



1966

**COMET,
FALCON,
FAIRLANE
and
MUSTANG**

SHOP MANUAL

Copyright © 2006, Forel Publishing Company, LLC, Woodbridge, Virginia

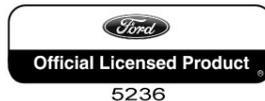
All Rights Reserved. No part of this book may be used or reproduced in any manner whatsoever without written permission of Forel Publishing Company, LLC. For information write to Forel Publishing Company, LLC, 3999 Peregrine Ridge Ct., Woodbridge, VA 22192

1966 Comet, Falcon, Fairlane and Mustang Shop Manual

ISBN: 0-9673211-3-1

EAN: 978-0-9673211-3-4

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



This publication contains material that is reproduced and distributed under a license from Ford Motor Company. No further reproduction or distribution of the Ford Motor Company material is allowed without the express written permission of Ford Motor Company.

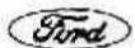
Disclaimer

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 services of a competent professional should be sought.

1966

COMET, FALCON, FAIRLANE and MUSTANG

SHOP MANUAL



SERVICE PUBLICATIONS

FIRST PRINTING—AUGUST, 1965

©1965 FORD MOTOR COMPANY, DEARBORN, MICHIGAN

GROUP INDEX

Vehicle Identification	1
Brakes	2
Suspension, Steering, Wheels and Tires	3
Rear Axle	4
Drive Shaft and Clutch	5
Manual Transmission	6
Automatic Transmission	7
Engine	8
Ignition System	9
Fuel System	10
Cooling System	11
Exhaust System	12
Charging System	13
Starting System	14
Lighting System, Horns and Instruments	15
Ventilating, Heating, and Accessories	16
Body, Doors and Windows	17
Trim, Seats, and Convertible Tops	18
Maintenance Schedule	19
Maintenance Operations	20
Lubrication Chart	21
Schematics	22

**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 1966 Comet, Falcon, Fairlane and Mustang 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 PUBLICATIONS

VEHICLE IDENTIFICATION

GROUP 1

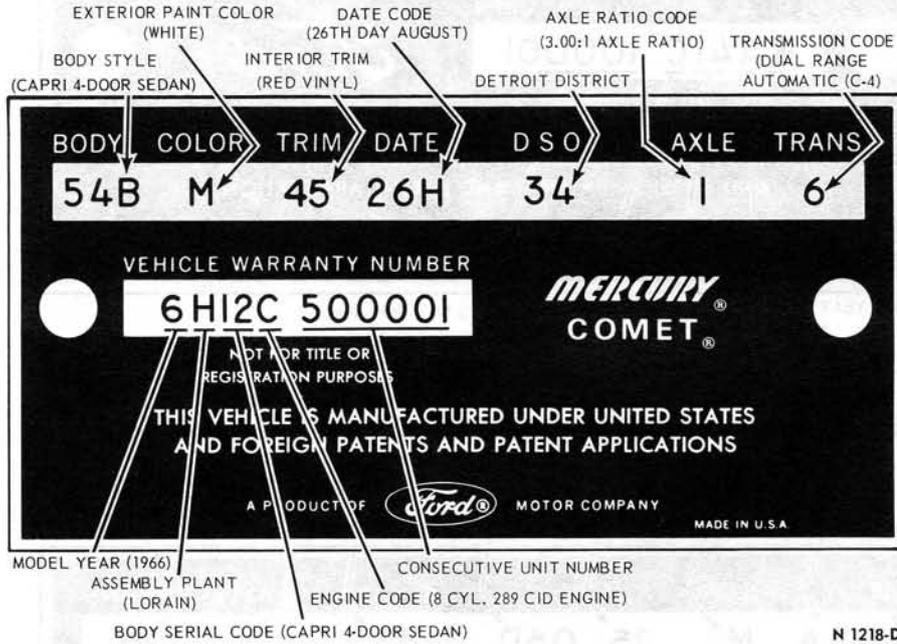


FIG. 1—Comet Warranty Plate

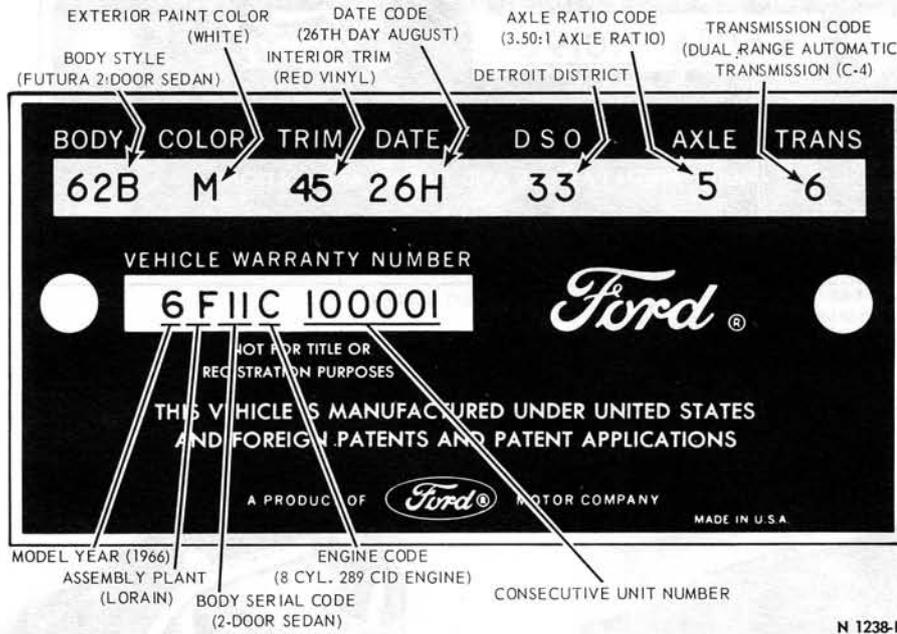
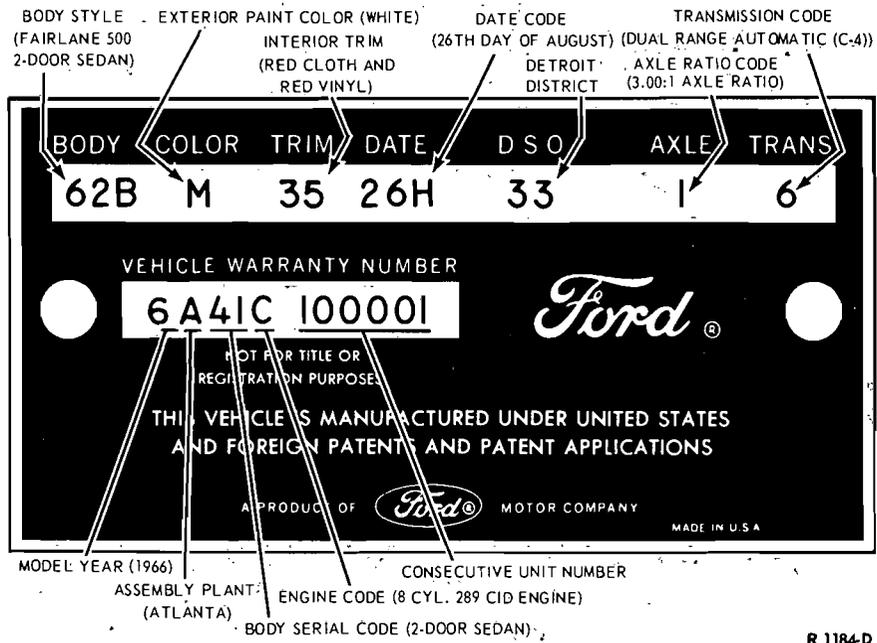


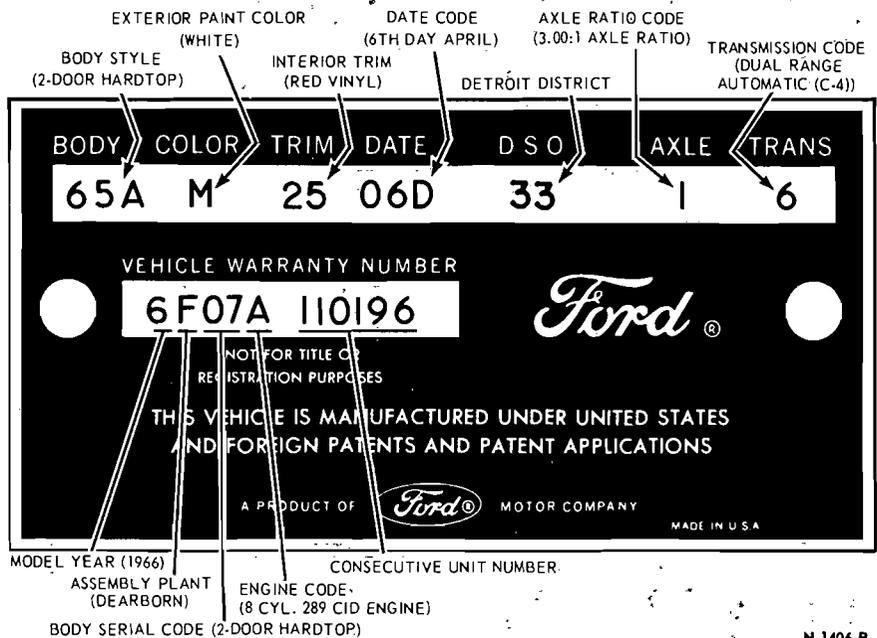
FIG. 2—Falcon Warranty Plate

VEHICLE IDENTIFICATION



R 1184-D

FIG. 3—Fairlane Warranty Plate



N 1406-B

FIG. 4—Mustang Warranty Plate

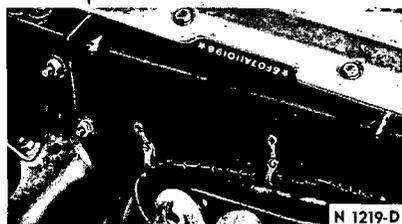


FIG. 5—Vehicle Identification Number Location—Comet, Falcon and Mustang

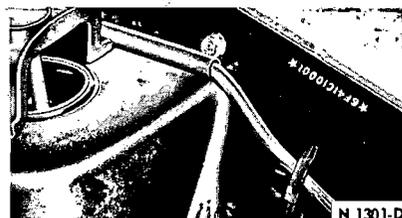


FIG. 6—Vehicle Identification Number Location—Fairlane

Figures 1, 2, 3 and 4 illustrate the Comet, Falcon, Fairlane and Mustang Warranty Plates. The warranty plate is located on the rear face (lock face) of the left front door.

The official Vehicle Identification Number, for title and registration purposes, is stamped on the top upper flange of the left front fender apron for Falcon, Comet and Mustang (Fig. 5) and on the vertical face of the left front fender apron near the top for the Fairlane (Fig. 6). Do not use the Vehicle Warranty Number, which appears on the warranty plate, for title or registration purposes.

VEHICLE DATA

The vehicle data appears in a line across the top of the warranty plate (Figs. 1, 2, 3 and 4). 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, 2, 3 and 4). 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 Series Codes, Body Style Codes and the Model.

COMET

Body Serial Code	Body Style Code	Body Type	Model
02	54A	4-Door Sedan [Ⓛ]	Comet
01	62A	2-Door Sedan [Ⓛ]	202
06	71A	4-Door Wagon [Ⓛ]	
12	54B	4-Door Sedan [Ⓛ]	Capri
13	63B	2-Door Hardtop [Ⓛ]	
16	71C	4-Door (Villager) Wagon [Ⓛ]	
22	54D	4-Door Sedan [Ⓛ]	
23	63C	2-Door Hardtop [Ⓛ]	Comet
23	63D	2-Door Hardtop [Ⓛ]	Caliente
25	76B	2-Door Convertible [Ⓛ]	
25	76D	2-Door Convertible [Ⓛ]	
27	63E	2-Door Hardtop [Ⓛ]	Cyclone
27	63H	2-Door Hardtop [Ⓛ] (GT)	
29	76C	2-Door Convertible	
29	76H	2-Door Convertible [Ⓛ] (GT)	

[Ⓛ]Bench Seat
[Ⓛ]Bucket Seats

FALCON

Body Serial Code	Body Style Code	Body Type	Model
02	54A	4-Door Sedan	Standard Sedan
01	62A	2-Door Sedan	
12	54B	4-Door Sedan (Bench)	Futura
11	62B	2-Door Sedan (Bench)	
14	62C	2-Door Sport Coupe (Bucket)	
22	71A	4-Door Wagon	Station Wagon
24	71B	4-Door Wagon Deluxe	
27	66A	2-Door Standard Ranchero	Ranchero
27	66B	2-Door Deluxe Ranchero	
27	66D	2-Door Standard (RPO Bucket W/Console)	

FAIRLANE

Body Serial Code	Body Style Code	Body Type	Model
31	62A	2-Door Coupe	Fairlane
32	54A	4-Door Club Coupe	
41	62B	2-Door Sedan	Fairlane 500
42	54B	4-Door Sedan	
43	63B	2-Door Hardtop	
45	76B	2-Door Convertible	
46	63C	2-Door Hardtop [Ⓛ]	Fairlane 500 XL
47	76C	2-Door Convertible [Ⓛ]	
40	63D	2-Door Hardtop [Ⓛ]	Fairlane 500 GT
44	76D	2-Door Convertible [Ⓛ]	
38	71D	4-Door Ranch Wagon	Station Wagons
48	71B	4-Door Cust. Ranch Wagon	
49	71E	4-Door Squire	

[Ⓛ]Bucket Seats

MUSTANG

Body Serial Code	Body Style Code	Body Type	Model
09	63A	2-Door Fastback [Ⓛ]	Mustang
07	65A	2-Door Hardtop [Ⓛ]	
08	76A	2-Door Convertible [Ⓛ]	
09	63B	2-Door Fastback [Ⓛ]	
07	65B	2-Door Hardtop [Ⓛ]	
08	76B	2-Door Convertible [Ⓛ]	
07	65C	2-Door Hardtop [Ⓛ]	
08	76C	2-Door Convertible [Ⓛ]	

[Ⓛ]Std. Bucket Seats
[Ⓛ]Luxury Bucket Seats
[Ⓛ]Std. Bench 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-30J M-32-I#	Color
A	1724-A	Black
F	1226-A	Lt. Blue
H	1912-A	Lt. Beige
K	1903-A	Dk. Blue Met.
M	1619-A	White
P	1910-A	Med. Palomino Met.
R	1879-A	Dk. Green Met.
T	2008-A	Red
U	1070-A	Med. Turquoise Met.
V	1921-A	Emberglo Met.
X	1632-A	Maroon Met.
Y	1269-A	Lt. Blue Met.
Z	1915-A	Med. Sage Gold Met.
4	1901-A	Med. Silver Met.
5	2025-A	Red
8	1955-A	Yellow

INTERIOR TRIM CODES

Code	Trim Schemes
11	Silver Cloth and Black Vinyl
12	Blue Cloth and Blue Vinyl
15	Red Cloth and Red Vinyl
17	Aqua Cloth and Aqua Vinyl
22	Blue Vinyl
25	Red Vinyl
26	Black Vinyl
27	Aqua Vinyl
32	Blue Cloth and Blue Vinyl
35	Red Cloth and Red Vinyl
36	Black Vinyl
37	Aqua Cloth and Aqua Vinyl
38	Ivy Gold Cloth and Ivy Gold Vinyl
42	Blue Vinyl
44	Emberglo Vinyl
45	Red Vinyl
46	Black Vinyl
47	Aqua Vinyl
48	Ivy Gold Vinyl
52	Blue Cloth and Blue Vinyl
55	Red Cloth and Red Vinyl
57	Aqua Cloth and Aqua Vinyl
62	Blue Vinyl
64	Emberglo Vinyl
65	Red Vinyl
66	Black Vinyl
67	Aqua Vinyl
68	Ivy Gold Vinyl
82	Blue Vinyl
84	Emberglo Vinyl
85	Red Vinyl
86	Black Vinyl
87	Aqua Vinyl
88	Ivy Gold Vinyl
1D	Parchment Cloth and Parchment Vinyl
2D	Parchment Vinyl
3D	Parchment Cloth and Parchment Vinyl
4D	Parchment Vinyl
5D	Parchment Cloth and Parchment Vinyl
0D	Parchment Vinyl
B1	Parchment Vinyl W/Silver
B2	Parchment Vinyl W/Blue
B4	Parchment Vinyl W/Emberglo
B5	Parchment Vinyl W/Red
B6	Parchment Vinyl W/Black
B7	Parchment Vinyl W/Aqua
B8	Parchment Vinyl W/Ivy Gold
B9	Parchment Vinyl W/Palomino
C2	Parchment Vinyl W/Blue
C3	Parchment Vinyl W/Burgundy
C4	Parchment Vinyl W/Emberglo
C6	Parchment Vinyl W/Black
C7	Parchment Vinyl W/Aqua
C8	Parchment Vinyl W/Gold
C9	Parchment Vinyl W/Palomino
D2	Parchment Vinyl W/Blue
D3	Parchment Vinyl W/Burgundy
D4	Parchment Vinyl W/Emberglo
D6	Parchment Vinyl W/Black
D7	Parchment Vinyl W/Aqua
D8	Parchment Vinyl W/Gold
D9	Parchment Vinyl W/Palomino
F2	Parchment Vinyl W/Blue
F3	Parchment Vinyl W/Burgundy
F4	Parchment Vinyl W/Emberglo
F6	Parchment Vinyl W/Black
F7	Parchment Vinyl W/Aqua
F8	Parchment Vinyl W/Ivy Gold
F9	Parchment Vinyl W/Palomino
H1	White Vinyl W/Silver
H2	White Vinyl W/Blue
H4	White Vinyl W/Emberglo

INTERIOR TRIM CODES (Cont'd.)

Code	Trim Schemes
H5	White Vinyl W/Red
H6	White Vinyl W/Black
H7	White Vinyl W/Aqua
H8	White Vinyl W/Palomino

DATE CODES

A number signifying the date precedes the month code letter. A second-year code letter will be used if the model exceeds 12 months.

Month	Code First Year	Code Second 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)

Units built on a Domestic Special Order, Foreign Special Order, or other special orders will have the complete order number 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 a regular production unit, only the District code number will appear.

COMET

Code	District	Code	District
11	Boston	34	Detroit
16	Philadelphia	41	Chicago
15	New York	42	St. Louis
17	Washington	46	Twin Cities
21	Atlanta	51	Denver
22	Dallas	52	Los Angeles
23	Jacksonville	53	Oakland
26	Memphis	54	Seattle
31	Buffalo	81	Ford of Canada
32	Cincinnati	84	Home Office Reserve
33	Cleveland	90-99	Export

FALCON, FAIRLANE AND MUSTANG

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	90-99	Export

REAR AXLE RATIO CODES

A number designates a conventional axle, while a letter designates a Locking differential.

Code	Ratio	Code	Ratio
1	3.00:1	A	3.00:1
2	2.83:1	L	2.83:1
3	3.20:1	C	3.20:1
4	3.25:1	D	3.25:1
5	3.50:1	E	3.50:1
6	2.80:1	F	2.80:1
8	3.89:1	H	3.89:1

TRANSMISSION CODES

Code	Type
1	3-Speed Manual
4	Dual Range Automatic (C-6)
5	4-Speed Manual
6	Dual Range Automatic (C-4)

MODEL YEAR CODE

The number 6 designates 1966

ASSEMBLY PLANT CODES

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

ENGINE CODES

A	8 Cyl. 289 Cu. In. (4V Prem.)
C	8 Cyl. 289 Cu. In. (2V)
K	8 Cyl. 289 Cu. In. (4V Hi-Perf.)
T	6 Cyl. 200 Cu. In. (1V)
Y	8 Cyl. 390 Cu. In. (2V)
Z	8 Cyl. 390 Cu. In. (4V)
2	6 Cyl. Ⓞ200 Cu. In. (1V)
3	8 Cyl. Ⓞ289 Cu. In. (2V)
Ⓞ	Low Compression

CONSECUTIVE UNIT NUMBER

Each model year, each assembly plant begins production with the number 100001 (Falcon, Fairlane or Mustang) or 500001 (Comet) and continues on for each unit built.

BRAKES

GROUP 2

PART 2-1	PAGE	PART 2-3	PAGE
GENERAL BRAKE SERVICE	2-1	SPECIFICATIONS	2-39
PART 2-2			
BRAKE SYSTEM	2-8		

PART 2-1 GENERAL BRAKE SERVICE

Section	Page	Section	Page
1 Diagnosis and Testing	2-1	Parking Brake Linkage Adjustment	2-4
Preliminary Tests	2-1	Power Brake Master Cylinder Push Rod Adjustment	2-4
Road Test	2-1	Hydraulic System Bleeding	2-4
Disc Brake Trouble Symptoms and Possible Causes	2-2	3 Cleaning and Inspection	2-6
Drum Brake Trouble Symptoms and Possible Causes	2-3	Disc Brakes	2-6
Booster Diagnosis Guide	2-4	Drum Brakes	2-7
2 Common Adjustments and Repairs	2-4	Booster Unit	2-7

1 DIAGNOSIS AND TESTING

PRELIMINARY TESTS

FLUID LEVEL

Check the fluid in the master cylinder, and add Rotunda (R-103-A (B7AZ-19542-A) heavy-duty brake fluid.

AUTOMATIC ADJUSTERS

Push the brake pedal down as far as it will go while the car is standing. If the car is equipped with power brakes, the engine should be running while making this test. If the brake pedal travels more than half-way between the released position and the floor, check the automatic adjusters for being inoperative. To check adjuster operation, inspect the brake shoes and the adjuster components for binding or improper installation and follow the procedure described under Brake Shoe Adjustments in Part 2-2, Section 2.

Make several reverse stops to ensure uniform adjustment at all wheels.

HYDRAULIC SYSTEM

If the car is equipped with power brakes, shut off the engine and ex-

haust all vacuum from the booster system before performing this test.

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 Hydraulic System Bleeding, Section 2. Also, check for leaks or insufficient fluid.

BOOSTER

With the transmission in neutral, stop the engine and apply the parking 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.

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.

LOCKED BRAKES

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 from approximately 50 mph.

TABLE 1—Disc Brake Trouble Symptoms and Possible Causes

Possible Causes of Trouble Symptoms	TROUBLE SYMPTOMS								
	Excessive Pedal Travel	Brake Roughness or Chatter (Pedal Pumping)	Excessive Pedal Effort	Pull	Rattle	Brakes Heat Up During Driving and Fail to Release	Leaky Wheel Cylinder	Grabbing or Uneven Braking Action	No Braking Effect When Pedal is Depressed
Shoe and Lining Knock-back after violent cornering or rough road travel	X								
Piston and Shoe and Lining Assembly Not Properly Seated or Positioned	X								X
Air Leak or Insufficient Fluid in System or Caliper	X								X
Loose Wheel Bearing Adjustment	X								
Damaged or Worn Caliper Piston Seal	X						X		X
Excessive Lateral Run-out of Rotor		X							
Rotor Excessively Out of Parallel		X							
Frozen or Seized Pistons			X	X		X		X	
Brake Fluid, Oil or Grease on Linings			X	X			X	X	
Shoe and Lining Worn Below Specifications			X						
Proportioning Valve Malfunction			X						
Caliper Out of Alignment with Rotor				X				X	
Loose Caliper Attachment		X		X				X	
Shoe Hold-Down Clips Missing or Improperly Positioned					X				
Operator Riding Brake Pedal						X			
Scores in the Cylinder Bore							X		
Corrosion Build-up in the Cylinder Bore or on the Piston Surface			X				X		
Bleeder Screw Still Open	X							X	X
Lines From Master Cylinder to Proportioning Valve Interchanged						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 2, 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 un-	seated 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

MUSTANG

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 by turning the handle counterclockwise and pushing it inward.

2. Pull the parking brake handle outward to the third notch from its normal released position.

3. Raise the car.

4. Turn the locking adjustment nut forward against the equalizer (Fig. 1) until a moderate drag is felt when turning the rear wheels in the direction of forward rotation.

5. Release the parking brake, and make sure that the brake shoes return to the fully released position and no drag is felt when turning the rear wheels.

COMET—FALCON—FAIRLANE

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. Loosen the equalizer lock nut and turn the adjusting nut forward against the equalizer until a moderate drag is felt when turning the rear wheels (Fig. 2). Tighten the lock nut.

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, or cause excessive brake pedal travel.

To check the adjustment of the screw, fabricate a gauge of the dimension shown in Fig. 3. Then place the gauge against the master cylinder mounting surface of the booster body as shown in Fig. 4 or 5. 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. Side forces may break the valve plunger.

This is an approximate adjustment only. The push rod should not move more than 0.015 inch as it contacts the master cylinder piston. No movement (exact contact) is ideal.

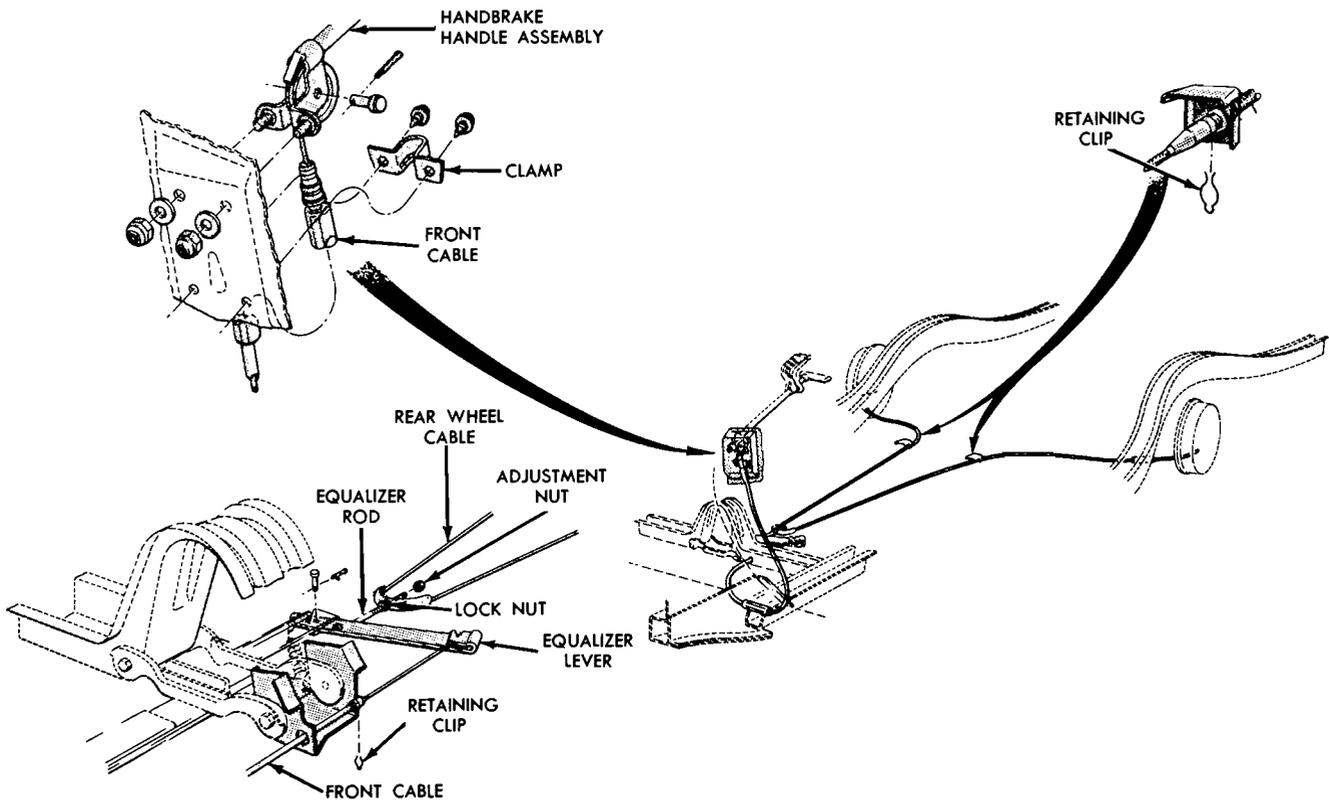
HYDRAULIC SYSTEM BLEEDING

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 or disc brake calipers, and lines.

The hydraulic system can be bled manually or with pressure bleeding equipment.

With disc brakes, more pumping of the pedal is required and more frequent checking of the master cylinder may be necessary while bleeding.

On a car with disc brakes, remove the front wheels and tires to gain access to the bleeder fitting on the disc brake calipers.



H-1328-A

FIG. 1—Parking Brake Linkage—Mustang

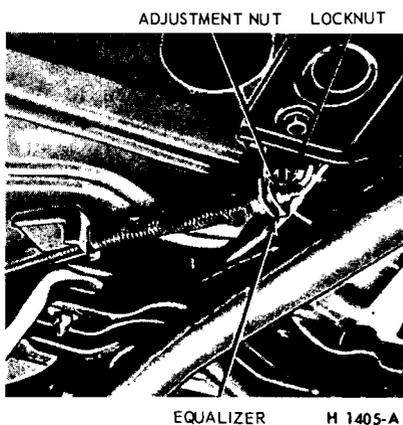


FIG. 2—Parking Brake Linkage Adjustment Comet—Fairlane—Falcon

MANUAL BLEEDING

Bleed the longest lines first. Keep the master cylinder reservoir filled with new Rotunda R-103-A (B7AZ-19542-A) brake fluid during the bleeding operation.

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

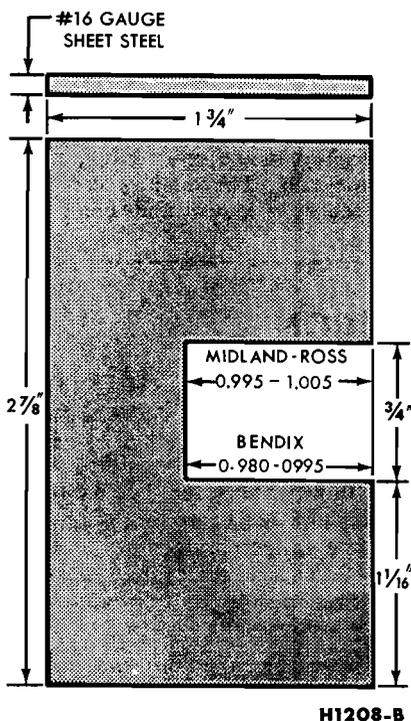


FIG. 3—Push Rod Gauge Dimensions

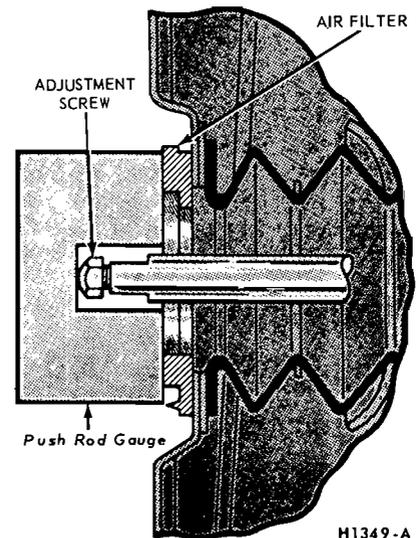


FIG. 4—Push Rod Adjustment—Midland-Ross

1. Position a bent $\frac{3}{8}$ -inch box wrench on the bleeder fitting on the right rear brake wheel cylinder (Fig. 6). Attach a rubber drain tube to the bleeder fitting. The end of the tube should fit snugly around the bleeder fitting.

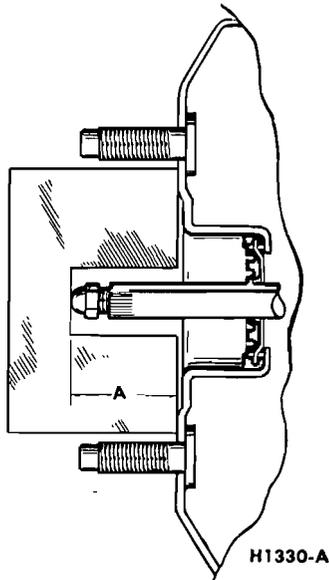


FIG. 5—Push-Rod Adjustment—Bendix

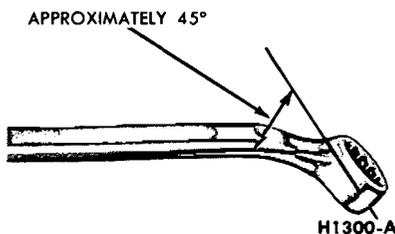


FIG. 6—Brake Bleeder Wrench

2. Submerge the free end of the tube in a container partially filled with clean brake fluid. Loosen the bleeder fitting approximately $\frac{3}{4}$ turn.

3. Push the brake pedal down slowly through 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, close the bleeder fitting and remove the drain tube.

5. Repeat this procedure on the brake cylinders or disc calipers at each wheel 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 $\frac{3}{8}$ inch of the top of the reservoir. The diaphragm-type gasket should be properly positioned in the reservoir cap before the cap is installed.

6. On a car with disc brakes, pump the brake pedal until the front brake pistons are returned to their normal positions and that the shoe and lining assemblies are properly seated.

7. Before driving the car, check the operation of the brakes and be sure that a firm pedal is obtained.

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 to the reservoir, and attach the bleeder tank hose to the fitting on the adapter cap.

An adapter cap can be fabricated by cutting a hole in the center of a reservoir cap and smoldering a fitting at the hole. The adapter cap must be securely seated and completely

sealed on the master cylinder or leakage will occur.

3. Position a $\frac{3}{8}$ -inch box wrench on the bleeder fitting on the right rear brake wheel cylinder (Fig. 6). 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 on the brake cylinder or disc caliper at each wheel in order: left rear, right front, and left front. Refill the master cylinder reservoir after each brake cylinder is bled.

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 $\frac{3}{8}$ -inch from the top of the reservoir. Be sure that the diaphragm-type gasket is properly positioned in the reservoir cap, and then install the cap.

10. On a car with disc brakes, pump the brake pedal until the front brake pistons are returned to their normal positions and the shoe and lining assemblies are properly seated.

11. Before driving the car, check the operation of the brakes and be sure that a firm pedal is obtained.

3 CLEANING AND INSPECTION

DISC BRAKES

1. Remove the wheel and tire, caliper splash shield, and the shoes and linings as outlined in Part 2-2, Section 2.

2. Make three thickness measurements with a micrometer across the middle section of the shoe and lining. Take one reading at each side and one in the center. If the assembly has worn to a thickness of 0.195-inch (shoe and lining together) at any one of the three measuring locations, replace all (4) shoe and lining assemblies on both front wheels.

3. With the shoe and lining assemblies installed, insert a feeler gauge between the lining and rotor. If the clearance is not within 0.002-0.010-inch, check for shoe and lining assemblies not being properly seated on the caliper bridges, for a piston pushed back in the cylinder bore, for a seized piston, or for malfunction of a piston seal.

Ordinarily, the clearance should be 0.002-0.010 inch. However, if the car was stopped by a brake application just prior to checking the clearance, the brakes may drag slightly.

4. To check rotor runout, first eliminate the wheel bearing end play by tightening the adjusting nut. After tightening the nut make certain that the rotor can still be rotated.

5. Clamp a dial indicator to the caliper housing so that the stylus contacts the rotor at a point approximately 1 inch from the outer edge. Rotate the rotor and take an indicator reading. If the reading exceeds 0.0025 inch total indicator runout, replace the rotor. Do not attempt to refinish a rotor that indicates runout

in excess of specification. When the runout check is finished be sure to adjust the bearings as outlined in Group 3, in order to prevent bearing failure.

6. Check the rotor for scoring. Minor scores can be removed with a fine emery cloth. If the rotor is excessively scored, replace it.

7. Visually check the caliper. If it is cracked it should be replaced. If leakage or seized pistons is evident, disassemble and repair the caliper as required.

8. If upon disassembly the caliper is found to be distorted or damaged, or if the cylinder bores are scored or excessively worn, replace the assembly.

The two halves of the caliper assembly should never be separated. Damage or failure of one requires replacement of both as a unit.

DRUM BRAKES

1. Remove the wheel from the drum, and 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 plate and interior of the brake drum.

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

4. Check the condition of the brake shoes, retracting springs, and drum for signs of overheating. If the shoes have a slight blue coloring, or if the springs show a change in free length, indicating overheating, replacement of the retracting and hold down springs is necessary. **Overheated springs lose their force 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 dirt in the cylinder. The cylinder cups and other parts contained in the overhaul kit 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 UNITS

Disassembled views of the brake booster are shown in Figs. 40, 49 and 50, 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

Section	Page	Section	Page
1 Description and Operation	2-8	Hydraulic Lines	2-24
Hydraulic Self-Adjusting Brake System	2-8	Brake Tube Replacement	2-24
Disc Brake Assemblies	2-8	Brake Hose Replacement	2-24
Booster System—Bendix	2-11	3 Removal and Installation	2-24
Booster System—Midland-Ross	2-13	Master Cylinder—Standard Brakes	2-24
Parking Brake	2-14	Master Cylinder—Power Brakes	2-24
2 In-Car Adjustments and Repairs	2-16	Booster Unit	2-25
Brake Shoe Adjustments	2-16	Brake Pedal—Manual Shift Transmission	2-25
Front Brake Drum	2-17	Brake Pedal—Automatic Transmission	2-27
Rear Brake Drum	2-17	Parking Brake Control Assembly	2-27
Brake Shoes and Adjusting Screw	2-17	Parking Brake Equalizer to Control Cable	2-27
Disc Brake Shoe and Lining Replacement	2-18	Parking Brake Equalizer to Rear Wheel Cable	2-30
Disc Brake Caliper Assembly	2-19	4 Major Repair Operations	2-31
Front Wheel Hub and Rotor Assembly—Disc Brakes	2-19	Brake Drum Refinishing	2-31
Disc Brake Rotor Splash Shield	2-20	Brake Shoe Relining	2-31
Proportioning Valve	2-20	Master Cylinder	2-31
Wheel Cylinder Repair	2-21	Disassembly of Bendix Type Booster	2-33
Wheel Cylinder Replacement	2-21	Assembly of Bendix Type Booster	2-34
Brake Carrier Plate Replacement	2-24	Disassembly of Midland-Ross Type Booster	2-35
		Assembly of Midland-Ross Type Booster	2-36

1 DESCRIPTION AND OPERATION

Disc brakes are available as optional equipment for the front wheels on Mustang 8-cylinder cars. The hydraulic brake system employs duo-servo single anchor, internal expanding and self-adjusting drum brake assemblies on the rear wheels of cars with disc brakes, and of front and rear wheels of all others.

A vacuum booster is available as optional equipment on all models except Mustangs equipped with disc brakes.

The master cylinder converts physical force from the brake pedal (and booster if so equipped) into hydraulic pressure against the pistons in the calipers (disc brakes) or in the wheel cylinders (drum brakes). The pistons in turn convert hydraulic pressure back into physical force at the brake shoes.

SELF ADJUSTING DRUM BRAKE ASSEMBLIES

The self-adjusting brake mechanism consists of a cable, cable guide, adjusting lever, and adjuster spring (Fig. 1 and 2). 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 sec-

ondary 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 star-wheel to turn and expand the shoes. The star-wheel is turned one tooth at a time as the linings pro-

gressively 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 are non-adjustable.

DISC BRAKE ASSEMBLIES

RELATION AND FUNCTION OF COMPONENT PARTS

The disc brake is a fixed caliper, opposed piston, non-energized, ventilated disc type, actuated by a hydraulic system (Fig. 3). There is no lateral movement of either the disc (rotor) or the caliper. The caliper assembly consists of two caliper housings bolted together with each half containing two cylinder bores of 1⁵/₁₆ inch diameter. Each cylinder bore contains a piston with an attached molded rubber dust boot to

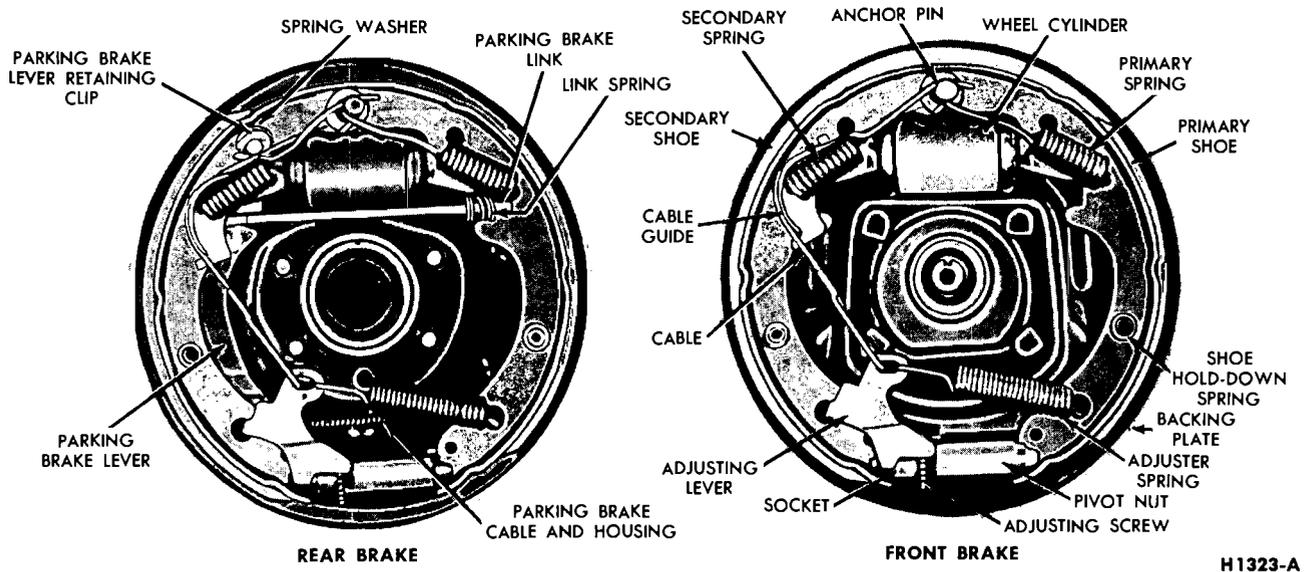


FIG. 1—Self-Adjusting Brake Assemblies—9 Inch Drum

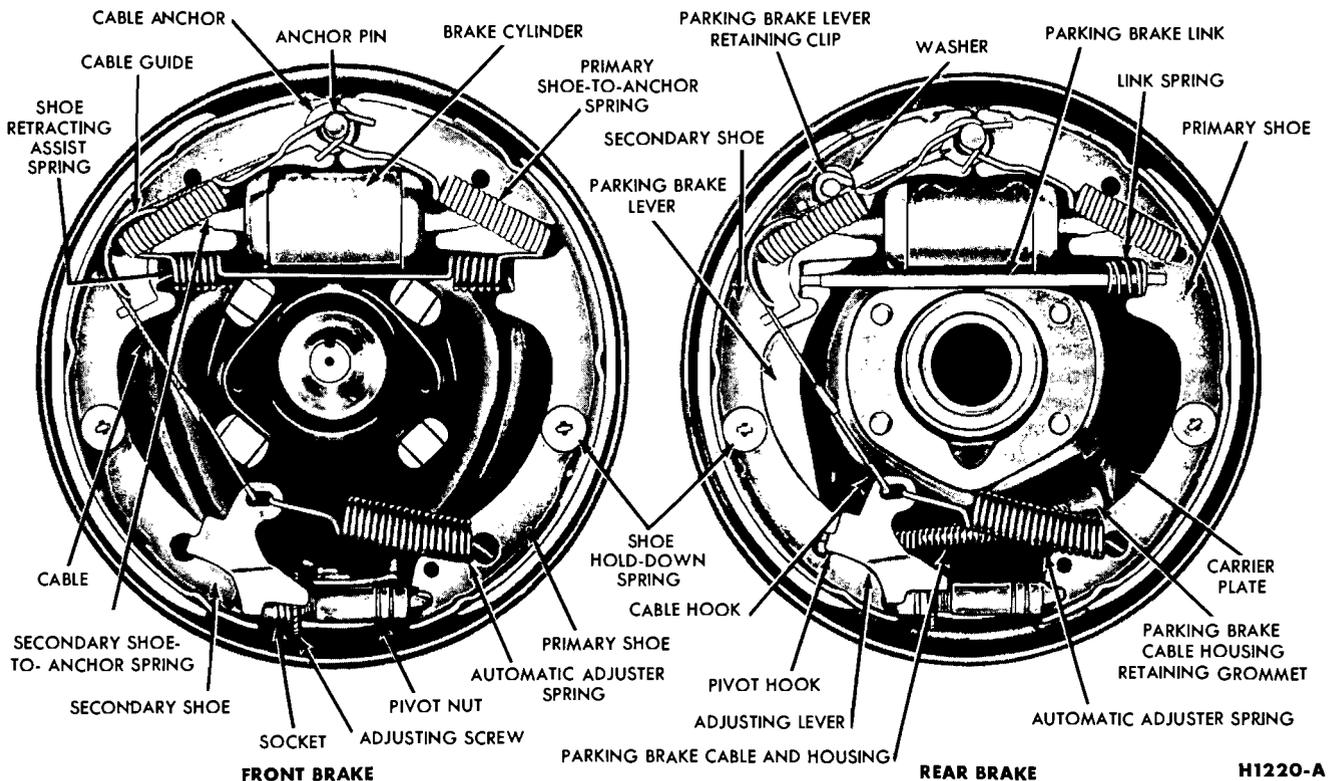


FIG. 2—Self Adjusting Brake Assemblies—10 Inch Drum

seal the cylinder bore from contamination. (Fig. 4). Square-section rubber piston seals are positioned in grooves in the cylinder bores.

The piston seals perform three important tasks:

1. They provide hydraulic sealing between the cylinders and pistons.

2. They return the pistons to released position, when hydraulic pressure is released.

3. They maintain the shoes in correct adjustment at all times (comparable to the automatic adjusters in drum-type brakes).

The cylinders are connected hy-

draulically by means of internal passages in the caliper housing and an external transfer tube between the two halves of the caliper assembly. One bleeder screw and fluid inlet fitting is provided on each caliper assembly.

The shoe and lining assemblies are

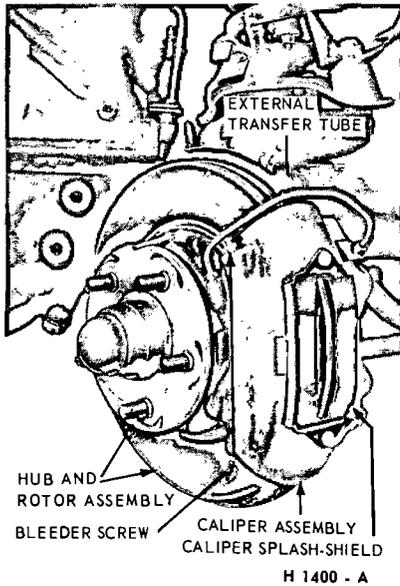
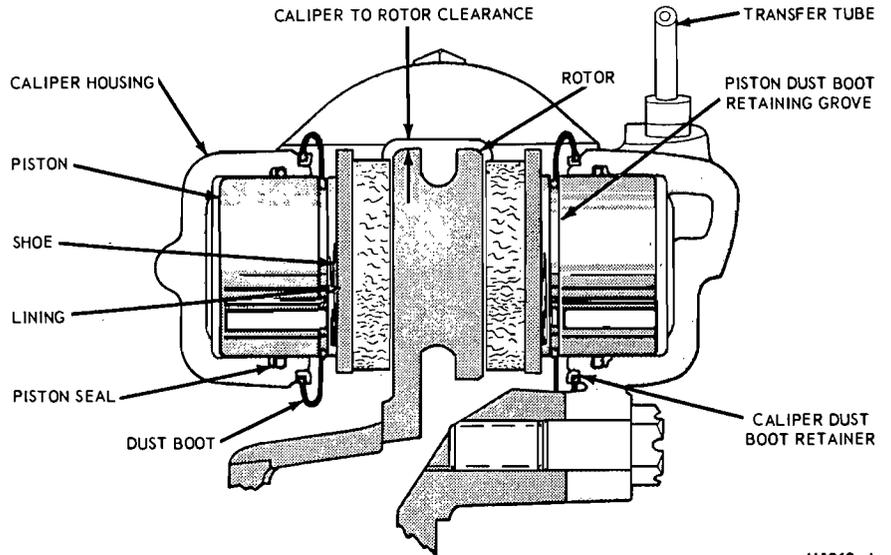


FIG. 3—Typical Disc Brake Assembly

located between parallel machined abutments within the caliper, and are supported radially by tabs on the outer ends of the shoe assemblies (Fig. 35). The shoes slide axially in the caliper abutments by means of the tabs which ride on machined ledges (bridges) when hydraulic pressure is applied to the piston (Fig. 19). A shoe and lining assembly consists of friction material bonded to a metal plate called the shoe. It is replaced as a unit. Brake torque is absorbed by the mating of the shoe end against the caliper abutments (Fig. 35). A splash shield is attached to the top of the caliper to retain the shoe and lining assemblies and reduce contamination. The caliper assembly is mounted to a bracket located between the spindle and rotor splash shield, to the front of the wheel vertical centerline.

The cast iron disc is of the ventilated rotor type incorporating forty fins and is staked to, and rotates with, the wheel hub. The outside diameter of the rotor is 11.375 inches and the inside diameter is 7.375 inches. This type of design increases cooling area and permits circulation of air through the rotor resulting in more rapid cooling of the brake. A splash shield bolted to the spindle is used primarily to prevent road contaminants from contacting the inboard rotor and lining surfaces (Fig. 20). The wheel provides protection for the outboard surface of the rotor.



H1369 - A

FIG. 4—Typical Caliper Assembly—Sectional View

OPERATION

As the brake pedal is depressed, hydraulic pressure from the master cylinder forces the pistons out of the caliper bores against their respective shoe and lining assemblies. The force of the pistons against the shoes moves the linings against both sides of the revolving rotor to effect braking action.

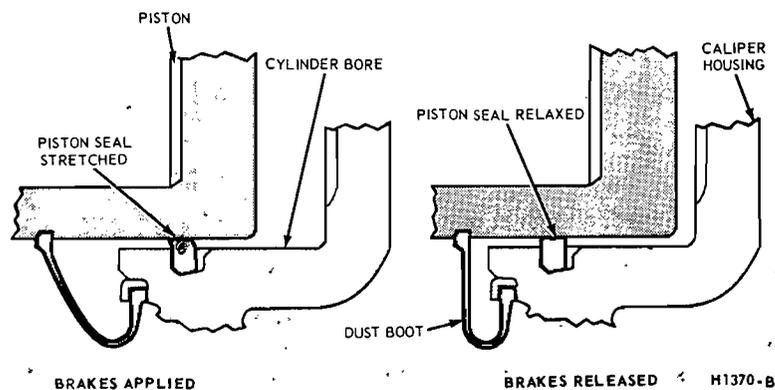
During brake application, the rubber seal on each piston stretches as the piston moves against the shoe (Fig. 5). When the hydraulic pressure against the piston is released, the seal relaxes or rolls back. This roll-back action pulls the piston away from the shoe approximately 0.005 inch to relieve the force of the lining against the rotor and, thereby, provide the required running clearance. Also, inherent rotor runout contributes to the maintenance of running clearance. Auto-

matic adjustment is achieved by the pistons sliding in the seals outward from the cylinder bores. The piston gradually changes its position relative to the seal as the lining wears and, thus, maintains the correct adjustment location at all times.

When the brakes are in the unapplied position, there is no hydraulic pressure to the calipers because the fluid source at the master cylinder by-passes the residual check valve.

A warning sound feature is incorporated in the design of the brake shoes. Metal tabs on the ends of the shoes create an audible metallic, scraping noise, when the linings become worn enough to allow the tabs to contact the rotor. This metal-to-metal contact warns the driver that the shoes need replacing and is not detrimental to the function of the disc brake.

A proportioning valve located be-



H1370 - B

FIG. 5—Function of Piston Seal

tween the master cylinder and the rear brake wheel cylinders provides balanced braking action between the front and the rear brakes under a wide range of braking conditions. (Fig. 21). By regulating the hydraulic pressure applied to the rear wheel cylinders, the valve limits rear braking action when high pressures are required at the front brakes. In this manner, premature rear wheel skid is prevented. The proportioning valve is serviced as an assembly and is never adjusted or overhauled.

BOOSTER SYSTEM—BENDIX TYPE

The diaphragm type brake booster is a self contained vacuum-hydraulic braking unit mounted on the engine side of the dash panel.

The vacuum power chamber consists of a front and rear shell locked together. Within the vacuum chamber are the rubber diaphragm and the integral valve hub and diaphragm plate. The rubber diaphragm fits over the plate, and the outer bead of the diaphragm is locked between the front and rear shells (Fig. 6). The diaphragm return spring is located between the diaphragm plate and the front shell.

The valve hub section of the diaphragm plate protrudes from the

rear shell. A synthetic rubber seal is used between the valve hub and the rear shell. The seal and the valve hub are protected from dirt by a rubber guard connected between the air filter at the end of the hub and a flange on the rear shell. The control valve assembly fits into the hub and is connected to the brake pedal by the valve operating rod. The control valve assembly consists of a plunger, a valve body which supports a single poppet of flexible rubber, and two return springs. When the brake pedal is in the released position the valve return spring holds the valve assembly and operating rod away from the diaphragm plate. In this position, the poppet on the valve body is off the vacuum port seat which is a part of the diaphragm plate. The poppet return spring likewise holds the poppet against the atmospheric port seat which is a part of the plunger.

The hydraulic master cylinder which contains all of the components of the conventional master cylinder is bolted to the booster front shell. The hydraulic push rod forms the link between the master cylinder piston and the vacuum power diaphragm assembly. The end of the push rod, that enters the master cylinder piston, is equipped with a self-locking adjusting screw. The oppo-

site end has a piston head which enters the diaphragm plate. A seal, located in the front shell, seals the opening between the hydraulic push rod and the shell.

Engine manifold vacuum is supplied to the booster through a vacuum check valve located in the front shell. Air is admitted through the air filter located at the end of the valve hub. The hydraulic push rod is actuated by pedal pressure assisted by the diaphragm, which derives power from the pressure differential existing between the vacuum on its front side and atmospheric pressure on its rear side. A passage in the diaphragm plate permits vacuum to pass from the front to the rear side of the diaphragm when the vacuum port opens as the brakes are released.

RELEASED POSITION

With the engine running and the brakes released (Fig. 7), vacuum from the intake manifold is admitted through the check valve to the front (constant vacuum) chamber of the power unit. In the released position (no pressure applied to the brake pedal), the valve operating rod and valve plunger are held to the rear in the valve hub by the valve return spring to CLOSE the atmospheric

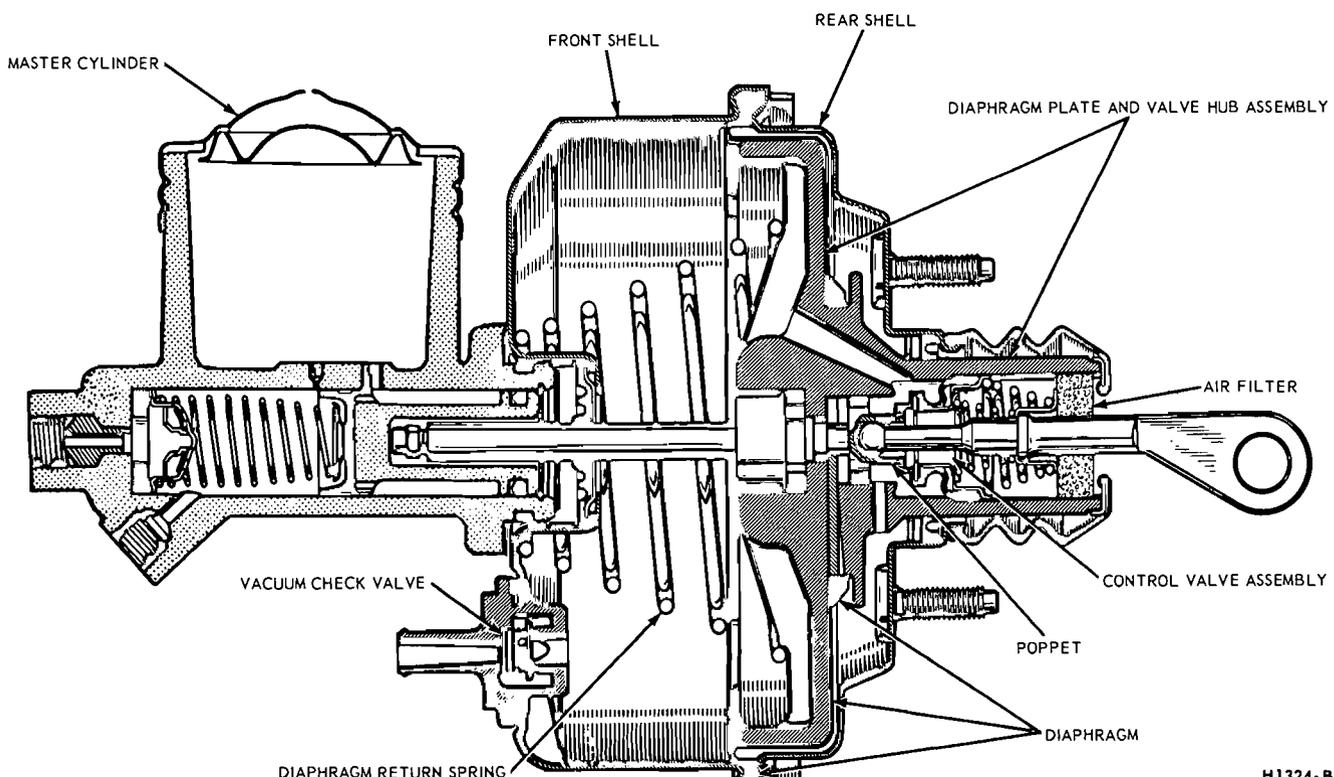


FIG. 6—Cutaway View of Vacuum Booster—Bendix-Type

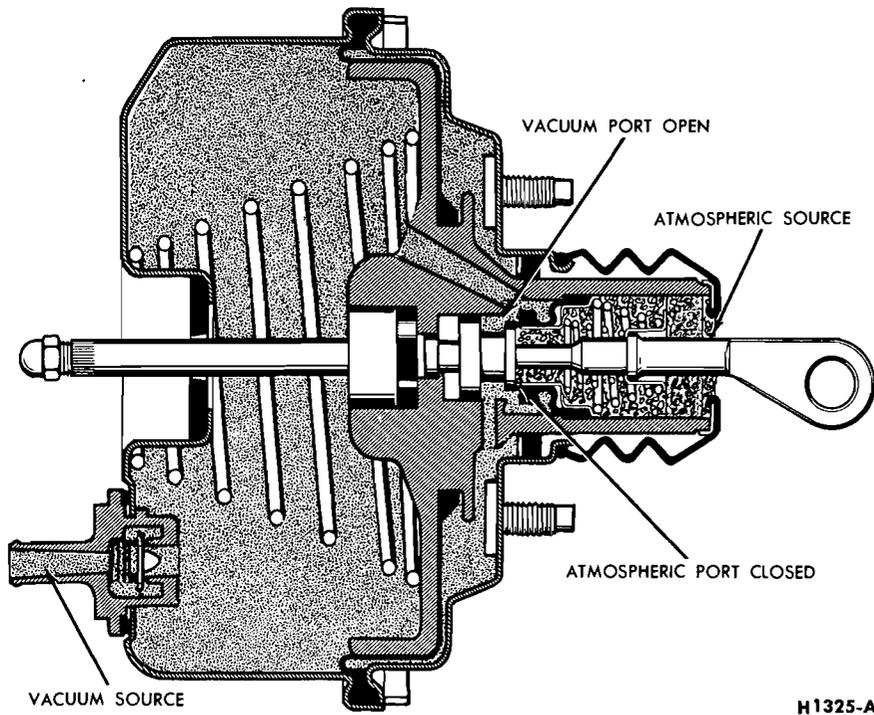


FIG. 7—Booster in Released Position—Bendix-Type

port and OPEN the vacuum port. With the valve in this position, the rear (control vacuum) chamber is also open to vacuum through the porting in the diaphragm and valve hug assembly. The diaphragm is then balanced or suspended in vacuum, since vacuum is present on both sides of the power diaphragm. With the power diaphragm balanced in vacuum, the diaphragm return spring holds the diaphragm and hydraulic push rod in the fully released position. With the hydraulic push rod in this position, the hydraulic compensating port in the hydraulic master cylinder is OPEN. The open port permits brake fluid to either return from the brake system to the fluid reservoir or enter the brake system from the fluid reservoir to compensate for any gain or loss in fluid volume.

APPLIED POSITION

When the brakes are applied (Fig. 8), the valve operating rod and valve plunger move forward in the valve hub section of the diaphragm plate to compress the valve return spring and force the poppet against the vacuum valve seat in the diaphragm plate to CLOSE the vacuum port. Any additional movement of the valve operating rod in the applied direction moves the valve plunger away from the poppet valve to OPEN the atmospheric port and

admit atmosphere through the air cleaner and passages in the diaphragm plate to the rear side of the power chamber. With vacuum present on the front side of the diaphragm and valve housing and atmospheric pressure present on the rear side of the diaphragm, a force is developed to move the vacuum power diaphragm assembly, hydraulic

push rod and master cylinder piston forward to close the compensating port and force hydraulic fluid under pressure through the residual check valve and brake tubes into the brake wheel cylinders. As hydraulic pressure is developed in the brake master cylinder, a counter force (to the rear) acting through the hydraulic push rod, sets up a reaction force against the power diaphragm assembly and valve plunger through the rubber reaction disc (located at the end of the hydraulic push rod). The rubber reaction disc acts similar to a column of fluid to distribute the pressure between the vacuum power diaphragm assembly and the valve plunger in proportion to their respective contact areas. The pressure acting against the valve plunger and valve hub assembly to close off the the valve plunger slightly to the rear in relation to the diaphragm and valve hub assembly to close off the atmospheric port. The driver is thus assured a feel of the brake, since part of the counter force reacts through the valve plunger, valve operating rod, and pedal linkage against the driver's foot. This reaction force is in direct proportion to the hydraulic pressure developed within the brake system.

HOLDING POSITION

During brake application, the reaction force which opposes the

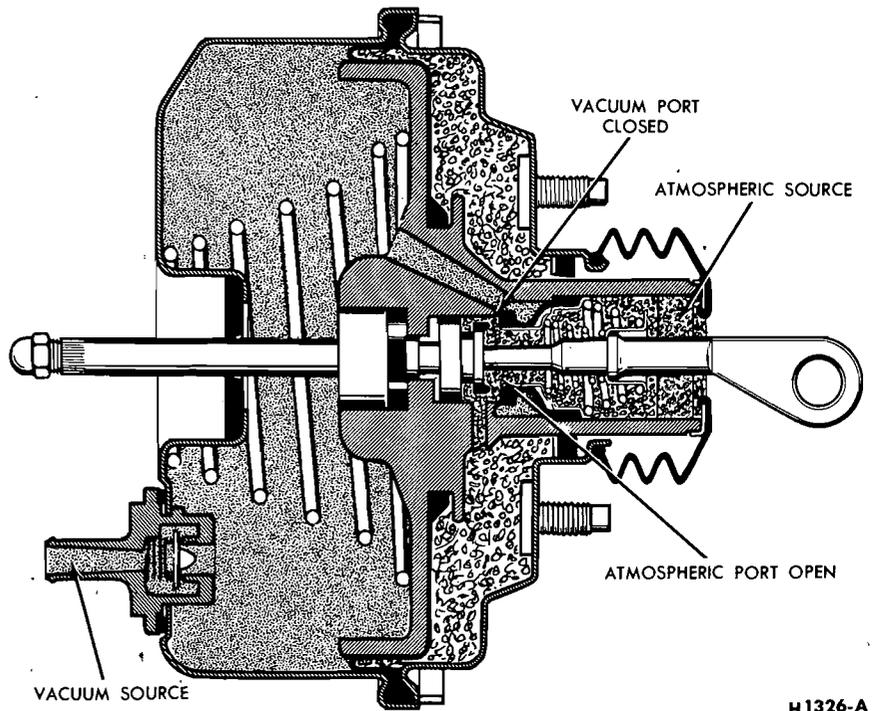


FIG. 8—Booster in Applied Position—Bendix-Type

force applied by the driver, tends to close the atmospheric port. When both atmospheric and vacuum ports are CLOSED, the booster is said to be in the holding position (Fig. 9).

power brake application may be made from the vacuum in the booster. With the engine off and no vacuum in the power system, the brakes can be applied in the conven-

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.

Wither 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. 10). 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.

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. This reaction lever and ring assembly is designed to transmit the reaction forces back through the actuating control valve assembly to the brake pedal and provide the driver with a resistance that is in 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

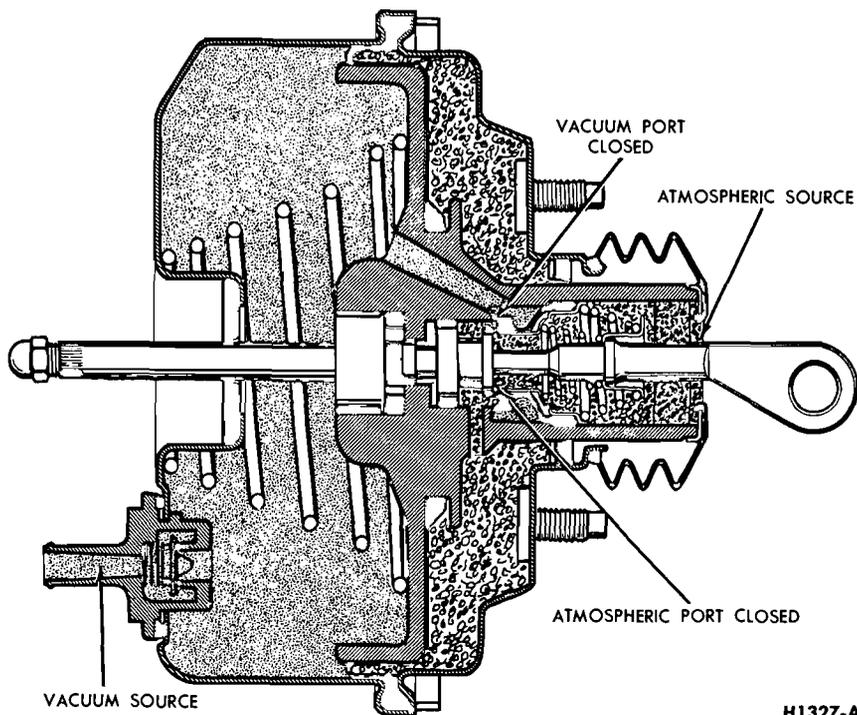


FIG. 9—Booster in Holding Position—Bendix-Type

With both valves closed, any degree of brake application attained will be held until either the atmospheric port is **reopened** by an increase in pedal pressure to further increase the brake application or by a decrease in pedal pressure to **reopen** the vacuum port to decrease the brake application. Whenever the pressure applied to the brake pedal is held constant for a moment, the valve returns to its holding position. However, upon reaching the fully applied position the force applied to the brake pedal overrules the reaction force. In this position the valve plunger and atmospheric valve seat are held away from the valve poppet to admit maximum atmospheric pressure to the rear chamber. With the front chamber open to manifold vacuum, full power application is attained which is referred to as the run-out of the power unit. Any increase in hydraulic pressure beyond this point must be supplied by physical effort of the driver.

NO POWER CONDITION

It should be noted that in case of engine failure and consequent loss of engine vacuum, at least one full

tional manner by applying more physical effort to the brake pedal.

BOOSTER SYSTEM— MIDLAND-ROSS

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. 10, 11 and 12).

Atmospheric pressure is present at all times in the atmospheric chamber at the front side of the atmospheric valve. The air intake to the atmospheric chamber is protected by an air filter. The atmospheric chamber is separated from the vacuum chamber by the bellows 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

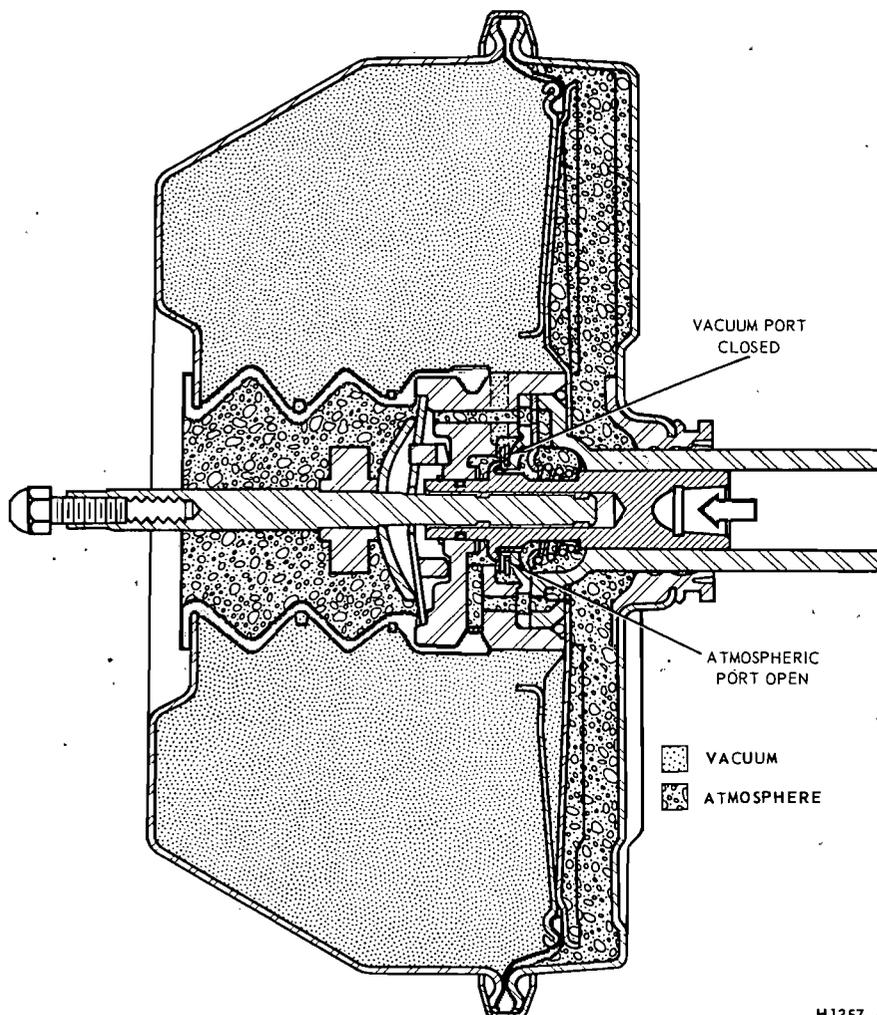


FIG. 10—Booster in Applied Position—Midland-Ross

acting through the reaction ring and lever assembly will tend to move the atmospheric valve to the closed position (Fig. 11). 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.

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. 12). 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 to either return from the brake system to the fluid reservoir, or enter the brake system from the reservoir.

PARKING BRAKES—MUSTANG

An independent hand-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. The rear brake cables connect the equalizer assembly to the parking brake lever at each rear secondary shoe as shown in Figs. 1 and 2.

When the handle is pulled the primary and secondary brake shoes are forced against the rear brake drums. The handle is held in the applied position by the engagement of a spring loaded pawl with a ratchet. Turning the handle counterclockwise disengages the pawl from the ratchet to release the brakes.

PARKING BRAKE COMET, FAIRLANE AND FALCON

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. The rear brake cables connect the equalizer assembly to the parking brake lever at each rear secondary shoe (Fig. 1).

When the pedal is depressed 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 (Fig. 29).

The parking brake control assembly is mounted to the cowl inner side 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 that the ratchet teeth will slide over the pawl as the pedal is depressed; however, when

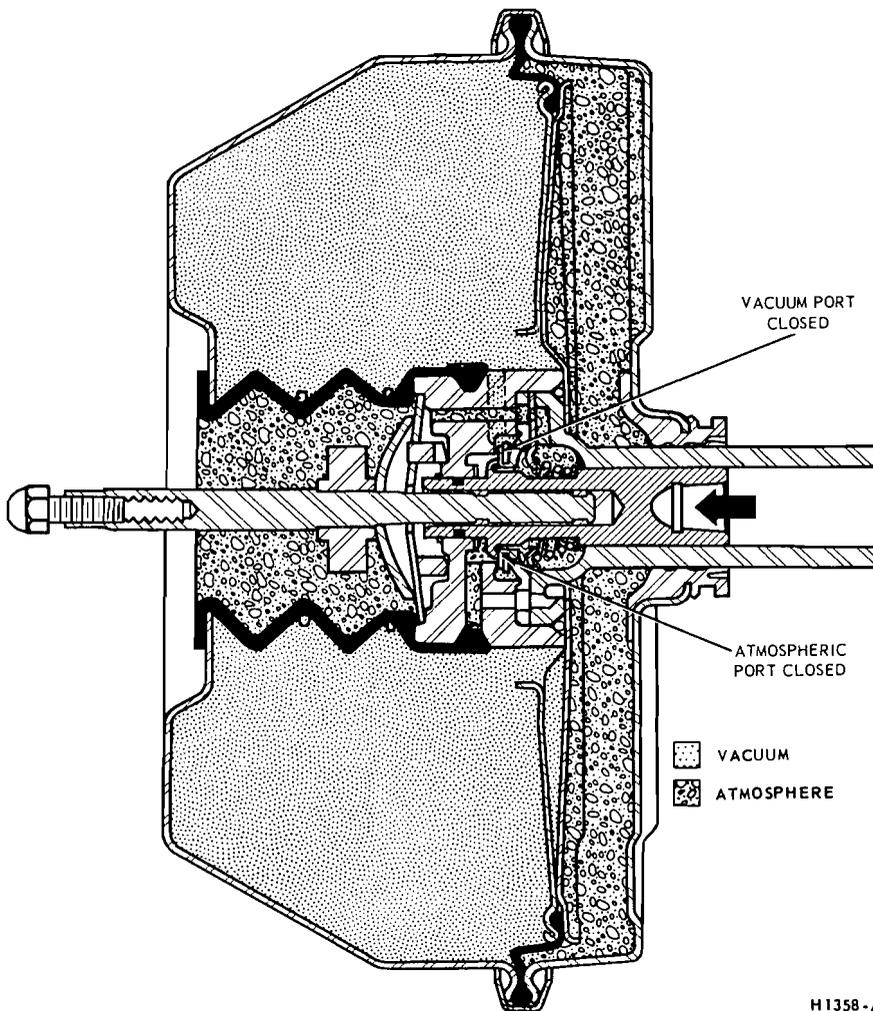


FIG. 11—Booster in Holding Position—Midland-Ross

the applying motion stops and the pedal starts to release, the pawl engages the ratchet and thus locks the

brakes in the applied position.

When the manual release lever is pulled back, (Fig. 29), the cam ac-

tion of the lever on the pawl cam pin will disengage the pawl from the ratchet to release the brakes.

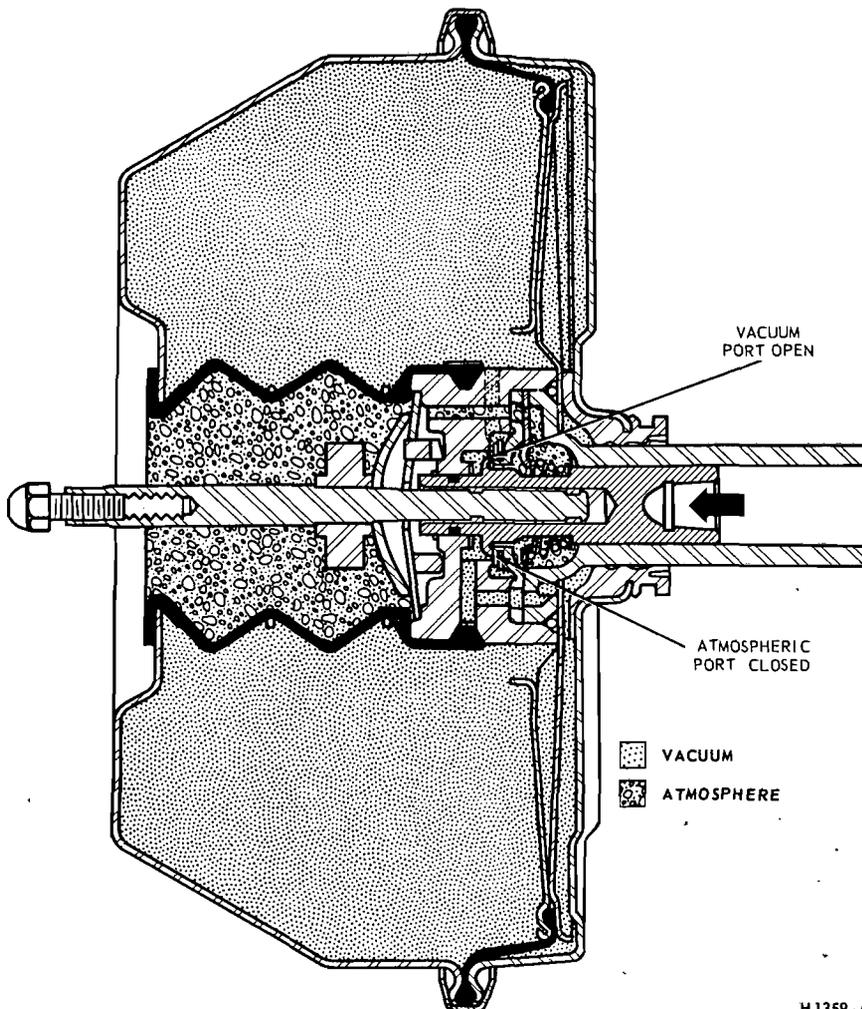


FIG. 12—Booster in Released Position—Midland-Ross

2 IN-CAR ADJUSTMENTS AND REPAIRS

BRAKE SHOE ADJUSTMENTS

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 manual adjustment is performed with the drums removed, using the tool and the procedure detailed below.

In case a brake drum cannot be removed in the normal manner, an access knock-out slug is provided in the brake carrier plate. Knock the slug out with a punch and then release the brake shoe as detailed under **Brake Drum-Removal**. Re-

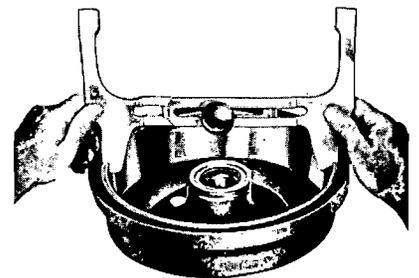
move the drum and knock-out slug. (Install a standard adjusting hole cover in the carrier plate when assembling).

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

To adjust the brake shoes:

1. Using Rotunda Tool HRE 8650, (Fig. 13) determine the inside diameter of the drum braking surface.

2. Reverse the tool as shown in Fig. 14 and adjust the brake shoe diameter to fit the gauge. Hold the automatic adjusting lever out of engagement while rotating the adjust-



H 1411-A

FIG. 13—Measuring Drum

ing screw, to prevent burring the screw slots. Make sure the adjusting screw rotates freely. If neces-

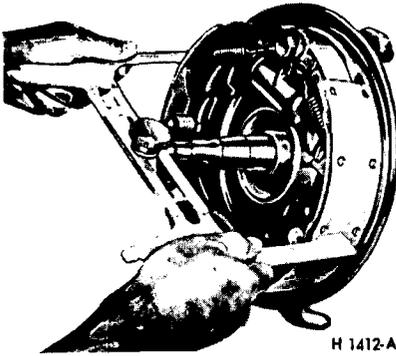


FIG. 14—Measuring Shoes

sary, lubricate the adjusting screw threads with a thin, uniform coating of CIAZ-19590-B Grease.

3. Rotate Tool HRE 8650 around the brake shoes to be sure of the setting.

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.

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

6. Complete the adjustment by applying the brakes several times while backing the car.

7. After the brake shoes have been properly adjusted, check the operation of the brakes by making several stops while operating in a forward direction.

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 from the drum.

2. Remove the drum. If the drum will not come off, knock the access slug out of the brake carrier plate, using a punch. Insert a narrow screwdriver through the slot 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. 15). **Be very careful not to burr, chip, or damage the notches in the adjusting screws; 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.

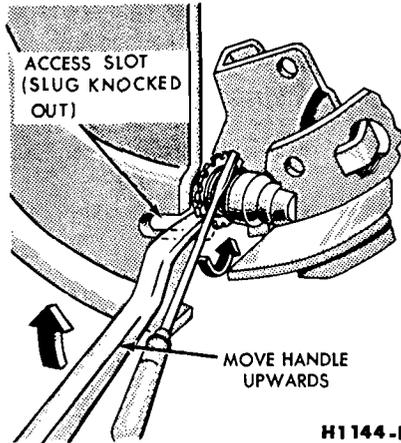


FIG. 15—Backing Off Brake Adjustment

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

INSTALLATION

1. If the drum is being replaced, remove the protective coating from the new drum with carburetor degreaser. Install new bearings and grease retainer. Soak the new grease retainer in light engine oil at least 30 minutes before installation if retainer is of a leather composition. Rubber seals need not be treated with oil before installation. Pack 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 for procedure.

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

2. Adjust the brakes and install the drum assembly 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, knock the excess slug out of the brake carrier plate, using a punch. Insert a narrow screwdriver through the

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. 15). **Be very careful not to burr, chip or damage the notches in the adjusting screw; otherwise, the self-adjusting mechanism will not function properly.**

If the adjustment was backed off, make sure that the adjuster lever is properly seated in the shoe web.

INSTALLATION

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

2. Adjust the brakes as outlined under Brake Shoe Adjustments in this section.

3. Place the drum over the brake assembly and into position. Install the three Tinnerman nuts and tighten them securely. Install the wheel on the axle shaft flange studs against the drum, and tighten the attaching nuts to specifications.

BRAKE SHOES AND ADJUSTING SCREW

REMOVAL

1. With the wheel and drum removed, install a clamp over the ends of the wheel cylinder as shown in Fig. 16.

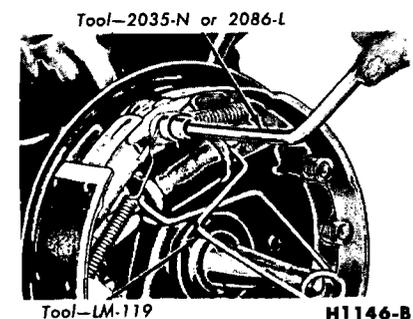


FIG. 16—Retracting Spring Removal—Typical

2. Remove the brake retracting springs using Tool 2035-N or 2086-L (Fig. 16).

3. Disconnect the brake shoe hold-down springs and remove the brake shoe assemblies along with the complete automatic adjustment mechanism.

4. Disassemble the brake shoes.

5. On rear brakes, remove the parking brake link and spring from

the brake assemblies. Disconnect the parking brake cable from the parking brake lever.

6. After removing the rear brake shoes disassemble the parking brake lever from the secondary shoe by removing the retaining clip and spring washer (Fig. 1 and 2).

INSTALLATION

1. Before installing the rear brake shoes, assemble the parking brake lever to the secondary shoe and secure it 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 backing plate.

3. Position the brake shoes on the backing plate and secure them 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.

Install the cable guide on the secondary shoe web with the flanged hole properly fitted into the hole in the secondary shoe web. Install the secondary shoe to anchor spring (Figs. 1 and 2).

5. Place the cable eye over the anchor pin with the crimped side toward the backing plate. Install the primary shoe to anchor spring with the tool shown in Fig. 17.

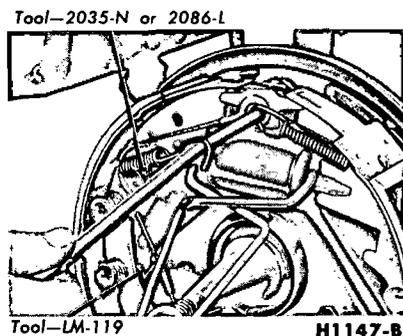


FIG. 17—Retracting Spring Installation—Typical

6. Thread the cable around the cable guide groove.

It is imperative that the cable be positioned in this groove and not between the guide and the shoe web. 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.

7. Apply a small amount of 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 $\frac{1}{2}$ 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 accidental installation of the adjusting screw on the wrong side of the car the socket end of the adjusting screw is stamped with an R or L (Fig. 18). The ad-

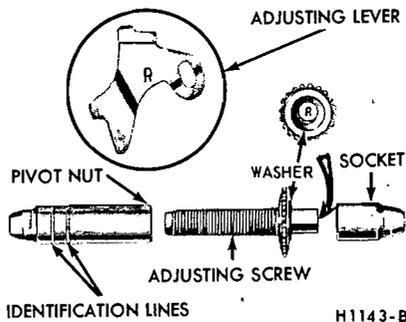


FIG. 18—Adjusting Screw and Lever Identification

justing 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.

8. 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.

9. 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. 18).

10. 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 (Figs. 1 and 2).

11. 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.

12. 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 $\frac{3}{16}$ inch (plus or minus $\frac{1}{32}$ inch) above the centerline of the screw. If the contact point is below the 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 $\frac{83}{16}$ inches on 9 inch brakes or $10\frac{1}{8}$ inches on 10 inch brakes 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.

DISC BRAKE SHOE AND LINING REPLACEMENT

After any brake service work, pump the brake pedal to obtain a firm pedal before moving the car. Riding the brake pedal (common on left foot applications) should be avoided when driving the car.

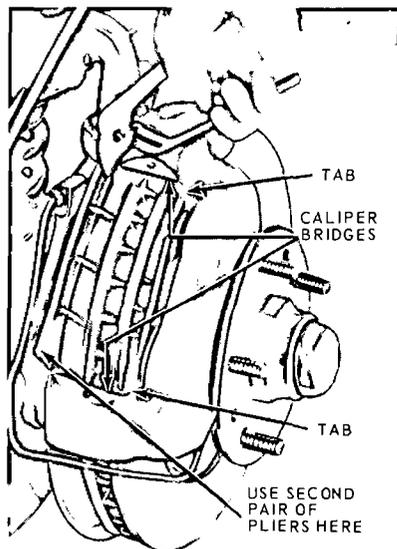
REMOVAL

1. Remove the wheel and tire from the hub and rotor assembly. **Be careful to avoid damage or interference with the caliper splash shield, bleeder screw fitting or transfer tube.**

2. Remove the two bolts that attach the caliper splash shield, and remove the shield (Fig. 3).

3. To facilitate removal and installation of the shoe and lining assemblies, the pistons must be pushed into their bores. Apply a steady inward pressure against each shoe and lining assembly toward its respective caliper housing on each side of the rotor (Fig. 4). Maintain the pressure for at least a minute. If the pistons will not go in easily, force them in with water pump pliers.

4. Grasp the metal flange on the outer end of the shoe with two pairs of pliers and pull the shoe out of the caliper (Fig. 19).



H 1366 - A

FIG. 19—Removing Disc Brake Shoe and Lining Assembly—Typical

CLEANING AND INSPECTION

When the shoe and lining assemblies are replaced, remove the dust boots from the pistons. Check the condition of the boots, and inspect each piston surface for damage or corrosion. Thoroughly clean each dust boot and surrounding area before installing.

INSTALLATION

1. Position a new shoe and lining

assembly on each side of the rotor so that the lining faces the rotor. Be sure that the tabs on the shoe flanges seat fully against the caliper bridges (Fig. 19).

2. Install the caliper splash shield and secure the shield to the caliper with two retaining bolts (Fig 3).

3. Pump the brake pedal several times until a firm pedal is obtained and the shoe and lining assemblies are properly seated.

4. Install the wheel and tire on the hub and rotor assembly.

5. Check and refill the master cylinder reservoir with specified brake fluid as required.

6. Road test the car.

It should not be necessary to bleed the system after a shoe and lining replacement.

DISC BRAKE CALIPER ASSEMBLY**REMOVAL**

1. Remove the wheel and tire from the hub and rotor assembly. **Be careful to avoid damage or interference with the caliper splash shield, bleeder screw fitting or transfer tube.**

2. Disconnect the front brake flexible hose from the brake tube at the bracket on the frame (Fig. 24).

3. Remove the two bolts that attach the caliper to the mounting bracket.

Take care to avoid loosening the bridge bolts that hold the two halves of the caliper together.

4. Lift the caliper assembly off the rotor.

INSTALLATION

1. Position the caliper assembly on the rotor, and mate the mounting bolt holes in the caliper with those in the spindle. It may be necessary to push the caliper pistons into the cylinder bores to obtain clearance between the shoe and lining assemblies and the rotor. The shoe and lining assemblies should be seated properly on the bridges.

2. Install the caliper to mounting bracket attaching bolts and torque to specification. Check to insure that the rotor runs squarely and centrally between the two halves of the caliper. There should be approximately 0.090-0.120 inch clearance between the caliper and the rotor outside diameter (Fig. 4).

3. Connect the front wheel brake flexible hose to the brake tube at the bracket on the frame (Fig. 24). The

hose should be checked for correct routing.

4. Bleed the brake system as outlined in Section 2-1. Check the master cylinder fluid level, and the specified brake fluid as required.

5. **Pump the brake pedal several times to actuate the piston seals and to position the shoe and lining assemblies.**

6. Install the wheel and tire.

7. Road test the car.

FRONT WHEEL HUB AND ROTOR ASSEMBLY—DISC BRAKES**REMOVAL**

1. Remove the wheel and tire from the hub and rotor assembly (Fig. 20). **Be careful to avoid damage or interference with the caliper splash shield, bleeder screw fitting or transfer tube.**

2. Remove the caliper assembly from the spindle and the rotor. If the caliper does not require servicing, it is not necessary to disconnect the brake hose or remove the caliper from the car. Position the caliper out of the way, and support it with a wire to avoid damaging the caliper or stretching the hose. Insert a clean cardboard spacer between the linings to prevent the pistons from coming out of the cylinder bores while the caliper is removed.

Handle the rotor and caliper assemblies in such a way as to avoid deformation of the rotor and nicking or scratching of the brake linings.

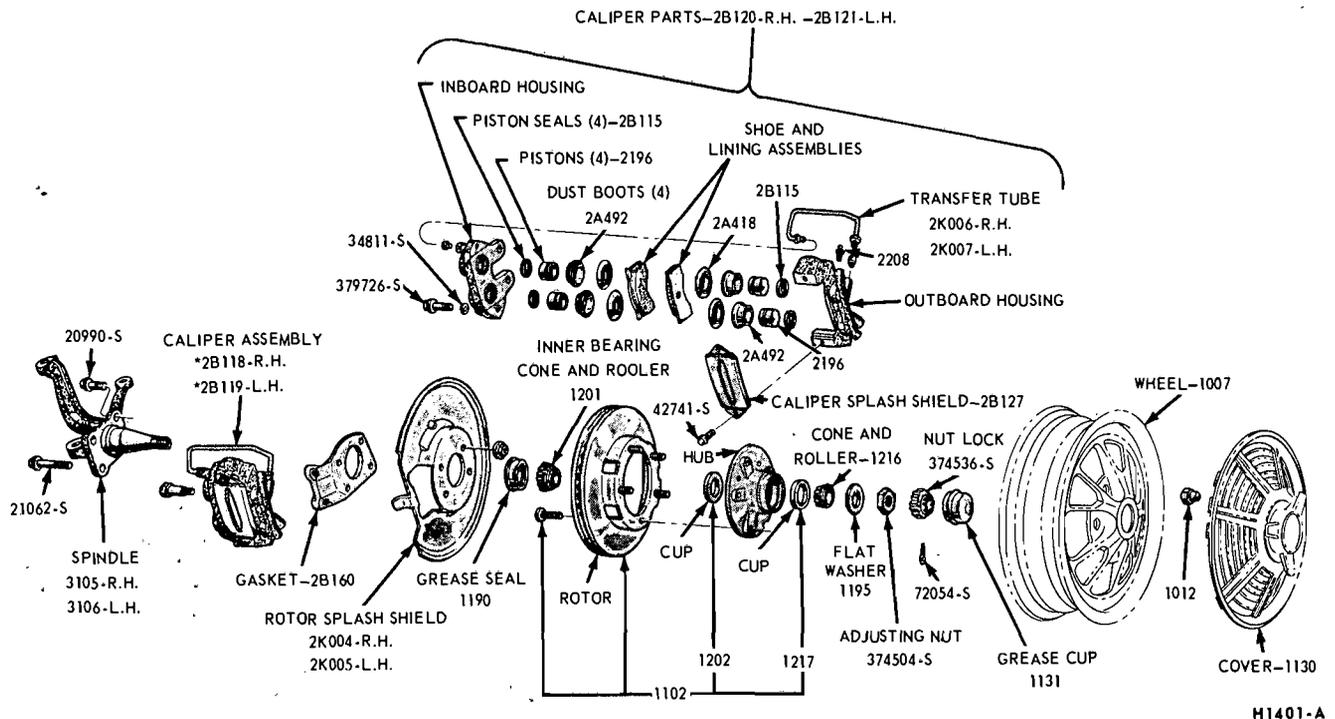
3. Remove the grease cap from the hub. Remove the cotter pin, nut lock, adjusting nut, and flat washer from the spindle. Remove the outer bearing cone and roller assembly.

4. Remove the hub and rotor assembly from the spindle.

INSTALLATION

1. If the rotor is being replaced, remove the protective coating from the new rotor with carburetor degreaser. Pack a new set of bearings with specified grease, and install the inner bearing cone and roller assembly in the inner cup. Pack grease lightly between the lips of a new grease retainer and install the retainer (Fig. 20).

If the original rotor is being installed, make sure that the grease in the hub is clean and adequate, that the inner bearing and grease retainer are lubricated and in good condition, and that the rotor braking surfaces are clean.



H1401-A

FIG. 20—Disc Brake Disassembled

2. Install the hub and rotor assembly on the spindle.

3. Lubricate and install the outer wheel bearing, washer and adjusting nut.

4. Adjust the wheel bearings to specification, and then install the nut lock, cotter pin, and grease cap. **The wheel bearing adjustment is especially important with disc brakes.**

5. Mount the caliper assembly on the mounting bracket and torque the two mounting bolts to specification. If necessary, push the caliper pistons into the cylinder bores to obtain clearance between the shoe and lining assemblies and the rotor. Be sure that the shoe and lining assemblies are seated on the bridges. Check the flexible hose for correct routing.

6. Install the wheel and tire on the hub and rotor assembly.

DISC BRAKE ROTOR SPLASH SHIELD

REMOVAL

1. Remove the caliper and the hub and rotor assembly as outlined under Removal in the foregoing procedure.

2. Remove the four nuts that attach the splash shield to the mounting bracket and remove the shield (Fig. 20).

3. Remove the gasket.

INSTALLATION

1. Install the gasket.

2. If the shield is bent, straighten it out before installation. Position the shield to the mounting bracket, install the attaching nuts, and torque to specification (Fig. 20).

3. Install the hub and rotor assembly and the caliper as outlined under Installation in the foregoing procedure.

PROPORTIONING VALVE

The proportioning valve is serviced as an assembly and is never adjusted or overhauled.

REMOVAL

1. Disconnect and remove the Master cylinder - to - proportioning valve brake tube (Fig. 23).

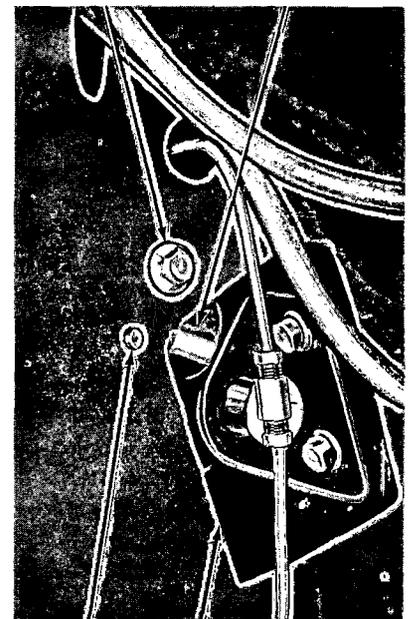
2. Disconnect the front-to-rear brake tube from the proportioning valve.

3. Working underneath the left fender, remove the bolt that attaches the proportioning valve to the fender apron and remove the valve through the access hole (Fig. 21).

INSTALLATION

1. From underneath the left fender, install the proportioning valve through the access hole in the fender apron. Position the valve to the

RETAINING BOLT PROPORTIONING VALVE



MOUNTING TANG FENDER APRON H1365-A

FIG. 21—Removing or Installing Proportioning Valve

apron so that the mounting tang extends through the hole in the fender apron as shown in Fig. 21. Install the attaching bolt.

2. Connect the front-to-rear brake tube to the valve (Fig. 23).

3. Position and connect the master cylinder-to-proportioning valve brake tube.

4. Bleed the brake system.

WHEEL CYLINDER REPAIR

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

DISASSEMBLY

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

2. Place a clamp over the ends of the brake cylinder as shown in Fig. 16.

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

4. The 6-cylinder Falcon and Mustang models are not provided with links. Remove the rubber boots from the ends of the piston.

On 8-cylinder models and on all Comets and Fairlanes, remove the links and rubber boots from the ends of the piston. Remove the pistons, cups, and return spring from the cylinder bore (Fig. 22).

5. 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 the 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. A baffle in the front wheel cylinder of the 6-cylinder Falcon and Mustang models prevents honing; therefore, the cylinder must be replaced.

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

ASSEMBLY

1. Apply a coating of heavy-duty brake fluid to all internal parts.

2. Thread the bleeder screw into the cylinder and tighten securely.

3. Insert the return spring, cups, and pistons into their respective positions in the cylinder bore (Fig. 22). Place a boot over each end of the cylinder. On 8-cylinder model Mustangs and Falcons and all Comets and Fairlanes, install the links in the ends of the brake cylinders.

4. Install the shoe and adjuster assemblies, then adjust the shoes as outlined in this section.

5. Install the brake drum and wheel, then bleed the brakes as outlined in this section.

WHEEL CYLINDER REPLACEMENT

REMOVAL

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

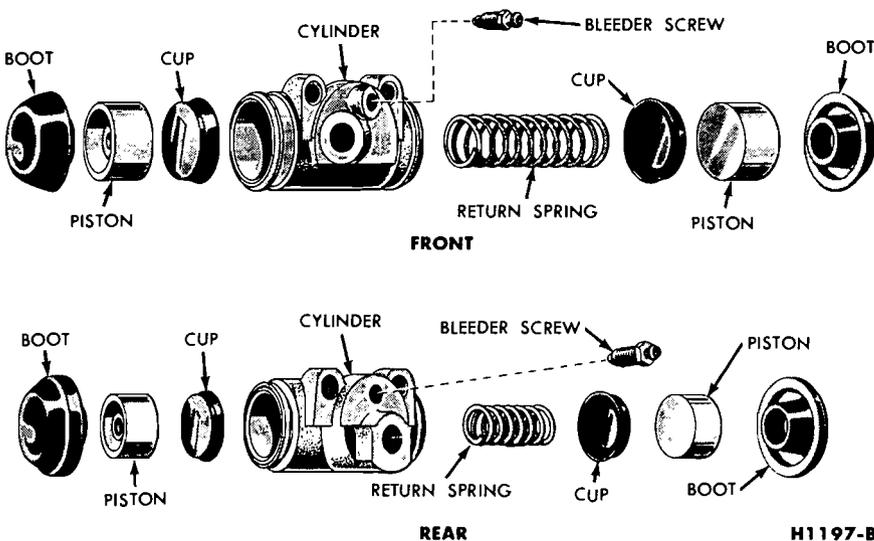


FIG. 22—Front and Rear Wheel Cylinders

2. Place a clamp over the ends of the wheel cylinder as shown in Fig. 16.

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

4. 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.

5. Remove the wheel cylinder attaching bolts and lock washers and remove the cylinder.

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 in place against the carrier plate. Install the two lock washers and attaching bolts. Torque them to specifications.

b. Install a new copper gasket over the hose fitting. Thread the hose assembly into the cylinder and tighten it securely.

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 specifications.

2. To install a rear cylinder:

a. Position the rear wheel cylinder in place against the carrier plate. 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 with the attaching bolts and lock washers.

c. Tighten the tube fitting nut to specifications.

H1197-B

3. Install the links in the ends of the wheel cylinder (8-cylinder models only on Falcon and Mustang and all Comet and Fairlane models).

4. Install the brake shoes as detailed in this section.

5. Adjust the brakes as detailed in Part 2-2, Section 2.

6. Install the brake drums and wheels.

7. Bleed the brakes as detailed 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 4235-C 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 on the attaching 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 attaching nuts through the access hole in the axle shaft flange.

Position a new front carrier plate to the wheel spindle and install the attaching 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.

4. Adjust the brake shoes (Section 2).

5. Install the brake drum and wheel 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 (Figs. 23 and 24).

Always bleed the entire hydraulic 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, disc caliper, or brake cylinder, tighten the tube fitting nut to specified torque with Milbar tool 1112-144 or equivalent.

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.

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

Since the rear brake hose is integral with the rear brake tube connector, the entire hose and connector is replaced as an assembly. Mount the connector to the rear axle housing with the retaining bolt (axle vent) and lock washer. Connect the two rear wheel brake tubes to the connector.

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(s) from the master cylinder (Fig. 27)

3. Remove the bolts that secure the master cylinder to the dash panel and lift the cylinder out and away from the push rod. 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 against the dash panel.

2. Install and torque the mounting bolts to specification.

3. Connect the brake line(s) to the master cylinder fitting, but leave the brake line fitting(s) loose.

4. Fill the master cylinder reservoir with heavy-duty Rotunda brake fluid to within $\frac{3}{8}$ inch of the top. Install and tighten the filler cap.

5. Bleed the master cylinder to let air escape from the cylinder at the brake line fitting(s). Then tighten the fitting(s).

6. Remove the filler cap and fill the reservoir to the level specified. Be sure that the diaphragm type gasket is properly seated in the cap. 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. Disconnect the hydraulic line(s) from the master cylinder.

2. Remove the two nuts and lock washers that attach the master cylinder to the booster.

3. Remove the master cylinder from the vacuum booster.

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. 4 or 5, Part 2-1). If the push rod dimension is not correct, see Master Cylinder Push Rod Adjust-

ment Part 2-1, Section 2.

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

3. Install, but do not tighten the attaching nuts and lock washers.

4. Connect the hydraulic line(s) to the master cylinder.

5. Tighten the two master cylinder attaching nuts.

6. Tighten all hydraulic line fittings.

7. Bleed the brake system. Fill the master cylinder to $\frac{3}{8}$ inch from the top of the filler opening. Be sure that the diaphragm type gasket is properly seated in the reservoir cap, and install the cap.

BRAKE BOOSTER

REMOVAL

1. Working inside the car below the instrument panel, disconnect the stop light switch wires at the connector.

2. Remove the hairpin type 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 lower the switch away from the pin. Slide the master cylinder push rod link and the nylon washers and bushing off from the brake pedal pin (Fig. 25 or 26).

3. Working in the engine compartment, loosen the hose clamp, and disconnect the vacuum hose from the booster at the check valve.

4. Remove the two master cylinder attaching nuts and pull the master cylinder from the booster, without disconnecting the hydraulic lines. Secure the master cylinder out of the way.

5. Remove the four mounting bracket-to-dash panel attaching bolts.

6. Remove the booster and bracket assembly from the dash panel, sliding the push rod link out from the engine side of the dash panel.

INSTALLATION

1. Mount the booster and bracket assembly to the dash panel by sliding the push rod link in through the hole in the dash panel. Install the four attaching bolts.

2. Position the brake master cylinder to the booster assembly and install the attaching nuts.

3. Connect the vacuum hose to the booster at the check valve, and tighten the hose clamp.

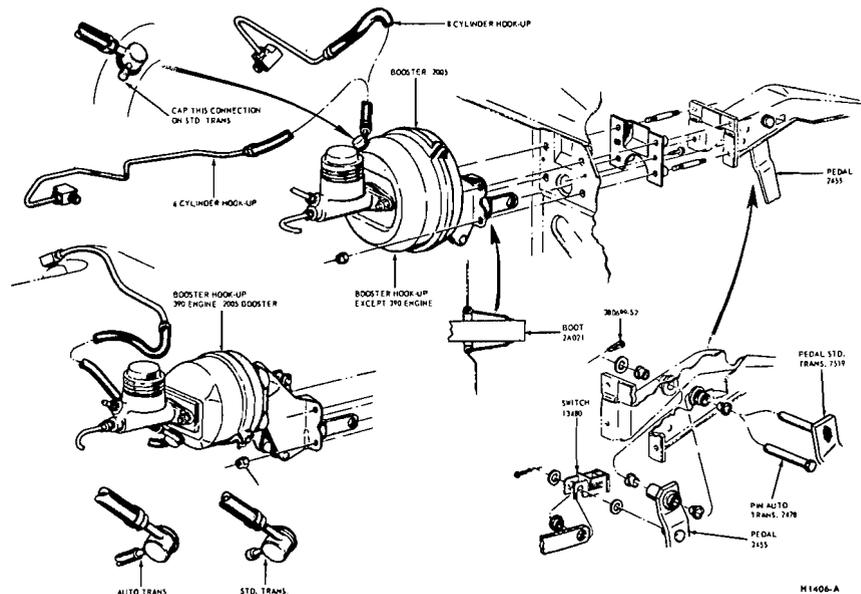


FIG. 25—Vacuum Booster Installation—Comet-Fairlane-Falcon

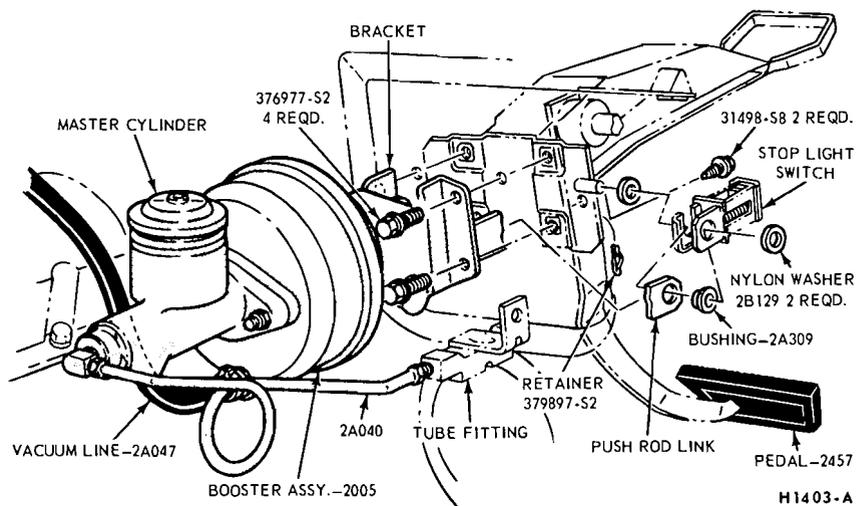


FIG. 26—Booster Installation—Mustang

4. Working from inside the car, install the inner nylon washer, the master cylinder push rod link, 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 outer nylon washer as shown in Fig. 25 or 26. Secure these

parts to the pin with the hairpin type retainer.

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

BRAKE PEDAL—MANUAL SHIFT TRANSMISSION REMOVAL

1. On a Falcon, Comet or Fairlane, remove the clutch pedal assist spring, (Fig. 27).

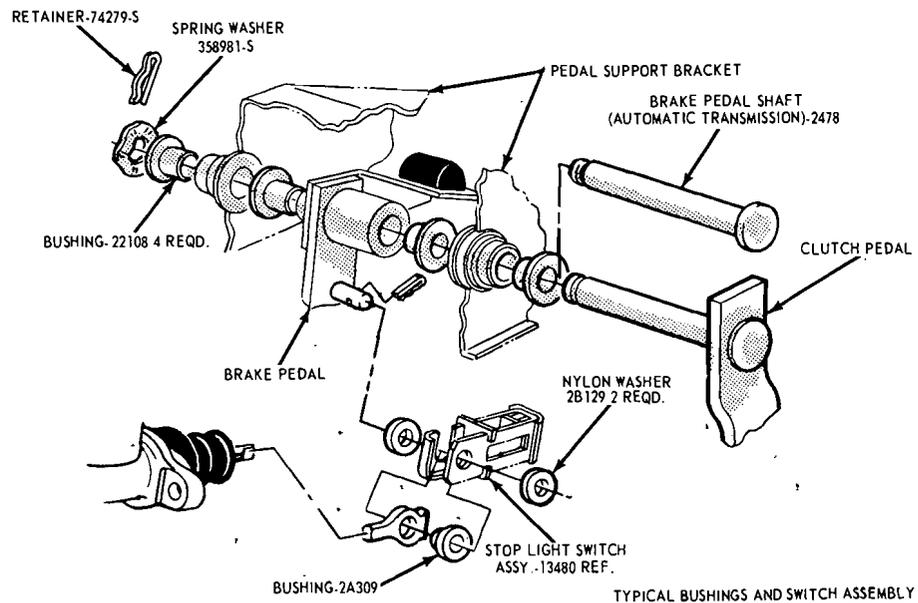
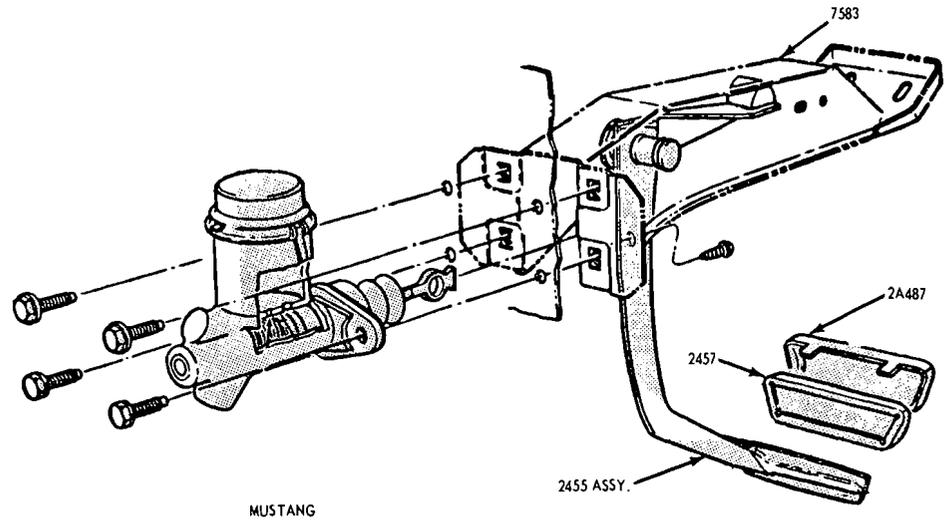
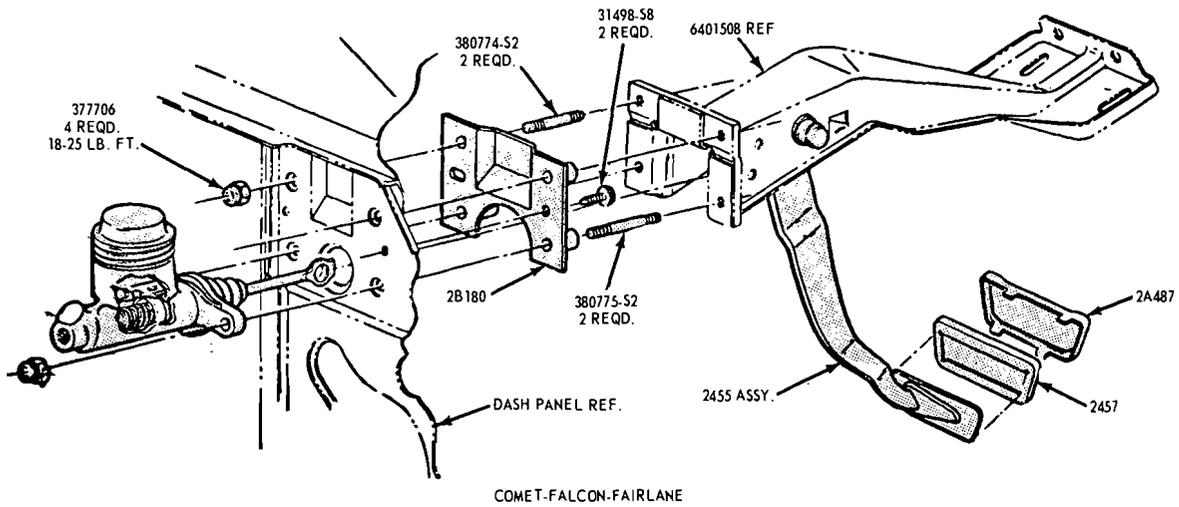


FIG. 27—Master Cylinder, Brake Pedal and Related Parts—Falcon, Fairlane, Comet and Mustang

On a Mustang, remove the pedal bumper and bracket assembly from the pedal support bracket to relieve the tension on the assist spring, and then remove the spring.

2. Disconnect the clutch pedal-to-equalizer rod at the clutch pedal by removing the hairpin type retainer and bushing.

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

4. Remove the switch retainer, and slide the stop light switch off the brake pedal pin just far enough for the switch outer hole to clear the pin. Then lower the switch away from the pin.

5. Slide the master cylinder push rod and the nylon washers and bushing off from the brake pedal pin (Fig. 27).

6. Remove the self-locking pin and washer from the clutch and brake pedal shaft, then remove the clutch pedal and shaft assembly, the brake pedal assembly, and the bushings from the pedal support bracket (Fig. 27).

INSTALLATION

1. Apply a coating of SAE 10 engine oil 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 support bracket, then install the clutch pedal and shaft assembly through the support bracket and brake pedal assembly. Install the spring washer and retainer. (Fig. 27).

3. Install the split bushing in the spring groove of the clutch pedal. Hook the clutch assist spring to the groove and to the spring retainer.

4. Connect the clutch pedal to equalizer rod to the clutch pedal assembly with the bushing and the hairpin retainer. Apply SAE 10 engine oil to the bushing.

5. 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 outer nylon washer as shown in Fig. 27. Secure these parts to the pin with the self-locking pin.

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

BRAKE PEDAL— AUTOMATIC TRANSMISSION

REMOVAL

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

2. Remove the self-locking pin and slide the stop light switch off the brake pedal pin **just far enough for the switch outer hole to clear the pin**. Then lower the switch away from the pin. Slide the master cylinder push rod and the nylon washers and bushing off from the brake pedal pin (Fig. 27).

3. Remove the self-locking pin and washer from the brake pedal shaft, then remove the shaft, the brake pedal assembly and the bushings from the pedal support bracket.

INSTALLATION

1. Apply a coating of SAE10 engine oil to the bushings and locate all the bushings in their proper places on the pedal assembly and pedal support bracket. (Fig. 27).

2. Position the brake pedal assembly to the support bracket, then install the pedal shaft through the support bracket and brake pedal assembly. Install the washer and self-locking pin.

3. 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 outer nylon washer as shown in Fig 27. Secure these parts to the pin with the self-locking pin.

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

PARKING BRAKE HANDLE— MUSTANG

REMOVAL

1. Remove the two screws that hold the handle bracket on the instrument panel. Remove the attaching screws and the insulator bracket (Fig. 28).

2. Remove the two nuts and lock washers that secure the control to the dash panel.

3. Remove the clevis pin that secures the pulley to the control handle assembly.

4. Disengage the locking rod and remove the ball on the cable from the slot in the control assembly.

INSTALLATION

1. Disengage the locking rod and connect the ball end of the cable to the slot on the control assembly.

2. Assemble the pulley to the control handle and the clevis pin.

3. Position the assembly against the dash panel and instrument panel. Secure the assembly to the instrument panel with the two screws.

4. Install the insulator bracket with the attaching screws (Fig. 28).

5. Working from under the left front fender, install the two lock washers and attaching nuts.

PARKING BRAKE CONTROL ASSEMBLY—FAIRLANE, FALCON, COMET

REMOVAL

1. Make sure the parking brake is completely released. Remove the 3 screws (Fig. 29) that attach the control assembly to the cowl inner side panel.

2. Pull the control away from the cowl panel and remove the hairpin lock retaining the parking brake cable housing to the control assembly.

3. Disconnect the ball-end of the parking brake cable from the control and remove the control assembly.

INSTALLATION

1. Connect the ball-end of the parking brake cable to the control.

2. Install the hair-pin cable housing retainer.

3. Position the control assembly to the cowl side panel and install the attaching screws. Torque to 12-20 ft-lb.

PARKING BRAKE EQUALIZER TO HANDLE CABLE— MUSTANG

REMOVAL

1. Remove the attaching screws and insulator-bracket from the dash panel (Fig. 28).

2. Remove the parking brake handle assembly and disengage the cable from the handle as outlined in this section.

3. Pull the cable down through the hole in the dash panel.

4. Remove the hairpin retainer, and disengage the cable and housing from the bracket on the crossmember.

5. Disconnect the cable ball from the equalizer lever, and remove the cable from the car.

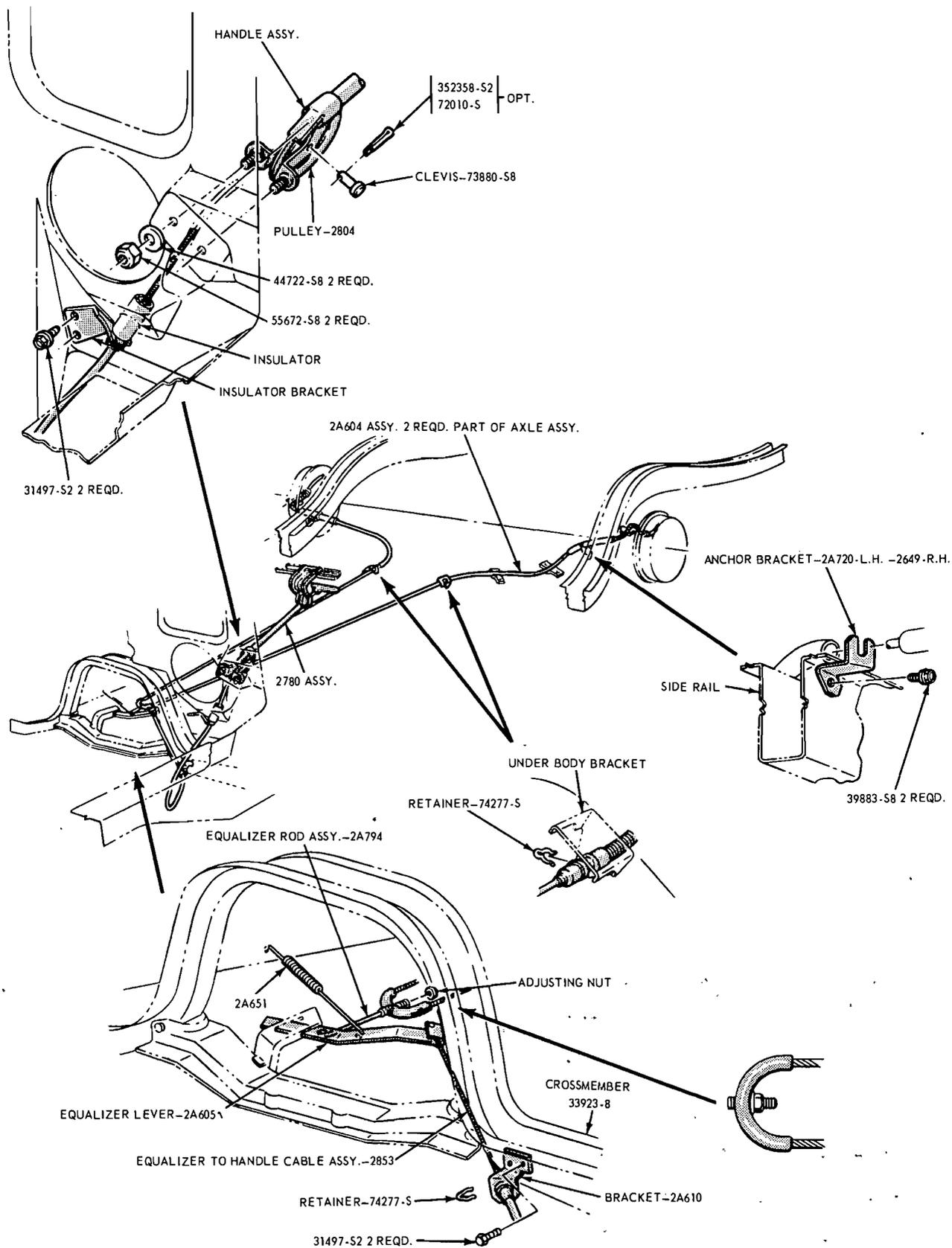


FIG. 28—Parking Brake Linkage—Mustang

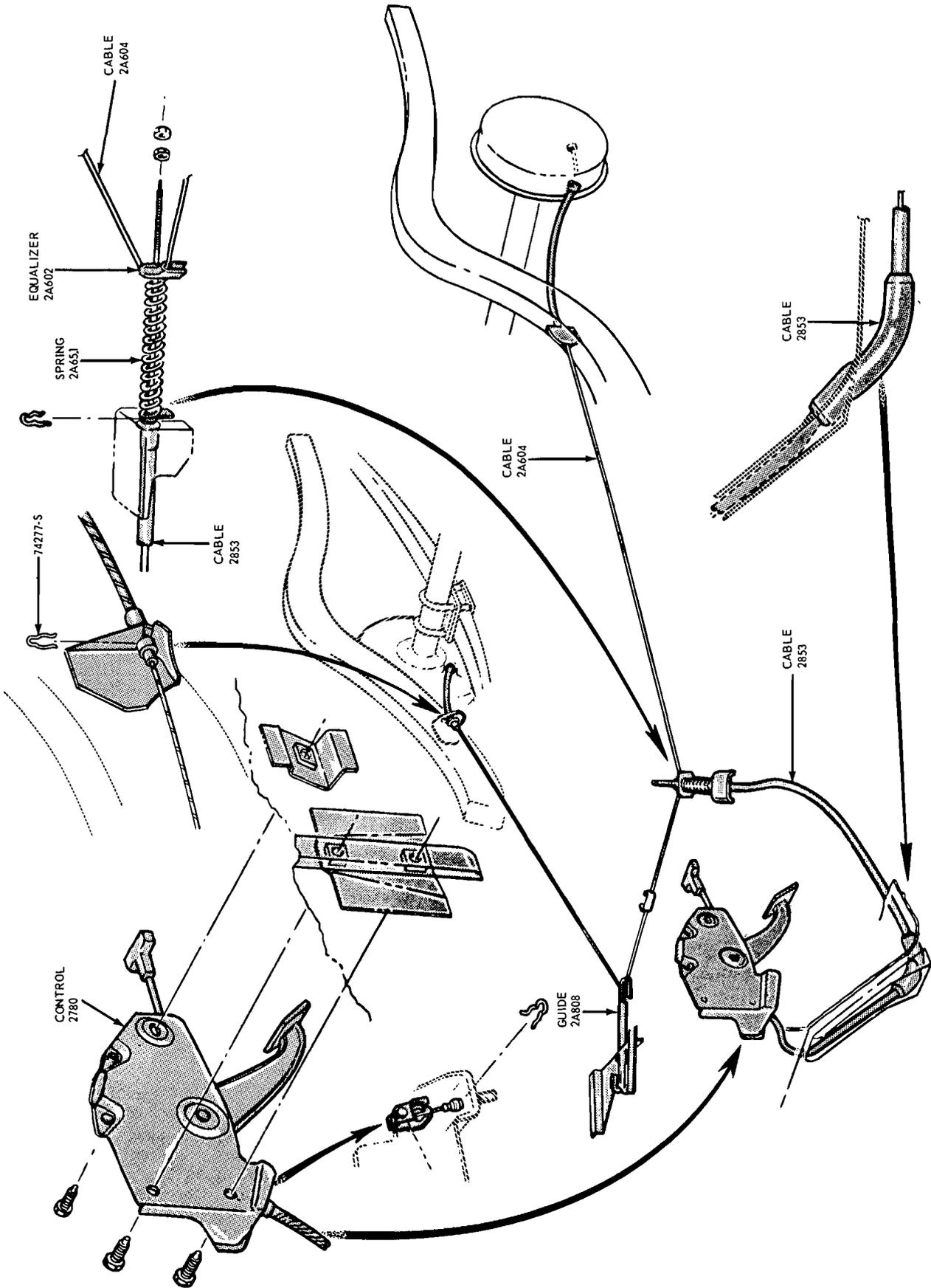


FIG. 29—Parking Brake Linkage—Comet-Fairlane-Falcon

INSTALLATION

1. Connect the cable lower ball to the equalizer lever (Fig. 28).

2. Engage the cable and housing to the bracket on the crossmember and secure with the hairpin retainer.

3. Push the upper end of the cable up through the hole in the dash panel.

4. Connect the cable upper ball to the parking brake handle, and install the handle assembly as outlined in this section.

5. Install the insulator bracket to the dash panel and secure with the two attaching screws.

PARKING BRAKE EQUALIZER TO PEDAL CABLE—FAIRLANE, COMET, FALCON**REMOVAL**

1. Remove the two nuts that attach the cable to the equalizer and remove the equalizer and spring (Fig. 29).

2. Remove the hair pin retainer holding the cable housing to the frame bracket at the equalizer.

3. Working from inside the car, remove the hair pin retainer holding the cable housing to the parking brake control assembly.

4. Disconnect the ball end of the cable from the parking brake control arm.

5. Remove the left front cowl side trim panel, roll back the floor mat and pull the cable assembly from the floor.

INSTALLATION

1. Position the cable housing through the opening in the floor and pull the grommet into position from under the car.

2. Install the ball-end of the cable in the parking brake control.

3. Install the hair pin retainer to lock the cable housing in position on the parking brake control.

4. Working from under the car, position the cable housing in the frame bracket and install the retainer.

5. Position the spring and equalizer on the cable and install the adjusting nut.

6. Apply the parking brake one notch from the released position.

7. Tighten the adjusting nut until a light to moderate drag is felt when the rear wheels are rotated.

8. Tighten the check nut securely.

9. Fully release the parking brake. No drag should be felt when the wheels are rotated.

10. Position the floor mat and install the cowl side trim panel.

PARKING BRAKE EQUALIZER TO REAR WHEEL CABLE

A single cable passing through the equalizer and cable guides connects both parking brake assemblies on Comet and Fairlane station wagons and on Falcon and Mustang passenger cars. Separate cables for each parking brake are used on Comet and Fairlane passenger cars.

FAIRLANE AND COMET PASSENGER CARS**REMOVAL**

1. Remove the equalizer lock nut and adjusting nut, equalizer and spring.

2. With the cables slack, disconnect the ball-ends from the connector (Fig. 29).

3. Remove the cable from the guide, if required.

4. Remove the hair pin lock retaining the cable housing to the side rail bracket.

5. Remove the wheel and tire and the rear brake drum as outlined in Section 2.

6. Disconnect the rear end of the cable from the parking brake lever on the brake shoe. Disengage the cable housing retaining grommet from the carrier plate and withdraw the cable and housing from the inboard side of the carrier plate.

7. Slide the cable and housing out of the side rail bracket.

INSTALLATION

1. Insert the rear end of the cable through the side rail bracket and pull the cable and housing into position.

2. Insert the rear end of the cable and housing through the hole in the carrier plate from the inboard side.

3. Connect the cable to the parking brake lever on the brake shoe, and install the cable housing retaining the grommet in the carrier plate.

4. Position the cable housing in the side rail bracket and install the hair pin type retainer.

5. Position the cable in the guide and install the connector, thus hooking the two cables together.

6. Insert the cable into the equalizer and install the equalizer, spring, adjusting nut and lock nut to the front, parking brake control, cable.

7. Adjust the parking brake as directed in Part 2-1, Section 2.

FAIRLANE AND COMET STATION WAGONS AND FALCON PASSENGER CAR**REMOVAL AND INSTALLATION**

1. Generally follow the procedure given above, omitting separation of the cables, since the hand brake cable supplied for these models is in one piece. Removal and installation of both rear wheels, tires and drums will also be required.

MUSTANG**REMOVAL**

1. Remove the adjusting lock nut and cable yoke from the equalizer rod (Fig. 28), along with the rear cable assembly.

2. Remove the hairpin retainers and disengage the cable rear housings from the brackets on the underbody.

3. If an 8-cylinder model, remove the single bolt and clamp retaining the cable housing to the underbody immediately behind the cable housing bracket.

4. Remove the two bolts and clamp securing the cable housing to the underbody on all models.

5. Remove the wheels and tires and the rear brake drums as outlined in Section 2.

6. Disconnect the rear ends of the cable from the parking brake levers on the brake shoes. Disengage the cable housing retaining grommets from the carrier plates and withdraw the cable ends and housings from the inboard sides of the carrier plates.

7. Slide the cable housings out of the main side brackets and remove the cable assembly from the car.

INSTALLATION

1. Insert both cable ends and housings through the holes in the carrier plates from the inboard side.

2. Connect the cable ends to the parking brake levers on the brake shoes and engage the cable housing retaining grommets to the carrier plate.

3. Position the cable housings in the main side brackets and install the hairpin retainers.

4. Install the front clamp with one bolt, if an 8-cylinder model.

5. Install the rear clamp with two bolts.

6. Position the cable yoke and cable on the equalizer rod and install the adjusting locknut.

7. Adjust the parking brake as directed in Part 2-1, Section 2.

4 MAJOR REPAIR OPERATIONS

BRAKE DRUM REFINISHING

The 6-cylinder Falcon and Mustang models are equipped with 9-inch brake drums. All other models are equipped with 10-inch drums.

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.

If the drum diameter is less than 0.030 inch oversize (9.030 inches 6-cylinder Falcon or Mustang, or 10.030 inches on other models after refinishing, standard lining may be installed. If the drum diameter is more than 9.030 inches or 10.030 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 $\frac{1}{32}$ inch of any 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.**

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 9.030 or 10.030 inches, standard lining may be installed. If the diameter is 9.030 to 9.060 or 10.030 to 10.060 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. **Genuine 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 .005 inch clearance between any two rivets.

MASTER CYLINDER— EXCEPT CARS WITH DISC BRAKES

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. 32).

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. 30).

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. 31).

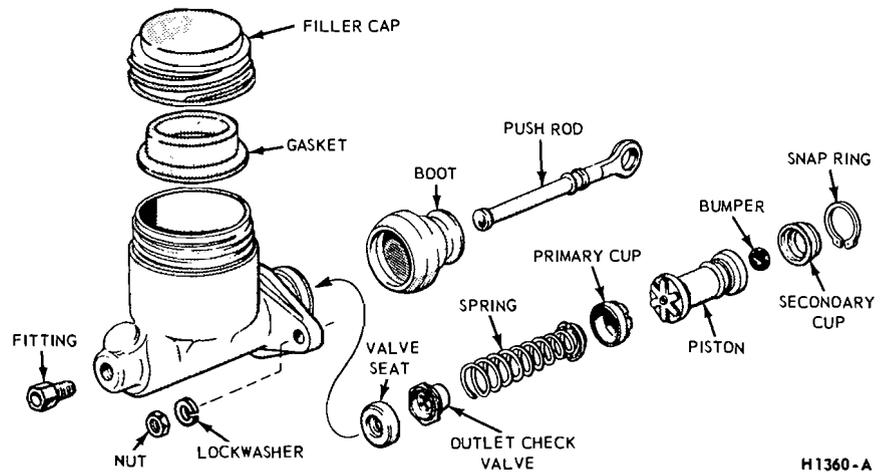


FIG. 30—Master Cylinder With Standard Brake System

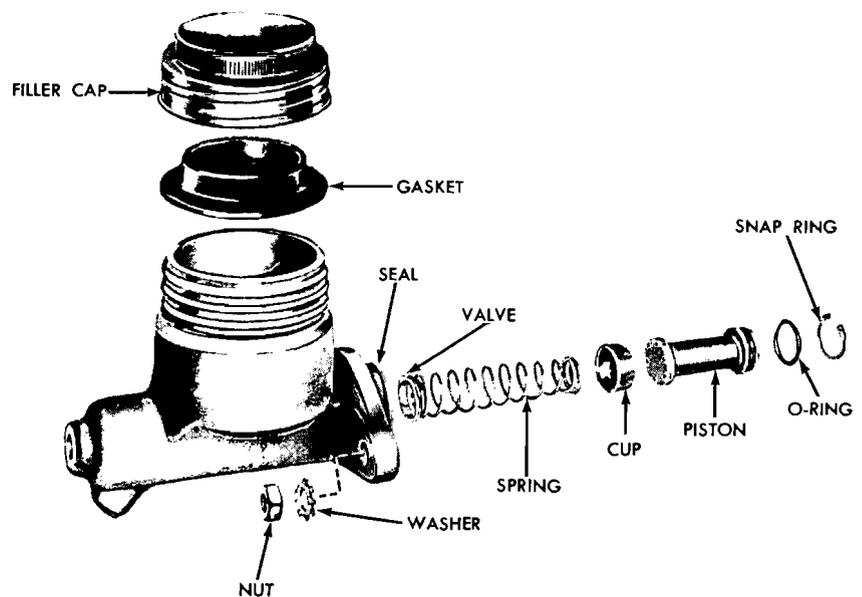


FIG. 31—Master Cylinder With Booster

ASSEMBLY

1. Dip all parts except the master cylinder body in clean Rotunda 103-A heavy-duty brake fluid.

2. Install the brake line fitting(s) on the cylinder and tighten them securely.

3. When assembling a master cylinder used with the standard brake system, install the valve seat, check valve, spring, cup, and piston assembly in the cylinder bore (Fig. 30).

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. 31).

4. Install the snap-ring in the back of the bore (Fig. 32).

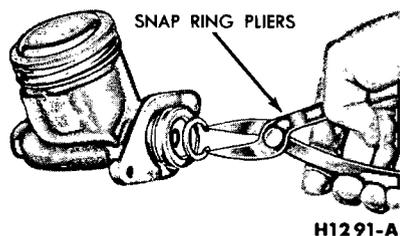


FIG. 32—Removing Snap Ring From Master Cylinder—Typical

MASTER CYLINDER—WITH DISC BRAKES**DISASSEMBLY**

1. Press in against the piston while removing the snap ring retainer, and then remove the piston assembly, cup, spring, residual check valve and seat. (Fig. 33).

2. Remove secondary cup from the piston. Remove the cover by releasing the spring clips on the sides, and remove the diaphragm.

ASSEMBLY

1. Clamp the master cylinder housing in a vise. Dip the hydraulic cylinder parts in brake fluid and assemble the check valve seal, residual check valve, and piston return spring in the bore of the cylinder in the order shown in Fig. 33.

2. If the secondary piston cup was removed from the piston, dip the cup in brake fluid and assemble the cup in the groove of the piston with the lip of the cup as shown.

3. Place the primary cup on the end of the piston assembly, and guide it into the cylinder bore.

4. Press in against the piston to compress the spring while seating

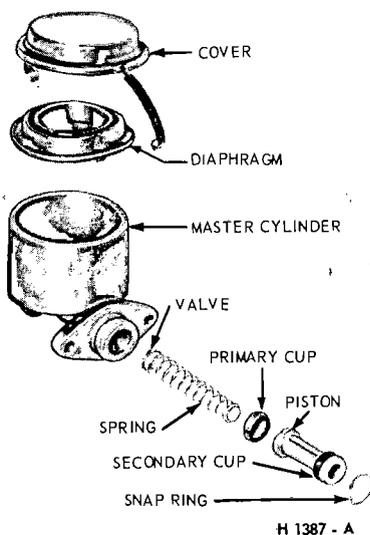


FIG. 33—Master Cylinder Used With Disc Brakes—Disassembled

the snap ring in the groove in the cylinder bore.

5. Install a new diaphragm (only if the old one is defective) in the cover, and attach the cover to the cylinder with the spring clips.

MASTER CYLINDER CLEANING AND INSPECTION

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. 30). 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. 31).

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.

DISC BRAKE CALIPER**DISASSEMBLY**

Do not remove the bridge bolts that hold the two halves of the caliper together. The two caliper housings are shown separated in Fig. 35 for illustration purposes only.

1. Remove the caliper assembly from the car as outlined in Section 2.

2. Remove the two retaining bolts and the caliper splash shield Fig. 35.

3. Remove the two shoe and lining assemblies.

4. Remove the flexible brake hose from the caliper.

5. Remove the external transfer tube.

6. Remove the four dust boots from the caliper housings and piston grooves.

7. Clamp the caliper in a vise and secure it by the mounting flanges on the inboard housing (Fig. 34).

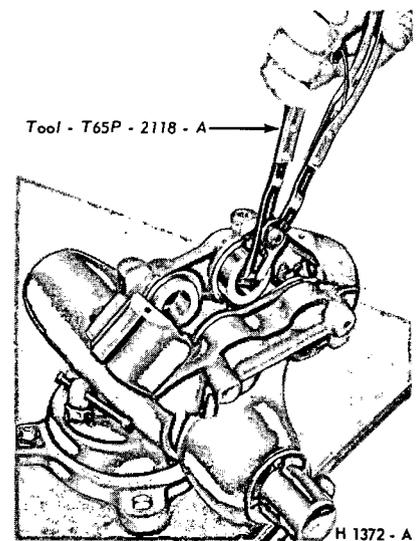


FIG. 34—Removing or Installing Pistons

8. Remove the four pistons from the cylinder bores with the special tool shown in Fig. 34. To prevent cocking with consequent damage to the piston or bore, rotate the piston with the tool while pulling it outward at the same time. Be careful to avoid scratching or damaging the outside diameter surface or dust boot retaining groove of the piston. Such damage causes poor sealing.

If a piston is so completely seized in the cylinder bore that it can not be removed with the special tool, force the cylinder out of the bore by positioning two screwdrivers in the piston dust boot retaining groove and prying outward. To prevent

cocking, tap the end of the piston lightly around the circumference with a hammer, while the prying force is being applied. Be careful to avoid damaging the dust boot retainer in the caliper housing (Fig. 35). If this method of removal is used, the pistons must be replaced.

If the caliper dust boot retainer or retaining groove is damaged or scratched, pry the retainer out of the caliper housing with screwdrivers.

9. Remove the rubber piston seals from the grooves in the cylinder bores by carefully inserting the point of a small knife or other pointed instrument under the seal and raising the seal up far enough to be pulled out with the fingers.

CLEANING AND INSPECTION

Clean all metal parts with alcohol or a suitable solvent (Fig. 35). Use clean, dry compressed air to clean out and dry the grooves and passageways. Be sure that the caliper bore and component parts are completely free of any foreign material.

Check the cylinder bores and pistons for damage or excessive wear. Replace the piston if it is pitted, scored, or the chrome plating is worn

off. Check the caliper dust boot retainer for wear or damage.

ASSEMBLY

1. Clamp the caliper in a vise and secure it by the mounting flange on the inboard housing.

2. If a new caliper dust boot retainer is to be installed, thoroughly clean the contact area on the caliper housing and apply Loctite Sealant, Grade H to the retainer surface that seats in the housing. Install the retainer in the caliper housing.

3. Apply a film of clean brake fluid to new caliper piston seals and install them in the grooves of the cylinder bore. The seal should be positioned at one area in the groove and gently worked around. **Do not use the old seals.**

4. Coat the outside diameter of the pistons with brake fluid and install them in the cylinder bores so that the open end of the piston and the boot retaining groove face out of the bore. To avoid cocking, locate the piston squarely in the bore and apply a slow, steady pressure. If a piston will not easily go all the way into the bore, remove it and thoroughly inspect the cylinder bore, the

piston seal and the installation of the seal. If the piston still will not go in with bore in good condition and the piston seal properly installed, use the tool shown in Fig. 34. Rotate the piston with the tool while pushing it inward at the same time.

5. Carefully install four new dust boots on the caliper housings and pistons. Be sure that each boot is fully seated in the groove of its respective caliper housing and piston (Fig. 35). **Do not use the old dust boots.**

6. Install the external transfer tube.

7. Install the flexible brake hose to the caliper.

8. Install the caliper assembly on the spindle, and install the shoe and lining assemblies and the splash shield as outlined in Section 2.

9. Check the caliper for fluid leaks under maximum pedal pressures. **Do not move the car until a firm brake pedal is obtained.**

DISASSEMBLY OF BOOSTER—BENDIX TYPE

1. Remove the speed nuts that attach the mounting plate to the rear shell and remove the plate.

On a Mustang, remove the retaining nuts and lockwashers and remove the mounting brackets from the rear shell (Fig. 40.)

2. Pull the hydraulic push rod and front seal (Fig. 36) from the front shell.

3. Scribe an index mark across the front and rear shells.

4. Place the booster in a vise as shown in Fig. 37. Press downward on the rear shell and at the same time, turn it counterclockwise with a flat bar to release it from the front shell. Release the pressure on the rear shell slowly to prevent the dia-

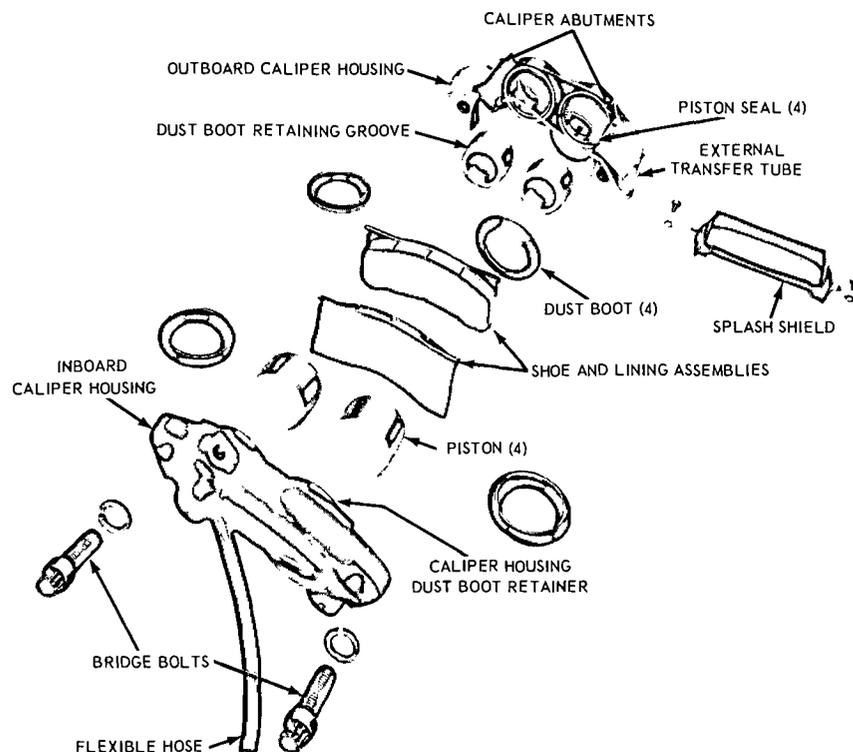
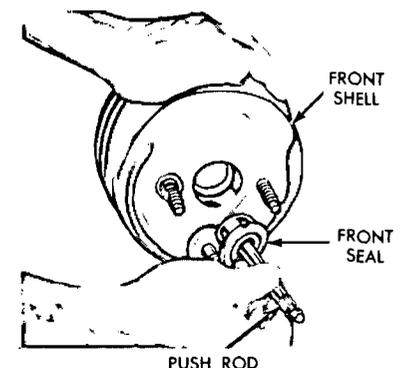


FIG. 35—Caliper Assembly—Disassembled



H1334-A

FIG. 36—Removing Front Seal and Push Rod—Bendix Booster

H1367-A

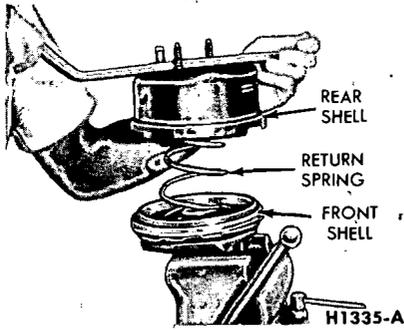


FIG. 37—Separating Booster Shells—Bendix Booster

phragm plate return spring from flying out.

5. Separate the two shells and remove the return spring.

6. Withdraw the diaphragm plate and diaphragm from the rear shell. Remove the dust shield.

7. Remove the diaphragm from the diaphragm plate as shown in Fig. 38.

8. Pry the filter retainer off the diaphragm plate being careful not to chip or damage the plate.

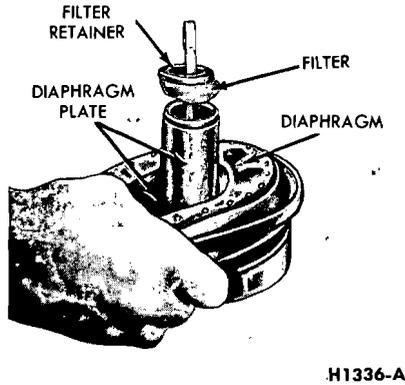


FIG. 38—Removing Diaphragm—Bendix Booster

9. Hold the diaphragm plate so that the valve retainer is facing downward. Press the valve push rod inward to release the tension on the retainer and allow it to drop out of the plate (Fig. 39).

10. Withdraw the valve and rod from the plate.

11. Press the reaction disc out of the diaphragm plate.

12. Drive the seal out of the rear

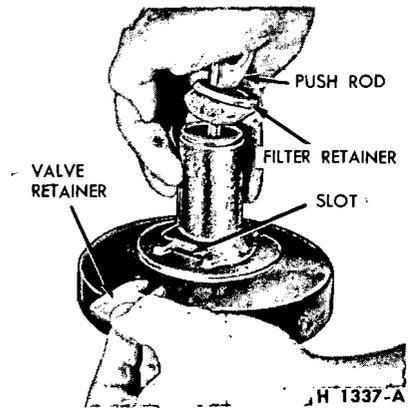


FIG. 39—Removing or Installing Valve Retainer—Bendix Booster

shell with a punch or screwdriver. (Fig. 40). Discard the seal.

13. Working from the inside of the front shell, cut the bead off the check valve grommet. Remove the check valve.

ASSEMBLY OF BOOSTER—BENDIX-TYPE

1. Place the rear shell on two

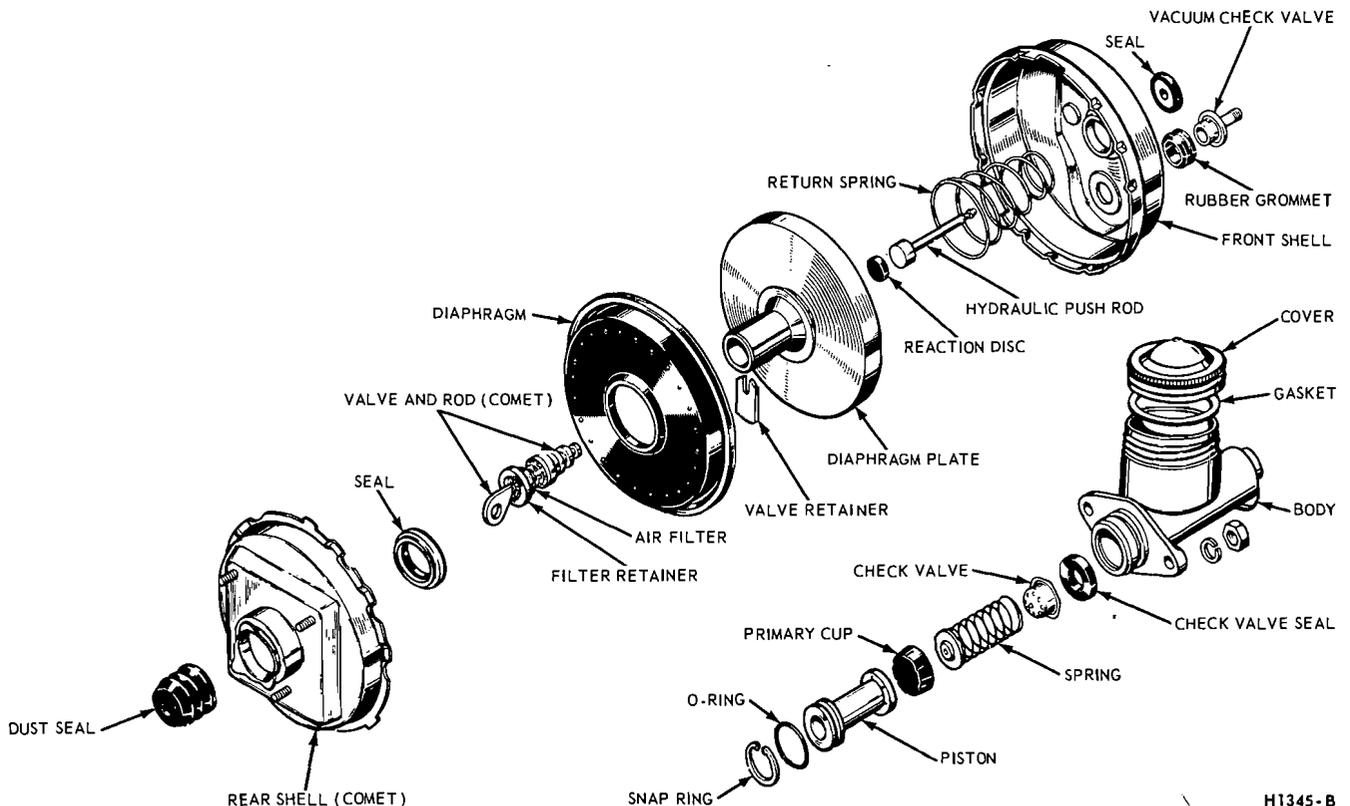


FIG. 40—Vacuum Booster Disassembled—Booster

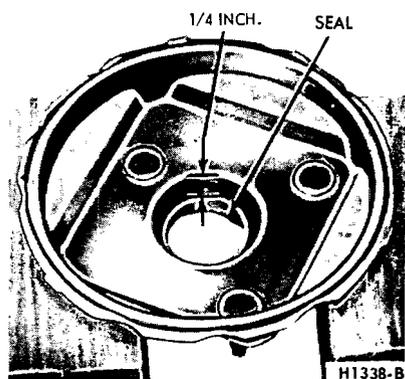


FIG. 41—Installing Rear Shell Seal—Bendix Booster

wood blocks as shown in Fig. 41. Press a new seal, plastic side first, into the recess on the inside of the shell to a depth of 1/4 inch.

2. Dip a new check valve grommet (Fig. 40) in alcohol and install it in the front shell making sure that the beveled edge is toward the inside. Make sure that the grommet is seated. Dip the shoulder of the check valve in alcohol and install it in the grommet. Press the check valve into the grommet until the flange contacts the grommet.

3. Apply silicone grease to the outer surface of the diaphragm plate hub of the diaphragm plate. Push surfaces of the valve.

4. Insert the valve and rod into the hub of the diaphragm plate. Push the rod inward until the retaining groove is aligned with the slot, and then slide the retainer into the groove (Fig. 39).

5. Tuck the filter into place in the plate hub. Press the filter retainer onto the hub being careful not to chip or damage the plastic. (Fig. 38).

6. Install the diaphragm on the diaphragm plate, making sure that the diaphragm lip is tucked in all around the recess between the hub and the plate (Fig. 38).

7. Place the rear shell in a vise. Apply silicone lubricant generously to the top outer flange of the shell. Apply silicone grease to the seal in the rear shell.

8. Carefully guide the valve rod and diaphragm plate hub through the seal in the rear shell.

9. Center the large end of the return spring on the diaphragm plate.

10. Align the index mark on the front shell with the one on the rear shell. Place a flat bar on the front

shell and compress the spring until the tangs on the rear shell contact the notched sections of the front shell, and then rotate it clockwise to lock it in place.

11. Apply lubricant sparingly to the stem of the hydraulic push rod keeping it away from the adjusting screw area. Apply silicone grease liberally to the piston area of the push rod and to the reaction disc.

12. Center the reaction disc on the push rod piston. Guide the disc and push rod into the base of the diaphragm plate, and press the rod inward until the disc is bottomed (Fig. 42).

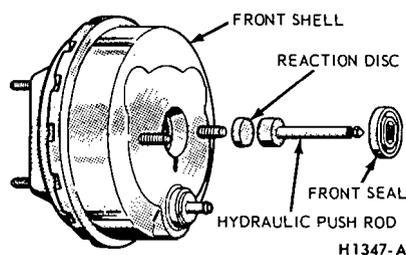


FIG. 42—Installing Reaction Disc, Push Rod and Front Seal—Bendix Booster

13. Press a new front seal into the front shell until it bottoms in the recess (Fig. 42).

14. Install a new dust seal over the push rod and onto the rear shell.

15. On a Comet, position the mounting plate on the rear shell and secure it in place with speed nuts.

On a Mustang, position the two mounting brackets on the rear shell studs, and install the retaining nuts and lock washers (Fig. 40).

DISASSEMBLY OF BOOSTER—MIDLAND-ROSS TYPE

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. 49).

3. Remove the vacuum manifold and check valve assembly and the rubber grommet from the booster body (Fig. 49).

4. Disconnect the valve operating rod from the lever assembly by removing the retainer clip and connecting pin (Fig. 49).

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 attaching 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.

2. Remove the clamp band screw and nut, and separate the clamp band, booster body, and end plate (Fig. 49).

3. Push the bellows assembly into the vacuum chamber (Fig. 43), and separate the bellows, control valve, diaphragm assembly, and end plate from the booster body.

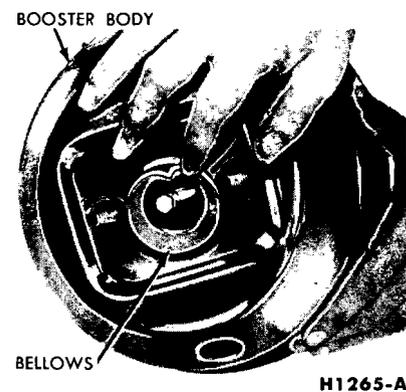


FIG. 43—Bellows to Booster Body Engagement—Midland-Ross

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

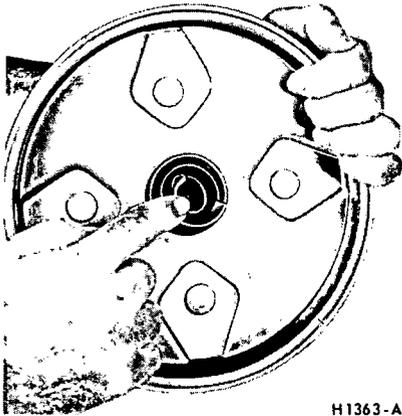
5. Remove the rear seal from the end plate (Fig. 44).

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. 45).

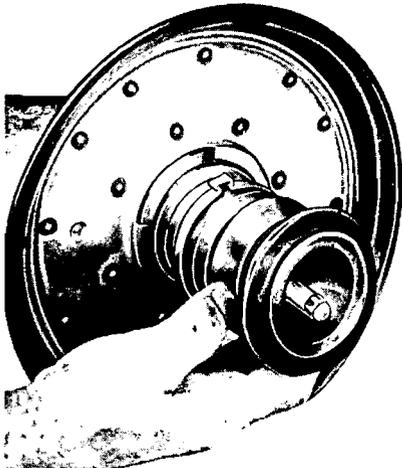
2. Remove the two support rings and the protector from the bellows.

3. Remove the push rod assembly and the reaction lever assembly from the control hub (Fig. 46).



H1363-A

FIG. 44—Removing or Installing Rear Seal to End Plate—Midland-Ross



H1395-A

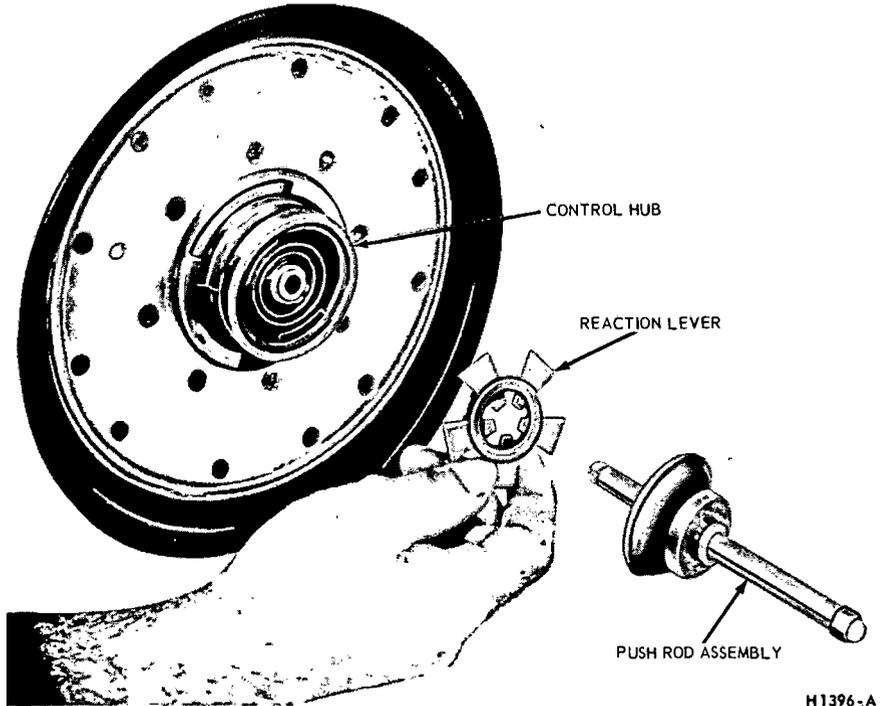
FIG. 45—Removing or Installing the Bellows Assembly—Midland-Ross

4. Remove the two plastic guides from the push rod. Remove the reaction cone retainer and the cone from the push rod (Fig. 46).

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.

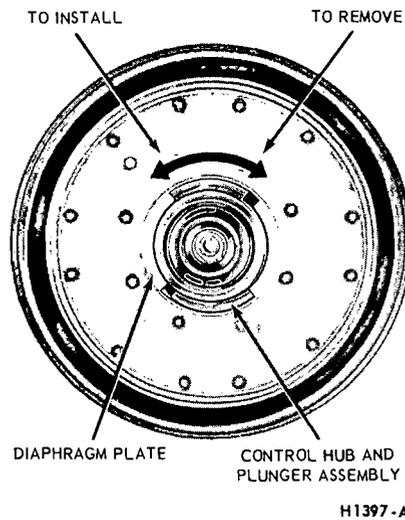
6. Turn the control hub and plunger assembly clockwise to separate it from the diaphragm, and then remove the tail stock and O-ring from the diaphragm (Fig. 47).

7. Remove the retainer that holds the plunger to the control hub (Fig. 48). Separate the control hub and plunger assembly. It may be necessary to file the burr from the pro-



H1396-A

FIG. 46—Push Rod Assembly, Reaction Lever and Control Hub—Midland-Ross



H1397-A

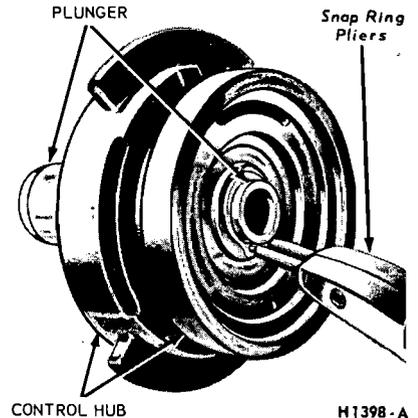
FIG. 47—Removing or Installing Control Hub and Plunger Assembly—Midland-Ross

truding 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,



H1398-A

FIG. 48—Removing or Installing Plunger to Control Hub Retainer—Midland-Ross

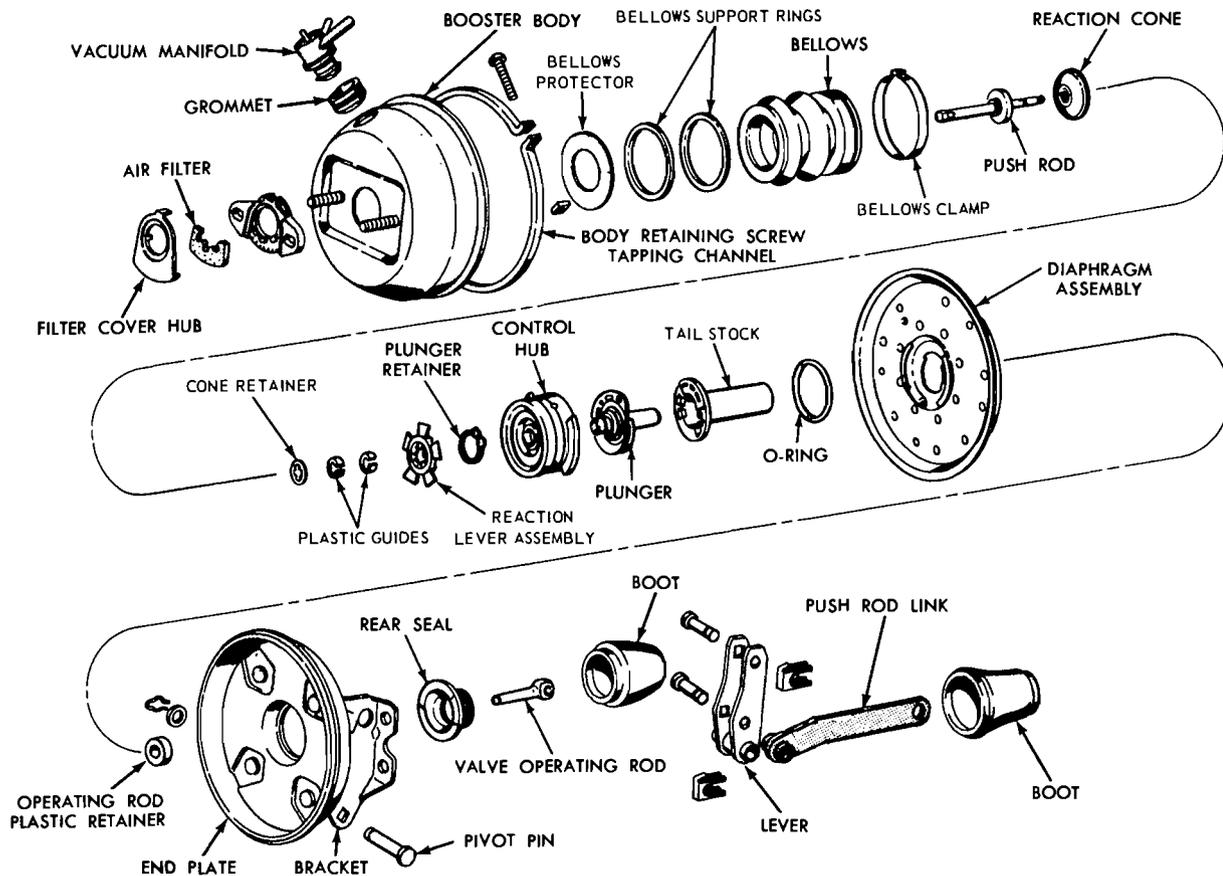
rubber valve, O-ring, and fiber washer from the plunger (Fig. 49).

ASSEMBLY OF BOOSTER—MIDLAND-ROSS TYPE

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. 49).



H1362-B

FIG. 49—Booster Unit Disassembled—Midland-Ross

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. 50). Compress the valve spring, and install the retainer in the plunger groove to secure the control valve plunger to the control hub (Fig. 48).

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. 47).

5. Install the lever assembly in the control hub with the rubber protrusions toward the hub (Fig. 46).

6. Assemble the reaction cone, re-

tainer, 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 $\frac{1}{32}$ inch from the end of the bellows (Fig. 45).

ASSEMBLY OF MAJOR COMPONENTS

1. Assemble the rear seal in the end plate (Fig. 44) 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. 49).

3. Assemble the booster body to the end plate. Make sure that the lip of the diaphragm is evenly positioned 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. 46).

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 and band bolt. Tap the clamp band with a fibre 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. 49).

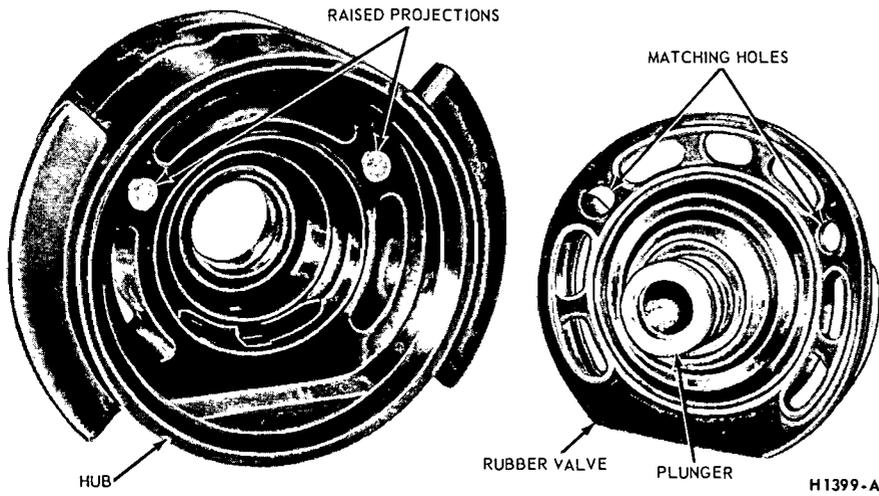


FIG. 50—Assembling Valve Plunger to Hub—Midland-Ross

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.

PART 2-3 SPECIFICATIONS

LINING DIMENSIONS—INCHES

FALCON

MODELS	POSITION	FRONT	REAR	COLOR CODE
Falcon Sedan & Hardtop—Six Cylinder	Primary Secondary	2.25 x 7.75 2.25 x 10.0	1.5 x 7.75 1.5 x 10.0	Red-Blue Green
Falcon Station Wagons—Six Cylinder	Primary Secondary	2.25 x 8.35 2.25 x 10.75	2.25 x 8.35 2.25 x 10.75	Silver Yellow-Black
Falcon Sedans—Eight Cylinder	Primary Secondary	2.25 x 8.35 2.25 x 10.75	1.75 x 8.35 1.75 x 10.75	Silver Yellow-White
Station Wagon—Eight Cylinder	Primary Secondary	2.50 x 8.35 2.50 x 10.75	2.00 x 8.35 2.00 x 10.75	Yellow-Black Black-Black

MUSTANG

MODELS	POSITION	FRONT	REAR	COLOR CODE
All Six Cylinder	Primary Secondary	2.25 x 7.75 2.25 x 10.0	1.5 x 7.75 1.5 x 10.0	Red-Blue Green
All Eight Cylinder	Primary Secondary	2.25 x 8.35 2.25 x 10.75	1.75 x 8.35 1.75 x 10.75	Silver Yellow-White
All Eight Cylinder	Disc	4.82 x 1.84	—	White

FAIRLANE AND COMET

MODELS	POSITION	FRONT	REAR	COLOR CODE
Fairlane & Comet 200 & 289 Passenger Cars	Primary Secondary	2.25 x 8.35 2.25 x 10.75	1.75 x 8.35 1.75 x 10.75	Silver Yellow-White
Fairlane & Comet LPO Police & 390 Passenger Cars Maximum Fade Resist.	Primary Secondary	2.50 x 8.35 2.50 x 10.75	2.00 x 8.35 2.00 x 10.75	Yellow-Black Black-Black
Fairlane & Comet LPO Taxi— Max. Wear Resist. (Bonded)	Primary Secondary	2.50 x 9.51 2.50 x 10.75	2.00 x 9.51 2.00 x 10.75	Red White
Station Wagons—Fairlane & Comet 200 & 289	Primary Secondary	2.50 x 8.35 2.50 x 10.75	2.00 x 8.35 2.00 x 10.75	Yellow-Black Black-Black
Station Wagon Fairlane & Comet 390	Primary Secondary	2.50 x 8.35 2.50 x 10.75	2.50 x 8.35 2.50 x 10.75	Yellow-Black Black-Black

CHECKS AND ADJUSTMENTS—INCHES

FALCON

Master Cylinder Bore Diameter Standard	1.000	Lining Maximum Wear Limit (From Top of Rivets)	0.031
Master Cylinder Maximum Allowable Hone	0.003		
Front Wheel Cylinder Bore Diameter 9" Brake 10" Brake	1.062 1.125	Lining Maximum Clearance to Shoe (Midway Between Rivets)	0.008
Rear Wheel Cylinder Bore Diameter 9" Brake 10" Brake	0.844 0.906	Pedal Travel—Standard Pedal Travel—Power Push Rod Adjustment—Power Brakes— Bendix—Midland-Ross	6.50 4.50 0.980-0.995 0.995-1.005
Wheel Cylinder Maximum Allowable Hone [Ⓢ]	0.003	Hydraulic Line Diameter	0.188
Drum Diameter 9" Brake 10" Brake	9.0 10.0	Parking Brake—Type Foot Operated with Pedal Mounted Below Left Side of the Instrument Panel	
Drum Maximum Allowable Run-Out	0.007		
Drum Maximum Boring Diameter 9" Brake 10" Brake	9.060 10.060		

[Ⓢ]Front Wheel Brake Cylinders on Cars with 9" Brakes cannot be Honed

CHECKS AND ADJUSTMENTS—INCHES (Continued)
MUSTANG

Master Cylinder Bore Diameter Standard Power	1.000 0.875	Lining Maximum Wear Limit (From Top of Rivets)	0.031
Master Cylinder Maximum Allowable Hone	0.003	Lining Maximum Clearance to Shoe (Midway Between Rivets)	0.008
Front Wheel Cylinder Bore Diameter 6 Cylinder Engine 8 Cylinder Engine	1.062 1.125	Pedal Ratio Pedal Travel—Standard	6.3:1 6.50
Rear Wheel Cylinder Bore Diameter 6 Cylinder Engine 8 Cylinder Engine	0.844 0.906	Pedal Travel—Power Push Rod Adjustment—Power Brakes Bendix Midland-Ross	3.54 0.980-0.995 0.995-1.005
Wheel Cylinder Maximum Allowable Hone [Ⓞ]	0.003		
Drum Diameter: 6 Cylinder Engine 8 Cylinder Engine	9.0 10.0	Hydraulic Line Diameter	0.188
Drum Maximum Allowable Run-Out	0.007	Parking Brake-Type Hand Operated with Handle Mounted on Lower Left Side of the Instrument Panel	
Drum Maximum Boring Diameter 6 Cylinder Engine 8 Cylinder Engine	9.060 10.060		
FRONT WHEEL DISC BRAKE (RPO—8 CYLINDER ENGINE)			
Master Cylinder Bore Diameter	0.938	Lining Thickness:	0.400 Nominal
Master Cylinder Maximum Allowable Hone	0.003		
Caliper Cylinder Bore Diameter	1.636	Lining Maximum Wear Limit (From Surface of Shoe)	0.030
Rotor Diameter: Outside Inside	11.375 7.375	Lining to Rotor Clearance (Brakes Released)	0.002-0.010
Rotor Thickness	0.810	Pedal Travel (Non Power)	6.50
Rotor Maximum Allowable Runout	0.002	Pedal Ratio	5.57:1
Lining Area	34.00 sq. in.		

[Ⓞ]Front Wheel Brake Cylinders on 6 Cyl. Cars cannot be Honed

FAIRLANE AND COMET

Master Cylinder Bore Diameter	1.000	Lining Maximum Wear Limit (From Top of Rivets or Shoe Rim)	0.031
Master Cylinder Maximum Allowable Hone	0.003		
Front Wheel Cylinder Bore Diameter Passenger—200 & 289 Station Wagon and 390 Car	1.125 1.094	Lining Maximum Clearance to Shoe (Midway Between Rivets)	0.008
Rear Wheel Cylinder Bore Diameter 390 Car Passenger—200 & 289 Station Wagon—d11	0.875 0.906 0.938	Pedal Travel—Standard Pedal Travel—Power	6.5 4.5
LPO Maximum Fade & Maximum Wear Resistant Wheel Cylinders (200 & 289)		Push Rod Adjustment—Power Brakes Bendix Midland-Ross	0.980-0.995 0.995-1.005
Front Wheel Cylinder Bore Diameter	1.094		
Rear Wheel Cylinder Bore Diameter	0.875	Hydraulic Line Diameter	0.188
Drum Diameter	10.0		
Drum Maximum Allowable Run-Out	0.007	Parking Brake—Type Foot Operated With Pedal Mounted Below Left Side of the Instrument Panel	
Drum Maximum Boring Diameter	10.060		
Drum Width—Front Passenger Station Wagon—Maximum Fade and Wear Resistant & 390 car	2.25 2.50		
Drum Width—Rear Passenger Station Wagon Maximum Fade & Maximum Wear Resistant	1.75 2.50 2.00		

TORQUE LIMITS—BRAKES

Description	Falcon ft-lbs	Mustang ft-lbs	Comet and Fairlane ft-lbs
Brake Cylinder to Brake Carrier Plate Bolt	5-7	5-7	10-20
Parking Brake Control Assembly to Instrument Panel Bolt	15-20	8-12	15-20
Master Cylinder to Dash Panel Bolt	20-34	18-25	20-34
Tube Connector to Master Cylinder	6-12	6-12	6-12
Master Cylinder Cover	Finger Tight	Finger Tight	Finger Tight
Parking Brake Control Assembly to Dash Panel Bolt	15-20	8-12	15-20
Brake Hose Bolt	10-15	10-15	10-15
Brake Pedal Support Bracket to Dash Panel Bolt	20-34	20-34	20-34
Brake Pedal Support Bracket to Instrument Panel Nut	9-13	9-13	9-13
FRONT DRUM BRAKES ONLY	5 Lug—75-110	5 Lug—6 Cyl.	75-110
Wheel Assembly to Wheel Hub and Drum Assembly Nut	4 Lug—55-85	4 Lug—8 Cyl.	
Wheel, Hub and Drum Assembly to Wheel Spindle Nut [Ⓢ]	17-25	17-25	17-25
Carrier Plate to Spindle Nut	25-45	25-45	25-45
REAR BRAKES ONLY	8 Cyl.—30-40	8 Cyl.—30-40	
Axle Housing to Carrier Plate Lock Nut	6 Cyl.—25-35	6 Cyl.—25-35	30-40
Drum to Axle Shaft Assembly Speednut	Hand Push Fit	Hand Push Fit	Hand Push Fit
Wheel Assembly to Axle Shaft to Drum Assembly Nut	4 Lug—55-85 5 Lug—75-110	4 Lug—55-85 5 Lug—75-110	75-110
Brake Line Connection to Axle Housing Bolt	12-18	12-18	
Bleeder Screw to Wheel Cylinder	50 in-lbs Max.	50 in-lbs Max.	55 in-lbs Max.
POWER BRAKES			
Vacuum Manifold to Booster Body Mounting Bolt	8-10		
Master Cylinder to Booster Body	10-13		
Brake Booster to Dash Panel	12-15		
Push Rod to Brake Pedal Bolt	10-15		

Ⓢ.0005 to .0065 Bearing end play at assembly.

TORQUE LIMITS—DISC BRAKES

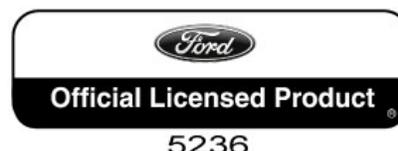
Description	ft-lbs
Caliper Assembly to Mounting Bracket	45-60
Mounting Bracket to Spindle	35-45
Caliper Bleeder Screw	10 (120 in-lbs maximum)— Must be leak proof
Caliper Splash Shield	7-9
Caliper Bridge Bolts	65-75
Rotor Splash Shield to Spindle	10-20
Hub and Rotor Assembly to Front Wheel Spindle	17-25—Rotate rotor while torquing [Ⓢ]
Wheel Assembly to Front Wheel Hub and Rotor Assembly	75-110 ft-lbs
Brake Tube Fitting Nuts to Proportioning Valve	70 in-lbs—maximum— Must be leak proof

Ⓢ.0005" to .0065" maximum bearing end play with torque specification of 17-25 ft./lbs.

This is only a **Demo** of the product! Only a few pages are included.

Description: The Ford Shop Manual is the original manual used by the Ford dealership mechanics at to guide them through repairs and maintenance. Each section provides information on the operation of major systems, diagnostics, troubleshooting, overhaul, as well as the removal and installation of major components. Written in an easy to understand format, this manual contains step-by-step instructions designed for the novice and the expert. In addition, this manual is filled with illustrations, photographs, and diagrams that help in the identification of parts and proper assembly.

Our manuals are fully approved and licensed by the Ford Motor Company



We are a licensed distributor of Adobe Reader



Adobe Reader: Unlike some CD-ROM versions on the market, this product is produced in Adobe Reader (pdf) format to retain the exact look and feel of the original manual. Simply scroll through the pages and sections like reading a normal printed manual. In addition, unlike a printed version, each page can be printed (or reprinted, if damaged in the garage), zoom in to over 1200% to see the exact details, and you can search for keywords.

Product Features:

- ▶ Printable - Print only the pages you need (if a page is damaged in the shop, just print a new one!)
- ▶ Searchable - Search the entire manual in seconds.
- ▶ Zoom - Zoom in to over 1200% to see the exact details.
- ▶ Transportable - Use on any Windows computer. No additional software needed.
- ▶ Bookmarked - Manual is bookmarked to locate sections in seconds.
- ▶ Money Back Guarantee!



Visit us online for other great Ford Products:

