

Fastener Tightening Specifications

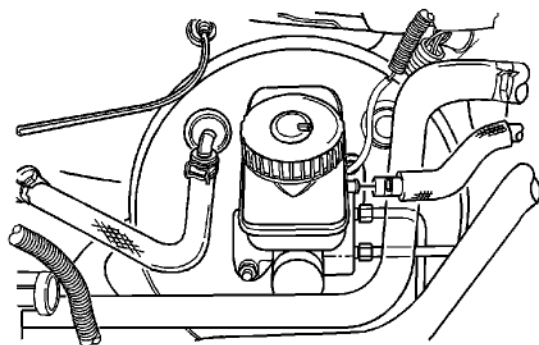
Application	Specification	
	Metric	English
Bleeder Screws	9 N·m	80 lb in
Bleeder Valves	6 N·m	53 lb in
Booster and Support Bracket-to-Dash Panel Nuts	24 N·m	18 lb ft
Booster Pushrod Hex Nut	16 N·m	12 lb ft
Booster-to-Support Bracket Nuts	12 N·m	9 lb ft
Brake Lines	16 N·m	12 lb ft
Brake Pedal-to-Pedal Bracket Hex Nut	22 N·m	16 lb ft
Caliper Mounting Bolt	100 N·m	74 lb ft
Dust Cover Screws	4.5 N·m	40 lb in
Front Brake Hose-to-Caliper Bolt	40 N·m	30 lb ft
Hub-to-Disc Screws	4.5 N·m	40 lb in
Master Cylinder Attaching Nuts	18 N·m	13 lb ft
Proportioning Valves	40 N·m	30 lb ft
Trim Panel Screws	7 N·m	62 lb in
Wheel Hub Caulking Nut -- Drum Brakes	190 N·m	140 lb ft

Brake System Specifications

Application	Specification	
	Metric	English
Brake Drums		
• Inside Diameter - New	200 mm	7.87 in
• Maximum Inside Diameter	201 mm	7.91 in
• Maximum Radial Runout - Not Installed	0.04 mm	0.002 in
Wheel Cylinder Diameter - Rear	20.64 mm	0.81 in
Brake Rotors		
• Disc Type	Ventilated	
• Discard Thickness for 236 mm (9.29 in) Diameter Rotor	18 mm	0.709 in
• Discard Thickness for 256 mm (10.08 in) Diameter Rotor	22 mm	0.866 in
• Maximum Assembled Lateral Runout - Installed	0.06 mm	0.002 in
• Maximum Groove Depth	0.40 mm	0.016 in
• Maximum Lateral Runout - Not Installed	0.03 mm	0.001 in
• Maximum Thickness Variation	0.10 mm	0.004 in
• New Rotor Thickness - 236 mm (9.29 in) Diameter Rotor	20 mm	0.787 in
• New Rotor Thickness - 256 mm (10.08 in) Diameter Rotor	24 mm	0.945 in
• Rotor Diameter - Larger Size with SACL500 Stamping	256 mm	10.08 in
• Rotor Diameter - Smaller Size with SACL485F Stamping	236 mm	9.29 in
Booster Ratio	5:1	
Booster Size		
• 1.4L L95, 1.5L LV8, 1.6L LXT	241.3 mm	9.5 in
• 1.2L LMU, 1.4L LDT, 1.6L LXV	254 mm	10 in
Master Cylinder		
• Bore Diameter	22.22 mm	0.87 in
• Minimum Bore Diameter	20.64 mm	0.81 in
Caliper		
• Piston Minimum Diameter	54 mm	2.12 in

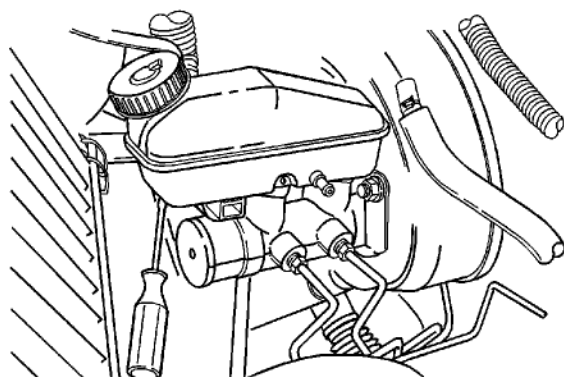
Master Cylinder Reservoir Replacement

Removal Procedure



Note: Remove the reservoir only when replacing a damaged or a leaking reservoir.

1. Disconnect the electrical connector from the reservoir.

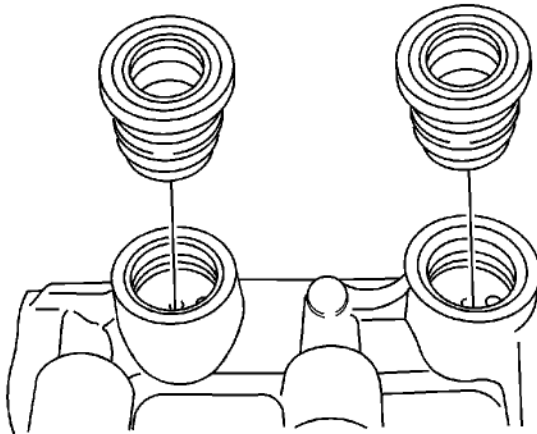


2. For vehicles with the manual transaxle, disconnect the clip to the clutch hose connection at

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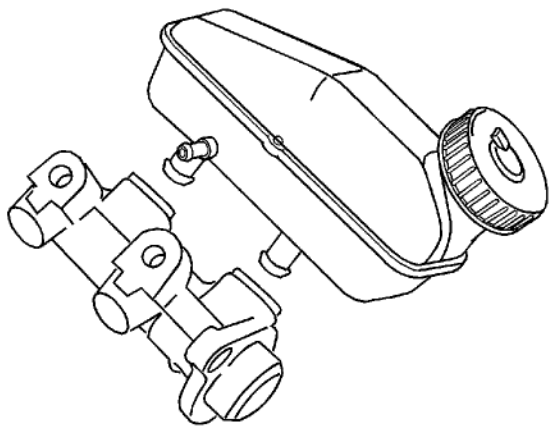
the master cylinder.

3. Gently pry upward with a screwdriver to release the reservoir.
4. Tilt the reservoir and pull it upward in order to remove it.

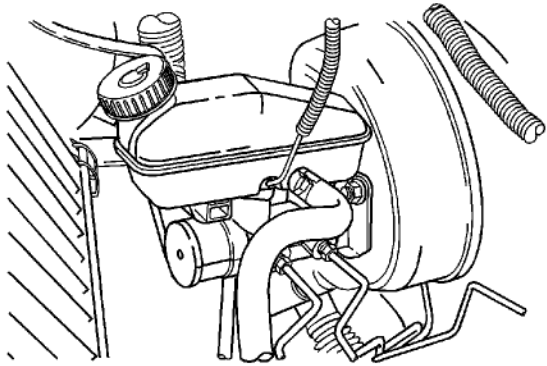


5. Remove the reservoir seals from the master cylinder body.

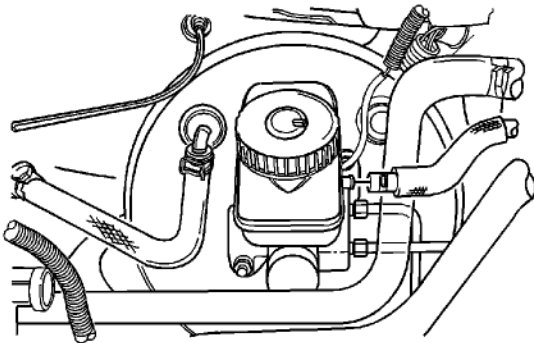
Installation Procedure



1. Lubricate the new seals with clean brake fluid. Install the seals into the cylinder body.
2. Install the reservoir on the master cylinder body.



3. For vehicles with the manual transaxle, connect the clip to the clutch hose connection at the master cylinder.



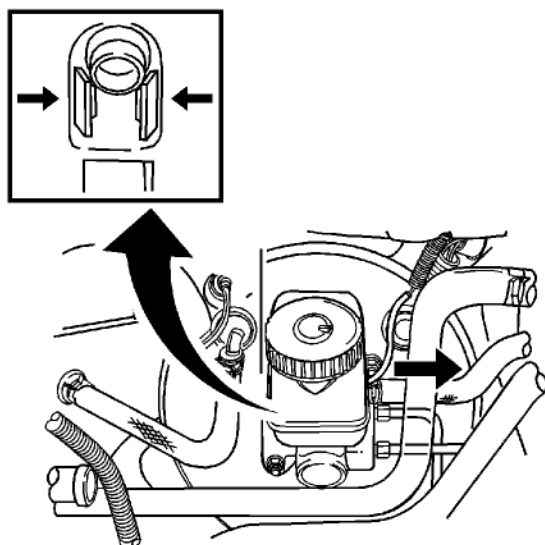
4. Add brake fluid.

Caution: Refer to [Vehicle Lifting and Jacking Caution](#) in the Preface section.

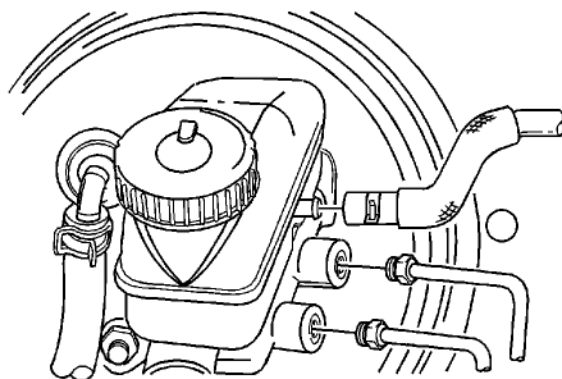
5. Raise and suitably support the vehicle.
6. Bleed the braking system. Refer to [Hydraulic Brake System Bleeding](#).
7. Lower the vehicle.
8. Connect the reservoir electrical connector.

Master Cylinder Replacement

Removal Procedure



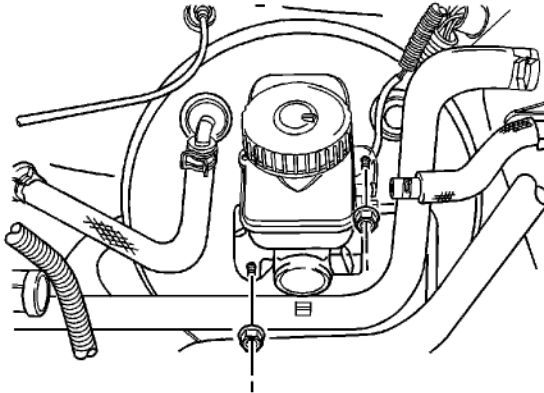
1. Disconnect the electrical connector from the reservoir.



2. For vehicles with the ABS braking system, disconnect the brake lines from the master cylinder body.
3. For vehicles with the non-ABS braking system, disconnect the brake lines from the proportioning valves.

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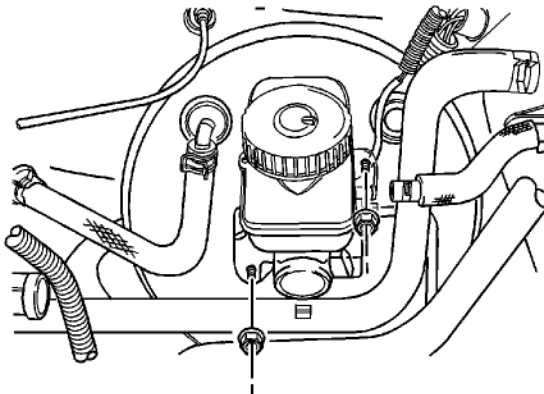
4. For vehicles with the manual transaxle, disconnect the clip to the clutch hose connection at the master cylinder.
5. Plug the opening to the brake lines to prevent fluid loss and contamination.



6. Remove the attaching nuts from the power booster.
7. Remove the master cylinder assembly.
8. Remove the seal from the booster housing. Discard the seal.
9. Drain the brake fluid.

Installation Procedure

Caution: Refer to [Brake Fluid Effects on Paint and Electrical Components Caution](#) in the Preface section.





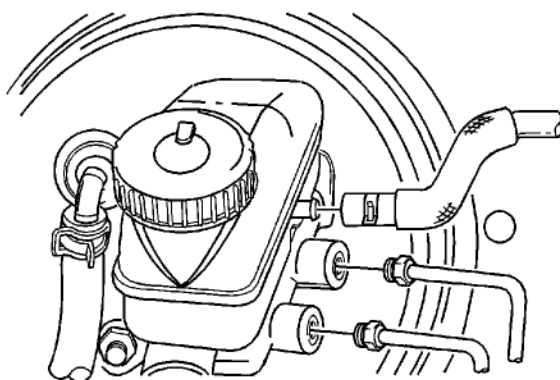
1. Install the master cylinder assembly with the new attaching nuts.

Caution: Refer to [Fastener Caution](#) in the Preface section.

2. Install the new seal to the booster housing.

Tighten

Tighten the master cylinder attaching nuts to 18 N·m (13 lb ft).



3. For vehicles with the ABS braking system (as shown), connect the brake lines to the cylinder body.
4. For vehicles with the non-ABS braking system, connect the brake lines to the proportioning valves.

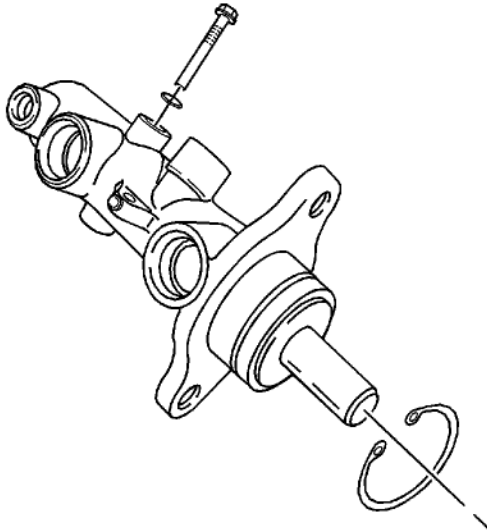
Tighten

Tighten the brake lines to 16 N·m (12 lb ft).

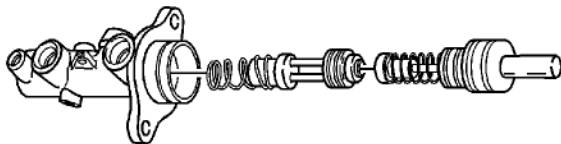
5. For vehicles with the manual transaxle, connect the clip to the clutch hose connection at the master cylinder.
6. Connect the electrical connector on the reservoir.
7. Add brake fluid.
8. Check for leaks and recheck the fluid level.
9. Bleed the brake system. Refer to [Hydraulic Brake System Bleeding](#).

Master Cylinder Overhaul

Disassembly Procedure



1. Remove the master cylinder. Refer to [Master Cylinder Replacement](#).
2. Remove the brake fluid reservoir. Refer to [Master Cylinder Reservoir Replacement](#).

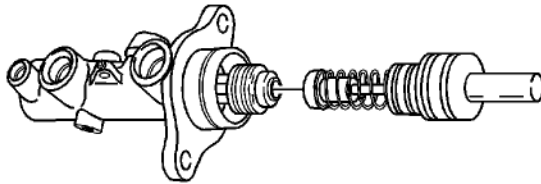


3. Remove the seal ring from the cylinder bore.
4. Press down the piston with a welding rod or an equivalent tool in a compensating port.

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Caution: Use care not to damage the piston bore or retainer groove during primary piston retainer ring removal.

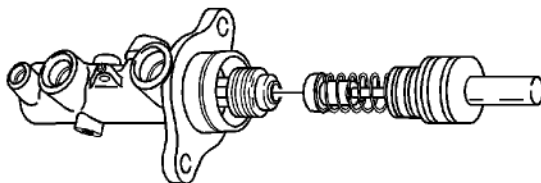
5. Remove and discard the retaining ring from the cylinder body. The non-ABS master cylinder body is shown.



6. Remove the primary piston. The ABS master cylinder body is shown.
7. Carefully remove the secondary piston assembly and the spring from the master cylinder bore.
8. Discard the rubber parts and the retaining rings.

Assembly Procedure

Warning: Refer to [Brake Fluid Warning](#) in the Preface section.

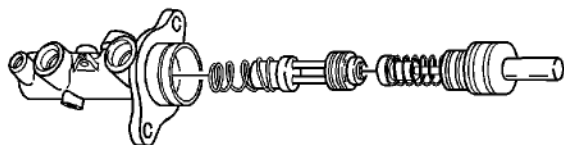




Caution: Do not hone the master cylinder bore. When the brake master cylinder is overhauled, it is recommended that the cylinder body be replaced rather than CLEANED UP by honing the bore. The master cylinder has a hard, highly polished BEARINGIZED surface, which is produced by diamond boring followed by ball or roller burnishing under heavy pressure. Honing will destroy this hard smooth surface and cause rapid wear of the rubber cups.

Caution: Use only approved solvents when cleaning or flushing the master cylinder and related components. Solvents which contain traces of mineral oil or other contaminants will damage the rubber parts in the system.

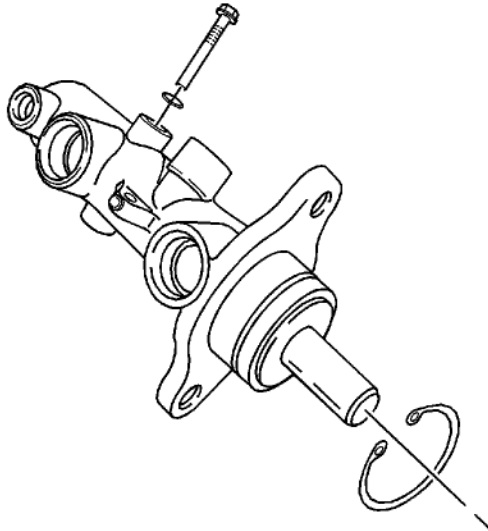
1. Clean the parts with denatured alcohol or clean brake fluid. Dry the parts with compressed air.
2. Inspect the master cylinder bore for scoring or corrosion. If scoring or corrosion is evident, replace the master cylinder body.
3. Lubricate the master cylinder bore with clean brake fluid.
4. Carefully insert the secondary piston assembly bore until the secondary piston contacts the base of the cylinder body. Use a wood or a plastic drift, if necessary.
5. Insert the primary piston.



6. Press the pistons into the cylinder bore using a wooden or a plastic drift. The non-ABS cylinder body is shown.

Note: When installing the new retaining ring, take care not to damage the cylinder bore.

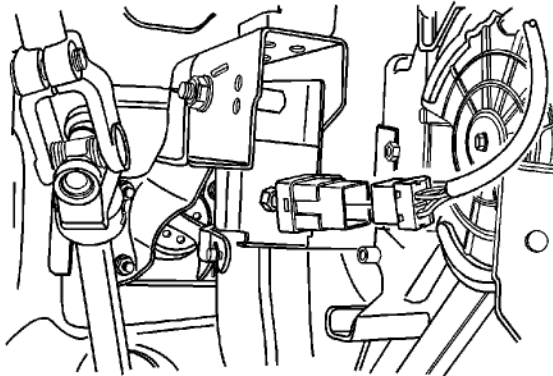
7. Insert the new retaining ring into the groove in the cylinder bore. Remove the welding rod.
8. Move the pistons backward and forward after installation in order to inspect for free movement.



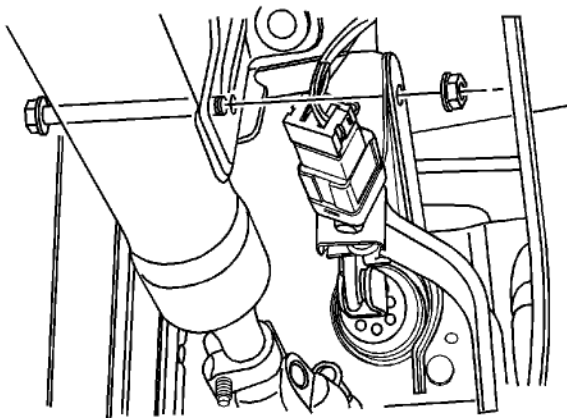
9. Lubricate the seal ring and insert the seal on the shaft into the cylinder bore. The open side must face outward until the seal rests on the piston.
10. Install the brake fluid reservoir to the master cylinder. Refer to [Master Cylinder Reservoir Replacement](#).
11. Install the master cylinder assembly. Refer to [Master Cylinder Replacement](#).
12. Bleed the braking system. Refer [Hydraulic Brake System Bleeding](#).

Brake Pedal Assembly Replacement

Removal Procedure

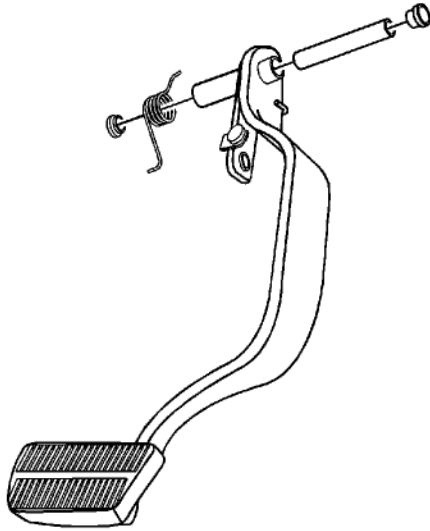


1. Remove the screws that hold the trim panel to the instrument panel.
2. Remove the trim panel.
3. Remove the stop lamp switch. Refer to [Stop Lamp Switch Replacement](#).
4. Disconnect the retaining ring, the pin, and the spring from the pushrod/brake pedal connection.



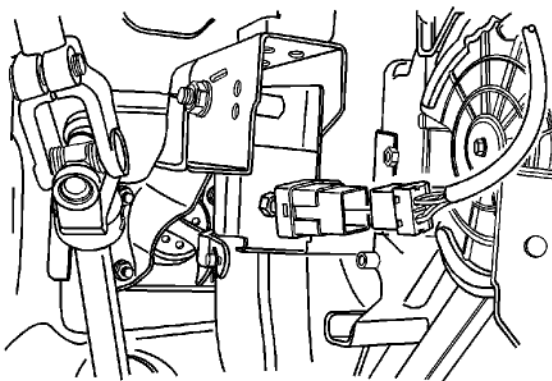


5. Remove the pedal mounting shaft and nut.
6. Remove the brake pedal, exposing the brake booster pushrod and the pedal-to-dash panel bracket.



7. Remove the brake pedal cover.

Installation Procedure



1. Install a new brake pedal cover, if needed.
2. Coat the pedal shaft with grease.

3. Position the brake pedal on the pedal-to-dash panel bracket and the pedal shaft.

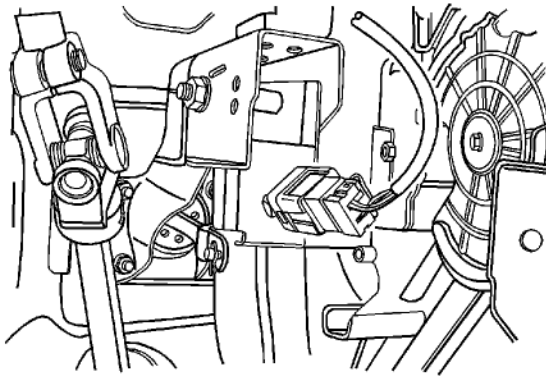
Caution: Refer to [Fastener Caution](#) in the Preface section.

4. Place the nut on the pedal mounting shaft.

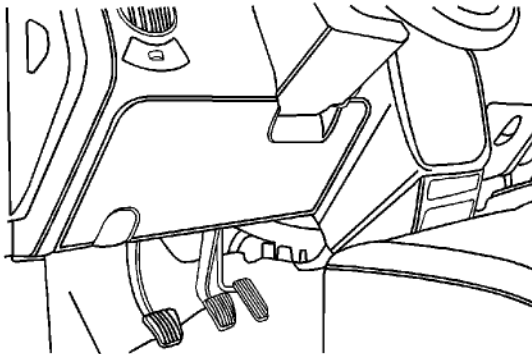
Tighten

Tighten the brake pedal-to-pedal bracket nut to 22 N·m (16 lb ft).

5. Install the pushrod to the pedal with the pin and the retaining ring.



6. Install the spring on the shaft in its original position.
7. Install the stop lamp switch. Refer to [Stop Lamp Switch Replacement](#).



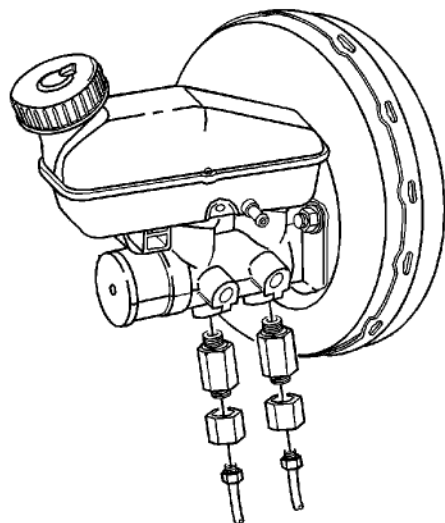
8. Install the trim panel with the screws.

Tighten

Tighten the trim panel screws to 7 N·m (62 lb in).

Brake Proportion Valve Replacement

Removal Procedure

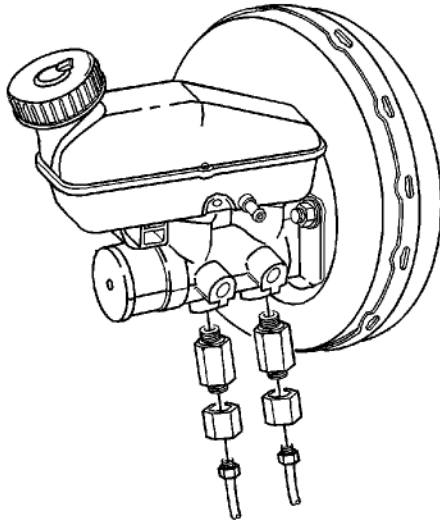


1. Disconnect the brake lines from the proportioning valves.
2. Remove the valves from the master cylinder body.

Installation Procedure

Warning: Refer to [Brake Fluid Warning](#) in the Preface section.

Caution: Refer to [Fastener Caution](#) in the Preface section.



Note: Since these valves are adjusted in pairs to the correct control range, they must be replaced in pairs.

1. Install the proportioning valves to the cylinder body.

Tighten

Tighten the proportioning valves to 40 N·m (30 lb ft).

2. Connect the brake lines to the valves.

Tighten

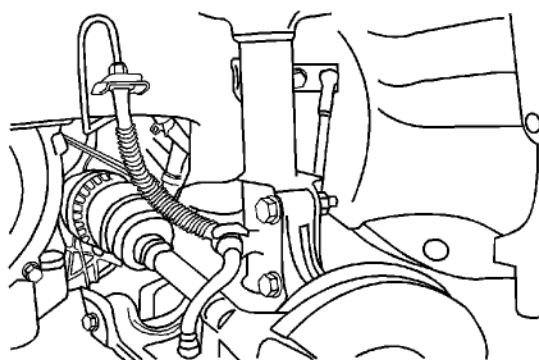
Tighten the brake lines to 16 N·m (12 lb ft).

3. Bleed the braking system. Refer to [Hydraulic Brake System Bleeding](#).

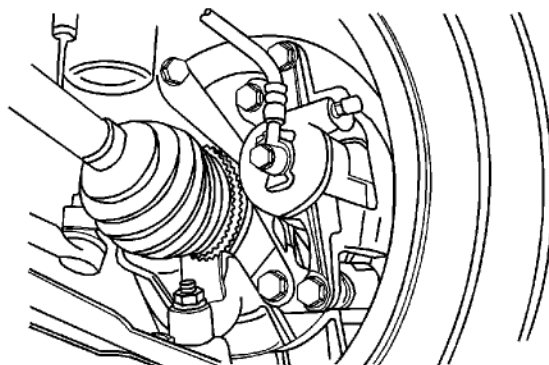
Front Brake Hose Replacement

Removal Procedure

Caution: Refer to [Vehicle Lifting and Jacking Caution](#) in the Preface section.



1. Raise and support the vehicle.
2. Disconnect the brake line from the brake hose support bracket on the wheel housing.
3. Remove the E-ring retainer.
4. Remove the brake hose from the wheelhousing bracket.

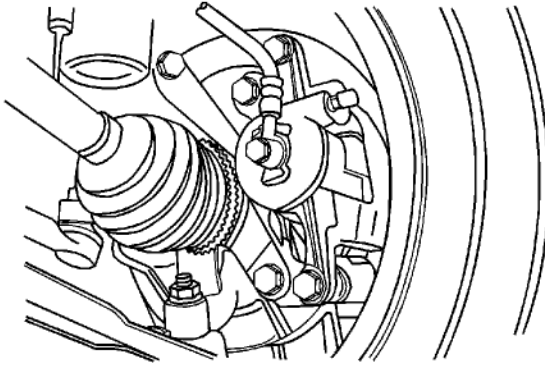




5. Remove the bolt from the brake caliper.
6. Remove the seal rings and the brake hose.

Installation Procedure

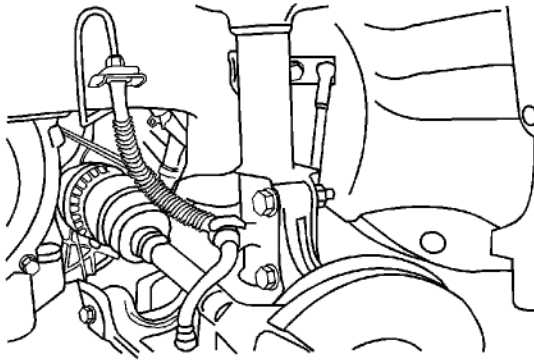
Caution: Refer to Fastener Caution in the Preface section.



1. Install the new brake hose to the caliper with new seal rings and the bolt.

Tighten

Tighten the front brake hose-to-caliper bolt to 40 N·m (30 lb ft).



2. Install the brake hose and the E-ring retainer to the wheelhousing bracket.
3. Connect the brake line to the brake hose.

Tighten

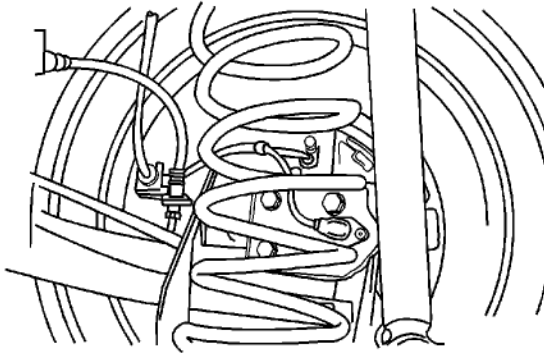
Tighten the brake line to 16 N·m (12 lb ft).

4. Lower the vehicle.
5. Bleed the brake system. Refer to [Hydraulic Brake System Bleeding](#).
6. Check the brake system for leaks.

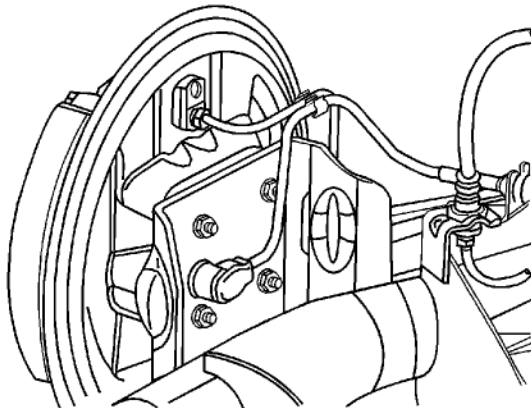
Rear Brake Hose Replacement

Removal Procedure

Caution: Refer to [Vehicle Lifting and Jacking Caution](#) in the Preface section.



1. Raise and support the vehicle.
2. Disconnect the brake lines from the brake hoses at the body and the rear axle brackets.

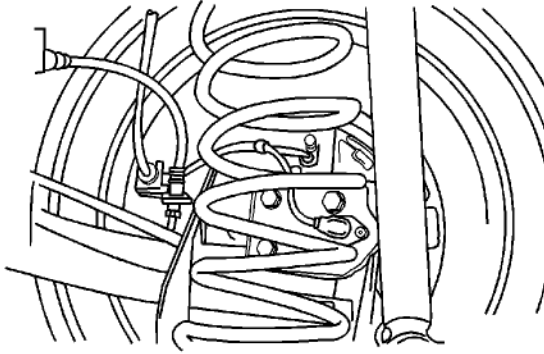


3. Remove both brake hose E-ring retainers.

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4. Remove the brake hoses from the brackets.

Installation Procedure



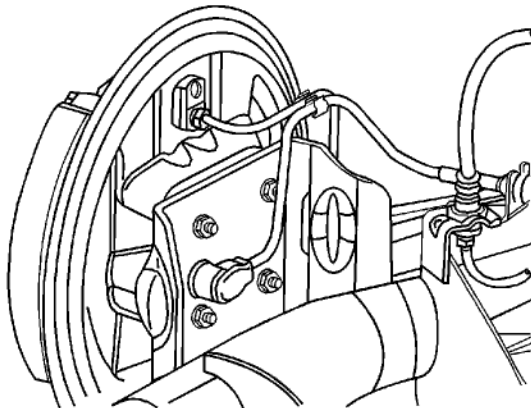
1. Install the brake hoses to the body and the rear axle brackets.

Caution: Refer to [Fastener Caution](#) in the Preface section.

2. Connect the brake lines to the brake hose.

Tighten

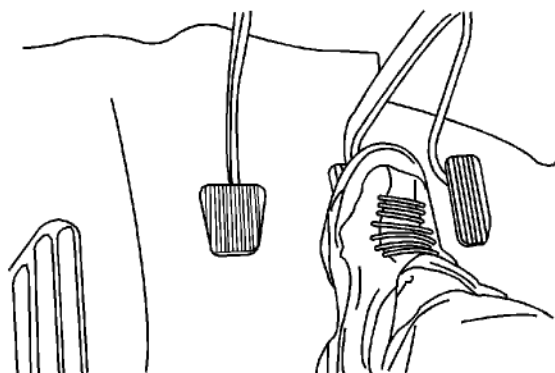
Tighten the brake lines to 16 N·m (12 lb ft).



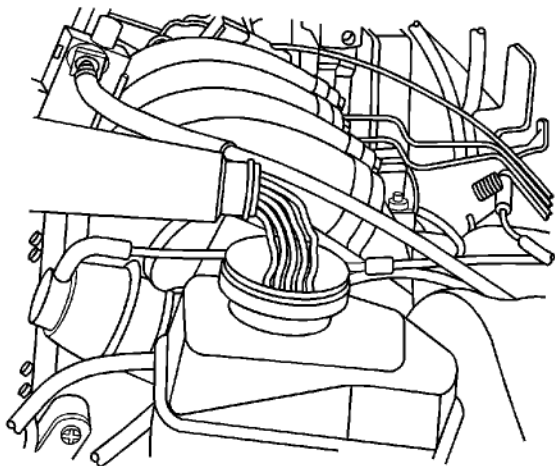


3. Install the brake hose retainers.
4. Lower the vehicle.
5. Bleed the brake system. Refer to [Hydraulic Brake System Bleeding](#).
6. Check the brake system for leaks.

Hydraulic Brake System Bleeding



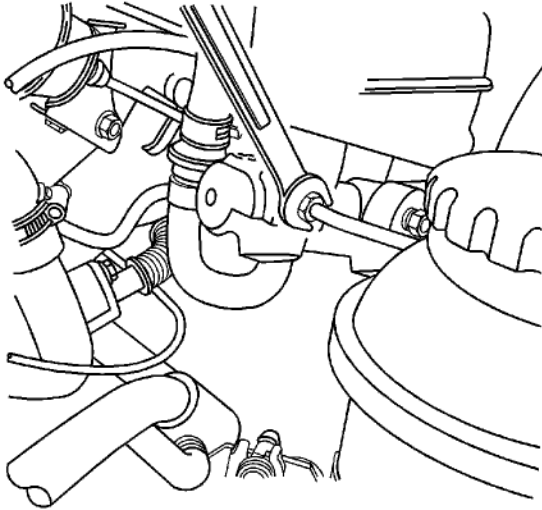
1. Remove the booster reserve by applying the brakes several times with the engine OFF until all the reserve is depleted.



Note: If the master cylinder is known or suspected to have air in the bore, then it must be bled before any wheel cylinder or caliper is bled.

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2. Fill the master cylinder reservoir with brake fluid. Keep the master cylinder at least 1/2 full of fluid during the bleeding operation.



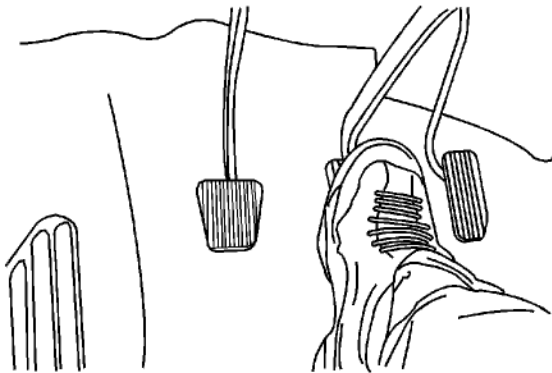
3. Disconnect the front brake lines at the master cylinder.
4. Allow the brake fluid to fill the master cylinder until it begins to flow from the front pipe connector port.

Caution: Refer to [Fastener Caution](#) in the Preface section.

5. Connect the front brake lines to the master cylinder.

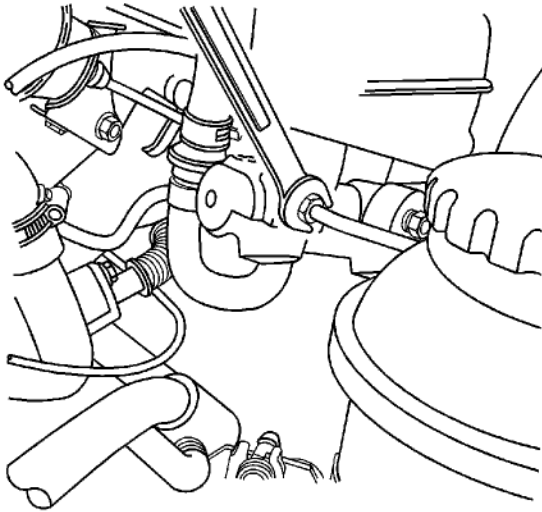
Tighten

Tighten the brake lines to 16 N·m (12 lb ft).





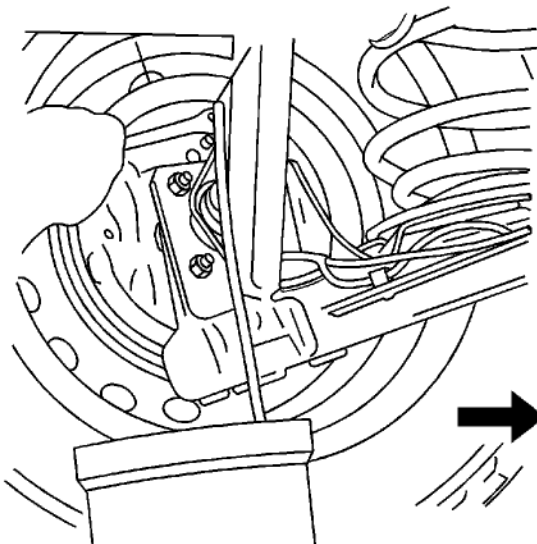
6. Slowly push and hold the brake pedal one time.



7. Loosen the front brake line at the master cylinder to purge all air from the cylinder.
8. Tighten the brake line as in step 5, and then release the brake pedal slowly. Wait 15 seconds before proceeding to the next step.
9. Repeat the sequence, including the 15 second wait, until all the air is removed from the master cylinder bore.

Caution: Refer to [Brake Fluid Effects on Paint and Electrical Components Caution](#) in the Preface section.

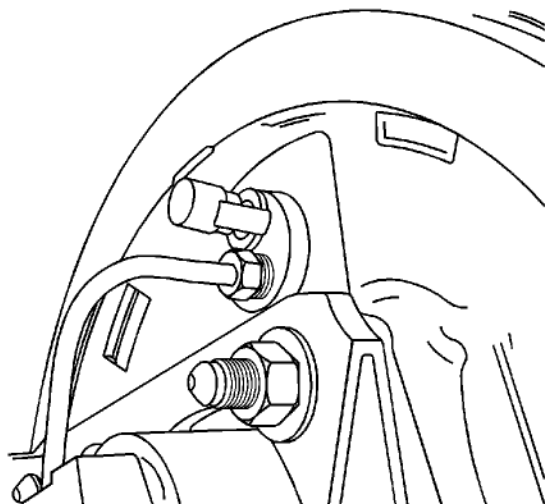
10. After all the air has been removed at the forward connections, bleed the master cylinder at the rear air inlet connections in the same manner as with the front connections.





Note: The bleeding sequence is as follows: right rear, left front, left rear, and right front.

11. Attach a transparent tube over the valve. Allow the tube to hang submerged in brake fluid in a transparent container.



12. Slowly push and hold the brake pedal one time.
13. Remove the bleeder cap and loosen the bleeder screw to purge the air from the cylinder.
14. Tighten the bleeder screw.

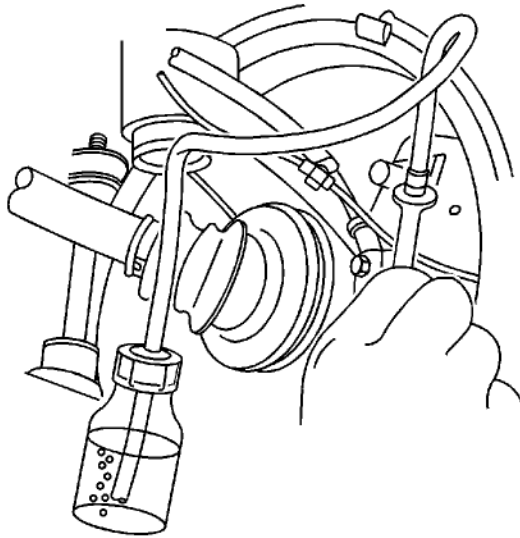
Tighten

Tighten the bleeder screw to 9 N·m (80 lb in).

15. Slowly release the brake pedal. Wait 15 seconds before proceeding with the next step.

Note: Rapid pumping of the brake pedal pushes the master cylinder secondary piston down the bore in a manner that makes it difficult to bleed the system.

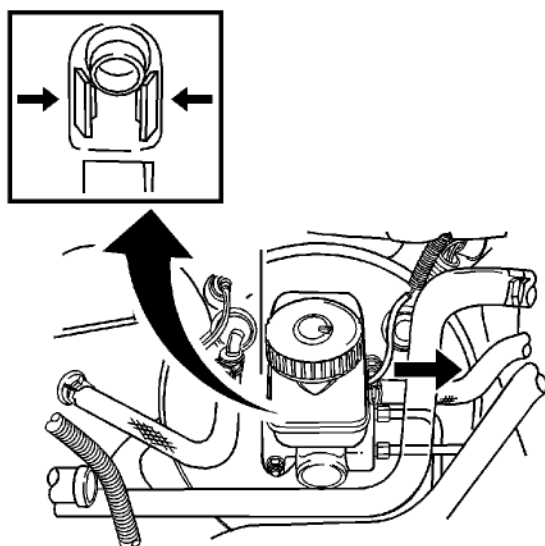
16. Repeat the sequence, including the 15 second wait, until all the air is removed. It may be necessary to repeat the sequence 10 or more times to remove all the air.
17. Locate the front bleeder caps.



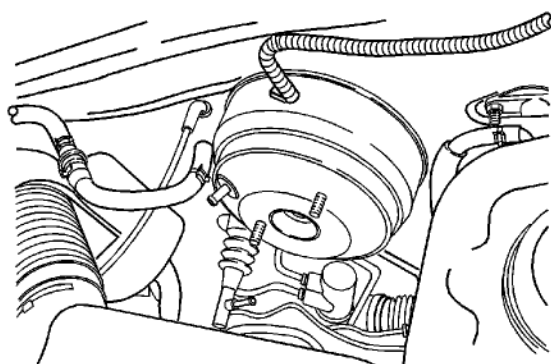
18. Proceed to bleed the front brakes following the appropriate sequence, beginning with step 12.
19. Check the brake pedal for sponginess. Repeat the entire bleeding procedure to correct this condition.

Power Vacuum Brake Booster Replacement

Removal Procedure

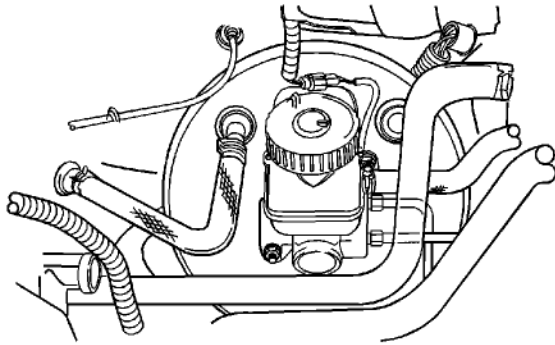


1. Disconnect the electrical connector from the reservoir.

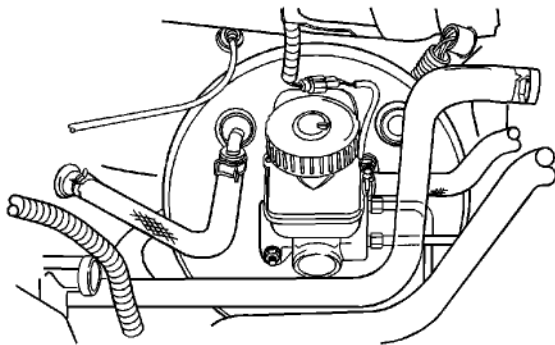


2. For vehicles with a manual transaxle, disconnect the clip on the clutch hose connection to the master cylinder.
3. Plug the clutch hose and the master cylinder so that the fluid does not escape.

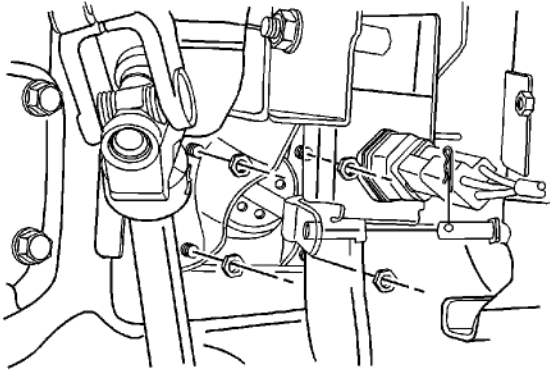
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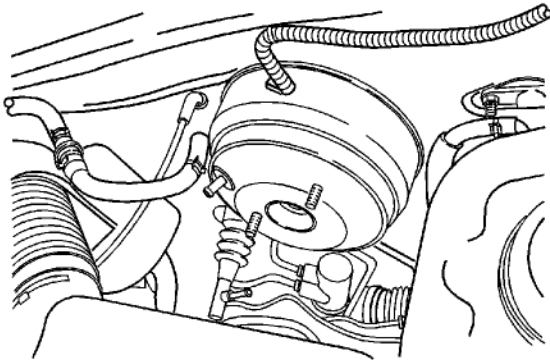
4. Remove the master cylinder attaching nuts.
5. Push the master cylinder forward slightly and move it out of the way. Do not disconnect the brake lines.
6. Remove and discard the booster housing seal.



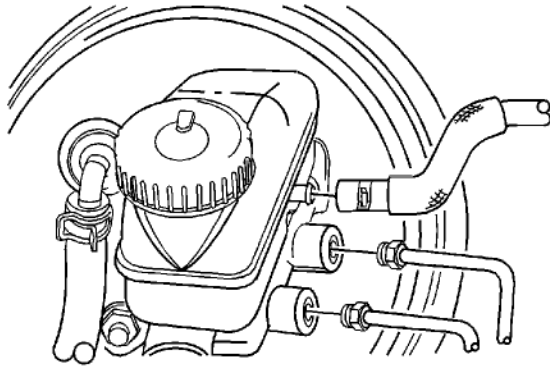
7. Remove the clip on the vacuum hose connection to the booster, DOHC engine connection shown.
8. Disconnect the brake lamp switch.
9. Remove the brake pedal spring.
10. Disconnect the clip and the pushrod pin from the pedal bracket assembly. Refer to [Brake Pedal Assembly Replacement](#).



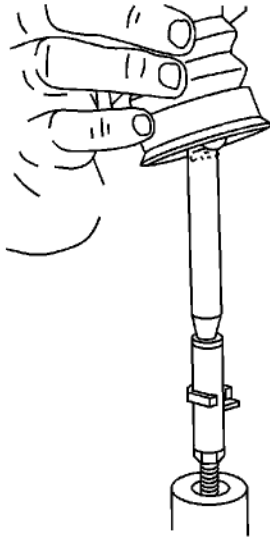
11. Remove the booster and the support bracket-to-dash panel nuts.



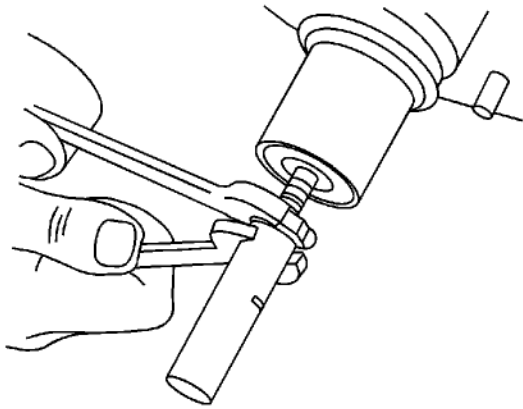
12. Remove the booster and the bracket assembly from the dash panel.



13. Remove the bracket nuts from the booster and remove the booster.



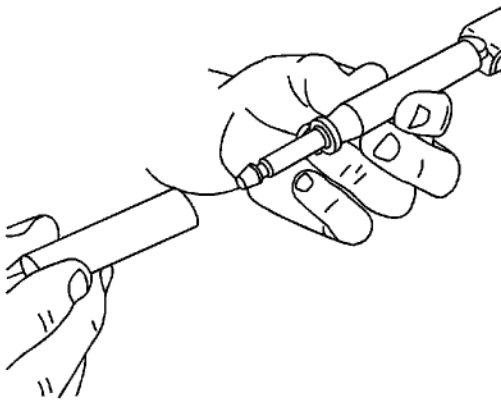
14. Remove the rubber boot and the retainer.



15. Remove the pushrod.
16. Remove the adjustment sleeve from the pushrod.
17. Remove the hex nut.

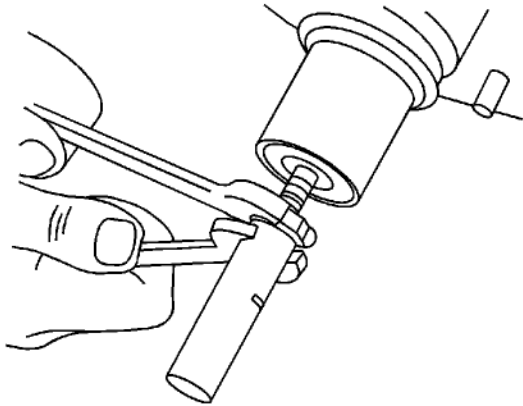
Installation Procedure

Caution: Refer to [Brake Fluid Effects on Paint and Electrical Components Caution](#) in the Preface section.



1. Inspect the pushrod and the adjustment sleeve for damage and proper fit.

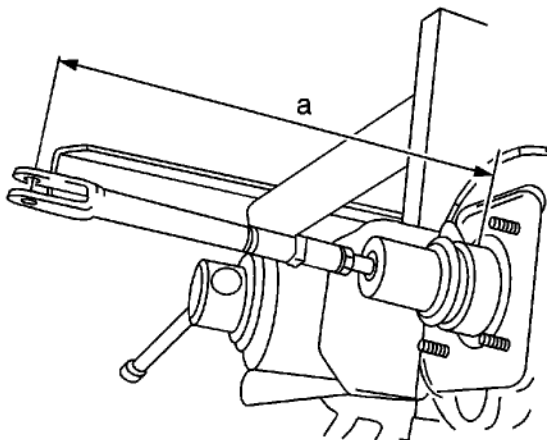
Caution: Refer to [Fastener Caution](#) in the Preface section.



2. Install the hex nut and the adjustment sleeve on the booster.

Tighten

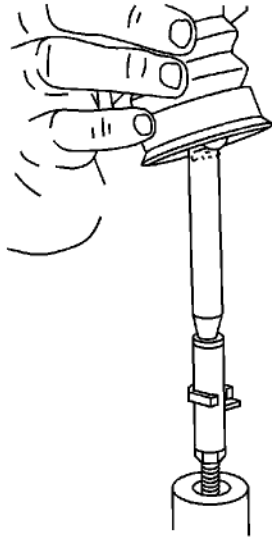
Tighten the booster pushrod hex nut and the adjustment sleeve to 16 N·m (12 lb ft).



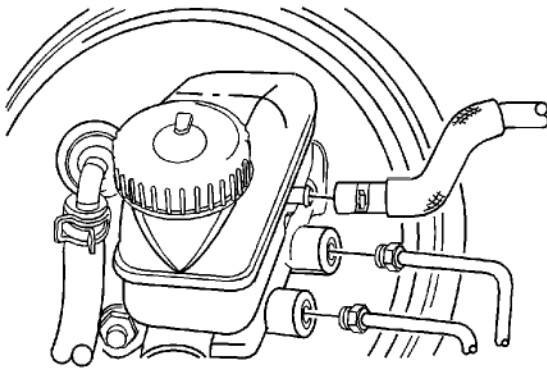
3. Insert the pushrod in the adjustment sleeve and mount the retainer.

Note: This measurement (a) should be 278.5 mm (10 in).

4. Measure the distance from the booster to the center of the fork bin bore.



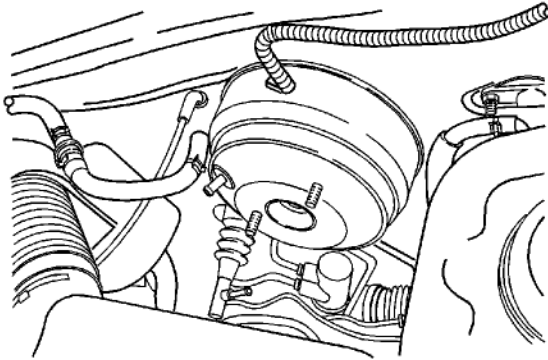
5. Install the rubber boot on the booster.



6. Install the brackets to the booster.

Tighten

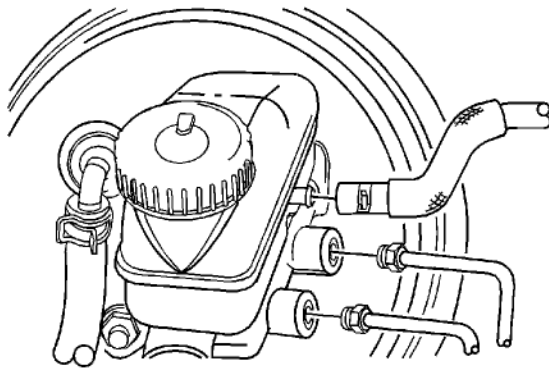
Tighten the booster-to-support bracket nuts to 12 N·m (9 lb ft).



7. Install the booster and the bracket assembly to the dash panel.

Tighten

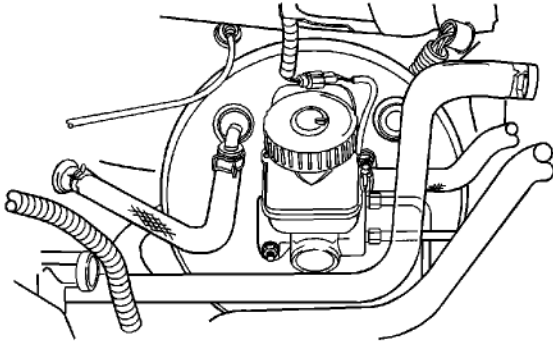
Tighten the booster and support bracket-to-dash panel nuts to 24 N·m (18 lb ft).



8. Connect the master cylinder to the booster and install a new booster housing seal.

Tighten

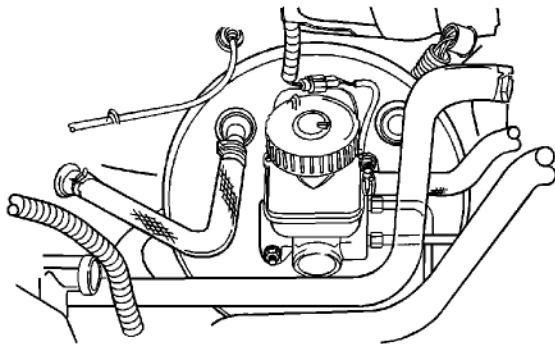
Tighten the master cylinder attaching nuts to 24 N·m (18 lb ft).



9. Install the new vacuum hose to the booster, DOHC engine connection shown. Refer to [Power Brake Booster Vacuum Check Valve and Hose Replacement](#).
10. Install new hose clamps on the vacuum hose.
11. Install the pushrod pin to the brake pedal bracket assembly and connect the clip and the spring. Refer to [Brake Pedal Assembly Replacement](#).
12. Install the brake lamp switch.

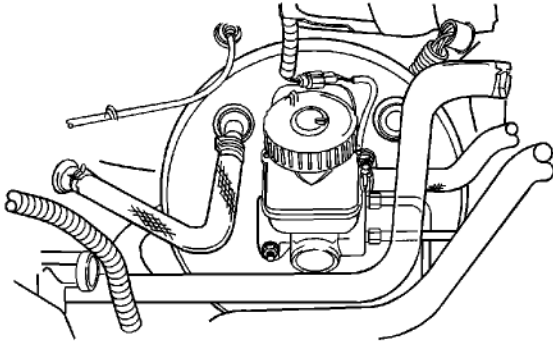
Power Brake Booster Vacuum Check Valve and Hose Replacement

Removal Procedure



1. For vehicles with a DOHC engine, remove the clip on the vacuum hose connection at the intake manifold.
2. Pull the hose from the union nut connection. If the hose does not remove easily or is deteriorated, pry off and discard the hose.
3. For vehicles with a SOHC engine, similarly remove the clip on the vacuum hose nut connection to the intake manifold.
4. Pull the hose from the union nut connection. If the hose does not remove easily or is deteriorated, pry off and discard the hose.
5. Remove the clip on the vacuum hose connection to the brake booster.
6. Remove the vacuum hose.

Installation Procedure



1. Mount the vacuum hose, DOHC engine connection shown, and make sure the connections are tight on each end.
2. Install the vacuum hose clips.