SECTION 06-06 Brake System, Hydraulic

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VEHICLE APPLICATION

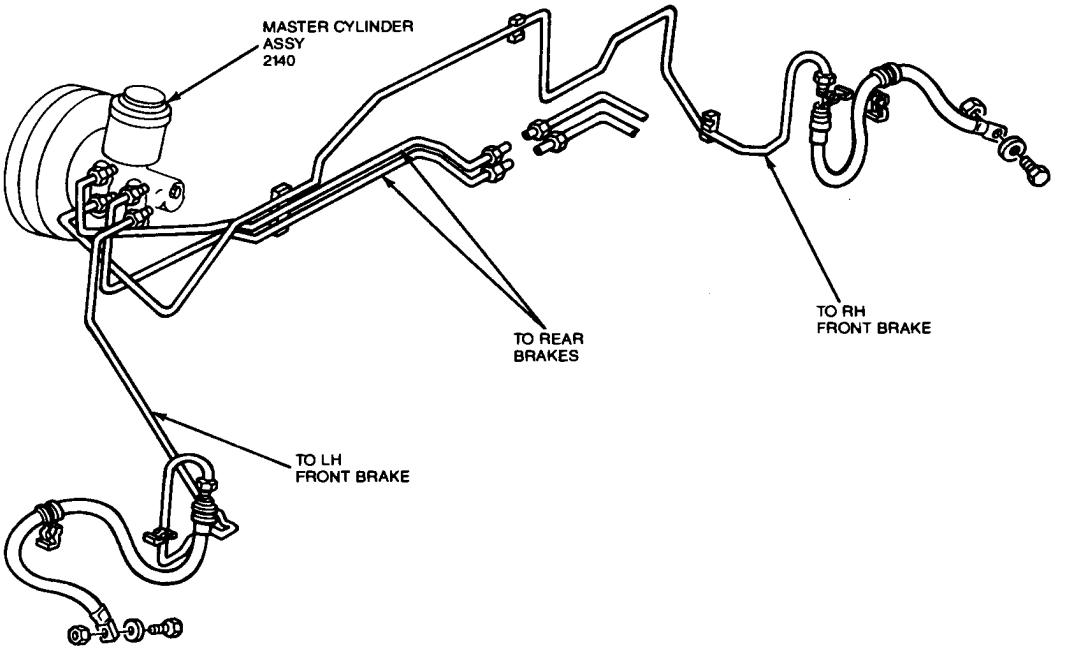
Capri.

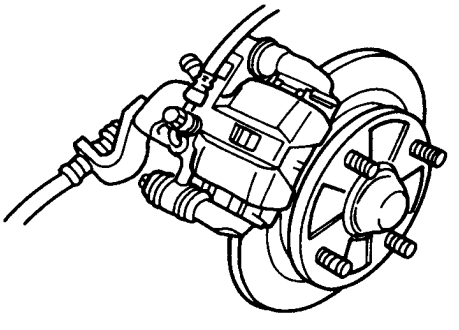
DESCRIPTION

WARNING: BRAKE FLUID CONTAINS POLYGLYCOL ETHERS AND POLYGLYCOLS. AVOID CONTACT WITH EYES. WASH HANDS THOROUGHLY AFTER HANDLING. IF BRAKE FLUID CONTACTS EYES, FLUSH EYES WITH RUNNING WATER FOR 15 MINUTES. GET MEDICAL ATTENTION IF IRRITATION PERSISTS. IF TAKEN INTERNALLY, DRINK WATER AND INDUCE VOMITING. GET MEDICAL ATTENTION IMMEDIATELY.

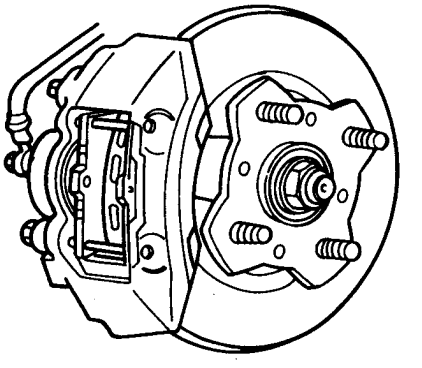
DESCRIPTION (Continued)

The dual hydraulic brake system is a conventional, pedal-actuated system with a master cylinder, pressure control valve, brake tubes and hoses. The hydraulic brake line routing has been diagonally split left front to right rear and right front to left rear. The master cylinder has a reservoir, brake pressure control valve, and pressure differential warning indicator, all combined in one assembly.





REAR DISC BRAKE (SOLID)



FRONT DISC BRAKE (VENTILATED)

H6888-A

DIAGNOSIS AND TESTING

Refer to Section 06-00.

REMOVAL AND INSTALLATION

Master Cylinder

Removal

NOTE: Pump brake pedal several times to exhaust any vacuum in the booster.

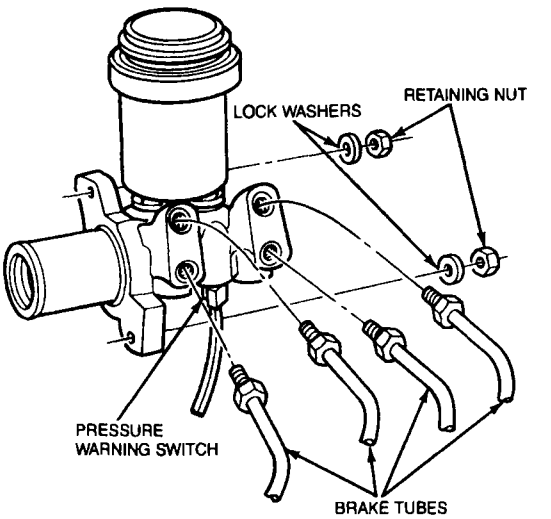
1. Remove brake tubes from master cylinder.
2. Cap brake tubes and master cylinder ports to prevent contamination.
3. Remove vacuum valve from booster.
4. Disconnect pressure warning switch connector.
5. Remove two nuts and lockwashers retaining master cylinder to brake booster assembly.
6. Remove master cylinder from brake booster.

   NOTE: It may be necessary to insert a small pry bar between the booster and the master cylinder to free the master cylinder.

   CAUTION: Brake fluid will damage painted surfaces. Be sure to throughly remove any fluid that may have contacted any paint surface.

Installation

1. Position master cylinder onto booster assembly studs.
2. Install two lockwashers and nuts retaining master cylinder. Tighten nuts to 10-16 N·m (8-11 lb-ft).
3. Remove caps from brake tubes and master cylinder ports.
4. install brake tubes to master cylinder.
5. Install vacuum valve to booster.
6. Connect pressure warning switch connector.
7. Fill reservoir to the proper level with Heavy-Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A) or equivalent.
8. Bleed brake system. Refer to Section 06-00.
9. Check and if necessary, adjust stoplamp switch. Refer to Section 17-01.



Proportioning Valve

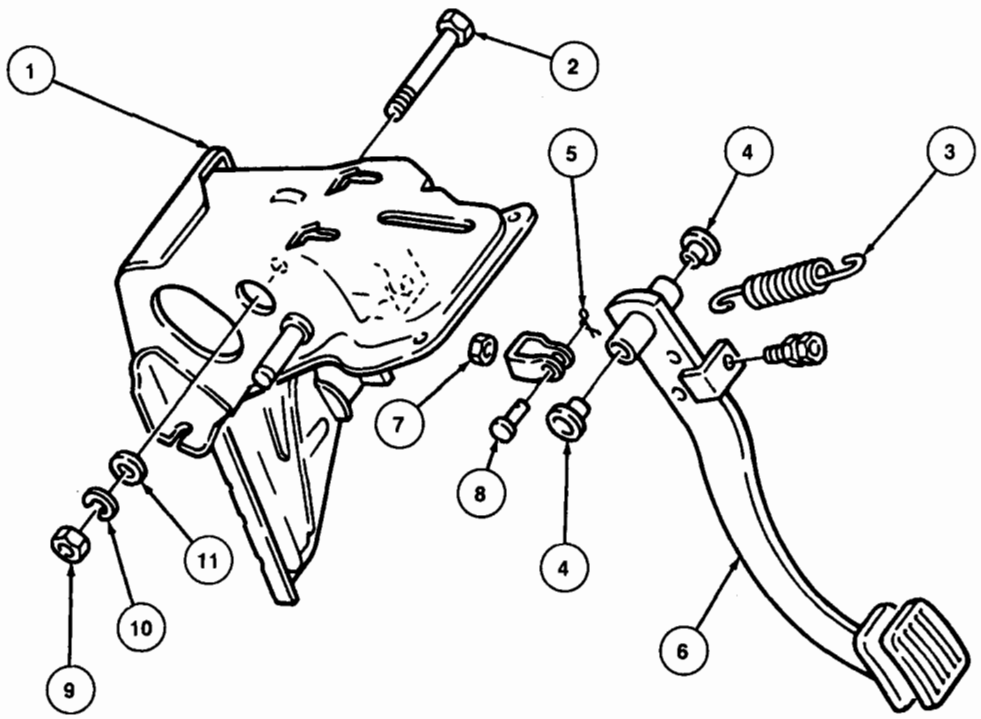
The proportioning valves are an integral part of the master cylinder. If service is required, refer to Master Cylinder, Disassembly and Assembly.

Brake Pedal

Removal

1. Remove the spring clip and clevis pin from the brake pedal.

REMOVAL AND INSTALLATION (Continued)



Item	Part Number	Description
1	01508	Pedal Bracket
2	9981 11070 9981 31021	Pedal Bolt (Automatic Transaxle) Pedal Bolt (Manual Transaxle)
3	2472	Return Spring
4	2481	Pedal Bushing
5	D001 43152	Spring Clip
6	2455	Pedal
7	9992 21000	Clevis Locknut
8	9923 20822	Clevis Pin
9A	0603 34307	Nut
10	9997 11000	Lockwasher
11	9995 21000	Washer
A		Tighten to 20-35 N·m (15-26 lb-ft)

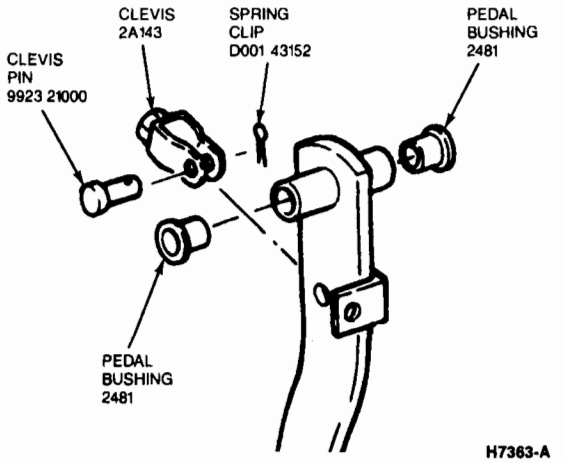
2. Remove the nut, lockwasher and washer from the pedal bolt.
3. Remove the pedal bolt from the pedal and pedal bracket.
4. Remove the pedal from the pedal bracket and disconnect the return spring.
5. Remove the pedal bushings from the pedal.

Installation

1. Apply Multi-Purpose Grease D8AZ-19584-AA (ESR-M1C159-A and ESB-M1C93-A) to pedal bushings and clevis pin.
2. Install the pedal bushings in the pedal.
3. Attach the return spring and position the pedal in the pedal bracket.
4. Install the pedal bolt in the pedal and pedal bracket.
5. Install the washer, lockwasher and nut on the pedal bolt. Tighten nut to 20-35 N·m (15-26 lb-ft).
6. Position the clevis on the brake pedal.

REMOVAL AND INSTALLATION (Continued)

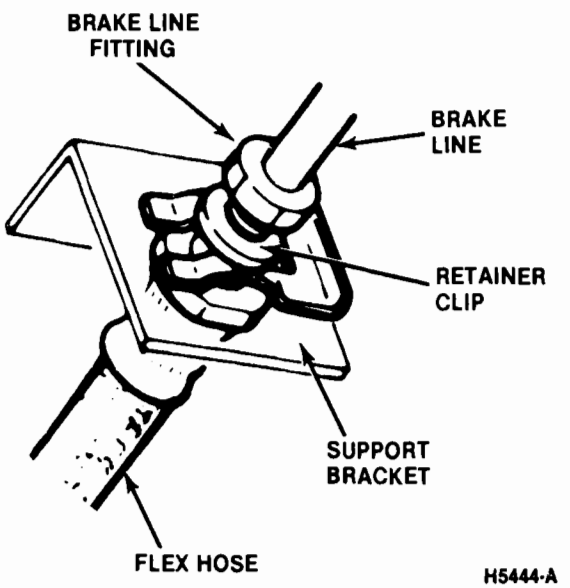
7. Install the clevis pin in the clevis and brake pedal. Install the spring clip on the clevis pin.



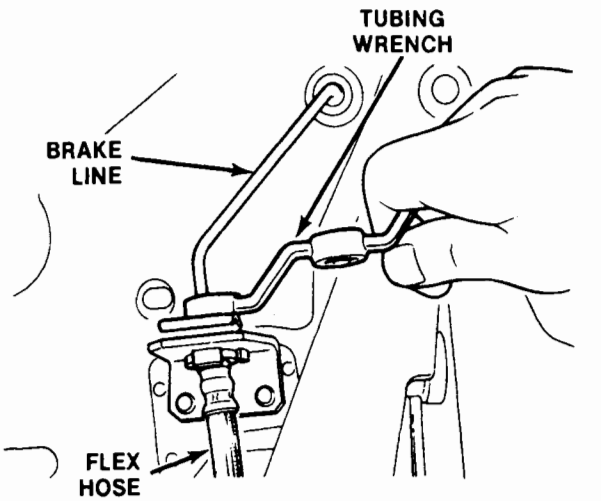
Caliper Hose

Removal

1. Remove the retainer clip from the flex hose attaching it to the strut.



2. Using a tubing wrench, loosen and remove the brake line fitting where it attaches to the flex hose.
3. Remove the retainer clip from the end of the flex hose.
4. Remove the banjo bolt from the flex hose and separate it from the caliper.
5. Discard the two copper washers that seal the banjo fitting.



Installation

1. Install two new copper washers and the banjo bolt on the banjo fitting.
2. Position the flex line against the caliper and loosely install the banjo bolt.
3. Position the other end of the flex line in its bracket on the body and loosely install the brake line fitting.
4. Install the two retainer clips at the support brackets.
5. Tighten the banjo bolt at the caliper to 22-29 N·m (17-21 lb-ft).
6. Tighten the brake line fitting at the other end of the flex hose to 13-22 N·m (10-17 lb-ft).
7. Bleed brake system. Refer to Section 06-00.

Brake Tube Replacement

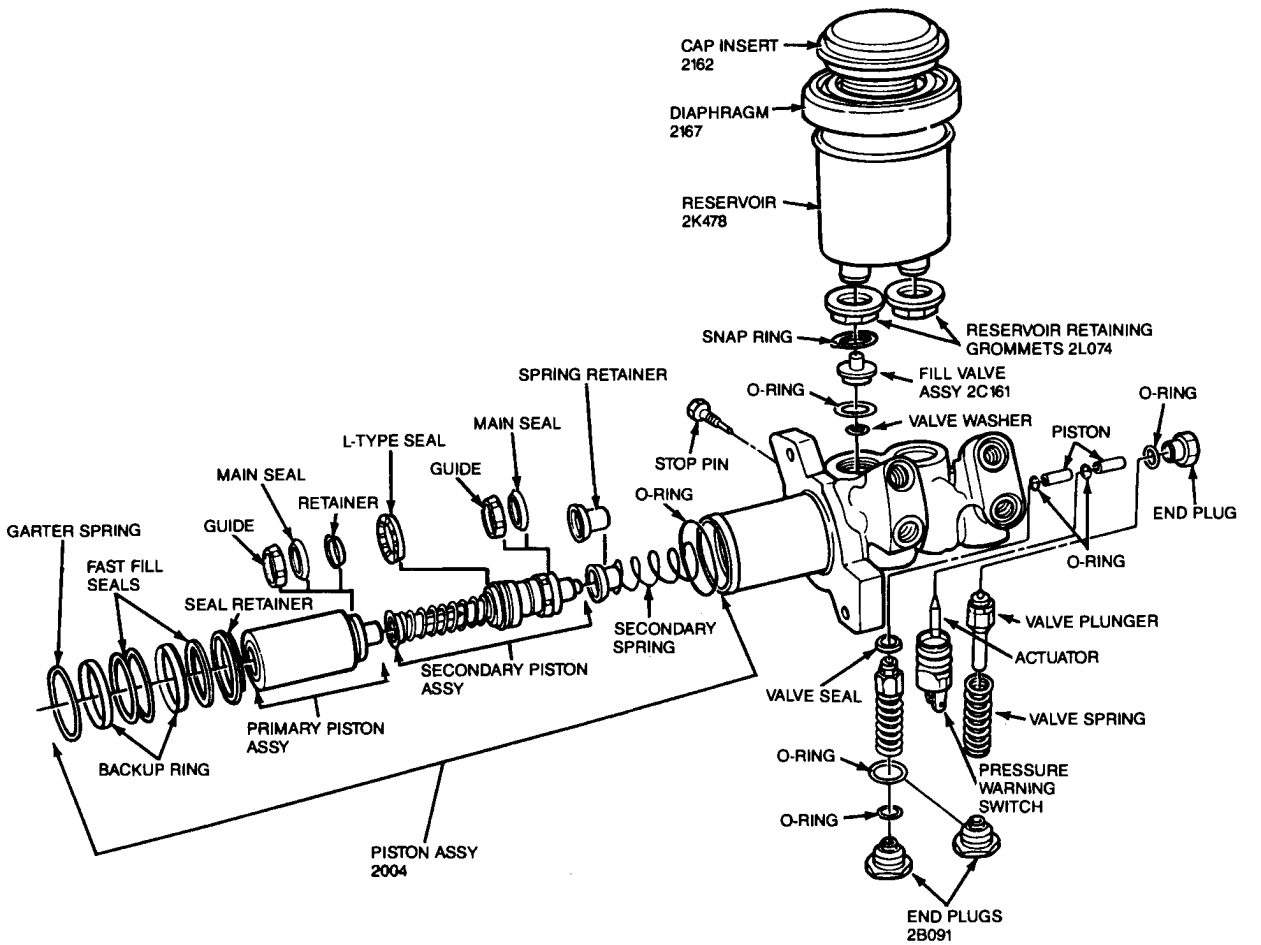
Refer to Section 06-00.

DISASSEMBLY AND ASSEMBLY

Master Cylinder

Disassembly

Master Cylinder—Disassembled View

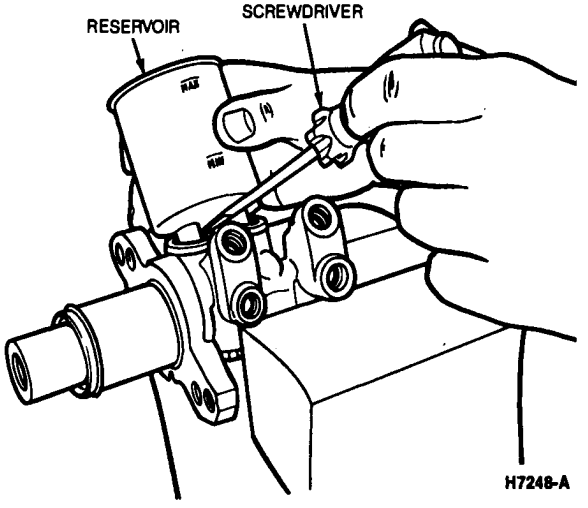


1. Remove master cylinder as outlined.

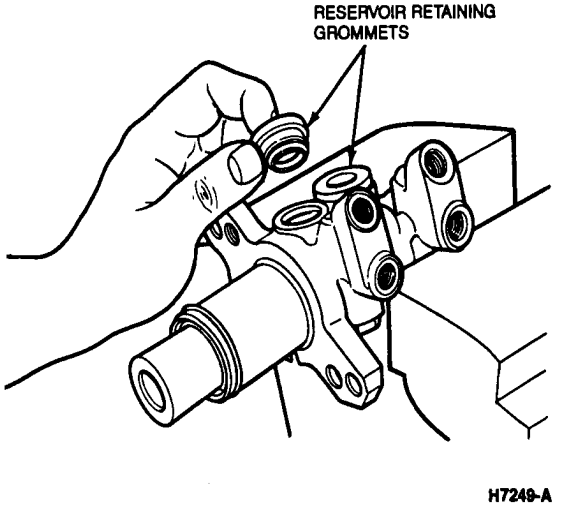
2. Thoroughly clean outside of master cylinder. Remove cap. Remove and discard all brake fluid from cylinder.
3. Mount the master cylinder in a soft-jawed vise.

DISASSEMBLY AND ASSEMBLY (Continued)

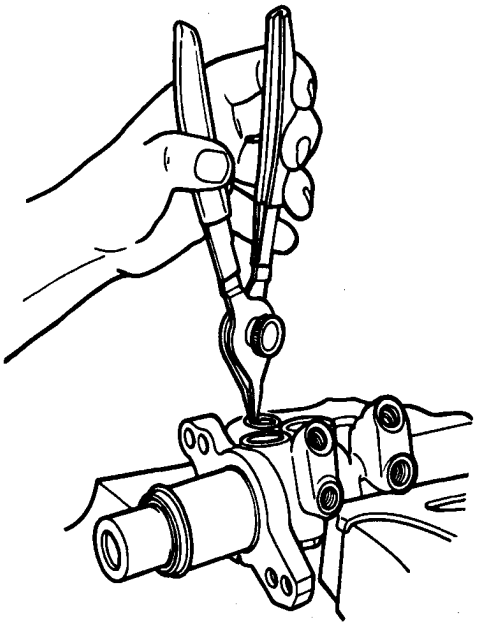
4. Gently pry up on the reservoir with a small screwdriver and remove it from the master cylinder.



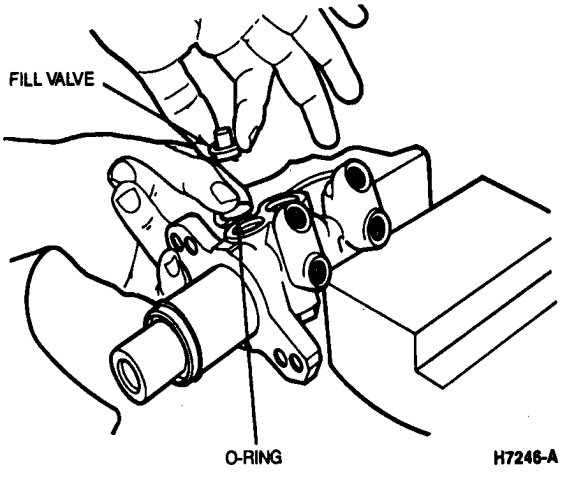
5. Remove reservoir retaining grommets.



6. Remove snap ring from primary reservoir.

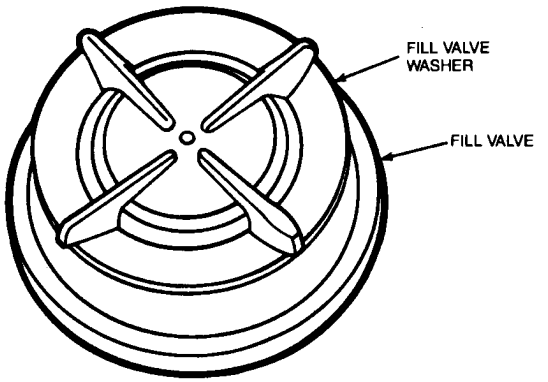


7. Remove fill valve and O-ring from port.

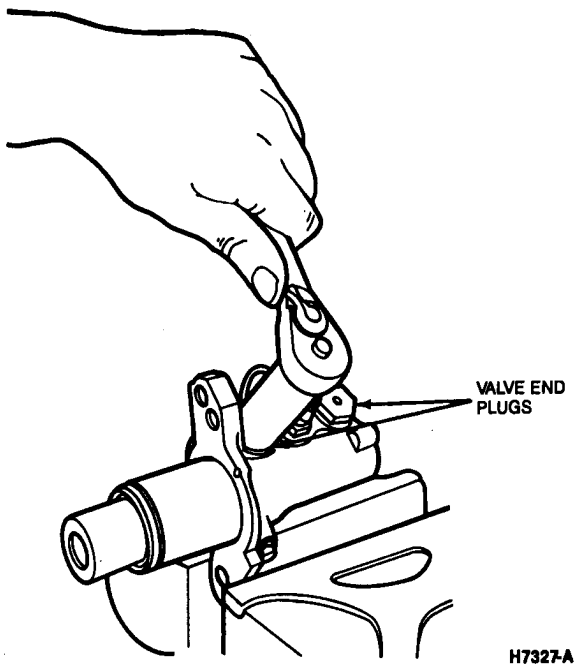


DISASSEMBLY AND ASSEMBLY (Continued)

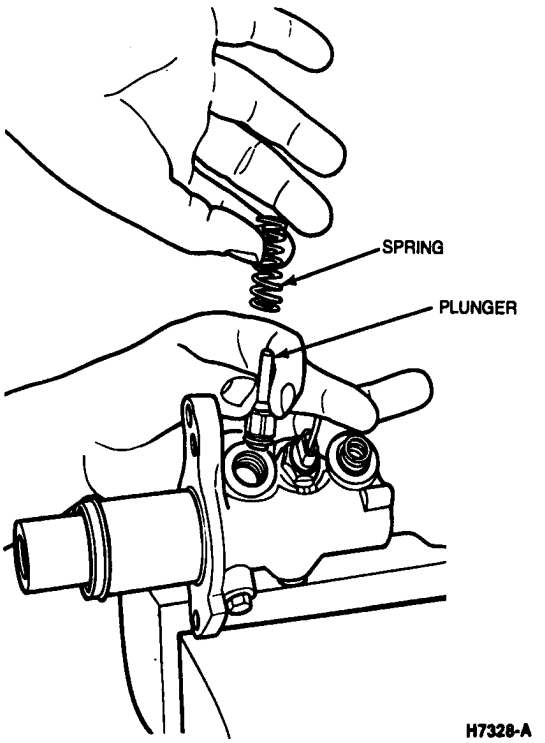
8. Remove fill valve washer.



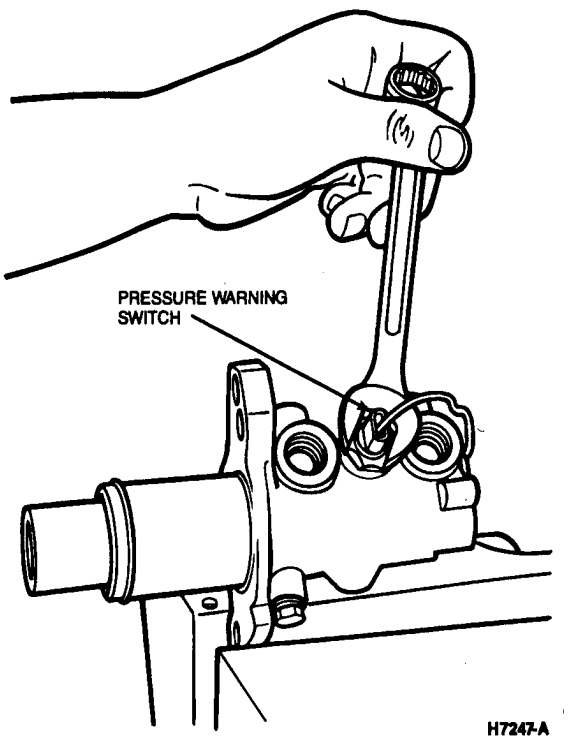
9. Remove proportioning valve end plugs.
   WARNING: VALVE END PLUGS ARE UNDER SPRING TENSION.



10. Remove internal and external O-ring valve end plugs.
11. Remove valve springs and plungers.

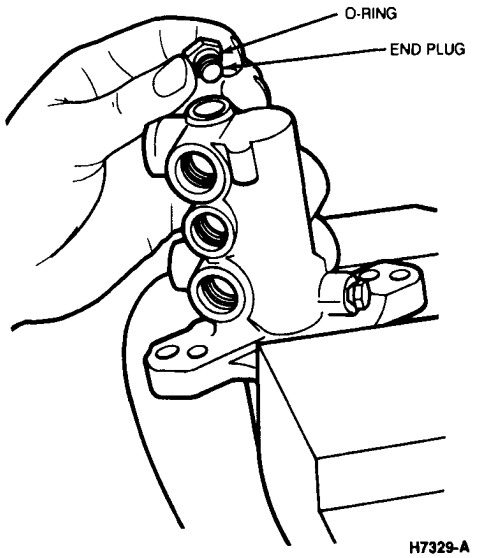


12. Remove valve seals from plungers.
13. Remove pressure warning switch and actuator from body.

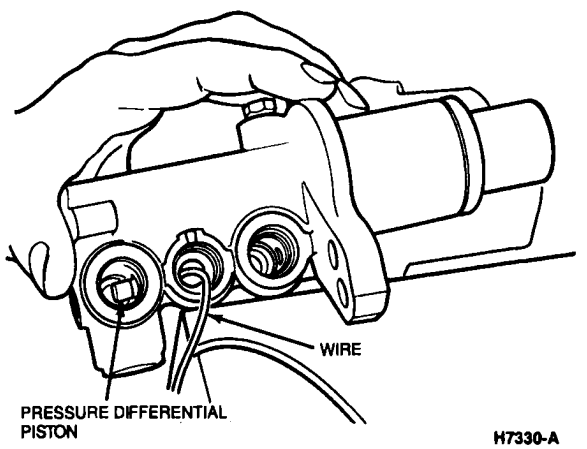


DISASSEMBLY AND ASSEMBLY (Continued)

14. Remove end plug from body. Remove O-ring from end plug.

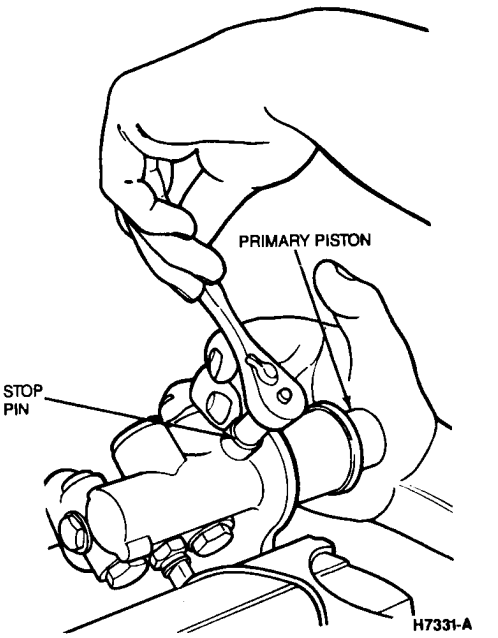


15. Using a piece of wire remove pressure differential pistons. Remove O-rings from pistons.



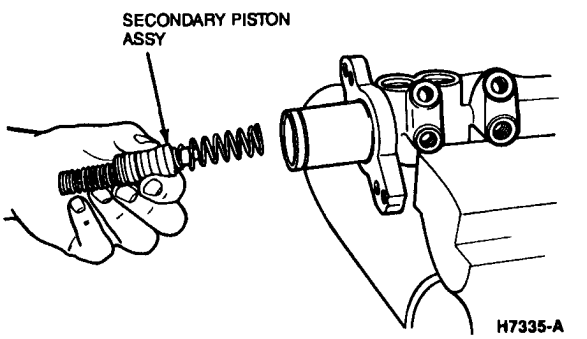
16. Push in on the primary piston and remove the secondary piston stop pin.

WARNING: USE CARE WHEN RELEASING PRIMARY PISTON. IT IS UNDER SPRING PRESSURE.



17. Remove secondary piston from bore.

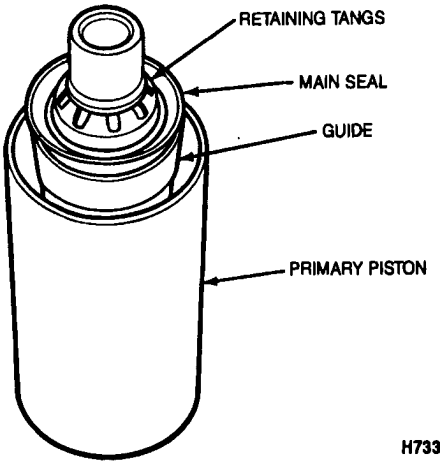
NOTE: It may be necessary to tap body on a piece of wood to remove piston from bore.



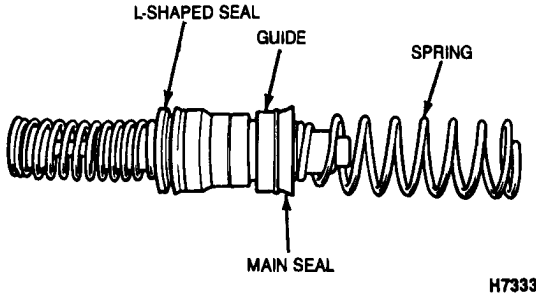
DISASSEMBLY AND ASSEMBLY (Continued)

18. Remove retainer, main seal and guide from primary piston.

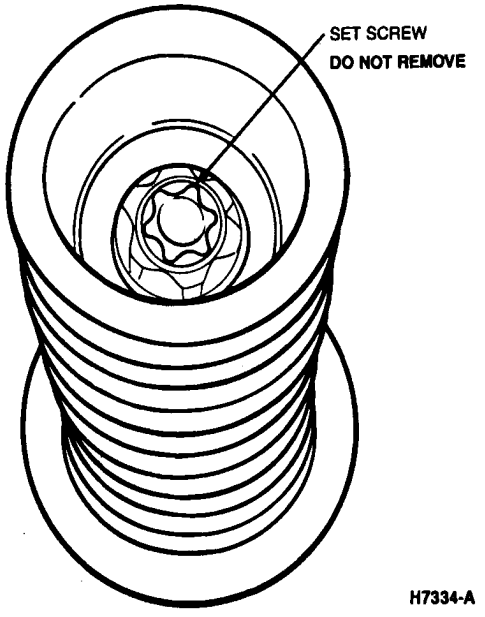
    NOTE: Remove retainer by prying up on tangs.



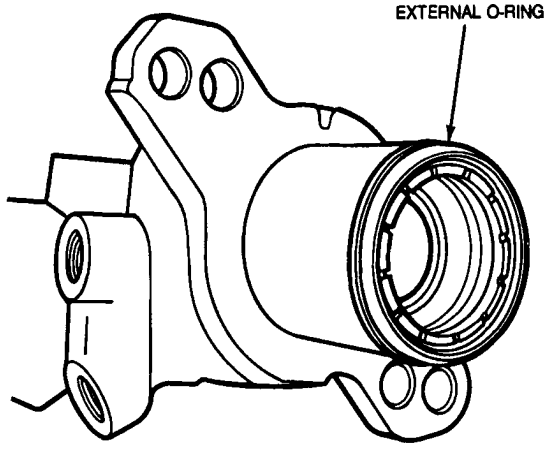
19. Remove spring, main seal and guide from secondary piston.
20. Remove L-shaped seal from secondary piston by stretching it out and over piston.



CAUTION: The secondary piston has a set screw that has a factory preset length and must not be removed.



21. Remove two fast fill seals from cylinder housing using a hook-type tool. Use care not to damage bore when removing seals.
22. Remove garter spring, backup rings and retainer.
23. Remove O-ring on outside of cylinder housing.

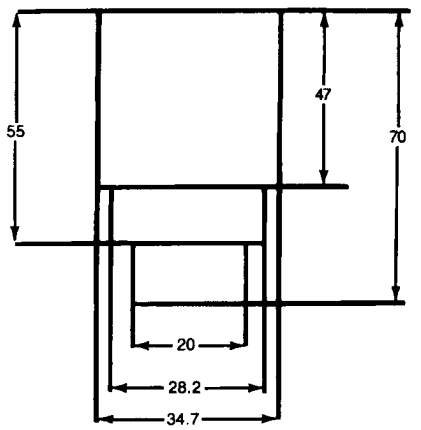


Assembly

1. Install seal retainer into bore with small diameter of seal facing inward.
2. Install first fast fill seal with lip of seal facing inward against seal retainer.
3. Install first backup ring with large diameter facing inward.

DISASSEMBLY AND ASSEMBLY (Continued)

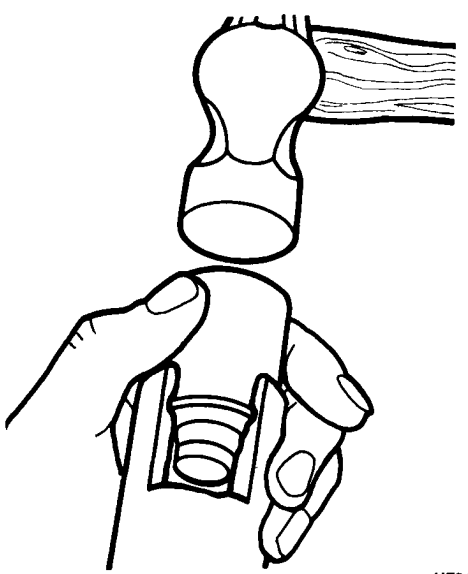
4. To install first garter spring in cylinder bore, a fabricated drift of nylon or aluminum is required. Fabricate tool to dimensions shown.



NOTE: ALL DIMENSIONS IN MILLIMETERS

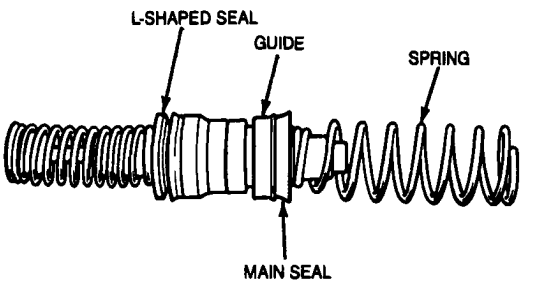
H7244-A

5. Position drift in cylinder bore against garter spring. Lightly tap drift to position garter spring in location groove.



H7245-A

6. Install second fast fill seal with lip of seal facing inward against garter spring.
7. Install second backup ring with large diameter facing inward.
8. Install second garter spring against backup ring using fabricated drift.
9. Coat secondary piston L-shaped seal with brake fluid.
10. Install seal over secondary piston. Ensure seal lip is facing spring and nylon spacer is against back of seal.
11. Install guide on secondary piston (large diameter first) and main seal (with lip facing away from spring).
12. Lubricate secondary piston with brake fluid. Install secondary spring and retainer onto piston.



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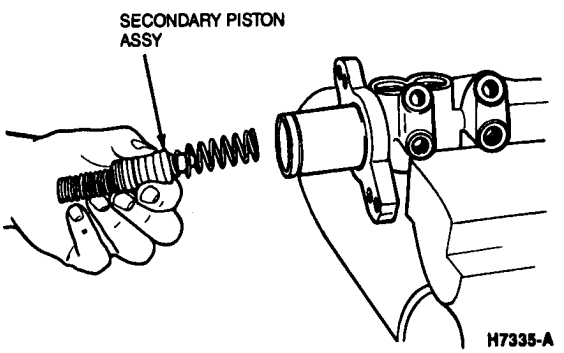
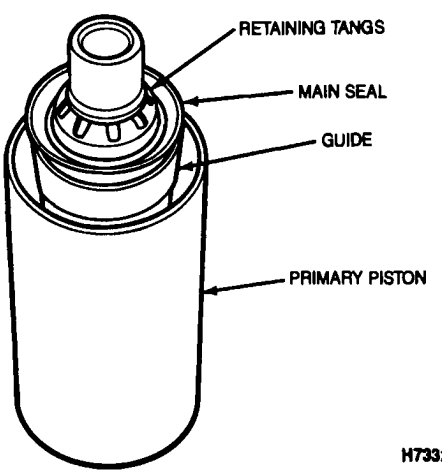
13. Install secondary piston into bore.



H7335-A

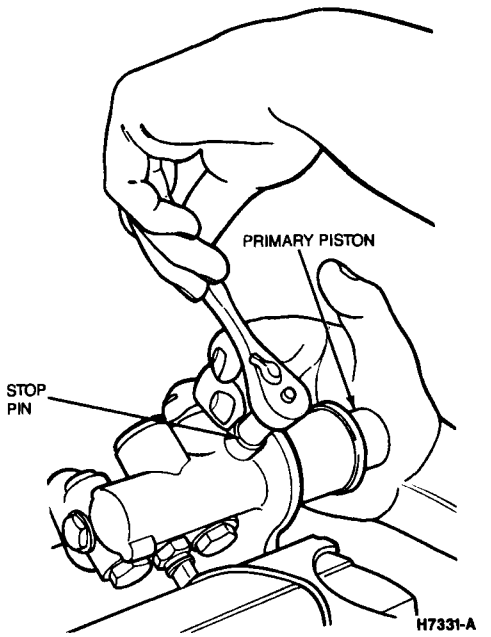
14. Install primary piston guide (large inter diameter first) and main seal with lip toward end of piston.
15. Install a new retainer over piston and ensure tangs of retainer snap into position.



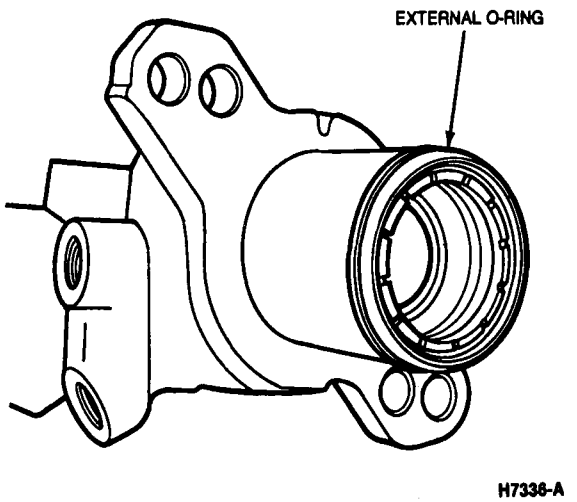
H7332-A

DISASSEMBLY AND ASSEMBLY (Continued)

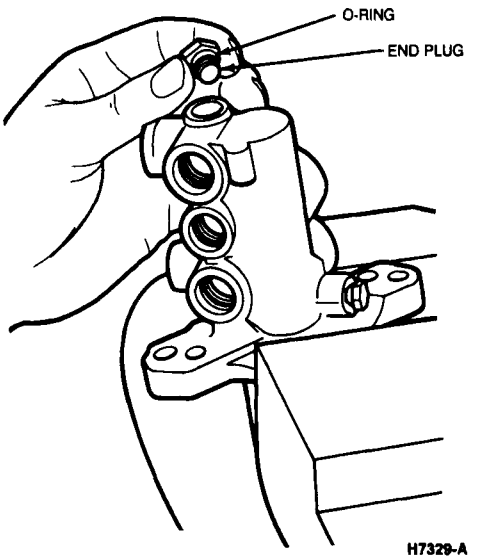
16. Lubricate primary piston with brake fluid. Install piston into cylinder bore, compress piston assembly and install stop pin.



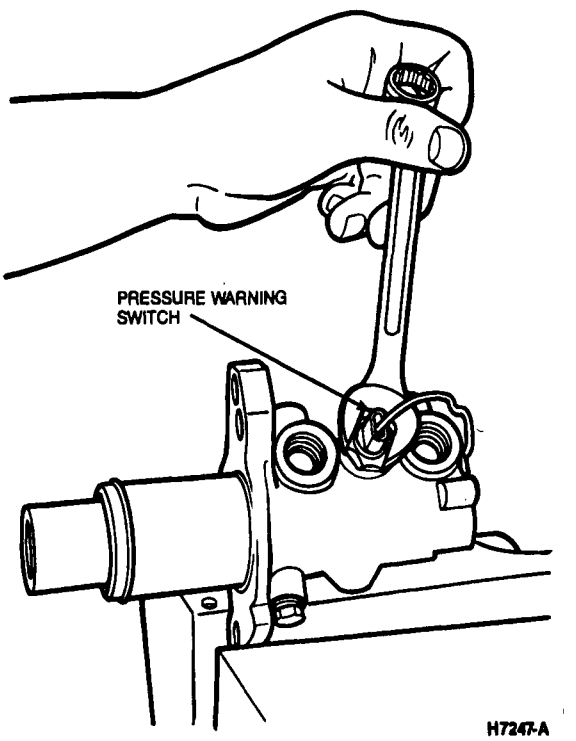
17. Install new O-ring on outside of cylinder housing.



18. Install new O-rings on pressure differential pistons, coat with brake fluid and install into cylinder bore.
19. Install new O-ring onto end plug.
20. Install end plug. Tighten to 9-12 N·m (80-106 lb-in).

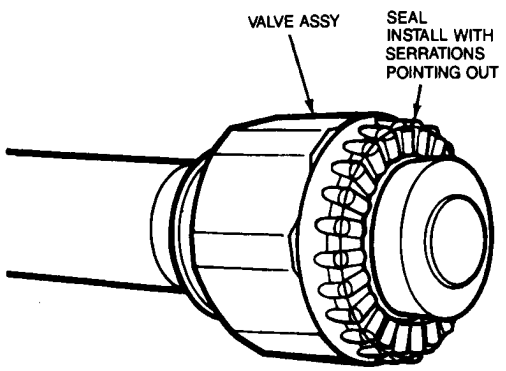


21. Check position of pressure differential pistons through switch hole. There must be enough clearance between pistons for switch actuation rod installation.
22. Install pressure warning switch and switch actuation rod. Screw switch in until detents contact cylinder housing then tighten one-half additional turn.



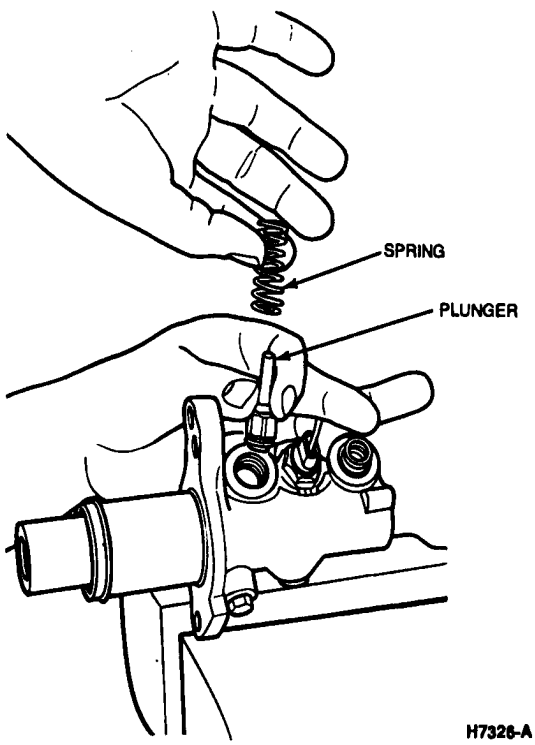
DISASSEMBLY AND ASSEMBLY (Continued)

23. Install new valve seal onto valve plungers with serrations on seal face away from plungers.



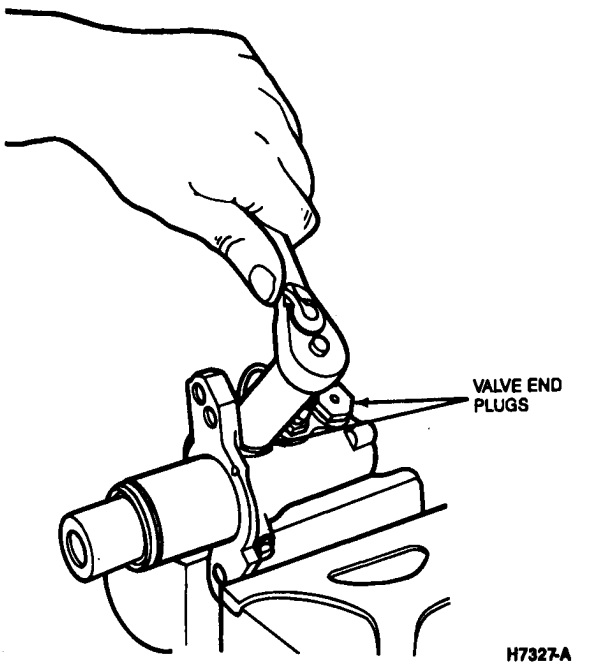
H7337-A

24. Install new internal and external O-rings on proportioning valve end plugs.
25. Lubricate plunger seals, install valve springs over plungers and position valves into cylinder bores.



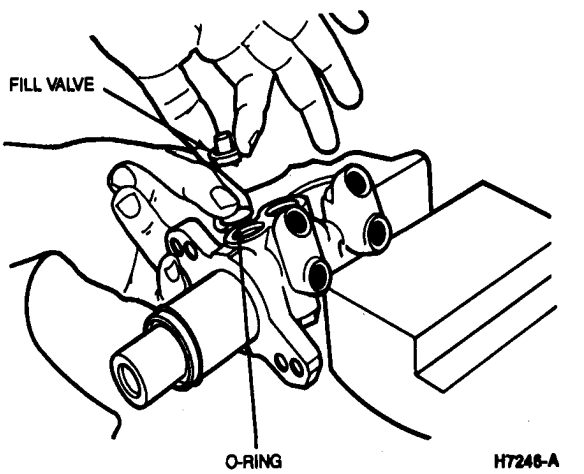
H7326-A

26. Install proportioning valve end plugs. Tighten to 23-27 N·m (17-19 lb-ft).



H7327-A

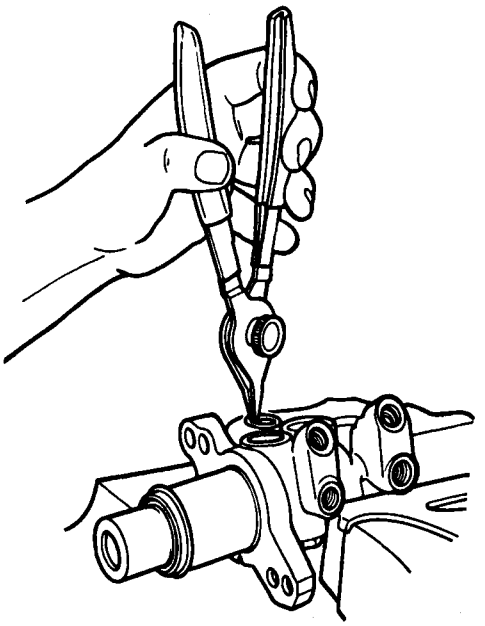
27. Install a new fill valve O-ring and new fast fill valve washer over a new fast fill valve. Install fast fill valve into port.



H7246-A

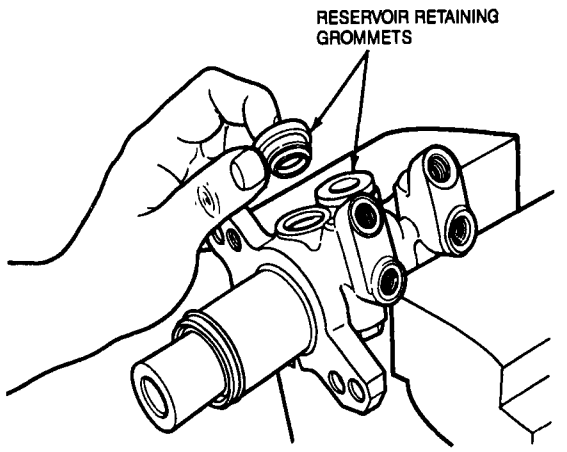
DISASSEMBLY AND ASSEMBLY (Continued)

28. Install fast fill valve retaining snap ring. Ensure snap ring is fully seated in the groove.



H7250-A

29. Lubricate new reservoir grommets and install into cylinder.



H7249-A

30. Install master cylinder brake reservoir.
31. Install a new cap insert into a new diaphragm and install cap.
32. Install master cylinder as outlined.
33. Prime and bleed brake system. Refer to Section 06-00.

ADJUSTMENTS

Push Rod Length

NOTE: Push rod length is not adjustable. To ensure the master cylinder is free to return to its rest position with no residual pressure, verify stoplamp switch adjustment. Refer to Section 17-01.

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	N·m	Lb-Ft
Master Cylinder Bracket	20-34	15-25
Master Cylinder-to-Booster Nuts	10-16	8-11
Brake Hose Banjo Bolt	22-29	17-21
Master Cylinder End Plug	9-12	80-106 (Lb-In)
Proportioning Valve End Plugs	23-27	17-19
Brake Line Hose Fitting	13-22	10-17
Brake Pedal Pivot Bolt Nut	20-35	15-28