

TRANSMISSION		
Transmission Type	5 forward speed, foot shift	
Clutch Type	Wet – multiple disc	
Clutch Fluid Capacity	1.0 quart	0.95 liter
Fluid Part No. (quart)	98854-96	
Fluid Part No. (gallon)	98855-96	

TRANSMISSION GEAR RATIOS	FINAL*	OVERALL**
First (Low) Gear	2.69	9.717
Second Gear	1.85	6.687
Third Gear	1.43	5.180
Fourth Gear	1.18	4.269
Fifth (High) Gear	1.00	3.615

*Final gear ratios indicate number of mainshaft revolutions required to drive output sprocket one revolution.

**Overall gear ratios indicate number of engine revolutions required to drive rear wheel one revolution.

PRIMARY DRIVE (ENGINE-TO-TRANSMISSION)	
Engine Sprocket	35 teeth
Clutch Sprocket	56 teeth
Ratio	1.60: 1

FINAL DRIVE (TRANSMISSION-TO-REAR WHEEL)	
Transmission Sprocket	27 teeth
Rear Wheel Sprocket	61 teeth
Secondary Drive Belt	128 teeth
Ratio	2.26:1

CLUTCH PLATE	NUMBER REQUIRED	NEW COMPONENT THICKNESS		SERVICE WEAR LIMITS (MINIMUM THICKNESS)	
		IN.	MM	IN.	MM
Friction Plate (fiber)	8	0.0866 + 0.0031	2.1996 + 0.0787	0.006	0.152
Steel Plate	6	0.0629 + 0.0020	1.5977 + 0.0508	0.006	0.152
Clutch Pack				0.661 minimum	16.789 minimum

NOTE

Service wear limits are given as a guideline for measuring components that are not **new**. For measurement specifications not given under SERVICE WEAR LIMITS, see NEW COMPONENTS.

TORQUE VALUES

ITEM	TORQUE		NOTES
Access Door Mounting Bolts	13-17 ft-lbs	18-23 Nm	LOCTITE THREADLOCKER 243 (blue), page 6-34
Clutch Mainshaft Nut	70-80 ft-lbs	95-109 Nm	LOCTITE THREADLOCKER 262 (red), left hand threads, page 6-16
Countershaft Retainer TORX Screw	13-17 ft-lbs	18-23 Nm	LOCTITE THREADLOCKER 243 (blue), page 6-29
Engine Sprocket Nut	190-210 ft-lbs	258-285 Nm	LOCTITE THREADLOCKER 262 (red), page 6-16
Footrest Mount Bolts	10-15 ft-lbs	14-20 Nm	page 6-7
Isolator TORX Bolts, Rear	63-70 ft-lbs	85-95 Nm	LOCTITE THREADLOCKER 262 (red), ANTI-SEIZE under bolt heads, special procedure, page 6-7
Primary Chain Adjuster Locknut (exterior)	20-25 ft-lbs	27-34 Nm	on exterior of chaincase, page 6-4
Primary Chain Adjuster Locknut (interior)	15-18 ft-lbs	20-24 Nm	on interior of chaincase, page 6-4
Primary Chain Inspection Cover Screws	40-60 in-lbs	5-7 Nm	page 6-3
Primary Cover Mounting Screws	100-120 in-lbs	11-14 Nm	3 lengths, page 6-5
Large primary cover screws	16-28 ft-lbs	22-38 Nm	page 6-5
Shifter Lever Mounting Bolt	27-29 ft-lbs	37-39 Nm	LOCTITE THREADLOCKER 243 (blue), page 6-5
Shifter Shaft Assembly Locknuts (top and bottom)	90-110 in-lbs	10-12 Nm	tighten bottom nut first, page 6-34
Shifter Upper Clamp Pinch Screw	59-66 in-lbs	7-8 Nm	LOCTITE THREADLOCKER 243 (blue), page 6-5
Sideplate Screws	19 ft-lbs	26 Nm	page 6-7
Transmission Detent Plate Nut	13-17 ft-lbs	18-23 Nm	page 6-22
Transmission Drain Plug	14-30 ft-lbs	19-41 Nm	remove debris from end, page 6-5
Transmission Sprocket Nut	58 ft-lbs then an additional 30-40 degrees	68 Nm then an additional 30-40 degrees	LOCTITE THREADLOCKER 262 (red), left hand threads, special torque & turn method, page 6-35
Transmission Sprocket Screws	90-110 in-lbs	10-12 Nm	replace after 3 removals, page 6-36

GENERAL

An opening between the primary drive and transmission compartments allows the same lubricant supply to lubricate moving parts in both compartments.

Since the primary chain runs in lubricant, little service will be required other than checking lubricant level and chain tension. If, through hard usage, the primary chain does become worn, it must be replaced. Remove and install the chain following the procedure under [6.5 PRIMARY DRIVE/CLUTCH](#).

ADJUSTMENT/LUBRICATION

See [1.13 PRIMARY CHAIN](#) for inspection and adjustment procedures.

See [1.10 CLUTCH](#) for complete lubrication service on the primary chain.

REMOVAL

Primary Cover



WARNING

To protect against shock and accidental start-up of vehicle, disconnect the negative battery cable before proceeding. Inadequate safety precautions could result in death or serious injury.

1. Disconnect negative cable from battery terminal.
2. Raise rear wheel off floor using REAR WHEEL SUPPORT STAND (Part No. B-41174).
3. Remove muffler. See [2.28 EXHAUST SYSTEM](#).
4. See [Figure 6-1](#). Place a drain pan under the engine. Remove drain plug (9) and drain lubricant from primary drive.

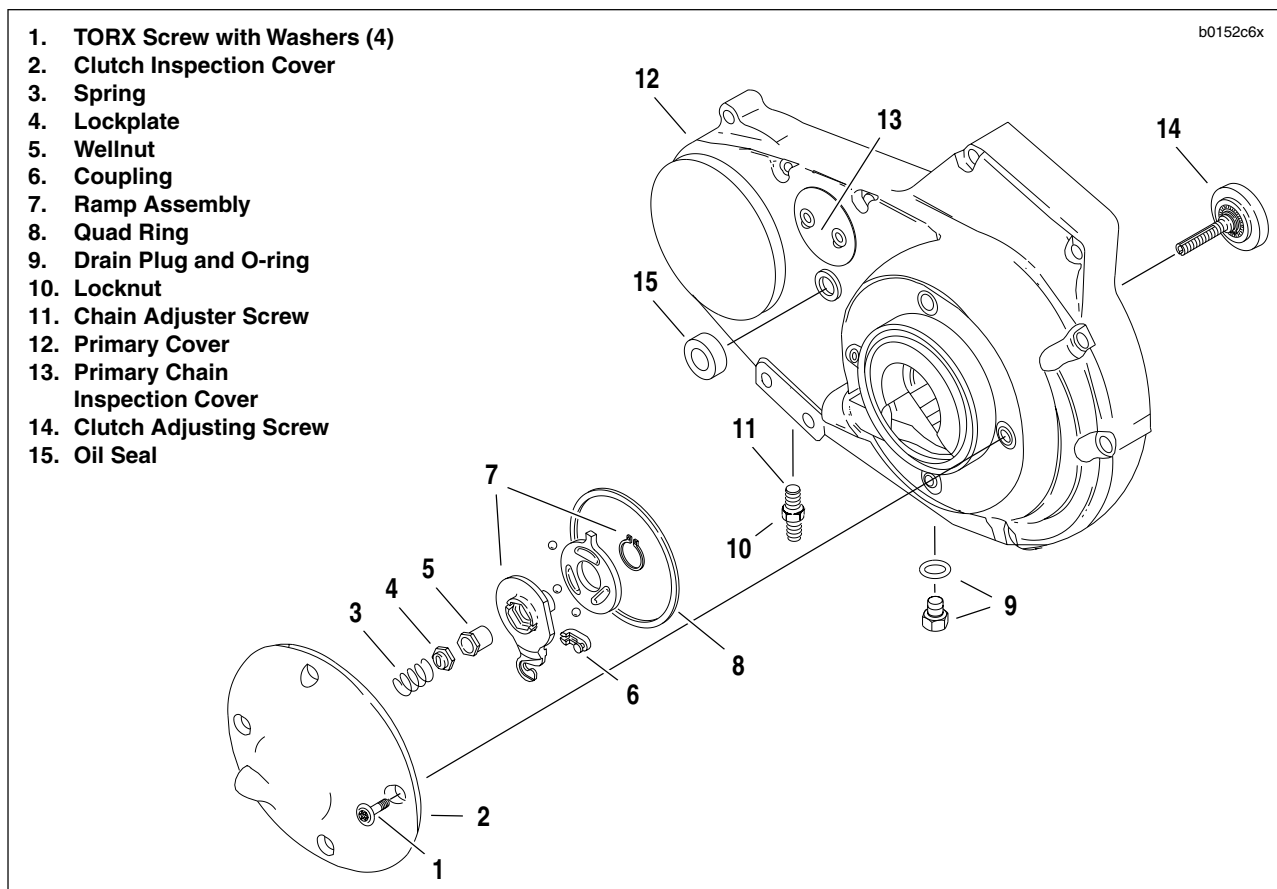


Figure 6-1. Primary Cover

5. Carefully remove lower shift lever mounting bolt, washer, plastic bushings and spacer.
6. Mark orientation of upper clamp opening on splined shaft and remove pinch screw and shift lever assembly. Remove rubber washer from splined shaft.
7. Add freeplay to clutch cable. See [1.10 CLUTCH](#).
8. Loosen locknut (10). Turn chain adjuster screw (11) counterclockwise (outward) to relax primary chain tension.
9. Remove four TORX screws with washers (1) and clutch inspection cover (2). Remove and discard Quad ring (8) from groove in primary cover.
10. Slide spring (3) with attached hex lockplate (4) from flats of clutch adjusting screw (17).
11. Turn clutch adjusting screw (14) clockwise to release ramp and coupling mechanism. As the adjusting screw is turned, ramp assembly (7) moves forward. Unscrew well-nut (5) from end of adjusting screw.
12. Remove hook of ramp from button to the rear of cable end coupling (6). Remove cable end from slot in coupling. Remove coupling and ramp assembly.
13. Remove screws which secure primary cover. Remove cover and gasket. Discard gasket.
14. Remove and discard shifter lever oil seal (15).

Primary Chain Adjuster

1. See [Figure 6-2](#). Remove primary cover (1).
2. Remove locknut (2) from chain adjuster screw (3). Turn adjuster screw out of threaded boss in primary cover.
3. Slide shoe (6) off plate (5) (shoe must be slid off plate toward closed or blind side of shoe). Remove locknut (4) and plate (5).

INSTALLATION

Primary Chain Adjuster

1. See [Figure 6-3](#). If shoe (6) is badly worn, replace it or adjust assembly.
2. Install plate (5) over top of chain adjuster screw (3). Place spacer (7) over top of adjuster screw next to plate. Secure plate and spacer to adjuster screw by threading on locknut (4). Tighten locknut to 15-18 ft-lbs (20-24 Nm).
3. Place plate into slots at open end of shoe (6). Slide shoe over plate until locknut at top end of adjuster screw is against closed (blind) side of shoe.
4. Position adjuster inside primary cover (1) with closed side of shoe against cover. Thread adjuster screw into tapped boss at bottom of primary cover. At outside of cover, install locknut (2) onto adjuster screw with nylon sealing surface toward cover. Tighten to 20-25 ft-lbs (27-34 Nm).
5. Install primary cover.

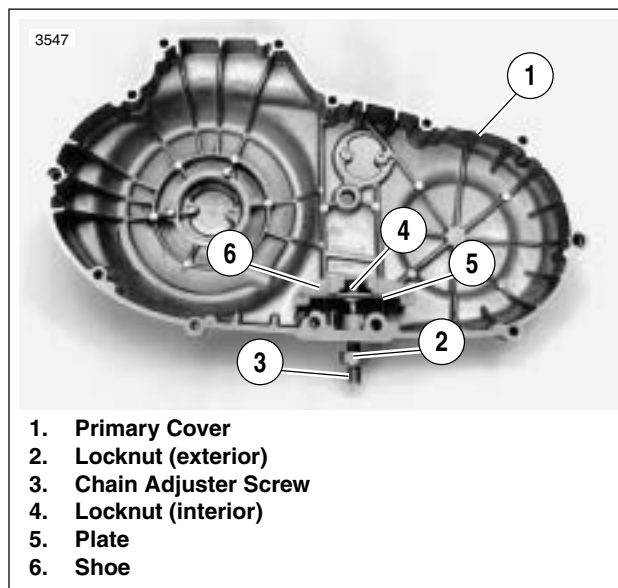


Figure 6-2. Removing Primary Chain Adjuster

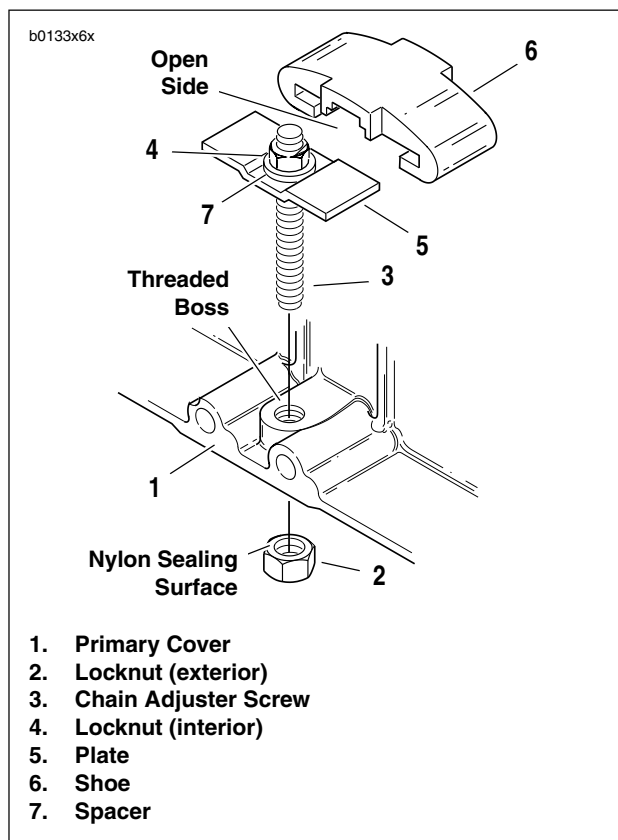


Figure 6-3. Primary Chain Adjuster

Primary Cover

1. Remove foreign material from magnetic drain plug. Install plug and tighten to 14-30 ft-lbs (19-41 Nm).
2. Wipe gasket surface clean. Install **new** gasket on primary cover.
3. See [Figure 6-4](#). Install primary cover and gasket onto left crankcase half using mounting screws. Tighten screws to 100-120 **in-lbs** (11-14 Nm).
4. See [Figure 6-1](#). Install **new** shifter lever oil seal (15).
5. Fit coupling (6) over cable end with rounded side inboard, the ramp connector button outboard. With retaining ring side of ramp assembly facing inward, place hook of ramp (7) around coupling button and rotate assembly counterclockwise until tang on inner ramp fits in slot of primary cover.
6. Thread wellnut (5) on adjusting screw (14) until slot of screw is accessible with a screwdriver. Fit wellnut hex into recess of outer ramp and turn adjusting screw counterclockwise.
7. Fill transmission to proper level with fresh lubricant. See [1.10 CLUTCH](#).
8. Adjust clutch. See [1.10 CLUTCH](#).
9. Adjust primary chain tension. See [1.13 PRIMARY CHAIN](#).
10. See [Figure 6-5](#). Apply LOCTITE THREAD-LOCKER 243 (Blue) to shift lever mounting bolt.
11. Install shifter lever assembly with mounting bolt, washer and plastic bushings and spacer. Do not tighten mounting bolt.
12. Install rubber washer and upper shift lever assembly to splined shaft.
13. Align clamp opening with mark made on splined shaft during removal.
14. Apply LOCTITE THREADLOCKER 243 (Blue) to pinch screw.
15. Install pinch screw to upper clamp.
16. Tighten pinch screw to 59-66 **in-lbs** (7-8 Nm).
17. Tighten mounting bolt to 27-29 ft-lbs (37-39 Nm).
18. Install muffler. See [2.28 EXHAUST SYSTEM](#).
19. Connect negative battery cable to battery.

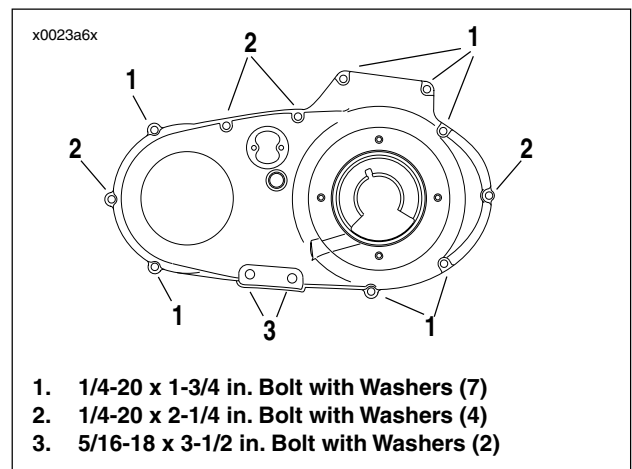


Figure 6-4. Install Primary Cover Bolts

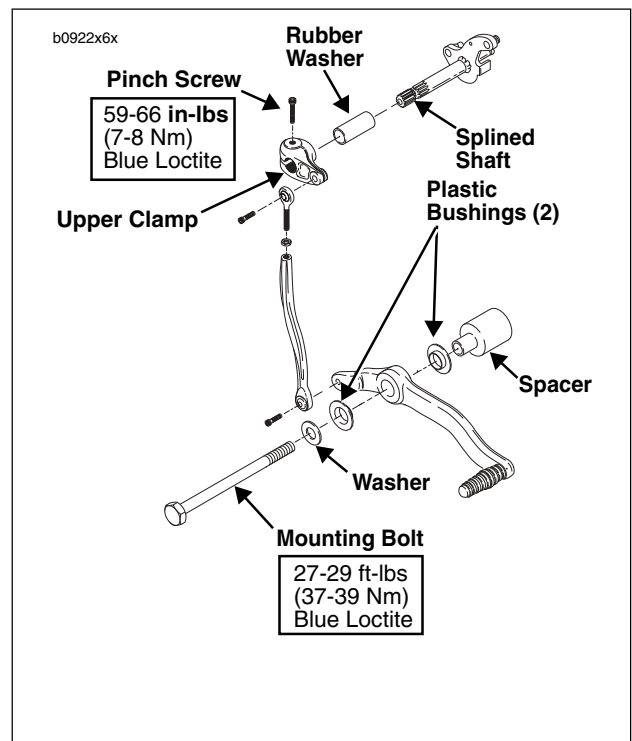


Figure 6-5. Shifter Lever

GENERAL

The drive belt should be checked for unusual wear, cracking or loss of teeth. Check the belt sprocket for unusual wear, broken teeth or damaged flange.

- See [1.11 DRIVE BELT DEFLECTION](#) for adjustment information.
- See [1.12 DRIVE BELT AND SPROCKET](#) for inspection and cleaning procedures.

REMOVAL

Belt removal requires special lifts to support the motorcycle. If you do not have the proper equipment, have your Buell dealer perform the repair.

- Lift and secure the motorcycle.
 - Place vehicle on a lift and anchor front wheel in place.
 - Raise rear wheel off lift using REAR WHEEL SUPPORT STAND (Part No. B-41174).

WARNING

To protect against shock and accidental start-up of vehicle, disconnect the negative battery cable before proceeding. Inadequate safety precautions could result in death or serious injury.

- Disconnect negative battery cable.
- Remove the stone guard and lower belt guard. See [2.33 BELT GUARDS](#).
- Remove chin fairing. See [2.34 CHIN FAIRING](#)
- Remove sprocket cover. See [2.30 SPROCKET COVER](#).
- Remove rear fender. See [2.32 REAR FENDER](#).
- See [Figure 6-6](#). Remove rear wheel.
 - Remove rear axle nut (1) (metric), lockwasher (2), washer (3) and right side axle carrier (4).
 - Hold axle adjuster bolt (5) with a 5/16 in. wrench. Loosen locknut (6) and axle adjusters (7). Repeat on left side.
 - From left side, slowly pull rear axle from swingarm. As axle is removed, remove right side spacer, rear brake caliper mount, left side axle carrier and washer. Suspend rear brake caliper mount from frame with a piece of rope. Push rear wheel forward and slip off belt.
- See [Figure 6-7](#). Remove right isolator TORX bolt (1) and isolator (3). See [2.20 REAR ISOLATORS](#).

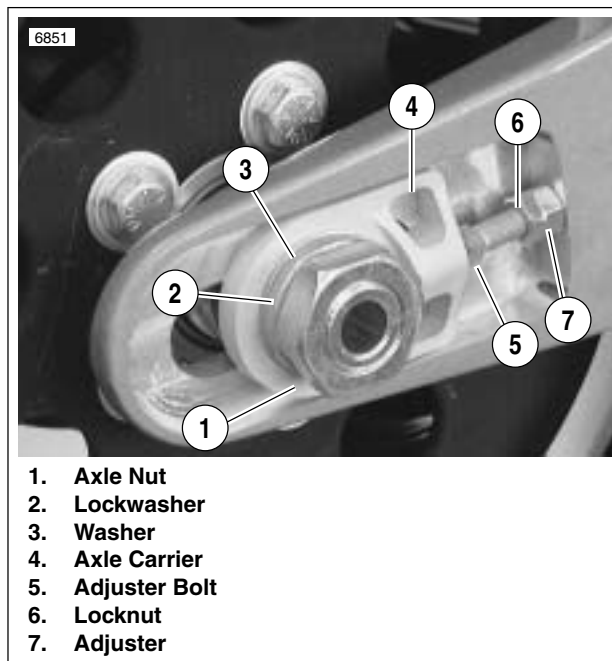


Figure 6-6. Rear Axle, Right Side

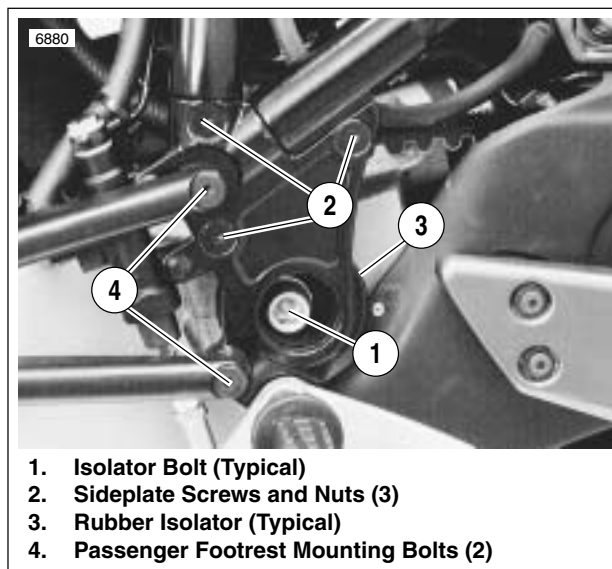


Figure 6-7. Sideplate (Typical)

- Remove right side passenger peg mounting bolts (4).
- Remove the three allen screws and nuts (2) from the sideplate. Detach the sideplate using special care to watch how the rear brake line is twisted.
- Slide the drive belt from the sprockets between the frame and mount block.
- Inspect belt and sprockets. See [1.12 DRIVE BELT AND SPROCKET](#).

INSTALLATION

- Slide a **new** belt over the sprockets.

CAUTION

- Use caution when installing isolator bolts. Make sure isolator bolt hole is aligned with threaded hole in bearing adjusting bolt to avoid cross-threading bolt.
 - Observe seam on rubber isolator after isolator bolt is tightened. If seam twists, apply more **LOCTITE ANTI-SEIZE** to underside of isolator bolt heads. Failure to comply will result in damage to rubber isolators. See Figure 6-9.
- See Figure 6-8. Install right rubber isolator.
 - Apply **LOCTITE THREADLOCKER 262** (red) to isolator bolt threads.
 - Apply **LOCTITE ANTI-SEIZE** to bottom of isolator bolt head.
 - Align metal pin with frame and hole in isolator.
 - Install isolator TORX bolt and washer through isolators and into the bearing adjusting bolt.
 - Tighten isolator TORX bolt to 63-70 ft-lbs (85-95 Nm).
 - See Figure 6-9. After tightening TORX isolator bolt, verify that seam on isolator is perpendicular to swingarm mount block.
 - Install rear fender. See [2.32 REAR FENDER](#).
 - Align the **new** belt and rear wheel. See [1.11 DRIVE BELT DEFLECTION](#).
 - Install sprocket cover. See [2.30 SPROCKET COVER](#).
 - See Figure 6-7. Install sideplate and right side passenger footrest mount.
 - Tighten sideplate screws (2) to 19 ft-lbs (26 Nm).
 - Tighten footrest mount bolts (4) to 10-15 ft-lbs (14-20 Nm).
 - Install chin fairing. See [2.34 CHIN FAIRING](#).
 - Install stone guard and belt guard. See [2.33 BELT GUARDS](#).
 - Connect the negative battery cable to the battery.

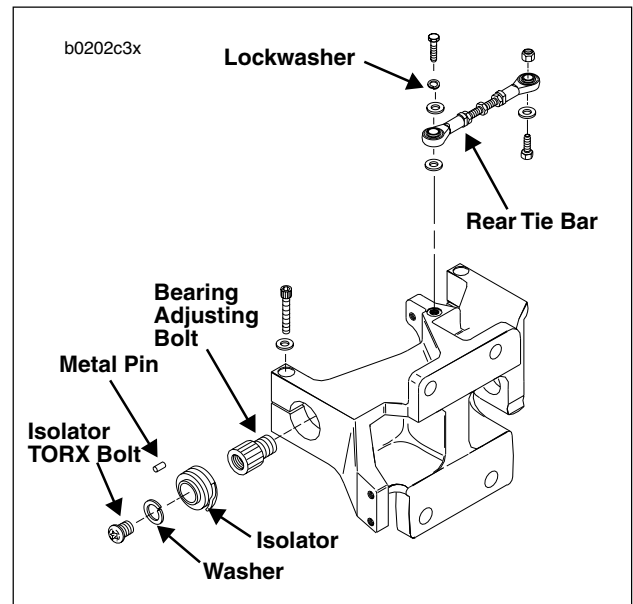


Figure 6-8. Installing Isolators (Typical)

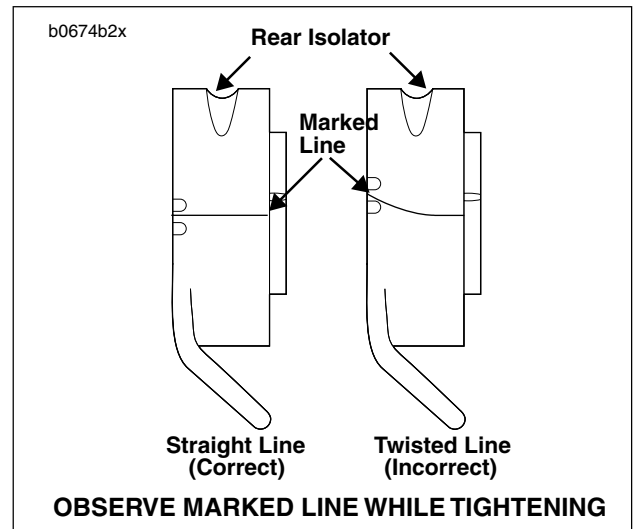


Figure 6-9. Isolator Alignment

CLUTCH RELEASE MECHANISM

6.4

NOTE

See [1.10 CLUTCH](#) for clutch adjustment procedure.

DISASSEMBLY

⚠ WARNING

To protect against shock and accidental start-up of vehicle, disconnect the negative battery cable before proceeding. Inadequate safety precautions could result in death or serious injury.

1. Disconnect negative battery cable from battery terminal.
2. Pull clutch cable ferrule (end of cable housing) away from clutch hand lever bracket. Gap between ferrule and bracket should be 1/16-1/8 (1.6-3.2 mm). Adjust freeplay by turning cable adjuster.
3. See [Figure 6-10](#). Remove four TORX screws with washers (1) and clutch inspection cover (2).
4. Slide spring (3) with attached screw lockplate (4) from flats of adjusting screw (12).

5. Turn adjusting screw (12) clockwise to release ramp and coupling mechanism. As the adjusting screw is turned, ramp assembly moves forward. Unscrew nut (5) from end of adjusting screw.
6. Remove hook of ramp from cable end coupling (16). Remove cable end (10) from slot in coupling.
7. Remove and discard retaining ring (13) from ramp assembly to separate inner and outer halves. Remove three balls (7) from ramp sockets.

CLEANING AND INSPECTION

1. Thoroughly clean all parts in cleaning solvent.
2. See [Figure 6-10](#). Inspect three balls (7) of release mechanism and ball socket surfaces of inner and outer ramps for wear, pitting, surface breakdown and other damage. Replace parts as necessary.
3. Check hub fit of inner (15) and outer (6) ramps. Replace ramps if excessively worn.
4. Check clutch cable for frayed or worn ends. Replace cable if damaged or worn.
5. Change or add transmission fluid if necessary. See [1.10 CLUTCH](#).

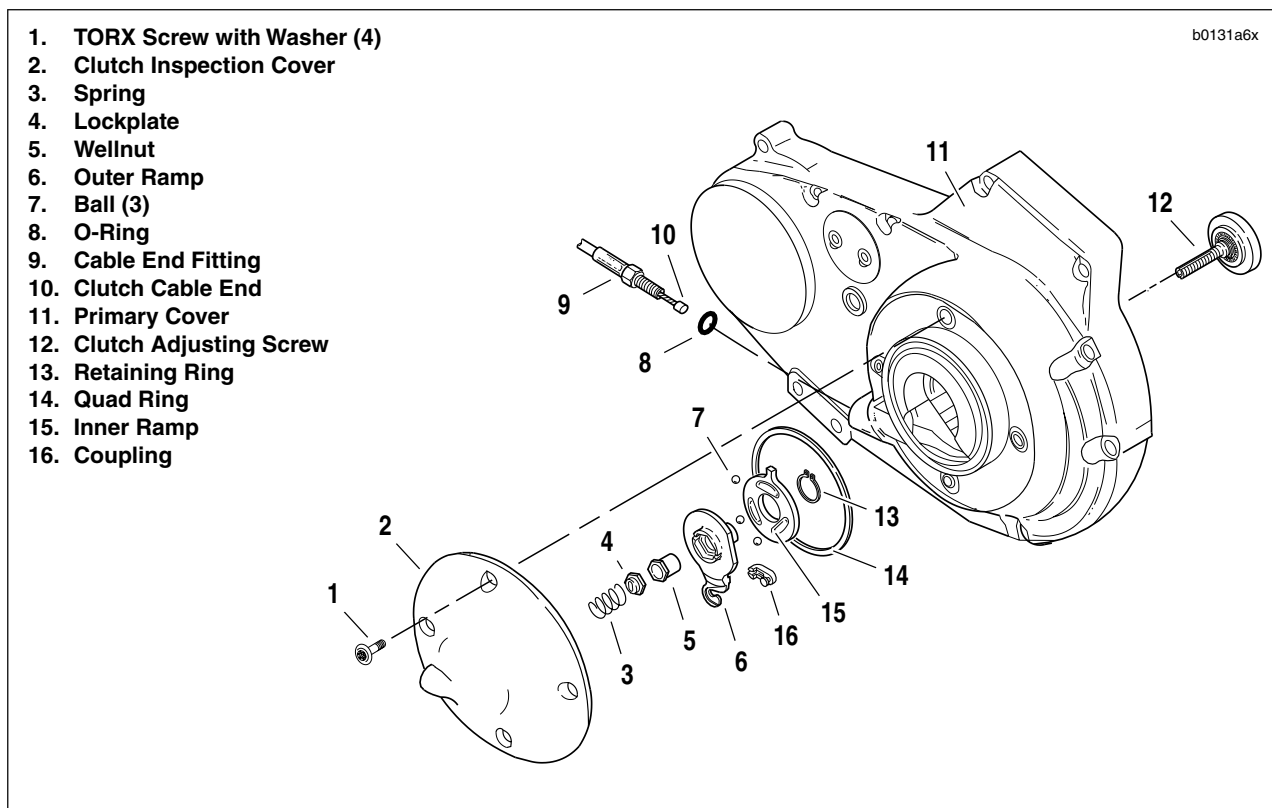


Figure 6-10. Clutch Release Mechanism

ASSEMBLY

1. See [Figure 6-11](#). Assemble inner and outer ramp.
 - a. Apply multi-purpose grease to balls (2) and ramps (1, 3).
 - b. Insert balls in sockets of outer ramp (1).
 - c. Install inner ramp (3) on hub of outer ramp (1) with tang 180° from hook of outer ramp.
 - d. Install **new** retaining ring (4) in groove of outer ramp hub.
2. See [Figure 6-12](#). Install ramp assembly.
 - a. Fit coupling (5) over cable end (4) with rounded side inboard, the ramp connector button outboard.
 - b. With retaining ring side of ramp assembly facing inward, place hook of ramp around coupling button.
 - c. Rotate assembly counterclockwise until tang on inner ramp fits in slot of primary cover (6).
3. Secure assembly in place.
 - a. Thread wellnut (2) on adjusting screw (3) until slot of screw is accessible with a screwdriver.
 - b. Fit nut hex into recess of outer ramp (1).
 - c. Turn adjusting screw counterclockwise until resistance is felt.
4. Adjust clutch release mechanism. See [1.10 CLUTCH](#).
5. Connect negative battery cable to battery terminal.

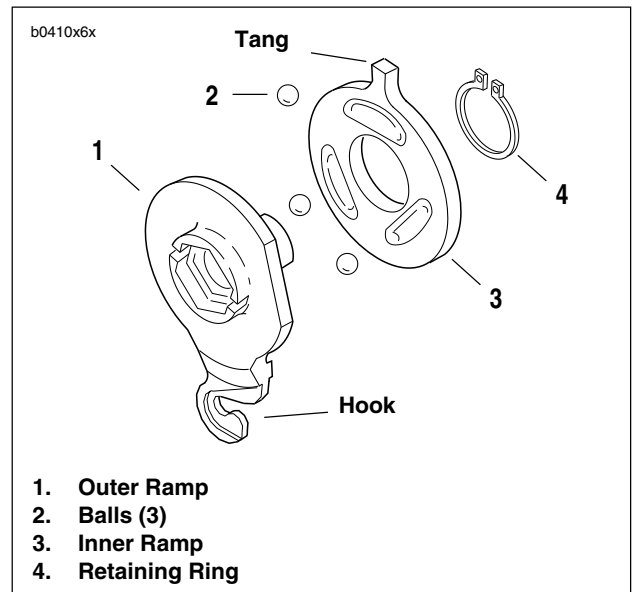


Figure 6-11. Inner and Outer Ramp

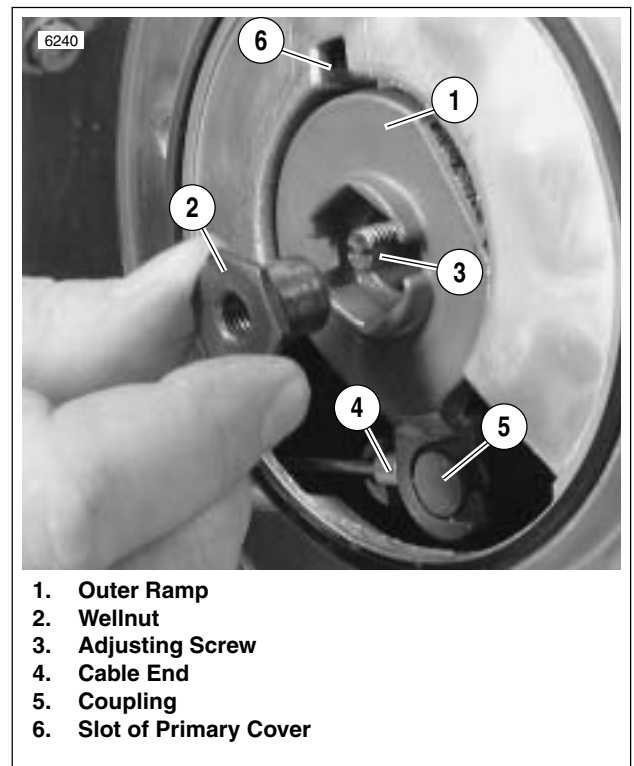


Figure 6-12. Nut and Outer Ramp

GENERAL

The purpose of the clutch is to smoothly disengage and engage the engine from the rear wheel for starting, stopping and shifting gears.

See Figure 6-13. The clutch is a wet, multiple-disc clutch with six steel plates (1), one spring plate (2) and eight fiber (friction) plates (3) stacked alternately in the clutch shell (4). The order of plate assembly, from inboard to outboard, is as follows:

F - St - F - St - F - St - F - **Sp** - F - St - F - St - F - St - F
(F = Fiber plate, St = Steel plate, **Sp** = Spring plate)

The fiber plates (clutch driving plates) are keyed to the clutch shell (4), which is driven by the engine through the primary chain. The steel plates (clutch driven plates) and the centrally located spring plate (also a clutch driven plate) are keyed to the clutch hub (5), which drives the rear wheel through the transmission and secondary drive belt.

When the clutch is engaged (clutch lever released), the diaphragm spring (7) applies strong inward force against the pressure plate (6). The pressure plate then presses the clutch plates (1, 2 and 3) together, allowing no slippage between the plates and causing the plates to turn as a single unit. The result is that the rotational force of the clutch shell (4) is fully transmitted through the “locked” clutch plates to the clutch hub (5). As long as the transmission is set in a forward gear, power from the engine will be transmitted to the rear wheel.

When the clutch is disengaged (clutch lever pulled to left handlebar grip), the pressure plate (6) is pulled outward (by clutch cable action) against the diaphragm spring (7), thereby compressing the diaphragm spring. With the pressure plate retracted, strong inward force no longer squeezes the clutch plates (1, 2 and 3) together. The fiber plates (3) are now free to rotate at a different relative speed than that of the steel (1) and spring (2) plates (i.e. – slippage between the clutch plates occurs). The result is that the rotational force of the clutch shell (4) is no longer fully transmitted through the “unlocked” clutch plates to the clutch hub (5). The engine is free to rotate at a different speed than the rear wheel.

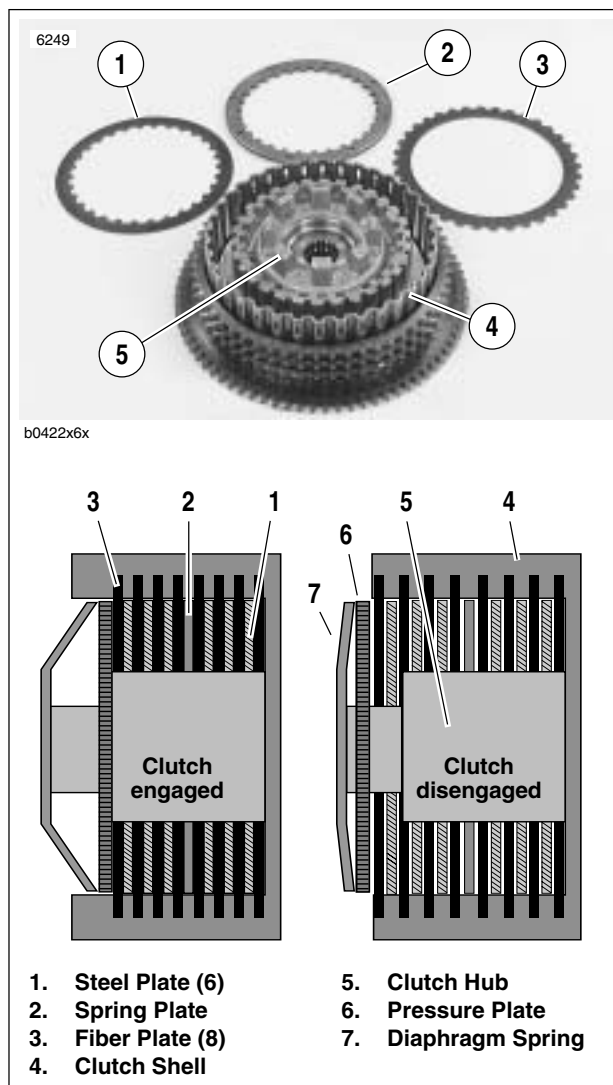


Figure 6-13. Clutch Plates and Hub/Shell Assembly

Table 6-1. Clutch Troubleshooting

SYMPTOM	CAUSE (CHECK IN FOLLOWING ORDER)	REMEDY
Clutch slips.	Incorrect clutch release adjustment. Worn clutch plates.	Check and adjust clutch release mechanism. Check service wear limits. Replace plates.
Clutch drags.	Incorrect clutch release adjustment. Worn clutch release ramps or balls. Warped clutch steel plates. Blade worn or damaged clutch gear splines. Overfilled primary.	Check and adjust clutch release mechanism. Replace release ramps and/or balls. Replace clutch steel plates. Replace clutch gear or hub as required. Drain lubricant to correct level.

REMOVAL/DISASSEMBLY

Clutch Pack

⚠ WARNING

To protect against shock and accidental start-up of vehicle, disconnect the negative battery cable before proceeding. Inadequate safety precautions could result in death or serious injury.

1. Disconnect negative battery cable from battery terminal.
2. Remove primary cover. See [6.2 PRIMARY CHAIN](#).

⚠ WARNING

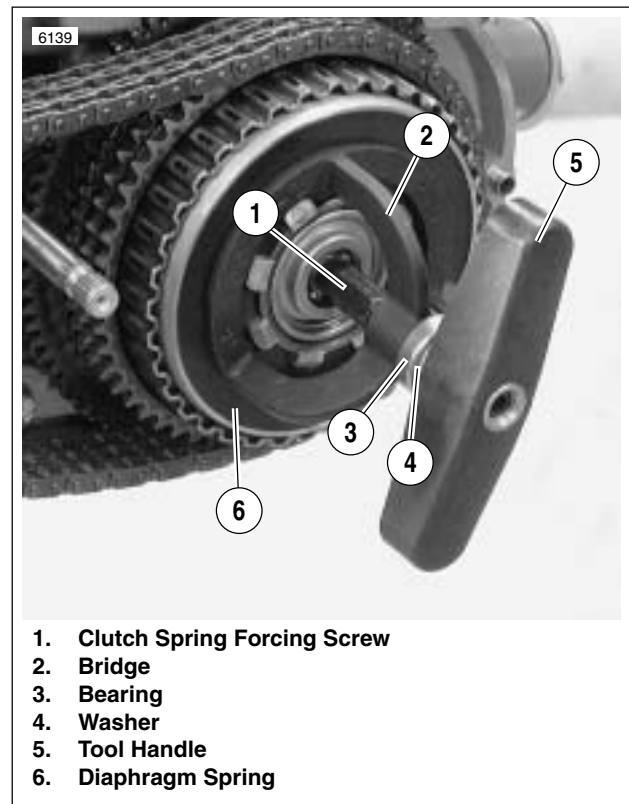
Do not attempt to disassemble the clutch without **SPRING COMPRESSING TOOL** (Part No. HD-38515-A), **CLUTCH SPRING FORCING SCREW** (Part No. HD-38515-91) and proper eye protection. Otherwise, the highly compressed diaphragm spring could fly out with great force, which could result in death or serious injury.

3. See [Figure 6-14](#). Attach tools to compress clutch diaphragm spring.
 - a. Thread the CLUTCH SPRING FORCING SCREW (Part No. HD-38515-91) (1) onto the clutch adjusting screw.
 - b. Place the bridge (2) of SPRING COMPRESSING TOOL (Part No. HD-38515-A) against diaphragm spring (6).
 - c. Install bearing (3) and washer (4).
 - d. Thread the tool handle (5) onto end of forcing screw.

CAUTION

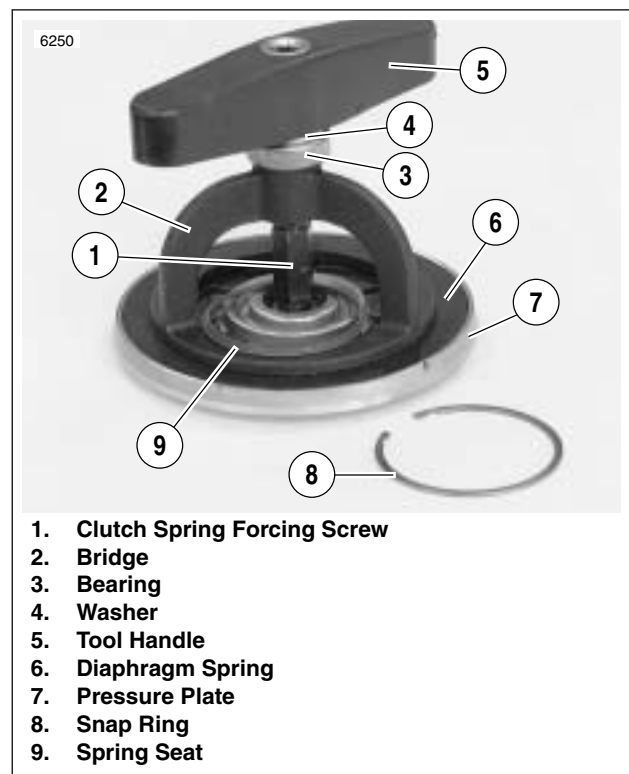
See [Figure 6-15](#). Turn compressing tool handle (5) only the amount required to release spring seat (9) and remove snap ring (8). Excessive compression of diaphragm spring (6) could damage clutch pressure plate (7).

4. Remove pressure plate assembly.
 - a. Place a wrench on the clutch spring forcing screw (1) flats to prevent the forcing screw from turning.
 - b. Turn compressing tool handle (5) clockwise until tool relieves pressure on snap ring (8) and spring seat (9). Remove and discard snap ring (8).
 - c. Unseat spring seat (9) from the groove in clutch hub prongs.
 - d. Remove pressure plate assembly.
5. See [Figure 6-16](#). Remove the clutch pack from the hub/shell assembly. The pack consists of eight fiber plates (18), six steel plates (19) and a spring plate (20).



1. Clutch Spring Forcing Screw
2. Bridge
3. Bearing
4. Washer
5. Tool Handle
6. Diaphragm Spring

Figure 6-14. Compressing Clutch Diaphragm Spring



1. Clutch Spring Forcing Screw
2. Bridge
3. Bearing
4. Washer
5. Tool Handle
6. Diaphragm Spring
7. Pressure Plate
8. Snap Ring
9. Spring Seat

Figure 6-15. Pressure Plate Assembly

b0009c6x

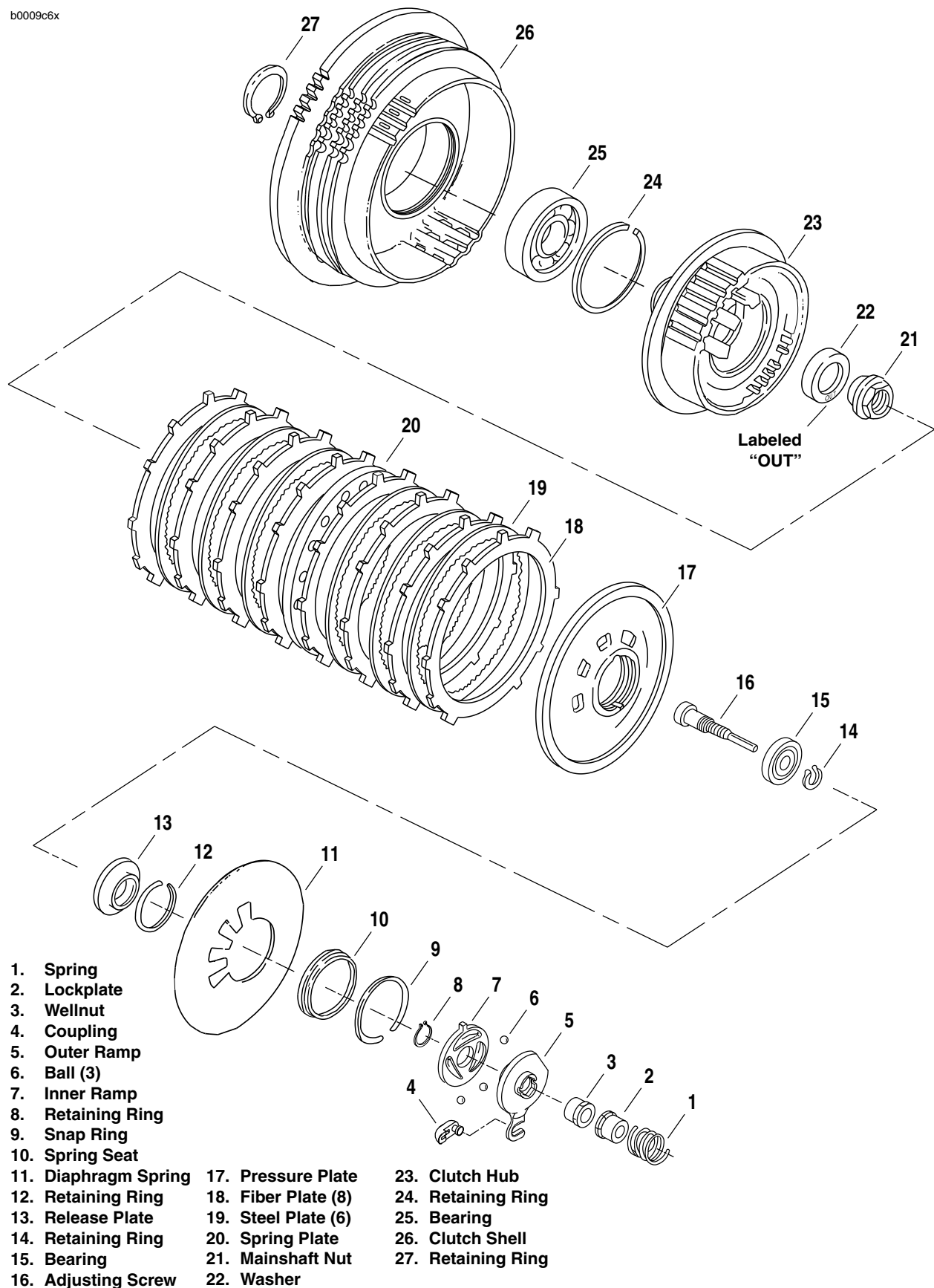


Figure 6-16. Clutch Assembly

Primary Chain/Drive

⚠ WARNING

To protect against shock and accidental start-up of vehicle, disconnect the negative battery cable before proceeding. Inadequate safety precautions could result in death or serious injury.

1. Disconnect negative battery cable from battery terminal.
2. Remove primary cover. See [6.2 PRIMARY CHAIN](#).
3. Loosen engine sprocket.
 - a. Install SPROCKET LOCKING LINK (Part No. HD-38362).
 - b. Remove the engine sprocket nut.
 - c. Loosen, but do not remove, engine sprocket. If necessary, use the slotted portion of TWO CLAW PULLER (Part No. HD-97292-61) and two bolts to loosen the engine sprocket.
4. See [Figure 6-17](#). Remove adjusting screw assembly.
 - a. Remove large retaining ring (1).
 - b. Remove adjusting screw assembly (2, 3 and 4) from pressure plate.

CAUTION

See [Figure 6-16](#). Mainshaft nut (21) has left-hand threads. To prevent damage, turn nut clockwise to loosen and remove from mainshaft.

5. Remove mainshaft nut (21) and washer (22).
6. Remove the clutch assembly, primary chain and engine sprocket as a unit.
 - a. Inspect primary chain and sprockets for damage or excessive wear.
 - b. Inspect stator and rotor. See [7.7 ALTERNATOR](#).
 - c. Replace damaged parts as necessary.
7. Install adjusting screw assembly into pressure plate.
 - a. See [Figure 6-18](#). Align two tabs on perimeter of release plate with corresponding recesses in pressure plate.
 - b. See [Figure 6-17](#). Secure the adjusting screw assembly with large retaining ring (1).
8. Attach tools to compress clutch diaphragm spring. See Step 2 of [CLUTCH PACK](#) under [6.5 PRIMARY DRIVE/CLUTCH](#).
9. Remove clutch pack components. See Steps 3-4 of [CLUTCH PACK](#) under [6.5 PRIMARY DRIVE/CLUTCH](#).

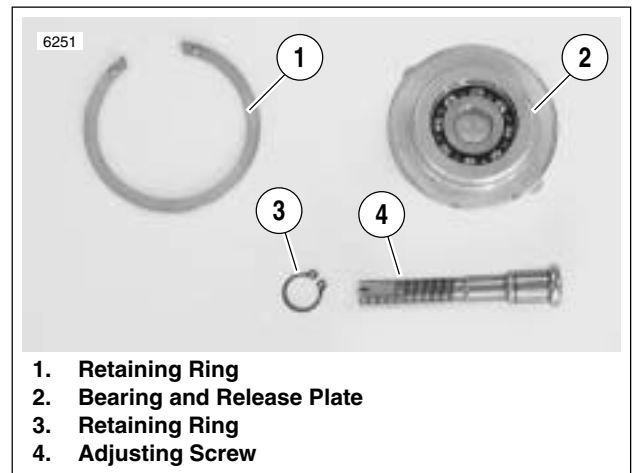


Figure 6-17. Adjusting Screw Assembly

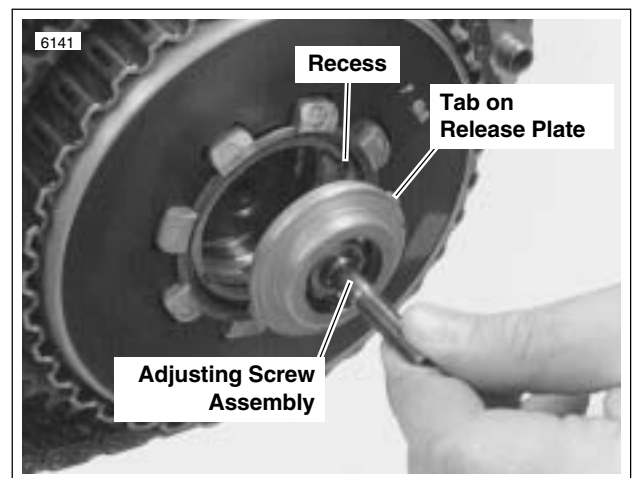


Figure 6-18. Aligning Tabs

10. See [Figure 6-15](#). Disassemble pressure plate.
 - a. Place a wrench on the clutch spring forcing screw (1) flats to prevent the forcing screw from turning.
 - b. Turn the compressing tool handle (5) counterclockwise until the handle spins off.
 - c. Remove washer (4), bearing (3) and bridge (2).
 - d. Remove clutch spring forcing screw (1) from clutch adjusting screw.
 - e. Remove spring seat (9) and diaphragm spring (6) from pressure plate (7).
11. See [Figure 6-17](#). Remove and disassemble adjusting screw assembly.
 - a. Remove large retaining ring (1).
 - b. Remove adjusting screw assembly (2, 3 and 4) from pressure plate.
 - c. If necessary, disassemble adjusting screw assembly. Remove and discard small retaining ring (3) and then separate the adjusting screw (4) from the bearing and release plate (2). Remove bearing from release plate.

CAUTION

See [Figure 6-16](#). Due to the possible damage to the bearing (25), the clutch hub (23) and shell (26) assembly should not be disassembled unless the bearing, hub or shell require replacement. If the assembly is pressed apart, the bearing must be replaced.

12. Disassemble clutch hub and clutch shell if necessary.
 - a. Remove retaining ring (27) from inboard end of clutch hub (23).
 - b. Using an arbor press, separate clutch hub (23) from assembly of clutch shell (26), bearing (25) and retaining ring (24).
 - c. Remove retaining ring (24) from groove in clutch shell (26).
 - d. Press on the inboard side of bearing (25) outer race to remove bearing from clutch shell.

INSPECTION/REPAIR

1. See [Figure 6-16](#). Wash all parts, except fiber (friction) plates (18) and bearing (25), in cleaning solvent. Blow dry with compressed air. Examine the clutch components as follows:
 - a. Check all clutch plates for wear and discoloration.
 - b. Inspect each steel (drive) plate (19) for grooves.
 - c. Place each steel plate on a flat surface. Using a feeler gauge, check for flatness in several places. Replace any plates that are damaged or are warped more than 0.006 in. (0.152 mm).
2. Check the diaphragm spring (11) for cracks or bent tabs. Install a **new** spring if either condition exists.
3. See [Figure 6-19](#). Check fiber plates for thickness.
 - a. Wipe the lubricant from the eight fiber plates and stack them on top of each other.
 - b. Measure the thickness of the eight stacked fiber plates with a dial caliper or micrometer. The minimum thickness must be 0.661 in. (16.789 mm).
 - c. If the thickness is less than specified, discard the fiber plates and steel plates. Install a **new** set of both friction and steel plates.
4. See [Figure 6-20](#). Check the clutch shell.
 - a. Inspect primary chain sprocket (1) and the starter ring gear (2) on the clutch shell. If either sprocket or ring gear are badly worn or damaged, replace the clutch shell.
 - b. Check the slots that mate with the clutch plates on both clutch shell (4) and hub (3). If slots are worn or damaged, replace shell and/or hub.
 - c. If clutch shell was removed from motorcycle, check the bearing for smoothness. Rotate the clutch shell while holding the clutch hub. If bearing is rough or binds, it must be replaced.

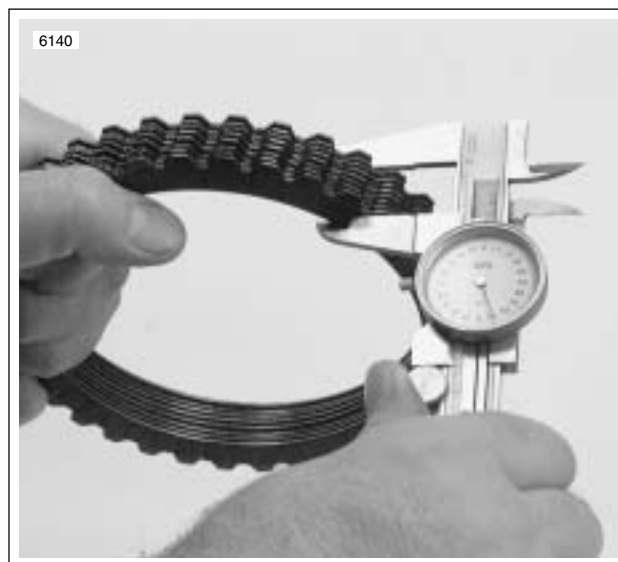
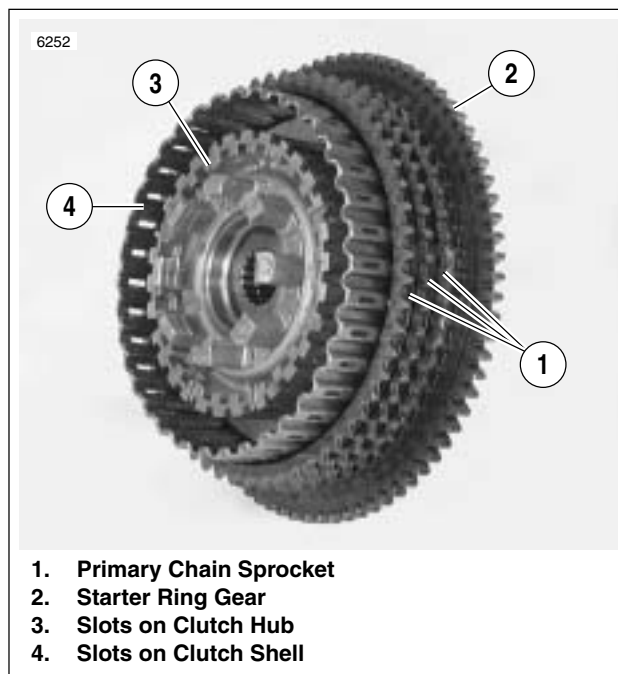


Figure 6-19. Measuring Friction Plates



1. **Primary Chain Sprocket**
2. **Starter Ring Gear**
3. **Slots on Clutch Hub**
4. **Slots on Clutch Shell**

Figure 6-20. Checking Clutch Shell

ASSEMBLY

Clutch Pack

1. See [Figure 6-16](#). Install the clutch pack, which consists of eight fiber plates (18), six steel plates (19) and a spring plate (20), into the clutch hub (23). The order of plate assembly, from inboard to outboard, is as follows:

F - St - F - St - F - St - F - **Sp** - F - St - F - St - F - St - F

(F = Fiber plate, St = Steel plate, **Sp** = Spring plate)

CAUTION

See [Figure 6-15](#). Turn compressing tool handle (5) only the amount required to install spring seat (9) and snap ring (8). Excessive compression of diaphragm spring (6) could damage clutch pressure plate (7).

2. Place assembly of spring seat, **new** snap ring, diaphragm spring, pressure plate, adjusting screw components and compressing tool onto clutch hub and against clutch pack.
 - a. See [Figure 6-21](#). Align square openings of pressure plate and diaphragm spring (1) so that the assembly can be installed over prongs (2) of clutch hub.
 - b. Position spring seat (5) with its larger O.D. side toward diaphragm spring (1).
 - c. See [Figure 6-15](#). Place a wrench on the clutch spring forcing screw (1) flats to prevent the forcing screw from turning.
 - d. Turn compressing tool handle (5) clockwise until diaphragm spring (6) compresses just enough to install spring seat (9) and **new** snap ring (8) into the groove in clutch hub prongs.
 - e. With snap ring positioned against outboard side of spring seat, and fully seated in groove of clutch hub, carefully loosen and remove compression tool.

Primary Drive

1. See [Figure 6-22](#). Assemble clutch hub and shell if necessary.
 - a. Press **new** bearing (3) in clutch shell (4). Secure bearing with a **new** retaining ring (2).
 - b. Press inboard end of clutch hub (1) into shell bearing (3). Secure with **new** retaining ring (5) on end of hub.
2. Assemble pressure plate hardware.
 - a. See [Figure 6-17](#). Place bearing inside release plate. Insert adjusting screw (4) through bearing and release plate (2). Secure with **new** retaining ring (3).
 - b. See [Figure 6-21](#). Position diaphragm spring (1) with its concave side facing toward pressure plate onto pressure plate assembly.

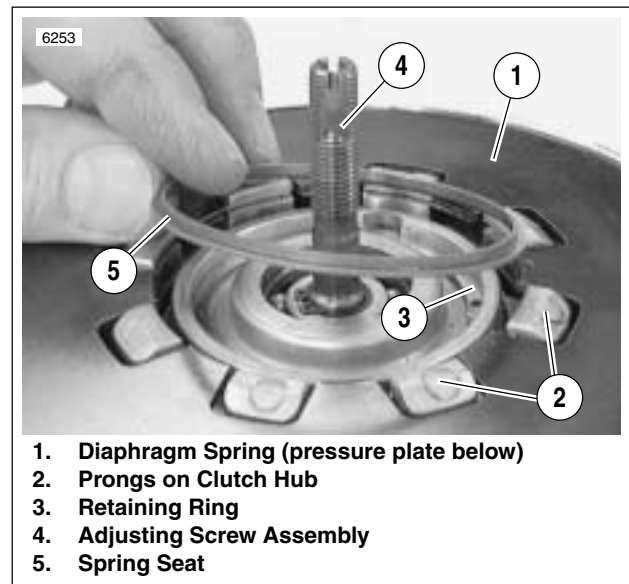


Figure 6-21. Spring Seat Installation

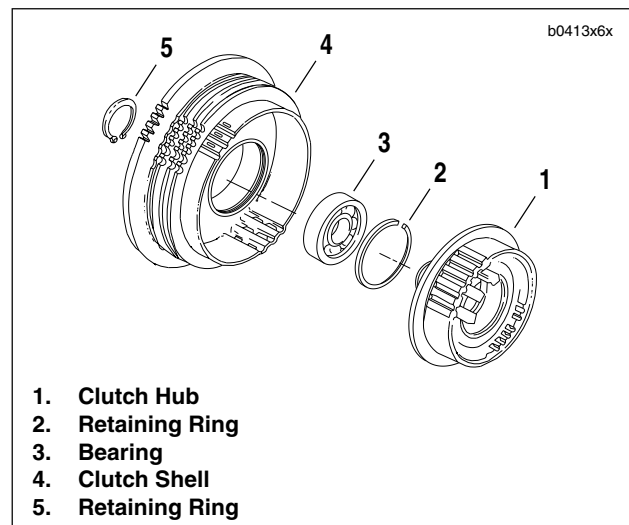


Figure 6-22. Clutch Hub and Shell Assembly

- c. Insert adjusting screw assembly (4) into pressure plate. Secure with large retaining ring (3).
 - d. Position spring seat (5) with its larger O.D. side toward diaphragm spring.
3. Attach tools to compress clutch diaphragm spring. See Step 2 of [CLUTCH PACK](#) under [6.5 PRIMARY DRIVE/CLUTCH](#). Do not tighten compressing tool against diaphragm spring at this time.
 4. Install the clutch pack. Follow all instructions of [CLUTCH PACK](#) under [6.5 PRIMARY DRIVE/CLUTCH](#).

INSTALLATION

NOTE

If clutch pack replacement was the only service work performed, start with Step 5.

1. Install the engine sprocket, clutch assembly and primary chain as a unit into primary chaincase.
2. See [Figure 6-23](#). Install the engine sprocket nut.
 - a. Place SPROCKET LOCKING LINK (3) (Part No. HD-38362) between primary chain and engine sprocket.
 - b. Apply two or three drops of LOCTITE THREAD-LOCKER 262 (red) onto threads of sprocket shaft.
 - c. Install engine sprocket nut. Tighten nut to 190-210 ft-lbs (258-285 Nm).

CAUTION

See [Figure 6-24](#). Washer (2) must be installed with the word "out" facing the mainshaft nut (1) or transmission may be damaged.

3. Install mainshaft nut and washer.
 - a. Apply two or three drops of LOCTITE THREAD-LOCKER 262 (red) onto threads on end of mainshaft.
 - b. Place washer (2) on mainshaft with the word "out" facing away from clutch hub (3).
 - c. Install nut (1) (**left-hand threads**). Tighten to 70-80 ft-lbs (95-109 Nm).
4. Remove SPROCKET LOCKING LINK.
5. Install adjusting screw assembly into pressure plate.
 - a. See [Figure 6-18](#). Align two tabs on perimeter of release plate with corresponding recesses in pressure plate.
 - b. See [Figure 6-17](#). Secure the adjusting screw assembly with retaining ring.
6. Install primary cover. See [6.2 PRIMARY CHAIN](#).
7. Connect negative battery cable to negative battery terminal.

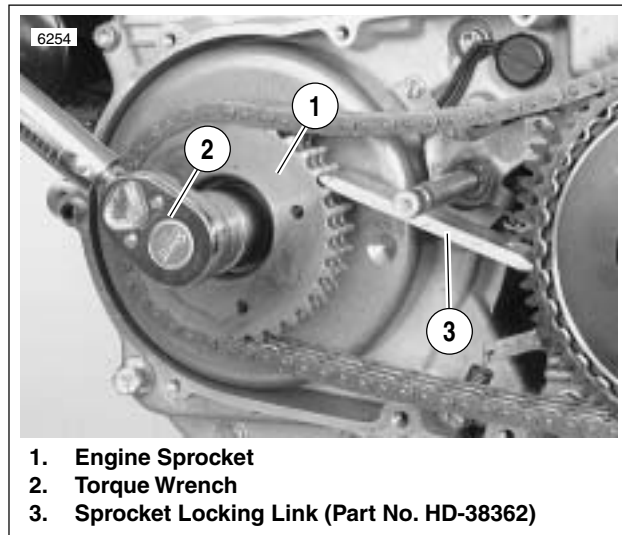


Figure 6-23. Sprocket Locking Link

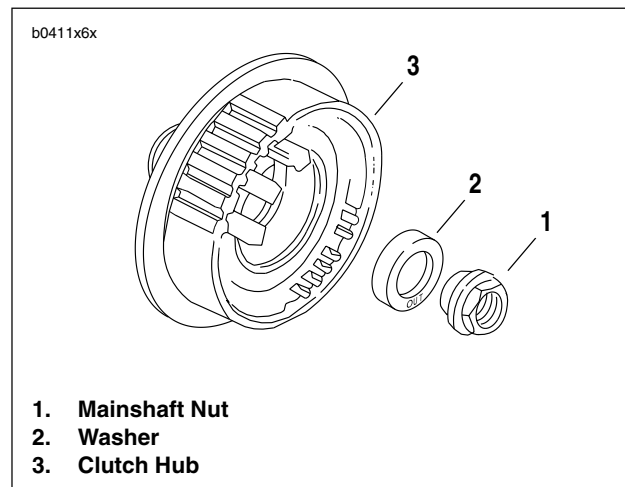


Figure 6-24. Mainshaft Nut and Washer

GENERAL

See [Figure 6-25](#). The transmission is a five-speed constant-mesh type housed in an extension of the crankcase. The transmission permits the rider to vary the ratio of engine speed-to-rear driving wheel speed in order to meet the varying conditions of operation.

See [Figure 6-26](#). The transmission is foot-operated by the gear shift lever, which transmits the force through a gear shifter shaft. The shifter shaft actuates a pawl and a shifter fork drum. The shifter fork drum moves shifter forks, which slide a series of shifter clutch gears, on the mainshaft and countershaft, into and out of mesh with the other gears.

LUBRICATION

Drain transmission and refill to correct level with fresh, clean lubricant at least once each year or every 5000 miles (8000 km), whichever comes first. For best results, drain lubricant while hot.

See [1.10 CLUTCH](#) for more information.

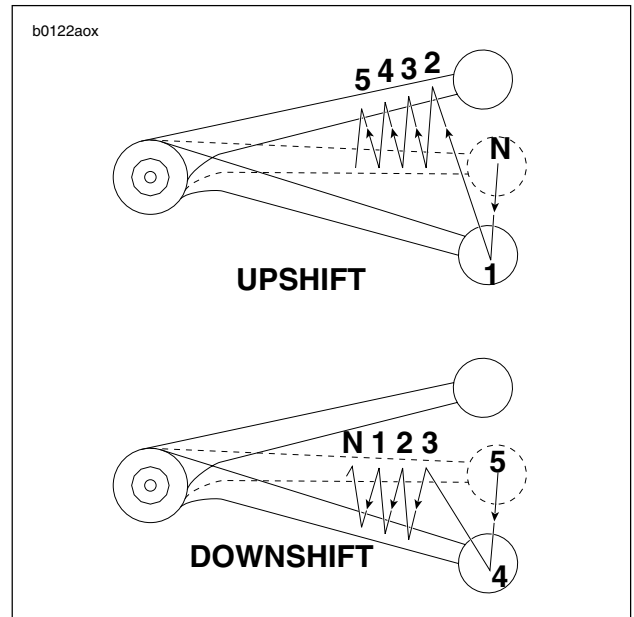


Figure 6-25. Transmission Shift Pattern

XLH transpower flow

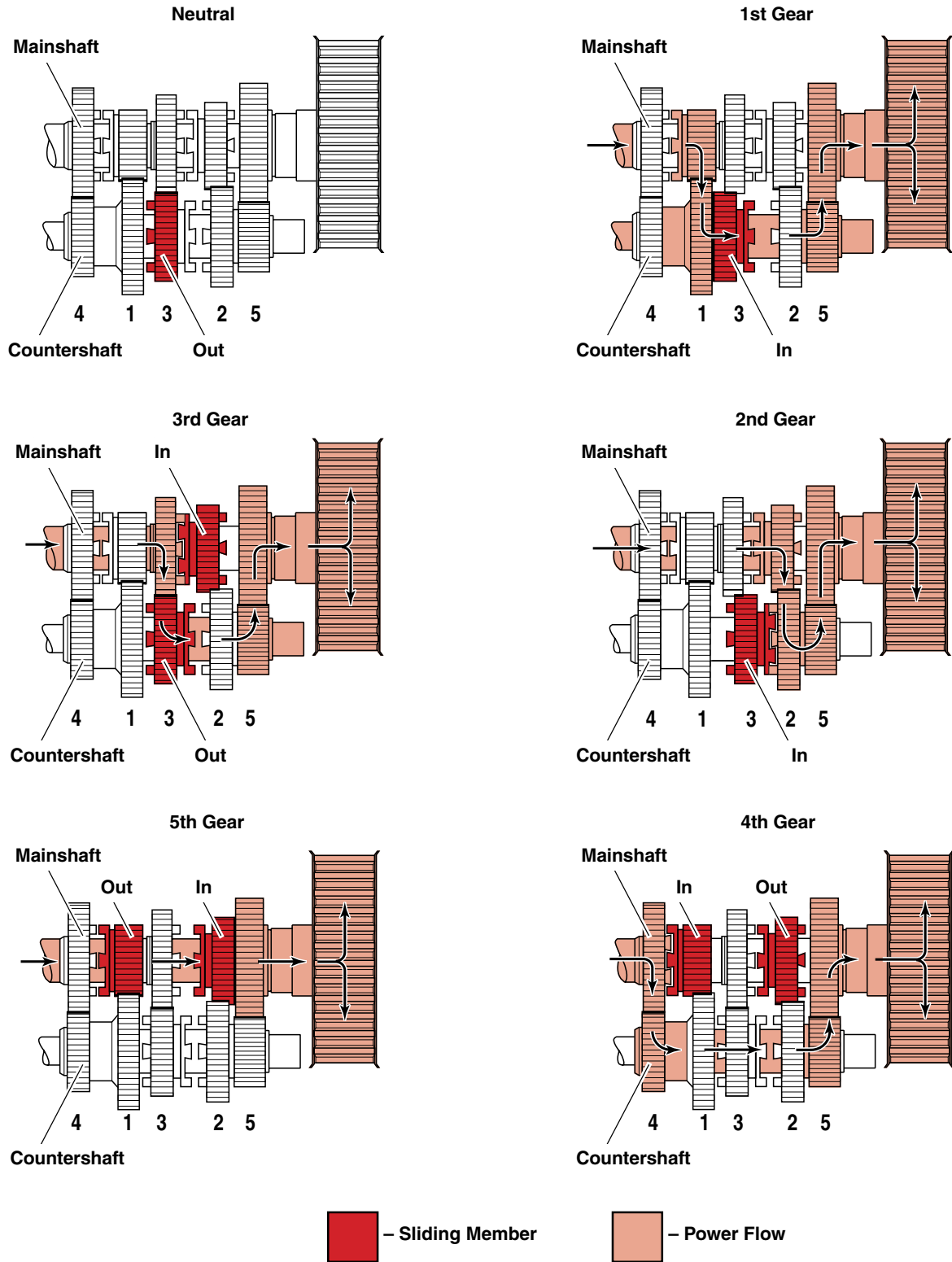


Figure 6-26. Transmission Power Flow

GENERAL

The rear compartment of the left and right crankcase halves form the transmission case. An access cover (door) allows removal of transmission components without removing the engine or disassembling (splitting) the crankcase.

REMOVAL

1. Raise rear wheel off floor using REAR WHEEL SUPPORT STAND (Part No. B-41174).
2. Remove muffler and drain primary drive/transmission. See [TRANSMISSION FLUID](#) under [1.10 CLUTCH](#)
3. Remove sprocket cover. See [2.30 SPROCKET COVER](#).
4. Remove rear fender. See [2.32 REAR FENDER](#).
5. See [Figure 6-27](#). Move rear wheel forward.
 - a. Loosen rear axle nut (2) (metric).
 - b. Hold axle adjuster bolt (1) with a 5/16 in. wrench. Loosen locknut (3).
 - c. Turn adjusters (4) on each side of swingarm an equal number of turns counterclockwise.
 - d. Move rear wheel as far forward as possible.
6. See [Figure 6-28](#). Place transmission in first gear. Remove two socket head screws (5) and lockplate (4).

CAUTION

Transmission sprocket nut has left-hand threads. To prevent damage, turn nut clockwise to loosen and remove from main drive gear shaft.

7. Remove transmission sprocket nut (3) from main drive gear shaft (1).
8. Remove secondary drive belt from transmission sprocket (2). Remove transmission sprocket from main drive gear shaft (1).
9. Remove primary cover. See [6.2 PRIMARY CHAIN](#).
10. Remove clutch assembly, primary chain and engine sprocket. See [PRIMARY CHAIN/DRIVE](#) under [6.5 PRIMARY DRIVE/CLUTCH](#).

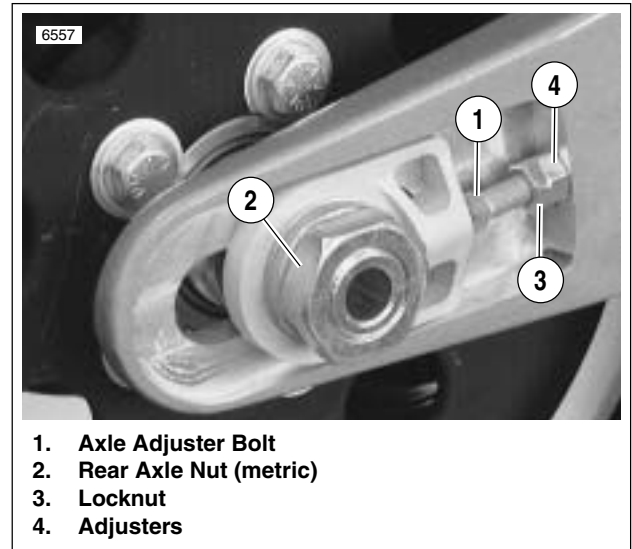


Figure 6-27. Rear Axle Assembly

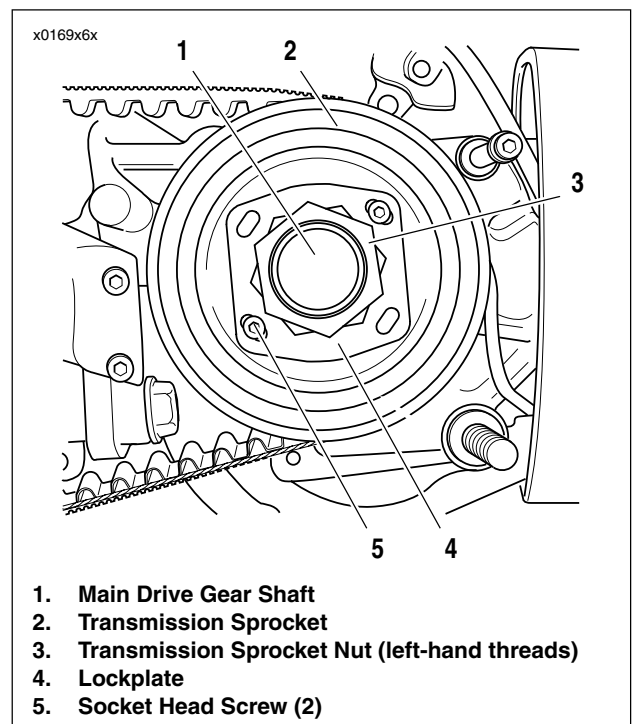


Figure 6-28. Transmission Sprocket

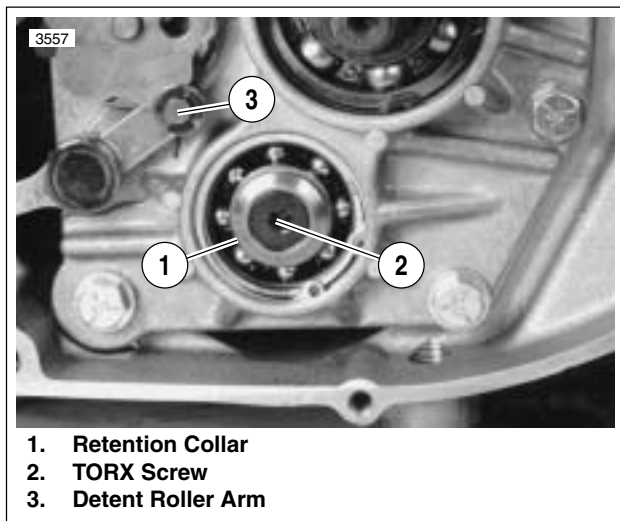


Figure 6-29. Countershaft Retainer

11. See [Figure 6-29](#). Lock transmission in gear. Remove countershaft TORX screw (2) and retention collar (1).
12. See [Figure 6-30](#). Detach spring (1) from groove in post (2).
13. Remove retaining ring (9) and detent plate (8). You will need to use a **new** retaining ring for installation.
14. Remove two locknuts (3) and washers (10) which attach shifter shaft assembly (6) to studs at transmission case. Remove shifter shaft assembly.
15. Remove five access door bolts (7). Remove transmission assembly by pulling it straight outward, away from transmission case.

CLEANING AND INSPECTION

Thoroughly clean transmission compartment with cleaning solvent. Blow parts dry with compressed air. Inspect parts to determine if any must be replaced. Replace all parts that are badly worn or damaged.

Neutral Indicator Switch

See [Figure 6-31](#). The neutral indicator switch is threaded into the transmission portion of the right crankcase half. See [7.22 NEUTRAL INDICATOR SWITCH](#) for testing, removal and installation procedures.

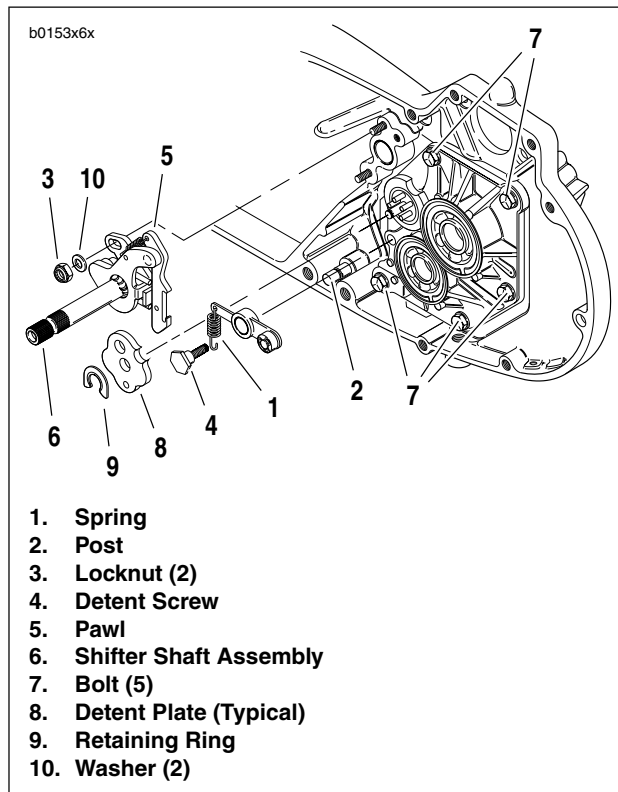


Figure 6-30. Shifter Shaft Assembly

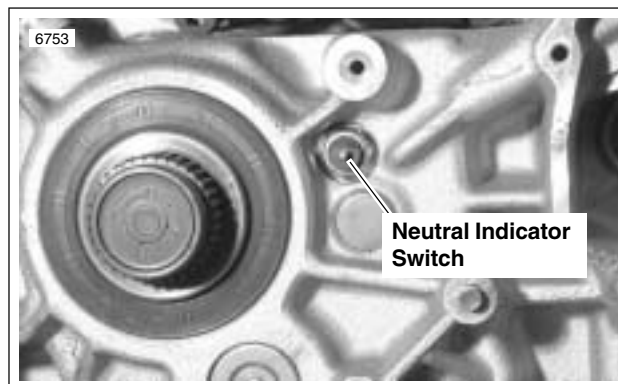


Figure 6-31. Neutral Indicator Switch

SHIFTER FORKS AND DRUM

6.8

DISASSEMBLY

1. Remove transmission assembly. See [6.7 TRANSMISSION CASE](#). Mount transmission assembly in vise with protected jaws.
2. See [Figure 6-32](#). Remove nut (10), washer (14), detent screw (18), plates (8, 9), detent arm (16) and spring (17).
3. Remove and discard the three fork cotter pins (4).
4. Remove three shifter fork pins (5). A small magnet is useful in freeing the fork pins (5).

5. Slide shifter fork drum (7) away from access door, through shifter forks. The neutral indicator pin prevents removal in the other direction.
6. Remove shifter forks (1, 2 and 3).

CLEANING AND INSPECTION

1. See [Figure 6-32](#). Clean all parts except bearings (19, 20) with solvent.

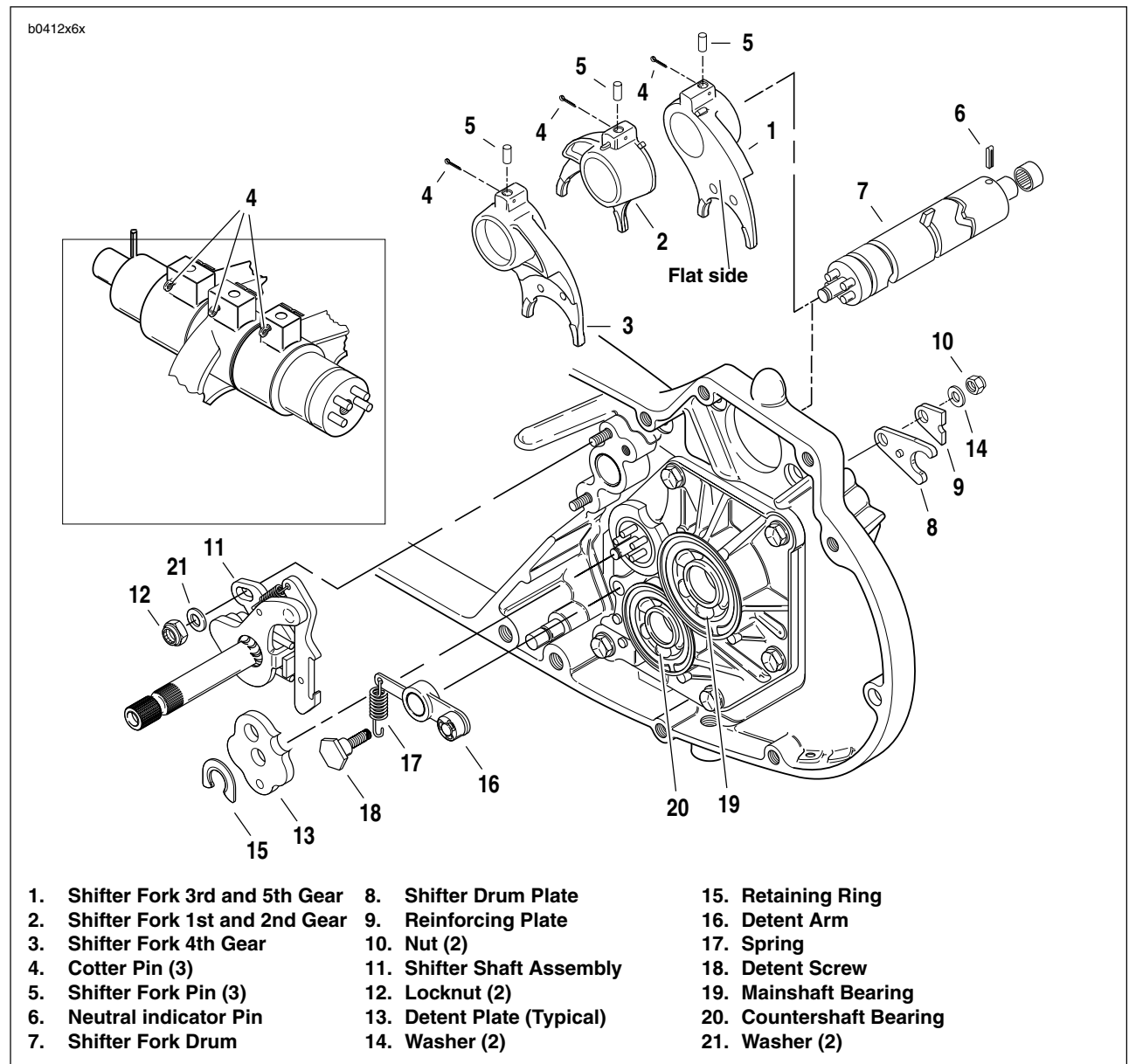


Figure 6-32. Shifter Mechanism

2. Inspect bearings (19, 20) and shifter drum ends. If ends of shifter drum are pitted or grooved, replace the shifter drum and bearings. If replacing bearings, see [6.11 ACCESS DOOR BEARINGS](#).
3. Inspect shifter fork drum (7) for cracks or wear. Replace if necessary.

ASSEMBLY

1. See [Figure 6-33](#). Identify all shifter forks before assembly. Note shape of fork and location of fork pin holes.
2. Install shifter forks.
 - a. Lubricate the shaft bore of all three shifter forks (1, 2 and 3) with SPORT-TRANS FLUID.
 - b. Place 3rd and 5th gear shifter fork (1) in the fork groove of mainshaft 2nd gear. Be sure the flat side of fork is facing the access cover.
 - c. Place 1st and 2nd gear shifter fork (2) in the fork groove of countershaft 3rd gear. Be sure the flat side of fork is facing away from the access door.
 - d. Place 4th gear shifter fork (3) in the fork groove of mainshaft 1st gear. Be sure the flat side of fork is facing away from the access door.
3. See [Figure 6-32](#). Install shifter shaft drum.
 - a. Position the shifter drum shaft so that the neutral indicator pin (6) is upward. The shaft is then in the neutral position.
 - b. Insert the pin end of shifter drum shaft (7) through the hubs of shifter forks (1, 2 and 3) and through the bearing in access cover.
 - c. Align the hole through the top of each shifter fork with the appropriate cam groove in the shifter drum.

CAUTION

The cotter pins must be inserted through the shifter forks as shown in [Figure 6-33](#). This will prevent possible damage to the cotter pins.

4. See [Figure 6-32](#). Secure shifter mechanism.
 - a. Lubricate the three shifter fork pins (5) with SPORT-TRANS FLUID.
 - b. Drop fork pins (5) through the holes in shifter forks.
 - c. With a small screwdriver press on the pins while manipulating the forks back and forth until the pin seats in the drum groove.
 - d. Secure shifter fork pins with **new** cotter pins (4).

NOTE

See [Figure 6-34](#). Detent plate (2) and retaining ring (1) are not installed at this time. These parts are installed during transmission installation after the final shifter pawl adjustment is made. See [6.13 TRANSMISSION INSTALLATION AND SHIFTER PAWL ADJUSTMENT](#).

5. Install detent plate hardware.
 - a. At the inside of the access door, place the shifter drum plate (7) in the groove of the drum shaft. See inset [Figure 6-34](#).
 - b. Correctly align reinforcement plate (8) with the pin pressed in the shifter drum plate (7).
 - c. Insert detent screw (3) through detent arm (5), access door, shifter drum plate (7), reinforcing plate (8) and washer (9).
 - d. Thread nut (10) on detent screw. Tighten nut to 13-17 ft-lbs (18-23 Nm).

NOTE

See [Figure 6-35](#). Install detent roller arm between countershaft bearing and detent plate location.

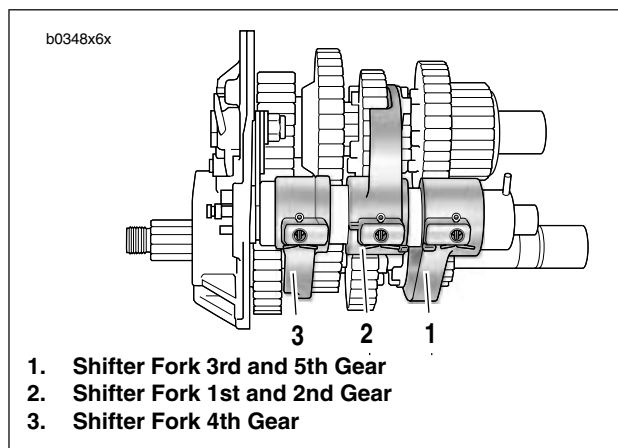


Figure 6-33. Shifter Fork Identification

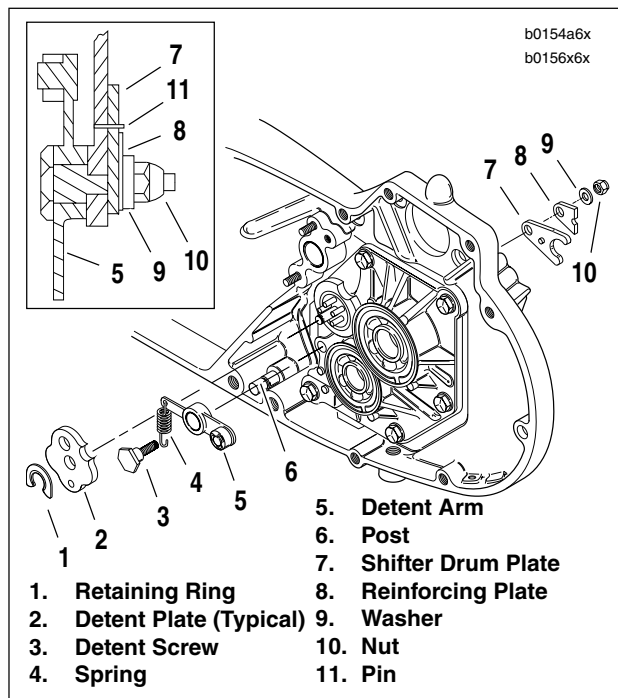


Figure 6-34. Detent Plate Mounting

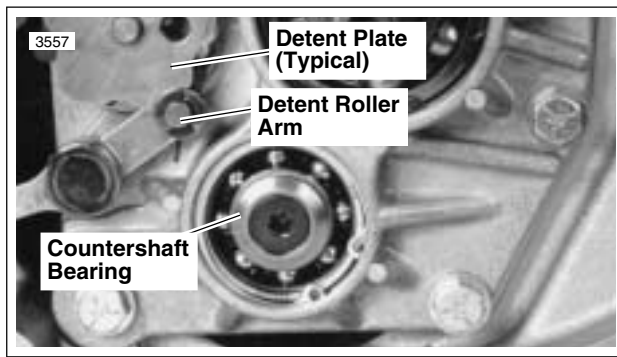


Figure 6-35. Detent Roller Arm