<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
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<td>5-1</td>
</tr>
<tr>
<td>5.2 SPECIFICATIONS: DRIVE</td>
<td>5-2</td>
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<tr>
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<td>5-3</td>
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<td>5.4 DRIVE COMPONENTS</td>
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<td>5.5 PRIMARY CHAINCASE HOUSING</td>
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<td>5.6 CLUTCH</td>
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<td>5.7 TRANSMISSION SPROCKET</td>
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<td>5.8 DRIVE BELT</td>
<td>5-21</td>
</tr>
</tbody>
</table>
## FASTENER TORQUE VALUES IN THIS CHAPTER

The table below lists torque values for all fasteners presented in this chapter.

<table>
<thead>
<tr>
<th>FASTENER</th>
<th>TORQUE VALUE</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clutch diaphragm spring retainer bolts</td>
<td>70-100 in-lbs</td>
<td>7.9-11.3 Nm</td>
</tr>
<tr>
<td>Clutch hub mainshaft nut</td>
<td>70-80 ft-lbs</td>
<td>94.9-108.5 Nm</td>
</tr>
<tr>
<td>Compensating sprocket bolt, final torque</td>
<td>175 ft-lbs</td>
<td>237.3 Nm</td>
</tr>
<tr>
<td>Compensating sprocket bolt, first torque</td>
<td>100 ft-lbs</td>
<td>135.6 Nm</td>
</tr>
<tr>
<td>Primary chaincase sealing fasteners</td>
<td>26-28 ft-lbs</td>
<td>35.3-38.0 Nm</td>
</tr>
<tr>
<td>Primary chain tensioner fasteners</td>
<td>21-24 ft-lbs</td>
<td>28.5-32.6 Nm</td>
</tr>
<tr>
<td>Primary cover fasteners</td>
<td>12-13 ft-lbs</td>
<td>16.0-17.6 Nm</td>
</tr>
<tr>
<td>Primary cover mass, Japanese models only</td>
<td>15-19 ft-lbs</td>
<td>20.3-25.6 Nm</td>
</tr>
<tr>
<td>Shift lever bolt</td>
<td>18-22 ft-lbs</td>
<td>24.4-29.8 Nm</td>
</tr>
<tr>
<td>Transmission sprocket lockplate screws</td>
<td>90-120 in-lbs</td>
<td>10.2-13.6 Nm</td>
</tr>
<tr>
<td>Transmission sprocket nut, final torque</td>
<td>35 ft-lbs</td>
<td>47.5 Nm</td>
</tr>
<tr>
<td>Transmission sprocket nut, final torque</td>
<td>35-40 degrees</td>
<td>35-40 degrees</td>
</tr>
<tr>
<td>Transmission sprocket nut, initial torque</td>
<td>100 ft-lbs</td>
<td>135.6 Nm</td>
</tr>
</tbody>
</table>

5.6 CLUTCH, Clutch Pack Only
5.4 DRIVE COMPONENTS, Installation
5.4 DRIVE COMPONENTS, Installation
5.4 DRIVE COMPONENTS, Installation/Loosen then final tighten
5.5 PRIMARY CHAINCASE HOUSING, Installation
5.4 DRIVE COMPONENTS, Installation
5.3 PRIMARY CHAINCASE COVER, Installation/Apply LOCTITE 243 MEDIUM STRENGTH THREADLOCKER AND SEALANT (blue).
5.3 PRIMARY CHAINCASE COVER, Installation/Apply two drops of LOCTITE 262 HIGH STRENGTH THREADLOCKER AND SEALANT (red)
5.3 PRIMARY CHAINCASE COVER, Installation
5.3 PRIMARY CHAINCASE COVER, Installation
5.7 TRANSMISSION SPROCKET, Installation/Lock patch, use 3-5 times
5.7 TRANSMISSION SPROCKET, Installation/plus 35-40 degrees
5.7 TRANSMISSION SPROCKET, Installation/Do not loosen to align lockplate screws.
5.7 TRANSMISSION SPROCKET, Installation/Right-hand threads, initial torque only, apply several drops of LOCTITE 271 HIGH STRENGTH THREADLOCKER (red) to last few threads.
## SPECIFICATIONS

### Table 5-1. Sprocket Specifications

<table>
<thead>
<tr>
<th>SPROCKETS</th>
<th>NO. OF TEETH</th>
<th>DOM/HD1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensating</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Clutch</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Transmission</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Rear wheel: All But Japanese Market</td>
<td>66</td>
<td></td>
</tr>
<tr>
<td>Rear wheel: Japanese Market</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>

### Table 5-2. Clutch Specifications

<table>
<thead>
<tr>
<th>CLUTCH</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Wet-multiple disc</td>
</tr>
<tr>
<td>Clutch lever free play (after internal adjustment)</td>
<td>1/16-1/8 in (1.6-3.2 mm)</td>
</tr>
</tbody>
</table>

### Table 5-3. Gear Specifications

<table>
<thead>
<tr>
<th>GEAR</th>
<th>OVERALL GEAR RATIO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>DOM/HD1</td>
</tr>
<tr>
<td>First (low)</td>
<td>9.311</td>
</tr>
<tr>
<td>Second</td>
<td>6.454</td>
</tr>
<tr>
<td>Third</td>
<td>4.793</td>
</tr>
<tr>
<td>Fourth</td>
<td>3.882</td>
</tr>
<tr>
<td>Fifth</td>
<td>3.307</td>
</tr>
<tr>
<td>Sixth (high)</td>
<td>2.790</td>
</tr>
</tbody>
</table>

**NOTE**

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

### Table 5-4. Primary Chaincase Lubricant Refill Capacity

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>CAPACITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>fl oz</td>
</tr>
<tr>
<td>Wet</td>
<td>34</td>
</tr>
<tr>
<td>Dry *</td>
<td>38</td>
</tr>
</tbody>
</table>

* Quantity after complete disassembly.
GENERAL

The primary chaincase is a sealed housing containing the primary chain, chain tensioner, clutch, engine compensating sprocket and alternator.

For information on primary chain lubrication, see 1.8 PRIMARY CHAINCASE LUBRICANT.

REMOVAL

**WARNING**

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

1. Disconnect negative battery cable.
2. Remove shift lever.
3. Drain primary chaincase. See 1.8 PRIMARY CHAINCASE LUBRICANT, Change Primary Chaincase Lubricant.
4. See Figure 5-1. Remove fasteners (1, 2). Remove primary chaincase cover.
5. Remove and discard cover gasket.

![Figure 5-1. Primary Chaincase Cover and Fasteners](image)

**INSTALLATION**

<table>
<thead>
<tr>
<th>FASTENER</th>
<th>TORQUE VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary cover mass,</td>
<td>15-19 ft-lbs</td>
</tr>
<tr>
<td>Japanese models only</td>
<td></td>
</tr>
<tr>
<td>Primary cover fasteners</td>
<td>12-13 ft-lbs</td>
</tr>
<tr>
<td>Shift lever bolt</td>
<td>18-22 ft-lbs</td>
</tr>
</tbody>
</table>

1. **Japanese models with forward controls:** See Figure 5-2. If primary cover mass (3) was removed from primary chaincase cover (2):
   a. Apply two drops of LOCTITE 262 HIGH STRENGTH THREADLOCKER AND SEALANT (red) to threads of cover mass.
   b. Install cover mass.
   c. Tighten to 15-19 ft-lbs (20.3-25.6 Nm).

2. **All models without forward controls:** Install new tower gasket (4).

   **NOTE**

   *Always install a new gasket between primary cover and housing.*

3. Install new cover gasket (1).

4. See Figure 5-1. Apply a drop of LOCTITE 243 MEDIUM STRENGTH THREADLOCKER AND SEALANT (blue) to each primary cover fastener (1, 2). Install in locations shown. Tighten finger-tight.

5. See Figure 5-3. Tighten primary cover fasteners to 12-13 ft-lbs (16.0-17.6 Nm) in the sequence shown.

6. See Figure 5-4. Install shift lever (3) with screw (1) and lockwasher (2). Tighten to 18-22 ft-lbs (24.4-29.8 Nm).

7. Fill primary chaincase. See 1.8 PRIMARY CHAINCASE LUBRICANT, Change Primary Chaincase Lubricant.

8. Connect negative battery cable.
1. Cover gasket
2. Primary chaincase cover
3. Primary cover mass (models with forward controls, Japan only)
4. Gasket (Japan only)
5. Crankcase gasket

Figure 5-2. Primary Chaincase Cover Gasket

Figure 5-3. Primary Chaincase Cover Torque Sequence

1. Screw
2. Lockwasher
3. Shift lever
4. Spacer
5. Shift lever peg kit
6. Shifter lever
7. Shifter rod

Figure 5-4. Mid-Control Shifter Linkage
REMOVAL

PART NUMBER | TOOL NAME
------------|-----------------
HD-48219    | PRIMARY DRIVE LOCKING TOOL
OTC 6198    | T70 SOCKET BIT
SNAP-ON STX70E | T70 SOCKET BIT

**WARNING**

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (-) battery cable before proceeding. (00048a)

1. Disconnect negative battery cable.
2. Remove primary chaincase cover. See 5.3 PRIMARY CHAINCASE COVER, Removal.

**NOTE**

To remove the primary chain, remove compensating sprocket, clutch assembly and primary chain as an assembly.

3. See Figure 5-5. Install cable strap (2) as shown. Exposed portion below cover indicates need for removal before cover installation.

4. See Figure 5-6. Remove chain tensioner fasteners (2). Remove chain tensioner (1).

5. Mark one of the links of the primary chain. Maintaining the original direction of rotation during assembly may prolong service life.

6. See Figure 5-7. Loosen locknut (3).

**WARNING**

Wear safety glasses or goggles when removing or installing retaining rings. Retaining rings can slip from the pliers and could be propelled with enough force to cause serious eye injury. (00312a)

7. Remove retaining ring (1) and release plate (2).

**NOTE**
The mainshaft nut has left-hand threads.

8. See Figure 5-8. Place the PRIMARY DRIVE LOCKING TOOL (Part No. HD-48219) between engine and clutch sprockets as shown.

9. Rotate clutch hub mainshaft nut (4) clockwise to remove.

10. See Figure 5-9. Place the primary drive locking tool between the teeth of the engine and clutch sprockets as shown.

**NOTE**
The compensating sprocket bolt is a T70 drive. Use T70 SOCKET BIT (Part No. Snap-on STX70E), T70 SOCKET BIT (Part No. OTC 6198) or equivalent.

11. Rotate compensating sprocket bolt (1) counterclockwise to remove.
1. Retaining ring
2. Release plate
3. Locknut

Figure 5-7. Clutch

1. Engine compensating sprocket
2. Primary drive locking tool
3. Clutch sprocket
4. Clutch hub mainshaft nut

Figure 5-8. Removing Clutch Hub Mainshaft Nut

1. Bolt
2. Primary drive locking tool

Figure 5-9. Removing Engine Compensating Sprocket Bolt

1. Shaft extension
2. Large spring washer (2)
3. Medium spring washer (2)
4. Small spring washer
5. Sliding cam
6. Compensating sprocket
7. Thrust washer
8. Thrust bearing
9. Sprocket retainer
10. Bolt

Figure 5-10. Engine Compensating Sprocket Assembly
## INSTALLATION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>TOOL NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD-48219</td>
<td>PRIMARY DRIVE LOCKING TOOL</td>
</tr>
<tr>
<td>OTC 6198</td>
<td>T70 SOCKET BIT</td>
</tr>
<tr>
<td>SNAP-ON STX70E</td>
<td>T70 SOCKET BIT</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FASTENER</th>
<th>TORQUE VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compensating sprocket bolt, first torque</td>
<td>100 ft-lbs 135.6 Nm</td>
</tr>
<tr>
<td>Compensating sprocket bolt, final torque</td>
<td>175 ft-lbs 237.3 Nm</td>
</tr>
<tr>
<td>Clutch hub mainshaft nut</td>
<td>70-80 ft-lbs 94.9-108.5 Nm</td>
</tr>
<tr>
<td>Primary chain tensioner fasteners</td>
<td>21-24 ft-lbs 28.5-32.6 Nm</td>
</tr>
</tbody>
</table>

### NOTES

- **Install the primary chain, compensating sprocket and clutch as a single unit.**
- **The O-ring inside the shaft extension is for manufacturing assembly only and has no replacement part.**

1. See Figure 5-10. Apply a thin layer of primary chaincase oil to the inner diameter of the compensating sprocket (6) and the splines of shaft extension (1). Install shaft extension.

#### NOTE

**Outer diameter of spring washers must contact each other.**

2. Install large spring washers (2) and medium spring washers (3).

3. Install small spring washer (4) so outer diameter contacts sliding cam (5).

4. Install primary chain, compensating sprocket and clutch as an assembly.

5. Lightly lubricate thrust bearing (8). Install thrust washers (7), bearing (8), retainer (9) and **new** bolt (10). Hand-tighten.

#### NOTE

**Clutch hub mainshaft nut has left-hand threads.**


7. See Figure 5-12. Place the PRIMARY DRIVE LOCKING TOOL (Part No. HD-48219) between the engine and clutch sprockets as shown.

#### NOTE

**The compensating sprocket bolt is a T70 drive. Use T70 SOCKET BIT (Part No. Snap-on STX70E), T70 SOCKET BIT (Part No. OTC 6198) or equivalent.**

8. Tighten compensating sprocket bolt (1) to 100 ft-lbs (135.6 Nm).

9. Loosen one-half turn.

10. Final tighten to 175 ft-lbs (237.3 Nm).

11. See Figure 5-13. Install the PRIMARY DRIVE LOCKING TOOL (Part No. HD-48219) between the engine and clutch sprockets as shown.

12. Tighten clutch hub mainshaft nut (2) to 70-80 ft-lbs (94.9-108.5 Nm). Remove primary drive locking tool.

13. See Figure 5-14. Install release plate (2) with locknut (3) and adjuster screw into clutch hub bore. The word "OUT" stamped on the release plate faces out.

### WARNING

Wear safety glasses or goggles when removing or installing retaining rings. Retaining rings can slip from the pliers and could be propelled with enough force to cause serious eye injury. (00312a)

14. Inspect retaining ring (1) and replace if necessary. Install retaining ring in clutch hub bore. Verify that retaining ring is completely seated in groove.

15. Adjust clutch. See 1.10 CLUTCH, Adjustment.

#### NOTE

**Primary chain tensioner is non-repairable. If tensioner is worn or damaged, replace assembly.**

16. Tensioner parts can be disassembled. If primary chain tensioner becomes disassembled, assemble in order shown:

   a. See Figure 5-15. Locate end of spring rod (2) on roll pin (3).
   b. See Figure 5-16. Slide wedge (2) of primary chain tensioner in direction of arrow until all travel is removed.
   c. See Figure 5-17. Push shoe (1) down until it contacts wedge. Keep tension on shoe so wedge stays in place.
   d. Insert cable strap (2) as shown to hold wedge in place. Verify that end of cable strap is located below primary chain tensioner. Cable strap hangs below primary cover gasket surface and serves as a reminder to remove before installing primary cover.

#### NOTE

**Primary chain tensioner will not complete chain adjustment until vehicle is ridden. Test ride vehicle after tensioner removal/installation to verify proper adjustment.**

17. See Figure 5-18. Install primary chain tensioner (1) with fasteners (2). Tighten to 21-24 ft-lbs (28.5-32.6 Nm). Remove cable strap.

18. Set preliminary chain tension:

   a. Check tension at the top span while pulling down on chain midway between sprockets. Correct tension is 0.500-0.625 in (13-14 mm)
   b. If chain is loose, move chain adjuster one notch. Check tension.
   c. Repeat steps until tension is within specification.
NOTES

- Always install a new gasket between primary cover and housing. Not replacing this gasket may cause primary chaincase leaks.

- Verify that all debris is washed from the inside ribs.

19. Install primary chaincase cover. Fill primary chaincase. See 5.3 PRIMARY CHAINCASE COVER, Installation.

20. Connect negative battery cable.

Figure 5-11. Spring Washer Orientation

1. Large spring washer (2)
2. Medium spring washer (2)

Figure 5-12. Installing Engine Compensating Sprocket Bolt

1. Bolt
2. Primary drive locking tool

Figure 5-13. Installing Clutch Hub Mainshaft Nut

1. Primary drive locking tool
2. Clutch hub mainshaft nut

Figure 5-14. Clutch

1. Retaining ring
2. Release plate
3. Locknut
1. Shoe
2. Spring rod
3. Roll pin

**Figure 5-15. Spring Rod Location**

1. Shoe
2. Wedge

**Figure 5-16. Primary Chain Tensioner**

1. Chain tensioner shoe
2. Cable strap

**Figure 5-17. Securing Chain Tensioner**

1. Chain tensioner
2. Chain tensioner fasteners
3. Cable strap

**Figure 5-18. Chain Tensioner**
REMOVAL

**WARNING**

To prevent accidental vehicle start-up, which could cause death or serious injury, disconnect negative (−) battery cable before proceeding. (00048a)

1. Disconnect negative battery cable.
2. Remove primary chaincase cover. See 5.3 PRIMARY CHAINCASE COVER, Removal.
3. Remove starter. See 7.11 STARTER, Removal.
4. Remove primary chain, clutch and compensating sprocket. See 5.4 DRIVE COMPONENTS, Removal.
5. See Figure 5-19. Remove five sealing fasteners (5). Remove primary chaincase housing (6). Discard the crankcase gasket (7) and sealing fasteners.

![Diagram of Primary Chaincase Housing](snt03677)

Figure 5-19. Primary Chaincase Housing

**INSPECTION**

1. Inspect primary chaincase for cracks or damaged gasket surface.
2. Check the mainshaft bearing.
3. Replace if bearing does not rotate freely. See 5.5 PRIMARY CHAINCASE HOUSING, Mainshaft Bearing and Seal.
4. Replace the oil seal. See 5.5 PRIMARY CHAINCASE HOUSING, Mainshaft Bearing and Seal.
5. **Models with forward controls**: Inspect shifter shaft bushing for wear. Replace if necessary. See 5.5 PRIMARY CHAINCASE HOUSING, Shifter Shaft Bushing.

MAINSHAFT BEARING AND SEAL

**Removal**

**WARNING**

Wear safety glasses or goggles when removing or installing retaining rings. Retaining rings can slip from the pliers and could be propelled with enough force to cause serious eye injury. (00312a)

1. Remove seal. Use a seal remover or rolling head pry bar for best results.
2. See Figure 5-20. Remove retaining ring (1).

**NOTE**

Support the bearing support area on the transmission side of the primary chaincase while pressing bearing out.

3. Place inner primary chaincase in an arbor press with clutch side up.
4. Press out bearing from clutch side applying pressure to the outer race.

**Installation**

1. Inspect the bearing bore to verify that it is clean and smooth.

**NOTE**

Support the bearing support area on the clutch side of the primary chaincase while pressing bearing.

2. Place primary chaincase in arbor press with the transmission side up.
3. Apply a thin film of oil to outer diameter of bearing.
4. Applying pressure to the outer race, press new bearing letter side up until it makes solid contact with the bearing support area.
5. See Figure 5-20. Retaining ring (1) must be oriented as shown to prevent blocking of oil passage (2). Install retaining ring. Verify that the ring is fully seated in the groove.

**NOTES**

- The garter spring side of the oil seal is also identified by the words "OIL SIDE."
- Install oil seal with a seal driver that presses only against outer rim of oil seal, NOT against the inner area.
- **Minimum allowable depth**: Oil seal case is flush with machined surface of primary housing.
- **Maximum allowable depth**: Oil seal case contacts retaining ring.
6. Install mainshaft oil seal:
   a. Lubricate the OD of the new seal with SCREAMIN' EAGLE ASSEMBLY LUBE. Place over bore with the lip garter spring side (stamped "OIL SIDE") facing toward the bearing.
   b. Press the seal into bore until outer edge of seal is flush with machined surface of inner primary housing.

7. Lubricate the bearing and seal lip with multi-purpose grease or SCREAMIN' EAGLE ASSEMBLY LUBE.

1. Retaining ring
2. Oil passage

Figure 5-20. Retaining Ring Orientation

### MAINSHAFT BEARING INNER RACE

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>TOOL NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD-34902-C</td>
<td>MAINSHAFT BEARING INNER RACE REMOVER/INSTALLER</td>
</tr>
</tbody>
</table>

**Removal**

**NOTE**

Bearing outer race installation requires properly aligned bearing inner race. Use the recommended tool, MAINSHAFT BEARING INNER RACE REMOVER/INSTALLER (Part No. HD-34902-C).

1. See Figure 5-21. Install end cap (2) into end of mainshaft.
2. Position puller (3) around mainshaft, under bearing inner race.
3. Turn forcing screw (4) clockwise while holding puller to remove bearing.

Figure 5-21. Pulling Mainshaft Inner Bearing Race

### Installation

1. See Figure 5-22. Slide bearing inner race (1) onto mainshaft.

**NOTE**

*Extension shaft has left-hand threads.*

2. Install extension shaft (2) onto end of mainshaft.
3. Position installer sleeve (4) over extension shaft and against bearing inner race. Apply graphite lubricant to threads of extension shaft.
4. Place two washers (5) over threaded portion of extension shaft and install nut.
5. Tighten nut (6) while holding extension shaft stationary with wrench on flats (3) at end of screw threads. Press race onto shaft until edge of race contacts step on shaft.
6. Lubricate race with SCREAMIN' EAGLE ASSEMBLY LUBE.
SHIFTER SHAFT BUSHING

1. See Figure 5-23. Press out old bushing from clutch side of housing. Inspect the bushing bore to verify that it is clean and smooth.

2. Press new bushing into bore from transmission side of housing. Installed bushing must be flush to 0.020 in (0.51 mm) below edge of bore.

NOTE
Cover mainshaft clutch hub splines with tape to prevent the splines from damaging the primary housing inner oil seal.

1. Verify pivot shaft torque. See 2.23 REAR FORK, Installation.

NOTE
See Figure 5-24. Dowels (1) in crankcase gasket (2) must engage holes in crankcase.

2. See Figure 5-25. Position gasket on gasket surface (2). Verify dowels in gasket engage dowel holes (3).

3. Spread a thin film of oil on mainshaft oil seal lip and rubber portion of crankcase gasket.


5. See Figure 5-26. Install new sealing fasteners.

6. See Figure 5-27. Tighten in sequence shown to 26-28 ft-lbs (35.3-38.0 Nm).

7. Install the primary chain, clutch, compensating sprocket and chain tensioner. See 5.4 DRIVE COMPONENTS, Installation.

8. Install starter. See 7.11 STARTER, Installation.

NOTE
Always install a new gasket between primary cover and housing.

9. Install primary chaincase cover and new gasket. Fill primary chaincase. See 5.3 PRIMARY CHAINCASE COVER, Installation.

10. Adjust drive belt deflection.
11. Connect negative battery cable.

**Figure 5-24. Crankcase Gasket**

1. Dowel
2. Crankcase gasket

**Figure 5-26. Primary Chaincase Sealing Fastener**

**Figure 5-27. Sealing Fastener Tightening Sequence**

1. Crankcase
2. Gasket surface
3. Dowel holes
REMOVAL AND INSTALLATION

To remove the clutch without disassembly or for installation instructions, see 5.4 DRIVE COMPONENTS, Removal.

CLUTCH PACK ONLY

<table>
<thead>
<tr>
<th>FASTENER</th>
<th>TORQUE VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clutch diaphragm spring</td>
<td>70-100 in-lbs</td>
</tr>
<tr>
<td>retainer bolts</td>
<td></td>
</tr>
</tbody>
</table>

Partial Disassembly

NOTE
This procedure can be performed on the motorcycle without removing the clutch shell or hub.

1. Remove primary chaincase cover. See 5.3 PRIMARY CHAINCASE COVER, Removal.

2. See Figure 5-28. Remove six bolts (1) (metric) to release diaphragm spring retainer (2) from clutch hub. Loosen each bolt gradually in a crosswise pattern.

3. Remove diaphragm spring retainer, diaphragm spring (3) and pressure plate (4) from clutch hub.

4. Remove friction plates (5, 7), steel plates (6), damper spring (8) and damper spring seat (9) from clutch hub (11).

Cleaning And Inspection

WARNING
Compressed air can pierce the skin and flying debris from compressed air could cause serious eye injury. Wear safety glasses when working with compressed air. Never use your hand to check for air leaks or to determine air flow rates. (00061a)

1. Wash all parts in cleaning solvent, except for friction plates and bearing, if removed. Dry parts with low-pressure, compressed air.

2. Check friction plates:
   a. Use compressed air to remove all lubricant from the friction plates. Do not wipe off with a rag.
   b. Measure the thickness of each friction plate.
   c. If the thickness of any plate is less than 0.143 in (3.62 mm), replace with an entirely new set.
   d. Look for worn or damaged fiber surface material (both sides).

   NOTE
Replace all nine friction plates with an entirely new set if any individual plate shows evidence of wear or damage.

3. Check the steel plates:
   a. Discard any plate that is grooved or bluish in color. Blue plates are likely warped or distorted.
   b. Check each plate for distortion. Lay the plate on a precision flat surface. Insert a feeler gauge between the plate and the flat surface in several places. Replace any steel plate that is warped more than 0.006 in (0.15 mm).

4. Hold the clutch hub and rotate the clutch shell to check bearing for smooth operation. Replace the bearing if it runs rough, binds or has any end play.

5. Inspect the primary chain sprocket and the starter ring gear on the clutch shell. Replace the clutch shell if worn or damaged.

6. Check the slots that mate with the clutch plates on both the clutch shell and hub. Replace if slots are worn or damaged.

   NOTE
Springs are identified by a dab of paint on one face. See the parts catalog to verify that the correct spring is installed.

7. Check the diaphragm spring and diaphragm spring retainer for cracks or bent tabs. Replace part if either condition exists.
1. Bolt (6) (metric)
2. Diaphragm spring retainer
3. Diaphragm spring
4. Pressure plate
5. Friction plate (9)
6. Steel plate (8)
7. Narrow friction plate
8. Damper spring
9. Damper spring seat
10. Mainshaft nut (metric)
11. Clutch hub
12. Clutch shell
13. Bearing
14. Retaining ring
15. Retaining ring

Figure 5-28. Clutch Shell Assembly

Assembly

NOTE
Submerge and soak all friction plates in primary chaincase lubricant for at least 5 minutes.

1. See Figure 5-30. Install the narrow friction plate on the clutch hub.

2. See Figure 5-28. Install damper spring seat (9) on clutch hub (11). It must sit inboard of narrow friction plate (7).

NOTE
See Figure 5-29. Note damper spring (4) orientation to damper spring seat (3).
3. See Figure 5-28. Install damper spring (8) on clutch hub with the concave side facing away from damper spring seat.

4. Install a steel plate (6) with round edge outward, then a friction plate (5) on the clutch hub. Install seven remaining sets in the same manner, alternating between steel plates and friction plates.

5. Install pressure plate (4) on clutch hub, aligning holes in plate with threaded bosses on hub.

6. Seat diaphragm spring (3) in recess of pressure plate with the concave side inward.

7. Align holes in diaphragm spring retainer (2) with threaded bosses on clutch hub. Tabs on spring retainer contact flats on inboard side of bosses.

8. Install six bolts (1) (metric) to secure diaphragm spring retainer to clutch hub. Alternately tighten to 70-100 in-lbs (7.9-11.3 Nm).

**NOTE**
Always install a new gasket between primary cover and housing.

9. Install primary chaincase cover. Fill primary chaincase. See 5.3 PRIMARY CHAINCASE COVER, Installation.

---

**WARNING**

Wear safety glasses or goggles when removing or installing retaining rings. Retaining rings can slip from the pliers and could be propelled with enough force to cause serious eye injury. (00312a)

**NOTE**
Do not disassemble the clutch shell and hub assembly unless the bearing, hub or shell require replacement. Replace the bearing if disassembled.

4. See Figure 5-31. Remove clutch hub retaining ring (2).

5. See Figure 5-32. Support clutch shell in arbor press with ring gear side up. Press hub from bearing in clutch shell.

6. See Figure 5-31. Remove bearing retaining ring (1) from groove in clutch shell bore.

7. See Figure 5-33. Support clutch shell in arbor press with ring gear side is down. Use a suitable press plug to remove bearing.

8. Clean and inspect components. See 5.6 CLUTCH, Clutch Pack Only.
Assembly

1. Place clutch shell in arbor press with ring gear side up. Support clutch shell bore on sprocket side to avoid damage to ears on clutch basket.

2. Using a suitable press plug, press against outer race until bearing contacts shoulder in clutch shell bore.

**WARNING**

Wear safety glasses or goggles when removing or installing retaining rings. Retaining rings can slip from the pliers and could be propelled with enough force to cause serious eye injury. (00312a)

3. See Figure 5-31. Install bearing retaining ring (1) with flat side toward bearing.

4. Place clutch shell in arbor press with sprocket side up. Center the hub in bearing. Support bearing inner race with a sleeve on transmission side.

5. Press hub into bearing until shoulder contacts bearing inner race.

6. Turn assembly over. Install clutch hub retaining ring (2) in groove of clutch hub.

7. Assemble clutch components. See 5.6 CLUTCH, Clutch Pack Only.

8. Install clutch. See 5.4 DRIVE COMPONENTS, Installation.

**NOTE**

Always install a **new** gasket between primary cover and housing.

9. Install primary chaincase cover and **new** gasket. Fill primary chaincase. See 5.3 PRIMARY CHAINCASE COVER, Installation.
REMOVAL

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>TOOL NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD-46282-A</td>
<td>FINAL DRIVE SPROCKET LOCKING TOOL</td>
</tr>
<tr>
<td>HD-47910</td>
<td>MAINSHAFT LOCKNUT WRENCH</td>
</tr>
<tr>
<td>HD-94660-2</td>
<td>PILOT</td>
</tr>
</tbody>
</table>

1. Remove primary chaincase housing. See 5.5 PRIMARY CHAINCASE HOUSING, Removal.
2. Remove debris deflector. See 2.20 BELT GUARD AND DEBRIS DEFLECTOR.

   **NOTE**
   Loosen both axle adjusters an equal number of turns to maintain wheel alignment.

3. See Figure 5-34. Remove retaining ring (3). Loosen rear axle nut (2). Loosen both axle adjusters (1) to release tension on the drive belt.

   **NOTE**
   Only remove sprocket nut while transmission is installed in frame. Failure to do so will damage transmission or transmission stand.

4. Remove transmission sprocket.
   a. See Figure 5-35. Remove both screws (1) and lockplate (2).
   b. See Figure 5-36. Secure sprocket using FINAL DRIVE SPROCKET LOCKING TOOL (Part No. HD-46282-A) (3). Final drive sprocket locking tool must rest against lower portion of rear fork pivot nut (2).

   **NOTE**
   Sprocket nut has a right-hand thread.

   c. Install PILOT (Part No. HD-94660-2) on mainshaft.
   d. Remove the sprocket nut using MAINSHAFT LOCKNUT WRENCH (Part No. HD-47910) (1).

5. Remove belt from sprocket as sprocket is removed.

---

Figure 5-34. Axle Adjusters (Left Side Shown)

Figure 5-35. Transmission Sprocket
1. Mainshaft locknut wrench
2. Rear fork pivot nut
3. Final drive sprocket locking tool
4. 3/4 in breaker bar

Figure 5-36. Sprocket Nut Removal (Typical)

CLEANING AND INSPECTION

1. Using a non-volatile cleaning solvent, clean sprocket of all grease and dirt.
2. Inspect belt and sprocket. See 1.11 DRIVE BELT AND SPROCKETS, Inspection.
3. Inspect both main drive gear and mainshaft seals. Replace if damaged.

INSTALLATION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
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<tbody>
<tr>
<td>HD-46282A</td>
<td>FINAL DRIVE SPROCKET LOCKING TOOL</td>
</tr>
<tr>
<td>HD-47910</td>
<td>MAINSHAFT LOCKNUT WRENCH</td>
</tr>
<tr>
<td>HD-94660-2</td>
<td>PILOT</td>
</tr>
<tr>
<td>SNAP-ON TA360</td>
<td>TORQUE ANGLE GAUGE</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FASTENER</th>
<th>TORQUE VALUE</th>
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</thead>
<tbody>
<tr>
<td>Transmission sprocket nut, initial torque</td>
<td>100 ft-lbs 135.6 Nm</td>
</tr>
<tr>
<td>Transmission sprocket nut, final torque</td>
<td>35 ft-lbs 47.5 Nm</td>
</tr>
<tr>
<td>Transmission sprocket nut, final torque</td>
<td>35-40 degrees 35-40 degrees</td>
</tr>
<tr>
<td>Transmission sprocket lockplate screws</td>
<td>90-120 in-lbs 10.2-13.6 Nm</td>
</tr>
</tbody>
</table>

NOTE

Install sprocket nut only while transmission is installed in frame. Failure to do so will damage to transmission or transmission stand.

1. Place transmission sprocket in position. Install the belt on the sprocket as the sprocket is installed.

2. If reusing the sprocket nut, apply LOCTITE 271 HIGH STRENGTH THREADLOCKER (red) to the threads of the sprocket nut.

   NOTES
   - Never get oil on the threads of the sprocket nut or the integrity of the lock patch can be compromised.
   - The transmission sprocket nut has right-hand threads. Turn the nut clockwise to install.

3. See Figure 5-35. Apply a thin film of clean engine oil to the mating surfaces of the sprocket nut (3) and the sprocket (4). Install the sprocket nut until finger-tight.

4. See Figure 5-37. Lock transmission sprocket with the FINAL DRIVE SPROCKET LOCKING TOOL (Part No. HD-46282A) (2). The locking tool must rest against the rear fork pivot (3).

5. Install PILOT (Part No. HD-94660-2) on mainshaft.

6. Using MAINSHAFT LOCKNUT WRENCH (Part No. HD-47910), tighten sprocket nut to 100 ft-lbs (135.6 Nm) initial torque.

7. Loosen sprocket nut one full turn.

8. Tighten to 35 ft-lbs (47.5 Nm).

   NOTE
   See Figure 5-38. To determine proper angles during final tightening, scribe lines (3) or use TORQUE ANGLE GAUGE (Part No. SNAP-ON TA360) after the 35 ft-lbs (47.5 Nm) torque is applied.

9. Continue turning sprocket nut an extra 35-40 degrees (35-40 degrees)

   NOTE
   The lockplate has four screw holes and can be installed either side out. If the screw holes cannot be properly aligned, tighten the nut slightly to align. Do not exceed 45 degrees. Never loosen nut to align the screw holes.

10. Install lockplate over transmission sprocket nut with two lockplate holes aligned with tapped holes in sprocket.

   NOTES
   - New screws have lock patches.
   - Screws can be reused up to three times if LOCTITE 271 HIGH STRENGTH THREADLOCKER (red) is applied before installation.
   - To confirm the lockplate security, install BOTH screws.

11. See Figure 5-35. Install two screws (1) to secure lockplate (2) to sprocket (4). Tighten to 90-120 in-lbs (10.2-13.6 Nm).

12. Install primary chain assembly. See 5.4 DRIVE COMPONENTS.

   NOTE
   Always install a new gasket between primary cover and housing.

13. Install primary chaincase cover. Fill primary chaincase. See 5.3 PRIMARY CHAINCASE COVER.

14. Verify pivot shaft torque. See 2.23 REAR FORK.

15. Adjust drive belt deflection. See 1.11 DRIVE BELT AND SPROCKETS.
16. Verify vehicle alignment and tighten rear axle. See 2.9 VEHICLE ALIGNMENT.

17. Install debris deflector. See 2.20 BELT GUARD AND DEBRIS DEFLECTOR.

Figure 5-37. Sprocket Nut Installation (Typical)

- Mainshaft locknut wrench
- Final drive sprocket locking tool
- Rear fork pivot nut
- Breaker bar

1. Transmission sprocket nut
2. Transmission sprocket
3. Scribed lines

Figure 5-38. Transmission Sprocket Nut Final Tightening
REMOVAL
1. Remove rear wheel. See 2.5 REAR WHEEL, Removal.
2. Remove primary chain, clutch, engine compensating sprocket and chain adjuster. See 5.4 DRIVE COMPONENTS.
3. Remove primary chaincase housing. See 5.5 PRIMARY CHAINCASE HOUSING, Removal.
4. Remove lower shock absorber fasteners, allow rear fork to rotate down. See 2.22 REAR SHOCK ABSORBERS.
5. Slip drive belt from transmission sprocket and rear fork.
6. Inspect belt and sprockets. See 1.11 DRIVE BELT AND SPROCKETS, Inspection.

INSTALLATION

**WARNING**

Never bend belt forward into a loop smaller than the drive sprocket diameter. Never bend belt into a reverse loop. Over bending can damage belt resulting in premature failure, which could cause loss of control and death or serious injury. (00339a)

1. Install belt over transmission sprocket and rear fork.

**NOTE**
See Figure 5-39. Improper handling of belt during installation can affect belt durability.

2. Rotate rear fork up. Install lower shock absorber mounting fasteners. See 2.22 REAR SHOCK ABSORBERS, Installation.

3. Install primary chaincase housing. See 5.5 PRIMARY CHAINCASE HOUSING, Installation.

**NOTE**
Always install a new gasket between primary cover and housing.

4. Install primary chain assembly. See 5.4 DRIVE COMPONENTS.
5. Install primary chaincase cover. See 5.3 PRIMARY CHAINCASE COVER.
6. Fill primary chaincase. See 1.8 PRIMARY CHAINCASE LUBRICANT.
7. Install rear wheel. See 2.5 REAR WHEEL, Installation.
8. Align vehicle. See 2.9 VEHICLE ALIGNMENT.
9. Adjust drive belt deflection. See 1.11 DRIVE BELT AND SPROCKETS, Adjusting Belt Deflection.

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**Figure 5-39. Proper Drive Belt Handling**

1. Forward bend: 5 in (127 mm) minimum diameter
2. Reverse bend: 10 in (254 mm) minimum diameter
3. Do not twist
4. Do not crimp, pinch or kink
5. Do not pry