

SPECIFICATIONS

Type:

Front	Disc
Rear	Drum

Operation:

Footbrake	Hydraulic
Handbrake	Mechanical on front wheels

Master cylinder, 1979–1984 and Utility models:

Type	Dual circuit
Bore diameter	20.64 mm

Master cylinder, 1985–1987 Sedan and Station Wagon models:

Type	Dual circuit with fast fill mechanism
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Bore diameter —

Front	20.64 mm
Rear	25.4 mm

Front disc brakes, 1979–1984 and Utility models:

Disc thickness, nominal	12.5 mm
Disc thickness, minimum	10.00 mm
Maximum disc run out	0.10 mm
Minimum pad and backing plate thickness	7.5 mm

Front disc brakes, 1985–1987 Sedan and Station Wagon models:

Disc thickness, nominal	18.0 mm
Disc thickness, minimum	16.0 mm
Maximum disc run out	0.10 mm
Minimum pad and backing plate thickness	7.5 mm

Rear drum brakes:

Drum diameter, nominal	180.0 mm
Drum diameter, maximum	182.0 mm
Minimum lining thickness	1.5 mm

TORQUE WRENCH SETTINGS

Front caliper lock pin:

1979–1984 and Utility models—	
Lock pin to caliper body	74 Nm
Lock pin to anchor plate	24 Nm
1985–1987 Sedan and Station Wagon models	
	41 Nm

Front caliper guide pin:

1985–1987 Sedan and Station Wagon models	
	54 Nm

Front caliper anchor bolt

	69 Nm
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Bleeder valve

	9 Nm
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Disc to hub bolt

	58 Nm
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1. BRAKES TROUBLE SHOOTING

BRAKE PEDAL HARD

(1) Vacuum servo system inoperative: Check servo system and rectify.

(2) Frozen wheel cylinder or caliper, pistons: Overhaul cylinder or caliper.

(3) Restricted brake lines: Check lines and remove restriction or renew lines.

(4) Incorrect brake pads or shoe linings fitted: Check and replace with the recommended type.

(5) Frozen brake pedal pivot: Overhaul pedal pivot assembly.

NOTE: The vacuum servo system can be checked as follows: With the engine switched off, pump the brake pedal several times to deplete any vacuum in the system. With the engine still switched off, press down firmly on the brake pedal and hold it in this position, noting the position and effort applied. Holding down on the brake pedal, start the engine. If the servo unit is operating correctly, the pedal will sink slightly and the effort required on the pedal will reduce slightly. If the pedal does not sink slightly when the engine is started, the servo unit may be considered inoperative and should be renewed.

BRAKE DRAG

(1) Frozen wheel cylinder or caliper pistons: Overhaul cylinder or caliper.

(2) Frozen handbrake cable: Renew handbrake cable.

(3) Broken or stretched brake shoe return springs: Renew defective springs.

(4) Clogged master cylinder ports: Overhaul master cylinder.

(5) Faulty or maladjusted hill holder valve (HHV): Adjust the HHV cable or renew the HHV.

NOTE: To check this condition, jack up the vehicle and place on chassis stands. Spin the wheels one at a time to check for binding. If the wheels are not binding, have an assistant apply the brakes and release them. Check that the brakes are immediately releasing. A clogged master cylinder port will cause binding of the two wheels fed by that circuit of the master cylinder. Open the bleeder valve on one of the offending cylinders and check if pressure build up is the cause of the binding. A frozen handbrake cable will usually cause binding on both front wheels. Disconnect the handbrake cable from the calipers and check that the wheels turn freely. The HHV operates on the right front/left rear brake circuit only. If drag is felt in this circuit only, the HHV may be considered to be at fault.

LOW AND/OR SPONGY BRAKE PEDAL

(1) Air in brake hydraulic system: Bleed hydraulic system

(2) Insufficient fluid in the system: Locate and rectify cause of fluid loss, replenish fluid and bleed the system

(3) Incorrectly adjusted rear brake shoes: Check and adjust the rear brakes.

(4) Binding front caliper pistons or guide pins: Overhaul calipers.

(5) Worn master cylinder cups: Overhaul the master cylinder.

NOTE: A spongy brake pedal in most cases is caused by air in the hydraulic system. For air to enter the system one or more of the sealing rubbers or pipes must be sucking in air. The source of the leak must be rectified before bleeding the brake system. The source of the air leak may show as a fluid leak.

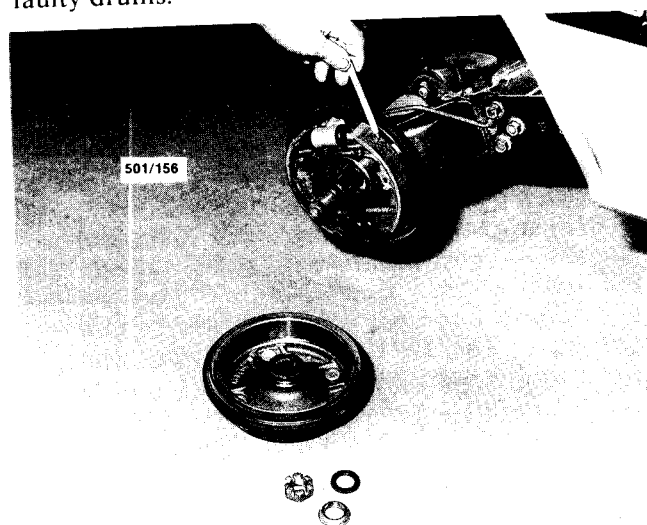
Worn master cylinder cups may be indicated by the brake pedal sinking to the floor on very light application of the brake pedal, the fluid will bypass the cups causing the piston to travel to the end of the cylinder with no effect. There may be no indication of an external fluid leak.

Siezed caliper guide pins or pistons may also cause a low brake pedal, it is possible for the caliper to appear to be functioning correctly on application of the brakes but the binding condition will cause the caliper piston to return slightly into the caliper bore, thereby increasing the pad to disc clearance which will, in turn cause a low pedal.

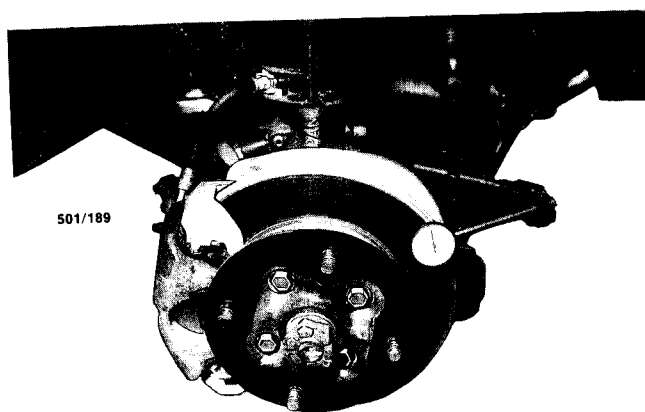
BRAKES LOCK ON APPLICATION

(1) Gummy linings or brake pads due to fluid contamination: Renew the linings or brake pads and rectify any fluid leaks.

(2) Eccentric brake drums: Check and renew all faulty drums.



Check the brake linings for wear and contamination.



Method of checking disc run out using a dial gauge.

(3) Incorrect brake linings installed: Check and renew the linings as a set with the recommended type.

(4) Broken or stretched brake return springs: Check and renew all the springs.

(5) Faulty proportioning valve: Renew the proportioning valve.

NOTE: If this condition arises, first remove all the wheels and check the condition of friction material for both oil contamination and excessive wear. Check the brake shoe return springs for stretching by comparing the free length with a new spring. An eccentric brake drum will be indicated by a pulsating brake pedal when the brakes are lightly applied.

BRAKE PEDAL PULSATES

(1) Eccentric brake drum or disc: Check and renew the brake drum or disc.

(2) Worn hub bearings: Check and renew bearings.

NOTE: Brake drums or discs that prove to be running out must be machined. This job is best entrusted to a brake specialist who will be able to determine if a new disc or drum is required.

BRAKE FADE

(1) Brake pads or linings saturated with hydraulic fluid: Renew as a set the pads or linings and rectify all fluid leaks.

(2) Incorrect shoe adjustment: Check and adjust the rear brakes.

(3) Eccentric brake drum: Check and rectify faulty drum.

(4) Incorrect linings fitted: Check and replace with the recommended type.

NOTE: In most cases brake fade is caused by overuse of the footbrake, which in turn causes a build up of heat in the friction

material and drums or discs. Once this excess heat is allowed to dissipate the brakes should again function normally.

BRAKES OVERHEATING

- (1) Incorrect rear brake shoe adjustment: Check and adjust rear brakes.
- (2) Broken brake shoe return spring: Renew all the springs.
- (3) Faulty handbrake cables or adjustment: Check the cables, renew or adjust.
- (4) Frozen wheel cylinder or caliper piston: Overhaul the wheel cylinder or caliper.
- (5) Obstructed or damaged hydraulic hose or line: Remove obstruction or renew the hose or line.
- (6) Obstructed master cylinder compensating port: Overhaul the master cylinder.
- (7) Blocked vent in the master cylinder reservoir cap: Check and remove the obstruction in vent.
- (8) Overuse of footbrake: Revise driving habits.
- (9) Maladjusted hill holder valve (HHV), or broken return spring: Adjust HHV cable or renew return spring.

NOTE: To check for brake binding, raise the vehicle and spin each wheel in turn by hand.

If it is found that one wheel cylinder or caliper piston is sticking then it is advisable to overhaul all wheel cylinders and calipers and the master cylinder.

BRAKE FAILURE

- (1) Loss of brake fluid due to leaking wheel cylinder: Overhaul or renew the wheel cylinders.
- (2) Loss of brake fluid due to leaking caliper: Overhaul or renew the caliper
- (3) Faulty master cylinder: Overhaul the master cylinder.
- (4) Loss of brake fluid due to a fractured hose,

pipe or faulty union: Renew faulty components as necessary and bleed the hydraulic system.

(5) Air in the hydraulic system: Locate the source of air leak and rectify. Bleed the hydraulic system.

(6) Water in hydraulic fluid: Drain, flush, refill and bleed the hydraulic system.

NOTE: To locate the source of a brake fluid leak, refill the master cylinder reservoir with brake fluid and have an assistant pump the brake pedal. Check for obvious signs of external leakage, prior to dismantling and overhauling the brake system.

If it is found that water has entered the hydraulic system, it is advisable to dismantle the system and check for corrosion of the components.

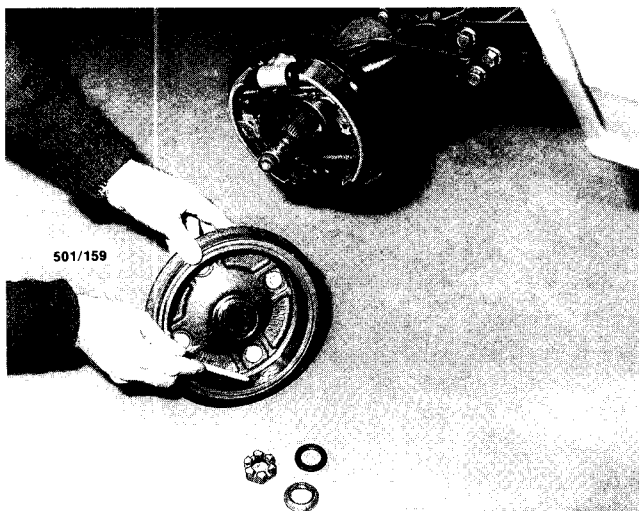
BRAKE NOISE

(1) Brakes squeal during application: Glazed friction material. Remove and inspect the brake pads and deglaze the friction material with emery paper.

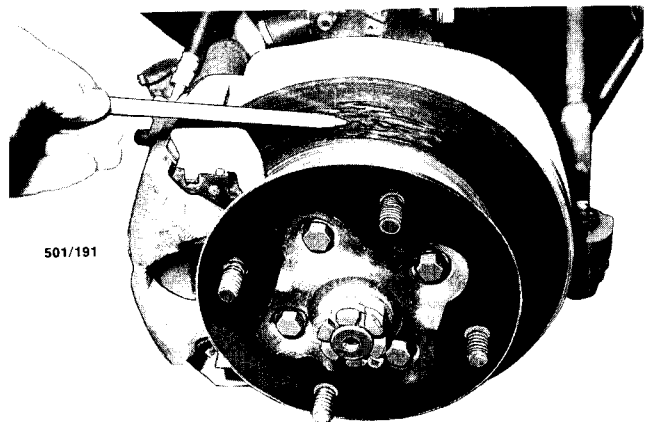
(2) Grinding noise during application: Friction material worn away. Inspect the friction material on the brake pads and shoes, renew the brake pads or shoes as necessary and machine or renew the brake drums or discs.

NOTE: Brake squeal in most cases is caused by the friction material on the brake pads or shoes becoming glazed. Wear indicators are incorporated in the disc pads and will provide an audible warning when the pads are approaching the wear limit. Unsuitable friction material or the omission of the anti-squeal shims may also cause brake noise.

If the brake pads or shoes are worn to metal always renew the brake pads or shoes as a set of four. If scored, the brake drum or disc will require machining or renewing otherwise braking efficiency will be impaired.



Check the brake drums for wear, scoring and cracking.



Check the disc for scoring and cracking.

2. DESCRIPTION

The brakes are applied by two circuits by means of a dual circuit master cylinder. The braking is split diagonally, i.e. the right front and the left rear circuits are controlled by one portion of the master cylinder and the left front and right rear circuits are controlled by the other portion of the master cylinder. Should a malfunction occur in one circuit, the remaining circuit is capable of stopping the vehicle safely.

The four wheel hydraulically operated brakes utilise drum brakes on the rear wheels and disc brakes on the front wheels.

The rear drum brakes are manually adjusted on all 1979–1984 and Utility models and also 1985–1987 two wheel drive Sedan and Station Wagon models. The brakes are of the self adjusting type on 1985–1987 four wheel drive Sedan and Station Wagon models.

On all models a vacuum servo unit is installed between the master cylinder and the bulkhead.

The calipers are of the floating type and are self adjusting. The single piston caliper automatically compensates for brake pad wear by the floating caliper feature. The caliper floats on two guide pins located in the anchor plate. Wear indicators are incorporated in the front disc pads on later models and provide an audible warning when the pads are approaching the wear limit.

The dual circuit master cylinder incorporates the fluid reservoir and fluid level warning lamp switch. 1985–1987 Sedan and Station Wagon models have a fast fill feature whereby a larger rear chamber provides fluid to the operating chambers of the master cylinder at a faster rate than is normal with conventional master cylinders. This feature shortens the stroke of the brake pedal and improves brake pedal "feel".

1985–1987 Sedan and Station Wagon models are equipped with a proportioning valve mounted to the left hand rear of the vehicle underbody. The proportioning valve prevents rear brake lock up under severe braking conditions. Pressure is applied equally to the front and rear brakes until a pre-determined pressure or split point is reached.

Once this split point is reached, the pressure applied to the rear brakes is proportionally less than that applied to the front brakes. In the case of a failure of either brake circuit, pressure is applied equally to the front and rear brakes on the remaining circuit even though the split point may be exceeded.

The Hill Holder Valve (HHV) assembly is installed on 1985–1987 manual transaxle Sedan and Station Wagon models to assist the driver when moving off uphill, doing away with the need to use the handbrake. The HHV is incorporated in the right hand front/left hand rear brake hydraulic circuit and is brought into operation by the action of the clutch pedal and the inclination of the vehicle. The valve incorporates a ball, a seal and a pushrod activated by

the clutch pedal. When the vehicle is positioned on an uphill incline, the ball rolls into contact with the pushrod. When the clutch pedal is operated, the pushrod moves away and the ball covers the seal, closing the port from the master cylinder and maintaining the pressure applied in the brake circuit until the clutch pedal is released.

The cable operated handbrake is incorporated in the front caliper assemblies and is applied to the front disc pads via a screw mechanism in the caliper piston.

3. MASTER CYLINDER

TO REMOVE AND INSTAL

(1) Raise the bonnet and fit fender covers to the front fenders.

(2) Disconnect the fluid level switch wiring connector by pulling on the connector not the wires.

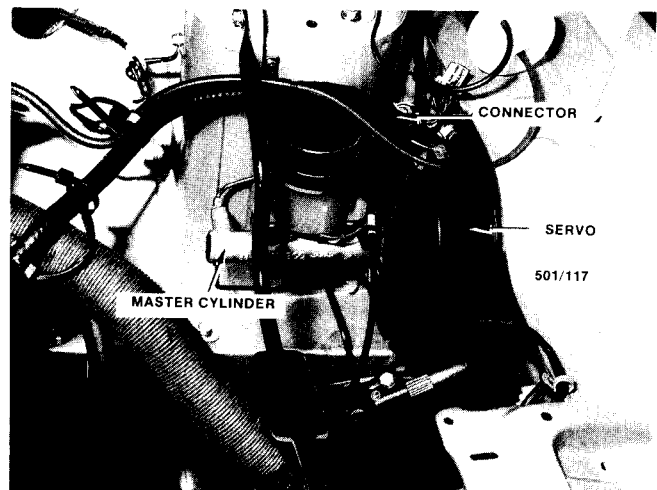
(3) Disconnect the brake fluid pipes from the master cylinder and plug all pipes to prevent the entry of dirt.

(4) Remove the nuts retaining the master cylinder to the servo unit and remove the master cylinder from the vehicle.

NOTE: Care should be exercised when removing or installing the master cylinder assembly to ensure that brake fluid is not permitted to drop onto the surrounding paintwork of the vehicle. Brake fluid, if accidentally split, should be immediately washed away with water and allowed to dry naturally. Do not wipe it with a cloth.

Installation is a reversal of the removal procedure with attention to the following points:

(1) Pour a small quantity of new brake fluid into the master cylinder and pump the piston assemblies with a blunt rod until fluid begins to emerge from the outlets.



Installed view of the brake master cylinder and servo unit, 1986 model shown.

(2) Instal the master cylinder to the vehicle. Installation may be made easier if the brake pipes are loosely installed to the master cylinder before the master cylinder is mounted to the servo.

(3) Bleed the brakes system as described later in this section.

TO DISMANTLE

(1) Remove the master cylinder from the vehicle as previously described. Remove the reservoir cap/s and, where fitted, the strainer and drain the brake fluid from the reservoir.

(2) Press the piston into the master cylinder slightly using a blunt rod and remove the piston stopper screw.

(3) Hold the piston into the master cylinder and remove the piston retaining snap ring and, on 1979-1984 and Utility models, the stopper washer.

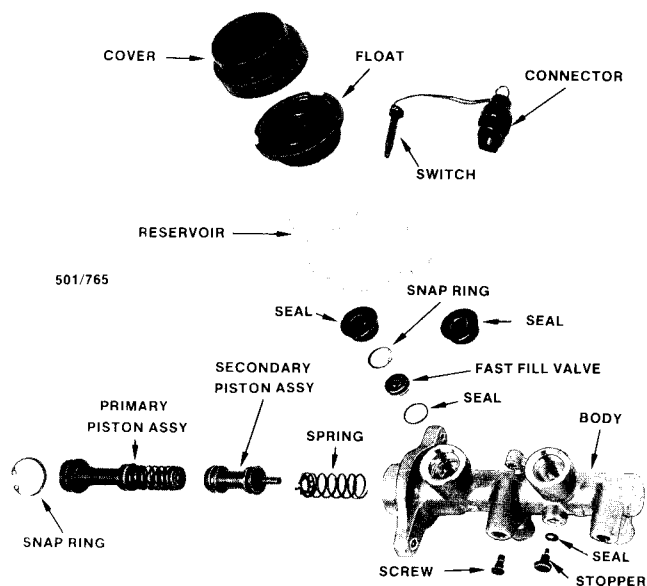
(4) Remove the primary and secondary piston assemblies from the master cylinder bore. It may be necessary to tap the master cylinder on a block of wood to free the piston assemblies from the master cylinder.

(5) On 1979-1984 and Utility models, remove the brake pipe unions and withdraw the check valve assemblies from the master cylinder, note the installed position of the components to aid assembly.

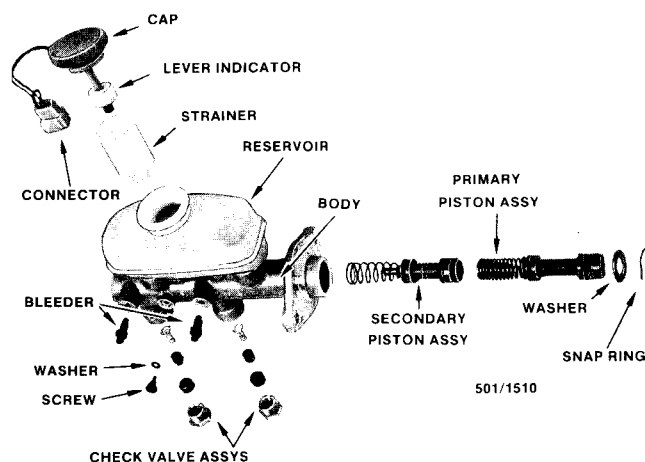
(6) Further dismantling of the master cylinder is not recommended. The piston assemblies must be renewed as units.

The reservoir/s should not be removed unless fluid leakage is evident.

If the reservoirs are to be removed from early 1979-1984 model master cylinders, new reservoirs will be required. Loosen the clamps retaining the reservoirs to the master cylinder and remove the reservoirs from the master cylinder.



Dismantled view of a 1986 model master cylinder.



Dismantled view of a 1983 model master cylinder.

On later models, remove the screw/s retaining the reservoir to the master cylinder and remove the reservoir and seals.

The fast fill valve on 1985-1987 Sedan and Station Wagon model master cylinders may be removed after the removal of the reservoir. Remove the snap ring retaining the valve to the master cylinder and remove the valve from the cylinder.

TO CLEAN AND INSPECT

(1) Wash all components thoroughly in methylated spirits. Do not use petrol, kerosene or other cleaning solvents.

(2) Check the master cylinder bore for wear, corrosion and pitting.

NOTE: Do not hone the master cylinder bore. If the bore is pitted or worn, renew the master cylinder as an assembly.

(3) Ensure that the inlet and compensating ports between the reservoir and the cylinder bore are free of all obstructions.

(4) Discard all rubber parts and the piston assemblies. Inspect the check valve springs for possible reuse on 1979-1984 and Utility models. Ensure that the overhaul kit contains all the necessary components to overhaul the master cylinder before discarding any components.

TO ASSEMBLE

Assembly is a reversal of the dismantling procedure with attention to the following points;

(1) Always use a genuine major repair/overhaul kit which contains pre-assembled pistons and rubber seals. The use of a major kit will ensure a thorough overhaul and long service life from the unit.

(2) Liberally lubricate the cylinder bore and all the internal parts with clean brake fluid.

(3) On 1979-1984 and Utility models instal the check valve assemblies and unions to the master

cylinder outlet ports in the order noted during dismantling, ensuring that the wide end of the springs are facing the master cylinder body. Tighten the unions securely.

(4) Install the primary and secondary piston assemblies to the master cylinder, press the primary piston into the master cylinder slightly using a blunt rod and install the stopper screw using a new sealing washer.

(5) On 1979–1984 and Utility models, install the stopper washer to the master cylinder bore.

(6) While holding the primary piston into the master cylinder, install the piston retaining snap ring to the groove in the master cylinder ensuring that the snap ring is correctly seated.

(7) If removed, install the fast fill valve and reservoir/s using new seals and reservoirs as required.

(8) Pour a small quantity of clean brake fluid into the reservoir and pump the piston assemblies with a blunt rod until fluid begins to flow from all of the outlets.

(9) Install the master cylinder to the vehicle as previously described.

4. FRONT DISC BRAKE ASSEMBLY

Special Equipment Required:

To Check Brake Disc Run Out — Dial gauge

To Renew Brake Pads — Piston resetting tool

To Overhaul Caliper — Spring compressor

TO REMOVE AND INSTALL BRAKE PADS

(1) Raise the front of the vehicle and support it on chassis stands. Remove the front wheels.

(2) Drain approximately two thirds of the brake fluid from the master cylinder reservoir. This may be done by syphoning, or by loosening the brake pipe unions or bleeder valves, if fitted, at the master cylinder and bleeding the fluid into a container.

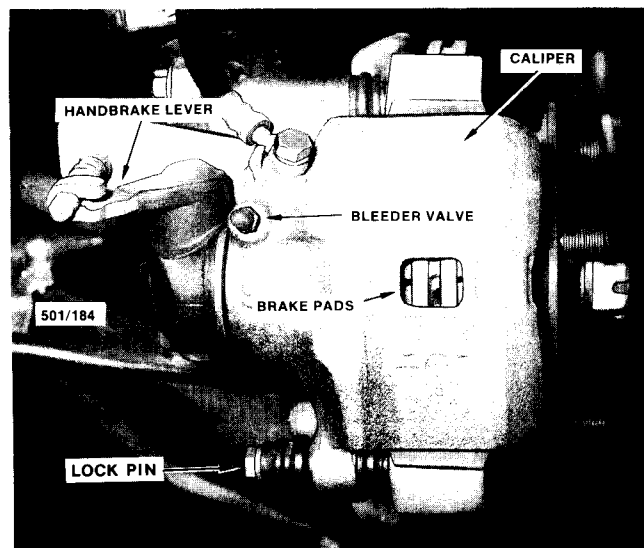
NOTE: Do not completely remove the brake pipe from the master cylinder or drain all the fluid from the reservoir otherwise it will be necessary to bleed the hydraulic system. The fluid is drained to prevent overflow when the caliper piston is pushed back into its bore to facilitate brake pad renewal.

Complete work on one caliper assembly at a time and renew the brake pads as complete sets of four, that is two pads to each caliper assembly.

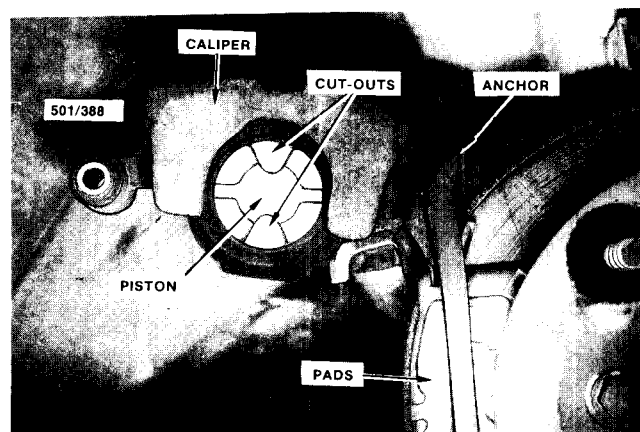
(3) Ensure that the handbrake is fully released.

(4) Push the caliper handbrake lever towards the applied position and disconnect the inner handbrake cable from the lever.

(5) Remove the clip retaining the outer handbrake cable to the support bracket on the caliper and remove the cable from the bracket.



Installed view of the front brake caliper, 1986 model shown.



View showing the caliper positioned as for pad renewal, 1983 model shown.

(6) Remove the lock pin from the caliper and swing the caliper up to allow the pads to be removed from the anchor plate. Tie the caliper in this position if necessary.

(7) Remove the pads from the anchor plate noting the position of the anti rattle springs and the anti squeal shims.

(8) Wind the piston into the caliper bore in a clockwise direction using the piston resetting tool or a suitable alternative. A discarded 1/2 inch drive socket of the appropriate outer diameter may be ground to provide lugs to locate in the piston grooves. The socket, a short extension and ratchet handle may then be used to wind the piston into the bore. Do not push the piston into the caliper bore without rotating it or damage to the handbrake spindle may occur.

(9) Align the cut-outs in the piston so that the peg on the rear of the inner disc pad will fit within one of the cut-outs in the piston when the caliper is in position on the anchor plate.

- (10) Ensure that the dust seal is not distorted after the piston has been wound in and set to position.

NOTE: Overhaul the caliper if fluid leaks are evident or the dust seals are deteriorated. If the pistons are difficult to wind into the caliper, the caliper may be considered to require overhaul. It is good practice to remove the caliper from the guide pin and lubricate the pin with silicone grease. After installation of the caliper on the guide pin, hold it in as far as it will go for at least 5 seconds to expell any air from the guide pin bore in the caliper. On models fitted with an air bleed plug on the guide pin bore, remove the plug before installing the caliper and instal the plug after the caliper is in place.

- (11) Apply a thin smear of PBC grease available from Subaru dealers, to the surfaces of the brake pads which are in contact with the anchor plate and instal the new pads, shims and clips to the caliper. Ensure that the anti rattle clips and anti squeal shims are installed to the position noted on removal.

- (12) Lubricate the lock pin and sleeve with silicone grease. Ensure that the caliper moves smoothly on the pins, also that the dust covers are in a serviceable condition. Renew all defective pins and seals.

- (13) Swing the caliper down over the pads and into position on the anchor plate. Instal the lock pin and tighten it to Specifications.

- (14) Instal the outer handbrake cable to the mounting bracket and instal the retaining clip. Push the lever towards the applied position and instal the inner handbrake cable to the lever.

- (15) Repeat the procedure for the remaining wheel.

- (16) Top up the brake master cylinder reservoir with the recommended fluid and pump the brake pedal several times to bring the pads into position alongside the disc.

- (17) Instal the wheels and lower the vehicle to the ground.

NOTE: Do not drive the vehicle before pumping the caliper pistons back to position, the first application of the brake pedal may not apply the brakes.

TO OVERHAUL CALIPER

NOTE: As special tools are required to overhaul the caliper assemblies, it is recommended that this work be entrusted to a Subaru dealer or a specialist brake workshop having the necessary equipment.

- (1) Raise the front of the vehicle and support it on chassis stands. Remove the front wheels.
(2) Disconnect the brake hose from the caliper. Plug the hose to prevent the entry of dirt.

- (3) Ensure that the handbrake is fully released.
(4) Push the caliper handbrake lever towards the applied position and disconnect the inner handbrake cable from the lever.

- (5) Remove the clip retaining the outer handbrake cable to the support bracket on the caliper and remove the cable from the bracket.

- (6) Remove the lock pin from the caliper and swing the caliper up to allow the caliper to be withdrawn from the guide pin on the anchor plate and remove the caliper from the vehicle.

On 1985-1987 Sedan and Station Wagon models, the guide pin and sleeve are bolted to the anchor plate, it is not necessary to remove this assembly.

NOTE: Do not remove the anchor plate unless the disc is to be removed.

- (7) Remove the guide and lock pin sleeves, where fitted, and boots from the caliper, note the installed positions as an aid to assembly.

- (8) Carefully prise the piston dust seal retaining clip from the seal and remove the seal from the caliper.

- (9) Place a pad of cloth in front of the piston and carefully remove the piston from the caliper by applying low air pressure to the fluid inlet port of the caliper. Use care during this operation, do not use excessive air pressure and keep hands clear of the piston.

- (10) Using a thin blunt probe, preferably made from wood or plastic, lift and remove the seal from the groove in the caliper bore.

- (11) Remove the rings retaining the handbrake lever boots to the caliper, remove the small boot from the lever, disconnect the large boot from the caliper and leave it in place on the lever.

- (12) Remove the snap ring retaining the handbrake lever and shaft assembly to the caliper.

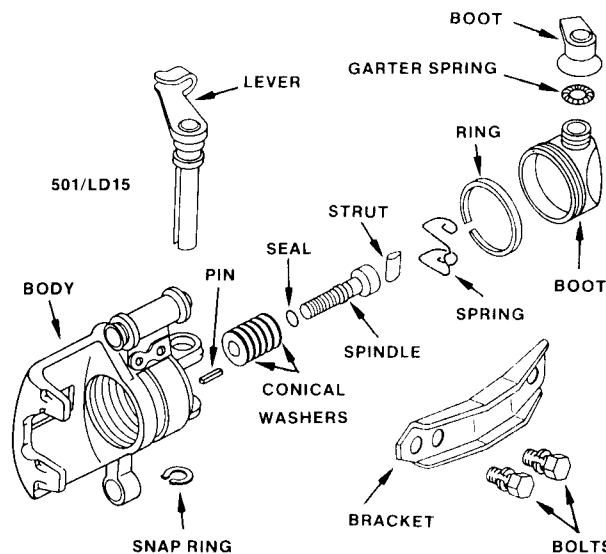
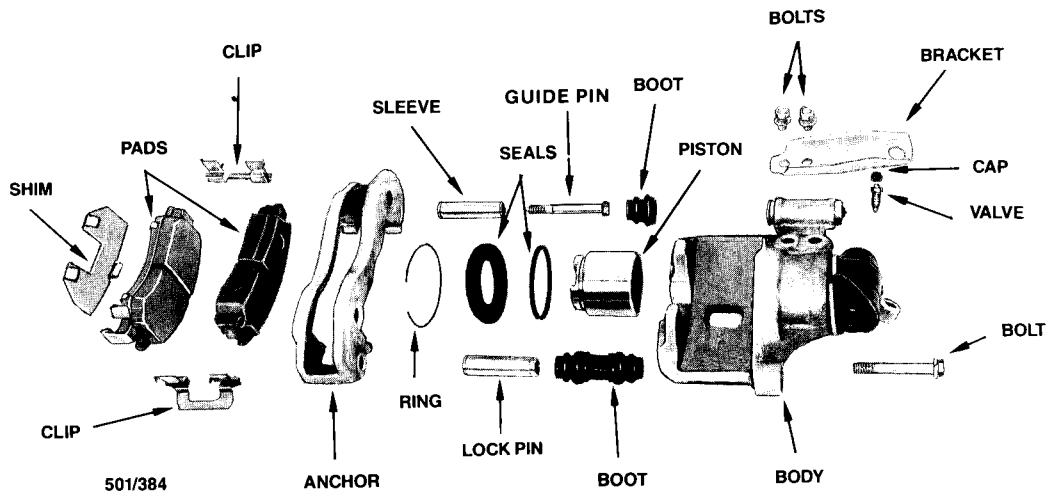


Illustration of the brake caliper showing the handbrake mechanism, 1986 model shown.



Dismantled view of the front caliper, 1986 model shown.

(13) Using the spring compressor or a suitable alternative, apply pressure to the spindle to relieve the tension between the spindle and the shaft of the handbrake lever.

(14) Remove the shaft and lever assembly from the caliper and remove the spring compressor. Remove the boot from the lever.

(15) Remove the return spring and the strut from the caliper.

(16) Remove the spindle assembly from the caliper.

(17) Note the position of the conical washers and remove the washers from the spindle.

(18) Carefully prise the seal from the groove on the spindle and discard the seal.

(19) Clean all parts except the brake pads in methylated spirits and examine them carefully for wear and corrosion, particularly the piston. Renew any corroded, worn or doubtful parts. Discard the piston and spindle seals.

A small degree of corrosion in the caliper bore may not necessitate the renewal of the caliper body as the sealing surface is on the piston.

(20) If the operation of the handbrake mechanism in the piston is in doubt, renew the piston.

Assembly is a reversal of the dismantling procedure with attention to the following points:

(1) Coat the new piston seal with clean brake fluid and install the seal into the groove in the caliper bore. Ensure that the seal is not twisted and is correctly seated in the groove.

(2) Coat the bore of the caliper with clean brake fluid and install the piston to the bore by hand aligning the grooves on the piston to ensure clearance for the peg on the rear of the inner brake pad when the caliper is installed to the anchor plate.

(3) Apply the RX2 grease supplied in the repair kit to the grooves in the caliper and the piston and install the dust seal to the caliper and the piston. Ensure that the seal is not twisted and install the retaining clip.

(4) Suitably cover the screw portion of the spindle to protect the seal, coat the seal groove with the silicone grease supplied in the repair kit and install the 'O' ring seal to the spindle ensuring that it is not twisted and is correctly seated in the groove.

(5) Apply the RX2 grease supplied in the repair kit to the spindle at the location of the conical washers and install the washers to the spindle as noted during dismantling. Alternate the mounting of the washers so that the outer circumferences of the washers are in contact with each other and the inner circumferences of the two end washers will contact with the spindle and caliper body respectively. liberally coat each washer with RX2 grease.

(6) Install the spindle to the caliper, wind it into the piston in a clockwise direction.

(7) Liberally coat the head of the spindle and the handbrake lever bearings with RX2 grease.

(8) Place the return spring and strut in position on the caliper body and compress the spindle and conical washer assembly using the spring compressor.

(9) Install the large handbrake lever boot to the lever, liberally coat the lever shaft with RX2 grease and install the lever to the caliper. Align the return spring and strut in the groove in the lever shaft.

(10) Install the snap ring to the handbrake lever shaft.

(11) Pack the area of the handbrake mechanism with RX2 grease, install the boot to the caliper body and install the retaining ring.

(12) Install the small handbrake lever boot to the lever and install the retaining ring.

(13) Install the guide and lock pin boots to the positions noted during dismantling, coat the sleeves, where fitted, with the silicone grease supplied in the repair kit and install the sleeves to the caliper.

(14) Install the caliper to the anchor plate ensuring that the pads, springs and shims are located correctly and tighten the lock pin(s) to the following torque figures:

Models with fixed guide pin fitted and the lock pin screwed into the caliper body	74 Nm
Models with fixed guide pin fitted and the lock pin screwed into the anchor plate	24 Nm
1985-1987 Sedan and Station Wagon models	41 Nm

NOTE: On 1979-1984 and Utility models, after installation of the caliper on the guide pin, hold it in as far as it will go for at least 5 seconds to expel all air from the guide pin bore in the caliper.

On models fitted with an air bleed plug, remove the plug before installing the caliper and instal the plugs after the caliper is in place.

(15) Instal the brake hose to the caliper using new sealing washers. Ensure that the brake hose is not twisted, is correctly routed and will not contact any suspension components. In 1979-1984 and Utility models, ensure that the brake hose is mounted to the inner bracket on the suspension unit.

(16) Instal the inner handbrake cable to the lever and the outer cable to the support bracket. Ensure that the handbrake cable is correctly routed and will not contact any suspension components.

(17) Bleed the brakes as described later in this section.

(18) If necessary, adjust the handbrake as described later in this section.

(19) Top up the brake fluid and pump the brake pedal several times to bring the pads into position against the disc.

(20) Lower the vehicle to the ground and test the operation of the brakes.

TO REMOVE AND INSTAL BRAKE DISC

(1) Raise the front of the vehicle and support it on chassis stands. Remove the front wheels.

NOTE: If the disc run-out is not to be checked, it is adviseable to remove the split pin from the nut retaining the hub and disc assembly to the drive shaft and loosen the retaining nut before raising the vehicle.

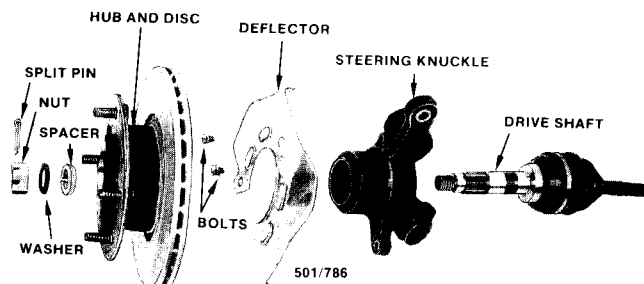
(2) Ensure that the handbrake is fully released.

(3) Push the caliper handbrake lever towards the applied position and disconnect the inner handbrake cable from the lever.

(4) Remove the clip retaining the outer handbrake cable to the support bracket on the caliper and remove the cable from the bracket.

(5) Remove the lock pin from the caliper and swing the caliper up to allow the caliper to be removed from the anchor plate.

Remove the caliper from the anchor plate tie it away from the working area.



Dismantled view of the front hub and disc assembly and steering knuckle.

(6) Note the installed positions of the anti rattle clips and shims and remove the brake pads from the anchor plate.

(7) Mount a suitable dial gauge to a suspension component in a position to allow the plunger of the gauge to contact the disc at a point not further than 5 mm from the outer circumference of the disc.

(8) Rotate the disc and check that the run-out is within Specifications.

Have the disc machined, or renew the disc if the run-out exceeds Specifications.

NOTE: A small amount of run-out may be corrected by changing the mounted position of the disc on the hub.

(9) Remove the bolts retaining the caliper anchor plate to the steering knuckle and remove the anchor plate from the steering knuckle.

(10) Remove the split pin from the nut retaining the hub and disc assembly to the drive shaft and remove the retaining nut, washer and spacer.

(11) Withdraw the hub and disc assembly from the drive shaft. It may be necessary to use a suitable puller for this operation.

(12) Remove the bolts retaining the disc to the hub, suitably mark the relationship of the disc to the hub and remove the disc from the hub.

Installation is a reversal of the removal procedure with attention to the following points:

(1) Ensure that the mounting surfaces of the hub and disc are clean and true.

(2) Instal the disc to the marks made during removal.

(3) Tighten the disc to hub retaining bolts to Specifications.

(4) Check the disc run out as previously described.

(5) Tighten the anchor plate retaining bolts and the caliper lock pin to Specifications.

(6) Instal the brake pads, springs and clips to the positions noted on removal. Ensure that the caliper piston is in the correct position to allow the pin on the rear of the rear brake pad to enter the groove in the piston when the caliper is positioned on the anchor plate.

(7) Pump the brake pedal several times to en-

sure that the brake pads are correctly positioned prior to driving the vehicle as the first application of the brake pedal may not apply the brakes.

5. REAR DRUM BRAKE ASSEMBLY

TO ADJUST REAR BRAKES

NOTE: 1985-1987 four wheel drive Sedan and Station Wagon models are equipped with self adjusting rear brakes, the following procedure applies to all other models.

- (1) Raise the rear of the vehicle and support on chassis stands.
- (2) Working under the vehicle at the rear of the brake assembly, tighten the adjusting screw until the wheel is locked.
- (3) Loosen the adjusting screw 180 deg and check that the wheel rotates freely.
- (4) If any tight spots are felt, remove the rear hub and brake drum assembly and inspect the brake system. Check the brake drum for distortion.



Method of adjusting the rear brakes, 1983 model shown.

TO REMOVE AND DISMANTLE

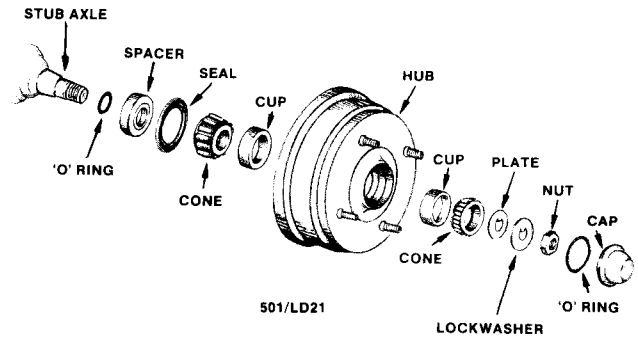
- (1) Raise the rear of the vehicle and support it on chassis stands. Remove the rear wheels.

On four wheel drive models, remove the hub caps and brake drum hub retaining nut split pins and loosen the brake drum hub retaining nut prior to raising the vehicle.

- (2) On four wheel drive models, remove the brake drum hub retaining nut, washer and spacer, noting the installed position of the spacer, and remove the brake drum hub from the vehicle. It may be necessary to release the brake adjustment to allow the drum to clear the linings.

On two wheel drive models proceed as follows:

- (a) Remove the grease cap from the brake drum hub using a suitable lever. Discard the O ring.
- (b) Straighten the lockwasher and remove the



Schematic diagram of the two wheel drive rear hub components.

nut, lockwasher and plate from the end of the stub axle.

- (c) Slide the brake drum hub from the stub axle, using care not to drop the outer bearing. It may be necessary to release the brake adjustment to allow the drum to clear the linings.

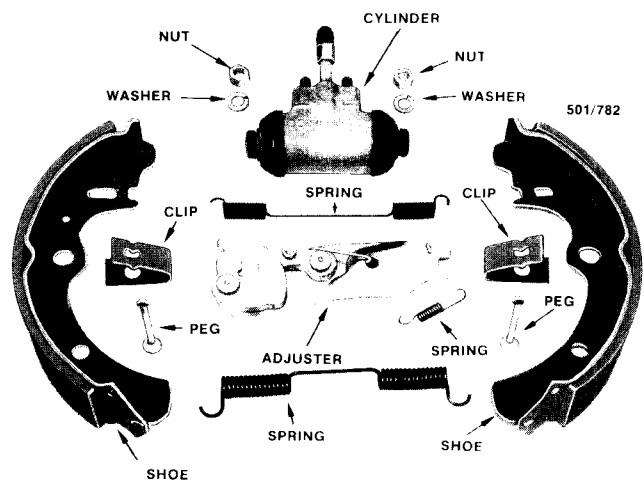
- (3) Remove the brake shoe hold down clips and pegs by depressing the clips and rotating the pegs to allow the clips to be removed from the pegs. Withdraw the pegs from the rear of the brake backing plate.

- (4) Pull the brake shoes away from each other and disconnect them from the wheel cylinder and the adjuster on early models, late two wheel drive models and Utilities or the lower anchor on late four wheel drive Sedan and Station Wagon models. Remove the shoes with the return springs and self adjuster, if fitted, attached.

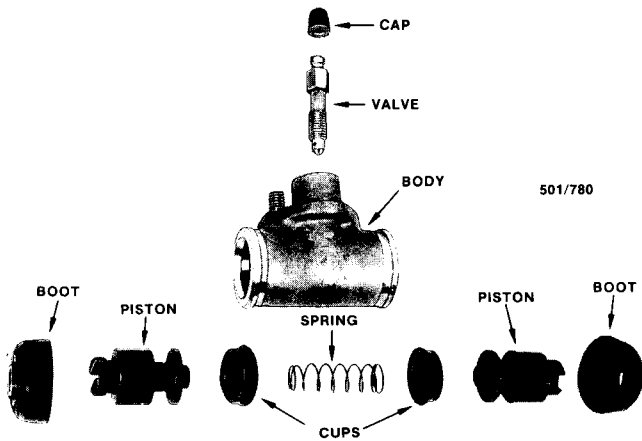
- (5) Separate the return springs and adjuster from the brake shoes noting the installed position of the springs and adjuster.

- (6) Undo the flare nut retaining the brake pipe to the wheel cylinder and withdraw the brake pipe from the wheel cylinder. Plug the brake pipe to prevent the entry of dirt and loss of brake fluid.

- (7) Remove the nuts retaining the wheel cylinder



Dismantled view of the rear drum brake assembly, 1986 four wheel drive model shown with automatic adjuster.



Dismantled view of the rear wheel cylinder.

der to the backing plate and remove the wheel cylinder.

(8) If necessary, remove the nuts retaining the adjuster to the backing plate and remove the adjuster.

(9) Clean all the parts except the brake shoes in methylated spirits and inspect them for wear and deterioration. Renew all unserviceable and suspect parts.

(10) Inspect the brake drum for scoring and distortion, repair or renew the brake drum as necessary.

(11) If necessary, overhaul the wheel cylinder as follows:

(a) Remove the boots from either end of the wheel cylinder.

(b) Withdraw the pistons and spring from the wheel cylinder. Remove and discard the cups from the pistons.

(c) Remove the bleeder valve from the wheel cylinder.

(d) Clean all the parts in methylated spirits and inspect them for wear, deterioration and corrosion, renew all unserviceable and suspect parts.

(e) Inspect the bore of the wheel cylinder for scores and corrosion, if the serviceability of the cylinder is in doubt, renew the wheel cylinder.

(f) Coat the new cups with brake fluid and install the cups to the pistons ensuring that the cups are correctly seated in the grooves in the piston.

(g) Install the piston assemblies and spring to the wheel cylinder and install the boots.

(h) Install the bleeder valve to the wheel cylinder.

TO ASSEMBLE AND INSTALL

Assembly is a reversal of the dismantling procedure with attention to the following points:

(1) Install the wheel cylinder to the backing plate and tighten the retaining nuts securely.

(2) Install the adjuster, if fitted, to the backing plate and tighten and retaining nuts securely.

(3) Install the return springs and the self adjuster,

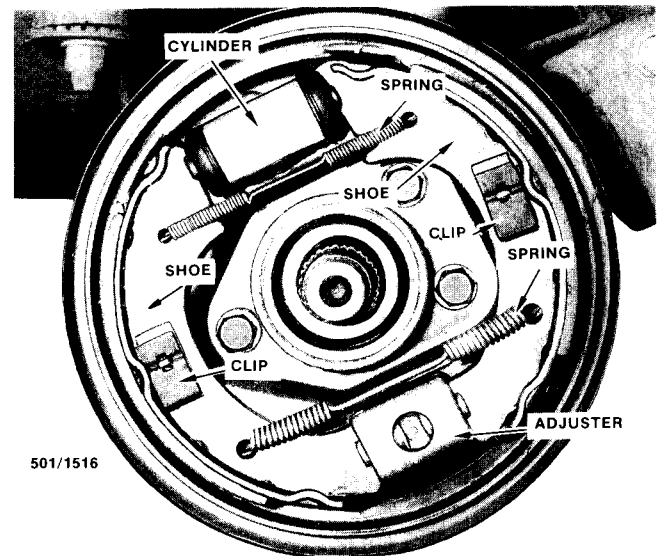
if fitted, to the positions on the brake shoes noted during dismantling.

(4) Locate one shoe on one side of the wheel cylinder and adjuster or lower anchor and stretch the remaining shoe to locate on the remaining wheel cylinder and adjuster or lower anchor.

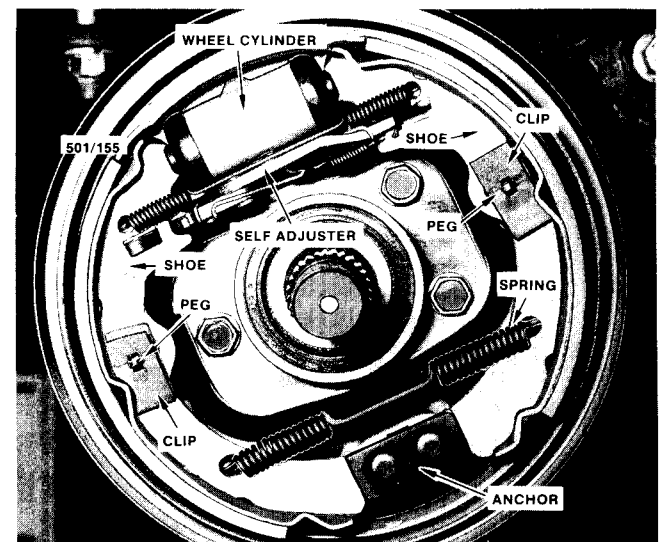
(5) Ensure that the self adjuster, if fitted, is correctly located, and install the hold down pegs and clips to the backing plate and brake shoes.

(6) Install the brake pipe to the wheel cylinder and tighten the flare nut securely.

(7) On models with self adjusting rear brakes, lift the pawl away from the ratchet cam on the self adjuster and move the adjuster to the minimum setting to allow the brake drum to be installed.



Installed view of the rear drum brakes, 1983 model shown with manual adjuster.



Installed view of the rear drum brakes, 1986 four wheel drive model shown with automatic adjuster.

(8) On two wheel drive models, repack or renew the hub bearings as required, refer to the Rear Suspension section if necessary.

(9) Instal the brake drum hub, spacer, washer and nut to the axle shaft. On four wheel drive models, tighten the retaining nut securely.

On two wheel drive models, refer to the Rear Suspension section for the rear hub bearing adjusting procedure. Renew the O ring and instal the grease cap.

NOTE: On four wheel drive models, ensure that the painted front face of the spacer is facing toward the retaining nut.

(10) Adjust the rear brakes as previously described.

On models with self adjusting rear brakes, adjustment of the brakes is effected by the action of the brakes shoes during application of the brakes, the shoes should self adjust during the bleeding operation. If the rear brakes are not adjusted after the bleeding operation, pump the brake pedal until the correct adjustment is achieved.

(11) Bleed the brakes as described later in this section.

(12) Instal the wheels, lower the vehicle to the ground and test the operation of the brakes.

On four wheel drive models, tighten the brake drum hub retaining nut to Specifications as listed in the Rear Suspension section. Tighten the retaining nut a further 30 degrees maximum if necessary and instal the retaining nut split pin.

6. BRAKE SERVO UNIT

TO CHECK OPERATION

(1) With the engine switched off, apply the footbrake several times to exhaust all vacuum from the system.

(2) Again apply the footbrake and hold the footbrake fully depressed.

(3) Start the engine, if the servo unit and the vacuum circuit are functioning correctly, a distinct downward movement of the brake pedal should be felt.

Should the pedal fail to sink when the engine is started and vacuum is applied to the servo unit, the vacuum circuit or servo unit may be considered faulty and the cause of the fault should be investigated.

(4) Ensure that the brake pedal is released, start the engine and run at a medium speed. Stop the engine.

Let the vehicle stand for one to two minutes, press the brake pedal several times and check the operation. The pedal feel should get progressively harder as the vacuum is exhausted from the system. If the pedal feel is hard to start with and does not change during this check, the system may be suspected of developing a vacuum leak or the one way check valve may be faulty.

NOTE: Before removing the servo unit from the vehicle for inspection, disconnect the vacuum supply hose, start the engine and check that vacuum is reaching the servo unit. Check the one way check valve as described below.

TO TEST ONE WAY CHECK VALVE

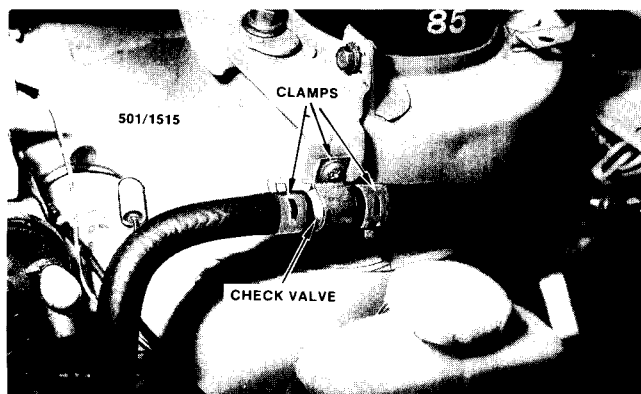
NOTE: The check valve is located on the right hand inner fender on 1979-1984 and Utility models and is incorporated in the vacuum hose on 1985-1987 Sedan and Station Wagon models.

(1) Remove the check valve or hose from the vehicle.

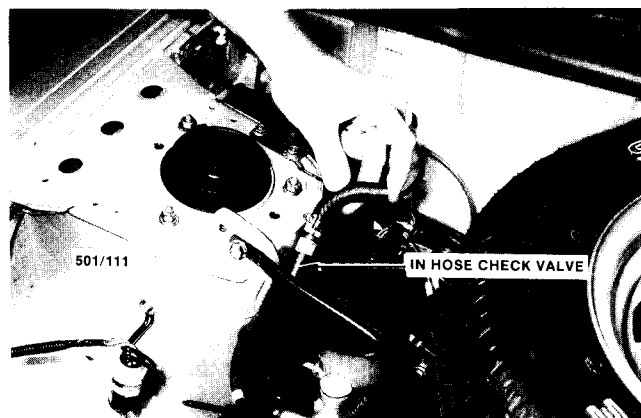
(2) Check the valve for sticking, suction on the manifold side of the valve or hose should allow air to flow freely. Air blown into the valve from the manifold side should not pass through the valve

(3) Instal the valve or hose and check the operation of the system as previously described.

NOTE: Check that there are no vacuum leaks at the hose connections and that the hose is not collapsed due to deterioration.



View showing the location of the check valve, 1983 model shown.



Check for vacuum at the servo vacuum hose, 1986 model shown.

TO REMOVE AND INSTAL SERVO UNIT

- (1) Raise the bonnet and instal fender covers to the front fenders.
- (2) Remove the brake master cylinder as previously described.
- (3) Disconnect the vacuum hose from the servo unit.
- (4) Working inside the vehicle, remove the clip retaining the clevis pin to the brake pedal and remove the clevis pin.
- (5) Remove the nuts retaining the servo to the bulkhead and, working in the engine compartment, remove the servo from the vehicle taking care not to damage the brake pipes.

NOTE: Use care when handling the servo unit after removal from the vehicle. Do not allow the master cylinder side of the servo unit to face downwards after removal as internal components of the servo unit may become dislodged necessitating the renewal of the servo unit. Do not apply excessive sideways force to the pushrod or damage to the servo unit may occur.

Installation is a reversal of the removal procedure with attention to the following points:

- (1) Ensure that the pedal height and free play are to Specifications. If necessary, adjust as described under the heading Brake Pedal later in this section.
- (2) Bleed the brakes as described under the heading Hydraulic System later in this section.

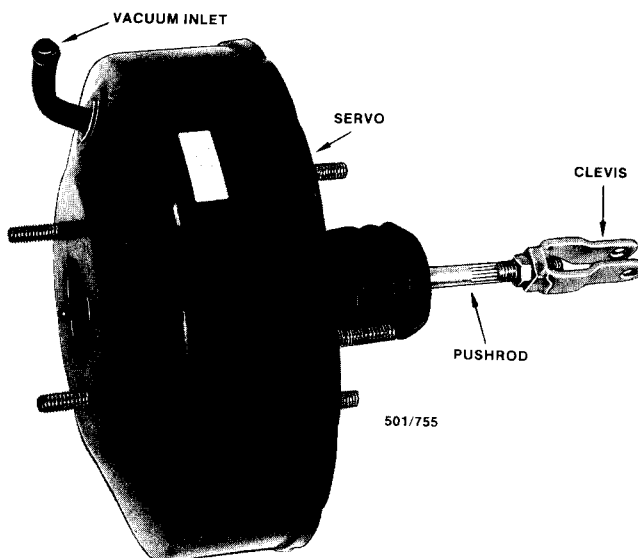
7. HANDBRAKE

TO ADJUST HANDBRAKE

- (1) Remove the centre panel of the centre console.
- (2) Operate the handbrake lever several times.
- (3) Loosen the locknut and rotate the adjusting nut until the handbrake is applied when the lever is raised three or four notches on the ratchet. Operate the footbrake lightly several times during the adjusting operation.
- (4) When the adjustment is satisfactory, tighten the locknut and instal the console centre panel.

TO REMOVE AND INSTAL HANDBRAKE CABLES

- (1) Raise the front of the vehicle and support it on chassis stands. Remove the front wheels.
- (2) Remove the centre panel of the centre console.
- (3) Remove the locknut and the adjusting nut from the equaliser.
- (4) Remove the inner cables from the equaliser and remove the clamps retaining the outer cables to the vehicle floor.



View of the servo unit removed from the vehicle, 1986 model shown.

- (5) Working under the front of the vehicle, pull the inner cables from the outer cables sufficiently to disconnect them from the caliper handbrake lever and disconnect the cables.

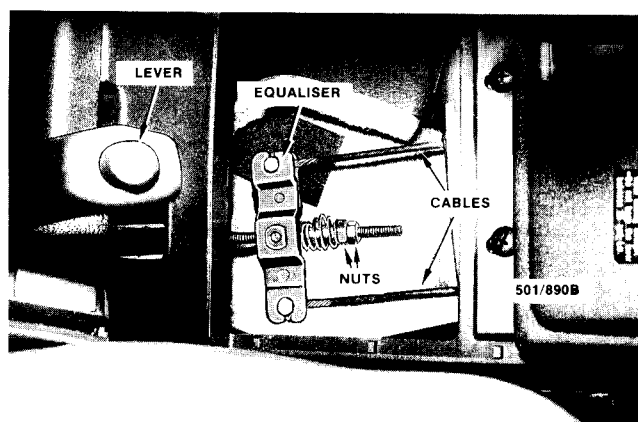
- (6) Remove the clip retaining the outer cable to the support bracket on the caliper and remove the clamps from the lower control arm and the crossmember.

- (7) Detach the outer cable from the guides at the rear of the crossmember.

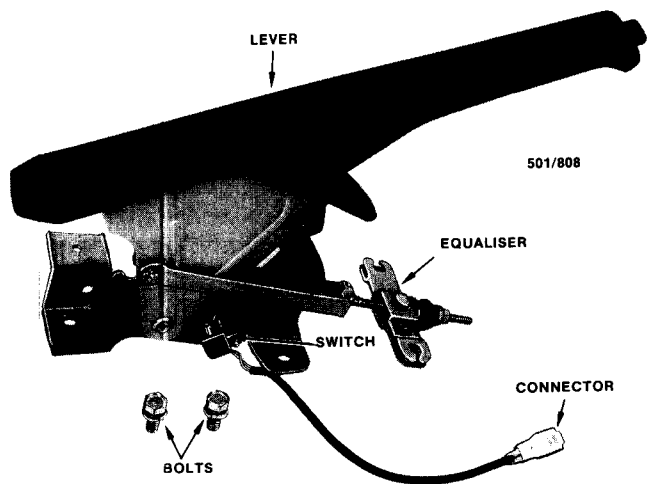
- (8) Withdraw the cable assemblies from the vehicle.

Installation is a reversal of the removal procedure with attention to the following points:

- (1) Ensure that the handbrake cables are routed correctly and will not contact any suspension components.
- (2) Adjust the handbrake as previously described.



View showing the location of the handbrake adjustment point, 1986 four wheel drive model shown.



View of the handbrake assembly removed from the vehicle.

TO REMOVE AND INSTALL HANDBRAKE LEVER

- (1) Remove the centre console as described in the Body section.
- (2) Remove the locknut and the adjusting nut from the equaliser.
- (3) Remove the equaliser from the handbrake cables.
- (4) Disconnect the warning lamp switch wiring connector by pulling on the connector not the wires.
- (5) Remove the bolts retaining the handbrake assembly to the vehicle floor and remove the handbrake assembly from the vehicle.

Installation is a reversal of the removal procedure with attention to the following point:

Adjust the handbrake as previously described.

8. BRAKE PEDAL

TO ADJUST PEDAL HEIGHT AND FREE PLAY

1979–1984 and Utility Models

- (1) Check that the free play of the brake pedal is within 5–11 mm and that the distance between the clevis pin and the front section of the pedal mounting bracket is 175 mm.

(2) If necessary, loosen the locknut on the stop lamp switch, disconnect the wiring connector by pulling on the connector not the wires and screw the switch in or out to achieve the correct pedal height.

(3) Loosen the locknut of the pushrod, and screw the pushrod in or out to achieve the correct free play.

(4) Tighten the locknuts securely and connect the wiring connector.

1985–1987 Sedan and Station Wagon Models

- (1) Check that the free play of the brake pedal is within 5–11 mm and that the distance between the clevis pin and the front section of the pedal mounting bracket is 146.5 mm.

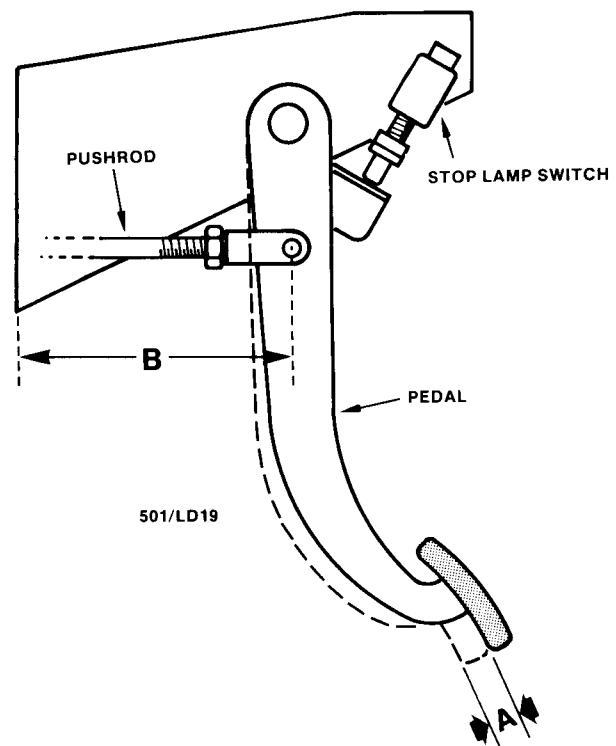


Illustration showing the pedal height and free play measurement points. A = free play. B = pedal height. Refer to text for specifications.

- (2) If necessary, loosen the locknut on the stop lamp switch, disconnect the wiring connector by pulling on the connector not the wires and screw the switch in or out to achieve the correct pedal height.

(3) Loosen the locknut on the pushrod, and screw the pushrod in or out to achieve the correct free play.

(4) Tighten the locknuts securely and connect the wiring connector.

TO REMOVE AND INSTALL

- (1) Remove the lower trim panel from the dashboard.

(2) Remove the nuts from the pedal shaft and the clutch cable support bracket on 1985–1987 Sedan and Station Wagon models or the snap ring from the pedal shaft on 1979–1984 and Utility models, and withdraw the clutch pedal with the cable attached.

(3) Remove the clip from the clevis on the brake pushrod and remove the clevis pin from the clevis.

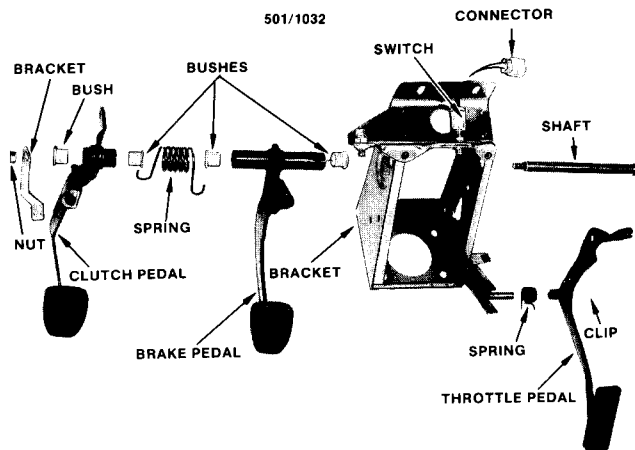
(4) Withdraw the pedal shaft and withdraw the brake pedal, return spring and bushes.

(5) Inspect the bushes for wear, renew the bushes if necessary.

Installation is a reversal of the removal procedure with attention to the following points:

- (1) Ensure that the return spring is correctly located.

(2) Adjust the pedal height and free play as previously described.



Dismantled view of the pedal assembly, 1986 model shown.

9. PROPORTIONING VALVE

The proportioning valve is not repairable and must be renewed if found to be faulty.

TO REMOVE AND INSTALL

(1) Raise the rear of the vehicle and support it on chassis stands.

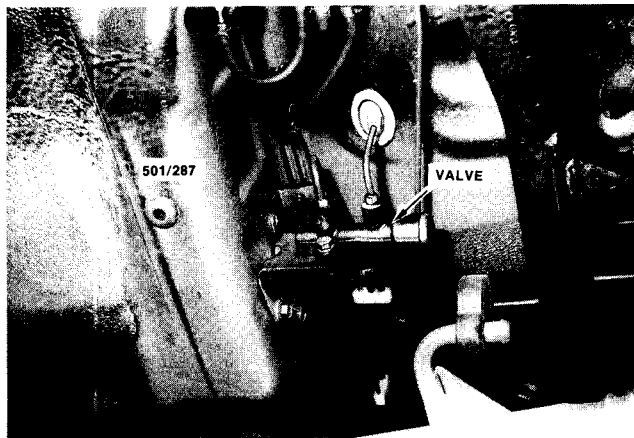
(2) Place a suitable container under the proportioning valve and loosen the flare nuts retaining the brake pipes to the valve.

(3) Remove the bolts retaining the mounting bracket to the vehicle and remove the valve and bracket from the vehicle.

Installation is a reversal of the removal procedure with attention to the following points:

(1) Tighten the brake pipe flare nuts securely. Installation may be made easier if the brake pipes are loosely installed to the valve before the valve is installed to the vehicle.

(2) Bleed the brakes as described later in this section.



Installed view of the proportioning valve, 1986 four wheel drive model shown.

10. HILL HOLDER VALVE (HHV)

The Hill Holder Valve (HHV) is not repairable and must be renewed if found to be faulty.

TO ADJUST

(1) Ensure that the clutch cable is adjusted correctly, refer to the Clutch section if necessary.

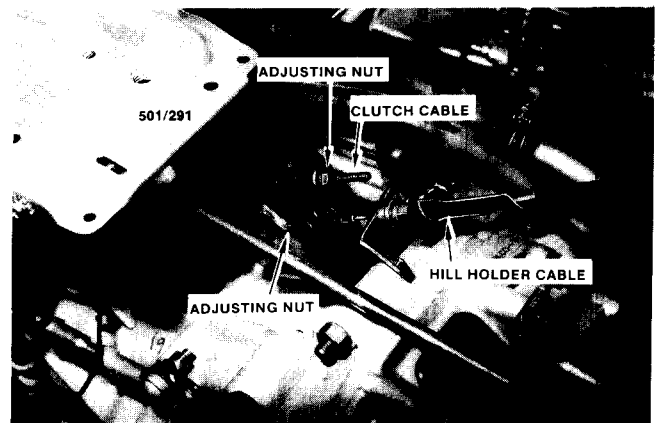
(2) Locate the vehicle on an incline of more than 3 deg gradient, facing uphill.

(3) Check the operation of the HHV as follows:
The vehicle should move off from rest smoothly when the clutch is released without the brakes holding on or the vehicle slipping downhill.

(4) If the brakes hold on when the clutch is released and the vehicle starts to move off, loosen the locknut at the transaxle end of the cable and turn the adjusting nut half a turn at a time to lengthen the cable.

(5) If the vehicle slips downhill when the clutch is released, loosen the locknut and turn the adjusting nut half a turn at a time to shorten the cable.

(6) Tighten the locknut securely when the operation of the HHV is satisfactory.



Installed view of clutch and HHV cables, 1986 model shown.

TO REMOVE AND INSTALL

(1) Drain the brake fluid from the master cylinder and place a suitable container under the HHV.

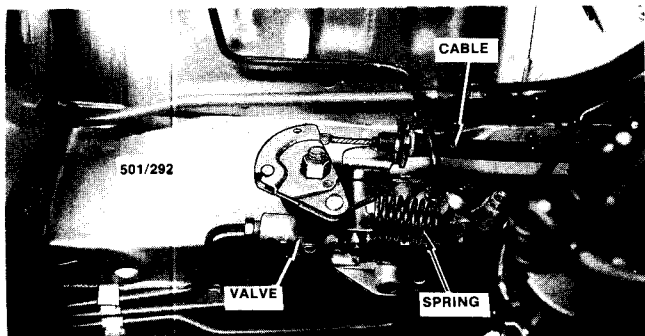
(2) Remove the clip retaining the outer cable to the HHV bracket, pull the outer cable back to allow the inner cable to be withdrawn from the bracket and disconnect the inner cable from the HHV.

(3) Loosen the flare nuts retaining the brake pipes to the HHV and withdraw the brake pipes from the valve.

(4) Remove the bolts retaining the HHV to the chassis and remove the HHV from the vehicle.

Installation is a reversal of the removal procedure with attention to the following points:

(1) Tighten the brake pipe flare nuts securely. Installation may be made easier if the brake pipes are



Installed view of the HHV, 1986 model shown.

loosely installed to the HHV before it is installed to the vehicle.

(2) Bleed the brakes as described later in this section.

(3) If necessary, adjust the HHV cable as previously described.

11. HYDRAULIC SYSTEM

TO BLEED

Bleeding the hydraulic system is not a routine maintenance operation and should only be necessary when some portion of the hydraulic system has been disconnected or fluid has been drained off, thereby allowing air to enter the system.

The brake fluid in the system should be changed at regular intervals, refer to the Lubrication and Maintenance section. The procedure for changing the brake fluid and bleeding the system is similar with attention to the notes in the text. Always store brake fluid in an air tight container as moisture can be absorbed by the fluid thereby reducing the serviceability of the fluid. Do not mix conventional and silicone brake fluid.

(1) Fill the fluid reservoir on the master cylinder with clean brake fluid of the specified type and maintain the level to at least half full during the bleeding operation.

NOTE: If changing the fluid, drain the fluid from the reservoir, clean the reservoir and fill it with clean fluid.

On 1979-1984 and Utility model master cylinders, it is possible to drain the master cylinder by loosening the bleeder valves and pumping the brake pedal to drain the fluid from the cylinder, taking care not to completely empty the reservoir thereby allowing air to enter the system. On later model master cylinders, it is necessary to syphon the fluid from the reservoirs.

(2) Bleed the brakes in the following sequence: 1979-1984 and Utility models.

1. right rear, 2. left front, 3. left rear, 4. right front.
1985-1987 Sedan and Station Wagon models.

1. left front, 2. right rear, 3. right front, 4. left rear.

(3) Attach a transparent bleeder tube to the first bleeder valve in the sequence and allow the free end of the tube to be immersed in a jar containing a small amount of brake fluid.

(4) With the aid of an assistant, pump the brake pedal several times and with the brake pedal depressed, open the bleeder valve. Close the bleeder valve whilst fluid and air is escaping from the bleeder tube to maintain pressure in the system and prevent air being taken back into the system. Allow the pedal to return slowly and remain in the returned position for two-three seconds. Repeat this step until clear fluid containing no air bubbles flows from the bleeder tube.

NOTE: If changing the brake fluid, continue bleeding until clean fluid flows from the bleeder tube.

(5) Carry out the bleeding operation on the remaining bleeder valves in the system, working in the sequence previously described.

NOTE: Do not allow the fluid in the reservoir to fall below half full at any time during the bleeding operation or air may enter the system and the bleeding operation will have to be carried out again from the beginning. Always use new fluid for topping up the reservoir.

(6) After the bleeding operation, the brake pedal should be firm when depressed with no evidence of sponginess. Ensure that all the bleeder valves are tight.

NOTE: If sponginess is evident after the bleeding operation, it may be necessary to pressure bleed the brake system to expel all traces of air from the lines. This is best entrusted to an authorised dealer or brake specialist.

(7) Top up the master cylinder reservoir with clean brake fluid of the specified type.



Method of bleeding air from the hydraulic brake system.