1965 FORD and MERCURY SHOP MANUAL

1965 Ford and Mercury Shop Manual
EAN: 978-1-60371-060-2
ISBN: 1-60371-060-4

Forel Publishing Company, LLC
3999 Peregrine Ridge Ct.
Woodbridge, VA 22192
Email address: webmaster@ForelPublishing.com
Website: http://www.ForelPublishing.com

Note from the Editor

This product was created from the original Ford Motor Company's publication. Every effort has been made to use the original scanned images, however, due to the condition of the material; some pages have been modified to remove imperfections.

Disclaimer

Although every effort was made to ensure the accuracy of this book, no representations or warranties of any kind are made concerning the accuracy, completeness or suitability of the information, either expressed or implied. As a result, the information contained within this book should be used as general information only. The author and Forel Publishing Company, LLC shall have neither liability nor responsibility to any person or entity with respect to any loss or damage caused, or alleged to be caused, directly or indirectly by the information contained in this book. Further, the publisher and author are not engaged in rendering legal or other professional services. If legal, mechanical, electrical, or other expert assistance is required, the [illegible]essional should be sought.

1965

FORD-MERCURY

SHOP MANUAL

GROUP INDEX

SPECIFICATIONS AND SPECIAL SERVICE TOOLS AT END OF EACH GROUP

FOREWORD

This shop manual provides the Service Technician with complete information for the proper servicing of the 1965 Ford and Mercury cars

The information is grouped according to the type of work being performed, such as diagnosis and testing, frequently performed adjustments and repairs, in-vehicle adjustments, overhaul, etc. Specifications and recommended special tools are included.

Refer to the opposite page for important vehicle identification data.

The descriptions and specifications in this manual were in effect at the time this manual was approved for printing. The Ford Motor Company reserves the right to discontinue models at any time, or change specifications or design, without notice and without incurring obligation.

SERVICE DEPARTMENT

FORD MOTOR COMPANY

VEHICLE IDENTIFICATION

GROUP 1

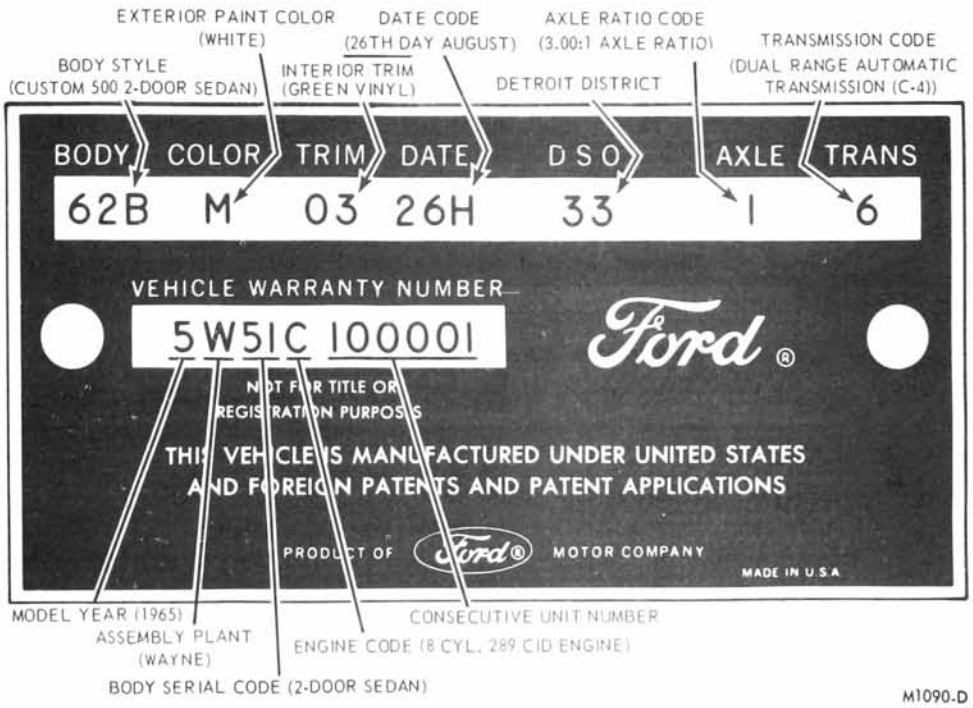


FIG. 1—Ford Warranty Plate

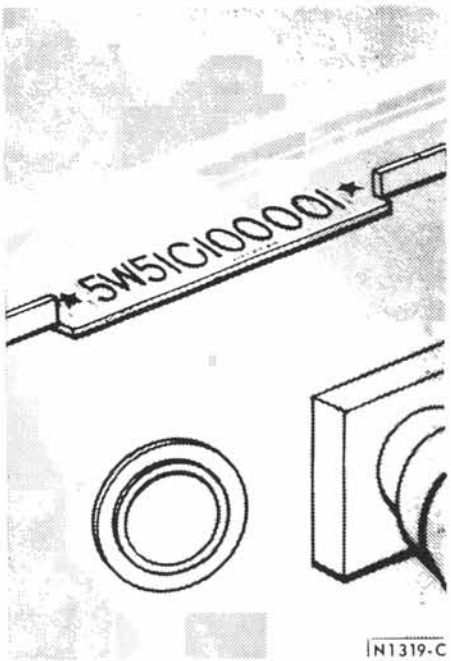


FIG. 3—Ford Vehicle Identification Number Location

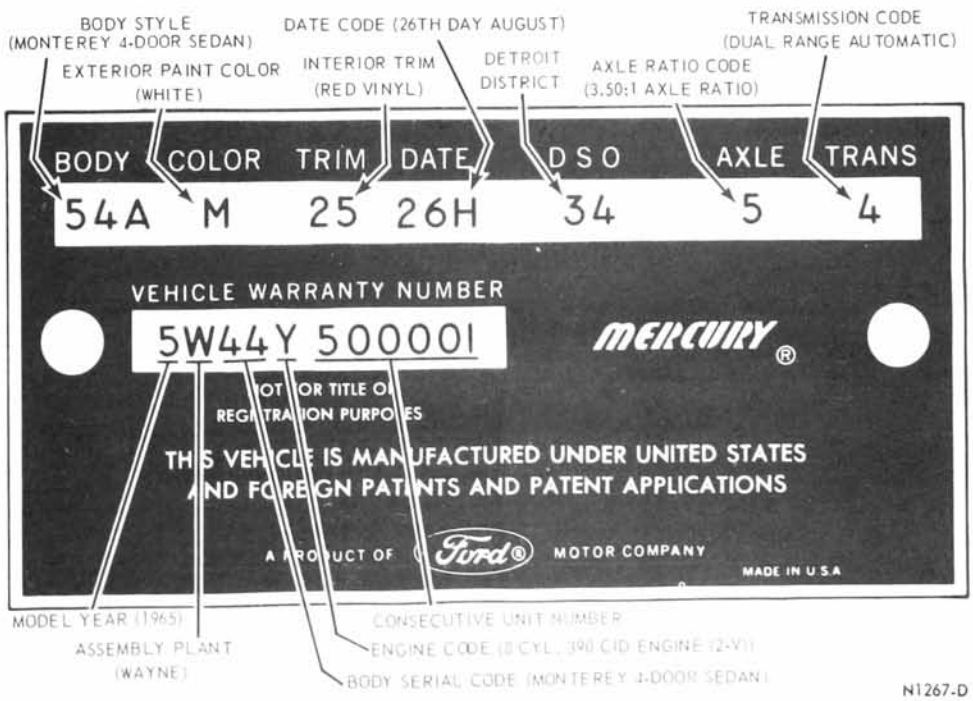


FIG. 2—Mercury Warranty Plate

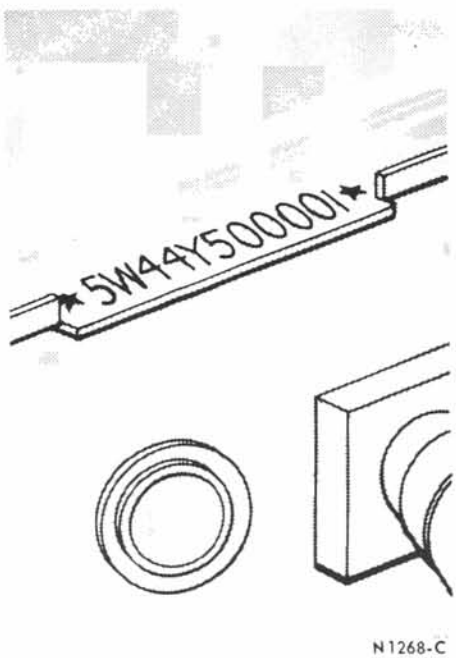


FIG. 4—Mercury Vehicle Identification Number Location

Fig. ... Plates. The plate is lo...

The ... registration purposes ... (weld flange) of the da... Do not use the Vehicl... plate for title or reg...

VEHICLE DATA

The vehicle data appears in a line across the top of the warranty plate (Figs. 1 and 2). The first two letters and a number identify the Body Style. The following one or two letters identify the Exterior Paint Color. The next code consisting of two numbers, or a letter and a number, identifies the Interior Trim. The Date Code showing the date the car was manufactured,

follows the Trim Code and consists of two numbers and a letter. The next code gives the district in which the car was ordered and consists of two numbers. The next to the last code is the Axle Ratio Code and is designated by a number for a conventional axle or a letter for an Equa-Lock axle. The last code in the vehicle data is the Transmission Code and consists of one number. The charts that follow, list in detail the various vehicle data codes.

VEHICLE WARRANTY NUMBER

The vehicle warranty number is the second line of numbers and letters appearing on the Warranty Plate (Figs. 1 and 2). The first number indicates the model year. The letter following the model year indicates the assembly plant at which the car was manufactured. The next two numbers designate the Body Serial Code. The letter following the Body Serial Code designates the Engine Code. The remaining numbers indicate the Consecutive Unit Number. The charts that follow, list the various Vehicle Warranty Number codes.

BODY SERIAL AND STYLE CODES

The two-digit numeral which follows the assembly plant code identifies the body series. This two-digit number is used in conjunction with the Body Style Code, in the Vehicle Data, which consists of a two-digit number with a letter suffix. The following chart lists the Body Serial Codes, Body Style Codes and the model.

MERCURY

Body Serial Code	Body Style Code	Body Type
Monterey		
42	50A	4-Door Sedan†
43	62A	2-Door Sedan
44	54A	4-Door Sedan
45	76A	2-Door Convertible
47	63A	2-Door H/T Fastback
48	57A	4-Door H/T Fastback
45	76G	2-Door Convertible*
47	63G	2-Door H/T Fastback*
Montclair		
52	50B	4-Door Sedan†
57	63B	2-Door H/T Fastback
58	57B	4-Door H/T Fastback
Parklane		
62	50F	4-Door Sedan†
65	76F	2-Door Convertible
65	76C	2-Door Convertible*
67	63F	2-Door H/T Fastback
67	63C	2-Door H/T Fastback*
Commuter		
72	71B	4-Door 6 Passenger Station Wagon
72	71C	4-Door 9 Passenger Station Wagon
Colony Park		
76	71A	4-Door 6 Passenger Station Wagon
76	71E	4-Door 9 Passenger Station Wagon

†Reverse Back Window
*Bucket Seats

FORD

Ford Custom		
53	62E	2-Door Sedan
54	54E	4-Door Sedan

FORD (Cont.)

Galaxie 500 XL		
68	63C	2-Door Fastback*
69	76B	2-Door Convertible*
Galaxie 500 Lt'd.		
60	57F	4-Door Fastback
67	63F	2-Door Fastback
Station Wagons		
72	71B	4-Door 6 Passenger
74	71C	4-Door 9 Passenger
Country Squire		
76	71E	4-Door 6 Passenger
78	71A	4-Door 9 Passenger

*Bucket Seats

EXTERIOR PAINT COLOR CODES

A single letter code designates a solid body color and two letters denote a two-tone—the first letter, the lower color and the second letter the upper color.

Code	M-30-J/ *M-32-J#	Color
A	1724-A	Black
C	1736-A	Med. Ivy Gold Met.
D	1625-A	Med. Turq. Met.
F	1226-A	Med. Ivy Gold Met.
H	1544-A	Dk. Blue Met.
I	1737-A	Lt. Beige Met.
J	1515-A	Red
K	1621-A	Med. Gray Met.
M	1619-A	White
O	1732-A	Lt. Peacock
P	1738-A	Palomino Met.
R	1879-A	Dk. Ivy Green Met.
T	1631-A	Lt. Beige
V	1729-A	Yellow
X	1632-A	Maroon Met.
Y	1269-A	Med. Blue Met.
5	1731-A	Dk. Turq. Met.

*M-32-J Acrylic Alternate with M-30-J.

INTERIOR TRIM CODES

Code	Trim Schemes
03	Green Vinyl
04	Beige Vinyl
12	Blue and Lt. Blue Met. Fabric & Vinyl
15	Red Fabric & Vinyl
16	Black Fabric & Vinyl
17	Turquoise and Lt. Turq. Met. Fabric & Vinyl
19	Palomino and Med. Palomino Fabric & Vinyl
D6	White Pearl (W/Black) Vinyl
22	Lt. Blue Met. Vinyl
25	Red Vinyl
26	Black Vinyl
29	Med. Palomino Vinyl
32	Blue and Blue Met. Vinyl
33	Burgundy Vinyl
35	Red Vinyl
36	Black Vinyl
37	Turquoise and Turq. Met. Vinyl
38	Ivy Gold and Lt. Ivy Gold Vinyl
39	Palomino and Med. Palomino Vinyl
E2	White Pearl (W/Blue) Vinyl
E3	White Pearl (W/Burgundy) Vinyl

INTERIOR TRIM CODES (Cont.)

Code	Trim Schemes
E5	White Pearl (W/Red) Vinyl
E6	White Pearl (W/Black) Vinyl
E7	White Pearl (W/Turq.) Vinyl
E8	White Pearl (W/Ivy Gold) Vinyl
E9	White Pearl (W/Palomino) Vinyl
42	Med. Blue Met. Vinyl
45	Red Vinyl
46	Black Vinyl
47	Turquoise Vinyl
48	Lt. Ivy Gold D/L Vinyl
49	Med. Palomino Vinyl
52	Blue and Blue Met. Fabric & Vinyl
55	Red Fabric & Vinyl
56	Black Fabric & Vinyl
57	Turquoise and Turq. Met. Fabric & Vinyl
58	Ivy Gold Fabric & Vinyl
59	Palomino and Med. Palomino Fabric & Vinyl
F6	White (W/Black) Vinyl
62	Blue Met. and Lt. Blue Met. Vinyl
65	Red Vinyl
66	Black Vinyl
67	Med. Turq. and Lt. Turq. Vinyl
68	Lt. Ivy Gold Vinyl
69	Med. Palomino Vinyl
G2	White Pearl (W/Blue) Vinyl
L2	White Pearl (W/Blue) with Headrest Vinyl
G3	White Pearl (W/Burgundy) with Headrest Vinyl
L3	White Pearl (W/Burgundy) with Headrest Vinyl
G5	White Pearl (W/Red) Vinyl
L5	White Pearl (W/Red) with Headrest Vinyl
G6	White Pearl (W/Black) Vinyl
L6	White Pearl (W/Black) with Headrest Vinyl
G7	White Pearl (W/Turq.) Vinyl
L7	White Pearl (W/Turq.) with Headrest Vinyl
G8	White Pearl (W/Ivy Gold) Vinyl
L8	White Pearl (W/Ivy Gold) with Headrest Vinyl
G9	White Pearl (W/Palomino) Vinyl
L9	White Pearl (W/Palomino) with Headrest Vinyl
72	Med. Blue Met. Vinyl
K2	Blue with Headrest Vinyl
75	Red Vinyl
K5	Red with Headrest Vinyl
76	Black Vinyl
K6	Black with Headrest Vinyl
77	Turquoise Vinyl
K7	Turquoise with Headrest Vinyl
78	Lt. Ivy Gold D/L Vinyl
K8	Ivy Gold with Headrest Vinyl
79	Med. Palomino Vinyl
K9	Med. Palomino with Headrest Vinyl
M6	White Pearl (W/Black) Vinyl
82	Lt. Blue Met. Vinyl
85	Red Vinyl
86	Black Vinyl
87	Turquoise Vinyl
89	Med. Palomino Vinyl
92	Lt. Blue Met. Vinyl (Mercury), Fabric & Vinyl (Ford)
93	Burgundy Fabric & Vinyl
95	Red Vinyl
96	Black Vinyl (Mercury), Fabric and Vinyl (Ford)
97	Turquoise Fabric & Vinyl
	Med. Palomino Vinyl (Mercury), Fabric & Vinyl (Ford)
	Palomino Fabric & Vinyl
	& Vinyl
Z9	

DATE CODES

The code letters for the month are preceded by a numeral to show the day of the month when the car was completed. The second year code letters are to be used if the model production exceeds 12 months.

Month	First Model Year	Second Model Year
January	A	N
February	B	P
March	C	Q
April	D	R
May	E	S
June	F	T
July	G	U
August	H	V
September	J	W
October	K	X
November	L	Y
December	M	Z

DISTRICT CODES (DSO)

Domestic Special Orders, Foreign Special Orders, Limited Production Options and Pre-Approved Special Orders have the complete order number recorded in this space. Also to appear in this space is the two-digit code number of the District which ordered the unit. If the unit is regular production, only the District code number will appear.

FORD

Code	District	Code	District
11	Boston	45	Davenport
12	Buffalo	51	Denver
13	New York	52	Des Moines
14	Pittsburgh	53	Kansas City
15	Newark	54	Omaha
21	Atlanta	55	St. Louis
22	Charlotte	61	Dallas
23	Philadelphia	62	Houston
24	Jacksonville	63	Memphis
25	Richmond	64	New Orleans
26	Washington	65	Oklahoma City
31	Cincinnati	71	Los Angeles
32	Cleveland	72	San Jose
33	Detroit	73	Salt Lake City
34	Indianapolis	74	Seattle
35	Lansing	81	Ford of Canada
36	Louisville	83	Government
41	Chicago	84	Home Office Reserve
42	Fargo	85	American Red Cross
43	Rockford	89	Transportation Services
44	Twin Cities	90	Export

MERCURY

Code	District	Code	District
11	Boston	34	Detroit
15	New York	41	Chicago
16	Philadelphia	42	St. Louis
17	Washington	51	Denver
21	Atlanta	52	Los Angeles
22	Dallas	53	Oakland
23	Jacksonville	54	Seattle
26	Memphis	81	Ford of Canada
31	Buffalo	84	Home Office Reserve
32	Cincinnati	90-99	Export
33	Cleveland		

AXLE RATIO CODES

A number designates a conventional axle, while a letter designates an Equa-Lock axle.

Code	Ratio	Code	Ratio
1	3.00:1	A	3.00:1
4	3.25:1	E	3.25:1
5	3.50:1	F	3.50:1
8	3.89:1	H	3.89:1
9	4.11:1	I	4.11:1

MODEL YEAR CODE

The numeral 5 designates 1965.

ASSEMBLY PLANT CODES

Code Letter	Assembly Plant	Code Letter	Assembly Plant
A	Atlanta	N	Norfolk
D	Dallas	P	Twin Cities
E	Mahwah	R	San Jose
F	Dearborn	S	Pilot Plant
G	Chicago	T	Metuchen
H	Lorain	U	Louisville
J	Los Angeles	W	Wayne
K	Kansas City	Y	Wixom
L	Michigan Truck	Z	St. Louis

TRANSMISSION CODES

Code	Type
1	3-Speed Manual-Shift
2	Overdrive
4	Cruise-O-Matic (Ford) Multi-Drive (Mercury)
5	4-Speed Manual-Shift
6	C-4 Automatic Dual Range

ENGINE CODES

Code	Engine
C	8 Cylinder 289 Cu. In. (4V Prem.)
H	8 Cylinder 390 Cu. In. (2V Spec.)
L	8 Cylinder 427 Cu. In. (4V OH Cam)
M	8 Cylinder 427 Cu. In. (8V OH Cam)
P	8 Cylinder 390 Cu. In. (4V Spec.)
R	8 Cylinder 427 Cu. In. (8V Hi Perf.)
V	6 Cylinder 240 Cu. In. (1V)
X	8 Cyl. 352 Cu. In. (4V)
Y	8 Cylinder 390 Cu. In. (2V)
Z	8 Cylinder 390 Cu. In. (4V)
5	6 Cyl. *240 Cu. In. (1V)
3	8 Cylinder *289 Cu. In. (4V)
9	8 Cylinder *390 Cu. In. (4V)

*Low Compression.

CONSECUTIVE UNIT NUMBER

Each assembly plant, with each model year, begins with consecutive unit number 100001 (Ford) or 500001 (Mercury) and continues on for each car built.

BRAKES

GROUP 2

PART 2-1 GENERAL BRAKE SERVICE

1 DIAGNOSIS AND TESTING

PRELIMINARY TESTS

1. Check the fluid level in the master cylinder, and add FoMoCo **heavy-duty** SAE 70R3 brake fluid if required.

2. With the engine running or enough vacuum in the system for power brakes, push the brake pedal down as far as it will go while the car is standing still. If the pedal travels more than halfway between the released position and the floor, check the brake adjustment and the automatic adjusters.

To check adjuster operation, check the shoes and the adjuster components for binding or improper installation. Follow the procedure described under "Brake Shoe Adjustments" in Part 2-2, Section 2.

several reverse brake stops

ing brake. Depress the service brake pedal several times to exhaust all vacuum in the system. Then, depress the pedal and hold it in the applied position. Start the engine. If the vacuum system is operating, the pedal will tend to fall away under foot pressure and less pressure will be required to hold the pedal in the applied position. If no action is felt, the vacuum booster system is not functioning. Follow the procedures in the "Booster Diagnosis Guide" With the engine shut off, exhaust all vacuum in the system. Depress the brake pedal and hold it in the applied position. If the pedal gradually falls away under this pressure, the hydraulic system is leaking. Check all tubing hoses, and connections for leaks.

If the brake pedal movement feels spongy, bleed the hydraulic system to remove air from the lines and cylinder. See Section 2, "Hydraulic System Bleeding". Also, check for leaks or insufficient fluid.

4. Should one of the brakes be locked and the car must be moved, open the brake cylinder bleeder screw long enough to let out a few drops of brake fluid. **This bleeding operation will release the brakes, but it will not correct the cause of the trouble.**

ROAD TEST

The car should be road tested only if the brakes will safely stop the car. Apply the brakes at a speed of 25-30 mph to check for the existence of the trouble symptoms listed in Table 1, with the exception of those resolved in the preliminary tests and brake chatter. For each of the symptoms encountered, check and eliminate the causes which are also listed in Table 1. To check for brake chatter or surge, apply the brakes lightly at approximately 50 mph.

For booster removal and installation procedures, refer to Part 2-2, Section 3. For disassembly and assembly procedures, refer to Part 2-2, Section 4. For cleaning and inspection refer to Part 2-1, Section 3.

TABLE 1—Brake Trouble Symptoms and Possible Causes

Possible Causes of Trouble Symptoms	Trouble Symptoms												
	One Brake Drags	All Brakes Drag	Hard Pedal	Spongy Pedal	Car Pulls to One Side	One Wheel Locks	Brakes Chatter	Excessive Pedal Travel	Pedal Gradually Goes to Floor	Brakes Uneven	Shoe Click After Release	Noisy or Grabbing Brakes	Brakes Do Not Apply
Mechanical Resistance at Pedal or Shoes		x	x										
Brake Line Restricted	x	x	x		x								x
Leaks or Insufficient Fluid				x				x	x				x
Improper Tire Pressure					x					x			
Improperly Adjusted or Worn Wheel Bearing	x				x								
Distorted or Improperly Adjusted Brake Shoe	x	x	x	x	x	x	x	x			x	x	
Faulty Retracting Spring	x				x	x							
Drum Out of Round	x				x		x						
Linings Glazed or Worn			x		x	x	x	x			x	x	x
Oil or Grease on Lining			x		x	x	x			x		x	x
Loose Carrier Plate	x					x	x						
Loose Lining							x						
Scored Drum										x		x	
Dirt on Drum-Lining Surface												x	
Faulty Brake Cylinder	x				x	x						x	
Dirty Brake Fluid	x	x								x			x
Faulty Master Cylinder		x						x	x				x
Air in Hydraulic System	x			x				x					x
Self Adjusters Not Operating					x			x					
Insufficient Shoe-to-Carrier Plate Lubrication	x										x		
Tire Tread Worn						x							
Poor Lining to Drum Contact					x		x						
Front Suspension					x		x						
											x		
				x			x	x					
		x	x					x				x	

BRAKE BOOSTER TROUBLE DIAGNOSIS GUIDE

BOOSTER INOPERATIVE—HARD PEDAL	If the preliminary tests show that the booster is inoperative or if a hard pedal condition still exists after eliminating the causes of "Hard Pedal" listed in table 1, the trouble may be caused by vacuum leakage. Disconnect the vacuum line (two lines if equipped with an automatic transmission) at the booster, remove the vacuum manifold and check valve assembly, and look for a sticking or faulty check valve. Check all vacuum connections for leakage or obstruction. Check all hoses for a leaking or collapsed condition. Repair or replace parts as necessary. If the foregoing procedure does not eliminate the trouble, remove the booster from the car. Separate the booster body from the end plate, and check the bellows, booster body, and diaphragm assembly for damage that would cause leaks. When assembling, be sure that the diaphragm assembly is properly positioned. Improper location could cause leakage between the vacuum and atmospheric sides of the diaphragm.
BRAKES DRAG OR GRAB	If the brakes still drag or grab after eliminating the causes listed in Table 1, the condition is probably caused by a sticking valve plunger assembly.	Remove and disassemble the booster. Clean, inspect, and replace parts as necessary.
SELF APPLICATION OF BRAKES WHEN ENGINE STARTS	Remove and disassemble the booster. Check the diaphragm for being out of locating radii in the housing. Check for a sticking or unseated	atmospheric valve. Clean, inspect, and replace parts as necessary. Be sure that the diaphragm is properly located when assembling.

2 COMMON ADJUSTMENTS AND REPAIRS

PARKING BRAKE LINKAGE ADJUSTMENT

Check the parking brake cables when the brakes are fully released. If the cables are loose, adjust them as follows:

1. Fully release the parking brake pedal.

2. Depress the parking brake pedal one notch from its normal released position.

3. Raise the car.

4. Turn the adjusting nut forward against the equalizer until a moderate drag is felt when turning the rear wheels (Fig. 1).

5. Release the parking brake, and make sure that the brake shoes return to the fully released position.

POWER BRAKE MASTER CYLINDER PUSH ROD ADJUSTMENT

The push rod is provided with an adjustment screw to maintain the correct relationship between the booster control valve plunger and the master cylinder piston. Failure to maintain this relationship will prevent the master cylinder piston from completely releasing hydraulic pressure and can cause the brakes to drag.

To check the adjustment of the screw, fabricate a gauge of the dimensions shown in Fig. 2. Remove

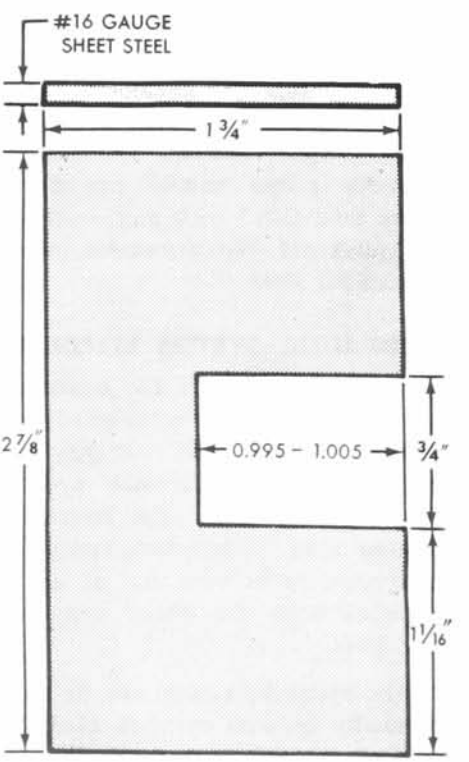


FIG. 2—Push Rod Gauge Dimensions

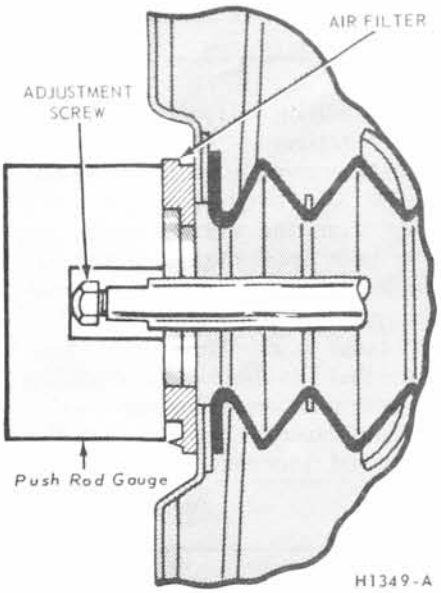


FIG. 3—Push Rod Adjustment

the air filter assembly and push the bellows back into the booster body. Re-install the air filter directly against the booster body, and then place the gauge against the master cylinder mounting surface of the air filter assembly as shown in Fig. 3. The push rod screw should be adjusted so that the end of the screw just touches the inner edge of the slot in the gauge. Do not set up side forces on the push rod as it may break the valve plunger.

This is an approximate adjustment only. To verify the adjustment, look through the make-up (rear) port when installing the master cylinder to the booster. The master cylinder piston should not move more than 0.015 inch as it contacts the push rod. No movement (exact contact) is ideal.

HYDRAULIC SYSTEM BLEEDING

When any part of the hydraulic system has been disconnected for repair or replacement, air may get into the lines and cause spongy pedal action. Bleed the hydraulic system after it has been properly connected to be sure that all air is expelled from the brake cylinders and lines.

the master cylinder reservoir filled with new heavy-duty brake fluid during the bleeding operation. If the reservoir is not kept full, the diaphragm gasket may be sucked down to the bottom of the master cylinder.

Never use brake fluid which has been drained from the hydraulic system.

1. Position a bent ⅜-inch box wrench on the bleeder fitting on the right rear brake wheel cylinder

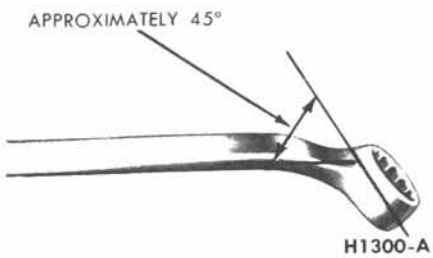


FIG. 4—Wrench for Bleeding Brake

(Fig. 4). Attach a rubber drain tube to the bleeder fitting. **The end of the tube should fit snugly around the bleeder fitting.**

2. Submerge the free end of the tube in a container partially filled with clean brake fluid, and loosen the bleeder fitting approximately ¾ turn.

3. Push the brake pedal down slowly thru its full travel. Close the bleeder fitting, then return the pedal to the fully-released position. Repeat this operation until air bubbles cease to appear at the submerged end of the tube.

4. When the fluid is completely free of air bubbles, tighten the bleeder fitting and remove the drain tube.

5. Repeat this procedure at each brake wheel cylinder in order: left rear, right front, and left front. Refill the master cylinder reservoir after each brake cylinder is bled and when the bleeding operation is completed. The fluid level should be within ⅜ inch of the top of the reservoir. The diaphragm-type gasket should be properly positioned in the reservoir cap, before the cap is installed.

PRESSURE BLEEDING

Bleed the longest lines first. **Never use brake fluid which has been drained from the hydraulic system.**

The bleeder tank should contain enough new heavy-duty brake fluid to complete the bleeding operation, and it should be charged with 10-30 pounds of air pressure.

1. Clean all dirt from the master cylinder reservoir cap.

2. Remove the master cylinder reservoir cap, install an adapter cap on the reservoir, and attach the bleeder tank hose to the fitting on the adapter cap. Adapter cap 2162 can be used, or an adapter cap can be fabricated by cutting a hole in the center of a filler cap and soldering a fitting at the hole.

3. Position a ⅜-inch box wrench on the bleeder fitting on the right rear brake wheel cylinder (Fig. 4). Attach a rubber drain tube to the bleeder fitting. **The end of the tube should fit snugly around the bleeder fitting.**

4. Open the valve on the bleeder tank to admit pressurized brake fluid to the master cylinder reservoir.

5. Submerge the free end of the tube in a container partially filled with clean brake fluid, and loosen the bleeder fitting.

6. When air bubbles cease to appear in the fluid at the submerged end of the drain tube, close the bleeder fitting and remove the tube.

7. Repeat this procedure at each brake wheel cylinder in the following order: left rear, right front, and left front.

8. When the bleeding operation is completed, close the bleeder tank valve and remove the tank hose from the adapter fitting.

9. Remove the adapter cap, refill the master cylinder reservoir to within ⅜ inch from the top of the reservoir, and install the filler cap. The diaphragm-type gasket should be properly installed in the cap before it is installed.

3 CLEANING AND INSPECTION

BRAKE ASSEMBLY

1. Remove the wheel from the drum, then remove the drum as outlined in Part 2-2, Section 2. Wash all the parts except the brake shoes in a cleaning fluid and dry with compressed air.

2. Brush all dust from the carrier plates and interior of the brake drums.

3. Inspect the brake shoes for excessive lining wear or shoe damage. If the lining is worn within 1/32 inch of the rivet heads or if the shoes are damaged, they must be replaced. Replace any lining that has been oil saturated. Replace lining in axle sets. Prior to replacement of lining, the drum diameter should be checked to determine if oversize linings must be installed.

4. Check the condition of brake shoes, retracting springs, hold-down springs, and drum for signs of overheating. If the shoes have a slight blue coloring, indicating overheating, replacement of the retracting and hold down springs is strongly recommended. **Overheated springs lose their pull and could cause the new lining to wear prematurely, if they are not replaced.**

5. If the car has 30,000 or more miles of operation on the brake linings or signs of overheating are present when relining brakes, the wheel cylinders should be disassembled and inspected for wear and entrance of dirt into the cylinder. The cylinder cups should be replaced, thus avoiding future problems.

6. Inspect all other brake parts and replace any that are worn or damaged.

7. Inspect the brake drums and, if necessary, refinish. Refer to Part 2-2, Section 4 for refinishing.

BOOSTER UNIT

A disassembled view of the brake booster is shown in Fig. 27, Part 2-2.

After disassembly, immerse all metal parts in a suitable solvent. Use only alcohol on rubber parts or parts containing rubber. After the parts have been thoroughly cleaned and rinsed in cleaning solvent, the metal parts which come in contact with hydraulic brake fluid or rubber parts should be rewashed in clean alcohol before assembly. Use an air hose to blow dirt and cleaning fluid from the recesses and internal passages. When overhauling a power booster, use all parts furnished in the repair kit. **Discard all old rubber parts.**

Inspect all other parts for damage or excessive wear. Replace damaged or excessively worn parts. If the inside of the booster body is rusted or corroded, polish it with steel wool or fine emery cloth.

PART 2-2 BRAKE SYSTEM

1 DESCRIPTION AND OPERATION

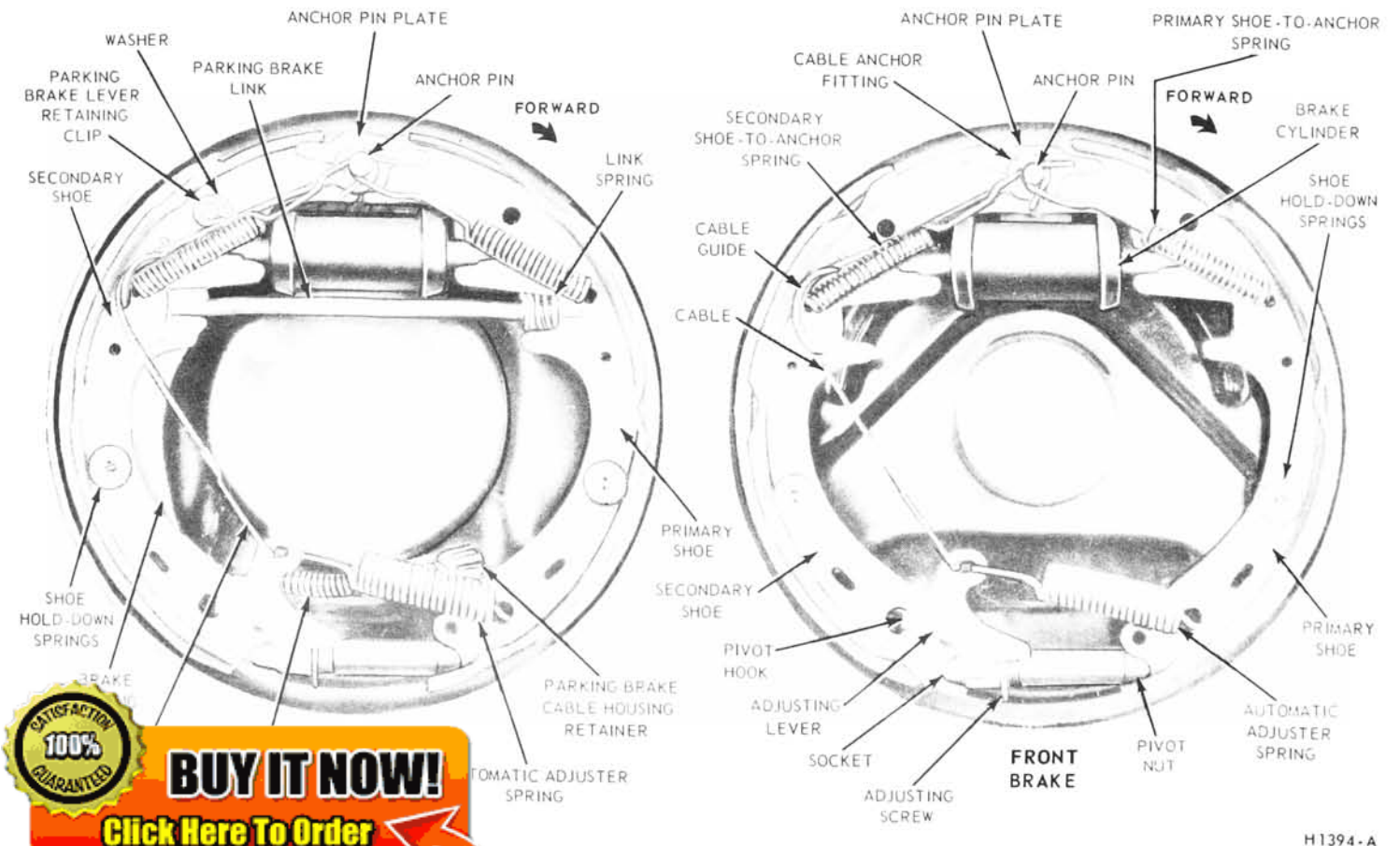
HYDRAULIC SELF-ADJUSTING BRAKE SYSTEM

The hydraulic brake system employs single anchor, internal expanding and self adjusting brake assemblies.

The master cylinder converts physical force from the brake pedal and booster into hydraulic pressure against the pistons in the wheel cylinders. The wheel cylinder pistons, in turn, convert hydraulic pressure back into physical force at the brake shoes.

The self-adjusting brake mechanism consists of a cable, cable guide, adjusting lever, and adjuster spring (Fig. 1). The cable is hooked over the anchor pin at the top and is connected to the lever at the bottom. The cable is connected to the secondary brake shoe by means of the cable guide. The adjuster spring is hooked to the primary brake shoe and to the lever. The automatic adjuster operates only when the brakes are applied while the car is moving rearward and only when the secondary shoe is free to move toward the drum beyond a predetermined point.

With the car moving rearward and the brakes applied, the "wrap-around" action of the shoes following the drum forces the upper end of the primary shoe against the anchor pin. The action of the wheel



cylinder moves the upper end of the secondary shoe away from the anchor pin. The movement of the secondary shoe causes the cable to pull the adjusting lever upward and against the end of a tooth on the adjusting screw star-wheel. The upward travel of the lever increases as lining wear increases. When the lever can move upward far enough, it passes over the end of the tooth and engages the tooth. When the brakes are released, the adjusting spring pulls the lever downward causing the starwheel to turn and expand the shoes. The star-wheel is turned one tooth at a time as the linings progressively wear.

With the car moving forward and the brakes applied, the secondary shoe is against the anchor pin and the primary shoe is moved toward the drum. Therefore, the adjuster does not operate.

The rear brake assembly is basically the same as the front brake. The conventional parking brake lever, link, and spring are used in the rear brake.

The anchor pins on all brakes are fixed and non-adjustable.

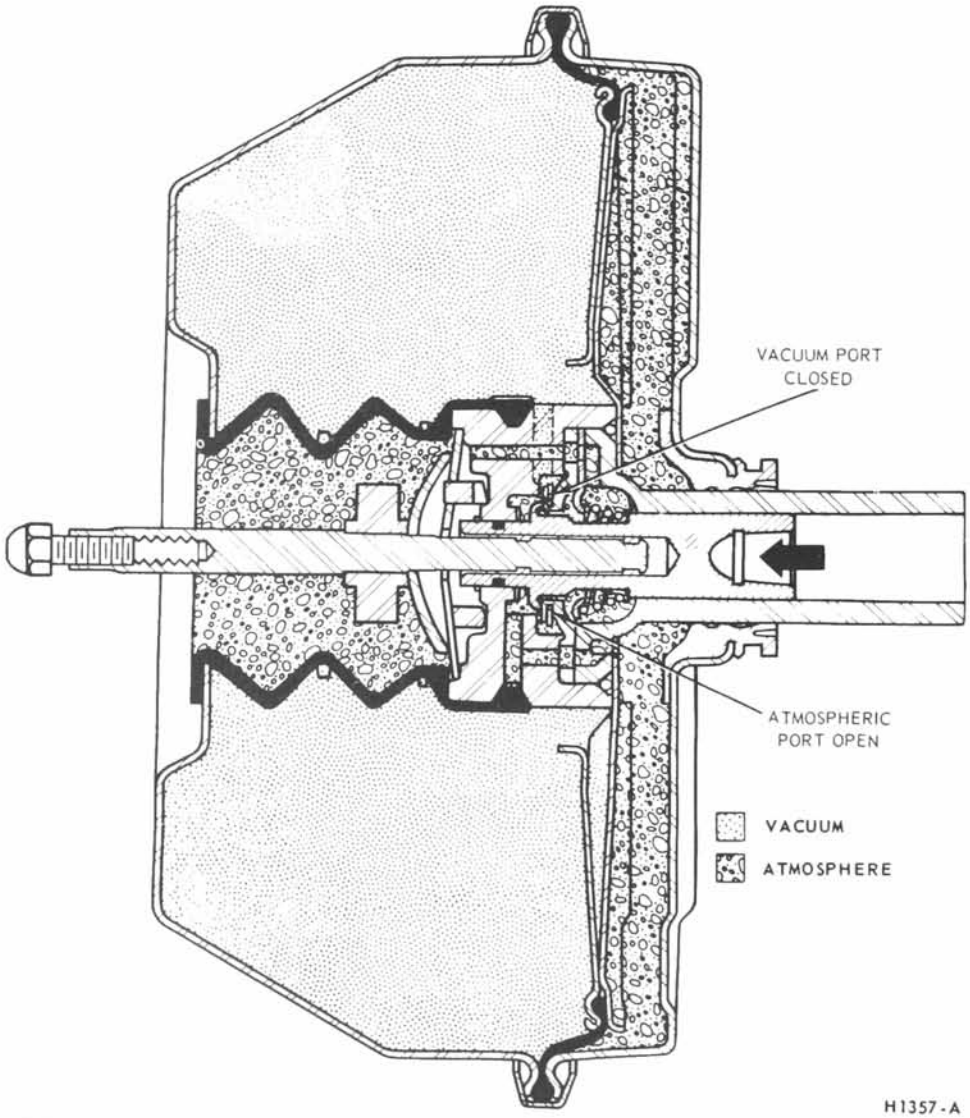


FIG. 2—Booster in Applying Position

BOOSTER SYSTEM

The optional power brake booster is installed on the engine side of the dash panel and is connected to the brake pedal through a lever assembly and push rod link.

The booster consists of a vacuum chamber, atmospheric valve, control valve plunger assembly, diaphragm, and an atmospheric chamber (Figs. 2, 3, and 4).

Atmospheric pressure is present [illegible]mes in the atmospheric [illegible]

assembly within the vacuum chamber.

Vacuum is present at all times in that area of the vacuum chamber forward of the diaphragm. Vacuum is supplied through a hose from the intake manifold to the vacuum manifold and check valve on the booster body. With this integral check valve and vacuum chamber, it is possible to obtain several power assisted brake applications with the engine shut off. This arrangement makes a vacuum reservoir unnecessary.

Either vacuum from the forward side of the diaphragm or air from the bellows (atmospheric chamber) can be connected to the rear side of the diaphragm through porting in the control valve hub and the plunger assembly.

APPLYING POSITION

As the brake pedal is depressed, the valve operating rod and valve plunger assembly move forward compressing the plunger return spring (Fig. 2). The initial movement of the plunger closes the porting from the vacuum chamber preventing further evacuation of the area back of the diaphragm. Further movement of the plunger forces the atmospheric valve off its seat so that atmospheric pressure from the bellows can enter the hub porting that leads to the rear side of the diaphragm.

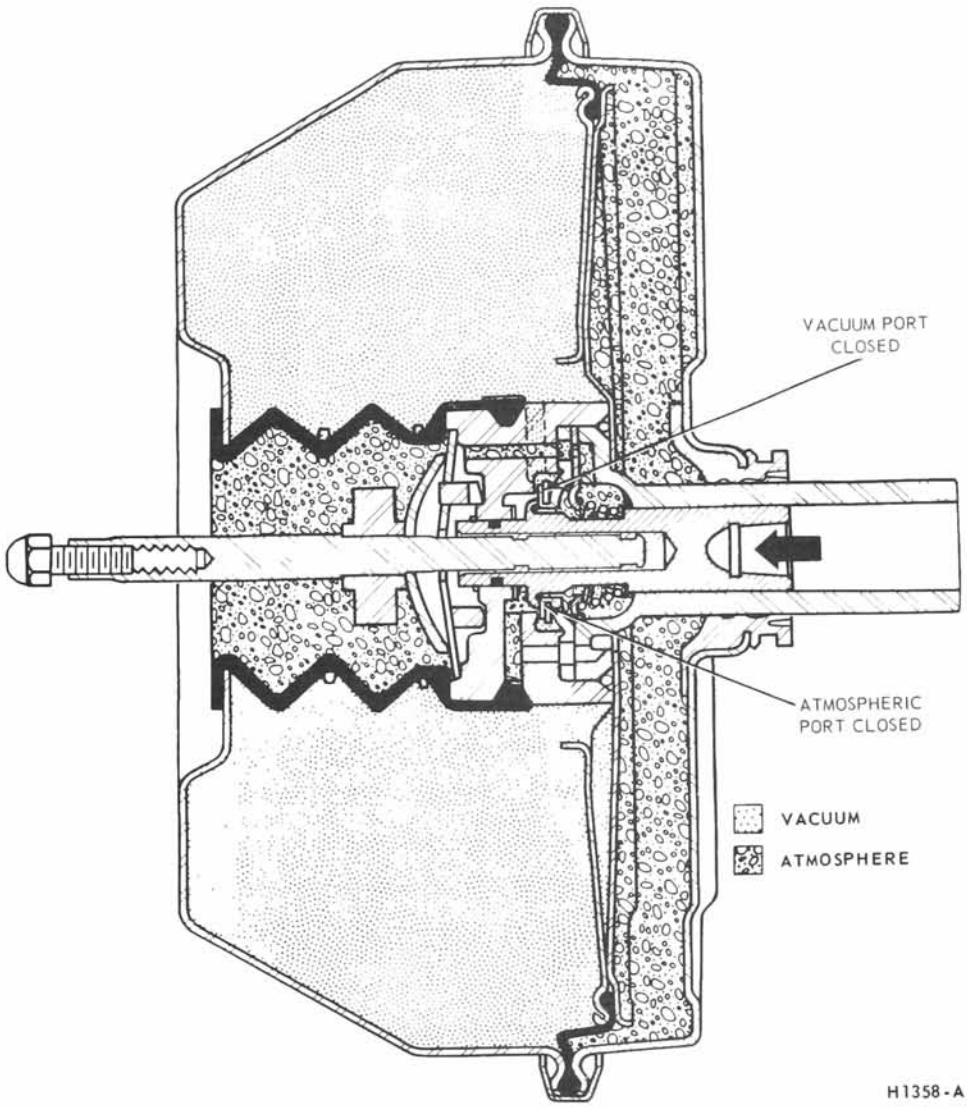


FIG. 3—Booster in Holding Position

With vacuum on the front side of the diaphragm and atmospheric pressure on the back side of the diaphragm, a force is developed to move the diaphragm, push rod and master cylinder piston forward to close the compensating port and force hydraulic fluid under pressure through the residual pressure check valve and brake tubes to the wheel brakes. As hydraulic pressure is developed in the hydraulic system, a reaction counter-force acts against the reaction lever and ring assembly. The reaction lever and ring assembly will tend to move the atmospheric valve to the closed position (Fig. 3). When these combined forces balance, the porting to the vacuum supply will remain closed and the atmospheric valve will cut off any further passage of atmospheric pressure to the area behind the diaphragm. Therefore, the power assist force acting on the master cylinder piston will stabilize and the hydraulic force applying the brakes will be maintained at a constant level.

proportion to the brake hydraulic apply forces. This is the means of providing the proper "driver feel" to the power brake unit.

HOLDING POSITION

When the forward motion of the brake pedal is stopped and held, the valve operating rod ceases to move the control valve plunger forward. However, the unbalanced forces of atmospheric pressure and vacuum on each side of the diaphragm will continue to move the outer sleeve of the control valve plunger forward keeping the vacuum porting closed. At the same time, the reaction force acting through the reaction ring and

RELEASED POSITION

When the pedal pressure is released from the valve operating rod and plunger assembly, the plunger return spring moves the plunger away from the atmospheric valve allowing the valve to seat against the hub (Fig. 4). This seating of the valve closes off the bellows chamber from the hub porting that connects to the rear side of the diaphragm. At the same time, the rearward movement of the plunger opens the porting from the vacuum chamber and draws out the air from the rear side of the power diaphragm. With vacuum on both sides of the diaphragm, the assist force against the master cylinder push rod is eliminated.

Also, a pressure differential is created by the presence of vacuum on the rear (small diameter) side of the valve hub and atmospheric (bellows) pressure on the front (large diameter) side. This pressure differential moves the valve hub and, with it, the valve plunger and diaphragm assembly back to the released position. This releasing action permits the brake shoe retracting springs, acting through the wheel cylinder pistons and the hydraulic fluid, to return the master cylinder piston and push rod to the released position.

With the piston and push rod in the released position, the hydraulic compensating port in the master cylinder is open. The open port permits fluid either to return from the brake system to the fluid reservoir, or enter the brake system from the reservoir.

PARKING BRAKE

An independent foot-operated parking brake control actuates the rear wheel brake shoes through a cable linkage. The operating cable is routed from the parking brake control assembly to the equalizer lever which is attached to the equalizer assembly (Fig. 17). The rear brake cables connect the equalizer assembly to the parking brake lever at each rear secondary shoe (Fig. 1).

Two types of brake pedal control are used. The automatic release type (Fig. 5) is used on the Mercury Parklane. All other models use the manual release type (Fig. 16).

When the pedal is depressed (either manual or automatic release type) the secondary brake shoes are forced against the rear brake drums. The pedal is held in the applied position by the engagement of a spring-loaded pawl with a ratchet in the control assembly (Figs. 5 and 16).

Either type of parking brake control assembly is mounted to the dash panel and the cowl upper panel. The pedal pivots on a stationary pedal mount. A spring-loaded pawl and a release lever are assembled to the pedal. A ratchet is assembled to the upper end of the pedal. The pawl contacts the ratchet at such an angle ratchet teeth will slide over

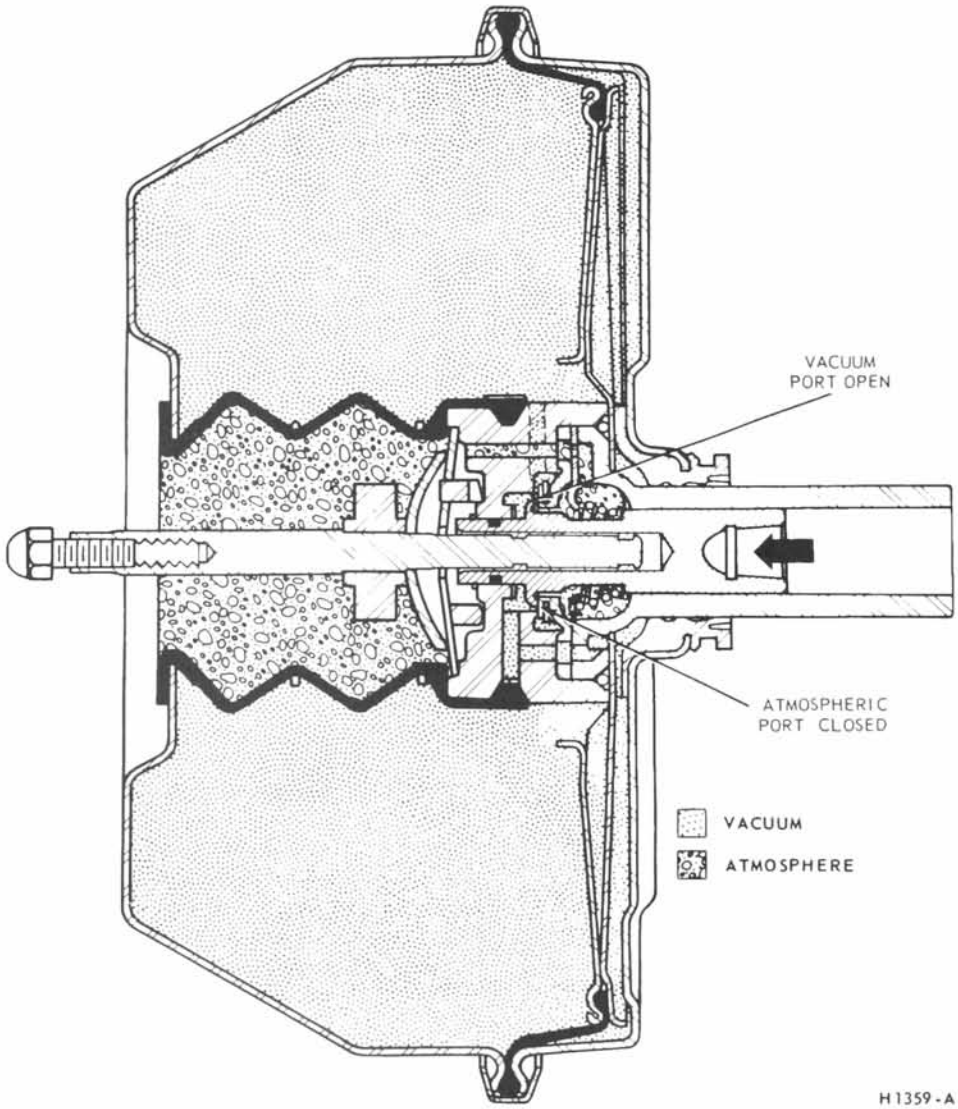


FIG. 4—Booster in Released Position

When the lever is pulled back on the manual release type (Fig. 16), the cam action of the lever on the pawl cam pin will disengage the pawl from the ratchet to release the brakes.

On the automatic type, the vacuum power unit will release the parking brakes automatically when the transmission selector lever is moved into any drive position with the engine running. The brakes will not release automatically, however, when the selector lever is in the neutral or park position with the engine running, or in any position with the engine off.

The power unit piston rod is attached to the release lever. Since the release lever pivots against the pawl, a slight movement of the release lever will disengage the pawl from the ratchet allowing the brakes to release. The release lever pivots on a rivet pin in the pedal mount (Fig. 5).

The vacuum power unit with mounting bracket is riveted to the control assembly. The vacuum actuated piston within the unit is connected by a rod to the upper end of the release lever to move the pawl out of engagement with the ratchet (Fig. 5). The lower end of the release lever extends out for alternate manual release in the event of vacuum power failure or

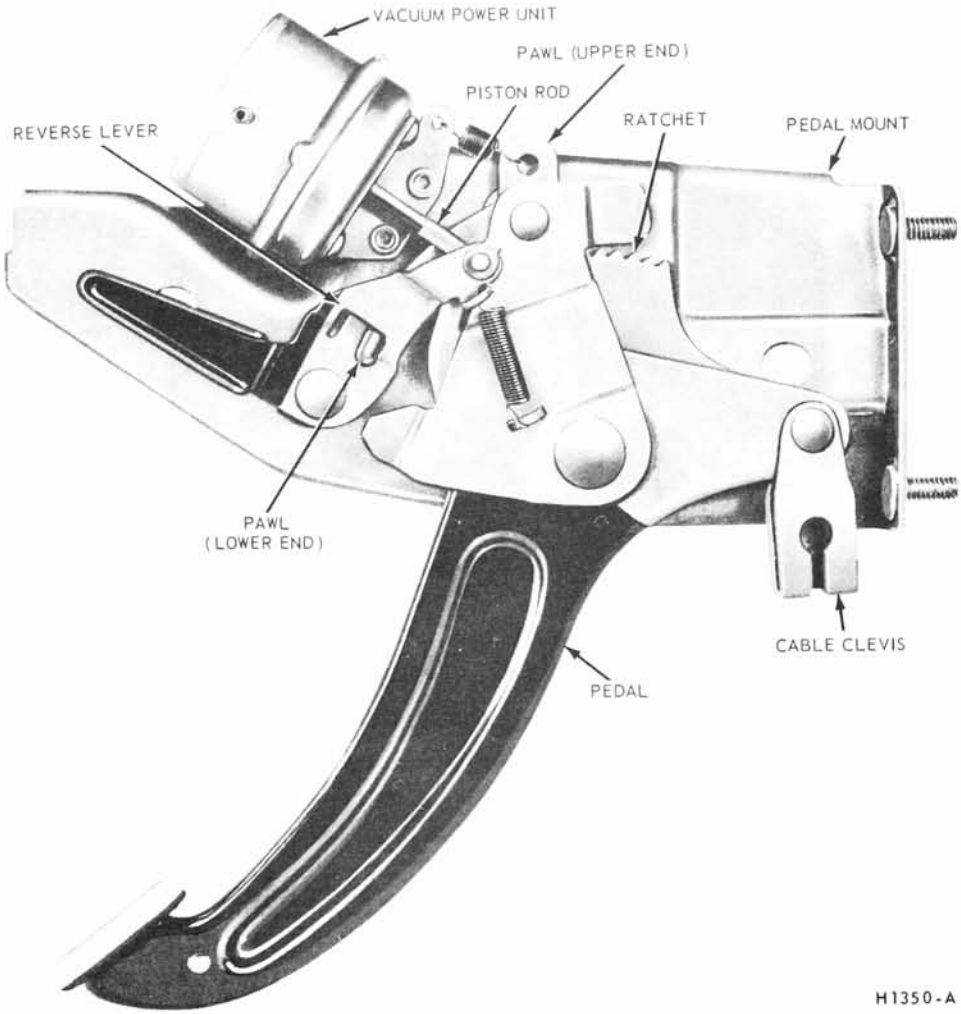


FIG. 5—Parking Brake Control Assembly with Automatic Release

for optional manual release at any time.

Hoses connect the power unit and the engine manifold to a vacuum release valve in the transmission neutral safety switch (Fig. 5 and 6). Moving the transmission selector lever into any drive position with the engine running will open the release valve to connect engine manifold vacuum to one side of the actuating piston in the power unit. The pressure differential thus created will cause the piston and link to pull the release lever.

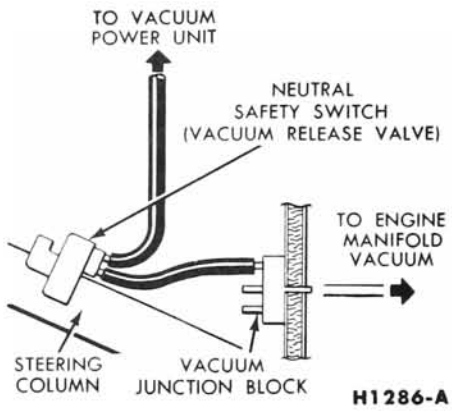


FIG. 6—Connections for Automatic Parking Brake Release

2 IN-CAR ADJUSTMENTS AND REPAIRS

BRAKE SHOE ADJUSTMENTS

The car should be raised with the wheels off the floor.

The hydraulic service brakes are self-adjusting and require a manual adjustment only after the brake shoes have been relined, replaced, or when the length of the adjusting screw has been changed while performing some other service operation.

The brake drums should be at normal room temperature when adjusting the brake shoes. If the shoes are adjusted when the drums are d expanded, the shoes may

the carrier plate and drum.

Before installing the brake drum on the front wheel spindle, wipe the spindle completely free of grease. Install the drum carefully so that the grease seal retainers within the hub will not be damaged.

2. Remove the adjusting hole cover from the carrier plate and, from the carrier plate side, turn the adjusting screw upward to expand the shoes (Fig. 7). Expand the shoes until a drag is felt when the drum is rotated.

3. Remove the drum. Mark the tooth on the star wheel where the lever contacts the adjusting screw. While holding the adjusting lever out of engagement with the adjusting screw, back off the adjusting screw ¾ of a turn with the fingers. If finger movement will not turn the screw, free it up; otherwise, the self-adjusting lever will not turn the screw. Lubricate the screw with a thin uniform coating of C1AZ-19590-B Grease.

Any other adjustment procedure may cause damage to the adjusting screw with consequent self adjuster problems.

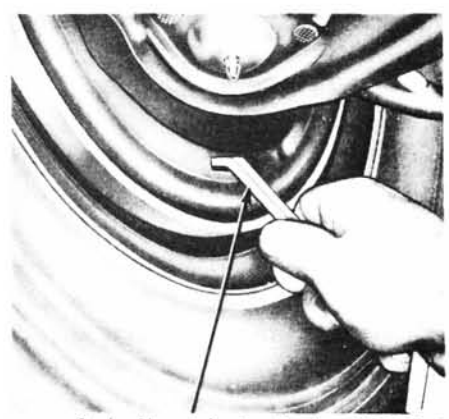


FIG. 7—Expanding Brake Shoes

4. Apply a small quantity of high-temperature grease to the points where the shoes contact the carrier plate, being careful not to get the lubricant on the linings. Install the drum.

On a front wheel, install the wheel outer bearing, washer, and adjusting nut, then adjust the wheel bearings as outlined in Part 3-5, Section 2.

On rear wheels, install the three Tinnerman nuts and tighten securely.

5. Install the wheel on the drum and tighten the mounting nuts to specification.

6. Install the adjusting hole cover on the brake carrier plate.

7. When adjusting the rear brake shoes, check the parking brake cables for proper adjustment. Make sure that the equalizer lever operates freely.

8. After the brake shoes have been properly adjusted, check the operation of the brakes.

FRONT BRAKE DRUM

REMOVAL

1. Raise the car until the wheel and tire clear the floor. Remove the wheel cover or hub cap, and remove the wheel and tire assembly from the drum.

2. Remove the drum. If the drum will not come off, insert a narrow screwdriver through the brake adjusting hole at the inner side of the brake carrier plate, and disengage the adjusting lever from the adjusting screw. While holding the adjusting lever away from the screw, back off the adjusting screw with the brake adjusting tool (Fig. 8). **Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise the self-adjusting mechanism will not function properly.**

3. Remove the grease cap from the hub. Remove the cotter pin, nut lock, adjusting nut, and flat washer from the spindle. Remove the outer bearing cone and roller assembly.

4. Pull the hub and drum assembly off the wheel spindle.

INSTALLATION

the wheel bearings, install the inner bearing cone and roller assembly in the inner cup, and install the new grease retainer. See Part 3-5, Section 4.

If the original drum is being installed, make sure that the grease in the hub is clean and adequate.

2. Install the drum assembly and adjust the brakes as outlined under "Brake Shoe Adjustments" in this section.

3. Install the outer wheel bearing, washer and adjusting nut.

4. Adjust the wheel bearing as outlined in Part 3-5, Section 2, then install the cotter pin grease cap. Install the wheel and hub cap.

REAR BRAKE DRUM

REMOVAL

1. Raise the car so that the wheel is clear of the floor.

2. Remove the hub cap and wheel. Remove the three Tinnerman nuts and remove the brake drum. If the drum will not come off, insert a narrow screwdriver through the brake adjusting hole in the carrier plate, and disengage the adjusting lever from the adjusting screw. While holding the adjusting lever away from the adjusting screw, back off the adjusting screw with the brake adjusting tool (Fig. 8). **Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise, the self-adjusting mechanism will not function properly.**

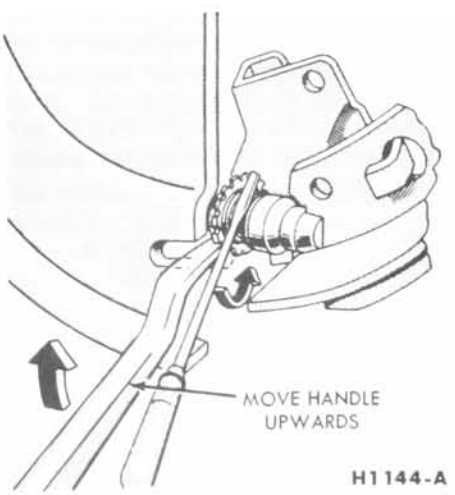


FIG. 8—Backing Off Brake Adjustment

INSTALLATION

1. Remove the protective coating from a new drum with carburetor degreaser.

2. Place the drum over the brake assembly and into position. Adjust the brakes as outlined under "Brake Shoe Adjustments" in this section.

3. Install the three Tinnerman nuts and tighten securely. Install the wheel on the axle shaft flange studs against the drum, and tighten the retaining nuts to specifications.

BRAKE SHOES AND ADJUSTING SCREW

REMOVAL

1. With the wheel and drum removed, install a clamp over the ends of the brake cylinder as shown in Fig. 9.

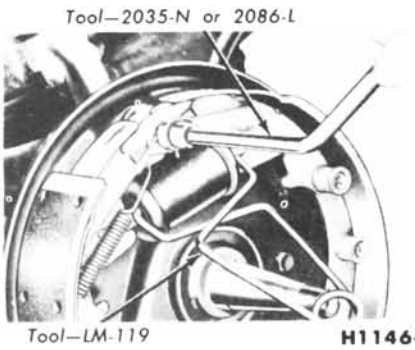


FIG. 9—Retracting Spring Removal

2. Contract the shoes as follows:

a. Disengage the adjusting lever from the adjusting screw by pulling backward on the adjusting lever (Fig. 1).

b. Move the outboard side of the adjusting screw upward and back off the pivot nut as far as it will go.

3. Pull the adjusting lever, cable and automatic adjuster spring down and toward the rear to unhook the pivot hook from the large hole in the secondary shoe web. **Do not attempt to pry the pivot hook out of the hole.**

4. Remove the automatic adjuster spring and adjusting lever (Fig. 1).

5. Remove the secondary shoe to anchor spring with the tool shown in Fig. 9. With the same tool, remove the primary shoe to anchor spring and unhook the cable eye from the anchor pin.

6. Remove the anchor pin plate.

7. Remove the cable guide from the secondary shoe (Fig. 1).

8. Remove the shoe hold-down springs, shoes, adjusting screw, pivot nut, and socket.

9. On rear brakes, remove the parking brake link and spring. Disconnect the parking brake cable from the parking brake lever.

10. After removing the rear brake secondary shoe, disassemble the parking brake lever from the shoe by removing the retaining clip and spring washer (Fig. 1).

INSTALLATION

1. Before installing the rear brake shoes, assemble the parking brake lever to the secondary shoe and secure with the spring washer and retaining clip.

2. Apply a light coating of high-temperature grease at the points where the brake shoes contact the carrier plate.

3. Position the brake shoes on the carrier plate and secure the assembly with the hold down springs. On the rear brake, install the parking brake link and spring. Connect the parking brake cable to the parking brake lever (Fig. 1).

4. Install the anchor pin plate on the anchor pin.

5. Place the cable eye over the anchor pin with the crimped side toward the carrier plate.

6. Install the primary shoe to anchor spring (Fig. 10).

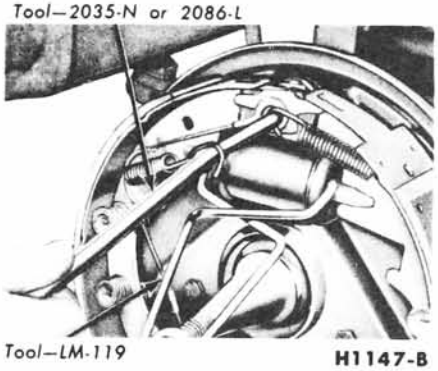


FIG. 10–Retracting Spring Installation

7. Install the cable guide on the secondary shoe web with the flanged hole fitted into the hole in the secondary shoe web. Thread the cable around the cable guide groove

Be certain that the cable eye is not cocked or binding on the anchor pin when installed. All parts should be flat on the anchor pin. Remove the brake cylinder clamp.

9. Apply high-temperature grease to the threads and the socket end of the adjusting screw. Turn the adjusting screw into the adjusting pivot nut to the limit of the threads and then back off ½ turn.

Interchanging the brake shoe adjusting screw assemblies from one side of the car to the other would cause the brake shoes to retract rather than expand each time the automatic adjusting mechanism operated. To prevent installation on the wrong side of the car, the socket end of the adjusting screw is stamped with an R or L (Fig. 11). The adjusting pivot nuts can be distinguished by the number of grooves machined around the body of the nut. Two grooves indicate a right hand nut; one groove indicates a left hand nut.

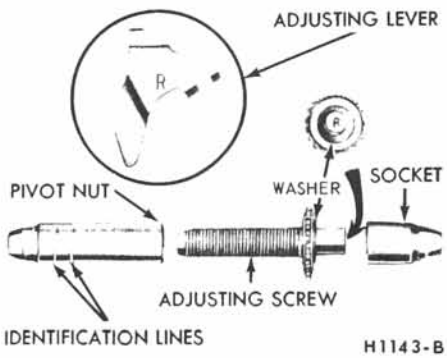


FIG. 11–Adjusting Screw and Lever Identification

10. Place the adjusting socket on the screw and install this assembly between the shoe ends with the adjusting screw toothed wheel nearest the secondary shoe.

11. Hook the cable hook into the hole in the adjusting lever. The adjusting levers are stamped with an R or L to indicate their installation on a right or left brake assembly (Fig. 11).

12. Position the hooked end of the adjuster spring completely into the large hole in the primary shoe web. The last coil of the spring should be at the edge of the hole. Connect the loop end of the spring to the adjuster lever hole.

13. Pull the adjuster lever, cable and automatic adjuster spring down and toward the rear to engage the pivot hook in the large hole in the secondary shoe web (Fig. 1).

14. After installation, check the action of the adjuster by pulling the section of the cable between the cable guide and the adjusting lever toward the secondary shoe web far enough to lift the lever past a tooth on the adjusting screw wheel. The lever should snap into position behind the next tooth, and release of the cable should cause the adjuster spring to return the lever to its original position. This return action of the lever will turn the adjusting screw one tooth.

If pulling the cable does not produce the action described, or if the lever action is sluggish instead of positive and sharp, check the position of the lever on the adjusting screw toothed wheel. With the brake in a vertical position (anchor at the top), the lever should contact the adjusting wheel $^{3}/_{16}$ inch (plus or minus $^{1}/_{32}$ inch) above the centerline of the screw. If the contact point is below this centerline, the lever will not lock on the teeth in the adjusting screw wheel, and the screw will not be turned as the lever is actuated by the cable.

To determine the cause of this condition:

a. Check the cable end fittings. The cable should completely fill or extend slightly beyond the crimped section of the fittings. If it does not meet this specification, possible damage is indicated and the cable assembly should be replaced.

b. Check the cable length. The cable should measure 11⅛ inches (plus or minus $^{1}/_{64}$ inch) from the end of the cable anchor to the end of the cable hook.

c. Check the cable guide for damage. The cable groove should be parallel to the shoe web, and the body of the guide should lie flat against the web. Replace the guide if it shows damage.

d. Check the pivot hook on the lever. The hook surfaces should be square with the body of the lever for proper pivoting. Replace the lever if the hook shows damage.

e. See that the adjusting screw socket is properly seated in the notch in the shoe web.

WHEEL CYLINDER REPAIR

It is not necessary to remove the brake cylinder from the carrier plate to disassemble, inspect, or hone and overhaul the cylinder. Removal is necessary only when the cylinder is damaged or scored beyond repair.

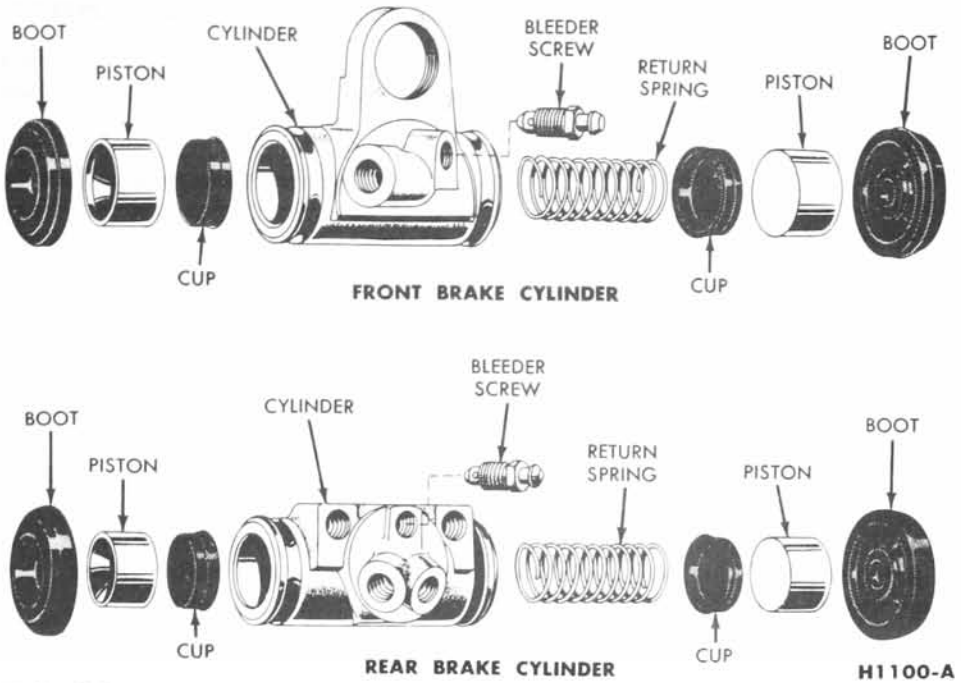


FIG. 12—Front and Rear Wheel Cylinders

DISASSEMBLY

1. Remove the links and the rubber boots from the ends of the brake cylinder. Remove the pistons, cups, and return spring from the cylinder bore (Fig. 12).

2. Remove the bleeder screw from the cylinder.

INSPECTION

1. Wash all parts in clean denatured alcohol. If alcohol is not available, use specified brake fluid. Dry with compressed air.

2. Check all internal parts for excessive wear or damage. **If any of the internal parts require replacing, all should be replaced.**

3. Inspect the cylinder bore for score marks or rust. If either condition is present, the cylinder bore must be honed. **However, the cylinder should not be honed more than 0.003 inch beyond its original diameter.**

4. Check the bleeder hole to be sure that it is open.

ASSEMBLY

1. Apply a coating of heavy-duty [illegible] to all internal parts.

[illegible] the cylinder. Bleed the brake system.

WHEEL CYLINDER REPLACEMENT

REMOVAL

1. With the wheel in a raised position, remove the wheel and the drum.

2. Remove the brake shoe assemblies, following procedures outlined in this section.

3. Disconnect the brake line from the brake cylinder. **On a car with a vacuum brake booster, be sure the engine is stopped and there is no vacuum in the booster system before disconnecting the hydraulic lines.**

To disconnect the hose at a front cylinder, loosen the tube fitting that connects the opposite end of the hose to the brake tube at a bracket on the frame. Remove the horseshoe-type retaining clip from the hose and bracket, disengage the hose from the bracket, then unscrew the entire hose assembly from the front wheel cylinder.

At a rear cylinder, unscrew the tube fitting that connects the tube to the cylinder. **Do not pull the metal tube away from the cylinder. Pulling the tube out of the cylinder connection will bend the metal tube and make installation difficult.** The tube will separate from the cylinder when the cylinder is removed from the carrier plate.

4. On the rear wheel, remove the wheel cylinder retaining bolts and lock washers and remove the cylinder. On the front wheel, remove the nut and washer that retains the cylinder to the anchor pin. Remove the cylinder from the anchor pin.

INSTALLATION

Wipe the end(s) of the hydraulic line to remove any foreign matter before making connections.

1. To install a front cylinder:

a. Position the cylinder on the anchor pin against the carrier plate. Install the washer and cylinder retaining nut on the anchor pin, and torque to specification.

b. Install a new copper gasket over the hose fitting. Screw the hose assembly into the cylinder.

c. Engage the opposite end of the hose to the bracket on the frame, install the horseshoe-type retaining clip, and connect the brake tube to the hose with the tube fitting nut. Tighten the nut to specification with tool 1112-144.

2. To install a rear cylinder:

a. Place the rear wheel cylinder into position. Enter the tubing into the cylinder, and start the tube fitting nut into the threads of the cylinder.

b. Secure the cylinder to the carrier plate by installing the retaining bolts and lockwashers.

c. Tighten the tube fitting nut to specification with tool 1112-144.

3. Install the links in the ends of the wheel cylinder, install the shoes and adjuster assemblies, and adjust the shoes as outlined in this section.

4. Install the brake drum and wheel, adjust the brakes (Part 2-2, Section 2), and bleed the brakes as outlined in Part 2-1, Section 2.

BRAKE CARRIER PLATE REPLACEMENT

REMOVAL

1. Remove the wheel and brake drum. Disconnect the brake line from the brake cylinder.

2. Remove the brake shoe and adjuster assemblies and the wheel cylinder as outlined in this section. On the rear wheels, disconnect the parking brake lever from the cable

3. If the rear carrier plate is being replaced, rotate the axle shaft so that the hole in the axle shaft flange lines up with the carrier plate retaining nuts and remove the nuts. Pull the axle shaft assembly out of the housing with tool-4235C and a slide hammer (Part 4-2), then remove the carrier plate.

If the front carrier plate is being replaced, remove the bolts and nuts that secure the plate to the front wheel spindle and remove the plate.

INSTALLATION

1. Position a new **rear** carrier plate and gaskets on the retaining bolts in the axle housing flange. Insert the axle shaft into the housing so that the splines engage the differential side gear with the bearing retainer sliding onto the retaining bolts and against the carrier plate. Install the retaining nuts through the access hole in the axle shaft flange.

Position a new **front** carrier plate and gasket to the wheel spindle and install the retaining bolts and nuts.

2. Install the wheel cylinder and connect the brake line as outlined in this section.

3. Install the brake shoe and adjuster assemblies as outlined in this section. On a rear brake, connect the parking brake cable to the lever. Install the brake drum and wheel.

4. Adjust the brake shoes (Section 2), and bleed the brake system as outlined in Part 2-1, Section 2.

HYDRAULIC LINES

Steel tubing is used throughout the brake system with the exception of the flexible hoses at the front wheels and at the rear axle housing brake tube connector (Fig. 13).

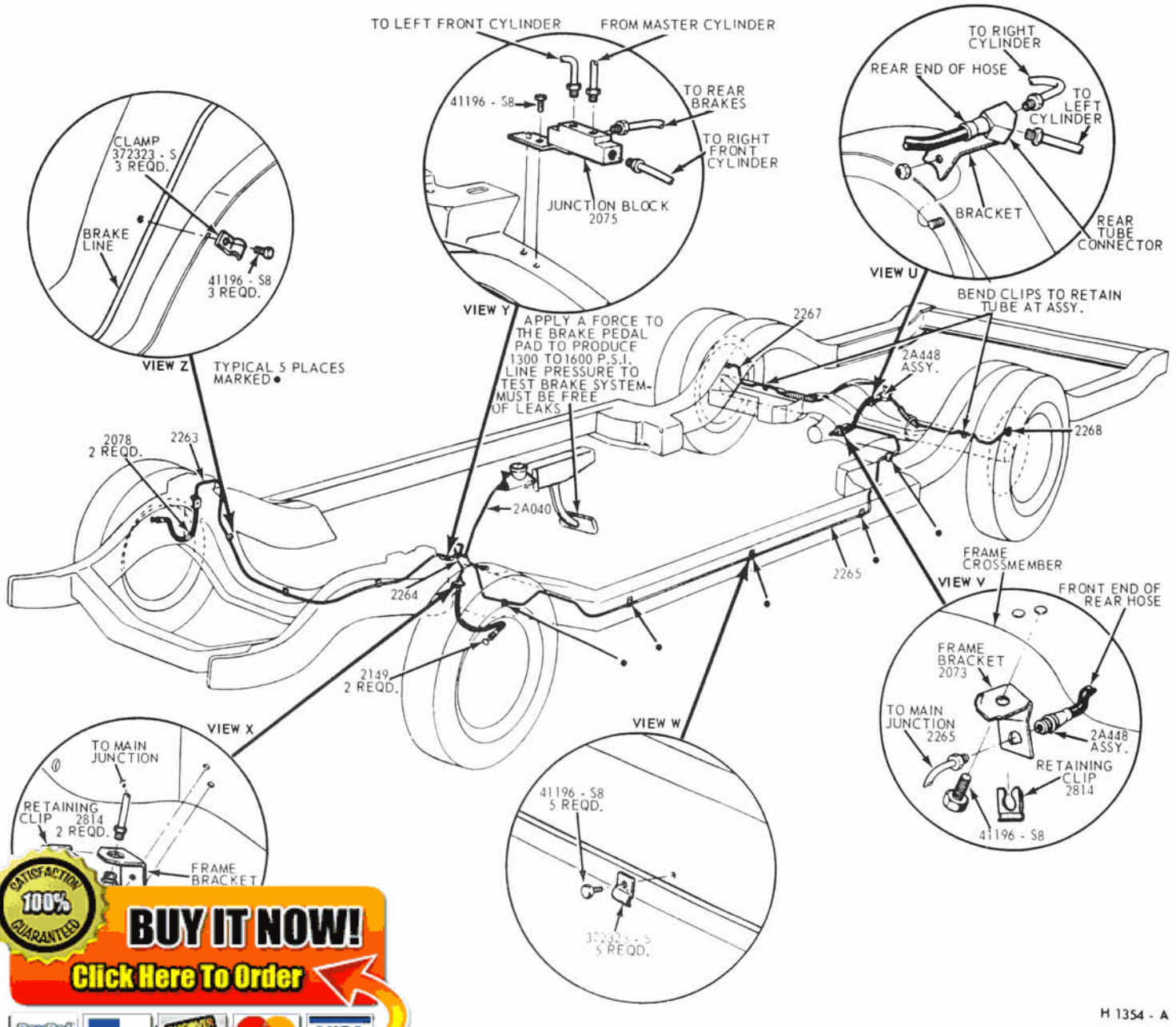
Always bleed the entire system after any hose or line replacement.

BRAKE TUBE REPLACEMENT

If a section of the brake tubing becomes damaged, the entire section should be replaced with tubing of the same type, size, shape, and length. **Copper tubing should not be used in a hydraulic system.** When bending brake tubing to fit underbody or rear axle contours, be careful not to kink or crack the tube.

All brake tubing should be flared properly to provide good leak-proof connections. Clean the brake tubing by flushing with clean denatured alcohol, before installation.

When connecting a tube to a hose, tube connector, or brake cylinder, tighten the tube fitting nut to specified torque with Milbar tool 1112-144 or equivalent.



H 1354 - A

BRAKE HOSE REPLACEMENT

A flexible brake hose should be replaced if it shows signs of softening, cracking, or other damage.

When installing a new front brake hose, position the hose to avoid contact with other chassis parts. Place a new copper gasket over the hose fitting and screw the hose assembly into the front brake cylinder. Engage the opposite end of the hose to the bracket on the frame. Install the horseshoe-type retaining clip, and connect the tube to the hose with the tube fitting nut (Fig. 13).

A rear brake hose should be installed so that it does not touch the muffler outlet pipe or shock absorber.

Place a new gasket over the rear hose fitting and screw the hose assembly into the rear brake tube connector. Engage the front end of the hose to the bracket on the frame. Install the horseshoe-type retaining clip, and connect the tube to the hose with the tube fitting nut.

3 REMOVAL AND INSTALLATION

MASTER CYLINDER—STANDARD BRAKES

REMOVAL

1. Disconnect the rubber boot from the rear end of the master cylinder in the passenger compartment.
2. Disconnect the brake line from the master cylinder.
3. Remove the nuts and lock washers that secure the master cylinder to the dash panel and lift the cylinder out and away from the push rod (Fig. 15). Remove the rubber boot from the push rod.

INSTALLATION

1. With the rubber boot on the push rod, guide the master cylinder over the end of the push rod, and position the cylinder on the mounting studs against the dash panel.
2. Install the lock washers and mounting nuts and torque to specification.
3. Connect the brake line to the master cylinder fitting, but leave the brake line fitting loose.
4. Fill the master cylinder reservoir with heavy-duty brake fluid to within 3/8 inch of the top. Be sure that the gasket is properly seated in the filler cap. Install and tighten the filler cap.
5. Bleed the master cylinder to let air escape from the cylinder at the brake line fitting. Then tighten the fitting.
6. Remove the filler cap and fill the reservoir to the level specified. Install the cap and wipe off any fluid from the cylinder.
7. Connect the rubber boot to the master cylinder.

MASTER CYLINDER—POWER BRAKES

REMOVAL

1. Remove the hydraulic line outlet fitting from the master cylinder.
2. Remove the retaining nuts, lock washers, and the master cylinder from the booster unit (Fig. 14).

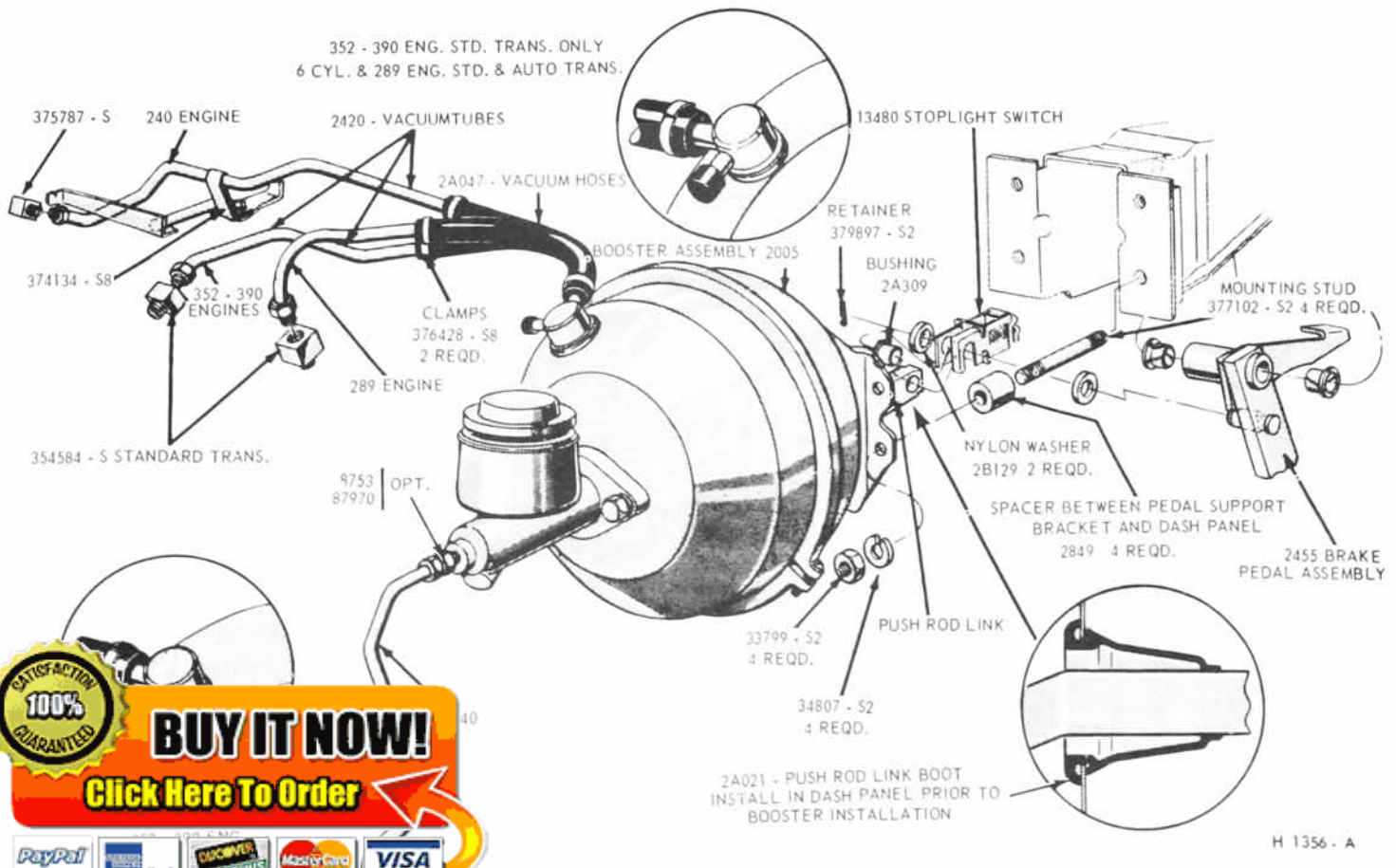


FIG. 14—Booster Installation

3. Remove the rubber seal from the outer groove at the end of the master cylinder.

INSTALLATION

1. Before installing the master cylinder, check the distance from the outer end of the push rod to the master cylinder mounting surface at the end of the vacuum cylinder (Fig. 3, Part 2-1). If the push rod dimension is not correct, see "Master Cylinder Push Rod Adjustment," Part 2-1, Section 2.

2. When the push rod adjustment is correct, replace the rubber seal in the groove at the end of the master cylinder.

3. Position the master cylinder over the push rod onto the two studs that are integral with the booster body.

4. Install the attaching nuts and lockwashers and torque the nuts to specifications.

5. Install the master cylinder hydraulic line outlet fitting.

6. Bleed the brake system. Fill the master cylinder within ⅜ inch from the top of the filler opening. Install the filler cap and gasket.

BOOSTER UNIT

REMOVAL

1. Working from inside the car below the instrument panel, disconnect the booster push rod link from the brake pedal assembly. To do this, proceed as follows:

Disconnect the stop light switch wires at the connector. Remove the hairpin retainer. Slide the stop light switch off from the brake pedal pin **just far enough for the switch outer hole to clear the pin,** and then lift the switch straight **upward** from the pin. Be careful not to damage the switch during removal. Slide the master cylinder push rod and the nylon washers and bushing off the brake pedal pin (Fig. 14).

2. Open the hood and disconnect the brake line at the master cylinder outlet fitting.

3. Disconnect the manifold vacuum hose from the booster unit. If the car is equipped with an automatic transmission disconnect the transmission vacuum unit hose.

4. Remove the four bracket-to-dash panel retaining nuts and washers (Fig. 14). Remove the booster and bracket assembly from the dash panel, sliding the push rod link out from the engine side of the dash panel. Remove the four spacers.

5. Remove the push rod link boot from the dash panel.

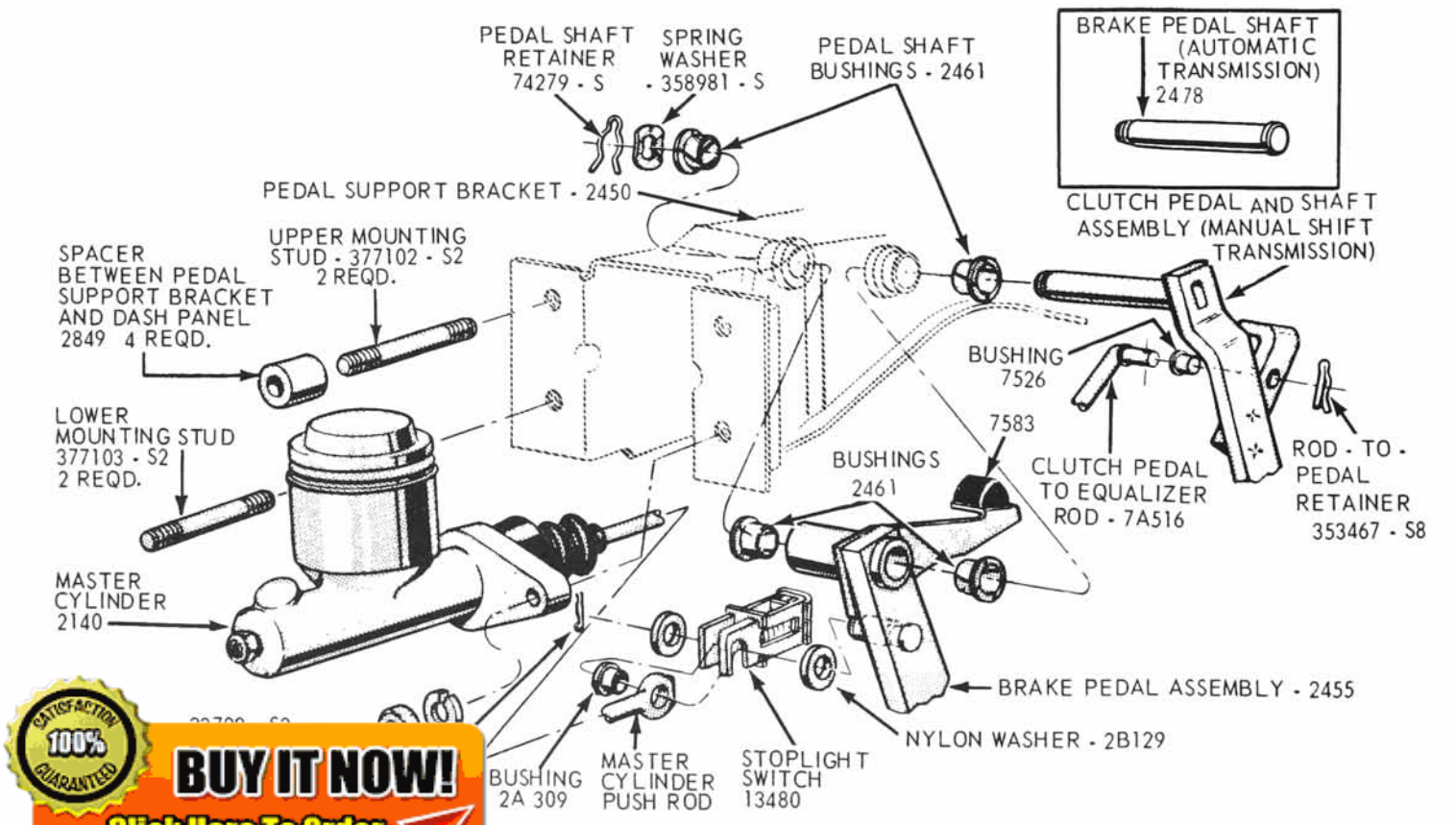
INSTALLATION

1. Install the push rod link boot in the hole in the dash panel as shown in Fig. 14. Install the four spacers on the mounting studs.

2. Mount the booster and bracket assembly to the dash panel by sliding the bracket onto the mounting studs and the push rod link in through the hole and boot in the dash panel. Install the bracket-to-dash panel retaining nuts and washers (Fig. 14).

3. Connect the manifold vacuum hose to the booster. If the car is equipped with an automatic transmission connect the transmission vacuum unit hose.

4. Connect the brake line to the master cylinder outlet fitting.



H 1355 - A

Stop Light Switch

5. Working from inside the car below the instrument panel, connect the booster push rod link to the brake pedal assembly. To do this, proceed as follows:

Install the inner nylon washer, the master cylinder push rod, and the bushing on the brake pedal pin. Position the switch so that it straddles the push rod with the switch slot on the pedal pin and the switch outer hole just clearing the pin. Slide the switch completely onto the pin, and install the nylon washer as shown in Fig. 14. **Be careful not to bend or deform the switch.** Secure these parts to the pin with the hairpin retainer. Connect the stop light switch wires to the connector, and install the wires in the retaining clip.

6. Bleed the brake system.

BRAKE PEDAL—MANUAL SHIFT TRANSMISSION

REMOVAL

1. Disconnect the clutch pedal-to-equalizer rod at the clutch pedal by removing the hairpin type retainer and bushing (Fig. 15).

2. Disconnect the stop light switch wires at the connector.

3. Remove the hairpin retainer. Slide the stop light switch off the brake pedal pin **just far enough for the switch outer hole to clear the pin,** and then lift the switch straight **upward** from the pin. **Be careful not to damage the switch during removal.** Slide the master cylinder push rod and the nylon washers and bushing off the brake pedal pin (Fig. 15).

4. Remove the hairpin type retainer and spring washer from the clutch and brake pedal shaft. Remove the clutch pedal and shaft, the brake pedal, and the bushings from the pedal support bracket (Fig. 15).

INSTALLATION

1. Apply a coating of Lubriplate to the bushings and locate all bushings in their proper places on the clutch and brake pedal assemblies.

2. Position the brake pedal to the s bracket, then install the al and shaft through the t

th master cylinder push rod, and th

P Position the switch so that it strad

dles the push rod with the switch slot on the pedal pin and the switch outer hole just clearing the pin. Slide the switch completely onto the pin, and install the nylon washer as shown in Fig. 15. **Be careful not to bend or deform the switch.** Secure these parts to the pin with the hairpin retainer.

4. Connect the stop light switch wires to the connector, and install the wires in the retaining clip.

5. Connect the clutch pedal-to-equalizer rod to the clutch pedal assembly with the bushing and hairpin retainer. Apply Lubriplate to the bushing. Adjust the clutch pedal free play to specification if required.

BRAKE PEDAL—AUTOMATIC TRANSMISSION

REMOVAL

1. Disconnect the stop light switch wires at the connector.

2. Remove the hairpin retainer. Slide the stop light switch off the brake pedal pin **just far enough for the switch outer hole to clear the pin,** and then lift the switch straight upward from the pin. **Be careful not to damage the switch during removal.** Slide the master cylinder push rod and the nylon washers and bushing off the brake pedal pin (Fig. 15).

3. Remove the hairpin type retainer and spring washer from the brake pedal shaft, then remove the shaft, the brake pedal and the bushings from the pedal support bracket.

INSTALLATION

1. Apply a coating of Lubriplate to the bushings and locate all the bushings in their proper places on the pedal assembly and pedal support bracket (Fig. 15).

2. Position the brake pedal assembly to the support bracket, then

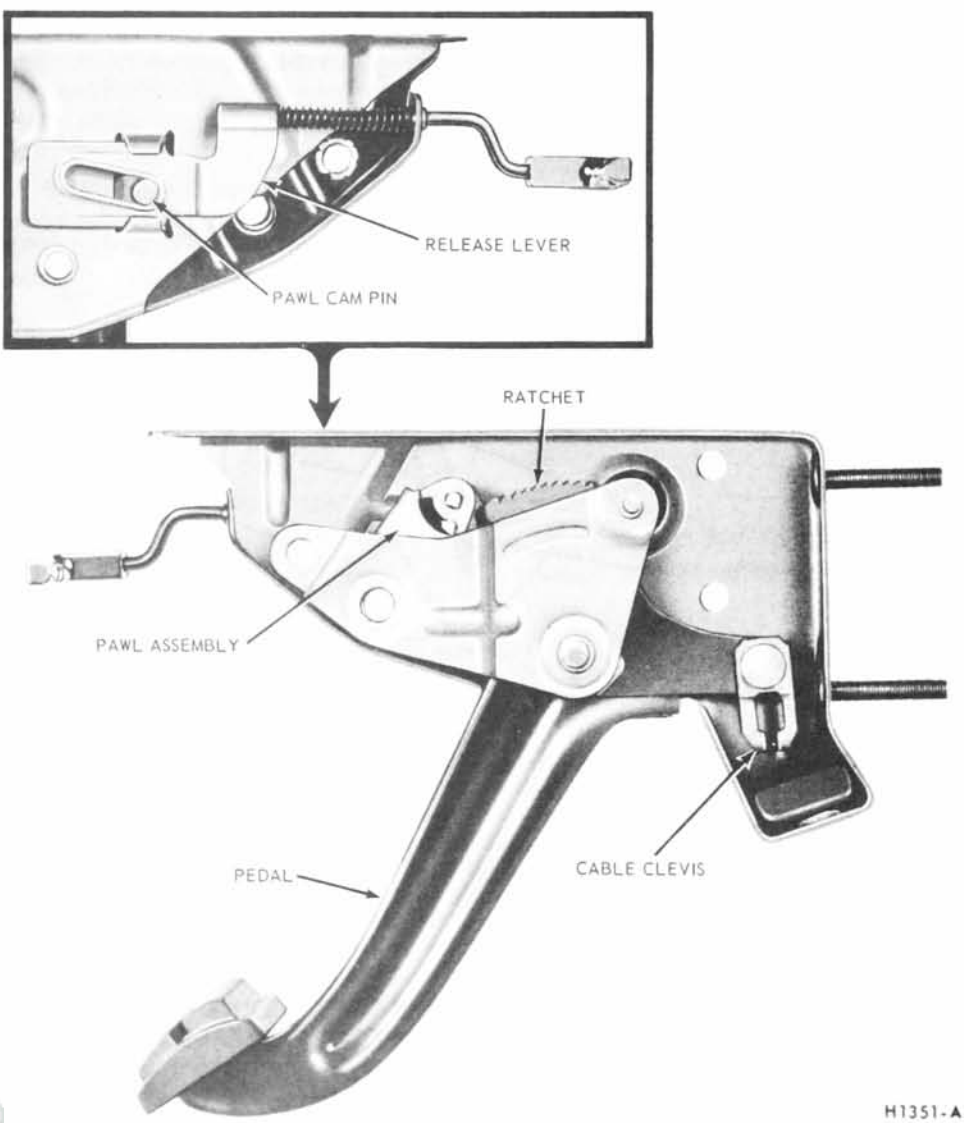


FIG. 16—Parking Brake Control Assembly—Manual Release

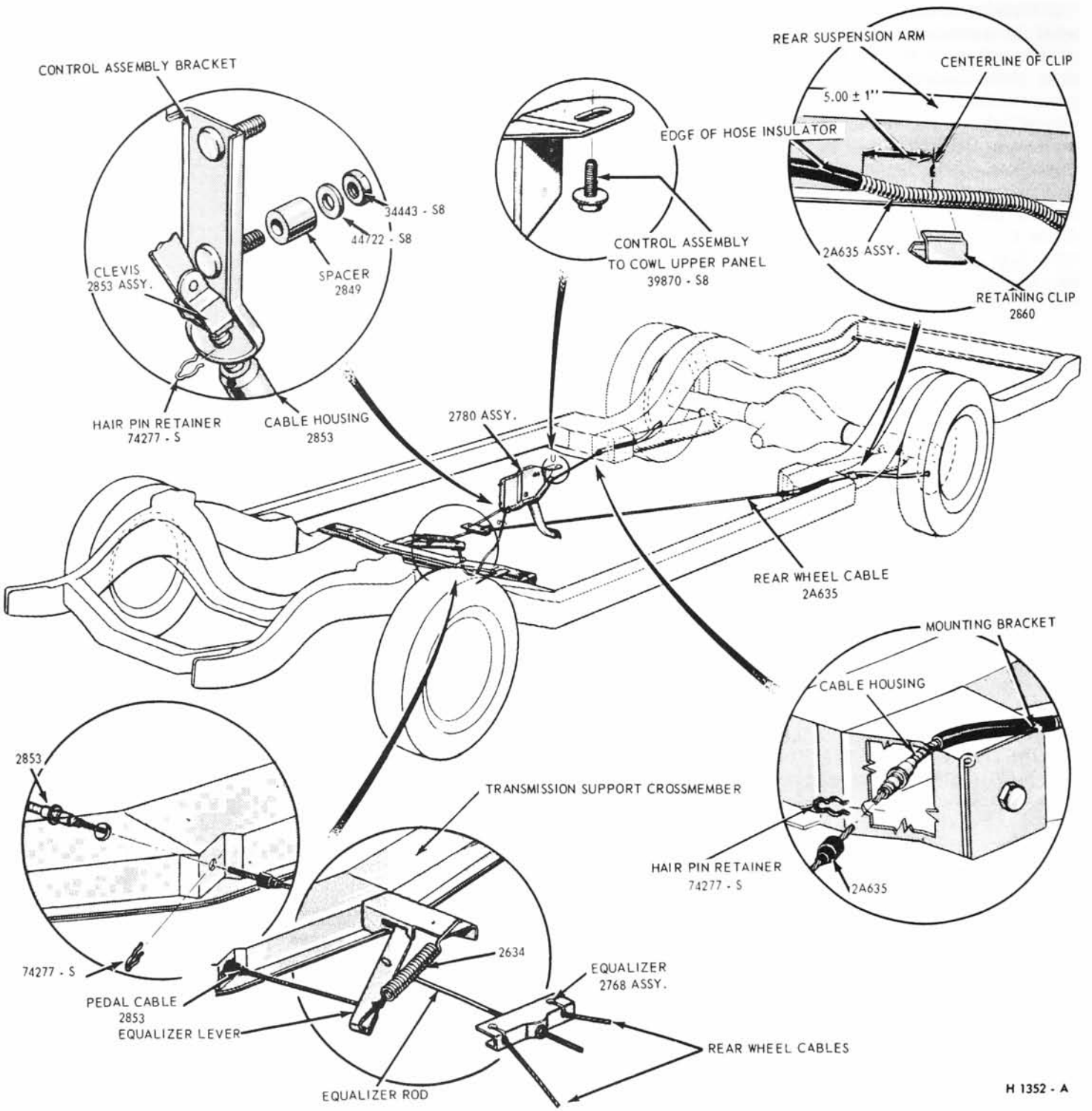


FIG. 17—Parking Brake System

install the pedal shaft through the support bracket and brake pedal assembly. Install the spring washer and retainer.

3. Install the inner nylon washer, the master cylinder push rod, and th[illegible]shing on the brake pedal pin. [illegible]the switch so that it strad-

bend or deform the switch. Secure these parts to the pin with the hairpin retainer.

4. Connect the stop light switch wires to the connector, and install the wires in the retaining clip.

PARKING BRAKE CONTROL ASSEMBLY

REMOVAL

1. Working from the engine compartment, remove the two nuts and washers that retain the parking brake control assembly to the dash panel (Figs. 5, 16, and 17).

2. Working from the passenger compartment, remove the bolt and nut that attach the control assembly to the cowl upper panel.

3. Pull the control assembly from the dash panel, remove the hairpin retainer that holds the cable housing to the control assembly bracket, and disconnect the ball end of the cable from the clevis on the pedal (Fig. 17). Disconnect the hose from the

vacuum power unit on an automatic release type control assembly.

INSTALLATION

1. Connect the ball end of the cable to the clevis on the pedal, and secure the cable housing to the control assembly bracket with the hairpin retainer. Connect the hose to the vacuum power unit on an automatic release type control assembly.

2. Install the two spacers on the mounting studs, and position the control assembly so that the mounting studs enter the holes in the dash panel (Fig. 17).

3. Install the bolt and nut that attach the control assembly to the cowl upper panel. Do not tighten at this time.

4. Working from the engine compartment, install the two attaching nuts and washers on the mounting studs at the dash panel.

5. Working from the passenger compartment, tighten the bolt and nut that attaches the assembly to the cowl upper panel. Check and adjust the parking brake linkage, if necessary.

PARKING BRAKE VACUUM POWER UNIT

REMOVAL

1. Remove the parking brake control assembly from the car as described under "Removal" in the foregoing procedure.

2. Drill out or grind off the two rivets that attach the vacuum power unit to the parking brake control assembly.

3. Remove the retainer clip that secures the vacuum piston rod to the release lever and disconnect the rod from the lever. Remove the power unit.

INSTALLATION

1. Position the vacuum power unit on the parking brake control assembly and secure with two round head bolts and nuts.

2. Connect the vacuum piston rod [illegible]ease lever and secure with

[illegible] operation of the parking brake control assembly with the engine running in all the transmission selector lever positions. With the engine running, the parking brake should remain engaged in "neutral" or "park" and should release in any drive position.

PARKING BRAKE EQUALIZER TO CONTROL CABLE

REMOVAL

1. Raise the car on a hoist. Move the parking brake equalizer lever forward and disconnect the ball end of the cable from the lever (Fig. 17).

2. Remove the hairpin retainer from the cable housing at the transmission rear support crossmember, and then pull the cable assembly forward and out of the crossmember.

3. Remove the cable housing from the retaining clip at the underside of the floor pan.

4. Lower the car. Remove the parking brake control assembly and disconnect the cable from the control as outlined in the "Removal" procedure under "Parking Brake Control Assembly"

5. Push the cable and housing down through the hole in the floor pan and remove it from under the car.

INSTALLATION

1. Working from the underside of the car, guide the upper end of the replacement cable into the hole in the floor pan.

2. Working from inside the car, pull the new cable and housing up through the hole in the floor pan.

3. Connect the upper end of the cable to the control assembly and install the control assembly as outlined in the "Installation" procedure under "Parking Brake Control Assembly."

4. Raise the car on a hoist. Guide the rear end of the cable assembly through the hole in the transmission rear support crossmember. Secure the cable assembly to the crossmember with the hair pin retainer (Fig. 17).

5. Engage the cable housing in the retaining clip at the underside of the floor pan.

6. Connect the cable rear end ball to the equalizer lever. Adjust the parking brake linkage as outlined in Part 2-1.

PARKING BRAKE EQUALIZER TO REAR WHEEL CABLE

REMOVAL

1. Raise the car and remove the hub cap and wheel.

2. Remove the three Tinnerman nuts that hold the brake drum in place, back off the brake shoes, and remove the drum.

3. Loosen the adjusting nut on the equalizer rod, and disconnect the cable from the equalizer (Fig. 1, Part 2-1).

4. Remove the clip that attaches the cable housing to the rear suspension arm (Fig. 17).

5. Remove the hair pin retainer that holds the cable housing to the rear suspension arm mounting bracket and pull the cable and housing out of the bracket (Fig. 17).

6. Working on the wheel side of the rear brake (Fig. 1), compress the prongs on the cable retainer so that they can pass through the hole in the carrier plate. Draw the cable retainer out of the hole.

7. With the spring tension off the parking brake lever, lift the cable out of the slot in the lever and remove through the carrier plate hole.

INSTALLATION

1. Pull enough of the cable through the housing so that the end of the cable may be inserted over the slot in the parking brake lever on the rear brake shoe (Fig. 1).

2. Pulling the excess slack from the cable, insert the cable housing into the carrier plate access hole so that the retainer prongs expand.

3. Thread the front end of the cable housing through the rear suspension arm mounting bracket and install the hair pin retainer (Fig. 17).

4. Fasten the cable housing to the rear suspension arm with the retaining clip. The clip should be installed so that its centerline is 4-6 inches from the edge of the hose insulator as shown in Fig. 17.

5. Insert the ball end of the cable into the equalizer and tighten the adjusting nut on the equalizer end slightly (Fig. 1, Part 2-1).

6. Install the rear drum. Tighten the three Tinnerman nuts that retain the drum, and install the wheel and hub cap.

7. Adjust the rear brake shoes as outlined in Section 2. Adjust the parking brake linkage as outlined in Part 2-1, Section 2.

4 MAJOR REPAIR OPERATIONS

BRAKE DRUM REFINISHING

Minor scores on a brake drum can be removed with a fine emery cloth. A drum that is excessively scored or shows a total indicator runout of over 0.007 inch should be turned down. Remove only enough stock to eliminate the scores and true up the drum. The refinished diameter must not exceed 0.060 inch oversize (11.090 inches).

If the drum diameter is less than 0.030 inch oversize (11.060 inches) after refinishing, standard lining may be installed. If the drum diameter is 11.060-11.090 inches, oversize linings must be installed.

After a drum is turned down, wipe the refinished surface with a cloth soaked in clean denatured alcohol. If one drum is turned down, the opposite drum on the same axle should also be cut down to the same size.

BRAKE SHOE RELINING

Brake linings that are worn to within 1/32 inch of the rivet or have been saturated with grease or oil should be replaced. Failure to replace worn linings will result in a scored drum. **When it is necessary to replace linings, they must also be replaced on the wheel on the opposite side of the car.**

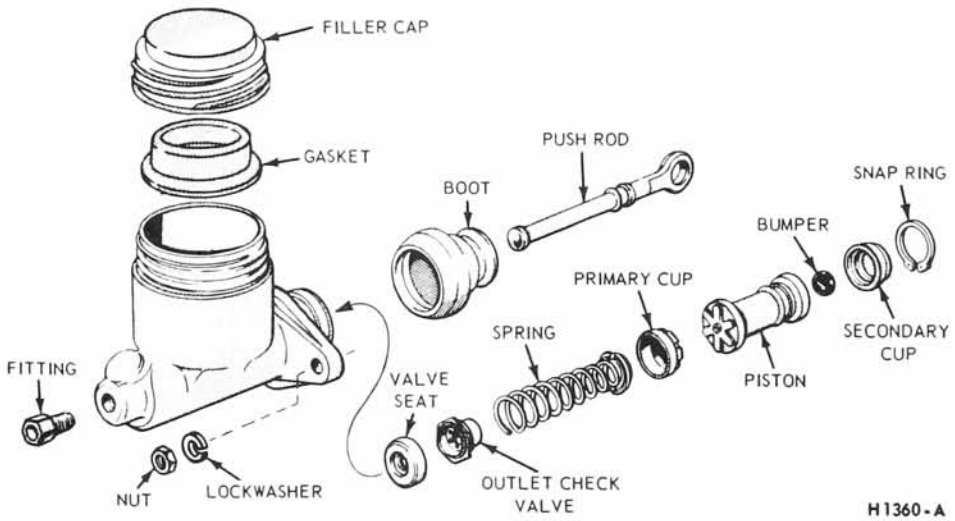
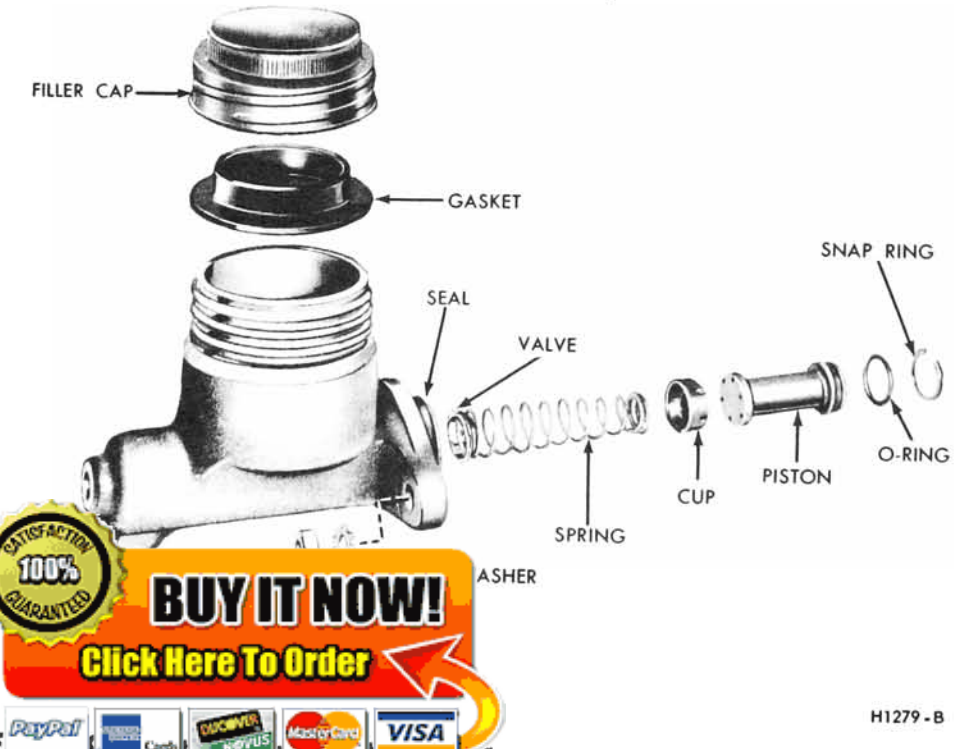


FIG. 18—Master Cylinder with Standard Brake System



Inspect brake shoes for distortion, cracks, or looseness. If this condition exists, the shoe should be discarded. **Do not repair a defective brake shoe.**

1. Wash the brake shoes thoroughly in a clean solvent. Remove all burrs or rough spots from the shoes.

2. Check the inside diameter of the brake drum. If the diameter is less than 11.060 inches, standard lining may be installed. If the diameter is 11.060-11.090 inches, oversize lining should be installed.

3. Position the new lining on the shoe. Starting in the center, insert and secure the rivets, working alternately towards each end. Install all parts supplied in the kit. **Replacement linings are ground and no further grinding is required.**

4. Check the clearance between the shoe and lining. The lining must seat tightly against the shoe with not more than 0.008 inch clearance between any two rivets.

MASTER CYLINDER

DISASSEMBLY

1. Clean the outside of the cylinder, and remove the filler cap and gasket. Pour out any brake fluid that may remain in the cylinder or reservoir.

2. Remove the snap ring from the bore at the rear of the cylinder with tool 33621 (Fig. 20).

3. When disassembling a master cylinder used with the standard brake system, remove the piston assembly, cup, spring, check valve, and valve seat from the cylinder bore (Fig. 18).

When disassembling a master cylinder used with a booster, remove the piston assembly, cup, and the spring and check valve assembly from the cylinder bore. Remove the O-ring from the piston (Fig. 19).

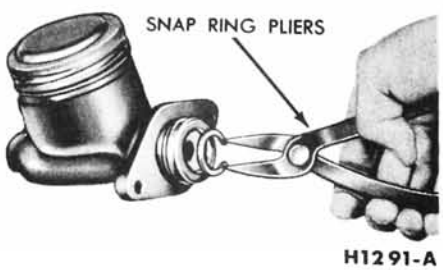


FIG. 20—Removing Snap Ring from Master Cylinder—Typical

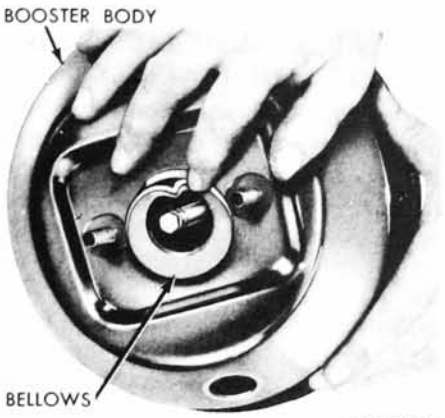


FIG. 21—Bellows-to-Booster Body Engagement

CLEANING, INSPECTION, AND REPAIR

1. Clean all master cylinder parts in clean denatured alcohol, and inspect the parts for wear or damage, replacing them as required. **When using a master cylinder repair kit, install all of the parts supplied.**

2. Check the ports and vents in the master cylinder to make sure that all are open and free of foreign matter. Check the condition of the diaphragm type gasket.

3. A leaf-type valve is riveted to the front end of the piston in a master cylinder used with the standard brake system (Fig. 18). If this valve is loose or has moved so that the piston ports are open, replace the piston.

When inspecting a master cylinder used with a booster, check the ports in the piston to make sure that they are open and free of foreign material (Fig. 19).

4. Inspect the cylinder walls for scores or rust, and recondition them if necessary. **Hone the cylinder walls no more than necessary (0.003 inch maximum). Oversize pistons and cups are not available for excessively honed cylinders.**

5. Remove any burrs or loose metal that may have resulted from the honing operation, and clean the cylinder with denatured alcohol.

ASSEMBLY

1. Dip all parts except the master body in clean FoMoCo

valve, spring, cup, and piston assembly in the cylinder bore (Fig. 18).

When assembling a master cylinder used with a booster, install the O-ring on the piston. Install the spring and check valve assembly, cup, and piston in the cylinder bore (Fig. 19).

4. Install the snap ring in the back of the bore (Fig. 20).

FIG. 22—Removing or Installing Rear Seal to End Plate

DISASSEMBLY OF BOOSTER

REMOVAL OF EXTERNAL PARTS

1. Remove the two attaching nuts and lockwashers, and separate the master cylinder from the booster body.

2. Remove the air filter assembly from the booster body. Separate the cover and retainer, and remove the air filter (Fig. 27).

3. Remove the vacuum manifold and check valve assembly and the rubber grommet from the booster body (Fig. 27).

4. Disconnect the valve operating rod from the lever assembly by removing the retainer clip and connecting pin (Fig. 27).

5. Disconnect the lever assembly from the end plate brackets by removing the retainer clip and pivot pin.

6. Disconnect the push rod link from the lever assembly by removing the retainer and connecting pin.

7. Remove the retaining nuts, and disassemble the brackets from the end plate.

8. Remove the rubber boot from the valve operating rod.

SEPARATION OF MAJOR COMPONENTS

1. Scribe a line across the booster body, clamp band, and end plate.

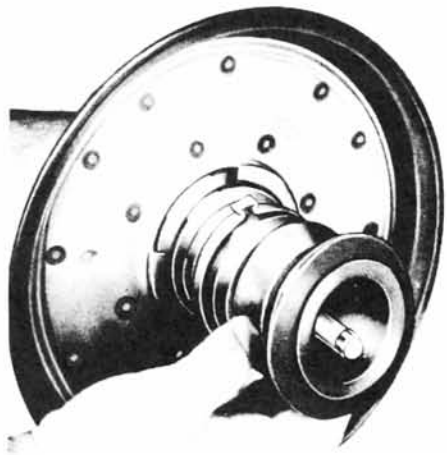


FIG. 23—Removing or Installing the Bellows Assembly

2. Remove the clamp band screw and nut, and separate the clamp band, booster body, and end plate (Fig. 27).

3. Push the bellows assembly into the vacuum chamber (Fig. 21), and separate the bellows, control valve, diaphragm assembly, and end plate from the booster body.

4. Push the valve, tail stock, and diaphragm assembly out of the end plate.

5. Remove the rear seal from the end plate (Fig. 22).

DISASSEMBLY OF BELLOWS, PUSH ROD AND VALVE ASSEMBLY FROM DIAPHRAGM

1. Remove the large bellows clamp and separate the bellows, bellows support rings, and bellows protector from the diaphragm and valve assembly (Fig. 23).

2. Remove the two support rings and the protector from the bellows.

3. Remove the push rod assembly and the reaction lever assembly from the control hub (Fig. 24).

4. Remove the two plastic guides from the push rod. Remove the reaction cone retainer and the cone from the push rod (Fig. 24).

5. Remove the valve operating rod from the plunger. To remove, hold the rod firmly and force the plunger off the rod breaking the plastic retainer. If the plunger is to be used again, remove all the broken pieces of the plastic retainer from the groove in the plunger.

6. Turn the control hub and plunger assembly clockwise to separate it from the diaphragm plate.

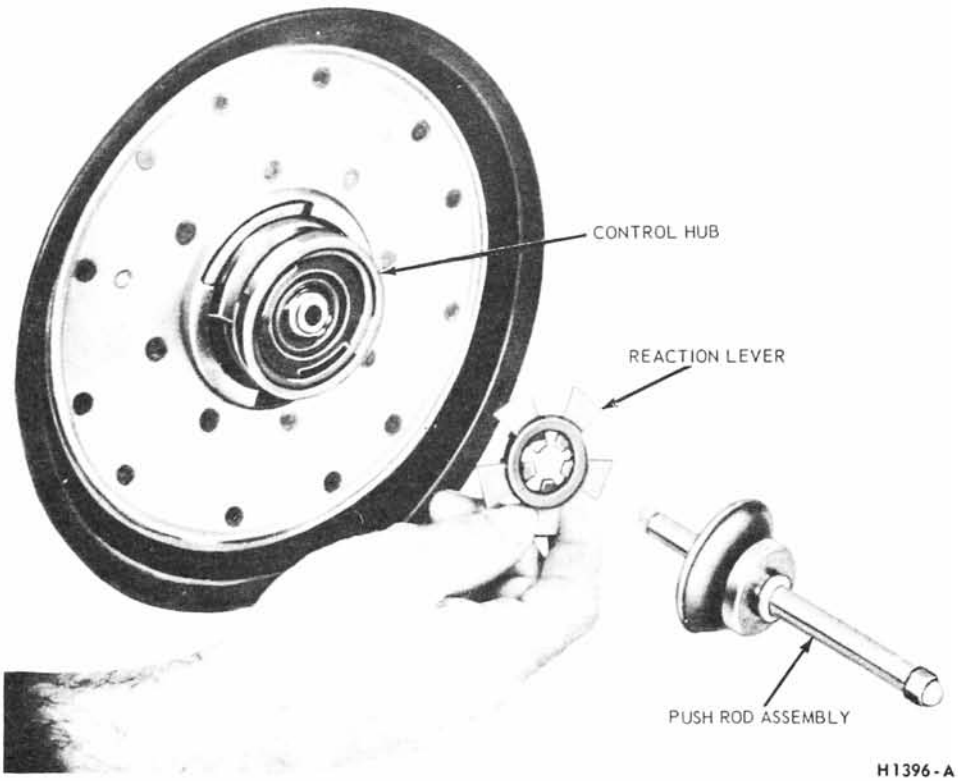


FIG. 24—Push Rod Assembly, Reaction Lever and Control Hub

and then remove the tail stock and O-ring from the diaphragm (Fig. 25).

7. Remove the retainer that holds the plunger to the control hub (Fig. 26). Separate the control hub and plunger assembly.

It may be necessary to file the burr from the protruding end of the plunger before it can be separated from the control hub.

DISASSEMBLY OF CONTROL VALVE PLUNGER

1. Compress the spring towards the rubber valve and remove the spring retainer.

2. Remove the spring, valve plate, rubber valve, "O" ring, and fiber washer from the plunger (Fig. 27).

ASSEMBLY OF BOOSTER CONTROL VALVE PLUNGER

1. Assemble the rubber valve, valve plate, spring, "O" ring, and fiber washer on the plunger.

2. Compress the spring towards the rubber valve and assemble the spring retainer on the plunger with the flange towards the spring (Fig. 27).

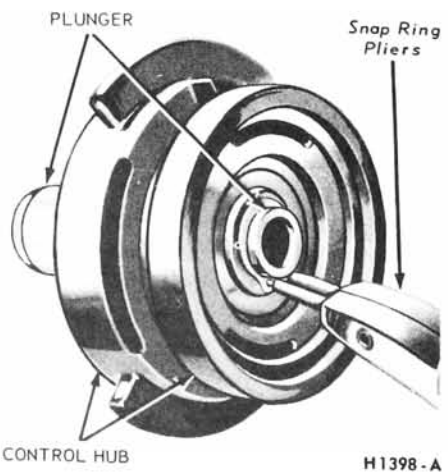


FIG. 26—Removing or Installing Plunger-to-Control Hub Retainer

ASSEMBLY OF VALVE ASSEMBLY, PUSH ROD, AND BELLOWS TO DIAPHRAGM

1. Assemble the control valve plunger assembly into the control hub so that the round holes in the rubber valve index with the raised projections on the hub, and the flat on the valve plate indexes with the flat projection on the hub (Fig. 28). Compress the valve spring, and install the retainer in the plunger groove to secure the control valve plunger to the control hub (Fig. 26).

2. Assemble the tail stock over the plunger with the flat on the tail stock indexing with the flat on the hub.

3. Assemble the "O" ring over the tail stock and into the "V" groove formed by the tail stock and hub.

4. Assemble the tail stock and the plunger and control hub assembly to the diaphragm, and turn the hub counterclockwise to secure these parts together (Fig. 25).

5. Install the lever assembly in the control hub with the rubber protrusions toward the hub (Fig. 24).

6. Assemble the reaction cone, retainer, and two plastic push rod guides on the push rod. Install the push rod assembly in the valve hub so that the push rod indexes in the valve plunger.

7. Install the two bellows support rings and bellows protector on the bellows. The support rings are positioned in the two larger folds of the bellows and the protector in the smaller fold.

8. Assemble the bellows on the control hub so that the lip of the bellows indexes in the groove on the hub. Secure the bellows to the hub by assembling the large bellows clamp on the diaphragm end of the bellows approximately $\frac{1}{32}$" from the end of the bellows (Fig. 23).

ASSEMBLY OF MAJOR COMPONENTS

1. Assemble the rear seal in the end plate (Fig. 22) and position the diaphragm, the control valve components, and the bellows as an assembly into the end plate.

2. Install the rubber grommet in the booster body with the large diameter side to be outside of the booster. Force the vacuum manifold and check valve assembly through the grommet (Fig. 27).

3. Assemble the booster body to the end plate. Make sure that the lip of the diaphragm is evenly positioned

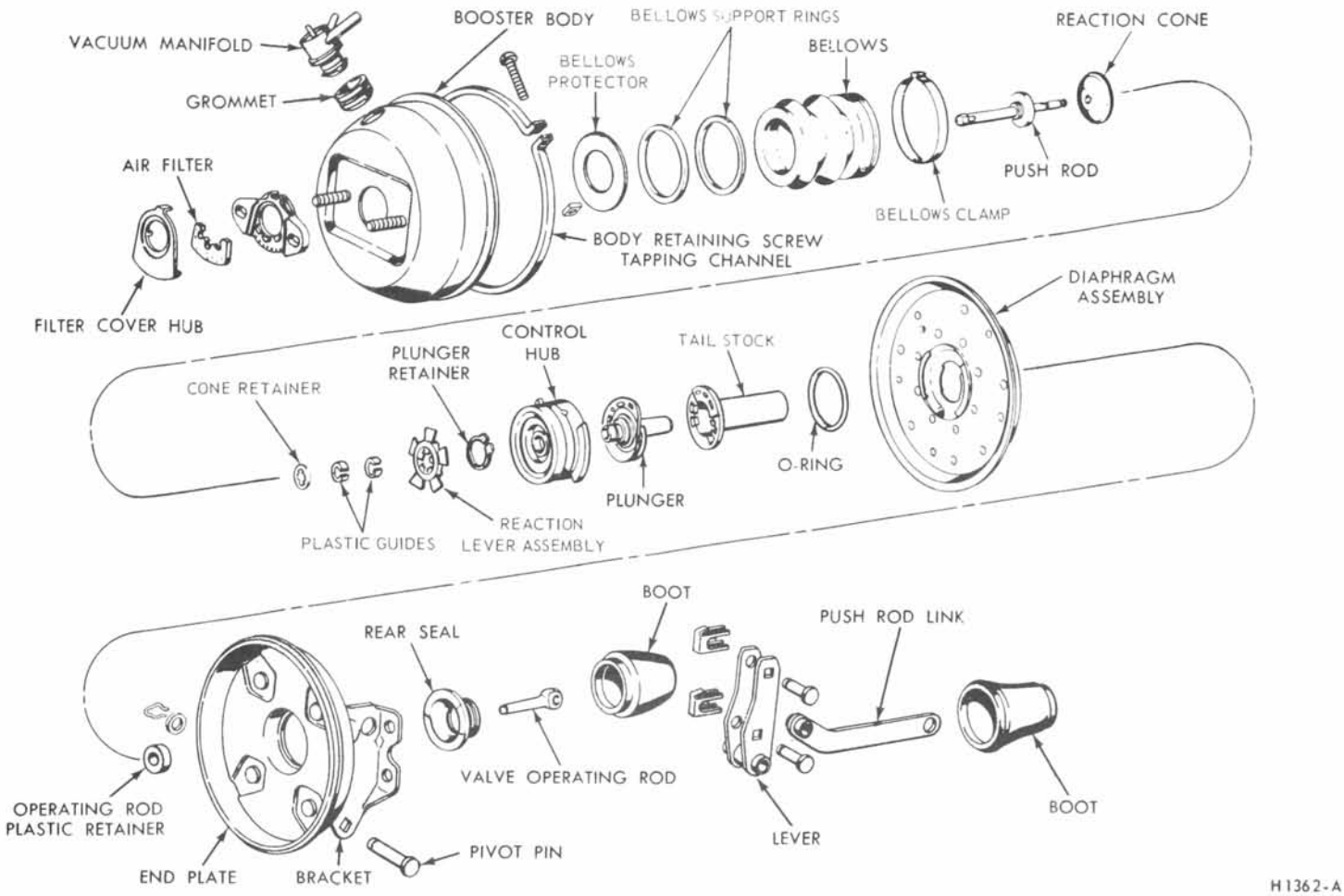


FIG. 27—Booster Unit Disassembled

on the retaining radius of the end plate and the booster body. Pull the front lip of the bellows through the booster body and position it evenly around the hole in the booster body (Fig. 21).

4. Install the clamp band over the lips of the booster body and end plate. Align the scribe lines, compress the assembly together, and secure with the clamp band bolt. Tap the clamp band with a fiber hammer around its circumference as the bolt is being tightened. Tighten to 15 inch-pounds of torque.

INSTALLATION OF EXTERNAL PARTS

1. Install the rubber boot to the valve operating rod and assemble the plastic retainer to the end of the rod. Insert the rod into the plunger so that the retainer engages the groove in the plunger. Install the lip of the boot in the groove of the rear seal (Fig. 27).

2. Connect the valve operating rod to the upper end of the lever, and connect the push rod link to the center of the lever with the connecting pins and clips.

3. Position the mounting brackets to the end plate and install the retaining nuts.

4. Connect the lever assembly to the lower end of the mounting brackets with the pivot pin and clip.

5. Position the air filter in the plastic filter cover, and then snap the cover and filter on the metal hub with the filter between.

6. Assemble the cover, filter, and hub assembly to the booster body with the metal hub against the booster body.

7. Assemble the master cylinder to the booster body. Torque the master cylinder mounting nuts to specification.

FIG. 28—Assembling Valve Plunger to Hub

PART 2-3 SPECIFICATIONS

LINING DIMENSIONS—INCHES

Models	Position	Front	Rear	Color Code
Ford Passenger Cars	Primary Secondary	2.5 x 9.34 2.5 x 12.12	2.25 x 9.34 2.25 x 12.12	Yellow-Black Blue-Black
Ford & Mercury—All 427 CID Engine & 8 Cylinder Police—Maximum Fade Resistant	Primary Secondary	3.00 x 9.34 3.00 x 12.12	2.25 x 9.34 2.25 x 12.12	Yellow-Black Blue-Blue
Ford and Mercury Station Wagons	Primary Secondary	3.00 x 9.34 3.00 x 12.12	2.25 x 9.34 2.25 x 12.12	Silver Yellow-White
Ford and Mercury Passenger Cars (240-289 CID Engine) All Taxi and 6 Cylinder Police—Maximum Wear Resistant	Primary Secondary	3.00 x 9.34 3.00 x 12.12	2.5 x 9.34 2.5 x 12.12	Pink Red-Red
Mercury Passenger Cars	Primary Secondary	2.5 x 9.34 2.5 x 12.12	2.25 x 9.34 2.25 x 12.12	Silver Yellow-White

CHECKS AND ADJUSTMENTS—INCHES

Master Cylinder Bore Diameter Standard Power	 1.000 0.875
Master Cylinder Maximum Allowable Hone	0.003
Front Wheel Cylinder Bore Diameter Passenger, Police & Taxi Station Wagon	 1.094 1.062
Rear Wheel Cylinder Bore Diameter Passenger, Police & Station Wagon Taxi (Max. Wear Resistant)	 0.969 0.875
Wheel Cylinder Maximum Allowable Hone	0.003
Drum Diameter	11.030
Drum Maximum Allowable Run-Out	0.007
Drum Maximum Boring Diameter	11.090
Drum Width—Front Passenger Station Wagon, Maximum Wear & Maximum Fade Resistant	 2.50 3.00
Drum Width—Rear Passenger Taxi	 2.25 2.50
Lining Maximum Wear Limit (From Top of Rivets or Shoe Rim)	0.031
Lining Maximum Clearance to Shoe (Midway Between Rivets)	0.008
[illegible]vel—Standard	7.00
[illegible]vel—Power	4.00
[illegible]it	Push-Rod Adjustment—0.995-1.005 inches
[illegible]ment Cable Length [illegible] ⅛ inch ± 1/64	End of Cable Anchor to End of Cable

TORQUE LIMITS

Description	Ft-lbs
Master Cylinder-To-Pedal Support Bracket	18-25
Pedal Pad to Brake Pedal Nut	12-16
Control Assembly—Parking Brake to Cowl Side Bolt	15-19
Master Cylinder Fitting	6-12
Left Hand Brake Hose—Front to Connector Bolt	12-18
Wheel Cylinder Bleeder Screw	120 in-lbs Maximum
Vacuum Connector at Engine Manifold	20-28

FRONT BRAKES

Carrier Plate and Cylinder Assembly Brake Shoe Anchor Pin Nut	20-30
Anchor Pin to Spindle Bolt	80-106
Wheel Assembly to Hub and Drum Assembly Nuts	75-110
Front Brake Carrier Plate to Spindle Nut	25-45

TORQUE LIMITS (Cont.)

REAR BRAKES

Description	Ft-lbs
Drum Assembly to Axle Shaft Assembly Speednut	Hand Push Fit
Wheel Assembly to Axle Shaft to Drum Assembly Nuts	75-110
Brake Cylinder to Brake Carrier Plate Bolt	10-20
Brake Carrier Plate to Axle Housing	30-40*

POWER BRAKES

Master Cylinder to Booster Body	10-13
Brake Booster to Pedal Support Bracket	18-25

*Models 59, 71 RPO Heavy Duty— 55-65 Foot Pounds

SERVICE TOOLS

Ford Tool No.	Former No.	Description
—	LM-119	Brake Cylinder Retaining Clamp
—	2035N 2086L	Brake Shoe Retracting Spring Remover and Installer
TOOL-4235-C	4235-C	Axle Shaft and Bearing Remover
TOOL-33621	33621	Pump Shaft Bearing Retainer and Power Brake Pliers
—	1112-144	Inch-Pound Torque Wrench

SUSPENSION, STEERING, WHEELS AND TIRES

GROUP 3

PART 3-1 SUSPENSION, STEERING, WHEELS AND TIRES—GENERAL SERVICE

1 DIAGNOSIS AND TESTING

MANUAL STEERING

Table 1 lists various manual and power steering trouble symptoms and possible causes. Several of these symptoms are also common to suspension, frame, and wheel and tire troubles. For this reason, be sure that the cause of the trouble is in the steering gear or linkage before adjusting, repairing, or replacing any of the steering parts.

POWER STEERING—PRELIMINARY TESTS

The following preliminary checks should always be made before performing any trouble-shooting operations.

AIR BLEEDING

... e power steering system
s...
tha...
cat...
ope... temperature...
che...
wheel through...

or four times. **Do not hold the wheels against their stops.** Recheck the fluid level.

CHECK FLUID LEVEL

Run the engine until the fluid is at normal operating temperature. Then turn the steering wheel all the way to the left and right several times, and shut off the engine.

Check the fluid level in the power steering reservoir. The level must be at the full mark on the dipstick. On a pump with a straight filler tube the lubricant must be to the bottom of the filler tube. If the level is low, add enough automatic transmission fluid C1AZ-19582-A to raise the level to the F mark on the dip stick or to the bottom of the filler tube. **Do not overfill the reservoir.**

CHECK PUMP BELT

If the pump belt is broken, glazed, or worn, replace it with a new belt. Use only the specified type of belt. Refer to Part 3-3 for belt adjustment.

CHECK FOR FLUID LEAKS

With the engine idling, turn the steering wheel from stop to stop several times. Check all possible leakage points. Tighten all loose fittings, and replace any damaged lines or defective seats.

CHECK TURNING EFFORT

With the front wheels properly aligned and tire pressures correct, check the effort required to turn the steering wheel.

1. With the car on dry concrete, set the parking brakes.
2. With the engine warmed up and running at idle speed, turn the steering wheel to the left and right several times to warm the fluid.
3. Attach a pull scale to the rim of the steering wheel. Measure the pull required to turn the wheel one complete revolution in each direction. The effort required to rotate the steering wheel should not exceed 5.0 pounds.

PUMP-FLUID PRESSURE TEST

A fluid pressure test will show whether the pump or some other unit in the power steering system

FORD MOTOR COMPANY

FORD MOTOR COMPANY
QUALITY SERVICE
SERVICE PUBLICATIONS

Official Licensed Product
Ford Motor Company

5002

FORM 7098-65

LITHO IN U.S.A.