SECTION 06-04 Brakes, Rear Disc

VEHICLE APPLICATION

Taurus / Sable.

DESCRIPTION

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

The rear disc brakes consist of solid full cast rotors and hydraulically activated caliper assemblies with integral mechanically (cable) operated parking brake mechanisms.

Except for the parking brake mechanism, the rear caliper assembly is similar to the pin slider front brake caliper. The added parking brake lever on the back of the caliper is cable-operated by the parking brake pedal located below the instrument panel, similar to rear drum brake installations. The caliper parking brake mechanism is self-adjusting.

DESCRIPTION (Continued)

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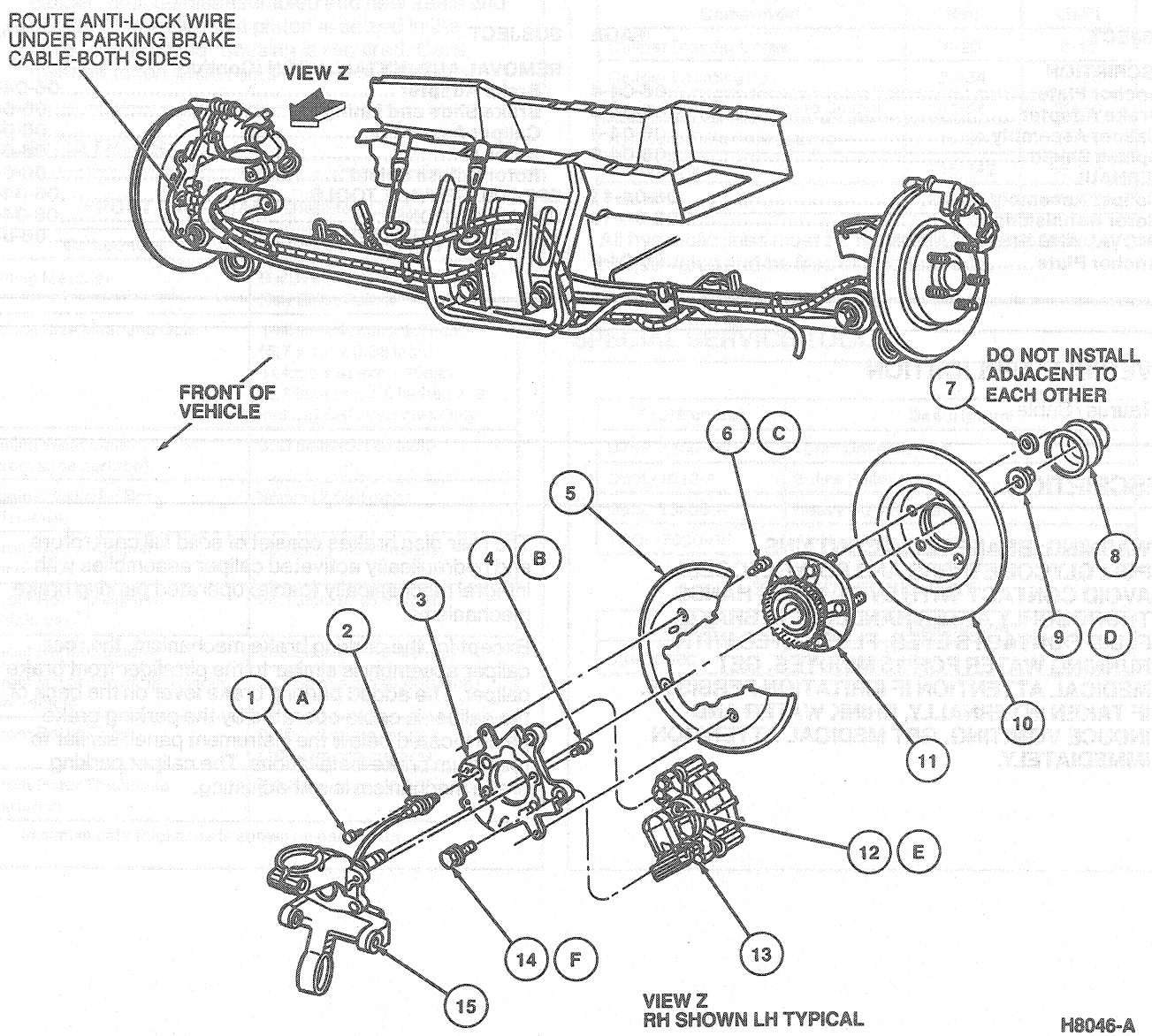

Item	Part Number	Description
1A	N605518-S100	Bolt
2	2C216 (LH) 2C190 (RH)	Anti-Lock Sensor Assy
3	2C101 (LH) 2C100 (RH)	Disc Brake Adapter
4B	N805086-S100	Bolt (4 Req'd)
5	2C028	Splash Shield
6C	N602726-S2	Bolt (3 Req'd)
7	W623485-S2	Retainer Nut (2 Req'd)
8	1N135	Dust Cap
9D	2B423	Nut
10	2C026	Rotor
11	2B664	Hub Assy

(Continued)

Item	Part Number	Description
12E	—	Bleed Screw
13	2K327 (RH) 2K328 (LH)	Caliper Assy
14F	N805163-S150	Bolt (2 Req'd)
15		Knuckle Assy
A		Tighten to 4.5-6.8 N·m (3-5 Lb-Ft)
B		Tighten to 59-81 N·m (44-60 Lb-Ft)
C		Tighten to 8-12 N·m (6-9 Lb-Ft)
D		Tighten to 255-345 N·m (188-254 Lb-Ft)

(Continued)

DESCRIPTION (Continued)

Item	Part Number	Description
E		Tighten to 8-13 N·m (6-10 Lb-Ft)

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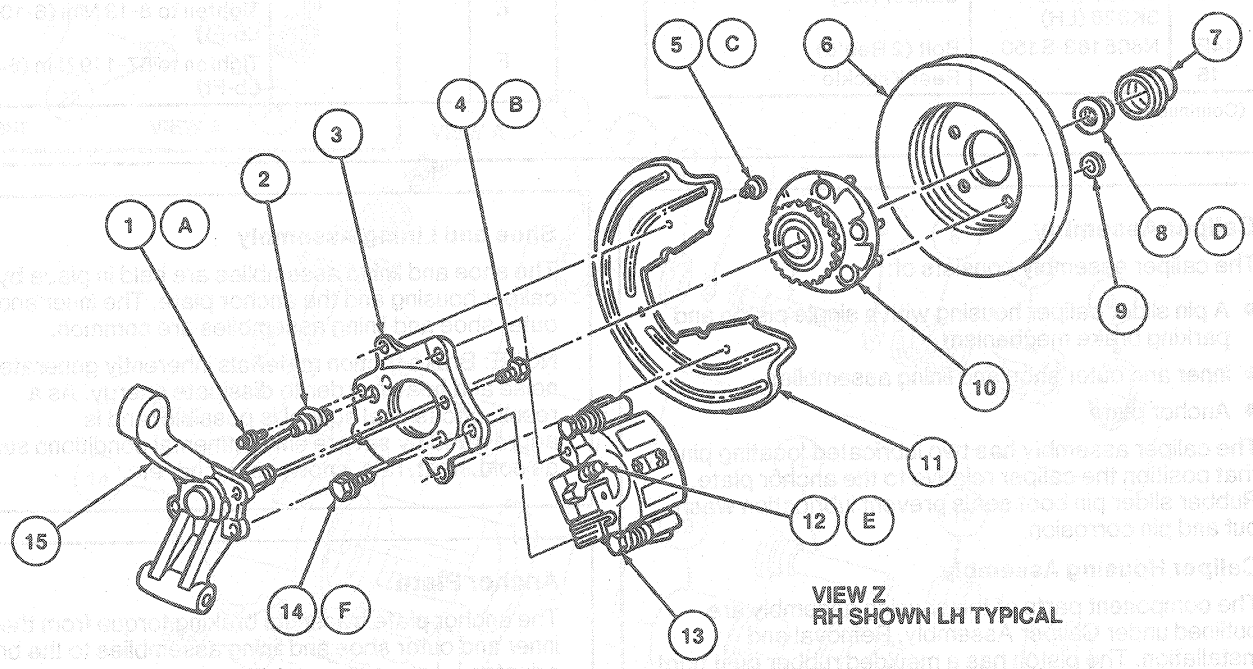
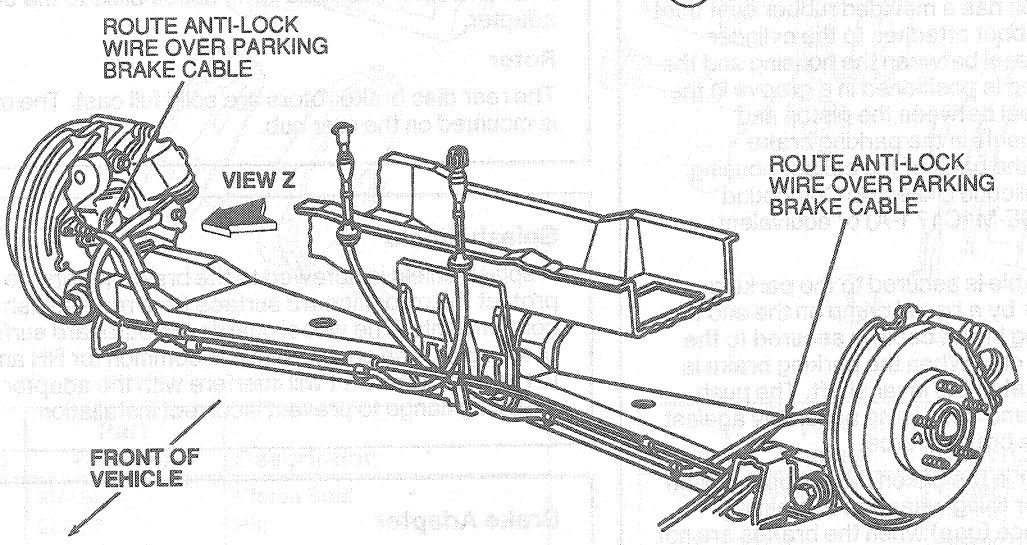
Item	Part Number	Description
F		Tighten to 87-119 N·m (64-88 Lb-Ft)

TH8046A

Station Wagon





H8047-A

Item	Part Number	Description
1A	N605518-S100	Bolt
2	2C216 (LH) 2C190 (RH)	Anti-Lock Sensor Assy

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Item	Part Number	Description
3	2C100 (RH) 2C101 (LH)	Disc Brake Adapter
4B	N805086-S100	Bolt (4 Req'd)
5C	N602726-S2	Bolt (3 Req'd)

(Continued)

DESCRIPTION (Continued)

Item	Part Number	Description
6	2C026	Rotor
7	1N135	Dust Cap
8D	4B423	Nut
9	W623485-S2	Retainer Nut (2 Req'd)
10	2B664	Hub Assy
11	2C028	Splash Shield
12E	—	Bleed Screw
13	3K327 (RH) 3K328 (LH)	Caliper Assy
14F	N805163-S150	Bolt (2 Req'd)
15	—	Rear Knuckle

(Continued)

Item	Part Number	Description
A		Tighten to 4.5-6.8 N·m (3-5 Lb-Ft)
B		Tighten to 59-81 N·m (44-60 Lb-Ft)
C		Tighten to 8-12 N·m (6-9 Lb-Ft)
D		Tighten to 255-345 N·m (188-254 Lb-Ft)
E		Tighten to 8-13 N·m (6-10 Lb-Ft)
F		Tighten to 87-119 N·m (64-88 Lb-Ft)

TH8047A

Caliper Assembly

The caliper assembly consists of:

- A pin slider caliper housing with a single piston and parking brake mechanism
- Inner and outer shoe and lining assemblies
- Anchor plate

The caliper assembly has two lubricated locating pins that position the caliper relative to the anchor plate. Rubber slider pin boot seals prevent lubrication wash out and pin corrosion.

Caliper Housing Assembly

The component parts of the housing assembly are outlined under Caliper Assembly, Removal and Installation. The piston has a moulded rubber dust boot on its outer end. The boot attaches to the cylinder bore and provides a seal between the housing and the piston. A rubber O-ring is positioned in a groove in the piston to provide a seal between the piston and housing. The components in the parking brake mechanism cavity in the back of the caliper housing are lubricated with Silicone Dielectric Compound D7AZ-19A331-A (ESE-M1C171-A) or equivalent silicone grease.

The parking brake cable is secured to the parking brake operating lever by a barrel crimp on the end of the cable. The parking brake cable is secured to the caliper by a retaining clip. When the parking brake is applied, the cable rotates the lever shaft. The push rod drives the piston and shoe lining assembly against the rotor, creating the braking force.

An automatic adjuster in the piston moves on the push rod to compensate for lining wear and to maintain lining-to-rotor clearance (gap) when the brakes are not applied.

Shoe and Lining Assembly

The shoe and lining assemblies are held in place by the caliper housing and the anchor plate. The inner and outer shoe and lining assemblies are common.

NOTE: Brake friction materials inherently generate noise and heat in order to dissipate energy. As a result, occasional squeal is possible, and is aggravated by severe environmental conditions such as cold, heat, rain, snow, salt, mud, etc.

Anchor Plate

The anchor plate transmits braking torque from the inner and outer shoe and lining assemblies to the brake adapter.

Rotor

The rear disc brake rotors are solid full cast. The rotor is mounted on the rear hub.

Splash Shield

A splash shield is screwed to the brake adapter to protect the rotor inboard surface from road splash contaminants. The wheel guards the outboard surface of the rotor. The splash shield is common for RH and LH and has tabs that will interfere with the adapter mounting flange to prevent incorrect installation.

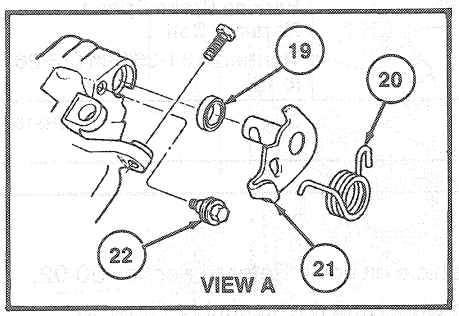
Brake Adapter

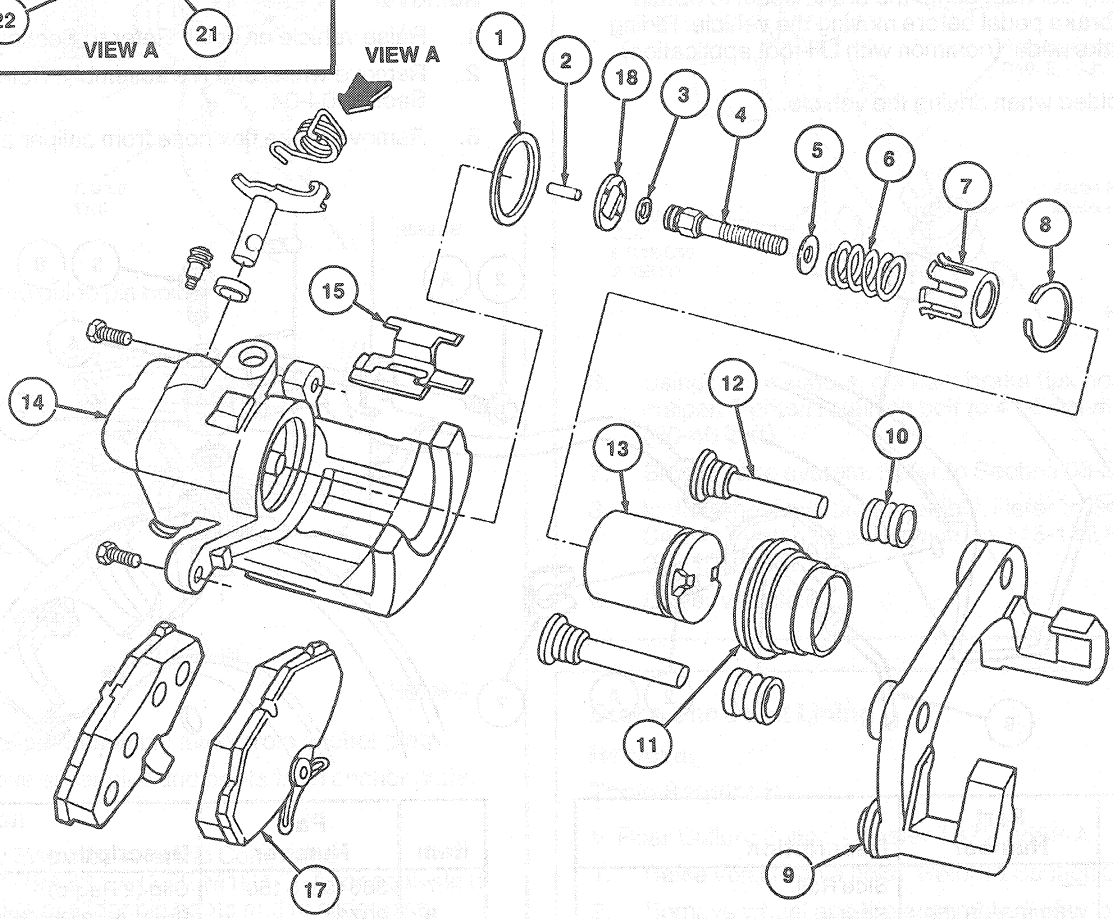
The brake adapter is attached to the rear knuckle by four bolts. The adapters are not interchangeable and are stamped RH and LH.

REMOVAL AND INSTALLATION

Caliper Assembly

During service, handle the caliper assembly and rotor in such a way as to avoid nicking, scratching or contaminating the brake linings or deforming the rotor.





H5166-E

Item	Part Number	Description
1	2N182	Piston Seal
2	2L627	Pin
3	2L594	O-Ring Seal
4	2N139	Push Rod
5	1N020	Flat Washer
6	2L396	Spring
7	2A787	Spring Cage
8	2A746	Snap Ring (Circlip)
9	2B511 (RH) 2B512 (LH)	Anchor Plate

(Continued)

Item	Part Number	Description
10	2A492	Slider Pin Boot Seal (2 Req'd)
11	2206	Piston Dust Boot
12	2B296	Slider Pin (2 Req'd)
13	2B588	Piston
14	2N122 (RH) 2N123 (LH)	Caliper Housing
15	—	Anti-Rattle Clip
16A	2N386	Slider Pin Pinch Bolt (2 Req'd)

(Continued)

REMOVAL AND INSTALLATION (Continued)

Item	Part Number	Description
17	2218	Shoe and Lining Assy
18	2N183	Locating Washer
19	2B595	Parking Brake Lever Shaft Seal
20	2L642	Parking Brake Lever Return Spring
21	2A637 (RH) 2A638 (LH)	Parking Brake Lever
22	2A795	Parking Brake Spring Retainer Bolt
A		Tighten to 31-35 N·m (23-26 lb-ft)

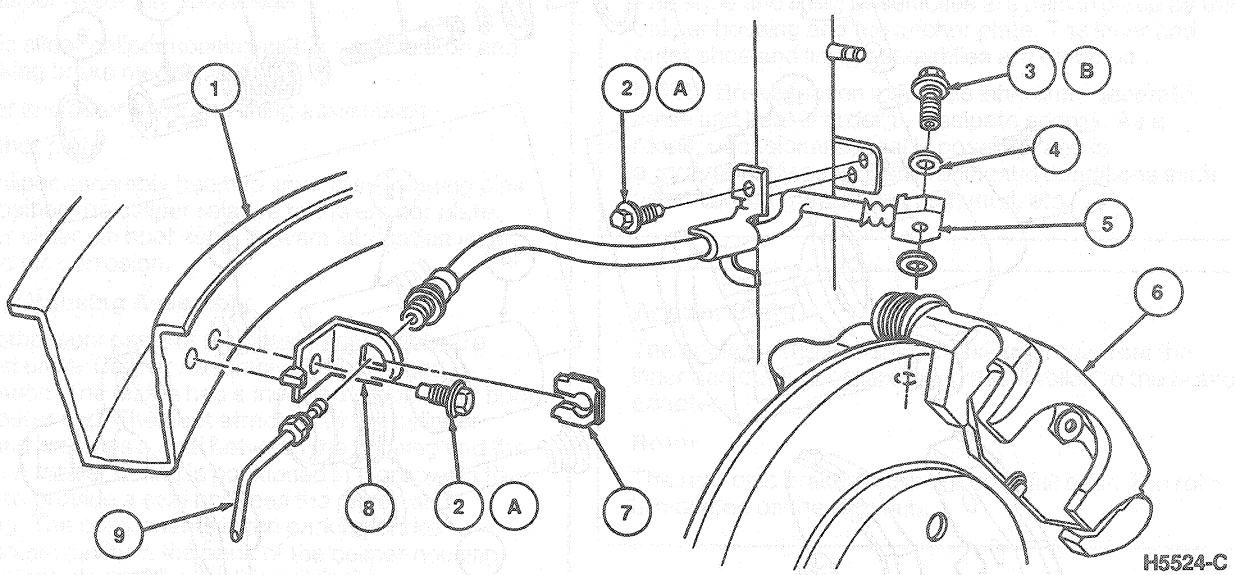
(Continued)

TH5166E

After any service, pump the brake pedal to obtain a firm brake pedal before moving the vehicle. Riding the brake pedal (common with LH-foot application) must be avoided when driving the vehicle.

Removal

1. Raise vehicle on hoist. Refer to Section 00-02.
2. Remove wheel and tire assembly. Refer to Section 04-04.
3. Remove brake flex hose from caliper assembly.



H5524-C

Item	Part Number	Description
1	—	Side Rail
2A	W611635-S150	Screw
3B	N801052-S100	Screw
4	388949-S	Washer (2 Req'd)
5	2A442 RH 2A478 LH	Hose Assy
6	2K328	Caliper Assy
7	386493-S150	Clip (2 Req'd)
8	2073	Bracket (2 Req'd)
9	2C287	Brake Line Assy
A		Tighten to 11-16 N·m (8-11 Lb-Ft)
B		Tighten to 40-60 N·m (30-45 Lb-Ft)

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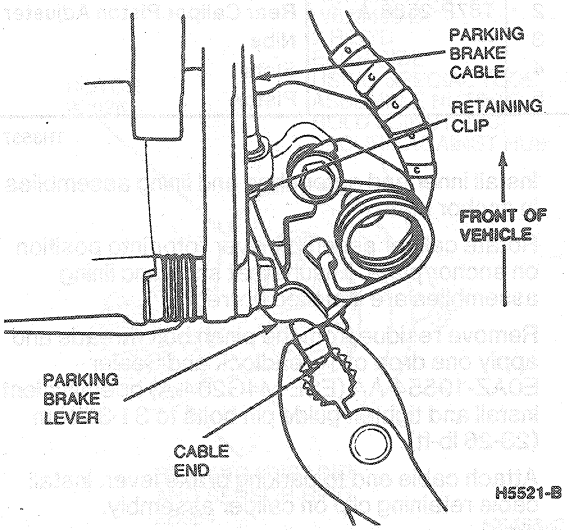
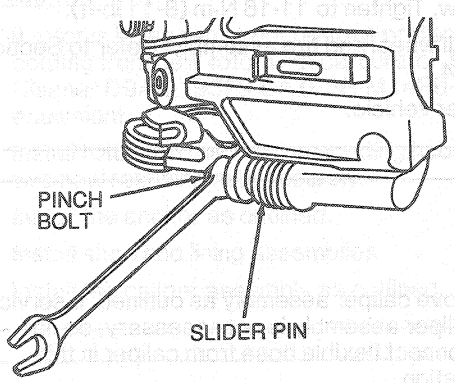
TH5524C

REMOVAL AND INSTALLATION (Continued)

4. Remove retaining clip from parking brake at caliper.
   Disengage parking brake cable end from lever arm.



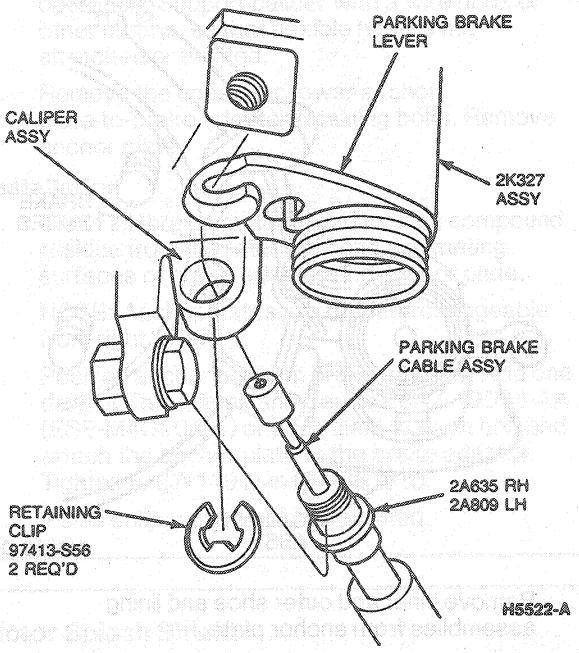
5. Remove guide pin bolts.



6. Lift caliper assembly away from anchor plate.
7. Remove slider pins and boots from anchor plate.

Installation

1. Apply Silicone Dielectric Compound D7AZ-19A331-A (ESE-M1C171-A) or equivalent to inside of slider pin boots and to slider pins.
2. Position slider pins and boots in anchor plate.
3. Position caliper assembly on anchor plate. Ensure that shoe and lining assemblies are installed correctly.
4. Remove residue from the pinch bolt threads and apply one drop of Threadlock and Sealer E0AZ-19554-AA (ESE-M4G204-A) or equivalent. Install guide pin bolts and tighten to 31-35 N·m (23-26 lb-ft).
5. Attach cable end to parking brake lever. Install cable retaining clip on caliper assembly.



6. Using new washers, connect brake flex hose to caliper. Tighten retaining bolt to 41-54 N·m (30-40 lb-ft).
7. Bleed brake system. Refer to Section 06-09.
8. Install wheel and tire assembly. Refer to Section 04-04. Tighten wheel lug nuts to 115-142 N·m (85-105 lb-ft).
9. Lower vehicle.

Brake Shoe and Lining

Removal

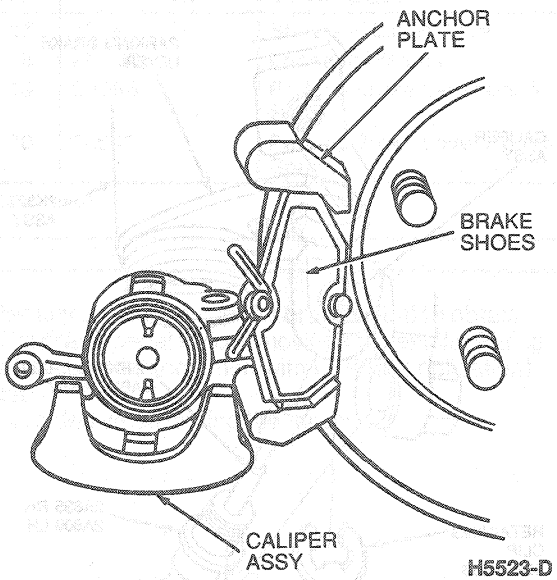
Tools Required:

- Rear Caliper Piston Adjuster T87P-2588-A

1. Raise vehicle on a hoist. Refer to Section 00-02.
2. Remove wheel and tire assembly. Refer to Section 04-04.
3. Remove screw retaining brake hose bracket to shock absorber bracket.
4. Remove retaining clip from parking brake cable at caliper. Remove cable end from parking brake lever.
5. Remove upper guide pin bolt.

REMOVAL AND INSTALLATION (Continued)

6. Rotate caliper away from rotor.

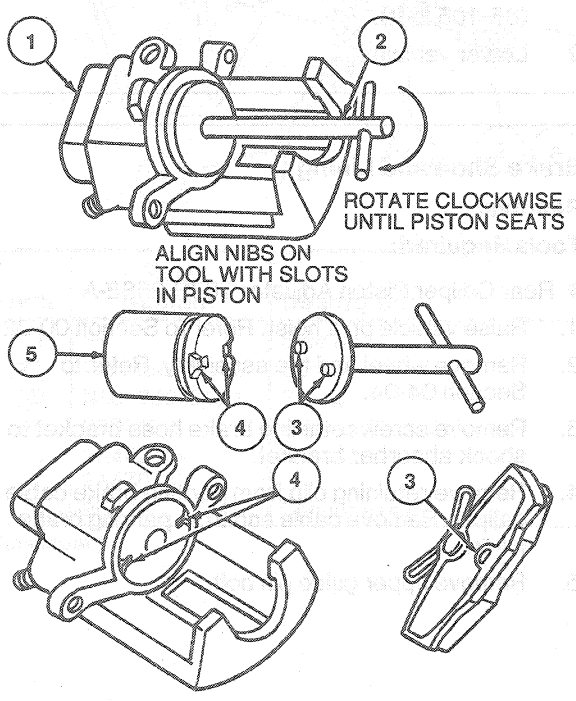


7. Remove inner and outer shoe and lining assemblies from anchor plate.

Installation

NOTE: Ensure that one of the two slots in piston face is positioned so it will engage nib on brake shoe.

1. Using Rear Caliper Piston Adjuster T87P-2588-A rotate piston clockwise until it is fully seated.



Item	Part Number	Description
1	—	Caliper Housing
2	T87P-2588-A	Rear Caliper Piston Adjuster
3	—	Nibs
4	—	Slots
5	—	Piston

TH6537D

2. Install inner and outer shoe and lining assemblies in anchor plate.
3. Rotate caliper assembly over rotor into position on anchor plate. Ensure that shoe and lining assemblies are installed correctly.
4. Remove residue from the pinch bolt threads and apply one drop of Threadlock and Sealer E0AZ-19554-AA (ESE-M4G204-A) or equivalent. Install and tighten guide pin bolts to 31-35 N·m (23-26 lb-ft).
5. Attach cable end to parking brake lever. Install cable retaining clip on caliper assembly.
6. Position brake flex hose and bracket assembly to shock absorber bracket and install retaining screw. Tighten to 11-16 N·m (8-11 lb-ft).
7. Install wheel and tire assembly. Refer to Section 04-04.
8. Lower vehicle.

Rotor

Removal

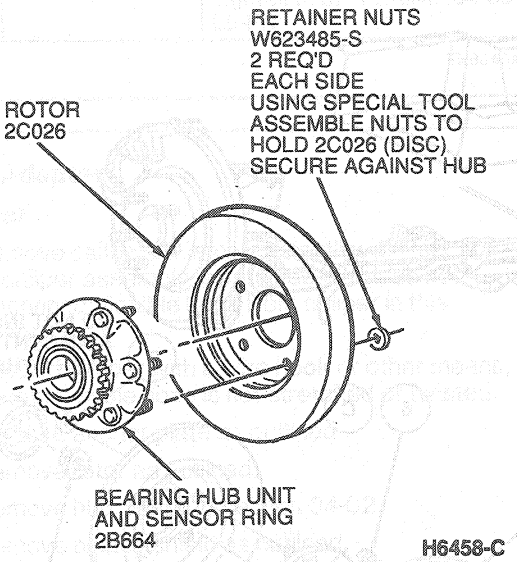
1. Remove caliper assembly as outlined. If service to caliper assembly is not necessary, do not disconnect flexible hose from caliper in this operation.

Support caliper with a wire hook or other means, so that flexible hose is not stretched or twisted.

2. Remove anchor plate as outlined.

REMOVAL AND INSTALLATION (Continued)

3. Remove two retainer nuts. Remove rotor from rear hub.



Installation

1. If rotor is being replaced, remove protective coating from new rotor with carburetor Tune-Up Cleaner D9AZ-19579-BA (ESR-M14P9-A) or equivalent.
2. Install rotors on their corresponding hubs. Install two new retaining nuts securely.
3. Install the anchor as outlined.
4. Install shoe and lining assemblies.
5. Install the caliper assembly as outlined.

Anchor Plate

Removal

NOTE: Anchor plate removal is required to remove the rotor.

1. Remove caliper assembly as outlined. If service to the caliper assembly is not necessary, do not disconnect flexible hose from caliper in this operation. Support caliper with a wire hook or other means, so that flexible hose is not stretched or twisted.
2. Remove the upper and lower anchor plate-to-brake adapter retaining bolts. Remove anchor plate.

Installation

1. Clean all foreign material and locking compound residue from the retaining bolts and mating surfaces of brake adapter and anchor plate.

   NOTE: Anchor plates are **not** interchangeable from right to left.
2. Position anchor plate on brake adapter. Add one drop of Threadlock and Sealer E0AZ-19554-AA (ESE-M4G204-A) or equivalent to each bolt and attach the anchor plate to the brake adaptor. Tighten to 87-119 N·m (64-88 lb-ft).
3. Install caliper assembly as outlined.

Rotor Splash Shield

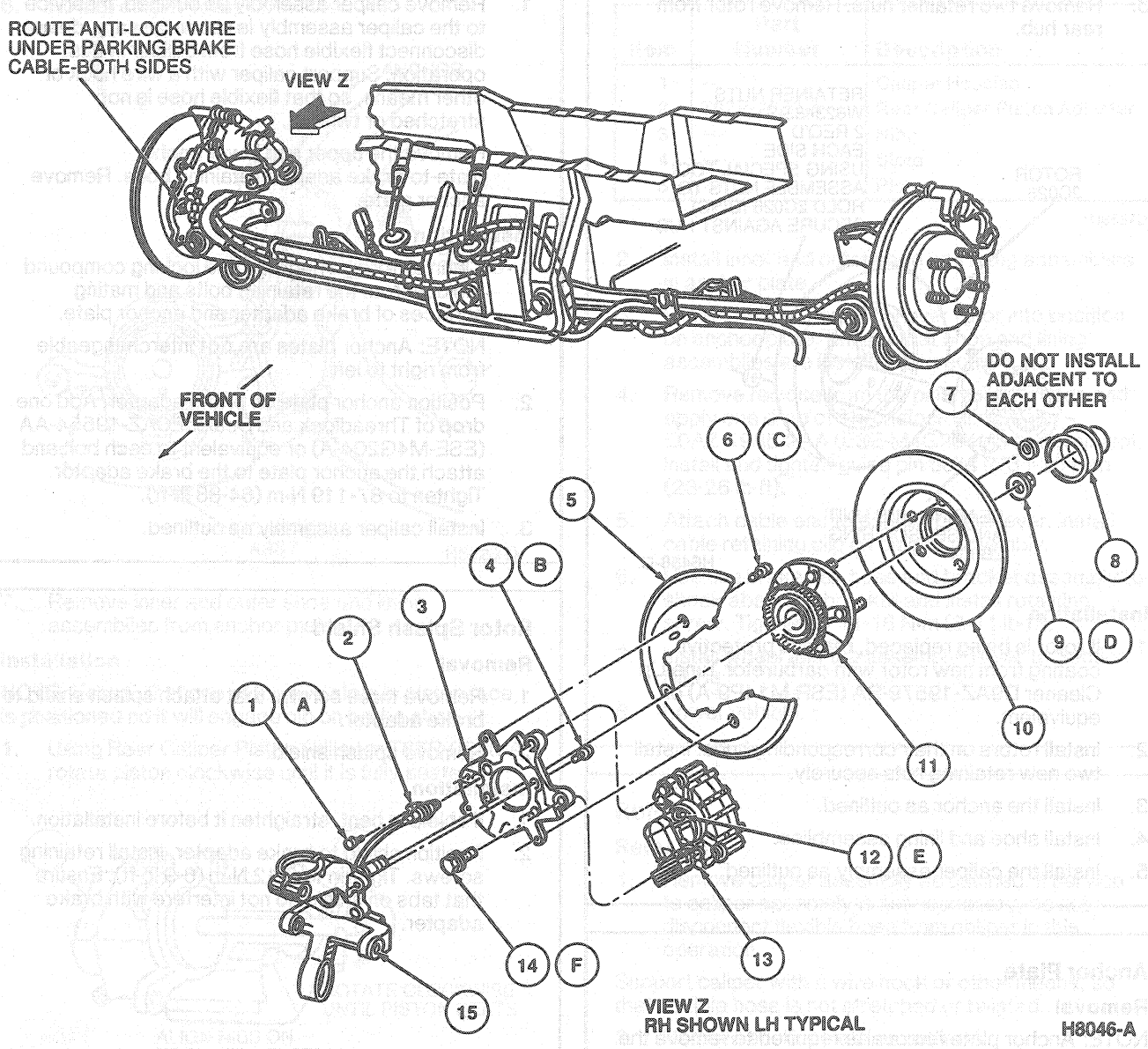
Removal

1. Remove three screws that attach splash shield to brake adapter.
2. Remove splash shield.

Installation

1. If shield is bent, straighten it before installation.
2. Position shield to brake adapter. Install retaining screws. Tighten to 8-12 N·m (6-9 lb-ft). Ensure that tabs on shield do not interfere with brake adapter.

REMOVAL AND INSTALLATION (Continued)



VIEW Z
RH SHOWN LH TYPICAL

H8046-A

Item	Part Number	Description
1A	N605518-S100	Bolt
2	2C216 (LH) 2C190 (RH)	Anti-Lock Sensor Assy
3	2C101 (LH) 2C100 (RH)	Disc Brake Adapter
4B	N805086-S100	Bolt (4 Req'd)
5	2C028	Splash Shield
6C	N602726-S2	Bolt (3 Req'd)
7	W623485-S2	Retainer Nut (2 Req'd)
8	1N135	Dust Cap
9D	2B423	Nut
10	2C026	Rotor
11	2B664	Hub Assy
12E	—	Bleed Screw

(Continued)

Item	Part Number	Description
13	2K327 (RH) 2K328 (LH)	Caliper Assy
14F	N805163-S150	Bolt (2 Req'd)
15		Knuckle Assy
A		Tighten to 4.5-6.8 N·m (3-5 Lb-Ft)
B		Tighten to 59-81 N·m (44-60 Lb-Ft)
C		Tighten to 8-12 N·m (6-9 Lb-Ft)
D		Tighten to 255-345 N·m (188-254 Lb-Ft)
E		Tighten to 8-13 N·m (6-10 Lb-Ft)

(Continued)

REMOVAL AND INSTALLATION (Continued)

Item	Part Number	Description
F		Tighten to 87-119 N·m (64-88 Lb-Ft)

TH8046A

Brake Adapter

Removal

1. Remove caliper assembly as outlined. If service to caliper assembly is not necessary, do not disconnect flexible hose from caliper in this operation.

   Support caliper with a wire hook or other means, so that flexible hose is not stretched or twisted.
2. Remove anchor plate as outlined.
3. Remove rotor as outlined.
4. Remove hub. Refer to section 04-02.
5. Remove splash shield as outlined.
6. Remove four retaining bolts and remove adapter.

Installation

NOTE: Adapters are not interchangeable from right to left and are stamped RH and LH.

1. Install brake adapter on knuckle.
2. Install four retaining bolts and tighten to 59-81 N·m (44-60 lb-ft).
3. Install bearing hub unit, nut and washer assembly. Tighten to 255-345 N·m (188-254 lb-ft).
4. Install the hub. Refer to section 04-02.
5. Install the splash shield, rotor, anchor plate and caliper assembly as outlined.

OVERHAUL

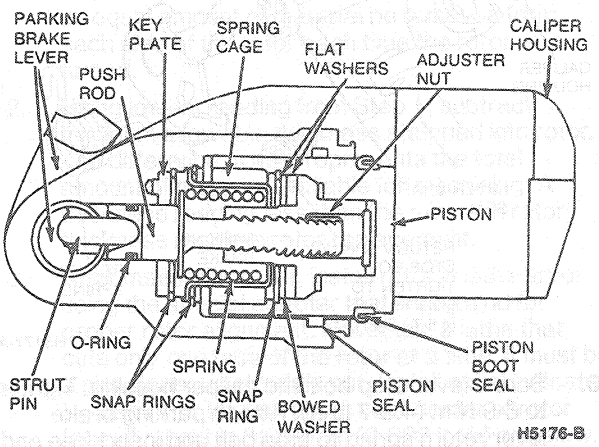
Caliper Assembly

Tools Required:

- Rear Caliper Piston Adjuster T87P-2558-A
- Rear Caliper Spring Compressor Set T87P-2588-B

Disassembly

1. Remove caliper assembly as outlined.
2. Mount caliper in a vise. Use vise-jaw protectors.
3. Using Rear Caliper Piston Adjuster T87P-2588-A, turn piston counterclockwise and remove piston from caliper piston bore.
4. Remove and discard piston dust boot seal and piston seal from caliper bore.



H5176-B

CAUTION: The snap ring (circlip) and spring cover are under spring load. Care should be taken when removing the snap ring (circlip).

5. With suitable snap-ring (circlip) pliers, remove snap ring (circlip) retaining push rod assembly from caliper.
6. From caliper bore, remove spring cover, spring, washer, key plate and pull out push rod and strut pin.
7. Remove and discard O-ring seal from push rod.
8. Remove parking brake lever return spring, unscrew parking brake lever stop bolt and pull parking brake lever out of caliper housing.

Cleaning and Inspection

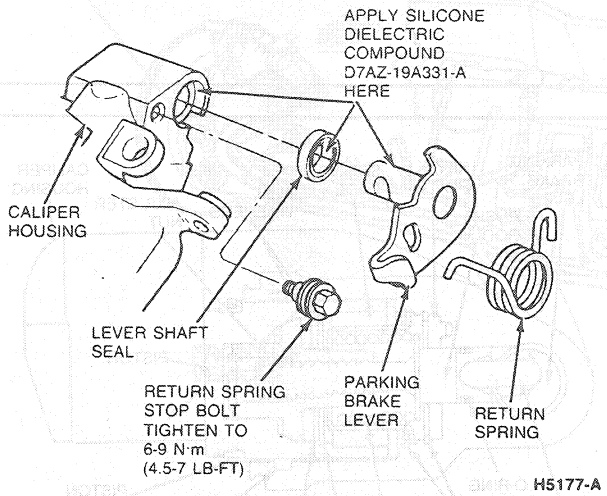
1. Clean all metal parts with isopropyl alcohol. Use clean, dry compressed air to clean out and dry grooves and passages. Ensure caliper bore and component parts are completely free of any foreign material.
2. Inspect caliper bores for damage or excessive wear. If piston is pitted, scored or plating is worn off, replace piston assembly.

Assembly

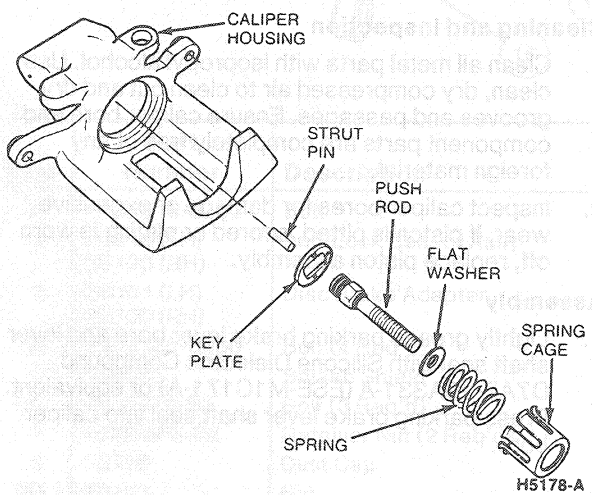
1. Lightly grease parking brake lever bore and lever shaft seal with Silicone Dielectric Compound D7AZ-19A331-A (ESE-M1C171-A) or equivalent. Press parking brake lever shaft seal into caliper bore.

OVERHAUL (Continued)

2. Grease parking brake shaft recess and slightly grease parking brake lever shaft. Insert shaft into bore in caliper housing.

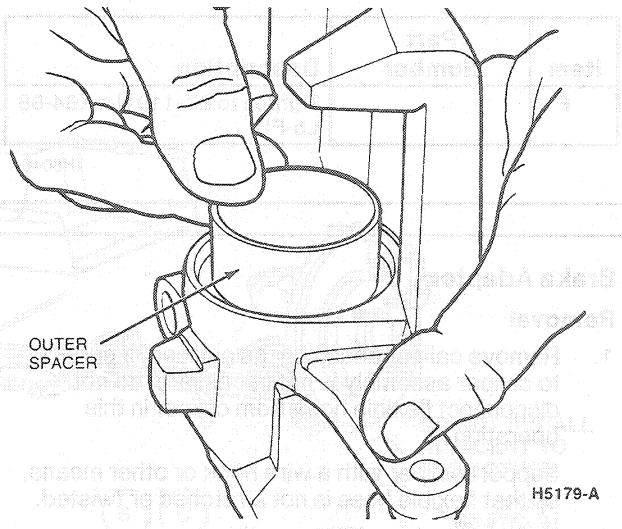


3. Screw lever stop bolt into caliper housing. Tighten to 6-9 N·m (4.5-7 lb-ft). Attach parking brake lever return spring to stop bolt and insert free end into parking brake lever slot.
4. Install a new O-ring seal in groove of push rod. Grease recess at push rod end with Silicone Dielectric Compound D7AZ-19A331-A (ESE-M1C171-A) or equivalent.
5. Position strut pin into caliper housing and in recess of parking brake lever shaft. Insert push rod into push rod bore of caliper housing. Ensure pin is positioned correctly between shaft recess and recess at end of push rod. Place key plate over push rod so that locating nib fits into drilled locating hole in caliper housing. Install flatwasher, push rod, spring and spring cover in order.

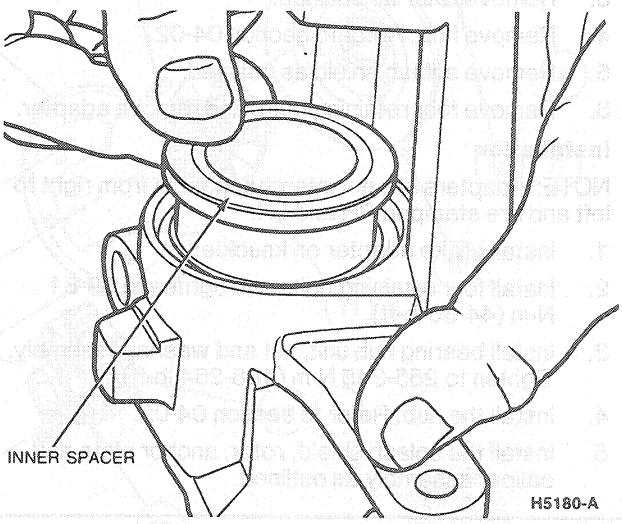


NOTE: Tools used in Steps 6 through 9 are part of Rear Caliper Spring Compressor Set T87P-2588-B.

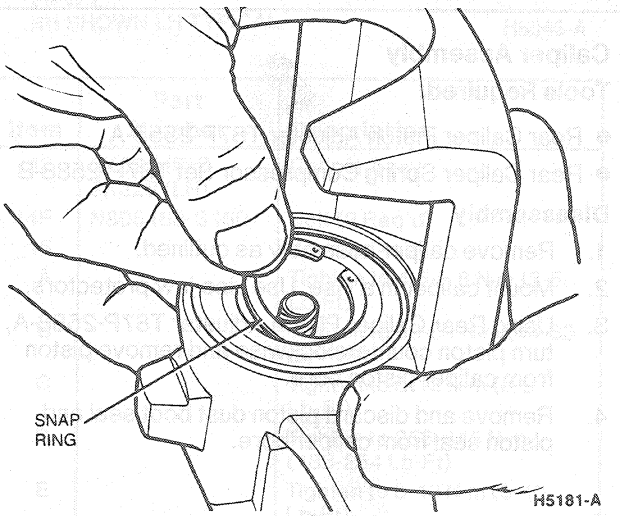
6. Insert outer spacer into piston bore.



7. Insert inner spacer into piston bore.

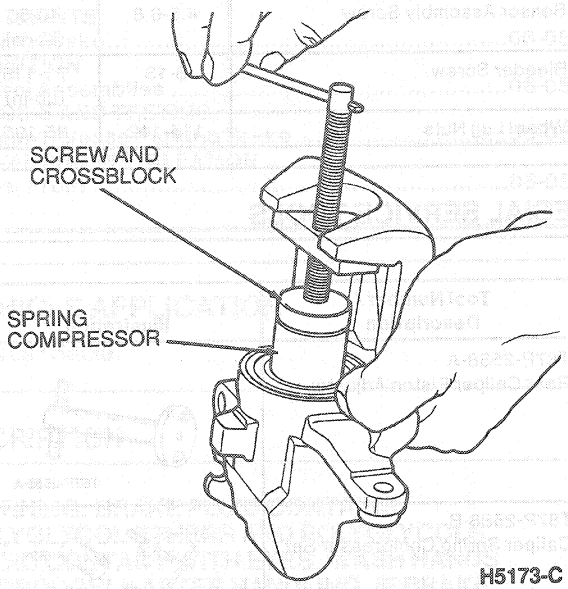


8. Place snap ring inside of inner spacer.



OVERHAUL (Continued)

9. Position spring compressor and screw and crossblock on push rod, and lightly screw tool clockwise to compress spring. Install snap ring (circlip).



CAUTION: Snap ring should click into place. Do not overcompress spring.

10. Install new piston seal in groove in caliper housing after lubricating seal with Heavy-Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A) or equivalent.
11. Coat piston and piston dust boot with Heavy Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A)or equivalent. Install dust boot into piston bore of caliper. Spread dust boot over piston and seat dust boot in piston groove. Rotate piston clockwise using Rear Caliper Piston Adjuster T87P-2588-A or equivalent until piston is fully seated.

    NOTE: Ensure one slot in piston face is positioned so it will engage with nib on brake pad shoe.
12. Install caliper assembly as outlined.

Rotor Refinishing

Tools Required:

- Rotunda Rotor Mounting Adapter 054-0032

The rear disc rotor is a solid full cast. A simplified method of measuring maximum allowable stock removal using a standard hand micrometer eliminates the need for special tools as on previous rear disc rotors. However, a Rotunda Rotor Mounting Adapter 054-00032 or equivalent will be required for use on the brake lathe for refinishing.

All rotor refinishing must adhere to the rule that equal amounts of rotor stock are removed from each braking surface each time a rotor is refinished.

The minimum allowable overall rotor thickness continues to be stamped on the rotor and must not be exceeded.

1. With a suitable micrometer, measure overall thickness of rotor braking surface at four equally spaced points around rotor.

    NOTE: Using a micrometer to measure rotor thickness simplifies the previous rotor measurement procedure, but it is mandatory that an equal amount of material be removed from each side of the rotor each time the rotor is turned.
2. Using lowest reading from Step 1, subtract minimum allowable thickness stamped into rotor. The difference, if any, represents the total amount of material available for machining. A thickness reading less than the minimum rotor thickness requires rotor replacement.
3. After measuring rotor, install rotor in lathe arbor using the special adapter that is required for proper rotor alignment. Never use a lathe that cuts only one face of the rotor at a time. It must be a simultaneous straddle cut. Install a dial indicator to read rotor lateral runout near center of rotor face. If runout is 0.050mm (0.002 inch) or below, proceed to machine rotor. If runout is over 0.050mm (0.002 inch), loosen rotor on arbor, and rotate rotor 90 degrees. Read runout, and if it is below 0.050mm (0.002 inch), proceed to machine the rotor. If runout is still over 0.050mm (0.002 inch), again loosen rotor, and rotate it an additional 90 degrees. Check runout. If runout is 0.050mm (0.002inch) or less, proceed to machine the rotor. If the runout still exceeds 0.050mm (0.002 inch), return rotor to best runout position obtained. If rotor runout can be brought below 0.050mm (0.002 inch), proceed to machine rotor. If rotor cannot be brought below 0.050mm (0.002 inch) runout, it must be replaced.
4. Set cutting tool to just contact high spots on rotor, then adjust cutting tool to minimum depth required to clean up rotor face. Equal material must be removed from each side. Do not exceed allowable stock removal. Clean all cuttings and chips from rotor and lubricate the hub pilot diameter with Disc Brake Caliper Slide Grease D7AZ-19590-A, (ESA-M1C172-A) or equivalent grease prior to installing rotor. Lubrication is required to ease future removal of rotor.

SPECIFICATIONS

BRAKE DIMENSIONS

Description	Specification Metric (USA) [1]
Lining Material	Nuturn 90-085
Lining Size Inner and Outer	93 x 34.5 x 12 (3.66 x 1.36 x 0.47)

(Continued)

SPECIFICATIONS (Continued)

BRAKE DIMENSIONS (Cont'd)

Description	Specification Metric (USA) [1]
Lining Wear Limit (From Shoe Surface)	3.12 (0.123)
Caliper Cylinder Bore Diameter	42.9 (1.69)
Rear Rotor Nominal Thickness	24.0 (0.94)
Rear Rotor [2] Minimum Thickness	12.75 (0.050)
Rear Rotor Diameter Inner Outer	 171 (6.73) 256.5 (10.10)
Rear Rotor Allowable Runout	0.050 (0.002)
Rear Rotor Finish [3]	0.4-3.2um (16-25u in)
Rear Rotor Thickness Variation	0.01 (0.0004)

1 mm (inches) unless specified.
2 Minimum safe thickness is shown on each rotor.
3 um micrometer (u in. micro inches)

TORQUE SPECIFICATIONS

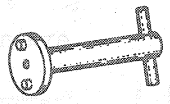
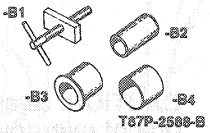
Description	N·m	Lb-Ft
Flex Hose-to-Caliper Retaining Bolt	41-54	30-40
Anchor Plate Retaining Bolts	87-119	64-88
Splash Shield Retaining Screws	8-12	71-106 (Lb-In)
Brake Adapter Retaining Bolts	59-81	44-60
Slider Pin Pinch Bolt	31-35	23-26
Parking Brake Lever Limiting Bolt	6-9	4.5-7
Brake Flex Hose Bracket to Strut	11-16	8-11

(Continued)

TORQUE SPECIFICATIONS (Cont'd)

Description	N·m	Lb-Ft
Hub Retainer and Washer Assembly	255-345	188-254
Sensor Assembly Screw	4.5-6.8	40-60 (Lb-In)
Bleeder Screw	8-13	71-115 (Lb-In)
Wheel Lug Nuts	115-142	85-105

SPECIAL SERVICE TOOLS

Tool Number / Description	Illustration
T87P-2588-A Rear Caliper Piston Adjuster	 T87P-2588-A
T87P-2588-B Caliper Spring Compressor Set	 T87P-2588-B

ROTUNDA EQUIPMENT

Model	Description
054-00032	Rotor Mounting Adapter

SECTION 06-05 Brake System, Parking

VEHICLE APPLICATION

Taurus / Sable.

DESCRIPTION

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

The parking brake system is cable actuated and controlled by an independent foot-operated parking brake control.

Control Assemblies

An independent foot-operated parking brake control actuates the rear wheel brake shoes through a cable system.

The parking brake warning indicator can be actuated by the parking brake control. It warns the driver to release the parking brake control before driving the vehicle. If the indicator remains lit, a brake malfunction has occurred.

The automatic (vacuum) release parking brake control is optional equipment.

On the automatic vacuum-type parking brake system, the vacuum power unit with mounting bracket is bolted to the control assembly.

The vacuum-actuated diaphragm within the unit is connected by a rod to the lower end of the release lever.

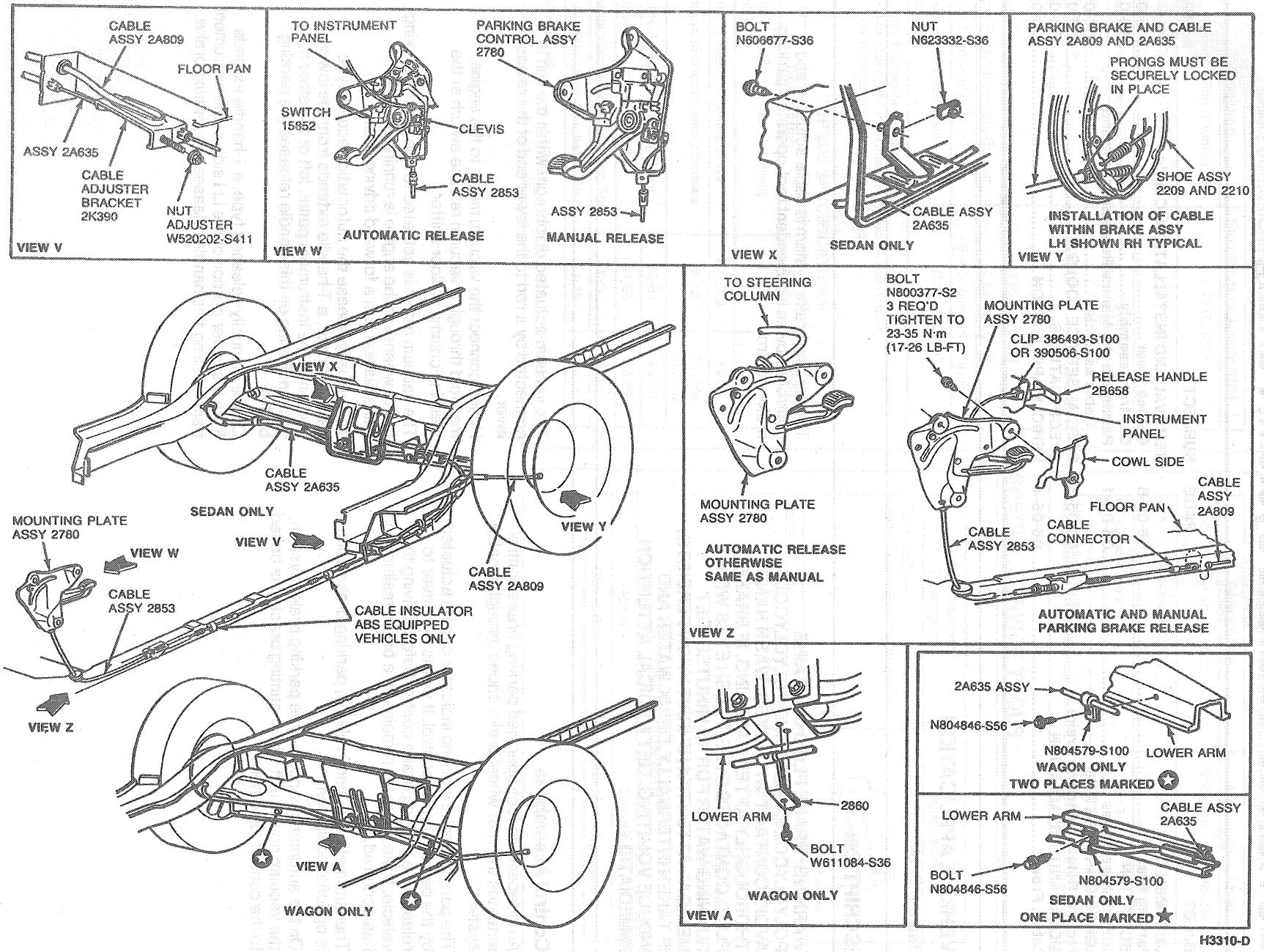
Hoses connect the vacuum motor to the engine manifold through a vacuum release switch at the steering column or floor shifter.

The vacuum motor is actuated to release the parking brake whenever the engine is running and the transmission is in a forward driving gear.

To manually release the automatic vacuum-type parking brake, a T-handle extends from the lower portion of the instrument panel, left of the steering column. Pulling on this handle releases the parking brake.

On the manually-released type, a T-handle extends from the lower portion of the LH side of the instrument panel. Pulling this handle releases the parking brake.

DESCRIPTION (Continued)



DIAGNOSIS AND TESTING

Vacuum Release Parking Brake

Tools Required:

- Rotunda Vacuum Tester 021-00014

Look closely at the operation of the brake linkage as the brake pedal is depressed. Then, check the operation of the brake linkage when the manual release lever is activated. These checks will indicate whether the manual parking brake control linkage is operating properly or requires service or adjustment. Adjustment may be necessary if the parking brake is unable to prevent moderate vehicle movement. Perform tests of the parking brake system and controls after making sure the linkage and manual controls operate properly.

When testing a parking brake vacuum release system, a minimum of 34 kPa (10 in-Hg) should be available at all points where vacuum is applied. This can be checked with a gauge such as Rotunda Vacuum Tester 021-00014 or equivalent.

Failure to maintain 34 kPa (10 in-Hg) during vacuum system tests could be caused by a loose hose connection, resulting in a vacuum leak. When checking for vacuum between two points, trace the hose along its entire routing to ensure it is not crossed with another hose or connected to the wrong connection.

All of the vacuum parking brake control checks are to be performed with the engine running at idle speed.

To detect any leaks in the parking brake vacuum hoses or to find disconnected or improperly connected hoses, listen for a hissing sound along the hose routing.

CAUTION: Do not apply air pressure to the vacuum system under any circumstances because the actuator diaphragm in the parking brake vacuum motor may be damaged.

1. Start engine and run it at idle speed. With the transaxle shift control in NEUTRAL, depress parking brake pedal to apply parking brake. Move transaxle shift control to D range, and observe the parking brake sector to determine if sector returns to its zero travel position when parking brake releases. If parking brake releases, parking vacuum control is working properly.

   NOTE: The parking brake vacuum release does not operate with transaxle in REVERSE.

2. If parking brake does not release, test for vacuum at vacuum line which is connected to the parking brake release vacuum motor. This can be accomplished by removing hoses from each component and attaching it to vacuum gauge. Vacuum will be available at vacuum motor only when transaxle selector is in D range. Connect two distributor tester vacuum hose adapters together with a coupling as a connector attaching the gauge. A minimum of 34 kPa (10 in-Hg) is required to actuate parking brake vacuum motor. If minimum reading is not present when performing this check, determine the damaged component and replace.

Operation Test

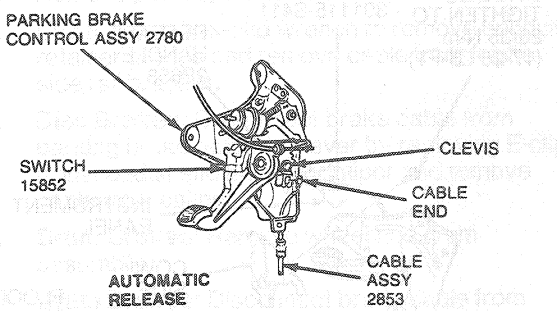
Check operation of the parking brake with vehicle on a hoist and parking brake fully released. Refer to Section 00-02. If there is any slack in the cables or if rear brakes drag when wheels are turned, adjust as required.

REMOVAL AND INSTALLATION

Control Assembly

Removal

1. Fully release parking brake.
2. Raise vehicle. Refer to Section 00-02.
3. Remove all tension from rear cables by backing off adjusting nut from equalizer or adjuster.
4. Lower vehicle.
5. Disconnect vacuum hose from vacuum release motor, if so equipped.
6. Disconnect release cable from parking brake control release arm and remove release cable grommet from parking brake control.
7. Disconnect wiring connector from parking brake warning indicator switch.
8. Remove cable end from clevis at brake control.



9. Remove push pin from cowl side trim panel.
10. Remove conduit retainer from control assembly using a 13mm box-end wrench to depress retaining prongs.
11. Remove three bolts and one push pin retaining control assembly to cowl side panel.
12. Remove control assembly from vehicle.

Installation

1. Position control assembly in vehicle.
2. Fit cable assembly through its mounting hole, and press pronged retainer in place. Ensure prongs are securely locked in place. Connect the cable end fitting to clevis at control assembly.
3. Install retaining bolts and push pin to cowl side bracket. Tighten screws to 23-35 N·m (17-26 lb-ft).

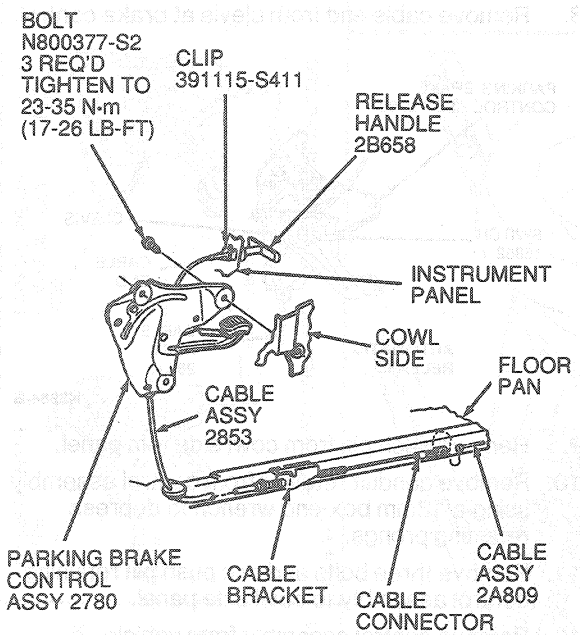
REMOVAL AND INSTALLATION (Continued)

4. Connect vacuum hose to vacuum release actuator, if so equipped.
5. Connect release cable to parking brake control release arm and install release cable grommet to parking brake control.
6. Connect wiring connector to parking brake warning indicator switch.
7. Raise vehicle. Refer to Section 00-02. Check parking brake operation and adjust as required. Lower vehicle.

Parking Brake Manual Release Handle and Cable Assembly

Removal

1. Disconnect release cable from parking brake control release arm and remove release cable grommet from parking brake control.
2. From under instrument panel, using a screwdriver, pry off and remove retainer clip securing cable and handle to instrument panel. Pull handle and cable assembly out of instrument panel.



AUTOMATIC AND MANUAL PARKING BRAKE RELEASE HANDLE H3986-C

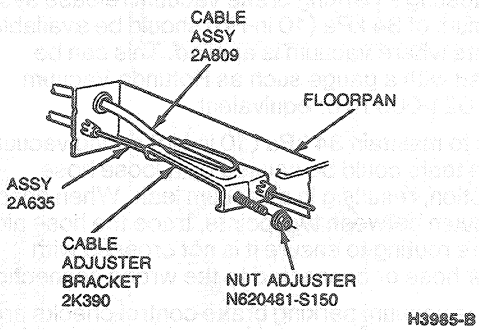
Installation

1. Start cable and handle assembly through locating hole in instrument panel and install retainer clip that secures handle to instrument panel.
2. Connect release cable to parking brake control release arm and install release cable grommet to parking brake control.

Cable, Front

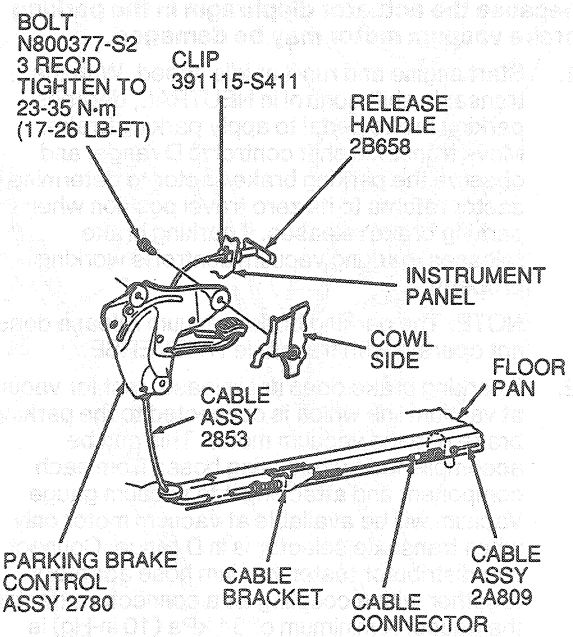
Removal

1. Raise vehicle on hoist. Refer to Section 00-02.
2. Loosen adjuster nut at adjuster bracket.
3. Lower vehicle.
4. Disconnect cable from control assembly at clevis, using a 13mm box-end wrench to depress the conduit retaining, prongs and remove cable end pronged fitting from brake control.
5. Remove LH cowl side panel and pull carpet back to expose cable.
6. Raise vehicle. Refer to Section 00-02.



H3985-B

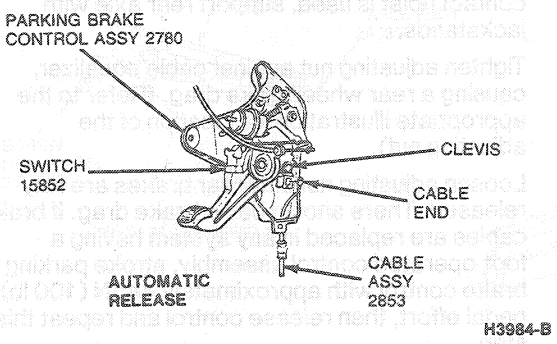
7. Disconnect front cable from rear cable at cable connector.
8. Remove cable and push-in prong retainer from cable bracket, using a 13mm box-end wrench to depress retaining prongs.



AUTOMATIC AND MANUAL PARKING BRAKE RELEASE HANDLE H3986-C

REMOVAL AND INSTALLATION (Continued)

9. Pull grommet down from floorpan.



Installation

1. Start cable through hole in floorpan and secure grommet in place.

   NOTE: Prongs must be securely locked in place.
2. Position cable through front cable bracket at frame side rail. Push prong into bracket.
3. Connect rear cable to front cable at connector.
4. Lower vehicle.
5. Push prong retainer into parking brake housing until prongs are secure, then connect cable to control clevis.
6. Reinstall carpet and LH cowl panel.
7. Raise vehicle. Refer to Section 00-02.
8. Adjust parking brake and lower vehicle.
9. Check parking brake operation.

Cables, Rear

LH Cable

Removal

1. Raise vehicle on hoist. Refer to Section 00-02.
2. Remove parking brake cable adjusting nut.
3. Remove rear cable end fitting from front cable connector.
4. **Drum Brakes:** Remove wheel and drum assembly. Refer to Section 06-02.
5. **Drum Brakes:** Disconnect brake cable end from parking brake actuating lever. Using a 13mm box-end wrench to depress the conduit retaining prongs, remove cable end pronged fitting from backing plate.
6. **Disc Brakes:** Disconnect brake cable end from parking brake actuating lever by removing E-clip from conduit end of fitting at caliper, and remove cable from caliper.
7. Push plastic snap-in grommet rearward to disconnect from side rail bracket.
8. Remove pronged connector from parking brake adjuster bracket. Remove cable assembly.

Installation

1. Insert cable through side rail bracket and adjuster bracket. Ensure pronged connector is securely attached to brake adjuster bracket.
2. Seat plastic snap-in grommet inside rail bracket.

   NOTE: Cable must be located over the RH cable.
3. **Drum Brakes:** Insert cable end into brake assembly backing plate and push pronged cable end into brake backing plate hole. Ensure prongs are locked in place.

   NOTE: Cable must be located over the RH cable.
4. **Disc Brakes:** Insert cable end into caliper and install E-clip.
5. Attach cable end to parking brake actuating lever.
6. Attach cable to front cable connector.
7. Install drum and wheel assembly. Refer to Section 06-02.
8. Install brake cable adjusting nut.
9. Adjust parking brake and lower vehicle.
10. Check for proper operation.

RH Cable

Removal

1. Raise vehicle on hoist. Refer to Section 00-02.
2. Remove parking brake cable adjusting nut.
3. Use a 13mm box-end wrench to remove conduit retainer prongs and remove cable from frame side rail bracket.
4. **Disc Brakes:** Disconnect brake cable from parking brake actuating lever by removing E-clip from conduit end fitting at caliper and remove cable from caliper.
5. **Drum Brakes:** Remove wheel and drum assembly.
6. **Drum Brakes:** Disconnect brake cable from parking brake actuating lever. Using a 13mm box-end wrench to depress the conduit retaining prongs, remove cable end pronged fitting from brake backing plate.
7. **Sedan:** Remove brake pressure control valve bracket at suspension arm.
8. **Sedan:** Remove cable retaining screw and clip from lower suspension arm and one screw from cable bracket at crossmember. Remove entire RH cable assembly.

   Wagon: Remove cable retaining clip and screw from each lower suspension arm, and one screw from cable retaining clip on lower suspension arm inner mounting bracket.

Installation

1. Insert cable into opening in frame side rail bracket and threaded end of cable in adjuster, and start adjuster nut on threads. Ensure pronged fitting is pressed into frame side rail bracket and securely locked in place.

REMOVAL AND INSTALLATION (Continued)

2. Route cable under LH brake cable and lower suspension arms.
3. Secure cable end into parking brake actuating lever.
4. **Disc Brakes:** Insert cable end into caliper and install E-clip.
5. **Drum Brakes:** Insert cable end pronged fitting into brake backing plate and securely lock in place.
6. Attach cable locator crossmember bracket and install nut and screw. Tighten to 8-11 N·m (71-97 lb-in).
7. Install brake cable retaining clips (wagon) or screw and clip (sedan) to suspension arms. Tighten retaining screws to 8-11 N·m (71-97 lb-in).
8. Install brake pressure control valve assembly bracket to control arm. Tighten to 6-8 N·m (50-70 lb-in).
9. **Drum Brakes:** Install drum and wheel assembly. Refer to Section 06-02.
10. Adjust parking brake.
11. Lower vehicle.
12. Check for proper operation.

ADJUSTMENTS

Parking Brake

Cable Adjustment

Taurus/Sable Drum Brake

1. Make sure parking brake is fully released.
2. Place transaxle in NEUTRAL. Raise vehicle on axle-type hoist. Refer to Section 00-02. If body contact hoist is used, support rear axle with jackstands.
3. Tighten adjusting nut against cable equalizer, causing a rear wheel brake drag. (Refer to the appropriate illustration for location of the adjusting nut).

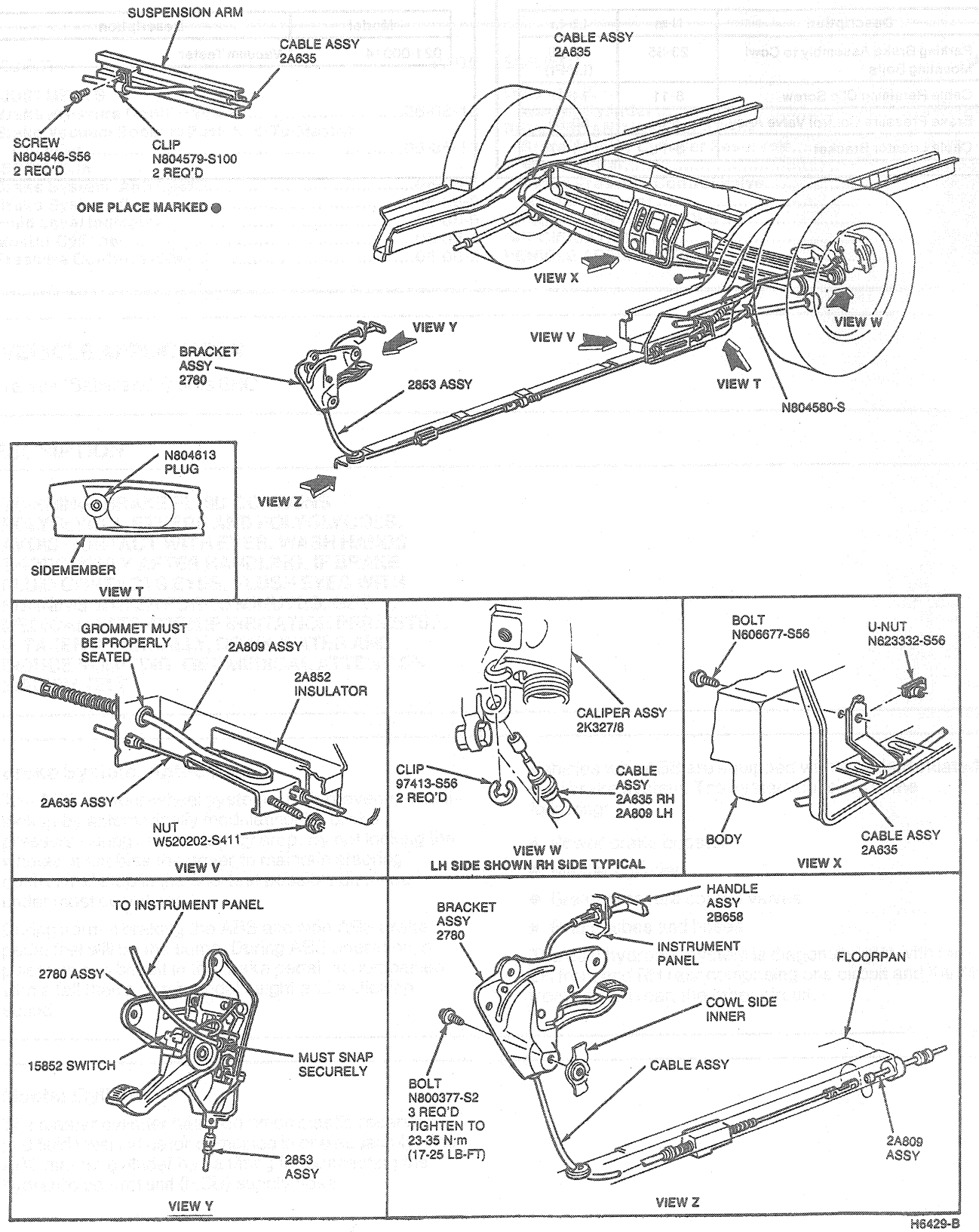
   Loosen adjusting nut until rear brakes are fully released. There should be no brake drag. If brake cables are replaced in any system having a foot-operated control assembly, stroke parking brake control with approximately 445N (100 lb) pedal effort, then release control and repeat this step.
4. Lower vehicle and check operation of parking brake.

Taurus SHO, Taurus/Sable Disc Brake

1. Make sure parking brake is fully released.
2. Raise vehicle. Refer to Section 00-02.
3. Tighten adjusting nut against cable adjuster bracket until there is a slight (less than 1.59mm (1/16 inch) movement of either rear parking brake lever at caliper. Refer to the illustration.

   If brake cables are replaced in any system having a foot-operated control assembly, depress parking brake control fully, then release control and repeat this step.
4. Lower vehicle and check operation of parking brake.

ADJUSTMENTS (Continued)



H6429-B

SPECIFICATIONS

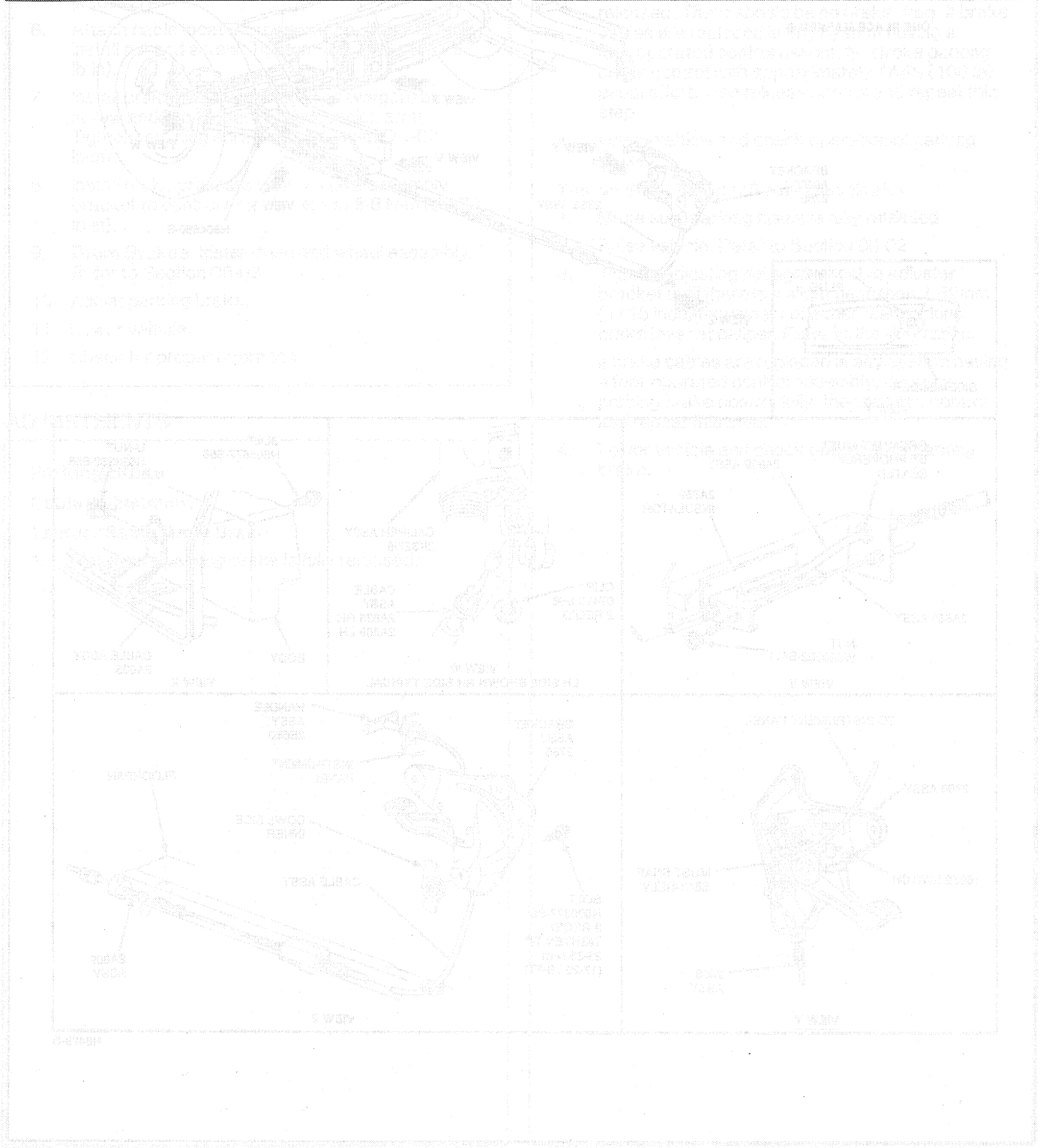
TORQUE SPECIFICATIONS

Description	N·m	Lb-in
Parking Brake Assembly to Cowl Mounting Bolts	23-35	17-26 (Lb-Ft)
Cable Retaining Clip Screw	8-11	71-97
Brake Pressure Control Valve Assy	6-8	50-70
Cable Locator Bracket	8-11	71-97

SPECIAL SERVICE TOOLS

ROTUNDA EQUIPMENT

Model	Description
021-00014	Vacuum Tester



SECTION 06-06 Brake System, Hydraulic

VEHICLE APPLICATION

Taurus / Sable and Taurus SHO.

DESCRIPTION

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

Brake System, Anti-Lock

The ABS is a four-wheel system which prevents wheel lockup by automatically modulating the brake pressure during an emergency stop. By not locking the wheels, it enables the driver to maintain steering control and stop in the shortest possible distance under most conditions.

During normal braking the ABS and Non-ABS brake pedal feel will be the same. During ABS operation, a pulsation can be felt in the brake pedal, accompanied with a fall then a rise in pedal height and a clicking sound.

Vehicles with ABS are equipped with a pedal actuated dual brake system. The system consists of the following:

- Power brake booster
- Master cylinder
- Brake pressure control valves
- Brake tubes and hoses

The dual hydraulic system is diagonally split with the LH front and RH rear comprising one circuit and the RH front and LH rear, the other circuit.

Master Cylinder

The master cylinder has a common plastic reservoir and fluid level indicator combined in one assembly. The ABS master cylinder has a fitting for connecting the hydraulic control unit (HCU) supply hose.

DESCRIPTION (Continued)

Brake System, Dual

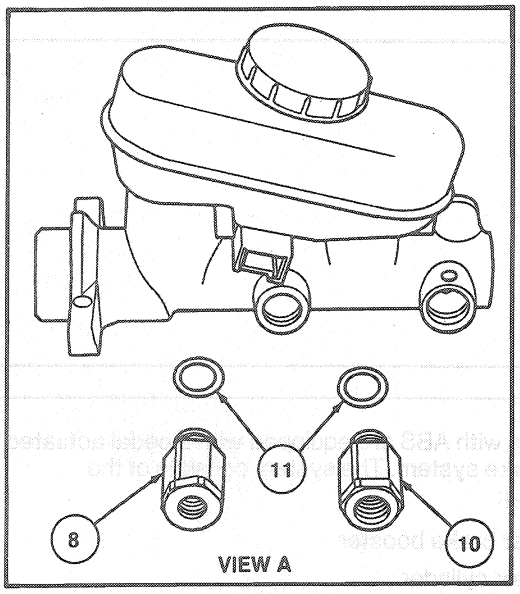
The dual hydraulic brake system is a conventional, pedal-actuated system with a master cylinder, pressure control valve, brake tubes and hoses. The hydraulic brake line routing has been diagonally split front to rear (LH front to RH rear and RH front to LH rear). The master cylinder has a common reservoir, brake pressure control valves (wagon only), and a fluid level indicator, all combined in one assembly.

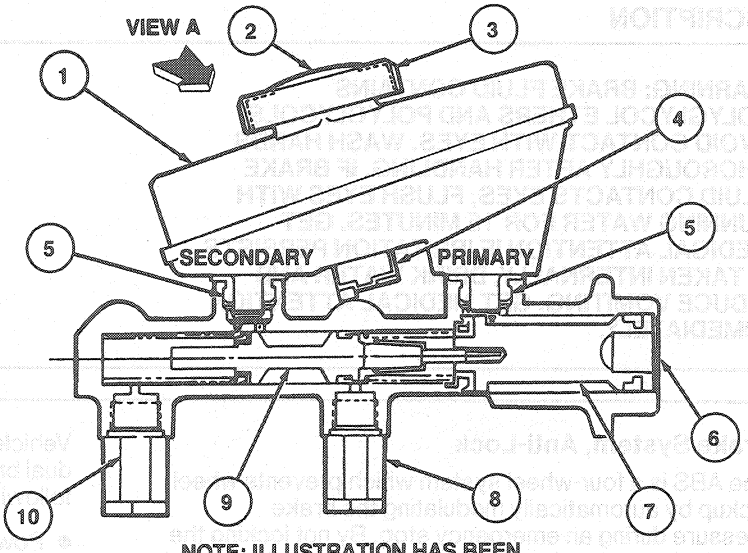
Pressure Control Valves

The sedan and station wagon use different types of rear brake pressure control valves. The valve for the sedan is mounted to the floorpan near the left rear wheel. It uses a mechanical linkage to the lower suspension arm to vary valve performance based on the rear weight of the vehicle.

The valves for the station wagon are installed in the master cylinder. They limit the pressure level at the rear brakes to minimize rear wheel lockup during hard braking.

Wagon





NOTE: ILLUSTRATION HAS BEEN ROTATED 90 DEGREES FOR CLARITY. H4000-F

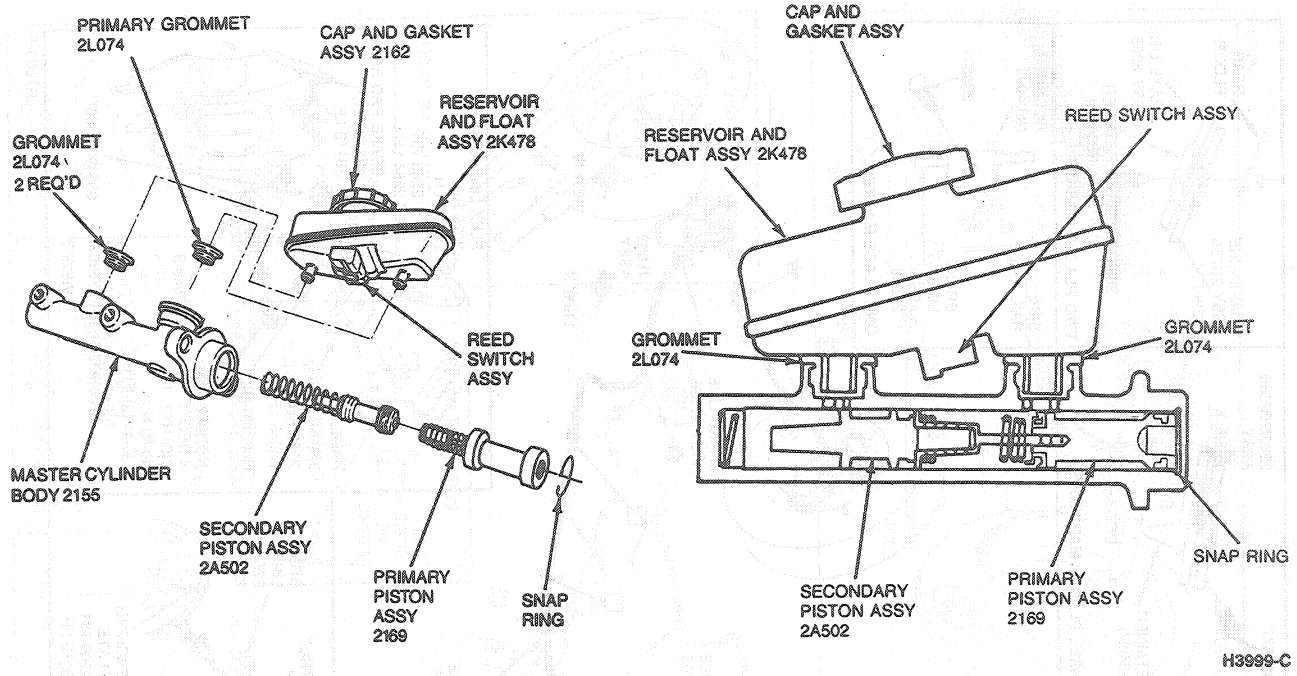
Item	Part Number	Description
1	2K478	Reservoir and Float Assy
2	2162	Cap and Gasket Assy
3	—	Cap Vent Slot (2 places)
4	—	Reed Switch Assy
5	2L074	Grommet
6	—	Snap Ring

(Continued)

Item	Part Number	Description
7	2169	Primary Piston Assy
8	2B091	LH Rear Pressure Control Valve
9	2A502	Secondary Piston Assy
10	2B091	RH Rear Pressure Control Valve
11	—	O-Ring

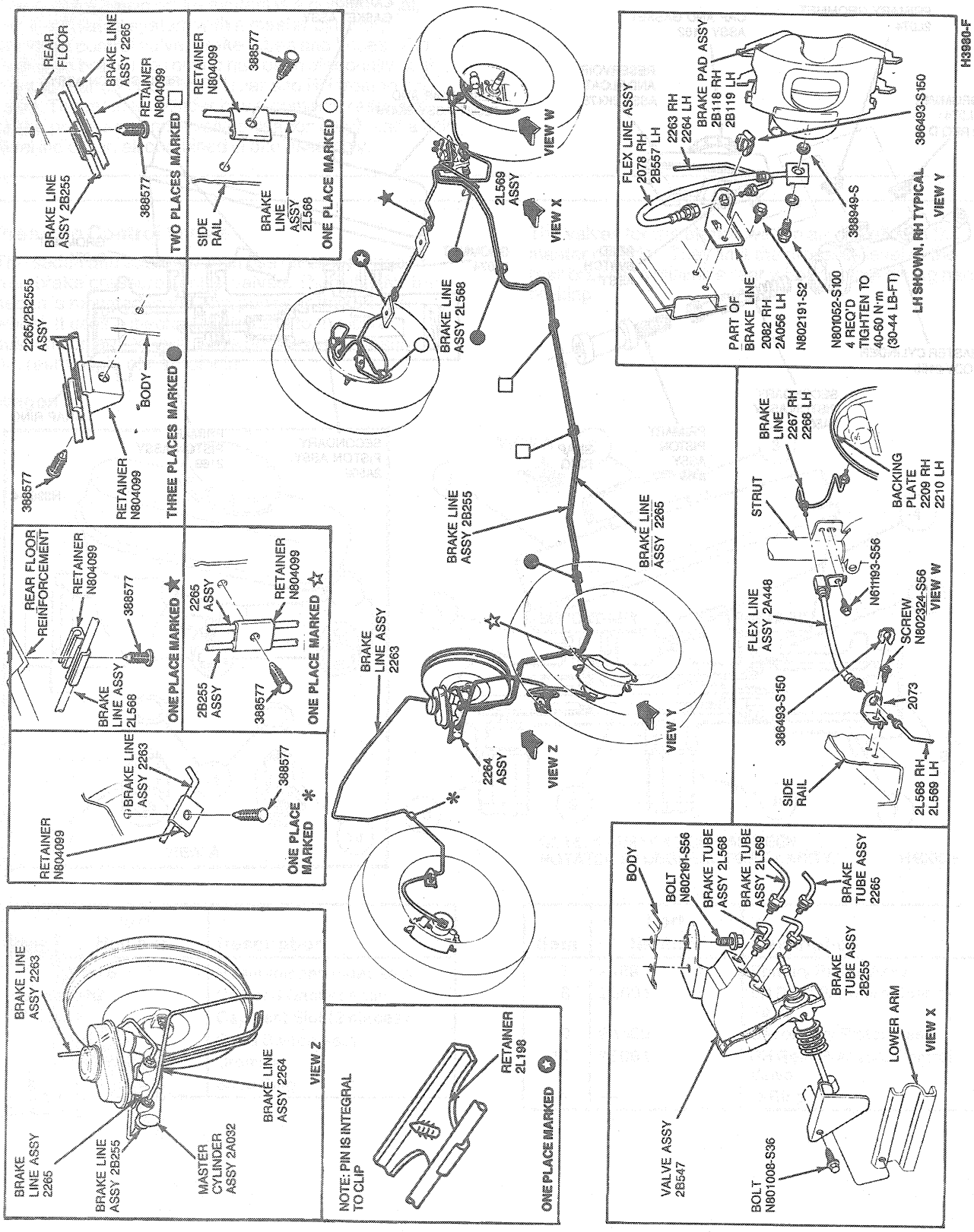
DESCRIPTION (Continued)

Sedan



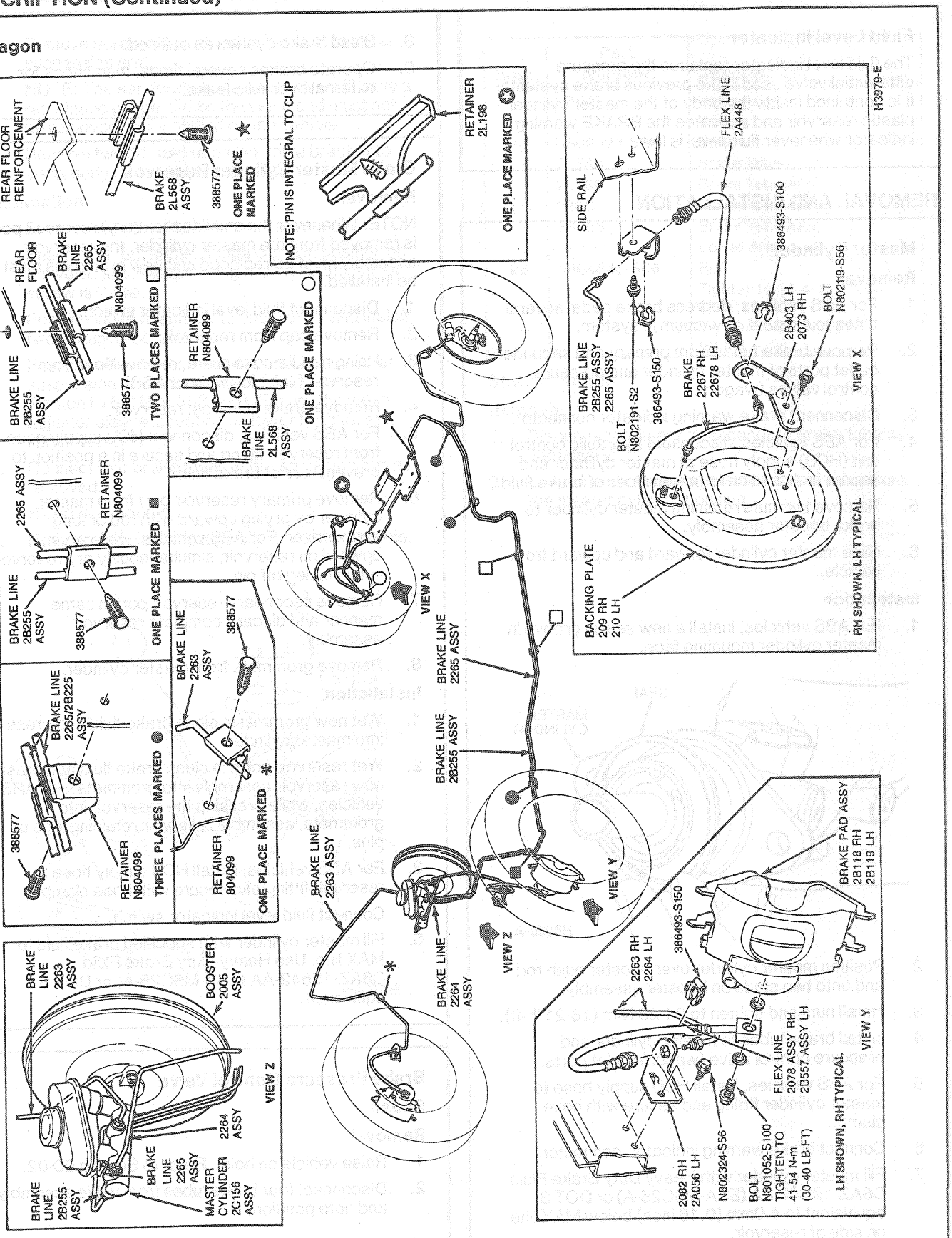
DESCRIPTION (Continued)

Sedan



DESCRIPTION (Continued)

Wagon



DESCRIPTION (Continued)

Fluid Level Indicator

The fluid level indicator replaces the pressure differential valve used in the previous brake systems. It is contained inside the body of the master cylinder plastic reservoir and activates the BRAKE warning indicator whenever fluid level is low.

REMOVAL AND INSTALLATION

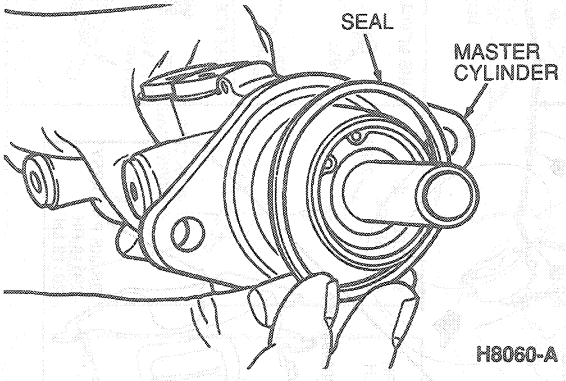
Master Cylinder

Removal

1. For ABS vehicles, depress brake pedal several times to exhaust all vacuum in system.
2. Remove brake tubes from primary and secondary outlet ports of master cylinder and pressure control valves (wagon).
3. Disconnect brake warning indicator connector.
4. For ABS vehicles, disconnect hydraulic control unit (HCU) supply hose at master cylinder and secure in a position to prevent loss of brake fluid.
5. Remove two nuts retaining master cylinder to brake booster assembly.
6. Slide master cylinder forward and upward from vehicle.

Installation

1. For ABS vehicles, install a new seal in groove in master cylinder mounting face.



2. Position master cylinder over booster push rod and onto two studs on booster assembly.
3. Install nuts and tighten to 21-29 N·m (16-21 lb-ft).
4. Install brake tubes to master cylinder and pressure control valve (wagon) outlet ports.
5. For ABS vehicles, install HCU supply hose to master cylinder fitting and secure with hose clamp.
6. Connect brake warning indicator connector.
7. Fill master cylinder with Heavy Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A) or DOT 3 equivalent to 4.0mm (0.16 inch) below MAX line on side of reservoir.
8. Bleed brake system as outlined.
9. Operate brakes several times, then check for external hydraulic leaks.

Brake Master Cylinder Reservoir

Removal

NOTE: Whenever the small (secondary) reservoir port is removed from the master cylinder, the reservoir assembly must be replaced and new grommets must be installed.

1. Disconnect fluid level indicator switch.
2. Remove cap from reservoir.
3. Using needle-nose pliers, remove float from reservoir (vehicles without ABS).
4. Remove brake fluid from reservoir.
5. For ABS vehicles, disconnect HCU supply hose from reservoir fitting and secure in a position to prevent loss of brake fluid.
6. Remove primary reservoir port from master cylinder by prying upward with rod or long screwdriver. For ABS vehicles, while prying upward on reservoir, simultaneously pry reservoir retaining leg off pin.
7. Remove secondary reservoir port in same manner and discard complete reservoir assembly.
8. Remove grommets from master cylinder.

Installation

1. Wet new grommet in clean brake fluid and press into master cylinder.
2. Wet reservoir ports in clean brake fluid and press new reservoir assembly into grommets. For ABS vehicles, while pressing the reservoir into grommets, assemble reservoir retaining legs on pins.
3. For ABS vehicles, install HCU supply hose to reservoir fitting and secure with hose clamp.
4. Connect fluid level indicator switch.
5. Fill master cylinder with specified brake fluid to MAX line. Use Heavy-Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A) or DOT-3 equivalent.

Brake Pressure Control Valve

Sedan

Removal

1. Raise vehicle on hoist. Refer to Section 00-02.
2. Disconnect four brake tubes from valve assembly and note position.

REMOVAL AND INSTALLATION (Continued)

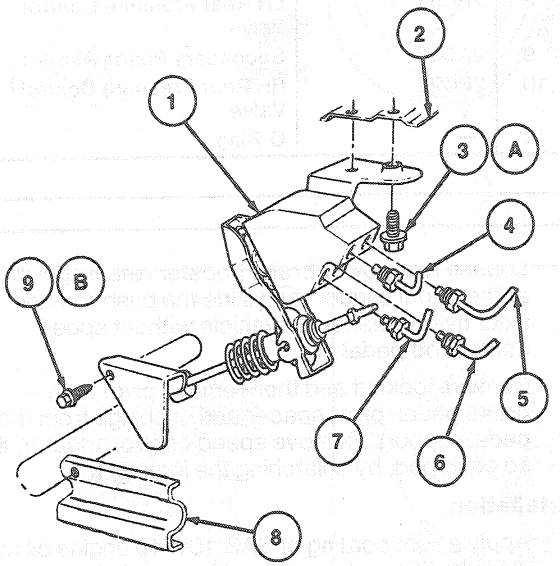
3. Remove screw retaining valve bracket to lower suspension arm.

   NOTE: The service replacement valve will have a red plastic gauge clip on the valve and must not be removed until installed on the vehicle.

4. Remove two screws retaining valve bracket to underbody and remove assembly.

Installation

1. Ensure rear suspension is in full rebound.
2. Ensure the red plastic gauge clip is in position on the valve and the operating rod lower adjustment screw is loose.
3. Position valve assembly to underbody and install two retaining screws.
4. Position valve lower mounting bracket to lower suspension arm. Install one retaining screw. Tighten to 6-8 N·m (4-6 lb-ft). Ensure the valve adjuster sleeve is resting on lower bracket and install setscrew.
5. Connect four brake tubes in the same position as removed.
6. Bleed rear brakes.
7. Remove red plastic gauge clip and lower vehicle.



H4007-E

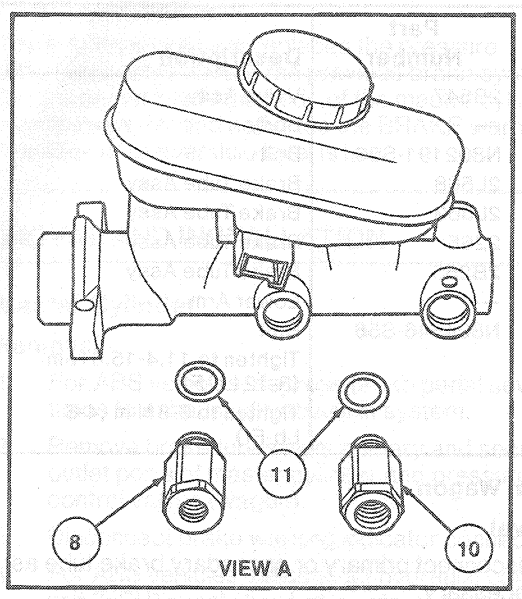
Item	Part Number	Description
1	2B547	Valve Assy
2	—	Body
3A	N802191-S56	Bolt
4	2L568	Brake Tube Assy
5	2L569	Brake Tube Assy
6	2265	Brake Tube Assy
7	2B255	Brake Tube Assy
8	—	Lower Arm
9B	N804846-S56	Bolt
A		Tighten to 11.4-15.6 N·m (8-12 Lb-Ft)
B		Tighten to 6-8 N·m (4-6 Lb-Ft)

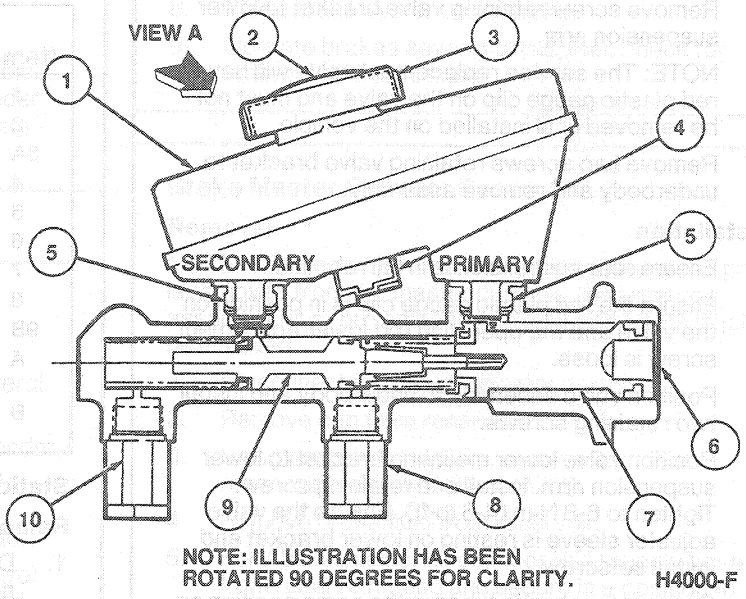
Station Wagon

Removal

1. Disconnect primary or secondary brake tube as necessary.
2. Loosen and remove pressure control valve from the master cylinder housing.

REMOVAL AND INSTALLATION (Continued)





NOTE: ILLUSTRATION HAS BEEN ROTATED 90 DEGREES FOR CLARITY. H4000-F

Item	Part Number	Description
1	2K478	Reservoir and Float Assy
2	2162	Cap and Gasket Assy
3	—	Cap Vent Slot (2 places)
4	—	Reed Switch Assy
5	2L074	Grommet
6	—	Snap Ring

(Continued)

Item	Part Number	Description
7	2169	Primary Piston Assy
8	2B091	LH Rear Pressure Control Valve
9	2A502	Secondary Piston Assy
10	2B091	RH Rear Pressure Control Valve
11	—	O-Ring

Installation

1. Install pressure control valve in master cylinder housing port and tighten to 13-24 N·m (10-18 lb-ft).
2. Install the brake tube and tighten to 16-20 N·m (12-15 lb-ft).
3. Fill and bleed brake system as outlined.

Brake Pedal

Removal

1. Disconnect battery ground cable.
2. Disconnect stoplamp switch wire connector from the switch.
3. Remove push rod retainer and nylon washer. Slide stoplamp switch outboard along brake pedal pin just far enough for outer hole of switch frame to clear pin. Remove switch by sliding it upward. Remove black stoplamp switch bushing from push rod.
4. Loosen four power brake booster retaining nuts at the pedal support and slide the push rod and inner nylon washer, on vehicle without speed control, off pedal pin.
5. Remove locknut and then remove pivot bolt, brake pedal, pivot spacer and bushings from the pedal support. Remove speed control adapter, if so equipped, by unlatching the locking tab.

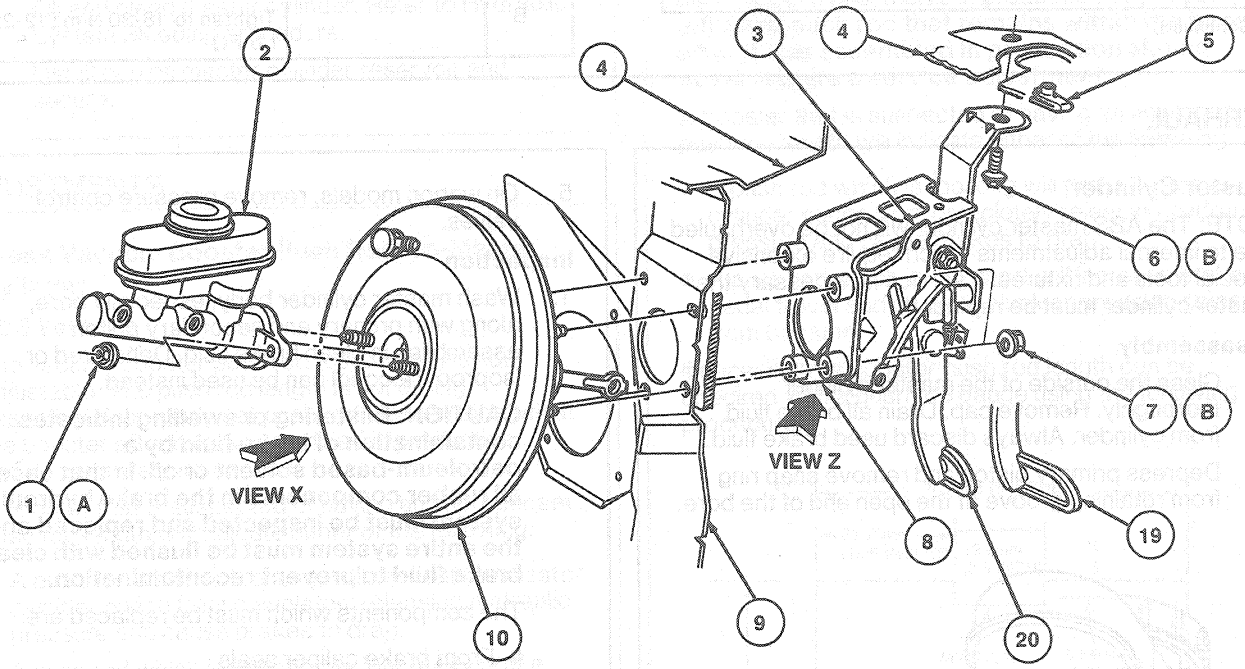
Installation

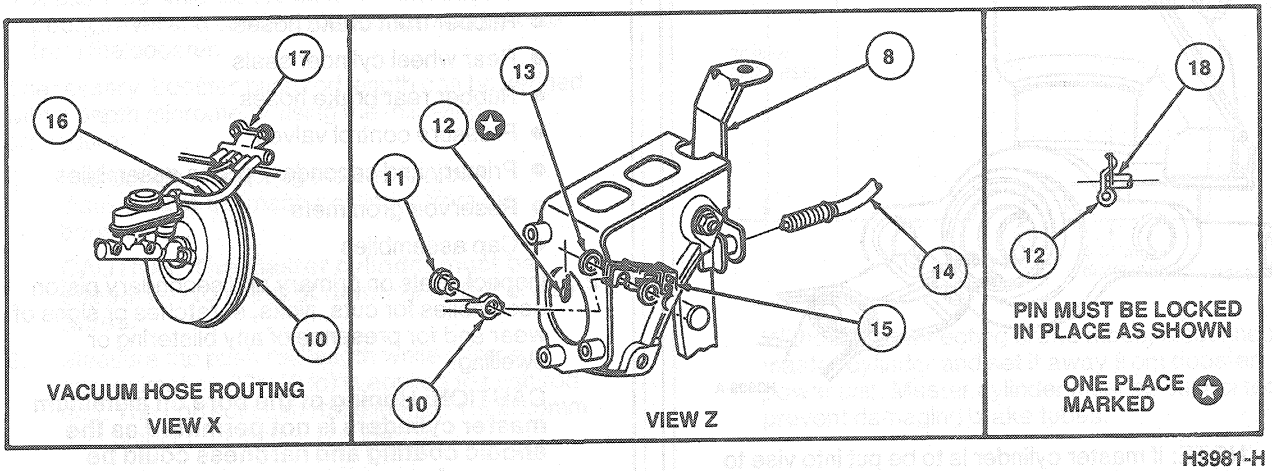
1. Apply a light coating of SAE 10W40 engine oil to clean bushings. Locate bushings and pivot spacer in brake pedal hub.
2. Position brake pedal in the pedal support and install pivot bolt. Install locknut. Tighten to 14-27 N·m (10-20 lb-ft).

   NOTE: The head of the booster push rod bushing must be on the side of the booster pushrod away from the pedal.

REMOVAL AND INSTALLATION (Continued)

3. Install the inner nylon washer or speed control adapter, if so equipped, the master cylinder push rod, and the black stoplamp switch bushing on the brake pedal pin. Do not oil stoplamp switch. Position the stoplamp switch so that it straddles the push rod with the slot on the pedal pin and the switch outer frame hole just clearing the pin. Slide the switch down onto the pin and push rod. Slide assembly inboard toward brake pedal arm. Install outer nylon washer and push rod retainer. Lock retainer securely.
4. Tighten booster retaining nuts to 21-29 N·m (16-21 lb-ft).
5. Connect stoplamp switch wire to the switch.
6. Connect battery ground cable.





H3981-H

Item	Part Number	Description
1A	382802-S191	Nut
2	2A032 (Sedan) 2C156 (Wagon)	Master Cylinder Assy

(Continued)

Item	Part Number	Description
3	7B633	Clutch Control Assy
4	—	Cowl
5	N800538-S100	U-Nut

(Continued)

REMOVAL AND INSTALLATION (Continued)

Item	Part Number	Description
6B	N606689-S2	Bolt
7B	N620481-S2	Nut
8	2450	Assy
9	—	Dash Panel
10	2005	Booster Assy
11	2A309	Bushing
12	380699-S100	Clip
13	2B129	Washer
14	—	Vacuum Tube

(Continued)

Item	Part Number	Description
15	13480	Stoplamp Assy
16	381298-SX42A	Vacuum Hose to Check Valve
17	9C490	Vacuum Tree
18	2455	Pedal Assy
19	—	Automatic Transmission
20	—	Manual Transmission
A		Tighten to 18-34 N·m (14-25 Lb-Ft)
B		Tighten to 16-30 N·m (12-22 Lb-Ft)

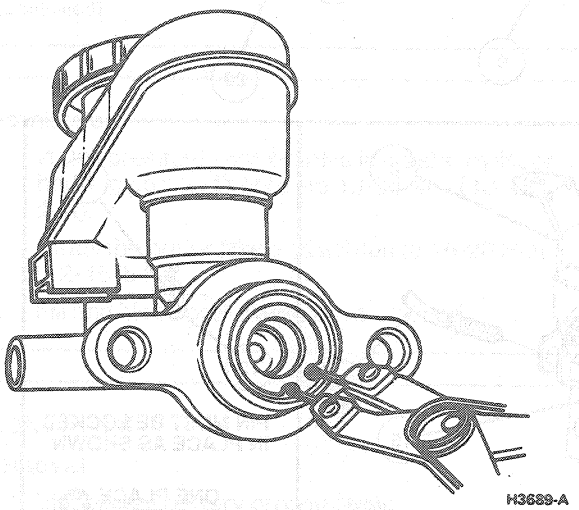
OVERHAUL

Master Cylinder

NOTE: The ABS master cylinder will not be overhauled due to internal adjustments which require extensive special tools and fixtures. If service is necessary the master cylinder must be replaced.

Disassembly

1. Clean the outside of the master cylinder thoroughly. Remove cap. Drain all brake fluid from cylinder. Always discard used brake fluid.
2. Depress primary piston and remove snap ring from retaining groove at the open end of the bore.



H3689-A

NOTE: If master cylinder is to be put into vise to aid in disassembly, mount into vise by flange only to avoid damage to bore or reservoir areas.

3. Remove primary and secondary piston assemblies from master cylinder. Tap open end of cylinder on bench to remove pistons. If secondary piston does not readily come out, apply air pressure to secondary outlet port to assist removal.
4. Remove the reservoir as outlined.
5. On wagon models, remove pressure control valves.

Inspection

1. Wash master cylinder body, especially bore, along with primary and secondary piston assemblies in clean brake fluid. Denatured or isopropyl alcohol can be used instead.

   CAUTION: Blistering or swelling indicates contamination of brake fluid by a petroleum-based solvent or oil. In that case, all rubber components in the brake hydraulic system must be inspected and replaced and the entire system must be flushed with clean brake fluid to prevent recontamination.

   The components which must be replaced are:

   - Front brake caliper seals
   - Rubber front brake hoses
   - Rear wheel cylinder seals
   - Rubber rear brake hoses
   - Pressure control valves
   - Primary and secondary piston assemblies
   - Reservoir grommets
   - Cap assemblies
2. Inspect seals on primary and secondary piston assemblies for cuts, nicks, scratches or signs of wear and for presence of any blistering or swelling.

   CAUTION: Honing of the bore on aluminum master cylinders is not permitted as the anodic coating and hardness could be removed.
3. Inspect master cylinder bore for pitting, corrosion or heavy wear. Heavy wear is characterized by scoring or galling of metal.

   NOTE: The aluminum body of the master cylinder is anodized. Some signs of bore wear, as evidenced by lighter areas of the anodized surface, are normal and not detrimental.

OVERHAUL (Continued)

Assembly

1. Dip replacement piston assemblies in clean Heavy-Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A) or DOT-3 equivalent for lubrication prior to assembly into cylinder.
2. Install secondary (smaller) piston assembly into bore, spring end first.
3. Install primary piston assembly, spring end first.
4. Depress primary piston and install snap ring.
5. Install pressure control valves as outlined.
6. Fill and bleed master cylinder. Refer to Hydraulic System Bleeding procedure.
7. Install cap on master cylinder reservoir and secure.

ADJUSTMENTS

Brake Vacuum Booster Push Rod-To-Master Cylinder

ABS Vehicles

The vacuum booster push rod (output rod) is not adjustable. The push rod length is set during assembly. A properly set push rod that remains within the booster after it was assembled in production, should never require service.

A booster that is suspected of having an improper set push rod length will indicate either of the following:

- A push rod which is too long, will prevent the master cylinder piston from completely releasing hydraulic pressure and cause brakes to drag.
- A push rod which is too short will increase brake pedal travel and cause a clunk or groaning noise from the booster.

If necessary, booster push rod length can be verified with a depth micrometer using the following procedure:

1. Without disconnecting the brake tubes, disassemble the master cylinder from the booster.

   CAUTION: The master cylinder must be supported to prevent damage to the brake tubes.

2. Measure the push rod length while a force of approximately 22N (5 lb) is applied to push rod end. The correct push rod dimension is 28.3mm ± 0.3mm (1.11 inch ± 0.01 inch).
3. If the push rod dimension is correct, assemble master cylinder to booster. Alternate the tightening of the retaining nuts to 21-29 N·m (16-21 lb-ft).
4. If the push rod dimension is incorrect, replace the booster. The push rod length is not adjustable.

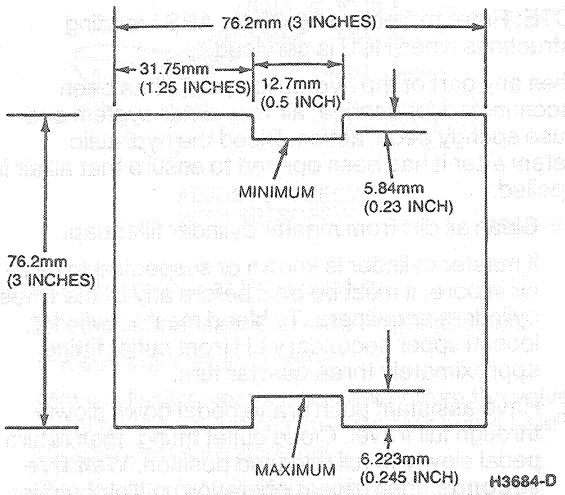
Non ABS Vehicles

The vacuum booster has an adjustable push rod (output rod) which is used to compensate for dimensional variations in an assembled booster. The push rod length is adjusted after each booster power unit has been assembled in production. **A properly adjusted push rod that remains within the booster after it was assembled in production should never require a service adjustment.**

A booster that is suspected of having an improper push rod length will indicate either of the following:

- A push rod which is too long will prevent master cylinder piston from completely releasing hydraulic pressure and cause brakes to drag.
- A push rod which is too short will increase brake pedal travel and cause a clunk or groaning noise from booster.

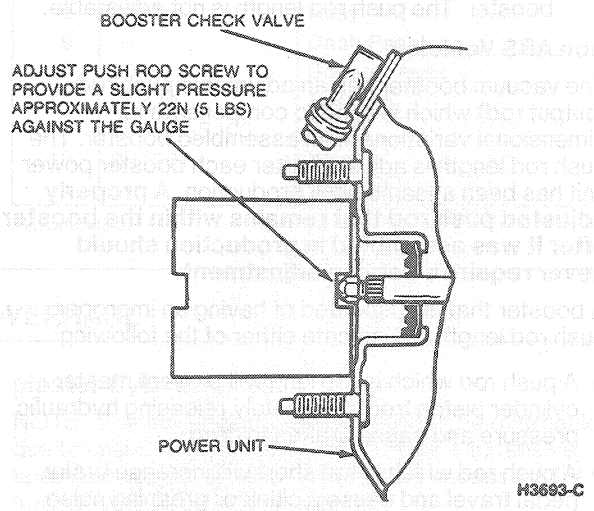
If necessary, a booster push rod length can be checked with a push rod gauge using the following procedure:



1. Without disconnecting brake tubes, disconnect master cylinder and set it away from booster power unit. Master cylinder must be supported to prevent damaging brake tubes.

ADJUSTMENTS (Continued)

2. With engine idling, check and adjust push rod length. A force of approximately 22N (5 lb) applied to the push rod with the gauge will ensure that push rod is seated with power unit.



3. Install master cylinder on booster. Gradually alternate tightening of the retaining nuts to 21-29 N·m (16-21 lb-ft).

Hydraulic System Bleeding

NOTE: Refer to Section 06-09 for ABS bleeding instructions when HCU is serviced.

When any part of the hydraulic system has been disconnected for service, air may enter system and cause spongy pedal action. Bleed the hydraulic system after it has been opened to ensure that all air is expelled.

1. Clean all dirt from master cylinder filler cap.
2. If master cylinder is known or suspected to have air in bore, it must be bled before any of the wheel cylinders or calipers. To bleed master cylinder, loosen upper secondary LH front outlet fitting approximately three-quarter turn.
3. Have assistant push brake pedal down slowly through full travel. Close outlet fitting, then return pedal slowly to full released position. **Wait five seconds,** then repeat operation until air bubbles cease to appear.
4. Loosen upper primary RH front outlet fitting approximately three-quarter turn.
5. Repeat Step 3.
6. To continue to bleed brake system, remove rubber dust cap from wheel cylinder bleeder fitting or caliper fitting. Check to ensure bleeder fitting is positioned at upper half of front caliper. If not, caliper is located on wrong side. Place suitable box wrench on bleeder fitting and attach rubber drain tube to fitting. **The end of tube should fit snugly around bleeder fitting.**
7. Submerge free end of tube in container partially filled with clean brake fluid and loosen bleeder fitting approximately three-quarter turn.
8. Have assistant push brake pedal down slowly through full travel. Close bleeder fitting, then return pedal to full release position. **Wait five seconds,** then repeat this operation until air bubbles cease to appear at submerged end of bleeder tube.
9. When fluid is completely free of air bubbles, secure bleeder fitting and remove bleeder tube. Install rubber dust cap on bleeder fitting.
10. Repeat this process on opposite diagonal system. Refill master cylinder reservoir after each wheel cylinder or caliper is bled, and install master cylinder cover and gasket. When bleeding operation is completed, fluid level should be filled to maximum fill level indicated on reservoir.
11. Always ensure disc brake pistons are returned to their normal positions by depressing brake pedal several times until normal pedal travel is established.
12. Check pedal feel. If pedal feels "spongy" repeat bleed procedure.

Pressure Bleeding

Tools Required:

- Rotunda Brake Bleeder 104-00064

For pressure bleeding, use bleeder-type bleeder tank only, such as Rotunda Brake Bleeder 104-00064 or equivalent.

Bleed longest line first on the system being bled. The bleeder tank should contain enough new brake fluid to complete bleeding operation. Use Heavy-Duty Brake Fluid C6AZ-19542-AA (ESA-M6C25-A) or DOT 3 equivalent for all brake applications. Never reuse brake fluid that has been drained from the hydraulic system. Pressure bleeder tank should be charged with approximately 69-206 kPa (10-30 psi) of air pressure.

CAUTION: Never exceed 344 kPa (50 psi) pressure.

1. Clean all dirt from master cylinder reservoir cover.
2. Remove master cylinder filler cap and fill master cylinder reservoir with specified brake fluid. Install pressure bleeder adapter tool to master cylinder and attach bleeder tank hose to fitting on adapter. Follow manufacturer's instructions when installing adapter.
3. If all wheel cylinders are to be bled, start with RH rear brake wheel cylinder and attach bleeder tube **snugly around bleeder fitting.**
4. Open valve on bleeder tank to admit pressurized brake fluid to master cylinder reservoir.
5. Submerge free end of tube in container partially filled with clean brake fluid and loosen bleeder fitting.
6. When air bubbles cease to appear in fluid at submerged end of bleeder tube, close bleeder fitting and remove tube. Replace rubber dust cap on bleeder screw.

ADJUSTMENTS (Continued)

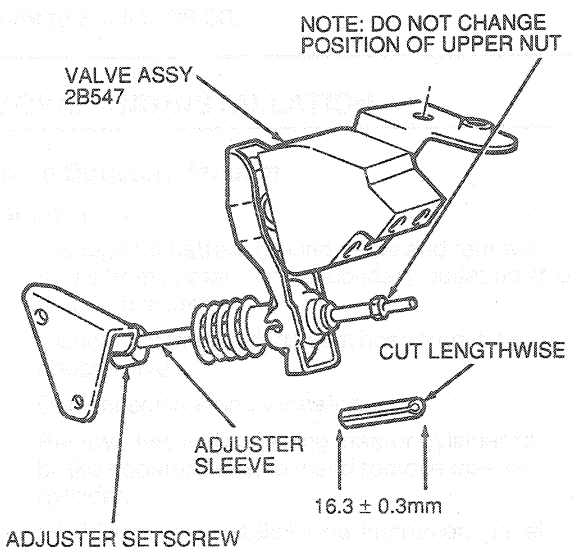
7. Repeat Steps 3 through 6 at LH front wheel caliper.
8. Next, repeat Steps 4, 5 and 6, starting at LH wheel cylinder and ending at RH front wheel caliper.
9. When bleeding operation is completed, close bleeder tank valve and remove tank hose from adapter fitting.
10. After disc brake service, ensure disc brake pistons are returned to their normal positions and the shoe and lining assemblies are properly seated. This is accomplished by depressing the brake pedal several times until normal pedal travel is established.
11. Remove the pressure bleeder adapter tool from master cylinder. Fill the master cylinder reservoir to 4.0mm (0.16 inch) below the MAX line on the reservoir. Install the master cylinder cap.

Brake Pressure Control Valve

Sedan

1. Drive vehicle on a hoist or alignment machine, so that vehicle is at curb load level and wheels are on a flat surface.

   NOTE: Do not change position of the upper nut on valve operating rod.
2. Loosen valve adjuster setscrew.
3. Obtain a piece of rubber or vacuum hose or plastic tubing 3/8-inch OD x 1/4-inch ID. Cut a piece 16.3mm ± 0.3mm and slice it lengthwise as shown.



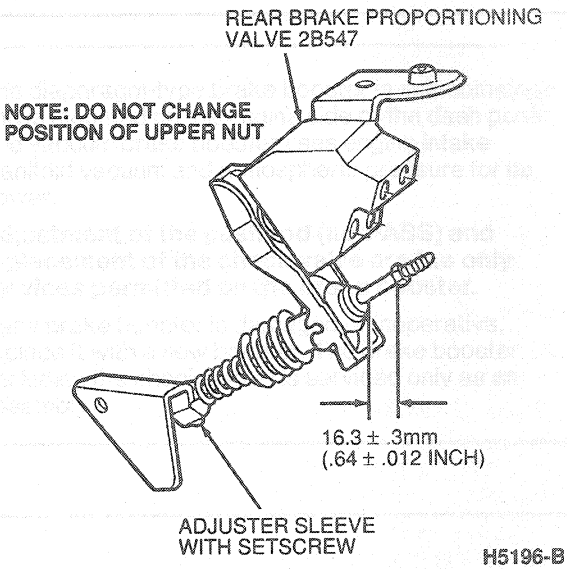
H4008-D

4. Place this length of hose or tubing on valve operating rod. Refer to illustration under Step 3.
5. Ensure the adjuster sleeve is resting on the lower mounting bracket. Install setscrew. The dimension will position the valve for normal operation. Remove hose or tube.

If further adjustment is necessary refer to the following procedures:

Decrease Pressure at Rear Brakes

1. Ensure suspension is at curb height.
2. Loosen adjuster setscrew.
3. Move adjuster sleeve up toward valve body on the operating rod 1mm for each 413 kPa (60 psi) pressure decrease.
4. Install setscrew in adjuster sleeve in desired position.



H5196-B

Increase Pressure at Rear Brakes

1. Ensure suspension is at curb height position.
2. Loosen adjuster setscrew.
3. Move adjuster sleeve down away from the valve body on the operating rod 1mm for each 413 kPa (60 psi) pressure increase.
4. Tighten setscrew in desired position.

SPECIFICATIONS

BRAKE BOOSTER APPLICATIONS

Vehicle	Booster Type and Size
Taurus/Sable	Vacuum—270mm (10.6 inch) Diameter Single Diaphragm

SPECIFICATIONS (Continued)

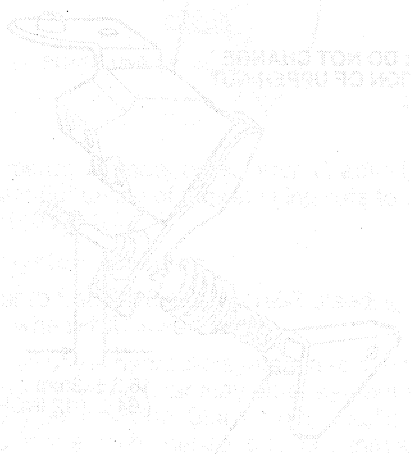
TORQUE SPECIFICATIONS

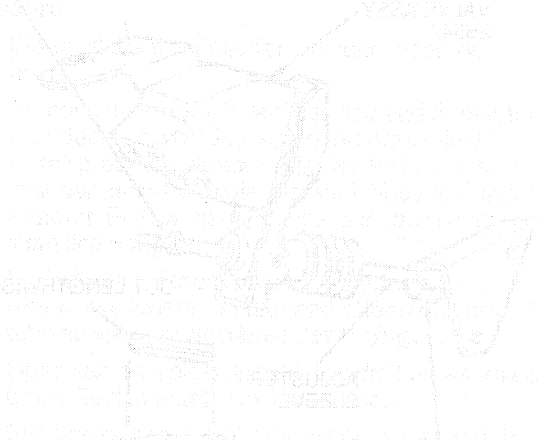
Description	N·m	Lb-Ft
Master Cylinder Mounting Nuts	21-29	16-21
Booster Retaining Nuts	21-29	16-21
Wheel Cylinder Bleeder Screw	10-20	7.5-15
Caliper Bleeder Screw	8-20	6-15
Brake Hose Connection to Caliper	41-54	30-40
Rear Hose Bracket Attachment	11-16	8-12
Brake Tube Connections—All[1]	16-20	12-15
Pressure Control Valves to Master Cylinder	13-22	10-16
Brake Pedal Pivot Shaft Nut	14-27	10-20
Proportioning Valve Bracket to Lower Arm	6-8	4-6

SPECIAL SERVICE TOOLS

ROTUNDA EQUIPMENT

Model	Description
104-00064	Brake Bleeder





1 All hydraulic lines must be tightened to the specific torque value and be free of fluid leakage

SECTION 06-07 Brake System, Power

VEHICLE APPLICATION

Taurus / Sable.

DESCRIPTION

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

The diaphragm-type brake booster is self-contained and is mounted on the engine side of the dash panel. The vacuum brake booster uses engine intake manifold vacuum and atmospheric pressure for its power.

Adjustment of the push rod (non-ABS) and replacement of the check valve are the only services permitted on the brake booster.

If any brake booster is damaged or inoperative, replace it with a new booster. The brake booster (including the check valve) is serviced only as an assembly.

DIAGNOSIS AND TESTING

Refer to Section 06-00.

REMOVAL AND INSTALLATION

Brake Booster, Vacuum

Removal

1. Disconnect battery ground cable and remove tubes from primary and secondary outlet ports of master cylinder.
2. Disconnect manifold vacuum hose from booster check valve.
3. Disconnect warning indicator.
4. Remove two nuts retaining master cylinder to brake booster assembly and remove master cylinder.
5. Working inside vehicle below instrument panel, remove stoplamp switch wiring connector from switch. Remove push rod retainer and outer nylon washer from pedal pin. Slide stoplamp switch along brake pedal pin just far enough for outer hole to clear pin. Refer to Section 17-01. Remove stoplamp switch by sliding it upward. Be careful not to damage stoplamp switch during removal.
6. Remove booster-to-dash panel retaining nuts. Slide booster push rod and push rod bushing off brake pedal pin.
7. Working inside engine compartment, remove two screws from manifold vacuum fitting at dash panel, and position out of way.
8. Position wiring harness out of the way.
9. Remove transmission shift cable and bracket assembly. Refer to Section 07-05.
10. Move booster forward until booster studs clear dash panel and remove booster.

Installation

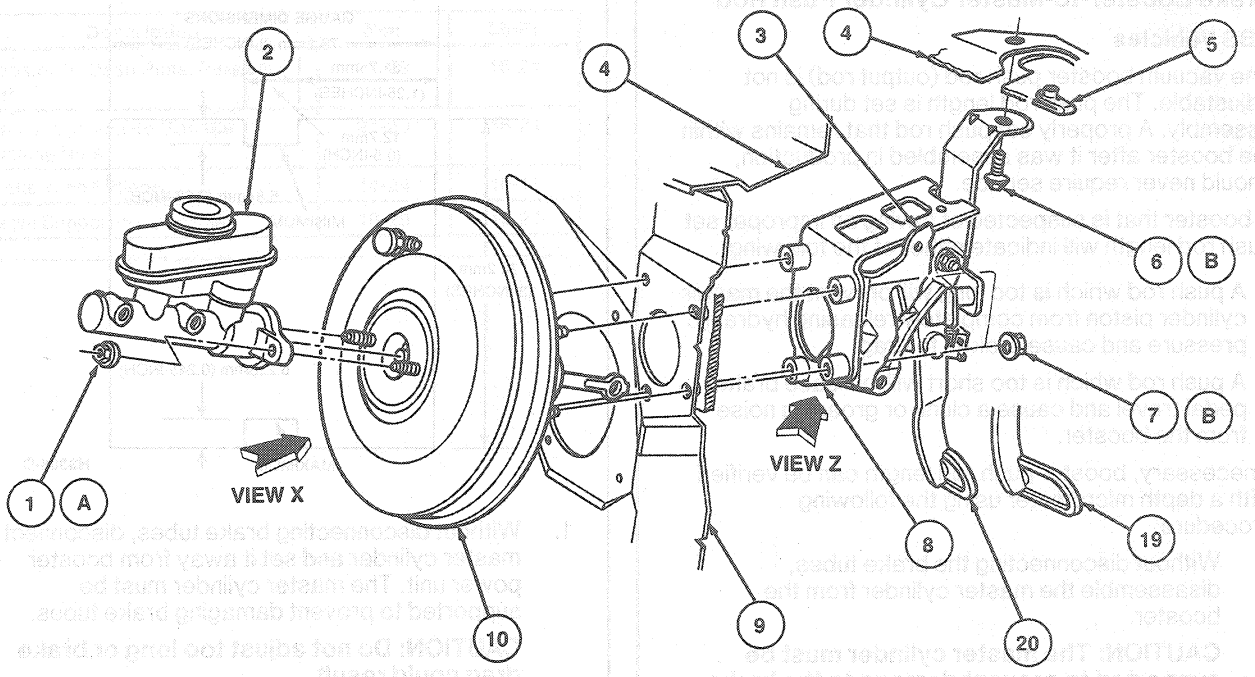
1. Align pedal support inside vehicle and place booster in position on dash panel. Hand-start retaining nuts.

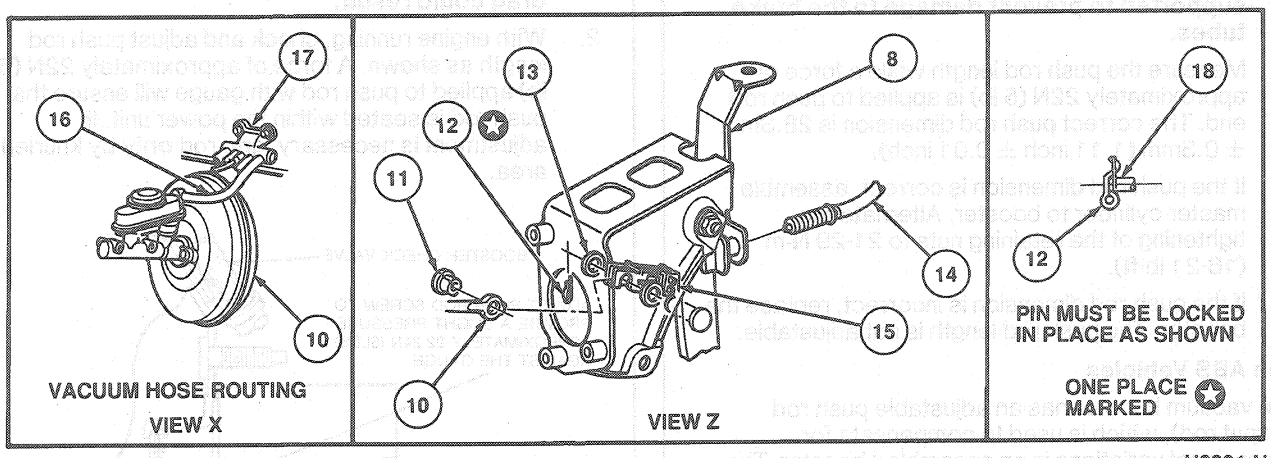
   NOTE: The head of the push rod bushing must be on the booster, push rod away from the pedal.

REMOVAL AND INSTALLATION (Continued)

2. Working inside vehicle, install inner nylon washer or speed control adapter, push rod and push rod bushing on brake pedal pin. Tighten booster-to-dash panel retaining nuts to 21-29 N·m (16-21 lb-ft).
3. Position stoplamp switch so that it straddles booster push rod with stoplamp switch slot toward pedal blade and hole just clearing pin. Slide stoplamp switch down onto pin. Slide assembly toward pedal arm, being careful not to bend or deform switch. Install nylon washer on pin and secure all parts to pin with hairpin retainer. Ensure retainer is fully installed and locked over pedal pin. Install stoplamp switch wiring connector on stoplamp switch. Refer to Section 17-01.
4. Position manifold vacuum fitting to dash panel and install two retaining screws.
5. Move wiring harness into position.
6. Install shift cable and bracket assembly. Refer to Section 07-05.
7. Connect manifold vacuum hose to booster check valve.
8. Position master cylinder assembly on booster assembly studs.
9. Install brake tube fittings into master cylinder ports. Tighten to 14-24 N·m (10-17 lb-ft). Tighten master cylinder nuts to 21-29 N·m (16-21 lb-ft).
10. Connect warning indicator.
11. Bleed brake system. Refer to Section 06-00.
12. Adjust manual shift linkage.
13. Connect battery ground cable and start engine. Check power brake function.
14. For vehicles with speed control, refer to Section 10-03 for dump valve adjustments.

REMOVAL AND INSTALLATION (Continued)





H3981-H

Item	Part Number	Description
1A	382802-S191	Nut
2	2A032 (Sedan) 2C156 (Wagon)	Master Cylinder Assy
3	7B633	Assy (Clutch Controls Release—Manual Trans Only)
4	—	Cowl
5	N800538-S100	U-Nut
6B	N606689-S2	Bolt
7B	N620481-S2	Nut
8	2450	Assy
9	—	Dash Panel
10	2005	Booster Assy
11	2A309	Bushing

(Continued)

Item	Part Number	Description
12	380699-S100	Clip
13	2B129	Washer
14	—	Vacuum Tube
15	13480	Stoplamp Assy
16	381298-SX42A	Vacuum Hose to Check Valve
17	9C490	Vacuum Outlet Manifold
18	2455	Pedal Assy
19	—	Automatic Transmisssion
20	—	Manual Transmission
A		Tighten to 21-29 N·m (16-21 Lb-Ft)
B		Tighten to 16-29 N·m (12-21 Lb-Ft)

TH3981H

ADJUSTMENTS

Brake Booster-to-Master Cylinder Push Rod

ABS Vehicles

The vacuum booster push rod (output rod) is not adjustable. The push rod length is set during assembly. A properly set push rod that remains within the booster after it was assembled in production, should never require service.

A booster that is suspected of having an improper set push rod length will indicate either of the following:

- A push rod which is too long will prevent the master cylinder piston from completely releasing hydraulic pressure and cause brakes to drag.
- A push rod which is too short will increase brake pedal travel and cause a clunk or groaning noise from the booster.

If necessary, booster push rod length can be verified with a depth micrometer using the following procedure:

1. Without disconnecting the brake tubes, disassemble the master cylinder from the booster.

   CAUTION: The master cylinder must be supported to prevent damage to the brake tubes.

2. Measure the push rod length while a force of approximately 22N (5 lb) is applied to push rod end. The correct push rod dimension is 28.3mm ± 0.3mm (1.11 inch ± 0.01 inch).
3. If the push rod dimension is correct, assemble master cylinder to booster. Alternate the tightening of the retaining nuts to 21-29 N·m (16-21 lb-ft).
4. If the push rod dimension is incorrect, replace the booster. The push rod length is not adjustable.

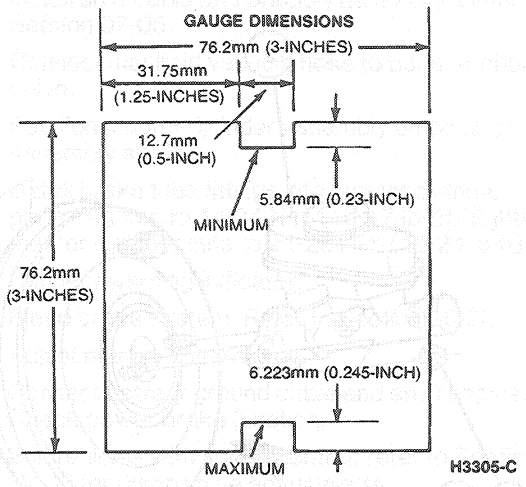
Non ABS Vehicles

The vacuum booster has an adjustable push rod (output rod), which is used to compensate for dimensional variations in an assembled booster. The push rod length is adjusted after each power booster unit has been assembled in production. **A properly adjusted push rod that remains assembled to the booster with which it was matched in production should never require a service adjustment.**

A booster that is suspected of having an improper push rod length will indicate either of the following:

- A push rod that is too long will prevent the master cylinder piston from completely releasing hydraulic pressure, eventually causing the brakes to drag.
- A push rod that is too short will have excessive brake pedal travel and cause a groaning noise to come from the booster.

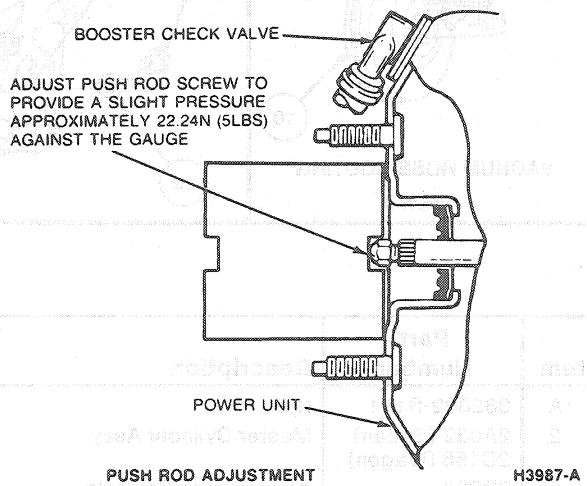
If necessary, booster push rod length can be checked with a push rod gauge by using the following procedure.



1. Without disconnecting brake tubes, disconnect master cylinder and set it away from booster power unit. The master cylinder must be supported to prevent damaging brake tubes.

   CAUTION: Do not adjust too long or brake drag could result.

2. With engine running, check and adjust push rod length as shown. A force of approximately 22N (5 lb) applied to push rod with gauge will ensure that push rod is seated within the power unit. If adjustment is necessary, grip rod **only** by knurled area.



3. Install master cylinder on booster unit. Gradually and alternately tighten retaining nuts to 21-29 N·m (16-21 lb-ft). Refer to Section 06-00.

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	N·m	Lb-Ft
Booster-to-Dash Panel Retaining Nut	21-29	16-21
Master Cylinder-to-Booster Locking Nuts	21-29	16-21
Brake Tube Fittings	14-24	10-17
Pedal Support-to-Cowl Top	16-29	12-21