

2007-08 TRANSMISSION

Manual Transmission - TL

SPECIAL TOOLS

Ref. No.	Tool Number	Description	Qty
* ①	07GAJ-PG20110	Mainshaft Holder	1
* ②	07GAJ-PG20130	Mainshaft Base	1
③	07NAD-PX40100	Attachment, 78 x 80 mm	1
④	07NAD-P20A100	Oil Seal Driver Attachment	1
⑤	07PAF-0030100	Installer, 46 mm I.D.	1
⑥	07SAZ-001000A	Backprobe Set	2
⑦	07XAJ-S0KA100	Preload Inspection Tool	1
* ⑧	07YAC-0010100	Adjustable Bearing Puller, 45—75 mm	1
⑨	070AD-PYZA100	Driver, 56 x 62 mm	1
⑩	07746-0010300	Attachment, 42 x 47 mm	1
⑪	07746-0010600	Attachment, 72 x 75 mm	1
⑫	07746-0030100	Driver, 40 mm I.D.	1
⑬	07749-0010000	Driver	1
⑭	07946-MB00000	Driver, 30 mm I.D.	1

* Part of Mainshaft Inspection Tool Set, 07GAJ-PG20102.

* * Must be used with commercially available 3/8"-16 UNF Slide Hammer.

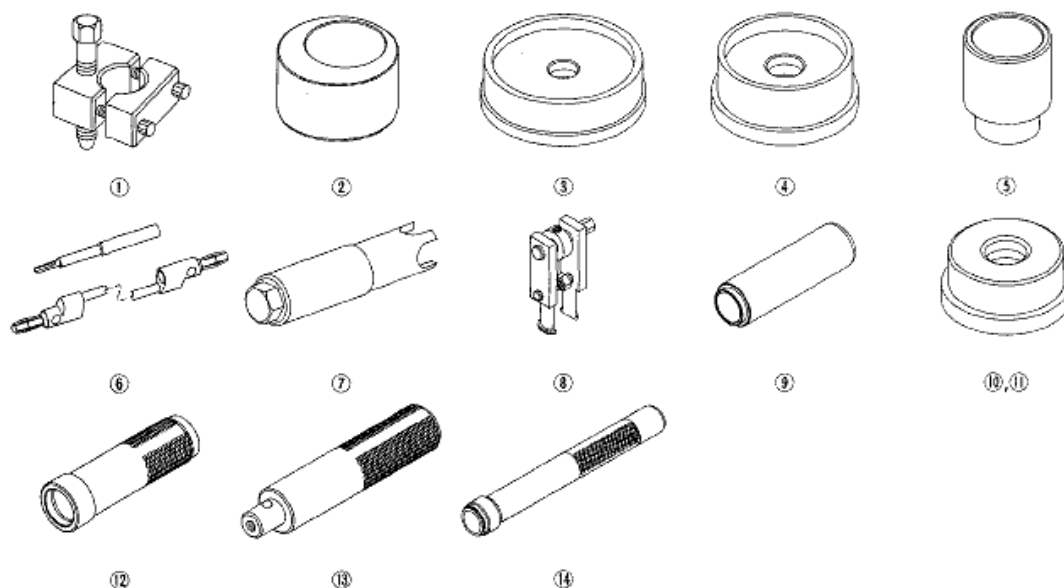


Fig. 1: Identifying Special Tools

Courtesy of AMERICAN HONDA MOTOR CO., INC.

GENERAL TROUBLESHOOTING INFORMATION

HOW TO TROUBLESHOOT CIRCUITS AT THE ECM

Special Tools Required

- Digital multimeter KS-AHM-32-003 (1) or a commercially available digital multimeter
- Backprobe set 07SAZ-001000A (2)

1. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a digital multimeter.

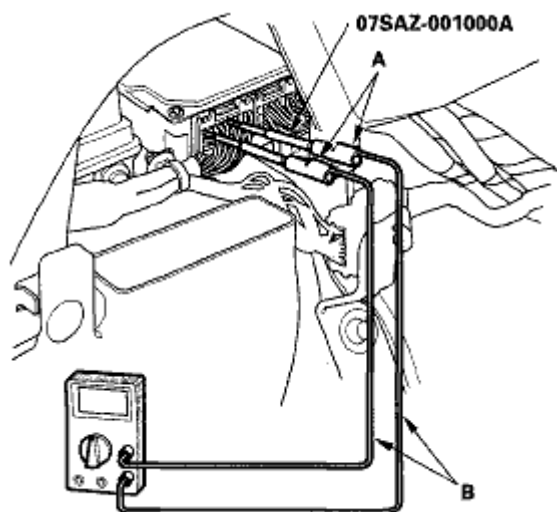


Fig. 2: Connecting Backprobe Adapters To Stacking Patch Cords
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it touches the end of the wire terminal.
3. If you can not get to the wire side of the connector or the wire side is sealed (A), disconnect the connector and probe the terminals (B) from the terminal side. Do not force the probe into the connector.

NOTE: Do not puncture the insulation on a wire. Punctures can cause poor or intermittent electrical connections.

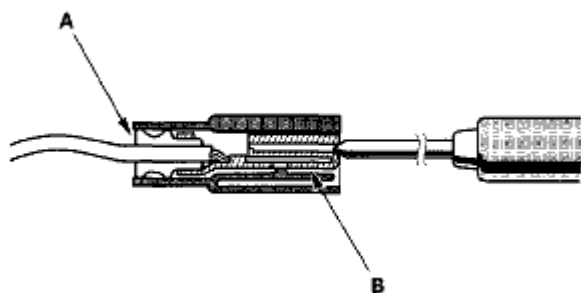


Fig. 3: Identifying Terminal
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

COMPONENT LOCATION INDEX

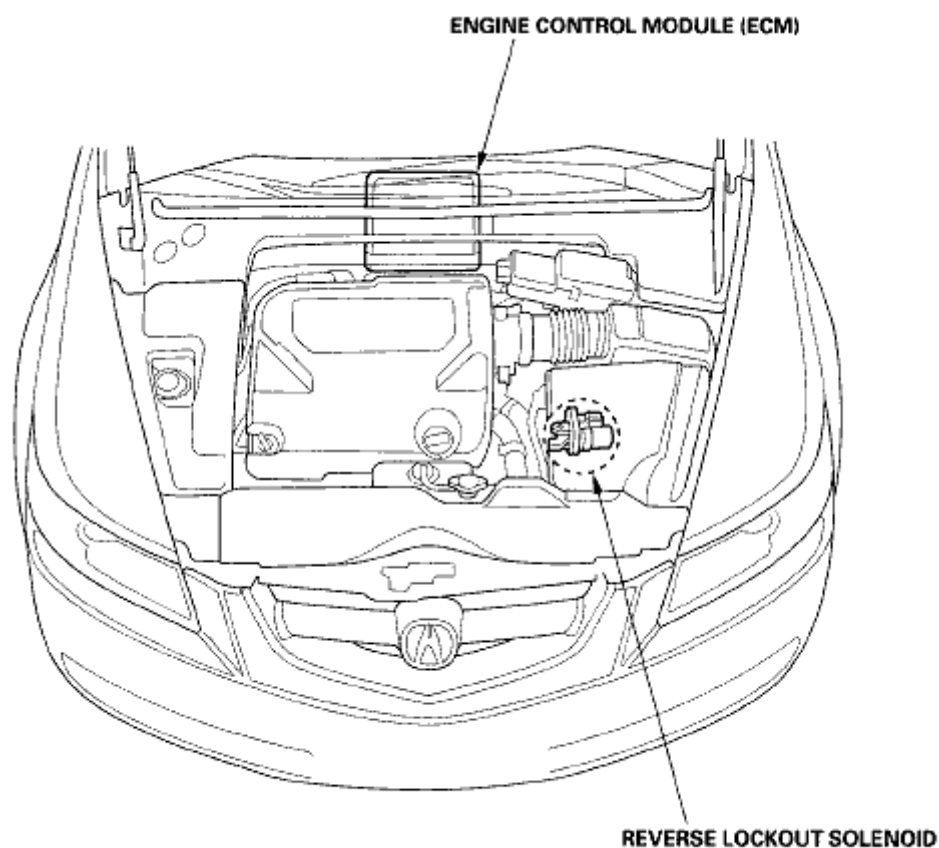


Fig. 4: Identifying Engine Control Module And Reverse Lockout Solenoid
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

SYSTEM DESCRIPTION

At a vehicle speed of 12 mph (20 km/h) or more, a signal from the ECM activates the reverse lockout solenoid, which pushes the select lock cam and select lock pin into the locked position. As a result, the interlock can not rotate to the reverse select position, making it impossible to engage reverse gear. At a vehicle speed of 9 mph (15 km/h) or less, the signal from the ECM is interrupted which turns off the reverse lockout solenoid. The return spring pulls back the select lock pin, enabling the interlock to move freely so reverse gear can be selected.

VEHICLE SPEED AND INHIBITOR POSITION REFERENCE

Vehicle speed	Inhibitor	Reverse selection
Above 12 mph (20 km/h)	ON	Not allowed
Below 9 mph (15 km/h)	OFF	OK
IG-SW OFF	OFF	OK

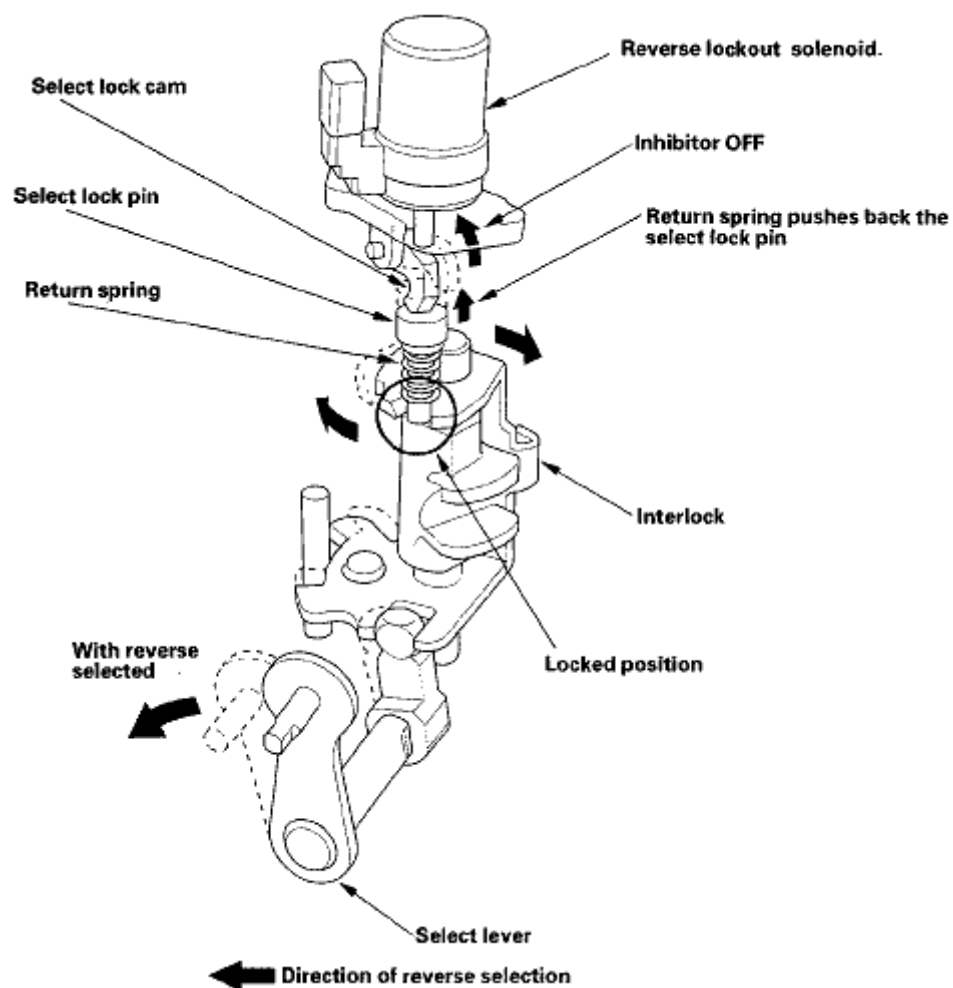


Fig. 5: Reverse Lockout System Diagram

Courtesy of AMERICAN HONDA MOTOR CO., INC.

CIRCUIT DIAGRAM

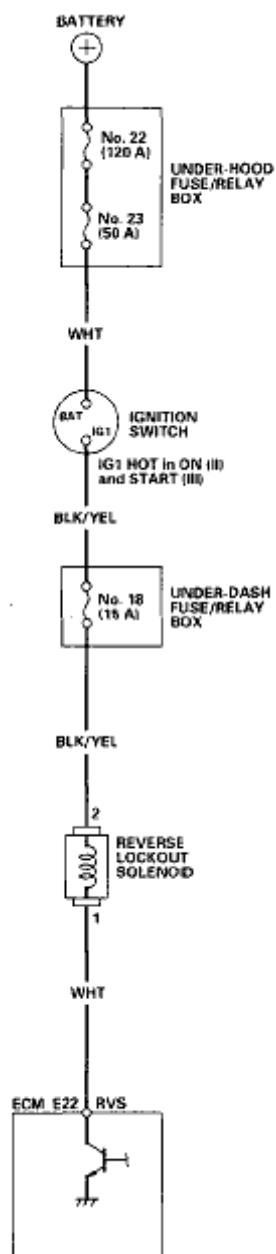


Fig. 6: Reverse Lockout System Circuit Diagram
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

CIRCUIT TROUBLESHOOTING

1. Check the No. 18(15 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES -Go to step 2.

NO -Replace the fuse, and recheck.

2. Start the engine, and check the Malfunction Indicator Lamp (MIL).

Does the MIL come on?

YES -Troubleshoot the DTC (see **GENERAL TROUBLESHOOTING INFORMATION**), and recheck.

NO -Go to step 3.

3. Turn the ignition switch OFF.
4. Shift into reverse gear.

Can you shift the transmission into reverse gear?

YES -Go to step 5.

NO -Repair the transmission, and recheck.

5. Raise the vehicle on a lift, make sure it is securely supported and allow the front wheels to rotate freely.
6. Start the engine. With the vehicle moving slowly (vehicle speed below 9 mph (15 km/h)), shift the transmission into reverse gear but do not release the clutch pedal.

Can you shift the transmission into reverse gear?

YES -Go to step 7.

NO -Turn the ignition switch OFF, then go to step 16.

7. Disable the VSA by pressing the VSA OFF switch. Shift the transmission into 1st gear, and lightly press the throttle until the speed meter reads above 12 mph (20 km/h). Try to shift the transmission into reverse.

Can you shift the transmission into reverse gear?

YES -Go to step 8.

NO -Intermittent failure, system is OK at this time.

8. Turn the ignition switch OFF.
9. Disconnect the reverse lockout solenoid 2P connector.

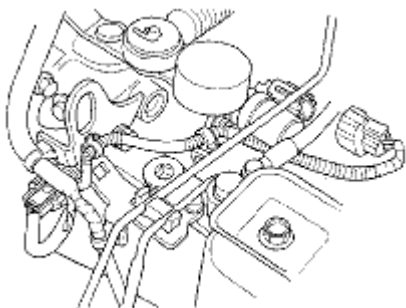
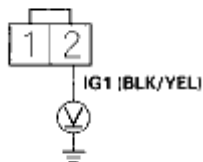


Fig. 7: Identifying Reverse Lockout Solenoid 2P Connector
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Turn the ignition switch ON (II).
11. Measure the voltage between the reverse lockout solenoid 2P connector terminal No. 2 and body ground.

**REVERSE LOCKOUT SOLENOID
2P CONNECTOR**



Wire side of female terminals

Fig. 8: Measuring Voltage Between Reverse Lockout Solenoid 2P Connector Terminal 2 And Body Ground
Courtesy of AMERICAN HONDA MOTOR CO., INC.

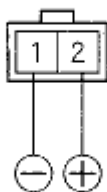
Is there battery voltage?

YES -Go to step 12.

NO -Check for loose or poor connections. If the connections are OK, repair open or short in the wire between the No. 18 (15 A) fuse in the under-dash fuse/relay box and the reverse lockout solenoid.

12. Turn the ignition switch OFF.
13. Remove the reverse lockout solenoid (see **REVERSE LOCKOUT SOLENOID DISASSEMBLY/REASSEMBLY**).
14. At the reverse lockout solenoid side, connect the reverse lockout solenoid 2P connector terminal No. 2 to the battery positive terminal, and connect the terminal No. 1 to the battery negative terminal. Check that the reverse lockout solenoid operates.

**REVERSE LOCKOUT SOLENOID
2P CONNECTOR**



Terminal side of male terminals

Fig. 9: Connecting Reverse Lockout Solenoid Connector Terminals To Battery Terminals
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Does the reverse lockout solenoid operate properly?

YES -Go to step 15.

NO -Replace the reverse lockout solenoid (see **REVERSE LOCKOUT SOLENOID DISASSEMBLY/REASSEMBLY**).

15. Check for continuity between reverse lockout solenoid 2P connector terminal No. 1 and ECM connector terminal E22.

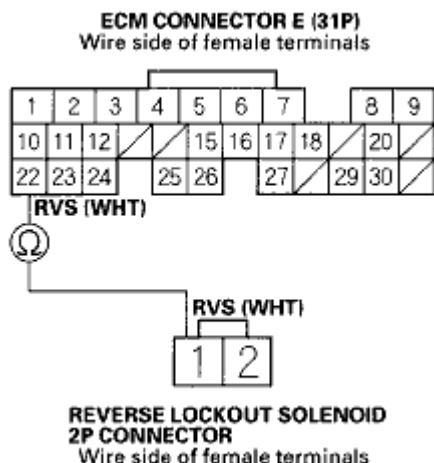


Fig. 10: Checking Continuity Between Reverse Lockout Solenoid 2P Terminal 1 And ECM Terminal E22

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Is there continuity?

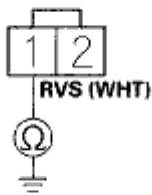
YES -Check for loose connections at ECM connector E (31P). If necessary, update the ECM if it does not have the latest software (see **UPDATING THE ECM/PCM**), or substitute a known-good ECM, then recheck (see **SUBSTITUTING THE ECM/PCM**). If the symptom/indication goes away with a known-good ECM, replace the original ECM (see **ECM/PCM REPLACEMENT**).

NO -Repair open in the wire between the reverse lockout solenoid and the ECM (E22).

16. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on **GENERAL TROUBLESHOOTING INFORMATION**).
17. Turn the ignition switch ON (II).
18. Make sure the HDS communicates with the vehicle and the ECM. If it doesn't communicate, troubleshoot the DLC circuit (see **DLC CIRCUIT TROUBLESHOOTING (PART 2)**).
19. Jump the SCS line with the HDS, then turn the ignition switch OFF.

NOTE: This step must be done to protect the ECM from damage.

20. Disconnect ECM connector E (31P).
21. Check for continuity between reverse lockout solenoid terminal No. 1 and body ground.

**REVERSE LOCKOUT SOLENOID
2P CONNECTOR**

Wire side of female terminals

Fig. 11: Checking Continuity Between Reverse Lockout Solenoid Terminal 1 And Body Ground
Courtesy of AMERICAN HONDA MOTOR CO., INC.

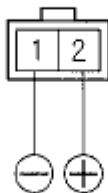
Is there continuity?

YES -Repair short to body ground in the wire between the reverse lockout solenoid and the ECM (E22).

NO -Update the ECM if it doesn't have the latest software (see **UPDATING THE ECM/PCM**), or substitute a known-good ECM (see **SUBSTITUTING THE ECM/PCM**), then recheck. If the symptom/indication goes away with a known-good ECM, replace the original ECM (see **ECM/PCM REPLACEMENT**).

REVERSE LOCKOUT SOLENOID TEST

1. Remove the reverse lockout solenoid (see **REVERSE LOCKOUT SOLENOID DISASSEMBLY/REASSEMBLY**).
2. Connect the battery positive terminal to the reverse lockout solenoid 2P connector terminal No. 2, and connect the battery negative terminal to the terminal No. 1.

**REVERSE LOCKOUT SOLENOID
2P CONNECTOR**

Terminal side of male terminals

Fig. 12: Connecting Battery Terminals To Reverse Lockout Solenoid 2P Connector Terminals
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Check that the reverse lockout solenoid works.
4. If the reverse lockout solenoid does not work, replace it.

REVERSE LOCKOUT SOLENOID DISASSEMBLY/REASSEMBLY

NOTE: Use fender covers to avoid damaging painted surfaces.

1. Remove the left rear engine compartment cover (A) and the left side engine compartment cover (B).

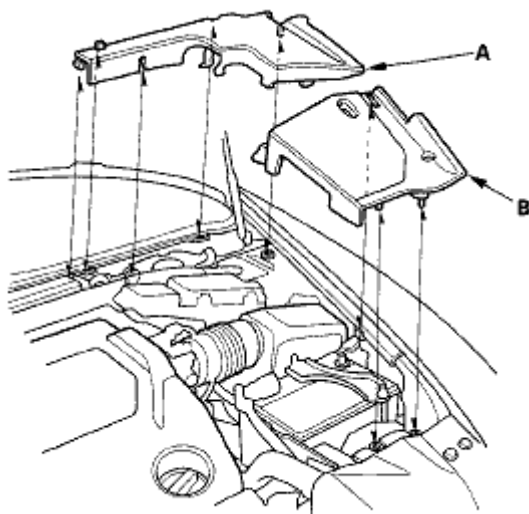


Fig. 13: Identifying Rear Engine Compartment Cover And Left Engine Compartment Cover
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Make sure you have the anti-theft codes for the audio system and the navigation system (if equipped).
3. Disconnect the negative cable from the battery, then disconnect the positive cable.
4. Remove the battery.
5. Remove the air cleaner assembly (see **THROTTLE BODY CLEANING**).
6. Remove the battery base.

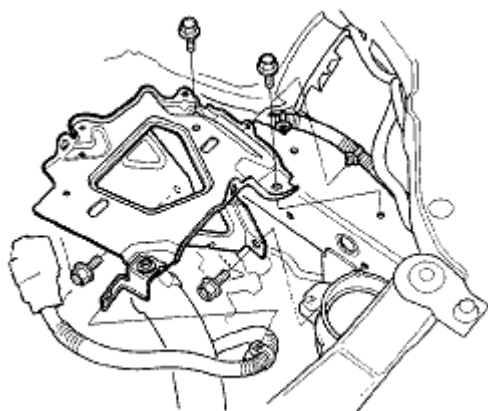


Fig. 14: Identifying Battery Base
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Carefully remove the shift cable bracket to avoid bending the shift cables (see step 17 on **TRANSMISSION REMOVAL**).
8. Disconnect the reverse lockout solenoid connector.
9. Remove the bolts (A), transmission harness bracket (B), and reverse lockout solenoid assembly (C).

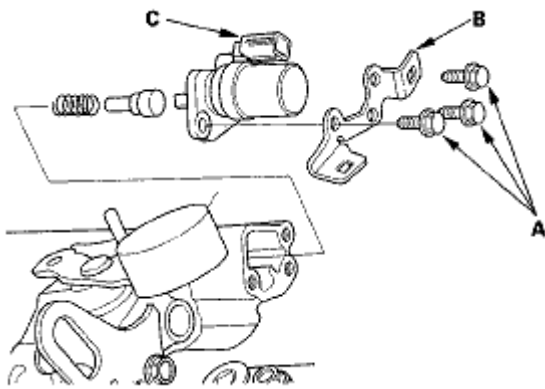


Fig. 15: Identifying Transmission Harness Bracket And Reverse Lockout Solenoid Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Remove the roller (A) and select lock cam (B).

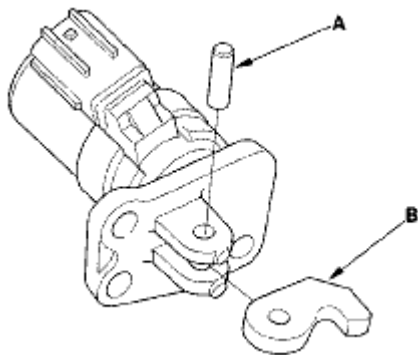


Fig. 16: Identifying Roller And Select Lock Cam
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Reassemble in the reverse order of removal.
12. Clean any the dirt and oil from the sealing surface.
13. Apply liquid gasket, P/N 08718-0001 evenly to the mating surface. Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- If you apply liquid gasket P/N 08718-0012, the component must be installed within 4 minutes.
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

14. Install the reverse lockout solenoid assembly (A), transmission harness bracket (B), and the bolts (C).

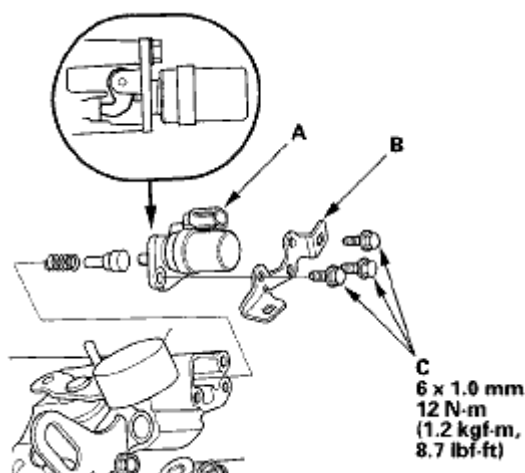


Fig. 17: Identifying Reverse Lockout Solenoid Assembly And Transmission Harness Bracket With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Connect the reverse lockout solenoid connector.
16. Install the shift cable bracket and shift cables (see step 37 on **TRANSMISSION INSTALLATION**).
17. Install the battery base.
18. Install the air cleaner assembly (see **THROTTLE BODY CLEANING**).
19. Install the battery. Clean the battery posts and cable terminals. Connect the positive cable to the battery first, then connect the negative cable, and apply multipurpose grease to prevent corrosion.
20. Install the left rear engine compartment cover and the left side engine compartment cover.
21. Enter the anti-theft codes for the audio system and navigation system (if equipped) and set the clock.

TRANSMISSION FLUID INSPECTION AND REPLACEMENT

NOTE: Use fender covers to avoid damaging painted surfaces.

1. Raise the vehicle on the lift.
2. Remove the engine under cover (see step 32 on **ENGINE REMOVAL**).
3. Remove the check bolt (A) and washer (B). Check the condition of the fluid and make sure it is at the proper level (C). If the fluid is dirty, remove the drain plug (D) and washer (E).

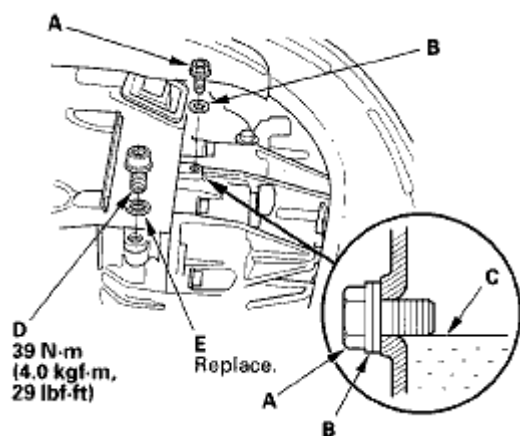


Fig. 18: Identifying Fluid Level And Drain Plug With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the drain plug with a new washer.
5. Lower the vehicle on the lift.
6. Remove the left rear engine compartment cover (A) and the left side engine compartment cover (B).

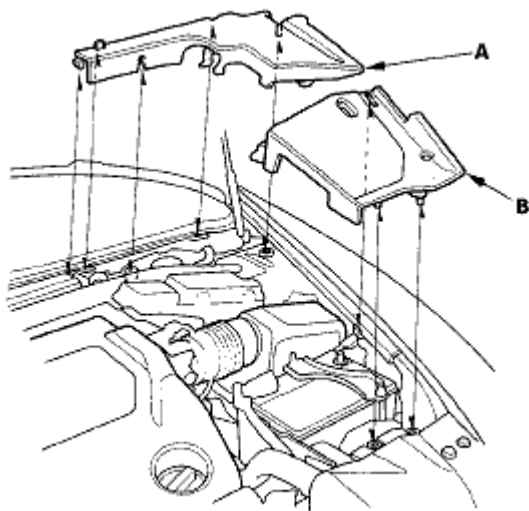


Fig. 19: Identifying Left Rear Engine Compartment Cover
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Make sure you have the anti-theft codes for the audio system and the navigation system (if equipped).
8. Disconnect the negative cable from the battery, then disconnect the positive cable.
9. Remove the battery.
10. Remove the air cleaner assembly (see **THROTTLE BODY CLEANING**).
11. Remove the battery base.

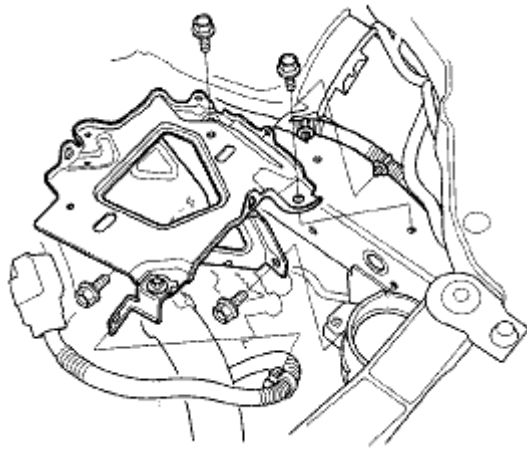


Fig. 20: Identifying Battery Base

Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Remove the filler plug (A) and washer (B).

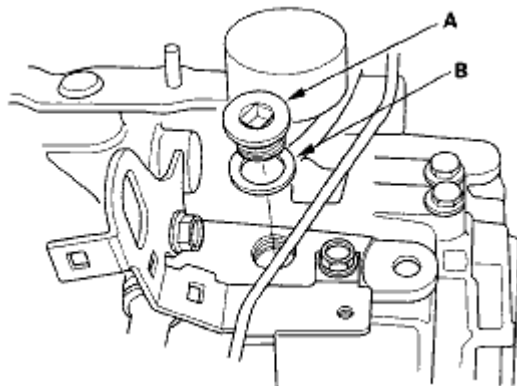


Fig. 21: Identifying Filler Plug And Washer

Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Refill the fluid from the filler plug hole of the transmission, and until the transmission fluid overflows from the check bolt hole (A).

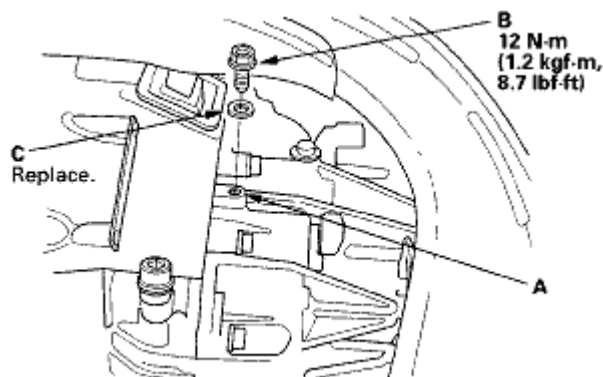


Fig. 22: Identifying Check Bolt With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. After the fluid stops overflowing, install the check bolt (B) with a new washer (C).

Fluid Capacity

2.1 L (2.2 US qt) at fluid change

2.5 L (2.6 US qt) at overhaul

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

15. Install the filler plug (A) with a new washer (B).

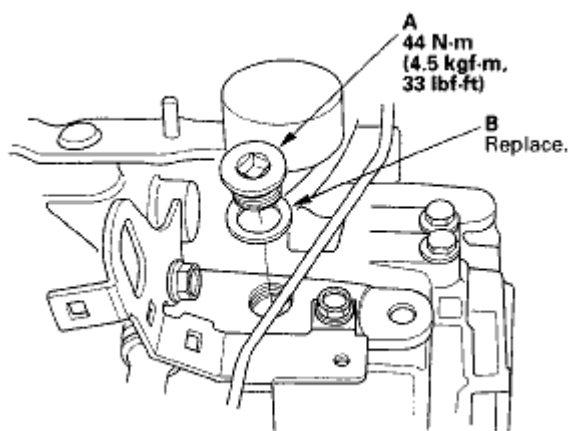


Fig. 23: Identifying Filler Plug And Washer With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Raise the vehicle on the lift.
17. Install the engine under cover (see step 44 on **ENGINE INSTALLATION**).
18. Lower the vehicle on the lift.
19. Install the battery base.

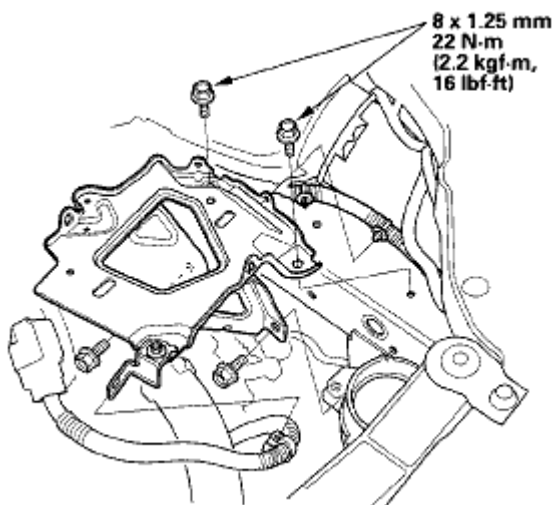


Fig. 24: Identifying Battery Base With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Install the air cleaner assembly (see **THROTTLE BODY CLEANING**).
21. Install the battery. Clean the battery posts and cable terminals. Connect the positive cable to the battery first, then connect the negative cable, and apply multipurpose grease to prevent corrosion.
22. Install the left rear engine compartment cover (A) and the left side engine compartment cover (B).

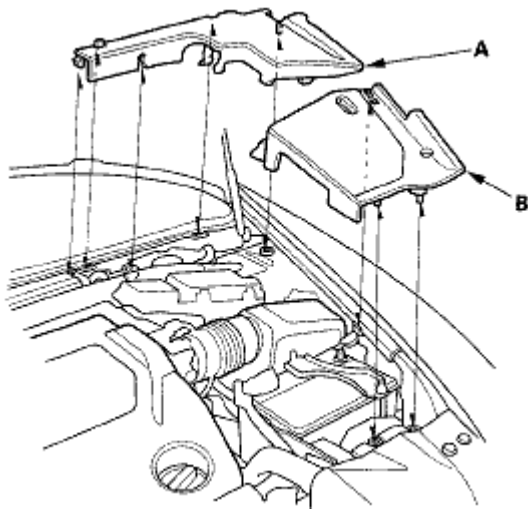


Fig. 25: Identifying Left Rear Engine Compartment Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Enter the anti-theft codes for the audio system and navigation system (if equipped) and set the clock.

BACK-UP LIGHT SWITCH TEST

NOTE: Use fender covers to avoid damaging painted surfaces.

1. Remove the left rear engine compartment cover (A) and the left side engine compartment cover (B).

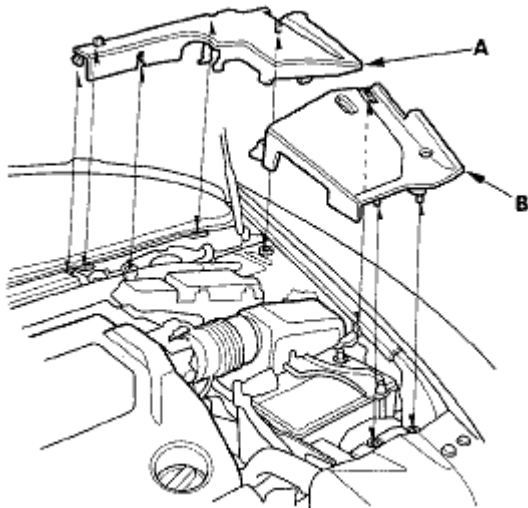


Fig. 26: Identifying Left Side Engine Compartment Cover
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Make sure you have the anti-theft codes for the audio system and the navigation system (if equipped).
3. Disconnect the negative cable from the battery, then disconnect the positive cable.
4. Remove the battery.
5. Remove the air cleaner assembly (see **THROTTLE BODY CLEANING**).
6. Remove the battery base.

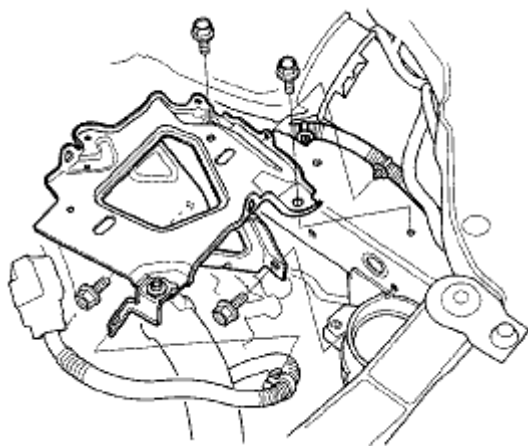


Fig. 27: Identifying Battery Base
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Disconnect the back-up light switch (A) 2P connector.

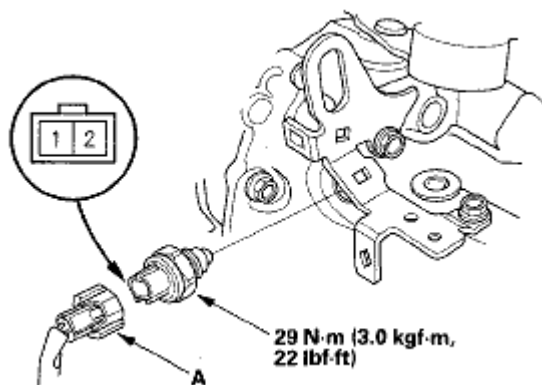


Fig. 28: Identifying Back-Up Light Switch 2P Connector With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Check for continuity between the back-up light switch 2P connector terminals No. 1 and No. 2. There should be continuity when the shift lever is only in reverse.
9. If necessary, replace the back-up light switch. Apply liquid gasket, P/N 08718-0001 evenly to the threads of the switch, and install it on the transmission housing. Install the switch within 5 minutes of applying the liquid gasket. Tighten the back-up light switch to the specified torque.

NOTE:

- If you apply liquid gasket P/N 08718-0012, the component must be

installed within 4 minutes.

- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

10. Install the battery base (see step 19 on **TRANSMISSION FLUID INSPECTION AND REPLACEMENT**).
11. Install the air cleaner assembly (see **THROTTLE BODY CLEANING**).
12. Install the battery. Clean the battery posts and cable terminals. Connect the positive cable to the battery first, then connect the negative cable, and apply multipurpose grease to prevent corrosion.
13. Install the left rear engine compartment cover and the left side engine compartment cover (see step 22 on **TRANSMISSION FLUID INSPECTION AND REPLACEMENT**).
14. Enter the anti-theft codes for the audio system and navigation system (if equipped) and set the clock.

TRANSMISSION REMOVAL

Special Tools Required

- Engine support hanger, A and Reds AAR-T-12566 *
- Front subframe adapter VSB02C000016 *
- Engine hanger balance bar VSB02C000019 *

* These special tools are available through the Acura 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 codes for the audio system and the navigation system (if equipped).
2. Remove the hood support struts from both sides of the pivot ball (bolted to the hood). Secure the hood (A) in a vertical position. Remove the right side pivot ball, and install it into the lower threaded hole (B), then reattach the support strut.

NOTE: Do not attempt to close the hood with the support strut in the vertical position; it will damage the support strut and the hood.

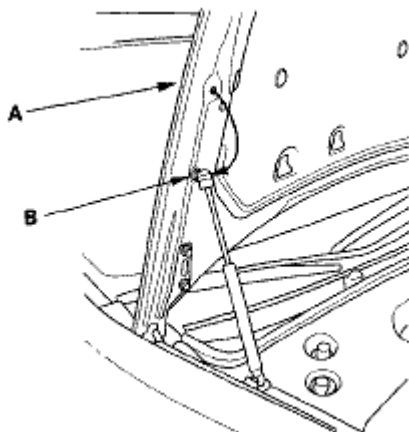
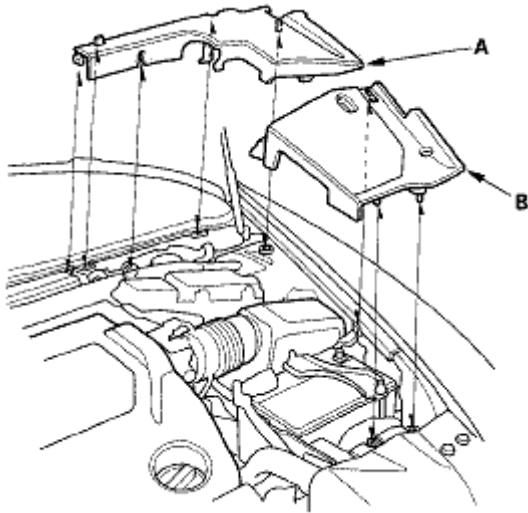


Fig. 29: Identifying Hood

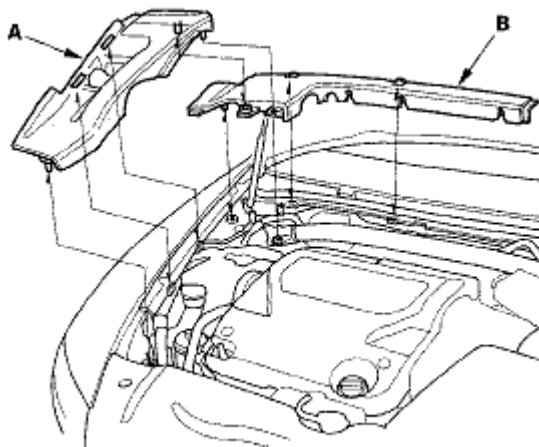
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the left rear engine compartment cover (A) and the left side engine compartment cover (B).

**Fig. 30: Identifying Left Rear Engine Compartment Cover And Left Side Engine Compartment Cover**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the right side engine compartment cover (A) and the right rear engine compartment cover (B).

**Fig. 31: Identifying Left Rear Engine Compartment Cover And Left Side Engine Compartment Cover**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the engine cover (A) and the bulkhead cover (B).

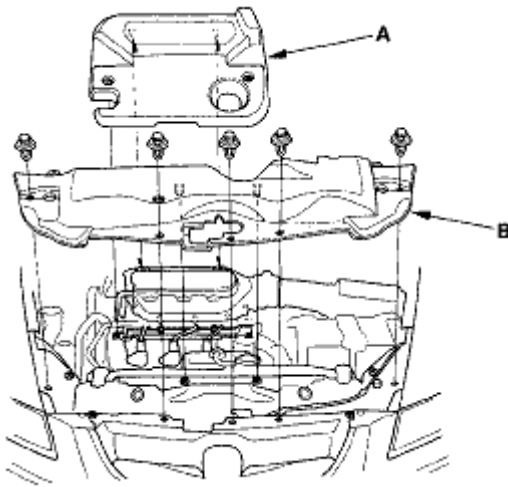


Fig. 32: Identifying Engine Cover And Bulkhead Cover
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Disconnect the negative cable from the battery, then disconnect the positive cable.
7. Remove the battery.
8. Remove the air cleaner assembly (see **THROTTLE BODY CLEANING**), and the resonator chamber (see **RESONATOR REMOVAL/INSTALLATION**).
9. Remove the battery base.

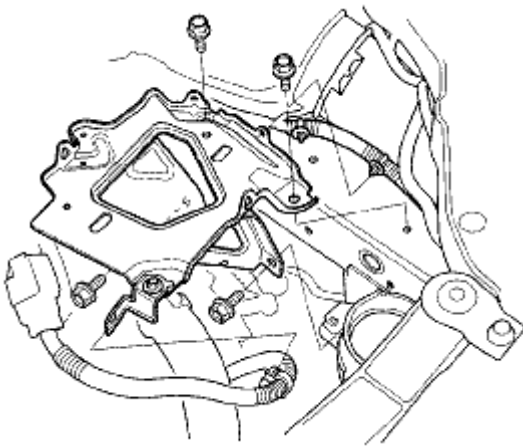


Fig. 33: Identifying Battery Base
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Remove the two bolts (A), then remove the under-hood fuse/relay box (B) from the body.

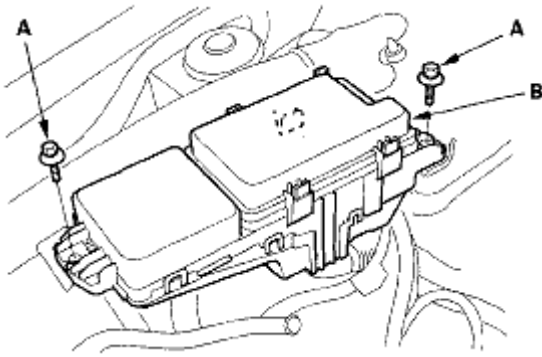


Fig. 34: Identifying Under-Hood Fuse/Relay Box
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Remove the strut brace.

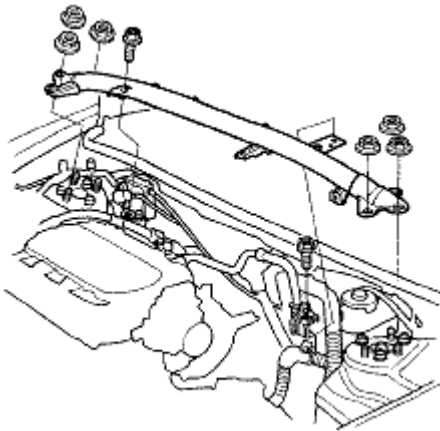


Fig. 35: Identifying Strut Brace
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Disconnect the back-up light switch connector (A) and reverse lockout solenoid connector (B), then remove the harness clips (C).

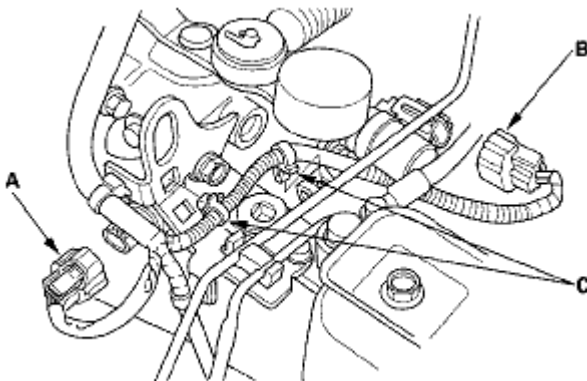


Fig. 36: Identifying Back-Up Light Switch Connector And Reverse Lockout Solenoid Connector
Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Disconnect the input shaft (mainshaft) speed sensor connector (A) and output shaft (countershaft)

speed sensor connector (B).

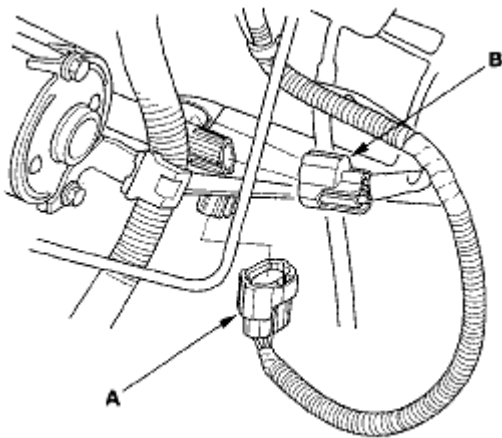


Fig. 37: Identifying Input Shaft (Mainshaft) Speed Sensor Connector And Output Shaft (Countershaft) Speed Sensor Connector
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove the harness clips (A), then disconnect the vacuum hose (B).

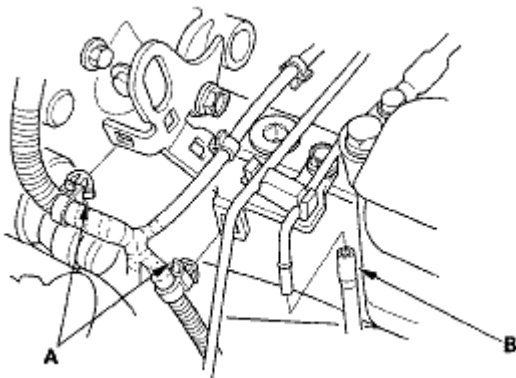


Fig. 38: Identifying Harness Clips And Vacuum Hose
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Remove the starter motor (see **STARTER REMOVAL AND INSTALLATION**).
16. Remove the harness bracket bolts (A).

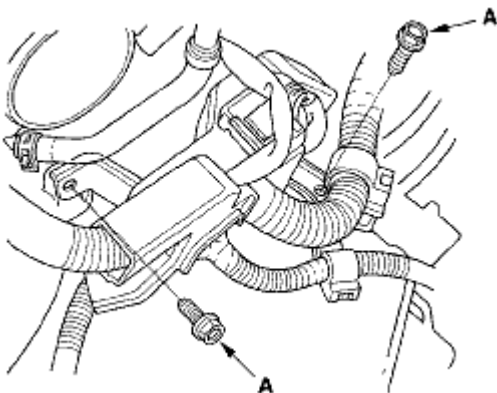
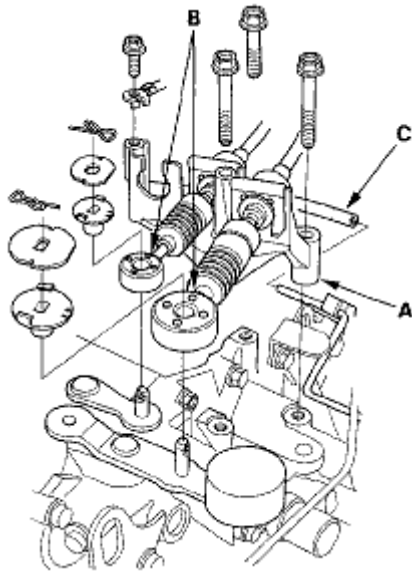


Fig. 39: Identifying Harness Bracket Bolts

Courtesy of AMERICAN HONDA MOTOR CO., INC.

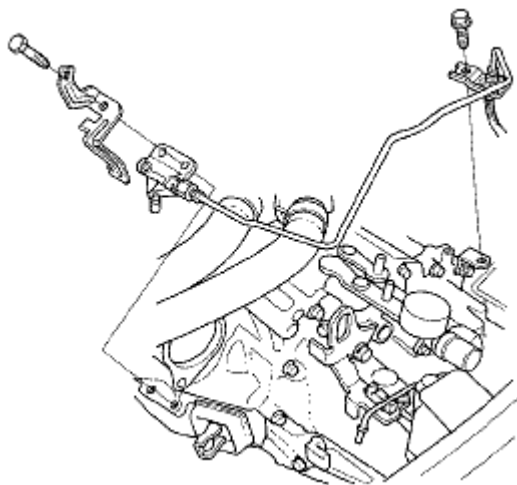
17. Remove the shift cable bracket (A), then disconnect the shift cables (B) from the top of the transmission housing. Carefully remove both cables and the bracket together to avoid bending the cables.

**Fig. 40: Identifying Shift Cable Bracket, Shift Cable And Vacuum Hose**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Disconnect the vacuum hose (C).
19. Carefully remove the slave cylinder to avoid bending the clutch line.

NOTE: Do not press the clutch pedal after the slave cylinder has been removed.

**Fig. 41: [Identifying Clutch Line]**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Lift and support the engine with the engine support hanger (A) and the engine hanger balance bar (B). Attach the front arm (C) to the front cylinder head with a spacer (D) and the 10 x 1.25 mm bolt (E). Attach the rear arm (F) to the rear cylinder head with the 8 x 1.25 mm bolt (G).

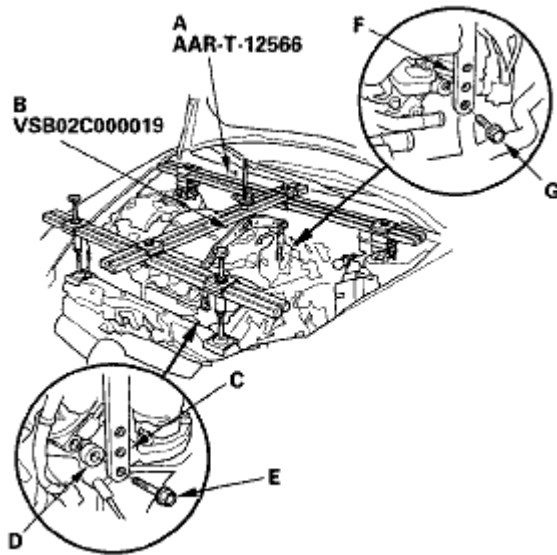


Fig. 42: Supporting Engine With Engine Support Hanger And Engine Hanger Balance Bar
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. Remove the upper transmission mounting bolts.

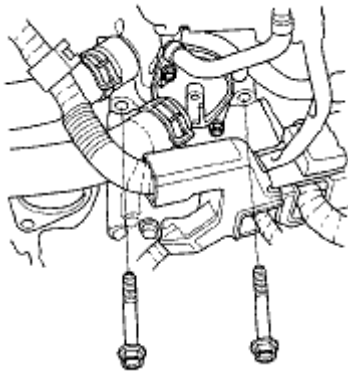


Fig. 43: Identifying Upper Transmission Mounting Bolts
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Remove and plug the return hose (A) from the power steering fluid reservoir (B). Immediately wipe off any spilled fluid.

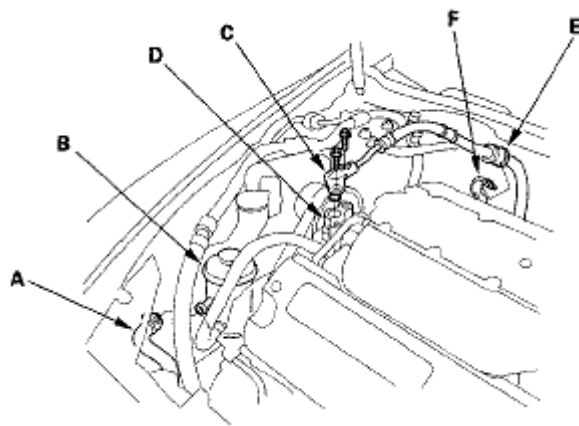


Fig. 44: Identifying Return Hose, Power Steering Pump And Power Steering Fluid Reservoir
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Remove the power steering pump outlet line (C) from the power steering pump (D), and remove the hose (E) from its clamp (F).
24. Remove the front engine mount mounting nuts (A), front engine mount stop (B), and the front engine mount mounting bolt (C).

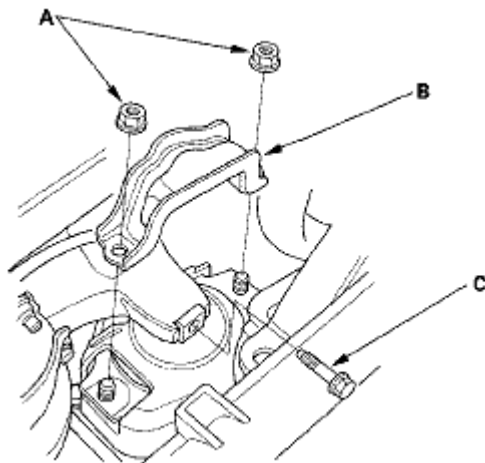


Fig. 45: Identifying Front Engine Mount Mounting Nuts And Bolt
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Remove the steering wheel (see **STEERING WHEEL REMOVAL**).
26. Remove the steering joint cover (A).

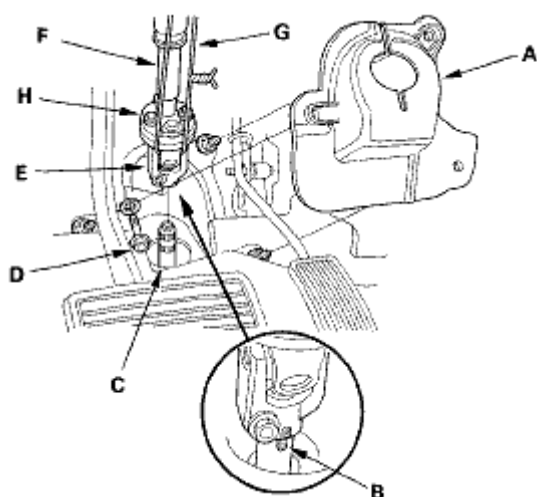


Fig. 46: Identifying Steering Joint Cover, Steering Gearbox Pinion Shaft And Steering Joint Bolt

Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. Make a reference mark (B) across the steering joint and steering gearbox pinion shaft (C). Remove the steering joint bolt (D), and disconnect the steering joint (E) by removing the steering joint toward the steering column. Hold the slider shaft (F) on the column with a piece of wire (G) between the joint yoke (H) on the slider shaft to the joint yoke on the upper shaft (see step 8 on **STEERING COLUMN REMOVAL AND INSTALLATION**).
28. Remove the transmission mount bracket (A) and ground cable (B).

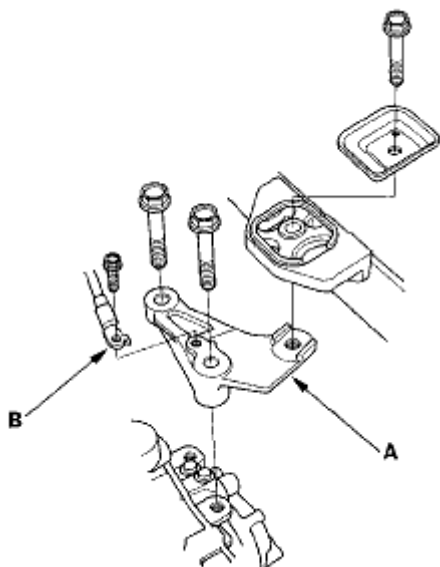


Fig. 47: Identifying Transmission Mount Bracket And Ground Cable
Courtesy of AMERICAN HONDA MOTOR CO., INC.

29. Raise the vehicle on the lift, and make sure it is securely supported.
30. Remove the engine under cover (see step 32 on **ENGINE REMOVAL**).
31. Drain the transmission fluid. Reinstall the drain plug with a new washer (see **TRANSMISSION FLUID INSPECTION AND REPLACEMENT**).

32. Remove the splash shield (see step 33 on **ENGINE REMOVAL**).
33. Remove exhaust pipe A (see step 42 on **ENGINE REMOVAL**).
34. Disconnect the front stabilizer link (see step 4 on **LOWER ARM REMOVAL/INSTALLATION**) from the lower arm.
35. Remove the damper fork (see step 5 on **DAMPER/SPRING REMOVAL AND INSTALLATION**).
36. Separate the knuckle from the lower arm (see step 12 on **KNUCKLE/HUB/WHEEL BEARING REPLACEMENT**).
37. Separate the tie-rod ball joint (see step 10 on **KNUCKLE/HUB/WHEEL BEARING REPLACEMENT**).
38. Remove the right and left driveshaft inboard joints.
 - Right driveshaft (see step 11 on **DRIVESHAFT REMOVAL**)
 - Left driveshaft (see step 12 on **DRIVESHAFT REMOVAL**)
39. Remove the intermediate shaft (see **INTERMEDIATE SHAFT REMOVAL**). Coat all precision finished surfaces with clean engine oil, then tie plastic bags over both ends of intermediate shaft.
40. Remove the lower engine rear mount base bracket bolts.

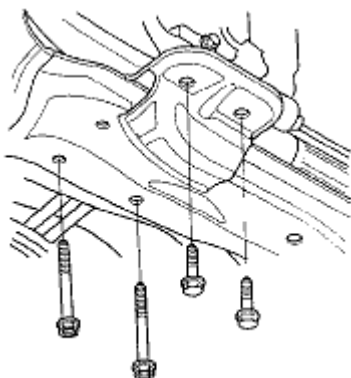


Fig. 48: Identifying Lower Engine Rear Mount Base Bracket Bolts
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

41. Disconnect the power steering pressure switch connector.

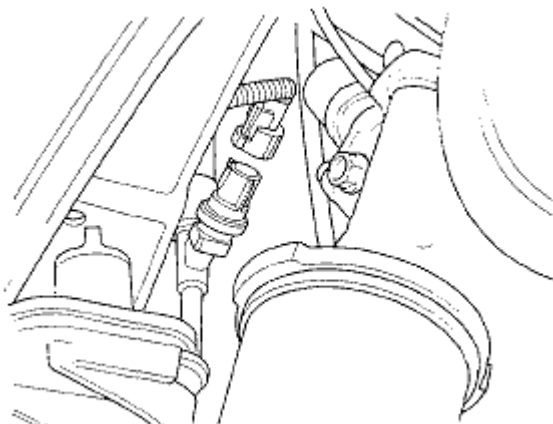


Fig. 49: Identifying Power Steering Pressure Switch Connector
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

42. Remove the lower transmission mount mounting nuts.

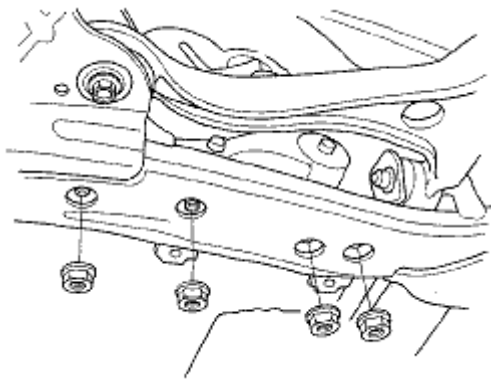


Fig. 50: Identifying Lower Transmission Mount Mounting Nuts
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

43. Remove the body mount bracket.

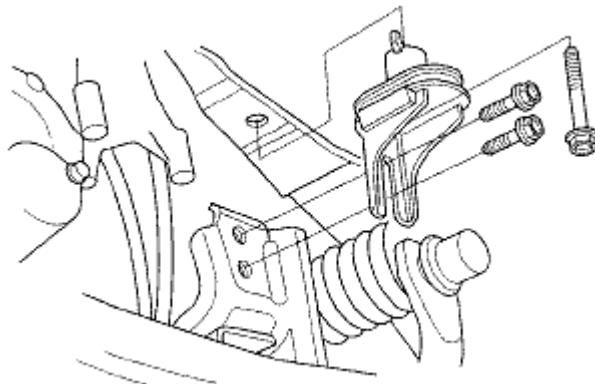


Fig. 51: Identifying Body Mount Bracket
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

44. Note the reference line (A) at both ends of the front subframe (B) that lines up with the edge (C) of the stiffeners (D).

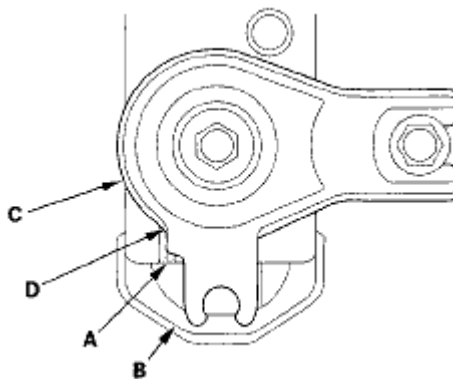


Fig. 52: Identifying Reference Line At Both Ends Of Front Subframe
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

45. Attach the front subframe adapter (VSB02C000016) to the front subframe by wrapping the band (A) over the front subframe and attaching the end of the band to the front subframe adapter with the pin (B).

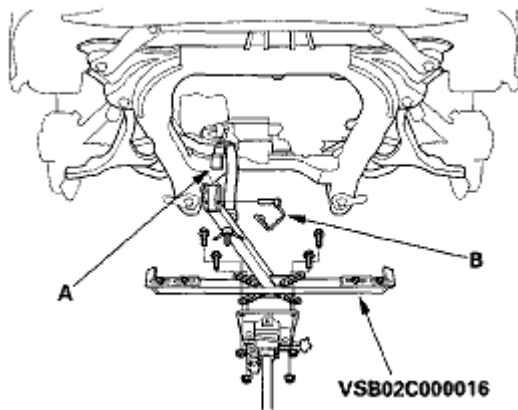


Fig. 53: Attaching End Of Band To Front Subframe Adapter With Pin
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

46. Raise the jack, and line up the slots in the front subframe adapter arms with the bolt holes on the corner of the jack base, then securely attach them with four bolts.
47. Remove the front subframe stiffeners (A) and front subframe (B).

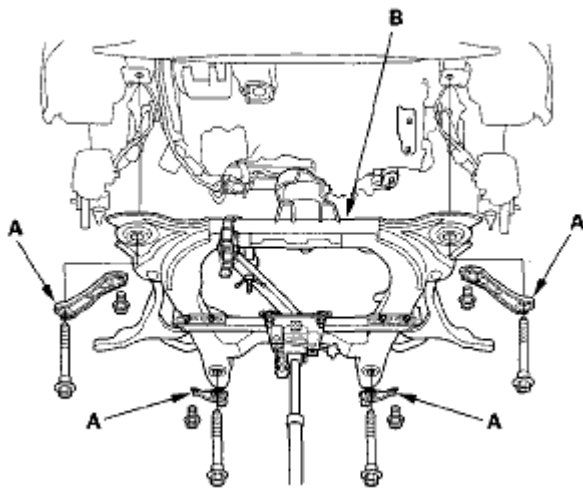


Fig. 54: Identifying Front Subframe Stiffeners And Front Subframe
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

48. Remove the front engine mount upper bracket.

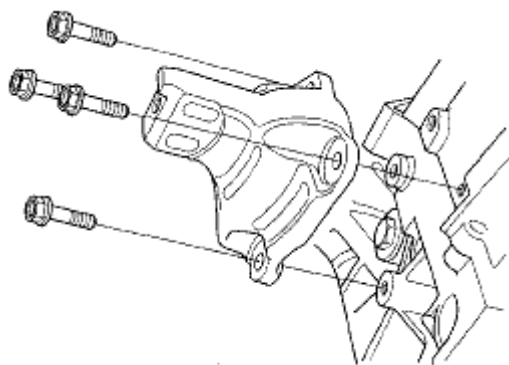


Fig. 55: Identifying Front Engine Mount Upper Bracket
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

49. Remove the lower transmission front mount (A) and the transmission lower rear mount (B).

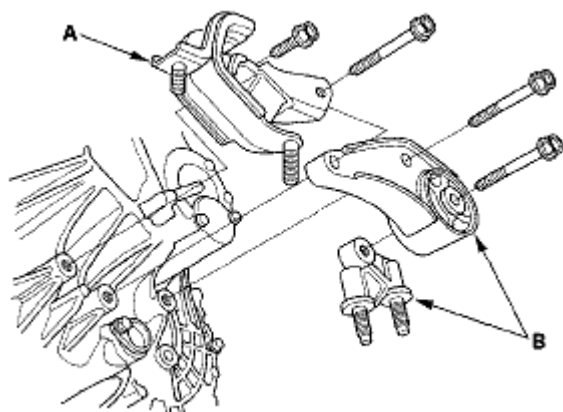


Fig. 56: Identifying Lower Transmission Front Mount And Transmission Lower Rear Mount
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

50. Remove the clutch cover (A) and lower mounting bolts (B).

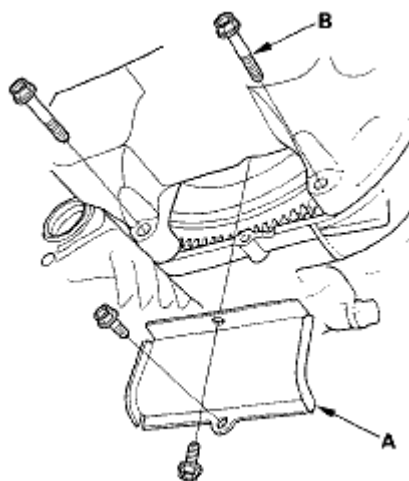


Fig. 57: Identifying Clutch Cover And Lower Mounting Bolts
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

51. Remove the lower transmission mounting bolts.

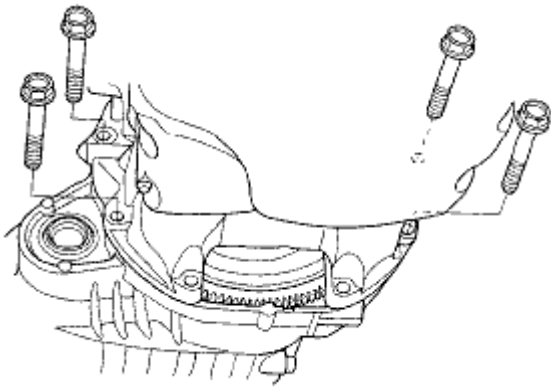


Fig. 58: Identifying Lower Transmission Mounting Bolts
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

52. Pull the transmission away from the engine until the transmission mainshaft clears the clutch pressure plate.
53. Slowly lower the transmission about 150 mm (6 in.). Check once again that all hoses and electrical wiring are disconnected and free from the transmission, then lower it all the way.
54. Remove the boot (A), release fork (B), and release bearing (C) from the transmission.

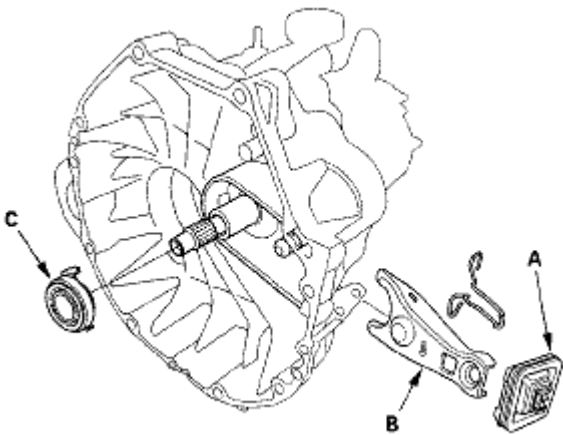


Fig. 59: Identifying Boot, Release Fork And Release Bearing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

TRANSMISSION INSTALLATION

Special Tools Required

- Engine support hanger, A and Reds AAR-T-12566 *
- Front subframe adapter VSB02C000016 *
- Engine hanger balance bar VSB02C000019 *

* These special tools are available through the Acura Tool and Equipment Program 1-888-424-6857

NOTE: Use fender covers to avoid damaging painted surfaces.

1. Make sure the 14 x 20 dowel pin (A) and 10 x 20 dowel pin (B) are installed in the clutch housing.

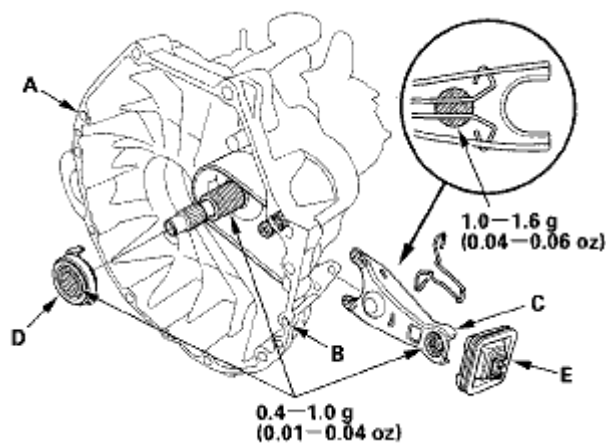


Fig. 60: Identifying Dowel Pin, Release Fork And Release Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Apply super high temperature grease (P/N 08798-9002) to the release fork (C) and the release bearing (D). Install the release fork, the release bearing, and the boot (E).
3. Place the transmission on the transmission jack, and raise it to the engine level.
4. Install the lower transmission mounting bolts.

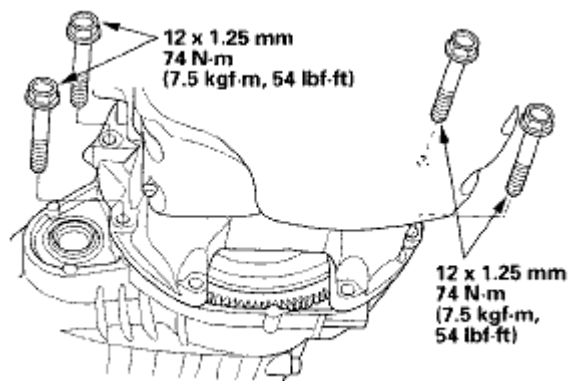


Fig. 61: Identifying Lower Transmission Mounting Bolts With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the lower mounting bolts (A) clutch cover (B).

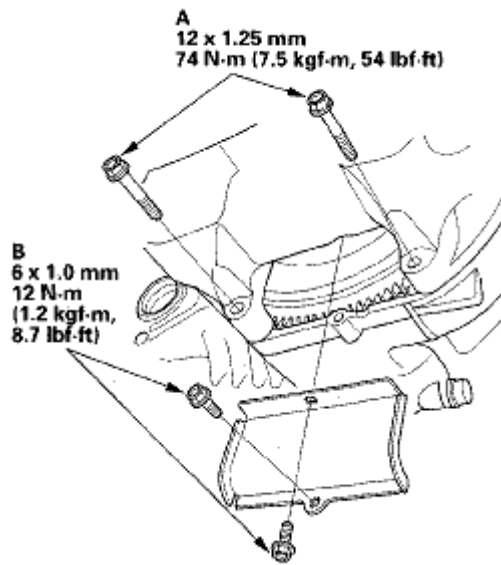


Fig. 62: Identifying Lower Mounting Bolts And Clutch Cover With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the front engine mount upper bracket with new bolts.

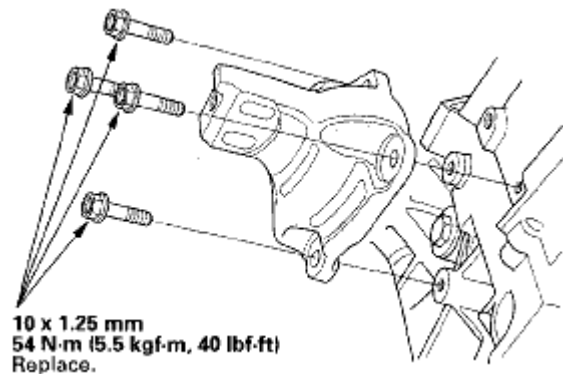


Fig. 63: Identifying Front Engine Mount Upper Bracket Bolts With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Support the front subframe with the front subframe adapter (VSB02C000016) and a jack.

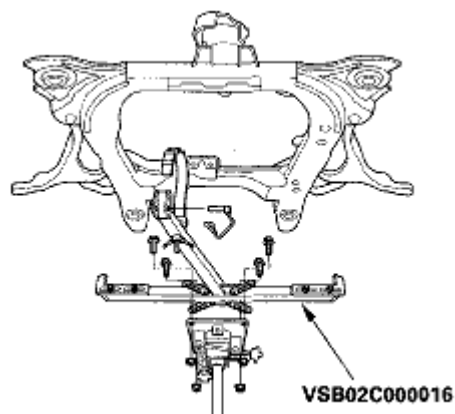


Fig. 64: Supporting Front Subframe With Front Subframe Adapter And Jack
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Loosely install the front subframe (A) and front subframe stiffeners (B) with new bolts as shown.

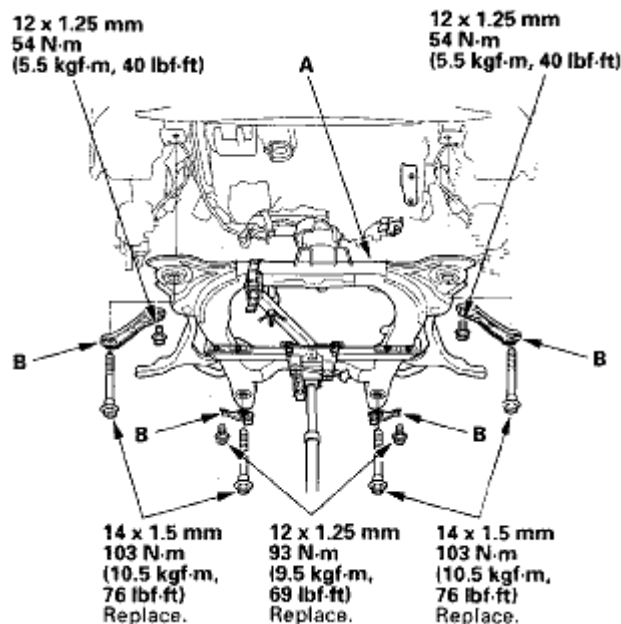


Fig. 65: Identifying Front Subframe And Front Subframe Stiffeners With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Align the reference line (A) that you noted when you removed the transmission with the edge (B) of both rear stiffeners (C), and tighten the rear subframe mounting bolts, the front bolts, and tighten the stiffener bolts to the specified torque.

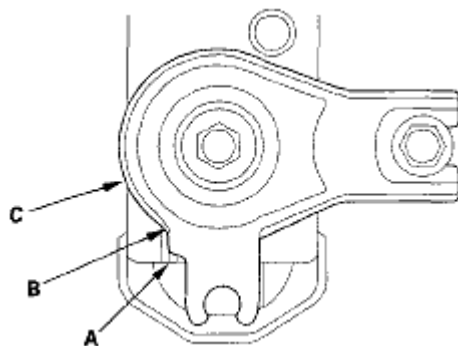


Fig. 66: Identifying Reference Line At Both Ends Of Front Subframe
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Remove the jack and front subframe adapter.
 11. Install the body mount bracket with new bolts.

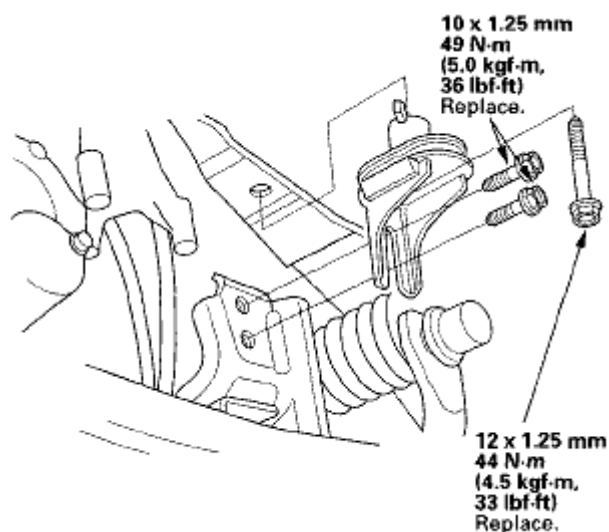


Fig. 67: Identifying Body Mount Bracket Bolts With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Install the lower transmission front mount (A) and the lower transmission rear mount (B) with new bolts as shown.

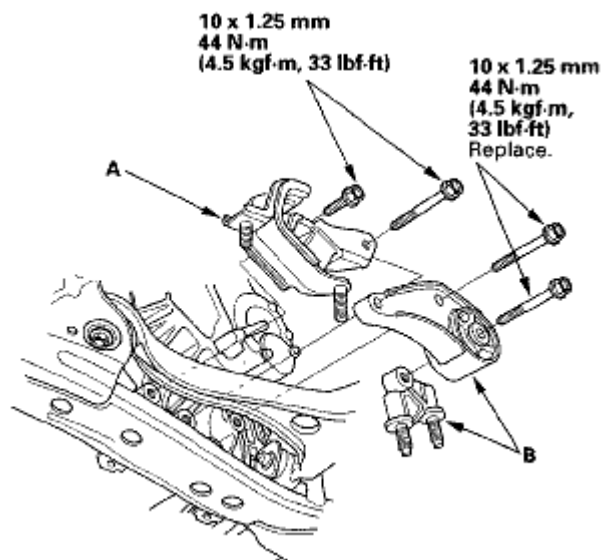


Fig. 68: Identifying Lower Transmission Front Mount And Lower Transmission Rear Mount With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Install new lower transmission mount mounting nuts.

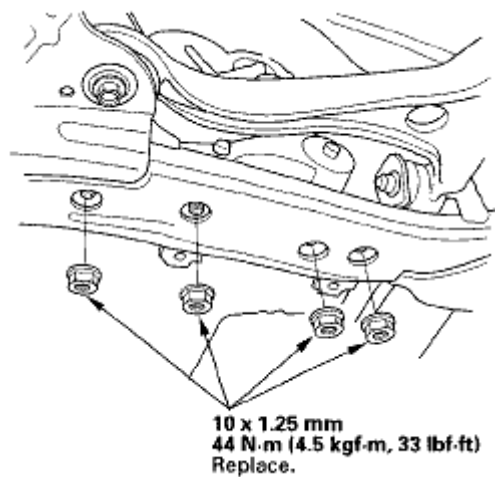


Fig. 69: Identifying Lower Transmission Mount Mounting Nuts With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Install new lower engine rear mount mounting bolts.

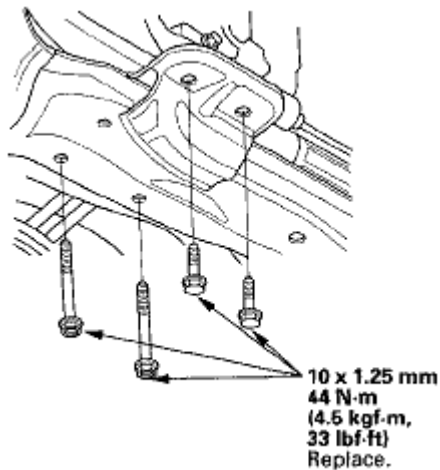


Fig. 70: Identifying Lower Engine Rear Mount Mounting Bolts With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Connect the power steering pressure switch connector.

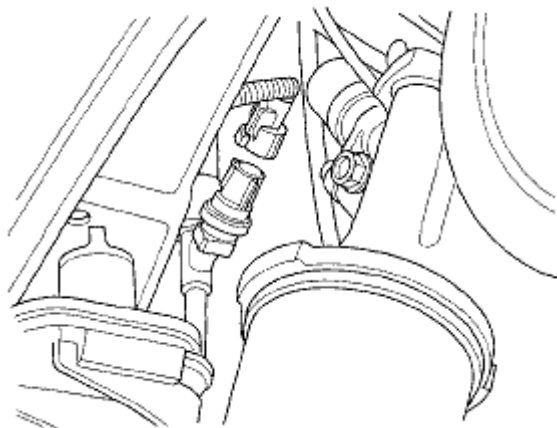


Fig. 71: Identifying Power Steering Pressure Switch Connector
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Install the intermediate shaft (see INTERMEDIATE SHAFT INSTALLATION).
17. Install the left and right driveshaft inboard joints (see DRIVESHAFT INSTALLATION).
18. Connect the tie-rod ball joint (see step 28 on STEERING GEARBOX INSTALLATION).
19. Connect the knuckle onto the lower arm (see step 17 on KNUCKLE/HUB REPLACEMENT).
20. Install the damper fork (see step 2 on INSTALLATION).
21. Connect the front stabilizer link (see step 4 on LOWER ARM REMOVAL/INSTALLATION) to the lower arm.
22. Install exhaust pipe A (see step 37 on ENGINE INSTALLATION).
23. Install the splash shield (see step 43 on ENGINE INSTALLATION).
24. Install the engine under cover (see step 44 on ENGINE INSTALLATION).
25. Lower the vehicle on the lift.
26. Install the transmission mount bracket (A) and ground cable (B) with new bolts as shown.

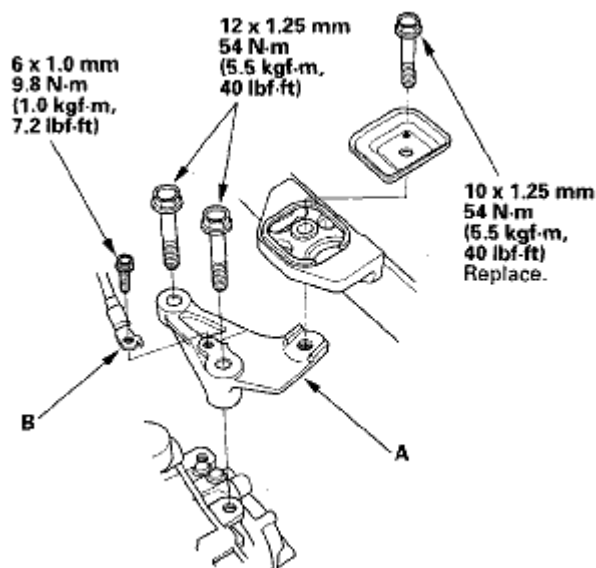


Fig. 72: Identifying Transmission Mount Bracket And Ground Cable With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. Remove the engine support hanger and engine hanger balance bar from the engine.
28. Connect the steering joint to the steering gearbox pinion shaft (A) by aligning the reference mark (B) you made when you disconnected the steering joint, and remove the wire (C) from the joint yoke (D).

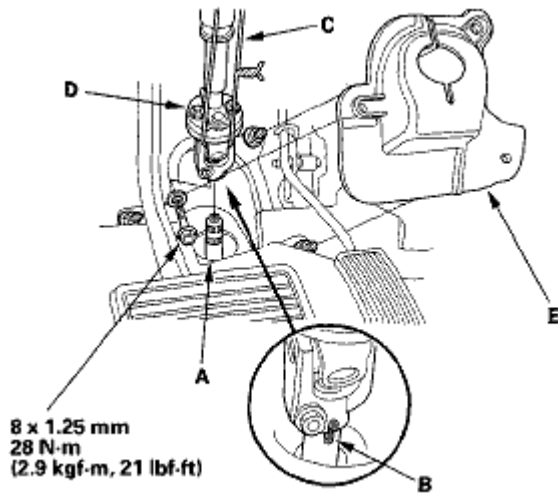


Fig. 73: Identifying Steering Gearbox Pinion Shaft, Steering Joint Cover And Joint Yoke With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

29. Install the steering joint cover (E).
30. Install the steering wheel (see **STEERING WHEEL INSTALLATION**).
31. Install the power steering pump outlet line (A) with a new O-ring (B) to the pump (C), and install the hose (D) in its clamp (E).

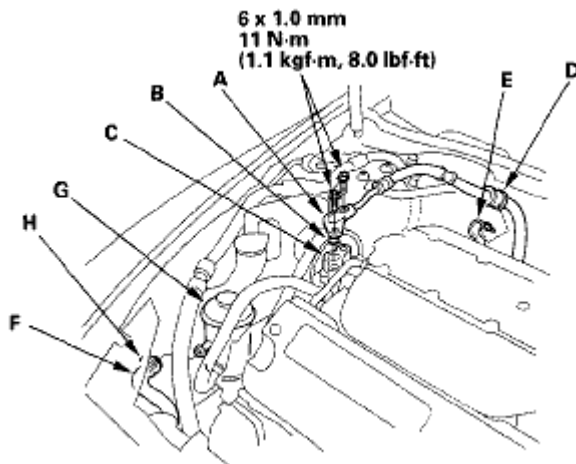


Fig. 74: Identifying Power Steering Pump Outlet Line, Return Hose And Power Steering Fluid Reservoir With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

32. Connect the return hose (F) to the power steering fluid reservoir (G), then secure the hose with its clamp (H).

33. Install the upper transmission mounting bolts.

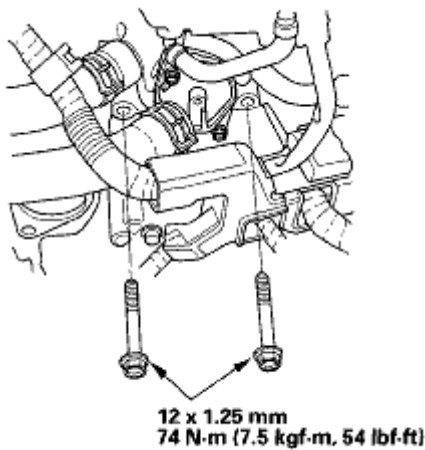


Fig. 75: Identifying Upper Transmission Mounting Bolts With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

34. Install a new front engine mount mounting bolt (A), the front engine mount stop (B), and mounting nuts (C).

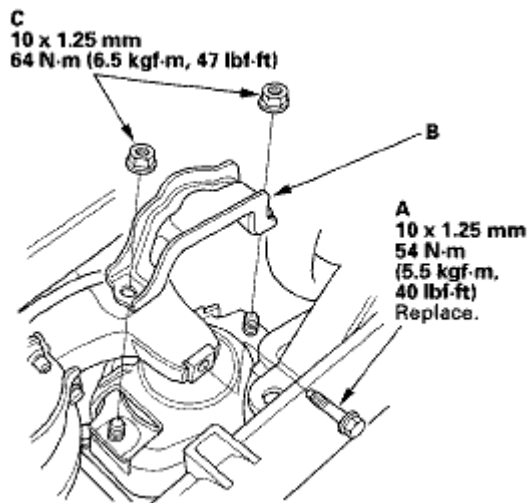


Fig. 76: Identifying Front Engine Mount Mounting Bolt And Front Engine Mount Stop With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

35. Apply super high temperature grease (P/N 08798-9002) to the end of the pushrod. Install the slave cylinder. Be careful not to bend the clutch line.

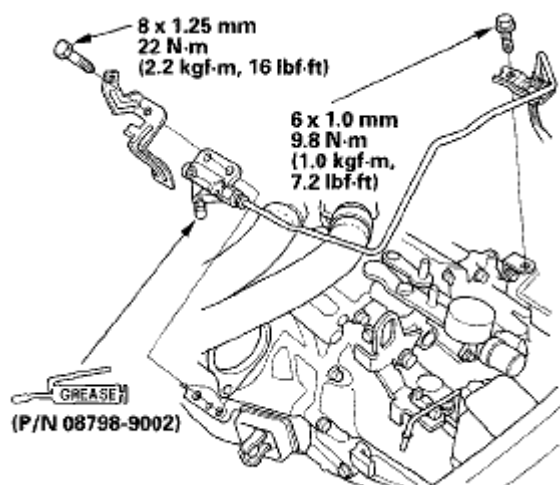


Fig. 77: Identifying Slave Cylinder With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

36. Connect the vacuum hose (A).

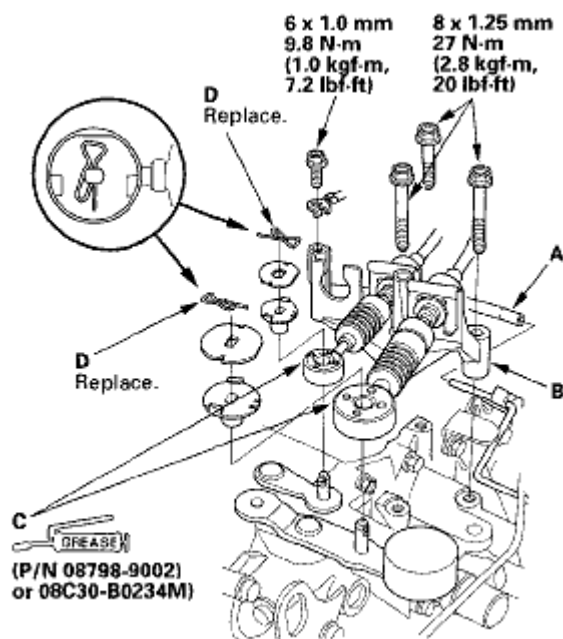


Fig. 78: Identifying Vacuum Hose, Shift Cable Bracket And Shift Cables With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

37. Install the shift cable bracket (B) and shift cables (C).
38. Apply a light coat of super high temperature grease (P/N 08798-9002) or silicone grease (P/N 08C30-B0234M) to the cable ends, then install new lock pins (D) as shown.
39. Install the harness bracket bolts (A).

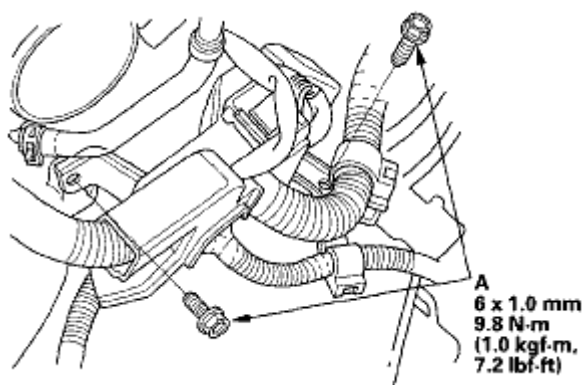


Fig. 79: Identifying Harness Bracket Bolts With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

40. Install the starter motor and wire (see **STARTER REMOVAL AND INSTALLATION**).
41. Connect the vacuum hose (A), then install the harness clips (B).

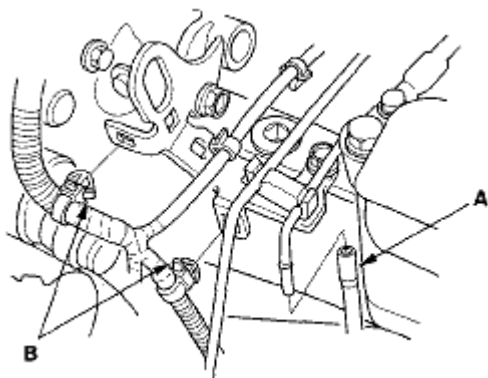


Fig. 80: Identifying Vacuum Hose And Harness Clips
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

42. Connect the input shaft (mainshaft) speed sensor connector (A) and output shaft (countershaft) speed sensor connector (B).

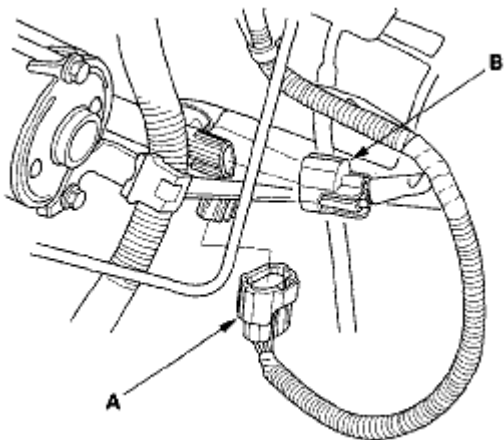


Fig. 81: Identifying Input Shaft (Mainshaft) Speed Sensor Connector And Output Shaft (Countershaft) Speed Sensor Connector

Courtesy of AMERICAN HONDA MOTOR CO., INC.

43. Connect the back-up light switch connector (A) and reverse lockout solenoid connector (B), then install the harness clips (C).

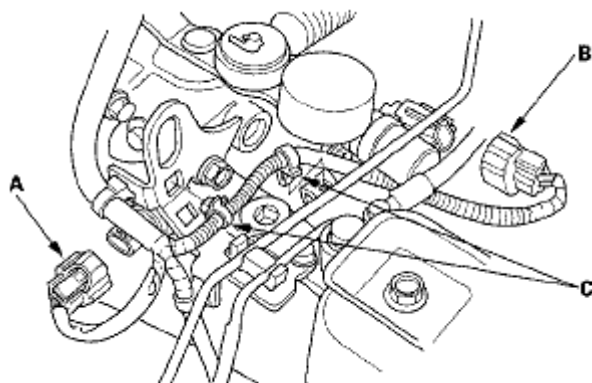


Fig. 82: Identifying Back-Up Light Switch Connector And Reverse Lockout Solenoid Connector
Courtesy of AMERICAN HONDA MOTOR CO., INC.

44. Install the strut brace.

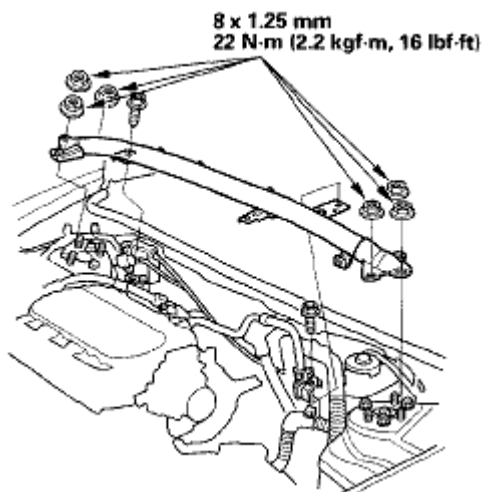


Fig. 83: Identifying Strut Brace With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

45. Install the under-hood fuse/relay box (A), then install the two bolts (B) to the body.

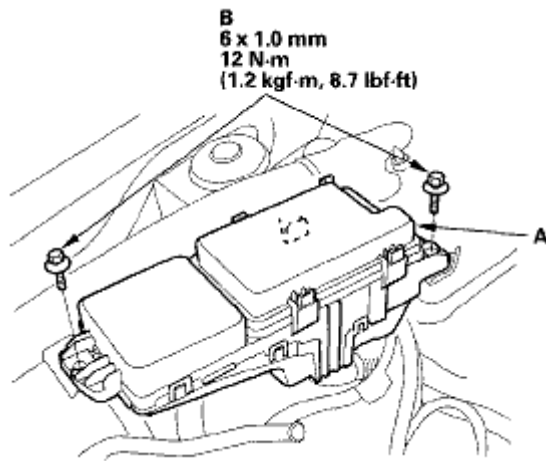


Fig. 84: Identifying Under-Hood Fuse/Relay Box Bolts With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

46. Refill the transmission with the recommended transmission fluid (see **TRANSMISSION FLUID INSPECTION AND REPLACEMENT**).
47. Install the battery base.

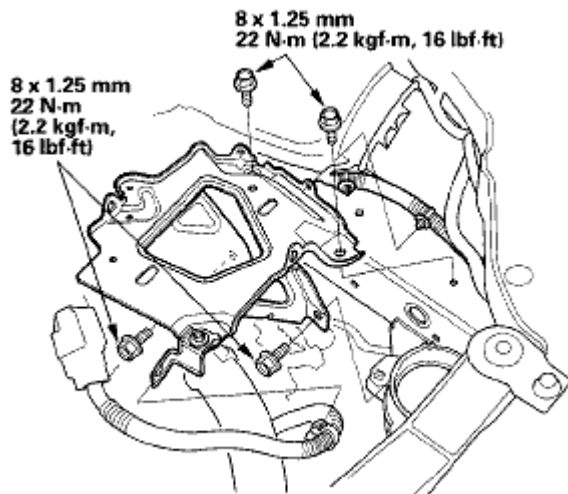


Fig. 85: Identifying Battery Base With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

48. Install the resonator chamber (see **RESONATOR REMOVAL/INSTALLATION**), and the air cleaner assembly (see **THROTTLE BODY CLEANING**).
49. Install the battery. Clean the battery posts and cable terminals. Connect the positive cable to the battery first, then connect the negative cable, and apply multipurpose grease to prevent corrosion.
50. Install the bulkhead cover (A) and the engine cover (B).

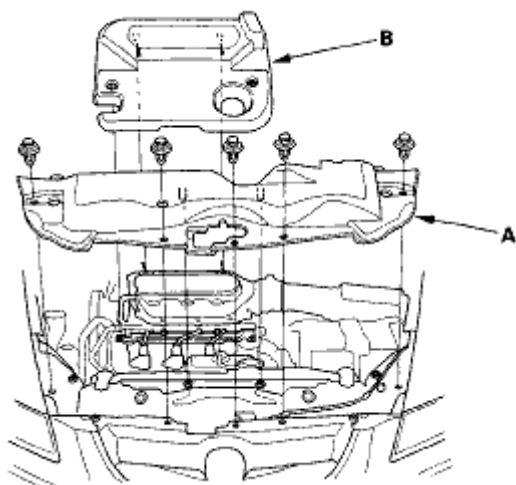


Fig. 86: Identifying Bulkhead Cover And Engine Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

51. Fill the power steering fluid reservoir with fluid to the upper level line.
52. Start the engine, then turn the steering wheel from lock to lock several times to bleed air from the system.
53. Recheck the fluid level, and refill if necessary.
54. Install the right rear engine compartment cover (A) and the right side engine compartment cover (B).

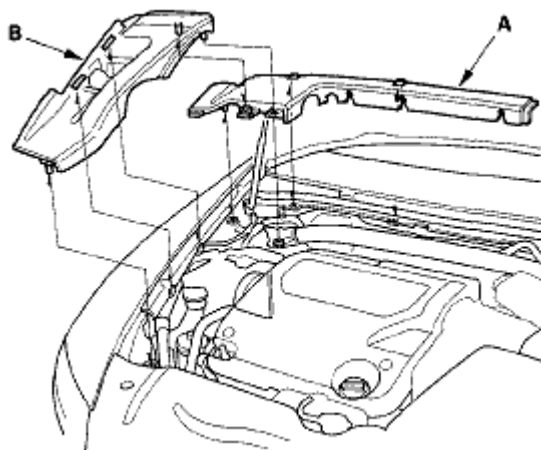


Fig. 87: Identifying Right Rear Engine Compartment Cover And Right Side Engine Compartment Cover
Courtesy of AMERICAN HONDA MOTOR CO., INC.

55. Install the left side engine compartment cover (A) and the left rear engine compartment cover (B).

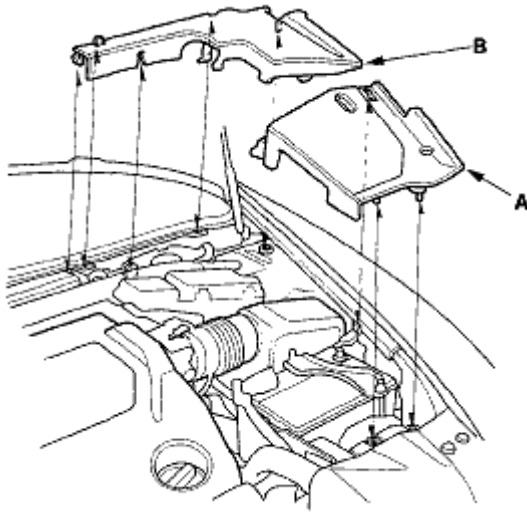


Fig. 88: Identifying Left Side Engine Compartment Cover And Left Rear Engine Compartment Cover

Courtesy of AMERICAN HONDA MOTOR CO., INC.

56. Reinstall the hood support struts to the proper locations on both sides of the hood.
57. Remove the steering wheel (see **STEERING WHEEL REMOVAL**).
58. Center the cable reel, and reinstall the steering wheel (see **STEERING WHEEL INSTALLATION**).
59. Check the front wheel alignment (see **WHEEL ALIGNMENT**).
60. Check the steering wheel spoke angle. If the steering spoke angles to the right and left are not equal (steering wheel and rack are not centered), correct the engagement of the joint/pinion shaft splines, then adjust the front toe by turning the tie-rod ends if necessary. If you need to correct the engagement of the joint/pinion shaft, repeat step 57 through step 59.
61. Check the shift lever and clutch operation.
62. Test-drive the vehicle.
63. Enter the anti-theft codes for the audio system and navigation system, (if equipped) and set the clock.

TRANSMISSION DISASSEMBLY

EXPLODED VIEW - CLUTCH HOUSING

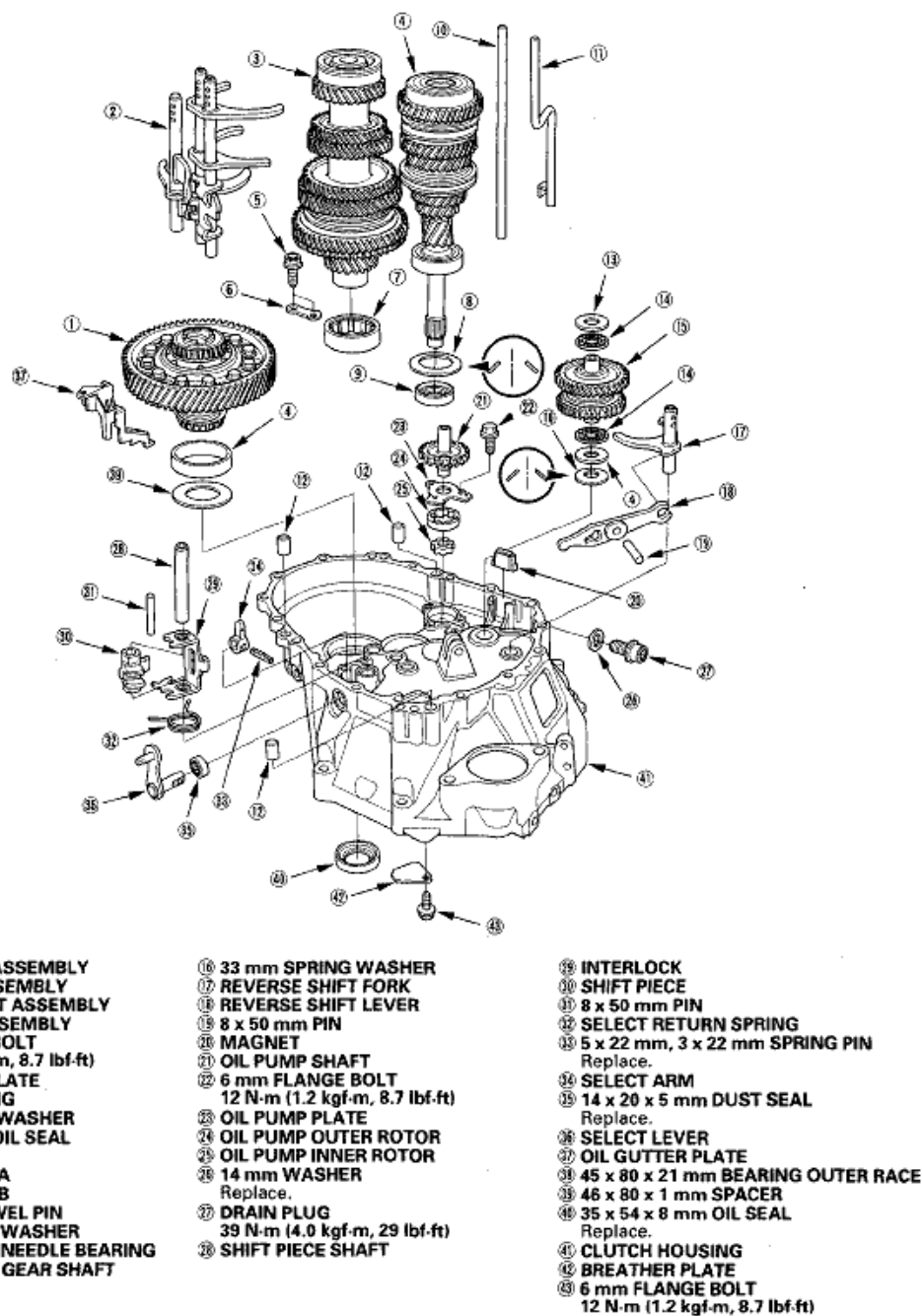


Fig. 89: Exploded View Of Clutch Housing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

EXPLODED VIEW - TRANSMISSION HOUSING

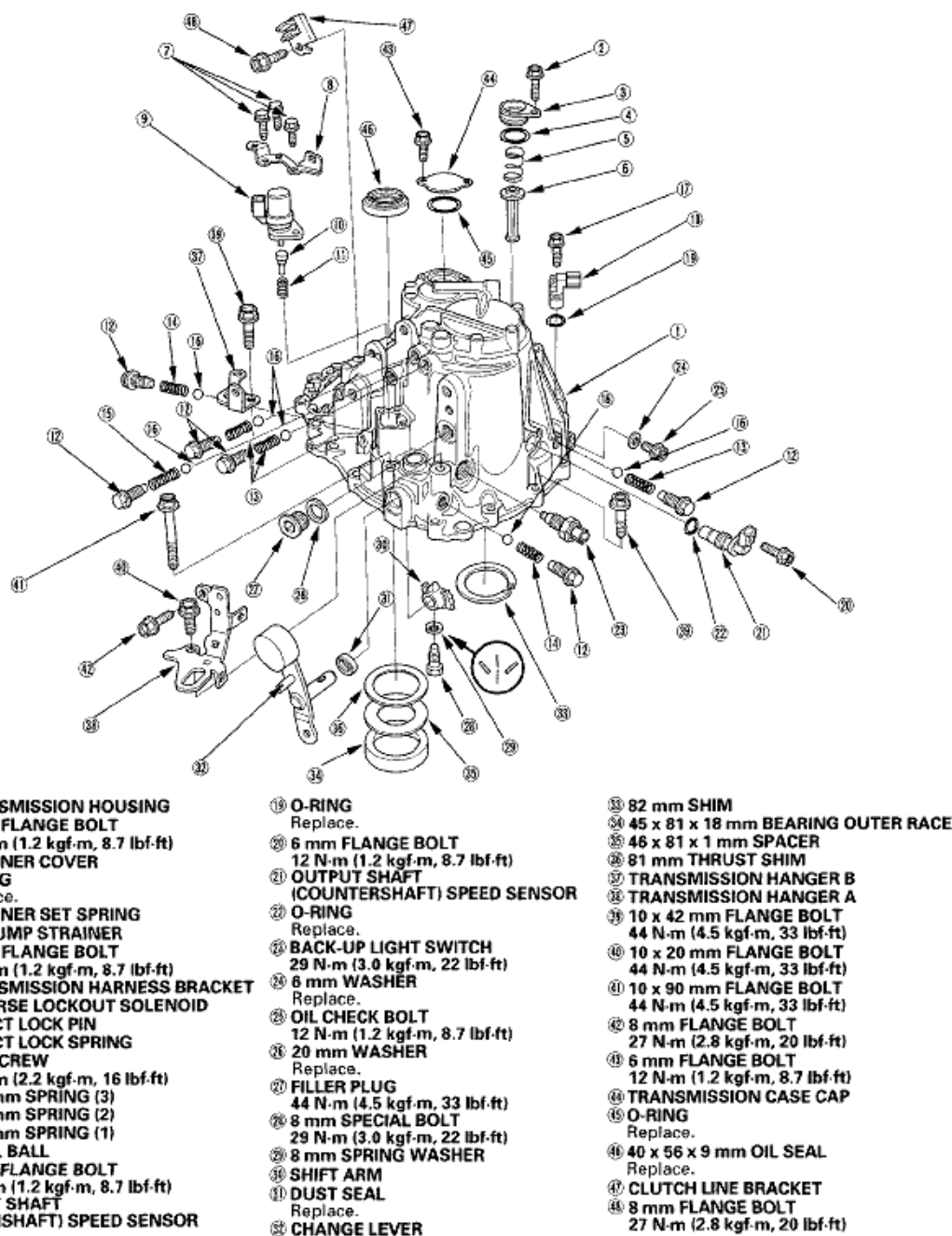


Fig. 90: Exploded View Of Transmission Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

1. Remove the strainer cover (A), O-ring (B), strainer set spring (C), and oil pump strainer (D).

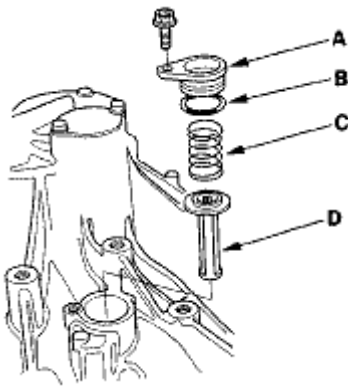


Fig. 91: Identifying Strainer Cover, O-Ring, Strainer Set Spring And Oil Pump Strainer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Remove the transmission harness bracket (A), reverse lockout solenoid (B), and back-up light switch (C).

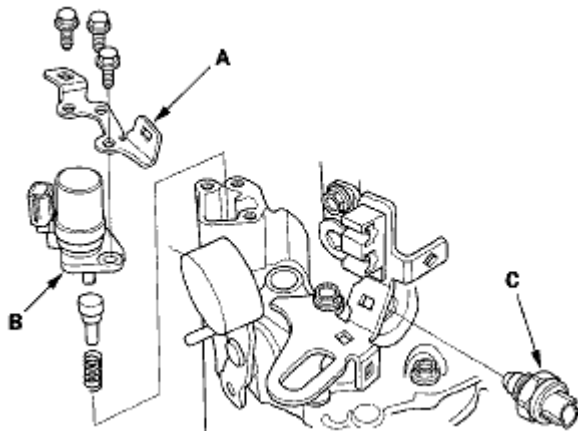


Fig. 92: Identifying Transmission Harness Bracket, Reverse Lockout Solenoid And Back-Up Light Switch
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Remove the set screws (A), 22.0 mm spring (B), 26.1 mm spring (C), 27.4 mm springs (D), steel balls (E), oil filler plug (F), washer (G), and clutch line bracket (H).

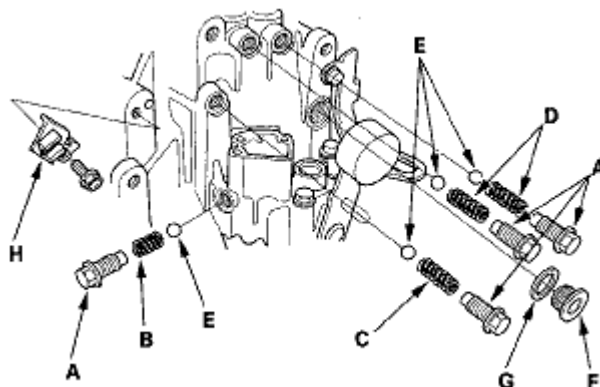


Fig. 93: Identifying Springs, Steel Balls, Oil Filler Plug And Clutch Line Bracket

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the set screws (A), 22.0 mm spring (B), 27.4 mm spring (C), steel balls (D), input shaft (mainshaft) speed sensor (E), output shaft (countershaft) speed sensor (F), and O-rings (G).

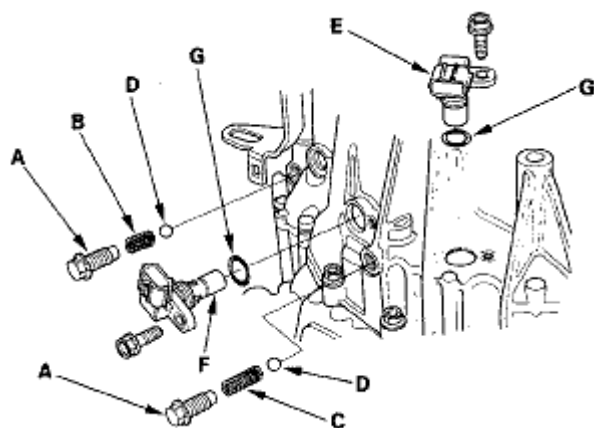


Fig. 94: Identifying Steel Balls, Input Shaft (Mainshaft) Speed Sensor And Output Shaft (Countershaft) Speed Sensor

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the oil check bolt (A), 6 mm washer (B), drain plug (C), and 14 mm washer (D).

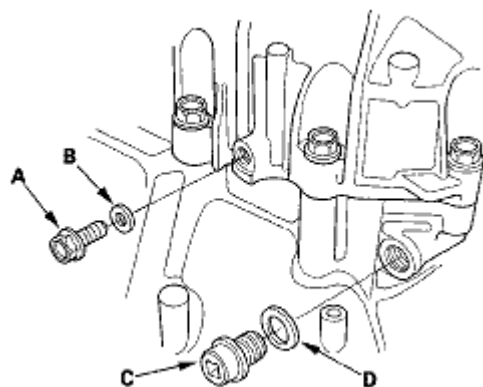


Fig. 95: Identifying Oil Check Bolt, Drain Plug And Washer

Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Remove transmission hanger A, transmission hanger B, and 8 mm flange bolt (C). Loosen the 10 mm flange bolts in a crisscross pattern in several steps, then remove them.

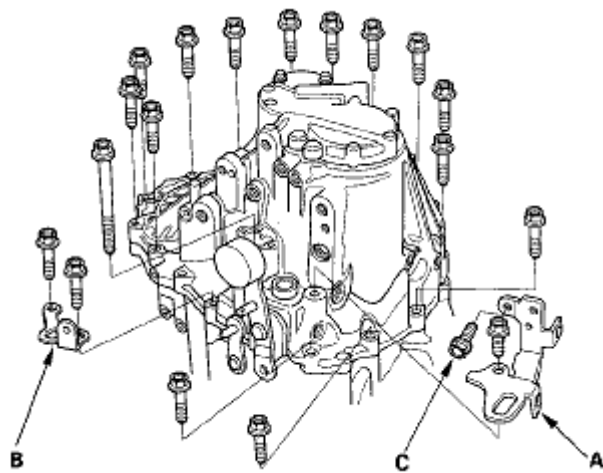


Fig. 96: Identifying Transmission Hanger And Flange Bolt
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Remove the transmission case cap (A) and the 37.7 mm O-ring (B).

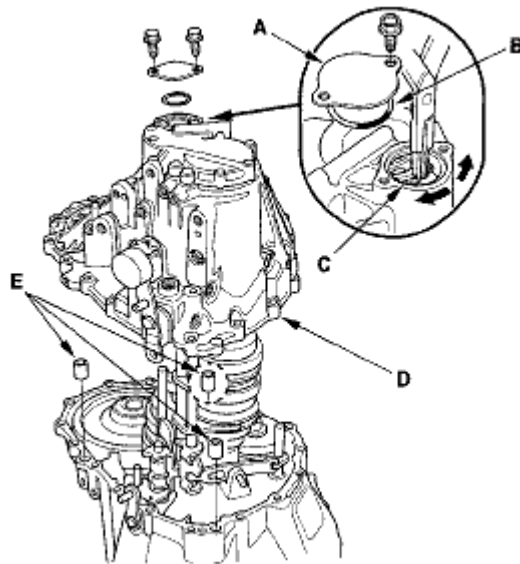


Fig. 97: Removing Transmission Case Cap And O-Ring
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Expand the 75 mm snap ring (C) on the countershaft ball bearing, and remove it from the groove with snap ring pliers.
9. Remove the transmission housing (D) and the three 14 x 20 mm dowel pins (E).
10. Remove the oil guide pipe A, oil guide pipe B, and magnet (C).

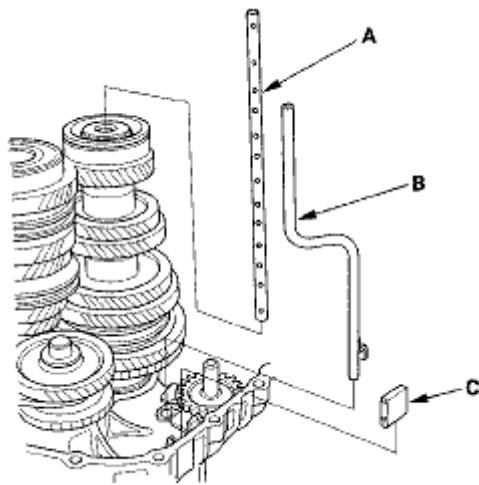


Fig. 98: Identifying Oil Guide Pipes And Magnet
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Remove the 8 x 50 mm pin (A) and reverse shift lever (B).

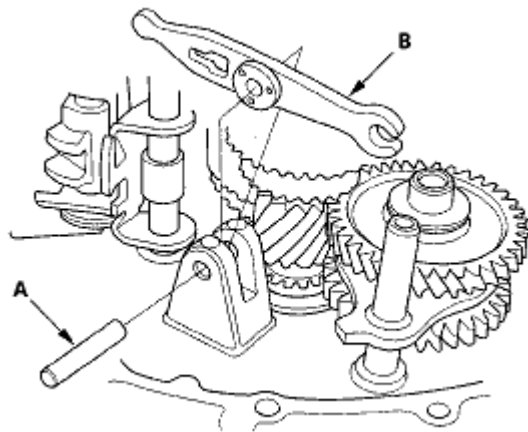


Fig. 99: Identifying Pin And Reverse Shift Lever
Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Remove the 20 mm thrust washers (A), 20 mm thrust needle bearings (B), reverse idler gear shaft assembly (C), 33 mm spring washer (D), and reverse shift fork (E) as an assembly.

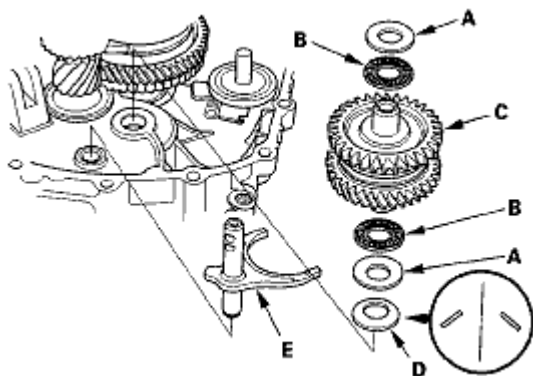


Fig. 100: Identifying Thrust Needle Bearings, Reverse Idler Gear Shaft Assembly And Reverse

Shift Fork**Courtesy of AMERICAN HONDA MOTOR CO., INC.**

13. Remove the 8 x 50 mm pin (A), select return spring (B), shift piece shaft (C), shift piece (D) and interlock (E).

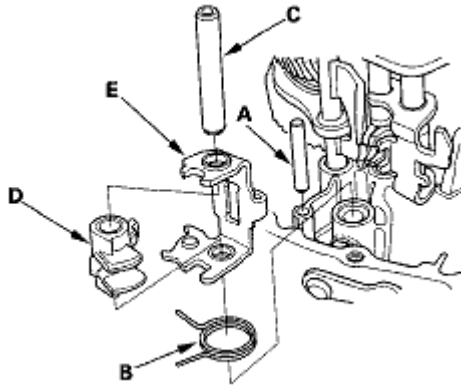


Fig. 101: Identifying Select Return Spring, Shift Piece Shaft, Shift Piece And Interlock
Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Remove the 5 mm spring pin, 3 mm spring pin (A), select arm (B), 14 x 20 x 5 mm dust seal (C), and select lever (D).

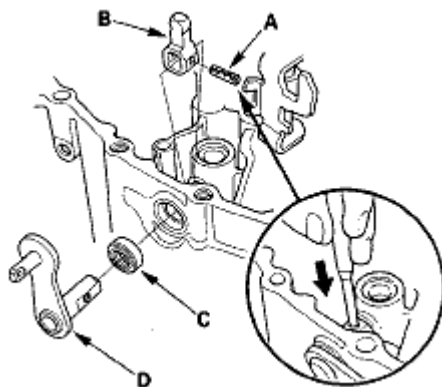


Fig. 102: Identifying Spring Pin, Select Arm, Dust Seal And Select Lever
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

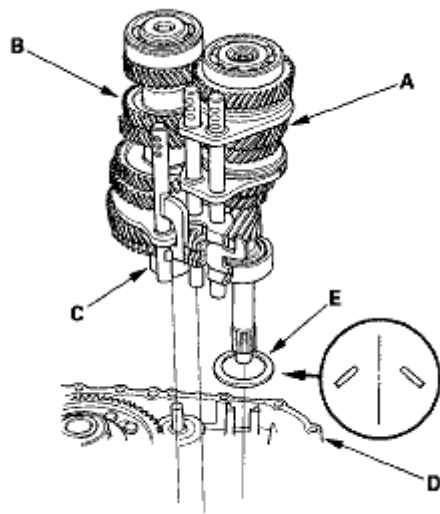


Fig. 103: Identifying Mainshaft Assembly, Countershaft Assembly, Shift Fork Assembly And Clutch Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Remove the 64 mm spring washer (E).
17. Remove the oil pump shaft (A) and differential assembly (B).

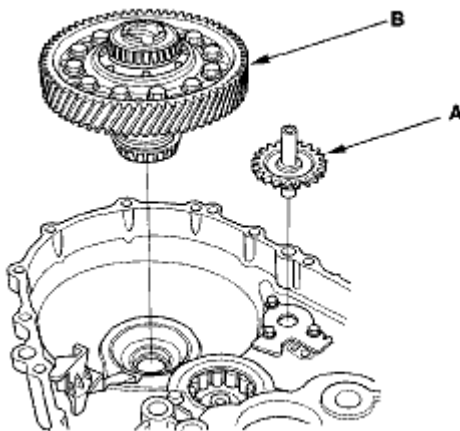


Fig. 104: Identifying Oil Pump Shaft And Differential Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Remove the oil pump plate (A), oil pump inner rotor (B), oil pump outer rotor (C).

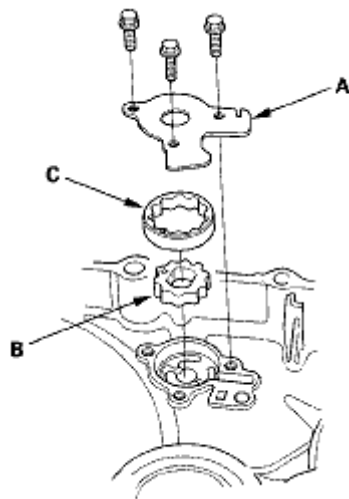


Fig. 105: Identifying Oil Pump Plate, Oil Pump Inner Rotor And Oil Pump Outer Rotor
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

19. Remove the 82 mm shim (A) from the transmission housing (B).

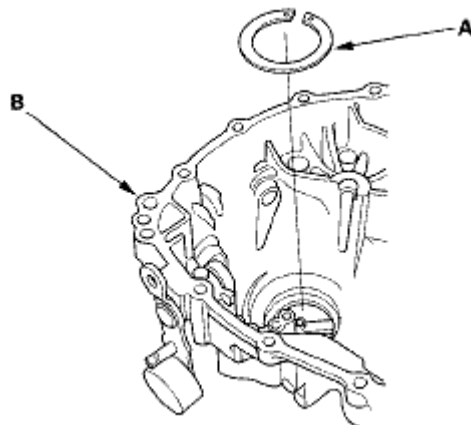


Fig. 106: Identifying Shim And Transmission Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Remove the 8 mm special bolt (A), 8 mm spring washer (B), shift arm (C), change lever (D), and 16 x 23 x 5 mm dust seal (E).

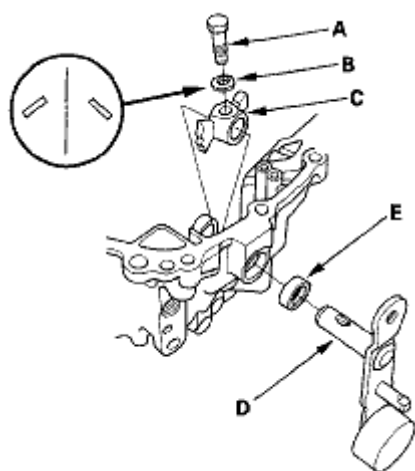


Fig. 107: Identifying Spring Washer, Shift Arm, Change Lever And Dust Seal
Courtesy of AMERICAN HONDA MOTOR CO., INC.

REVERSE SHIFT LEVER CLEARANCE INSPECTION

1. Measure the clearance between the reverse shift lever (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: 0.05-0.50 mm (0.002-0.020 in.)

Service Limit: 0.6 mm (0.024 in.)

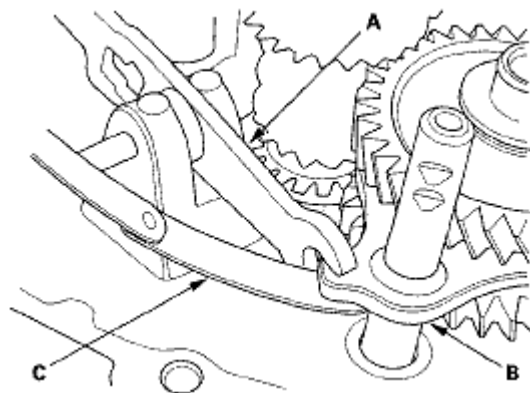


Fig. 108: Measuring Clearance Between Reverse Shift Lever And Reverse Shift Fork
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

Standard: 6.400-6.650 mm (0.2520-0.2618 in.)

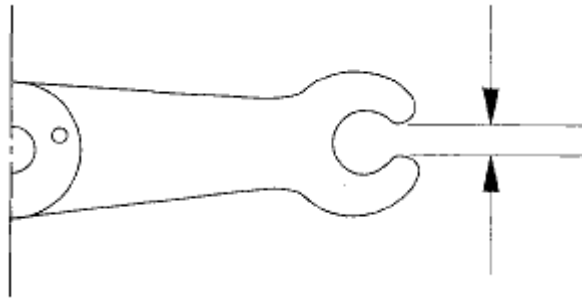


Fig. 109: Identifying Width Of Reverse Shift Lever
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Measure the clearance between the reverse shift lever (A) and reverse shift piece (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 4.

Standard: 0-0.4 mm (0-0.015 in.)

Service Limit: 0.5 mm (0.020 in.)

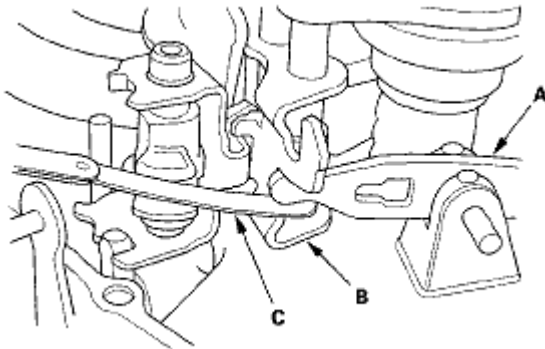


Fig. 110: Measuring Clearance Between Reverse Shift Lever And Reverse Shift Piece
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Measure the width of the reverse shift lever.
 - If the width is not within the standard, replace the reverse shift lever.
 - If the width is within the standard, replace the reverse shift piece.

Standard: 13.0-13.2 mm (0.51-0.52 in.)

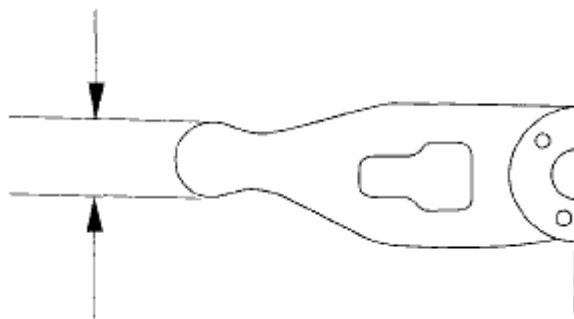


Fig. 111: Identifying Width Of Reverse Shift Lever

Courtesy of AMERICAN HONDA MOTOR CO., INC.

SELECT ARM CLEARANCE INSPECTION

1. Measure the clearance between the select arm (A) and interlock (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.)

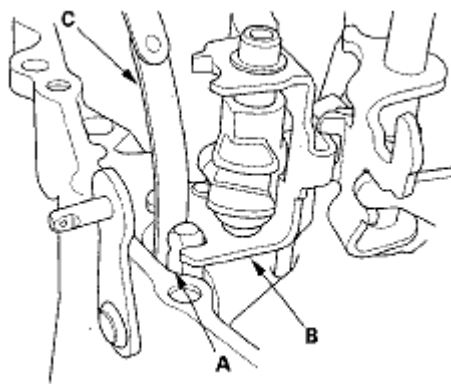


Fig. 112: Measuring Clearance Between Select Arm And Interlock
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the width of the select arm.
 - If the width is not within the standard, replace the select arm.
 - If the width is within the standard, replace the interlock.

Standard: 12.9-13.0 mm (0.50-0.51 in.)

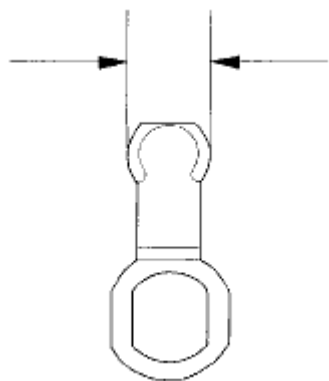


Fig. 113: Identifying Width Of Select Arm
Courtesy of AMERICAN HONDA MOTOR CO., INC.

SHIFT ARM CLEARANCE INSPECTION

1. Measure the clearance between the shift arm (A) and shift piece (B) with a feeler gauge (C). If the

clearance is more than the service limit, go to step 2.

Standard: 0.257-0.568 mm (0.010-0.022 in.)

Service Limit: 0.75 mm (0.030 in.)

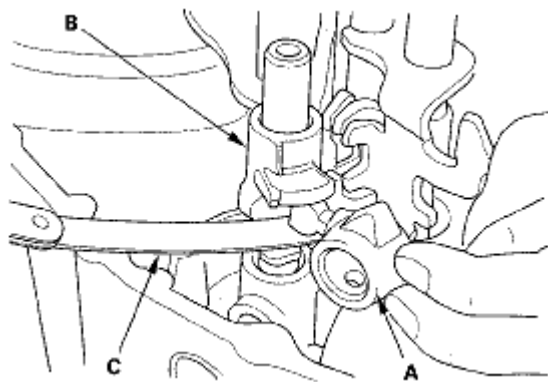


Fig. 114: Measuring Clearance Between Shift Arm And Shift Piece
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. 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 piece.

Standard: 13.6-13.8 mm (0.53-0.54 in.)

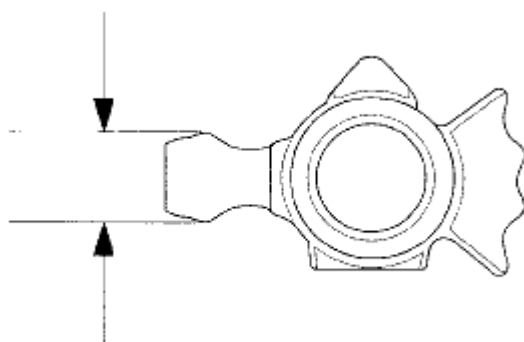


Fig. 115: Identifying Width Of Shift Arm
Courtesy of AMERICAN HONDA MOTOR CO., INC.

OIL PUMP CLEARANCE INSPECTION

1. Measure the thrust clearance between the oil pump rotors (A) and clutch housing (B) with a straight edge (C) and a feeler gauge (D).

Standard (new): 0.03-0.13 mm (0.001-0.005 in.)

Service Limit: 0.15 mm (0.006 in.)

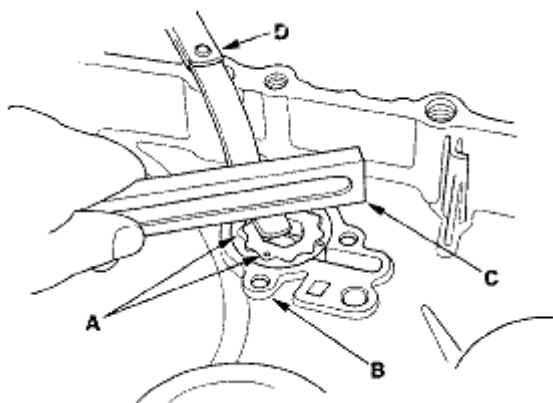


Fig. 116: Measuring Thrust Clearance Between Oil Pump Rotors And Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the side clearance between the outer rotor (A) and clutch housing (B) with a feeler gauge (C).

Standard (new): 0.1-0.2 mm (0.004-0.008 in.)

Service Limit: 0.22 mm (0.009 in.)

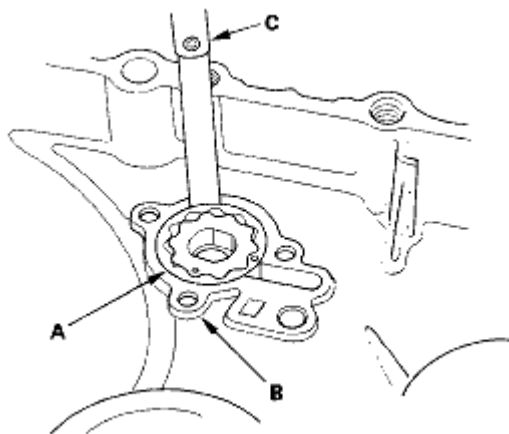


Fig. 117: Measuring Side Clearance Between Outer Rotor And Clutch Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Measure the side clearance between the outer rotor (A) and inner rotor (B) with a feeler gauge (C). If the clearance is not within the standard, replace the oil pump outer and inner rotors as a set.

Standard (new): below 0.14 mm (0.006 in.)

Service Limit: 0.2 mm (0.008 in.)

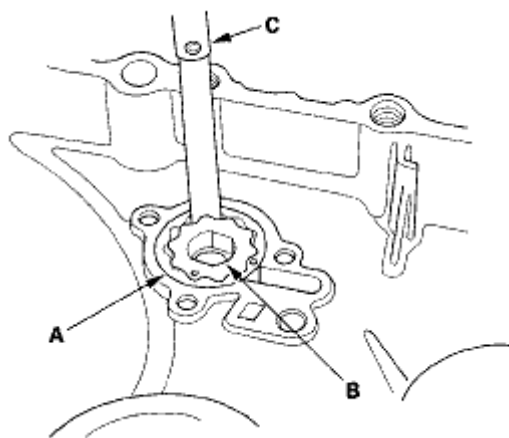


Fig. 118: Measuring Side Clearance Between Outer Rotor And Inner Rotor
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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.)

1st/2nd, 3rd/4th, 5th/6th

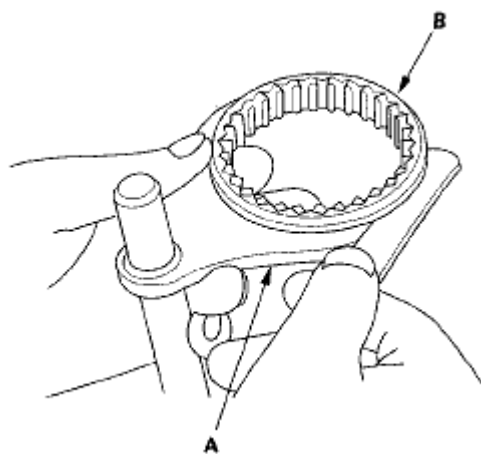


Fig. 119: Measuring Clearance Between Shift Fork And Matching Synchro Sleeve (1st/2nd, 3rd/4th, 5th/6th)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Reverse

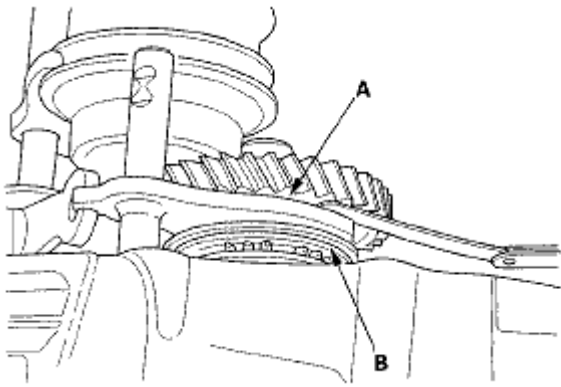


Fig. 120: Measuring Clearance Between Shift Fork And Matching Synchro Sleeve (Reverse)
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 synchro hub as a set.
 - If one arm of the shift fork shows more wear than others, the fork may be bent and needs to be replaced.

Standard: 1st/2nd, 3rd/4th, 5th/6th: 7.4-7.6 mm (0.29-0.30 in.)

Reverse: 6.2-6.4 mm (0.24-0.25 in.)

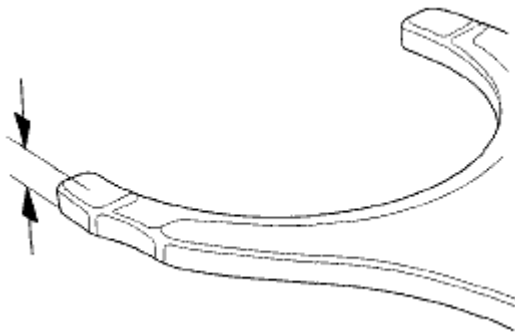


Fig. 121: Identifying Thickness Of Shift Fork Fingers
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

Standard: 0.2-0.6 mm (0.008-0.024 in.)

Service Limit: 0.7 mm (0.028 in.)

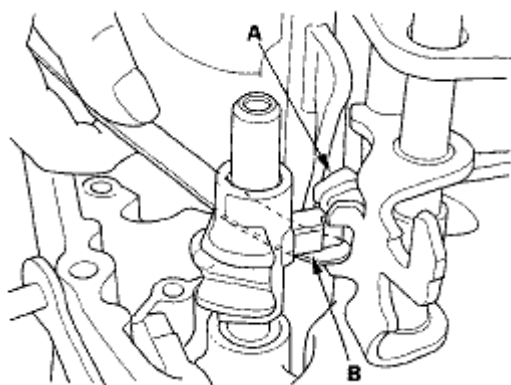


Fig. 122: Measuring Clearance Between Shift Fork And Shift Piece
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

Standard 12.8-13.0 mm (0.50-0.51in.)

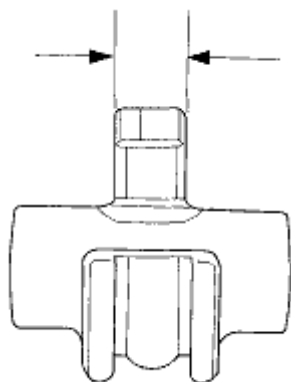


Fig. 123: Identifying Width Of Shift Piece
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

SHIFT FORK DISASSEMBLY/REASSEMBLY

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

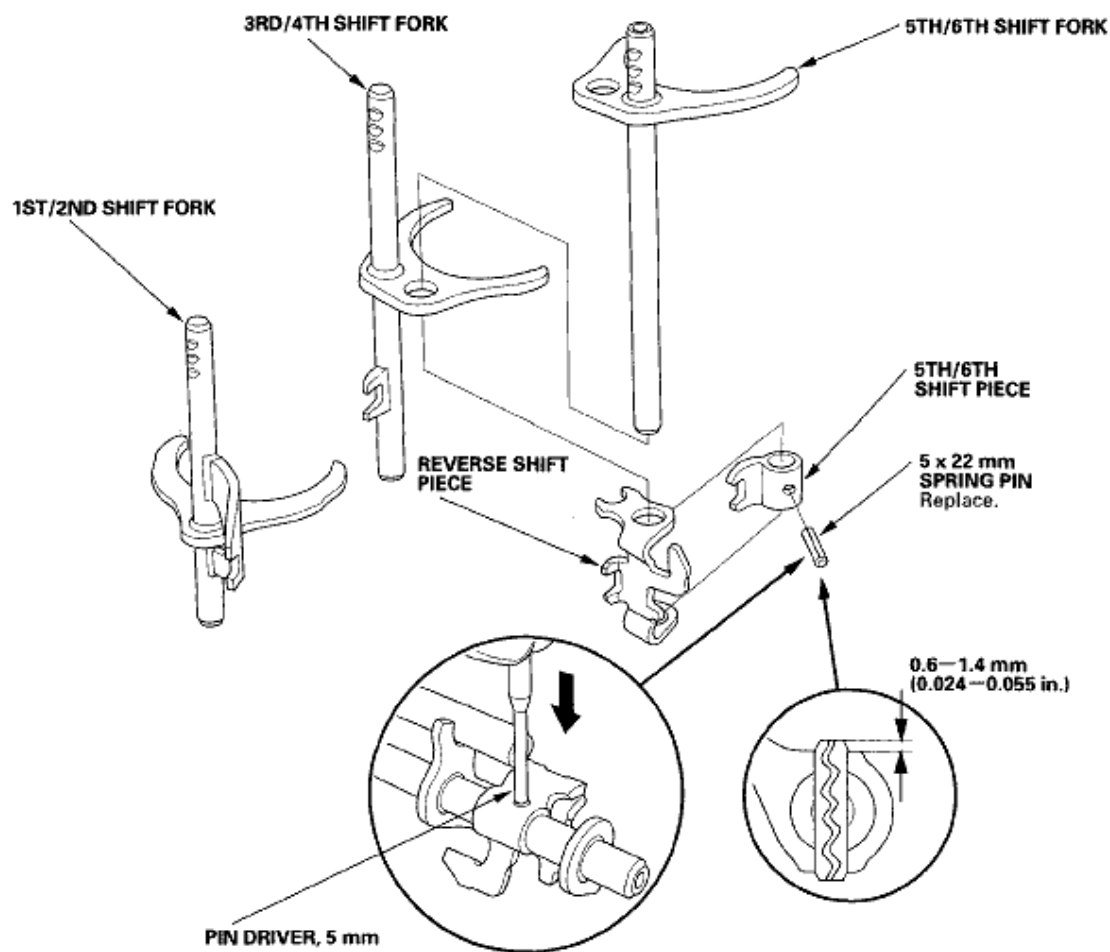


Fig. 124: Exploded View Of Shift Fork

Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT ASSEMBLY CLEARANCE INSPECTION

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

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

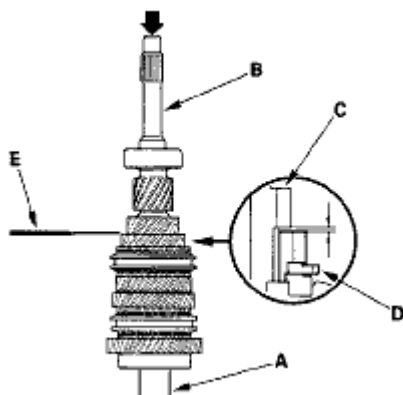


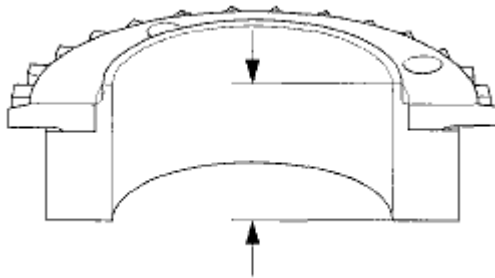
Fig. 125: Pushing Down On Mainshaft

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: 0.06-0.19 mm (0.002-0.007 in.)**Service Limit: 0.3 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 3rd/4th synchro sleeve as a set.

Standard: 23.89-23.97 mm (0.941 -0.944 in.)**Service Limit: 23.8 mm (0.94 in.)****Fig. 126: Identifying 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.
 - If the clearance is within the service limit, go to step 7.

Standard: 0.06-0.19 mm (0.002-0.007 in.)**Service Limit: 0.3 mm (0.01 in.)**

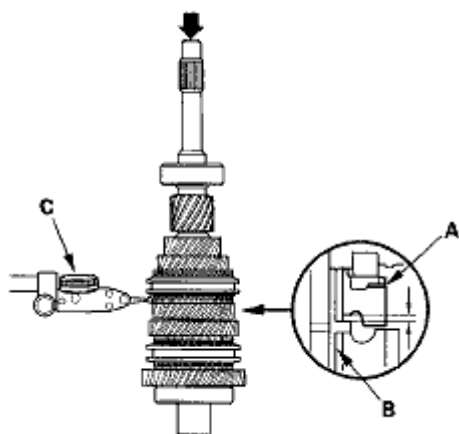


Fig. 127: Measuring Clearance Between 4th Gear And Distance Collar
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Measure the length (1) of the 4th gear side distance collar as shown.
 - If the length (1) is not within the standard, replace the distance collar.
 - If the length (1) is within the standard, go to step 6.

Standard: 22.53-22.58 mm (0.887-0.889 in.)

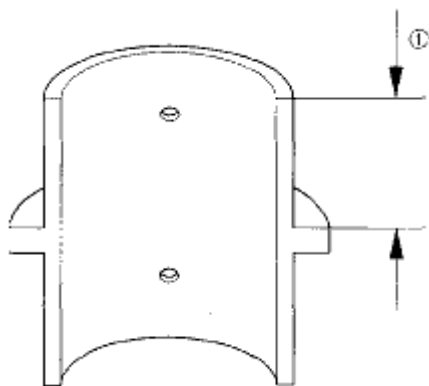


Fig. 128: Identifying Length Of 4th Gear Side Distance Collar
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 3rd/4th synchro sleeve as a set.

Standard: 22.39-22.47 mm (0.881-0.885 in.)

Service Limit: 22.3 mm (0.88 in.)

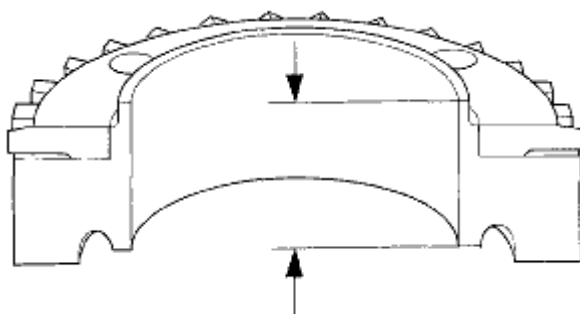


Fig. 129: Identifying Thickness Of 4th Gear
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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.
 - If the clearance is within the service limit, go to step 10.

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

Service Limit: 0.3 mm (0.01 in.)

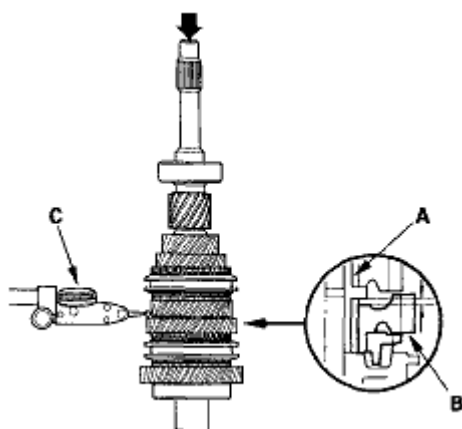


Fig. 130: Measuring Clearance Between Distance Collar And 5th Gear
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Measure the length (2) of the 5th gear side distance collar as shown.
 - If the length (2) is not within the standard, replace the distance collar.
 - If the length (2) is within the standard, go to step 9.

Standard: 22.53-22.58 mm (0.887-0.889 in.)

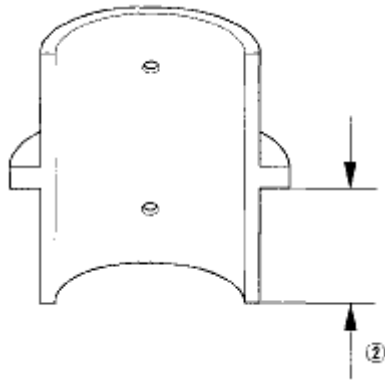


Fig. 131: Identifying Length Of 5th Gear Side Distance Collar
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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/6th synchro hub and 5th/6th synchro sleeve as a set.

Standard: 22.39-22.47 mm (0.881-0.885 in.)

Service Limit: 22.3 mm (0.88 in.)

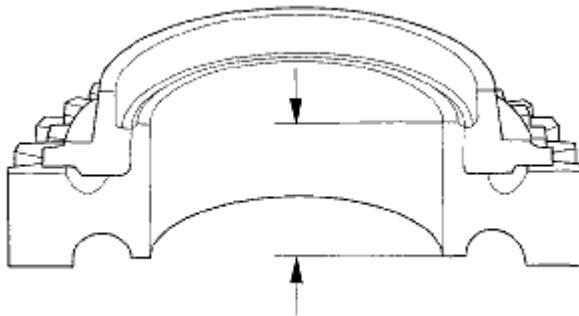


Fig. 132: Identifying Thickness Of 5th Gear
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Measure the clearance between 6th gear (A) and the angular ball bearing inner race (B) with a dial indicator (C). If the clearance is more than the service limit, go to step 11.

Standard: 0.13-0.26 mm (0.005-0.010 in.)

Service Limit: 0.35 mm (0.01 in.)

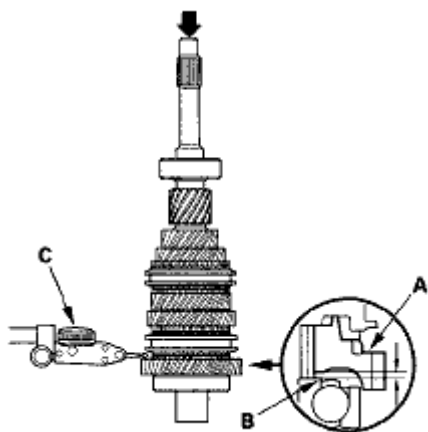


Fig. 133: Measuring Clearance Between 6th Gear And Angular Ball Bearing Inner Race
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Measure the length of the distance collar.
 - If the length is less than the standard, replace the distance collar.
 - If the length is within the standard, go to step 12.

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

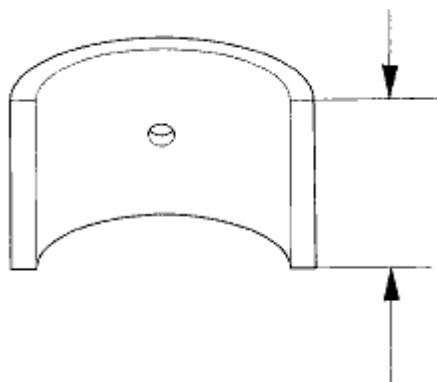


Fig. 134: Identifying Length Of Distance Collar
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Measure the thickness of 6th gear.
 - If the thickness is less than the service limit, replace 6th gear.
 - If the thickness is within the service limit, replace the 5th/6th synchro hub and 5th/6th synchro sleeve as a set.

Standard: 23.82-23.90 mm (0.937-0.940 in.)

Service Limit: 23.75 mm (0.94 in.)

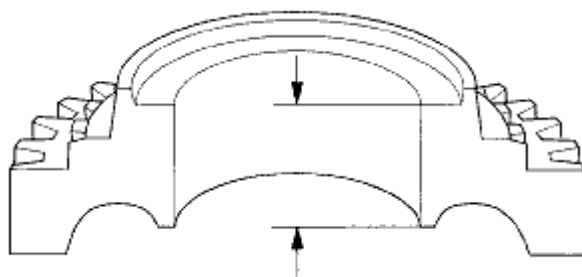


Fig. 135: Identifying Thickness Of 6th Gear
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT DISASSEMBLY

1. Support 6th gear (A) on the steel blocks, and press the mainshaft out of the ball bearing (B).

NOTE: Do not use a jaw-type puller; it can damage the gear teeth.

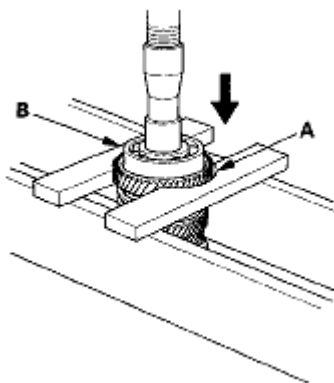


Fig. 136: Pressing Mainshaft Out Of Ball Bearing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Support 5th gear (A) on the steel blocks, and press the mainshaft out of the 5th/6th synchro hub (B).

NOTE: Do not use a jaw-type puller; it can damage the gear teeth.

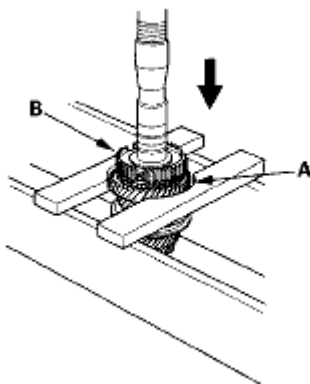


Fig. 137: Pressing Mainshaft Out Of 5th/6th Synchro Hub
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

- Support 3rd gear (A) on the steel blocks, and press the mainshaft out of the 3rd/4th synchro hub (B).

NOTE: Do not use a jaw-type puller; it can damage the gear teeth.

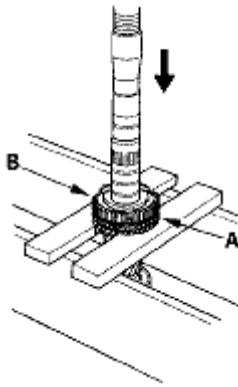


Fig. 138: Pressing Mainshaft Out Of 3rd/4th Synchro Hub
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

- Support the angular ball bearing on the steel blocks, and press out the mainshaft.

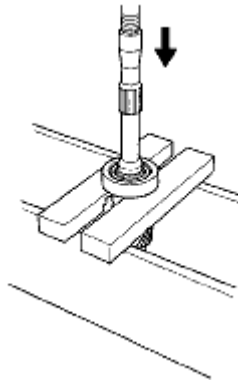


Fig. 139: Pressing Out Mainshaft
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT INSPECTION

- Inspect the oil passage, gear, and bearing contact areas for wear and damage, then measure mainshaft at points A, B, C, D, E, and F. If any part of the mainshaft is less than the service limit, replace it.

Standard:**A Ball bearing contact area**

(transmission housing side):

30.987—31.000 mm (1.2200—1.2205 in.)

B 6th gear distance collar contact area:

32.987—33.000 mm (1.2987—1.2992 in.)

C 4th/5th gear distance collar contact area:

35.987—36.000 mm (1.4168—1.4173 in.)

D Needle bearing contact area:

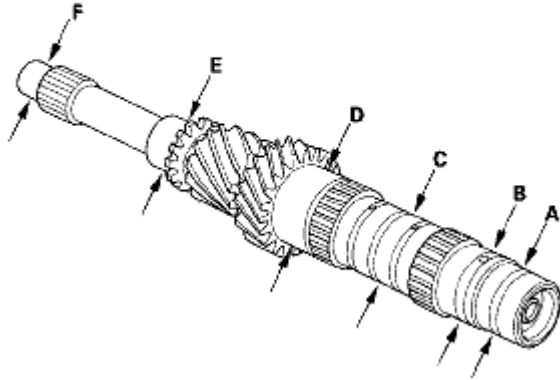
41.984—42.000 mm (1.6529—1.6535 in.)

E Ball bearing contact area (clutch housing side):

28.002—28.015 mm (1.1024—1.1030 in.)

F Pilot bearing contact area:

19.967—19.980 mm (0.7861—0.7866 in.)

Service Limit:**A:** 30.93 mm (1.218 in.)**B:** 32.93 mm (1.296 in.)**C:** 35.93 mm (1.415 in.)**D:** 41.93 mm (1.651 in.)**E:** 27.95 mm (1.100 in.)**F:** 19.91 mm (0.784 in.)**Fig. 140: Identifying Mainshaft Inspection Points**

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.)**

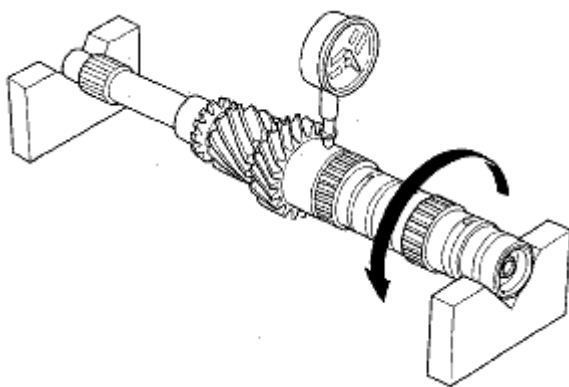


Fig. 141: Checking Mainshaft Runout
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT REASSEMBLY

EXPLODED VIEW

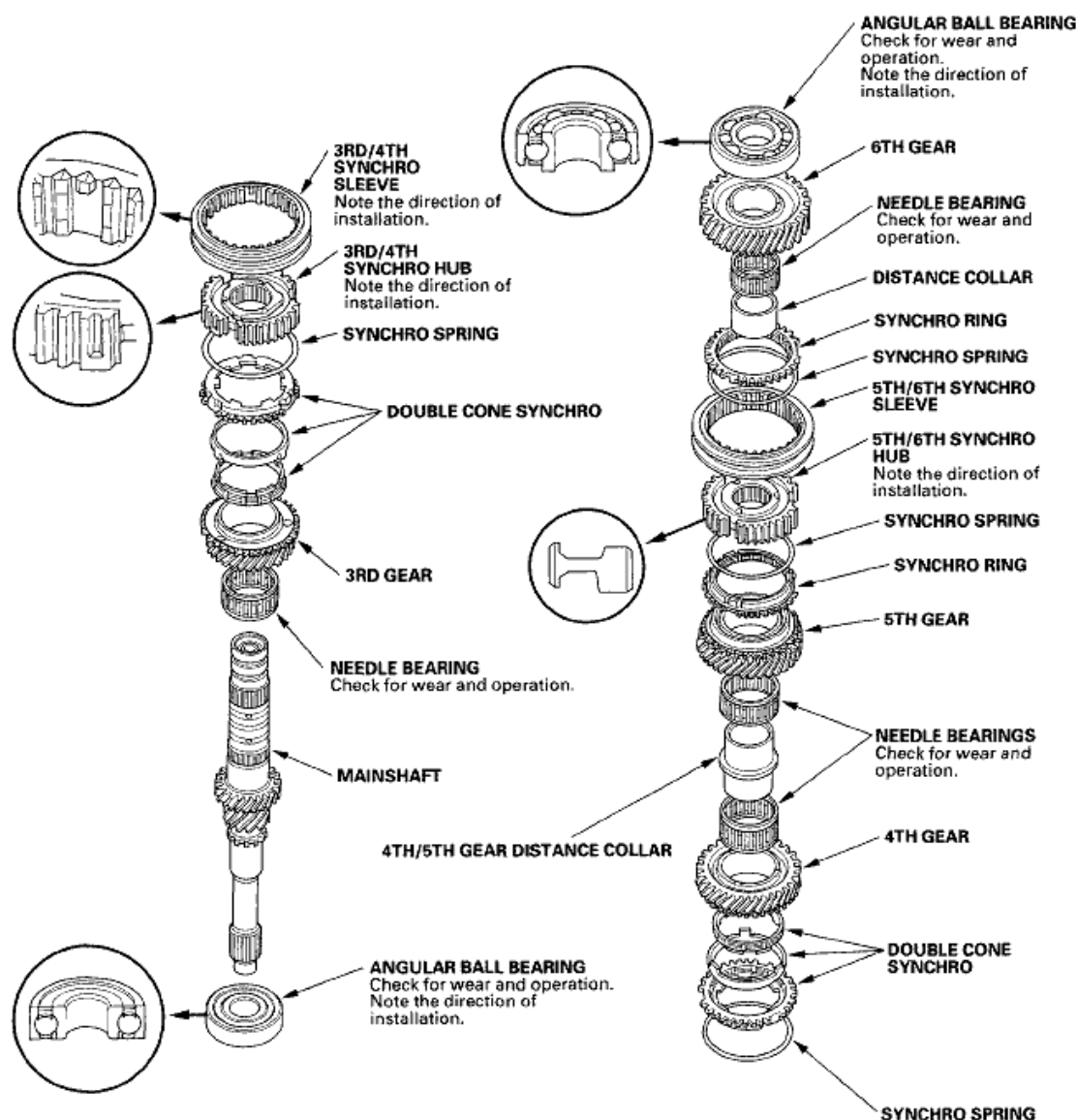


Fig. 142: Exploded View Of Mainshaft Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Special Tools Required

- Driver, 40 mm I.D. 07746-0030100
- Driver, 30 mm I.D. 07946-MB00000

NOTE: Refer to the Exploded View (See Fig. 142), as needed, during this procedure.

1. Clean all parts in solvent, dry them, and apply manual transmission fluid (MTF) to all contact surfaces except the 3rd/4th and 5th/6th synchro hubs.
2. Install the new angular ball bearing (A) using the 30 mm I.D. driver (B) and a press. Note the direction of installation.

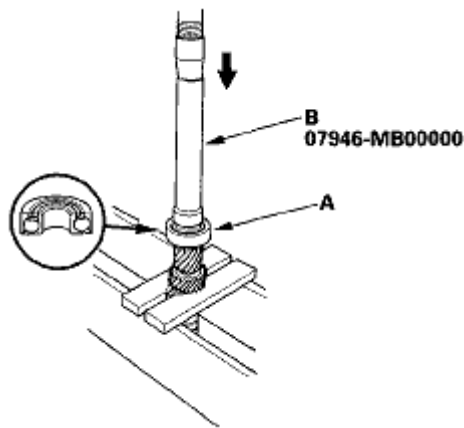


Fig. 143: Installing Angular Ball Bearing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the needle bearing (A) and 3rd gear (B) on the mainshaft (C).

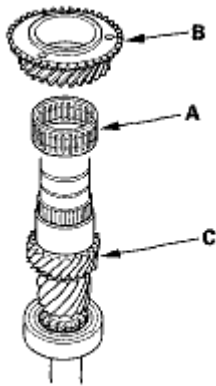


Fig. 144: Identifying Needle Bearing, 3rd Gear And Mainshaft

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. 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).

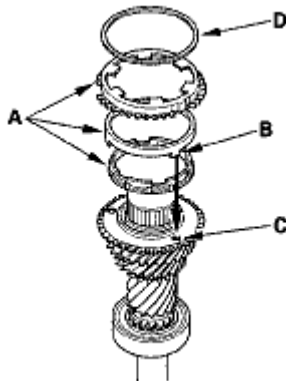


Fig. 145: Identifying Double Cone Synchro Assembly, Synchro Cone Fingers, 3rd Gear And Synchro Spring

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

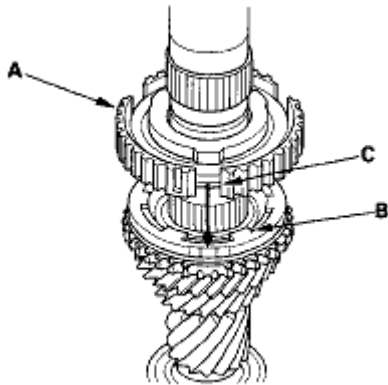


Fig. 146: Identifying 3rd/4th Synchro Hub, Outer Synchro Ring Fingers And 3rd/4th Synchro Hub

Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Install the 3rd/4th synchro hub (A) using the 40 mm I.D. driver (B).

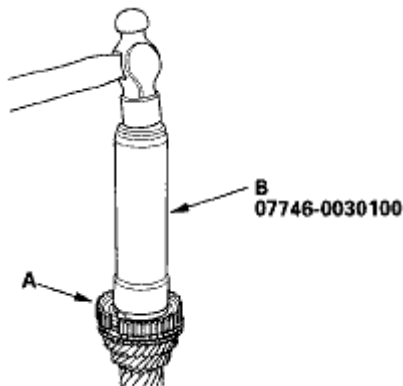


Fig. 147: Installing 3rd/4th Synchro Hub

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

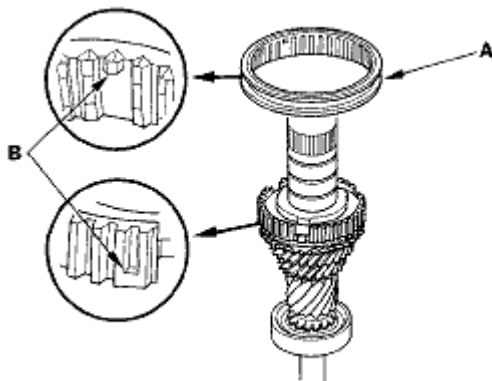


Fig. 148: Identifying 3rd/4th Synchro Sleeve
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Install the synchro spring (A).

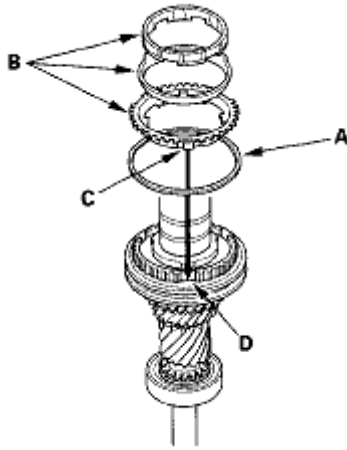


Fig. 149: Identifying Synchro Spring, Double Cone Synchro Assembly And 3rd/4th Synchro Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

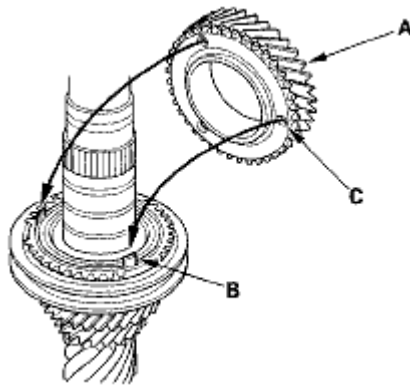


Fig. 150: Installing 4th Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Install the needle bearings, distance collar, 5th gear, synchro ring, and synchro spring.
12. Install the 5th/6th synchro hub (A) by aligning the outer synchro ring fingers (B) with the grooves in 5th/6th synchro hub (C).

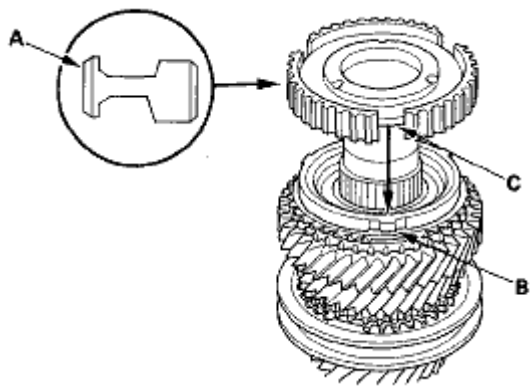


Fig. 151: Aligning Outer Synchro Ring Fingers With Grooves In 5th/6th Synchro Hub
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Install the 5th/6th synchro hub (A) using the 40 mm I.D. driver (B).

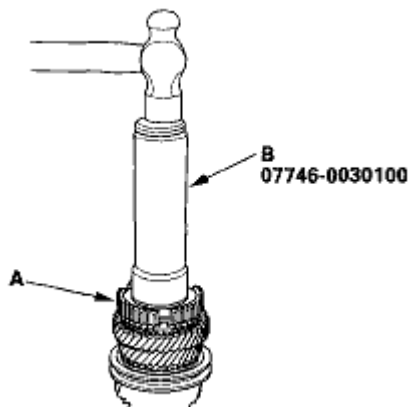


Fig. 152: Installing 5th/6th Synchro Hub
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Install the 5th/6th synchro sleeve.

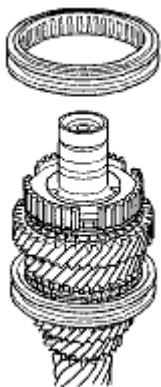


Fig. 153: Identifying 5th/6th Synchro Sleeve
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Install the synchro spring and synchro ring.
16. Install the distance collar, needle bearing, and 6th gear.

17. Install the new angular ball bearing (A) using the 40 mm I.D. driver (B). Note the direction of installation.

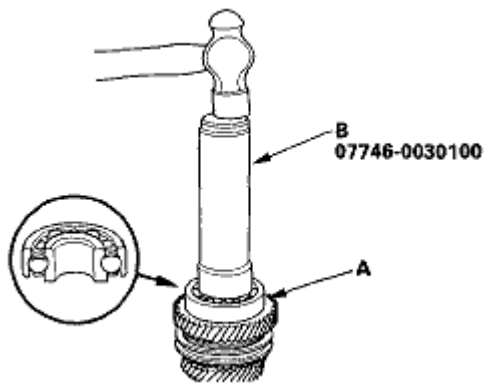


Fig. 154: Installing Angular Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT ASSEMBLY CLEARANCE INSPECTION

NOTE: Before inspection, make sure the 20 mm special bolt is tightened to the specified torque.

1. Measure the clearance between 1st gear (A) and the countershaft reverse gear (B) with a dial indicator (C).
 - If the clearance is more than the service limit, go to step 2.
 - If the clearance is within the service limit, go to step 4.

Standard: 0.04-0.17 mm (0.002-0.007 in.)

Service Limit: 0.28 mm (0.011 in.)

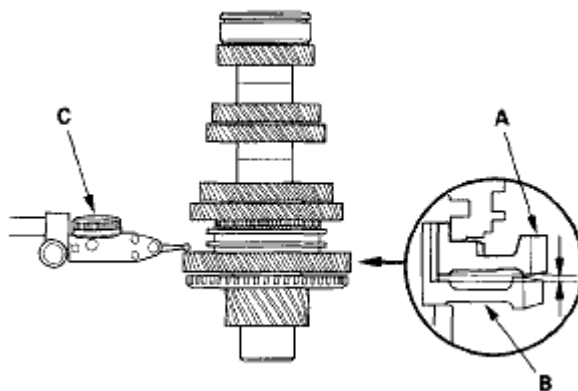


Fig. 155: Measuring Clearance Between 1st Gear And Countershaft Reverse Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Measure the length of the countershaft reverse gear.
 - If the length is less than the standard, replace the countershaft reverse gear.

- If the length is within the standard, go to step 3.

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

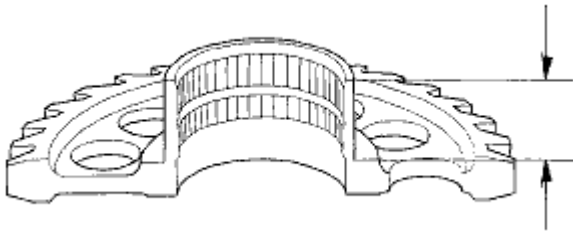


Fig. 156: Identifying Length Of Countershaft Reverse Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

Standard: 22.91-22.99 mm (0.902-0.905 in.)

Service Limit: 22.86 mm (0.900 in.)

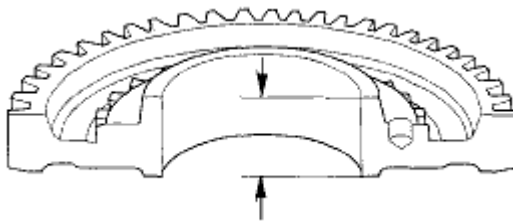


Fig. 157: Identifying Thickness Of 1st Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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: 0.04-0.17 mm (0.002-0.007 in.)

Service Limit: 0.28 mm (0.011 in.)

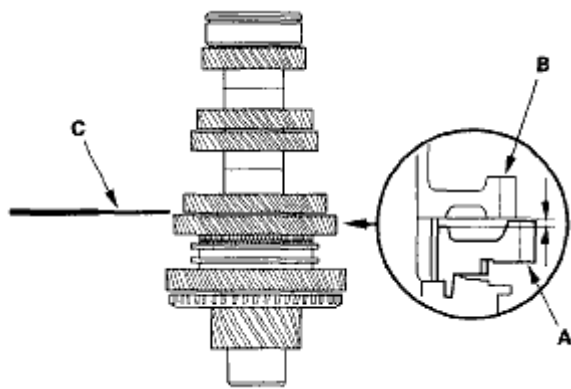


Fig. 158: Measuring Clearance Between 2nd Gear And 3rd Gear
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Measure the length of the distance collar.
 - If the length is less than the standard, replace the distance collar.
 - If the length is within the standard, go to step 6.

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

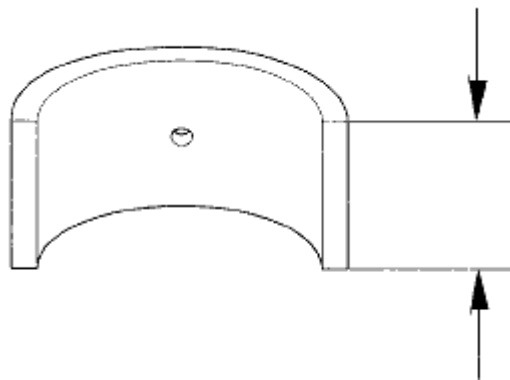


Fig. 159: Identifying Length Of Distance Collar
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Measure the thickness of 2nd gear as shown.
 - 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 1st/2nd synchro sleeve as a set.

Standard: 22.91-22.99 mm (0.902-0.905 in.)

Service Limit: 22.86 mm (0.900 in.)

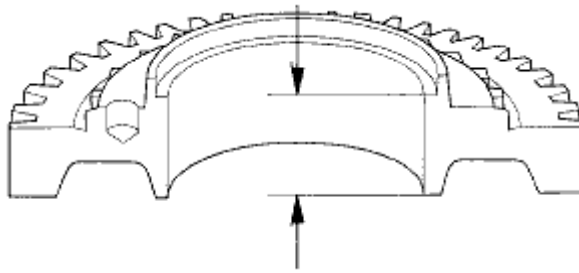


Fig. 160: Identifying Thickness Of 2nd Gear
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT DISASSEMBLY

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

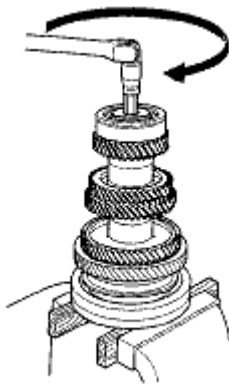


Fig. 161: Removing Countershaft Special Bolt
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Remove the 20 mm special bolt (left-hand threads).
3. Support 6th 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.

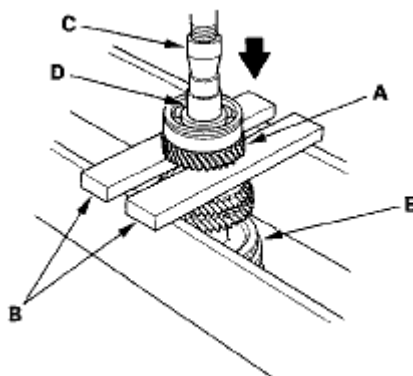


Fig. 162: Pressing Countershaft Out Of Ball Bearing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the 35 mm shim and 6th gear.

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 and 5th gear.

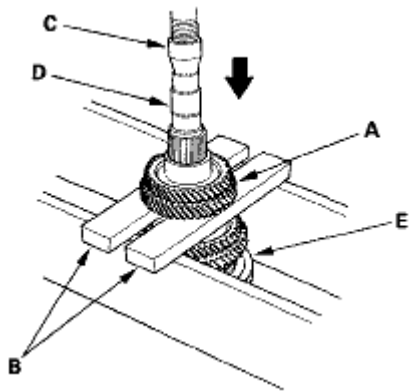


Fig. 163: Pressing Countershaft Out Of 4th And 5th Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 2nd and 3rd gear.

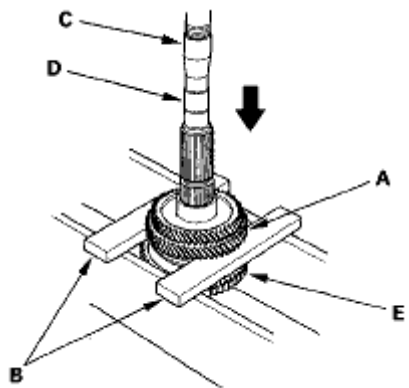


Fig. 164: Pressing Countershaft Out Of 2nd And 3rd Gear
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Remove the distance collar and needle bearing.
8. Remove the triple cone synchro assembly (A) and synchro spring (B).

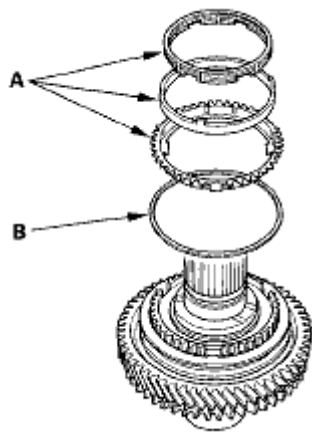


Fig. 165: Identifying Triple Cone Synchro Assembly And Synchro Spring
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Remove the 1st/2nd synchro sleeve.
10. Remove the 1st/2nd synchro hub (A).

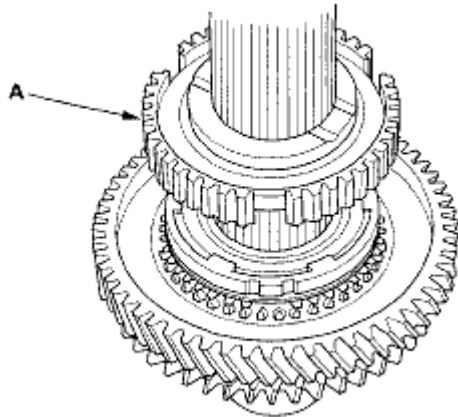


Fig. 166: Identifying 1st/2nd Synchro Hub
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Remove the synchro spring (A) and the triple cone synchro assembly (B).

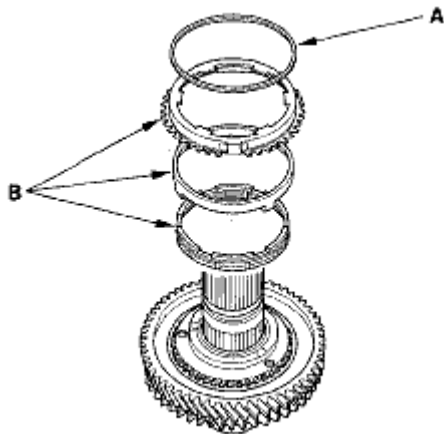


Fig. 167: Identifying Synchro Spring And Triple Cone Synchro Assembly

Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. Remove 1st gear (A), needle bearing (B), and countershaft reverse gear (C).

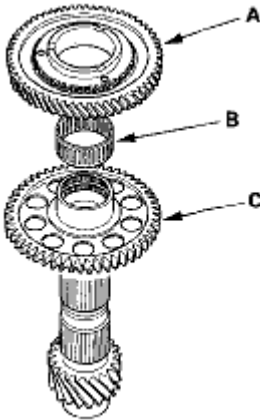


Fig. 168: Identifying 1st Gear, Needle Bearing And Countershaft Reverse Gear
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT INSPECTION

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

Standard:

A Ball bearing contact area

(transmission housing side):

30.002—30.015 mm (1.1812—1.1817 in.)

B Distance collar contact area:

42.975—42.991 mm (1.6919—1.6926 in.)

C Countershaft reverse gear contact area:

45.934—45.950 mm (1.8084—1.8091 in.)

D Needle bearing contact area

(clutch housing side):

43.974—43.990 mm (1.7313—1.7319 in.)

Service Limit:

A: 29.95 mm (1.179 in.)

B: 42.92 mm (1.690 in.)

C: 45.88 mm (1.806 in.)

D: 43.92 mm (1.729 in.)

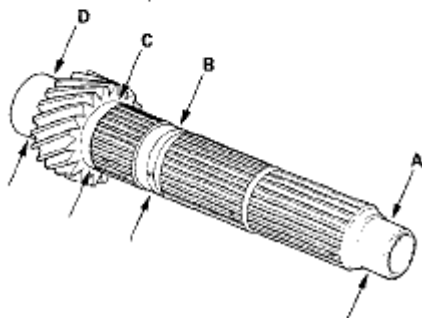


Fig. 169: Identifying Countershaft Inspection Points

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.)

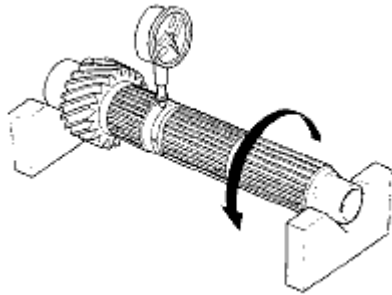


Fig. 170: Checking Countershaft Runout

Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT REASSEMBLY

EXPLODED VIEW

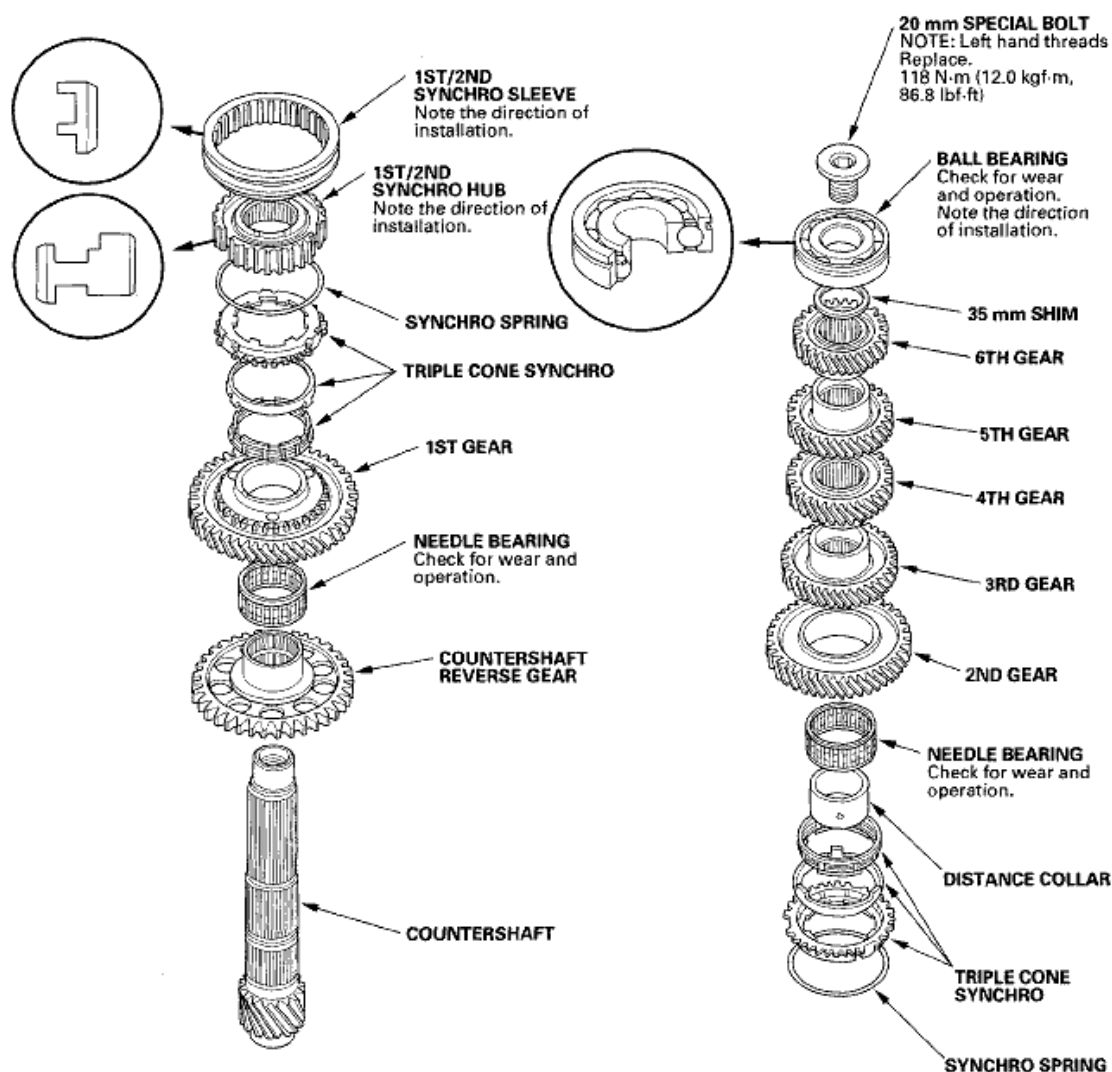


Fig. 171: Exploded View Of Countershaft Assembly With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Special Tools Required

- Driver, 56 x 62 mm 070AD-PYZA100
- Driver, 40 mm I.D. 07746-0030100

NOTE: Refer to the Exploded View (See [Fig. 171](#)), as needed, during this procedure.

1. Clean all parts in solvent, dry them, and apply manual transmission fluid (MTF) to all contact surfaces.
2. Install the countershaft reverse gear (A), needle bearing (B), and 1st gear (C) onto the countershaft (D).

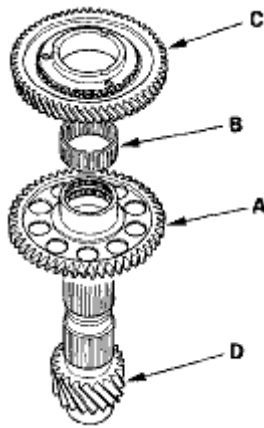


Fig. 172: Identifying Countershaft Reverse Gear, Needle Bearing, 1st Gear And Countershaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the triple cone synchro assembly (A) by aligning the synchro cone fingers (B) with the holes in 1st gear (C), then install the synchro spring (D).

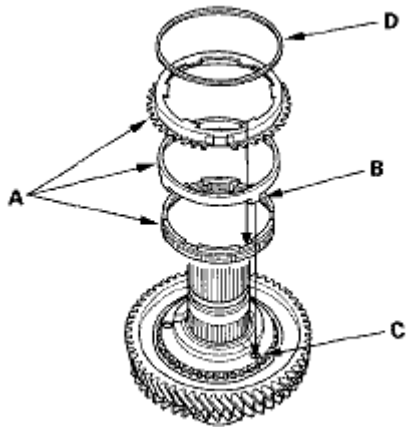


Fig. 173: Identifying Triple Cone Synchro Assembly, Synchro Cone Fingers, 1st Gear And Synchro Spring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

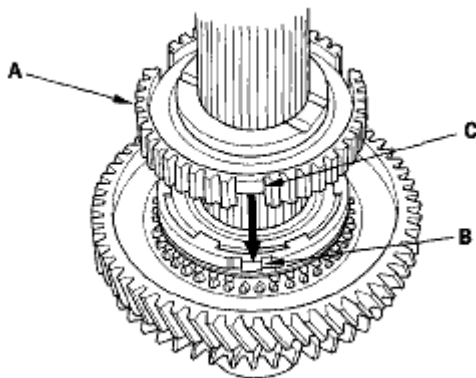


Fig. 174: Identifying 1st/2nd Synchro Hub, Outer Synchro Ring Fingers And 1st/2nd Synchro Hub

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the 1st/2nd synchro sleeve.
6. Install the synchro spring (A).

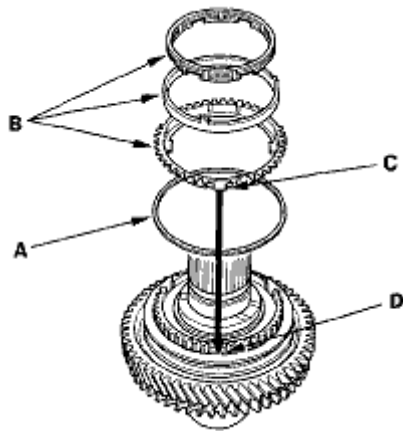


Fig. 175: Identifying Triple Cone Synchro Assembly, Outer Synchro Ring Fingers And 1st/2nd Synchro Hub

Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Install the triple cone synchro assembly (B) by aligning the outer synchro ring fingers (C) with the grooves in the 1st/2nd synchro hub (D).
8. Install the distance collar and needle bearing.
9. Install 2nd gear (A) by aligning the synchro cone fingers (B) with the holes in 2nd gear (C).

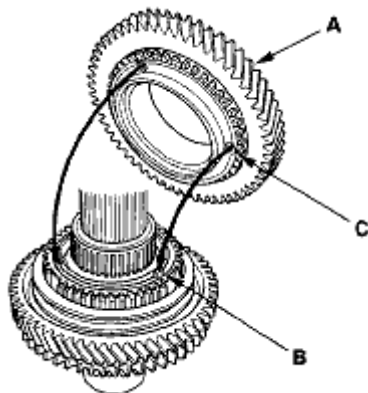


Fig. 176: Installing 2nd Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Support the countershaft (A) on the steel blocks, then install 3rd gear (B) using the 52 x 62 mm driver (C) and a press (D).

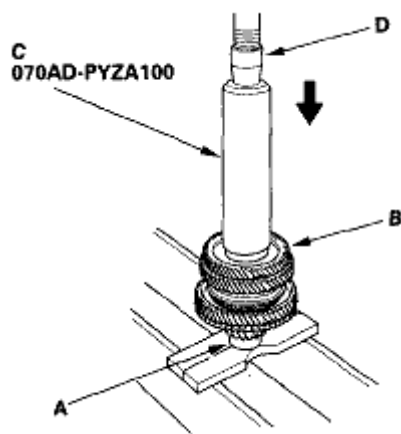


Fig. 177: Installing 3rd Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Install 4th gear (A) using the 52 x 62 mm driver (B) and a press (C).

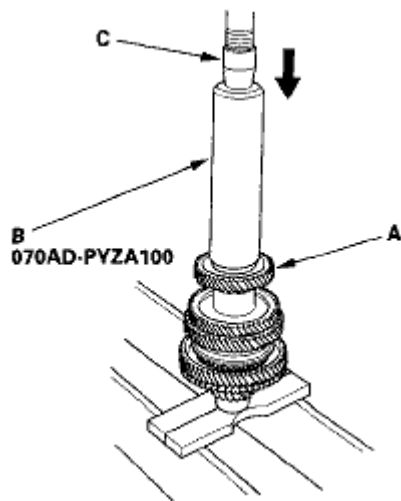


Fig. 178: Installing 4th Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

12. install 5th gear (A) using the 52 x 62 mm driver (B) and a press (C).

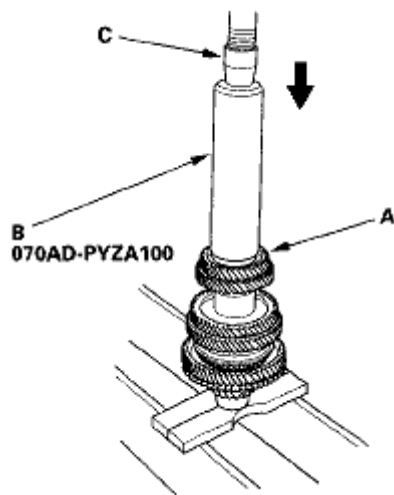


Fig. 179: Installing 5th Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Install 6th gear (A) using the 40 mm I.D. driver (B) and a press (C).

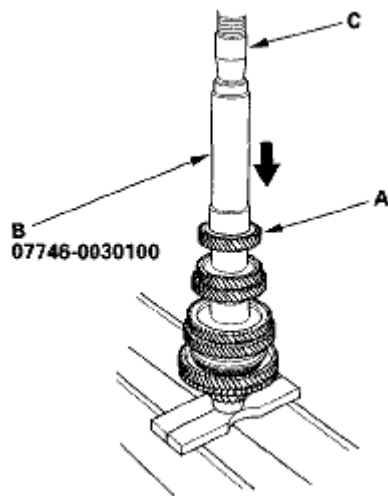


Fig. 180: Installing 6th Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Install the 35 mm shim (A) and the old ball bearing (B) using the 40 mm I.D. driver (C) and a press (D).

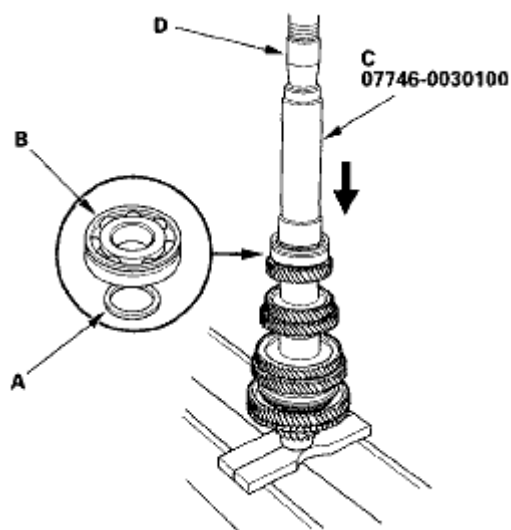


Fig. 181: Installing Ball Bearing

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.)

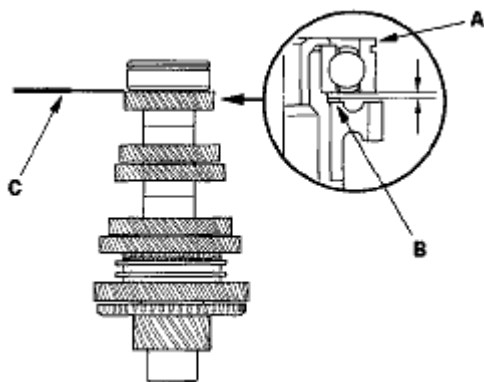


Fig. 182: Measuring Clearance Between Old Bearing And Shim

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

SHIM THICKNESS SPECIFICATION

	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 (0.059 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 6th gear (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft out of the old ball bearing.

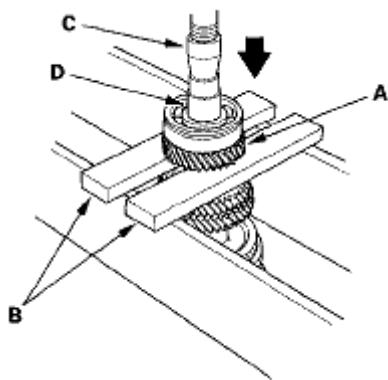


Fig. 183: Pressing Countershaft Out Of Old Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. If a new 35 mm shim was selected in step 16, install the shim, and recheck the clearance.
19. Install 6th gear (A) using the 40 mm I.D. driver (B) and a press (C).

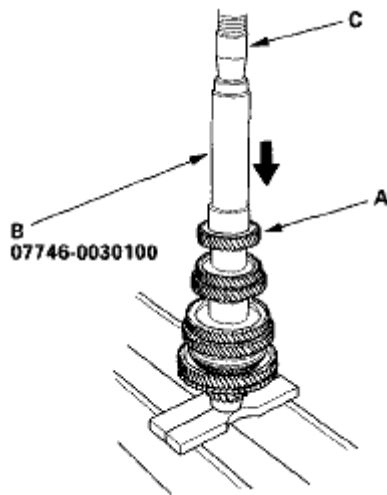


Fig. 184: Installing 6th Gear

Courtesy of AMERICAN HONDA MOTOR CO., INC.

20. Install the 35 mm shim (A) and new bearing (B) using the 40 mm I.D. driver (C) and a press (D).

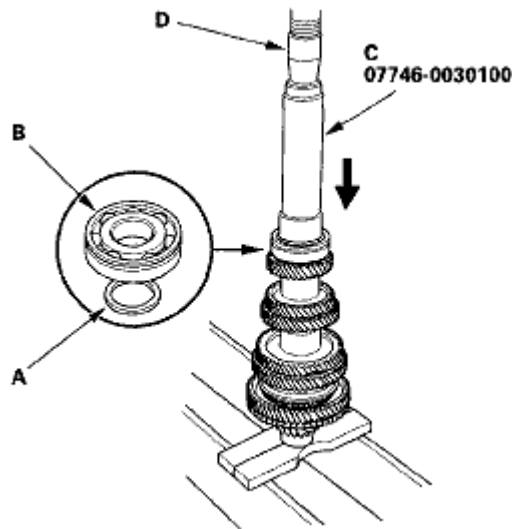


Fig. 185: Installing Shim And Bearing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

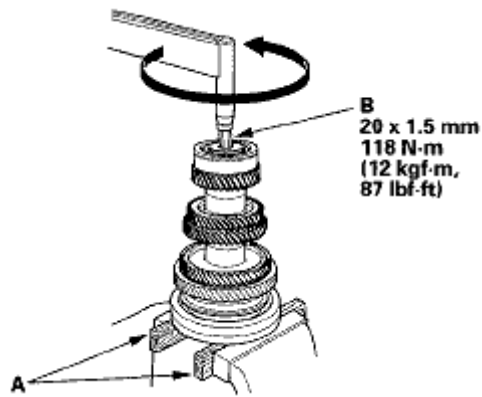


Fig. 186: Tightening Countershaft Special Bolt With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

22. Tighten the new 20 mm special bolt (B) (left-hand threads).

NOTE: Apply new MTF to the bolt threads and flanges.

REVERSE IDLER GEAR SHAFT ASSEMBLY DISASSEMBLY/REASSEMBLY

Prior to reassembling, clean all the parts in solvent, dry them, and apply manual transmission fluid (MTF) to all contact surfaces.

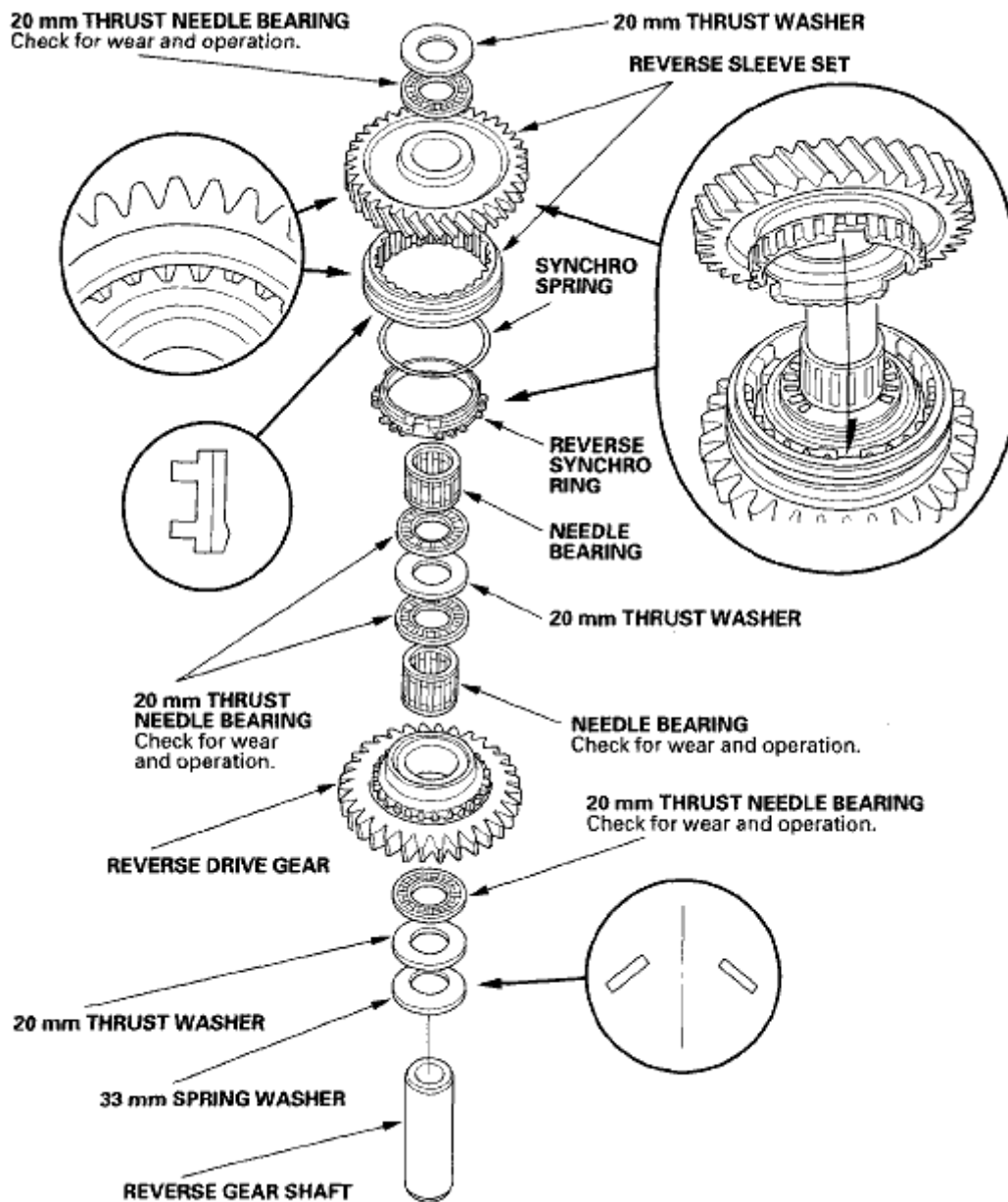


Fig. 187: Exploded View Of Reverse Idler Gear Shaft
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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 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.

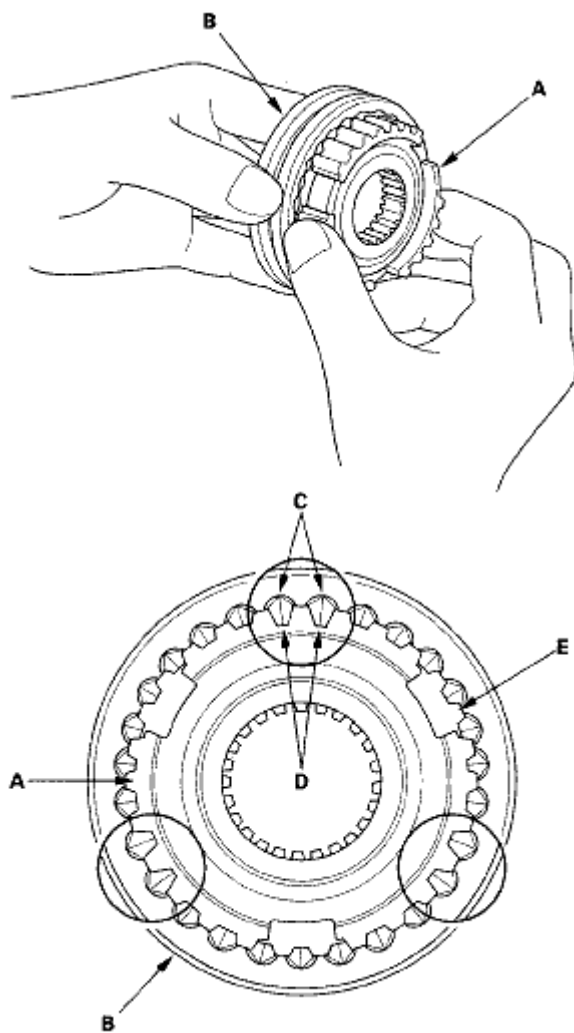


Fig. 188: Checking Synchro Sleeve And Hub
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

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).

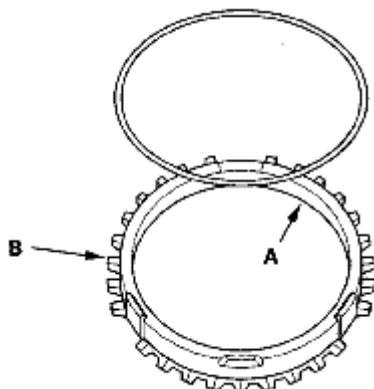


Fig. 189: Identifying Synchro Ring And Synchro Ring Teeth

Courtesy of AMERICAN HONDA MOTOR CO., INC.

Example of synchro ring teeth



Fig. 190: Identifying Example Of Synchro Ring Teeth
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

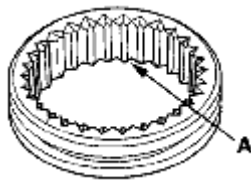


Fig. 191: Identifying Synchro Sleeve Teeth
Courtesy of AMERICAN HONDA MOTOR CO., INC.

Example of synchro sleeve teeth and gear teeth

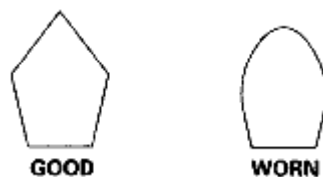


Fig. 192: Identifying Example Of Synchro Sleeve Teeth And Gear Teeth
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

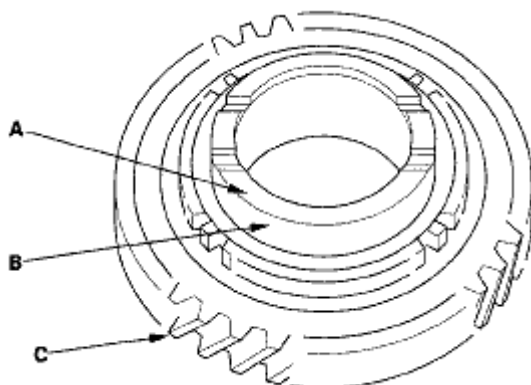


Fig. 193: Identifying Thrust Surface Of Gear Hub
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Inspect the cone surface (B) on each gear hub for wear and roughness.
5. Inspect the teeth on all gears (C) for uneven wear, scoring, and cracks.
6. Coat the cone surface of each gear hub with transmission fluid, 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 clearance. If the clearance is less than the service limit, replace the synchro ring and gear.

Synchro Ring-to-Gear Clearance

Standard:

5th gear: 0.70-1.49 mm (0.028-0.059 in.)

6th gear: 0.73-1.44 mm (0.029-0.057 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)

0.70-1.19 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.)

Triple Cone Synchro-to-Gear Clearance

Standard:

- ①: **Outer Synchro Ring (B) to Synchro Cone (C)**
1st gear: 0.70—1.19 mm (0.028—0.047 in.)
2nd gear: 0.70—1.19 mm (0.028—0.047 in.)
- ②: **Synchro Cone (C) to Gear (A)**
1st gear: 0.45—1.14 mm (0.018—0.045 in.)
2nd gear: 0.60—1.88 mm (0.024—0.074 in.)
- ③: **Outer Synchro Ring (B) to Gear (A)**
1st gear: 1.12—1.68 mm (0.044—0.066 in.)
2nd gear: 0.87—1.82 mm (0.034—0.072 in.)

Service Limit:

- ①: 0.3 mm (0.012 in.)
- ②: 0.3 mm (0.012 in.)
- ③: 0.6 mm (0.024 in.)

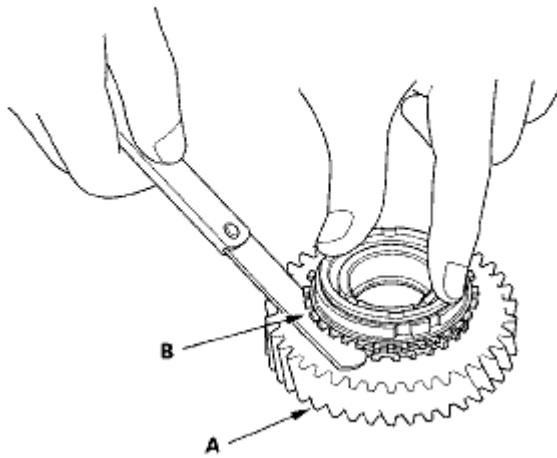
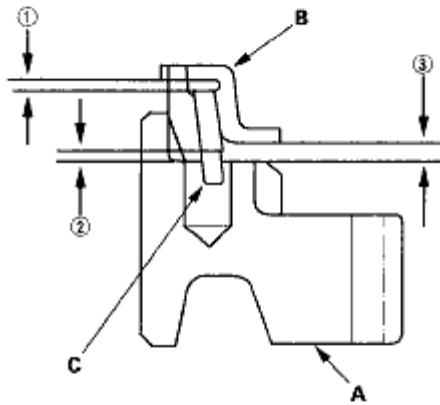


Fig. 194: Measuring Clearance Between Gear And Synchro Ring
Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT OIL SEAL REPLACEMENT

Special Tools Required

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

1. Remove the oil seal from the clutch housing. Be careful when removing the seal so the clutch housing is not damaged.

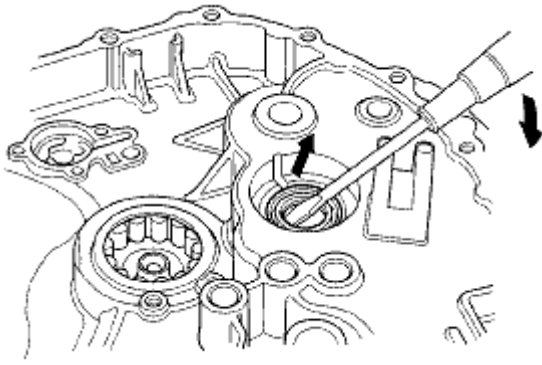


Fig. 195: Removing Oil Seal From Clutch Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Drive in the new oil seal from the transmission side using the driver (A) and 42 x 47 mm attachment (B).

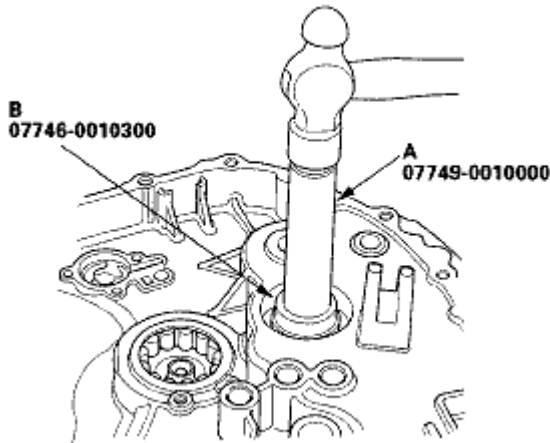


Fig. 196: Installing Oil Seal
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

COUNTERSHAFT BEARING REPLACEMENT

Special Tools Required

- Adjustable bearing puller, 45-75 mm 07YAC-0010100
- Attachment, 72 x 75 mm 07746-0010600
- Driver 07749-0010000
- Slide hammer, 3/8"-16 UNF commercially available

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

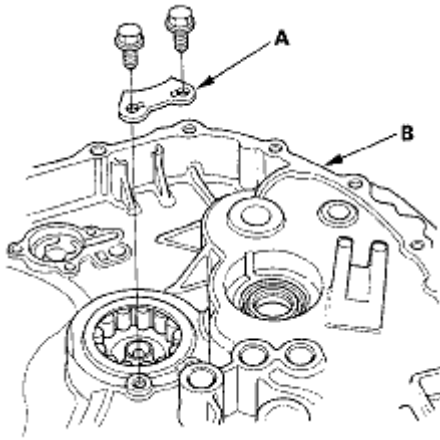


Fig. 197: Identifying Bearing Set Plate And Clutch Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Remove the needle bearing (A) from the clutch housing (B) using the 45-75 mm adjustable bearing puller (C) and a commercially available 3/8"-16 UNF slide hammer (D).

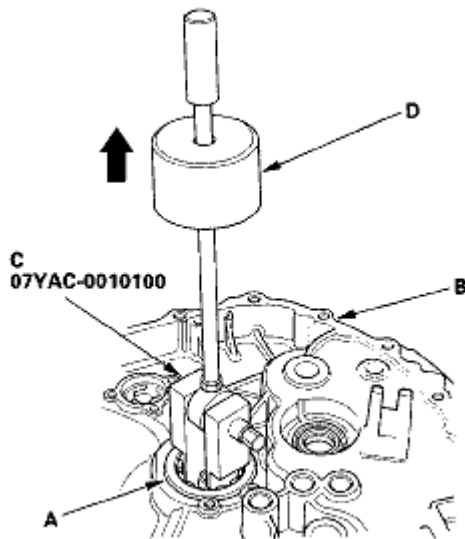


Fig. 198: Removing Needle Bearing From Clutch Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the new needle bearing (A) using the driver (B) and 72 x 75 mm attachment (C).

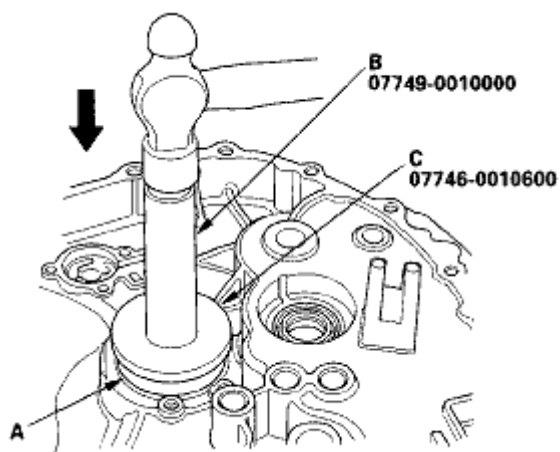


Fig. 199: Installing Needle Bearing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the bearing set plate (A) with bolts (B).

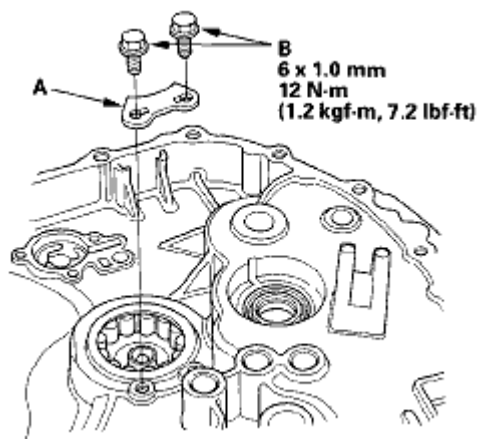


Fig. 200: Identifying Bearing Set Plate Bolts With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

MAINSHAFT THRUST CLEARANCE ADJUSTMENT

Special Tools Required

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

NOTE:

- Take measurement at normal room temperature.
- Clean all the parts thoroughly before installation.

1. Remove the 82 mm shim (A) from the transmission housing (B).

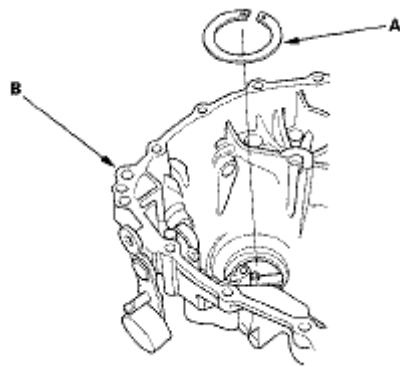


Fig. 201: Identifying Shim And Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Install the ball bearing (A), 3rd/4th synchro hub (B), 4th/5th gear distance collar (C), 5th/6th synchro hub (D), distance collar (E), and angular ball bearing (F) on the mainshaft (G), then install the assembled mainshaft in the transmission housing (H).

NOTE: **The angular ball bearing is directional. If installed the wrong way, the measurements will not be accurate.**

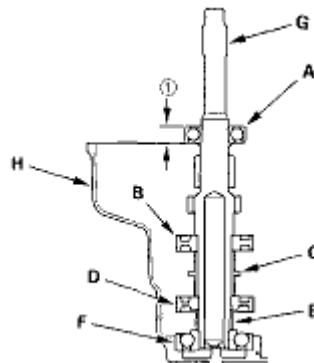


Fig. 202: Identifying Distance Between End Of Transmission Housing And Ball Bearing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Measure the distance (1) between the end of the transmission housing and ball bearing with a straight edge and depth gauge. Measure the at three locations, and average the readings.
4. Measure the distance (2) the depth of the clutch housing with a straight edge and depth gauge. Measure the at three locations, and average the readings.

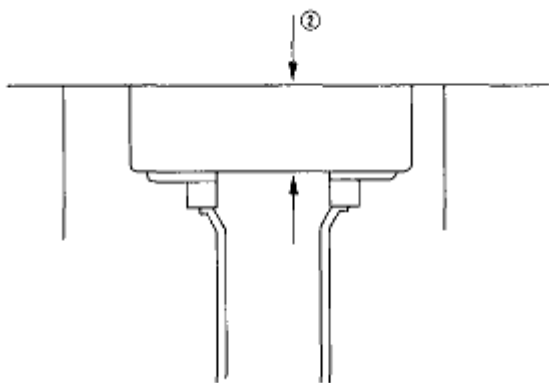


Fig. 203: Identifying Depth Of Clutch Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

Shim Selection Formula

5. Select the proper 82 mm shim from the chart. Follow the example below, and use the measurements you made in steps 3 and 4.

(Basic Formula)

$$(2) - (1) - (0.85 + 0.14) = \text{shim thickness (maximum)}$$

$$(2) - (1) - (0.85 + 0.21) = \text{shim thickness (minimum)}$$

- Subtract distance (2) (step 4) from distance (1) (step 3).
- 0.85 mm (0.033 in.): Spring washer, a dimension in the installation.
- 0.14 mm (0.006 in.): Minimum thrust clearance.
- 0.21 mm (0.008 in.): Maximum thrust clearance.

(For example)

$$21.04 - 17.97 - (0.85 + 0.14) = 2.08 \text{ mm (0.082 in.)}$$

$$21.04 - 17.97 - (0.85 + 0.21) = 2.01 \text{ mm (0.079 in.)}$$

Take the middle value 2.04 mm (0.080 in.) of the minimum value and the maximum value, and select the 0.93 mm (0.037 in.) and 1.11 mm (0.044 in.) shims.

NOTE: You may use more than one 82 mm shim to achieve the correct value.

82 mm Shim

SHIM THICKNESS SPECIFICATION

	Part Number	Thickness
A	23931-PR8-F00	0.60 mm (0.024 in.)
B	23932-PR8-F00	0.63 mm (0.025 in.)
C	23933-PR8-F00	0.66 mm (0.026 in.)

D	23934-PR8-F00	0.69 mm (0.027 in.)
E	23935-PR8-F00	0.72 mm (0.028 in.)
F	23936-PR8-F00	0.75 mm (0.030 in.)
G	23937-PR8-F00	0.78 mm (0.031 in.)
H	23938-PR8-F00	0.81 mm (0.032 in.)
I	23939-PR8-F00	0.84 mm (0.033 in.)
J	23940-PR8-F00	0.87 mm (0.034 in.)
K	23941-PR8-F00	0.90 mm (0.035 in.)
L	23942-PR8-F00	0.93 mm (0.037 in.)
M	23943-PR8-F00	0.96 mm (0.038 in.)
N	23944-PR8-F00	0.99 mm (0.039 in.)
O	23945-PR8-F00	1.02 mm (0.040 in.)
P	23946-PR8-F00	1.05 mm (0.041 in.)
Q	23947-PR8-F00	1.08 mm (0.043 in.)
R	23948-PR8-F00	1.11 mm (0.044 in.)
S	23949-PR8-F00	1.14 mm (0.045 in.)
T	23950-PR8-F00	1.17 mm (0.046 in.)
U	23951-PR8-F00	1.20 mm (0.047 in.)
W	23952-RAT-000	1.23 mm (0.048 in.)
X	23953-RAT-000	1.26 mm (0.050 in.)
Y	23954-RAT-000	1.29 mm (0.051 in.)
Z	23955-RAT-000	1.32 mm (0.052 in.)
AA	23956-RAT-000	1.35 mm (0.053 in.)
AB	23957-RAT-000	1.38 mm (0.054 in.)
AC	23958-RAT-000	1.41 mm (0.056 in.)
AD	23959-RAT-000	1.44 mm (0.057 in.)

6. Install the selected 82 mm shim (A) in the transmission housing (B).

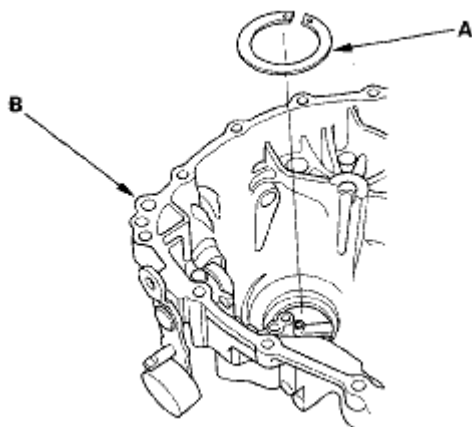


Fig. 204: Identifying Shim And Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

7. Thoroughly clean the spring washer before installing it on the clutch housing. Note the installation direction of the spring washer (see **TRANSMISSION DISASSEMBLY**).

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

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

11. Lightly tap on the mainshaft with a plastic hammer.
12. Attach the mainshaft holder (A) and mainshaft base (B) to the mainshaft as follows:
 - Back out the mainshaft holder bolt (C), and loosen the two hex bolts (D).
 - Fit the holder over the mainshaft so its lip is toward the transmission.
 - Align the mainshaft holder lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.

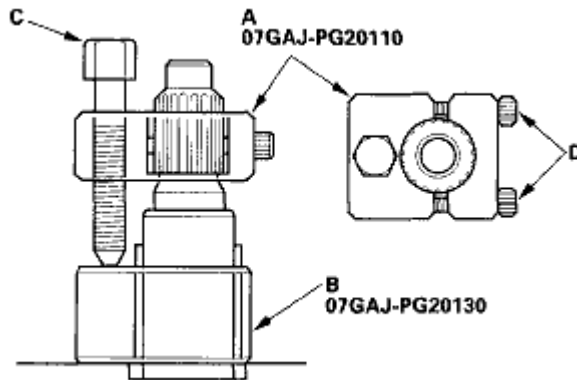


Fig. 205: Identifying Mainshaft Holder And Mainshaft Base
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

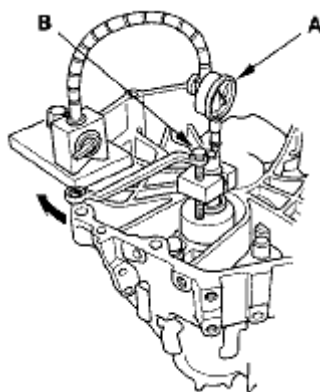


Fig. 206: Measuring Mainshaft End Play
Courtesy of AMERICAN HONDA MOTOR CO., INC.

16. Turn the mainshaft holder bolt (B) clockwise; stop turning when the dial gauge 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. Applying more pressure with the mainshaft holder bolt may damage the transmission.

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

Standard: 0.14-0.21 mm (0.006-0.008 in.)

TRANSMISSION REASSEMBLY

NOTE: Prior to reassembling, clean all parts in solvent, dry them, and apply manual transmission fluid (MTF) to all contact surfaces.

1. Press the new dust seal (A) into the transmission housing surface, then install the change lever (B), shift arm (C), 8 mm spring washer (D), and 8 mm special bolt (E).

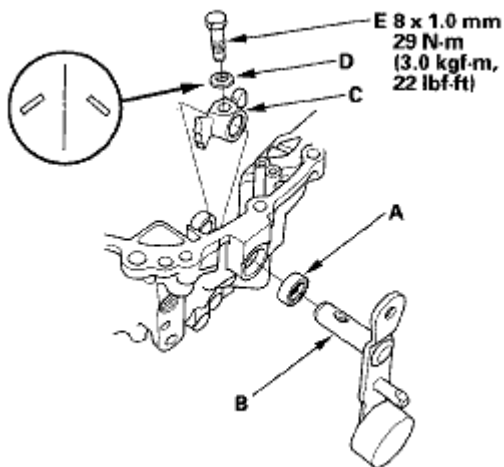


Fig. 207: Identifying Dust Seal, Change Lever, Shift Arm And Spring Washer With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Select the proper size 82 mm shim (A) according to the measurements made during the Mainshaft Thrust Clearance Adjustment (see MAINSHAFT THRUST CLEARANCE ADJUSTMENT). Install it into the transmission housing (B).

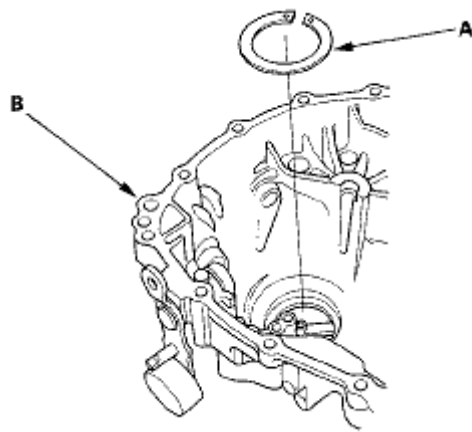


Fig. 208: Identifying Shim And Transmission Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the oil pump outer rotor (A), oil pump inner rotor (B), and oil pump plate (C).

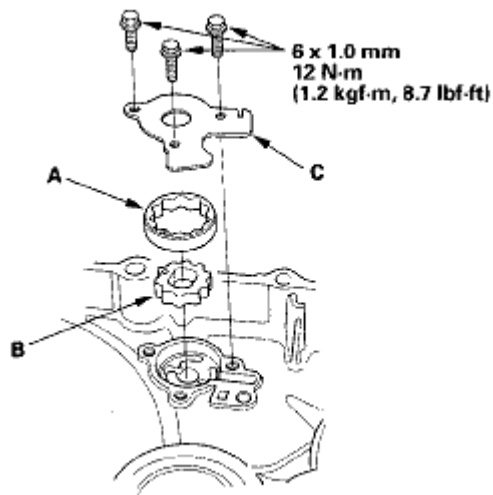


Fig. 209: Identifying Oil Pump Outer Rotor, Oil Pump Inner Rotor And Oil Pump Plate With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the differential assembly (A) and oil pump shaft (B).

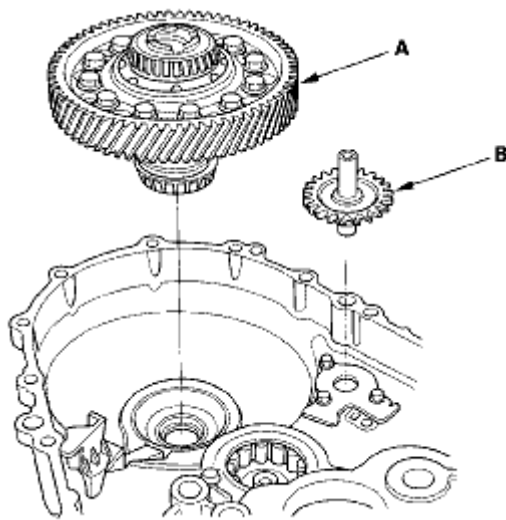


Fig. 210: Identifying Differential Assembly And Oil Pump Shaft
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the 64 mm spring washer (A). Note the installation direction of the 64 mm spring washer.

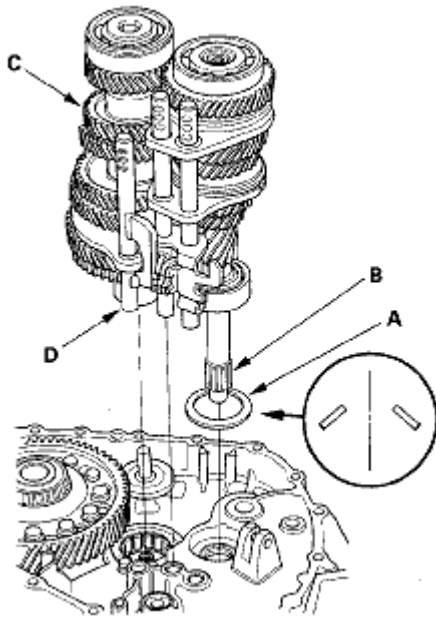


Fig. 211: Identifying Mainshaft Splines, Countershaft And Shift Fork Assembly
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Apply tape to the mainshaft splines (B) to protect the seal. Install the mainshaft and countershaft (C) into the shift fork assembly (D) as an assembly.
7. Press the new dust seal (A) into the clutch housing surface, then install the select lever (B), select arm (C), new 5 mm spring pin (D), and new 3 mm spring pin (E).

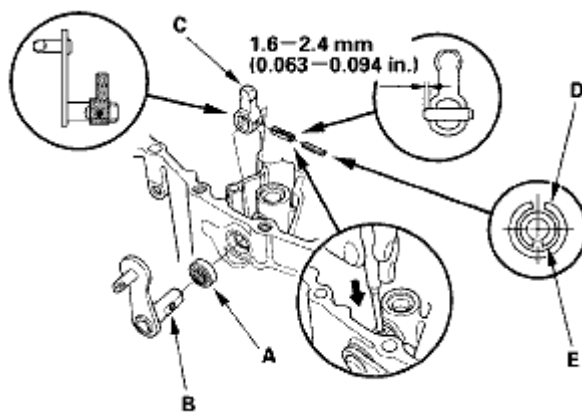


Fig. 212: Identifying Dust Seal, Select Lever, Select Arm And Spring Pin
Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Set the select return spring (A), 8 x 50 mm pin (B), and interlock (C) as shown.

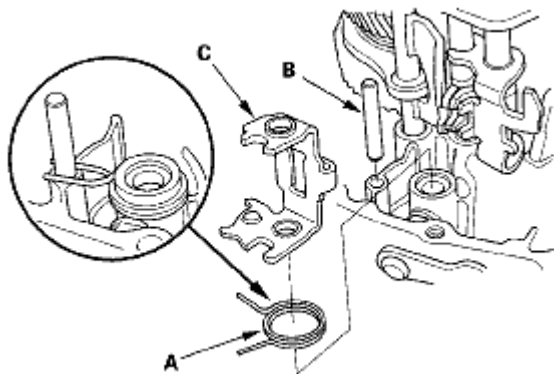


Fig. 213: Identifying Select Return Spring, Pin And Interlock
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Install the shift piece (A) and shift piece shaft (B).

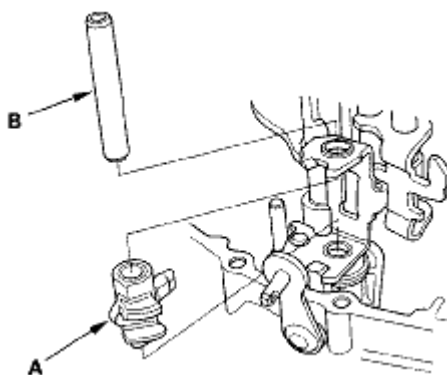


Fig. 214: Identifying Shift Piece And Shift Piece Shaft
Courtesy of AMERICAN HONDA MOTOR CO., INC.

10. Install the 33 mm spring washer (A). Note the installation direction of the spring washer.

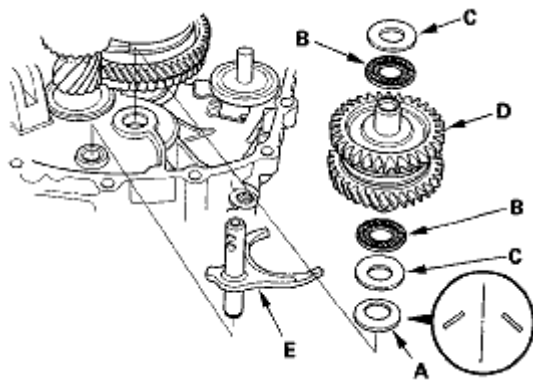


Fig. 215: Identifying Thrust Needle Bearings, Reverse Idler Gear Shaft Assembly And Reverse Shift Fork

Courtesy of AMERICAN HONDA MOTOR CO., INC.

11. Install the 20 mm thrust needle bearings (B), 20 mm thrust washers (C), reverse idler gear shaft assembly (D), and reverse shift fork (E) as an assembly.
12. Slide the reverse idler gear shaft assembly (A) on the rib (B) of the clutch housing, then install it into the hole (C) of the clutch housing.

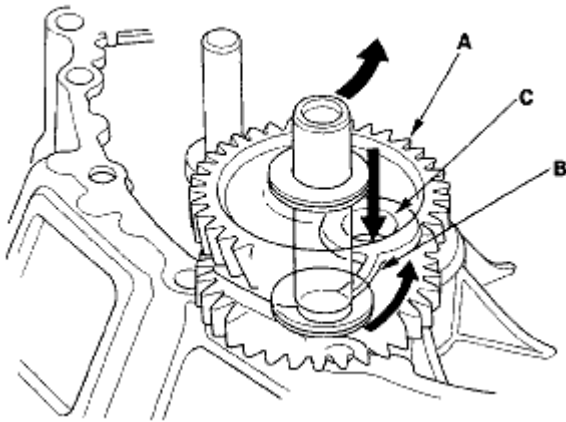


Fig. 216: Installing Reverse Idler Gear Shaft Assembly

Courtesy of AMERICAN HONDA MOTOR CO., INC.

13. Install the reverse shift lever (A), and 8 x 50 mm pin (B).

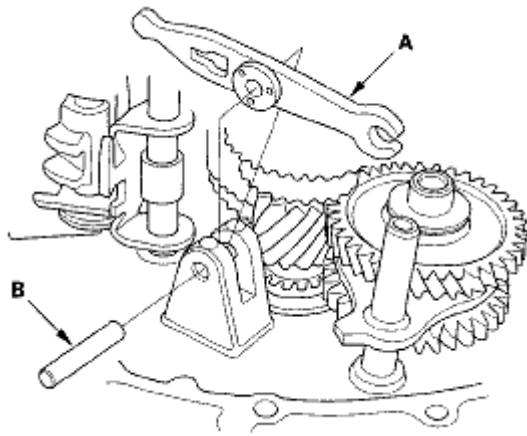


Fig. 217: Identifying Reverse Shift Lever And Pin
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

14. Install the oil guide pipe A, oil guide pipe B, and magnet (C).

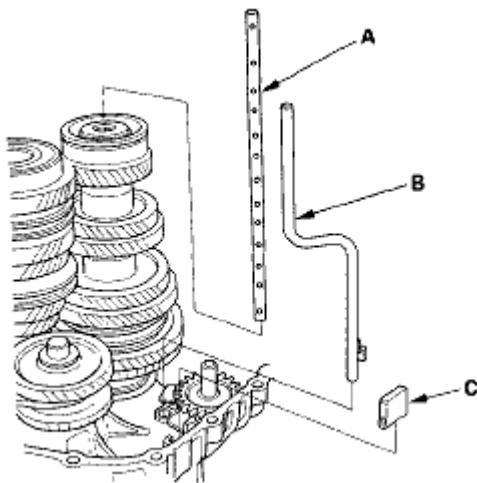


Fig. 218: Identifying Oil Guide Pipes And Magnet
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

15. Clean any dirt and oil from the transmission housing sealing surface.
16. Apply liquid gasket, P/N 08718-0001 evenly to the mating surface of the transmission housing and the clutch housing. Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- If you apply liquid gasket P/N 08718-0012, the component must be installed within 4 minutes.
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

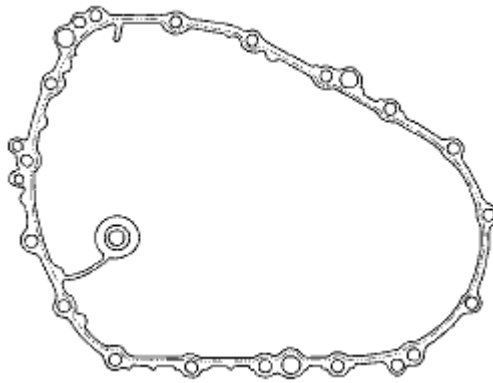


Fig. 219: Identifying Mating Surface Of Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

17. Install the three 14x20 mm dowel pins (A).

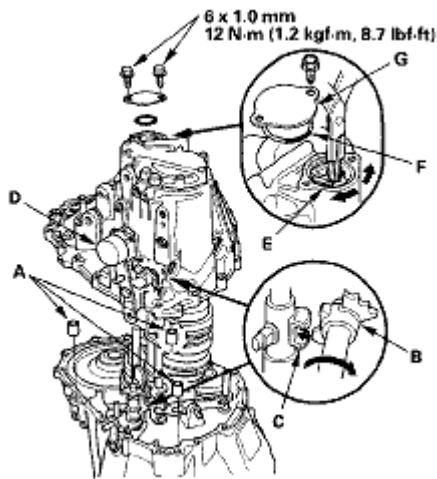


Fig. 220: Identifying Shift Arm, Shift Piece And Change Lever With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

18. Lower the transmission housing, then place the shift arm (B) in the groove of the shift piece (C) by turning the change lever (D).
19. While expanding the 75 mm snap ring (E) of the countershaft ball bearing with snap ring pliers, push the transmission housing down to start the countershaft ball bearing through the snap ring. Then release the pliers, and push down the housing unit it bottoms and the snap ring snaps in place in the counter shaft ball bearing snap ring groove.
20. Make sure the 75 mm snap ring is securely seated in the groove of the countershaft bearing.

Dimension ① as installed: 9.91—11.52 mm
(0.390—0.454 in.)

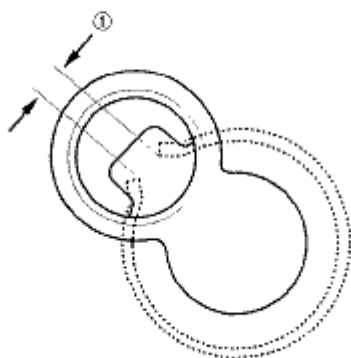


Fig. 221: Identifying Snap Ring Dimension
Courtesy of AMERICAN HONDA MOTOR CO., INC.

21. Install the new 37.7 mm O-ring (F) and transmission case cap (G).

NOTE: Check the operation of the change lever and select lever.

22. Install transmission hanger A, transmission hanger B, 8 mm flange bolt (C), and the 10 mm flange bolts, finger-tight.

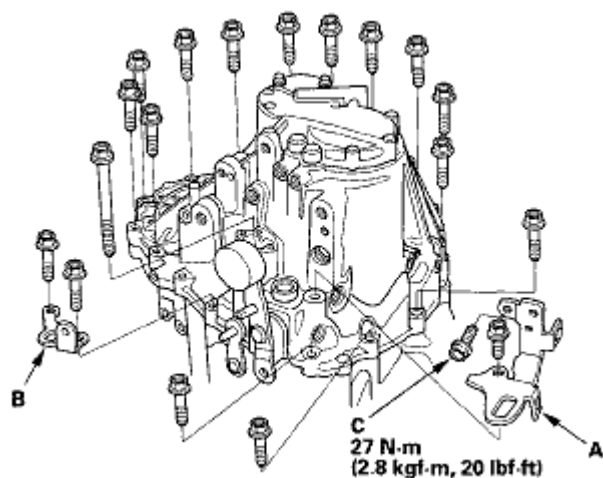


Fig. 222: Identifying Transmission Hanger And Flange Bolt With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

23. Tighten the 10 mm flange bolts in a crisscross pattern in several steps.

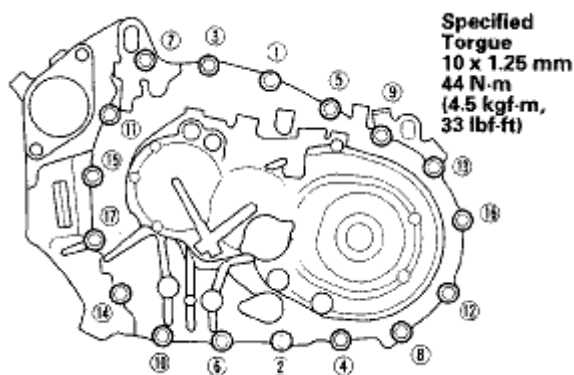


Fig. 223: Identifying Tightening Sequence Of Flange Bolts With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

24. Install the oil check bolt (A), new 6 mm washer (B), drain plug (C), and new 14 mm washer (D).

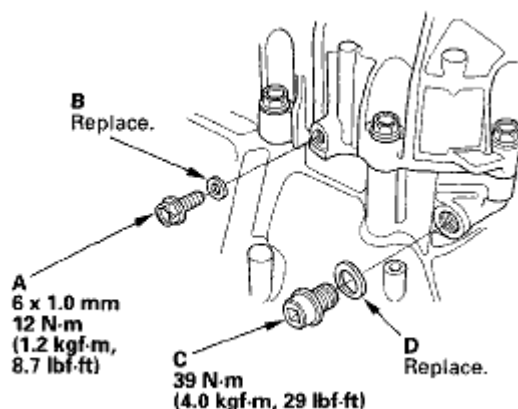


Fig. 224: Identifying Oil Check Bolt, Washer And Drain Plug With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

25. Apply liquid gasket, P/N 08718-0001 evenly to the set screws (A), then install the set screws, 22.0 mm spring (B), 27.4 mm spring (C), steel balls (D), input shaft (mainshaft) speed sensor (E), output shaft (countershaft) speed sensor (F), and new O-rings (G). Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- If you apply liquid gasket P/N 08718-0012, the component must be installed within 4 minutes.
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

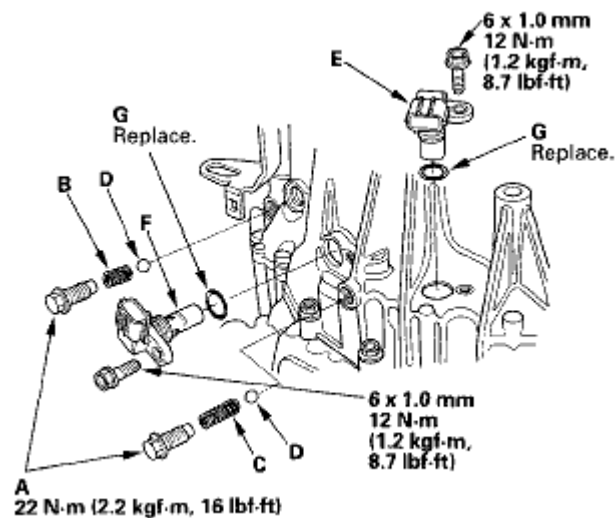


Fig. 225: Identifying Steel Balls, Input Shaft (Mainshaft) Speed Sensor And Output Shaft (Countershaft) Speed Sensor With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

26. Apply liquid gasket, P/N 08718-0001 evenly to the set screws (A), then install the set screws, 22.0 mm spring (B), 26.1 mm spring (C), 27.4 mm springs (D), steel balls (E), 20.0 mm washer (F), and clutch line bracket (G). Install the filler plug (H) finger-tight. Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- If you apply liquid gasket P/N 08718-0012, the component must be installed within 4 minutes.
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

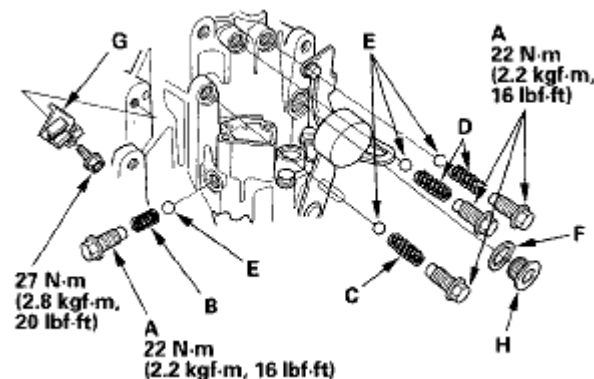


Fig. 226: Identifying Steel Balls, Washer, Clutch Line Bracket And Filler Plug With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

27. Clean any dirt or oil from the reverse lockout solenoid sealing surface.
28. Apply liquid gasket, P/N 08718-0001 evenly to the mating surface of the reverse lockout solenoid and

the transmission housing. Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- If you apply liquid gasket P/N 08718-0012, the component must be installed within 4 minutes.
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

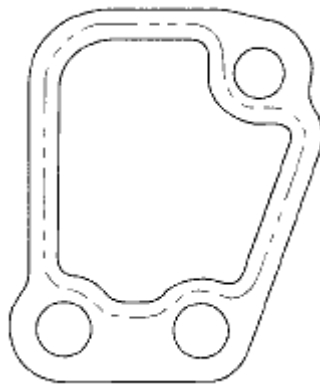


Fig. 227: [Identifying Mating Surface Of Reverse Lockout Solenoid]

Courtesy of AMERICAN HONDA MOTOR CO., INC.

29. Install the transmission harness bracket (A) and the reverse lockout solenoid (B).

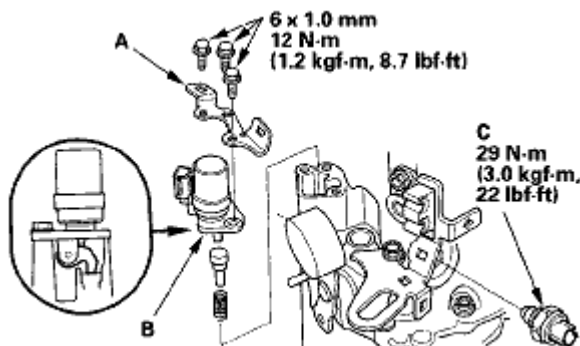


Fig. 228: Identifying Transmission Harness Bracket, Back-Up Light Switch And Reverse Lockout Solenoid With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

30. Apply liquid gasket, P/N 08718-0001 evenly to the threads of the back-up light switch (C), and install the switch in the transmission housing. Install the component within 5 minutes of applying the liquid gasket.

NOTE:

- If you apply liquid gasket P/N 08718-0012, the component must be installed within 4 minutes.
- If too much time has passed after applying the liquid gasket, remove the old liquid gasket and residue, then reapply new liquid gasket.

31. Install the strainer cover (A), new O-ring (B), strainer set spring (C), and oil pump strainer (D).

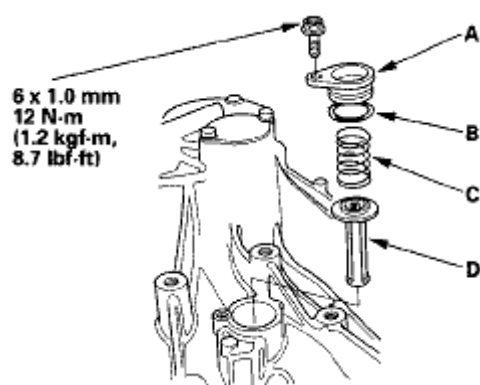


Fig. 229: Identifying Strainer Cover, O-Ring, Strainer Set Spring And Oil Pump Strainer With Torque Specifications

Courtesy of AMERICAN HONDA MOTOR CO., INC.

32. Adjust the differential carrier bearing preload (see **CARRIER BEARING PRELOAD ADJUSTMENT**).

GEARSHIFT MECHANISM REPLACEMENT

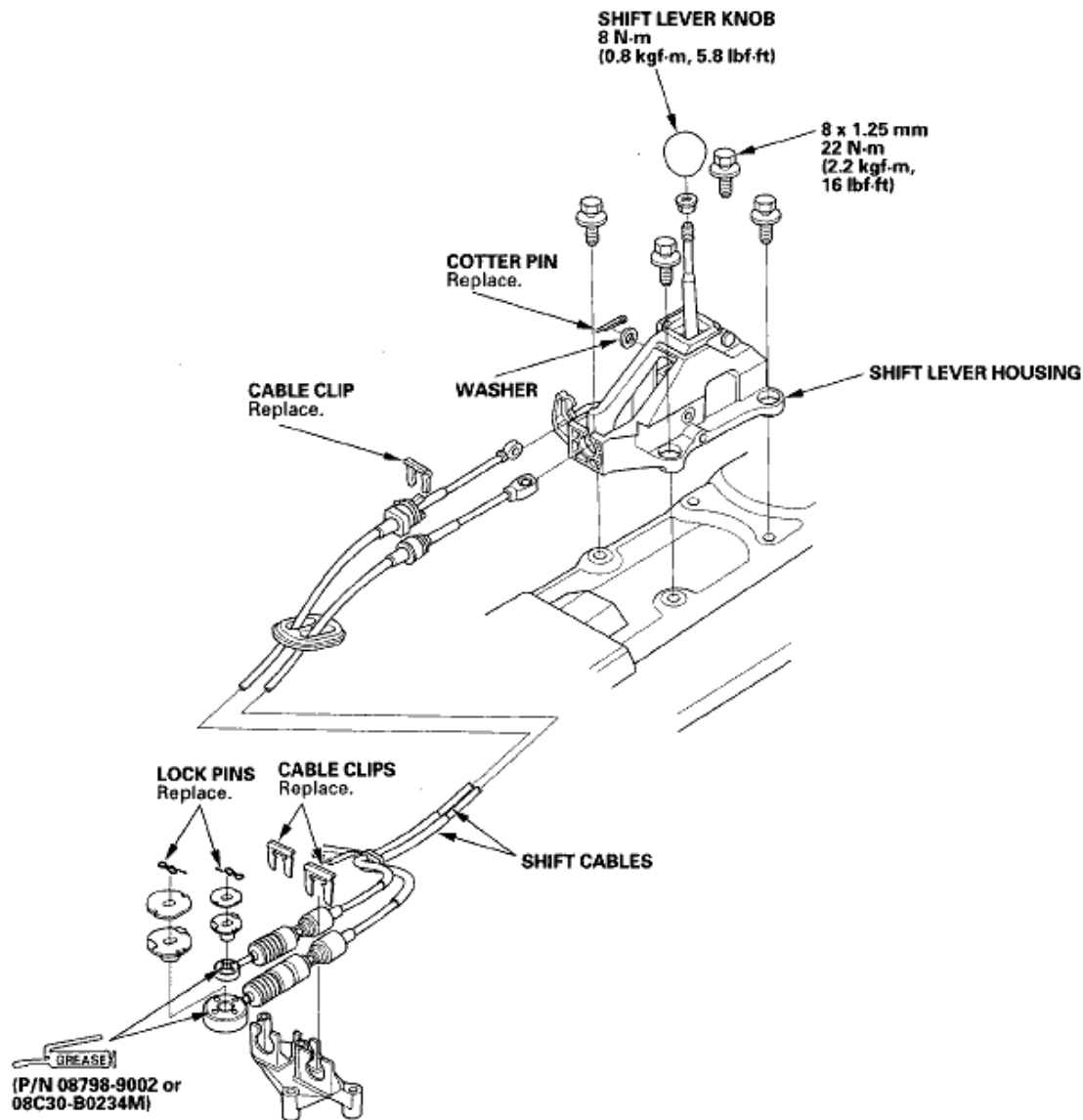


Fig. 230: Identifying Gearshift Mechanism Components With Torque Specifications
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

SHIFT LEVER HOUSING REPLACEMENT

1. Remove the rear center console (see CENTER CONSOLE REAR SECTION REMOVAL/INSTALLATION).
2. Remove the center console panel (see CENTER CONSOLE PANEL REMOVAL/INSTALLATION).
3. Remove the shift lever bracket (A) and center console duct (B).

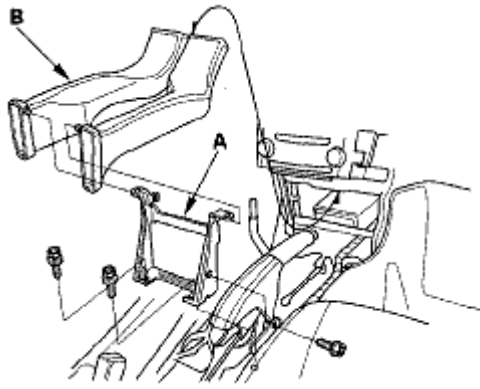


Fig. 231: Identifying Shift Lever Bracket And Center Console Duct
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Remove the harness clips (A). D

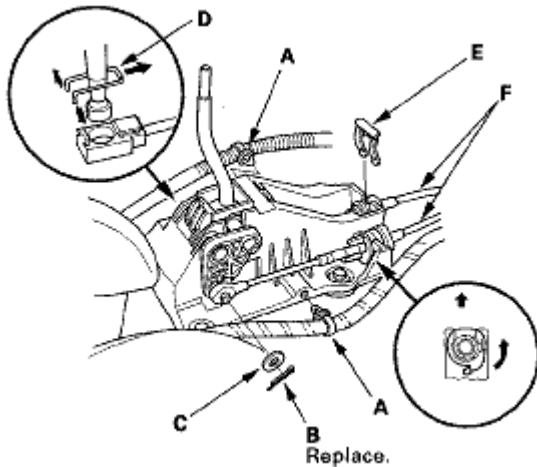


Fig. 232: Identifying Harness Clips, Cotter Pin, Shift Cable Clip And Shift Cables
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Remove the cotter pin (B), washer (C), and clamp (D).
6. Remove the shift cable clip (E).
7. Remove the select cable and shift cables (F) as shown.
8. Remove the shift lever housing.

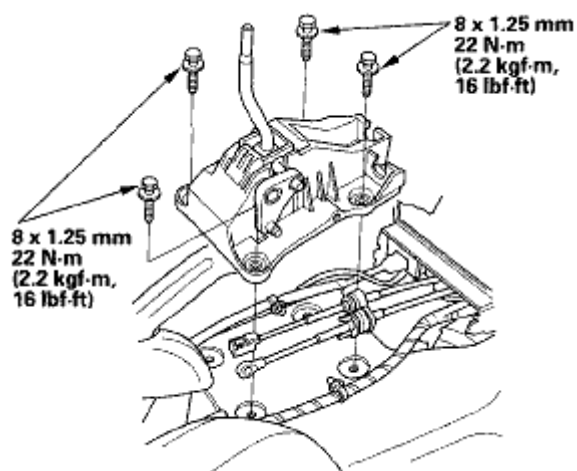


Fig. 233: Identifying Shift Lever Housing With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. Install the shift lever housing in the reverse order of removal.
10. Install the center console panel (see **CENTER CONSOLE PANEL REMOVAL/INSTALLATION**).
11. Install the rear center console (see **CENTER CONSOLE REAR SECTION REMOVAL/INSTALLATION**).

COMPONENT LOCATION INDEX

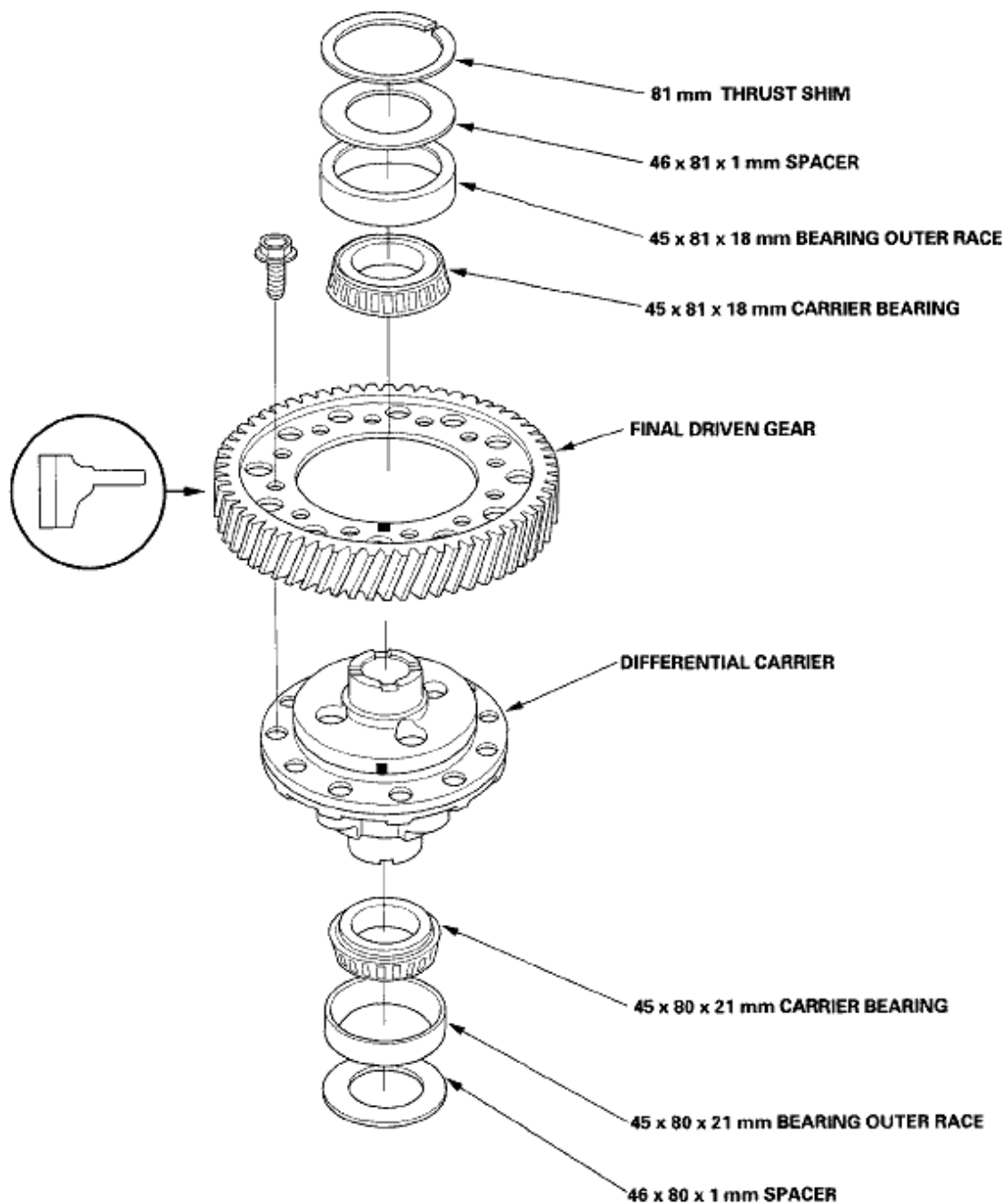


Fig. 234: Identifying M/T Differential Components Location
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

LIMITED SLIP DIFFERENTIAL CHECK

OPERATIONAL CHECK

NOTE: The helical type limited slip differential (LSD) distributes optimum power between the two driving axles according to the difference in torque as demanded by the driving wheels. Under no circumstances should the engine be started with either wheel raised off the ground, such as when adjusting wheel balance or when transporting the vehicle in the event of an accident.

1. Set the parking brake, and block the rear wheels.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
3. With the ignition switch turned OFF, shift the transmission into low gear.
4. Rotate either front wheel by hand, and check that the other wheel rotates in the opposite direction.
5. Replace the limited slip differential assembly if the opposite front wheel does not rotate, or if you can not spin the front wheels at all.

ROTATING TORQUE CHECK

1. Set the parking brake, and block the rear wheels.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see **LIFT AND SUPPORT POINTS**).
3. Remove the front wheels.
4. With the ignition switch turned OFF, shift the transmission into neutral.
5. Measure the rotating torque with a beam-type torque wrench in the direction shown. Rotate the torque wrench more than two complete turns, and take the maximum reading.

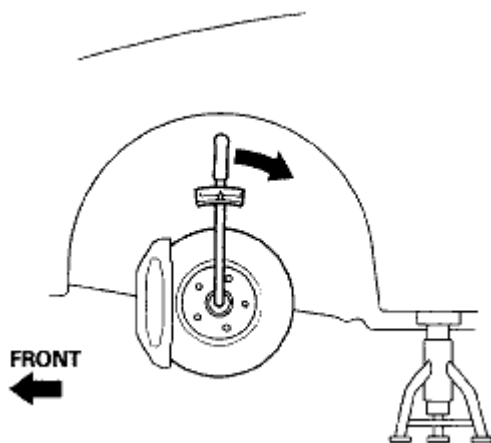


Fig. 235: Measuring Rotating Torque
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. Shift the transmission into low gear, and measure the rotating torque again.
7. Calculate the rotating torque.

Service Limit:

$$\frac{\text{Measurement from step 6}}{\text{Measurement from step 5}} \geq 2.5$$

For example:

$$\frac{7.8 \text{ N}\cdot\text{m} (0.8 \text{ kgf}\cdot\text{m})}{2.9 \text{ N}\cdot\text{m} (0.3 \text{ kgf}\cdot\text{m})} = 2.67 > 2.5$$

Fig. 236: Rotating Torque Calculation

Courtesy of AMERICAN HONDA MOTOR CO., INC.

8. Repeat steps 3 through 7 for the other wheel.
9. Replace the limited slip differential assembly if the rotating torque is lower than the service limit.

DIFFERENTIAL CARRIER, FINAL DRIVEN GEAR REPLACEMENT

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

1. Remove the bolts in a crisscross pattern in several steps, then remove the final driven gear (A) from the differential carrier (B).

NOTE: Inspect the final driven gear surface for wear and damage.

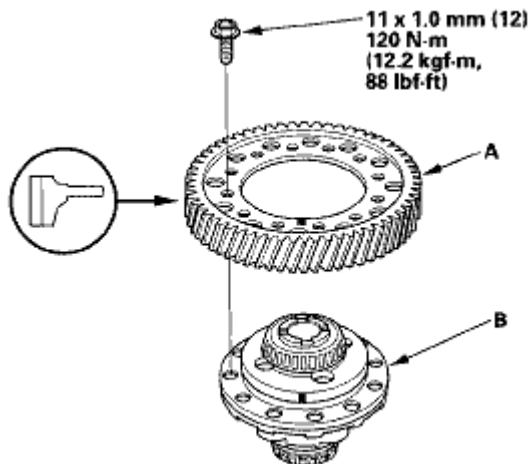


Fig. 237: Identifying Final Driven Gear And Differential Carrier With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

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

CARRIER BEARING REPLACEMENT

Special Tool Required

Installer, 46 mm I.D. 07PAF-0030100

NOTE: After you do this procedure, adjust the differential carrier bearing preload (see CARRIER BEARING PRELOAD ADJUSTMENT) while reassembling the transmission.

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 bearings (A) with a commercially available bearing puller (B) and bearing separator (C).

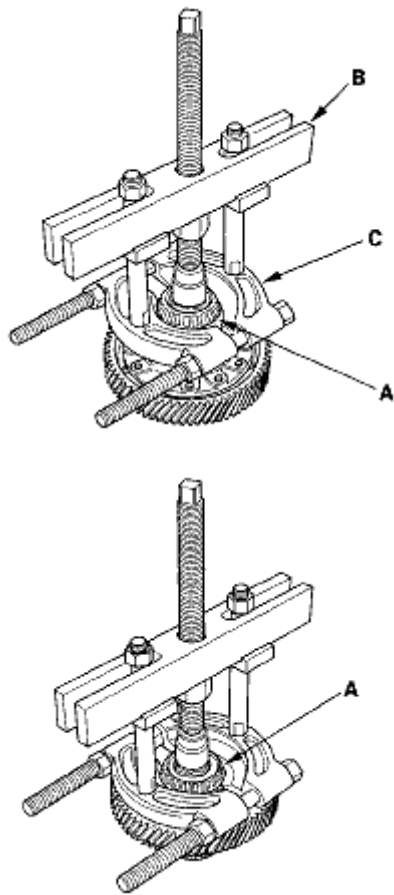


Fig. 238: Removing Carrier Bearings

Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the new bearings with the 46 mm I.D. installer and a press. Press on each bearing until it bottoms out. There should be no clearance between the bearings and the carrier.

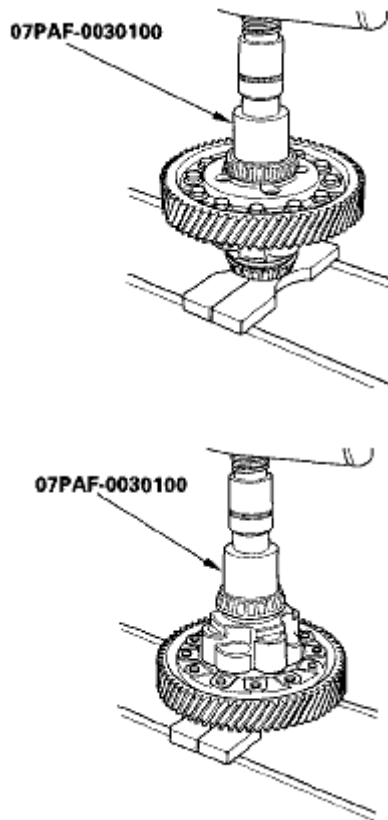


Fig. 239: Installing Carrier Bearings

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 oil seal (A) from the transmission housing (B). Be careful when removing the seal to avoid damaging the transmission housing.

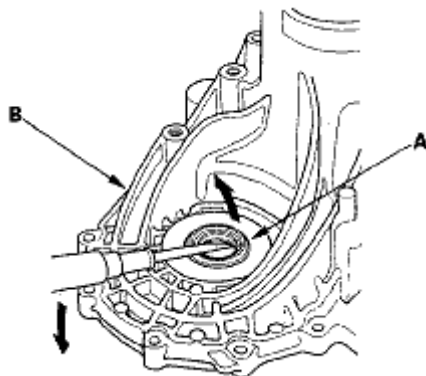


Fig. 240: Removing Oil Seal From Transmission Housing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

2. Remove the oil seal (A) from the clutch housing (B). Be careful when removing the seal to avoid damaging the clutch housing.

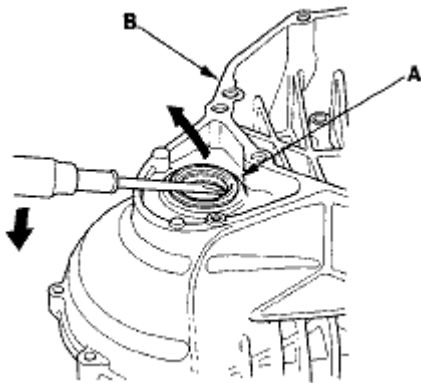


Fig. 241: Removing Oil Seal From Clutch Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the new oil seal in the transmission housing with the driver (A) and oil seal driver attachment (B).

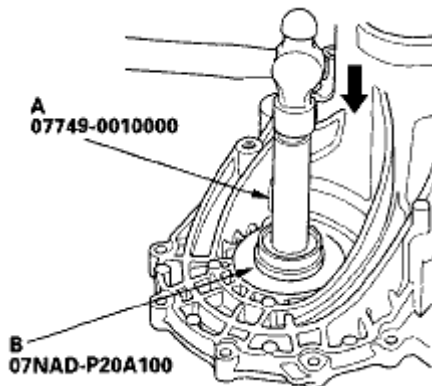


Fig. 242: Installing Oil Seal In Transmission Housing
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the new oil seal in the clutch housing with the driver (A) and oil seal driver attachment (B).

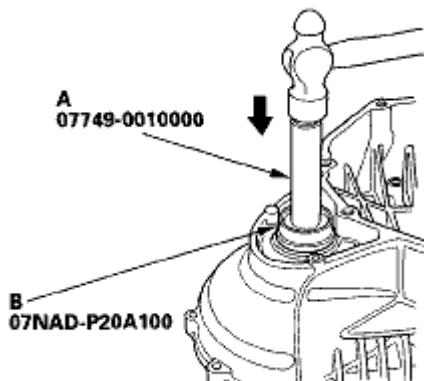


Fig. 243: Installing Oil Seal In Clutch Housing

Courtesy of AMERICAN HONDA MOTOR CO., INC.

BEARING OUTER RACE REPLACEMENT

Special Tools Required

- Attachment, 78 x 80 mm 07NAD-PX40100
- Driver 07749-0010000

NOTE:

- The bearing outer race and tapered roller bearing should be replaced as a set.
- Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.
- After you do this procedure, adjust the differential carrier bearing preload (see CARRIER BEARING PRELOAD ADJUSTMENT) while reassembling the transmission.

1. Remove the oil seals from the transmission housing and clutch housing (see OIL SEAL REPLACEMENT).
2. Remove the bearing outer race, spacer, and 81 mm thrust shim from the transmission housing, and the bearing outer race and spacer from the clutch housing by heating the housing to about 212°F (100°C) with a heat gun.

NOTE: Do not reuse the thrust shim if the outer race was driven out.

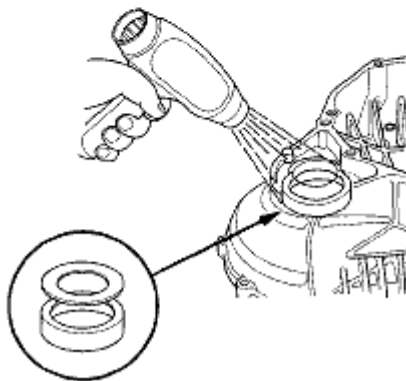
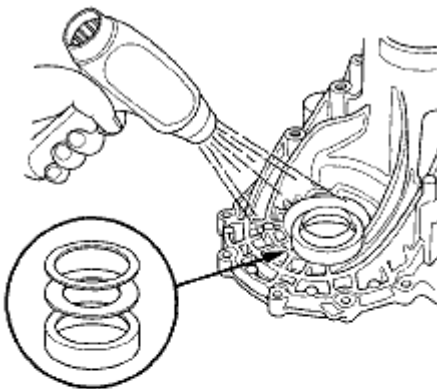
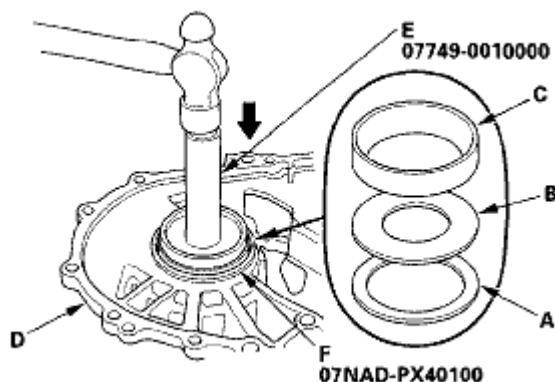


Fig. 244: Heating Housing With Heat Gun

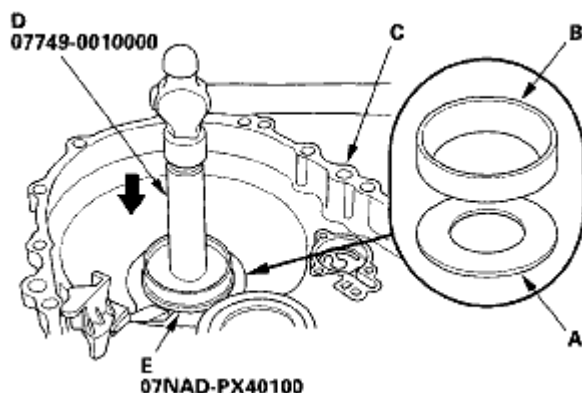
Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. Install the 81 mm thrust shim (A), spacer (B), and bearing outer race (C) into the transmission housing (D) using the driver (E) and 78 x 80 mm attachment (F).

**Fig. 245: Installing Thrust Shim, Spacer And Bearing Outer Race Into Transmission Housing**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the spacer (A) and bearing outer race (B) into the clutch housing (C) using the driver (D) and 78 x 80 mm attachment (E).

**Fig. 246: Installing Spacer And Bearing Outer Race Into Clutch Housing**

Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. Install the oil seals into the transmission housing (see step 3 on **OIL SEAL REPLACEMENT**) and clutch housing (see step 4 on **OIL SEAL REPLACEMENT**).

CARRIER BEARING PRELOAD ADJUSTMENT

Special Tools Required

- Attachment, 78 x 80 mm 07NAD-PX40100
- Preload inspection tool 07XAJ-S0KA100
- Driver 07749-0010000

If any of the items listed below were replaced, the carrier bearing preload must be adjusted.

- Transmission housing
 - Clutch housing
 - Differential carrier
 - Spacer
 - Carrier bearing and outer race
1. Remove the oil seals from the transmission housing and clutch housing (see **OIL SEAL REPLACEMENT**).
 2. If you replaced the carrier bearing on the transmission housing side of the carrier, replace the bearing outer race. Heat up the transmission housing to about 212°F (100°C) with a heat gun (A), then remove the bearing outer race (B), spacer (C), and 81 mm thrust shim (D).

NOTE: Do not heat the housing in to more than of 212°F (100°C).

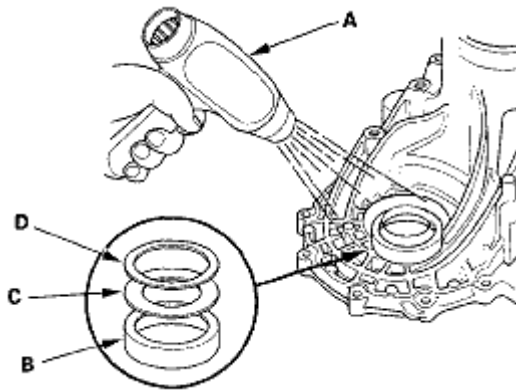


Fig. 247: Heating Transmission Housing With Heat Gun
 Courtesy of AMERICAN HONDA MOTOR CO., INC.

3. If you replaced the carrier bearing on the clutch housing side of the carrier, replace the bearing outer race. Heat up the clutch housing to about 212°F (100°C) with a heat gun (A), then remove the bearing outer race (B) and spacer (C).

NOTE: Do not heat the housing in to more than of 212°F (100°C).

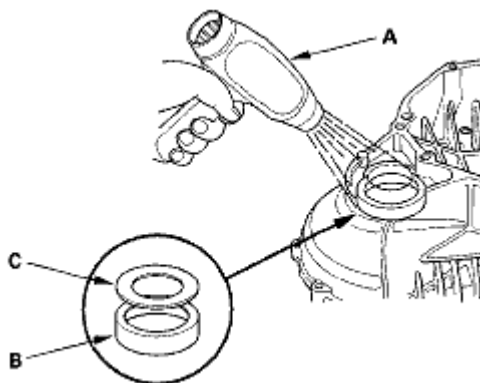


Fig. 248: Heating Clutch Housing With Heat Gun
Courtesy of AMERICAN HONDA MOTOR CO., INC.

4. Install the 81 mm thrust shim (A), spacer (B), and bearing outer race (C) in the transmission housing by using the driver (D) 78 x 80 mm attachment (E). (Use a new bearing outer race if you replaced the bearing.) There should be no space between the bearing outer race, spacer, and housing.

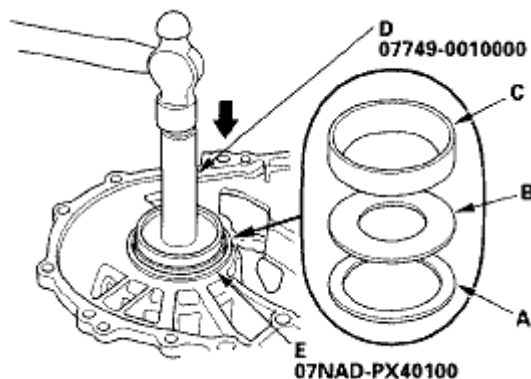


Fig. 249: Installing Thrust Shim, Spacer And Bearing Outer Race In Transmission Housing
Courtesy of AMERICAN HONDA MOTOR CO., INC.

5. If you removed the bearing outer race from the clutch housing, use the driver (A) and 78 x 80 mm attachment (B) to install a new bearing outer race (C) and spacer (D). There should be no space between the bearing outer race, spacer, and housing.

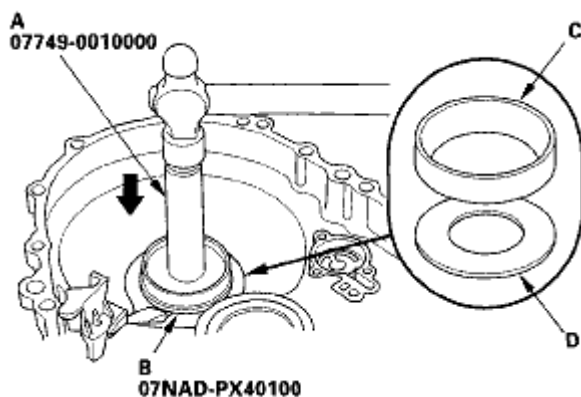


Fig. 250: Installing Bearing Outer Race And Spacer
Courtesy of AMERICAN HONDA MOTOR CO., INC.

6. With the mainshaft and countershaft removed, install the differential assembly, and bolt the transmission and clutch housing together, and tighten the bolts to 44 N.m (4.5 kgf.m, 33 lbf.ft).

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

7. Rotate the differential assembly in both directions to seat the carrier bearings.
8. At normal room temperature, measure the starting torque of the differential assembly by rotating it in both directions with the preload inspection tool (A) and a torque wrench (B).

Standard: 3.43-4.51 N.m (35-46 kgf.cm, 30-40 lbf.in.)

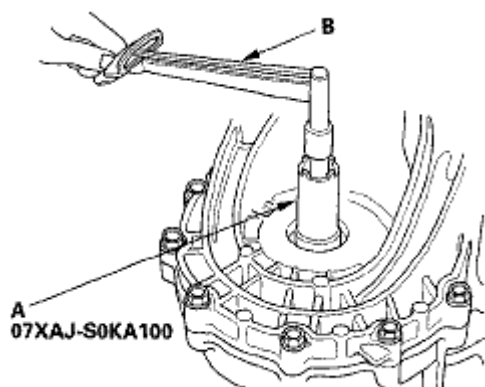


Fig. 251: Measuring Starting Torque Of Differential Assembly With Torque Specifications
Courtesy of AMERICAN HONDA MOTOR CO., INC.

9. If the carrier bearing preload is not within the standard, select an 81 mm shim that will provide the correct preload:
 - Compare the bearing preload you got on the first try with the specified preload of 3.43-4.51 N.m (35-46 kgf.cm, 30-40 lbf.in.).
 - If the preload you measure was less than specified, subtract it from the specified preload.
 - If the preload you measure was more than specified, subtract the specified preload from the preload you measure.

For example, with a 2.50 mm (0.098 in.) shim:

① specified	4.51 N·m (46 kgf·cm, 40 lbf·in.)	
— you got less	2.55 N·m (26 kgf·cm, 23 lbf·in.)	
		1.96 N·m (20 kgf·cm, 17 lbf·in.) less
② you got more	5.29 N·m (54 kgf·cm, 47 lbf·in.)	
— specified	4.51 N·m (46 kgf·cm, 40 lbf·in.)	
		0.78 N·m (8 kgf·cm, 7 lbf·in.) more

Fig. 252: Bearing Preload Calculation
Courtesy of AMERICAN HONDA MOTOR CO., INC.

NOTE: Each shim size up or down from standard makes about 0.3-0.4 N.m (3-4 kgf.cm, 2.6-3.5 lbf.in.) difference in preload.

In example (1), your preload was 1.96 N.m (20 kgf.cm, 17 lbf.in.) less than standard, so you need a shim five sizes thicker than standard (try the 2.65 mm (0.104 in.) 81 mm shim, and recheck).

In example (2), your preload was 0.78 N.m (8 kgf.cm, 7 lbf.in.) more than standard, so you need a shim two sizes thinner (try the 2.44 mm (0.096 in.) 81 mm shim, and recheck).

81 mm Thrust Shim**THRUST SHIM THICKNESS SPECIFICATION**

	Part Number	Thickness
A	41438-PYZ-000	2.05 mm (0.081 in.)
B	41439-PYZ-000	2.08 mm (0.082 in.)
C	41440-PYZ-000	2.11 mm (0.083 in.)
D	41441-PYZ-000	2.14 mm (0.084 in.)
E	41442-PYZ-000	2.17 mm (0.085 in.)
F	41443-PYZ-000	2.20 mm (0.087 in.)
G	41444-PYZ-000	2.23 mm (0.088 in.)
H	41445-PYZ-000	2.26 mm (0.089 in.)
J	41446-PYZ-000	2.29 mm (0.090 in.)
K	41447-PYZ-000	2.32 mm (0.091 in.)
L	41448-PYZ-000	2.35 mm (0.093 in.)
M	41449-PYZ-000	2.38 mm (0.094 in.)
N	41450-PYZ-000	2.41 mm (0.095 in.)
P	41451-PYZ-000	2.44 mm (0.096 in.)
Q	41452-PYZ-000	2.47 mm (0.097 in.)
R	41453-PYZ-000	2.50 mm (0.098 in.)
S	41454-PYZ-000	2.53 mm (0.100 in.)
T	41455-PYZ-000	2.56 mm (0.101 in.)
U	41456-PYZ-000	2.59 mm (0.102 in.)
V	41457-PYZ-000	2.62 mm (0.103 in.)
W	41458-PYZ-000	2.65 mm (0.104 in.)
X	41459-PYZ-000	2.68 mm (0.106 in.)
Y	41460-PYZ-000	2.71 mm (0.107 in.)
Z	41461-PYZ-000	2.74 mm (0.108 in.)
AA	41462-PYZ-000	2.77 mm (0.109 in.)
AB	41463-PYZ-000	2.80 mm (0.110 in.)
AC	41464-PYZ-000	2.83 mm (0.111 in.)
AD	41465-PYZ-000	2.86 mm (0.113 in.)
AE	41466-PYZ-000	2.89 mm (0.114 in.)
AF	41467-PYZ-000	2.92 mm (0.115 in.)
AG	41468-PYZ-000	2.95 mm (0.116 in.)
AH	41469-PYZ-000	2.98 mm (0.117 in.)
AJ	41470-PYZ-000	3.01 mm (0.119 in.)
AK	41471-PYZ-000	3.04 mm (0.120 in.)
AL	41472-PYZ-000	3.07 mm (0.121 in.)
AM	41473-PYZ-000	3.10 mm (0.122 in.)
AN	41474-PYZ-000	3.13 mm (0.123 in.)
AP	41475-PYZ-000	3.16 mm (0.124 in.)

10. Once the carrier bearing preload is correct, disassemble the transmission housing, and install new oil seals in the differential (see step 1 on **OIL SEAL REPLACEMENT**).

11. Reassemble the transmission (see **TRANSMISSION REASSEMBLY**).
12. Reinstall the transmission (see **TRANSMISSION INSTALLATION**).