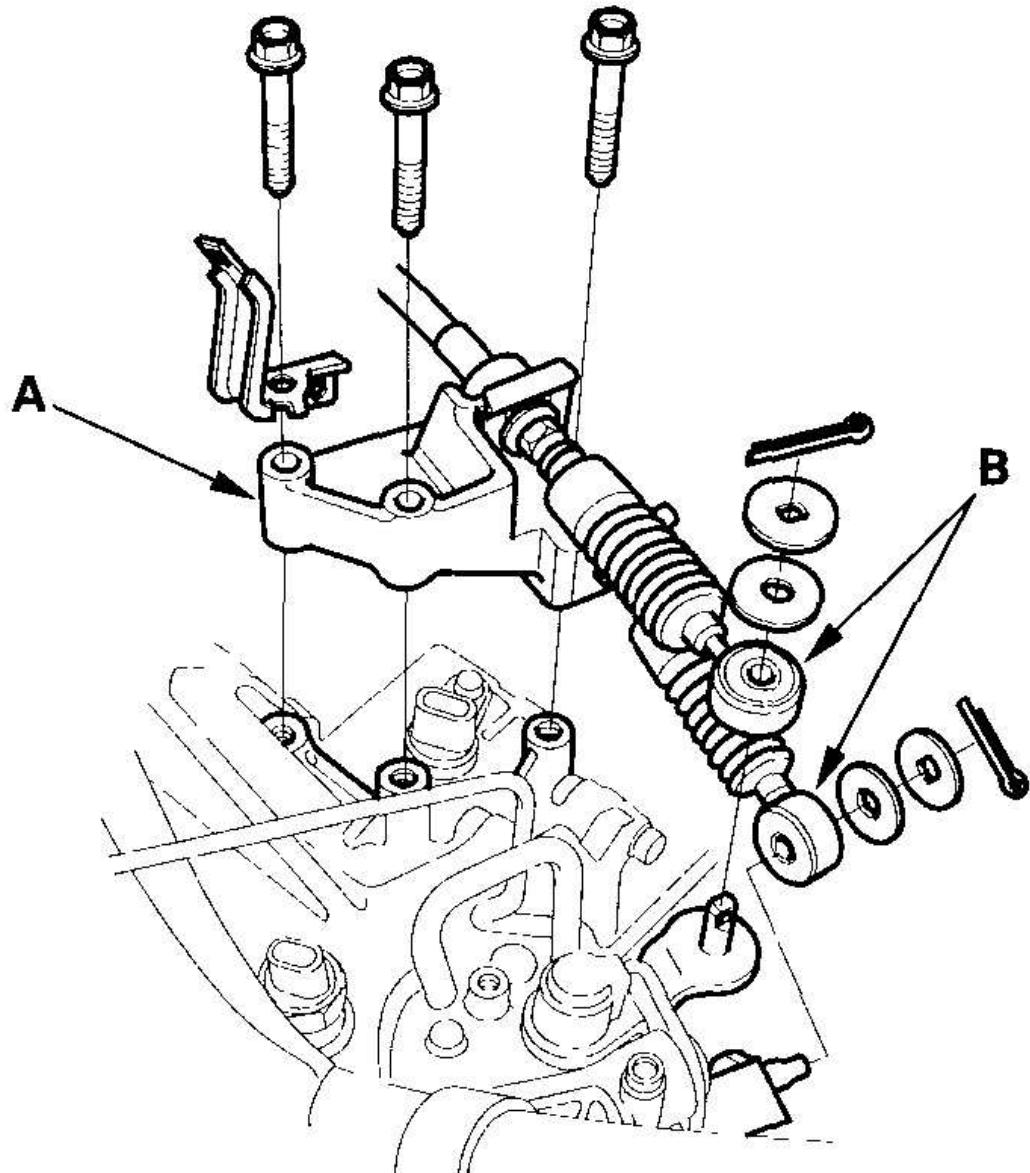
2000-06 TRANSMISSION Manual Transmission - Insight



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Fig. 10: Removing Wire Harness Clamps And Clutch Line Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

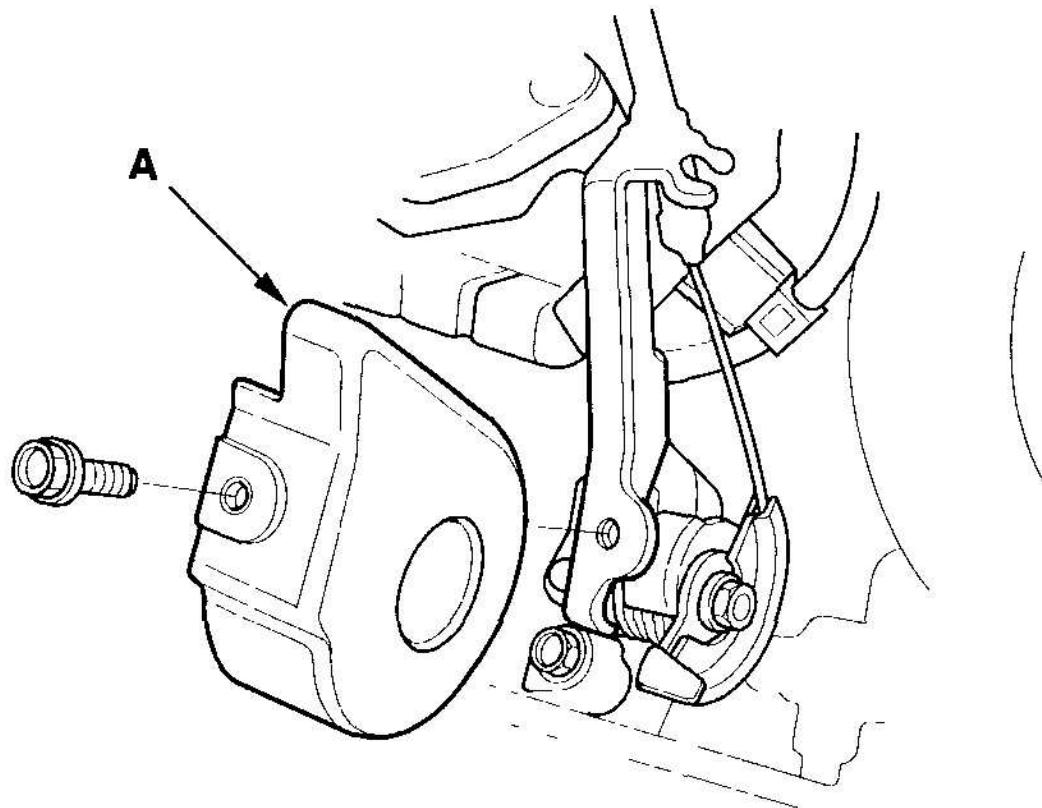
10. First remove the cable bracket (A), then disconnect the cables (B) from the top of the transmission housing. Carefully remove both cables and the bracket together to avoid bending the cables.



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Fig. 11: Removing Cable Bracket And Cables
Courtesy of AMERICAN HONDA MOTOR CO., INC.

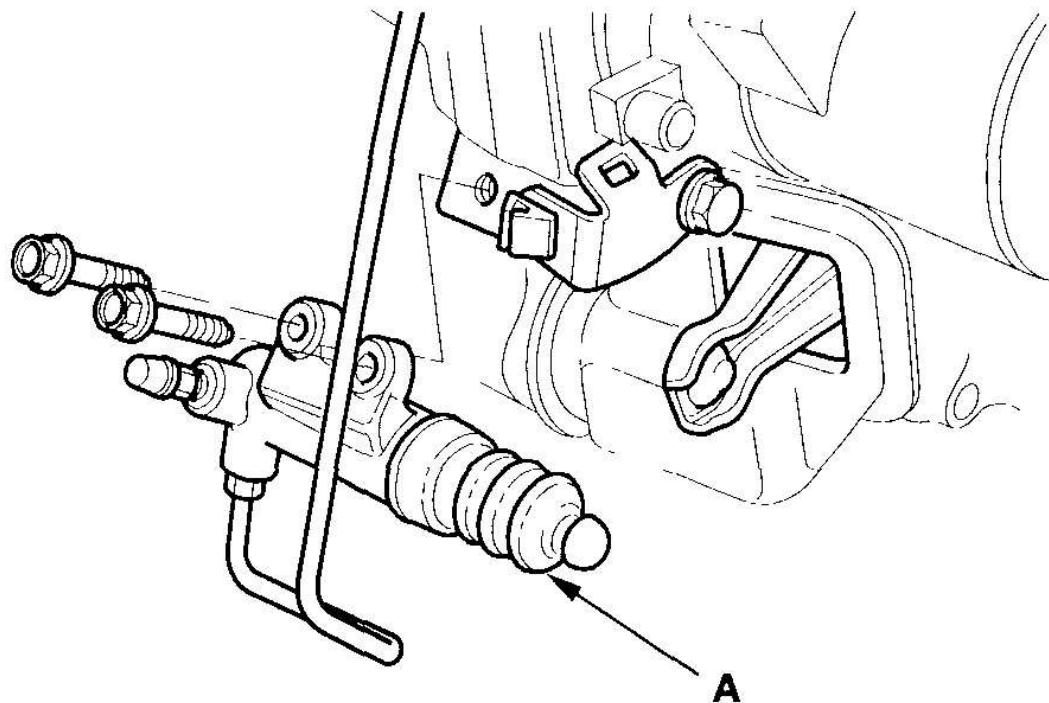
11. Remove the throttle drum cover (A).



G03681560

Fig. 12: Removing Throttle Drum Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

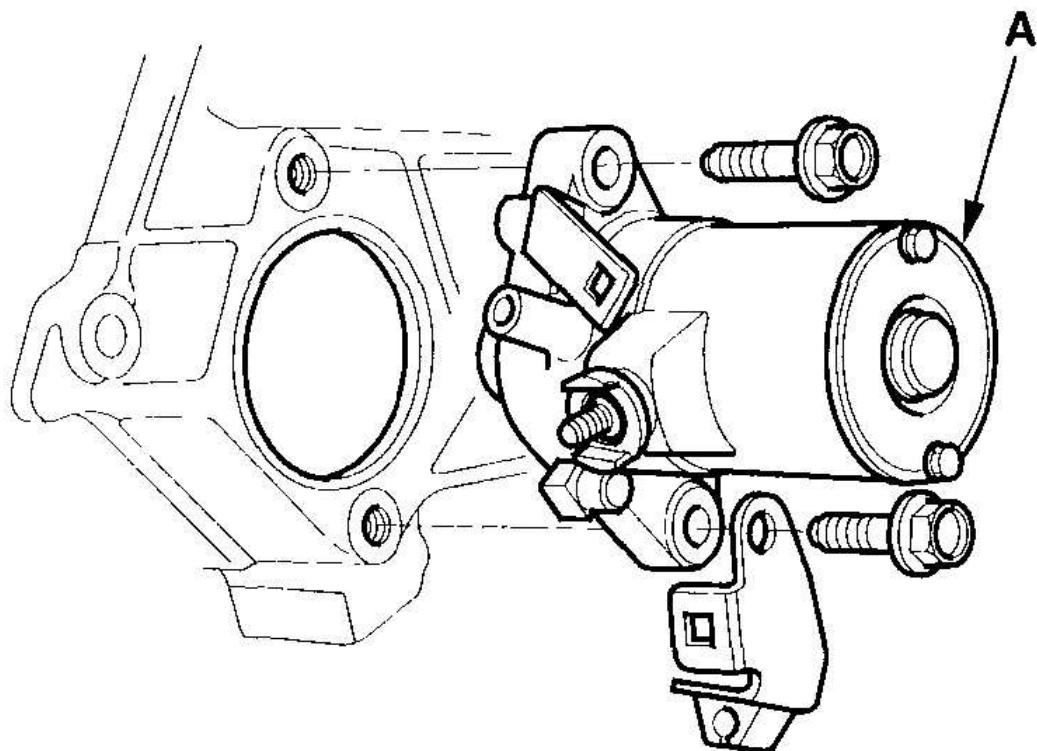
12. Remove the slave cylinder (A). Do not press the clutch pedal once the slave cylinder has been removed.



G03681561

Fig. 13: Removing Slave Cylinder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

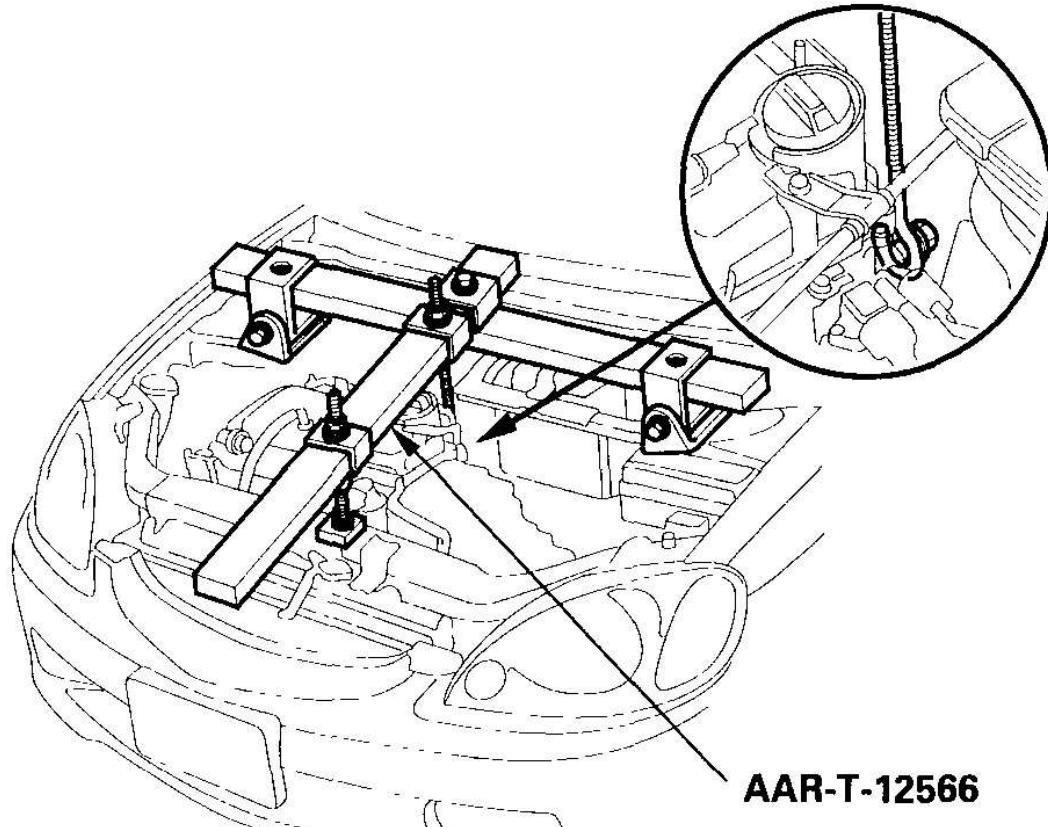
13. Remove the starter motor (A).



G03681562

Fig. 14: Removing Starter Motor
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Lift and support the engine/transmission assembly with an engine support hanger (P/N AAR-T-12566). Raise the transmission just enough to take the weight off of the mounts.



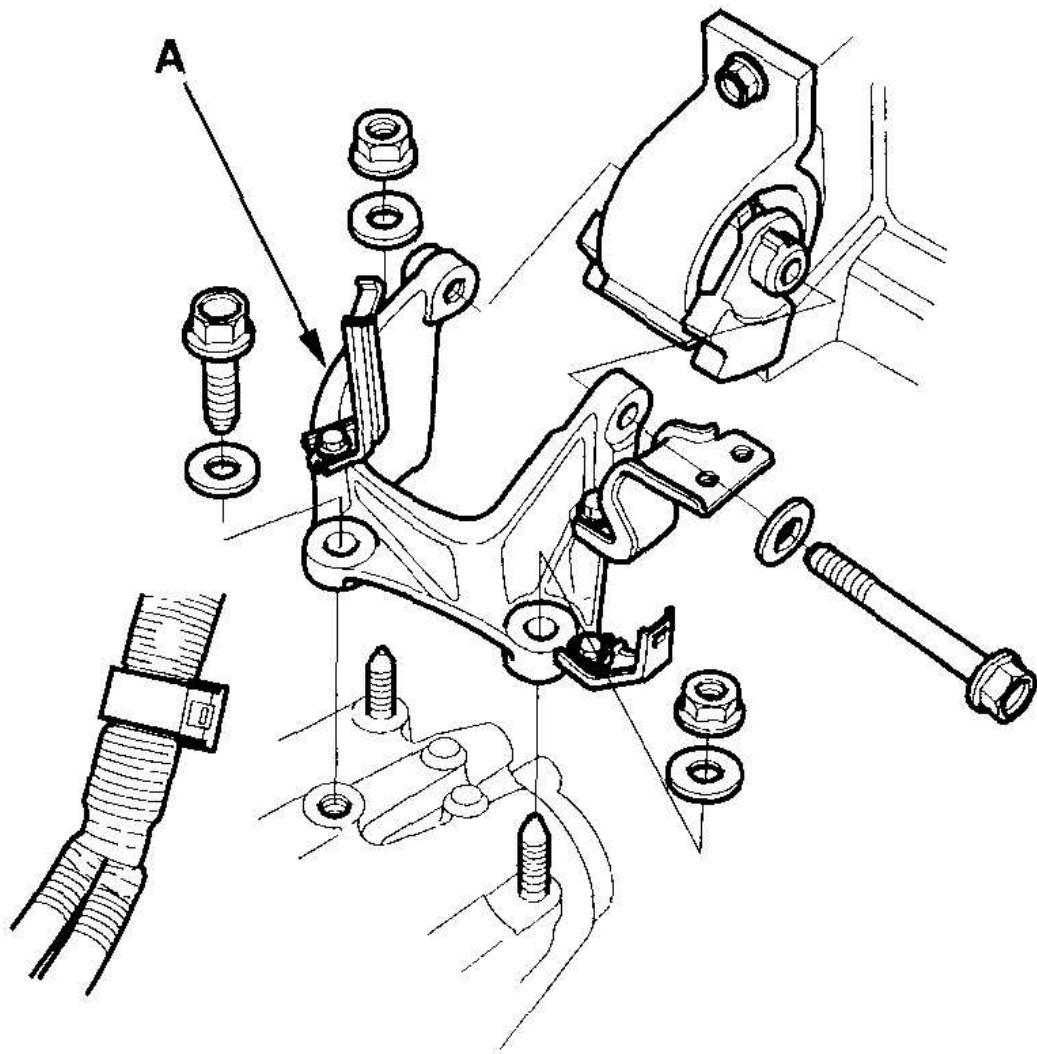
G03681563

AAR-T-12566

Fig. 15: Supporting Engine/Transmission Assembly With Engine Support Hanger

Courtesy of AMERICAN HONDA MOTOR CO., INC.

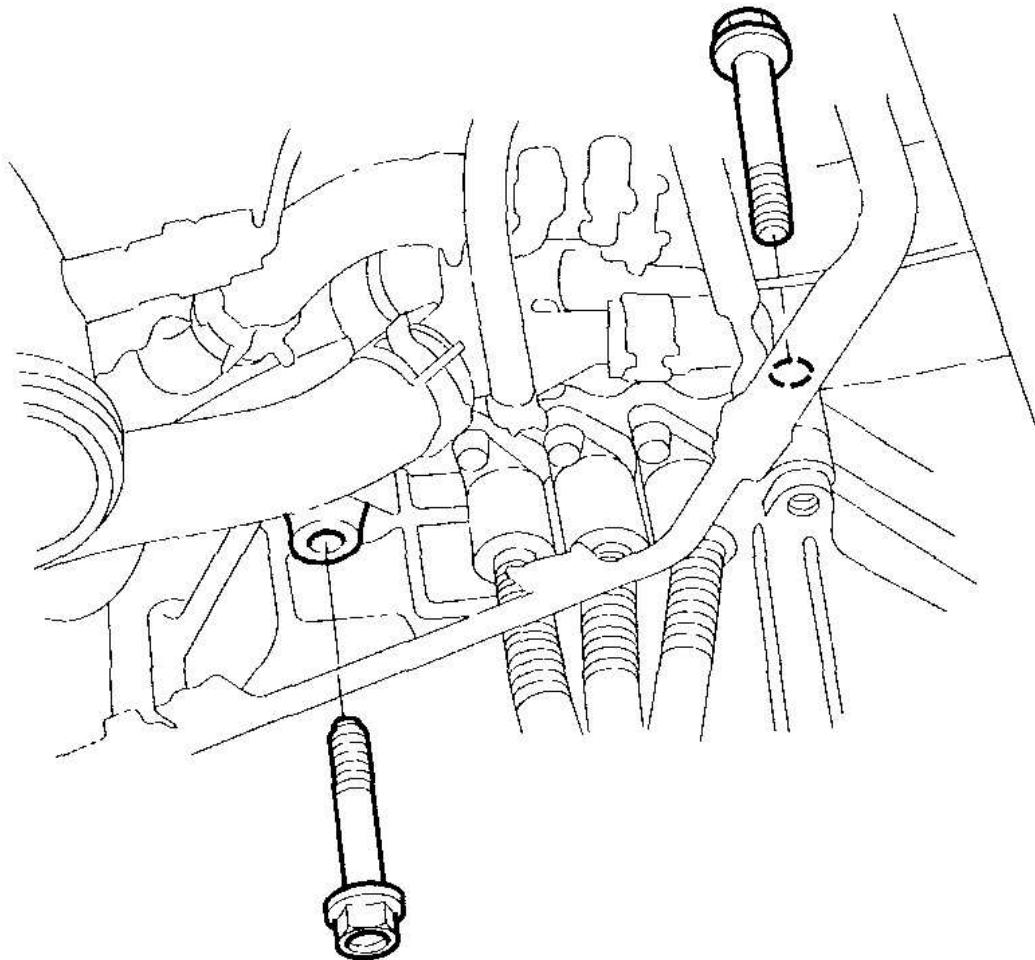
15. Remove the transmission mount bracket (A).



G03681564

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

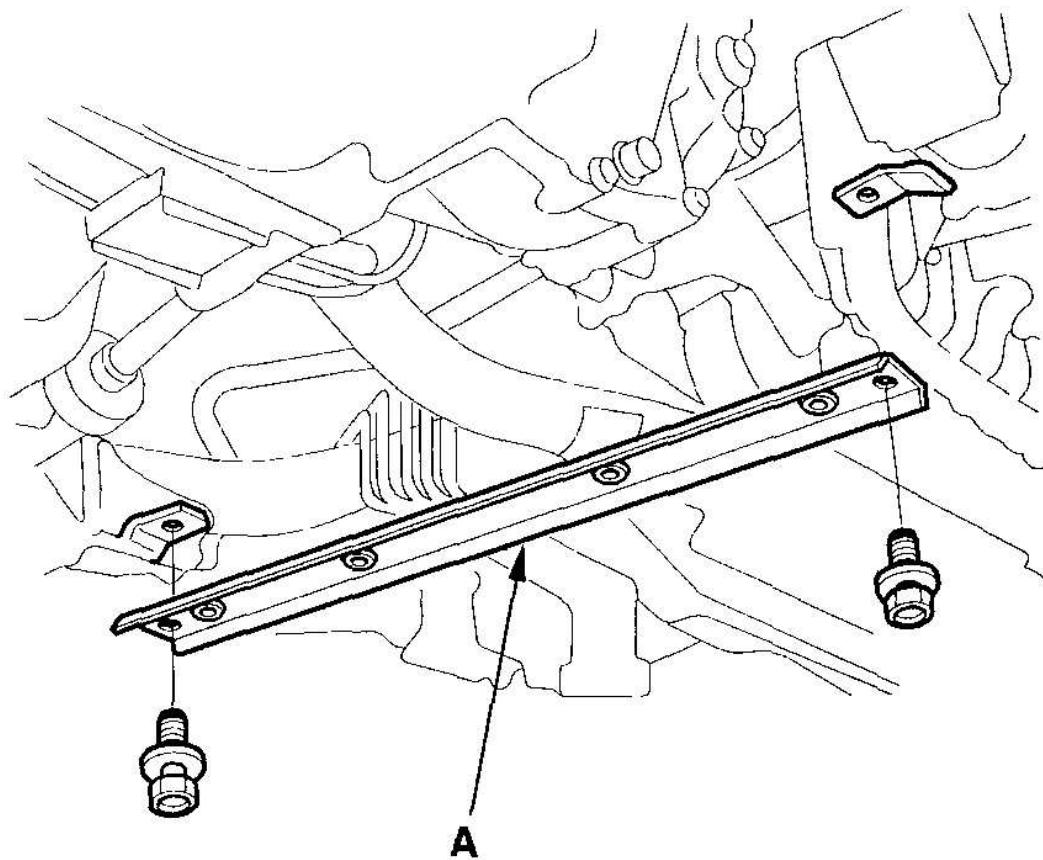
16. Remove the two transmission upper mounting



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Fig. 17: Removing Transmission Upper Mounting Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Remove the splash shield bracket (A).

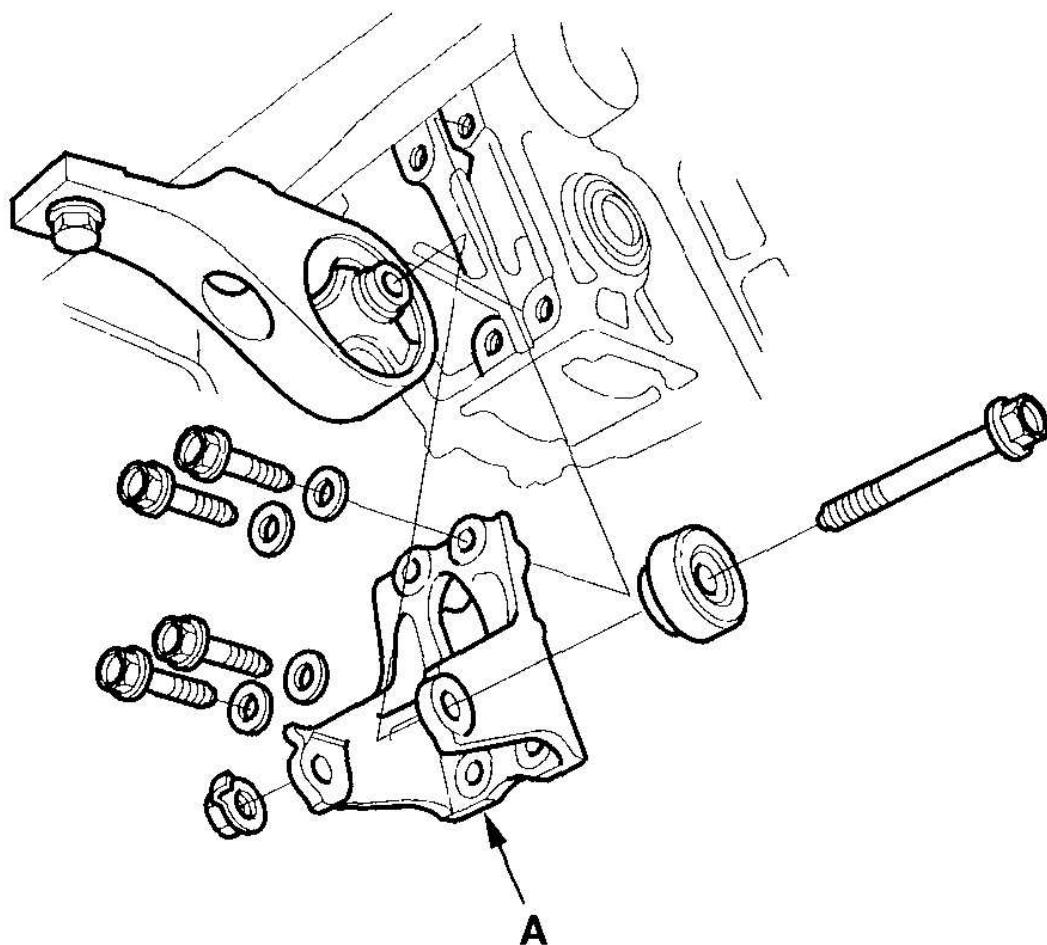


G03681566

Fig. 18: Removing Splash Shield Bracket

Courtesy of AMERICAN HONDA MOTOR CO., INC.

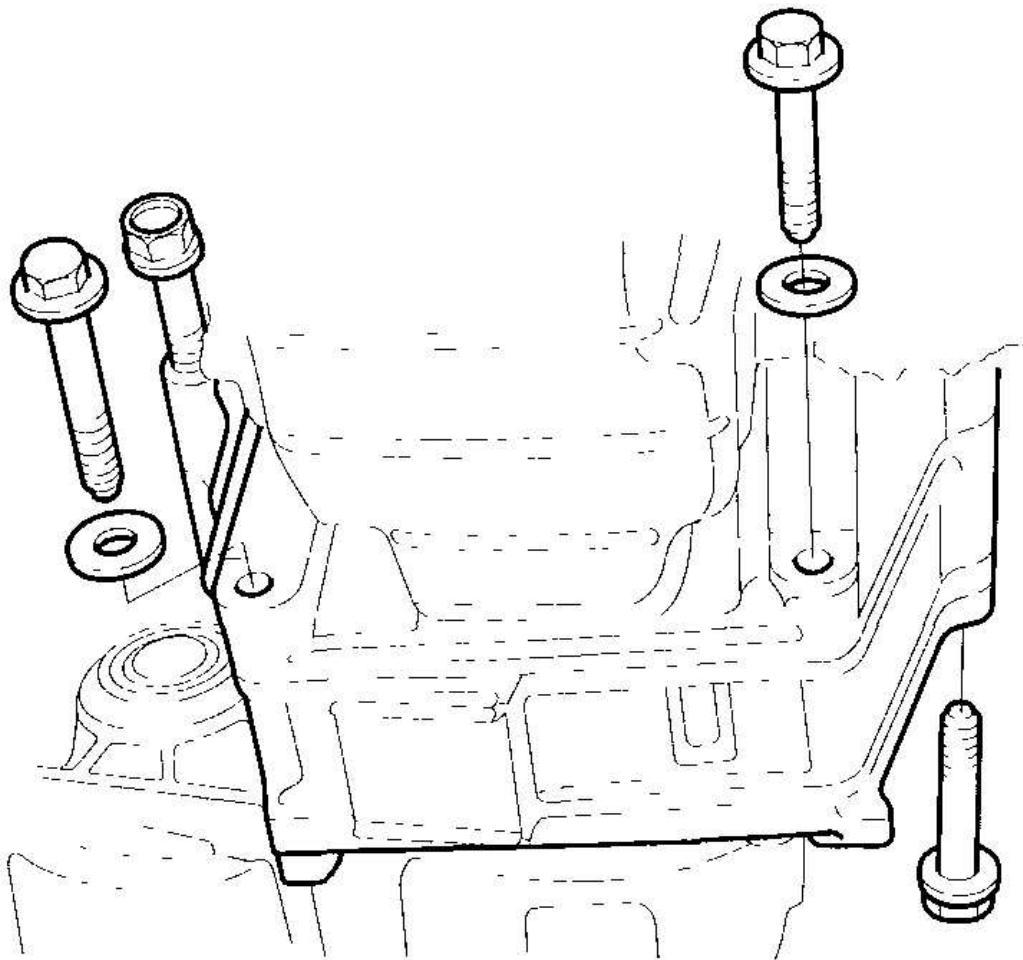
18. Remove the driveshafts (see **DRIVESHAFT INSPECTION**).
19. Place the transmission jack under the transmission, and remove the rear engine mount bracket (A).



G03681567

Fig. 19: Removing Rear Engine Mount Bracket
Courtesy of AMERICAN HONDA MOTOR CO., INC.

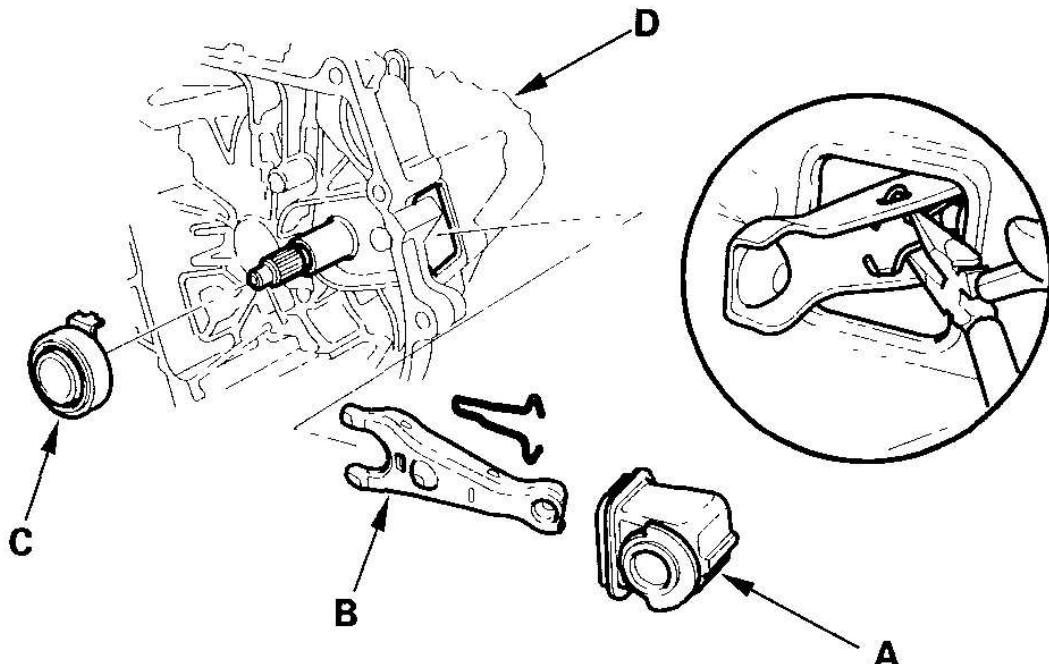
20. Remove the four transmission lower mounting bolts.



G03681568

Fig. 20: Removing Transmission Lower Mounting Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. Pull the transmission away from the engine until the transmission mainshaft clears the clutch pressure plate, then lower the transmission on the transmission jack.
22. Remove the boot (A), the release fork (B), and the release bearing (C) from the transmission (D).



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Fig. 21: Removing Boot, Release Fork, And Release Bearing From Transmission

Courtesy of AMERICAN HONDA MOTOR CO., INC.

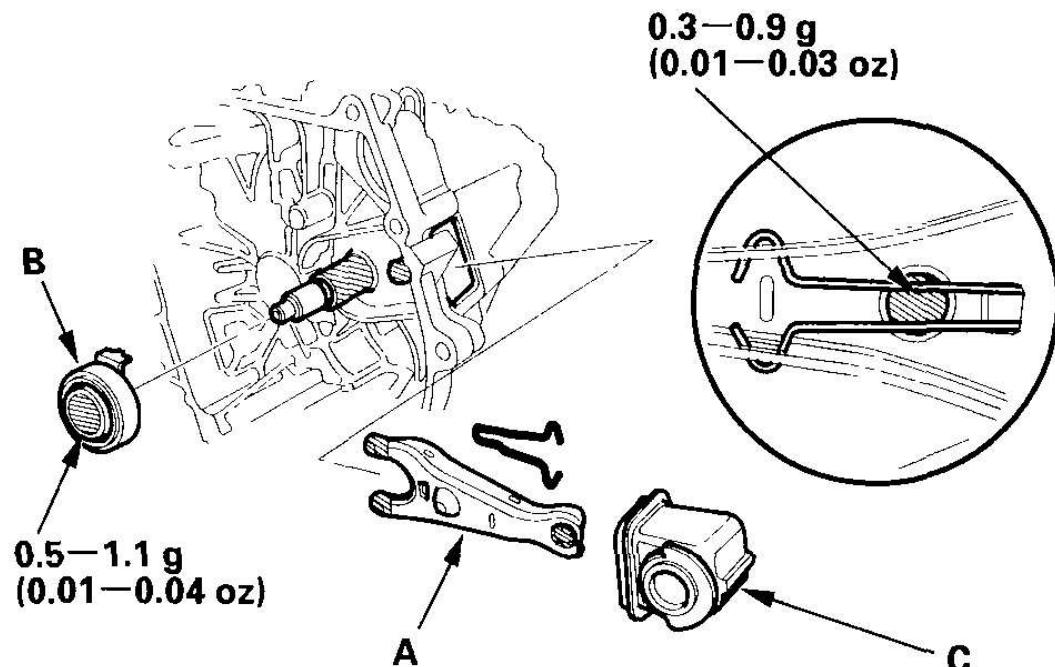
TRANSMISSION INSTALLATION

Special Tools Required

Engine support hanger, A & Reds AAR-T-12566 *

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

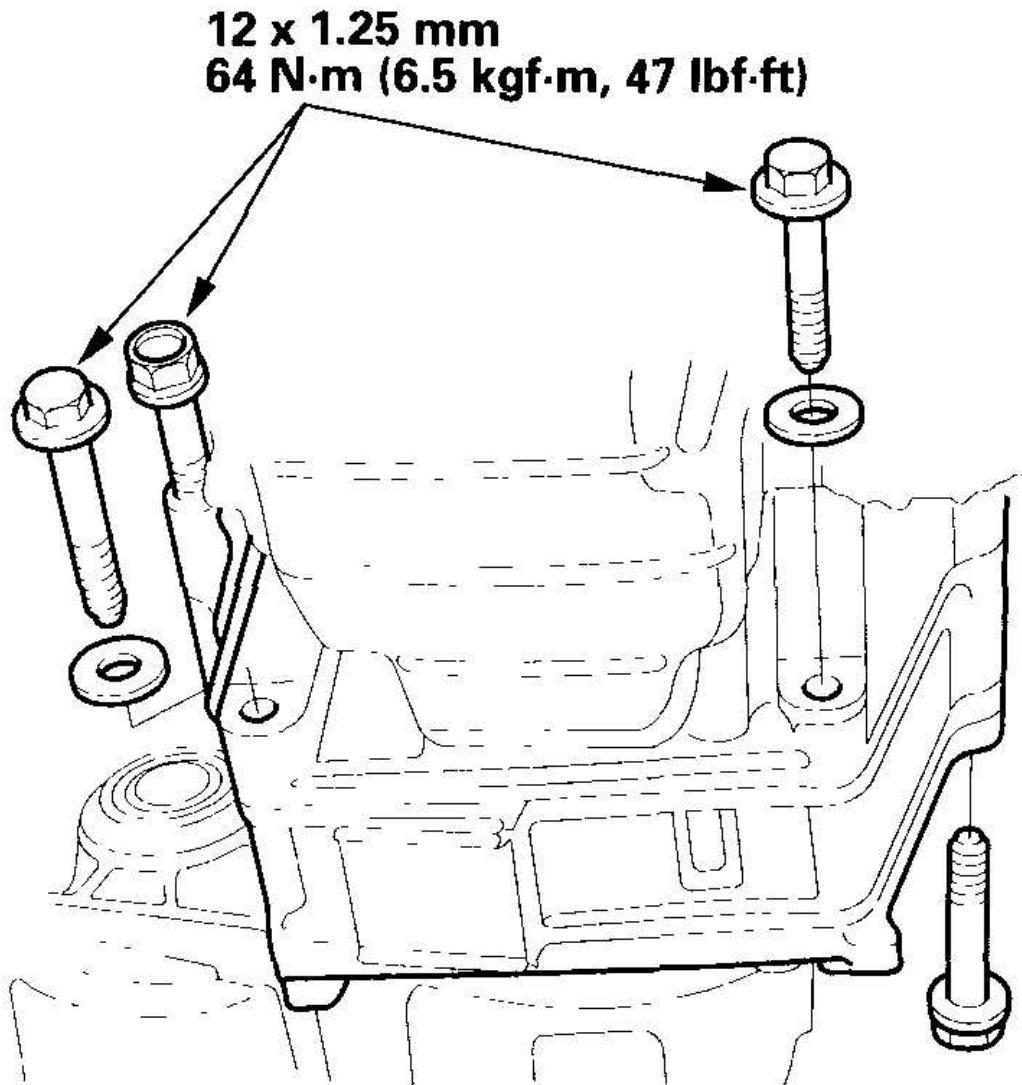
1. Make sure the two dowel pins are installed in the clutch housing.
2. Apply super high temp urea grease (P/N 08798-9002) to the release fork (A) and the release bearing (B). Install the release fork, the release bearing, and the boot (C).



G03681570

Fig. 22: Applying Grease To Release Fork And Release Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

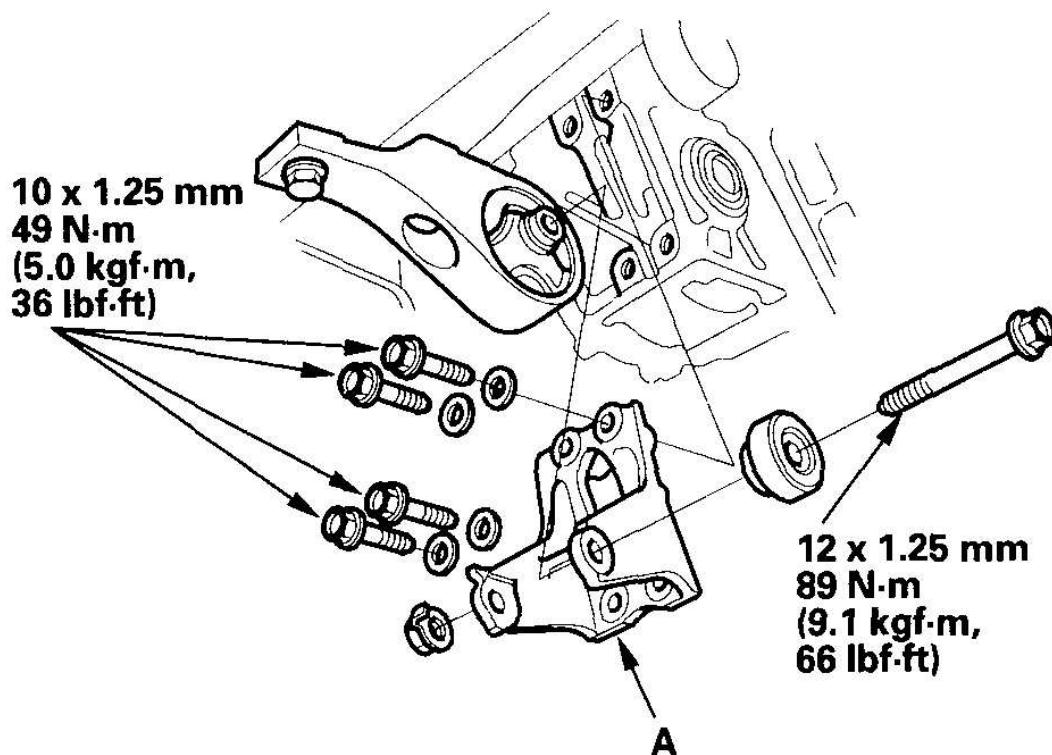


G03681571

Fig. 23: Identifying Tightening Torque Of Transmission Lower Mounting Bolts

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the rear engine mount bracket (A).

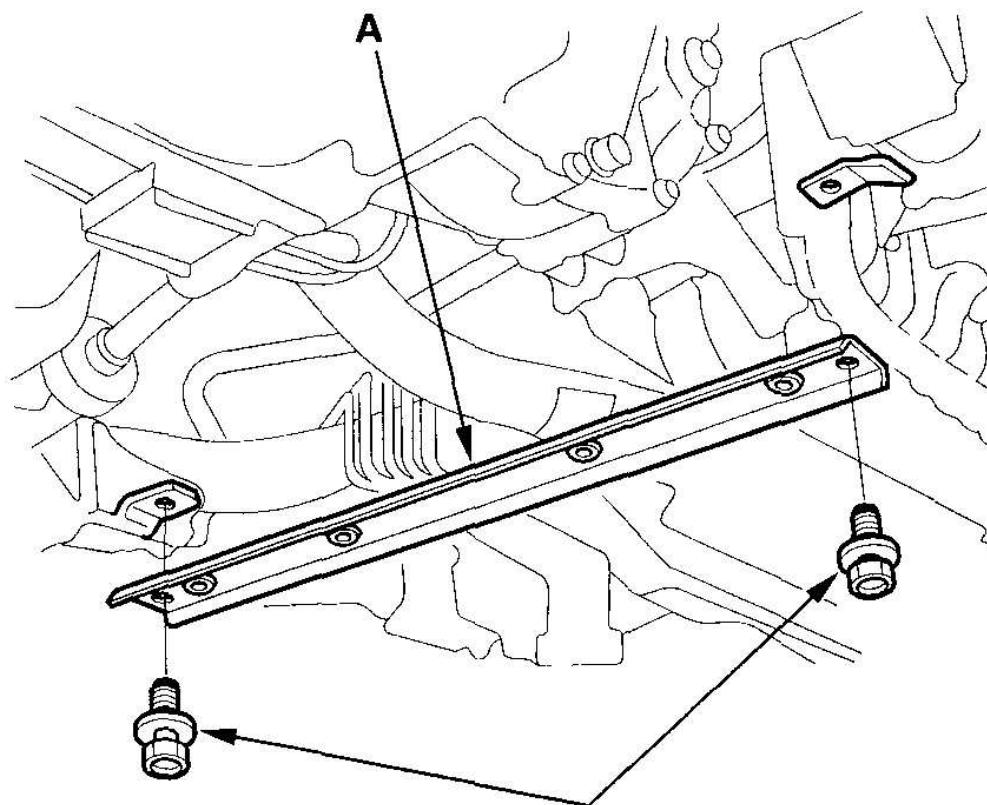


G03681572

Fig. 24: Identifying Tightening Torque Of Rear Engine Mount Bracket Bolts

Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the driveshafts (see **DRIVESHAFT INSTALLATION**).
7. Install the splash shield bracket (A).

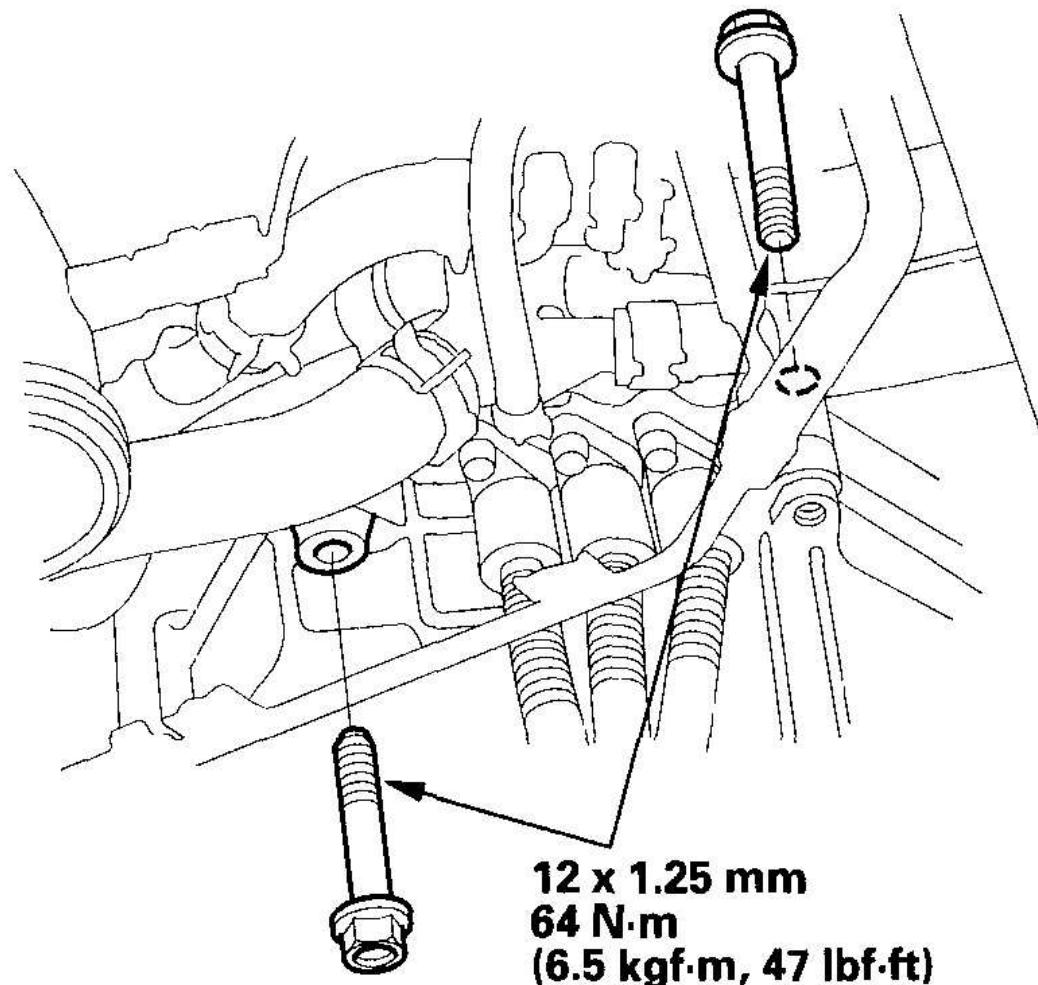


**6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)**

G03681573

Fig. 25: Identifying Tightening Torque Of Splash Shield Bracket Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Install the two transmission upper mounting bolts.

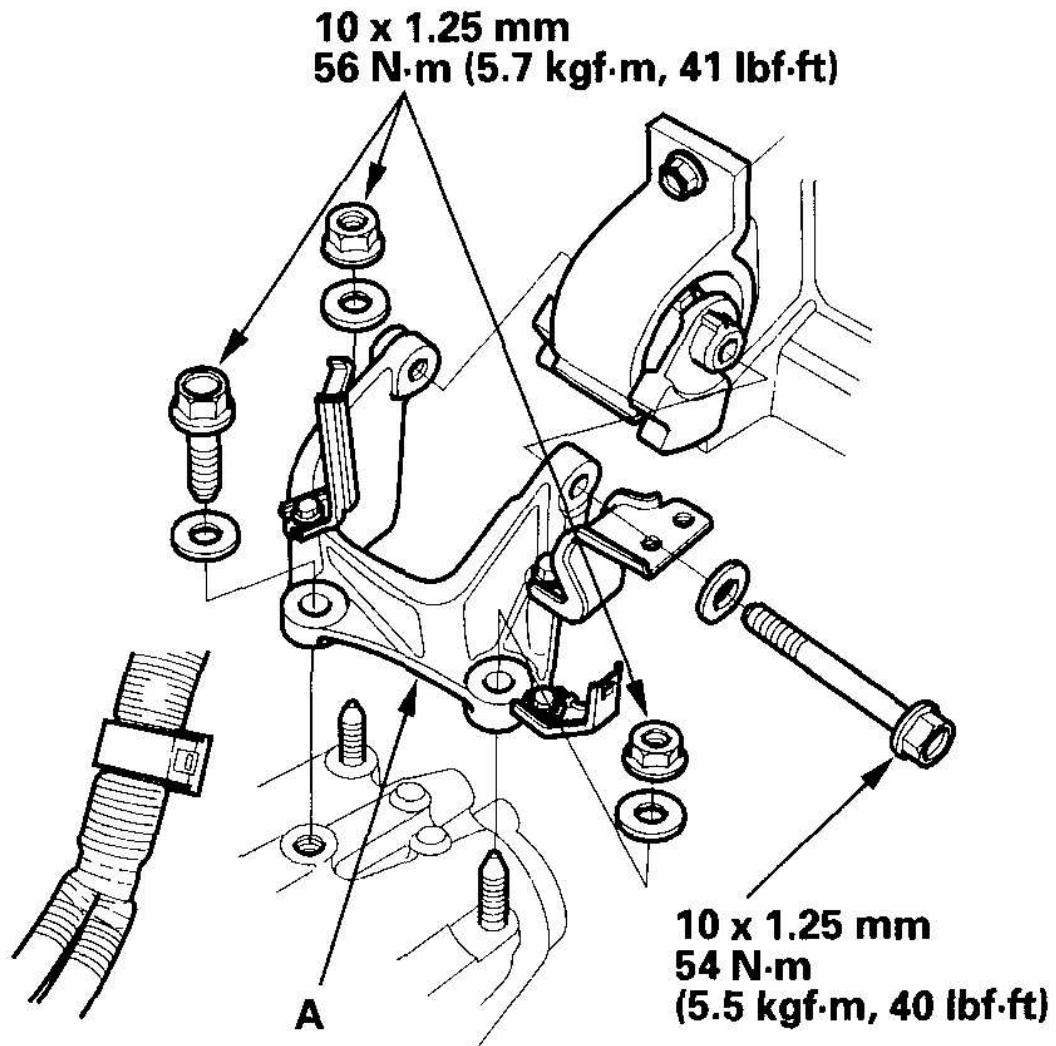


G03681574

Fig. 26: Identifying Tightening Torque Of Transmission Upper Mounting Bolts

Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Raise the transmission higher, install the transmission mount bracket (A).



G03681575

Fig. 27: Identifying Tightening Torque Of Transmission Mount Bracket Bolts

Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Remove the engine support hanger (P/N AAR-T-12566).

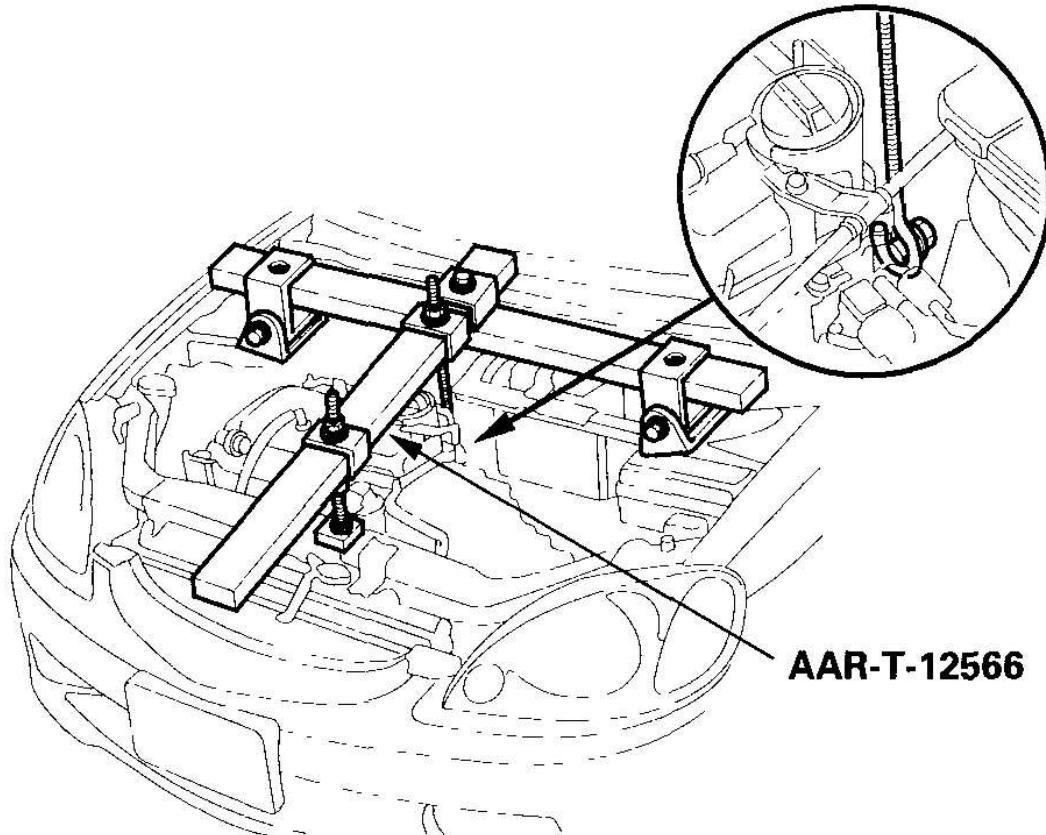
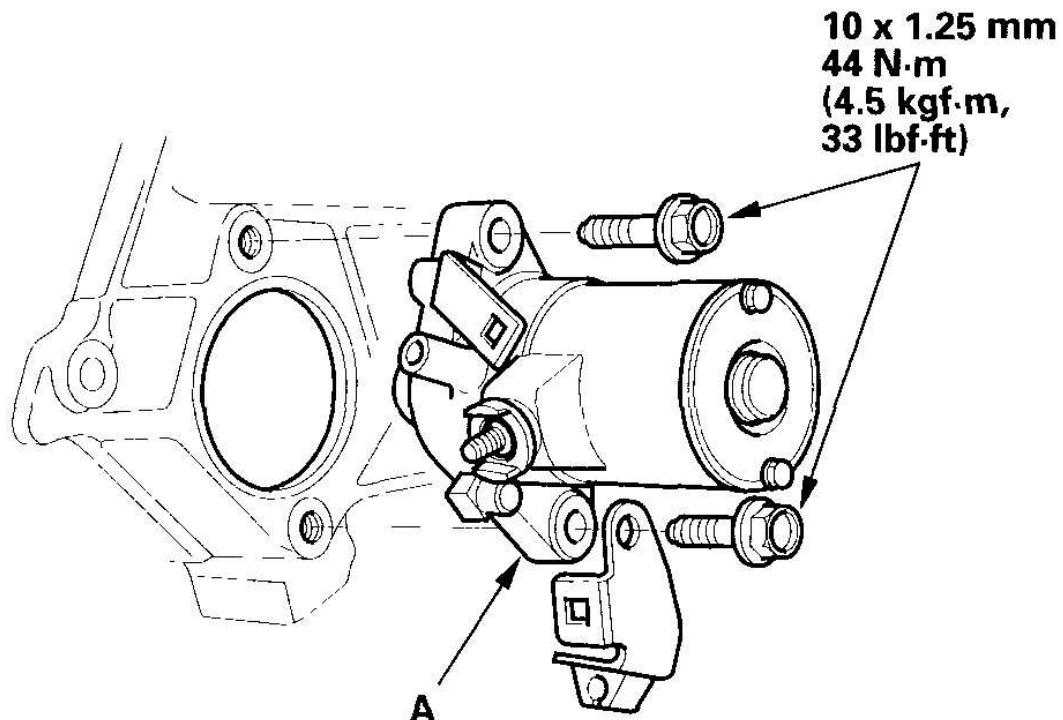


Fig. 28: Removing Engine Support Hanger
Courtesy of AMERICAN HONDA MOTOR CO., INC.

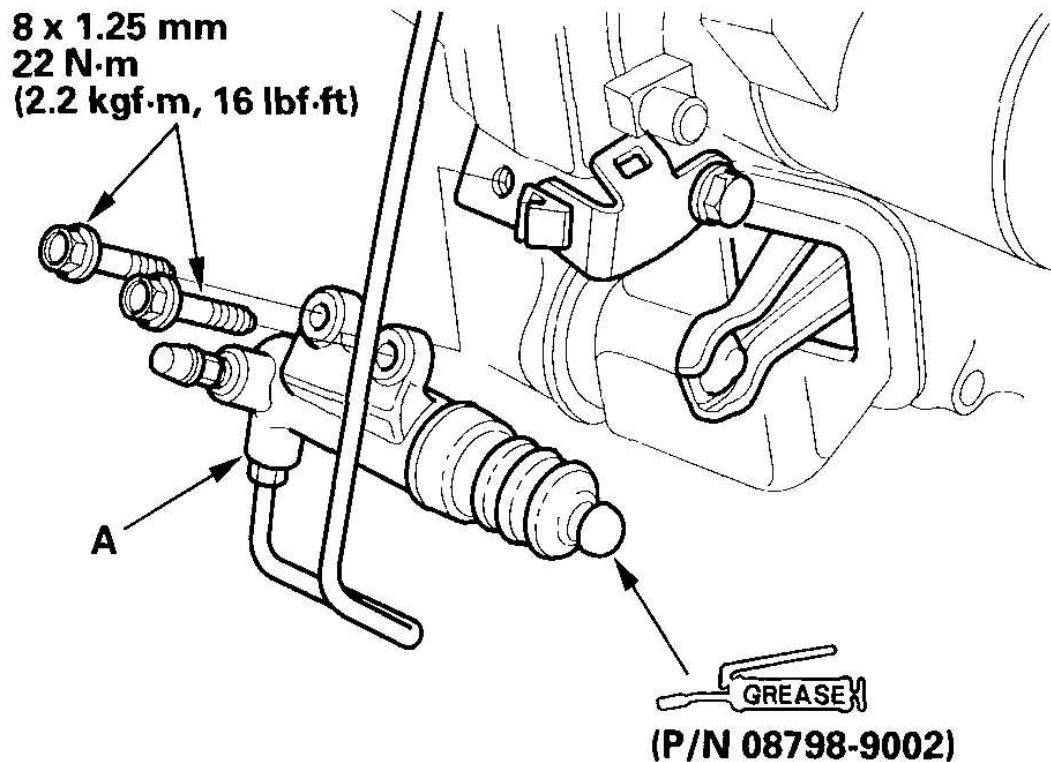
11. Install the starter motor (A).



G03681577

Fig. 29: Identifying Tightening Torque Of Starter Motor Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

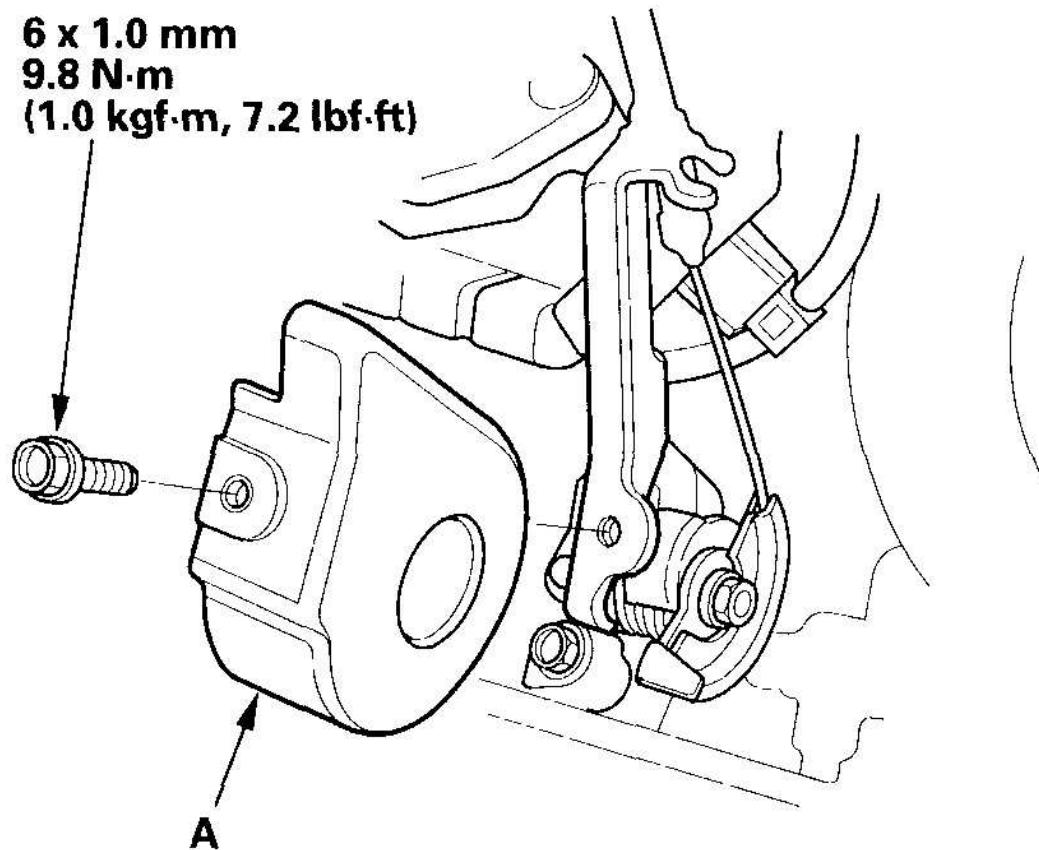
12. Apply super high temp urea grease (P/N 08798-9002) to the end of the slave cylinder rod. Install the slave cylinder (A). Be careful not to bend the clutch line.



G03681578

Fig. 30: Identifying Tightening Torque Of Slave Cylinder Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

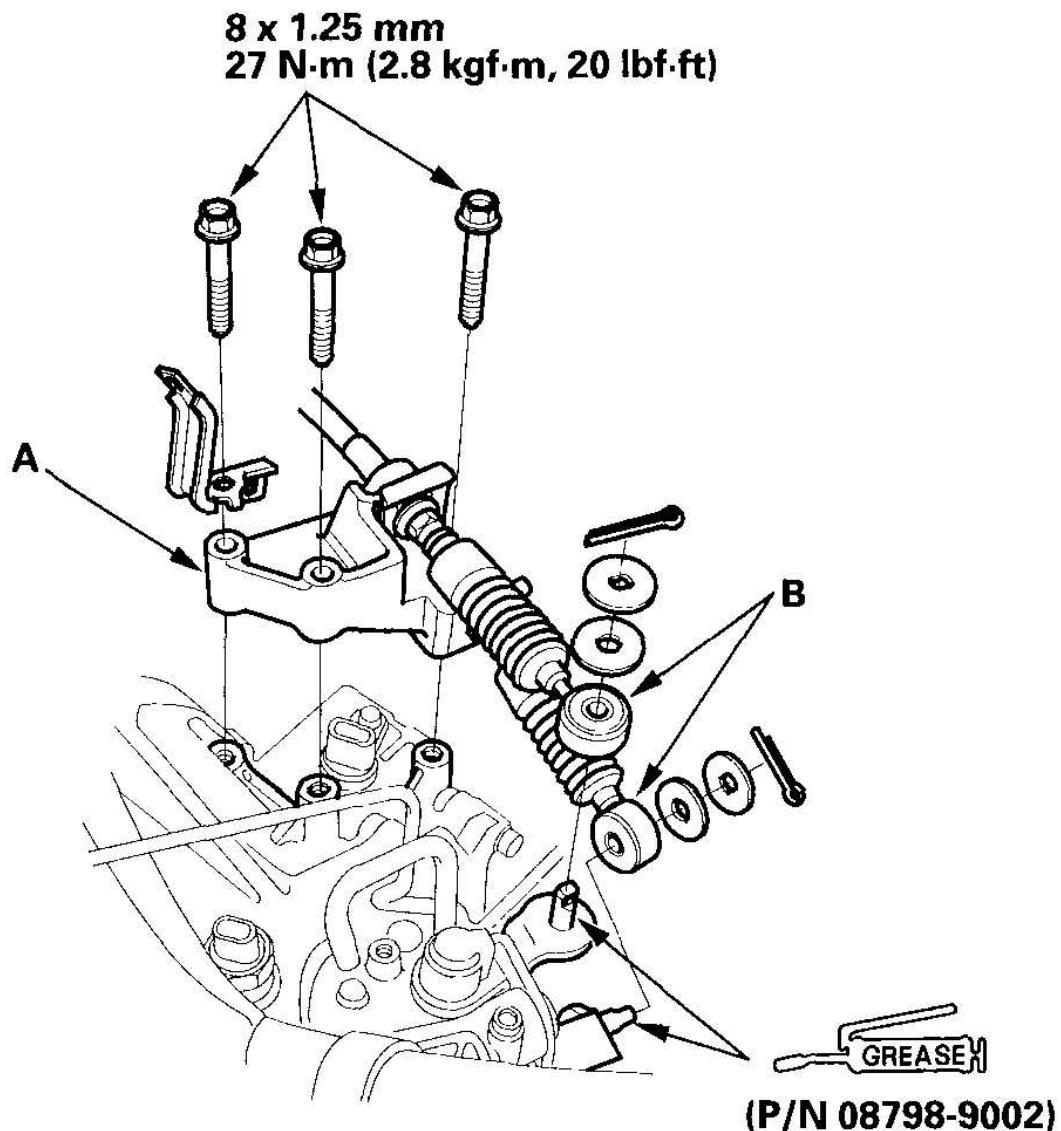
13. Install the throttle drum cover (A).



G03681579

Fig. 31: Identifying Tightening Torque Of Throttle Drum Cover Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

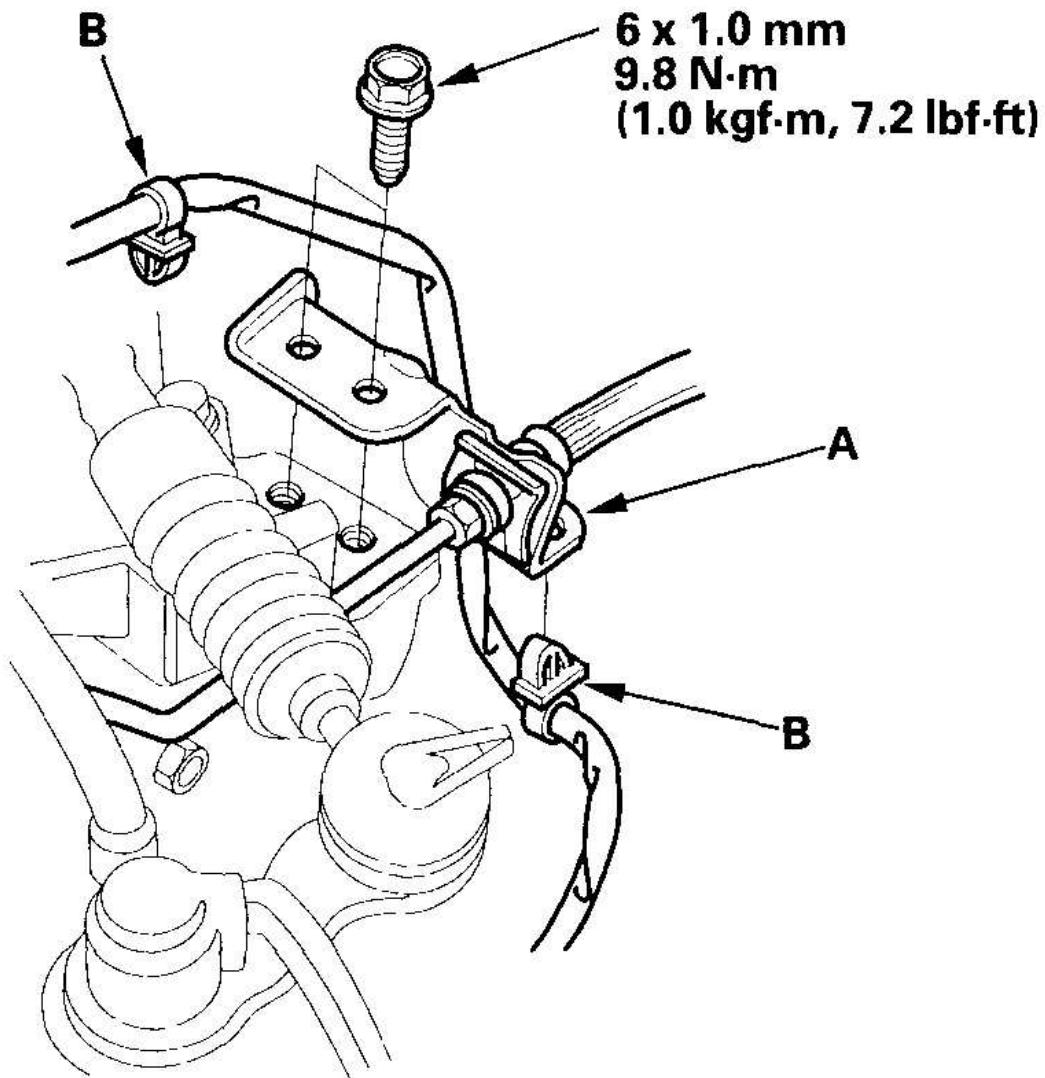
14. Install the cable bracket (A) and cables (B).



G03681580

Fig. 32: Identifying Tightening Torque Of Cable Bracket Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

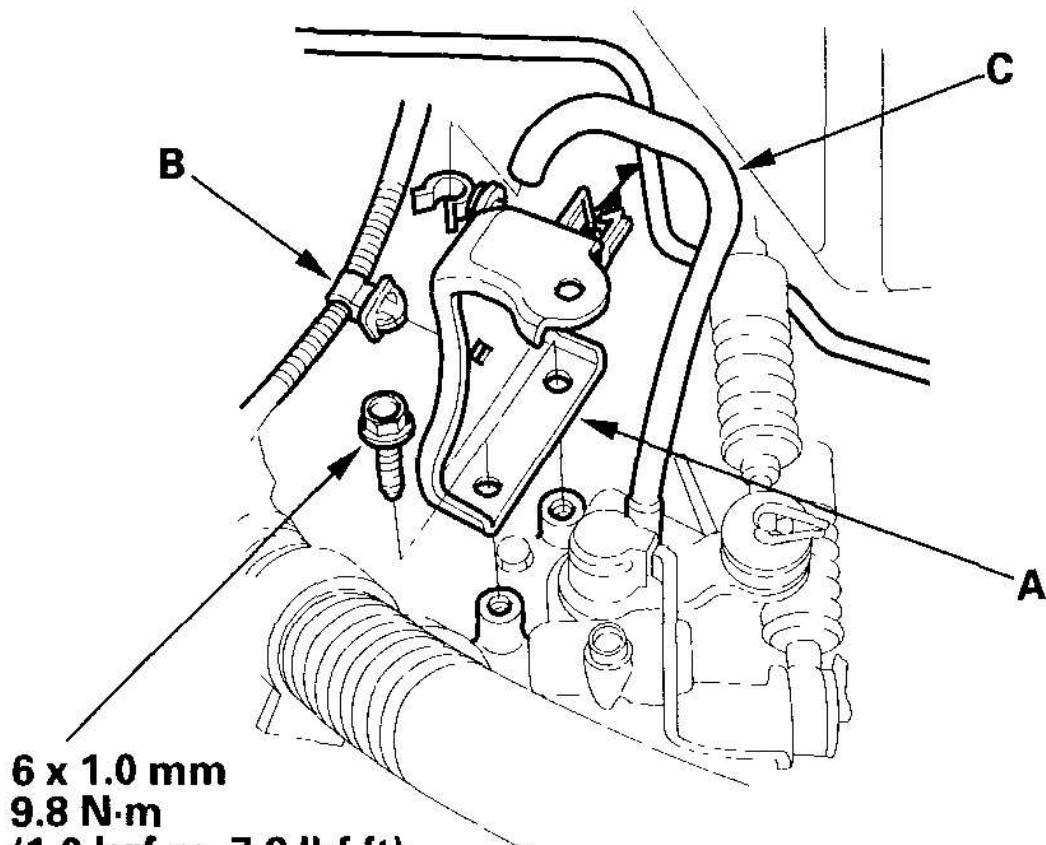
15. Apply a light coat of super high temp urea grease (P/N 08798-9002), and install new cotter pins.
16. Install the clutch line bracket (A) and wire harness clamps (B).



G03681581

Fig. 33: Identifying Tightening Torque Of Clutch Line Bracket Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

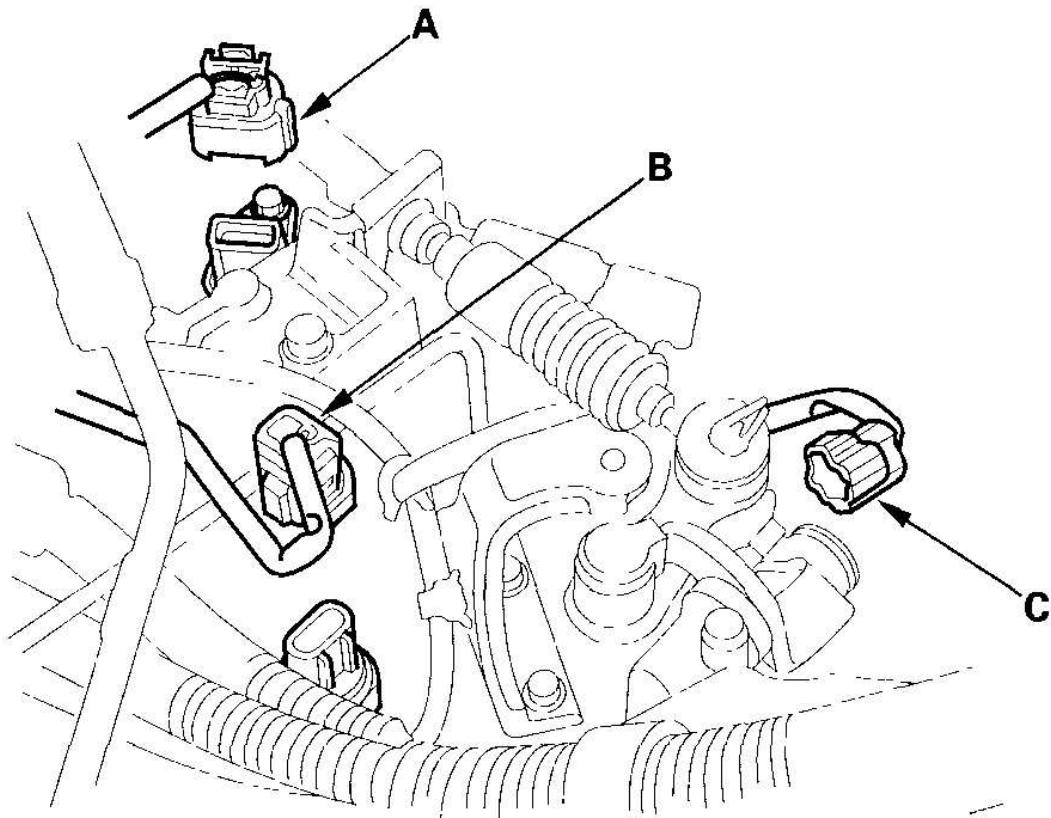
17. Install the air cleaner bracket (A), then install the harness clip (B) and breather tube (C).



G03681582

Fig. 34: Identifying Tightening Torque Of Air Cleaner Bracket Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Connect the vehicle speed sensor (VSS) (A), backup light switch (B), and neutral position switch (C) connectors.

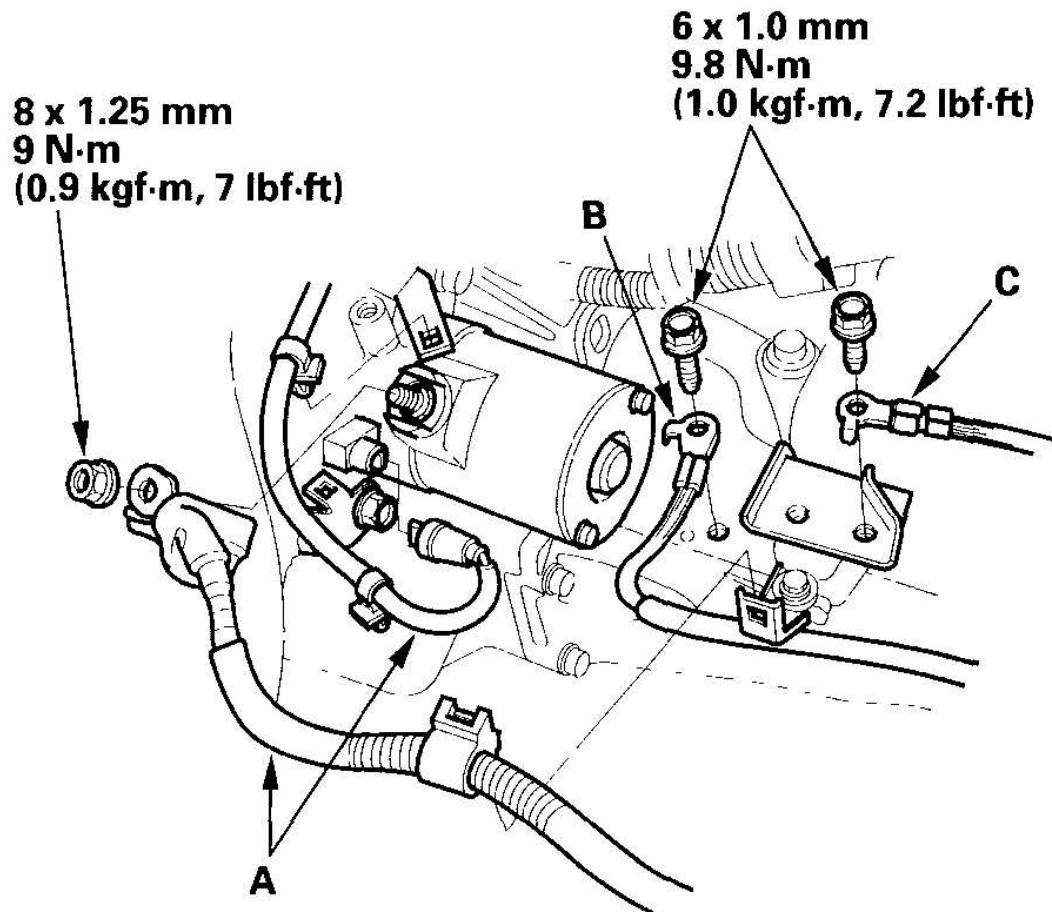


G03681583

Fig. 35: Connecting Vehicle Speed Sensor (VSS), Backup Light Switch, And Neutral Position Switch Connectors

Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Connect the starter motor cables (A), transmission ground cable (B), and engine ground cable (C).

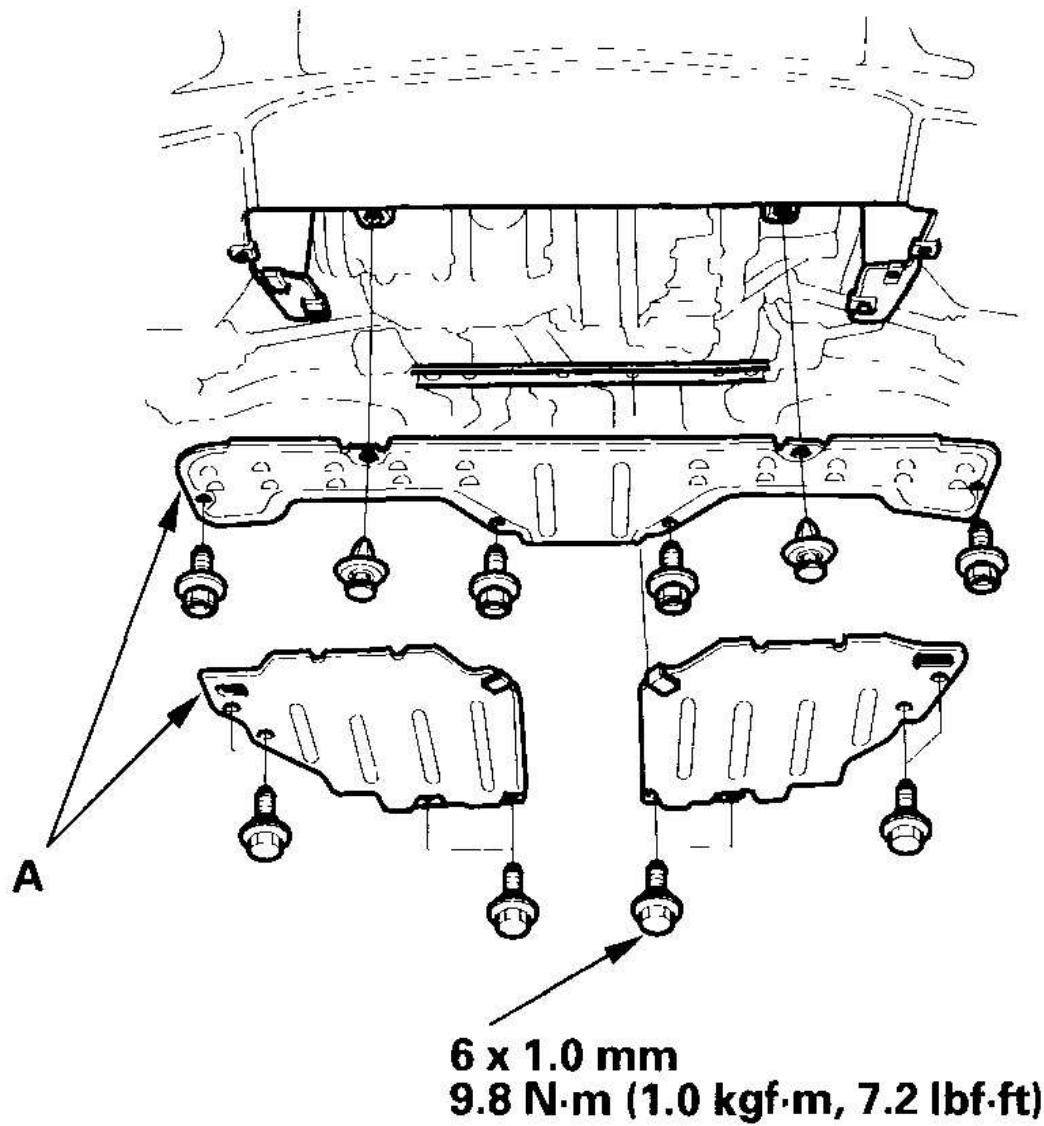


G03681584

Fig. 36: Identifying Tightening Torque Of Starter Motor, Transmission Ground And Engine Ground Cables Bolts

Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Refill the transmission fluid (see **GEARSHIFT MECHANISM REPLACEMENT**).
21. Install the splash shields (A).



G03681585

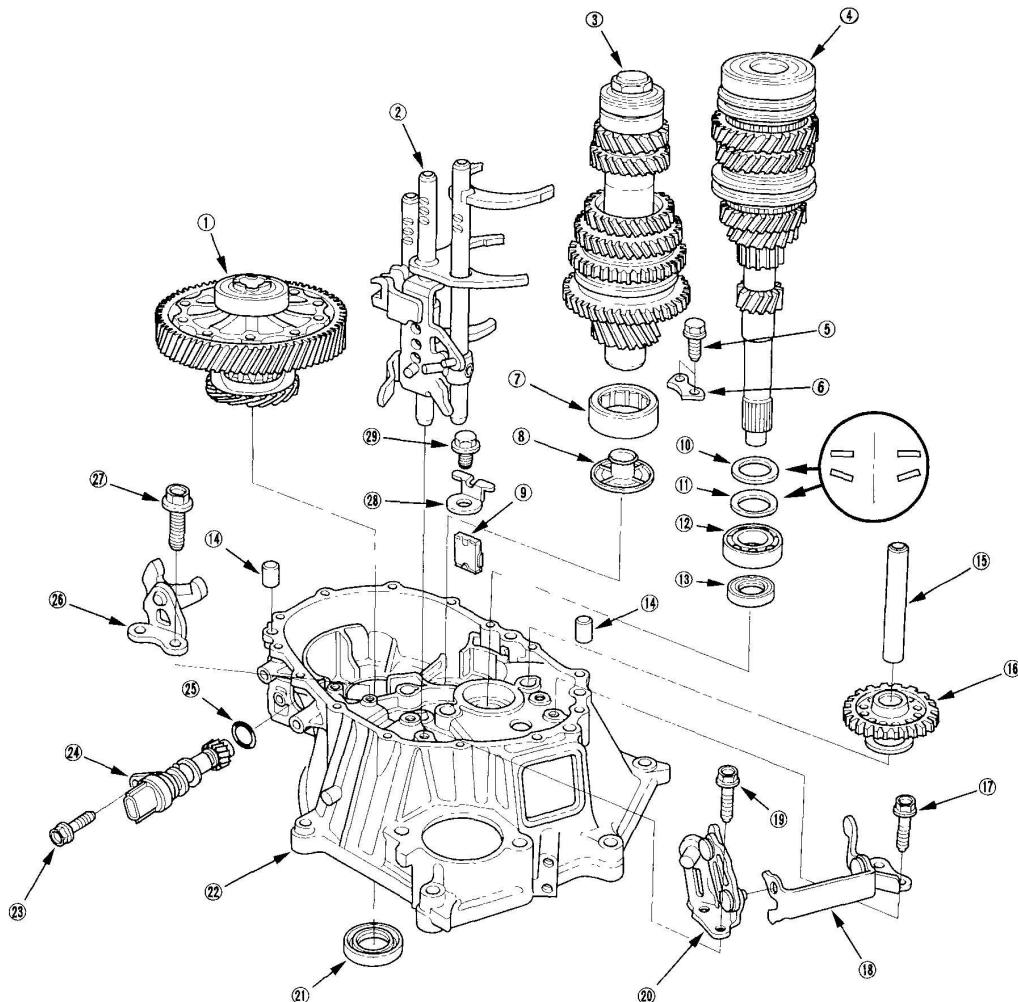
Fig. 37: Identifying Tightening Torque Of Splash Shield Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Install the engine cover, intake air duct, and air cleaner housing (see step 35 on **ENGINE ASSEMBLY**).
23. Install the battery. Clean the battery posts and cable terminals with sandpaper,

- then assemble them, and apply grease to prevent corrosion.
- 24. Turn the battery module switch ON.
 - 25. Check the clutch operation.
 - 26. Check the front wheel alignment (see **WHEEL ALIGNMENT**).
 - 27. Enter the radio anti-theft code, then enter the audio presets, and set the clock.
 - 28. Test-drive the vehicle.

TRANSMISSION DISASSEMBLY

EXPLODED VIEW - CLUTCH HOUSING



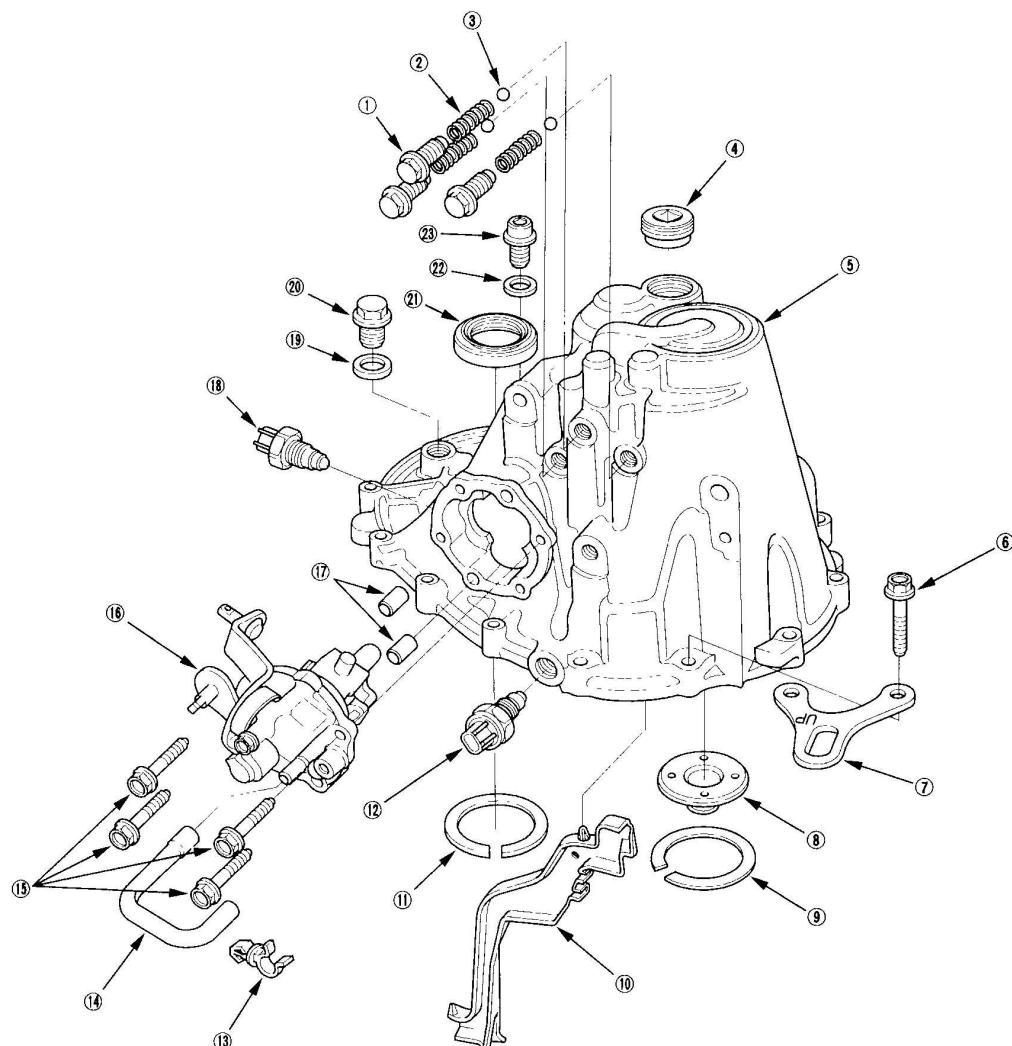
- ① DIFFERENTIAL ASSEMBLY
- ② SHIFT FORK ASSEMBLY
- ③ COUNTERSHAFT ASSEMBLY
- ④ MAINSHAFT ASSEMBLY
- ⑤ 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
- ⑥ BEARING SET PLATE
- ⑦ NEEDLE BEARING
- ⑧ OIL GUIDE PLATE C
- ⑨ MAGNET
- ⑩ 26 mm WASHER
- ⑪ 36 mm SPRING WASHER

- ⑫ BALL BEARING
- ⑬ 26 x 40 x 7 mm OIL SEAL
Replace.
- ⑭ 14 x 20 mm DOWEL PIN
- ⑮ REVERSE GEAR SHAFT
- ⑯ REVERSE IDLER GEAR
- ⑰ 6 mm FLANGE BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)
- ⑱ REVERSE SHIFT FORK
- ⑲ 6 mm FLANGE BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)
- ⑳ MBS CAM HOLDER
- ㉑ 35 x 58 x 8 mm OIL SEAL
Replace.
- ㉒ CLUTCH HOUSING
- ㉓ 6 mm FLANGE BOLT
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
- ㉔ VEHICLE SPEED SENSOR (VSS)
- ㉕ O-RING
Replace.
- ㉖ REVERSE LOCK CAM
- ㉗ 6 mm FLANGE BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)
- ㉘ MAGNET SET PLATE
- ㉙ 8 mm FLANGE BOLT
27 N·m (2.8 kgf·m, 20 lbf·ft)

G03681586

Fig. 38: Exploded View Of Clutch Housing And Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

EXPLODED VIEW - TRANSMISSION HOUSING



- ① SET SCREW
22 N·m (2.2 kgf·m, 16 lbf·ft)
- ② SPRING L. 21.5 mm (0.85 in.)
- ③ STEEL BALL
- ④ 32 mm SEALING CAP
25 N·m (2.5 kgf·m, 18 lbf·ft)
- ⑤ TRANSMISSION HOUSING
- ⑥ 8 mm FLANGE BOLT
27 N·m (2.8 kgf·m, 20 lbf·ft)
- ⑦ TRANSMISSION HANGER
- ⑧ OIL GUIDE PLATE M

- ⑨ 72 mm SHIM
- ⑩ OIL GUTTER PLATE
- ⑪ 72 mm SHIM
- ⑫ BACK-UP LIGHT SWITCH
29 N·m (3.0 kgf·m, 22 lbf·ft)
- ⑬ BREATHER TUBE CLAMP
- ⑭ BREATHER TUBE
- ⑮ 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
- ⑯ CHANGE LEVER ASSEMBLY
- ⑰ 8 x 10 mm DOWEL PIN

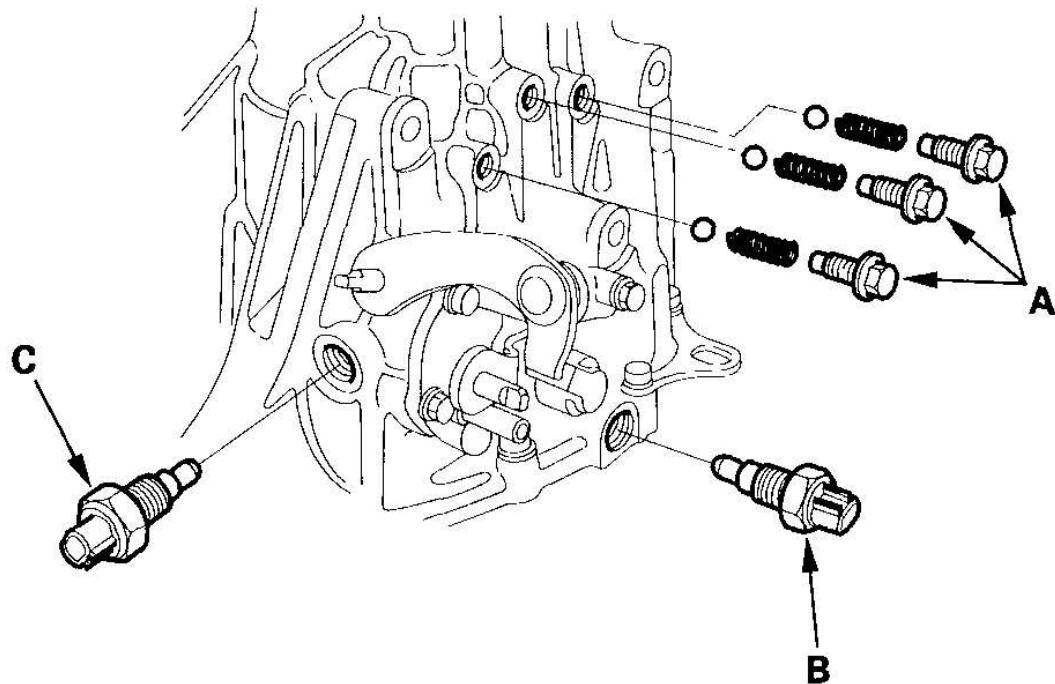
- ⑱ NEUTRAL POSITION SWITCH
29 N·m (3.0 kgf·m, 22 lbf·ft)
- ⑲ 20 mm WASHER
Replace.
- ⑳ FILLER PLUG
44 N·m (4.5 kgf·m, 33 lbf·ft)
- ㉑ 35 x 56 x 8 mm OIL SEAL
Replace.
- ㉒ 14 mm WASHER
Replace.
- ㉓ DRAIN PLUG
39 N·m (4.0 kgf·m, 29 lbf·ft)

G03681587

Fig. 39: Exploded View Of 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. Remove the set screws (A), springs, steel balls, back-up light switch (B), and neutral position switch (C).

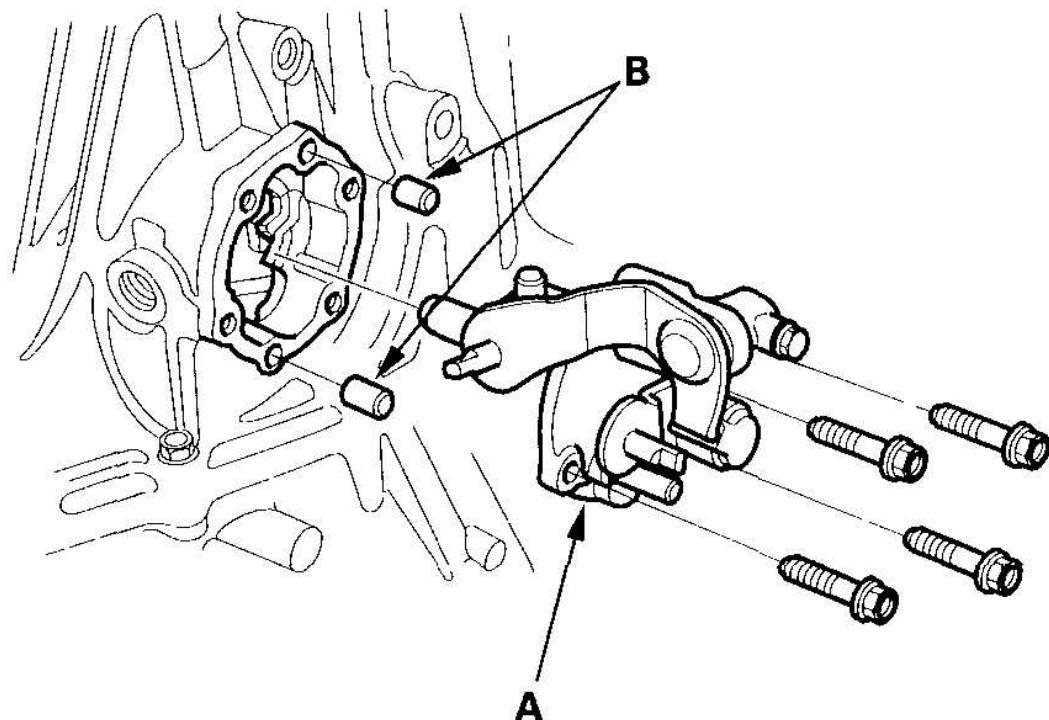


G03681588

Fig. 40: Removing Set Screws, Springs, Steel Balls, Back-Up Light Switch, And Neutral Position Switch

Courtesy of AMERICAN HONDA MOTOR CO., INC.

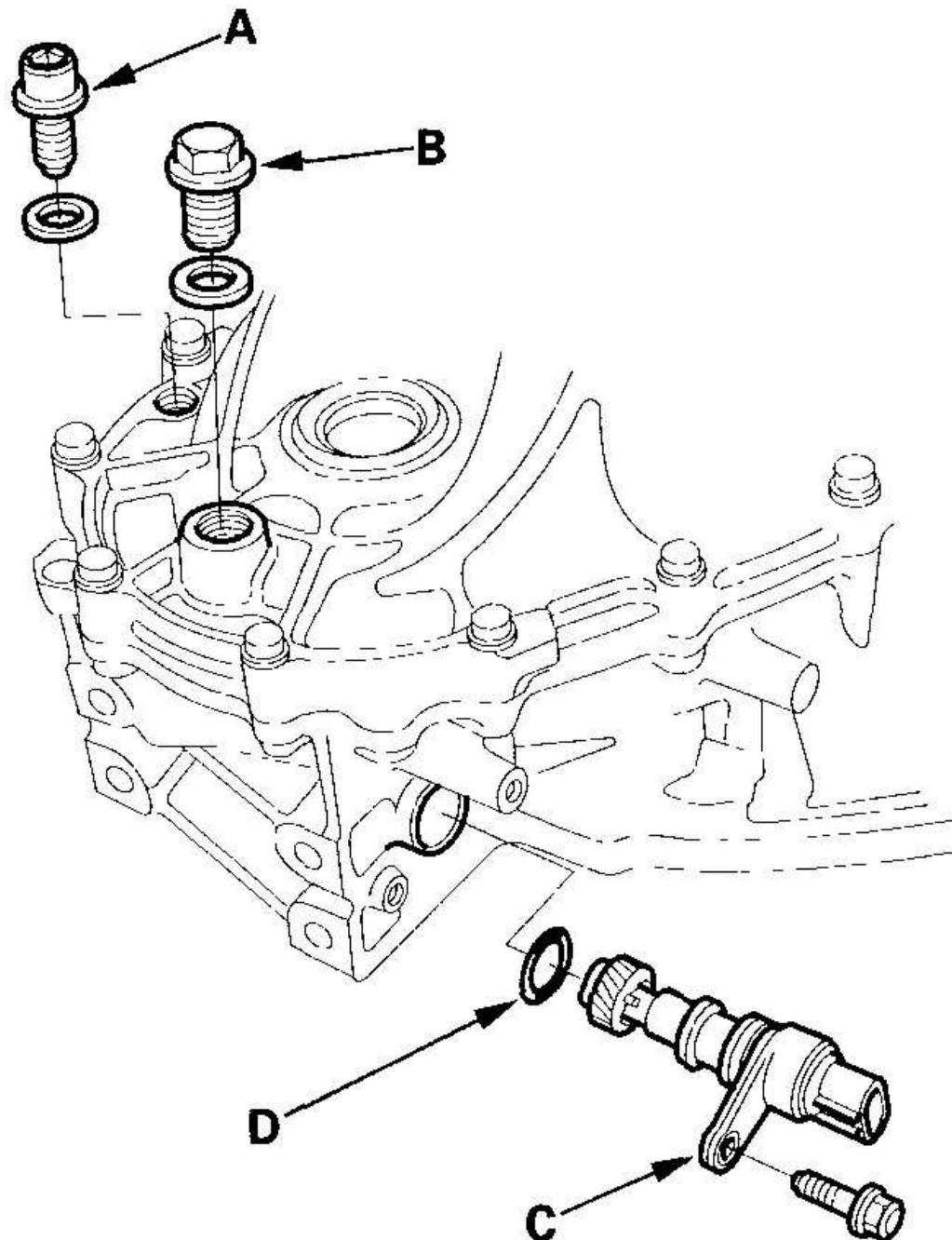
2. Remove the change lever assembly (A) and 8 x 10 mm dowel pins (B).



G03681589

Fig. 41: Removing Change Lever Assembly And Dowel Pins
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the drain plug (A), filler plug (B), vehicle speed sensor (VSS) (C), and O-ring (D).

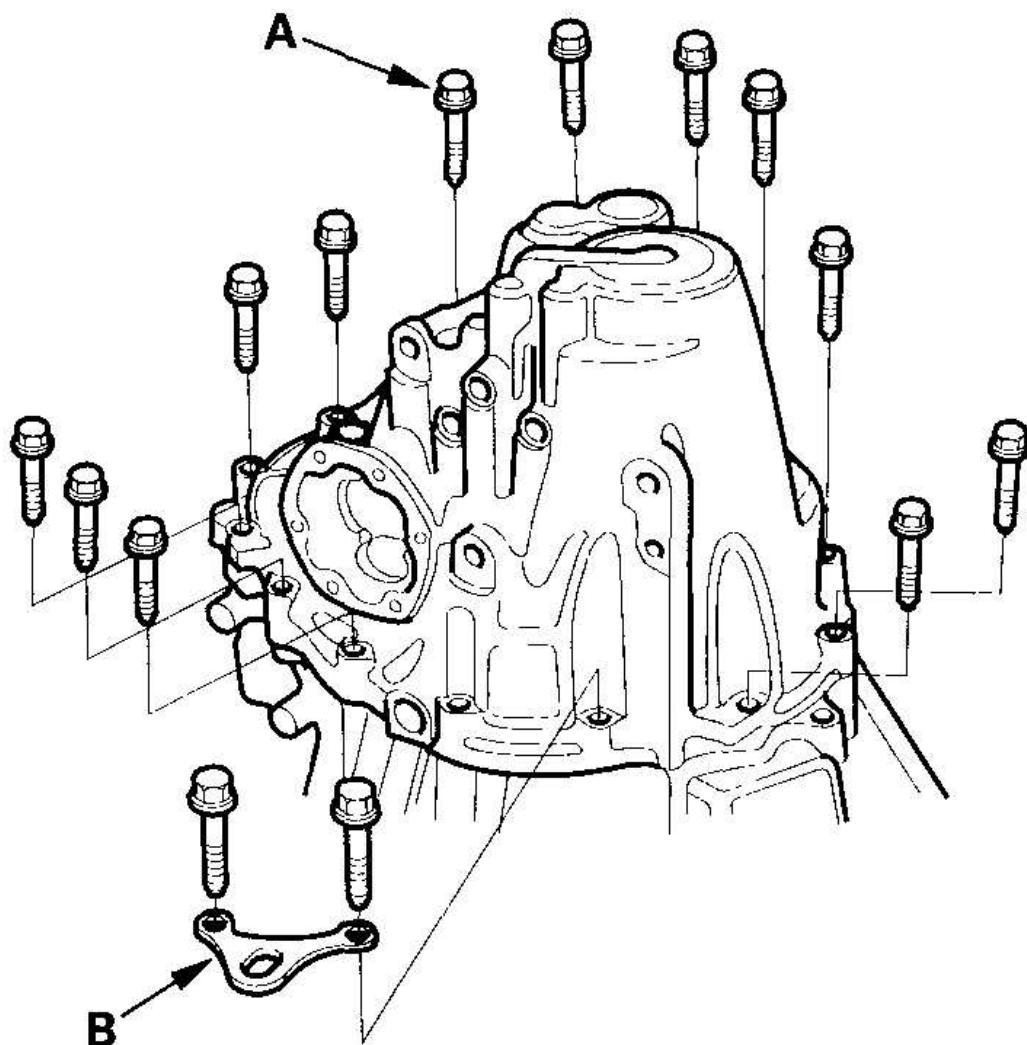


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Fig. 42: Removing Drain Plug, Filler Plug, Vehicle Speed Sensor (VSS),

And O-Ring**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

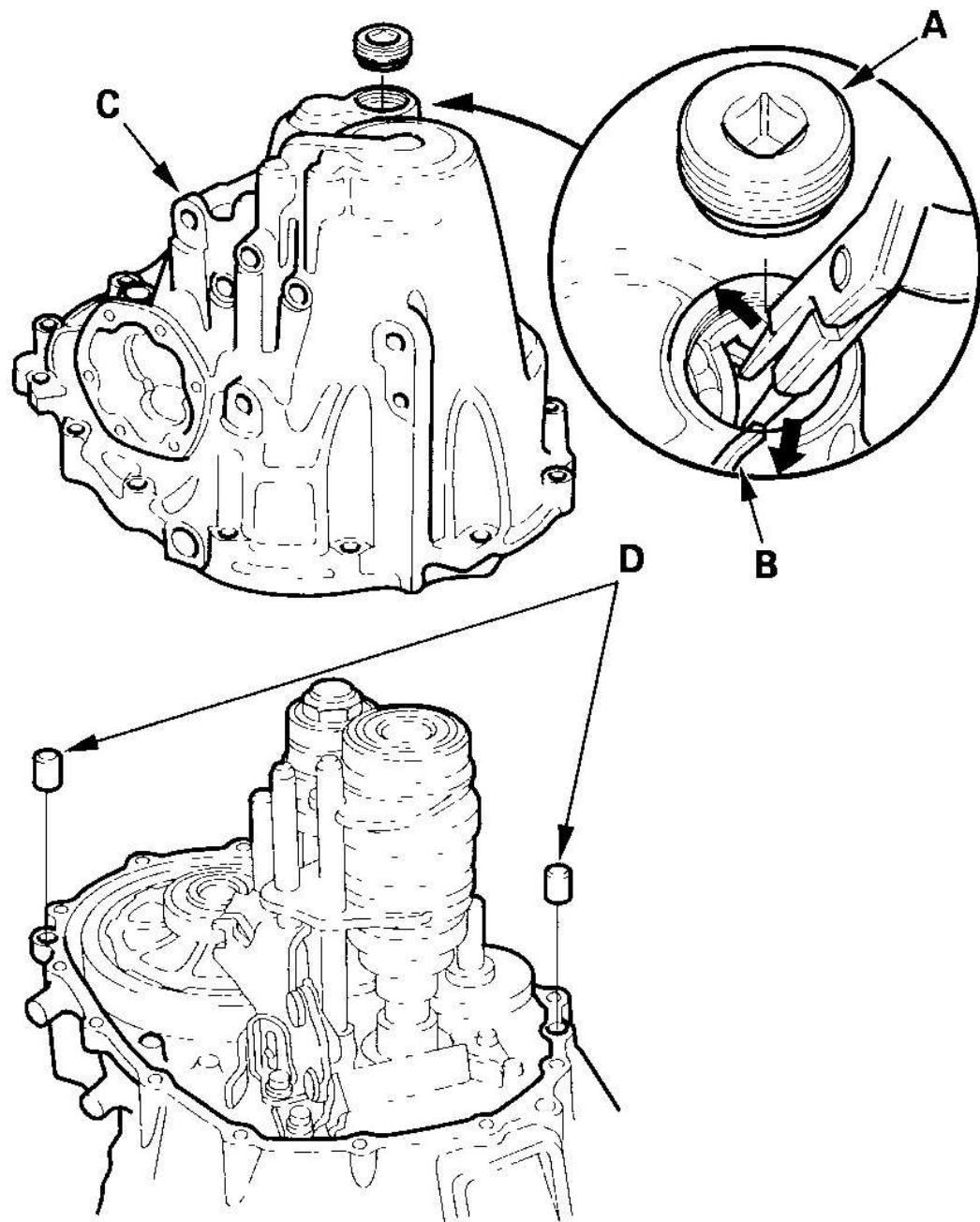
4. Remove the 8 mm flange bolts (A) and transmission hanger (B) in a crisscross pattern in several steps.



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Fig. 43: Removing Flange Bolts And Transmission Hanger
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

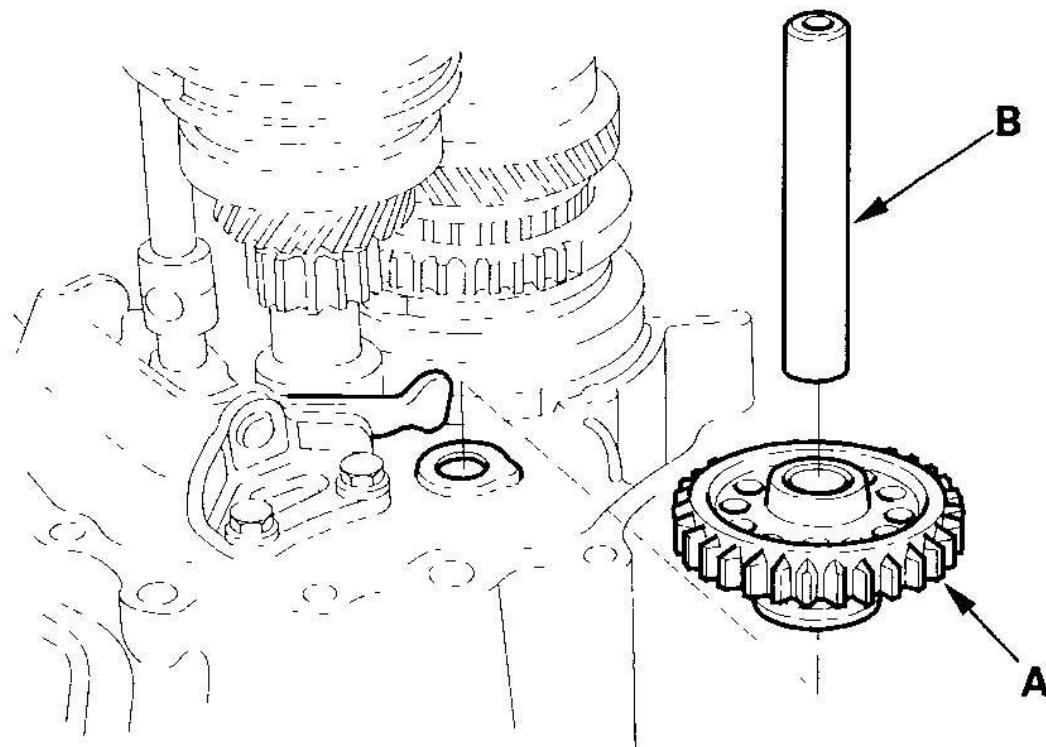


G03681592

Fig. 44: Removing 32 MM Sealing Cap

Courtesy of AMERICAN HONDA MOTOR CO., INC.

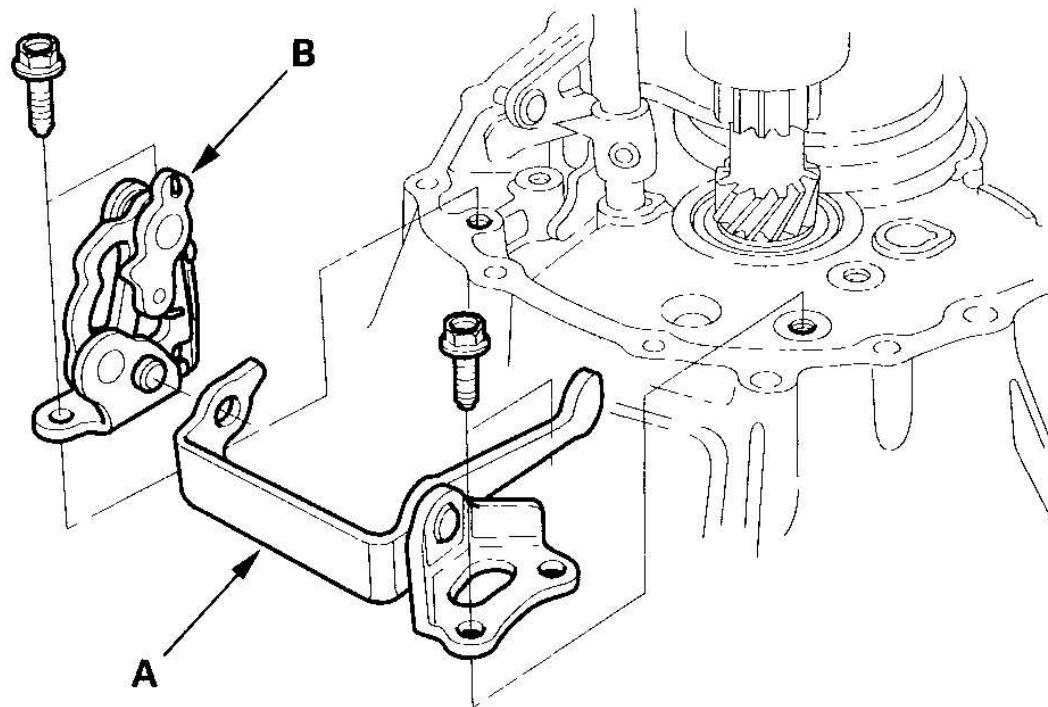
6. Expand the 52 mm snap ring (B) on the countershaft ball bearing, and remove it from the groove using a pair of snap ring pliers.
7. Remove the transmission housing (C) and 14 x 20 mm dowel pins (D).
8. Remove the reverse idler gear (A) and reverse gear shaft (B).



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Fig. 45: Removing Reverse Idler Gear And Reverse Gear Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Remove the reverse shift fork (A) and MBS cam holder (B).



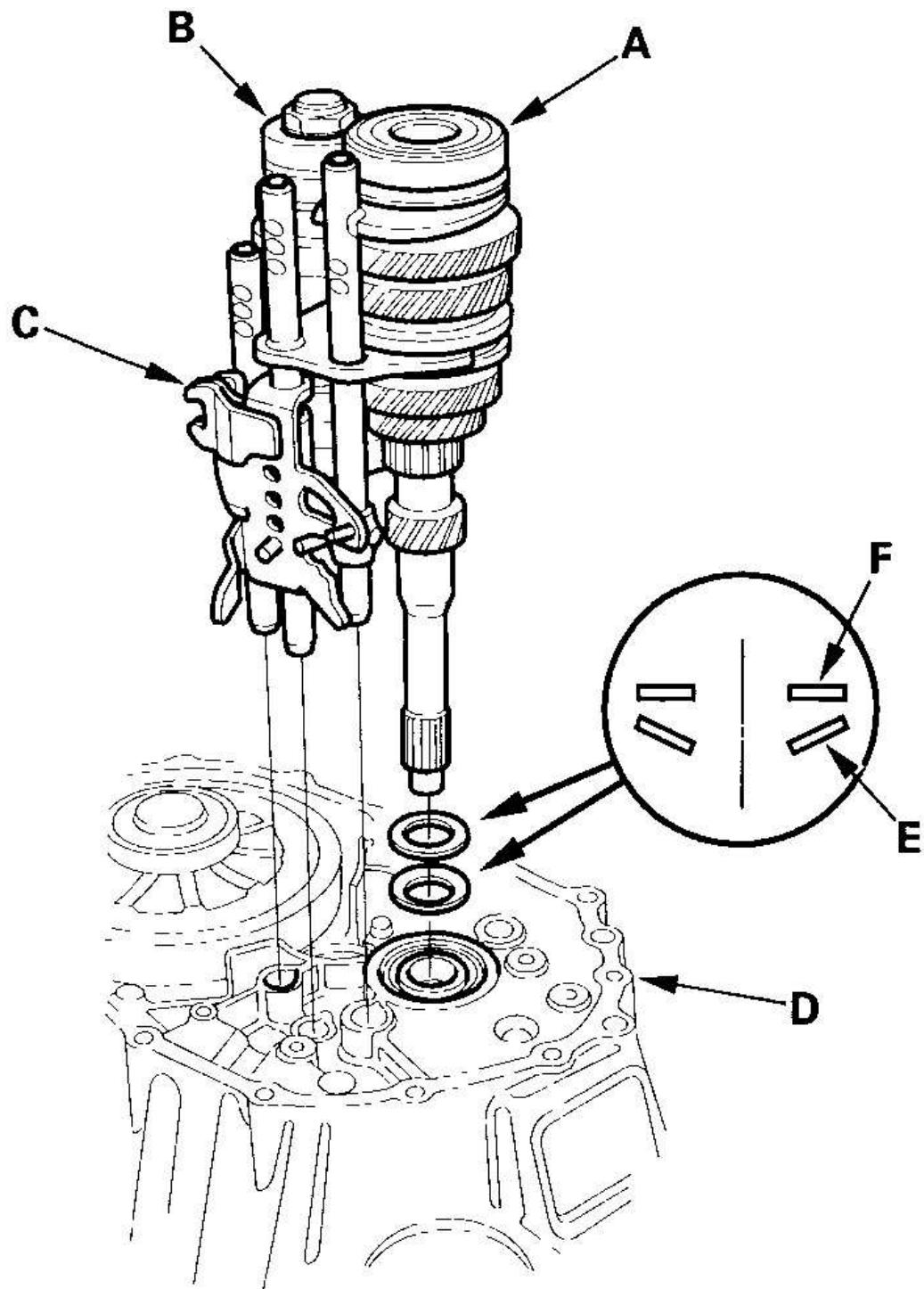
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Fig. 46: Removing Reverse Shift Fork And MBS Cam Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. 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).

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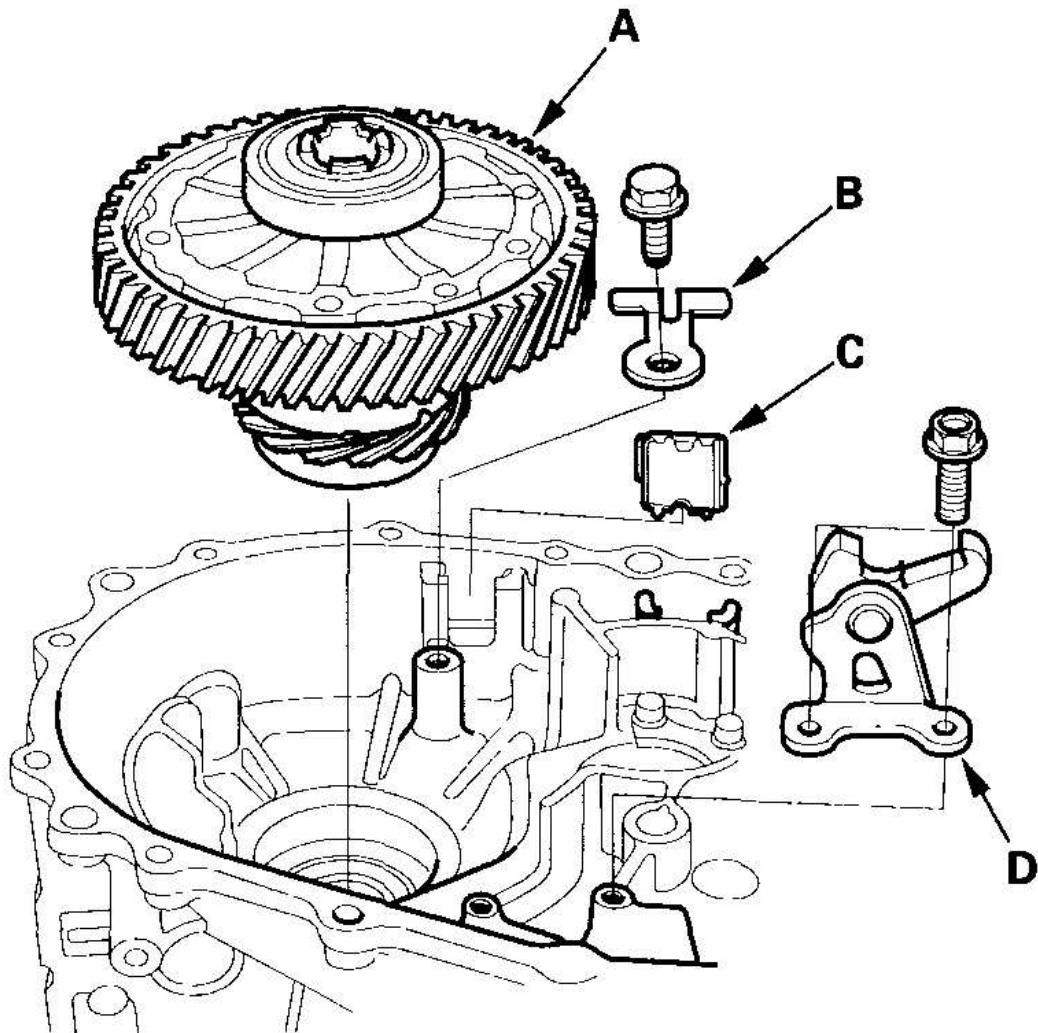
2000-06 TRANSMISSION Manual Transmission - Insight



G03681595

**Fig. 47: Removing Mainshaft Assembly And Countershaft Assembly With Shift Forks From Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.**

11. Remove the 36 mm spring washer (E) and 26 mm washer (F).
12. Remove the differential assembly (A), magnet set plate (B), magnet (C), and reverse lock cam (D).

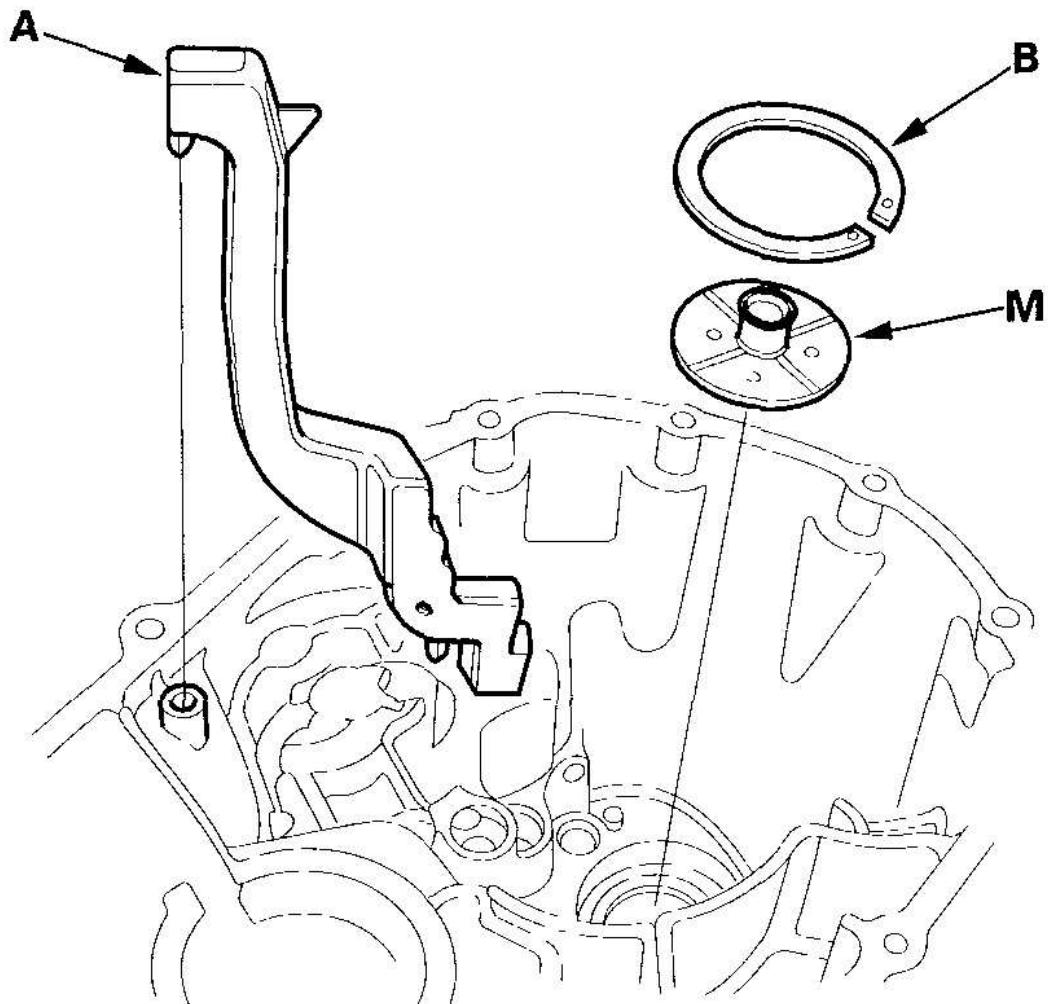


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Fig. 48: Removing Differential Assembly, Magnet Set Plate, Magnet, And Reverse Lock Cam

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



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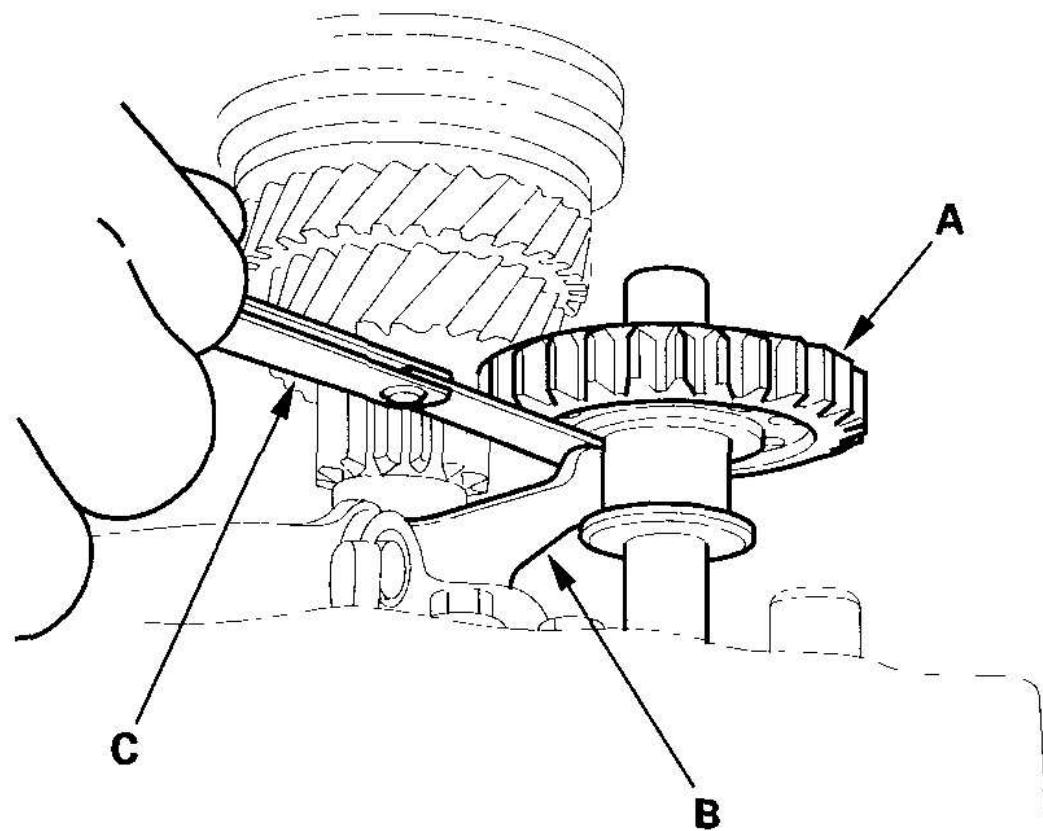
Fig. 49: Removing Oil Gutter Plate, Oil Guide Plate, And 72 MM Shim

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

Standard: 0.1-0.5 mm (0.004-0.020 in.)

Service Limit: 0.8 mm (0.032 in.)



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Fig. 50: Measuring Clearance Between Reverse Idler Gear And Reverse Shift Fork

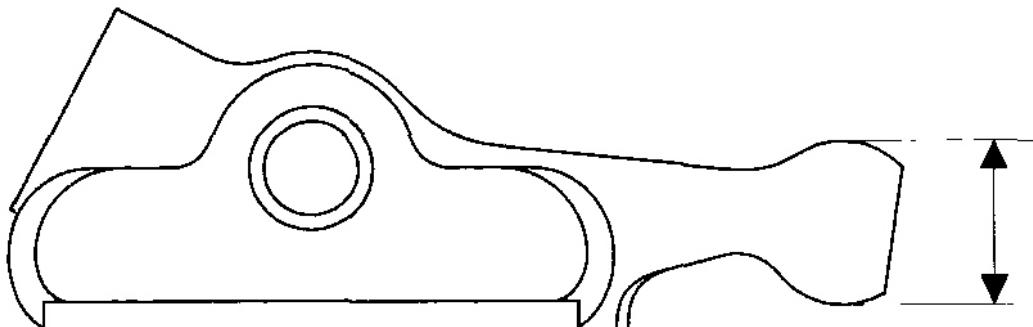
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the width of the reverse shift fork.

- If the width is less than the service limit, replace the reverse shift fork.
- If the width is within the service limit, replace the reverse gear.

Standard: 15.8-16.0 mm (0.622-0.630 in.)

Service Limit: 15.5 mm (0.610 in.)



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Fig. 51: Measuring Width Of Reverse Shift Fork

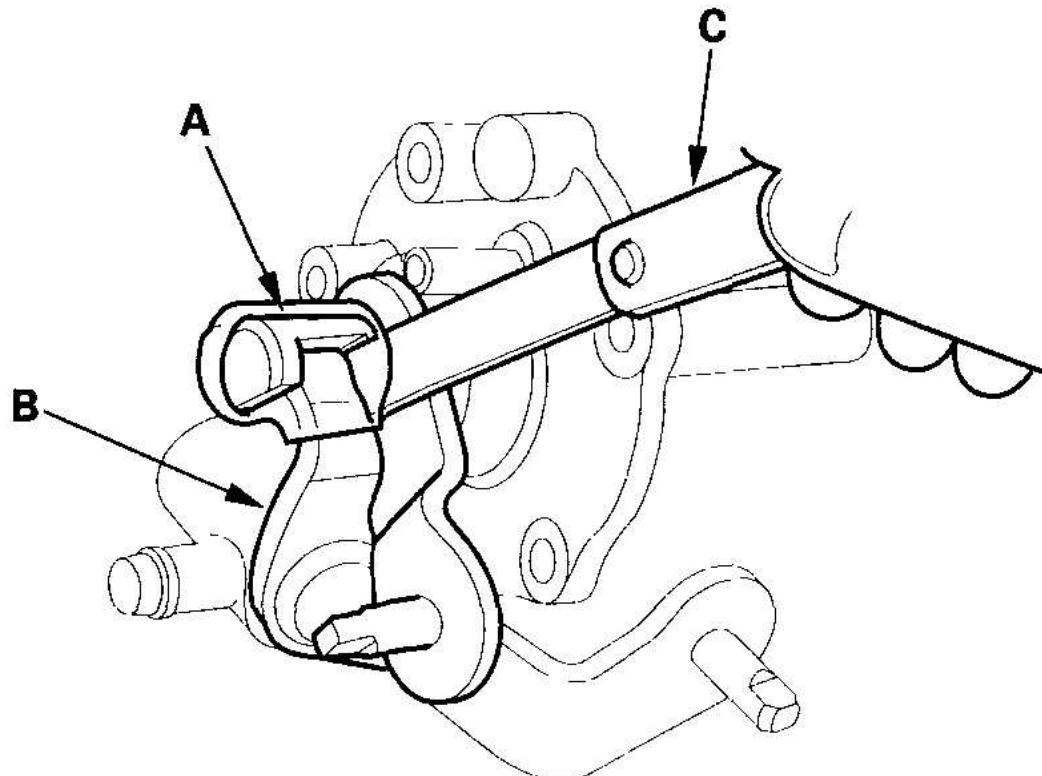
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CHANGE LEVER CLEARANCE INSPECTION

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

Standard: 0.05-0.40 mm (0.002-0.016 in.)

Service Limit: 0.6 mm (0.024 in.)

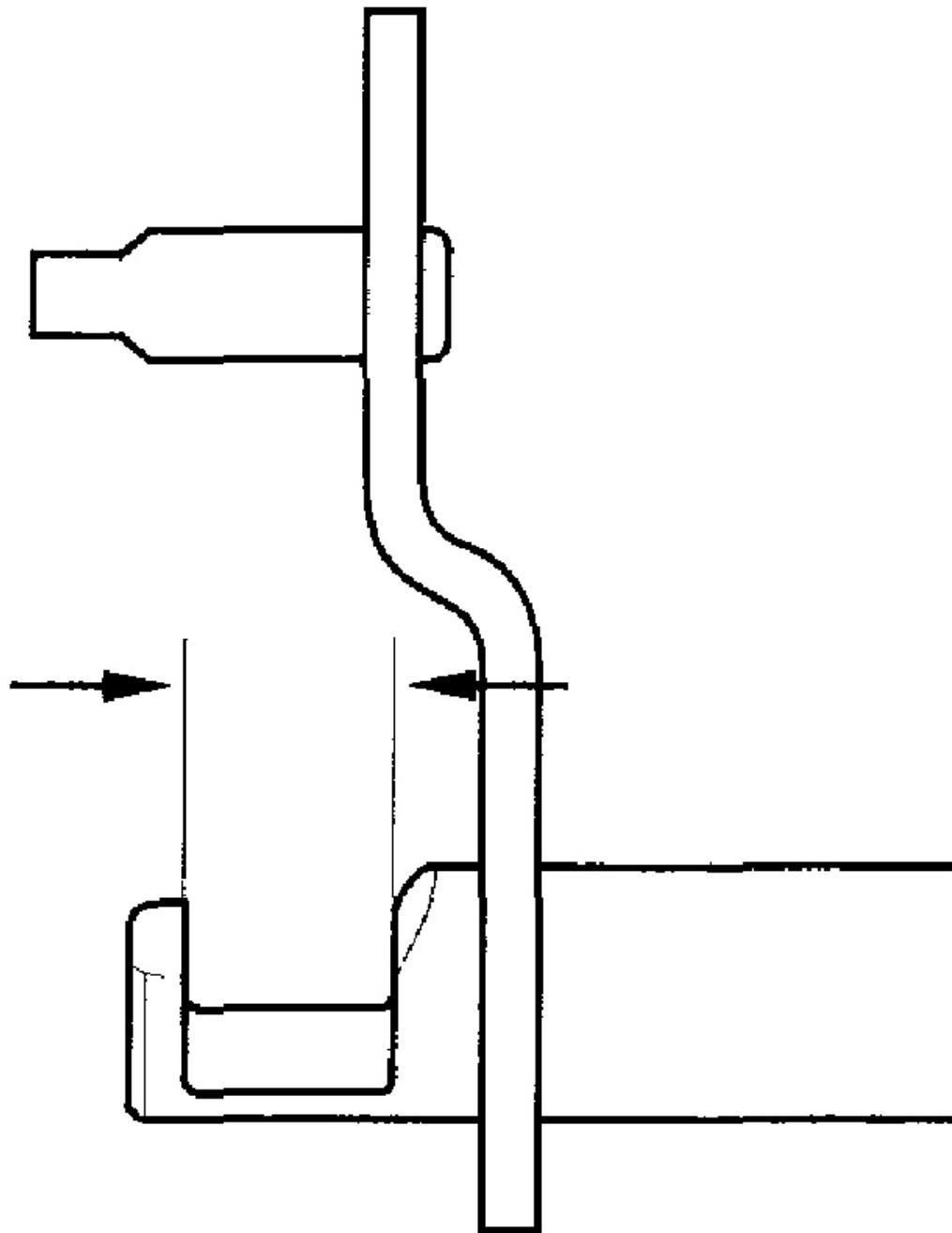


G03681600

Fig. 52: 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: 15.00-15.15 mm (0.591-0.596 in.)



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Fig. 53: Measuring Groove Of Change Lever

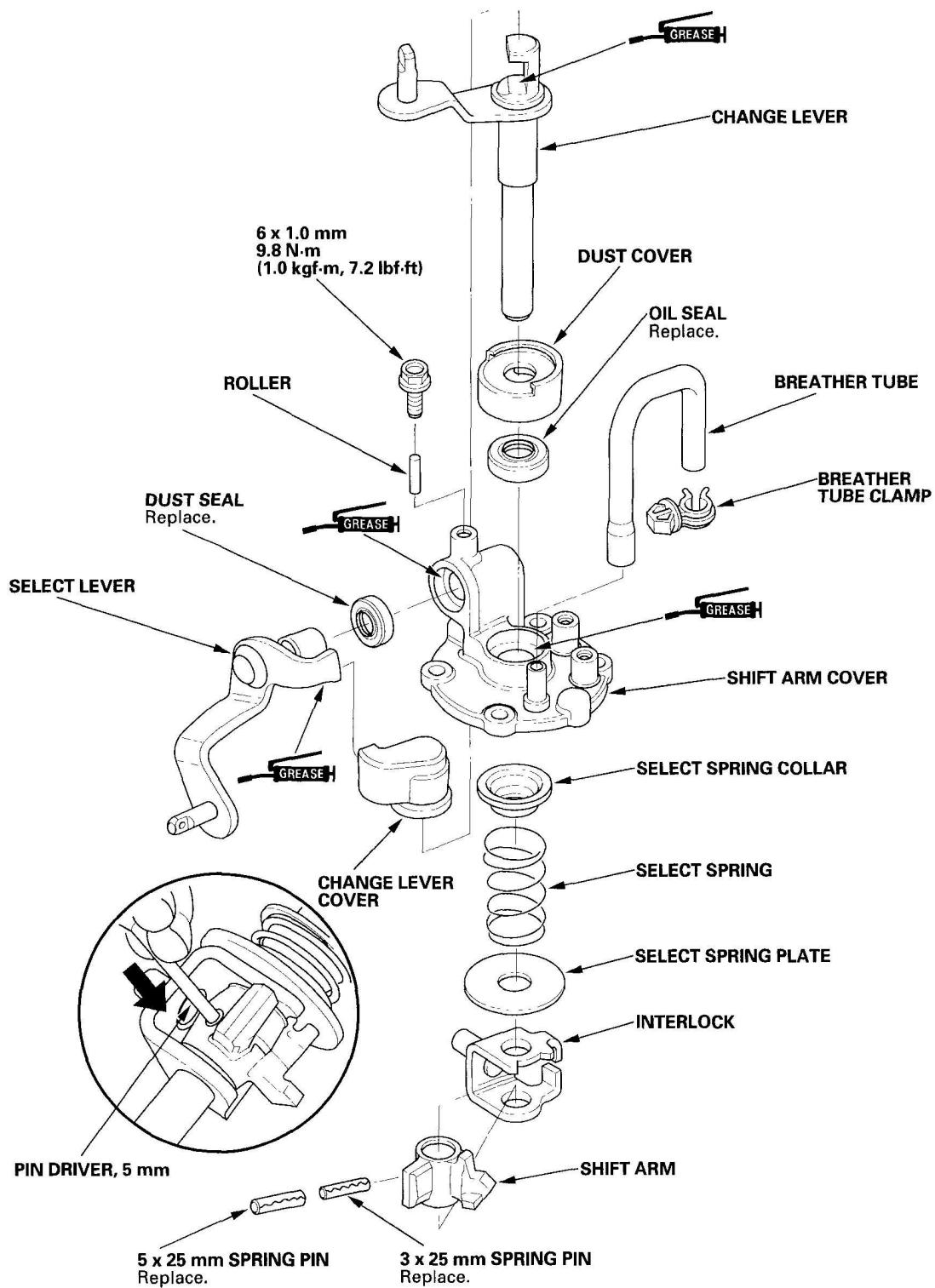
Courtesy of AMERICAN HONDA MOTOR CO., INC.

CHANGE LEVER ASSEMBLY DISASSEMBLY/REASSEMBLY

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

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Fig. 54: Exploded View And Torque Specifications Of Change Lever Assembly

Courtesy of AMERICAN HONDA MOTOR CO., INC.

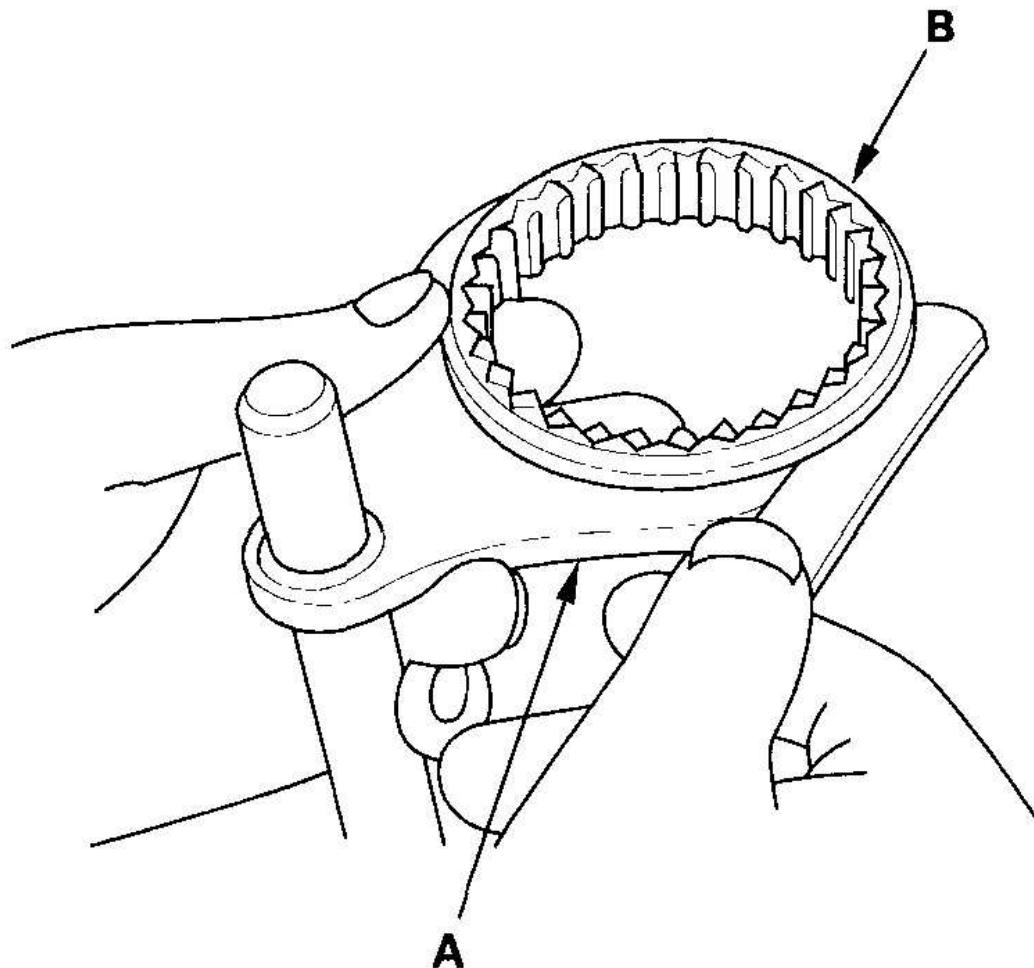
SHIFT FORK CLEARANCE INSPECTION

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: 1.00 mm (0.039 in.)



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Fig. 55: Measuring Clearance Between Each Shift Fork And Its Matching Synchro Sleeve

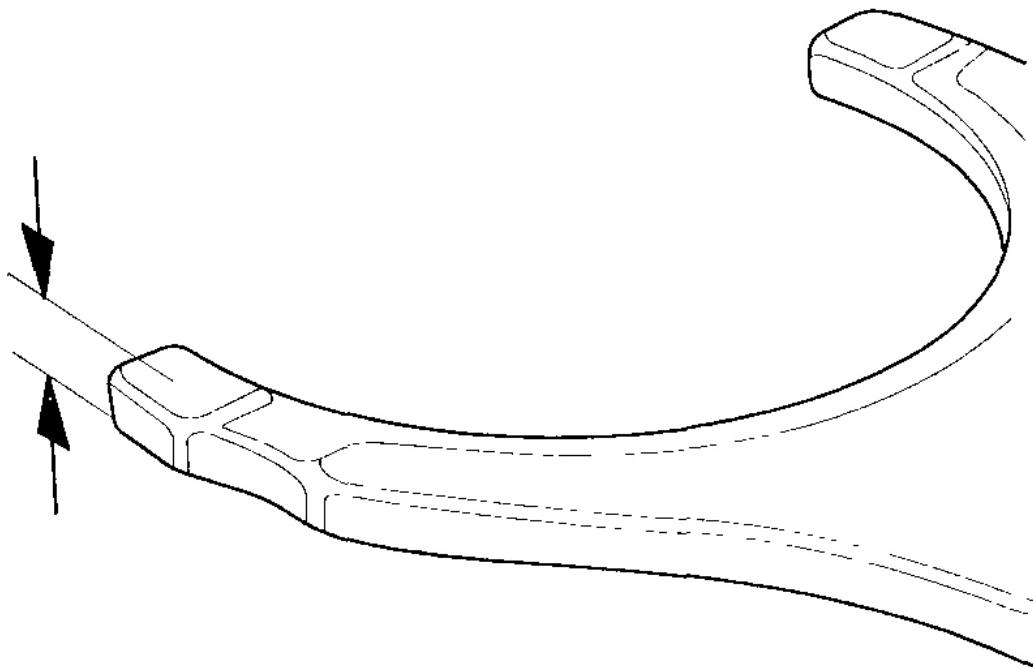
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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:

3rd/4th, 5th shift forks: 6.2-6.4 mm (0.24-0.25 in.)

1st/2nd shift fork: 6.7-6.9 mm (0.26-0.27 in.)



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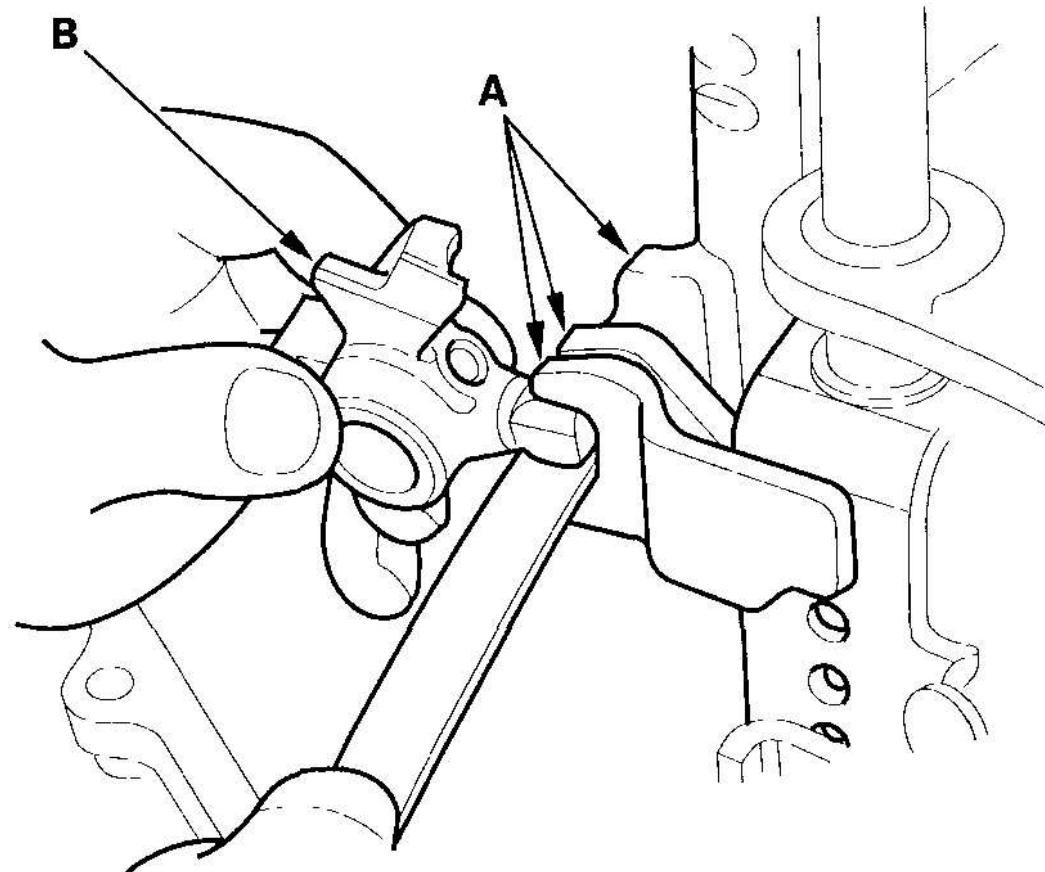
Fig. 56: Measuring Thickness Of Shift Fork Fingers

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: 0.62 mm (0.024 in.)

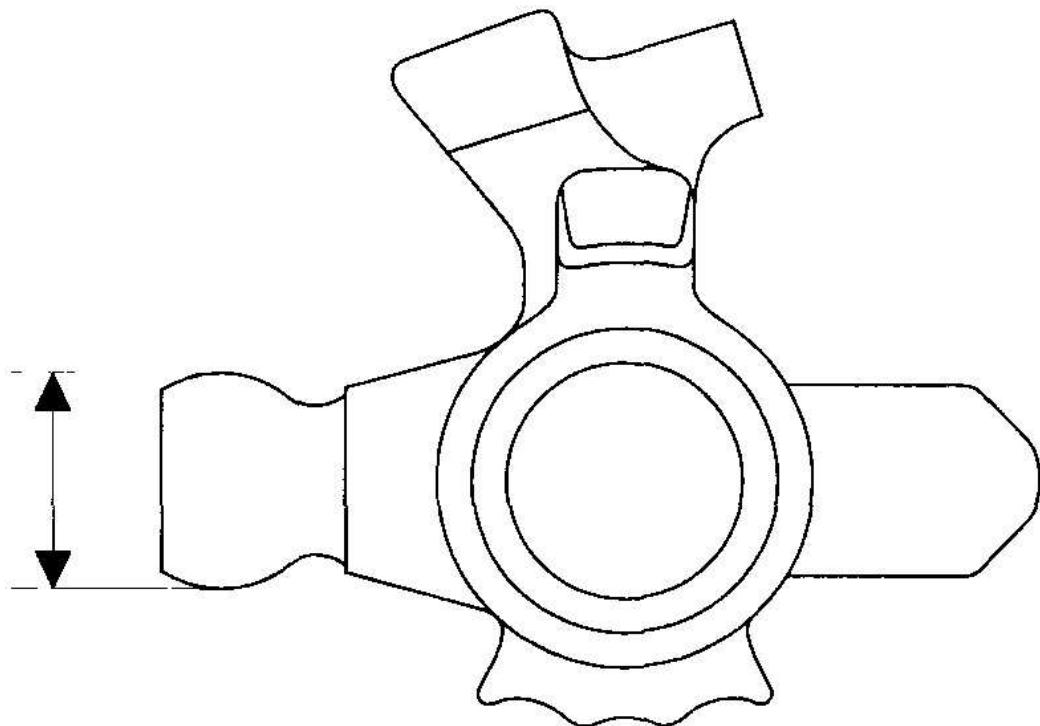


G03681605

Fig. 57: 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 shift piece.

Standard: 12.9-13.0 mm (0.508-0.512 in.)



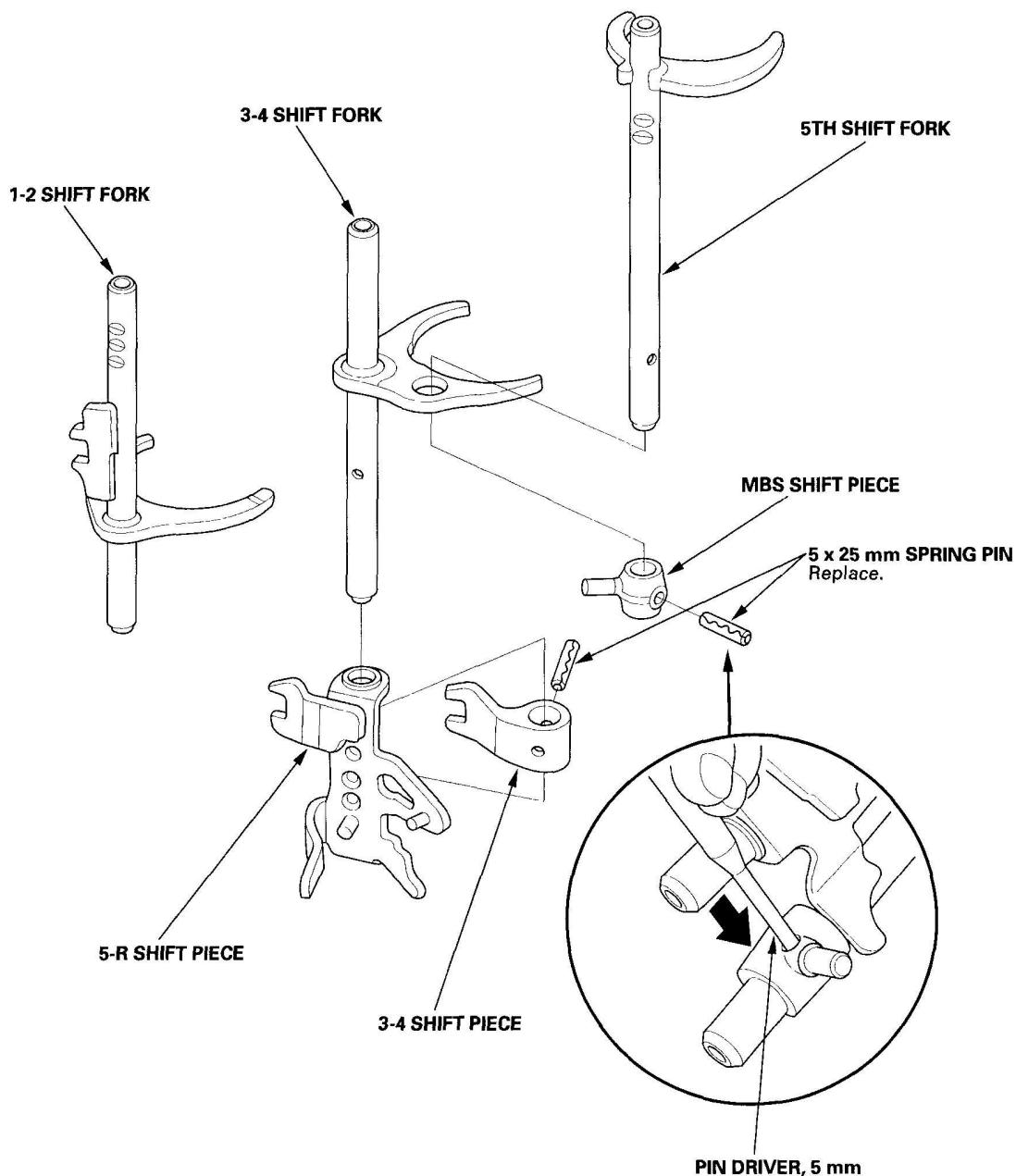
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Fig. 58: Measuring Width Of Shift Arm

Courtesy of AMERICAN HONDA MOTOR CO., INC.

SHIFT FORK DISASSEMBLY/REASSEMBLY

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



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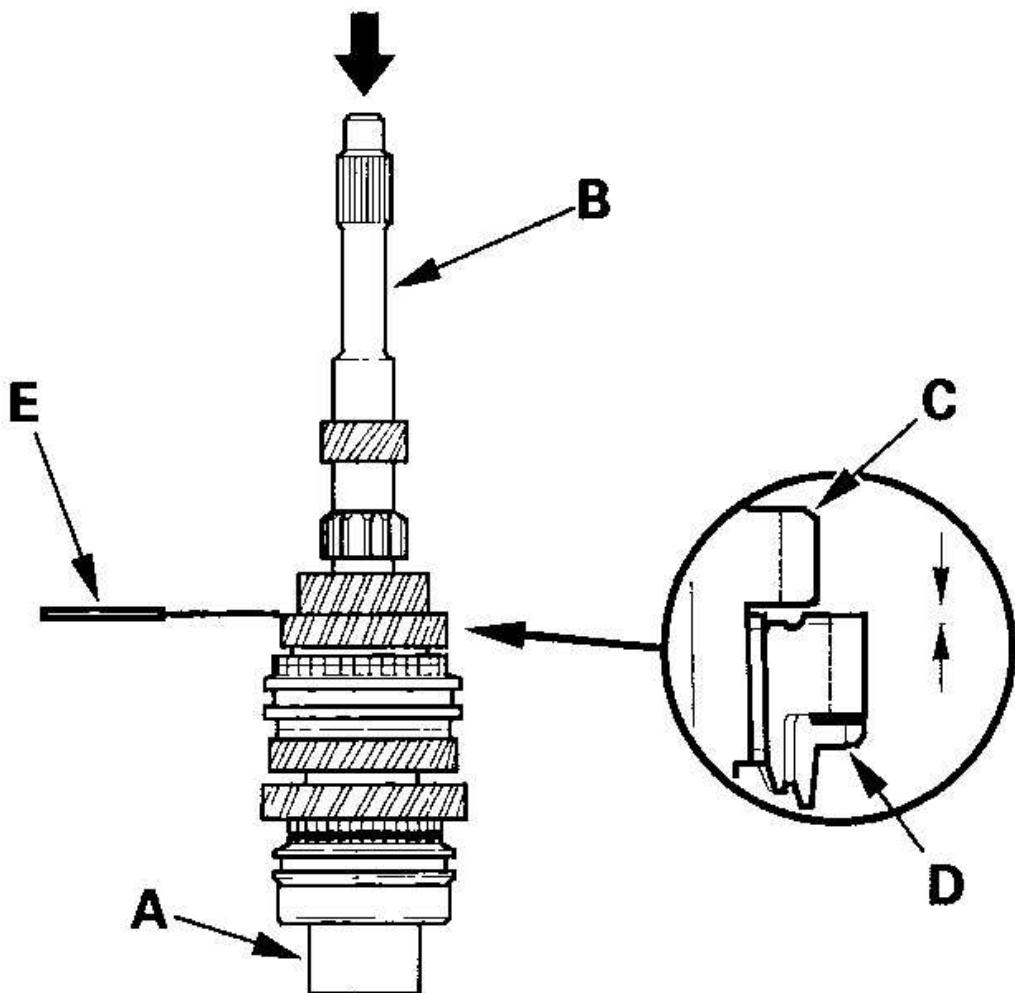
Fig. 59: Disassembly/Reassembly Of Shift Fork
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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).



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Fig. 60: Installing Bearing Inner Race On Mainshaft
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: 0.06-0.21 mm (0.002-0.008 in.)

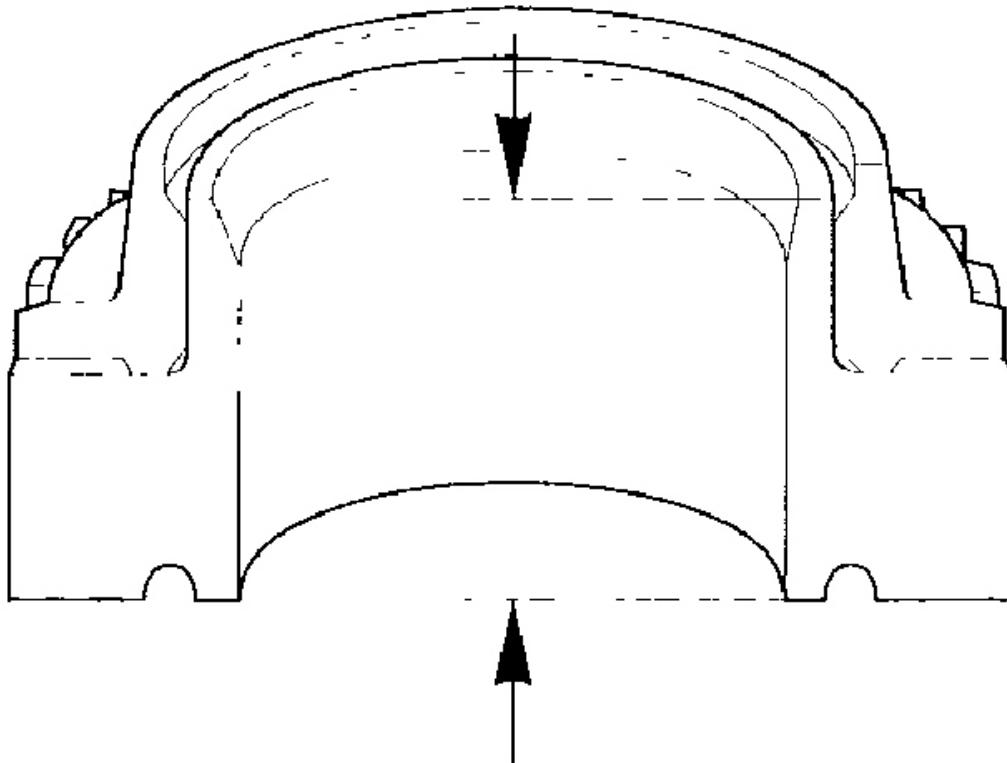
Service Limit: 0.33 mm (0.01 in.)

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

Service Limit: 27.85 mm (1.096 in.)



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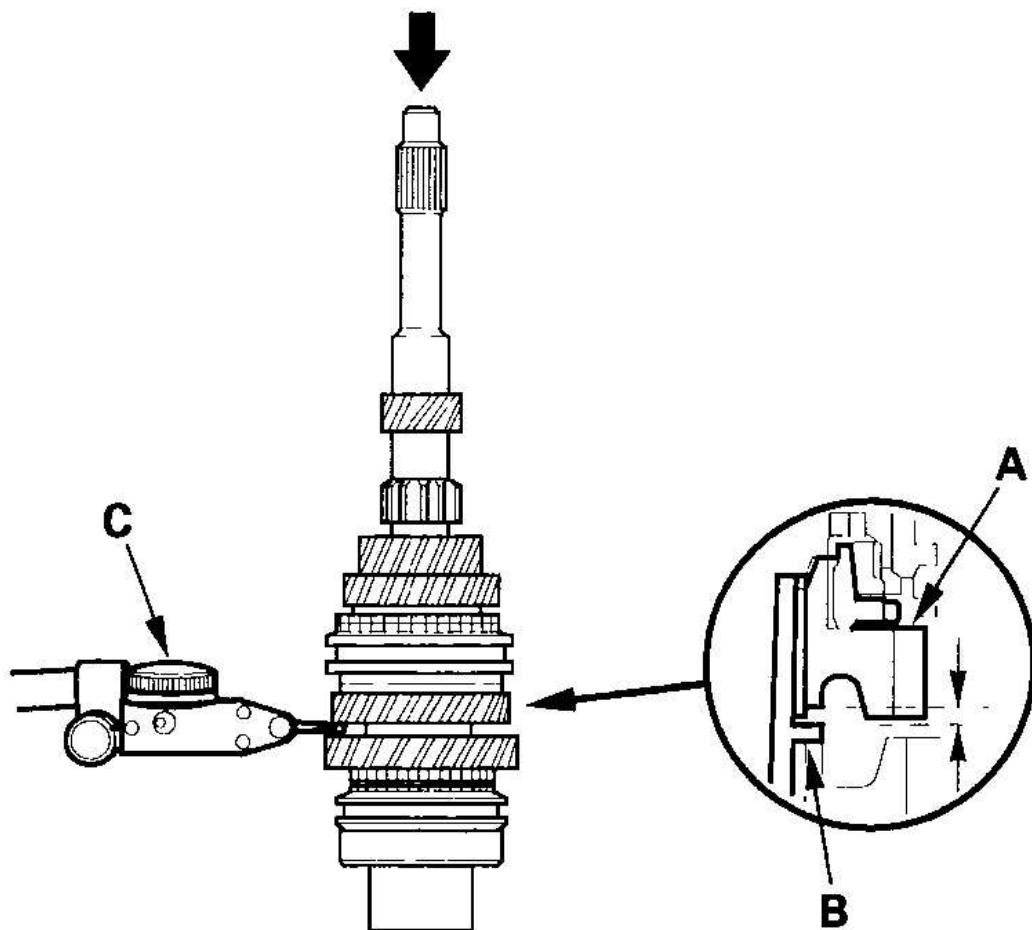
Fig. 61: Measuring Thickness Of 3RD Gear

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: 0.06-0.19 mm (0.002-0.007 in.)

Service Limit: 0.31 mm (0.01 in.)



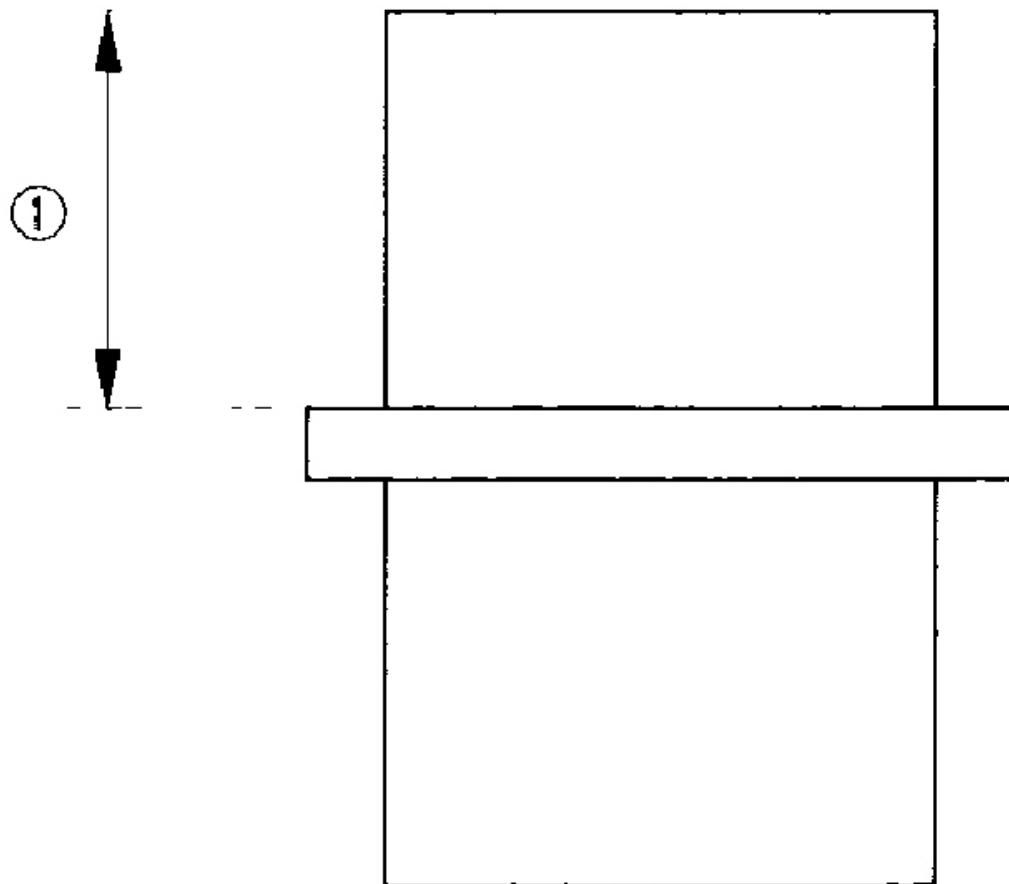
G03681610

Fig. 62: Measuring Clearance Between 4TH Gear And Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Measure distance (1) on the distance collar.
 - If distance (1) is less than the service limit, replace the distance collar.
 - If distance (1) is within the service limit, go to step 6.

Standard: 24.03-24.06 mm (0.946-0.947 in.)

Service Limit: 24.01 mm (0.945 in.)



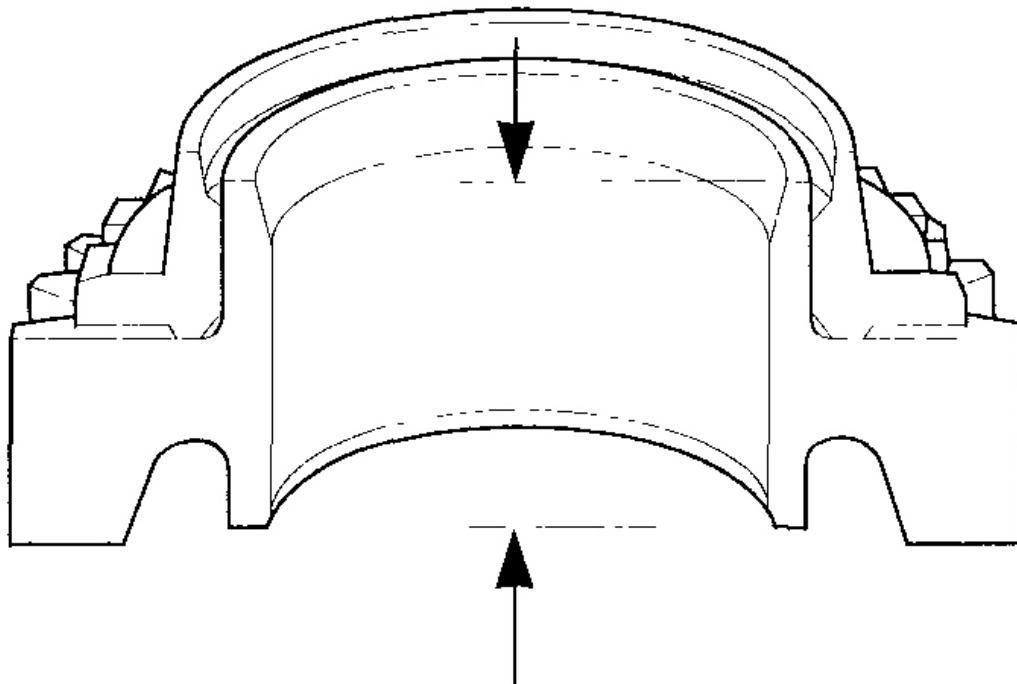
G03681611

Fig. 63: Measuring Distance On Distance Collar
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: 27.02-27.07 mm (1.064-1.066 in.)

Service Limit: 26.95 mm (1.061 in.)



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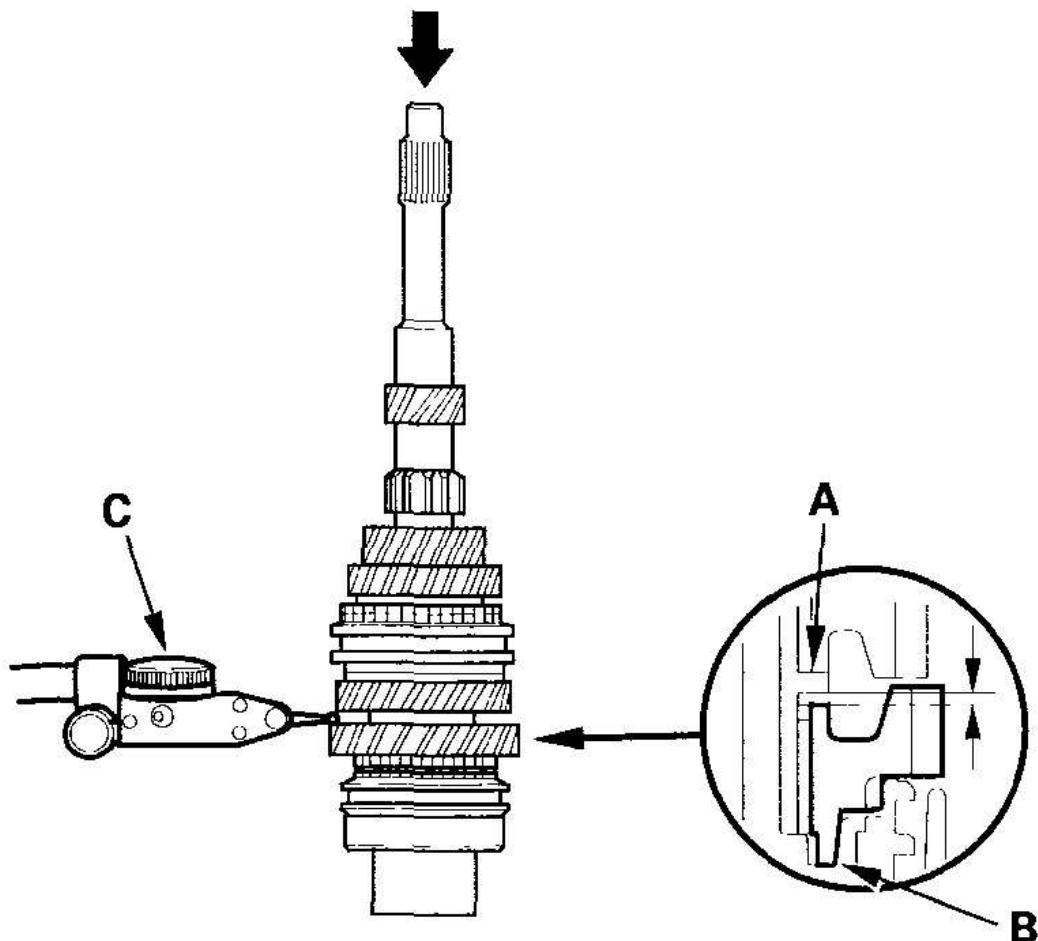
Fig. 64: Measuring Thickness Of 4TH Gear

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: 0.06-0.19 mm (0.002-0.007 in.)

Service Limit: 0.31 mm (0.01 in.)



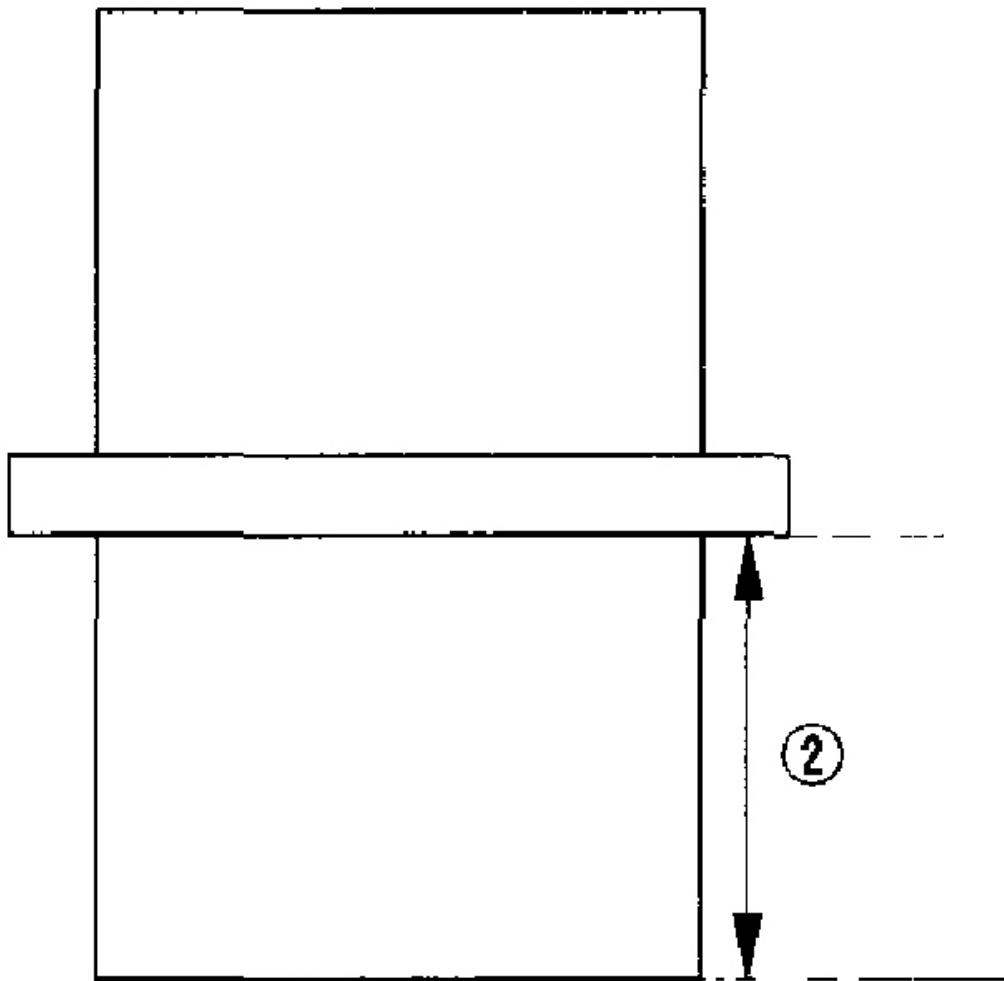
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Fig. 65: Measuring Clearance Between Distance Collar And 5TH Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Measure distance (2) on the distance collar.
 - If distance (2) is less than the service limit, replace the distance collar.
 - If distance (2) is within the service limit, go to step 9.

Standard: 24.03-24.06 mm (0.946-0.947 in.)

Service Limit: 24.01 mm (0.945 in.)



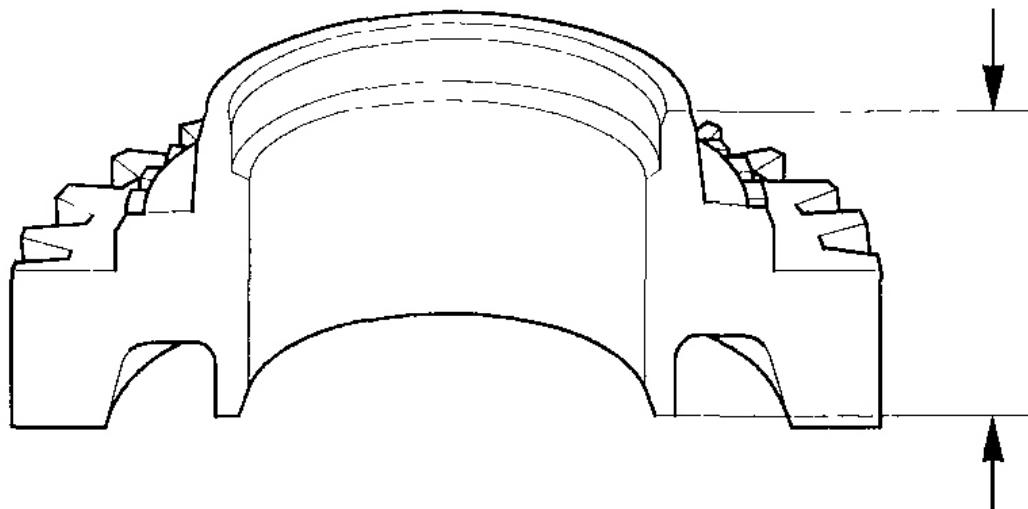
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Fig. 66: Measuring Distance On Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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: 28.92-28.97 mm (1.139-1.141 in.)

Service Limit: 28.85 mm (1.136 in.)



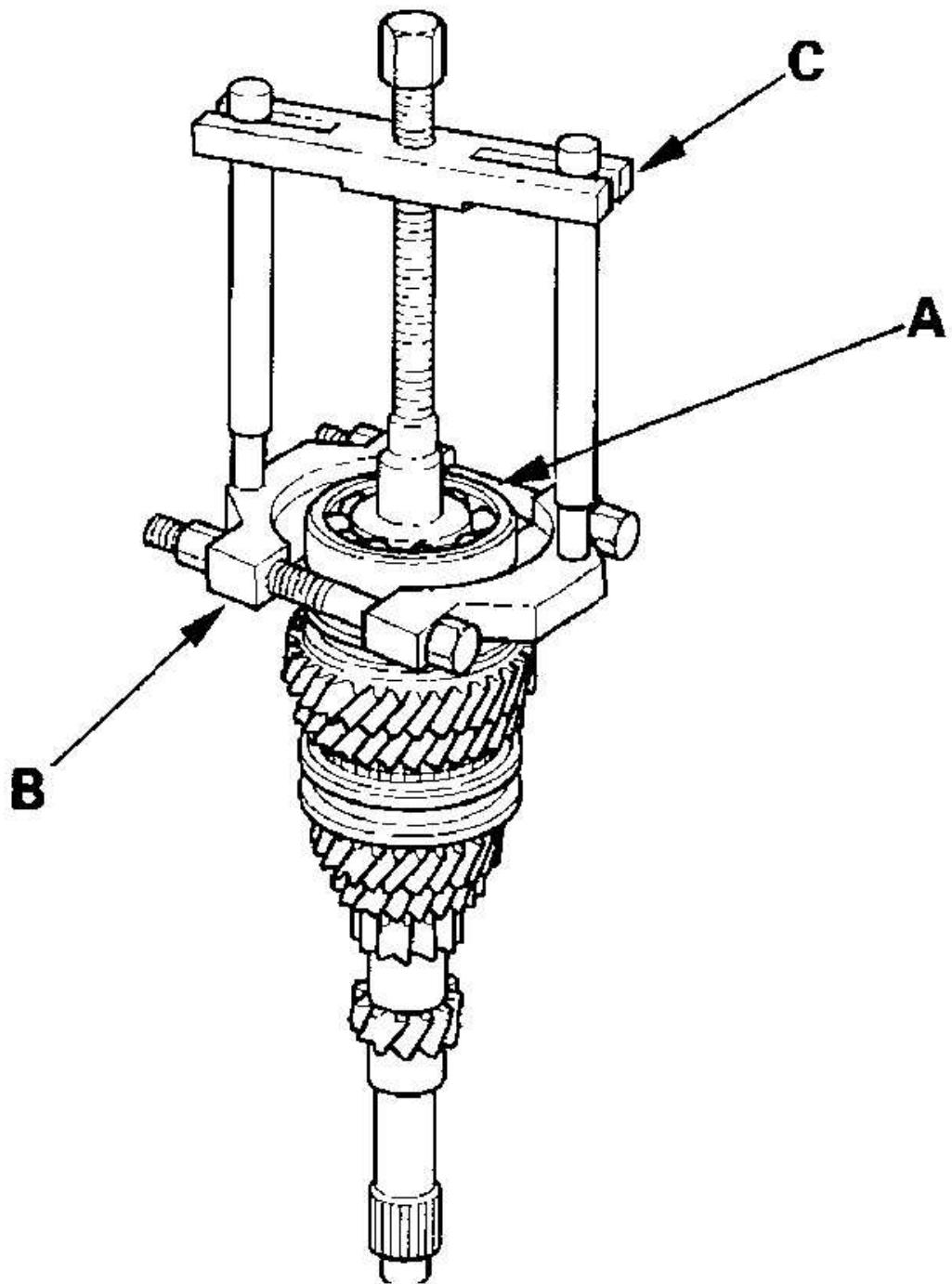
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Fig. 67: Measuring Thickness Of 5TH Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT DISASSEMBLY

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

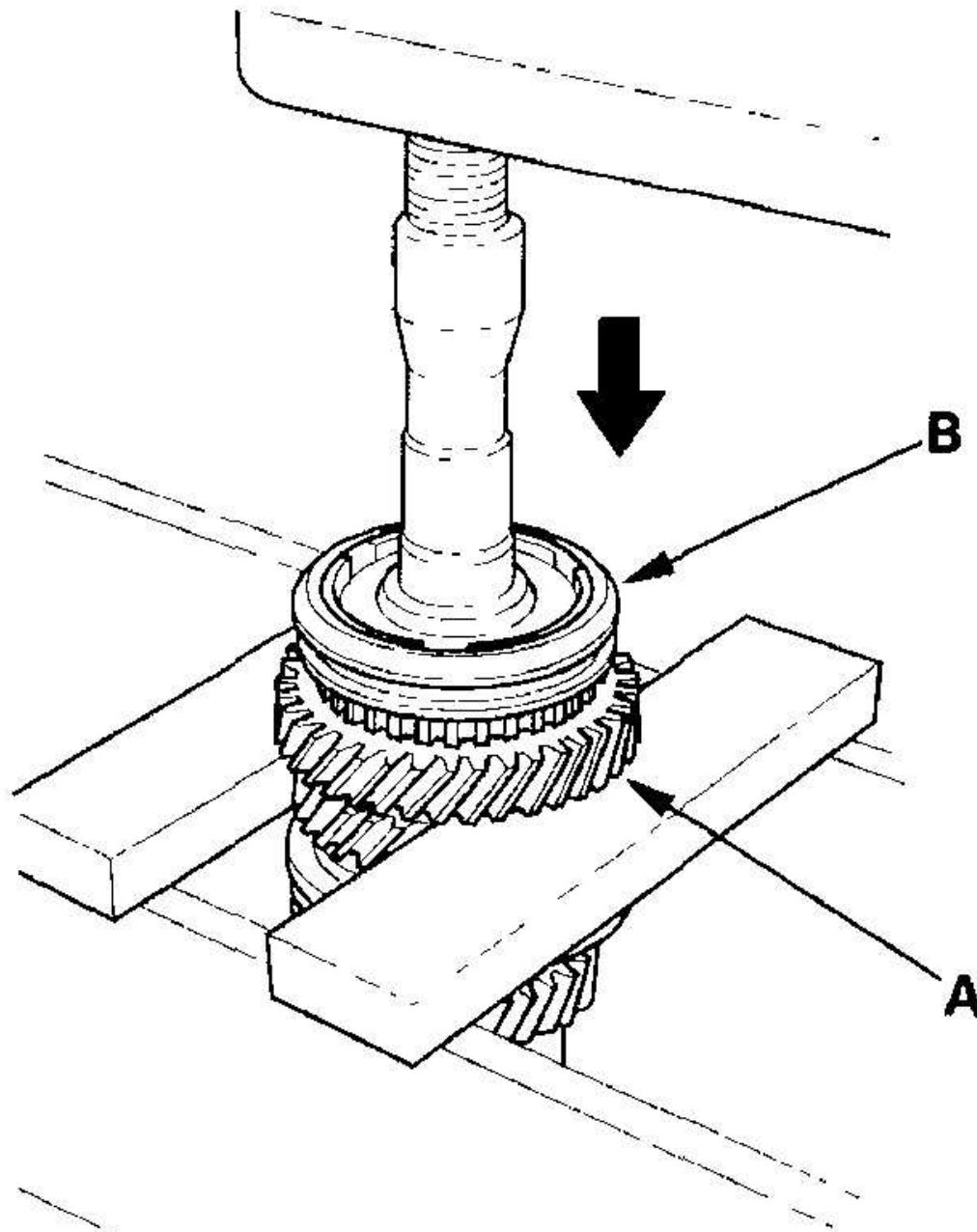


G03681616

Fig. 68: Removing Ball Bearing

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/sleeve (B), the synchro spring, the synchro ring, and the 5th gear. Use of a jaw-type puller can damage the gear teeth.



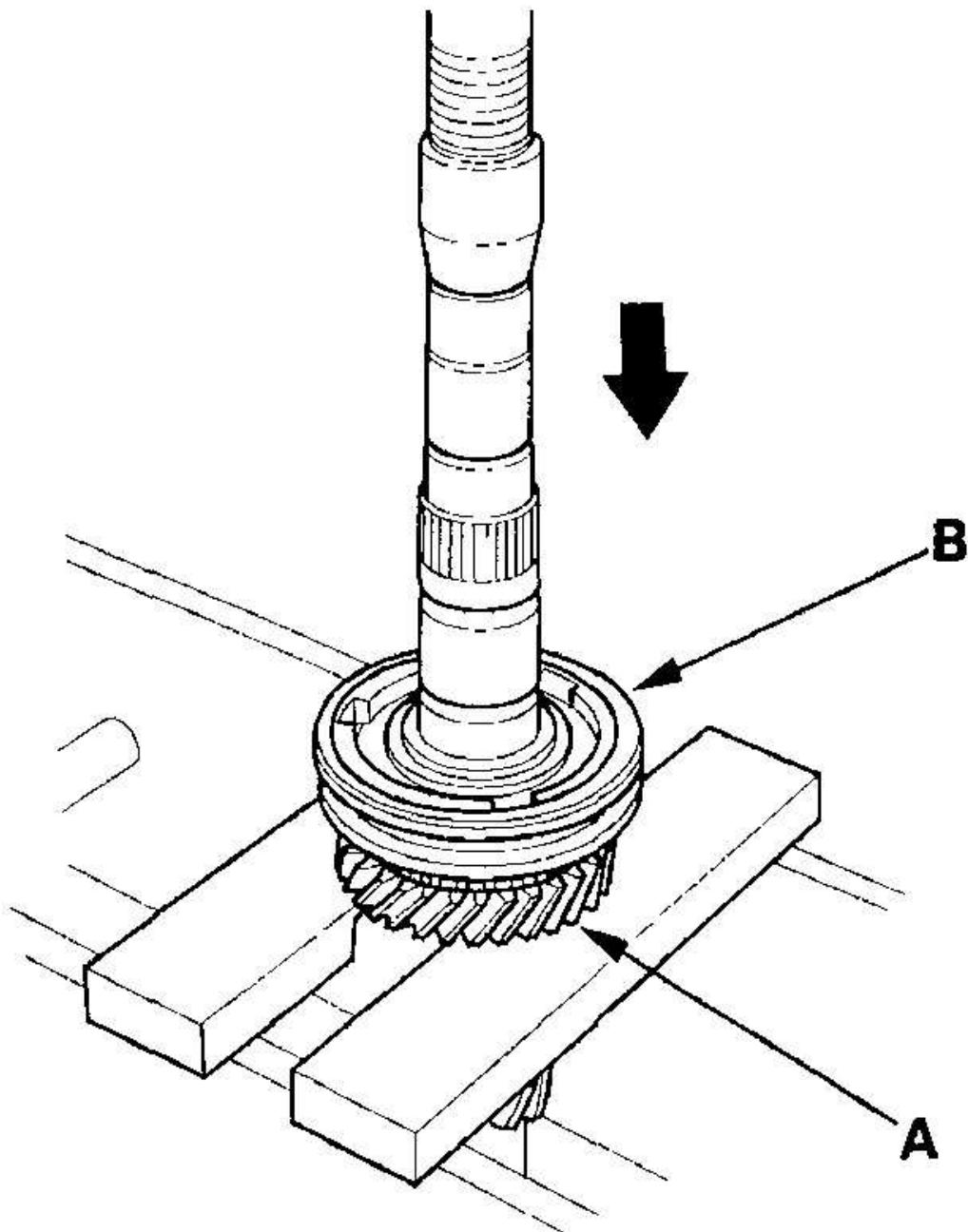
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Fig. 69: Removing Mainshaft Out Of 5TH Synchro Hub/Sleeve
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



G03681618

Fig. 70: Removing Mainshaft Out Of 3RD/4TH Synchro Hub/Sleeve

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, and D. If any part of the mainshaft is less than the service limit, replace it.

Standard:

A (Ball bearing surface): 25.987-26.000 mm

(1.0231-1.0236 in.)

B (Distance collar surface): 2000-2001 models:

28.980-28.993 mm

(1.1409-1.1415 in.)

2002-2006 models:

28.992-29.005 mm

(1.1414-1.1419 in.)

C (Needle bearing surface): 34.984-35.000 mm

(1.3773-1.3780 in.)

D (Ball bearing surface): 25.977-25.990 mm

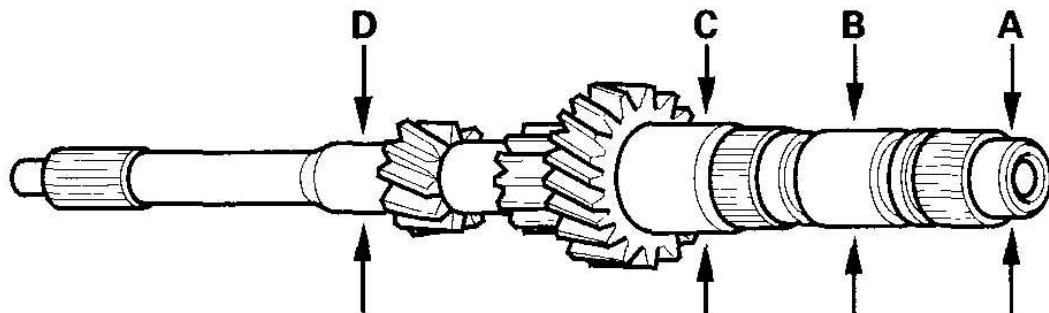
(1.0223-1.0232 in.)

Service Limit: A: 25.93 mm (1.021 in.)

B: 28.93 mm (1.139 in.)

C: 34.93 mm (1.375 in.)

D: 25.92 mm (1.020 in.)



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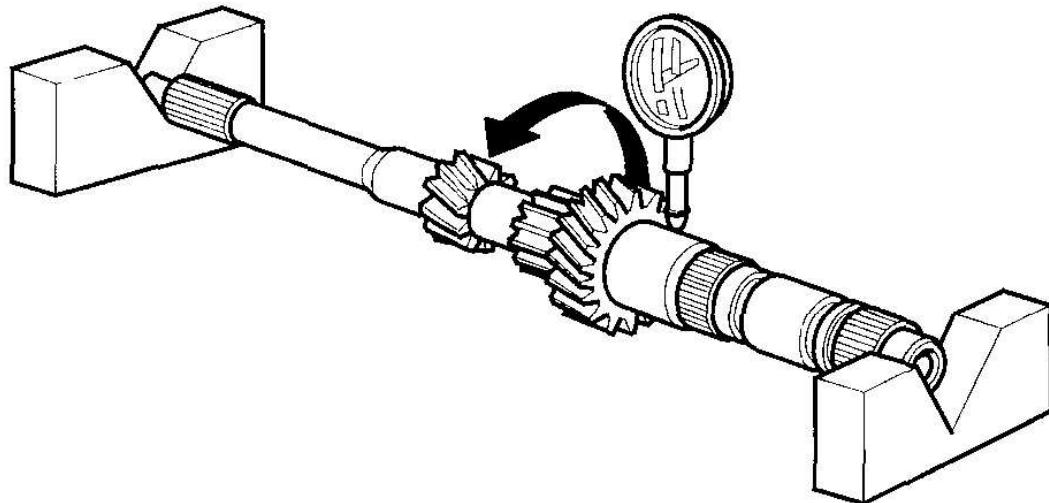
Fig. 71: Inspecting Mainshaft

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.)



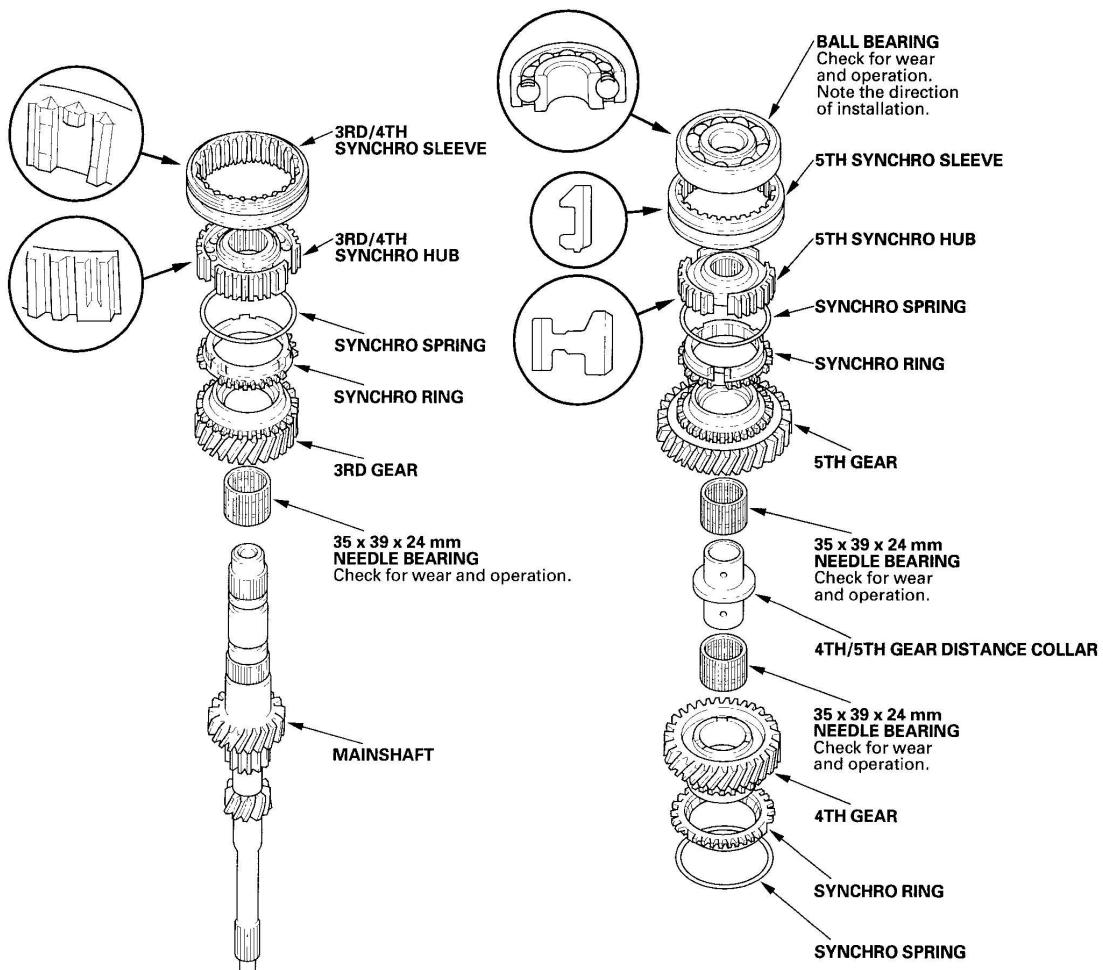
G03681620

Fig. 72: Measuring Mainshaft Runout

Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT REASSEMBLY

EXPLODED VIEW



G03681621

Fig. 73: Exploded View Of Mainshaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Special Tools Required

- Driver, 40 mm I.D. 07746-0030100
- Attachment, 30 mm I.D. 07746-0030300

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

1. Clean all the parts in solvent, dry them, and apply lubricant to all contact surfaces except the 3rd/4th and 5th synchro hubs.

2. Install 3rd gear, its bearing, and the 3rd gear synchro ring and synchro spring on the shaft.
3. Support 2nd gear (A) on steel blocks, then install the 3rd/4th synchro hubs (B) using the special tools and a press (C).

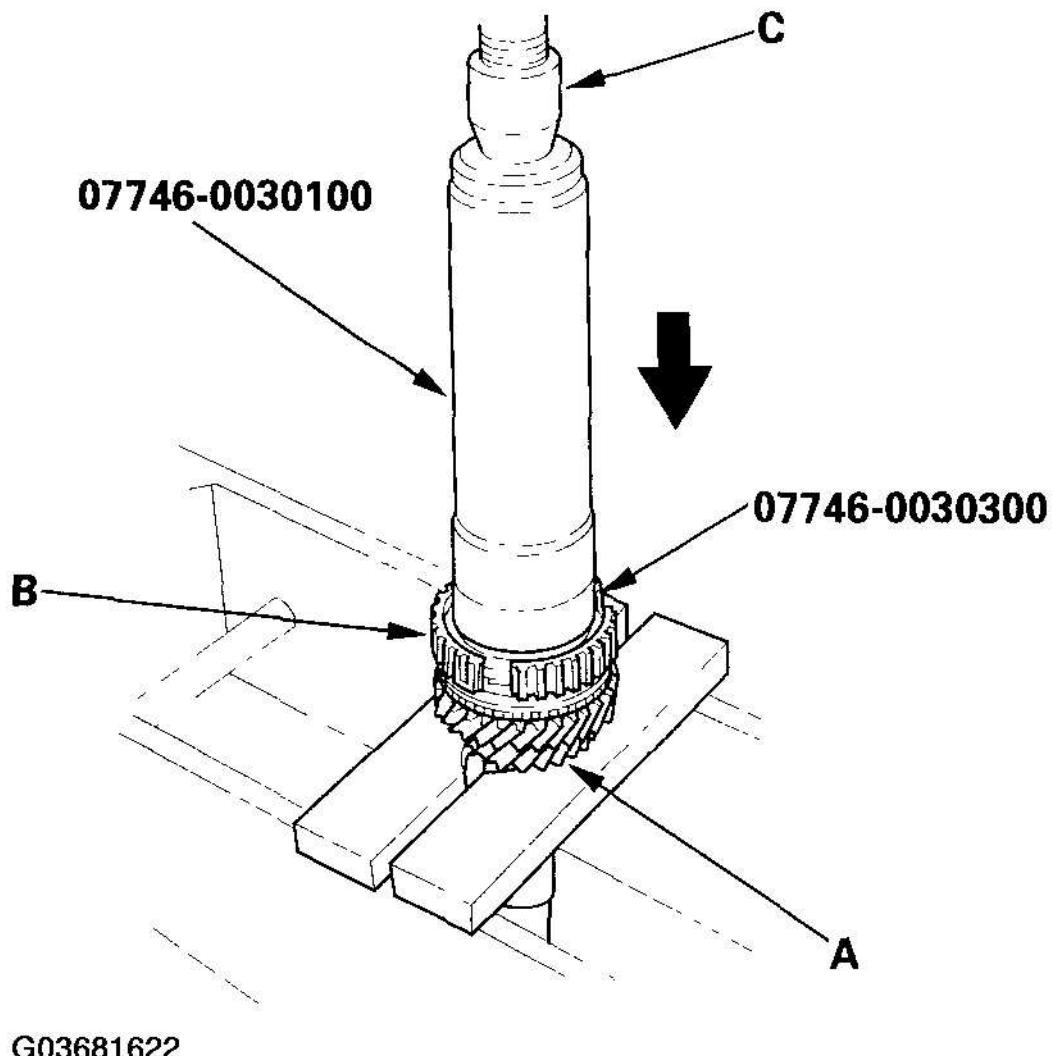
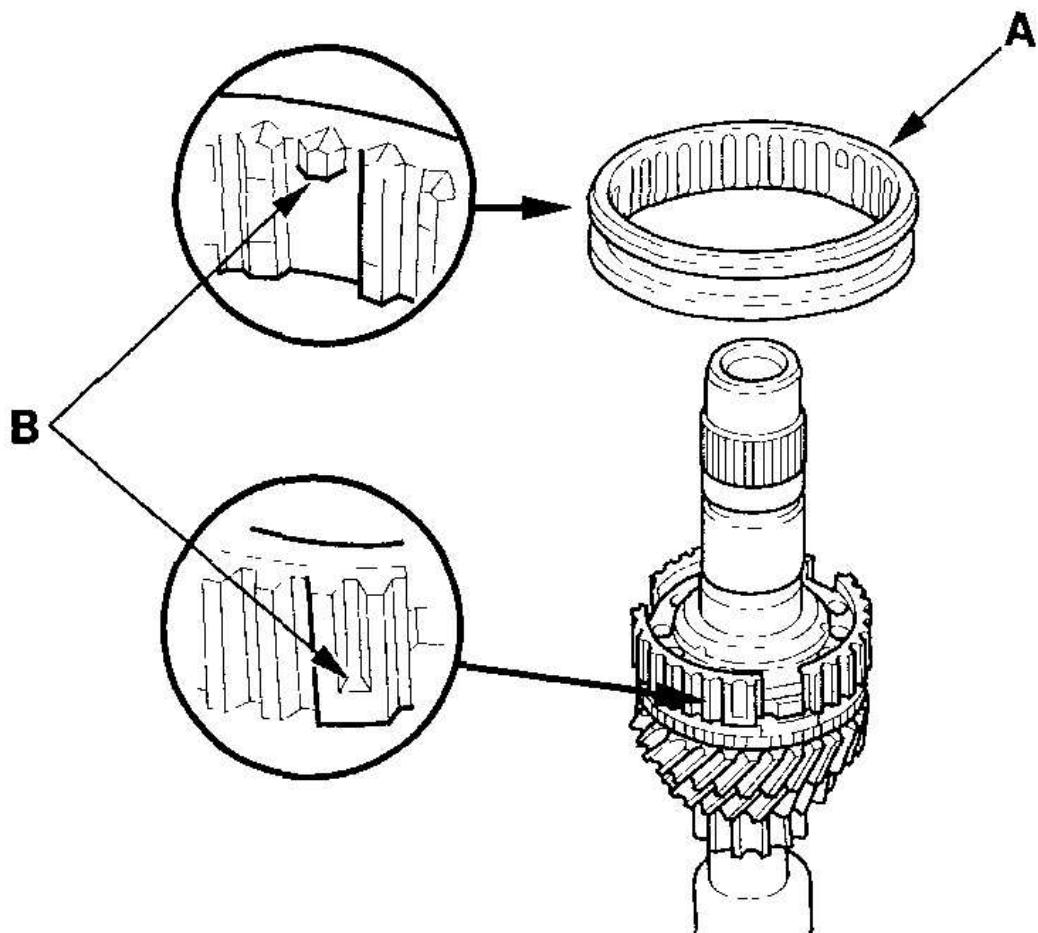


Fig. 74: Installing 3RD/4TH Synchro Hubs
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the 3rd/4th synchro sleeve (A) by aligning the stops (B) of the 3rd/4th

synchro sleeve and hub. After installing, check the operation of the 3rd/4th synchro hub set.



G03681623

Fig. 75: Installing 3RD/4TH Synchro Sleeve

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the 4th gear synchro spring and ring, 4th gear and its bearing, the distance collar, and 5th gear and its bearing on the shaft.
6. Install the 5th synchro hub (A) using the special tools and a press (B).

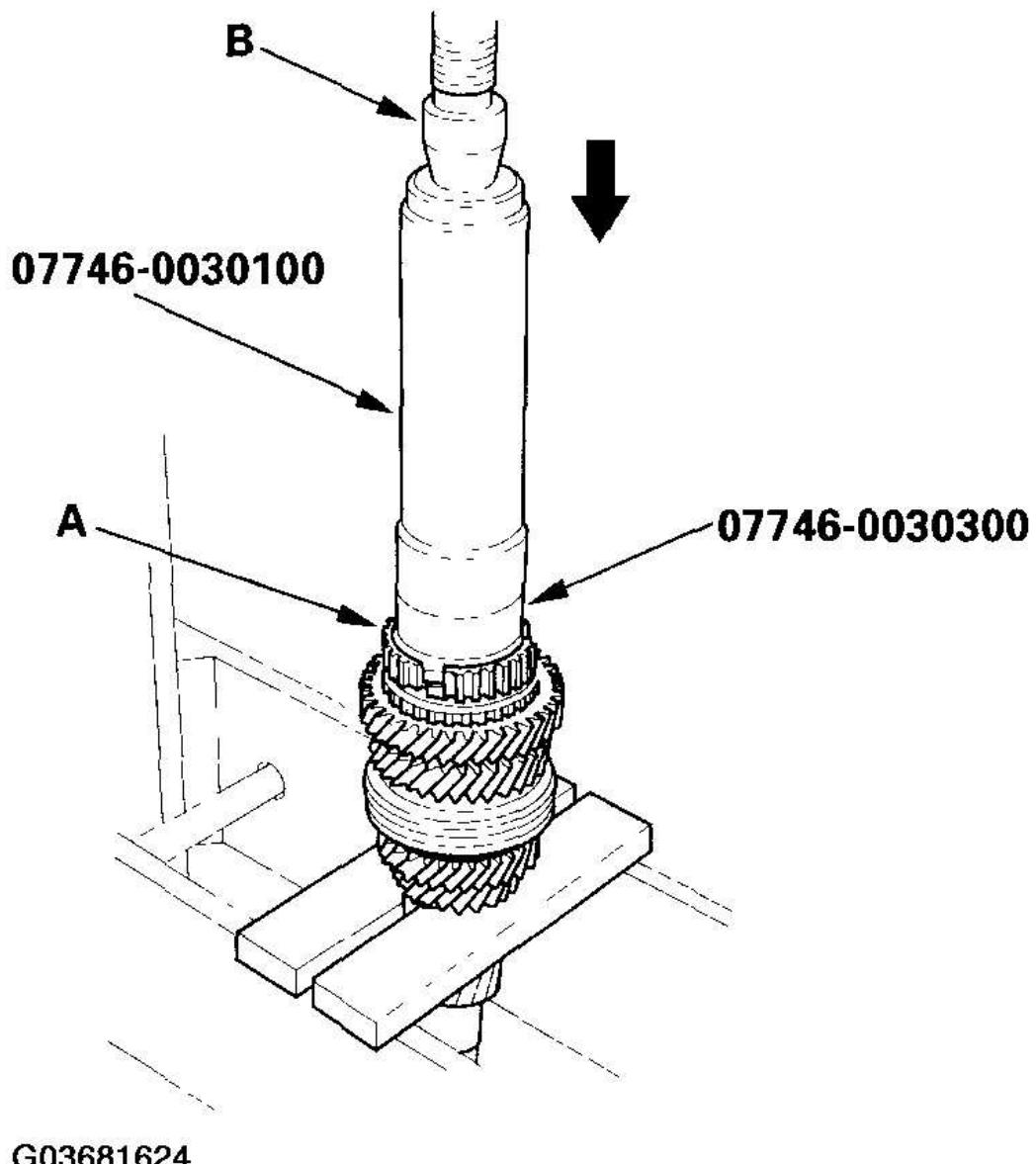


Fig. 76: Installing 5TH Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the 5th synchro sleeve.
8. Install the ball bearing (A) using the special tools and a press (B).

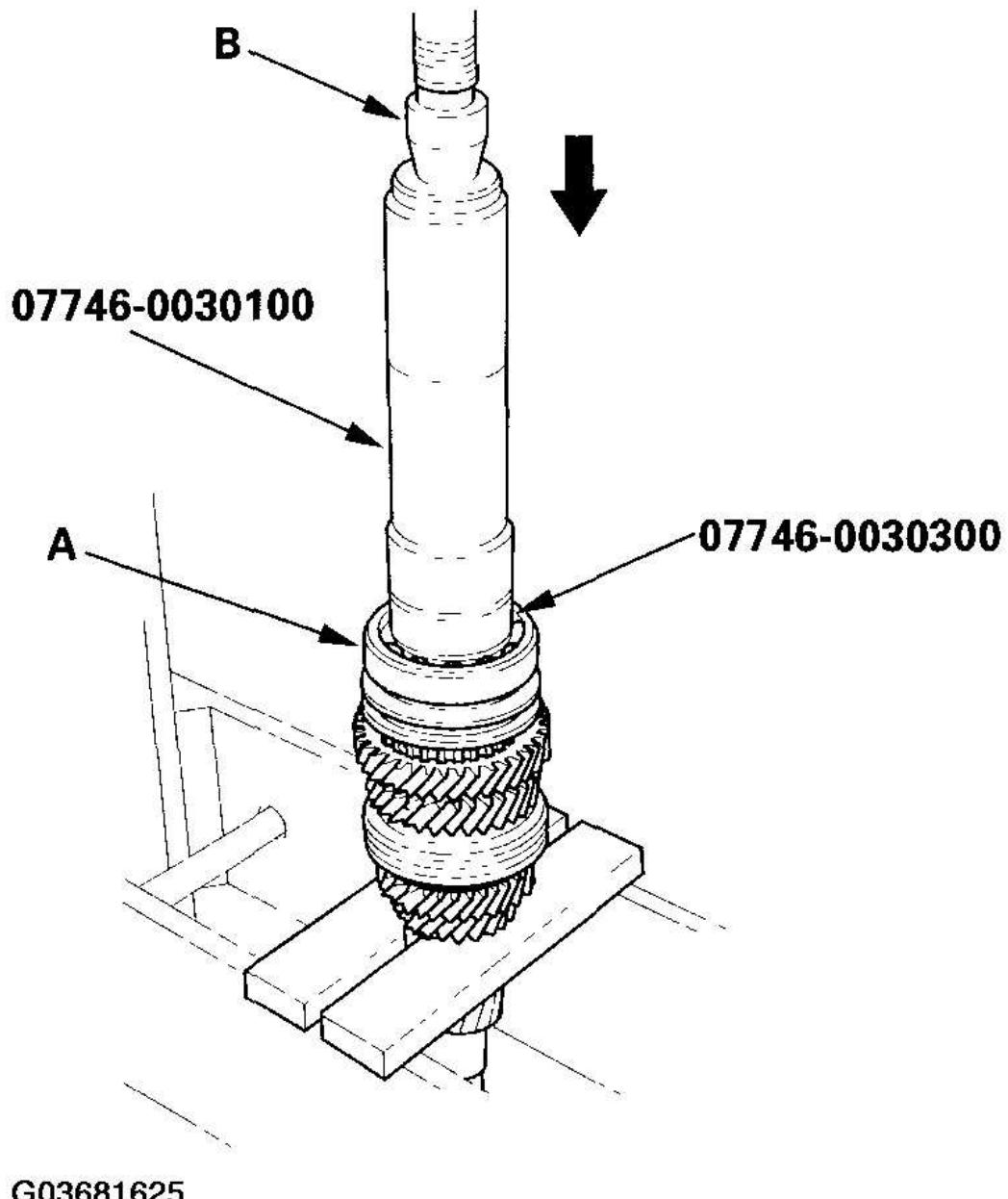


Fig. 77: Installing Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

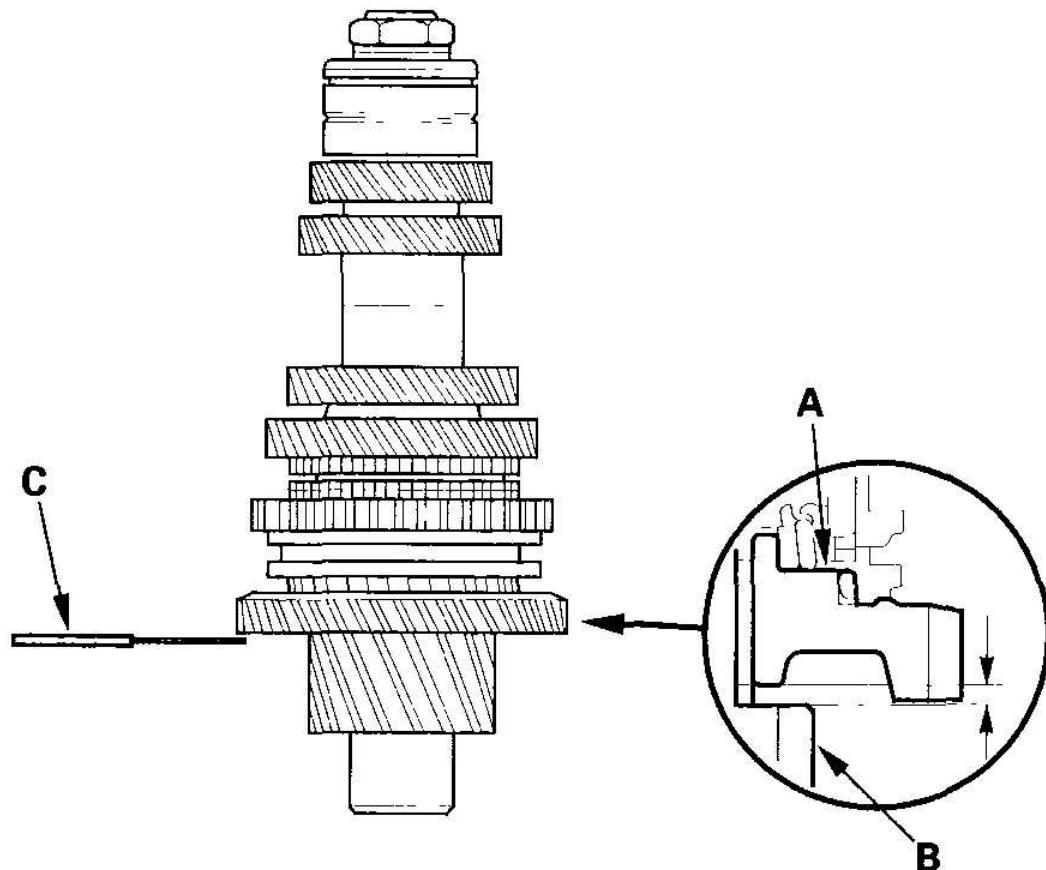
COUNTERSHAFT ASSEMBLY CLEARANCE INSPECTION

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

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

Standard: 0.03-0.10 mm (0.001-0.004 in.)

Service Limit: 0.22 mm (0.009 in.)



G03681626

Fig. 78: Measuring Clearance Between 1ST Gear And Countershaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. 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 reverse gear.

Standard: 26.91-26.94 mm (1.059-1.061 in.)

Service Limit: 26.86 mm (1.057 in.)

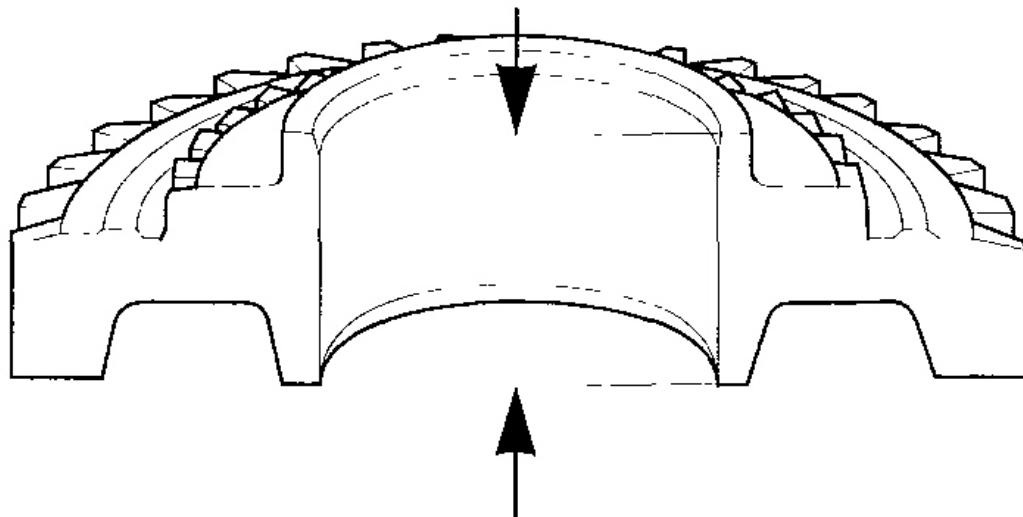


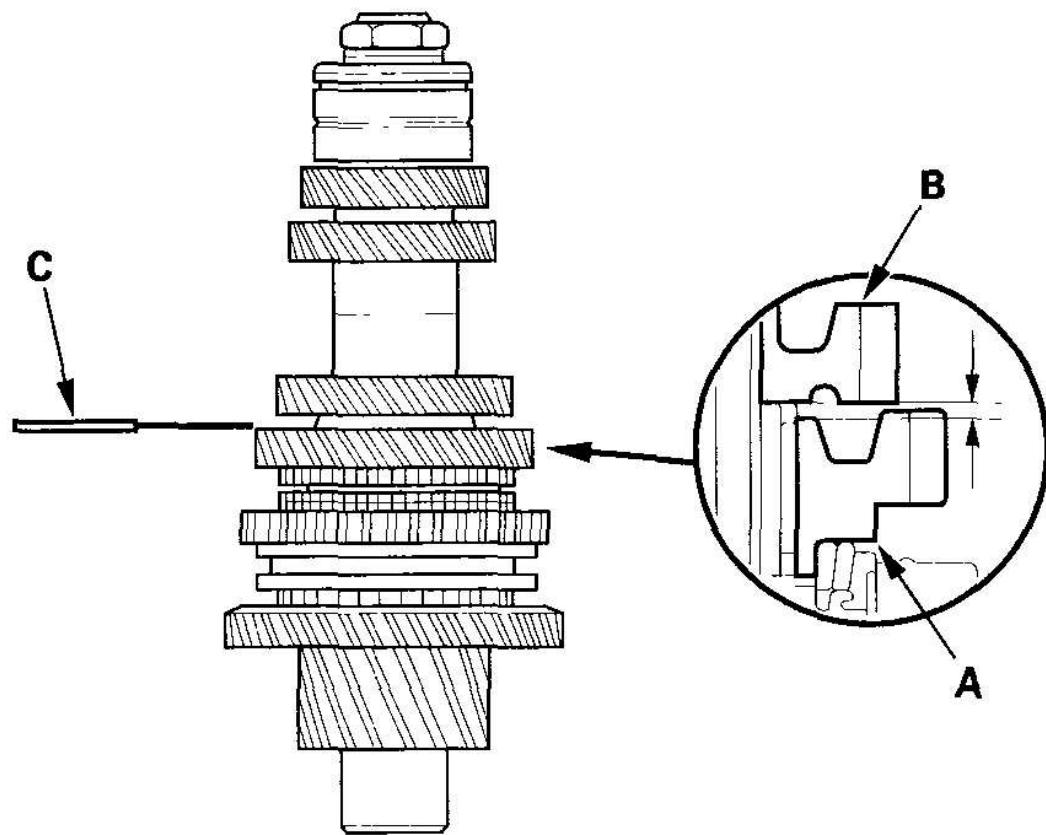
Fig. 79: Measuring Thickness Of 1ST Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. 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 4.

Standard: 0.04-0.12 mm (0.002-0.005 in.)

Service Limit: 0.24 mm (0.009 in.)



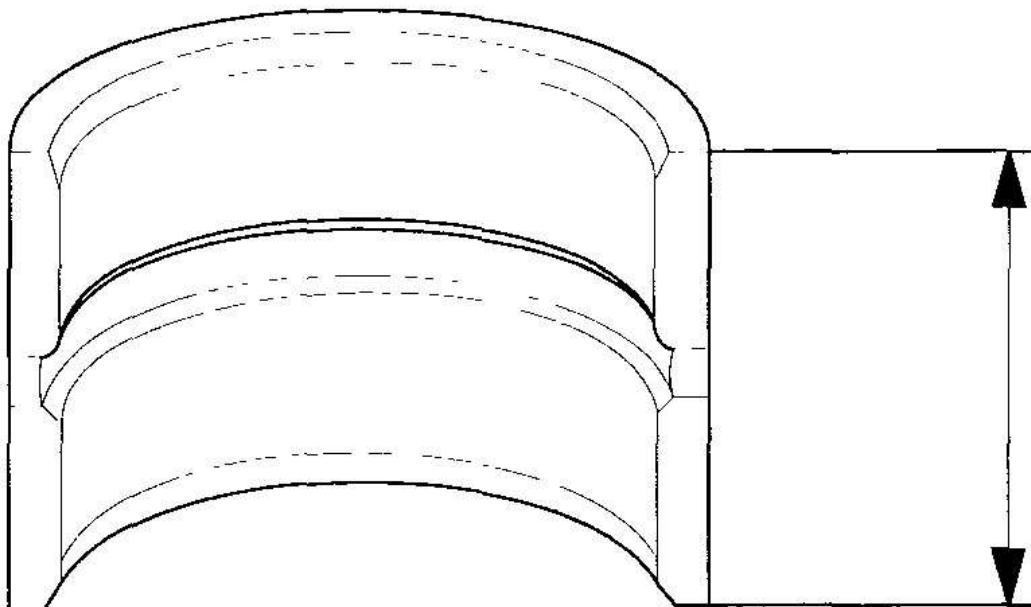
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Fig. 80: Measuring Clearance Between 2ND Gear And 3RD Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Measure the thickness of the distance collar.
 - If the thickness is less than the service limit, replace the distance collar.
 - If the thickness is within the service limit, go to step 5.

Standard: 27.53-27.56 mm (1.084-1.085 in.)

Service Limit: 27.51 mm (1.083 in.)



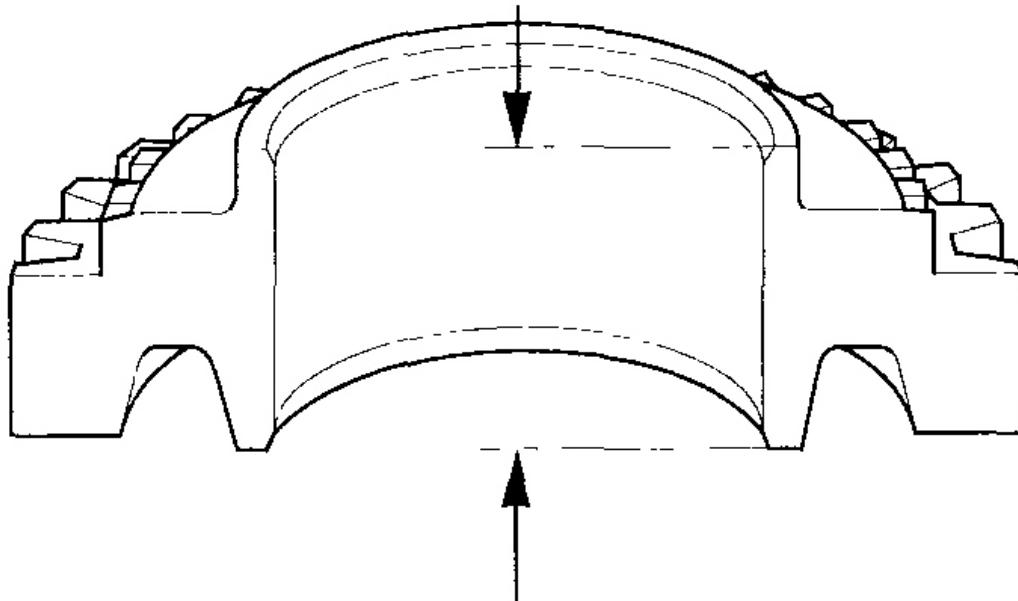
G03681629

Fig. 81: Measuring Thickness Of Distance Collar
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. 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 reverse gear.

Standard: 27.41-27.46 mm (1.079-1.081 in.)

Service Limit: 27.36 mm (1.077 in.)

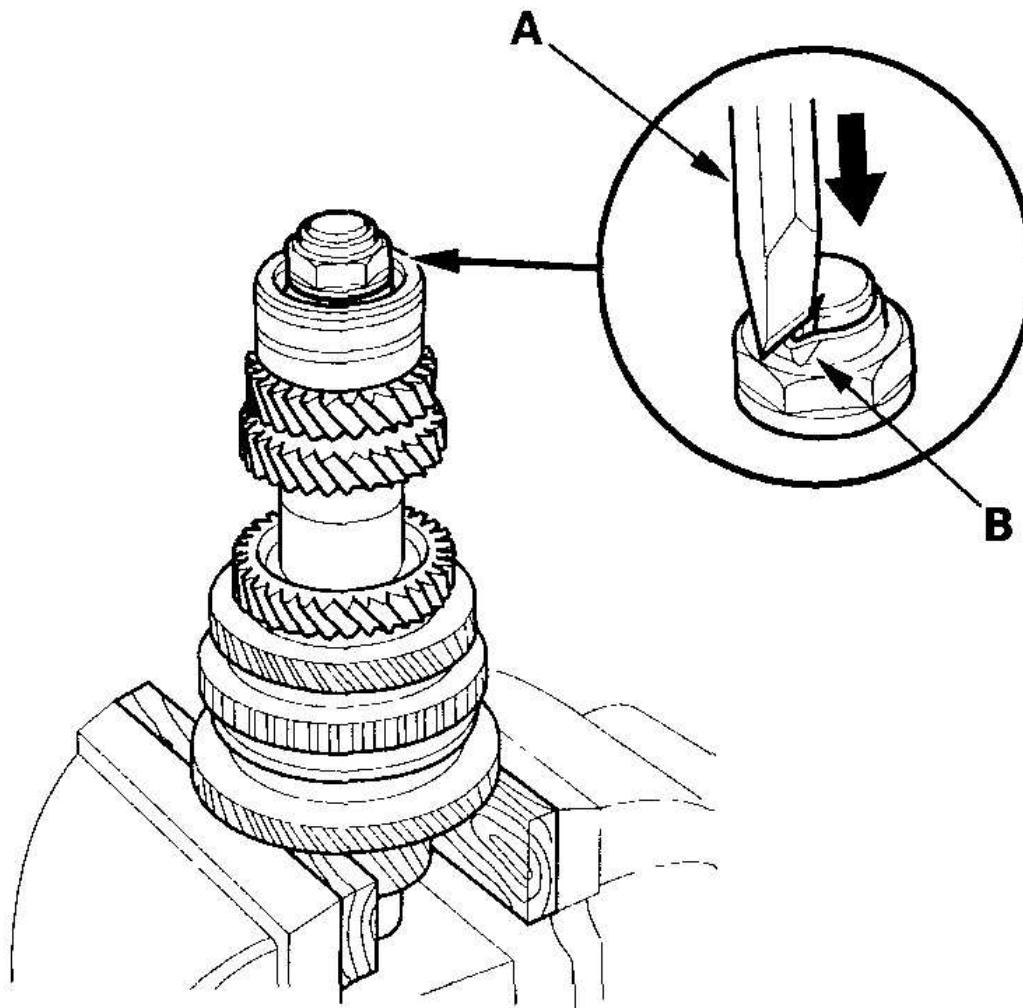


G03681630

Fig. 82: Measuring Thickness Of 2ND Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT DISASSEMBLY

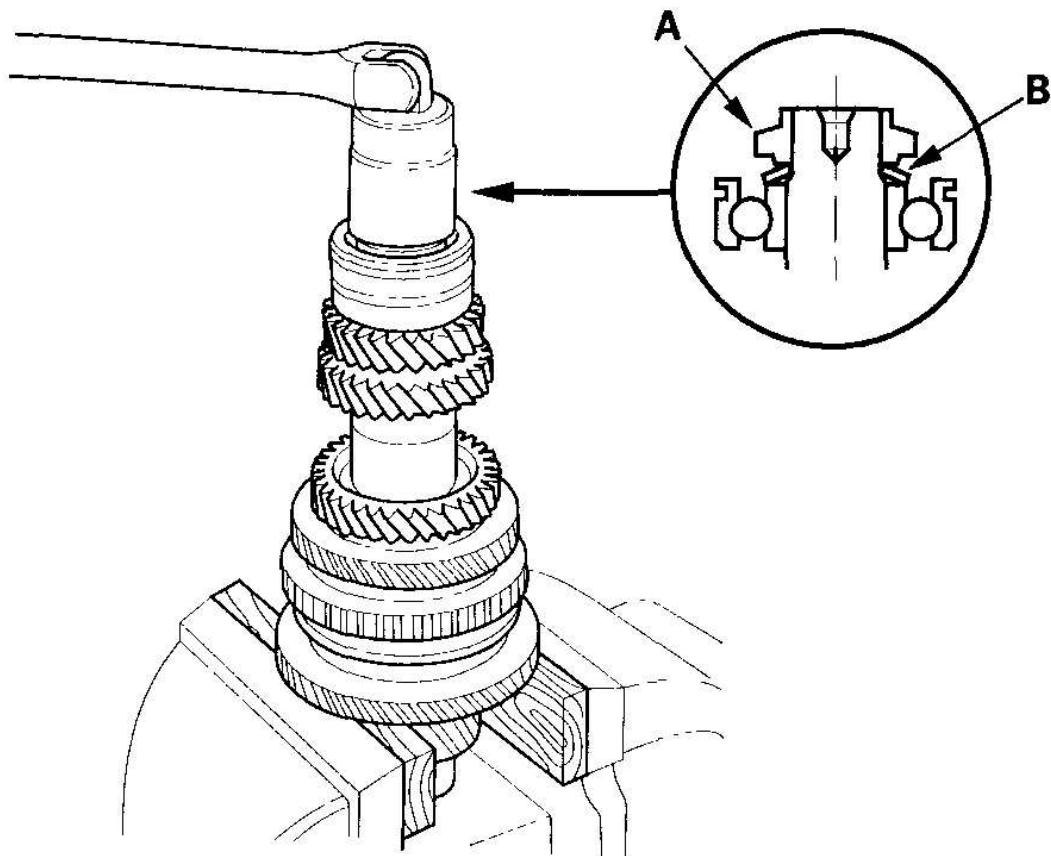
1. Securely clamp the countershaft assembly in a bench vise with wood blocks.



G03681631

Fig. 83: Raising Locknut Tab From Groove In Countershaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Use a chisel (A) to raise the locknut tab (B) from the groove in the countershaft.
3. Remove the locknut (A) and the spring washer (B).

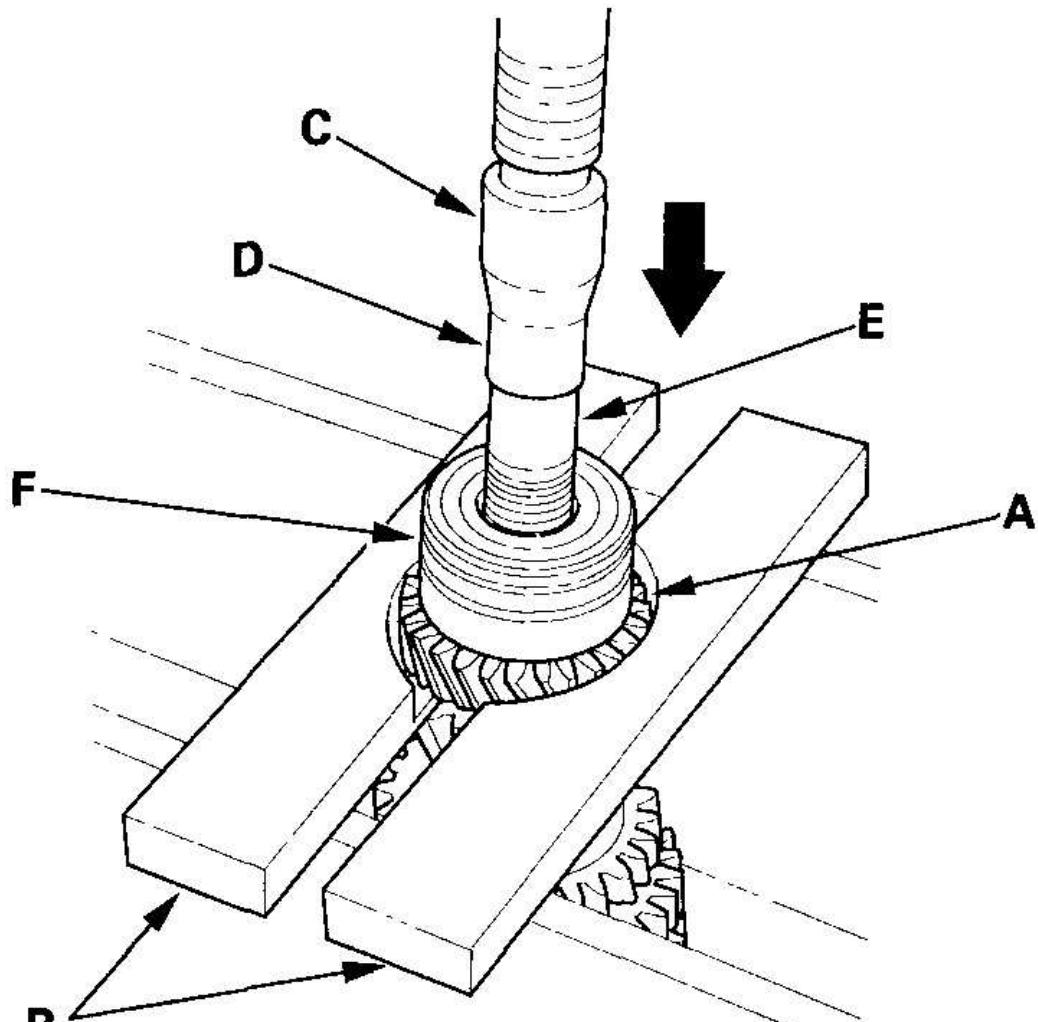


G03681632

Fig. 84: Removing Locknut And Spring Washer

Courtesy of AMERICAN HONDA MOTOR CO., INC.

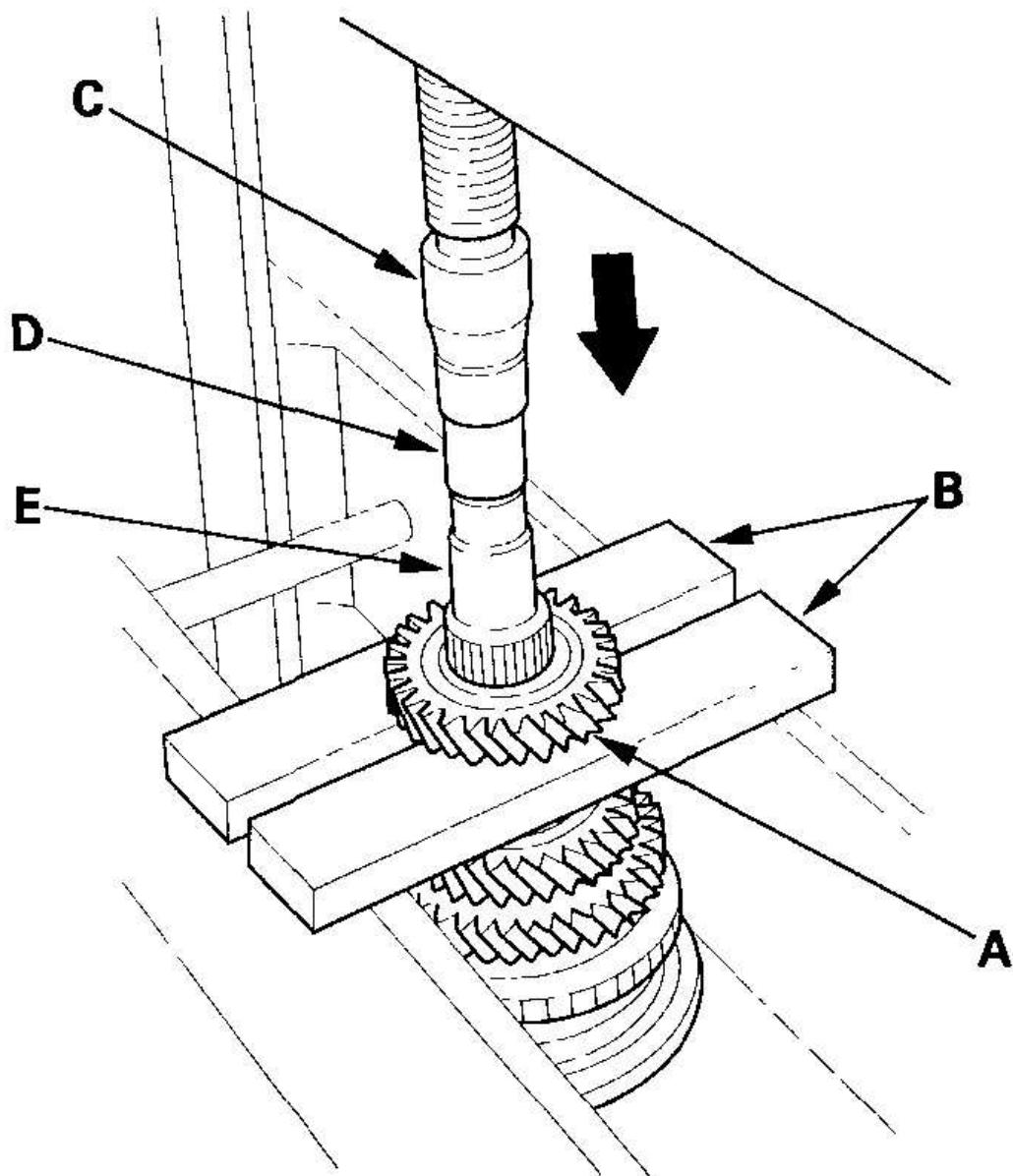
4. Support 5th gear (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of the ball bearing (F).



G03681633

Fig. 85: Removing Countershaft Out Of Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 4th gear.

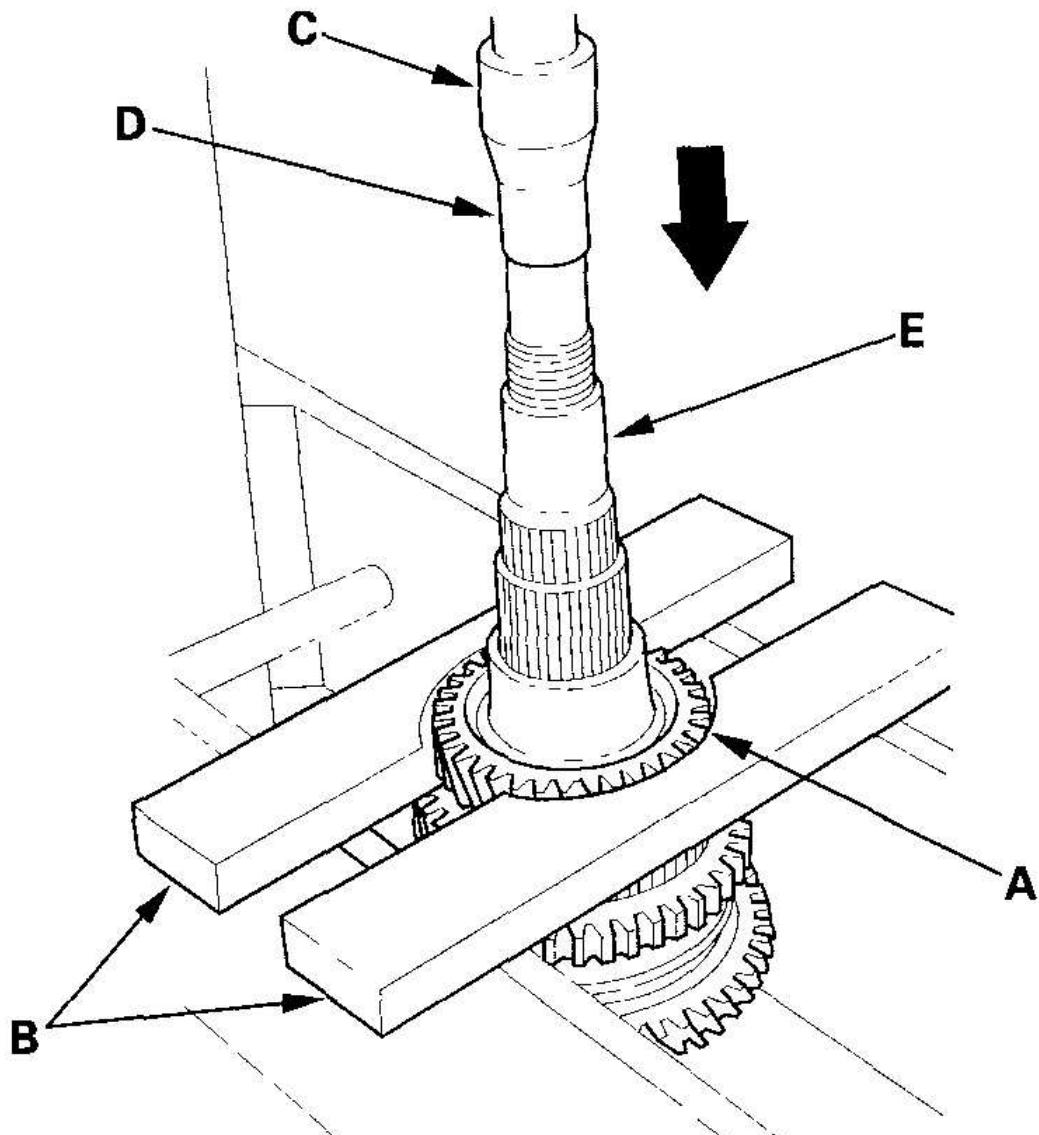


G03681634

Fig. 86: Removing Countershaft Out Of 4TH Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Support 3rd gear (A) on steel blocks (B), then use a press (C) and an

attachment (D) to press the countershaft (E) out of 3rd gear.



G03681635

Fig. 87: Removing Countershaft Out Of 3RD Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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): 24.980-24.993 mm

(0.9835-0.9840 in.)

B (Needle bearing surface): 37.984-38.000 mm

(1.4954-1.4961 in.)

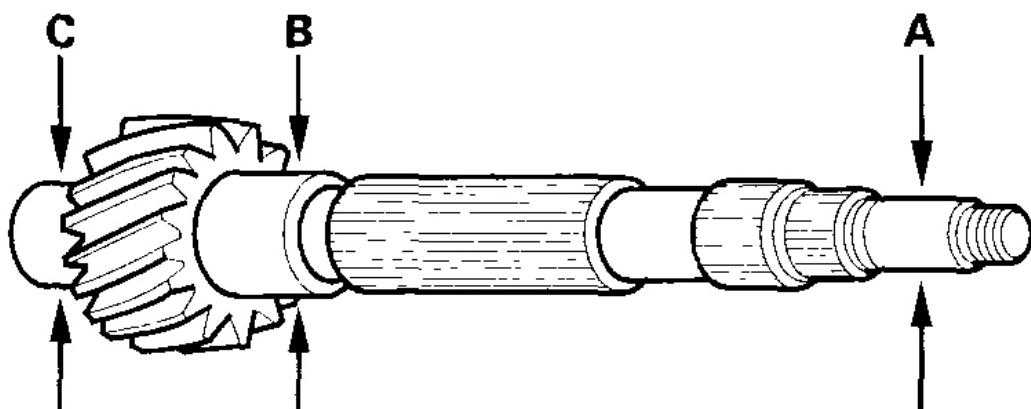
C (Needle bearing surface): 34.000-34.015 mm

(1.3386-1.3392 in.)

Service Limit: A: 24.93 mm (0.981 in.)

B: 37.934 mm (1.4935 in.)

C: 33.95 mm (1.337 in.)



G03681636

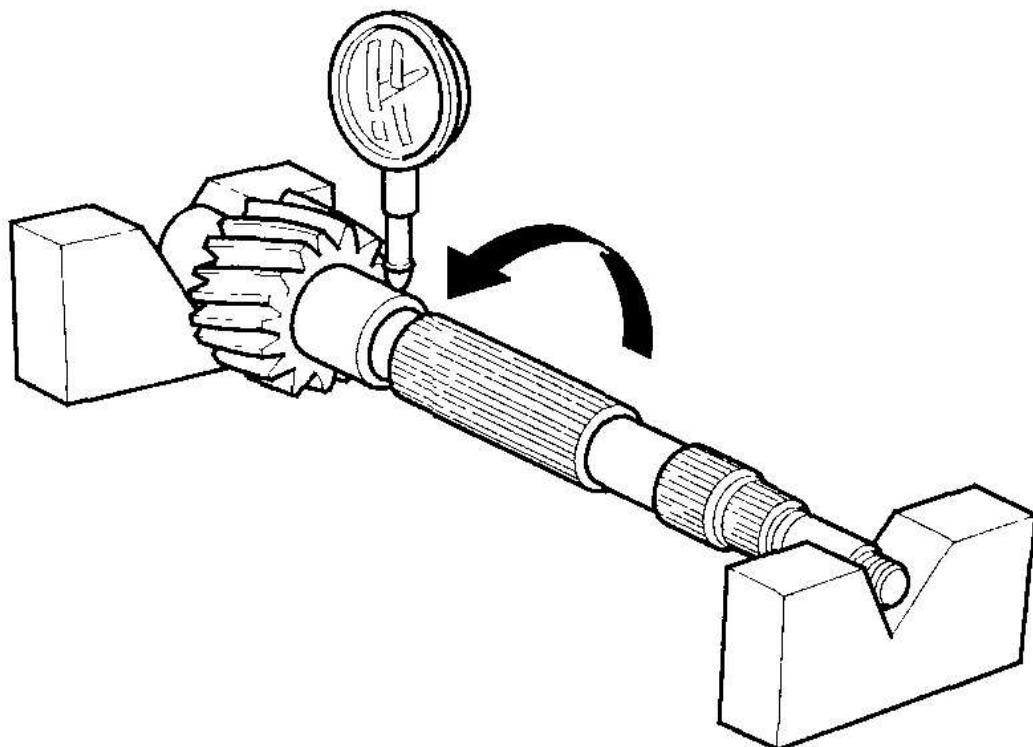
Fig. 88: Inspecting Countershaft

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.)



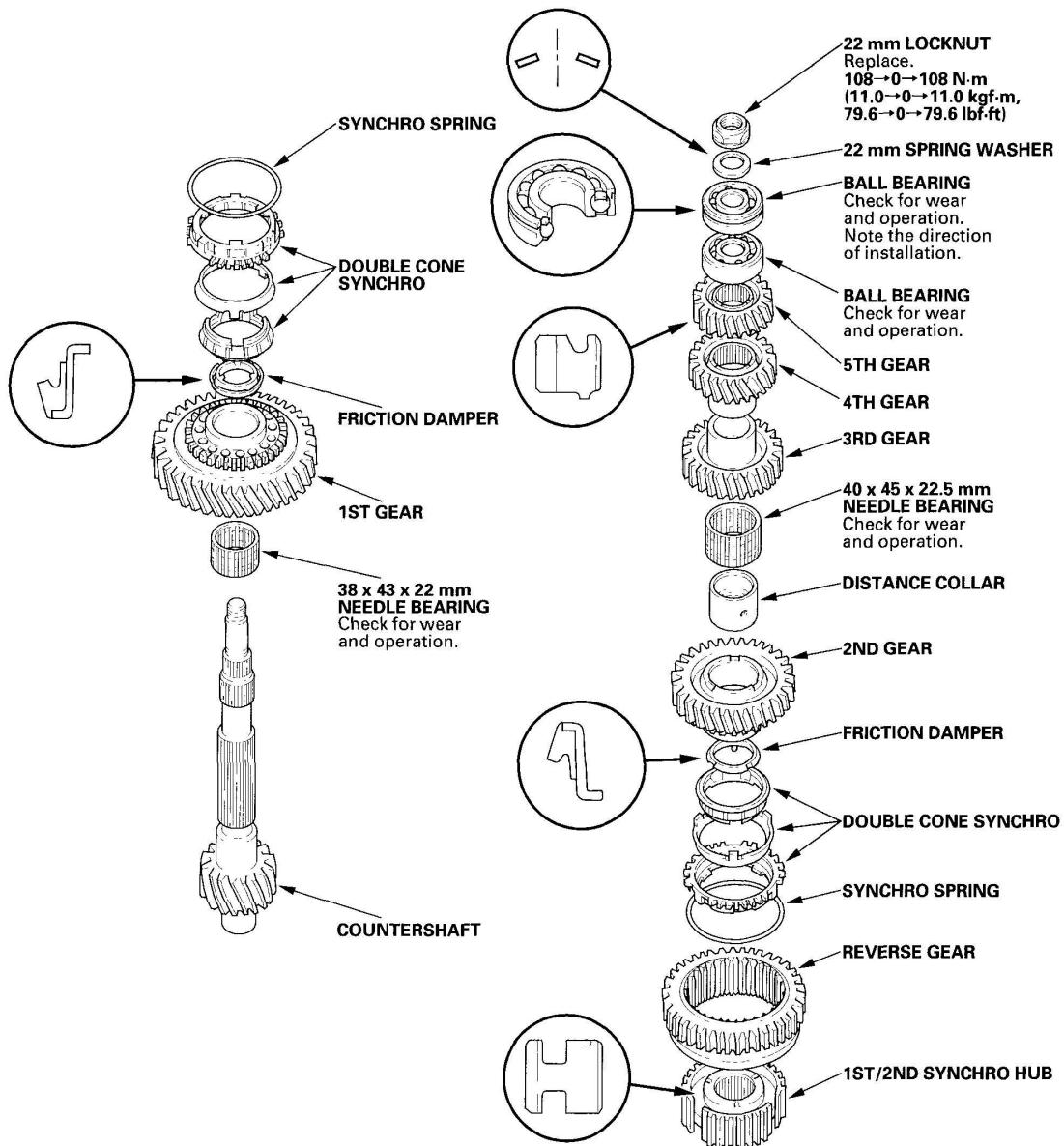
G03681637

Fig. 89: Measuring Countershaft Runout

Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT REASSEMBLY

EXPLODED VIEW



G03681638

Fig. 90: Exploded View Of Countershaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

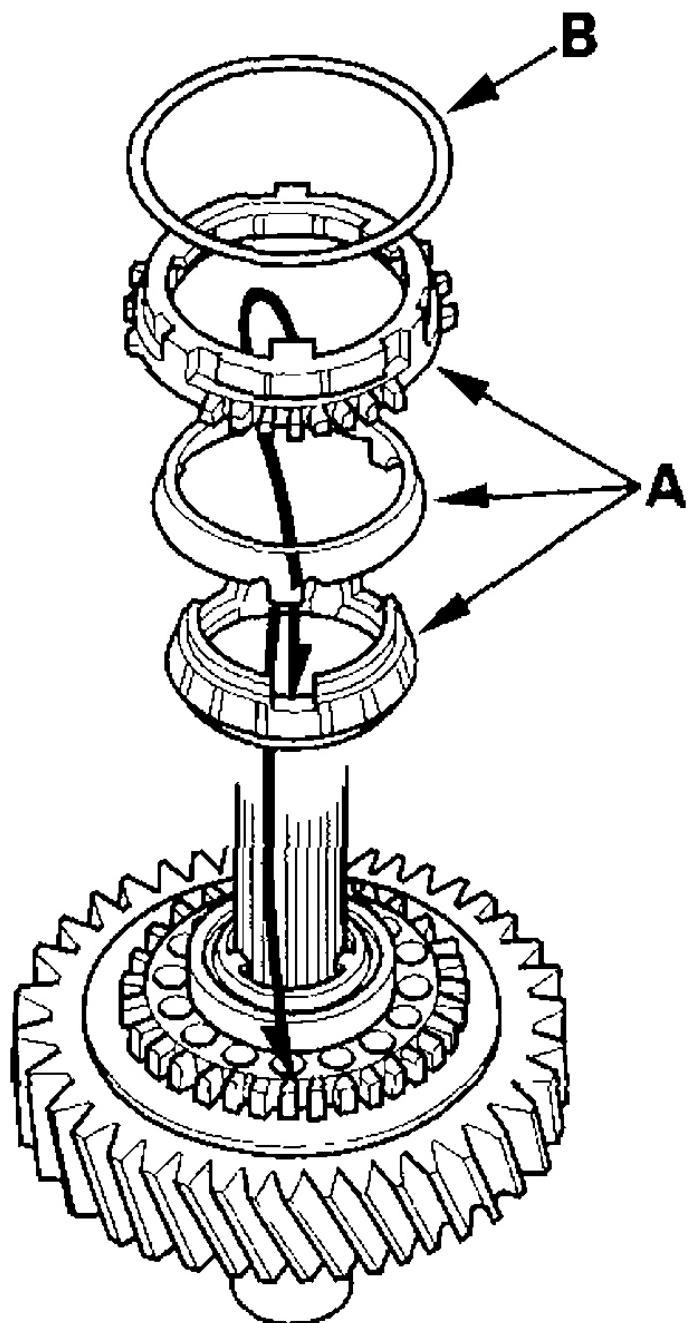
Special Tools Required

- Driver, 40 mm I.D. 07746-0030100
- Attachment, 25 mm I.D. 07746-0030200

- Attachment, 30 mm I.D. 07746-0030300
- Attachment, 35 mm I.D. 07746-0030400

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

1. Clean all the parts in solvent, dry them, and apply lubricant to all contact surfaces.
2. Install 1st gear, its bearing, and the friction damper on the shaft.
3. Install the 1st gear double cone synchro (A) and synchro spring (B) on the shaft.

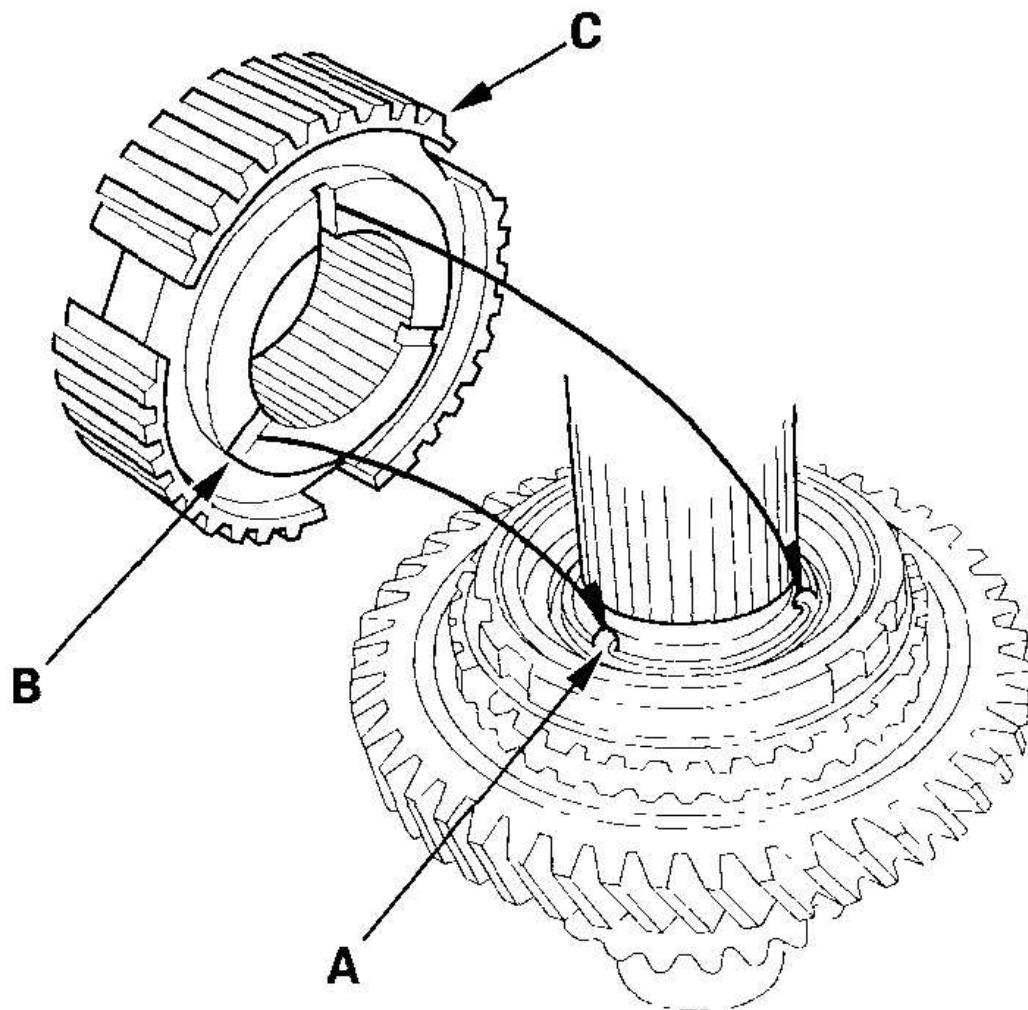


G03681639

Fig. 91: Installing 1ST Gear Double Cone Synchro And Synchro Spring On Shaft

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Align the fingers (A) on the friction damper with the grooves (B) on the 1st/2nd synchro hub (C), then install the 1st/2nd synchro hub onto the shaft.



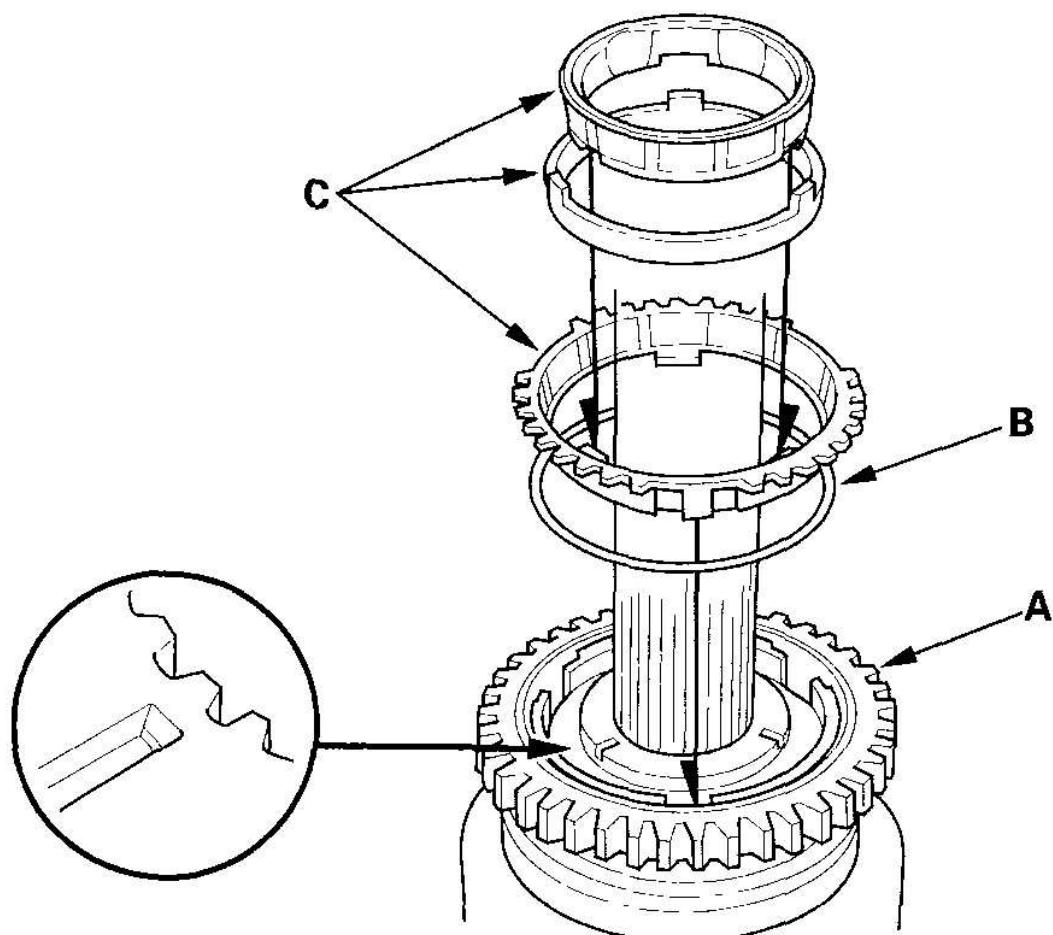
G03681640

Fig. 92: Aligning Fingers On Friction Damper With Grooves On 1ST/2ND Synchro Hub

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the reverse gear (A), synchro spring (B), and double cone synchro (C)

on the shaft.

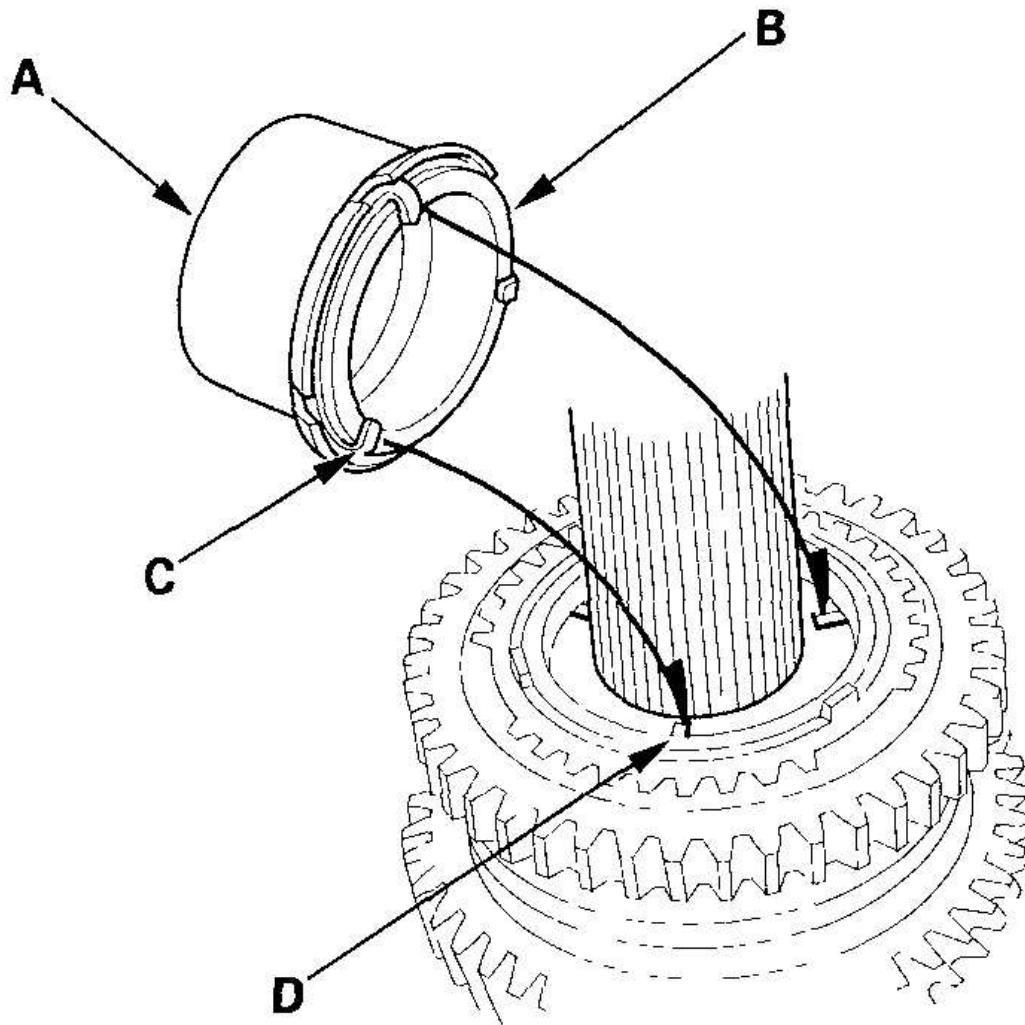


G03681641

Fig. 93: Installing Reverse Gear, Synchro Spring, And Double Cone Synchro On Shaft

Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the distance collar (A) and friction damper (B), then align the fingers (C) on the friction damper and grooves (D) in the 1st/2nd synchro hub.

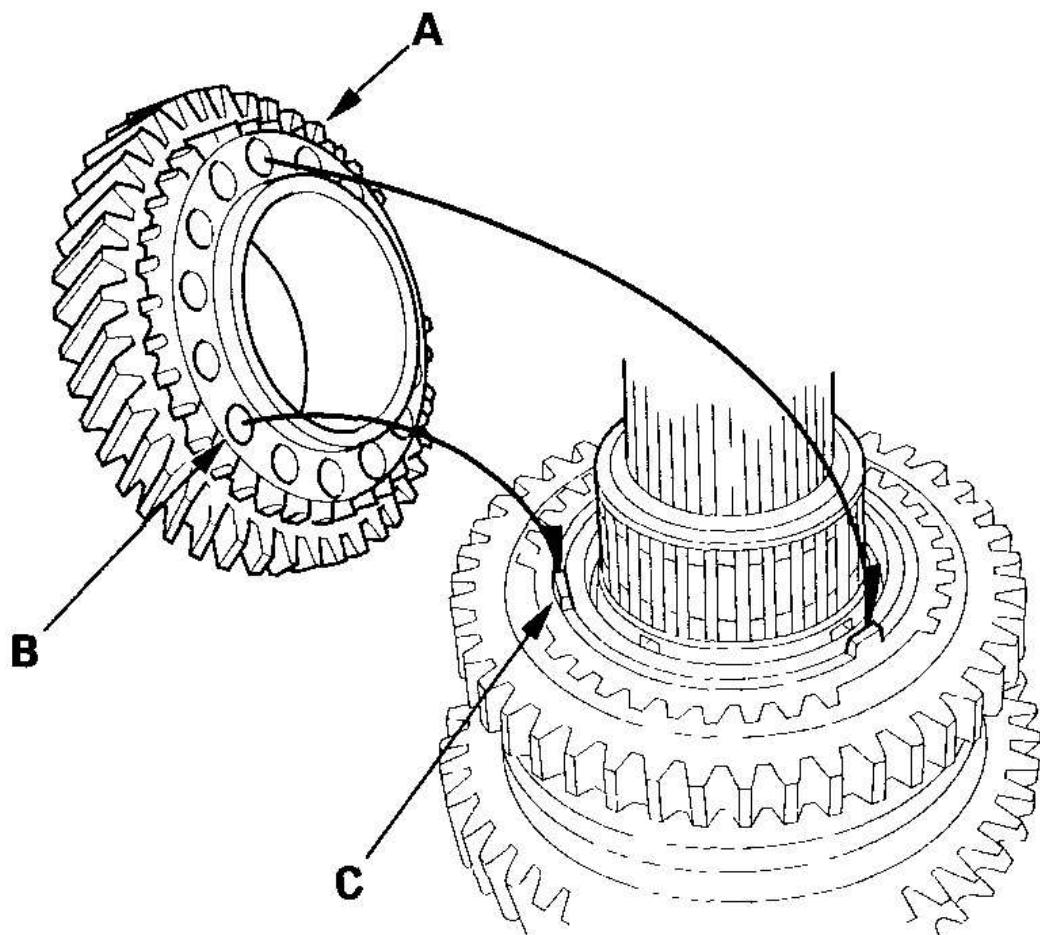


G03681642

Fig. 94: Aligning Fingers On Friction Damper And Grooves In 1ST/2ND Synchro Hub

Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the needle bearing and 2nd gear (A), then align the holes (B) on 2nd gear with the fingers (C) on the double cone synchro.

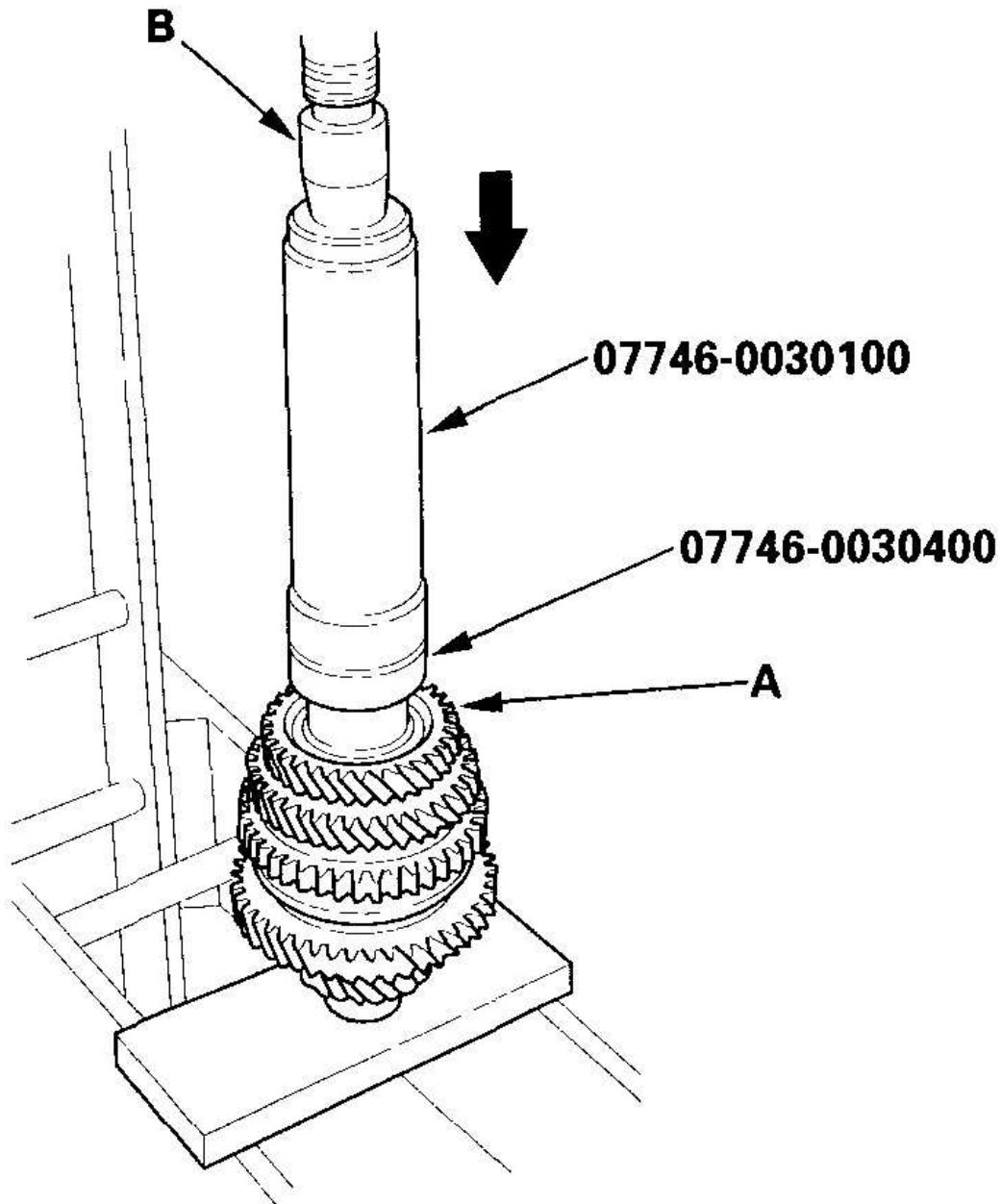


G03681643

Fig. 95: Aligning Holes On 2ND Gear With Fingers On Double Cone Synchro

Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Install 3rd gear (A) using the special tools and a press (B).

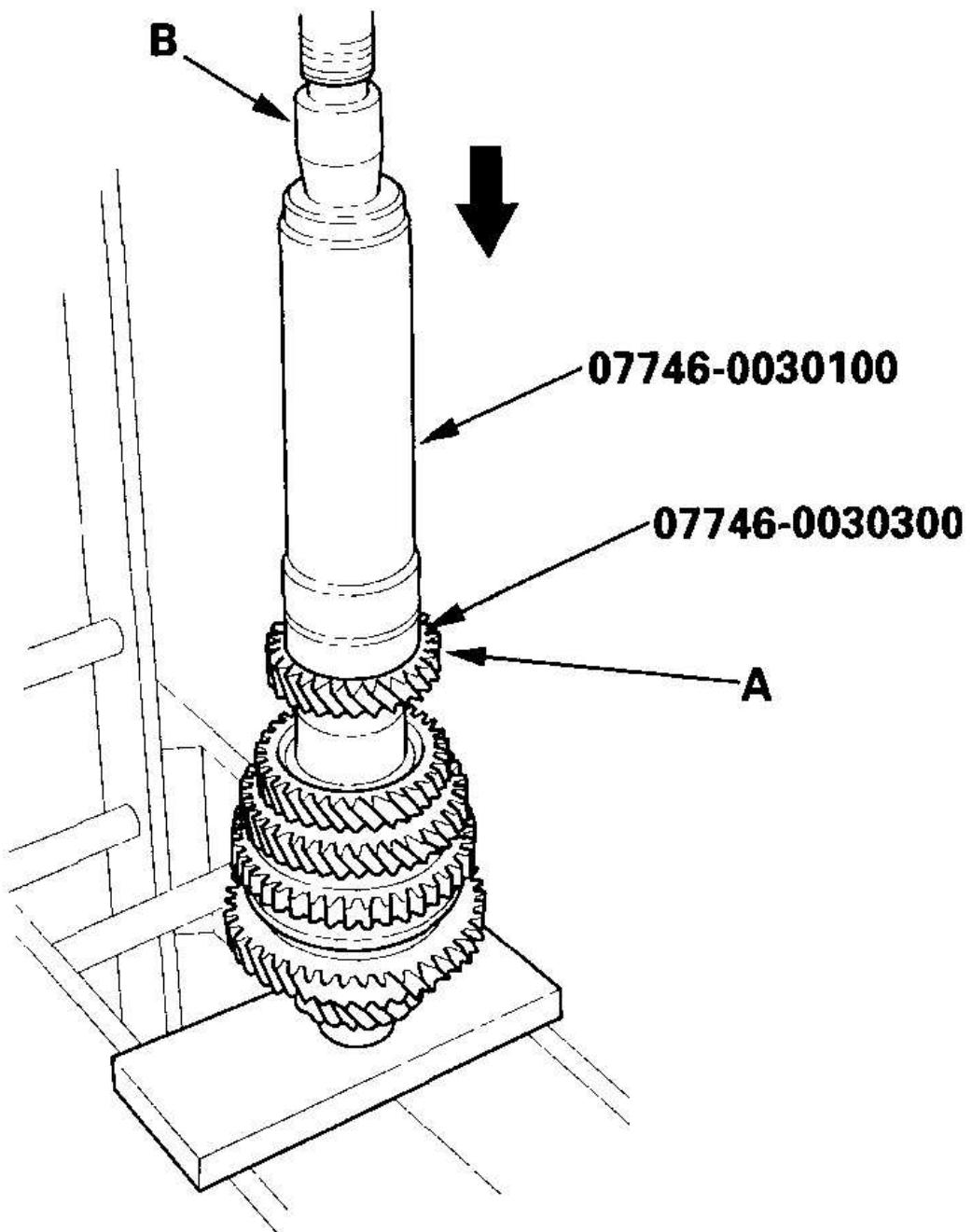


G03681644

Fig. 96: Installing 3RD Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Install 4th gear (A) using the special tools and a press (B).

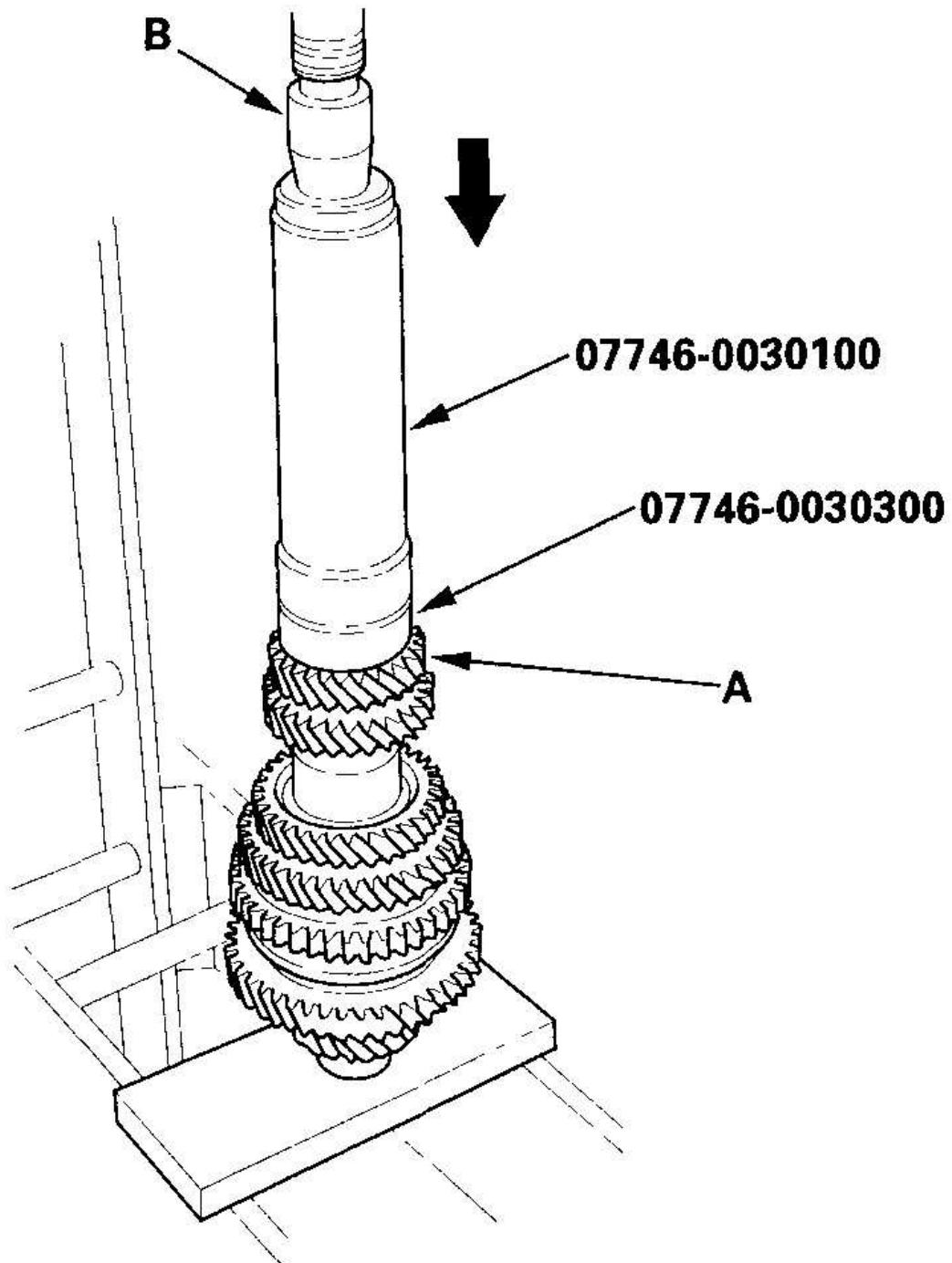


G03681645

Fig. 97: Installing 4TH Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install 5th gear (A) using the special tools and a press (B).

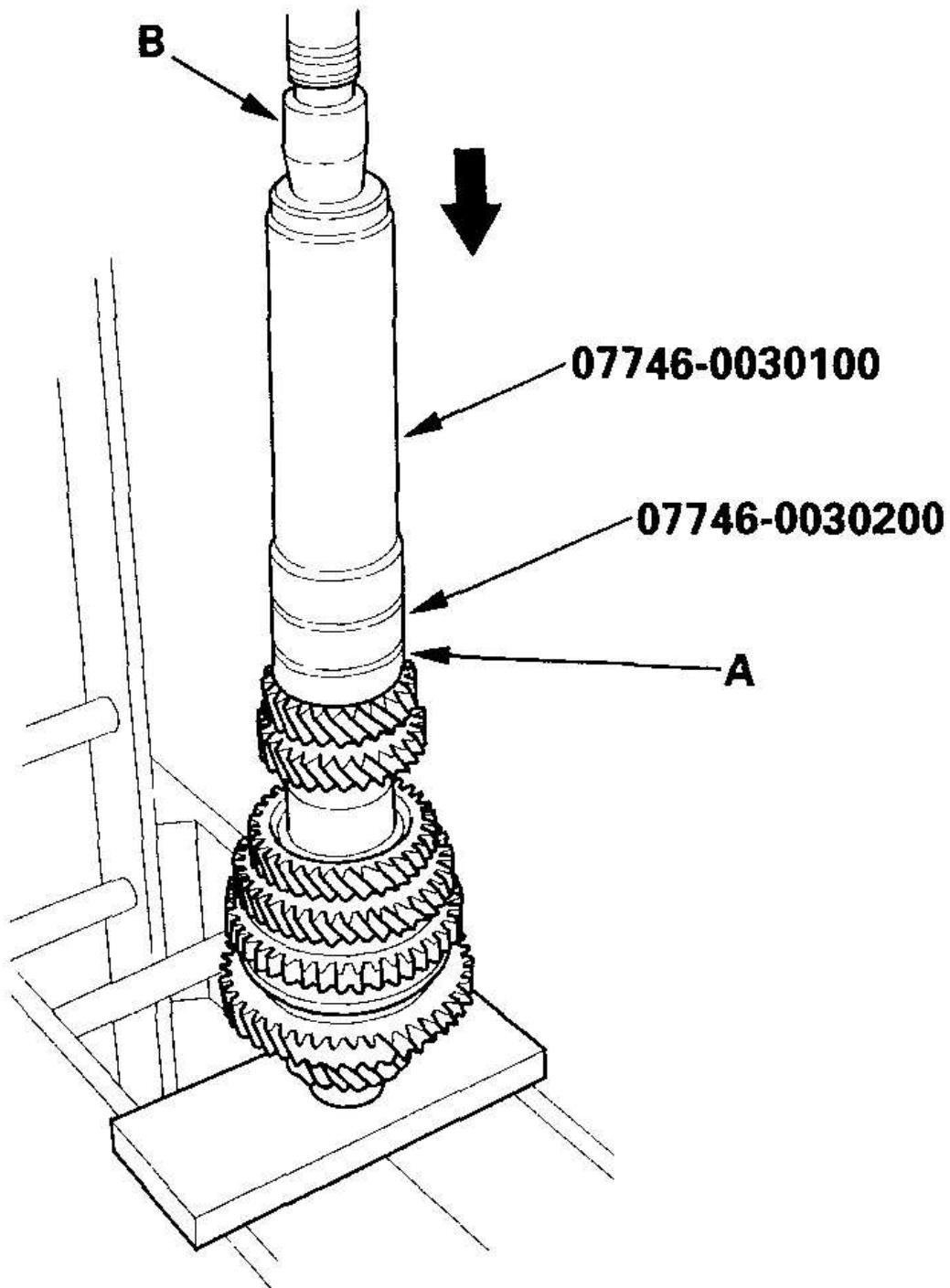


G03681646

Fig. 98: Installing 5TH Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Install the ball bearing (A) using the special tools and a press (B).

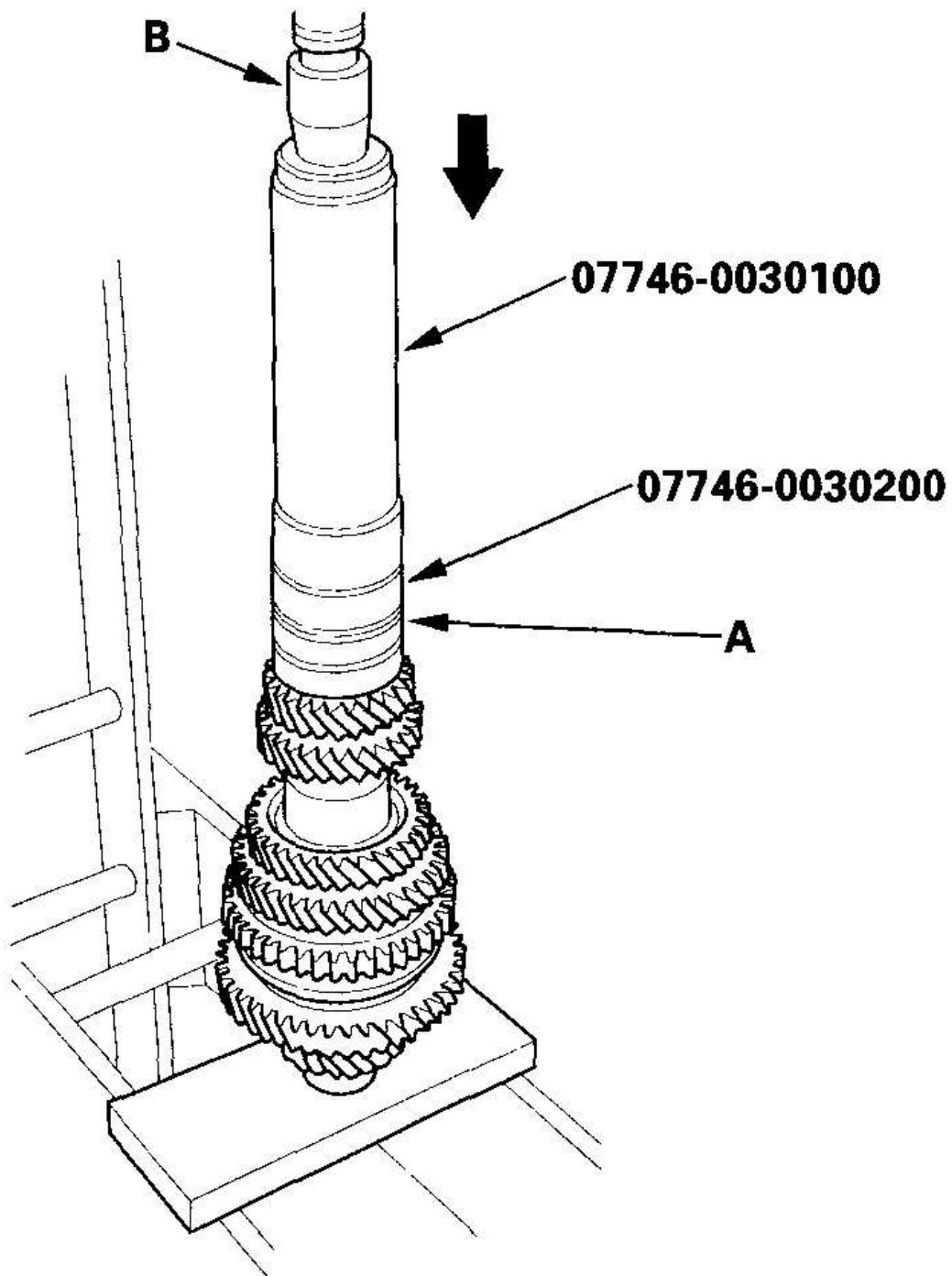


G03681647

Fig. 99: Installing Ball Bearing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

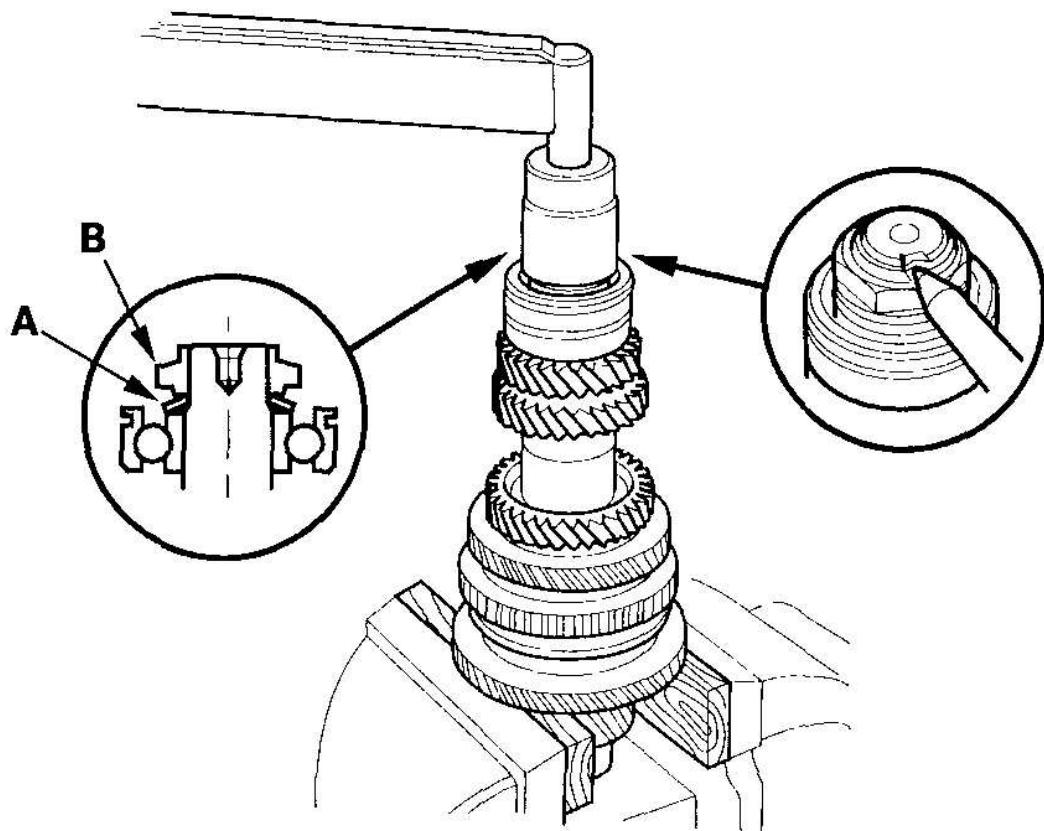
12. Install the ball bearing (A) using the special tools and a press (B).



G03681648

Fig. 100: Installing Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Install the 22 mm spring washer (A) and 22 mm locknut (B).



G03681649

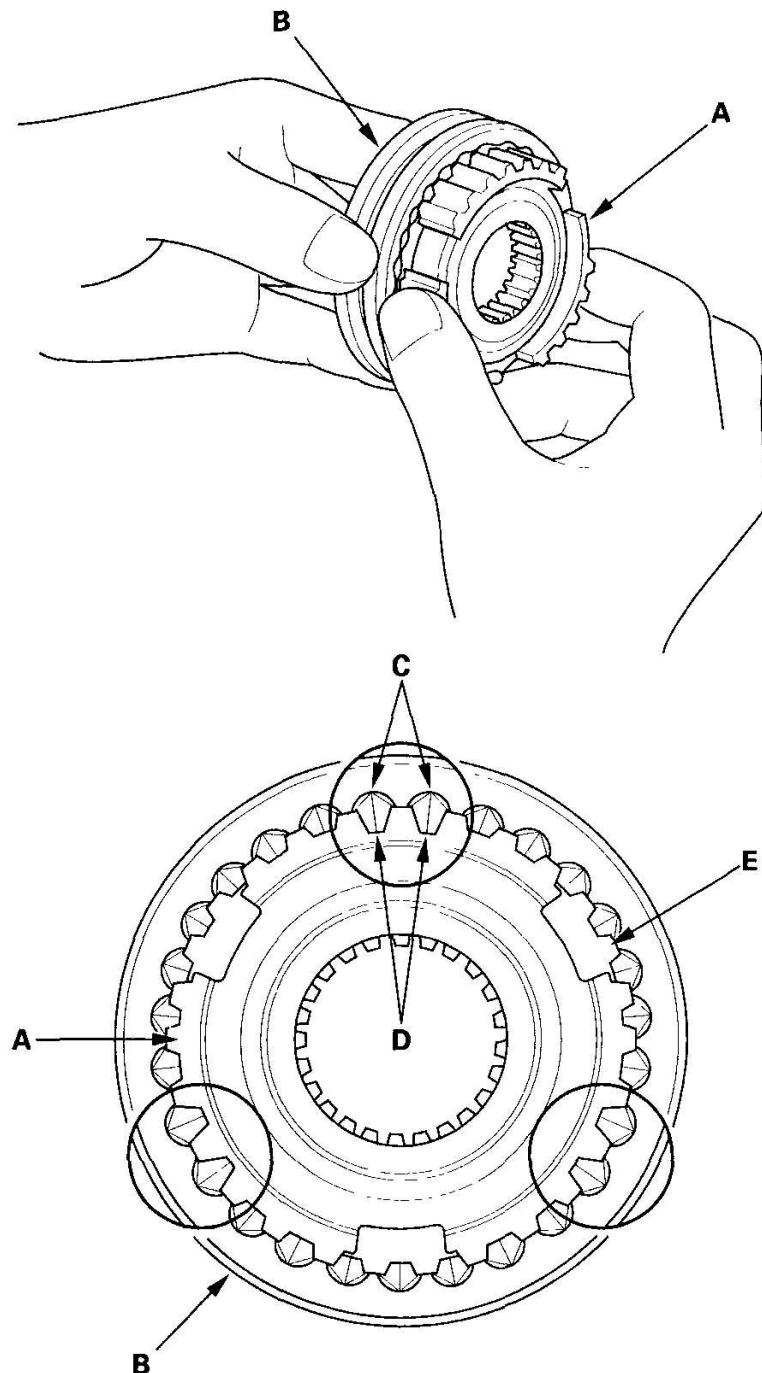
Fig. 101: Installing Spring Washer And Locknut
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Securely clamp the countershaft assembly in a bench vise with wood blocks.
15. Torque the new locknut to 108 N.m (11.0 kgf. m, 79.6 lbf. ft), then loosen it, and torque it again to the same value. Stake the locknut tab into the groove.

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.**

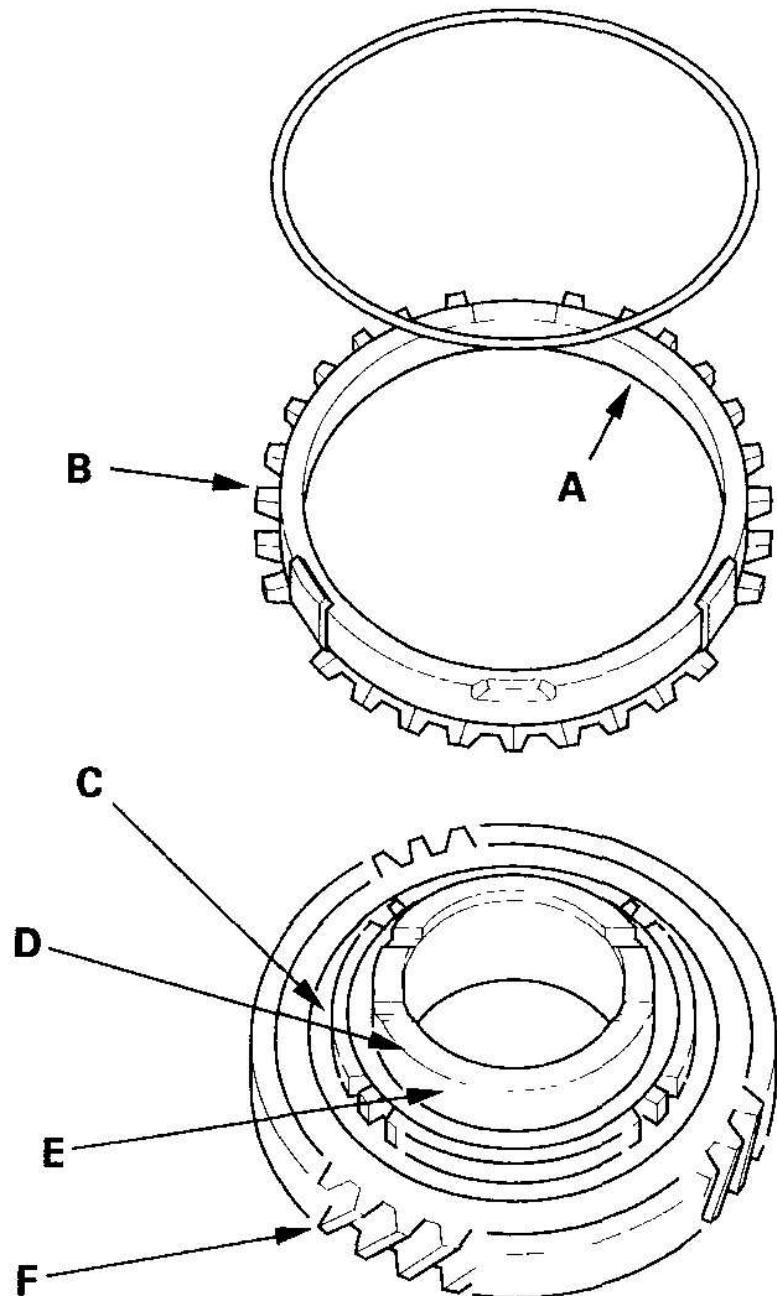


G03681650

Fig. 102: Checking Movement Of Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SYNCHRO RING AND GEAR INSPECTION

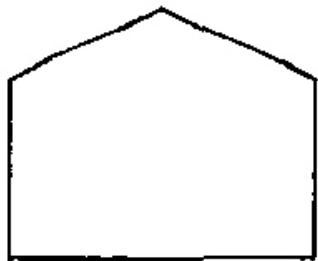
1. Inspect the inside of each synchro ring (A) for wear.



G03681651

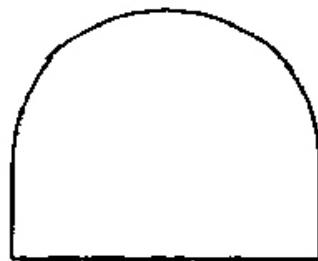
Fig. 103: Inspecting Inside Of Each Synchro Ring For Wear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Example of synchro ring teeth



GOOD

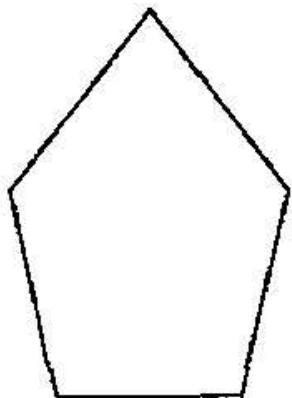
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WORN

Fig. 104: Example Of Synchro Ring Teeth
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Example of synchro sleeve teeth and gear teeth

**GOOD**

G03681653

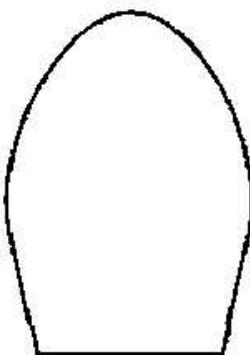
**WORN**

Fig. 105: Example Of Synchro Sleeve Teeth And Gear Teeth
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Inspect the teeth (B) on each synchro ring for wear (rounded off).
3. Inspect the teeth (C) on each synchro sleeve and matching teeth on each gear for wear (rounded off).
4. Inspect the thrust surface (D) on each gear hub for wear.
5. Inspect the cone surface (E) on each gear hub for wear and roughness.
6. Inspect the teeth on all gears (F) for uneven wear, scoring, galling, and cracks.
7. Coat the cone surface of each gear (E) with transmission fluid, and place its synchro ring on it. Rotate the synchro ring, making sure that it does not slip.
8. 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: 0.85-1.10 mm (0.033-0.043 in.)

Service Limit: 0.4 mm (0.016 in.)

Double Cone Synchro-to-Gear Clearance

Standard:

1 :Outer Synchro Ring (B) to Synchro Cone (C)

0.5-1.0 mm (0.02-0.04 in.)

2 :Synchro Cone (C) to Gear (A)

0.5-1.0 mm (0.02-0.04 in.)

3 :Outer Synchro Ring (B) to Gear (A)

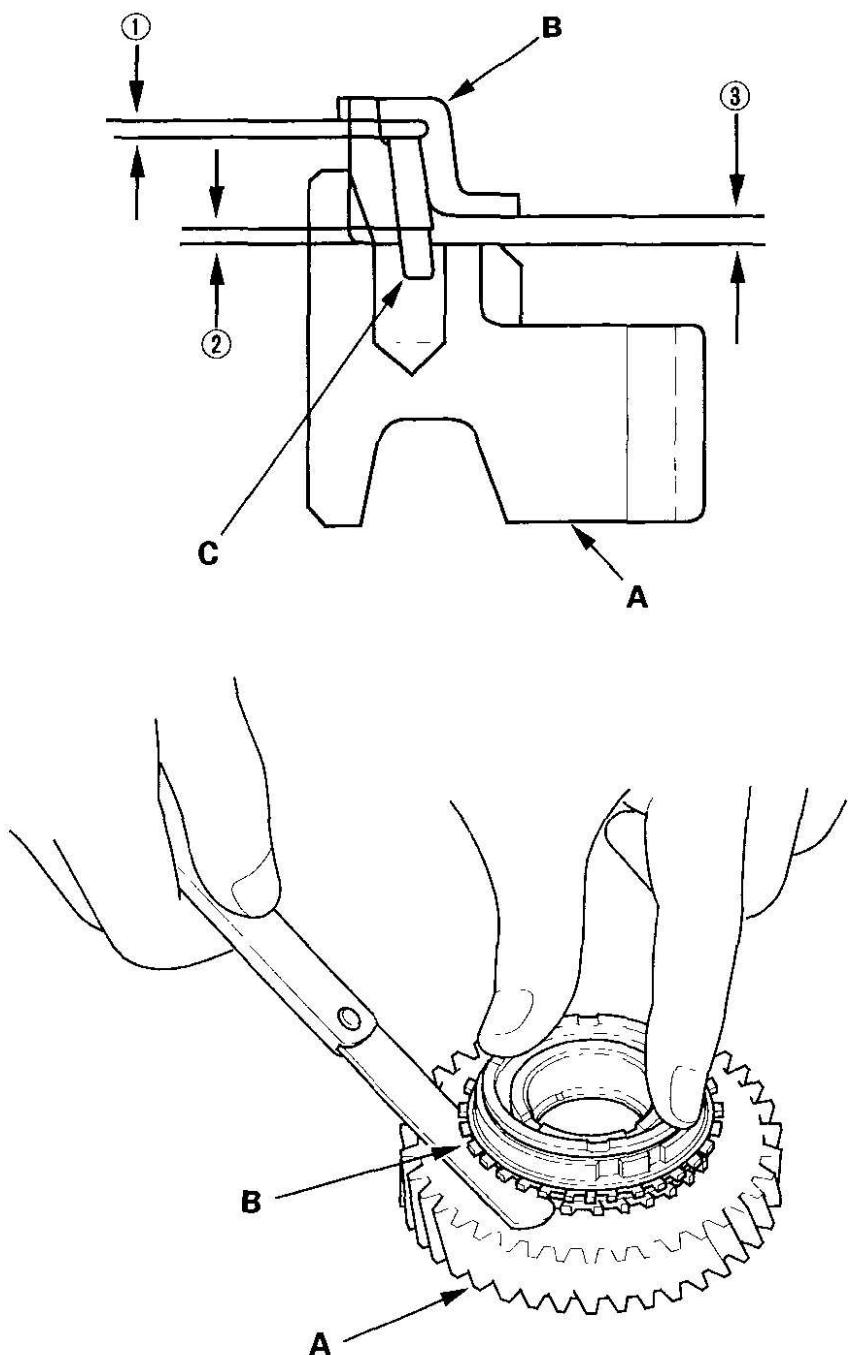
0.95-1.68 mm (0.037-0.066 in.)

Service Limit:

1 :0.3 mm (0.01 in.)

2 :0.3 mm (0.01 in.)

3 :0.6 mm (0.02 in.)



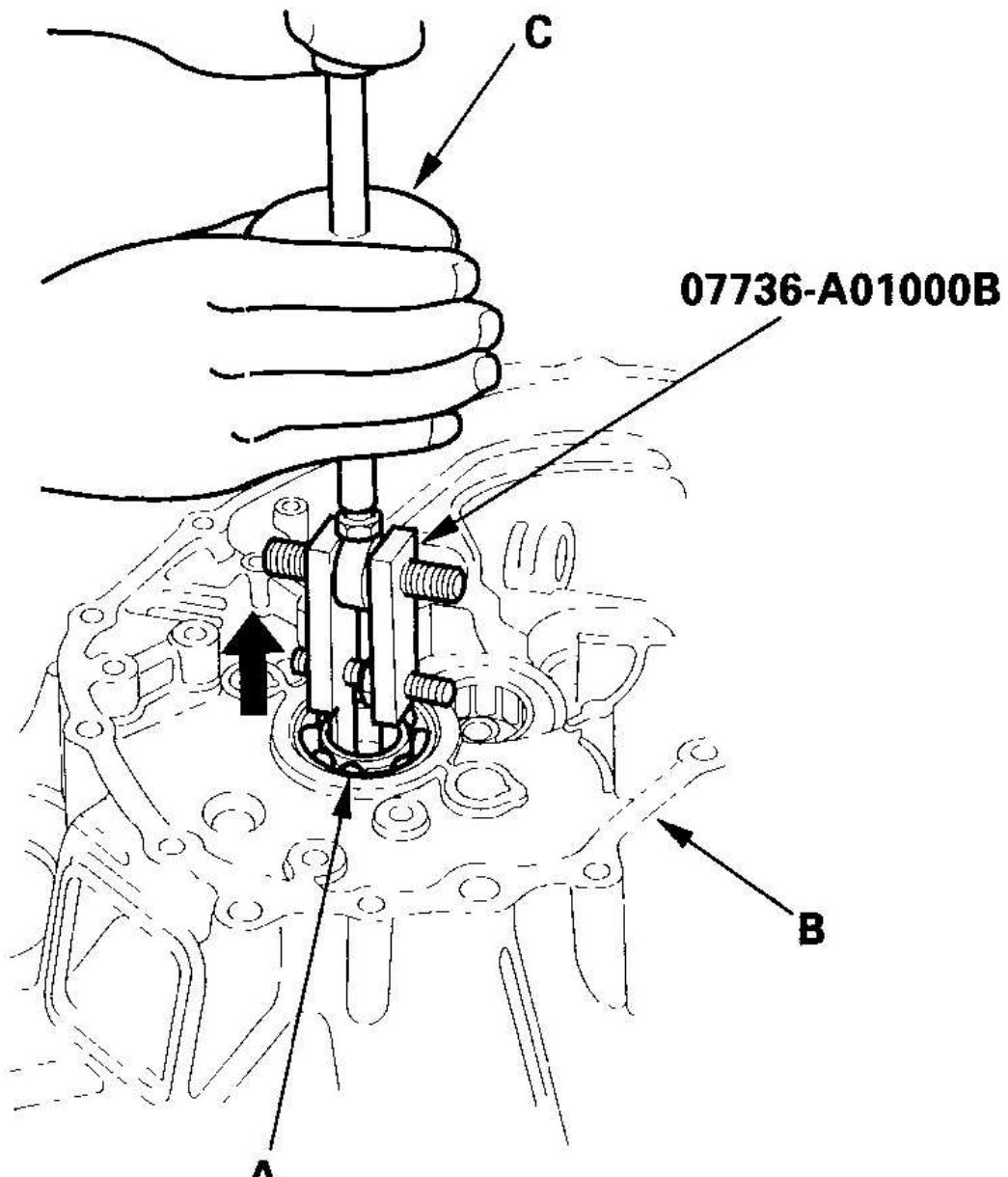
G03681654

Fig. 106: 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

- Adjustable bearing puller, 20-40 mm 07736-A01000B
- Driver 07749-0010000
- Attachment, 37 x 40 mm 07746-0010200
- Attachment, 52 x 55 mm 07746-0010400
 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).

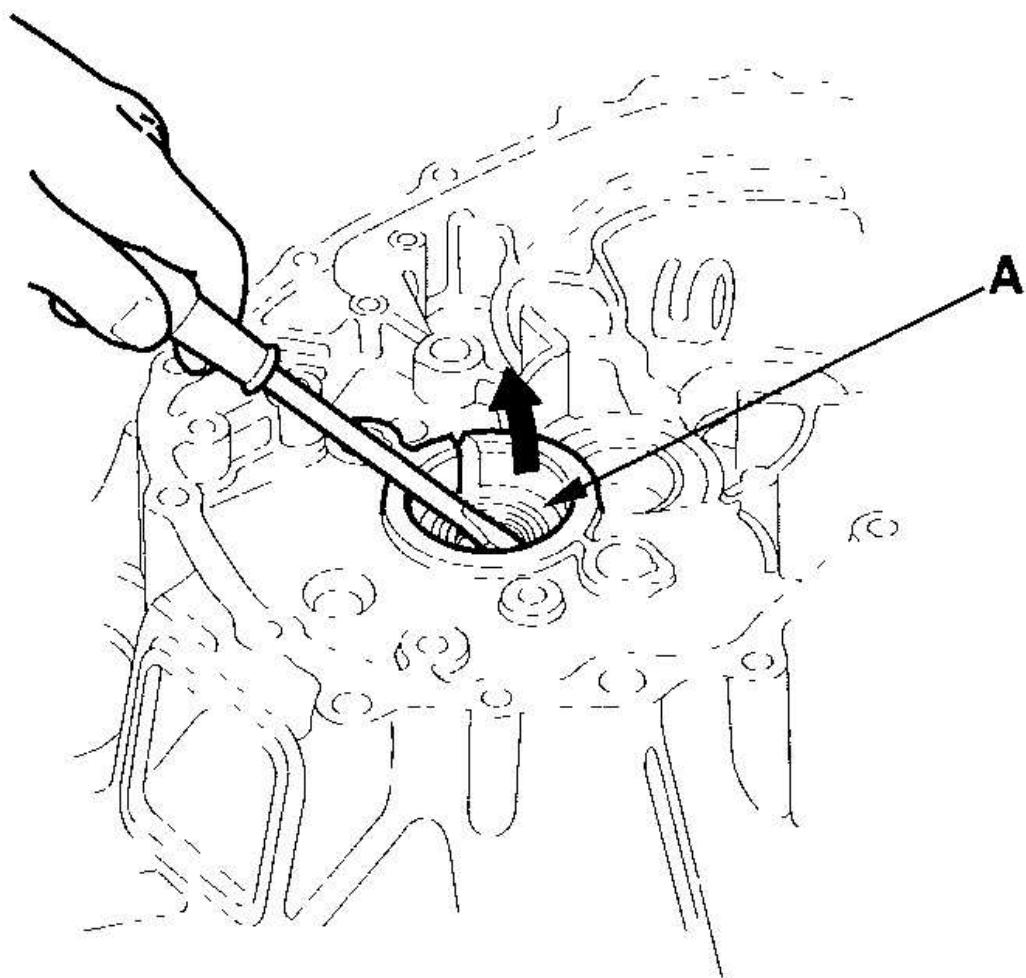


G03681655

Fig. 107: 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.

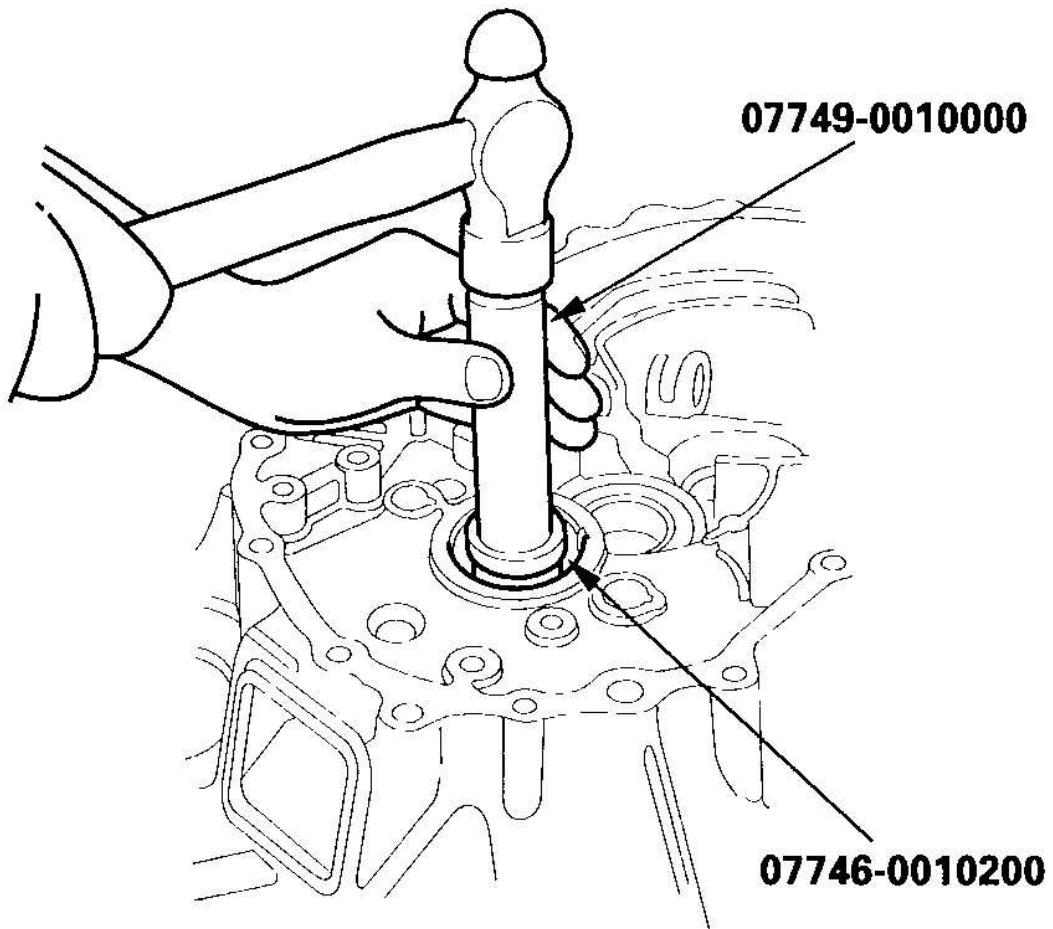


G03681656

Fig. 108: Removing Oil Seal

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

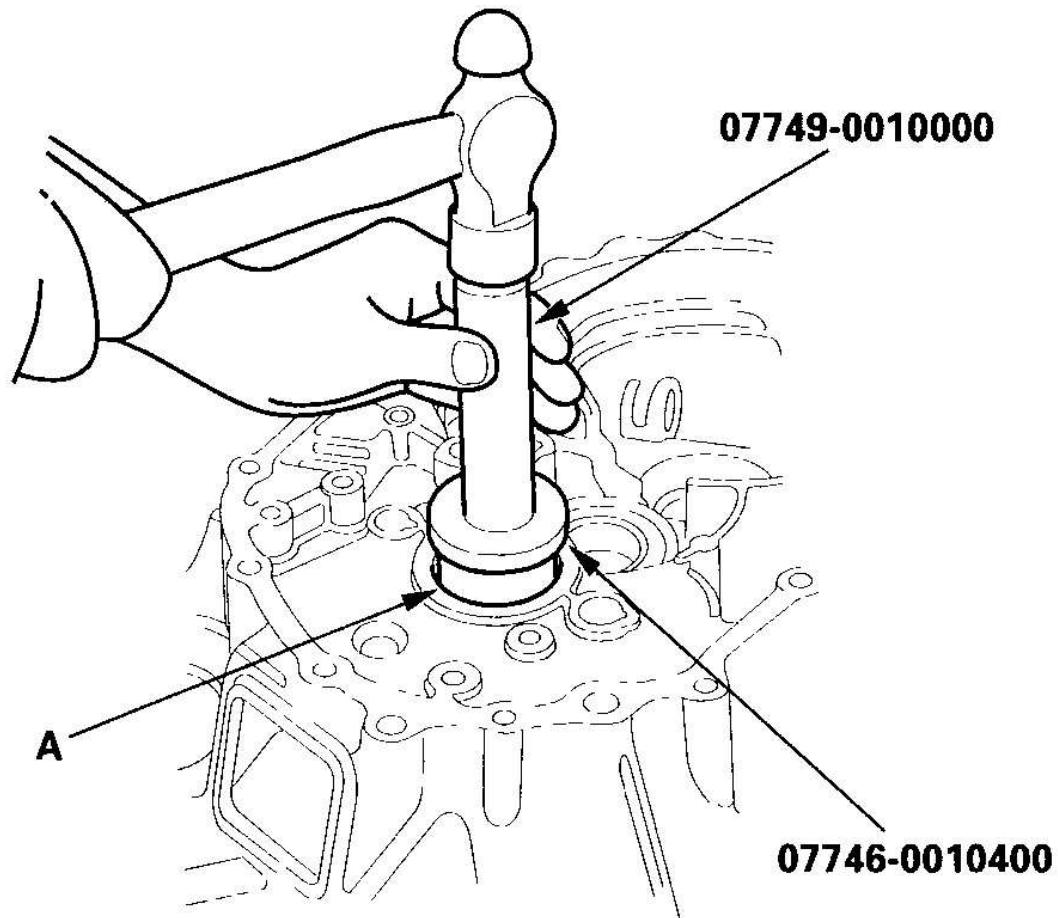


G03681657

Fig. 109: Installing Oil Seal

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



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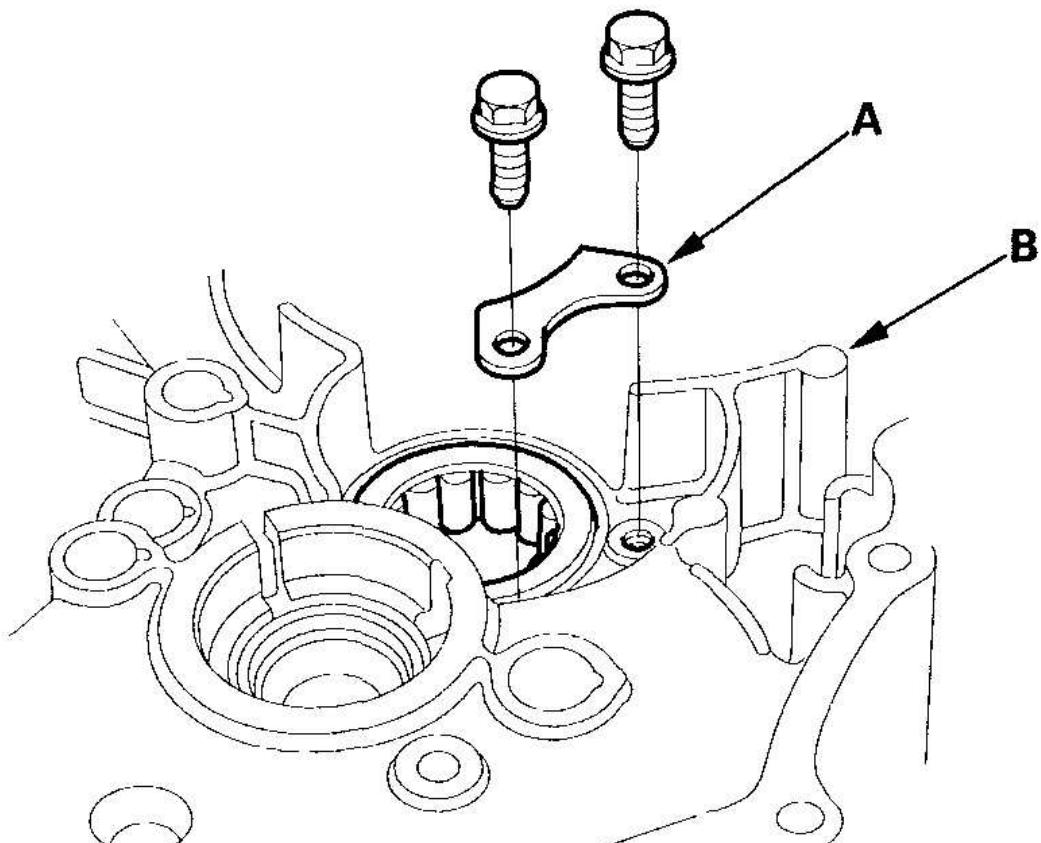
Fig. 110: Installing Ball Bearing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT BEARING REPLACEMENT

Special Tools Required

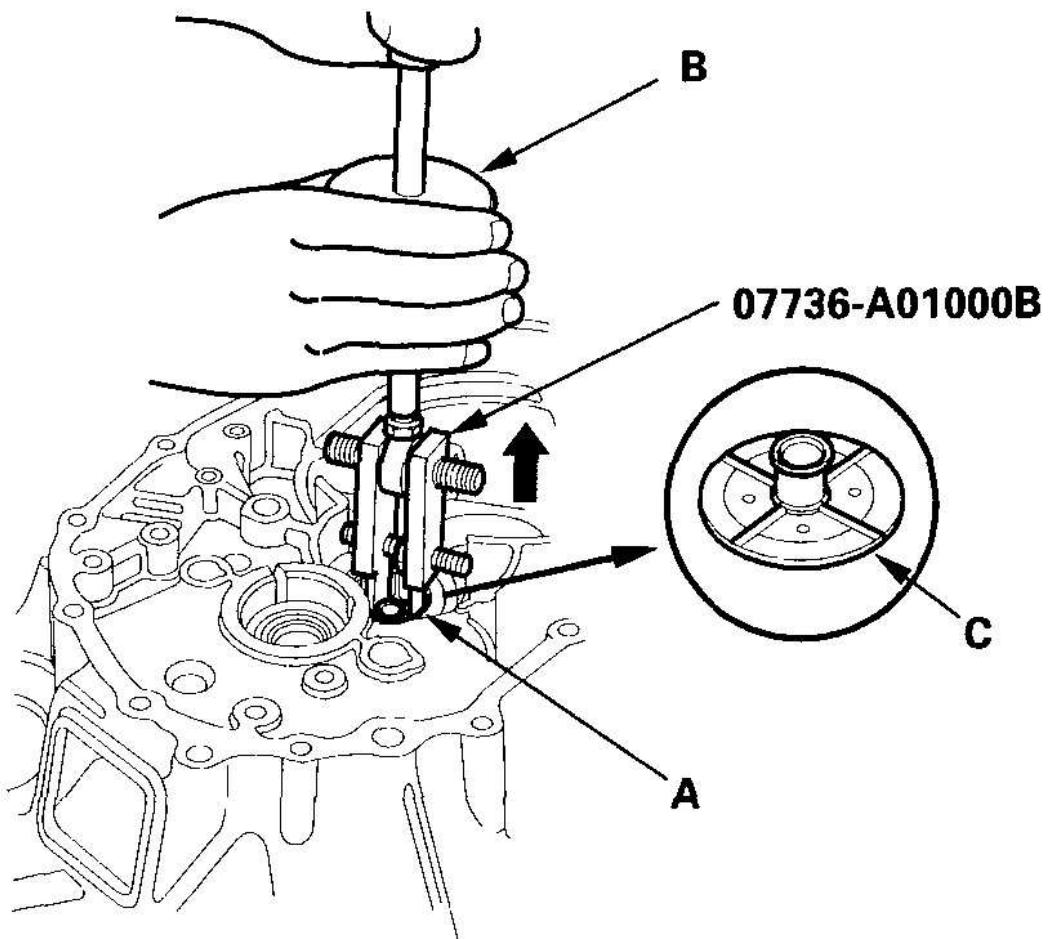
- Adjustable bearing puller, 20-40 mm 07736-A01000B
 - Driver 07749-0010000
 - Attachment, 52 x 55 mm 07746-0010400
1. Remove the bearing set plate (A) from the clutch housing (B).



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Fig. 111: 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.

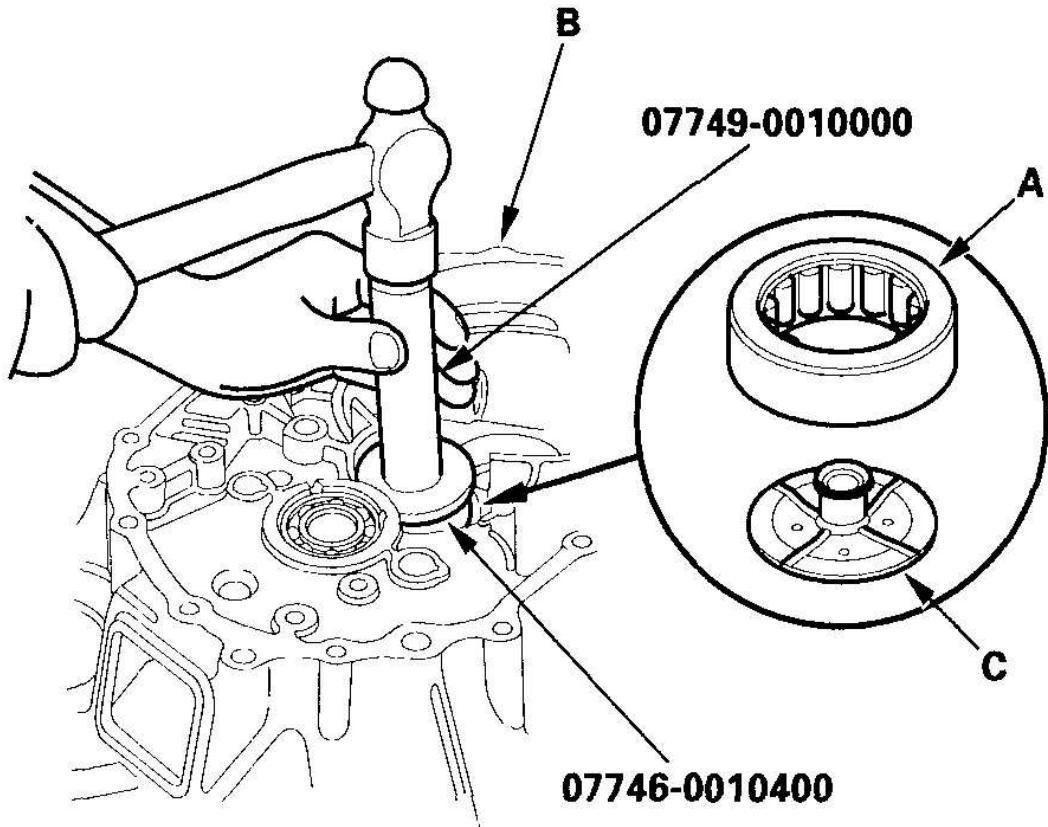


G03681660

Fig. 112: 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).

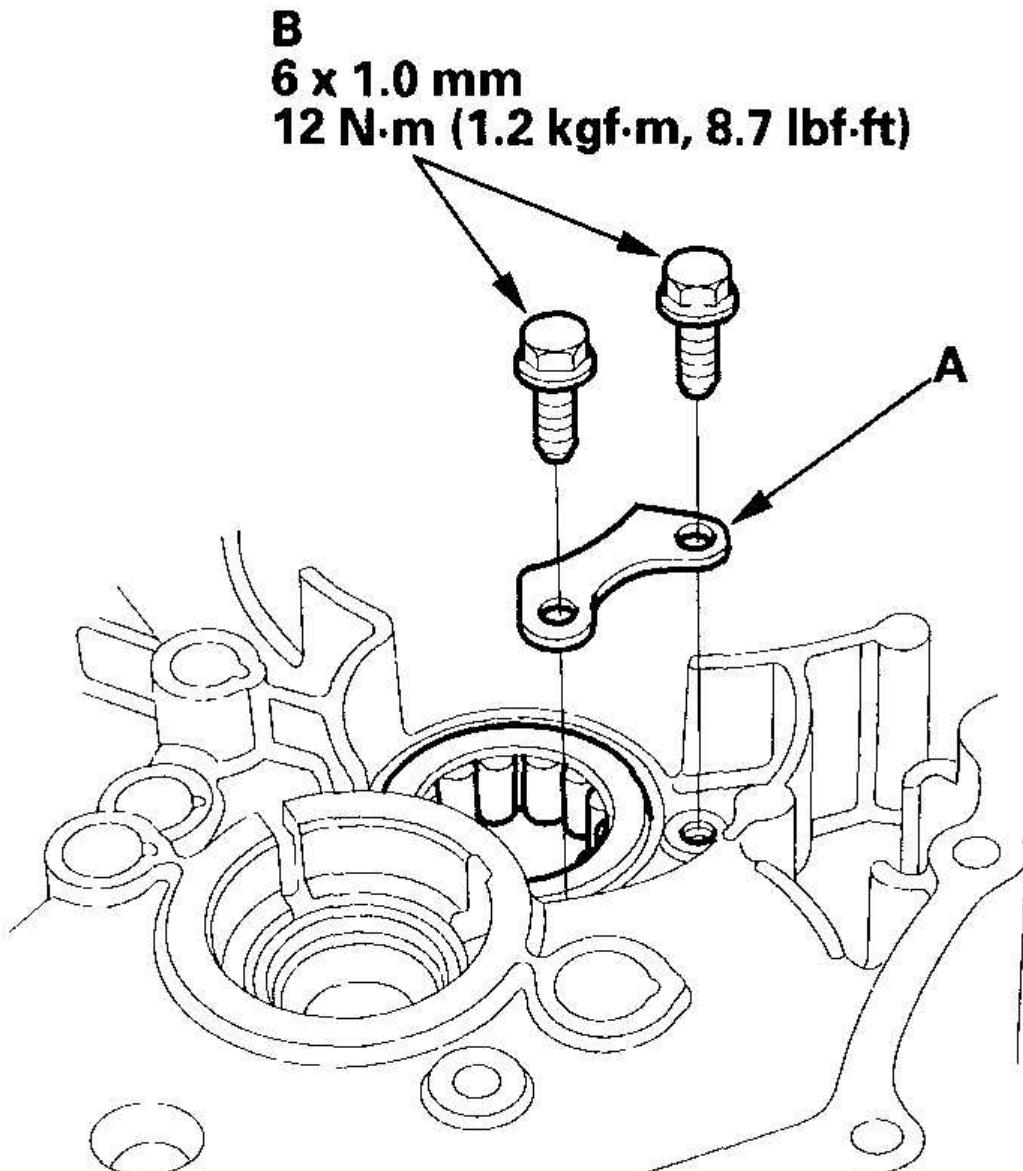


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Fig. 113: Positioning Oil Guide Plate And Needle Bearing In Bore Of Clutch Housing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



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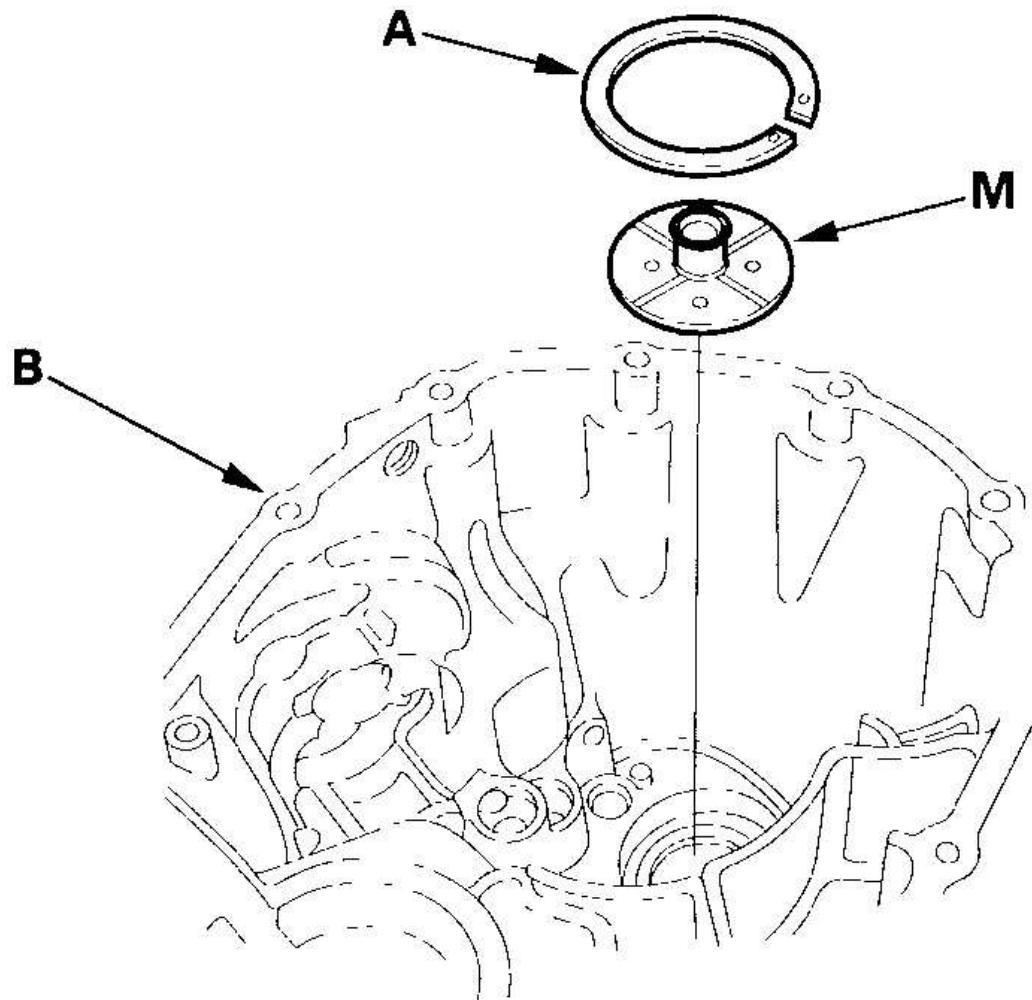
Fig. 114: Identifying Tightening Torque Of Bearing Set Plate Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT THRUST CLEARANCE ADJUSTMENT

Special Tools Required

- Mainshaft base 07GAJ-PG20130
- Base collar 07GAJ-PG20120
- Mainshaft holder 07GAJ-PG20110

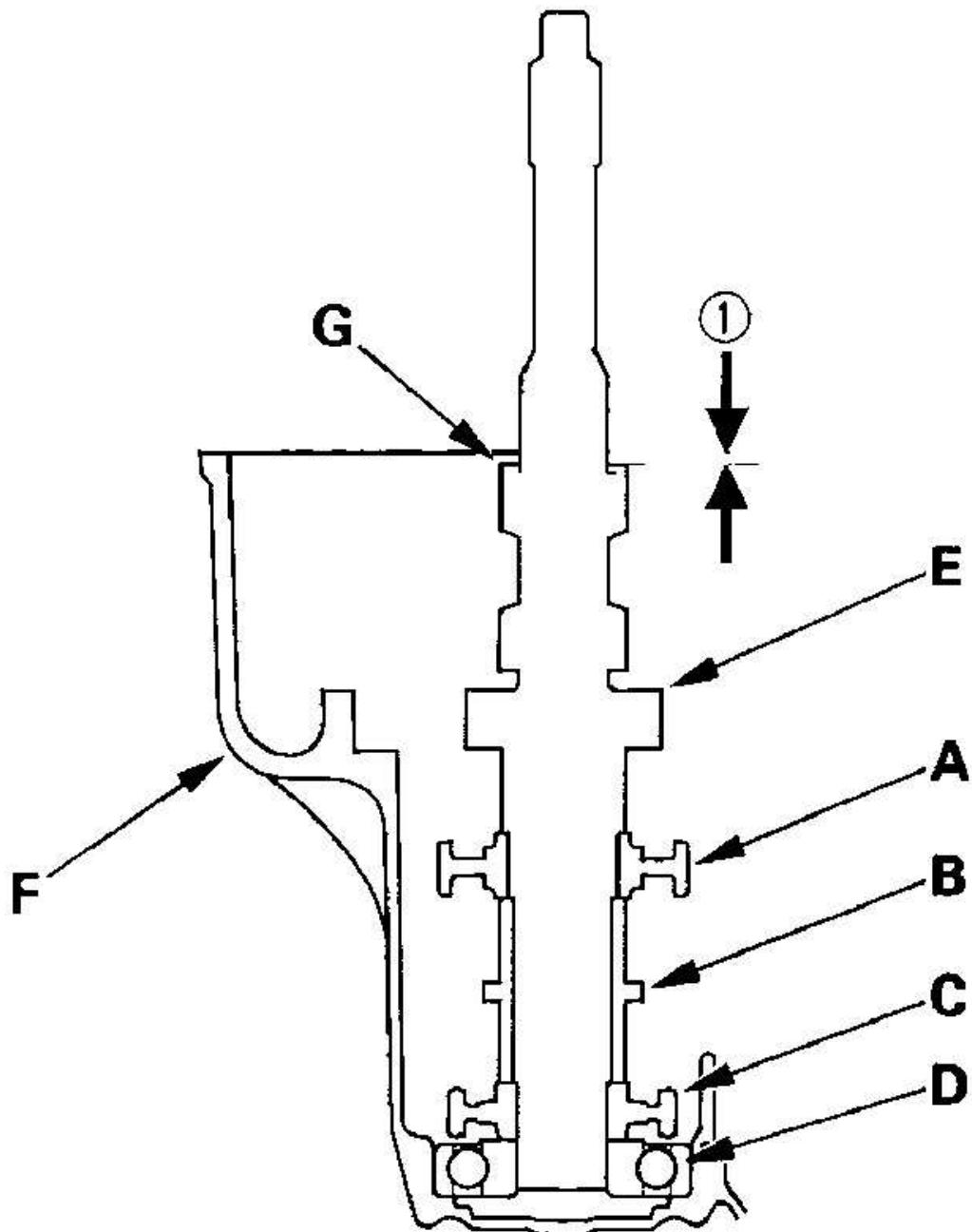
1. Remove the 72 mm shim (A) and oil guide plate M from the transmission housing (B).



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Fig. 115: Removing Shim And Oil Guide Plate From Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the 3rd/4th synchro hub (A), the distance collar (B), the 5th synchro hub (C), and ball bearing (D) on the mainshaft (E), then install the assembled mainshaft in the transmission housing (F).

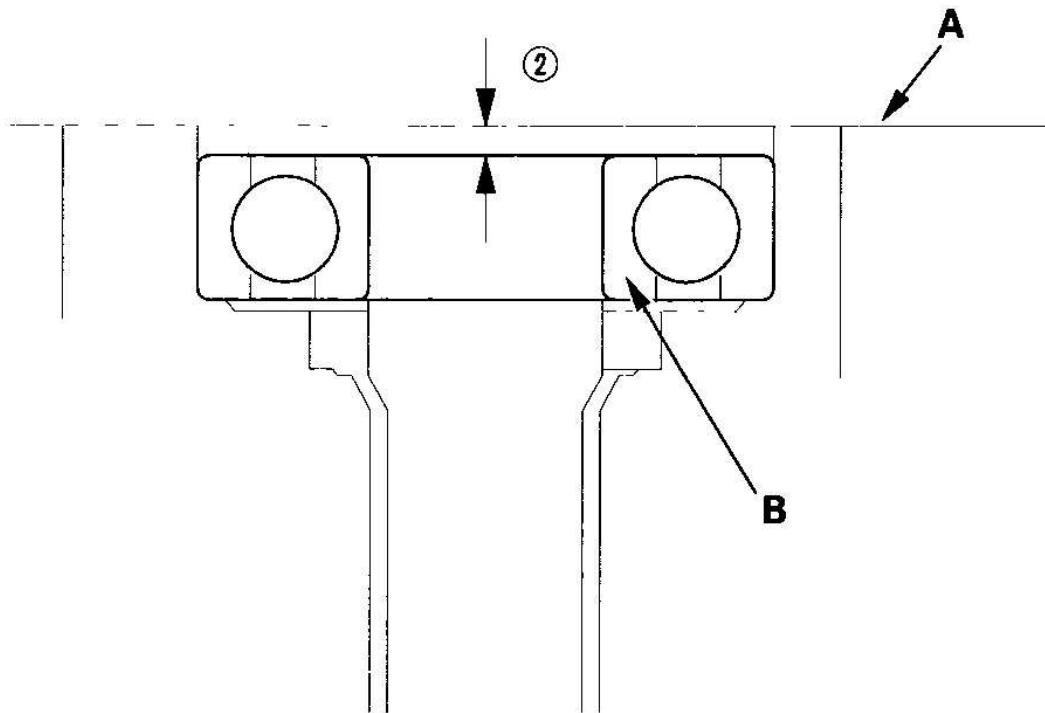


G03681664

Fig. 116: Installing Assembled Mainshaft In Transmission Housing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the washer (G) on the mainshaft.
4. Measure distance (1) between the end of the transmission housing and washer with a straight edge and vernier caliper. Measure at three locations and average the reading.
5. Measure distance (2) between the end of the clutch housing (A) and bearing inner race (B) with a straight edge and depth gauge. Measure at three locations, and average the readings.



G03681665

Fig. 117: Measuring Distance Between End Of Transmission Housing And Washer

Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Select the proper 72 mm shim from the chart. Follow the example below, and use the measurements you made in steps 4 and 5 :

- Add distance (2) (step 5) to distance (1) (step 4).
- From this number, subtract 0.95 (which is the midpoint of the flex range of the clutch housing bearing spring washer).
- Take this number and compare it to the available shim sizes in the chart.
- Try the 1.68 mm (0.0661 in.) shim.

(For example)

$$\begin{array}{r}
 \textcircled{1}: \mathbf{2.41} & \mathbf{2.63} \\
 + \textcircled{2}: \mathbf{0.22} & - \mathbf{0.95} \\
 \hline
 = \mathbf{2.63} & = \mathbf{1.68} \\
 \text{G03681666}
 \end{array}$$

Fig. 118: Shim Selection Formula

Courtesy of AMERICAN HONDA MOTOR CO., INC.

72 mm Shim

72 MM SHIM SPECIFICATIONS

	Part Number	Thickness
A	23931-P21-000	0.60 mm (0.0236 in.)
B	23932-P21-000	0.63 mm (0.0248 in.)
C	23933-P21-000	0.66 mm (0.0260 in.)

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D	23934-P21-000	0.69 mm (0.0271 in.)
E	23935-P21-000	0.72 mm (0.0283 in.)
F	23936-P21-000	0.75 mm (0.0295 in.)
G	23937-P21-000	0.78 mm (0.0307 in.)
H	23938-P21-000	0.81 mm (0.0319 in.)
I	23939-P21-000	0.84 mm (0.0331 in.)
J	23940-P21-000	0.87 mm (0.0343 in.)
K	23941-P21-000	0.90 mm (0.0354 in.)
L	23942-P21-000	0.93 mm (0.0366 in.)
M	23943-P21-000	0.96 mm (0.0378 in.)
N	23944-P21-000	0.99 mm (0.0390 in.)
O	23945-P21-000	1.02 mm (0.0402 in.)
P	23946-P21-000	1.05 mm (0.0413 in.)
Q	23947-P21-000	1.08 mm (0.0425 in.)
R	23948-P21-000	1.11 mm (0.0437 in.)
S	23949-P21-000	1.14 mm (0.0449 in.)
T	23950-P21-	1.17 mm

2006 Honda Insight

2000-06 TRANSMISSION Manual Transmission - Insight

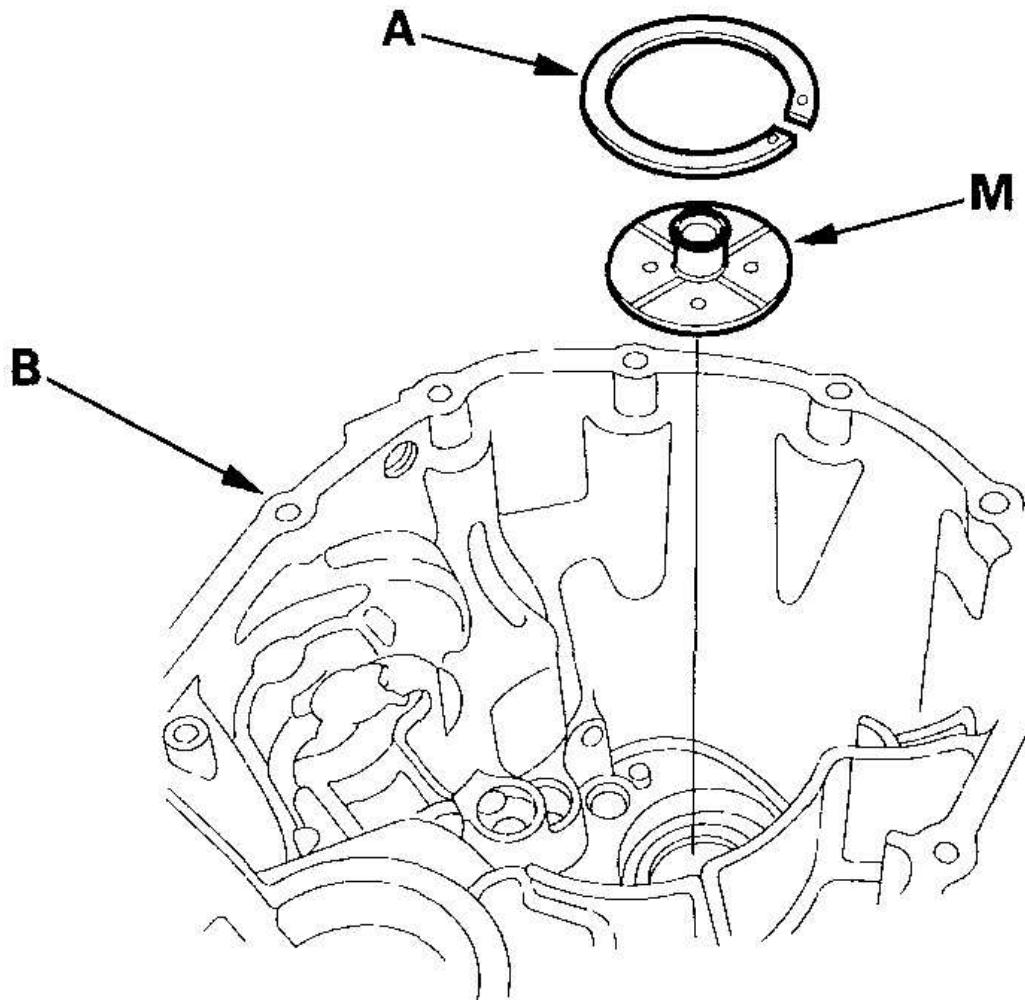
	000	(0.0461 in.)
U	23951-P21-000	1.20 mm (0.0472 in.)
V	23952-P21-000	1.23 mm (0.0484 in.)
W	23953-P21-000	1.26 mm (0.0496 in.)
X	23954-P21-000	1.29 mm (0.0508 in.)
Y	23955-P21-000	1.32 mm (0.0520 in.)
Z	23956-P21-000	1.35 mm (0.0531 in.)
AA	23957-P21-000	1.38 mm (0.0543 in.)
AB	23958-P21-000	1.41 mm (0.0555 in.)
AC	23959-P21-000	1.44 mm (0.0567 in.)
AD	23960-P21-000	1.47 mm (0.0579 in.)
AE	23961-P21-000	1.50 mm (0.0591 in.)
AF	23962-P21-000	1.53 mm (0.0602 in.)
AG	23963-P21-000	1.56 mm (0.0614 in.)
AH	23964-P21-000	1.59 mm (0.0626 in.)
AI	23965-P21-000	1.62 mm (0.0638 in.)
AJ	23966-P21-000	1.65 mm (0.0650 in.)

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AK	23967-P21-000	1.68 mm (0.0661 in.)
AL	23968-P21-000	1.71 mm (0.0673 in.)
AM	23969-P21-000	1.74 mm (0.0685 in.)
AN	23970-P21-000	1.77 mm (0.0697 in.)
AO	23971-P21-000	1.80 mm (0.0709 in)

7. Install the 72 mm shim (A) selected and oil guide plate M in the transmission housing (B).

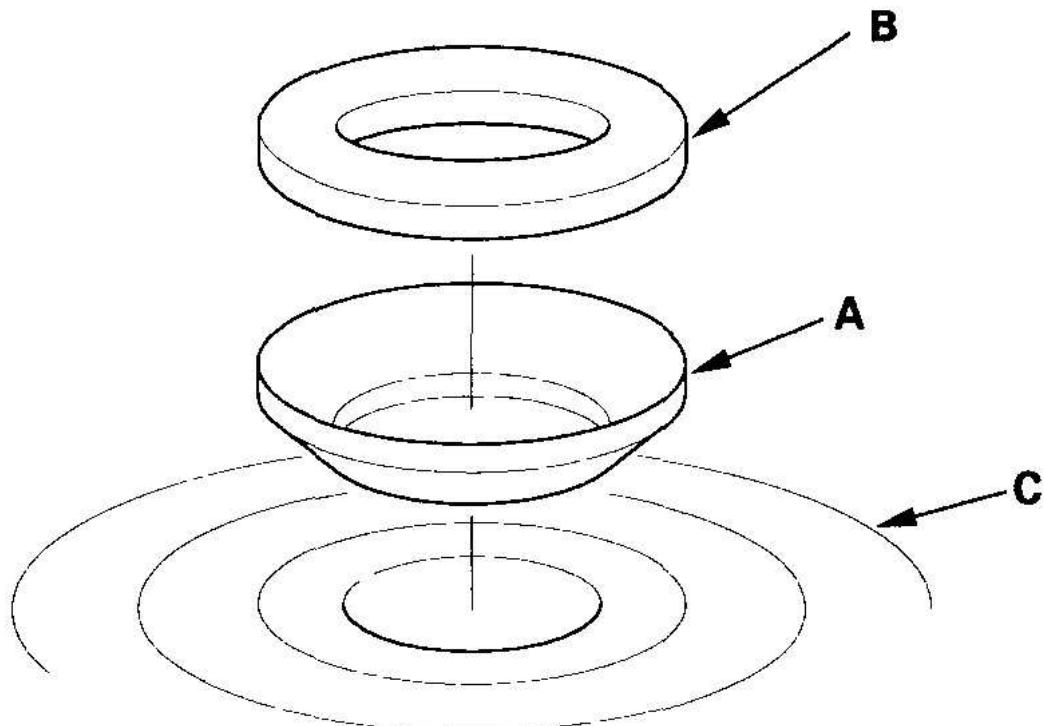


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Fig. 119: Installing Shim Selected And Oil Guide Plate In Transmission Housing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



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Fig. 120: Installing Spring Washer And Washer On Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Install the mainshaft in the clutch housing.
10. Place the transmission housing over the mainshaft and onto the clutch housing.
11. Tighten the clutch and transmission housings with several 8 mm bolts.

NOTE: It is not necessary to use sealing agent between the housings.

12. Lightly tap on the mainshaft with a plastic hammer.
13. Slide the special tools over the mainshaft (A).

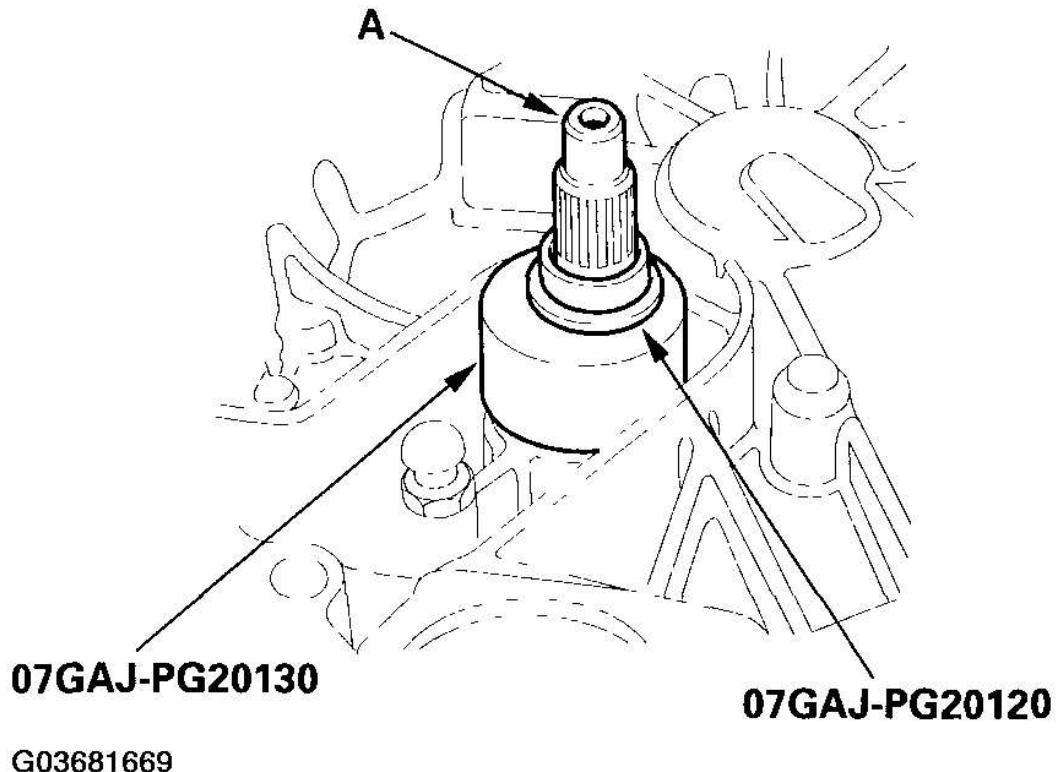


Fig. 121: Sliding Special Tools Over Mainshaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. 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 toward the transmission.
- Align the mainshaft holder's lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.

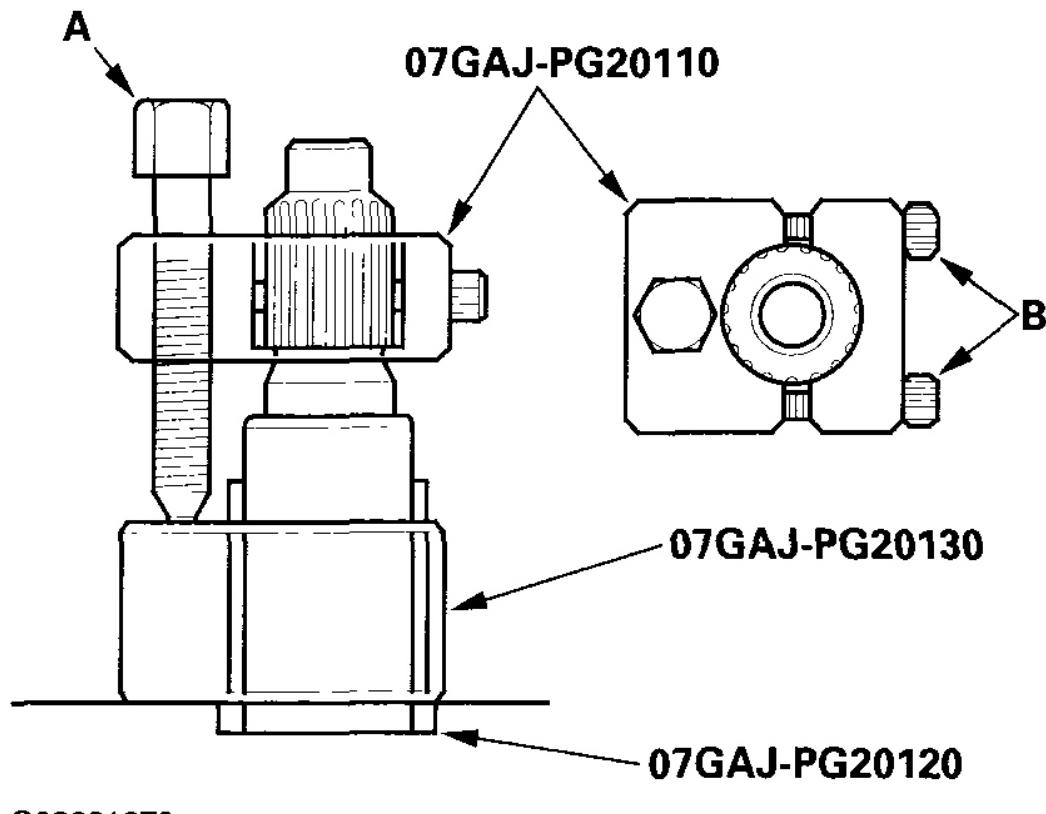


Fig. 122: Attaching Special Tools To Mainshaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Fully seat the mainshaft by tapping its end with a plastic hammer.
16. Thread in the mainshaft holder bolt until it just contacts the wide surface of the mainshaft base.
17. Zero a dial gauge (A) on the end of the mainshaft.

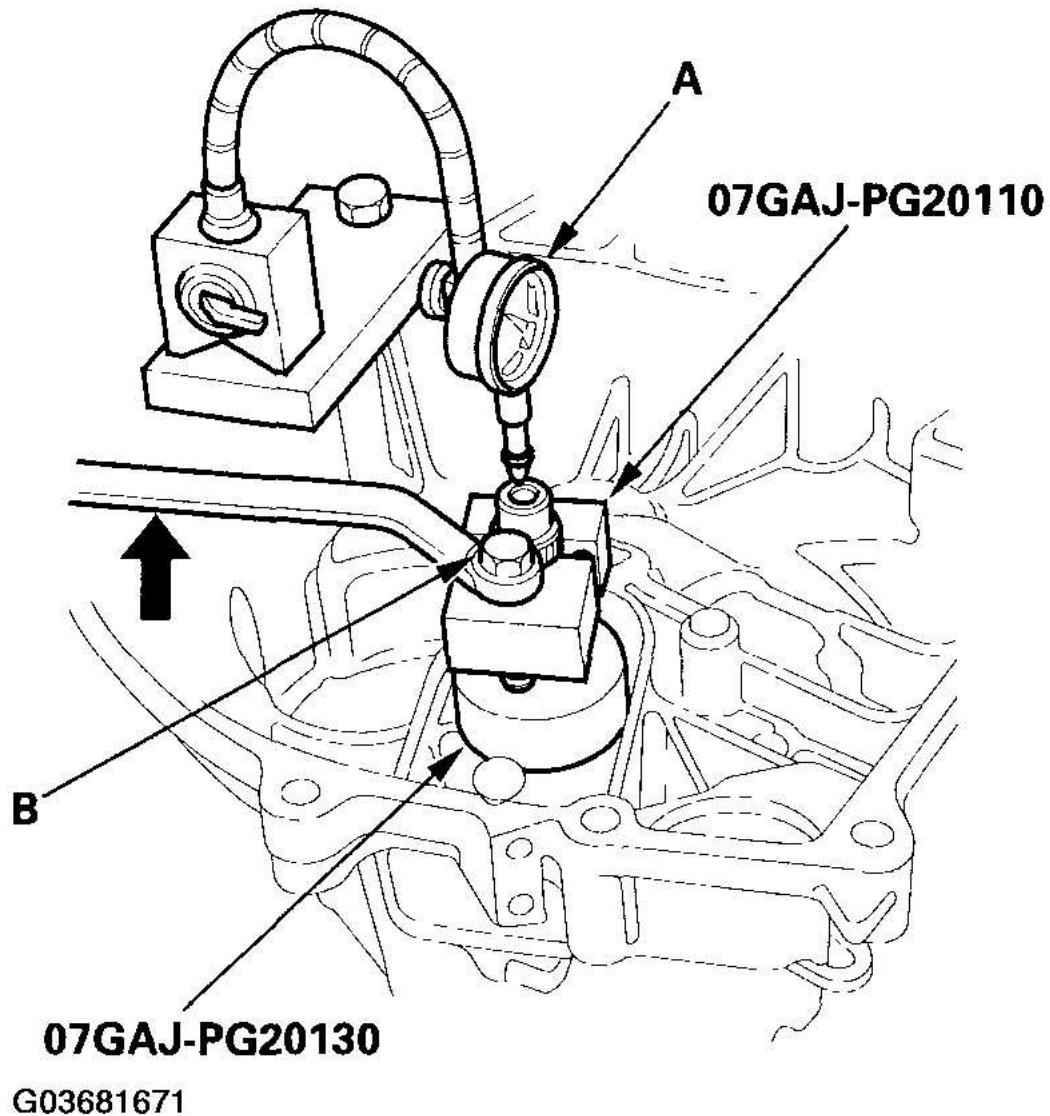


Fig. 123: Checking Mainshaft Endplay

Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. 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 end play.

NOTE: Do not turn the mainshaft holder bolt more than 60

degrees after the needle of the dial gauge stops moving, this may damage the transmission.

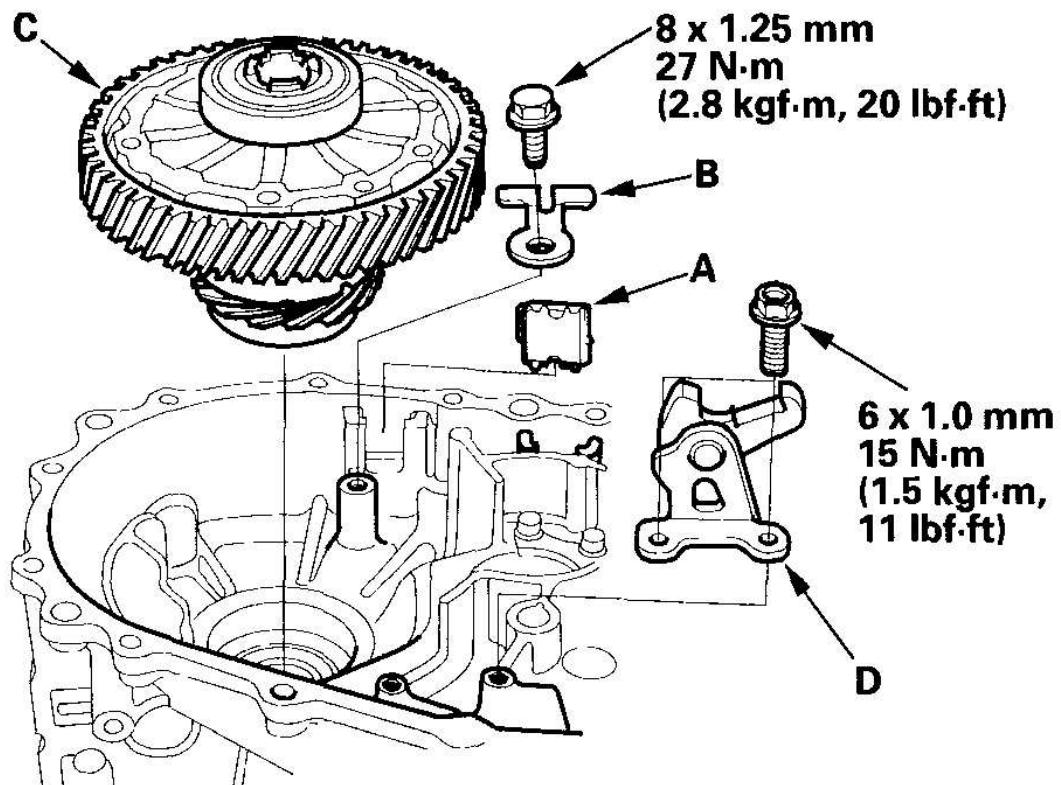
19. If the reading is within the standard, the clearance is correct. If the reading is not within the standard, recheck the shim thickness.

Standard: 0.11-0.18 mm (0.004-0.007 in.)

TRANSMISSION REASSEMBLY

NOTE: Prior to reassembling, clean all the parts in solvent, dry them, and lubricate all contact surfaces.

1. Install the magnet (A), magnet set plate (B), differential assembly (C), and reverse lock cam (D).

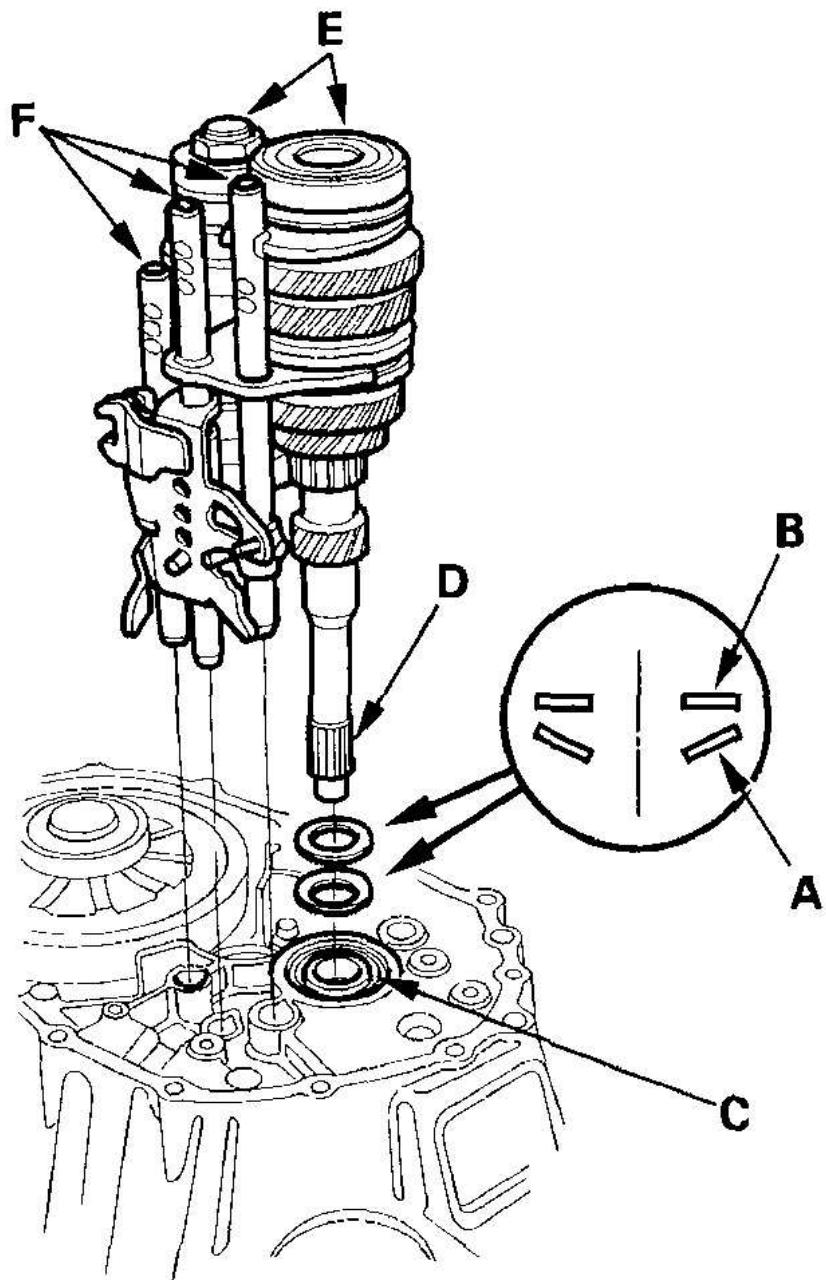


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Fig. 124: Installing Magnet, Magnet Set Plate, Differential Assembly, And Reverse Lock Cam

Courtesy of AMERICAN HONDA MOTOR CO., INC.

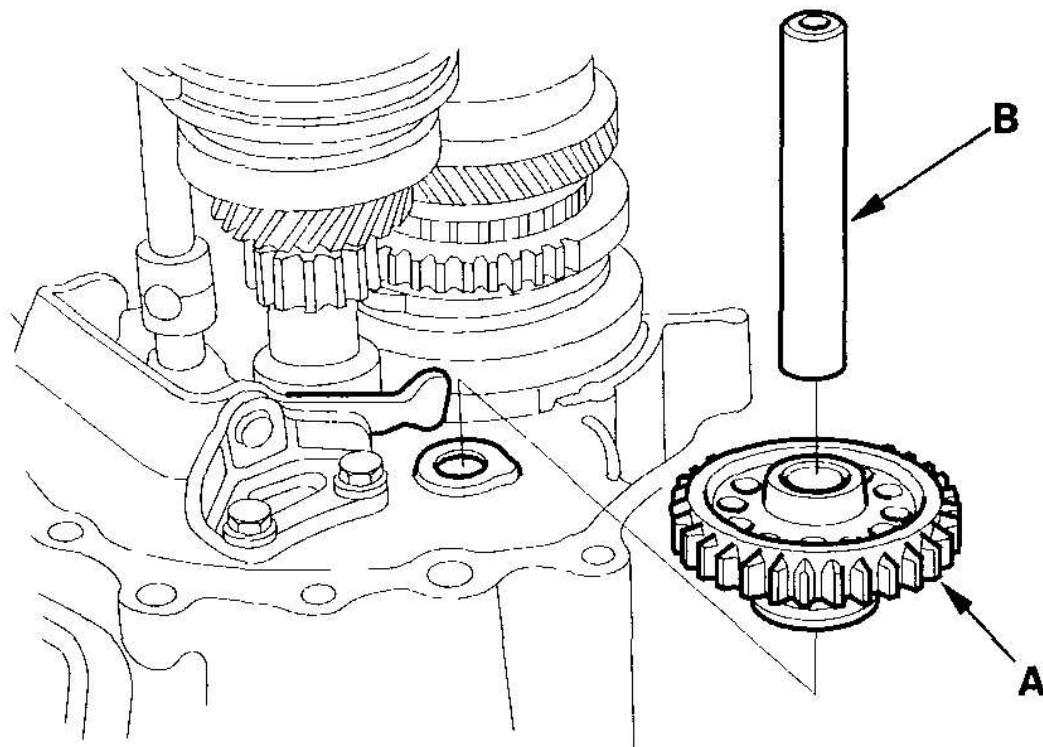
2. Install the 36 mm spring washer (A) and 26 mm washer (B) over the ball bearing (C). Note the installation direction of the spring washer (A).



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Fig. 125: Installing Spring Washer And Washer Over Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

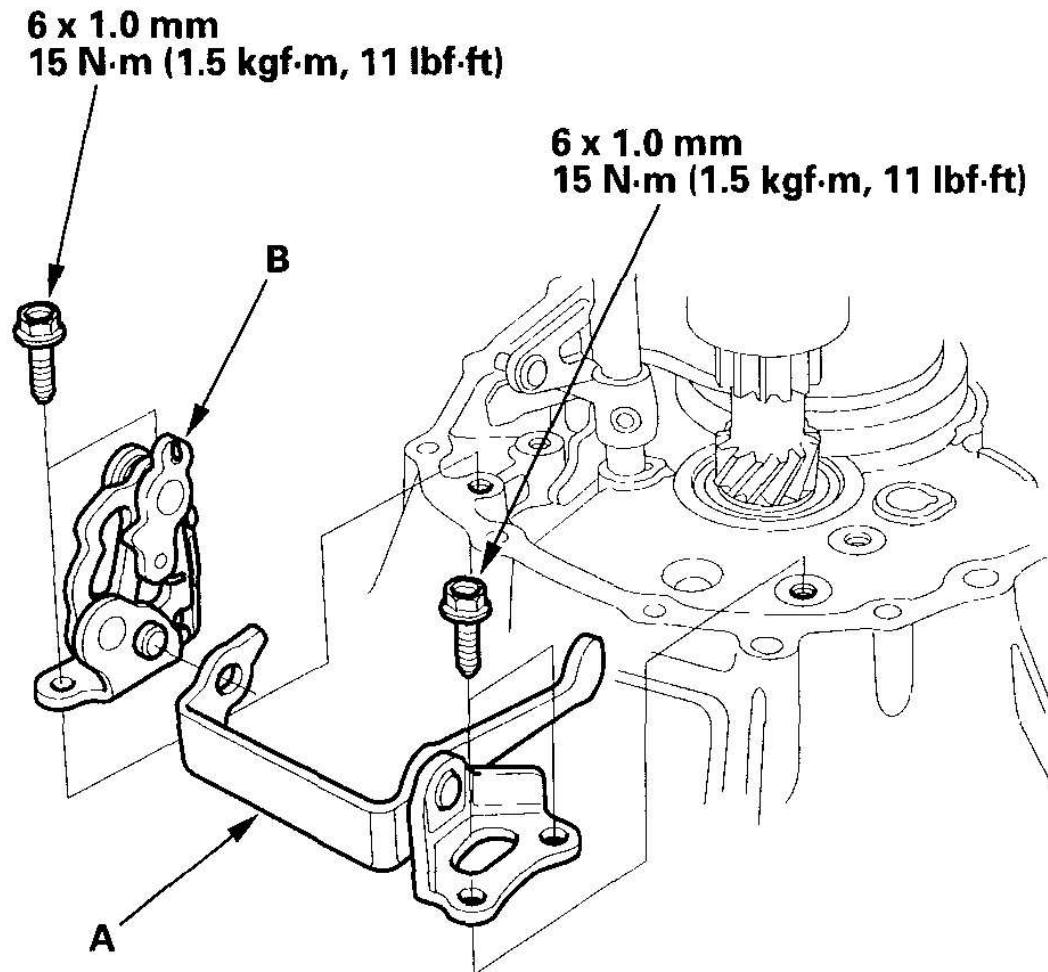
3. Apply tape to the mainshaft splines (D) to protect the seal. Install the mainshaft and countershaft (E) into the shift forks (F), and install them as an assembly.
4. Install the reverse idler gear (A) and reverse gear shaft (B).



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Fig. 126: Installing Reverse Idler Gear And Reverse Gear Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

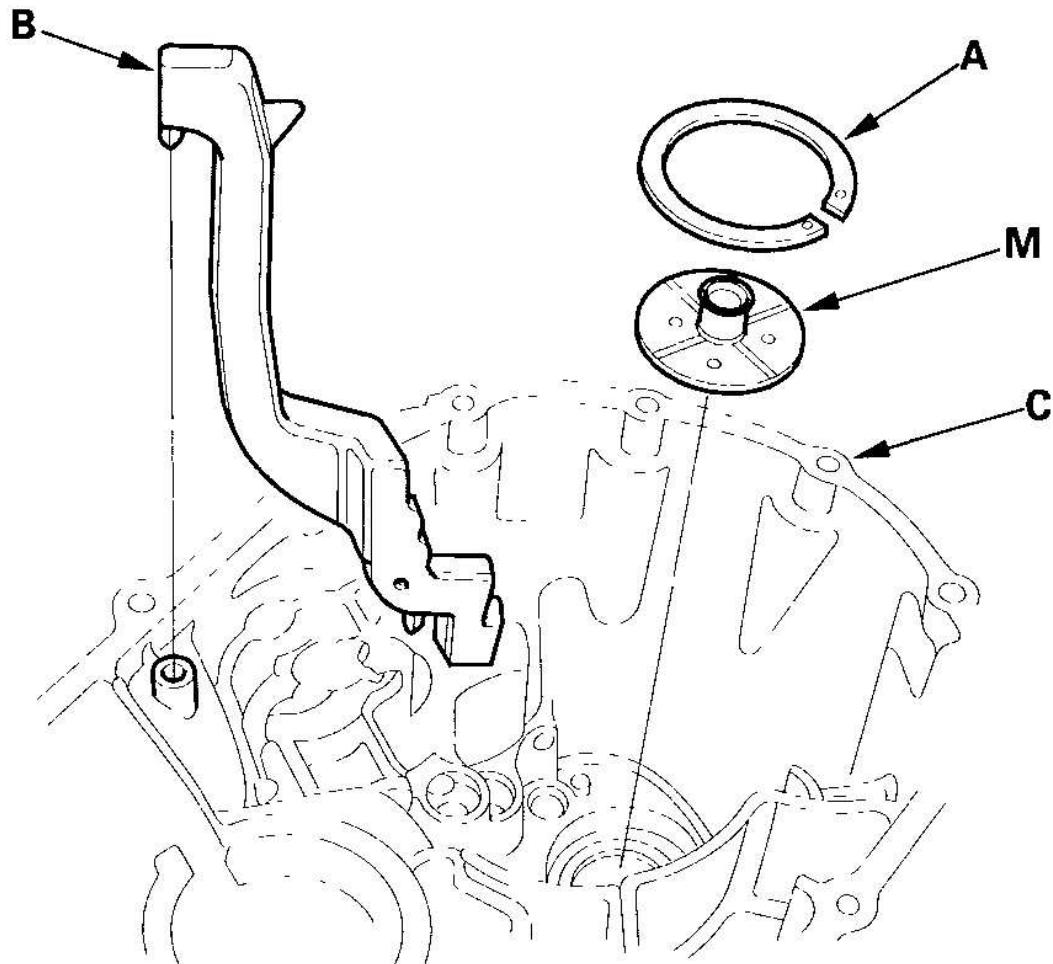
5. Install the reverse shift fork (A) and MBS cam holder (B).



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Fig. 127: Installing Reverse Shift Fork And MBS Cam Holder
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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



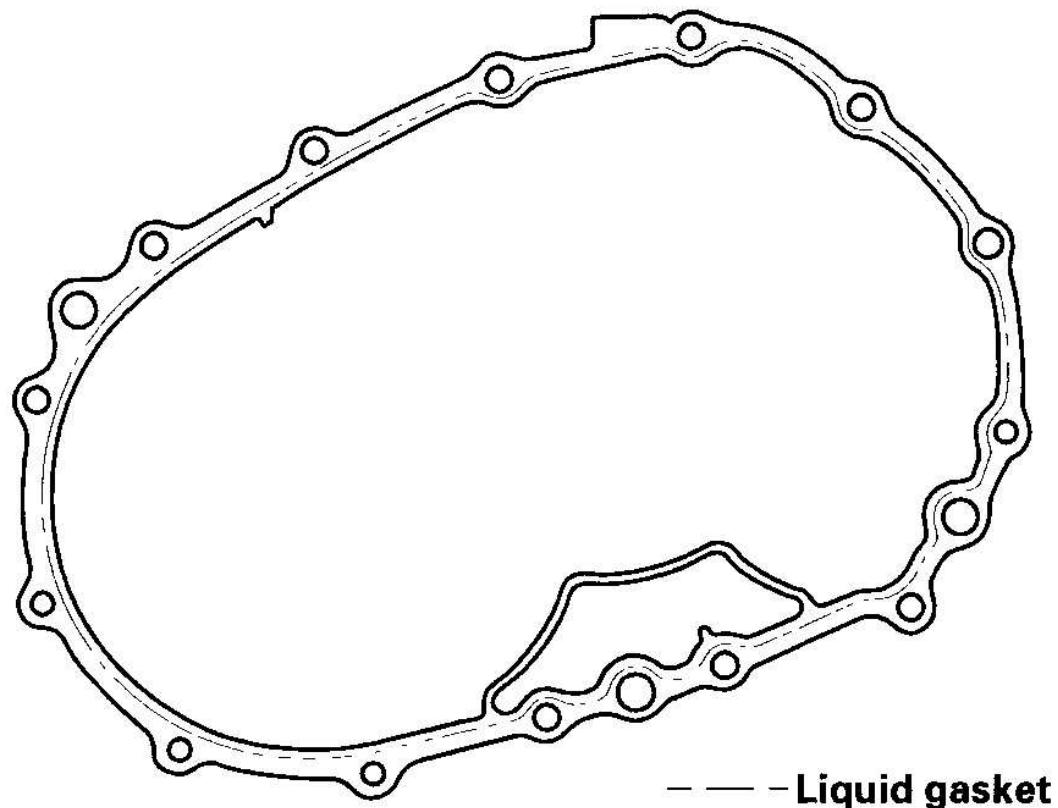
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Fig. 128: Installing Oil Gutter Plate, Oil Guide Plate, And Shim Into Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

NOTE: **Do not install the components if too much time has passed after applying the liquid gasket (for P/N 08718-**

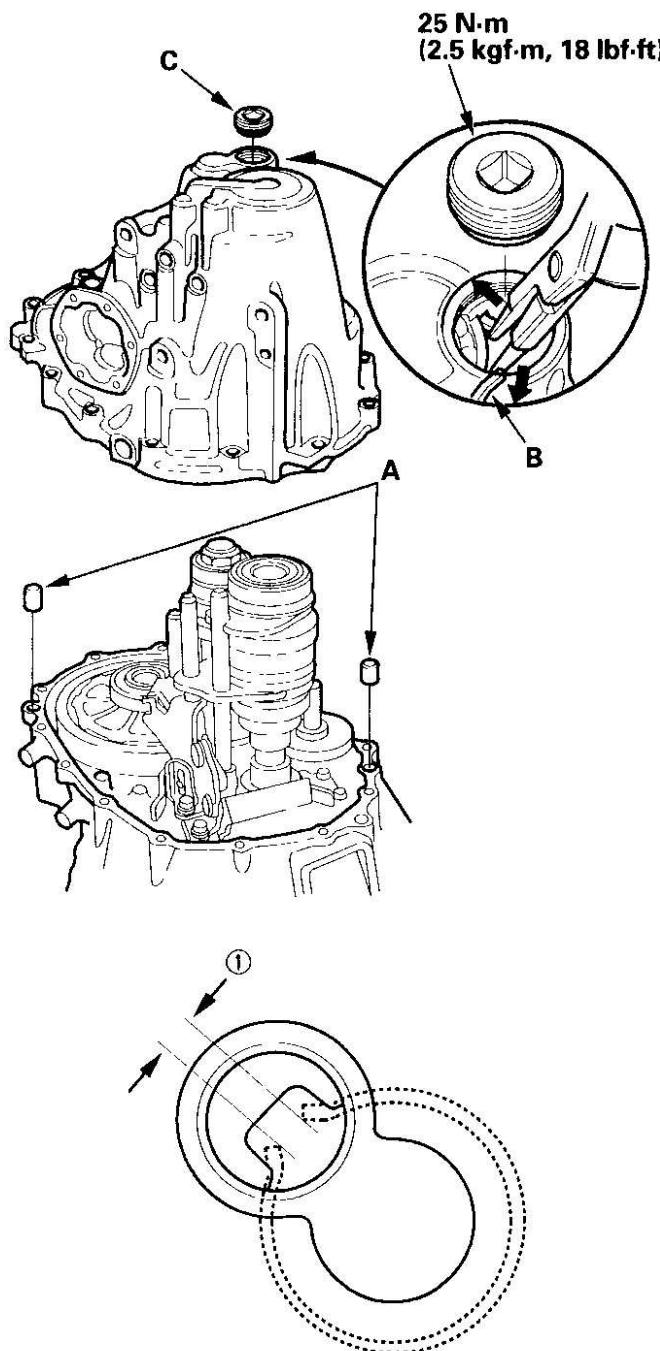
0002, no more than 4 minutes, for all others, no more than 5 minutes). Instead, remove the old residue, and reapply the liquid gasket.



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Fig. 129: Applying Liquid Gasket To Sealing Surface
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Install the 14x20 mm dowel pins (A).



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Fig. 130: Installing Dowel Pins

Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Lower the transmission housing the rest of the way as you expand the 52 mm snap ring (B). Release the snap ring so it seats in the groove of the countershaft bearing.
10. Make sure the 52 mm snap ring is securely seated in the groove of the countershaft bearing.

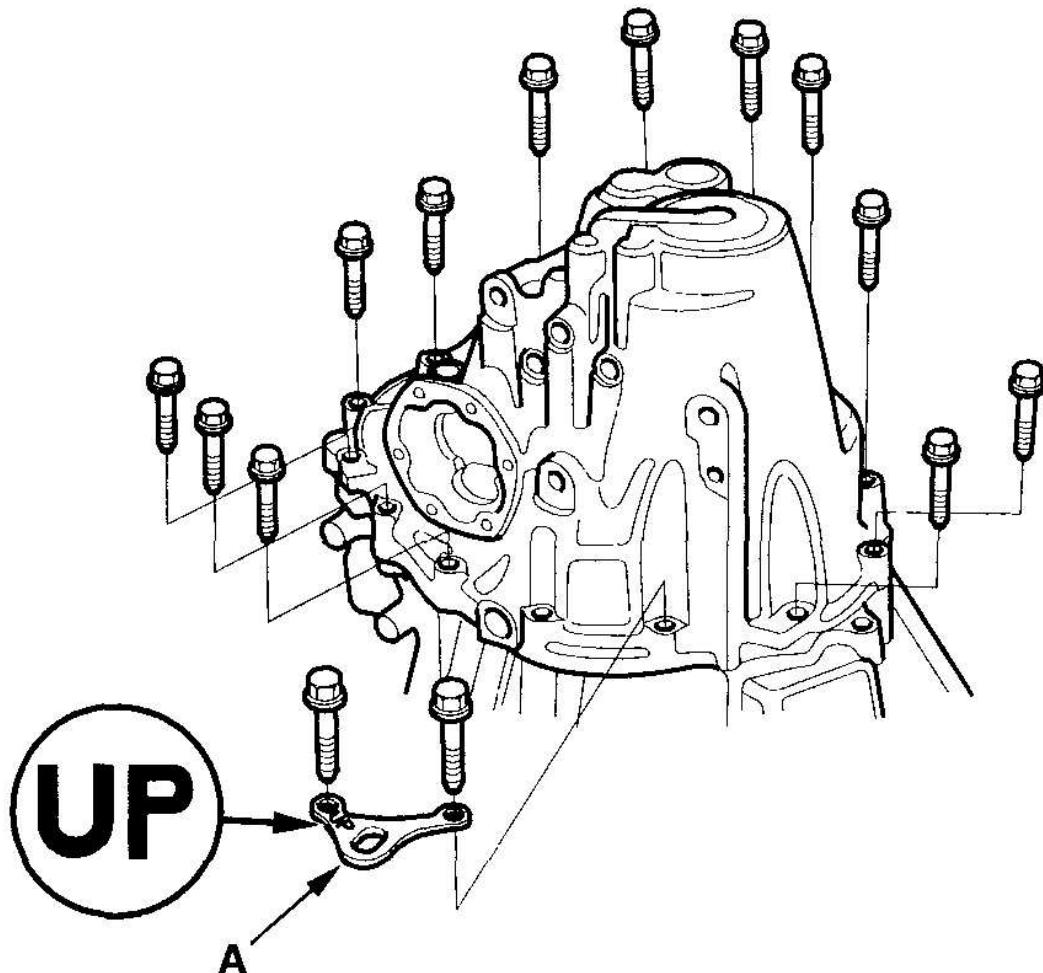
Dimension (1) as installed: 4.6 - 8.3 mm

(0.18-0.33 in.)

11. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to the threads of the 32 mm sealing cap (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.**

12. Install the transmission hanger (A) and the 8 mm flange bolts, finger-tight.



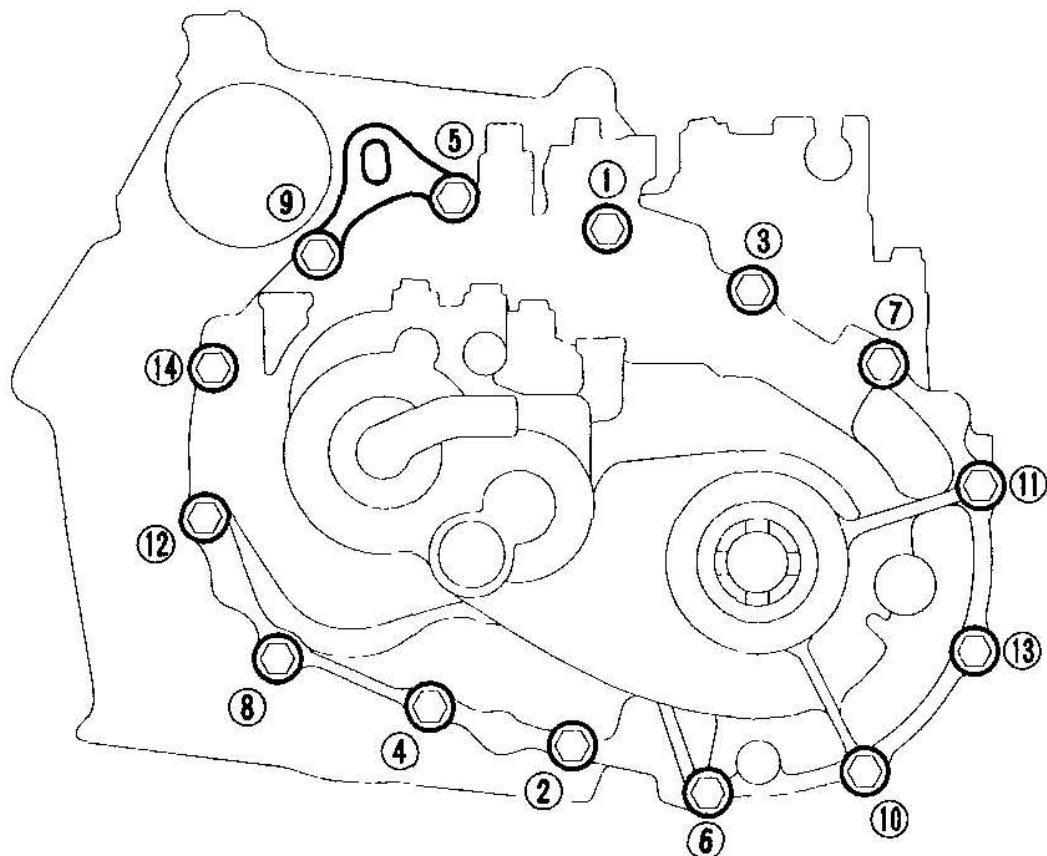
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Fig. 131: Installing Transmission Hanger And Flange Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

8 x 1.25 mm

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

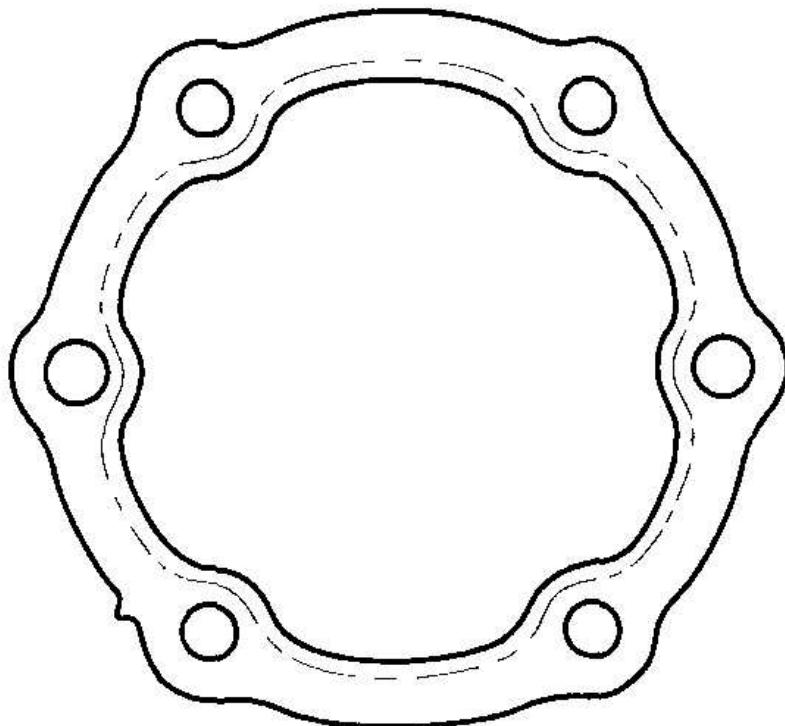


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Fig. 132: Identifying Tightening Sequence Of Transmission Flange Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove any dirt and oil from the change lever assembly 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.**



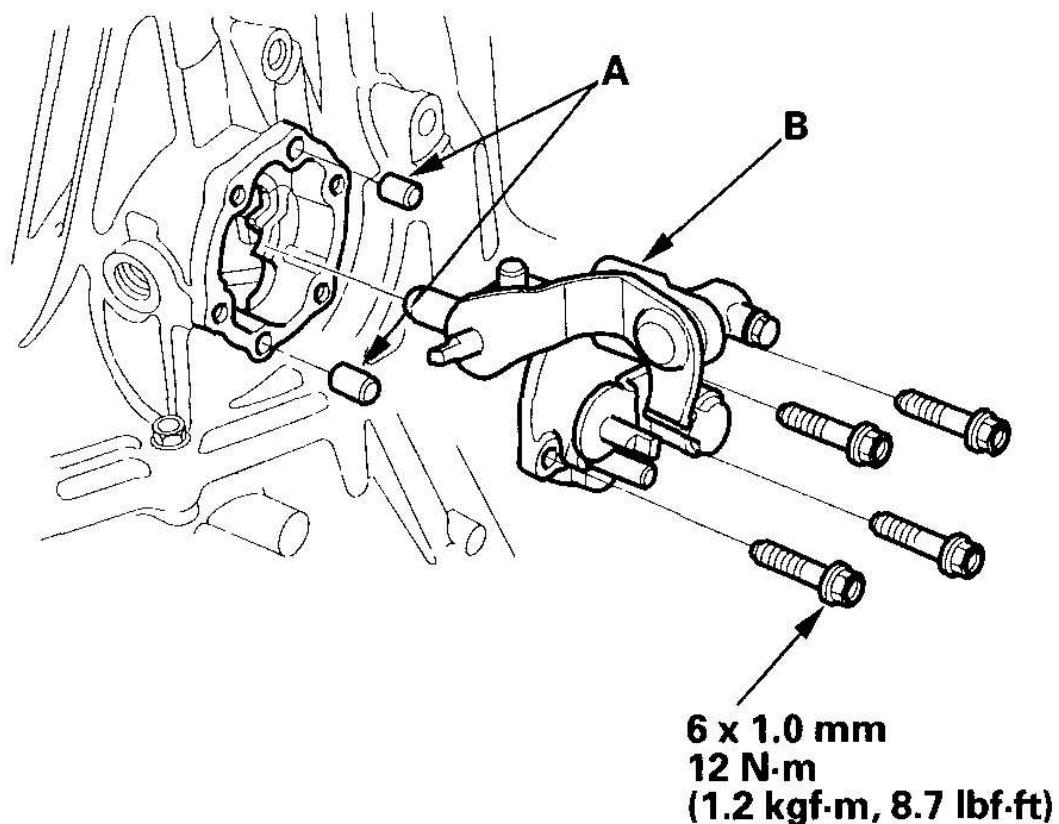
— — — Liquid gasket

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Fig. 133: Applying Liquid Gasket To Change Lever Assembly Sealing Surface

Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Install the 8x10 mm dowel pins (A) and change lever assembly (B).

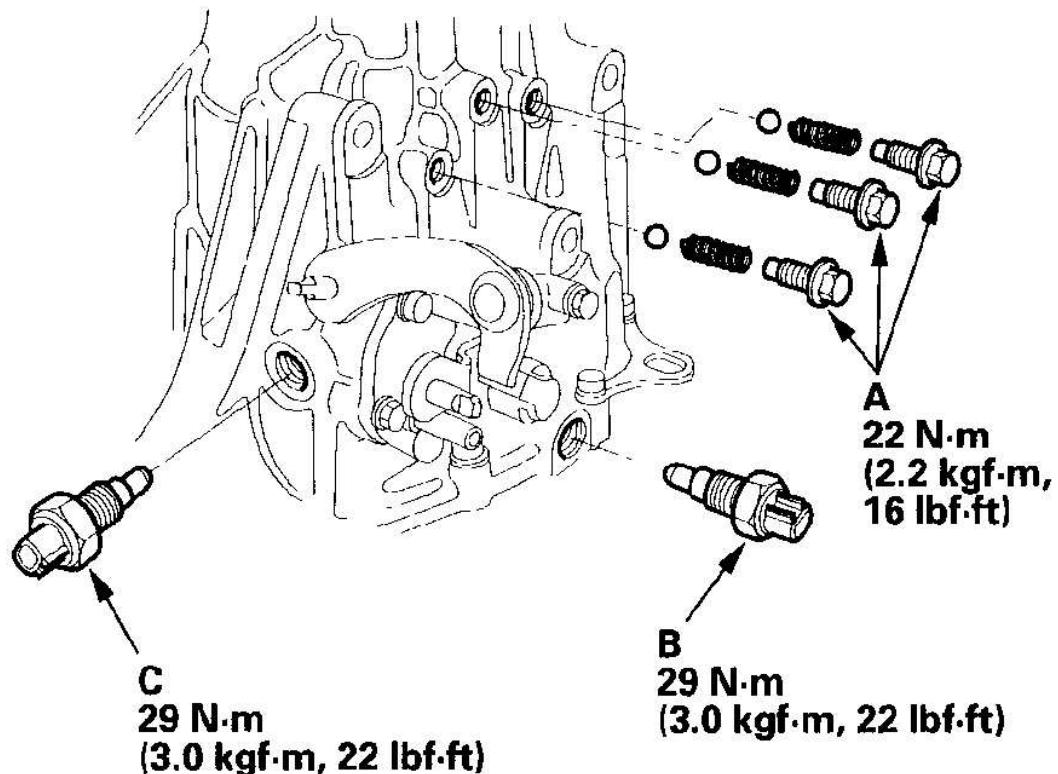


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Fig. 134: Identifying Tightening Torque Of Change Lever Assembly Bolts
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to the threads of the set screws, then install the set screws (A), springs, and steel balls.

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.



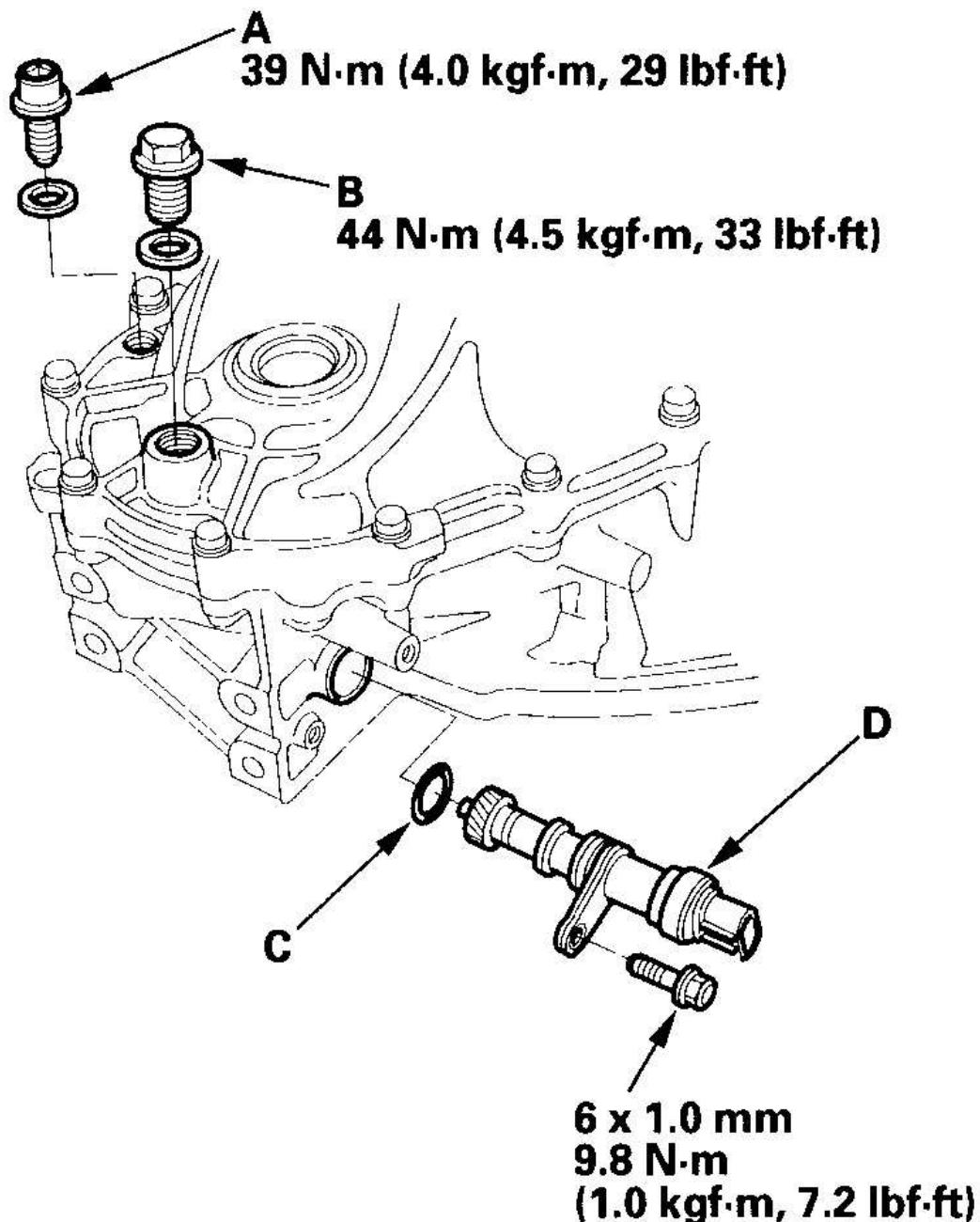
G03681683

Fig. 135: Identifying Tightening Torque Of Set Screws
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Apply liquid gasket (P/N 08718-0001 or 08718-0002) to the threads of the back-up light switch (B) and neutral position switch (C). Install the switches.

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.**

18. Install the drain plug (A), filler plug (B), O-ring (C), and vehicle speed sensor (VSS) (D).



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Fig. 136: Identifying Tightening Torque Of Drain Plug
Courtesy of AMERICAN HONDA MOTOR CO., INC.