BRAKES

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DESCRIPTION

Power assist front disc and rear drum brakes are standard equipment. Disc brake components consist of single piston calipers and ventilated rotors. Rear drum brakes are dual shoe units with cast brake drums.

The parking brake mechanism is lever and cable operated. The cables are attached to levers on the rear drum brake secondary shoes. The parking brakes are operated by a hand lever.

A dual diaphragm vacuum power brake booster is used for all applications. All models have an aluminum master cylinder with plastic reservoir.

All models are equipped with a combination valve. The valve contains a pressure differential valve and switch and a fixed rate rear proportioning valve.

Factory brake lining on all models consists of an organic base material combined with metallic particles. The original equipment linings do not contain asbestos.

WARNING

WARNING: DUST AND DIRT ACCUMULATING ON BRAKE PARTS DURING NORMAL USE MAY CONTAIN ASBESTOS FIBERS FROM AFTERMARKET LININGS. BREATHING EXCESSIVE CONCENTRATIONS OF ASBESTOS FIBERS CAN CAUSE SERIOUS BODILY HARM. EXERCISE CARE WHEN SERVICING BRAKE PARTS. DO NOT CLEAN BRAKE PARTS WITH COMPRESSED AIR OR BY DRY BRUSHING. USE A VACUUM CLEANER SPECIFICALLY DESIGNED FOR THE REMOVAL OF ASBESTOS FIBERS FROM BRAKE COMPONENTS. IF A SUITABLE VACUUM CLEANER IS NOT AVAILABLE, CLEANING SHOULD BE DONE WITH A WATER DAMPENED CLOTH. DO NOT SAND, OR GRIND BRAKE LINING UNLESS EQUIPMENT USED IS DESIGNED TO CONTAIN THE DUST RESIDUE. DISPOSE OF ALL RESIDUE CONTAINING ASBESTOS FIBERS IN SEALED BAGS OR CONTAINERS TO MINIMIZE EXPOSURE TO YOURSELF AND OTHERS. FOLLOW PRACTICES PRESCRIBED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION AND THE ENVIRONMENTAL PROTECTION AGENCY FOR THE HANDLING, PROCESSING, AND DISPOSITION OF DUST OR DEBRIS THAT MAY CONTAIN ASBESTOS FIBERS.

BRAKES - BASE (Continued)

CAUTION: Never use gasoline, kerosene, alcohol, motor oil, transmission fluid, or any fluid containing mineral oil to clean the system components. These fluids damage rubber cups and seals. Use only fresh brake fluid or Mopar brake cleaner to clean or flush brake system components. These are the only cleaning materials recommended. If system contamination is suspected, check the fluid for dirt, discoloration, or separation into distinct layers. Also check the reservoir cap seal for distortion. Drain and flush the system with new brake fluid if contamination is suspected.

CAUTION: Use Mopar brake fluid, or an equivalent quality fluid meeting SAE/DOT standards J1703 and DOT 3. Brake fluid must be clean and free of contaminants. Use fresh fluid from sealed containers only to ensure proper antilock component operation.

CAUTION: Use Mopar multi-mileage or high temperature grease to lubricate caliper slide surfaces, drum brake pivot pins, and shoe contact points on the backing plates. Use multi-mileage grease or GE 661 or Dow 111 silicone grease on caliper slide pins to ensure proper operation.

DIAGNOSIS AND TESTING - BASE BRAKE SYSTEM

Base brake components consist of the brake shoes, calipers, wheel cylinders, brake drums, rotors, brake lines, master cylinder, booster, and parking brake components.

Brake diagnosis involves determining if the problem is related to a mechanical, hydraulic, or vacuum operated component.

The first diagnosis step is the preliminary check.

PRELIMINARY BRAKE CHECK

(1) Check condition of tires and wheels. Damaged wheels and worn, damaged, or underinflated tires can cause pull, shudder, vibration, and a condition similar to grab.

(2) If complaint was based on noise when braking, check suspension components. Jounce front and rear of vehicle and listen for noise that might be caused by loose, worn or damaged suspension or steering components.

(3) Inspect brake fluid level and condition. Note that the brake reservoir fluid level will decrease in proportion to normal lining wear. **Also note that brake fluid tends to darken over time. This is normal and should not be mistaken for contamination.**

(a) If fluid level is abnormally low, look for evidence of leaks at calipers, wheel cylinders, brake lines, and master cylinder.

(b) If fluid appears contaminated, drain out a sample to examine. System will have to be flushed if fluid is separated into layers, or contains a substance other than brake fluid. The system seals and cups will also have to be replaced after flushing. Use clean brake fluid to flush the system.

(4) Check parking brake operation. Verify free movement and full release of cables and pedal. Also note if vehicle was being operated with parking brake partially applied.

(5) Check brake pedal operation. Verify that pedal does not bind and has adequate free play. If pedal lacks free play, check pedal and power booster for being loose or for bind condition. Do not road test until condition is corrected.

(6) Check booster vacuum check valve and hose.

(7) If components checked appear OK, road test the vehicle.

ROAD TESTING

(1) If complaint involved low brake pedal, pump pedal and note if it comes back up to normal height.

(2) Check brake pedal response with transmission in Neutral and engine running. Pedal should remain firm under constant foot pressure.

(3) During road test, make normal and firm brake stops in 25-40 mph range. Note faulty brake operation such as low pedal, hard pedal, fade, pedal pulsation, pull, grab, drag, noise, etc.

(4) Attempt to stop the vehicle with the parking brake only and note grab, drag, noise, etc.

PEDAL FALLS AWAY

A brake pedal that falls away under steady foot pressure is generally the result of a system leak. The leak point could be at a brake line, fitting, hose, or caliper/wheel cylinder. If leakage is severe, fluid will be evident at or around the leaking component.

Internal leakage (seal by-pass) in the master cylinder caused by worn or damaged piston cups, may also be the problem cause.

An internal leak in the ABS or RWAL system may also be the problem with no physical evidence.

LOW PEDAL

If a low pedal is experienced, pump the pedal several times. If the pedal comes back up worn linings, rotors, drums, or rear brakes out of adjustment are the most likely causes. The proper course of action is to inspect and replace all worn component and make the proper adjustments.

BRAKES - BASE (Continued)

SPONGY PEDAL

A spongy pedal is most often caused by air in the system. However, thin brake drums or substandard brake lines and hoses can also cause a spongy pedal. The proper course of action is to bleed the system, and replace thin drums and substandard quality brake hoses if suspected.

HARD PEDAL OR HIGH PEDAL EFFORT

A hard pedal or high pedal effort may be due to lining that is water soaked, contaminated, glazed, or badly worn. The power booster or check valve could also be faulty.

PEDAL PULSATION

Pedal pulsation is caused by components that are loose, or beyond tolerance limits.

The primary cause of pulsation are disc brake rotors with excessive lateral runout or thickness variation, or out of round brake drums. Other causes are loose wheel bearings or calipers and worn, damaged tires.

NOTE: Some pedal pulsation may be felt during ABS activation.

BRAKE DRAG

Brake drag occurs when the lining is in constant contact with the rotor or drum. Drag can occur at one wheel, all wheels, fronts only, or rears only.

Drag is a product of incomplete brake shoe release. Drag can be minor or severe enough to overheat the linings, rotors and drums.

Minor drag will usually cause slight surface charring of the lining. It can also generate hard spots in rotors and drums from the overheat-cool down process. In most cases, the rotors, drums, wheels and tires are quite warm to the touch after the vehicle is stopped.

Severe drag can char the brake lining all the way through. It can also distort and score rotors and drums to the point of replacement. The wheels, tires and brake components will be extremely hot. In severe cases, the lining may generate smoke as it chars from overheating.

Common causes of brake drag are:

- Seized or improperly adjusted parking brake cables.
- Loose/worn wheel bearing.
- Seized caliper or wheel cylinder piston.
- Caliper binding on corroded bushings or rusted slide surfaces.
- Loose caliper mounting.
- Drum brake shoes binding on worn/damaged support plates.
- Mis-assembled components.
- Long booster output rod.

If brake drag occurs at all wheels, the problem may be related to a blocked master cylinder return port, or faulty power booster (binds-does not release).

BRAKE FADE

Brake fade is usually a product of overheating caused by brake drag. However, brake overheating and resulting fade can also be caused by riding the brake pedal, making repeated high deceleration stops in a short time span, or constant braking on steep mountain roads. Refer to the Brake Drag information in this section for causes.

BRAKE PULL

Front brake pull condition could result from:

- Contaminated lining in one caliper
- Seized caliper piston
- Binding caliper
- Loose caliper
- Rusty caliper slide surfaces
- Improper brake shoes
- Damaged rotor

A worn, damaged wheel bearing or suspension component are further causes of pull. A damaged front tire (bruised, ply separation) can also cause pull.

A common and frequently misdiagnosed pull condition is where direction of pull changes after a few stops. The cause is a combination of brake drag followed by fade at one of the brake units.

As the dragging brake overheats, efficiency is so reduced that fade occurs. Since the opposite brake unit is still functioning normally, its braking effect is magnified. This causes pull to switch direction in favor of the normally functioning brake unit.

An additional point when diagnosing a change in pull condition concerns brake cool down. Remember that pull will return to the original direction, if the dragging brake unit is allowed to cool down (and is not seriously damaged).

REAR BRAKE GRAB OR PULL

Rear grab or pull is usually caused by improperly adjusted or seized parking brake cables, contaminated lining, bent or binding shoes and support plates, or improperly assembled components. This is particularly true when only one rear wheel is involved. However, when both rear wheels are affected, the master cylinder or proportioning valve could be at fault.

BRAKES DO NOT HOLD AFTER DRIVING THROUGH DEEP WATER PUDDLES

This condition is generally caused by water soaked lining. If the lining is only wet, it can be dried by driving with the brakes very lightly applied for a mile or two. However, if the lining is both soaked and dirt contaminated, cleaning and/or replacement will be necessary.

BRAKE LINING CONTAMINATION

Brake lining contamination is mostly a product of leaking calipers or wheel cylinders, worn seals, driving through deep water puddles, or lining that has become covered with grease and grit during repair. Contaminated lining should be replaced to avoid further brake problems.

WHEEL AND TIRE PROBLEMS

Some conditions attributed to brake components may actually be caused by a wheel or tire problem.

A damaged wheel can cause shudder, vibration and pull. A worn or damaged tire can also cause pull.

Severely worn tires with very little tread left can produce a grab-like condition as the tire loses and recovers traction. Flat-spotted tires can cause vibration and generate shudder during brake operation. A tire with internal damage such as a severe bruise, cut, or ply separation can cause pull and vibration.

BRAKE NOISES

Some brake noise is common with rear drum brakes and on some disc brakes during the first few stops after a vehicle has been parked overnight or stored. This is primarily due to the formation of trace corrosion (light rust) on metal surfaces. This light corrosion is typically cleared from the metal surfaces after a few brake applications causing the noise to subside.

BRAKE SQUEAK/SQUEAL

Brake squeak or squeal may be due to linings that are wet or contaminated with brake fluid, grease, or oil. Glazed linings and rotors with hard spots can also contribute to squeak. Dirt and foreign material embedded in the brake lining will also cause squeak/squeal.

A very loud squeak or squeal is frequently a sign of severely worn brake lining. If the lining has worn through to the brake shoes in spots, metal-to-metal contact occurs. If the condition is allowed to continue, rotors and drums can become so scored that replacement is necessary.

BRAKE CHATTER

Brake chatter is usually caused by loose or worn components, or glazed/burnt lining. Rotors with hard spots can also contribute to chatter. Additional causes of chatter are out-of-tolerance rotors, brake lining not securely attached to the shoes, loose wheel bearings and contaminated brake lining.

THUMP/CLUNK NOISE

Thumping or clunk noises during braking are frequently **not** caused by brake components. In many cases, such noises are caused by loose or damaged steering, suspension, or engine components. However, calipers that bind on the slide surfaces can generate a thump or clunk noise. In addition, worn out, improperly adjusted, or improperly assembled rear brake shoes can also produce a thump noise.

STANDARD PROCEDURE

STANDARD PROCEDURE - PRESSURE BLEEDING

Use Mopar brake fluid, or an equivalent quality fluid meeting SAE J1703-F and DOT 3 standards only. Use fresh, clean fluid from a sealed container at all times.

Do not pump the brake pedal at any time while bleeding. Air in the system will be compressed into small bubbles that are distributed throughout the hydraulic system. This will make additional bleeding operations necessary.

Do not allow the master cylinder to run out of fluid during bleed operations. An empty cylinder will allow additional air to be drawn into the system. Check the cylinder fluid level frequently and add fluid as needed.

Bleed only one brake component at a time in the following sequence:

- Master Cylinder
- Combination Valve
- Right Rear Wheel
- Left Rear Wheel
- Right Front Wheel
- Left Front Wheel

Follow the manufacturers instructions carefully when using pressure equipment. Do not exceed the tank manufacturers pressure recommendations. Generally, a tank pressure of 15-20 psi is sufficient for bleeding.

Fill the bleeder tank with recommended fluid and purge air from the tank lines before bleeding.

Do not pressure bleed without a proper master cylinder adapter. The wrong adapter can lead to leakage, or drawing air back into the system. Use adapter provided with the equipment or Adapter 6921.

BRAKES - BASE (Continued)

STANDARD PROCEDURE - MANUAL BLEEDING

Use Mopar brake fluid, or an equivalent quality fluid meeting SAE J1703-F and DOT 3 standards only. Use fresh, clean fluid from a sealed container at all times.

Do not pump the brake pedal at any time while bleeding. Air in the system will be compressed into small bubbles that are distributed throughout the hydraulic system. This will make additional bleeding operations necessary.

Do not allow the master cylinder to run out of fluid during bleed operations. An empty cylinder will allow additional air to be drawn into the system. Check the cylinder fluid level frequently and add fluid as needed.

Bleed only one brake component at a time in the following sequence:

- Master Cylinder
- Combination Valve
- Right Rear Wheel
- Left Rear Wheel
- Right Front Wheel
- Left Front Wheel

(1) Remove reservoir filler caps and fill reservoir.

(2) If calipers, or wheel cylinders were overhauled, open all caliper and wheel cylinder bleed screws. Then close each bleed screw as fluid starts to drip from it. Top off master cylinder reservoir once more before proceeding.

(3) Attach one end of bleed hose to bleed screw and insert opposite end in glass container partially filled with brake fluid (Fig. 1). Be sure end of bleed hose is immersed in fluid.

(4) Open up bleeder, then have a helper press down the brake pedal. Once the pedal is down close the bleeder. Repeat bleeding until fluid stream is clear and free of bubbles. Then move to the next wheel.

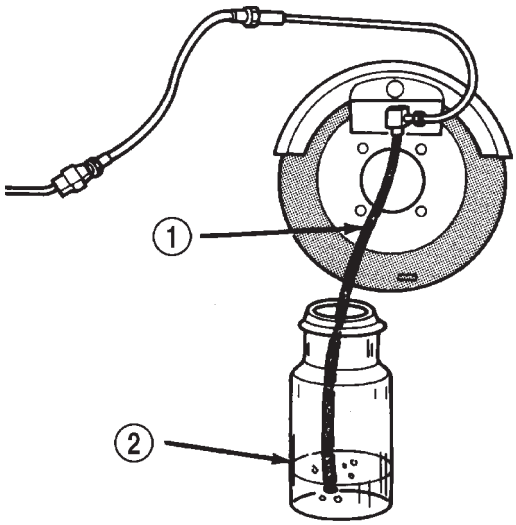


Fig. 1 Bleed Hose Setup

1 - BLEED HOSE
2 - FLUID CONTAINER PARTIALLY FILLED WITH FLUID

SPECIFICATIONS

BRAKE COMPONENTS

SPECIFICATIONS

DESCRIPTION	SPECIFICATION
Disc Brake Rotor Ventilated	Max. Runout 0.12 mm (0.005 in.)
Disc Brake Rotor Ventilated	Max. Thickness Variation 0.013 mm (0.0005 in.)
Disc Brake Rotor Ventilated	Min. Thickness 22.7 mm (0.8937 in.)
Disc Brake Caliper	Sliding
Brake Drum	9 in. or 10 in.
Brake Booster	Dual Diaphragm

BRAKES - BASE (Continued)

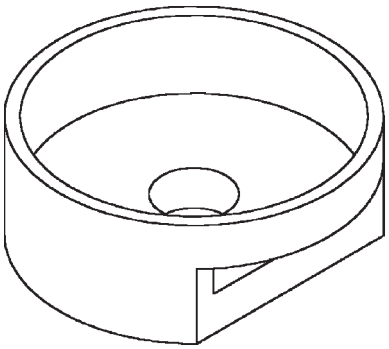
TORQUE

TORQUE SPECIFICATIONS

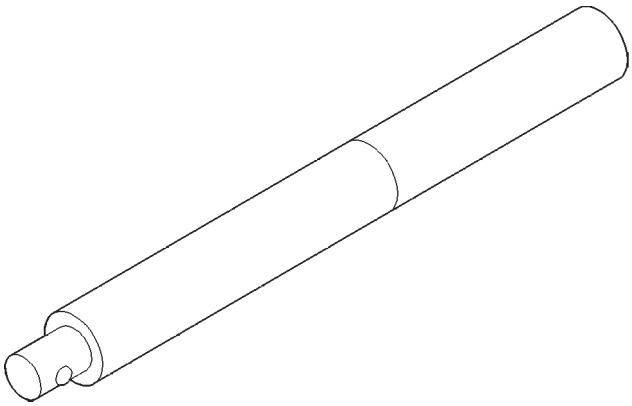
DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Brake Pedal Pivot Bolt/Nut	35	26	—
Brake Booster Mounting Nuts	39	29	—
Brake Pedal to the Column Nut	22.6	—	200
Master Cylinder Mounting Nuts	25	—	220
Master Cylinder Brake Lines	20	15	180
Combination Valve Mounting Nuts	17.5	—	155
Combination Valve Brake Lines	20	15	180
Caliper Mounting Bolts	15	11	—
Caliper Brake Hose Bolt	31	23	—
Wheel Cylinder Mounting Bolts	10	7	—
Wheel Cylinder Brake Line	14	—	124
Parking Brake Lever Screws	10-14	7-10	—
Parking Brake Lever Bracket Screws	10-14	7-10	—

SPECIAL TOOLS

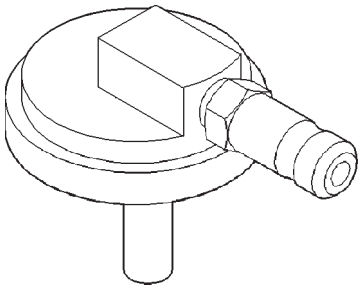
BASE BRAKES



Installer Caliper Dust Boot 8280



Handle C-4171



Adapter Pressure Bleeder 6921

BRAKE LINES

DESCRIPTION

Flexible rubber hose is used at both front brakes and at the rear axle junction block. Double walled steel tubing is used to connect the master cylinder to the major hydraulic braking components and then to the flexible rubber hoses. Double inverted style and ISO style flares are used on the brake lines.

DIAGNOSIS AND TESTING - BRAKE LINE AND HOSES

Flexible rubber hose is used at both front brakes and at the rear axle junction block. Inspect the hoses whenever the brake system is serviced, at every engine oil change, or whenever the vehicle is in for service.

Inspect the hoses for surface cracking, scuffing, or worn spots. Replace any brake hose immediately if the fabric casing of the hose is exposed due to cracks or abrasions.

Also check brake hose installation. Faulty installation can result in kinked, twisted hoses, or contact with the wheels and tires or other chassis components. All of these conditions can lead to scuffing, cracking and eventual failure.

The steel brake lines should be inspected periodically for evidence of corrosion, twists, kinks, leaks, or other damage. Heavily corroded lines will eventually rust through causing leaks. In any case, corroded or damaged brake lines should be replaced.

Factory replacement brake lines and hoses are recommended to ensure quality, correct length and superior fatigue life. Care should be taken to make sure that brake line and hose mating surfaces are clean and free from nicks and burrs. Also remember that right and left brake hoses are not interchangeable.

Use new copper seal washers at all caliper connections. Be sure brake line connections are properly made (not cross threaded) and tightened to recommended torque.

STANDARD PROCEDURE

STANDARD PROCEDURE - DOUBLE INVERTED FLARING

A preformed metal brake tube is recommended and preferred for all repairs. However, double-wall steel tube can be used for emergency repair when factory replacement parts are not readily available.

Special bending tools are needed to avoid kinking or twisting of metal brake tubes. Special flaring tools are needed to make a double inverted flare or ISO flare.

(1) Cut off damaged tube with Tubing Cutter.
(2) Ream cut edges of tubing to ensure proper flare.
(3) Install replacement tube nut on the tube.
(4) Insert tube in flaring tool.
(5) Place gauge form over the end of the tube.
(6) Push tubing through flaring tool jaws until tube contacts recessed notch in gauge that matches tube diameter.
(7) Tighten the tool bar on the tube
(8) Insert plug on gauge in the tube. Then swing compression disc over gauge and center tapered flaring screw in recess of compression disc (Fig. 2).
(9) Tighten tool handle until plug gauge is squarely seated on jaws of flaring tool. This will start the inverted flare.
(10) Remove the plug gauge and complete the inverted flare.

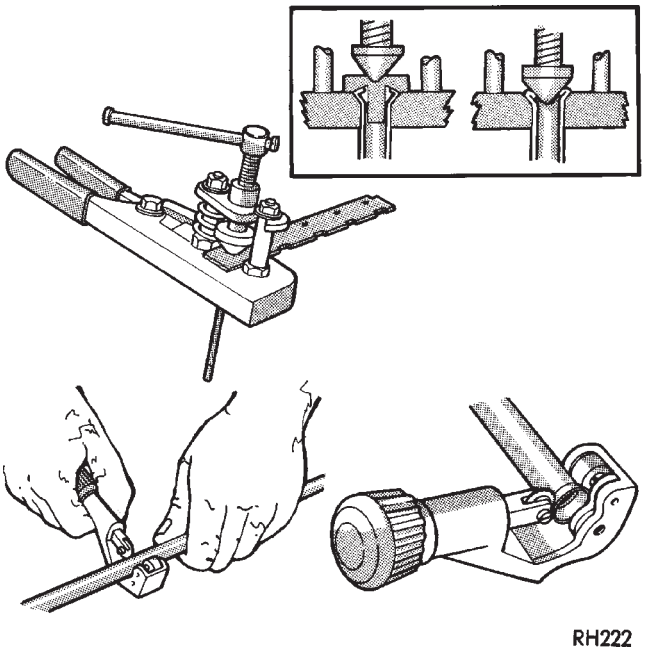


Fig. 2 Inverted

STANDARD PROCEDURE - ISO FLARING

A preformed metal brake tube is recommended and preferred for all repairs. However, double-wall steel tube can be used for emergency repair when factory replacement parts are not readily available.

Special bending tools are needed to avoid kinking or twisting of metal brake tubes. Special flaring tools are needed to make a double inverted flare or ISO flare.

To make a ISO flare use a ISO brake flaring tool or equivalent.

(1) Cut off damaged tube with Tubing Cutter.
(2) Remove any burrs from the inside of the tube.
(3) Install tube nut on the tube.

BRAKE LINES (Continued)

(4) Position the tube in the flaring tool flush with the top of the tool bar (Fig. 3). Then tighten the tool bar on the tube.

(5) Install the correct size adaptor on the flaring tool yoke screw.

(6) Lubricate the adaptor.

(7) Align the adaptor and yoke screw over the tube (Fig. 3).

(8) Turn the yoke screw in until the adaptor is squarely seated on the tool bar.

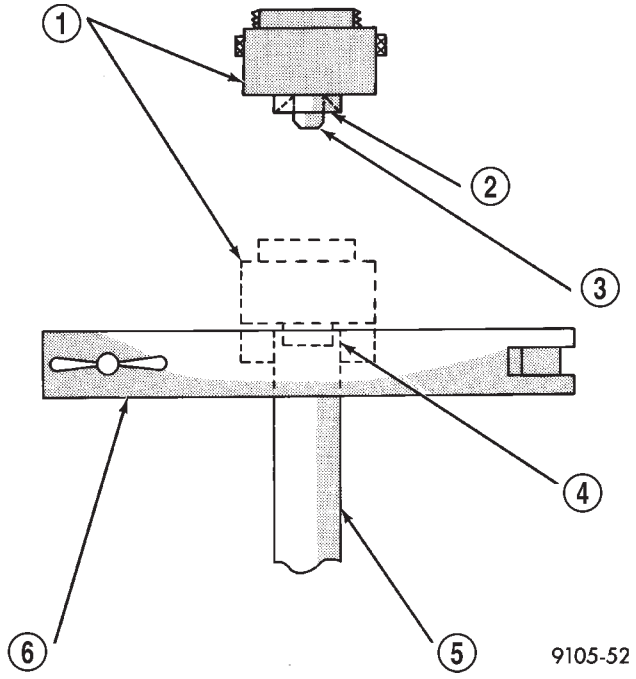


Fig. 3 ISO Flaring

1 - ADAPTER
2 - LUBRICATE HERE
3 - PILOT
4 - FLUSH WITH BAR
5 - TUBING
6 - BAR ASSEMBLY

REMOVAL

REMOVAL - FRONT HOSE

(1) Install prop rod on the brake pedal to keep pressure on the brake system.

(2) Remove the brake line from the brake hose inside the engine compartment by the front control arm bolt (Fig. 4).

(3) Raise and support vehicle.

(4) Remove the brake hose banjo bolt at the caliper.

(5) Remove the mounting bolt for the top of the brake hose at the vehicle (Fig. 5).

(6) Remove the hose.

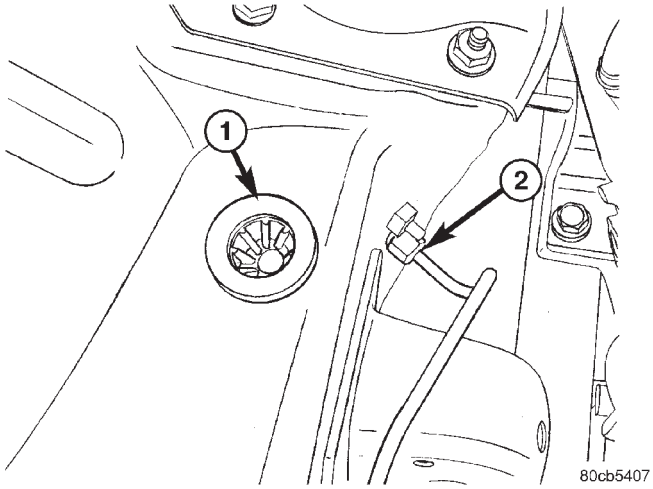


Fig. 4 INNER FENDER BRAKE LINE

1 - GROMMET
2 - BRAKE LINE

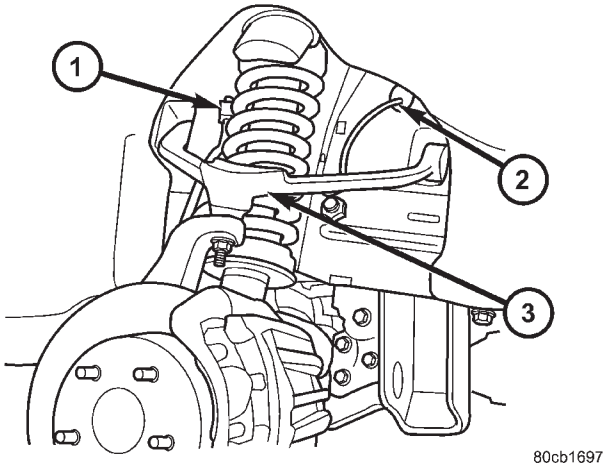


Fig. 5 FRONT BRAKE HOSE

1 - TOP OF FRONT BRAKE HOSE
2 - WHEEL SPEED SENSOR WIRE
3 - UPPER CONTROL ARM

REMOVAL - REAR BRAKE HOSE

(1) Install prop rod on the brake pedal to keep pressure on the brake system.

(2) Raise and support the vehicle.

(3) Remove the brake line from the hose at the body (Fig. 6).

(4) Remove the brake hose mounting bolt at the top of the hose located at the body (Fig. 6).

(5) Remove the vent tube (Fig. 7).

(6) Remove the two brake lines at the bottom of the hose located at the axle (Fig. 7).

(7) Remove the mounting bolt for the brake hose at the axle (Fig. 7).

(8) Remove the hose.

BRAKE LINES (Continued)

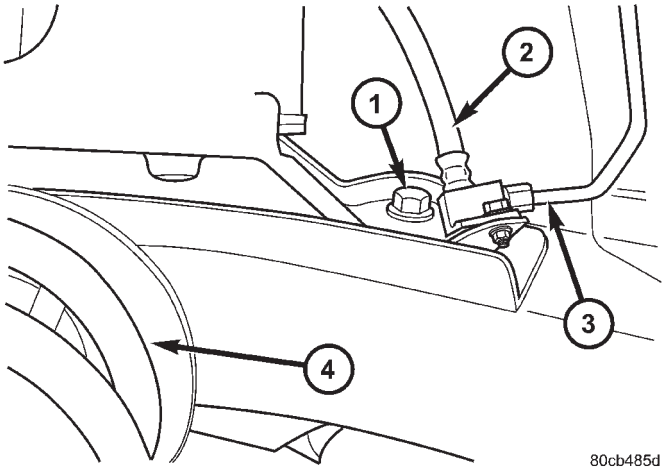


Fig. 6 BRAKE HOSE AT THE BODY

1 - MOUNTING BOLT
2 - BRAKE HOSE
3 - BRAKE LINE
4 - COIL SPRING

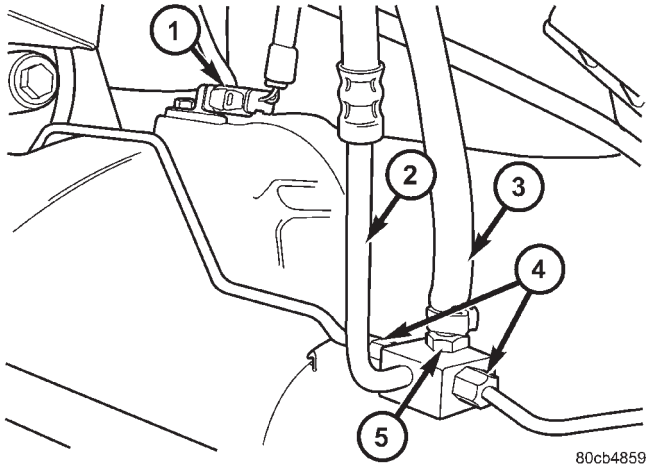


Fig. 7 BRAKE HOSE AT THE AXLE

1 - REAR WHEEL SPEED SENSOR
2 - BRAKE HOSE
3 - VENT HOSE
4 - BRAKE LINES
5 - MOUNTING BOLT

INSTALLATION

INSTALLATION - FRONT BRAKE HOSE

(1) Install the hose.
(2) Install the mounting bolt for the top of the brake hose at the vehicle (Fig. 8).
(3) Install the brake hose banjo bolt at the caliper.
(4) Lower the vehicle and remove the support.
(5) Install the brake line to the brake hose inside the engine compartment by the front control arm bolt.
(6) Remove the prop rod from the brake pedal.
(7) Bleed the brake system (Refer to 5 - BRAKES - STANDARD PROCEDURE).

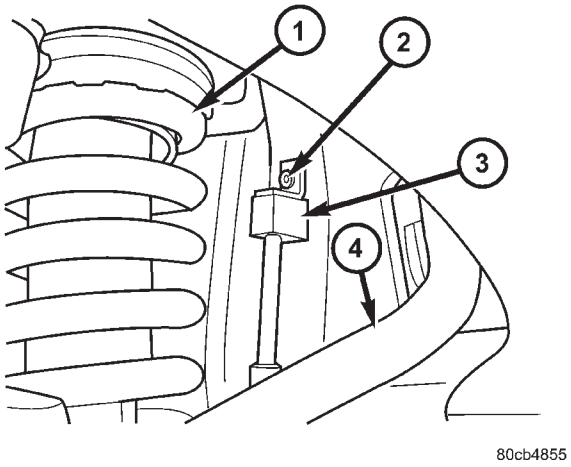


Fig. 8 BRAKE HOSE MOUNTED

1 - COIL SPRING
2 - MOUNTING BOLT
3 - BRAKE HOSE
4 - FRONT OF THE UPPER CONTROL ARM

INSTALLATION - REAR BRAKE HOSE

(1) Install the hose.
(2) Install the mounting bolt for the brake hose at the axle (Fig. 7).
(3) Install the two brake lines at the bottom of the hose located at the axle (Fig. 7).
(4) Install the vent tube (Fig. 7).
(5) Install the brake hose mounting bolt at the top of the hose located at the body (Fig. 6).
(6) Install the brake line to the hose at the body (Fig. 6).
(7) Lower the vehicle and remove the support.
(8) Remove the prop rod.
(9) Bleed the brake system (Refer to 5 - BRAKES - STANDARD PROCEDURE).

BRAKE PADS / SHOES

DESCRIPTION - REAR DRUM BRAKE

The rear brakes use a leading shoe (primary) and trailing shoe (secondary) design (Right rear brake is shown) (Fig. 9).

BRAKE PADS / SHOES (Continued)

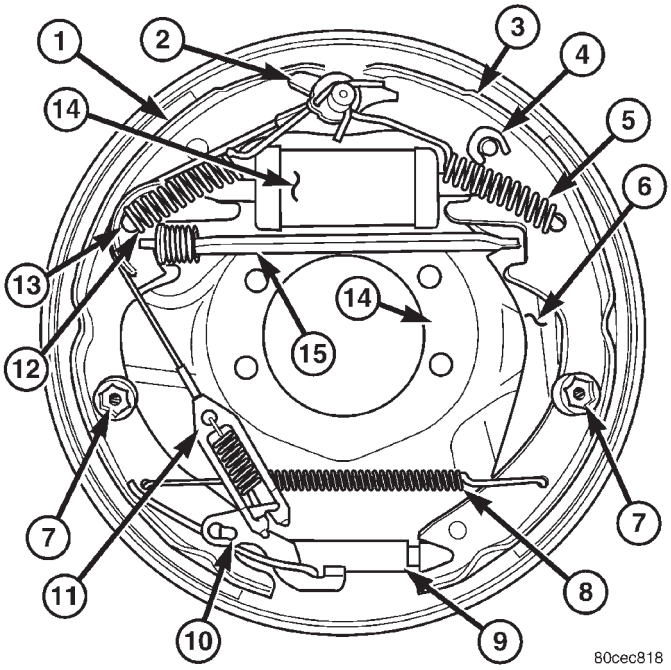


Fig. 9 BRAKE COMPONENTS

1 - SECONDARY SHOE
2 - SHOE GUIDE PLATE
3 - PRIMARY SHOE
4 - HORSE SHOE RETAINING CLIP
5 - PRIMARY RETURN SPRING
6 - PARK BRAKE STRUT
7 - HOLD DOWN SPRING AND RETAINERS
8 - SHOE RETURN SPRING
9 - ADJUSTER SCREW ASSEMBLY
10 - ADJUSTER LEVER
11 - ADJUSTER CABLE
12 - SECONDARY RETURN SPRING
13 - CABLE GUIDE
14 - WHEEL CYLINDER
15 - PARK BRAKE STRUT AND SPRING
16 - SUPPORT PLATE

OPERATION - REAR DRUM BRAKE

When the brake pedal is depressed hydraulic pressure pushes the rear brake wheel cylinder pistons outward. The wheel cylinder push rods then push the brake shoes outward against the brake drum. When the brake pedal is released return springs attached to the brake shoes pull the shoes back to there original position (Fig. 9).

REMOVAL

REMOVAL - FRONT BRAKE PADS

(1) Raise and support the vehicle.
(2) Remove the front wheel and tire assembly.
(3) Drain a small amount of fluid from the master cylinder brake reservoir with a **clean** suction gun.
(4) Bottom the caliper pistons into the caliper by prying the caliper over.
(5) Remove the caliper mounting bolts.
(6) Remove the disc brake caliper from the mount.

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

(7) Remove the inboard and outboard pads.

REMOVAL - DRUM BRAKE SHOES

(1) Raise the vehicle and remove the rear wheels.
(2) Remove and discard the spring nuts securing drums to wheel studs.
(3) Remove the brake drums. If drums prove difficult to remove, retract brake shoes. Remove the access hole plug at the rear of backing plate and back off adjuster screw with brake tool and screwdriver.
(4) Clean the individual brake components, including the support plate and wheel cylinder exterior, with a find mist of water. Then wipe the brake components clean with a dampened cloth.
(5) Remove the primary and secondary return springs from anchor pin with the brake spring pliers.
(6) Remove the U-clip and washer securing adjuster cable to the parking brake lever.
(7) Remove the hold-down springs, retainers and pins with standard retaining spring tool.
(8) Remove the parking brake strut and cable guide.
(9) Remove the adjuster lever, adjuster screw and spring.
(10) Remove the adjuster cable.
(11) Remove the brake shoes.
(12) Disconnect the cable from the parking brake lever and remove the lever (if needed).

INSTALLATION

INSTALLATION - FRONT BRAKE PADS

(1) Install the inboard and outboard pads.
(2) Install the caliper (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPERS - INSTALLATION).
(3) Install the tire and wheel assembly. (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

INSTALLATION - DRUM BRAKE SHOES

Bonded linings should be replaced when worn to a thickness of 1.6 mm (1/16 in.).

BRAKE PADS / SHOES (Continued)

Examine the lining contact pattern to determine if the shoes are bent or the drum is tapered. The lining should exhibit contact across its entire width. Shoes exhibiting contact only on one side should be replaced and the drum checked for runout or taper.

Inspect the adjuster screw assembly. Replace the assembly if the star wheel or threads are damaged, or the components are severely rusted or corroded.

Discard the brake springs and retainer components if worn, distorted or collapsed. Also replace the springs if a brake drag condition had occurred. Overheating will distort and weaken the springs.

Inspect the brake shoe contact pads on the support plate, replace the support plate if any of the pads are worn or rusted through. Also replace the plate if it is bent or distorted.

(1) Clean support plate with brake cleaner.

(2) If new drums are being installed, remove protective coating with carburetor cleaner followed by final rinse with brake cleaner.

(3) Clean and lubricate anchor pin with light coat of Mopar multi-mileage grease.

(4) Apply Mopar multi-mileage grease to brake shoe contact surfaces of support plate (Fig. 10).

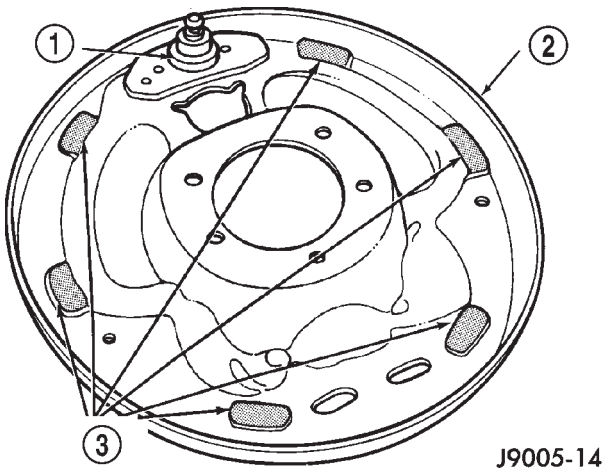


Fig. 10 Shoe Contact Surfaces

1 - ANCHOR PIN
2 - SUPPORT PLATE
3 - SHOE CONTACT SURFACES

(5) Lubricate the adjuster screw threads and pivot with spray lube.

(6) Attach parking brake lever to secondary brake shoe. Use new washer and U-clip to secure lever.

(7) Attach the parking brake cable to lever (if removed).

(8) Install the brake shoes on support plate. Secure shoes with new hold-down springs, pins and retainers.

(9) Install the parking brake strut and spring.

(10) Install the guide plate and adjuster cable on anchor pin.

(11) Install the adjuster cable guide on the shoe.

(12) Install the primary and secondary return springs.

(13) Lubricate and assemble adjuster screw.

(14) Install the adjuster screw, spring and lever and connect to adjuster cable.

(15) Adjust the shoes to the drum (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/BRAKE PADS/SHOES - ADJUSTMENTS).

(16) Install the brake drum.

(17) Install the wheel/tire assemblies and lower vehicle (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

(18) Verify firm brake pedal before moving vehicle.

ADJUSTMENTS

ADJUSTMENT - REAR DRUM BRAKE

The rear drum brakes are equipped with a self-adjusting mechanism. Under normal circumstances, the only time adjustment is required is when the shoes are replaced, removed for access to other parts, or when one or both drums are replaced.

Adjustment can be made with a standard brake gauge or with adjusting tool. Adjustment is performed with the complete brake assembly installed on the backing plate.

ADJUSTMENT WITH BRAKE GAUGE

(1) Be sure parking brakes are fully released.

(2) Raise rear of vehicle and remove wheels and brake drums.

(3) Verify that left and right automatic adjuster levers and cables are properly connected.

(4) Insert brake gauge in drum. Expand gauge until gauge inner legs contact drum braking surface. Then lock gauge in position (Fig. 11).

(5) Reverse gauge and install it on brake shoes. Position gauge legs at shoe centers as shown (Fig. 12). If gauge does not fit (too loose/too tight), adjust shoes.

(6) Pull shoe adjuster lever away from adjuster screw star wheel.

(7) Turn adjuster screw star wheel (by hand) to expand or retract brake shoes. Continue adjustment until gauge outside legs are light drag-fit or 30 thousands of an inch clearence on the shoes.

(8) Install brake drums and wheels and lower vehicle.

(9) Drive vehicle and make one forward stop followed by one reverse stop. Repeat procedure 8-10 times to operate automatic adjusters and equalize adjustment.

BRAKE PADS / SHOES (Continued)

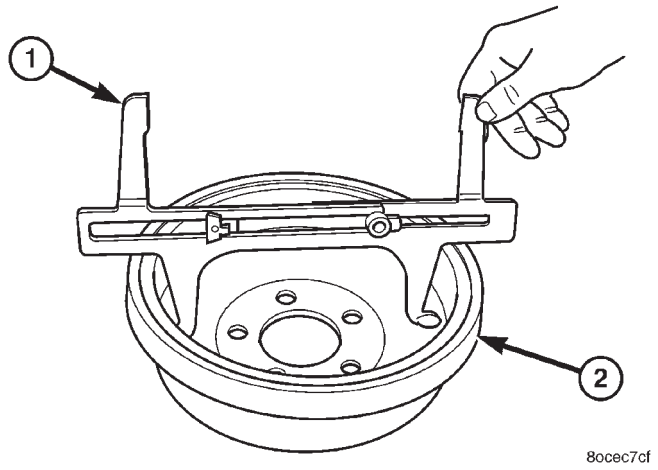


Fig. 11 ADJUSTING GAUGE ON DRUM

1 - BRAKE GAUGE
2 - BRAKE DRUM

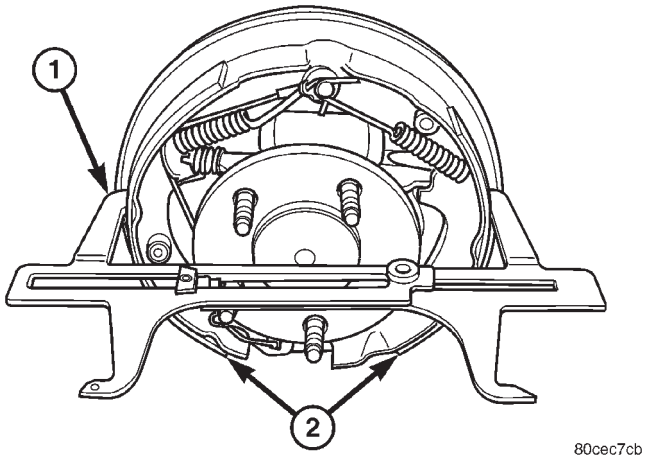


Fig. 12 ADJUSTING GAUGE ON BRAKE SHOES

1 - BRAKE GAUGE
2 - BRAKE SHOES

NOTE: Bring vehicle to complete standstill at each stop. Incomplete, rolling stops will not activate automatic adjusters.

ADJUSTMENT WITH ADJUSTING TOOL

(1) Be sure parking brake lever is fully released.

(2) Raise vehicle so rear wheels can be rotated freely.

(3) Remove plug from each access hole in brake support plates.

(4) Loosen parking brake cable adjustment nut until there is slack in front cable.

(5) Insert adjusting tool through support plate access hole and engage tool in teeth of adjusting screw star wheel (Fig. 13).

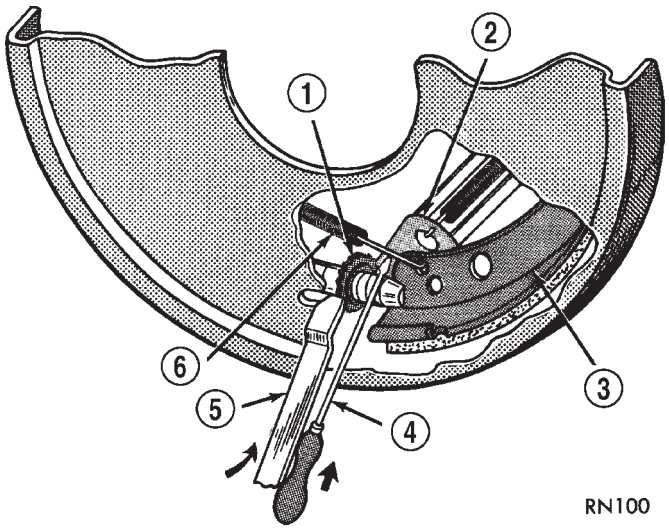


Fig. 13 Brake Adjustment

1 - STAR WHEEL
2 - LEVER
3 - BRAKE SHOE WEB
4 - SCREWDRIVER
5 - ADJUSTING TOOL
6 - ADJUSTER SPRING

(6) Rotate adjuster screw star wheel (move tool handle upward) until slight drag can be felt when wheel is rotated.

(7) Push and hold adjuster lever away from star wheel with thin screwdriver.

(8) Back off adjuster screw star wheel until brake drag is eliminated.

(9) Repeat adjustment at opposite wheel. Be sure adjustment is equal at both wheels.

(10) Install support plate access hole plugs.

(11) Adjust parking brake cable and lower vehicle.

(12) Drive vehicle and make one forward stop followed by one reverse stop. Repeat procedure 8-10 times to operate automatic adjusters and equalize adjustment.

NOTE: Bring vehicle to complete standstill at each stop. Incomplete, rolling stops will not activate automatic adjusters.

DISC BRAKE CALIPERS

DESCRIPTION

The calipers are a single piston type. The calipers are free to slide laterally, this allows continuous compensation for lining wear.

DISC BRAKE CALIPERS (Continued)

OPERATION

When the brakes are applied fluid pressure is exerted against the caliper piston. The fluid pressure is exerted equally and in all directions. This means pressure exerted against the caliper piston and within the caliper bore will be equal (Fig. 14).

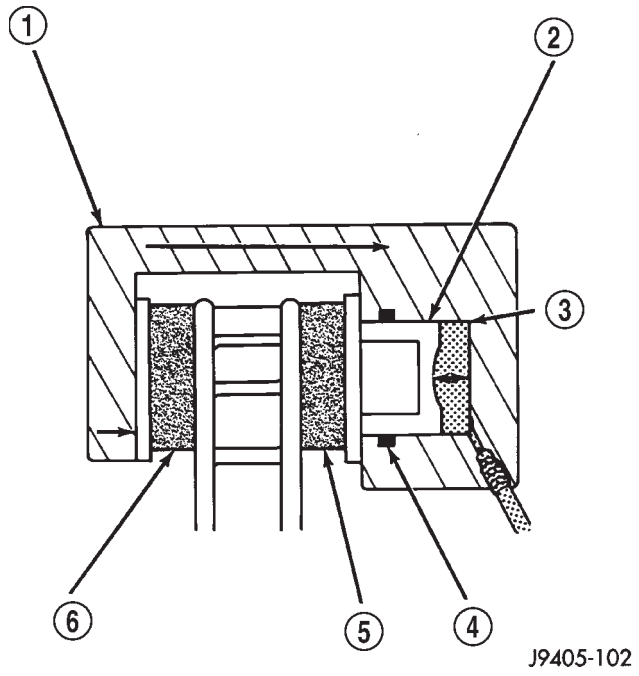


Fig. 14 Brake Caliper Operation

1 - CALIPER
2 - PISTON
3 - PISTON BORE
4 - SEAL
5 - INBOARD SHOE
6 - OUTBOARD SHOE

Fluid pressure applied to the piston is transmitted directly to the inboard brake shoe. This forces the shoe lining against the inner surface of the disc brake rotor. At the same time, fluid pressure within the piston bore forces the caliper to slide inward on the mounting bolts. This action brings the outboard brake shoe lining into contact with the outer surface of the disc brake rotor.

In summary, fluid pressure acting simultaneously on both piston and caliper, produces a strong clamping action. When sufficient force is applied, friction will attempt to stop the rotors from turning and bring the vehicle to a stop.

Application and release of the brake pedal generates only a very slight movement of the caliper and piston. Upon release of the pedal, the caliper and piston return to a rest position. The brake shoes do not retract an appreciable distance from the rotor. In fact, clearance is usually at, or close to zero. The reasons for this are to keep road debris from getting between the rotor and lining and in wiping the rotor surface clear each revolution.

The caliper piston seal controls the amount of piston extension needed to compensate for normal lining wear.

During brake application, the seal is deflected outward by fluid pressure and piston movement (Fig. 15). When the brakes (and fluid pressure) are released, the seal relaxes and retracts the piston.

The amount of piston retraction is determined by the amount of seal deflection. Generally the amount is just enough to maintain contact between the piston and inboard brake shoe.

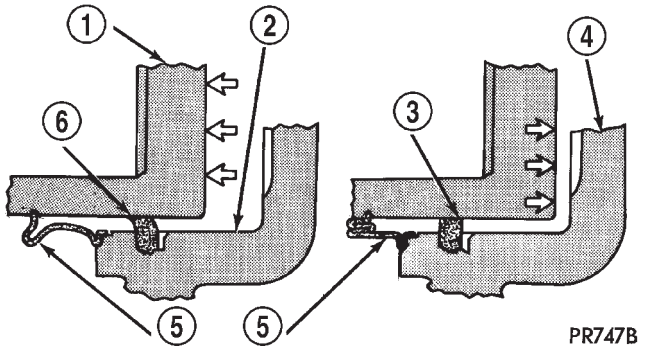


Fig. 15 Lining Wear Compensation By Piston Seal

1 - PISTON
2 - CYLINDER BORE
3 - PISTON SEAL BRAKE PRESSURE OFF
4 - CALIPER HOUSING
5 - DUST BOOT
6 - PISTON SEAL BRAKE PRESSURE ON

REMOVAL

(1) Install prop rod on the brake pedal to keep pressure on the brake system.
(2) Raise and support vehicle.
(3) Remove front wheel and tire assembly.
(4) Drain small amount of fluid from master cylinder brake reservoir with suction gun.
(5) Remove the brake hose banjo bolt if replacing caliper (Fig. 16).
(6) Remove the caliper mounting slide pin bolts (Fig. 16).
(7) Remove the caliper from vehicle.

DISASSEMBLY

(1) Remove brake shoes from caliper.
(2) Drain brake fluid out of caliper.
(3) Take a piece of wood and pad it with one-inch thickness of shop towels. Place this piece in the outboard shoe side of the caliper in front of the piston. This will cushion and protect caliper piston during removal (Fig. 17).

DISC BRAKE CALIPERS (Continued)

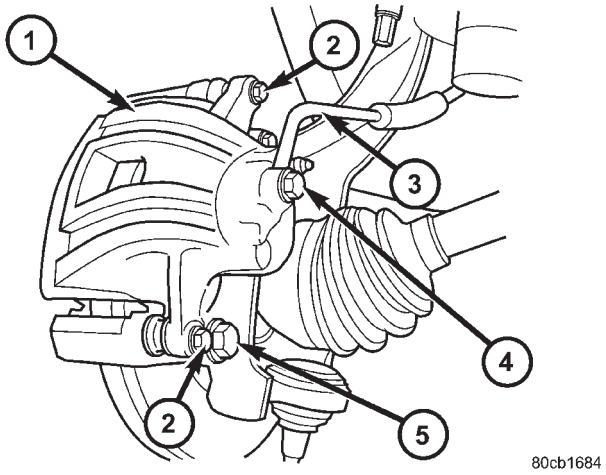


Fig. 16 DISC BRAKE CALIPER

1 - DISC BRAKE CALIPER
2 - CALIPER SLIDE MOUNTING BOLTS
3 - BRAKE HOSE
4 - BANJO BOLT
5 - CALIPER ADAPTER MOUNTING BOLT

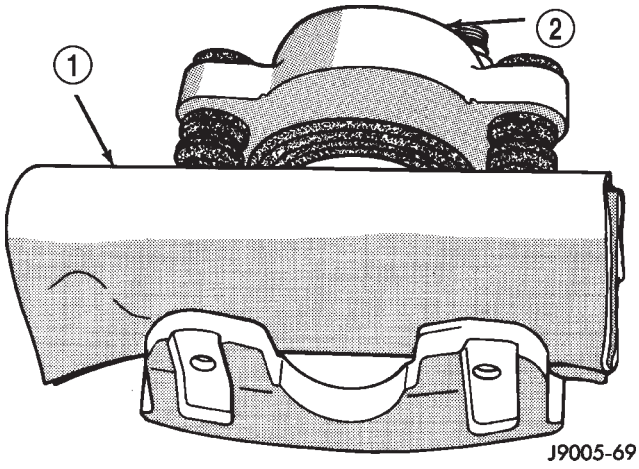


Fig. 17 PADDING CALIPER INTERIOR - TYPICAL

1 - SHOP TOWELS OR CLOTHS
2 - CALIPER

(4) Remove caliper piston with **short bursts** of low pressure compressed air. Direct air through fluid inlet port and ease piston out of bore (Fig. 18).

CAUTION: Do not blow the piston out of the bore with sustained air pressure. This could result in a cracked piston. Use only enough air pressure to ease the piston out.

WARNING: NEVER ATTEMPT TO CATCH THE PISTON AS IT LEAVES THE BORE. THIS MAY RESULT IN PERSONAL INJURY.

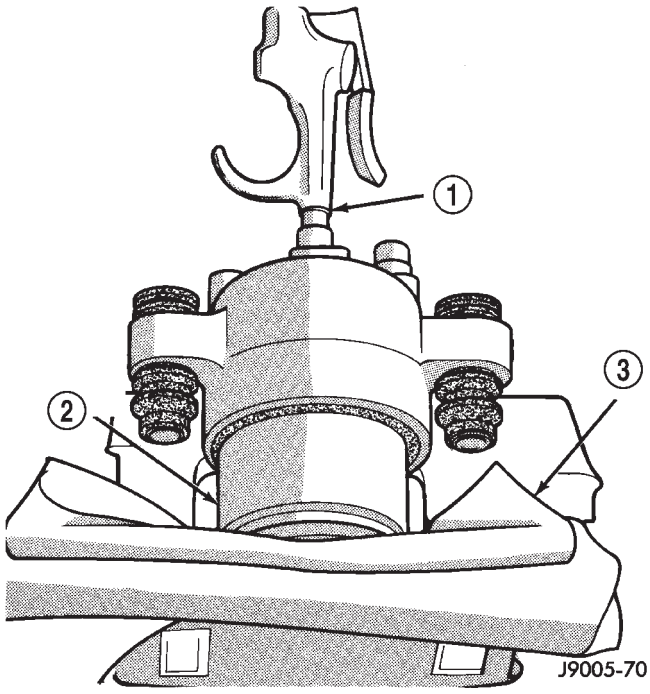


Fig. 18 CALIPER PISTON REMOVAL - TYPICAL

1 - AIR GUN
2 - CALIPER PISTON
3 - PADDING MATERIAL

(5) Remove caliper piston dust boot with suitable pry tool (Fig. 19).

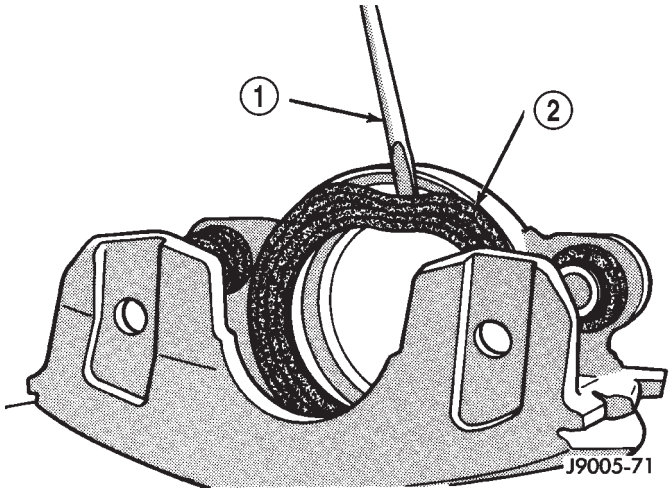


Fig. 19 CALIPER PISTON DUST BOOT REMOVAL - TYPICAL

1 - COLLAPSE BOOT WITH PUNCH OR SCREWDRIVER
2 - PISTON DUST BOOT

(6) Remove caliper piston seal with wood or plastic tool (Fig. 20). Do not use metal tools as they will scratch piston bore.

(7) Remove caliper mounting bolt bushings and boots (Fig. 21).

DISC BRAKE CALIPERS (Continued)

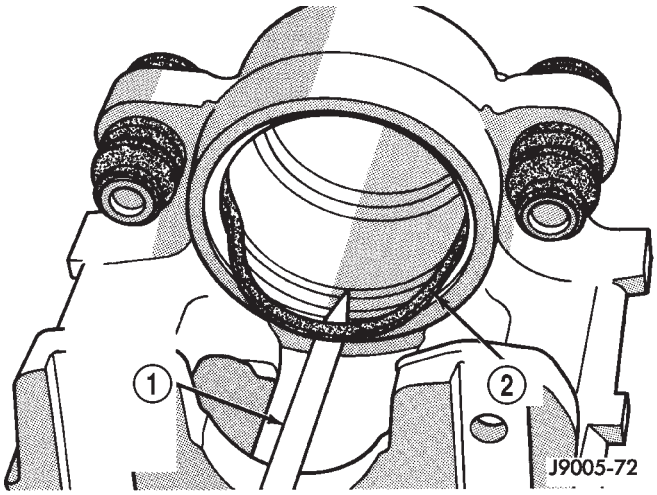


Fig. 20 PISTON SEAL REMOVAL - TYPICAL

1 - REMOVE SEAL WITH WOOD PENCIL OR SIMILAR TOOL
2 - PISTON SEAL

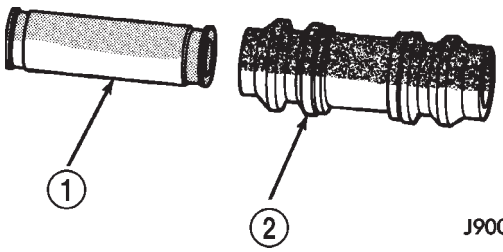


Fig. 21 MOUNTING BOLT BUSHING AND BOOT - TYPICAL

1 - CALIPER SLIDE BUSHING
2 - BOOT

CLEANING

Clean the caliper components with clean brake fluid or brake clean only. Wipe the caliper and piston dry with lint free towels or use low pressure compressed air.

CAUTION: Do not use gasoline, kerosene, thinner, or similar solvents. These products may leave a residue that could damage the piston and seal.

INSPECTION

The piston is made from a phenolic resin (plastic material) and should be smooth and clean.

The piston must be replaced if cracked or scored. Do not attempt to restore a scored piston surface by sanding or polishing.

CAUTION: If the caliper piston is replaced, install the same type of piston in the caliper. Never interchange phenolic resin and steel caliper pistons. The pistons, seals, seal grooves, caliper bore and piston tolerances are different.

The bore can be **lightly** polished with a brake hone to remove very minor surface imperfections (Fig. 22). The caliper should be replaced if the bore is severely corroded, rusted, scored, or if polishing would increase bore diameter more than 0.025 mm (0.001 inch).

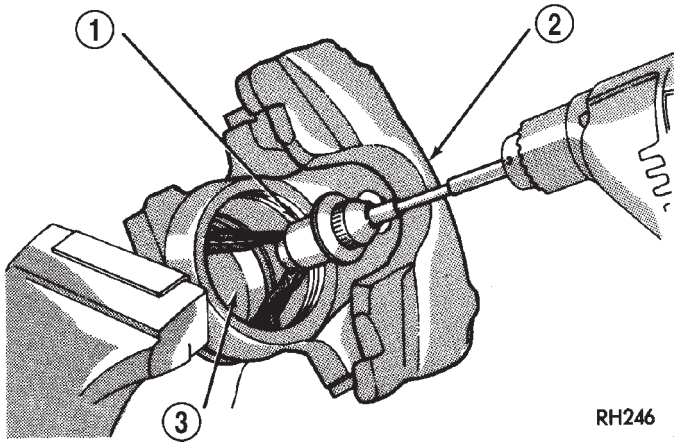


Fig. 22 POLISHING PISTON BORE - TYPICAL

1 - SPECIAL HONE
2 - CALIPER
3 - PISTON BORE

ASSEMBLY

CAUTION: Dirt, oil, and solvents can damage caliper seals. Insure assembly area is clean and dry.

(1) Lubricate caliper piston bore, new piston seal and piston with clean brake fluid.

(2) Lubricate caliper bushings and interior of bushing boots with silicone grease.

(3) Install bushing boots in caliper, then insert bushing into boot and push bushing into place (Fig. 23).

(4) Install new piston seal into seal groove with finger (Fig. 24).

(5) Install new dust boot on caliper piston and seat boot in piston groove (Fig. 25).

(6) Press piston into caliper bore by hand, use a turn and push motion to work piston into seal (Fig. 26).

(7) Press caliper piston to bottom of bore.

(8) Seat dust boot in caliper with Installer Tool C-4842 and Tool Handle C-4171 (Fig. 27).

(9) Replace caliper bleed screw if removed.

DISC BRAKE CALIPERS (Continued)

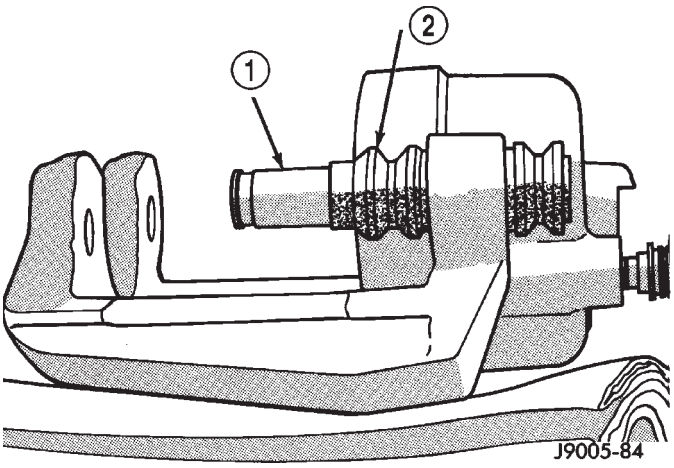


Fig. 23 BUSHINGS AND BOOTS INSTALLATION - TYPICAL

1 - BUSHING
2 - BOOT

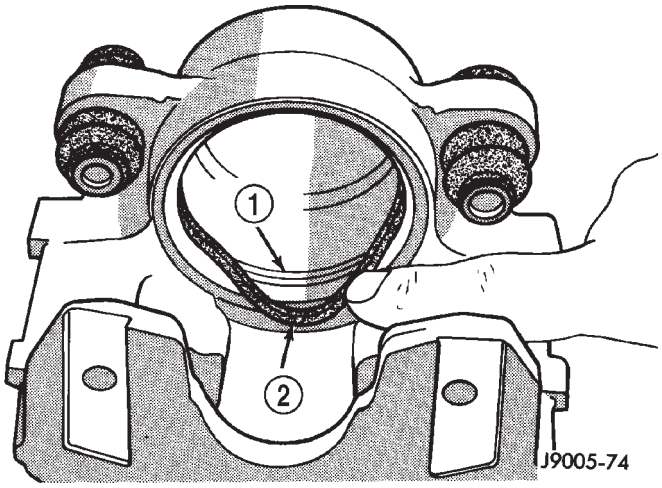


Fig. 24 PISTON SEAL INSTALLATION - TYPICAL

1 - SEAL GROOVE
2 - PISTON SEAL

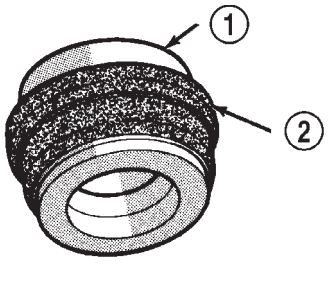


Fig. 25 DUST BOOT ON PISTON - TYPICAL

1 - PISTON
2 - DUST BOOT

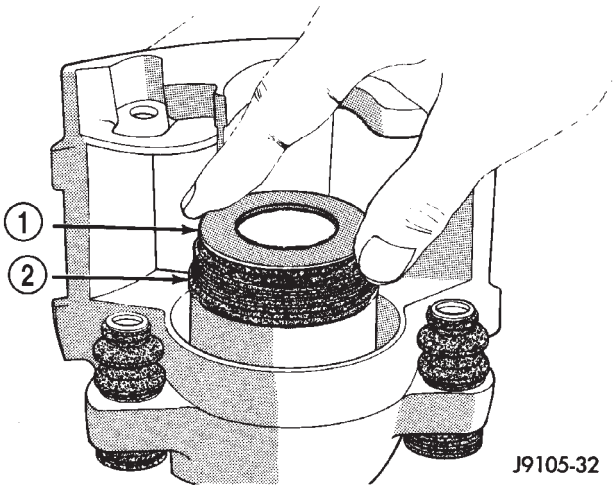


Fig. 26 CALIPER PISTON INSTALLATION - TYPICAL

1 - PISTON
2 - BOOT

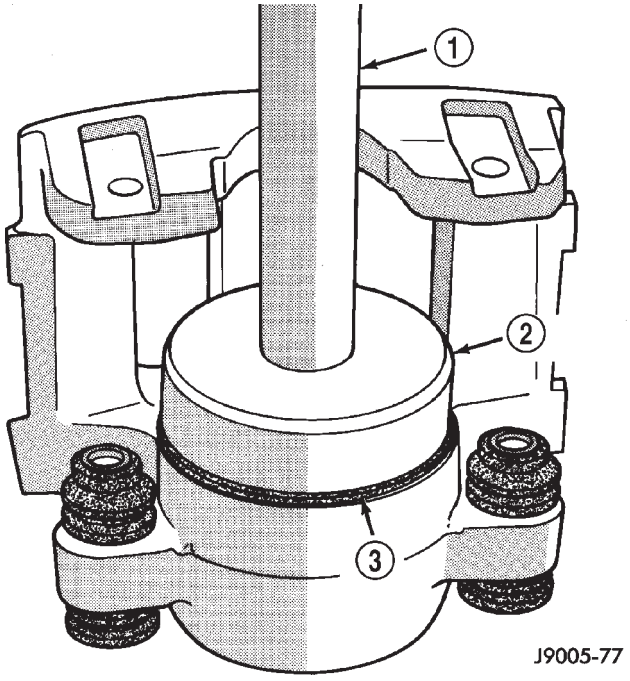


Fig. 27 PISTON DUST BOOT INSTALLATION - TYPICAL

1 - HANDLE C-4171
2 - INSTALLER C-4842
3 - DUST BOOT

INSTALLATION

(1) Install caliper to the caliper adapter.

(2) Coat the caliper mounting slide pin bolts with silicone grease. Begin with the bolt closet to the bleeder screws (top), Then install and tighten the bolts to 15 N·m (11 ft. lbs.).

(3) Install the brake hose banjo bolt if removed.

DISC BRAKE CALIPERS (Continued)

(4) Install the brake hose to the caliper with **new seal washers** and tighten fitting bolt to 31 N·m (23 ft. lbs.).

CAUTION: Verify brake hose is not twisted or kinked before tightening fitting bolt.

(5) Remove the prop rod from the vehicle.
(6) Bleed the base brake system,(Refer to 5 - BRAKES - STANDARD PROCEDURE) OR (Refer to 5 - BRAKES - STANDARD PROCEDURE).
(7) Install the wheel and tire assemblies (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).
(8) Remove the supports and lower the vehicle.
(9) Verify a firm pedal before moving the vehicle.

DISC BRAKE CALIPER ADAPTER

REMOVAL

(1) Raise and support the vehicle.
(2) Remove the front wheel and tire assembly.
(3) Drain a small amount of fluid from master cylinder brake reservoir with a **clean** suction gun.
(4) Bottom the caliper pistons into the caliper by prying the caliper over.
(5) Remove the caliper mounting bolts (Fig. 16).
(6) Remove the disc brake caliper from the mount.

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

(7) Remove the inboard and outboard brake pads. (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/BRAKE PADS/SHOES - REMOVAL).
(8) Remove the caliper adapter mounting bolts (Fig. 16).

INSTALLATION

(1) Install the caliper adapter mounting bolts. Tighten the mounting bolts to 135 N·m (100 ft.lbs).
(2) Install the inboard and outboard pads. (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/BRAKE PADS/SHOES - INSTALLATION).
(3) Install the caliper mounting bolts.
(4) Install the tire and wheel assembly. (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

ROTORS

DIAGNOSIS AND TESTING - DISC BRAKE ROTOR

The rotor braking surfaces should not be refinished unless necessary.

Light surface rust and scale can be removed with a lathe equipped with dual sanding discs. The rotor surfaces can be restored by machining in a disc brake lathe if surface scoring and wear are light.

Replace the rotor under the following conditions:
- severely scored
- tapered
- hard spots
- cracked
- below minimum thickness

ROTOR MINIMUM THICKNESS

Measure rotor thickness at the center of the brake shoe contact surface. Replace the rotor if worn below minimum thickness, or if machining would reduce thickness below the allowable minimum.

Rotor minimum thickness is usually specified on the rotor hub. The specification is either stamped or cast into the hub surface.

ROTOR RUNOUT

Check rotor lateral runout with dial indicator C-3339 (Fig. 28). Excessive lateral runout will cause brake pedal pulsation and rapid, uneven wear of the brake shoes. Position the dial indicator plunger approximately 25.4 mm (1 in.) inward from the rotor edge. The dial indicator should be positioned in the center of the rotor surface. Maximum allowable rotor runout is 0.102 mm (0.004 in.).

ROTOR THICKNESS VARIATION

Variations in rotor thickness will cause pedal pulsation, noise and shudder.

Measure rotor thickness at 6 to 12 points around the rotor face (Fig. 29).

Position the micrometer approximately 25.4 mm (1 in.) from the rotor outer circumference for each measurement.

Thickness should not **vary** by more than 0.013 mm (0.0005 in.) from point-to-point on the rotor. Machine or replace the rotor if necessary.

ROTORS (Continued)

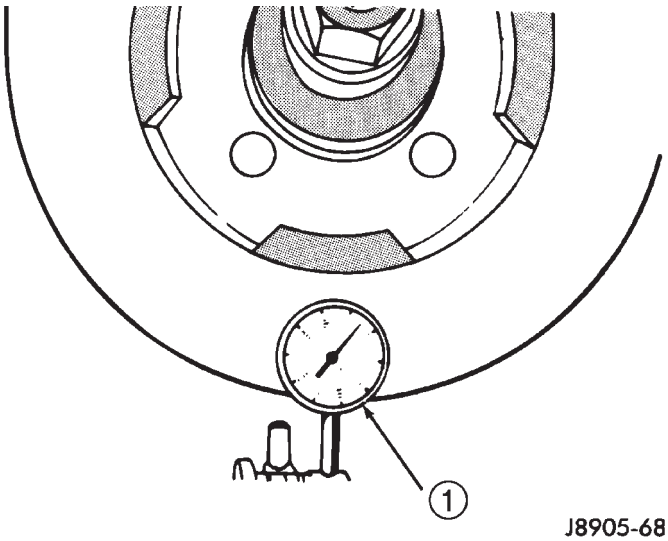


Fig. 28 Checking Rotor Runout And Thickness Variation

1 - DIAL INDICATOR

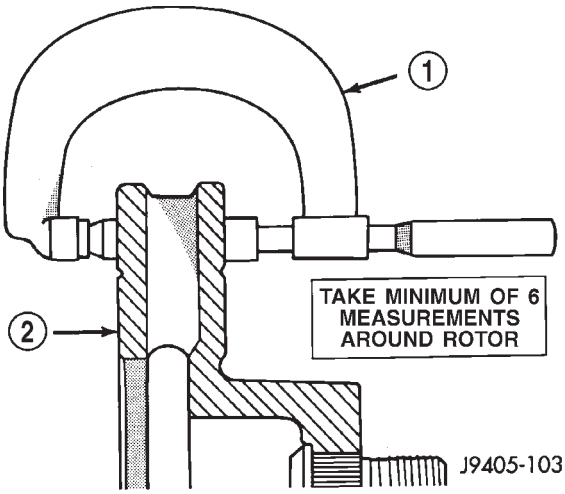


Fig. 29 Measuring Rotor Thickness

1 - MICROMETER
2 - ROTOR

STANDARD PROCEDURE - DISC BRAKE ROTOR

The disc brake rotor can be machined if scored or worn. The lathe must machine both sides of the rotor simultaneously with dual cutter heads. The rotor mounting surface must be clean before placing on the lathe. Equipment capable of machining only one side at a time may produce a tapered rotor. A hub mounted on-vehicle lathe is recommended. This type of lathe trues the rotor to the vehicles hub/bearing.

CAUTION: Brake rotors that do not meet minimum thickness specifications before or after machining must be replaced.

REMOVAL

(1) Raise and support the vehicle.
(2) Remove the tire and wheel assembly.
(3) Remove the caliper adapter (Fig. 30). (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPER ADAPTER - REMOVAL).

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

(4) Remove the disc brake rotor.

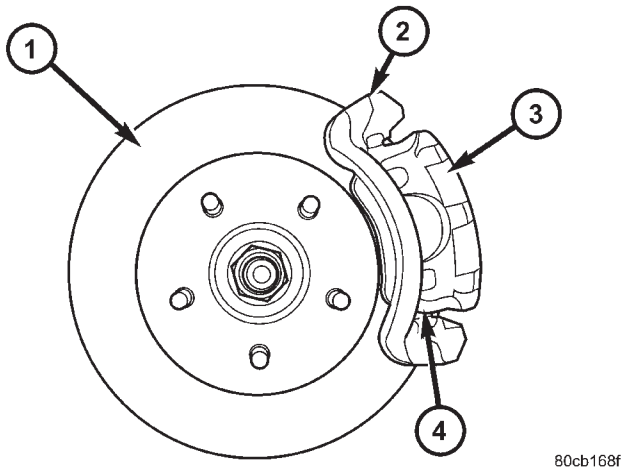


Fig. 30 DISC BRAKE ROTOR

1 - DISC BRAKE ROTOR
2 - CALIPER ADAPTER
3 - DISC BRAKE CALIPER
4 - SHOES

INSTALLATION

(1) Install the disc brake rotor to the hub.
(2) Install the caliper mounting adapter. (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPER ADAPTER - INSTALLATION).
(3) Install the tire and wheel assembly. (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

JUNCTION BLOCK

DESCRIPTION

The junction block and a rear brake proportioning valve. The valve is not repairable and must be replaced as an assembly if diagnosis indicates this is necessary.

OPERATION

PROPORTIONING VALVE

The proportioning valve is used to balance front-rear brake action at high decelerations. The valve allows normal fluid flow during moderate braking. The valve only controls fluid flow during high decelerations brake stops. If the primary brake hydraulic circuit cannot build pressure a by-pass feature is activated allowing full flow and pressure to the rear brakes.

DIAGNOSIS AND TESTING - PROPORTIONING VALVE

The valve controls fluid flow. If fluid enters the valve and does not exit the valve the combination valve must be replaced.

REMOVAL

(1) Install prop rod on the brake pedal to keep pressure on the brake system.

(2) Remove the brake lines from the junction block.

(3) Remove mounting nuts and bolt and remove the junction block (Fig. 31).

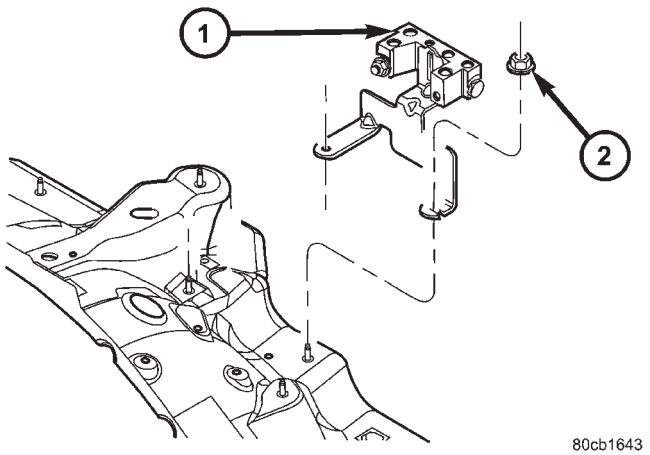


Fig. 31 JUNCTION BLOCK

1 - JUNCTION BLOCK
2 - MOUNTING NUT

INSTALLATION

(1) Install the junction block on the mounting studs.

(2) Install mounting nuts and bolt. Tighten to 14 N·m (125 in. lbs.).

(3) Install brake lines to the junction block and tighten to 20 N·m (180 in. lbs.).

(4) Bleed ABS brake system (Refer to 5 - BRAKES - STANDARD PROCEDURE).

PEDAL

DESCRIPTION

A suspended-type brake pedal is used, the pedal pivots on a shaft mounted in the steering coloumn support bracket. The bracket is attached to the dash panel. The unit is serviced as an assembly, except for the pedal pad.

OPERATION

The brake pedal is attached to the booster push rod. When the pedal is depressed, the primary booster push rod is depressed which move the booster secondary rod. The booster secondary rod depress the master cylinder piston.

REMOVAL

(1) Remove the knee blocker under the steering column,(Refer to 23 - BODY/INSTRUMENT PANEL/KNEE BLOCKER - REMOVAL).

(2) Remove the retainer clip securing the booster push rod to pedal (Fig. 32).

(3) Remove the brake lamp switch,(Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/BRAKE LAMP SWITCH - REMOVAL).

(4) Remove the nuts securing the pedal to the column bracket.

(5) Remove the pedal from the vehicle.

INSTALLATION

(1) Install the pedal into the vehicle.

(2) Install the nuts securing the pedal to the column bracket.

(3) Tighten the nuts to 22.6 N·m (200 in. lbs.).

(4) Lubricate the brake pedal pin and bushings with Mopar multi-mileage grease.

(5) Install the booster push rod on the pedal pin and install a new retainer clip (Fig. 32).

(6) Install the brake lamp switch,(Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/BRAKE LAMP SWITCH - INSTALLATION).

(7) Install the knee blocker,(Refer to 23 - BODY/INSTRUMENT PANEL/KNEE BLOCKER - INSTALLATION).

PEDAL (Continued)

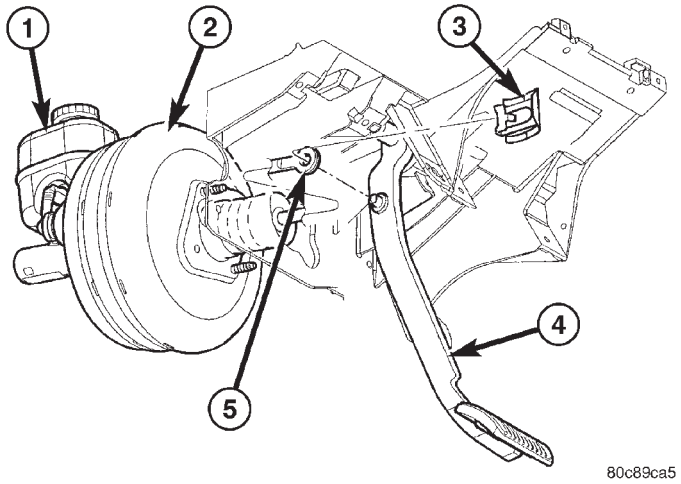


Fig. 32 BOOSTER PUSH ROD

1 - MASTER CYLINDER ASSEMBLY
2 - BRAKE BOOSTER
3 - CLIP
4 - BRAKE PEDAL
5 - BOOSTER ROD

POWER BRAKE BOOSTER

DESCRIPTION

The booster assembly consists of a housing divided into separate chambers by two internal diaphragms. The outer edge of each diaphragm is attached to the booster housing. The diaphragms are connected to the booster primary push rod.

Two push rods are used in the booster. The primary push rod connects the booster to the brake pedal. The secondary push rod connects the booster to the master cylinder to stroke the cylinder pistons.

OPERATION

The atmospheric inlet valve is opened and closed by the primary push rod. Booster vacuum supply is through a hose attached to an intake manifold fitting at one end and to the booster check valve at the other. The vacuum check valve in the booster housing is a one-way device that prevents vacuum leak back.

Power assist is generated by utilizing the pressure differential between normal atmospheric pressure and a vacuum. The vacuum needed for booster operation is taken directly from the engine intake manifold. The entry point for atmospheric pressure is through a filter and inlet valve at the rear of the housing (Fig. 33).

The chamber areas forward of the booster diaphragms are exposed to vacuum from the intake manifold. The chamber areas to the rear of the diaphragms, are exposed to normal atmospheric pressure of 101.3 kilopascals (14.7 pounds/square in.).

Brake pedal application causes the primary push rod to open the atmospheric inlet valve. This exposes the area behind the diaphragms to atmospheric pressure. The resulting pressure differential provides the extra apply force for power assist.

The booster check valve, check valve grommet and booster seals are serviceable.

DIAGNOSIS AND TESTING - MASTER CYLINDER/POWER BOOSTER

(1) Start engine and check booster vacuum hose connections. A hissing noise indicates vacuum leak. Correct any vacuum leak before proceeding.

(2) Stop engine and shift transmission into Neutral.

(3) Pump brake pedal until all vacuum reserve in booster is depleted.

(4) Press and hold brake pedal under light foot pressure. The pedal should hold firm, if the pedal falls away master cylinder is faulty (internal leakage).

(5) Start engine and note pedal action. It should fall away slightly under light foot pressure then hold firm. If no pedal action is discernible, power booster, vacuum supply, or vacuum check valve is faulty. Proceed to the POWER BOOSTER VACUUM TEST.

(6) If the POWER BOOSTER VACUUM TEST passes, rebuild booster vacuum reserve as follows: Release brake pedal. Increase engine speed to 1500 rpm, close the throttle and immediately turn off ignition to stop engine.

(7) Wait a minimum of 90 seconds and try brake action again. Booster should provide two or more vacuum assisted pedal applications. If vacuum assist is not provided, booster is faulty.

POWER BOOSTER VACUUM TEST

(1) Connect vacuum gauge to booster check valve with short length of hose and T-fitting (Fig. 34).

(2) Start and run engine at curb idle speed for one minute.

(3) Observe the vacuum supply. If vacuum supply is not adequate, repair vacuum supply.

(4) Clamp hose shut between vacuum source and check valve.

(5) Stop engine and observe vacuum gauge.

(6) If vacuum drops more than one inch Hg (33 millibars) within 15 seconds, booster diaphragm or check valve is faulty.

POWER BOOSTER CHECK VALVE TEST

(1) Disconnect vacuum hose from check valve.

(2) Remove check valve and valve seal from booster.

(3) Use a hand operated vacuum pump for test.

POWER BRAKE BOOSTER (Continued)

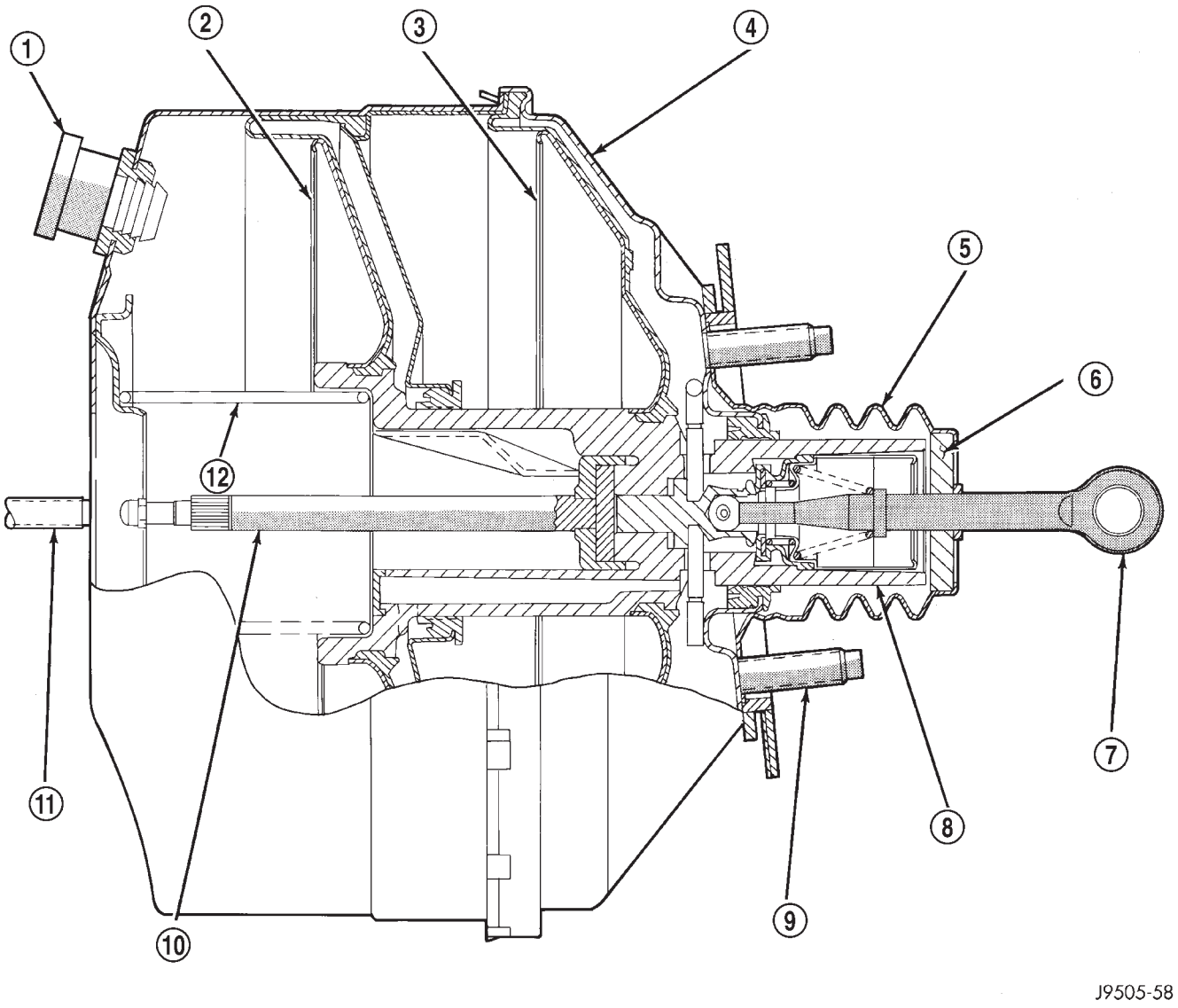


Fig. 33 Power Brake Booster–Typical

1 - VACUUM CHECK VALVE
2 - FRONT DIAPHRAGM
3 - REAR DIAPHRAGM
4 - HOUSING
5 - SEAL
6 - AIR FILTER
7 - PRIMARY PUSH ROD (TO BRAKE PEDAL)
8 - ATMOSPHERIC INLET VALVE ASSEMBLY
9 - BOOSTER MOUNTING STUDS (4)
10 - SECONDARY PUSH ROD (TO MASTER CYLINDER)
11 - MASTER CYLINDER MOUNTING STUD (2)
12 - SPRING

(4) Apply 15-20 inches vacuum at large end of check valve (Fig. 35).

(5) Vacuum should hold steady. If gauge on pump indicates vacuum loss, check valve is faulty and should be replaced.

REMOVAL

(1) Disconnect the wire to the fluid level switch at the bottom of the reservoir.

(2) Remove the master cylinder (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/MASTER CYLINDER - REMOVAL).

(3) Disconnect vacuum hose from booster check valve.

(4) Remove the brake lines from the master cylinder and the HCU (abs vehicles only) or the junction block for clearence.

(5) Disconnect the HCU from the mounts and move to the side for clearence of the booster.

POWER BRAKE BOOSTER (Continued)

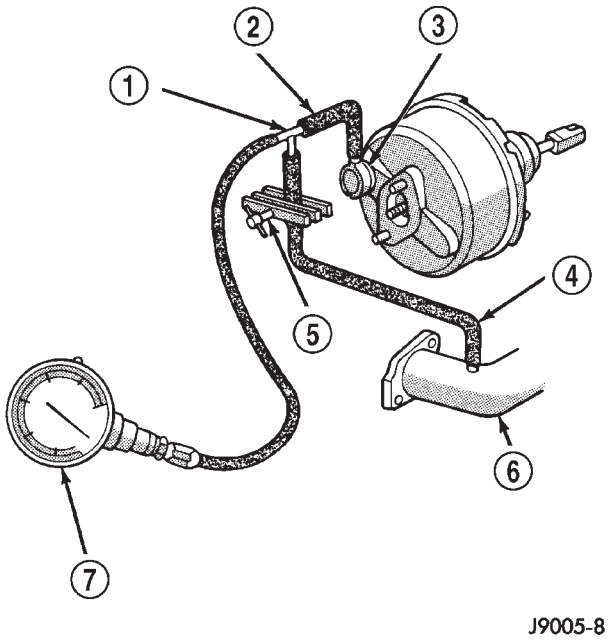


Fig. 34 Typical Booster Vacuum Test Connections

1 - TEE FITTING
2 - SHORT CONNECTING HOSE
3 - CHECK VALVE
4 - CHECK VALVE HOSE
5 - CLAMP TOOL
6 - INTAKE MANIFOLD
7 - VACUUM GAUGE

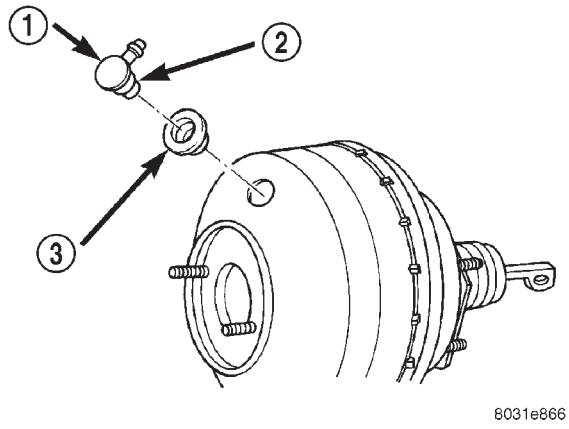


Fig. 35 TYPICAL - VACUUM CHECK VALVE AND SEAL

1 - BOOSTER CHECK VALVE
2 - APPLY TEST VACUUM HERE
3 - VALVE SEAL

(6) Remove knee blocker under the steering column,(Refer to 23 - BODY/INSTRUMENT PANEL/KNEE BLOCKER - REMOVAL).

(7) Remove retaining clip that secures booster push rod to brake pedal (Fig. 36).

(8) Remove nuts attaching booster to the dash panel (Fig. 37).

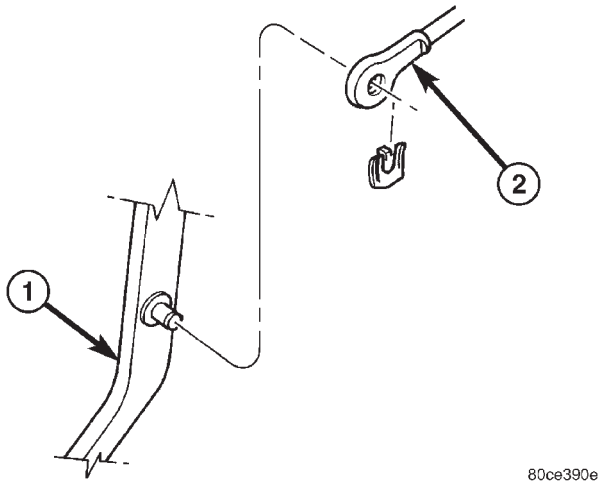


Fig. 36 BOOSTER PUSH ROD

1 - BRAKE PEDAL
2 - BOOSTER ROD

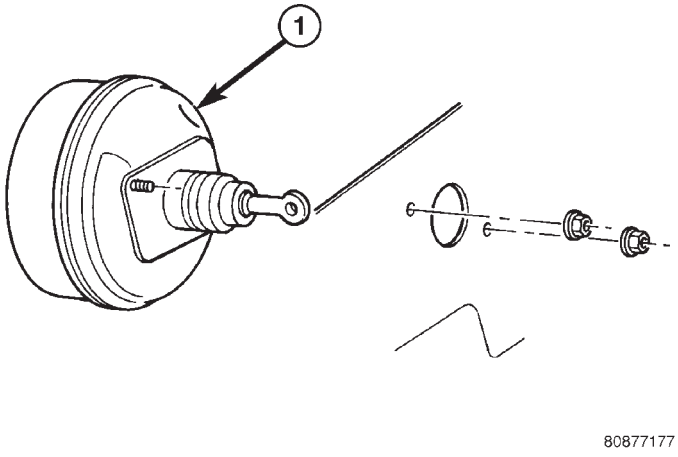


Fig. 37 BOOSTER MOUNTING

1 - BRAKE BOOSTER

(9) In engine compartment, slide booster studs out of dash panel, tilt booster upward, and remove booster from engine compartment.

INSTALLATION

(1) Align and position booster on the dash panel.

(2) Install booster mounting nuts. Tighten nuts just enough to hold booster in place.

(3) Slide booster push rod onto the brake pedal. Then secure push rod to pedal pin with retaining clip.

NOTE: Lubricate the pedal pin and bushing with Mopar multi-mileage grease before installation.

POWER BRAKE BOOSTER (Continued)

(4) Tighten booster mounting nuts to 22.6 N·m (200 ft. lbs.).

(5) Install the knee blocker,(Refer to 23 - BODY/ INSTRUMENT PANEL/KNEE BLOCKER - INSTALLATION).

(6) If original master cylinder is being installed, check condition of seal at rear of master cylinder. Replace seal if cut, or torn.

(7) Clean cylinder mounting surface of brake booster. Use shop towel wetted with brake cleaner for this purpose. Dirt, grease, or similar materials will prevent proper cylinder seating and could result in vacuum leak.

(8) Align and install master cylinder on the booster studs. Install mounting nuts and tighten to 22.6 N·m (200 in. lbs.).

(9) Connect vacuum hose to booster check valve.

(10) Remount the HCU. Tighten bracket mounting nuts to 22.6 N·m (200 in. lbs.).

(11) Connect and secure the brake lines to HCU or junction block and master cylinder. Start all brake line fittings by hand to avoid cross threading.

(12) Connect the wire to fluid level switch at the bottom of the reservoir.

(13) Fill and bleed base brake system,(Refer to 5 - BRAKES - STANDARD PROCEDURE).

(14) Verify proper brake operation before moving vehicle.

MASTER CYLINDER

DESCRIPTION

The master cylinder has a removable nylon reservoir. The cylinder body is made of aluminum and contains a primary and secondary piston assembly. The cylinder body including the piston assemblies are not serviceable. If diagnosis indicates an internal problem with the cylinder body, it must be replaced as an assembly. The reservoir and grommets are the only replaceable parts on the master cylinder.

OPERATION

The master cylinder bore contains a primary and secondary piston. The primary piston supplies hydraulic pressure to the front brakes. The secondary piston supplies hydraulic pressure to the rear brakes. The master cylinder reservoir stores reserve brake fluid for the hydraulic brake circuits.

DIAGNOSIS AND TESTING - MASTER CYLINDER/POWER BOOSTER

(1) Start engine and check booster vacuum hose connections. A hissing noise indicates vacuum leak. Correct any vacuum leak before proceeding.

(2) Stop engine and shift transmission into Neutral.

(3) Pump brake pedal until all vacuum reserve in booster is depleted.

(4) Press and hold brake pedal under light foot pressure. The pedal should hold firm, if the pedal falls away master cylinder is faulty (internal leakage).

(5) Start engine and note pedal action. It should fall away slightly under light foot pressure then hold firm. If no pedal action is discernible, power booster, vacuum supply, or vacuum check valve is faulty. Proceed to the POWER BOOSTER VACUUM TEST.

(6) If the POWER BOOSTER VACUUM TEST passes, rebuild booster vacuum reserve as follows: Release brake pedal. Increase engine speed to 1500 rpm, close the throttle and immediately turn off ignition to stop engine.

(7) Wait a minimum of 90 seconds and try brake action again. Booster should provide two or more vacuum assisted pedal applications. If vacuum assist is not provided, booster is faulty.

POWER BOOSTER VACUUM TEST

(1) Connect vacuum gauge to booster check valve with short length of hose and T-fitting (Fig. 38).

(2) Start and run engine at curb idle speed for one minute.

(3) Observe the vacuum supply. If vacuum supply is not adequate, repair vacuum supply.

(4) Clamp hose shut between vacuum source and check valve.

(5) Stop engine and observe vacuum gauge.

(6) If vacuum drops more than one inch HG (33 millibars) within 15 seconds, booster diaphragm or check valve is faulty.

POWER BOOSTER CHECK VALVE TEST

(1) Disconnect vacuum hose from check valve.

(2) Remove check valve and valve seal from booster.

(3) Use a hand operated vacuum pump for test.

(4) Apply 15-20 inches vacuum at large end of check valve (Fig. 39).

(5) Vacuum should hold steady. If gauge on pump indicates vacuum loss, check valve is faulty and should be replaced.

STANDARD PROCEDURE - MASTER CYLINDER BLEEDING

A new master cylinder should be bled before installation on the vehicle. Required bleeding tools include bleed tubes and a wood dowel to stroke the pistons. Bleed tubes can be fabricated from brake line.

(1) Mount master cylinder in vise.

MASTER CYLINDER (Continued)

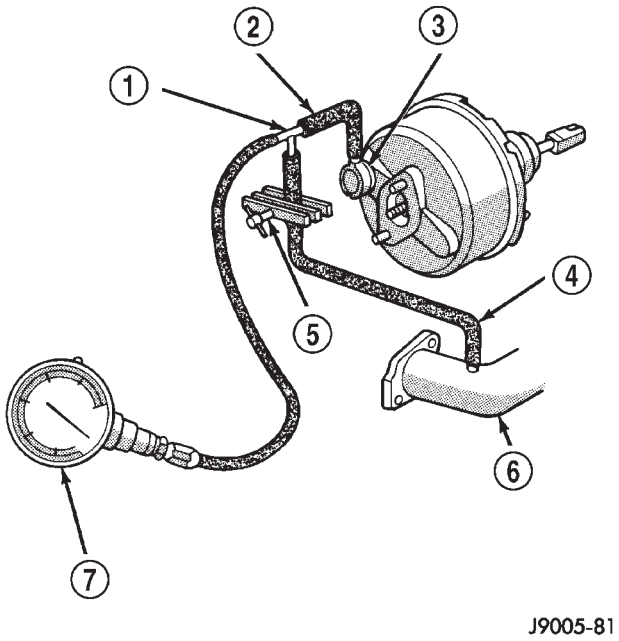


Fig. 38 Typical Booster Vacuum Test Connections

1 - TEE FITTING
2 - SHORT CONNECTING HOSE
3 - CHECK VALVE
4 - CHECK VALVE HOSE
5 - CLAMP TOOL
6 - INTAKE MANIFOLD
7 - VACUUM GAUGE

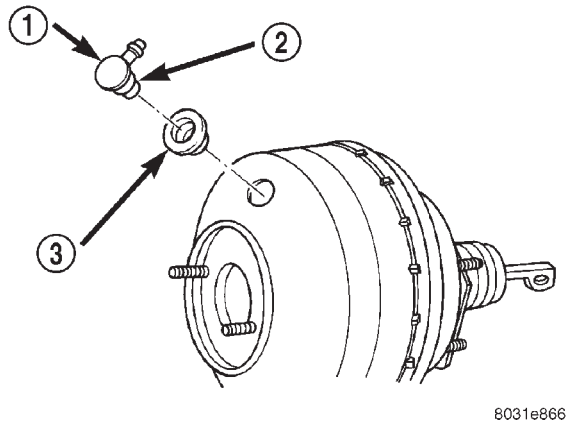


Fig. 39 TYPICAL - VACUUM CHECK VALVE AND SEAL

1 - BOOSTER CHECK VALVE
2 - APPLY TEST VACUUM HERE
3 - VALVE SEAL

(2) Attach bleed tubes to cylinder outlet ports. Then position each tube end into reservoir (Fig. 40).

(3) Fill reservoir with fresh brake fluid.

(4) Press cylinder pistons inward with wood dowel. Then release pistons and allow them to return under spring pressure. Continue bleeding operations until air bubbles are no longer visible in fluid.

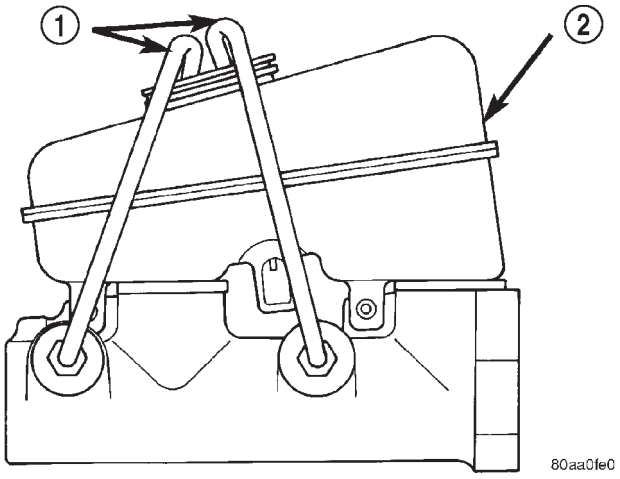


Fig. 40 MASTER - TYPICAL

1 - BLEEDING TUBES
2 - RESERVOIR

REMOVAL

(1) Siphon and drain the fluid from the reservoir.

(2) Remove the brake lines at the master cylinder.

(3) Disconnect the fluid level electrical connector from the reservoir.

(4) Remove mounting nuts from the master cylinder.

(5) Remove master cylinder.

(6) Remove cylinder cover and drain the rest of the fluid.

(7) If master cylinder reservoir requires service-,(Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ FLUID RESERVOIR - REMOVAL). (Fig. 41)

INSTALLATION

NOTE: If master cylinder is replaced, bleed cylinder before installation.

(1) Clean cylinder mounting surface of brake booster.

(2) Install master cylinder onto brake booster studs.

(3) Install mounting nuts and tighten to 25 N·m (220 in. lbs.).

(4) Connect the brake lines to the master cylinder and tighten to 20 N·m (180 in. lbs.).

(5) Connect fluid level electrical connector to the reservoir.

(6) Fill and bleed base brake system,(Refer to 5 - BRAKES - STANDARD PROCEDURE).

MASTER CYLINDER (Continued)

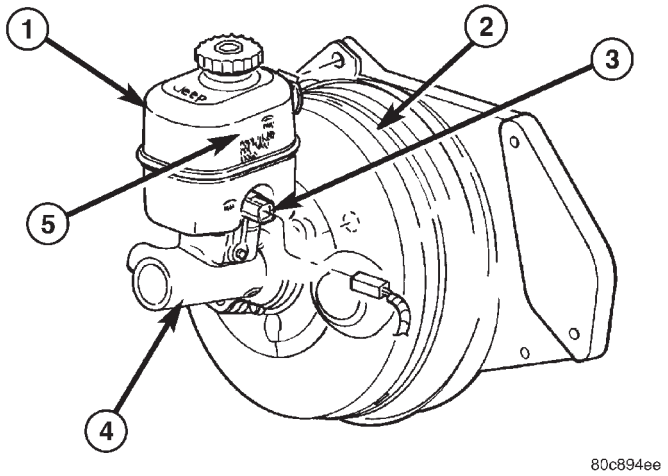


Fig. 41 MASTER CYLINDER

1 - FLUID RESERVOIR
2 - BOOSTER
3 - FLUID LEVEL SWITCH
4 - MASTER CYLINDER
5 - FLUID LEVEL MARKS

FLUID RESERVOIR

REMOVAL

(1) Install prop rod on brake pedal to keep pressure on the brake system.
(2) Remove reservoir cap and siphon fluid into drain container.
(3) Remove the electrical connector from the fluid level switch in the reservoir.
(4) Remove the reservoir mounting bolt.
(5) Remove the reservoir from the master cylinder by pulling upwards.
(6) Remove old grommets from cylinder body.

INSTALLATION

(1) Fill and bleed master cylinder on bench before installation in vehicle.

CAUTION: Do not use any type of tool to install the grommets. Tools may cut, or tear the grommets creating a leak problem after installation. Install the grommets using finger pressure only.

(2) Lubricate new grommets with clean brake fluid and Install new grommets in cylinder body. Use finger pressure to install and seat grommets.
(3) Start reservoir in grommets. Then rock reservoir back and forth while pressing downward to seat it in grommets.
(4) Install the mounting bolt for the reservoir to the master cylinder.
(5) Reconnect the electrical connector to the fluid reservoir level switch.
(6) Remove the prop rod from the vehicle.
(7) Fill and bleed base brake system,(Refer to 5 - BRAKES - STANDARD PROCEDURE).

FLUID

DIAGNOSIS AND TESTING - BRAKE FLUID CONTAMINATION

Indications of fluid contamination are swollen or deteriorated rubber parts.

Swollen rubber parts indicate the presence of petroleum in the brake fluid.

To test for contamination, put a small amount of drained brake fluid in clear glass jar. If fluid separates into layers, there is mineral oil or other fluid contamination of the brake fluid.

If brake fluid is contaminated, drain and thoroughly flush system. Replace master cylinder, proportioning valve, caliper seals, wheel cylinder seals, Antilock Brakes hydraulic unit and all hydraulic fluid hoses.

STANDARD PROCEDURES - MASTER CYLINDER FLUID LEVEL

Always clean the master cylinder reservoir and cap before adding fluid. This will prevent dirt from falling in the reservoir and contaminating the brake fluid.

The reservoir has a ADD and a FULL mark on the side (Fig. 42) fill to the FULL mark.

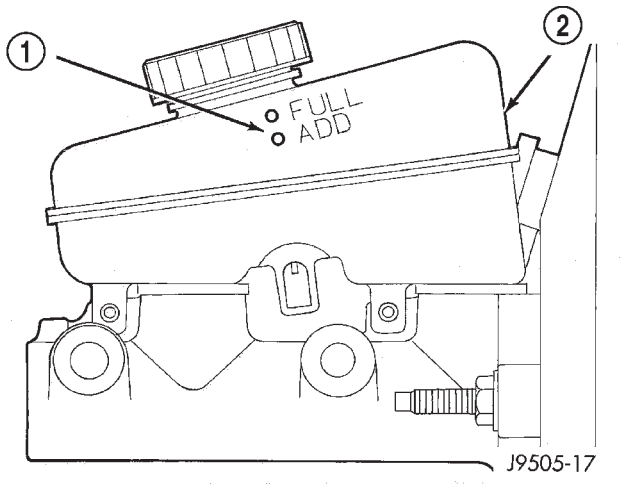


Fig. 42 TYPICAL - MASTER CYLINDER FLUID LEVEL

1 - FLUID LEVEL MARKS
2 - RESERVOIR

FLUID (Continued)

SPECIFICATIONS

BRAKE FLUID

The brake fluid used in this vehicle must conform to DOT 3 specifications and SAE J1703 standards. No other type of brake fluid is recommended or approved for usage in the vehicle brake system. Use only Mopar brake fluid or an equivalent from a tightly sealed container.

CAUTION: Never use reclaimed brake fluid or fluid from an container which has been left open. An open container will absorb moisture from the air and contaminate the fluid.

CAUTION: Never use any type of a petroleum-based fluid in the brake hydraulic system. Use of such type fluids will result in seal damage of the vehicle brake hydraulic system causing a failure of the vehicle brake system. Petroleum based fluids would be items such as engine oil, transmission fluid, power steering fluid, etc.

DRUM

DIAGNOSIS AND TESTING - BRAKE DRUM

The maximum allowable diameter of the drum braking surface is indicated on the drum outer edge. Generally, a drum can be machined to a maximum of 1.52 mm (0.060 in.) oversize. Always replace the drum if machining would cause drum diameter to exceed the size limit indicated on the drum.

BRAKE DRUM RUNOUT

Measure drum diameter and runout with an accurate gauge. The most accurate method of measurement involves mounting the drum in a brake lathe and checking variation and runout with a dial indicator.

Variations in drum diameter should not exceed 0.076 mm (0.003 in.). Drum runout should not exceed 0.20 mm (0.008 in.) out of round. Machine the drum if runout or variation exceed these values. Replace the drum if machining causes the drum to exceed the maximum allowable diameter.

STANDARD PROCEDURES - BRAKE DRUM MACHINING

The brake drums can be machined on a drum lathe when necessary. Initial machining cuts should be limited to 0.12 - 0.20 mm (0.005 - 0.008 in.) at a time as heavier feed rates can produce taper and surface variation. Final finish cuts of 0.025 to 0.038 mm (0.001 to 0.0015 in.) are recommended and will generally provide the best surface finish.

Be sure the drum is securely mounted in the lathe before machining operations. A damper strap should always be used around the drum to reduce vibration and avoid chatter marks.

The maximum allowable diameter of the drum braking surface is stamped or cast into the drum outer edge.

CAUTION: Replace the drum if machining will cause the drum to exceed the maximum allowable diameter.

SUPPORT PLATE

REMOVAL

REMOVAL - 198 RBI AXLE

(1) Remove wheel and tire assembly.
(2) Remove the brake drum.
(3) Remove the brake shoes.
(4) Remove parking brake cable from parking brake lever.
(5) Compress parking brake cable retainer tabs. Then push retainer and cable through and out of support plate.
(6) Disconnect brake line at wheel cylinder.
(7) Remove wheel cylinder from support plate,(Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/WHEEL CYLINDERS - REMOVAL).
(8) Remove the four bolts attaching the support plate to axle and remove the support plate with the axle, bearing and seal.
(9) Remove axle shaft,(Refer to 3 - DIFFERENTIAL & DRIVELINE/REAR AXLE/AXLE SHAFTS - REMOVAL).

REMOVAL - 8 1/4 AXLE

(1) Remove the wheel and tire assembly.
(2) Remove the brake drum.
(3) Install the brake pedal prop rod.
(4) Remove the brake shoes (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/BRAKE PADS/SHOES - REMOVAL).
(5) Remove parking brake cable from parking brake lever.
(6) Compress parking brake cable retainer tabs. Then push retainer and cable through and out of support plate.
(7) Disconnect the brake line at wheel cylinder.
(8) Remove the wheel cylinder from the support plate,(Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/WHEEL CYLINDERS - REMOVAL).

SUPPORT PLATE (Continued)

(9) Remove the axle shaft, (Refer to 3 - DIFFERENTIAL & DRIVELINE/REAR AXLE - 8 1/4/AXLE SHAFTS - REMOVAL).

(10) Remove the bolts attaching the support plate to the axle and remove the support plate (Fig. 43).

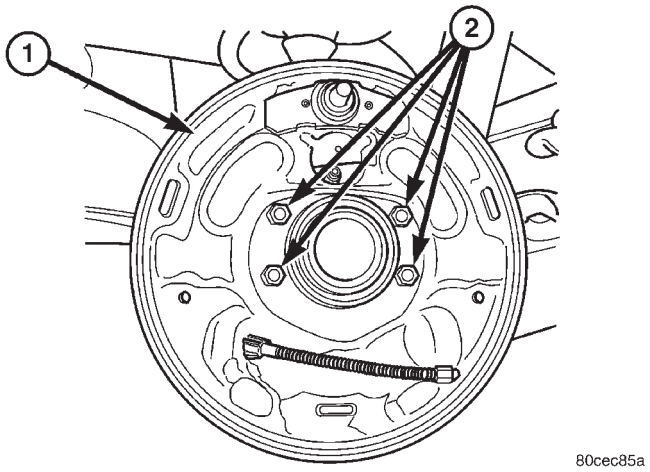


Fig. 43 SUPPORT PLATE 8 1/4

1 - SUPPORT PLATE
2 - MOUNTING NUTS

INSTALLATION

INSTALLATION - 198 RBI AXLE

(1) Install the support plate on the axle flange. Tighten 75 N·m (55 ft. lbs.)

(2) Install the axle, bearing and seal into the housing and tighten the four attaching bolts to 61 N·m (45 ft. lbs.).

(3) Install the wheel cylinder,(Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/WHEEL CYLINDERS - INSTALLATION).

(4) Install the brake line in the wheel cylinder.

(5) Install the parking brake cable in the support plate.

(6) Connect parking brake cable to lever on secondary shoe and install brake shoes on support plate.

(7) Adjust the brake shoes to the drum with the brake gauge.

(8) Install the brake drum and wheel and tire assembly (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

(9) Bleed brake system,(Refer to 5 - BRAKES - STANDARD PROCEDURE) OR (Refer to 5 - BRAKES - STANDARD PROCEDURE).

INSTALLATION - 8 1/4 AXLE

(1) Install the support plate on the axle flange. Tighten attaching bolts to 61 N·m (45 ft. lbs.) (Fig. 43).

(2) Install the wheel cylinder,(Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/WHEEL CYLINDERS - INSTALLATION).

(3) Install the brake line in the wheel cylinder and tighten the line to 14 N·m (124 in.lbs.)..

(4) Remove the brake pedal prop rod.

(5) Install the parking brake cable in the support plate.

(6) Install the axle shaft, (Refer to 3 - DIFFERENTIAL & DRIVELINE/REAR AXLE - 8 1/4/AXLE SHAFTS - INSTALLATION).

(7) Connect the parking brake cable to the lever on the primary shoe and install the brake shoes on the support plate (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/BRAKE PADS/SHOES - INSTALLATION).

(8) Adjust the brake shoes to the drum with the brake gauge (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/BRAKE PADS/SHOES - ADJUSTMENTS).

(9) Install the brake drum.

(10) Install the wheel and tire assembly (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

(11) Bleed the brake system,(Refer to 5 - BRAKES - STANDARD PROCEDURE).

WHEEL CYLINDERS

REMOVAL

(1) Remove wheel and tire assembly.

(2) Remove brake drum.

(3) Install brake pedal prop rod.

(4) Disconnect wheel cylinder brake line.

(5) Remove brake shoe return springs and move shoes out of engagement with cylinder push rods.

(6) Remove cylinder attaching bolts and remove cylinder from support plate (Fig. 44).

DISASSEMBLY

(1) Remove push rods and boots (Fig. 45).

(2) Press pistons, cups and spring and expander out of cylinder bore.

(3) Remove bleed screw.

CLEANING

Clean the cylinder and pistons with clean brake fluid or brake cleaner only. Do not use any other cleaning agents.

Dry the cylinder and pistons with compressed air. Do not use rags or shop towels to dry the cylinder components. Lint from cloth material will adhere to the cylinder bores and pistons.

WHEEL CYLINDERS (Continued)

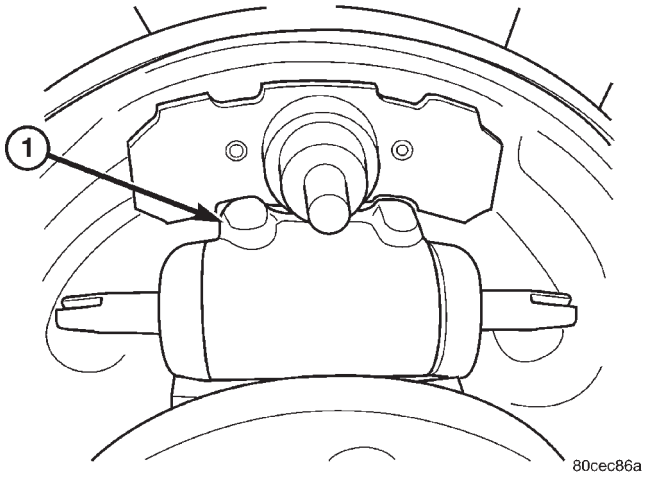


Fig. 44 WHEEL CYLINDER

1 - WHEEL CYLINDER
2 - SUPPORT PLATE

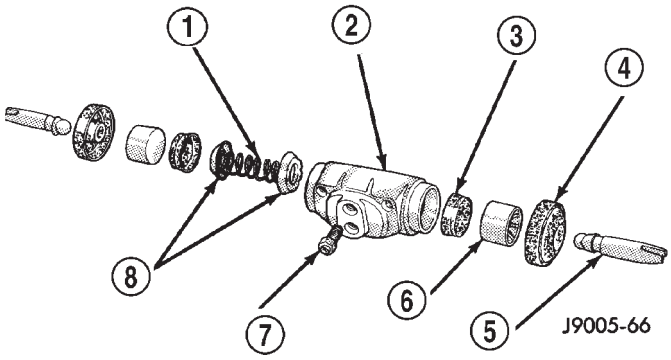


Fig. 45 Wheel Cylinder Components–Typical

1 - SPRING
2 - CYLINDER
3 - PISTON CLIP
4 - BOOT
5 - PUSH ROD
6 - PISTON
7 - BLEED SCREW
8 - CUP EXPANDERS

INSPECTION

Inspect the cylinder bore. Light discoloration and dark stains in the bore are normal and will not impair cylinder operation.

The cylinder bore can be lightly polished but only with crocus cloth. Replace the cylinder if the bore is scored, pitted or heavily corroded. Honing the bore to restore the surface is not recommended.

Inspect the cylinder pistons. The piston surfaces should be smooth and free of scratches, scoring and corrosion. Replace the pistons if worn, scored, or corroded. Do not attempt to restore the surface by sanding or polishing.

Discard the old piston cups and the spring and expander. These parts are not reusable. The original dust boots may be reused but only if they are in good condition.

ASSEMBLY

(1) Lubricate wheel cylinder bore, pistons, piston cups and spring and expander with clean brake fluid.

(2) Install first piston in cylinder bore. Then install first cup in bore and against piston. **Be sure lip of piston cup is facing inward (toward spring and expander) and flat side is against piston.**

(3) Install spring and expander followed by remaining piston cup and piston.

(4) Install boots on each end of cylinder and insert push rods in boots.

(5) Install cylinder bleed screw.

INSTALLATION

(1) Install cylinder mounting bolts and tighten to 20 N·m (15 ft. lbs.) (Fig. 44).

(2) Connect brake line to cylinder and tighten to 14 N·m (124 in. lbs.).

(3) Install the brake shoe return springs.

(4) Remove the brake pedal prop rod.

(5) Install the brake drum.

(6) Install the wheel and tire assembly (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

(7) Bleed base brake system (Refer to 5 - BRAKES - STANDARD PROCEDURE).

PARKING BRAKE

DESCRIPTION

The parking brake is a hand lever and cable operated system used to apply the rear brakes.

OPERATION

A hand operated lever in the passenger compartment is the main application device. The front cable is connected between the hand lever and the rear cables with an equalizer.

The rear cables are connected to the actuating lever on each primary brake shoe. The levers are attached to the brake shoes by a pin either pressed into, or welded to the lever. A clip is used to secure the pin in the brake shoe. The pin allows each lever to pivot independently of the brake shoe.

To apply the parking brakes, the hand lever is pulled upward. This pulls the rear brake shoe actuating levers forward, by means tensioner and cables. As the actuating lever is pulled forward, the parking brake strut (which is connected to both shoes), exerts

PARKING BRAKE (Continued)

a linear force against the secondary brake shoe. This action presses the secondary shoe into contact with the drum. Once the secondary shoe contacts the drum, force is exerted through the strut. This force is transferred through the strut to the primary brake shoe causing it to pivot into the drum as well.

A gear type ratcheting mechanism is used to hold the lever in an applied position. Parking brake release is accomplished by the hand lever release button.

A parking brake switch is mounted on the parking brake lever and is actuated by movement of the lever. The switch, which is in circuit with the red warning light in the dash, will illuminate the warning light whenever the parking brakes are applied.

Parking brake is self-adjusting when the lever is pulled. The cable tensioner, once adjusted at the factory, should not need further adjustment under normal circumstances.

ADJUSTMENTS

ADJUSTMENT - LOCK OUT

NOTE: The parking brake is self-adjusting, It can not be adjusted.

(1) Remove the center floor console (Refer to 23 - BODY/INTERIOR/FLOOR CONSOLE - REMOVAL).

(2) Pull up on the spring until the tab on the lever passes the tab on the cable guide and install a punch in the hole on the side then release (Fig. 46).

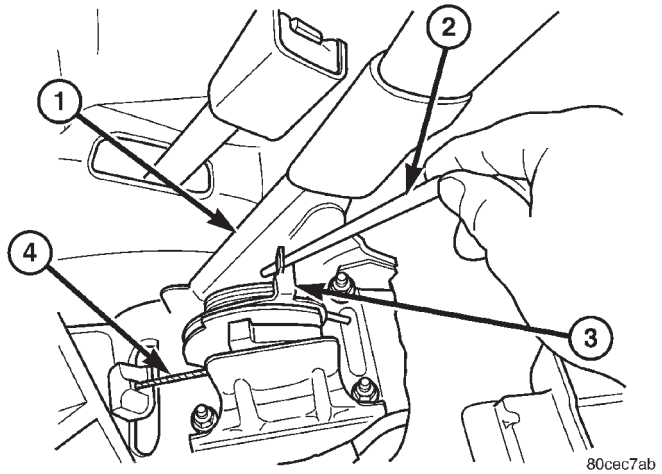


Fig. 46 LOCK OUT CABLES

1 - PARKING BRAKE HANDLE
2 - PUNCH
3 - CABLE GUIDE
4 - CABLE

(3) The park brake system is now locked out to perform necessary repairs.

CABLES

REMOVAL

(1) Lock out the parking brake cables (Refer to 5 - BRAKES/PARKING BRAKE - ADJUSTMENTS) (Fig. 46).

(2) Remove the rear seat (Refer to 23 - BODY/SEATS/SEAT - REMOVAL).

(3) Remove the cable saddle bracket (Fig. 47).

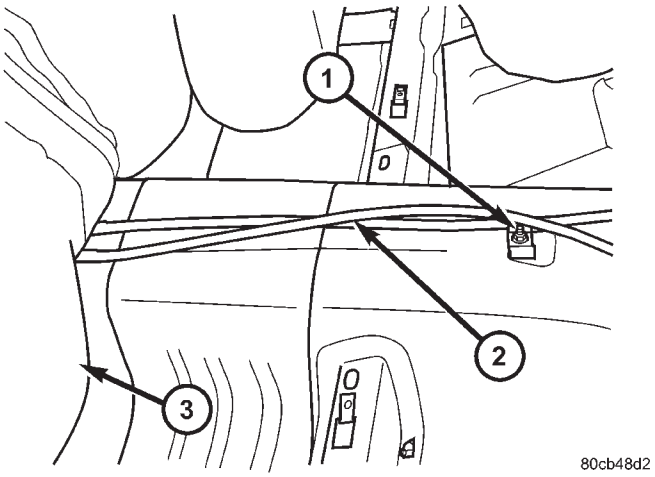


Fig. 47 MOUNTING BRACKETS

1 - MOUNTING SADDLE BRACKET
2 - PARK BRAKE CABLES
3 - CARPET

(4) Disconnect the two cables from the front mount (Fig. 48).

(5) Pull the carpet forward far enough in the rear to gain access to the two parking brake cables thru the floor (Fig. 47).

(6) Push the cables thru the floor with the grommets.

(7) Remove the primary brake shoe hold down spring and separate the shoes to gain access, Then disconnect the cable from lever on brake shoe.

(8) Remove cables from backing plates by using a screw driver to break off the tangs on the cable or a proper sized box end wrench over the tangs.

INSTALLATION

(1) Install the cables into the support plate.

(2) Reconnect the cable to the lever on the brake shoe, Install the primary brake shoe hold down spring and the shoes.

CABLES (Continued)

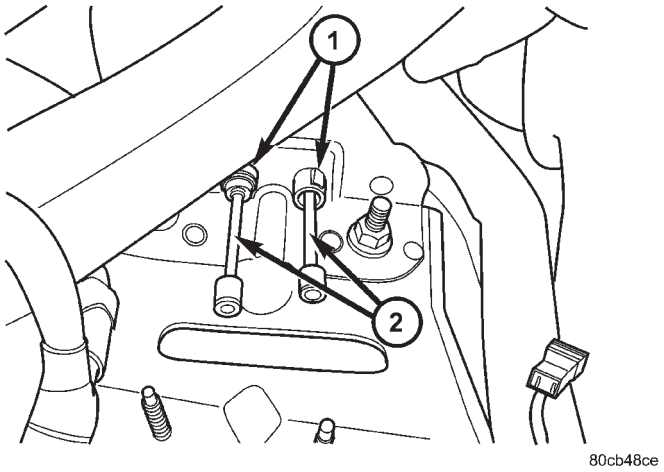


Fig. 48 CABLE FRONT MOUNT

1 - RETAINER CLIPS
2 - CABLES

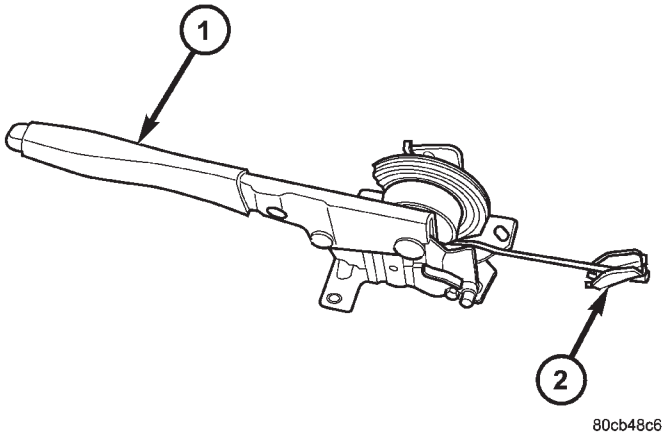


Fig. 49 PARKING BRAKE LEVER

1 - PARK BRAKE LEVER ASSEMBLY
2 - EQUALIZER

(3) Push the cables thru the floor and seat the grommets.
(4) Reconnect the two cables to the front mount.
(5) Install the cable saddle bracket (Fig. 47).
(6) Lay the carpet back down in the rear.
(7) Install the rear seat (Refer to 23 - BODY/SEATS/SEAT - INSTALLATION).
(8) Remove the lock out device on the lever.
(9) Test the parking brake.

LEVER

REMOVAL

The center floor console must be removed to service the parking brake lever,(Refer to 23 - BODY/INTERIOR/FLOOR CONSOLE - REMOVAL) .

(1) Lock out the parking brakes (Refer to 5 - BRAKES/PARKING BRAKE - ADJUSTMENTS).
(2) Disengage the front cables from the equalizer (Fig. 49).
(3) Disconnect the parking brake lamp switch wire (Fig. 49).
(4) Remove the parking brake lever assembly mounting bolts (Fig. 50).
(5) Remove the lever assembly.

INSTALLATION

(1) Install the parking brake lever assembly.
(2) Install the parking brake lever assembly to the mounting bolts. Tighten (Fig. 50).

Install the center floor console, (Refer to 23 - BODY/INTERIOR/FLOOR CONSOLE - INSTALLATION).

(3) Engage the front cables to the equalizer (Fig. 49).
(4) Reconnect the parking brake lamp switch wire (Fig. 49).
(5) If installing a new parking brake lever remove the pin that come on the lever when shipped.
(6) If you are reinstalling the original park brake lever remove the lock out device at this time.
(7) Test the parking brake lever. (Fig. 50).

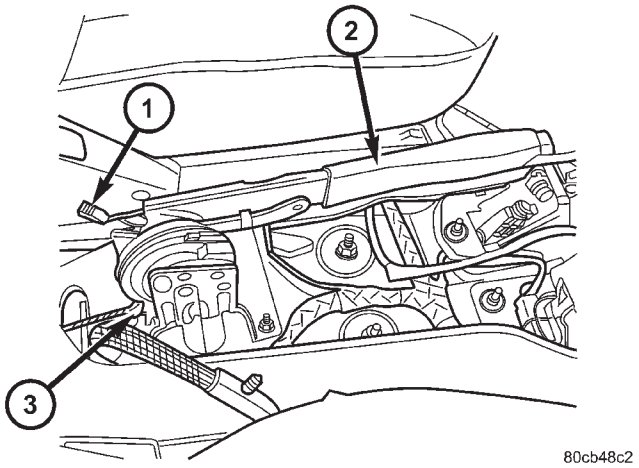


Fig. 50 LEVER MOUNT

1 - ELECTRICAL CONNECTOR
2 - PARK BRAKE LEVER ASSEMBLY
3 - CABLE

BRAKES - ABS

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BRAKES - ABS

DESCRIPTION

ANTILOCK BRAKING SYSTEM

The purpose of the antilock system is to prevent wheel lockup during periods of high wheel slip. Preventing lockup helps maintain vehicle braking action and steering control.

The antilock CAB activates the system whenever sensor signals indicate periods of high wheel slip. High wheel slip can be described as the point where wheel rotation begins approaching 20 to 30 percent of actual vehicle speed during braking. Periods of high wheel slip occur when brake stops involve high pedal pressure and rate of vehicle deceleration.

Battery voltage is supplied to the CAB ignition terminal when the ignition switch is turned to Run position. The CAB performs a system initialization procedure at this point. Initialization consists of a static and dynamic self check of system electrical components.

The static check occurs after the ignition switch is turned to Run position. The dynamic check occurs when vehicle road speed reaches approximately 30 kph (18 mph). During the dynamic check, the CAB briefly cycles the pump and solenoids to verify operation.

If an ABS component exhibits a fault during initialization, the CAB illuminates the amber warning light and registers a fault code in the microprocessor memory.

ELECTRONIC BRAKE DISTRIBUTION

The electronic brake distribution (EBD) functions like a rear proportioning valve. The EBD system uses the ABS system to control the slip of the rear wheels in partial braking range. The braking force of the rear wheels is controlled electronically by using the inlet and outlet valves located in the HCU.

OPERATION

ANTILOCK BRAKING SYSTEM

During normal braking, the master cylinder, power booster and wheel brake units all function as they would in a vehicle without ABS. The HCU components are not activated.

During antilock braking fluid pressure is modulated according to wheel speed, degree of slip and rate of deceleration. A sensor at each wheel converts wheel speed into electrical signals. These signals are transmitted to the CAB for processing and determination of wheel slip and deceleration rate.

The ABS system has three fluid pressure control channels. The front brakes are controlled separately and the rear brakes in tandem. A speed sensor input signal indicating a high slip condition activates the CAB antilock program. Two solenoid valves are used in each antilock control channel. The valves are all located within the HCU valve body and work in pairs to either increase, hold, or decrease apply pressure as needed in the individual control channels. The solenoid valves are not static during antilock braking. They are cycled continuously to modulate pressure. Solenoid cycle time in antilock mode can be measured in milliseconds.

ELECTRONIC BRAKE DISTRIBUTION

Upon entry into EBD the inlet valve for the rear brake circuit is switched on so that the fluid supply from the master cylinder is shut off. In order to decrease the rear brake pressure the outlet valve for

the rear brake circuit is pulsed. This allows fluid to enter the low pressure accumulator (LPA) in the HCU resulting in a drop in fluid pressure to the rear brakes. In order to increase the rear brake pressure the outlet valve is switched off and the inlet valve is pulsed. This increases the pressure to the rear brakes. This will continue until the required slip difference is obtained. At the end of EBD braking (no brake application) the fluid in the LPA drains back to the master cylinder by switching on the outlet valve and draining through the inlet valve check valve. At the same time the inlet valve is switched on to prevent a hydraulic short circiut in case of another brake application.The EBD will remain functional during many ABS fault modes. If the red and amber warning lamps are illuminated the EBD may have a fault.

DIAGNOSIS AND TESTING - ANTILOCK BRAKING SYSTEM

The ABS brake system performs several self-tests every time the ignition switch is turned on and the vehicle is driven. The CAB monitors the systems input and output circuits to verify the system is operating correctly. If the on board diagnostic system senses that a circuit is malfunctioning the system will set a trouble code in its memory.

NOTE: An audible noise may be heard during the self-test. This noise should be considered normal.

NOTE: The MDS or DRB III scan tool is used to diagnose the ABS system. For additional information refer to the Electrical, Electronic Control Modules section. For test procedures refer to the Chassis Diagnostic Manual.

STANDARD PROCEDURE - ABS BRAKE BLEEDING

ABS system bleeding requires conventional bleeding methods plus use of the DRB scan tool. The procedure involves performing a base brake bleeding, followed by use of the scan tool to cycle and bleed the HCU pump and solenoids. A second base brake bleeding procedure is then required to remove any air remaining in the system.

(1) Perform base brake bleeding,(Refer to 5 - BRAKES - STANDARD PROCEDURE) OR (Refer to 5 - BRAKES - STANDARD PROCEDURE).

(2) Connect scan tool to the Data Link Connector.

(3) Select ANTILOCK BRAKES, followed by MISCELLANEOUS, then ABS BRAKES. Follow the instructions displayed. When scan tool displays TEST COMPLETE, disconnect scan tool and proceed.

(4) Perform base brake bleeding a second time,(Refer to 5 - BRAKES - STANDARD PROCEDURE) OR (Refer to 5 - BRAKES - STANDARD PROCEDURE).

(5) Top off master cylinder fluid level and verify proper brake operation before moving vehicle.

SPECIFICATIONS

TORQUE SPECIFICATIONS

DESCRIPTION	N·m	Ft. Lbs.	In. Lbs.
Hydraulic Control Unit/Controller Antilock Brakes Mounting Nuts	14.1	—	125
Hydraulic Control Unit/Controller Antilock Brakes Brake Lines	20.3	—	180
Controller Antilock Brakes Mounting Screws	1.8	—	16
Wheel Speed Sensors Front Mounting Bolt	12	—	132
Wheel Speed Sensor Rear Mounting Bolt	9	—	80

ELECTRICAL

DESCRIPTION

Three wheel speed sensors are used. The front sensors are mounted to the steering knuckles. The rear sensor is mounted at the top of the rear axle differential carrier. Tone wheels are mounted to the outboard ends of the front axle shafts. The gear type tone wheel serves as the trigger mechanism for each sensor.

OPERATION

The sensors convert wheel speed into a small digital signal. The CAB sends 12 volts to the sensors. The sensor has an internal magneto resistance bridge that alters the voltage and amperage of the signal circuit. This voltage and amperage is changed by magnetic induction when the toothed tone wheel passes the wheel speed sensor. This digital signal is sent to the CAB. The CAB measures the voltage and amperage of the digital signal for each wheel.

FRONT WHEEL SPEED SENSOR

REMOVAL

(1) Disconnect the front wheel speed sensor wire connector that is located on the inboard side of the respective wheel house.

(2) Raise and support the vehicle.

(3) Remove the tire and wheel assembly.

(4) Remove the caliper adapter. (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPER ADAPTER - REMOVAL).

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose with result. Provide a suitable support to hang the caliper securely.

(5) Remove the disc brake rotor. (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - REMOVAL).

(6) Remove the wheel speed sensor mounting bolt to the hub (Fig. 1).

(7) Remove the wheel speed sensor wire from the hub/bearing (Fig. 1).

(8) Remove the wheel speed sensor wire hold down from the knuckle (Fig. 1).

(9) Remove the wheel speed sensor wire thru the wheel well.

(10) Remove the wheel speed sensor from the vehicle.

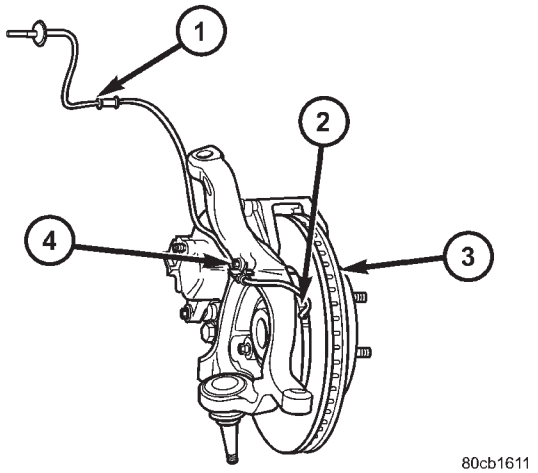

Fig. 1 FRONT WHEEL SPEED SENSOR

1 - WHEEL SPEED SENSOR WIRE
2 - WHEEL SPEED SENSOR
3 - ROTOR
4 - WHEEL SPEED SENSOR WIRE HOLD DOWN

INSTALLATION

(1) Install the wheel speed sensor to the vehicle.

(2) Install the wheel speed sensor wire thru the wheel well.

(3) Install the wheel speed sensor wire to the hub/bearing.

(4) Install the wheel speed sensor wire hold down to the knuckle.

(5) Install the wheel speed sensor mounting bolt to the hub. Tighten the mounting bolt to 14 N·m (10 ft.lbs.).

(6) Install the disc brake rotor (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/ROTORS - INSTALLATION).

(7) Install the disc brake caliper adapter. (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/DISC BRAKE CALIPER ADAPTER - INSTALLATION).

(8) Install the tire and wheel assembly (Refer to 22 - TIRES/WHEELS/WHEELS - STANDARD PROCEDURE).

(9) Reconnect the front wheel speed sensor wire connector to the inboard side of the wheel house being worked on.

REAR WHEEL SPEED SENSOR

REMOVAL

(1) Raise vehicle on hoist.
(2) Disconnect the sensor wire harness.
(3) Remove mounting stud from the sensor (Fig. 2).

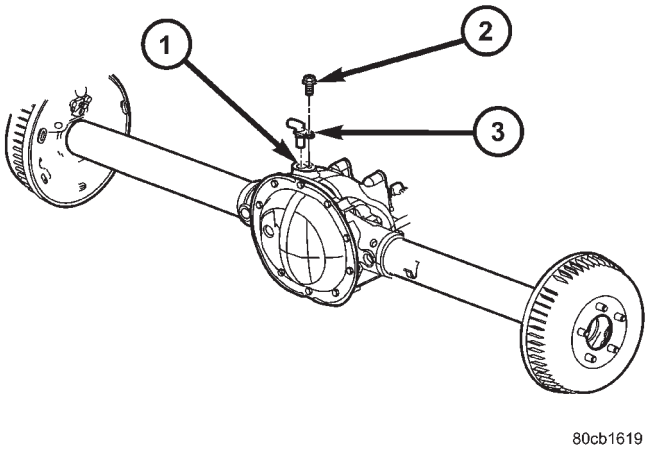

Fig. 2 REAR WHEEL SPEED SENSOR

1 - DIFFERENTIAL HOUSING
2 - MOUNTING BOLT
3 - WHEEL SPEED SENSOR

(4) Remove sensor.

INSTALLATION

(1) Connect harness to sensor. **Be sure seal is securely in place between sensor and wiring connector.**
(2) Install O-ring on sensor (if removed).
(3) Insert sensor in differential housing.
(4) Install the sensor mounting stud and tighten to 9 N·m (80 in. lbs.).
(5) Install the sensor electical connector.
(6) Lower vehicle.

HCU (HYDRAULIC CONTROL UNIT)

DESCRIPTION

The HCU consists of a valve body, pump motor, and wire harness.

OPERATION

Accumulators in the valve body store extra fluid released to the system for ABS mode operation. The pump provides the fluid volume needed and is operated by a DC type motor. The motor is controlled by the CAB.

The valves modulate brake pressure during antilock braking and are controlled by the CAB.

The HCU provides three channel pressure control to the front and rear brakes. One channel controls the rear wheel brakes in tandem. The two remaining channels control the front wheel brakes individually.

During antilock braking, the solenoid valves are opened and closed as needed. The valves are not static. They are cycled rapidly and continuously to modulate pressure and control wheel slip and deceleration.

During normal braking, the HCU solenoid valves and pump are not activated. The master cylinder and power booster operate the same as a vehicle without an ABS brake system.

During antilock braking, solenoid valve pressure modulation occurs in three stages, pressure increase, pressure hold, and pressure decrease. The valves are all contained in the valve body portion of the HCU.

PRESSURE DECREASE

The outlet valve is opened and the inlet valve is closed during the pressure decrease cycle.

A pressure decrease cycle is initiated when speed sensor signals indicate high wheel slip at one or more wheels. At this point, the CAB closes the inlet then opens the outlet valve, which also opens the return circuit to the accumulators. Fluid pressure is allowed to bleed off (decrease) as needed to prevent wheel lock.

Once the period of high wheel slip has ended, the CAB closes the outlet valve and begins a pressure increase or hold cycle as needed.

PRESSURE HOLD

Both solenoid valves are closed in the pressure hold cycle. Fluid apply pressure in the control channel is maintained at a constant rate. The CAB maintains the hold cycle until sensor inputs indicate a pressure change is necessary.

PRESSURE INCREASE

The inlet valve is open and the outlet valve is closed during the pressure increase cycle. The pressure increase cycle is used to counteract unequal wheel speeds. This cycle controls re-application of fluid apply pressure due to changing road surfaces or wheel speed.

HCU (HYDRAULIC CONTROL UNIT) (Continued)

REMOVAL

(1) Install prop rod on the brake pedal to keep pressure on the brake system.

(2) Remove negative battery cable from the battery.

(3) Pull up on the CAB harness connector release (Fig. 3)and remove connector.

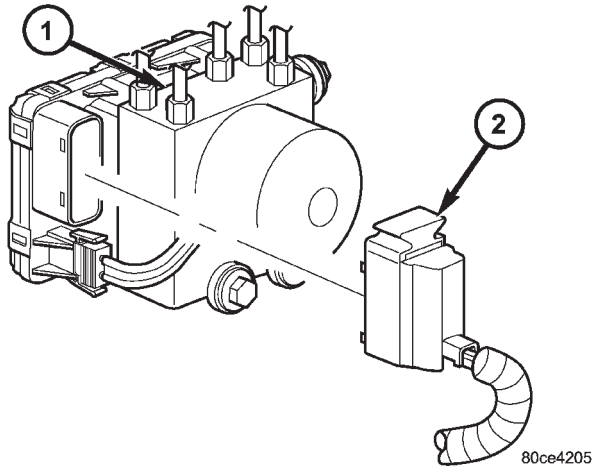

Fig. 3 CAB HARNESS CONNECTOR RELEASE

1 - ABS MODULE
2 - ELECTRICAL CONNECTOR

(4) Remove brake lines from the HCU.

(5) Remove HCU/CAB mounting nuts and bolt (Fig. 4) and remove HCU/CAB.

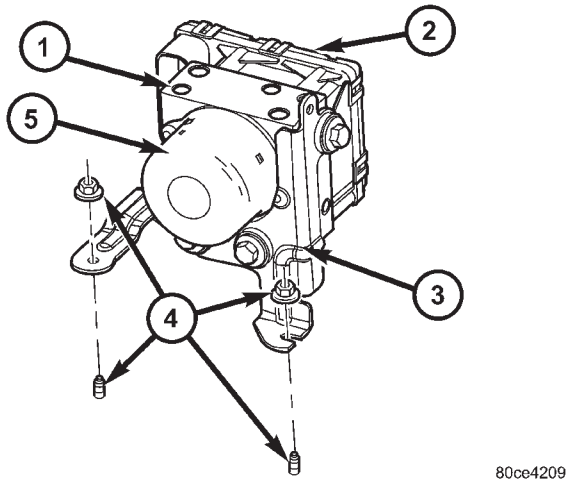

Fig. 4 HCU/CAB MOUNTING

1 - HCU
2 - CAB
3 - HCU/CAB BRACKET
4 - MOUNTING NUTS AND STUDS
5 - MOTOR

INSTALLATION

(1) Install HCU/CAB on the mounting studs.

(2) Install mounting nuts and bolt. Tighten to 11.5 N·m (102 in. lbs.).

(3) Install brake lines to the HCU and tighten to 19 N·m (170 in. lbs.).

(4) Install wiring harness connector to the CAB and push down on the release to secure the connector.

(5) Install negative battery cable to the battery.

(6) Bleed ABS brake system (Refer to 5 - BRAKES - STANDARD PROCEDURE).

BRAKES

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POWER BRAKE BOOSTER

REMOVAL - RHD

(1) Remove the air box (Refer to 9 - ENGINE/AIR INTAKE SYSTEM/AIR CLEANER ELEMENT - REMOVAL).

(2) Relocate the cruise control servo to gain access to the booster for removal.

(3) Remove the brake lines from the master cylinder.

(4) Remove the master cylinder (Refer to 5 - BRAKES/HYDRAULIC/MECHANICAL/MASTER CYLINDER - REMOVAL).

(5) Disconnect vacuum hose from booster check valve.

(6) Remove knee blocker under the steering column,(Refer to 23 - BODY/INSTRUMENT PANEL/KNEE BLOCKER - REMOVAL).

(7) Remove the brake light switch.(Refer to 8 - ELECTRICAL/LAMPS/LIGHTING - EXTERIOR/ BRAKE LAMP SWITCH - REMOVAL)

(8) Remove retaining clip that secures booster push rod to brake pedal (Fig. 1).

(9) Remove nuts attaching booster to the dash panel (Fig. 2).

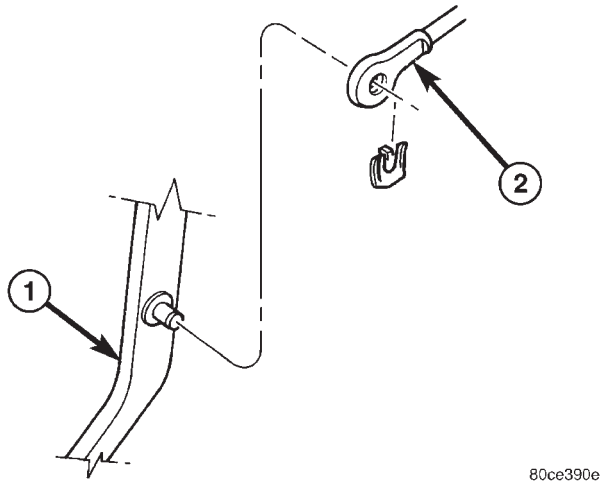

Fig. 1 BOOSTER PUSH ROD

1 - BRAKE PEDAL
2 - BOOSTER ROD

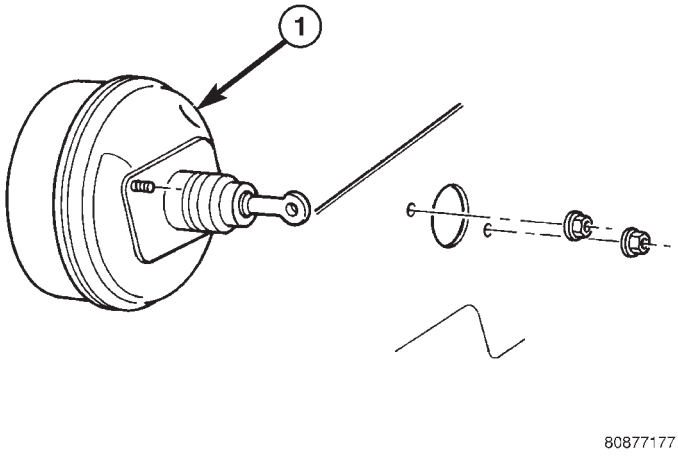

Fig. 2 BOOSTER MOUNTING

1 - BRAKE BOOSTER

(10) In engine compartment, slide booster studs out of dash panel, tilt booster upward, and remove booster from engine compartment.

INSTALLATION - RHD

(1) Align and position booster on the dash panel.

(2) Install booster mounting nuts. Tighten nuts just enough to hold booster in place.

(3) Slide booster push rod onto the brake pedal. Then secure push rod to pedal pin with retaining clip.

NOTE: Lubricate the pedal pin with Mopar multi-mileage grease before installation.

(4) Tighten booster mounting nuts to 39 N·m (29 ft. lbs.).

(5) Install the brake light switch.

(6) Install the knee blocker,(Refer to 23 - BODY/ INSTRUMENT PANEL/KNEE BLOCKER - INSTALLATION).

(7) If original master cylinder is being installed, check condition of seal at rear of master cylinder. Replace seal if cut, or torn.

(8) Clean cylinder mounting surface of brake booster. Use shop towel wetted with brake cleaner for

POWER BRAKE BOOSTER (Continued)

this purpose. Dirt, grease, or similar materials will prevent proper cylinder seating and could result in vacuum leak.

(9) Align and install master cylinder on the booster studs. Install mounting nuts and tighten to 17.5 N·m (155 in. lbs.).

(10) Connect vacuum hose to booster check valve.

(11) Remount the cruise control servo to the original location. Tighten bracket mounting nuts to 17.5 N·m (155 in. lbs.).

(12) Connect and secure the brake lines to HCU and master cylinder. Start all brake line fittings by hand to avoid cross threading.

(13) Connect the wire to fluid reservoir.

(14) Install the air box.

(15) Fill and bleed base brake system,(Refer to 5 - BRAKES - STANDARD PROCEDURE).

(16) Verify proper brake operation before moving vehicle.