



# INSTRUCTIONS

-J02667

REV. 7-25-03

Kit Number 42822-04, 43529-04

## FRONT PISTON REPAIR KIT

### General

This front piston repair kit is designed for installation on all 2004 and later XL model motorcycles.

#### NOTE

A Service Manual for your model motorcycle is available from your Harley Davidson Dealer.

There are no Service Parts available for these kits.

#### Kit Number 42822-04

Qty	Kit Contents
2	Piston
2	Piston seals
2	Dust seals
1	Grease

#### Kit Number 43529-04

Qty	Kit Contents
2	Piston seals
2	Dust seals
1	Grease

### WARNING

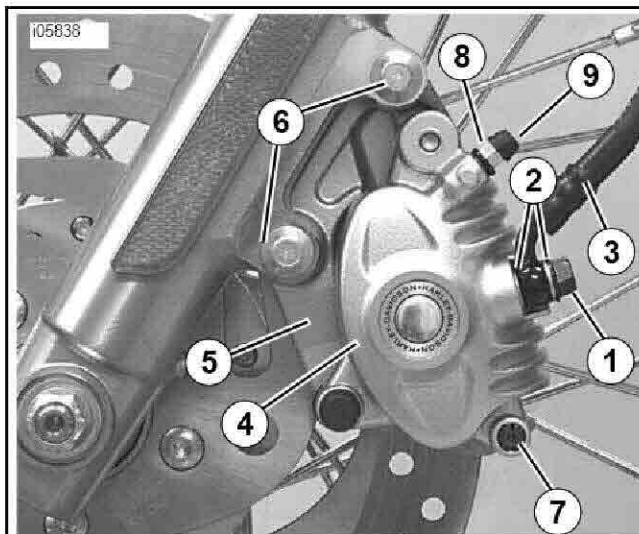
The rider's safety depends upon the correct installation of this kit. Follow the procedures listed in this instruction sheet and in the appropriate Service Manual. If the procedures are not within your capabilities, or if you do not have the correct tools, have your Harley-Davidson Dealer perform the installation. Failure to follow instructions could result in death or serious injury.

### Removal

### CAUTION

Damaged banjo bolt surfaces will leak when reassembled. Prevent damage to seating surfaces by carefully removing brake line components.

1. See Figure 1 and 2. Remove bleeder nipple cap (9) from bleeder valve (8) on front brake caliper (4). Install end of a length of clear plastic tubing over caliper bleeder valve, while placing free end in a suitable container. Open bleeder valve about 1/2 turn. Pump brake hand lever to drain brake fluid. Close bleeder valve.
2. See Figure 1. Remove the banjo bolt (1) and both steel washers (2) to detach front brake line (3) from caliper (4). Discard washers.
3. Remove pad pin plug (7).
4. See Figure 3. Loosen, but do not remove, brake pad pin.
5. See Figure 1. Remove both mounting bolts (6) (12 pt/10 mm). Pull caliper and mounting bracket assembly rearward to disengage from brake disc.



1. Banjo bolt
2. Washer (2)
3. Front brake line
4. Brake caliper
5. Caliper mounting bracket
6. Mounting bolt (92) 912 pt/10 mm)
7. Pad pin plug
8. Bleeder valve
9. Bleeder nipple cap

Figure 1. Front Caliper Bleeder Valve

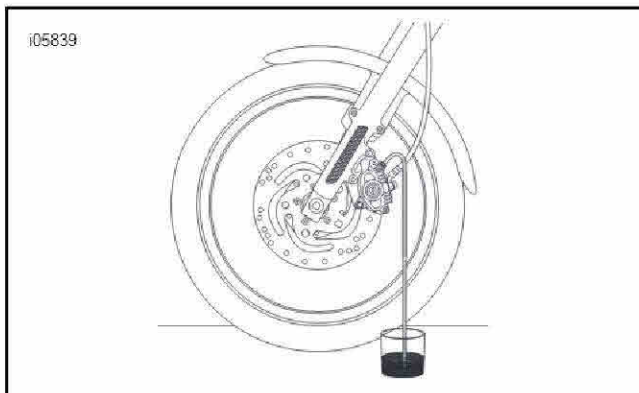


Figure 2. Bleeding Hydraulic System

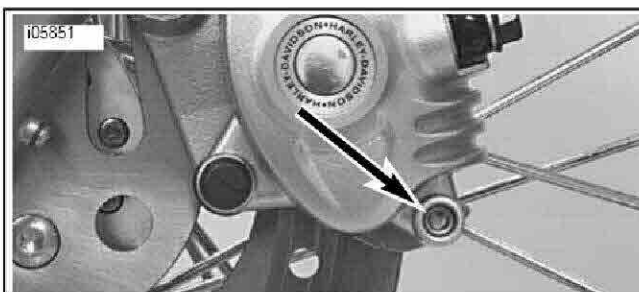


Figure 3. Bleeding Hydraulic System

-J02667

1 of 8

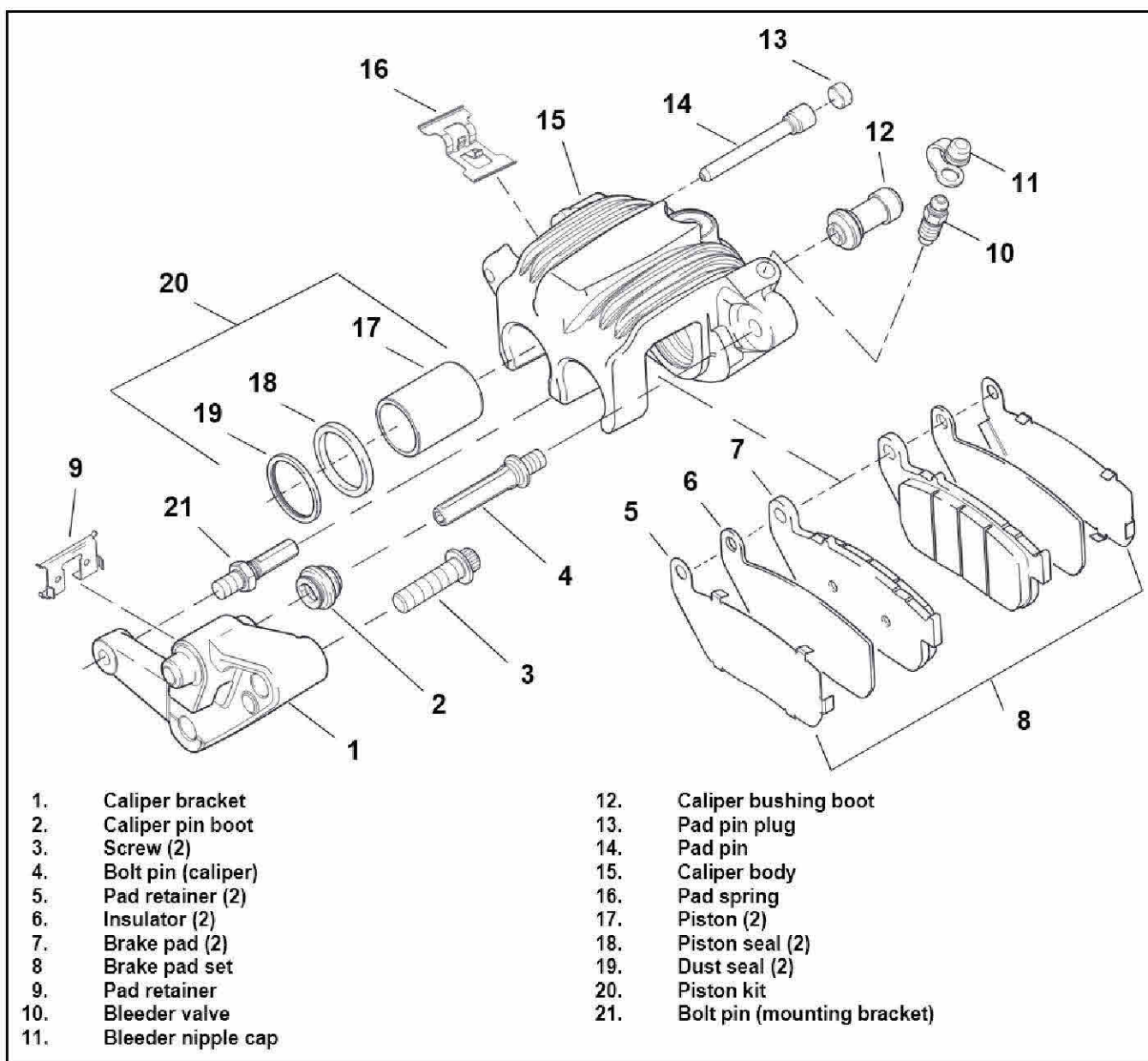


Figure 4. Front Brake Caliper Assembly

## Disassembly

1. See Figure 4. Remove brake pad pin (14) and brake pads (8) from caliper body (15).
2. Slide brake caliper off mounting bracket (1).
3. Remove pad spring (16). Do not remove bleeder valve (10) at this time.
4. See Figure 5. Install a discarded brake pad in the caliper (1) with the backing plate (5) facing the pistons. Position the brake pad so the friction material (4) is against the back of the caliper, as shown.
5. Loosely install brake pad pin (3) to hold brake pad in place.

### **WARNING**

Low pressure compressed air can blow debris into your face and eyes. Always wear eye protection or a face shield when using pressurized air. Failure to take adequate safety precautions could result in death or serious injury.

### **CAUTION**

Be careful not to damage banjo bolt sealing surface or threads of banjo bolt hole in brake caliper. It is recommended that you use an air nozzle with a rubber tip to perform the next step in this procedure.

### **CAUTION**

In the next step, the pistons will be forced out of their bores and up against the brake pad backing plate. Keep fingers away from this area. Failure to do so could result in serious injury.

6. See Figure 6. Gently apply low pressure compressed air to banjo bolt hole (3) to force pistons from caliper bores.
7. Remove brake pad pin and brake pad.
8. See Figure 4. Remove pistons (17) from caliper bores by hand. If necessary, wiggle pistons to completely remove.

### **CAUTION**

Damaged piston bores will leak when reassembled. Do not use metal objects to remove or install objects from piston bores. Prevent damage to pistons, seals and bores by only using a wooden toothpick when servicing calipers.

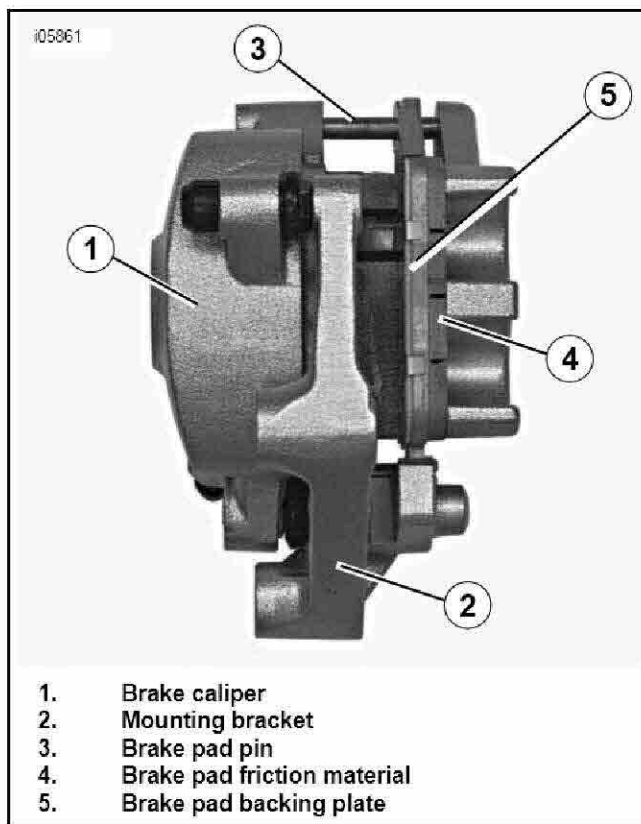


Figure 5. Front Brake Master Cylinder

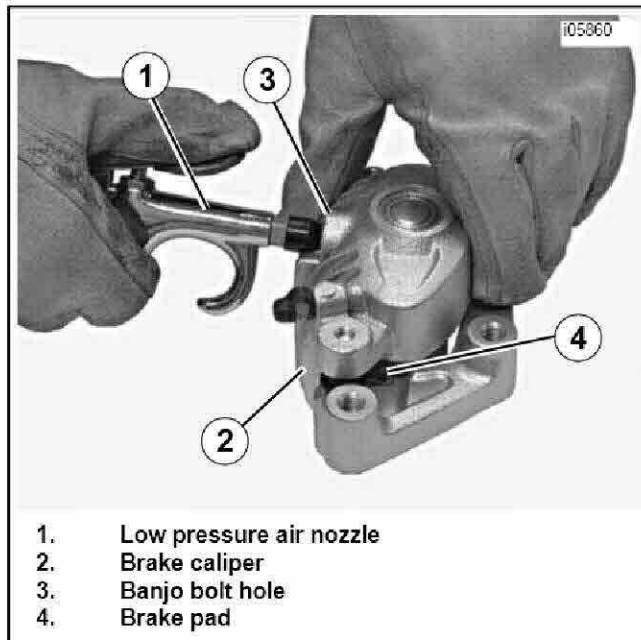


Figure 6. Removal Pistons

9. See Figure 7. Using a wooden toothpick (1), remove dust seal (2) and piston seal (3) from each caliper bore. Discard seals.

10. See Figure 4. If necessary, remove bleeder valve (10).

## CLEANING, INSPECTION AND REPAIR

### **⚠WARNING**

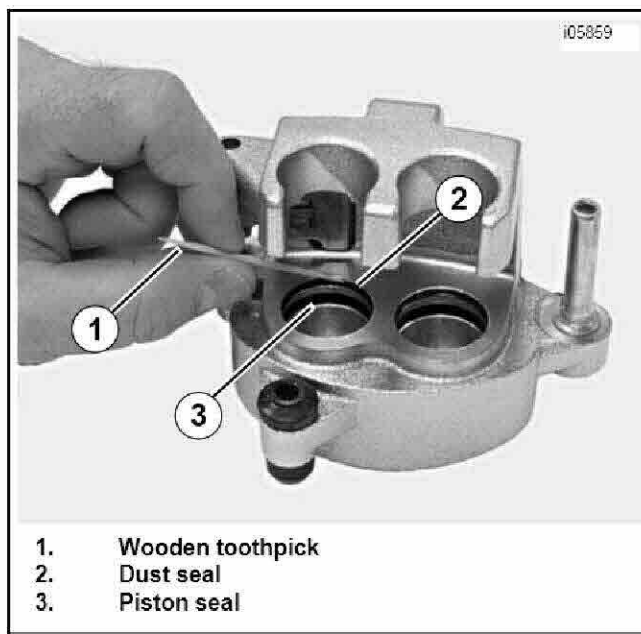
Always use denatured alcohol to clean metal brake system components and Harley-Davidson D.O.T. 5 SILICONE HYDRAULIC BRAKE FLUID (Part No. 99902-77) to clean rubber brake system components. Do not use mineral-base cleaning solvents, such as gasoline or paint thinner. Use of mineral-base solvents causes deterioration of rubber parts that continues after assembly. This may result in improper brake operation which could result in death or serious injury.

1. See Figure 4. Wipe old lubrication from inside of caliper pin boot (2) and caliper bushing boot (12) with a soft, clean cloth.
2. Clean all other rubber parts with Harley-Davidson D.O.T. 5 SILICONE HYDRAULIC BRAKE FLUID (Part No. 99902-77). Do not contaminate with mineral oil or other solvents. Clean all metal parts with denatured alcohol. Wipe parts dry with a clean, lint free cloth.

### **⚠WARNING**

Low pressure compressed air can blow debris into your face and eyes. Always wear eye protection or a face shield when using pressurized air. Failure to take adequate safety precautions could result in death or serious injury.

3. Blow out drilled passages and piston bore with low pressure compressed air from a clean air supply. Do not use a wire or similar instrument to clean drilled passages.
4. Carefully inspect all components. Replace any parts that appear damaged or worn.
  - a. Check pistons for pitting, scratching or corrosion on outside surfaces.
  - b. Inspect caliper piston bores. Do not hone bores. If bores show pitting or corrosion, replace caliper.
  - c. Inspect pad pin for grooving and wear. Measure the pad pin diameter in an unworn area, and then in the area of any grooving or wear. If wear is more than 0.011 in. (0.28 mm), replace pad pin.
  - d. Inspect caliper bolt pin. If damaged or excessively worn, replace brake caliper assembly.
  - e. Inspect caliper bushing boot and caliper pin boot. If worn or damaged, replace.
  - f. Always replace all seals after disassembly.



1. Wooden toothpick
2. Dust seal
3. Piston seal

Figure 7. Dust Seals and Piston Seals



Figure 8. Piston Nose Radius

### **⚠WARNING**

Always replace brake pads in complete sets for correct brake operation. Never replace just one brake pad. Failure to install brake pads as a set could result in death or serious injury.

5. Inspect brake pads and brake disc. Replace if necessary.
  - a. Refer to the Brake Pads and Discs for specifications in the appropriate Service Manual.
  - b. Refer to the Front Wheel for the brake disc replacement procedure in the appropriate Service Manual.



## ASSEMBLY

### CAUTION

Use **ONLY** KS62F assembly grease for lubrication. Use of D.O.T. 5 brake fluid will result in increased brake lever travel.

1. Lubricate the following parts prior to assembly using a light coat of KS62F assembly grease from the service parts kit. All other surfaces must be dry for assembly.
  - a. Nose radius of pistons. See Figure 8.
  - b. All surfaces of piston seals and dust seals.

### CAUTION

Damaged piston bores will leak when reassembled. Do not use metal objects to remove or install objects in piston bores. Prevent damage to bores by only using a wooden toothpick when servicing calipers.

2. See Figure 7. Install a **new** piston seal (3) and a new dust seal (2) into each piston bore.
3. Carefully insert pistons by hand, nose radius first (see Figure 8.), into caliper bores. If installation shows resistance, remove piston(s) and check that seals are properly installed.
4. Install bleeder valve on caliper housing if removed. Tighten bleeder valve to 35-61 **in-lbs** (3.9-6.9 Nm).
5. See Figure 9. Place caliper housing on workbench as shown. Install caliper pad spring in channel. Press firmly into place.

### NOTE

The front left and front right (not present on all vehicles) calipers do not use the same exact brake pad set as the rear brake caliper.

6. See Figure 10. Insert one set of brake pads (1) into caliper with friction material on pad facing opening for brake disc. Curved portion of pad fits into recessed area of caliper. Make sure brake pad front mounting tab (2) fits into slot (5) in caliper mounting bracket (4).
7. See Figure 4. Press brake pads (8) tightly against caliper pad spring (16) and install pad pin (14). Tighten to 131-173 **in-lbs** (14.7-19.6 Nm).

### NOTES

If pad pin does not fit, check the following:

- You are using a set of pads, not two identical pads.
  - Caliper pad spring orientation must match Figure 9.
  - See Figure 10. Pad front mounting tabs (2) must be fully seated in mounting bracket slot (5).
  - Pads must be pushed tight against caliper pad spring before pad pin is installed.
8. See Figure 4. Install pad pin plug (13). Tighten to 18-25 **in-lbs** (2.0-2.9 Nm).

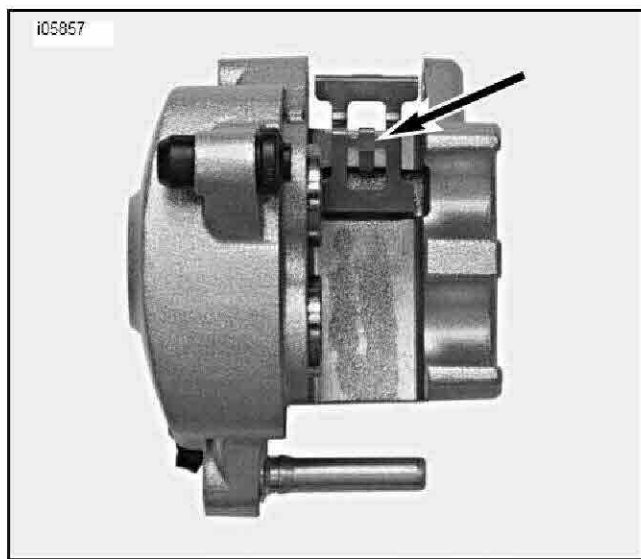


Figure 9. Front Caliper Pad Spring

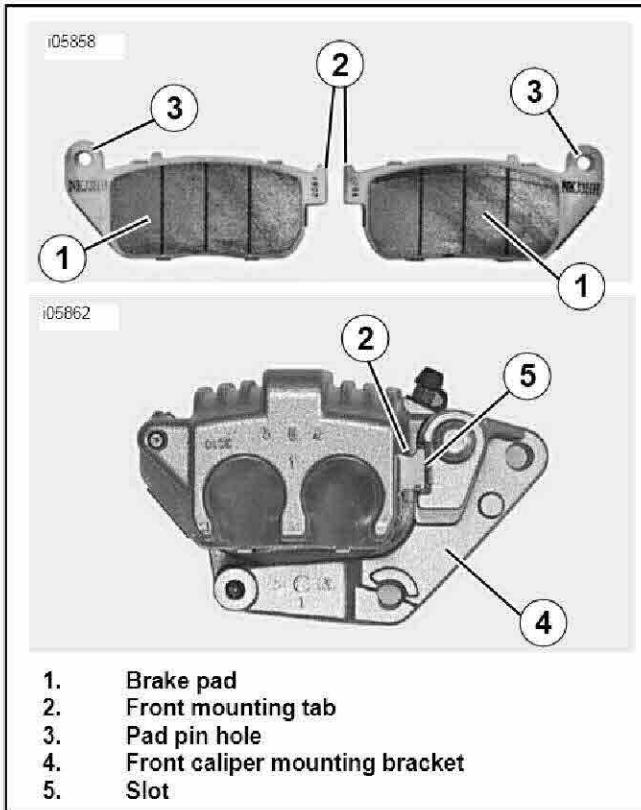


Figure 10. Front Brake Pads

## LUBRICATING FRONT CALIPER BOLT PINS AND BOOTS

1. See Figure 11. Apply approximately 0.4 g of G40M brake grease (Part No. 42820-04) inside caliper bushing boot (3) and caliper pin boot (4).
2. See Figure 12. Apply G40M brake grease inside boot lip (8) to prevent sticking between boots (3, 4) and bolt pins (5, 6).
3. Assemble brake caliper and mounting bracket, carefully sliding bolt pins into boots. Slide brake caliper all the way onto mounting bracket until boot lips fit over tapered shoulders (7) of bolt pins.

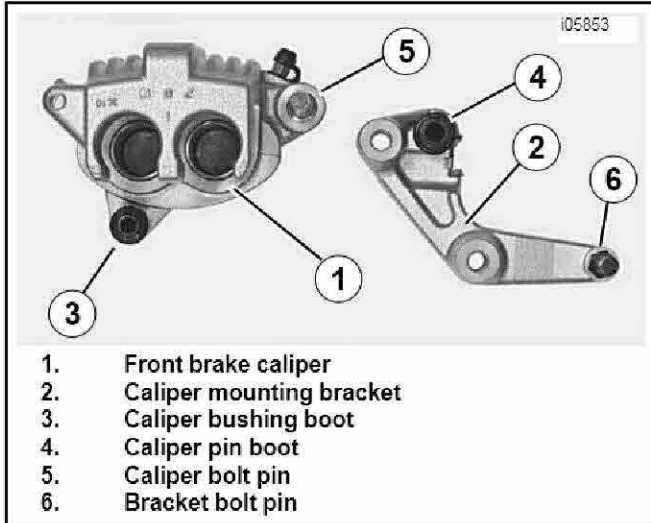


Figure 11. Front Brake Master Cylinder

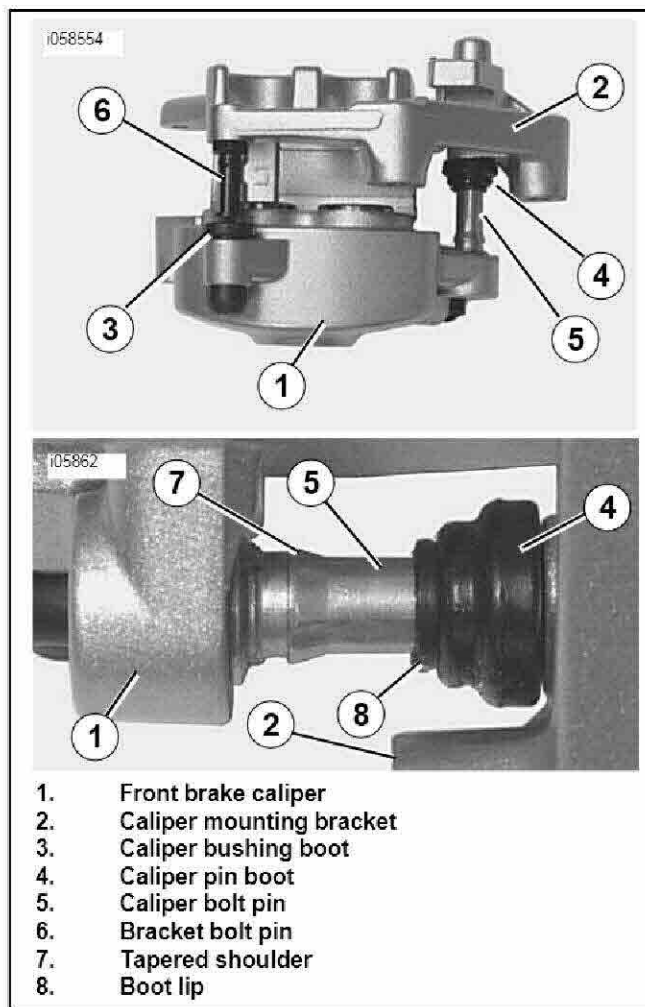


Figure 12. Assembling Front Brake Caliper and Mounting Bracket

## INSTALLATION

1. See Figure 13. If servicing a vehicle with a single front brake caliper, advance to the next step. On models with dual front brakes, align calipers to brake discs.
  - a. Tighten axle nut to 50-55 ft-lbs (67.8-74.6 Nm).
  - b. Loosen axle pinch bolt nuts.
  - c. Insert 7/16 in. drill bit (2) into hole in axle (1) as far as it will go.
  - d. Position fork leg against edge of drill bit. Contact point (3) must have edge of drill bit touching the edge of fork leg.
  - e. Tighten axle pinch bolt nuts to 25-30 ft-lbs (33.9-40.7 Nm) and withdraw drill bit.
2. See Figure 14. Place brake caliper (4) with mounting bracket (5) over brake disc with bleeder valve (7) facing upwards. Install mounting bolts (6) into mounting holes on fork leg. Tighten to 28-38 ft-lbs (38.0-51.5 Nm).

### CAUTION

To avoid leakage, verify that washers, banjo bolt, brake line and caliper bore are completely clean.

3. Position a new washer (2) on each side of hydraulic brake line (3) banjo fitting. Insert banjo bolt (1) through washers and fitting. Thread bolt into caliper housing. Tighten to 20-25 ft-lbs (27.1-33.9 Nm).
4. See Figure 15. Remove cover screws (4), top cover (2) and gasket from front brake master cylinder reservoir (1).

### NOTES

- See Figure 16. Do not use sight glass to determine maximum fluid level. Sight glass should only be used as a visual indicator that fluid level is low and needs attention.
  - Use only Harley-Davidson D.O.T. 5 SILICONE HYDRAULIC BRAKE FLUID from a sealed container.
  - Do not overfill reservoir. Do not reuse old brake fluid.
5. See Figure 16. Add enough Harley-Davidson D.O.T. 5 SILICONE HYDRAULIC BRAKE FLUID (Part No. 99902-77) to reservoir to bring fluid level even with ridge cast into inside of reservoir, about 1/4-inch (6.4 mm) below top edge.

### WARNING

Whenever brake calipers are installed, **BEFORE** moving motorcycle, you must pump brake fluid until the pistons push the pads against the brake disc. If you don't pump fluid pressure up again, the brakes will not be available to stop the motorcycle which could result in death or serious injury.

6. Bleed brake system. Refer to the appropriate Service manual for Bleeding Hydraulic Brake procedures.

### NOTE

On models with dual front brake calipers, make sure to perform brake system bleeding procedure on both calipers.

### WARNING

Verify proper operation of the master cylinder relief port. A plugged or covered relief port can cause brake drag or lockup, which may result in loss of vehicle control and could result in death or serious injury.

7. Verify proper operation of master cylinder relief port. With motorcycle positioned so that master cylinder reservoir is level, actuate brake lever with reservoir cover removed. A slight spurt of fluid will break the surface if all internal components are working properly.
8. See Figure 16. Add enough Harley-Davidson D.O.T. 5 SILICONE HYDRAULIC BRAKE FLUID (Part No. 99902-77) to reservoir to bring fluid level even with ridge cast into inside of reservoir, about 1/4-inch (6.4 mm) below top edge.
9. Install gasket and cover on master cylinder. Tighten cover screws to 9-17 in-lbs (1.0-2.0 Nm).
10. Tighten front axle and slider cap nuts if necessary.

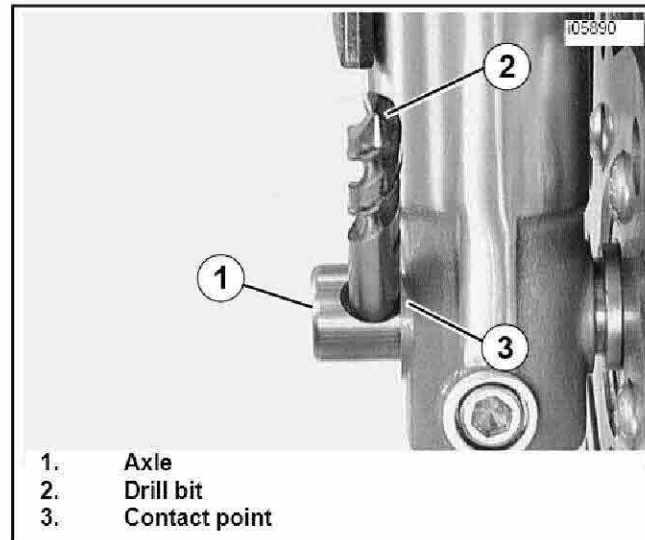
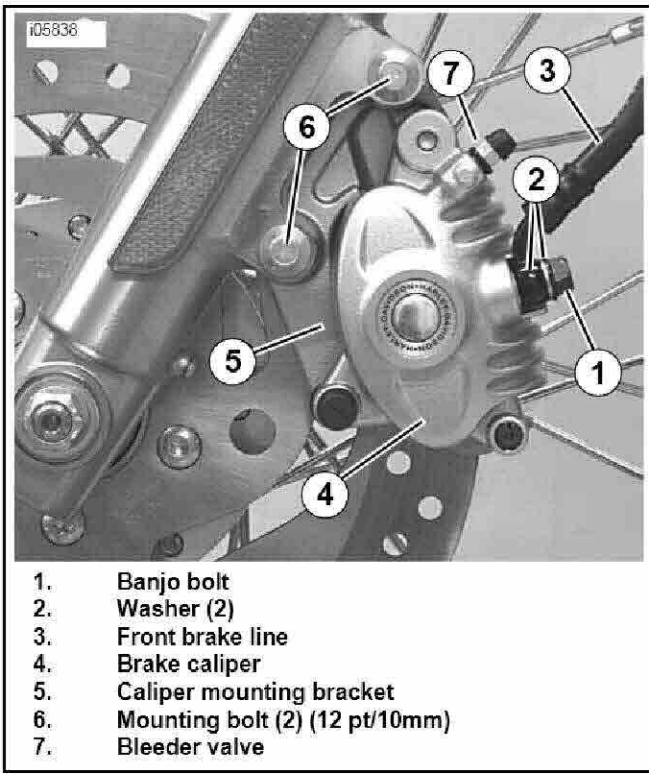


Figure 13. Dual Brake Disc Alignment



1. Banjo bolt
2. Washer (2)
3. Front brake line
4. Brake caliper
5. Caliper mounting bracket
6. Mounting bolt (2) (12 pt/10mm)
7. Bleeder valve

Figure 14. Front Caliper Assembly

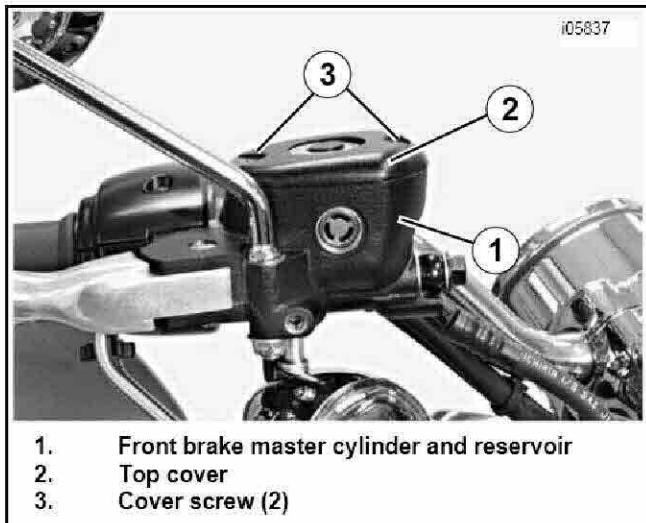
**⚠ WARNING**

After completing repairs or bleeding the system, always test motorcycle brakes at low speed. If brakes are not operating properly or braking efficiency is poor, testing at high speeds could result in death or serious injury.

11. Test brake system.
  - a. Turn ignition switch ON. Squeeze brake hand lever to verify operation of the brake lamp.
  - b. Test ride the motorcycle. If the brakes feel spongy, bleed the system again. Refer to the appropriate Service Manual for Bleeding Hydraulic Brake procedures.

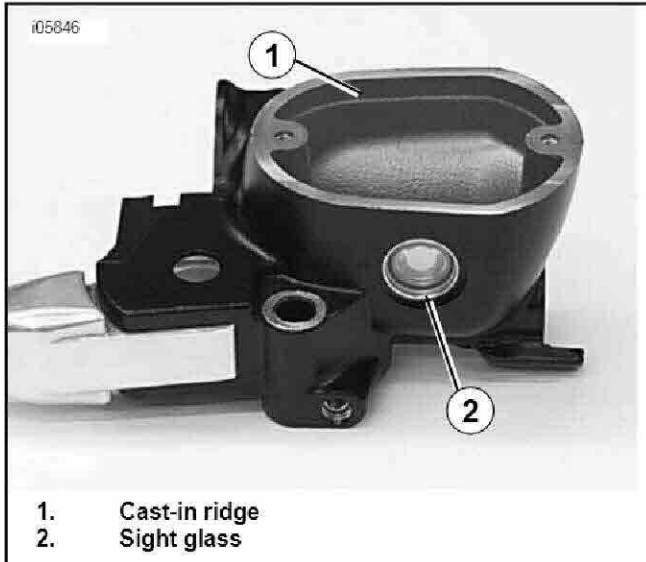
**NOTE**

Avoid making hard stops for the first 100 miles (160 km). This allows the new pads to become conditioned to the brake discs.



1. Front brake master cylinder and reservoir
2. Top cover
3. Cover screw (2)

Figure 15. Removing Master Cylinder Reservoir Cover



1. Cast-in ridge
2. Sight glass

Figure 16. Fitting Brake Lever/Master cylinder to Right Handlebar Switch Housing