

SPECIFICATIONS

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	

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

TRANSMISSION GEAR RATIOS	FINAL*	OVERALL**
First (Low) Gear	2.69	9.717
Second Gear	1.97	7.118
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.

CLUTCH PLATE THICKNESS	NUMBER REQUIRED	NEW COMPONENTS		SERVICE WEAR LIMITS	
		IN.	MM	IN.	MM
Friction plate (fiber)	8	0.0866 + 0.0031	2.200 + 0.079	0.006	0.15
Steel plate	6	0.0629 + 0.0020	1.598 + 0.051	0.006	0.15
Clutch pack				0.661 minimum	16.79 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**.



ITEM	TORQUE		NOTES
Access door mounting bolts	13-17 ft-lbs	18-23 Nm	LOCTITE THREADLOCKER 242 (blue), page 6-30
Clutch inspection cover TORX screws with washers	7-9 ft-lbs	9-12 Nm	page 6-3
Clutch mainshaft nut	70-80 ft-lbs	95-108 Nm	LOCTITE THREADLOCKER 262 (red), left hand threads, page 6-13
Countershaft retainer TORX screw	13-17 ft-lbs	18-23 Nm	LOCTITE THREADLOCKER 242 (blue), page 6-25
Engine sprocket nut	150-165 ft-lbs	203-224 Nm	LOCTITE THREADLOCKER 262 (red), page 6-13
Isolator bolts	100-110 ft-lbs	135.6-149.1 Nm	LOCTITE THREADLOCKER 262 (red), page 6-7
Primary chain adjuster locknut	10-12 ft-lbs	14-16 Nm	on interior of chaincase, page 6-4
Primary chain adjuster locknut	20-25 ft-lbs	27-34 Nm	on exterior of chaincase, page 6-4
Primary chain inspection cover screws	40-60 in-lbs	4.5-6.8 Nm	page 6-3
Primary cover bolts	80-110 in-lbs	9.0-12.4 Nm	3 lengths, page 6-5
Rear shock mounting bolts	40-45 ft-lbs	47.5-61.0 Nm	metric, page 6-7
Shift lever pinch screw	100-120 in-lbs	11.3-13.6 Nm	page 6-5
Shifter shaft assembly nuts	90-110 in-lbs	10.2-12.4 Nm	same torque for top and bottom nuts, page 6-30
Tie bar bolts	30-33 ft-lbs	40.7-44.7 Nm	page 6-7
Transmission detent plate nut	13-17 ft-lbs	18-23 Nm	page 6-19
Transmission drain plug	14-21 ft-lbs	19-28 Nm	page 6-5
Transmission sprocket nut	See note		LOCTITE THREADLOCKER 262 (red), left hand threads, special torque turn method, page 6-30
Transmission sprocket screws	90-110 in-lbs	10.2-12.4 Nm	replace after 3 removals, page 6-31

PRIMARY CHAIN

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 [PRIMARY DRIVE/CLUTCH, REMOVAL](#) on [page 6-10](#).

ADJUSTMENT/LUBRICATION

See [PRIMARY CHAIN](#) in Section 1 for inspection and adjustment procedures.

See [CLUTCH, TRANSMISSION FLUID](#) in Section 1 for complete lubrication service on the primary chain.

REMOVAL

Primary Cover

WARNING

To avoid accidental start-up of vehicle and possible personal injury, disconnect the battery cables before proceeding. Always disconnect the negative cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion producing personal injury.

1. Raise rear wheel off floor using [REAR WHEEL SUPPORT STAND](#) (Part No. B-41174).
2. Remove muffler. See [EXHAUST SYSTEM](#) in Section 2.
3. See [Figure 6-1](#). Place a drain pan under the engine. Remove drain plug (9) and drain lubricant from primary drive.
4. Remove shift lever assembly (12) and rubber washer (13). Do not to scratch primary cover (15).
5. Add freeplay to clutch cable. See [CLUTCH](#) in Section 1.

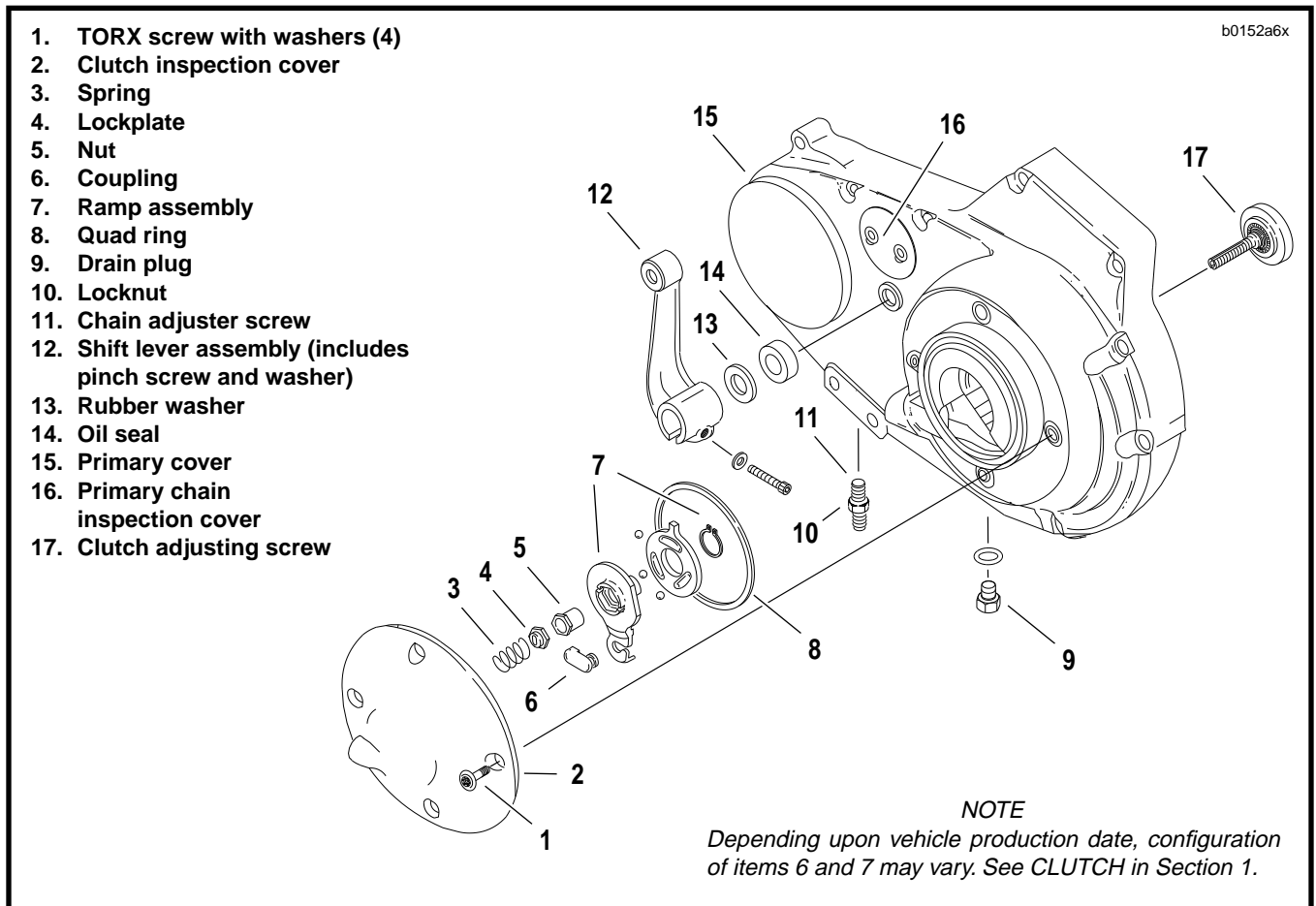


Figure 6-1. Primary cover



6. Loosen locknut (10). Turn chain adjuster screw (11) counterclockwise (outward) to relax primary chain tension.
7. Remove four TORX screws with washers (1) and clutch inspection cover (2). Remove and discard Quad ring (2) from groove in primary cover.
8. Slide spring (3) with attached hex lockplate (4) from flats of clutch adjusting screw (17).
9. Turn clutch adjusting screw (17) clockwise to release ramp and coupling mechanism. As the adjusting screw is turned, ramp assembly (7) moves forward. Unscrew nut (5) from end of adjusting screw.
10. 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.
11. Remove screws which secure primary cover. Remove cover and gasket. Discard gasket.
12. Remove and discard shift lever oil seal (14).

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 10-12 ft-lbs (14-16 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.
5. Install primary cover.

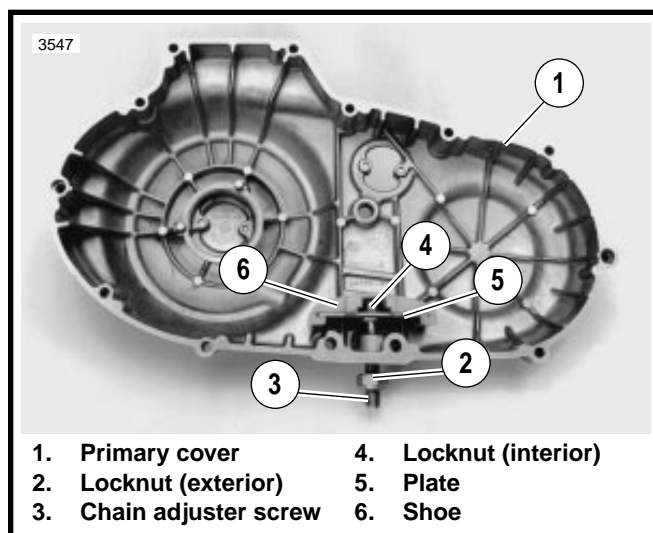


Figure 6-2. Removing Primary Chain Adjuster

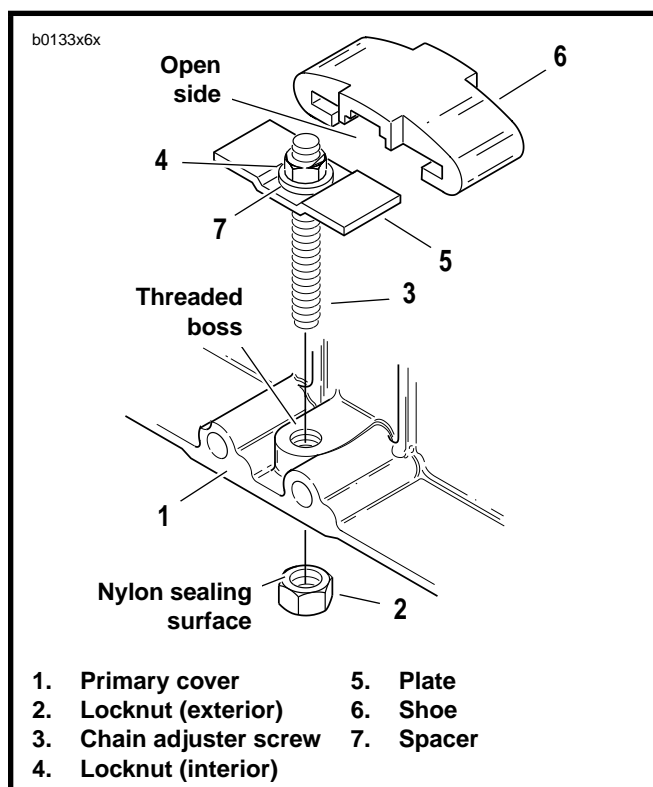


Figure 6-3. Primary Chain Adjuster

Primary Cover

1. Remove foreign material from magnetic drain plug. Install plug and tighten to 14-21 ft-lbs (19-28 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 bolts. Tighten bolts to 80-110 **in-lbs** (9.0-12.4 Nm).
4. See [Figure 6-1](#). Install **new** shift lever oil seal (14).
5. Fit coupling (6) over clutch cable end. 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 nut (5) on adjusting screw (17) until slot of screw is accessible with a screwdriver. Fit nut hex into recess of outer ramp and turn adjusting screw counterclockwise.
7. Fill transmission to proper level with fresh lubricant. See [CLUTCH, TRANSMISSION FLUID](#) in Section 1.
8. Adjust clutch. See [CLUTCH, ADJUSTMENT](#) in Section 1.
9. Adjust primary chain tension. See [PRIMARY CHAIN, ADJUSTMENT](#) in Section 1.
10. Install rubber washer (13) and shift lever assembly (12). Shift lever must bisect primary chain inspection cover. See [Figure 6-5](#). Tighten pinch screw to 100-120 **in-lbs** (11.3-13.6 Nm).
11. Install muffler. See [EXHAUST SYSTEM](#) in Section 2.

WARNING

Always connect positive battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion producing personal injury.

CAUTION

Hold battery cable when tightening battery terminal hardware. Failure to hold cable may cause battery damage.

12. Connect battery cables, positive cable first.

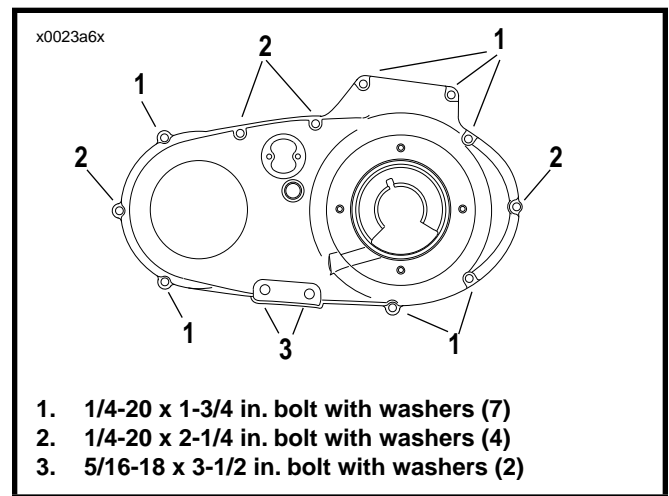


Figure 6-4. Install Primary Cover Bolts

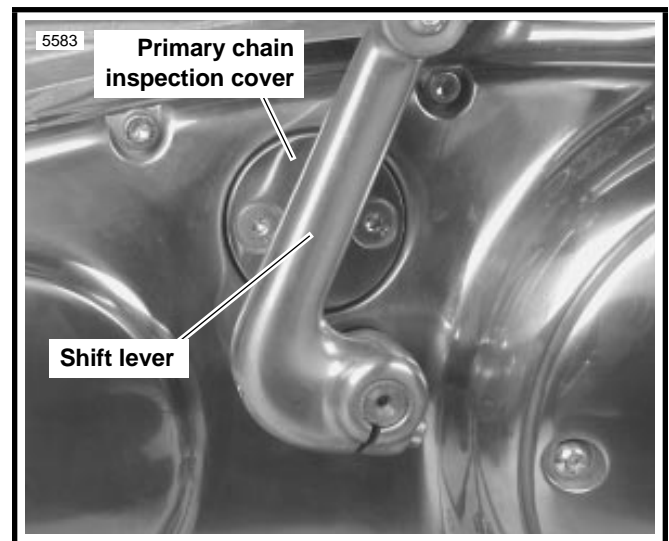


Figure 6-5. Shift Lever

SECONDARY DRIVE BELT

GENERAL

The secondary 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 [REAR BELT DEFLECTION](#) in Section 1 for inspection, adjustment 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.

1. Lift and secure the motorcycle.
 - a. Place vehicle on a lift and anchor front wheel in place.
 - b. Raise rear wheel off lift using [REAR WHEEL SUPPORT STAND \(Part No. B-41174\)](#).
2. Drain oil tank. See [ENGINE LUBRICATION SYSTEM](#) in Section 1.

⚠WARNING

To avoid accidental start-up of vehicle and possible personal injury, disconnect the battery cables before proceeding. Always disconnect the negative cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion producing personal injury.

⚠CAUTION

Hold battery cable when loosening battery terminal hardware. Failure to hold cable may cause battery damage.

3. Disconnect **both** battery cables, negative cable first.
4. Remove rear fender. See [FENDERS](#) in Section 2.
5. Remove rear caliper. See [REAR BRAKE CALIPER, REMOVAL/DISASSEMBLY](#) in Section 2.
6. Remove lower belt guard and sprocket cover. See [SPROCKET COVER](#) and [FENDERS](#) in Section 2.
7. Remove seat, fuel tank and tail section. See [TAIL SECTION, REMOVAL](#) in Section 2.
8. Remove air cleaner assembly. See [AIR CLEANER, REMOVAL](#) in Section 4.
9. Detach belt from rear sprocket.
 - a. Loosen rear axle nut (metric).
 - b. Loosen both rear axle adjuster nuts on swingarm.
 - c. Slide wheel forward.
 - d. Remove belt from rear sprocket.
10. Remove both rider footrests from frame.
11. See [Figure 6-6](#). Place a floor hoist behind the lift. Attach straps to frame and hoist. Raise hoist until straps tighten.
12. Remove rear shock mounting bolt (metric) from swingarm. Allow rear shock to hang from front mount.

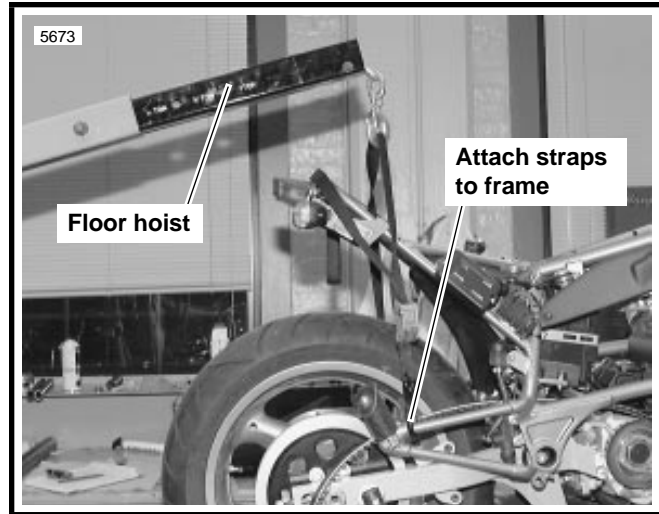


Figure 6-6. Floor Hoist

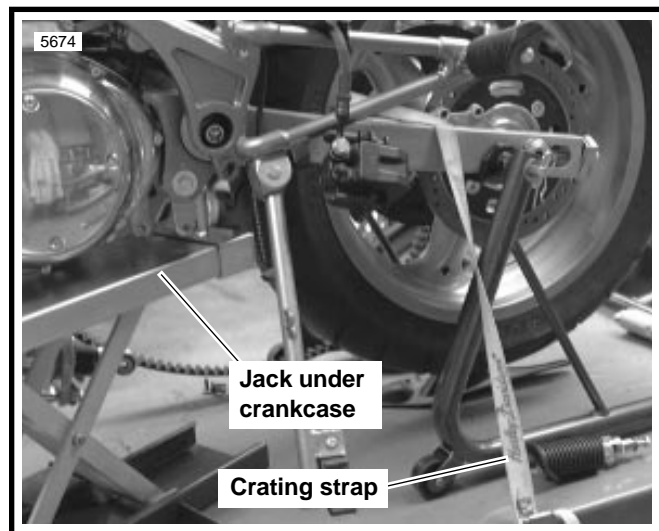



Figure 6-7. Crating Strap

13. Remove muffler and exhaust header. See [EXHAUST SYSTEM](#) in Section 2.
14. Detach feed, vent and return hoses from oil tank.
15. See [Figure 6-7](#). Place a jack underneath the rear swingarm and underneath the front of the crankcase.
16. Place a crating strap over swingarm and around lift. Tighten crating strap until snug.
17. Detach tie bars from frame mounts in the following sequence. Do not remove tie bars from engine.
 - a. Rear tie bar. Use a swivel socket.
 - b. Top tie bar.
 - c. Front tie bar and clutch cable clamp.
18. Remove isolator bolts and washers on each side.

- 
19. Slowly raise floor hoist until rubber isolators can be removed. Frame will rise while swingarm and engine remain secured to lift by crating strap.

NOTE

Rubber isolators align with a frame mounted metal pin.

20. Remove belt through gap between frame and swingarm mount block.

INSTALLATION

1. Install **new** belt over sprockets.
2. Install rubber isolators.
 - a. Align metal pin on frame with hole in isolator.
 - b. Slowly lower floor hoist to drop frame and isolators around swingarm mount block.

NOTE

If isolator fit is troublesome, place a flat tool such as a disposable putty knife between swingarm mount block and isolator. As frame lowers, withdraw tool when edge of isolator slides around edge of mount block.

3. Apply LOCTITE THREADLOCKER 262 (red) to isolator bolts. Install isolator bolts and washers through isolators and into swingarm mount block. Tighten bolts to 100-110 ft-lbs (135.6-149.1 Nm).
4. Attach tie bars to frame in the following order.
 - a. Place clutch cable clamp on front tie bar bolt. Clamp should hold cable on air cleaner side of motor. Insert bolt from front through frame and tie bar. Fasten with flat washer and nut. Tighten to 30-33 ft-lbs (40.7-44.7 Nm).
 - b. Insert bolt through top tie bar, washer, spacer and frame tab. Secure with locknut. Tighten to 30-33 ft-lbs (40.7-44.7 Nm).
 - c. Rear tie bar must be horizontal and below frame tab. Insert bolt upwards through tie bar and frame. Fasten with nut. Tighten to 30-33 ft-lbs (40.7-44.7 Nm).
5. Remove crating strap from lift and swingarm.
6. Remove jacks from underneath swingarm and crankcase.
7. Attach rear shock to swingarm with bolt (metric) and nut. Tighten to 40-45 ft-lbs (47.5-61.0 Nm).
8. Remove floor hoist straps from frame.
9. Connect and fill lubrication system. See [ENGINE LUBRICATION SYSTEM](#) in Section 1.

10. Install muffler and exhaust header. See [EXHAUST SYSTEM](#) in Section 2.
11. Align belt and rear wheel. See [REAR BELT DEFLECTION](#) in Section 1.
12. Install rider footrests. See [FOOTRESTS, INSTALLATION](#) in Section 2.
13. Install air cleaner. See [AIR CLEANER, INSTALLATION](#) in Section 4.
14. Install sprocket cover and rear belt guard. See [SPROCKET COVER](#) and [FENDERS](#) in Section 2.
15. Install rear fender. See [FENDERS, REMOVAL/INSTALLATION](#) in Section 2.
16. Install rear caliper. See [REAR BRAKE CALIPER, INSTALLATION](#) in Section 2.

⚠WARNING

After installing seat, pull upward on front of seat to be sure it is locked in position. If seat is loose, it could shift during vehicle operation and startle the rider, causing loss of control and personal injury.

17. Install tail section, fuel tank and seat. See [TAIL SECTION, INSTALLATION](#) in Section 2.

⚠WARNING

Always connect positive battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion resulting in personal injury.

⚠CAUTION

Hold battery cable when tightening battery terminal hardware. Failure to hold cable may cause battery damage.

18. Connect **both** battery cables, positive cable first.
19. Perform the following tests.
 - a. Check license plate lamp illumination.
 - b. Check oil level after starting vehicle and allowing motorcycle to reach normal operating temperature.
20. Remove supports.
 - a. Remove REAR WHEEL SUPPORT STAND.
 - b. Free front wheel and remove motorcycle from lift.

CLUTCH

GENERAL

See Figure 6-9. The purpose of the clutch is to smoothly disengage and engage the engine from the rear wheel for starting, stopping and shifting gears.

The clutch is a wet, multiple-disc clutch with six steel plates (19), one spring plate (20), and eight fiber (friction) plates (18) stacked alternately in the clutch shell (26). 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 = Friction plate, St = Steel plate, **Sp** = Spring plate)

The friction plates (clutch driving plates) are keyed to the clutch shell (26), 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 (23), which drives the rear wheel through the transmission and secondary drive belt.

When the clutch is engaged (clutch lever released), the diaphragm spring (11) applies strong inward force against the pressure plate (17); the pressure plate then presses the clutch plates (18, 19 and 20) 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 (26) is fully transmitted through the “locked” clutch plates to the clutch hub (23). 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 (17) is pulled outward (by clutch cable action) against the diaphragm spring (11), thereby compressing the diaphragm spring. With the pressure plate retracted, strong inward force no longer squeezes the clutch plates (18, 19 and 20) together. The friction plates (18) are now free to rotate at a different relative speed than that of the steel and spring plates (19, 20) (i.e. – slippage between the clutch plates occurs). The result is that the rotational force of the clutch shell (26) is no longer fully transmitted through the “unlocked” clutch plates to the clutch hub (23). The engine is free to rotate at a different speed than the rear wheel.

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.

CLUTCH RELEASE MECHANISM

ADJUSTMENT

See [CLUTCH, ADJUSTMENT](#) in Section 1.

DISASSEMBLY

⚠WARNING

To avoid accidental start-up of vehicle and possible personal injury, disconnect the battery cables before proceeding. Always disconnect the negative cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion producing personal injury.

1. 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.
2. See [Figure 6-8](#). Remove four TORX screws with washers (1) and clutch inspection cover (2).
3. Slide spring (3) with attached screw lockplate (4) from flats of adjusting screw (12).
4. 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.
5. Remove hook of ramp from cable end coupling (16). Remove cable end (10) from slot in coupling.
6. Remove retaining ring (13) from ramp assembly to separate inner and outer halves. Remove three balls (7) from ramp sockets.

CLEANING, INSPECTION AND REPAIR

1. Thoroughly clean all parts in cleaning solvent.
2. See [Figure 6-8](#). 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 [CLUTCH, TRANSMISSION FLUID](#) in Section 1.

ASSEMBLY

1. See [Figure 6-8](#). Apply multi-purpose grease to balls (7) and ramps (6, 15). Insert balls in sockets of outer ramp. Install inner ramp on hub of outer ramp with tang 180° from hook of outer ramp. Install retaining ring in groove of outer ramp hub.
2. Fit coupling (16) over cable end. Place hook of ramp around coupling button and rotate assembly counterclockwise until tang on inner ramp fits in slot of primary cover (11).
3. Thread nut (5) on adjusting screw (12) until slot of screw is accessible with a screwdriver. Fit nut hex into recess of outer ramp and turn adjusting screw counterclockwise until resistance is felt.
4. Adjust clutch release mechanism. See [CLUTCH, ADJUSTMENT](#) in Section 1.

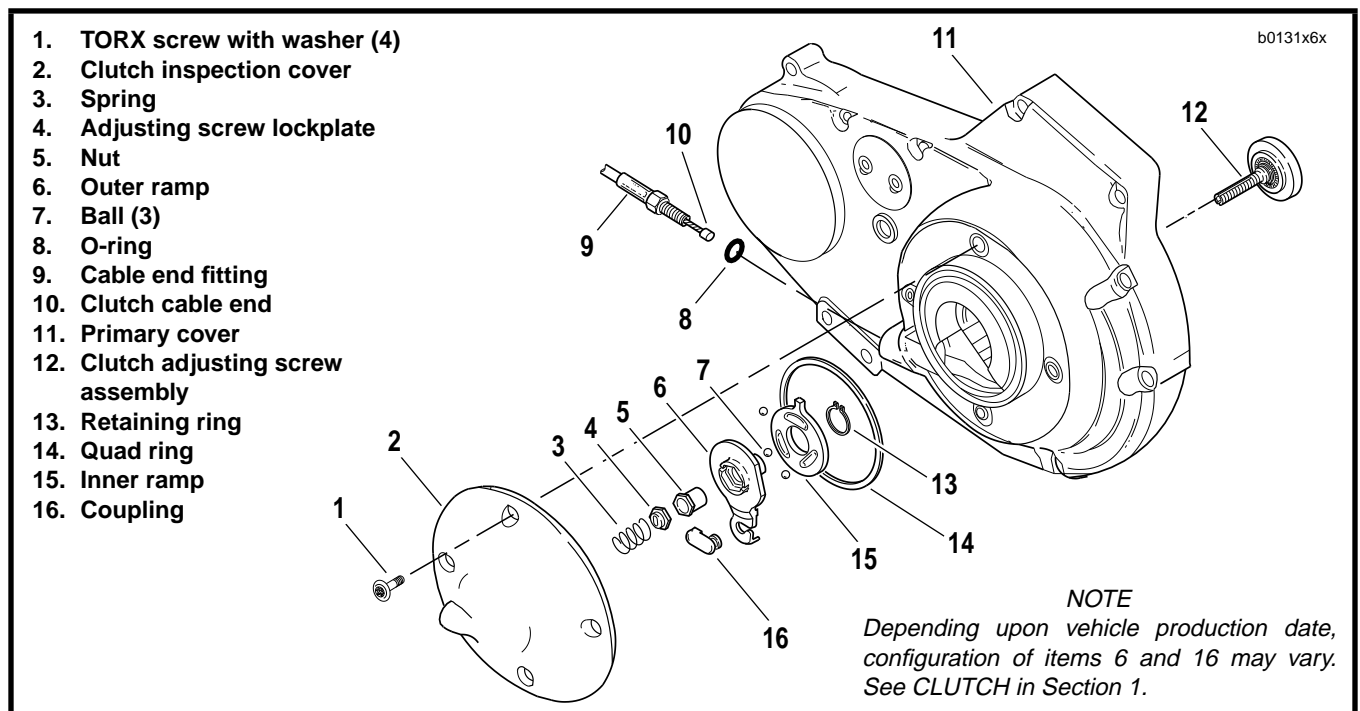


Figure 6-8. Clutch Release Mechanism

PRIMARY DRIVE/CLUTCH

REMOVAL

⚠WARNING

To avoid accidental start-up of vehicle and possible personal injury, disconnect the battery cables before proceeding. Always disconnect the negative cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion producing personal injury.

NOTE

See *Figure 6-9*. If replacement of clutch pack (friction plates [18], steel plates [19], and spring plate [20]) is the only service work to be performed, perform REMOVAL Step 1 only, and then proceed to DISASSEMBLY, NOTE.

1. Remove primary cover. See PRIMARY CHAIN on page 6-3.
2. Install SPROCKET LOCKING LINK (Part No. HD-38362). Remove the engine sprocket nut. 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.
3. Remove retaining ring (12). Remove adjusting screw assembly (13, 14, 15 and 16) from pressure plate (17).

⚠CAUTION

Clutch hub nut (21) has left-hand threads. To prevent damage, turn nut clockwise to loosen and remove from mainshaft.

4. Remove nut (21) and washer (22). Remove the clutch assembly, primary chain, and engine sprocket as an assembly from the vehicle.
5. If primary chain is damaged or excessively worn, remove it from engine sprocket and clutch assembly; replace original primary chain with a **new** one.

DISASSEMBLY

NOTE

See *Figure 6-9*. If replacement of clutch pack (friction plates [18], steel plates [19], and spring plate [20]) is the only service work to be performed, perform DISASSEMBLY Steps 2, 3, 4, 5 and 7 only, and then proceed to INSPECTION AND REPAIR, NOTE. **Observe all ⚠WARNING and ⚠CAUTION statements which apply to the steps specified.**

1. See *Figure 6-9*. With clutch assembly removed from primary chaincase, reinstall adjusting screw assembly (13, 14, 15 and 16) into pressure plate (17), noting that two tabs on perimeter of release plate (13) must be inserted into corresponding recesses in pressure plate (17). Secure the adjusting screw assembly with retaining ring (12).

⚠WARNING

See *Figure 6-10*. 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, possibly causing personal injury.

2. Thread the CLUTCH SPRING FORCING SCREW (Part No. HD-38515-91) (item 1, *Figure 6-10*.) onto the clutch adjusting screw (item 16, *Figure 6-9*.) Place the bridge (item 2, *Figure 6-10*.) of SPRING COMPRESSING TOOL (Part No. HD-38515-A) against diaphragm spring (item 10, *Figure 6-9*.) Thread the tool handle (item 3, *Figure 6-10*.) onto end of forcing screw.

⚠CAUTION

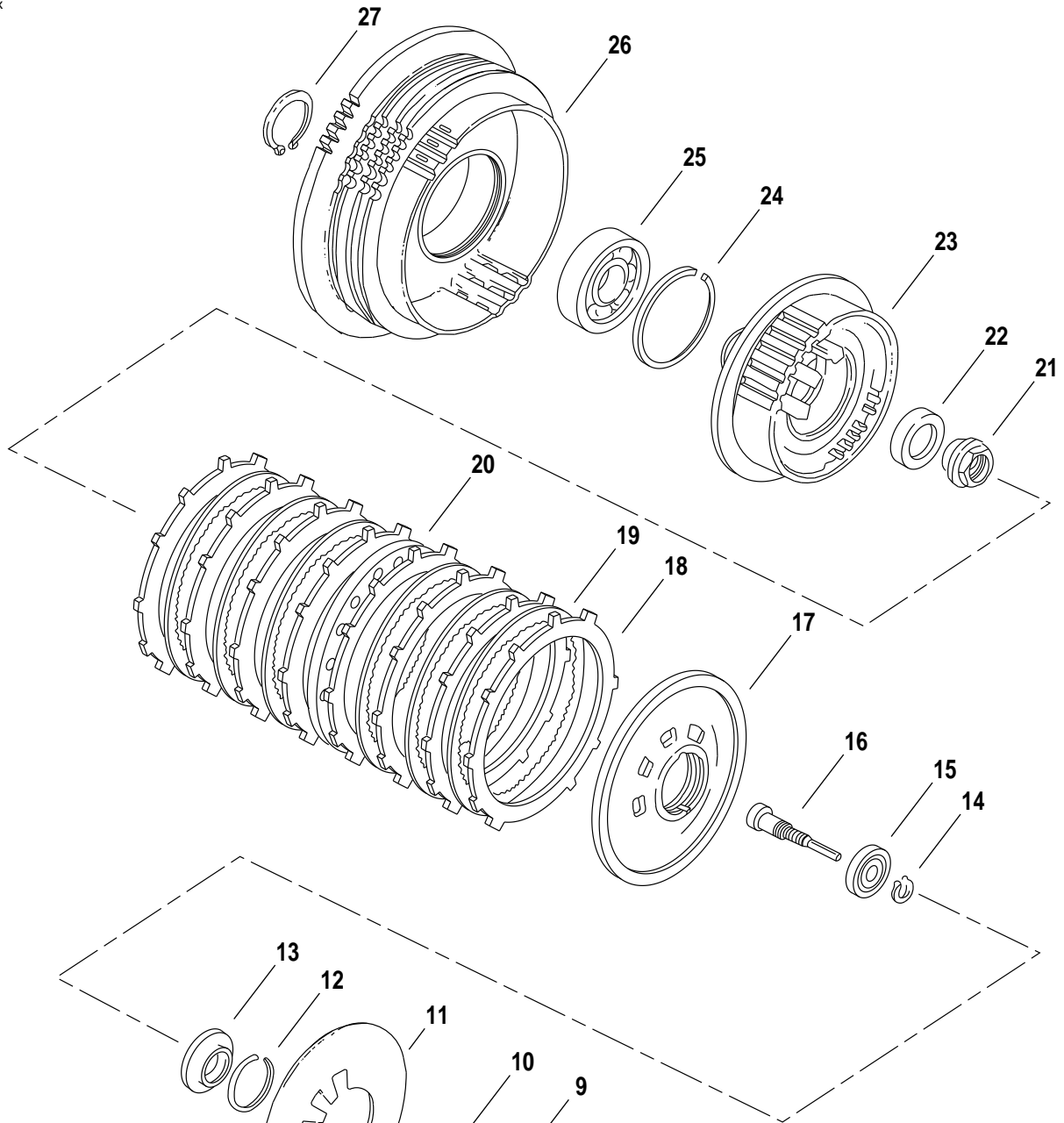
See *Figure 6-9*. Turn compressing tool handle only the amount required to remove spring seat (10) and snap ring (9). Excessive compression of diaphragm spring could damage clutch pressure plate.

3. See *Figure 6-10*. With a wrench on the clutch spring forcing screw flats to prevent the forcing screw from turning, turn handle clockwise until tool relieves pressure on snap ring (9) and spring seat (10).
4. Remove snap ring (9) and spring seat (10) from the groove in clutch hub (23) prongs. Remove the assembly of diaphragm spring (11), pressure plate (17), adjusting screw components, and compressing tool.
5. Turn the compressing tool handle counterclockwise until the clutch spring forcing screw disconnects from the clutch adjusting screw (16). Remove snap ring (9), spring seat (10), and diaphragm spring (11) from pressure plate (17) assembly.
6. Remove retaining ring (12) and adjusting screw assembly (13, 14, 15 and 16) from pressure plate (17). If necessary, disassemble adjusting screw assembly by removing retaining ring (14), and then separating the remaining adjusting screw components (13, 15 and 16).
7. Remove the clutch pack, which consists of eight friction plates (18), six steel plates (19), and a spring plate (20), from the clutch hub (23).

⚠CAUTION

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.

8. Remove retaining ring (27) from inboard end of clutch hub (23). Using an arbor press, separate clutch hub (23) from assembly of clutch shell (26), bearing (25), and retaining ring (24).
9. Remove retaining ring (24) from groove in clutch shell (26). Press on the inboard side of bearing (25) outer race to remove bearing from clutch shell.



- | | | |
|----------------------|------------------------|--------------------|
| 1. Spring | 17. Pressure plate | 23. Clutch hub |
| 2. Locking plate | 18. Friction plate (8) | 24. Retaining ring |
| 3. Well nut | 19. Steel plate (6) | 25. Bearing |
| 4. Coupling | 20. Spring plate | 26. Clutch shell |
| 5. Outer ramp | 21. Mainshaft nut | 27. Retaining ring |
| 6. Ball (3) | 22. Washer | |
| 7. Inner ramp | | |
| 8. Retaining ring | | |
| 9. Snap ring | | |
| 10. Spring seat | | |
| 11. Diaphragm spring | | |
| 12. Retaining ring | | |
| 13. Release plate | | |
| 14. Retaining ring | | |
| 15. Bearing | | |
| 16. Adjusting screw | | |

NOTE
 Depending upon vehicle production date, configuration of items 4 and 5 may vary. See **CLUTCH** in Section 1.

Figure 6-9. Clutch Assembly

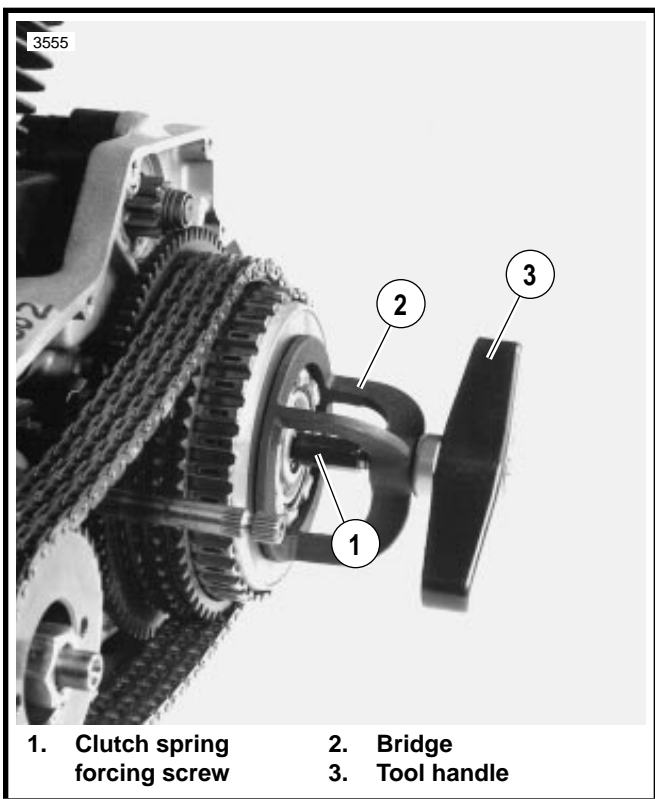


Figure 6-10. Compressing Clutch Diaphragm Spring

INSPECTION/REPAIR

NOTE

If replacement of clutch pack (friction plates [18], steel plates [19], and spring plate [20]) is the only service work to be performed, perform all INSPECTION AND REPAIR steps (except Step 5), and then proceed to ASSEMBLY, NOTE.

See Figure 6-9. Wash all parts, except the friction (driven) plates (18) and bearing (25), in cleaning solvent. Blow dry with compressed air. Examine the clutch components as follows:

1. Check for worn lining surface.
2. Inspect for checked or chipped lining.
3. Inspect each steel (drive) plate (19) for grooves. Also, check each steel plate for flatness in several places using a feeler gauge; the plate must be placed on a surface plate or flat surface. Replace any plates that are damaged or that are warped more than 0.006 in. (0.15 mm).
4. Wipe the lubricant from the eight friction plates, and stack them on top of each other. Measure the thickness of the eight stacked friction plates with a dial caliper or micrometer. The minimum thickness must be 0.661 in. (16.79 mm). If the thickness is less than specified, the friction plates and steel plates must be discarded, and a new set of both friction and steel plates must be installed.
5. Check the bearing (25) for smoothness by rotating the clutch shell while holding the clutch hub. If bearing is rough or binds, it must be replaced.

6. Check the primary chain sprocket and the starter ring gear on the clutch shell (26). If either sprocket or ring gear are badly worn or damaged, replace the clutch shell.
7. Check the slots that mate with the clutch plates on both clutch shell and hub. If slots are worn or damaged, replace shell and/or hub.
8. Check the diaphragm spring (11) for cracks or bent tabs. Install a new spring if either condition exists.

ASSEMBLY

NOTE

See Figure 6-9. If replacement of clutch pack (friction plates [18], steel plates [19], and spring plate [20]) is the only service work to be performed, perform ASSEMBLY Steps 2, 5, 6, 7, and 8 only, and then proceed to INSTALLATION, NOTE. Observe all **WARNING** and **CAUTION** statements which apply to the steps specified.

1. See Figure 6-9. If the assembly of the clutch hub (23) and shell (26) was disassembled, press new bearing (25) in clutch shell; secure bearing with a new retaining ring (24). Press inboard end of clutch hub into shell bearing; secure with new retaining ring (27) on end of hub.
2. Install the clutch pack, which consists of eight friction 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

INBOARDOUTBOARD

F	=	Friction plate
St	=	Steel plate
Sp	=	Spring plate

If disassembled, assemble bearing (15) and adjusting screw (16) in release plate (13); secure with new retaining ring (14).

3. Install adjusting screw assembly (13, 14, 15 and 16) into pressure plate (17), noting that two tabs on perimeter of release plate (13) must be inserted into corresponding recesses in pressure plate (17). Secure the adjusting screw assembly with retaining ring (12).
4. Position diaphragm spring (11), with its concave side facing inboard (toward pressure plate), onto pressure plate (17) assembly. Position spring seat (10), with its flat, larger O.D. side facing inboard (toward diaphragm spring), and a new snap ring (9) onto convex (outboard) side of diaphragm spring (11).
5. Thread the CLUTCH SPRING FORCING SCREW (Part No. HD-38515-91) (item 1, Figure 6-10.) onto the clutch adjusting screw (item 16, Figure 6-9.). Place the bridge (item 2, Figure 6-10.) of SPRING COMPRESSING TOOL (Part No. HD-38515-A) against diaphragm spring (item 10, Figure 6-9.). Thread the tool handle (item 3, Figure 6-10.) onto end of forcing screw. Do not tighten compressing tool against diaphragm spring at this time.

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- 
6. See [Figure 6-9](#). Align square openings of pressure plate (17) and diaphragm spring (11) so that the assembly can be installed over prongs of clutch hub (23). Place assembly of spring seat, snap ring, diaphragm spring, pressure plate, adjusting screw components, and compressing tool onto clutch hub (23), and against clutch pack.

CAUTION

Turn compressing tool handle only the amount required to install spring seat (10) and snap ring (9). Excessive compression of diaphragm spring (11) could damage clutch pressure plate.

7. Place a wrench on the clutch spring forcing screw flats to prevent the forcing screw from turning. Turn compressing tool handle clockwise until diaphragm spring (11) compresses just enough to install spring seat (10) and snap ring (9) into the groove in clutch hub (23) prongs. With snap ring positioned against flange face (outboard side) of spring seat, and fully seated in groove of clutch hub, carefully loosen and remove compression tool.
8. Remove retaining ring (12). Remove adjusting screw assembly (13, 14, 15 and 16) from pressure plate (17).

INSTALLATION

NOTE

See [Figure 6-9](#). If replacement of clutch pack (friction plates [18], steel plates [19], and spring plate [20]) was the only service work performed, perform **INSTALLATION Step 5** only.

1. Install the engine sprocket, clutch assembly, and primary chain as a unit into primary chaincase.

2. Install **SPROCKET LOCKING LINK** (Part No. HD-38362). Apply two or three drops of LOCTITE THREADLOCKER 262 (red) onto threads of sprocket shaft. Install the engine sprocket nut. Tighten nut to 150-165 ft-lbs (203-224 Nm).

CAUTION

Washer (22) must be installed with the word “out” facing the mainshaft nut (21) or transmission may be damaged.

3. Apply two or three drops of LOCTITE THREADLOCKER 262 (red) onto threads on end of mainshaft. Install washer (22) and nut (21) (**left-hand threads**) on mainshaft. Tighten nut (21) to 70-80 ft-lbs (95-108 Nm).
4. Install adjusting screw assembly (13, 14, 15 and 16) in the pressure plate (17), noting that two tabs on perimeter of release plate (13) must be inserted into corresponding recesses in pressure plate (17). Secure assembly with a **new** retaining ring (12).
5. Install primary cover. See [PRIMARY CHAIN](#) on [page 6-5](#).

WARNING

Always connect positive battery cable first. If the positive cable should contact ground with the negative cable installed, the resulting sparks may cause a battery explosion resulting in personal injury.

6. Connect battery cables, positive cable first.

TRANSMISSION

GENERAL

See [Figure 6-11](#). 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.

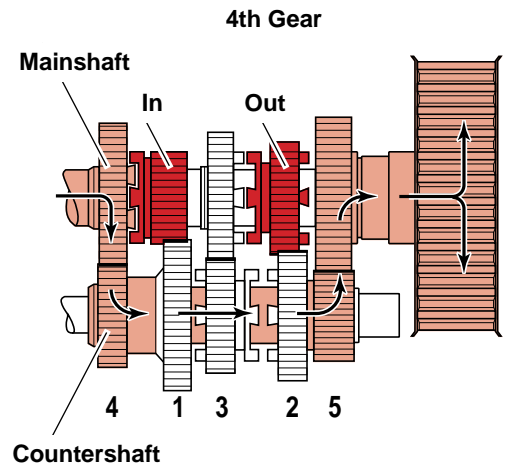
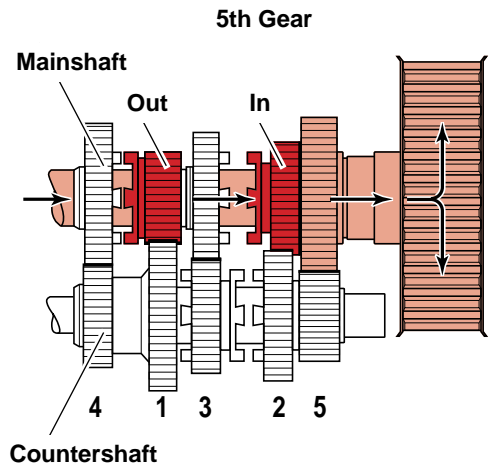
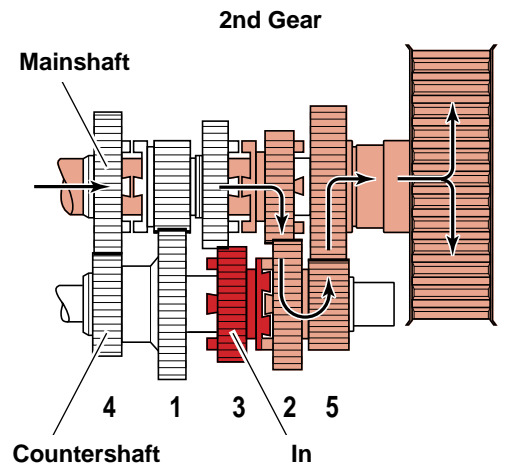
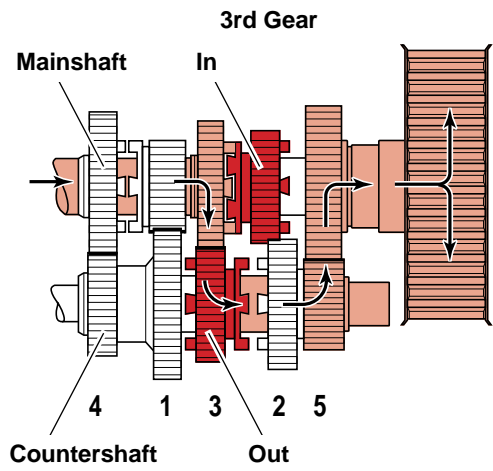
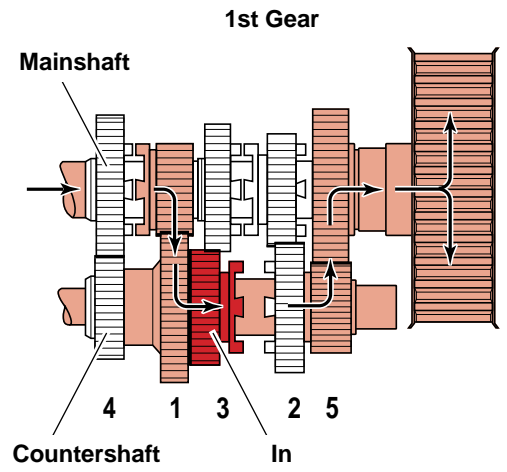
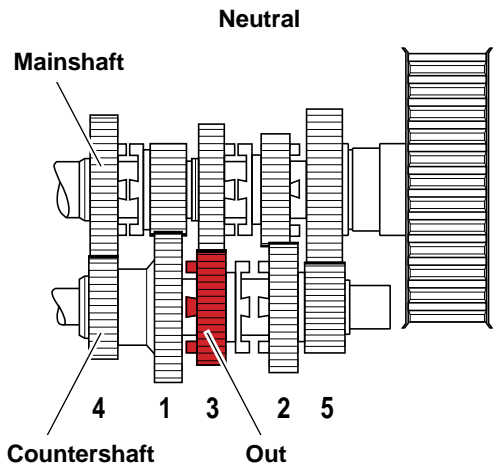
The transmission is foot-operated by the gear shifter lever, which transmits the force through a gear shifter shaft. The shifter shaft actuates a pawl and a shifter fork drum. The shifter fork drum moves shifter forks, which slide a series of shifter clutch gears, on the mainshaft and countershaft, into 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 [CLUTCH, TRANSMISSION FLUID](#) in Section 1 for more information.





- Sliding member



- Power flow

Figure 6-11. Transmission Power Flow



HOME



TRANSMISSION CASE

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 rear fender. See [FENDERS](#) in Section 2.
3. See [Figure 6-12](#). Loosen rear axle nut (metric). Reduce tension on secondary drive belt by turning axle adjuster nuts on each side of swingarm an equal number of turns counterclockwise. Move rear wheel as far forward as possible.
4. Remove muffler. See [EXHAUST SYSTEM](#) in Section 2. Place a drain pan under the engine. Remove drain plug and drain lubricant from primary drive/transmission.
5. Remove swingarm/drive support screws and retaining nut. Remove sprocket cover, washer and spacer.
6. See [Figure 6-13](#). 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 [PRIMARY CHAIN](#) on [page 6-3](#).
10. Remove clutch assembly, primary chain and engine sprocket. See [PRIMARY DRIVE/CLUTCH](#) on [page 6-10](#).
11. See [Figure 6-14](#). Lock transmission in gear. Remove countershaft TORX screw and retainer.
12. See [Figure 6-15](#). Detach spring (1) from groove in post (2).
13. Remove retaining ring (10) and detent plate (9). You will need to use a **new** retaining ring for installation.
14. Remove two locknuts (3) and washers (11) which attach shifter shaft assembly (6) to studs at transmission case. Remove shifter shaft assembly.
15. Remove five access door bolts (7) and washers (8). Remove transmission assembly by pulling it straight outward, away from transmission case.

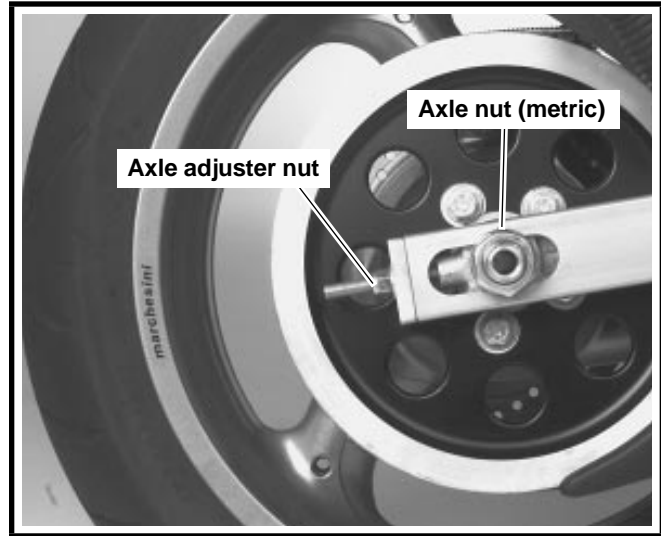


Figure 6-12. Secondary Drive Belt Adjustment

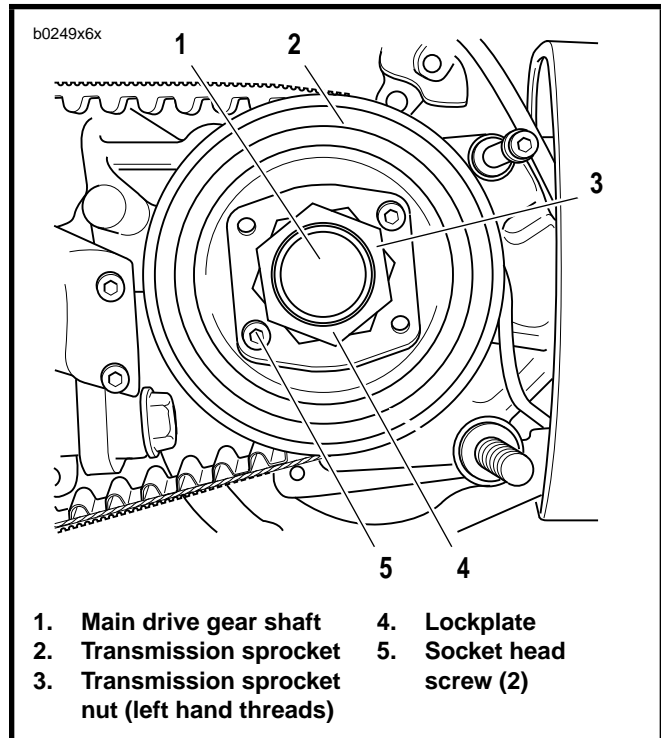


Figure 6-13. Transmission Sprocket

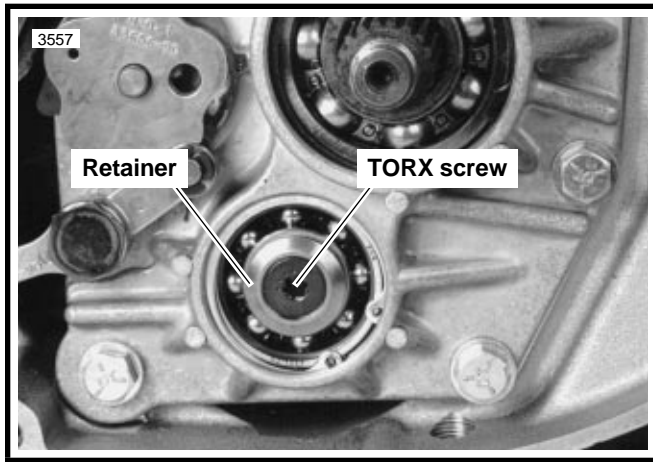


Figure 6-14. Countershaft Retainer

CLEANING, INSPECTION AND REPAIR

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 6-16](#). The neutral indicator switch is threaded into the transmission portion of the right crankcase half. See [NEUTRAL INDICATOR SWITCH](#) in Section 7 for testing, removal and installation procedures.

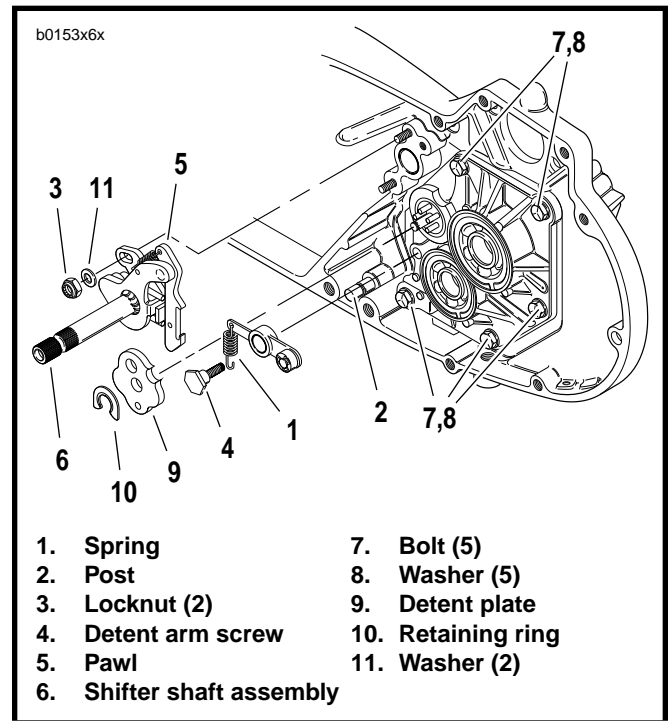


Figure 6-15. Shifter Shaft Assembly

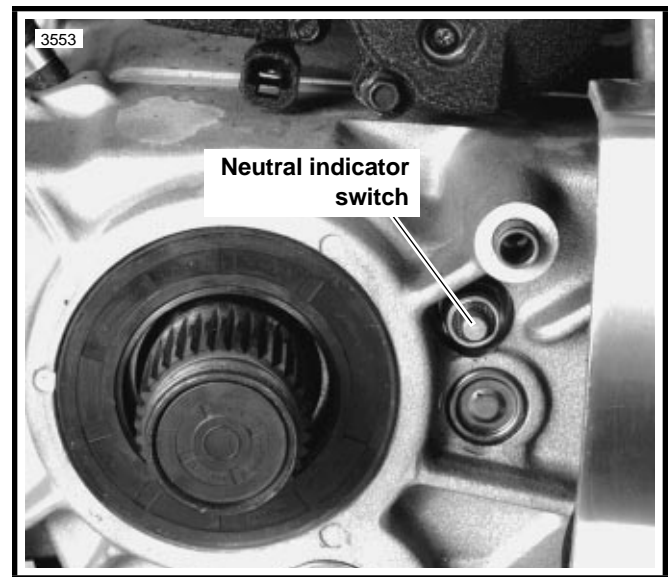


Figure 6-16. Neutral Indicator Switch

SHIFTER FORKS AND DRUM

DISASSEMBLY

1. Remove transmission assembly. See [TRANSMISSION CASE, REMOVAL](#) on [page 6-16](#). Mount transmission assembly in vise with protected jaws.

2. See [Figure 6-17](#). Remove nut (10), washer (14), screw (18), drum lock plates (8, 9), detent arm (16), and spring (17).

3. Remove and discard the three fork cotter pins (4).

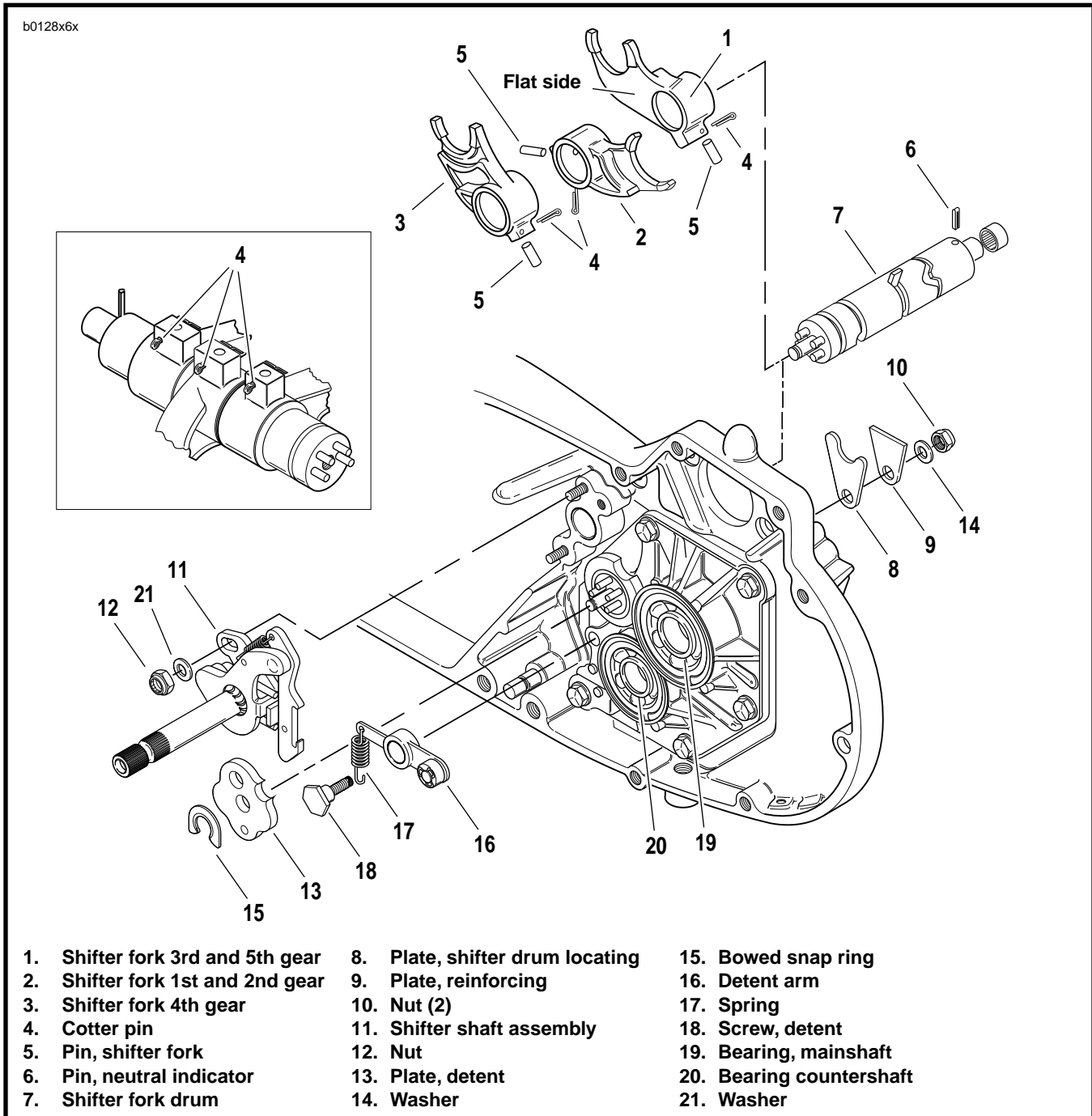


Figure 6-17. Shifter Mechanism

4. Remove three shift fork pins (5). A small magnet is useful in freeing the fork pins (5).
5. Slide shifter drum (7) away from access door, through shifter forks. The neutral switch pin prevents removal in the other direction.
6. Remove shift forks (1, 2 and 3).

CLEANING, INSPECTION AND REPAIR

1. See [Figure 6-17](#). Clean all parts except bearings (19, 20) with solvent.
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 [ACCESS DOOR BEARINGS](#) on [page 6-28](#).
3. Inspect shifter drum (7) for cracks or wear. Replace if necessary.

ASSEMBLY

1. See [Figure 6-18](#) for shifter fork identification. See [Figure 6-17](#). Lubricate the shaft bore in fork (1) with SPORT-TRANS FLUID. 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.

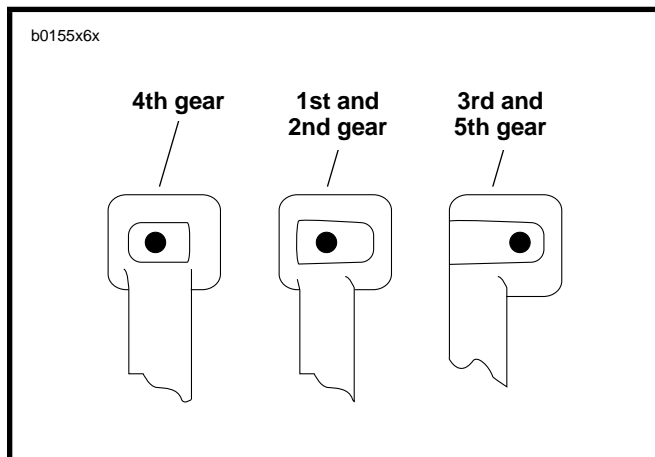


Figure 6-18. Shifter Fork Identification

2. Lubricate the shaft bore in fork (2) with SPORT-TRANS FLUID. 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.
3. Lubricate the shaft bore in fork (3) with SPORT-TRANS FLUID. 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.
4. See [Figure 6-17](#). Position the shifter drum shaft so that the neutral indicator switch activator pin (6) is upward. The shaft is then in the neutral position. Insert the pin end of drum shaft (7) through the hubs of shifter forks (1, 2 and 3) and through the bearing in access cover.

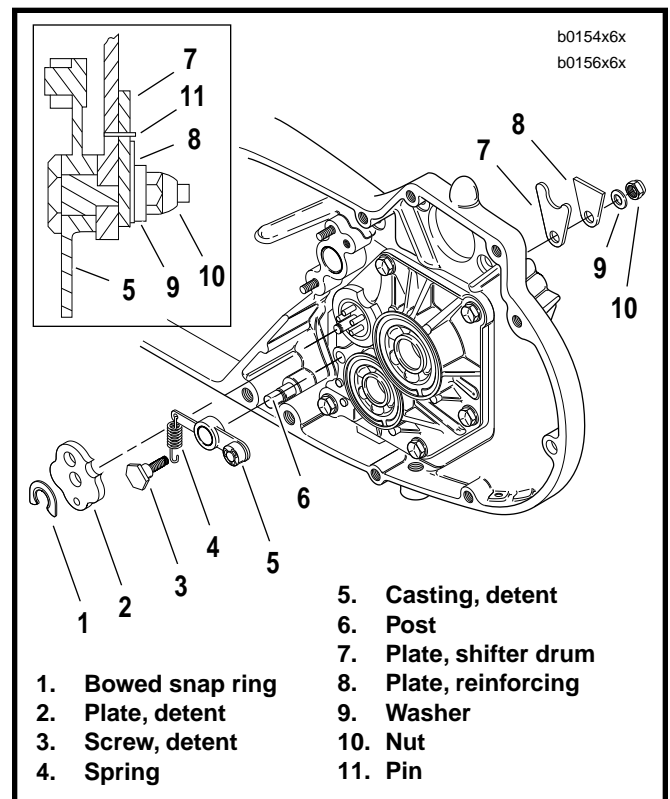


Figure 6-19. Detent Plate Mounting

5. Align the hole through the top of each shifter fork with the appropriate cam groove in the shifter drum. Lubricate pins (5) with SPORT-TRANS FLUID. Drop pins (5) through the holes in shifter forks. With a small screwdriver press on the pins while manipulating the forks back and forth until the pin seats in the drum groove. Secure pins in place with **new** cotter pins (4).

CAUTION

The cotter pins must be inserted through the shifter forks as shown in the inset of [Figure 6-17](#) to prevent possible damage to cotter pins (4).

NOTE

See [Figure 6-19](#). Detent plate (2) and bowed snap ring (1) are not installed at this time. These parts are installed during transmission installation after the final shifter pawl adjustment is made. See [TRANSMISSION INSTALLATION AND SHIFTER PAWL ADJUSTMENT](#) on [page 6-30](#).

6. At the inside of the access door, place the shifter drum plate (7) in the groove of the drum shaft. See inset [Figure 6-19](#). Take care to correctly align the drum plates (7) and (8) with the pin pressed in the drum plate. Take detent screw (3) and insert it through detent arm (5), access door, shift drum plate (7), drum reinforcement plate (8), and washer (9). Thread nut (10) on detent screw and tighten to 13-17 ft-lbs (18-23 Nm).