



# INSTRUCTIONS

J03735

2009-03-03



## CHROME FRONT BRAKE MASTER CYLINDER KIT

### GENERAL

#### Kit Number

45281-99D, 45284-99D

#### Models

These Chrome Master Cylinder Kits are designed to replace the original equipment front brake master cylinder on the following Harley-Davidson models:

- 1996 to 2004 Touring
- 1996 to 2003 Sportster®
- 1996-2005 Softail® and Dyna

#### Additional Parts Required

##### ⚠ WARNING

Rider and passenger safety depend upon the correct installation of this kit. Use the appropriate service manual procedures. If the procedure is not within your capabilities or you do not have the correct tools, have a Harley-Davidson dealer perform the installation. Improper installation of this kit could result in death or serious injury. (00333b)

##### NOTE

*This instruction sheet references Service Manual information. A Service Manual for your model motorcycle is required for this installation and is available from a Harley-Davidson Dealer.*

#### Kit Contents

See Figure 9 and Table 1.

See Figure 1. Master cylinders designed for dual disc (2 caliper) operation have an 11/16 inch (17.5 mm) bore (Kit No. 45281-99D), while those that are designed for single disc (1 caliper) operation have a 9/16 inch (14.3 mm) bore (Kit No. 45284-99D). The bore size is stamped on the master cylinder assembly inboard of the handlebar clamp bracket.

##### ⚠ WARNING

Do not use parts from single caliper repair kits (9/16 inch bore) on dual caliper models. Likewise, do not use parts from dual caliper repair kits (11/16 inch bore) on single caliper models. Using incorrect parts can cause brake failure, which could result in death or serious injury. (00278a)

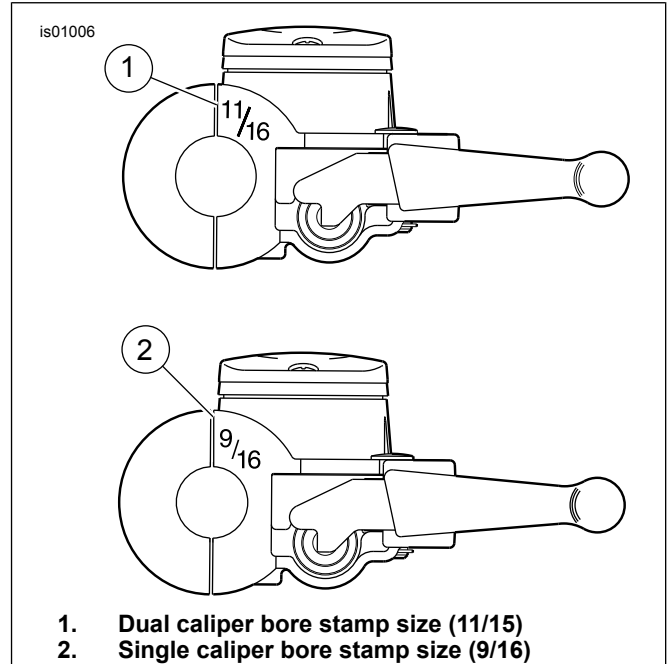


Figure 1. Master Cylinder Bore Identification

### INSTALLATION

#### Prepare the Motorcycle

1. Follow the Service Manual instructions to remove the seat.

##### ⚠ WARNING

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

2. Follow the Service Manual instructions to disconnect the negative (-) battery cable.

## Chrome Master Cylinder/Reservoir

### Remove the Existing Master Cylinder/Reservoir

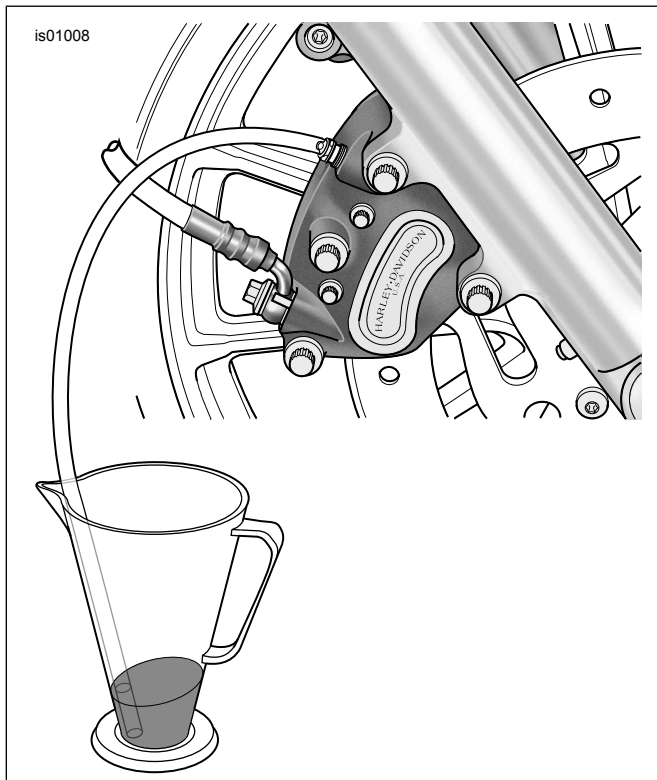


Figure 2. Draining Brake Fluid

1. See Figure 2. Drain the brake fluid.
  - a. Open bleeder nipple cap on front brake caliper.
  - b. Install end of a length of clear plastic tubing over caliper bleeder valve, while placing free end in a suitable container.
  - c. Open bleeder valve about 1/2-turn.
  - d. Pump brake hand lever to drain brake fluid.
  - e. Remove cover.
  - f. Close bleeder valve.

#### NOTICE

Remove brake line components carefully. Damage to seating surfaces can cause leakage. (00320a)

2. Remove bolt and 2 steel/rubber washers to disconnect fitting of hydraulic brake line from master cylinder. Discard washers.

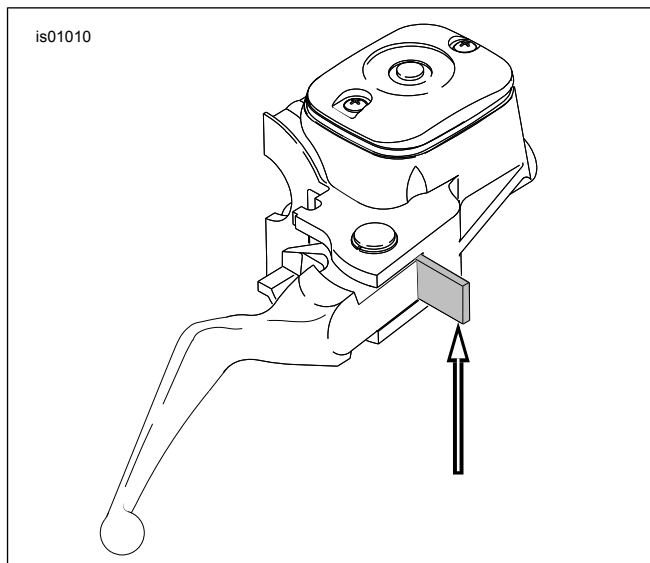


Figure 3. 5/32 in. (4 mm) Cardboard Insert

#### NOTICE

Do not remove or install the master cylinder assembly without first positioning a 5/32-inch (4 mm) thick insert between the brake lever and lever bracket. Removing or installing the master cylinder assembly without the insert in place may result in damage to the rubber boot and plunger on the front stoplight switch. (00324a)

3. See Figure 3. Place the cardboard insert between the brake lever and lever bracket.
4. Using T27 TORX<sup>®</sup> drive head, remove the 2 screws with flat washers securing the handlebar clamp to the master cylinder housing. Remove the brake lever/master cylinder assembly and clamp from the handlebar.

#### ⚠ 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)

5. Remove retaining ring from pivot pin groove at bottom of master cylinder bracket.
6. Remove pivot pin and brake hand lever from master cylinder assembly.

#### NOTE

New master cylinder comes with all internal components preassembled. It is not necessary to remove the components from the bore of the old master cylinder. See Figure 9.

#### ⚠ WARNING

Use denatured alcohol to clean clutch system components. Do not use mineral-based solvents (such as gasoline or paint thinner), which will deteriorate rubber parts even after assembly. Deterioration of these components can cause clutch failure, which could result in death or serious injury. (00296a)

7. With denatured alcohol, clean and inspect all parts that will be reused. Replace as necessary and wipe dry with a clean lint free cloth.

## Install Chrome Master Cylinder/Reservoir

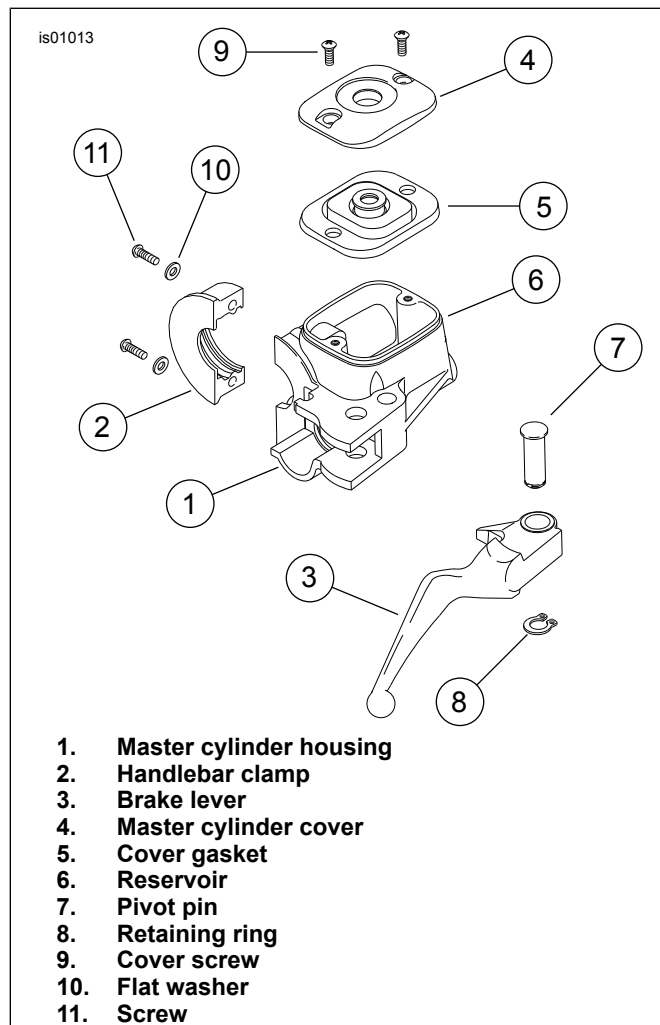


Figure 4. Brake Master Cylinder/Reservoir

1. See Figure 4. Align hole in brake hand lever (3) with hole in master cylinder housing (1). From the top of the assembly, slide pivot pin (7) through bracket and hand lever.
2. Install retaining ring (8) in pivot pin groove. Verify that retaining ring is completely seated in groove.

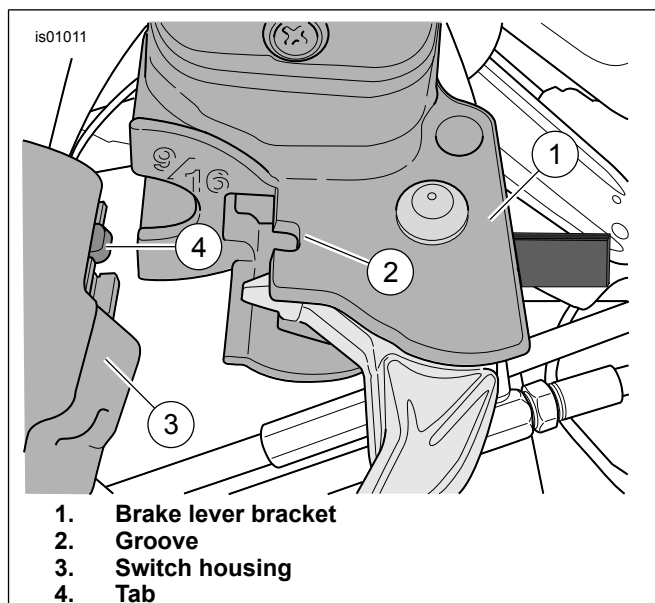


Figure 5. Brake Lever Bracket to Switch Housing

### NOTICE

Do not remove or install the master cylinder assembly without first positioning a 5/32-inch (4 mm) thick insert between the brake lever and lever bracket. Removing or installing the master cylinder assembly without the insert in place may result in damage to the rubber boot and plunger on the front stoplight switch. (00324a)

3. See Figure 5. Position the brake lever/master cylinder assembly inboard of the switch housing (3) engaging the tab (4) on the lower switch housing in the groove (2) at the top of the brake lever bracket (1).
4. See Figure 4. Align the holes in the handlebar clamp (2) with those in the master cylinder housing and start the 2 screws (11) with flat washers (10). Position for rider comfort. Beginning with the top screw, tighten the screws to 7.9–9 N·m (70–80 in-lbs) using a T27 TORX® drive head.

### NOTICE

Avoid leakage. Be sure gaskets, banjo bolt(s) and brake line are clean and undamaged before assembly. (00323a)

### ⚠ WARNING

Replace brake line gaskets. Re-using original gaskets can cause brake failure and loss of vehicle control, which could result in death or serious injury. (00318a)

5. Position **new** steel/rubber washers (included in kit) on each side of hydraulic brake line fitting. Insert bolt through washers and fitting. Thread bolt into master cylinder housing and tighten to 25–30 N·m (17–22 ft-lbs).
6. If removed, install length of clear plastic tubing over caliper bleeder valve. Place free end of tube in a clean container.
7. Stand the motorcycle upright so that the master cylinder is in a level position.

#### NOTE

Check your owner's manual for the correct type of brake fluid for your year and model motorcycle.

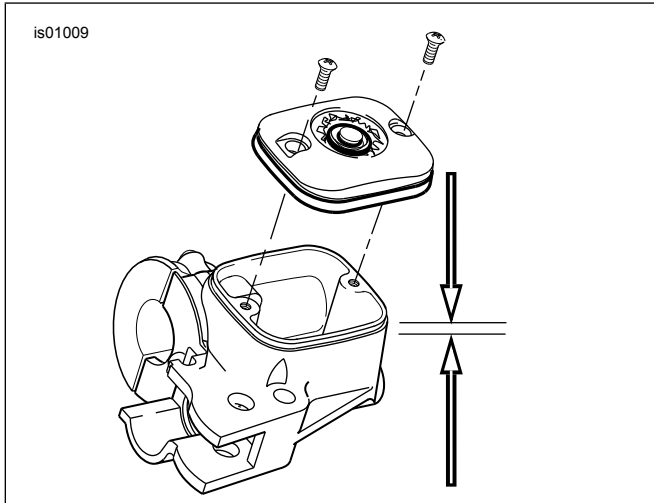


Figure 6. Reservoir Fill Level 1/8 in. (3.2 mm) Below Gasket Surface

#### ⚠ CAUTION

Direct contact of DOT 5 brake fluid with eyes can cause eye irritation, swelling, and redness. Avoid eye contact. In case of eye contact flush with large amounts of water and get medical attention. Swallowing large amounts of DOT 5 brake fluid can cause digestive discomfort. If swallowed, obtain medical attention. Use in well ventilated area. KEEP OUT OF REACH OF CHILDREN. (00144b)

#### ⚠ WARNING

Contact with DOT 4 brake fluid can have serious health effects. Failure to wear proper skin and eye protection could result in death or serious injury.

- If inhaled: Keep calm, remove to fresh air, seek medical attention.
- If on skin: Remove contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. If irritation develops, seek medical attention.
- If in eyes: Wash affected eyes for at least 15 minutes under running water with eye lids held open. If irritation develops, seek medical attention.
- If swallowed: Rinse mouth and then drink plenty of water. Do not induce vomiting. Contact Poison Control. Immediate medical attention required.
- See Safety Data Sheet (SDS) for more details available at [sds.harley-davidson.com](http://sds.harley-davidson.com)

(00240e)

8. See Figure 6. Add the correct type of BRAKE FLUID to the master cylinder reservoir until the fluid level is 1/8 inch (3.2 mm) from the top. Do not reuse old brake fluid. Use only D.O.T. approved brake fluid from a sealed container.

#### ⚠ WARNING

Be sure the master cylinder relief port is not plugged. A plugged relief port can cause brake drag or lockup and loss of vehicle control, which could result in death or serious injury. (00317a)

9. Verify operation of the master cylinder relief port. Actuate the brake hand lever. A slight spurt of fluid will brake the fluid surface in the reservoir compartment if all internal components are working properly.
10. Add brake fluid to the master cylinder reservoir until the fluid level is 1/8 inch (3.2 mm) from the top.
11. Press and hold the brake hand lever to build up hydraulic pressure.
12. Open bleeder valve about 1/2-turn. Brake fluid and air bubbles will flow from bleeder valve through tubing. Close bleeder valve when brake hand lever has moved 1/2 to 3/4 of its full range of travel. Allow brake hand lever to return slowly to its released position.
13. Repeat until all air bubbles are purged and pure brake fluid flows from the brake line.
14. Final tighten the bleeder valve to torque 9–11.3 N·m (80–100 in-lbs). Install the bleeder cap.
15. Add brake fluid to the master cylinder reservoir until the fluid level is about 1/8 inch (3.2 mm) from the top.
16. Note that the angular shape of the master cylinder cover makes one side thicker than the other. Install the cover (with gasket) on the master cylinder reservoir so that the thicker side is positioned above the brake line fitting. Install 2 Phillips screws to fasten the cover to the reservoir. Tighten the screws to 1.4–1.7 N·m (12–15 in-lbs).

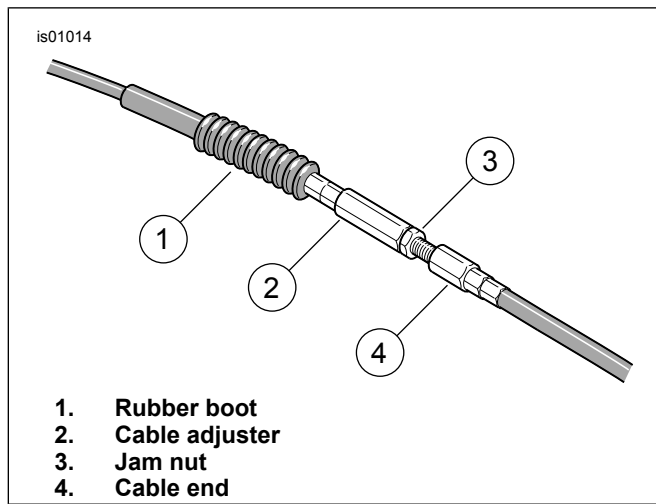
#### NOTE

The sight glass enables the rider to visually check the brake fluid level without removing the master cylinder cover. When the reservoir is full, the sight glass is dark. As the fluid level drops, the glass lightens up to indicate this condition to the rider.

## Chrome Clutch Lever Bracket

### Remove the Existing Clutch Lever Bracket

1. Stand motorcycle upright and level.



**Figure 7. Clutch Cable Adjuster**

2. See Figure 7. Loosen clutch cable adjuster so clutch cable is fully slack by performing the following:
  - a. Slide rubber boot (1) off cable adjuster.
  - b. Holding cable adjuster (2) with 1/2 inch wrench, loosen jam nut (3) using a 9/16 inch wrench.
  - c. Back jam nut (3) away and turn cable adjuster (2) toward jam nut to introduce a large amount of free play at the clutch hand lever.

**▲ 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. Remove the clutch cable anchor pin from the hand lever. To remove anchor pin, it will be necessary to remove the retaining ring and pivot pin.
4. Remove clevis and clutch lever.
5. Using a T27 TORX® drive head, remove the 2 screws with flat washers securing the handlebar clamp to the clutch lever bracket.

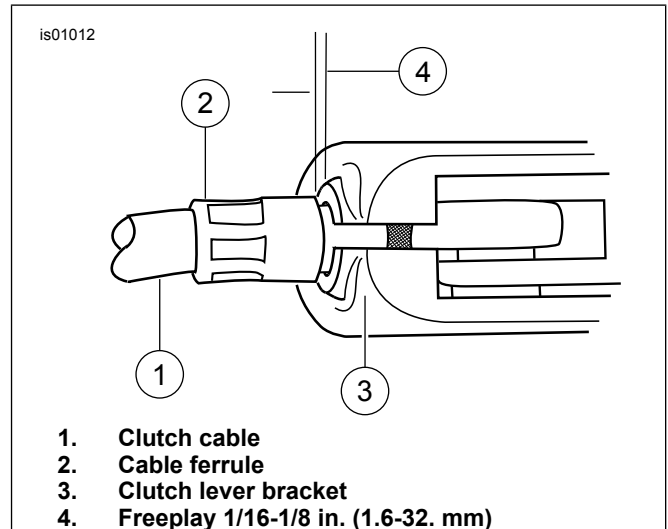
**Install the Chrome Clutch Lever Bracket**

1. See Figure 9. Install the clutch cable and anchor pin in the clutch hand lever. The flat in the pin must face in towards the hand lever.
2. Put cable clevis in position in clutch lever and slide anchor pin into place.

**▲ 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. Place clutch lever in new bracket and install pivot pin and retaining ring.
4. Align the holes in the handlebar clamp with those in the clutch lever bracket and start the 2 screws (with flat washers). Position for rider posture. Beginning with the top screw, tighten the screws to 7.9–9 N·m (70–80 in-lbs) using a T27 TORX® drive head.



**Figure 8. Clutch Hand Lever**

5. Adjust clutch lever free play:
  - a. See Figure 7. Turn cable adjuster away from jam nut until slack is eliminated at hand lever.
  - b. See Figure 8. Pull clutch cable ferrule (2) away from clutch lever bracket (3) to check free play. Turn cable adjuster as necessary to obtain 1/16-1/8 inch (1.6-3.2 mm) free play between end of cable ferrule and clutch lever bracket (4).
  - c. Hold adjuster with 1/2 inch wrench. Using 9/16 inch wrench, tighten jam nut against cable adjuster.
  - d. Cover cable adjuster with rubber boot.
6. Check clutch lever for proper operation.

**NOTE**

*If clutch adjustment is necessary, refer to the Service Manual.*

**Return the Motorcycle to Service**

1. Connect the negative (-) battery cable to the battery.
2. Follow the instructions in the Service Manual to replace the seat.

**▲ WARNING**

**After installing seat, pull upward on seat to be sure it is locked in position. While riding, a loose seat can shift causing loss of control, which could result in death or serious injury. (00070b)**

3. With the ignition/light key switch turned to IGNITION, actuate the front brake hand lever to verify operation of the brake lamp.

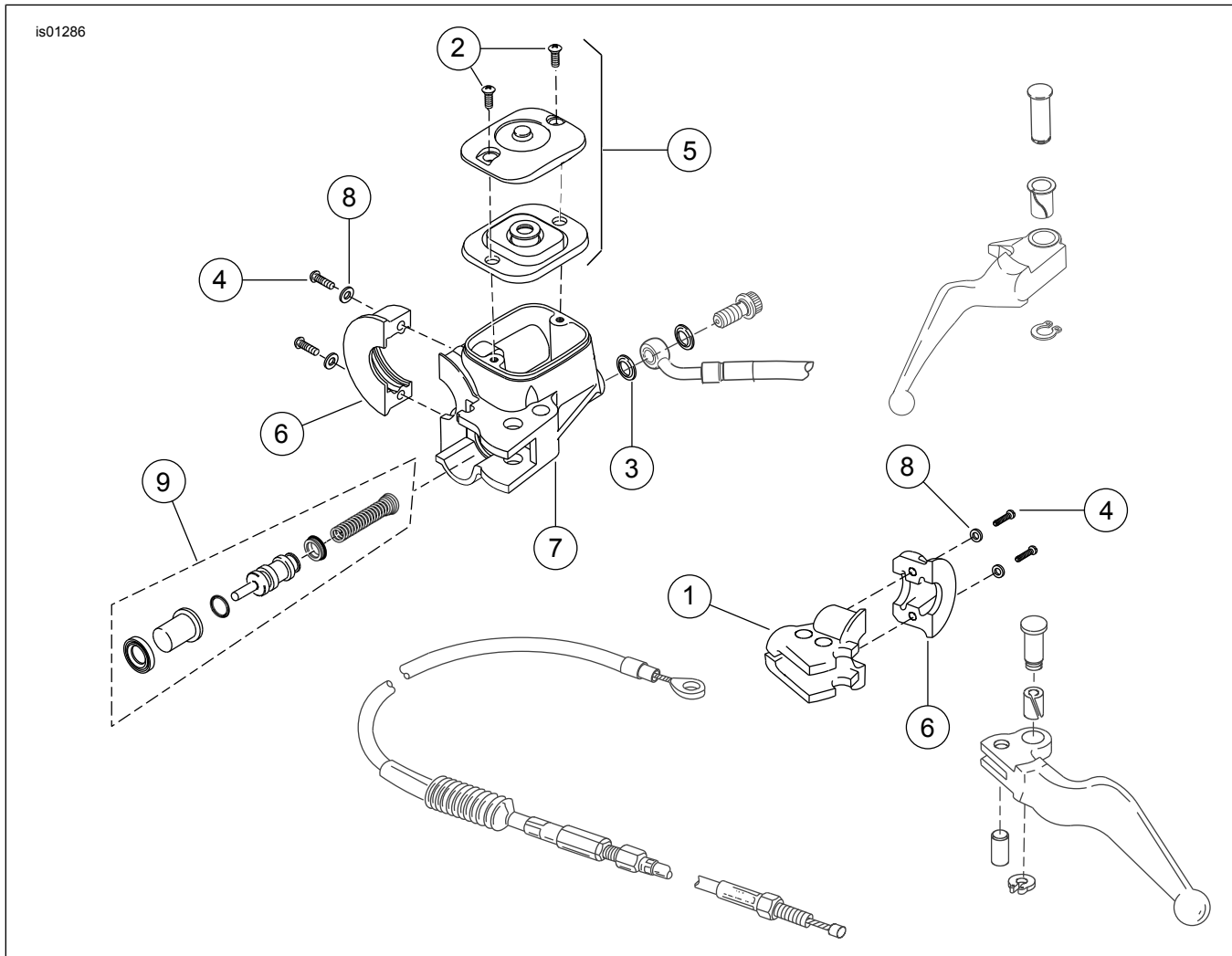
4. Test ride the motorcycle.

- a. If the brake feels spongy, repeat the front brake bleeding procedure.
- b. If the clutch drags or if the transmission shifts hard, repeat the clutch bleeding procedure.

**▲ WARNING**

After repairing the brake system, test brakes at low speed. If brakes are not operating properly, testing at high speeds can cause loss of control, which could result in death or serious injury. (00289a)

**SERVICE PARTS**



**Figure 9. Service Parts: Chrome Front Brake Master Cylinder Kit**

**Table 1. Service Parts Table**

| Item | Description (Quantity)                 | Part Number | Item | Description (Quantity)                                                   | Part Number |
|------|----------------------------------------|-------------|------|--------------------------------------------------------------------------|-------------|
| 1    | Bracket, clutch lever                  | 38403-99    | 6    | Chrome clamp (2)                                                         | 45282-99    |
| 2    | Oval head screw (2)                    | 2573        | 7    | Master cylinder/reservoir bracket assembly (dual disc - 11/16 in. bore)  | 45298-99    |
| 3    | Gasket, brakeline (2) (dual disc)      | 41731-01    |      | Master cylinder/reservoir bracket assembly (single disc - 9/16 in. bore) | 45297-99    |
|      | Gasket, brakeline (2) (single disc)    | 41733-01    | 8    | Washer (4)                                                               | 6099        |
| 4    | Button head screw (4)                  | 4293        | 9    | Master cylinder kit (dual disc - 11/16 in. bore)                         | 45072-96C   |
| 5    | Chrome reservoir cover kit, (D.O.T. 5) | 45078-96D   |      | Master cylinder kit (single disc - 9/16 in. bore)                        | 45006-96C   |