



INSTRUCTIONS

-J02666

2018-03-21

REAR MASTER CYLINDER REBUILD KIT

GENERAL

Kit Number

42810-04B

Models

This kit fits all 2004-2006 XL models.

▲ 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

Table 1. Kit Contents (Sold Components)

Qty	Description	Part Number
1	Retaining ring, circle clip	11121
1	Master cylinder boot	42811-04
1	Pin spring	44189-04
1	Brake grease, G40M	42820-04
1	Brake grease, CCI #20	42830-05
2	Sealing washer (2)	41732-04

OVERVIEW AND CHECKS

Overview

The rear brake master cylinder is mounted transverse to the centerline of the vehicle, beneath the rear fork pivot shaft assembly.

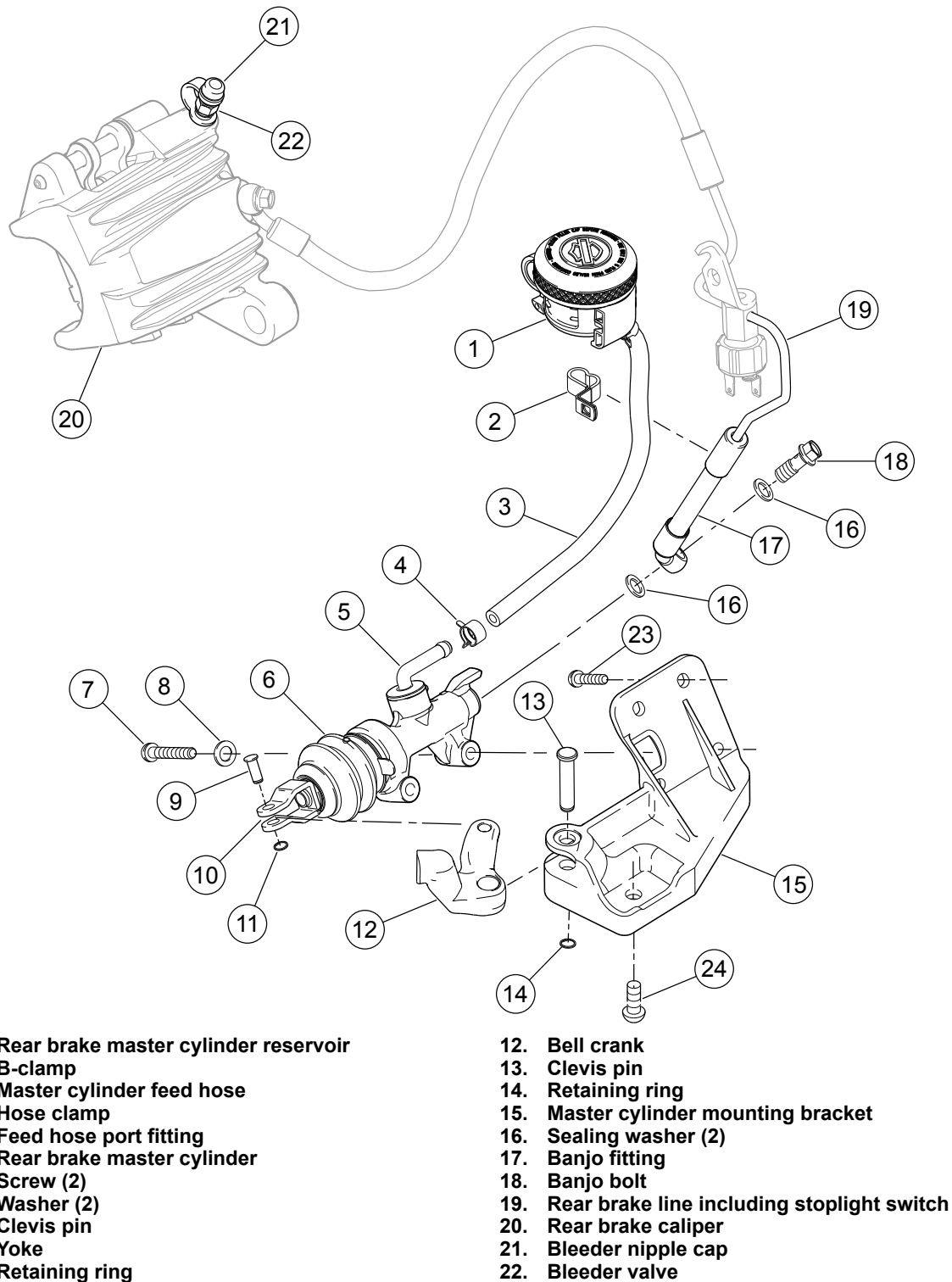
Checks

If the rear brake feels spongy, excessive pedal travel exists, brake does not work at all, or if pedal return to original position time is slow, perform the following checks:

1. Check the level of fluid in the rear brake reservoir. If it is low, refill and bleed brake system. Refer to BLEEDING REAR BRAKE in Service Manual.
2. Check for fluid leaks in the brake line, around banjo fittings or rear brake caliper piston or bleeder valve. Repair and bleed brake system.
 - a. For brake line replacement procedure, refer to BRAKE LINES in Service Manual.
 - b. To repair rear brake caliper, refer to REAR BRAKE CALIPER in Service Manual.
 - c. For hydraulic brake system bleeding procedure, refer to BLEEDING REAR BRAKE in Service Manual.
3. Check rear brake friction pads and disc for excessive wear or damage. Replace worn or damaged items.
 - a. For BRAKE PADS AND DISCS specifications refer to Service Manual.
 - b. Refer to BRAKE PAD REPLACEMENT procedure in Service Manual.
 - c. For brake disc replacement procedures, refer to REAR WHEEL in Service Manual.
4. Check mechanical brake linkage from brake pedal to master cylinder for damage. Repair or replace worn or damaged items. Refer to FOOTRESTS/FOOT CONTROLS in Service Manual.
5. Eliminate any air in the hydraulic brake assembly by bleeding the system. Refer to BLEEDING REAR BRAKE in Service Manual.

If none of these conditions exist but the rear brake system does not operate properly, the rear master cylinder is most likely defective and must be repaired or replaced.





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| 1. Rear brake master cylinder reservoir | 12. Bell crank |
| 2. B-clamp | 13. Clevis pin |
| 3. Master cylinder feed hose | 14. Retaining ring |
| 4. Hose clamp | 15. Master cylinder mounting bracket |
| 5. Feed hose port fitting | 16. Sealing washer (2) |
| 6. Rear brake master cylinder | 17. Banjo fitting |
| 7. Screw (2) | 18. Banjo bolt |
| 8. Washer (2) | 19. Rear brake line including stoplight switch |
| 9. Clevis pin | 20. Rear brake caliper |
| 10. Yoke | 21. Bleeder nipple cap |
| 11. Retaining ring | 22. Bleeder valve |

Figure 1. Rear Brake Master Cylinder and Reservoir

REMOVAL

- See Figure 1. Drain rear brake master cylinder reservoir (1) and remove hose clamp (4) and feed hose (3) from master cylinder feed hose port fitting (5). Refer to REAR BRAKE MASTER CYLINDER RESERVOIR in Service Manual.
- Remove bleeder nipple cap (21) from bleeder valve (22) on rear brake caliper (20). Install end of a length of plastic tubing over caliper bleeder valve, while placing free end in a suitable container.

⚠ 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)

- Open bleeder valve about 1/2-turn. Pump brake pedal to drain brake fluid. Close bleeder valve but do not tighten.

NOTE

Use correct retaining ring pliers and correct tips. Verify that tips are not excessively worn or damaged.

4. Remove retaining ring (11) from clevis pin (9). Remove clevis pin and disengage master cylinder yoke (10) from bell crank (12). Discard retaining ring.
5. Remove banjo bolt (18) and washers (16) from master cylinder (6). Lift banjo fitting away from master cylinder. Discard washers.

NOTICE

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

6. Remove two screws (7) and two washers (8) securing rear master cylinder to master cylinder mounting bracket (15) and remove rear master cylinder.
7. Remove master cylinder mounting bracket (if necessary) as follows:
 - a. Remove retaining ring (14) and clevis pin (13). Disconnect bell crank (12) from mounting bracket.
 - b. Remove two screws (23).
 - c. Remove screw (24) and mounting bracket.

DISASSEMBLY

NOTE

Do not disassemble the rear master cylinder unless problems are being experienced. Discard all seals during the disassembly procedure. Install a complete rebuild kit when the unit is reassembled.

1. See Figure 3. Clamp rear brake master cylinder in a vise with yoke (3) pointing up.
2. Remove external boot (5). Remove spring pin (12) from end of push rod (13). Discard spring pin.
3. See Figure 2 Grip yoke by the edges with an adjustable wrench. Do not grip yoke by the flats.

NOTE

Always wear eye protection when disassembling master cylinder. Spring pressure could propel components.

4. See Figure 3. Hold yoke with an adjustable wrench. Using an open-end wrench, unscrew shoulder nut (4). Remove yoke.
5. Press down on spring retainer (6) to compress external return spring (7). While spring is compressed, unscrew shoulder nut (4) from push rod (13). Carefully release pressure on external return spring. Remove spring retainer and external return spring.

NOTE

Do not remove boot collar nut (9) and push rod retainer (11) from push rod.

6. Remove and discard inner boot (8).

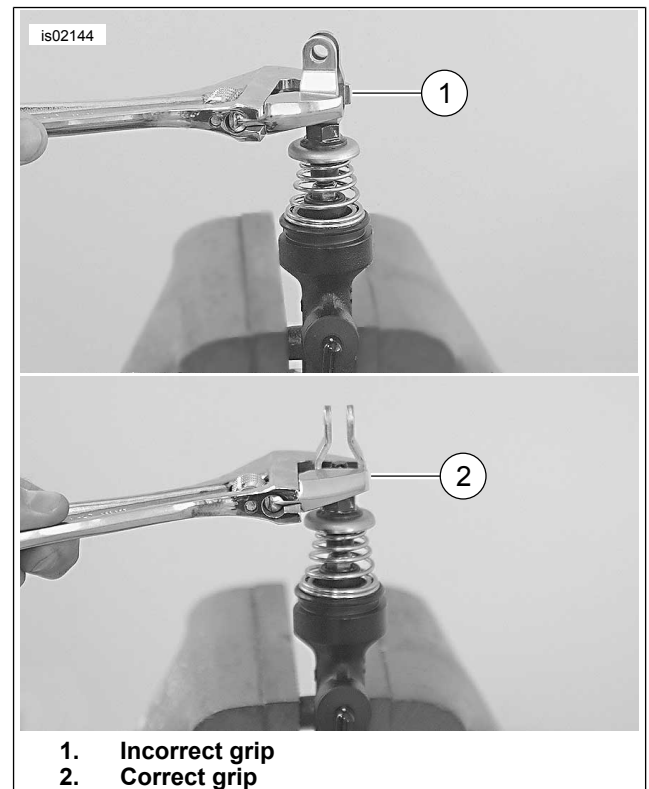
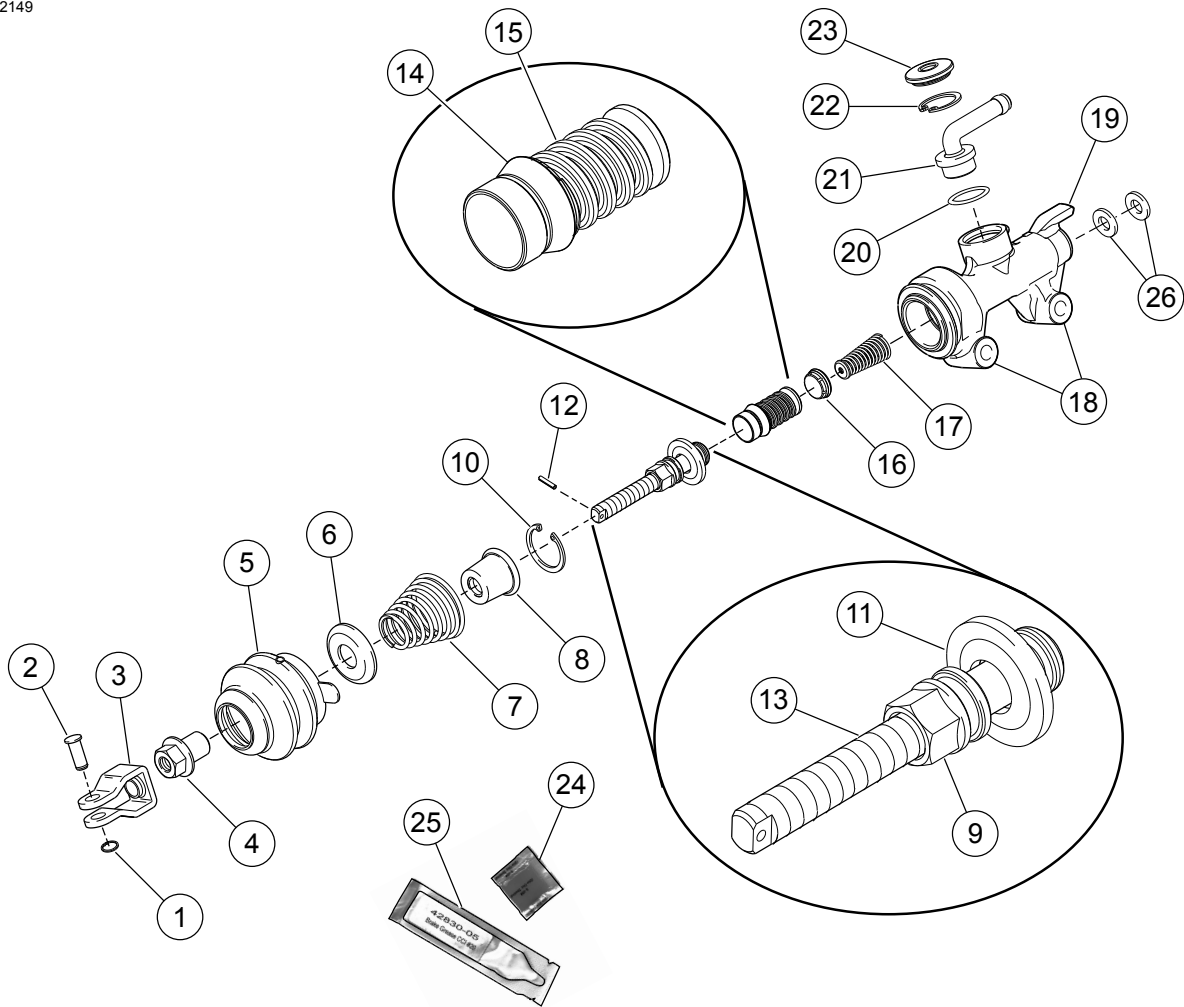


Figure 2. Grip Yoke With Wrench

⚠ 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. Thread shoulder nut back onto push rod several turns, to protect push rod threads. Press down on push rod to compress piston spring (17). Remove retaining ring (10), push rod (13) with boot collar nut (9) and push rod retainer (11), piston (15) with secondary cup (14), primary cup (16), and piston spring (17). Discard retaining ring, piston with secondary cup, primary cup, and piston spring.
8. Remove dust cover (23), retaining ring (22), feed port fitting (21), and O-ring (20). Discard retaining ring and O-ring.



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|---------------------------|----------------------------|
| 1. Retaining ring | 14. Secondary cup* |
| 2. Clevis pin | 15. Piston* |
| 3. Yoke | 16. Primary cup* |
| 4. Shoulder nut | 17. Piston spring* |
| 5. External boot | 18. Mounting boss (2) |
| 6. Spring retainer | 19. Master cylinder body |
| 7. External return spring | 20. O-ring |
| 8. Inner boot* | 21. Feed port fitting |
| 9. Boot collar nut | 22. Retaining ring |
| 10. Retaining ring* | 23. Dust cover |
| 11. Push rod retainer | 24. Brake grease, G40M* |
| 12. Spring pin | 25. Brake grease, CCI #20* |
| 13. Push rod | 26. Sealing washer (2)* |

Figure 3. Rear Brake Master Cylinder (* - items included in kit)

CLEANING, INSPECTION, AND REPAIR

⚠ WARNING

Use denatured alcohol to clean brake 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 brake failure, which could result in death or serious injury. (00291a)

⚠ 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. See Figure 3. Thoroughly clean master cylinder body (19) and all brake system components. Blow out drilled passages and piston bore in master cylinder body with low pressure compressed air from a clean air supply.
2. Carefully inspect all parts for wear or damage and replace as necessary.
 - a. Inspect the piston bore in the master cylinder housing for scratches, grooves, scoring, pitting, or corrosion. Replace the housing if any of these conditions are found.
 - b. Inspect the outlet port that mates with the brake line banjo fitting. This is a critical sealing surface. Replace the housing if any scratches, dents, or other damage is found.
3. Verify that vent holes in master cylinder are completely open and free of dirt or debris.

ASSEMBLY

NOTE

When assembling rear brake master cylinder, always use new parts from the service parts kit. Consult your parts catalog for the correct kit part number.

Brake grease CCI #20 is recommended for lubrication of cylinder bore, cups, and seals prior to assembly.

Stand master cylinder on wooden block or clean, lint-free towel to protect seating surfaces.

1. See Figure 3. Lubricate master cylinder (19) bore, new piston with secondary cup, and new primary cup (16) with brake grease CCI #20.

⚠ 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)

2. Coat new O-ring (20) with D.O.T. 5 Silicone Hydraulic Brake Fluid (99902-77). Install O-ring and feed port fitting (21) into feed port on top of master cylinder. Secure with new retaining ring (22). Verify that retaining ring is fully seated in groove.
3. Slide dust cover (23) onto feed port fitting and press into place in master cylinder feed port. See Figure 4. Turn feed port fitting (4) so it points toward banjo fitting hole (5) at end of master cylinder body (1).

NOTE

Clamp rear brake master cylinder (19) in a vise by its mounting bosses (18) only. Use brass jaw covers or other protective device on vise jaws.

4. Clamp master cylinder in a vise with banjo fitting end pointing down.

NOTE

Always wear eye protection when assembling master cylinder. Spring pressure could propel components.

5. See Figure 5. Install new primary cup (2) onto small end of new piston spring (4) with open end of cup facing spring. Slide piston spring with primary cup into master cylinder bore with large end of spring facing down.
6. Insert piston (1) with secondary cup (3) into cylinder bore with flat end of piston facing primary cup.
7. Apply approximately 0.1 g of G40M brake grease to ball end of push rod (5). Insert ball end of push rod into cupped end of piston.
8. See Figure 3. Thread shoulder nut (4) onto push rod (13) several turns to protect push rod threads. Press down on push rod to compress piston spring (17). Slide push rod retainer (11) down into master cylinder bore.
9. Secure push rod assembly with new retaining ring (10). Verify that retaining ring is fully seated in groove. Unthread shoulder nut from push rod.
10. See Figure 6. Apply approximately 0.1 g of G40M brake grease around groove (4) in boot collar nut (3). Carefully slide inner boot (5) down onto push rod (2) and into end of master cylinder bore. Press lip of inner boot down around groove in boot collar nut.

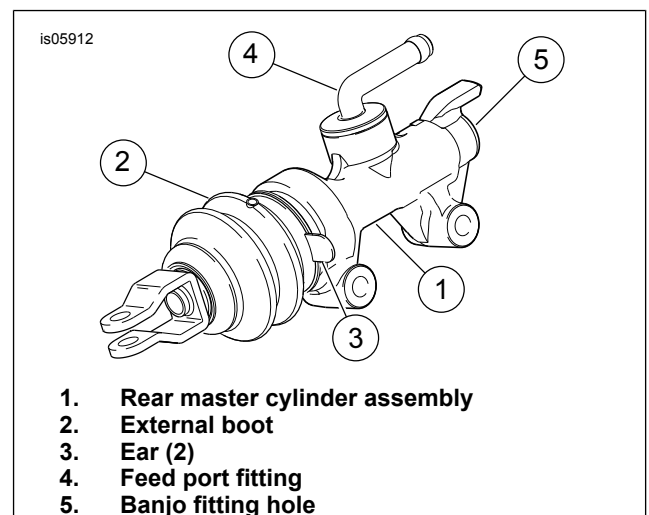


Figure 4. Assembled Rear Master Cylinder

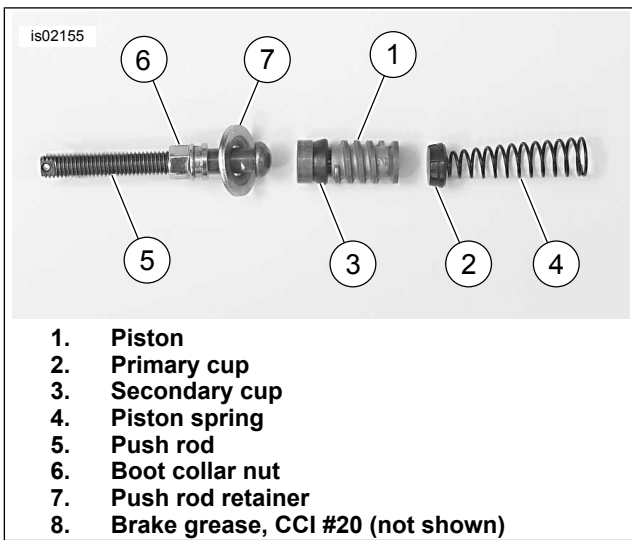


Figure 5. Rear Master Cylinder Piston, Push Rod, and Spring

11. See Figure 3. Install external return spring (7) and spring retainer (6). Thread shoulder nut (4) shoulder-first onto push rod (13), several turns past flats.
12. Thread yoke (3) onto push rod, at least 2-3 turns past flats. Install spring pin (12).
13. See Figure 7. Measure distance from centerline of clevis pin hole in yoke to centerline of master cylinder mounting boss closest to yoke. This distance must be 87.3 mm +/- 1 mm. Turn yoke on push rod in one direction or the other until this distance is obtained.

NOTE

Grip yoke by the edges with adjustable wrench. Do not grip yoke by the flats.

14. Holding yoke with an adjustable wrench, turn shoulder nut back against yoke. Tighten to 130-173 **in-lbs** (14.7-19.6 Nm).
15. Remove master cylinder assembly from vise. See Figure 4. Slide external boot (2) over yoke/push rod assembly and external return spring.
16. Position external boot so that ears (3) are at the 3 o'clock and 9 o'clock position when master cylinder body (1) is held upright. This assures that drain hole is at bottom of boot when master cylinder is mounted on motorcycle. Make sure that lip on large end of external boot fits fully in groove in end of master cylinder.

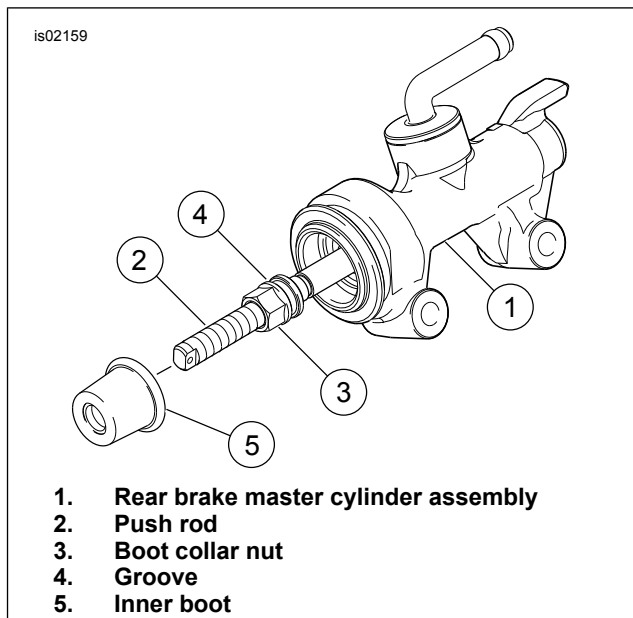


Figure 6. Lubricating and Installing Inner Boot

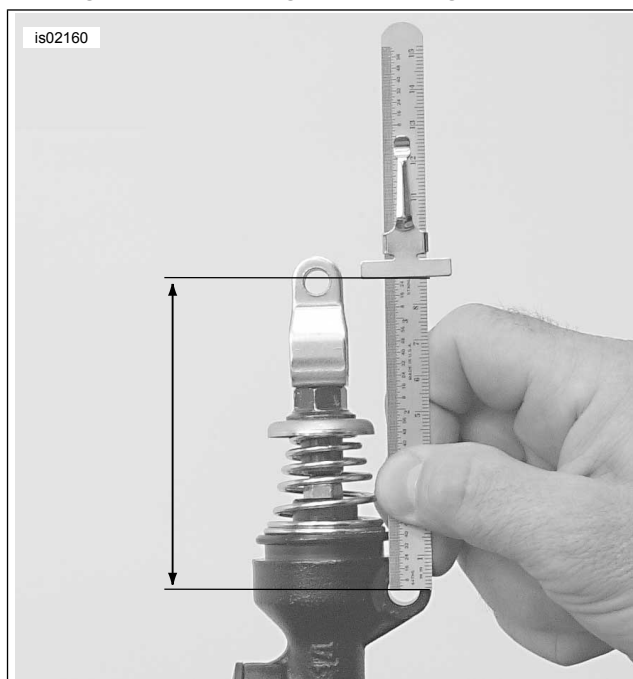


Figure 7. Adjusting Push Rod Length (87.3 mm +/- 1 mm)

INSTALLATION

1. See Figure 1. Install rear master cylinder assembly (6) on mounting bracket (15) with screws (7) and washers (8). Tighten to 15-20 ft-lbs (20.4-27.1 Nm).

▲ 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)

2. Fit yoke (10) onto bell crank (12). Install clevis pin (9) and secure with new retaining ring (11).
3. Position new sealing washer (16) supplied in kit on each side of hydraulic brake line banjo fitting (17). Insert banjo bolt (18) through washers and fitting. Thread bolt into master cylinder housing. Tighten to 20-25 ft-lbs (27.0-33.9 Nm).

NOTE

Rear brake master cylinder reservoir must be in a level position when filling and checking fluid level.

Reservoir cover may be removed from rear brake master cylinder reservoir to more easily verify fluid level in reservoir.

Use only D.O.T. 5 Silicone Hydraulic Brake Fluid from a sealed container.

Do not overfill reservoir. Do not reuse old brake fluid.

4. Install rear brake master cylinder feed hose (3) on master cylinder feed hose port fitting (5). Secure with hose clamp (4). Refer to REAR BRAKE MASTER CYLINDER RESERVOIR in Service Manual.

▲ WARNING

Be sure that brake fluid or other lubricants do not contact brake pads or discs. Such contact can adversely affect braking ability, which could cause loss of control, resulting in death or serious injury. (00290a)

▲ 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)

5. Position motorcycle upright (not resting on jiffy stand). Fill rear master cylinder reservoir with D.O.T. 5 Silicone Hydraulic Brake Fluid (99902-77) until the fluid level reaches the UPPER mark on the reservoir.
6. Bleed brake system. Refer to BLEEDING REAR BRAKE in Service Manual.
7. Turn ignition/light switch ON. Test operation of brake lamp with the rear brake applied.

▲ 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)

8. Test ride motorcycle at low speed. If brake feels spongy, repeat bleeding procedure.