

**PRIMARY ASSEMBLY PARTS LIST**

ITEM	DESCRIPTION	QTY
1	Drain plug, 3/8-24	1
2	Primary cover screws 1/4-20 x 1" SHCS	14
3	Outer primary	1
4	O-ring, inner-to outer primary	1
5	Inspection cover	1
6	Gasket, inspection cover	1
7	Inspection cover screws 1/4-20 x 1/2" SHCS, SS	4
22	Chain adjuster lock nut	1
25	Engine sprocket nut, 7/8-14	1
26	Engine sprocket washer	1
31	Locking tab	8
32	Inner primary to transmission screw, 5/16-18 x 1-1/4"	5
33	Inner primary to transmission screw, 5/16-18 x 1-1/2" hex	1
34	Zero-offset, inner primary to engine screw, 5/16-18 x 1-3/4" hex SHCS 1/2"-offset primary 5/16-18 x 2-1/4" hex SHCS	2
35	Inner primary to engine screws 1-1/4" for zero offset primary, 1-1/2" for 1/2" offset primary	2
36	Inner primary, zero offset, or Inner primary, 1/2" offset	1
37	O-ring, primary to engine	1
38	O-ring, primary to transmission	1
39	O-ring, starter	1
40	O-ring, primary to transmission, small	6
41	Engine sprocket, 29-tooth zero offset	1
42	Chain, 428-2 double row	1
43	Clutch assembly	1
54	External snap ring, 10 mm	1
55	Tensioning shoe	1
56	Chain adjuster assembly	1
57	Dowel, starter 5/16 x 3/4"	1
58	Dowel pin, primary 1/4 x 3/4"	2
59	Engine sprocket cover	1
60	Derby cover	1
61	Screws, 1/4-20 x 1/2" SHCS, SS	8
62	3/8" lock washer, SS, polished	2
63	Starter screws	2
64	Wiper seal	1
65	Chain adjust screw 5/16-18 x 7/8" FHCS	2
66	Vent fitting w/washer	1
67	O-ring, primary to engine	2

**CLUTCH ASSEMBLY PARTS LIST**

ITEM	DESCRIPTION	QTY
11	Retaining ring, keyhole fitting	1
12	Throw-out bearing assembly	1
13	Pivot plate screws 5/16-18 x 2" hex	4
14	Clutch pivot plate	1
15	Clutch diaphragm spring	1
16	Seat, diaphragm spring	1
17	Pressure plate	1
18	Flanged hub screw 5/16-18 x 3/4" SHCS	4
19	Clutch pack	1
20	Inner hub	1
21	Flanged hub	1
23	Clutch nut ( <b>left-hand thread</b> )	1
24	Washer, clutch nut, 1 inch I.D.	1
27	Retaining clip, 35 x 2.50 mm	1
28	Outer hub w/sprocket	1
29	5/16-24 x 5/8" hex screw, clutch carrier	6
30	Bearing carrier	1

**PULLEY COVER/CLUTCH PUSHROD PARTS LIST**

INDEX	DESCRIPTION	QTY.
8	Clutch adjust cover	1
9	Pushrod release cover O-ring	1
10	Clutch pushrod jam nut	1
44	Clutch pushrod	1
45	Pulley cover	1
46	Pulley cover screws 5/16-18 x 1" SHCS	3
47	Inner access cover mounting screws	5
48	Inner access cover	1
49	Inner access cover gasket	1
50	Inner ramp	1
51	Ferrule	1
52	Outer ramp	1
53	Ball bearings	3

**FLUIDS**

Primary fluid	32 oz.
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**TORQUE VALUES**

**NOTE:** All fasteners are Grade 5 or above. Thoroughly clean threads of all screws removed prior to assembly. Thoroughly clean internal threads at all screw locations. Use Loctite products as indicated. Use torque values specified.

DESCRIPTION	INDEX	TORQUE	LOCTITE
Primary drain plug	(1)	48 in•lbs	None
Outer primary screws	(2)	100 in•lbs	222 with 7649 primer N
Inspection cover screws	(7)	54 in•lbs and then 108 in•lbs	None
Clutch pushrod lock nut	(10)	30 ft•lbs	None
Pivot plate screws	(13)	20 ft•lbs	2760
Clutch hub screws	(18)	20 ft•lbs	2760
Chain adjuster lock nut	(22)	25 ft•lbs	None
Clutch hub nut	(23)	80 ft•lbs	2760
Engine sprocket nut	(25)	175 ft•lbs	2760
Ring gear screws	(29)	20 ft•lbs	2760
Inner primary to transmission screws	(32, 33)	14-16 ft•lbs	2440
Primary engine screws	(34)	20 ft•lbs	2440
Pulley cover screws	(46)	20 ft•lbs	2440
Inner access (ball ramp) cover screws	(47)	24 in•lbs	2440
Derby and sprocket cover screws	(61)	6 ft•lbs	2440
Starter screws	(63)	20 ft•lbs	Anti-Seize
Chain adjust screw	(65)	20 ft•lbs	2760
Vent fitting	(66)	10 in•lbs	2440

**NOTE:** Before performing *any* of the following procedures, disconnect battery, ground cable first.

**WARNING! TO PREVENT SPARKING, ALWAYS DISCONNECT GROUND CABLE FIRST AND RECONNECT LAST. SPARKS MAY CAUSE FLAMMABLE SUBSTANCES TO IGNITE OR EXPLODE.**

**CLUTCH ADJUSTMENT**

**NOTE:** Make all clutch adjustments with the system at ambient temperature.

1. Support the motorcycle upright and level.
2. Slide clutch cable adjuster boot away from adjusting hardware.
3. Turn clutch cable adjuster to provide maximum slack in cable.
4. Remove clutch adjust cover (8) and O-ring (9).
5. Loosen clutch pushrod jam nut (10).

**NOTE:** Only light force is needed to seat pushrod.

6. Turn clutch pushrod clockwise with a 7/32" Allen wrench to remove all free play, then turn clutch pushrod 1/4-turn, counter-

clockwise. Keep pushrod from rotating with a 7/32" Allen wrench and tighten jam nut.

**NOTE:** Thoroughly clean the clutch adjust cover (8), removing all oil and residue from the seat area and cap. Install when dry to prevent part from vibrating loose.

7. Install clutch adjust cover.

**NOTE:** Lubricate clutch cable with a dry-film lubricant such as Bike-Aid.

8. Adjust clutch cable at adjuster to provide 1/16" free play between clutch lever and clutch lever housing.
9. Tighten clutch cable adjuster locknut.
10. Slide clutch cable adjuster boot over hardware.

**SETTING PRIMARY CHAIN TENSION**

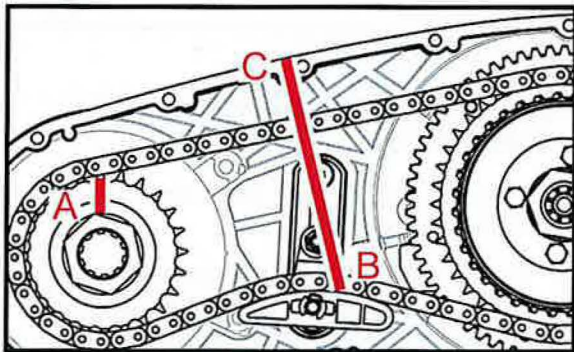
**NOTE:** Set chain slack at the high side of the tolerance range if possible. Check slack only at the tightest spot.

1. Remove inspection cover and outer primary as described in next section.
2. Adjust the chain tension shoe to a point resulting in a slight amount of chain slack

and tighten the adjustment bracket nut enough to prevent slippage.

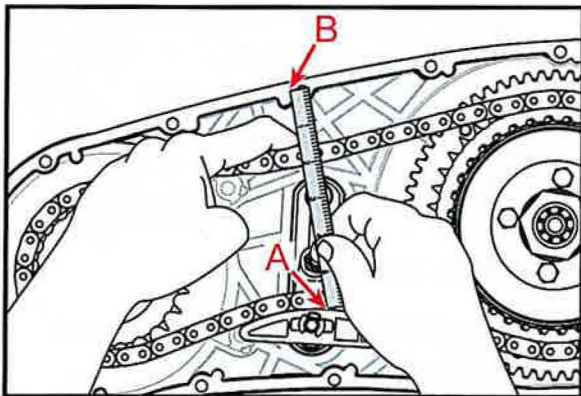
- To find the tightest spot in the chain, mark a spot on front sprocket (see "A" in image below) and rotate three full turns, continually checking chain tightness as you rotate the assembly.

**NOTE:** Use the tightest spot for all measurements and adjustments needed.



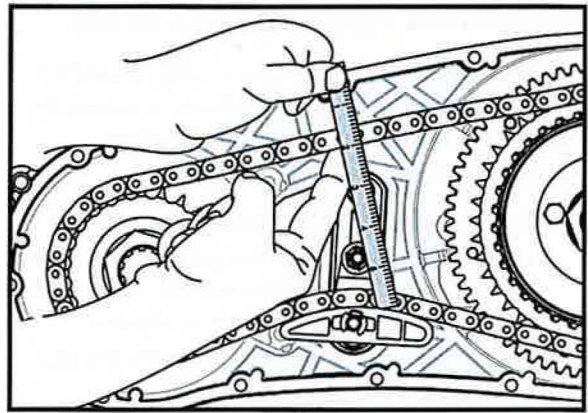
- Mark on front sprocket.
- Adjustment shoe measurement location.
- Top primary bolt hole.

- Lightly press down at the center of the chain link with ruler in positions A and B shown below and note the measurement.



Typical.

- Lightly press the chain up at the center of the chain link as shown in next image and note the measurement.



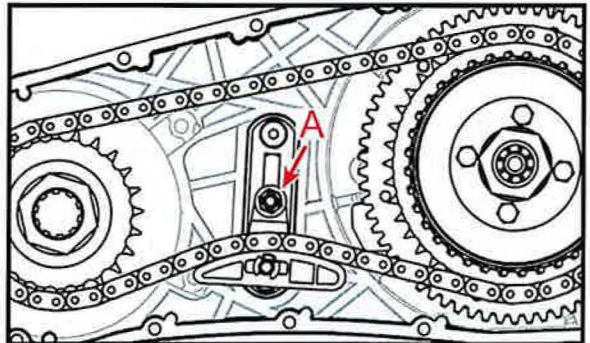
Typical.

**NOTE:** The difference between measurements will be the chain slack.

- Set the primary chain slack at the tightest spot on the chain from 5/8–7/8" with a cold engine.

**NOTE:** When adjusting chain slack with a hot engine, settings should be between 3/8 to 5/8".

- Tighten the primary chain adjuster lock nut (A, next image) to 25 ft•lbs.



A. Adjuster locknut. Tighten to 25 ft•lbs.

- Check the amount of chain slack and re-adjust if outside of the range given.
- Install outer primary and fluid as described in the next section.

## INSPECTION COVER REMOVAL

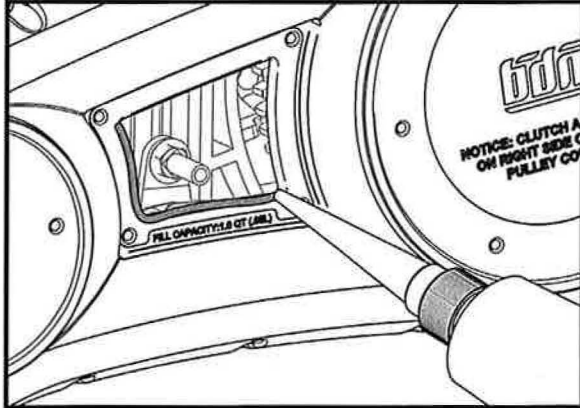
- Remove inspection cover screws (7).

**NOTE:** Inspection cover removal is accomplished by using a pick through a screw hole to pry cover free from outer primary following screw removal.

## INSPECTION COVER INSTALLATION

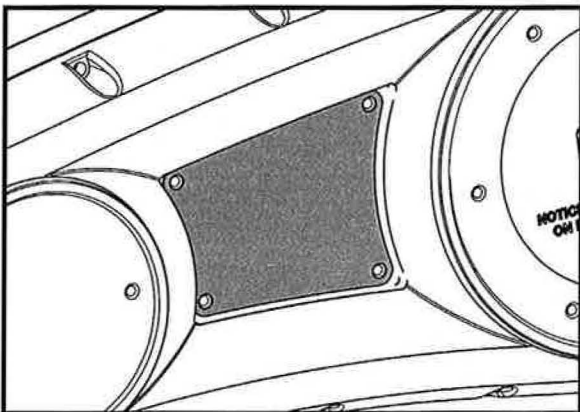
**NOTE:** Remove all of the old sealing material from the inspection cover, and from around the opening in the outer primary. All sealing surfaces must be free of oil and dry.

1. Before installing the primary inspection cover gasket (6), spread a small layer of Loctite 5699 RTV Silicone Sealer onto the face of the primary opening as shown. Spread sealer to ensure continuous surface coverage.



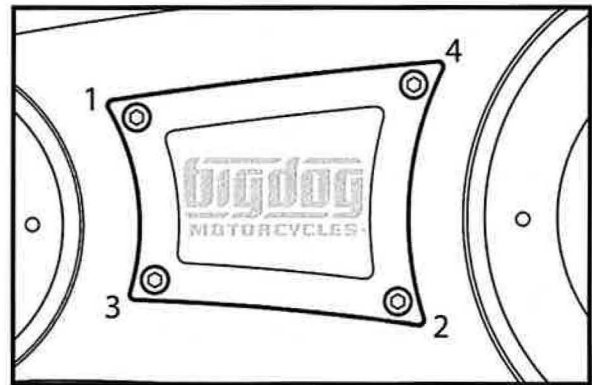
Typical – Spread sealant around opening.

2. Place gasket onto opening as shown in next image.



Typical.

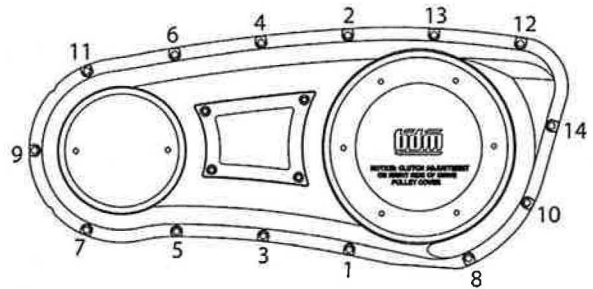
3. Install inspection cover screws (7) and hand tighten with **no** Loctite used. Tighten the inspection cover screws to 54 **in•lbs** using the sequence shown in the next image and then give a final torque of 108 **in•lbs** using the same sequence.



Typical – Tightening pattern.

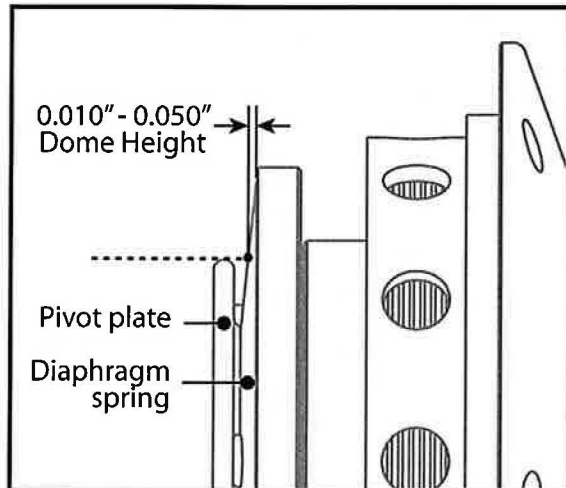
## OUTER PRIMARY - REMOVAL AND INSTALLATION

1. Remove primary case drain plug (1) and drain primary fluid.
2. Remove the fourteen 1/4" perimeter screws (2) and the outer primary (3). Installation is reverse of removal. Pay attention to tightening sequence. Make sure O-ring (4) is properly seated in groove. Replace O-ring if damaged. Apply Loctite 222 and primer N to screws before installation and tighten to 100 **in•lbs**.



Outer primary tightening sequence.

3. Install primary drain plug and tighten to 70-75 **in•lbs**.
4. Remove outer primary inspection cover (5) and fill primary with 32 oz. primary drive lubricant.

**CLUTCH DOME HEIGHT**

**NOTE:** The diaphragm spring dome height range of operation is 0.010 to 0.050". When dome height of clutch spring measurement exceeds 0.050", disassemble and measure the clutch pack as described below.

**CLUTCH PACK WEAR LIMIT AND MEASUREMENT**

1. Remove clutch pack as described in the next section.
2. Separate the steel and fiber plates from the clutch pack.
3. First, stack the fiber plates and measure the overall thickness. If the fiber plate stack measures 0.845" or less, install a new clutch pack.
4. If the fiber plate stack measures greater than 0.845", measure each steel plate on a surface plate to determine warpage. Steel plates should be flat within 0.006". If any steel plate is warped more than 0.006", replace entire clutch pack.

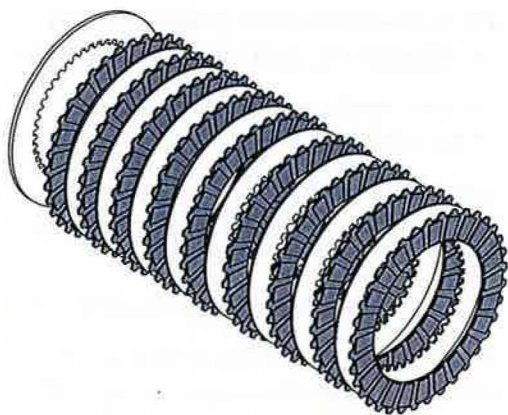
**NOTE:** New clutch packs are preassembled, pre-oiled and ready to install. It is not necessary to measure pack height or add shims to increase/decrease diaphragm spring dome height.

**CLUTCH DIAPHRAGM SPRING AND PACK REMOVAL AND INSTALLATION**

1. Loosen clutch pushrod jam nut (10) and clutch cable adjuster.
2. Remove throw-out bearing assembly retaining ring (11) with snap-ring pliers and discard.
3. Remove throw-out bearing assembly (12).
4. Remove four clutch pivot plate screws (13), pivot plate (14), diaphragm spring (15), spring seat (16), and pressure plate (17).
5. Remove the four, 5/16" socket head hub flange screws (18).
6. Remove clutch pack (19) and inner hub (20) as a unit.
7. Clean primary fluid from steel and fiber plates with brake cleaner.
8. Inspect steel plates for warpage or discoloration, and fiber plates for glazing (see *Clutch Pack Measurement*).
9. Inspect the splines on the inner clutch hub (20) and basket for wear.
10. Inspect teeth on the outside diameter of fiber plates for wear.
11. Inspect inner clutch hub splines for wear. Some wear is normal. If grooves are worn into the splines that affect axial movement of the plates, replace affected parts.
12. Inspect the portion of the flanged hub (21) engaging the transmission input shaft seal for damage. If damaged, replace the flanged hub.
13. Reinstall clutch hub with previously removed screws. Apply Loctite 2760 to screws and tighten to 20 ft•lbs.
14. Install clutch pack assembly with steel plate towards inside of clutch basket.

**NOTE:** All steel plates have rounded edges on one side and sharp on the other. In all cases, install plates with sharp edge towards transmission.





15. Reinstall pressure plate (17), spring seat (16), diaphragm spring (15) and pivot plate (14). Ensure pivot plate alignment tabs are not obstructing spring plate teeth. Apply Loctite 2760 to threads and tighten to 20 ft•lbs.
16. Reinstall throw-out bearing assembly (12) with **new** retaining ring (11). Ensure clip seats properly.

### CLUTCH BASKET/ENGINE SPROCKET/PRIMARY CHAIN - REMOVAL AND INSTALLATION

1. Loosen clutch pushrod jam nut (10) and clutch cable adjuster.
2. Loosen primary chain adjuster lock nut (22).
3. Remove clutch hub nut (**left-hand thread**) (23) and washer (24) using an impact wrench. Remove engine drive sprocket nut (25) and washer (26).

**NOTE:** Oil may drain from transmission into primary when removing clutch hub nut. This is normal.

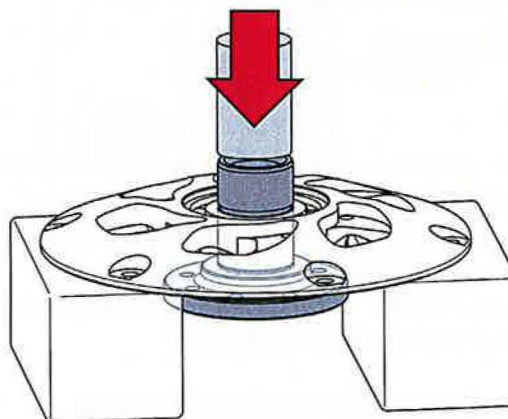
**NOTE:** For both clutch hub nut removal and engine drive sprocket removal, place a locking tool between engine sprocket and clutch basket gear to lock the primary drive.

4. Remove engine sprocket (41), chain (42), and clutch assembly (43) as one unit.

**NOTE:** Install clutch hub shim if it was previously removed.

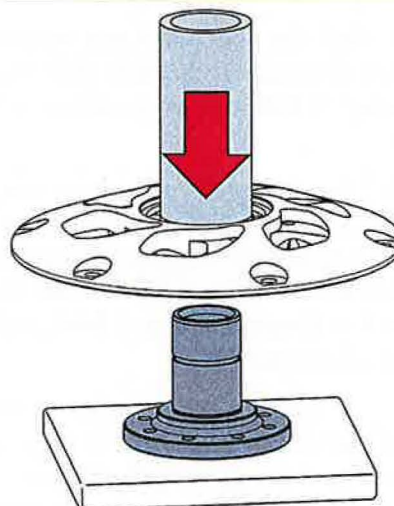
### CLUTCH DISASSEMBLY AND ASSEMBLY

1. To replace bearing carrier, remove six mounting screws attaching it to the outer hub.
2. Remove retaining clip holding flanged hub in bearing carrier.
3. Support bearing carrier on a hydraulic press and press out the flanged hub.



Typical. Removal.

**WARNING!** Properly support the bearing carrier to prevent the possibility of bodily injury when removing the flanged hub.



Typical. Installation. Press on inner race

4. Installation is in reverse order of removal.

**NOTE:** This procedure replaces the bearing carrier as an assembly. If not replacing the bearing carrier, a new bearing must be installed.

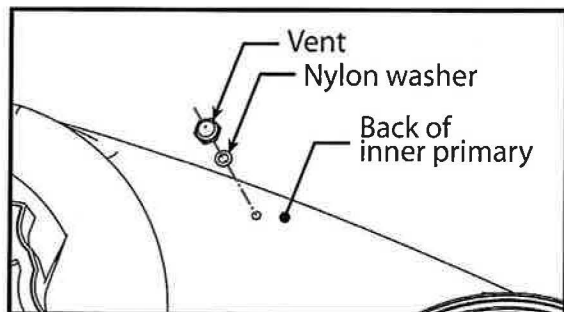


**CAUTION: WHEN PRESSING BEARING CARRIER ONTO FLANGED HUB, PRESS ONLY ON INNER RACE OF BEARING AS SHOWN ABOVE.**

- Place new bearing carrier on clutch basket. Apply Loctite 2760 to six mounting screws previously removed and tighten to 20 ft•lbs.
- Place clutch basket assembly, engine sprocket, and drive chain unit into primary as one unit.
- Apply two drops of Loctite 2760 to transmission main shaft. Install washer and clutch hub nut (**left-hand thread**) and locking tool. Tighten to 80 ft•lbs.
- With locking tool in place, apply two drops of Loctite 2760 to engine sprocket shaft. Install engine sprocket washer and nut. Tighten to 150 ft•lbs.
- Set primary chain tension.
- Install outer primary and fluid.
- Check transmission oil level. Add as needed.

### INNER PRIMARY VENT INSTALLATION

- Apply Loctite 2440 to vent threads.



- Install vent (**66**) and nylon washer from the **outside** of the inner primary. Tighten to 8-10 in•lbs.

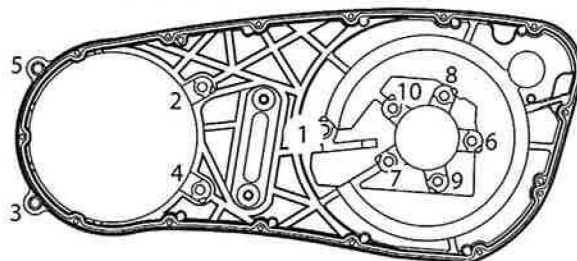
### INNER PRIMARY REMOVAL

- Disconnect harness wire to starter solenoid.
- Disengage locking tabs (**31**) from the eight screws retaining inner primary to engine and transmission.
- Remove six screws (**32, 33**) retaining inner primary to transmission.

- Remove four screws (**34, 35**) retaining inner primary to engine.
- Remove inner primary (**36**) and starter as an assembly.

### INNER PRIMARY INSTALLATION

- Inspect and install new O-rings if needed.
  - One O-ring, between engine and primary.
  - Two O-rings, engine-to-inner primary.
  - Six O-rings, transmission-to-inner primary.
- Install inner primary/starter assembly to engine and transmission.
- Apply Loctite 2440 to threads of primary engine screws (**35**), and loosely install primary offset screws (**34**) retaining inner primary to engine.
- Loosely install inner primary-to-transmission screws. Ensure that the long, 5/16-18 x 1-1/2" screw is properly located.
- Apply Loctite 2440 and tighten screws to 20 ft•lbs using sequence shown below.



*Inner primary tightening sequence.*

- Engage locking tabs.
- Reconnect starter wiring.

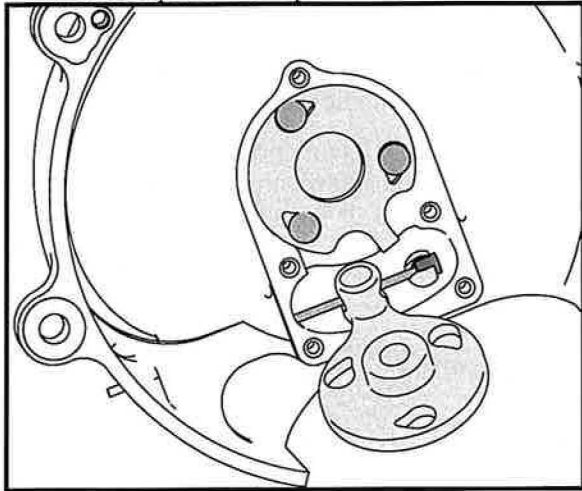
### PULLEY COVER/CLUTCH ACTUATOR

#### PULLEY COVER REMOVAL

- Remove exhaust system.
- Fully collapse clutch cable adjuster.
- Remove clutch adjust cover (**8**).
- Loosen clutch pushrod jam nut (**10**).
- Remove clutch pushrod (**44**).
- Remove the three socket head screws (**46**) retaining the pulley cover.
- Remove pulley cover (**45**).

### CLUTCH ACTUATOR REMOVAL

1. Remove five, inner access cover mounting screws (47).
2. Remove the inner access cover (48) and gasket (49).
3. Remove inner ramp (50).
4. Remove ferrule (51) retaining clutch cable end.
5. Remove outer ramp (52).
6. Clean and inspect the ramps (50, 52), ball bearings (53), and ferrule (51) for excessive wear. Replace worn parts.



Actuator/ramp assembly.

### CLUTCH ACTUATOR INSTALLATION

*NOTE: Installation is opposite of removal.*

1. Position outer clutch release ramp (52) into the pulley cover (45).
2. Pack clutch actuator assembly with bearing grease and position in ramps.
3. Install cable end and ferrule (51) into inner clutch ramp and position inner clutch ramp into pulley cover.
4. Fully pack housing with bearing grease.
5. Position inner access cover gasket (49) and inner access cover (48) on clutch release housing and secure with five mounting screws (47). Tighten access cover screws to 24 in•lbs.
6. Remove clutch cable clamp, holding cable to frame.

7. Lubricate clutch pushrod thoroughly with hi-temp bearing grease and install into actuator using minimal thread engagement (2-3 threads).
8. Install pulley cover assembly. Apply Loctite 2760 to threads of three pulley cover retaining screws. Tighten to 20 ft•lbs.
9. Adjust clutch.