1964 FORD and MERCURY

SHOP MANUAL

1964 Ford and Mercury Shop Manual
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1964

FORD-MERCURY

SHOP MANUAL

GROUP INDEX

SPECIFICATIONS AT END OF EACH GROUP

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FOREWORD

This shop manual provides the Service Technician with complete information for the proper servicing of the 1964 Ford and Mercury cars.

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

Refer to the opposite page for important vehicle identification data.

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

SERVICE DEPARTMENT

FORD MOTOR COMPANY

FORD IDENTIFICATION

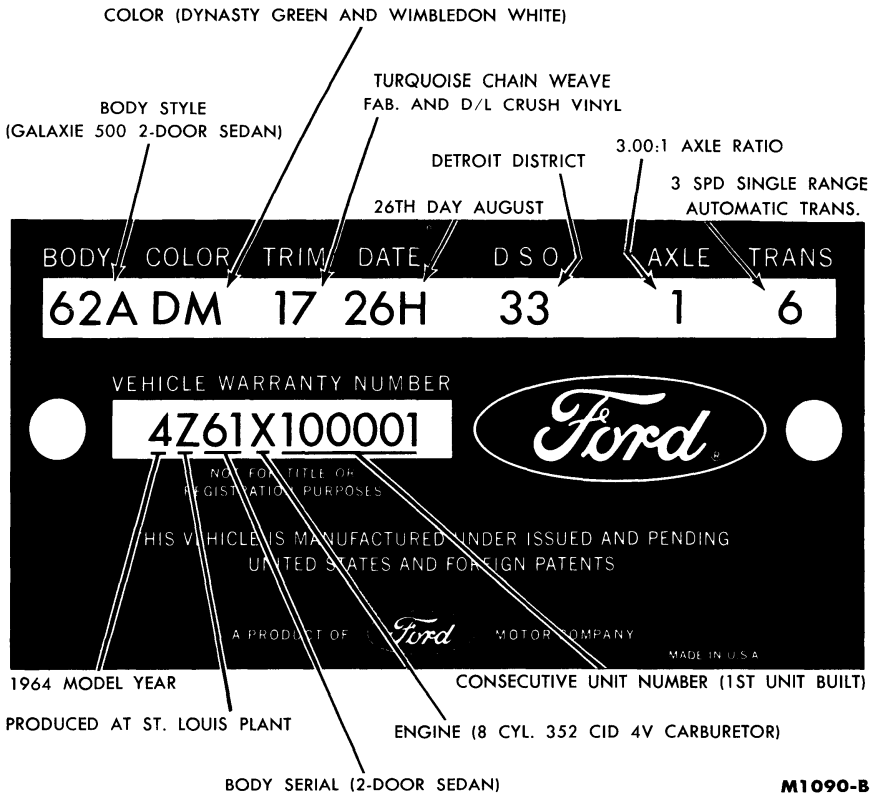


FIG. 1—1964 Ford Warranty Plate

Figure 1 illustrates the 1964 Galaxie Warranty Plate. The plate is located on the rear (lock) face of the left front door panel.

The official Vehicle Identification Number for title and registration purposes is stamped on a tab attached to the top right side (weld flange) of the dash panel in the engine compartment (Fig. 2). Do not use the "Vehicle Warranty Number" which appears on the Warranty plate for title or registration purposes.

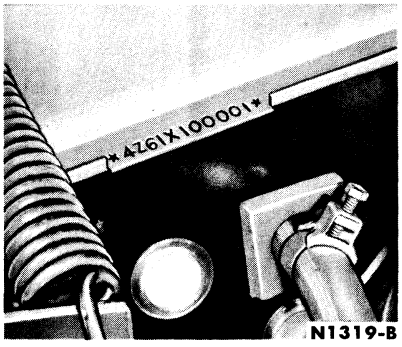


FIG. 2—Ford Vehicle Identification Number Location

17.....Turquoise Chain Weave Fab. and Lt. Turquoise D/L Crush Vinyl
26H.....26th Day August
33.....Detroit District
1.....3.00:1 Ratio
6.....C-4 Automatic Dual Range

BODY

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

Ford Custom 500
54B.....4-Door Sedan
62B.....2-Door Sedan

Galaxie 500
54A.....4-Door Sedan
57B.....4-Door Fastback
62A.....2-Door Sedan
63B.....2-Door Fastback
76A.....2-Door Convertible

Galaxie 500XL
57C.....4-Door Fastback
63C.....2-Door Fastback
76B.....2-Door Convertible

Station Wagons
71A.....4-Door 9-Pass. Country Squire
71B.....4-Door 6-Pass. Country Sedan
71C.....4-Door 9-Pass. Country Sedan
71E.....4-Door 6-Pass. Country Squire

COLOR

Two-tone paint codes use the same symbols as the single colors except that two symbols are used. The lower body color code will appear first in the warranty plate paint color space.

If a special paint is used, the paint color space will not be stamped.

Code	*M-30-J Number	Color	Sales Name
A	1724	Black	Raven Black
B	1638	Peacock	Pagoda Green
D	1625	Med. Turquoise Met.	Dynasty Green
F	1622	Med. Blue Met.	Guardsman Blue
G	1636	Buff	Prairie Tan
J	1515	Red	Rangoon Red
K	1621	Silver Mink Met.	Silver Smoke Gray
M	1619	White	Wimbledon White
R	1633	Yellow	Phoenician Yellow
T	1631	Lt. Beige	Navaho Beige
X	1632	Maroon Met.	Vintage Burgundy
Y	1623	Lt. Blue	Skylight Blue
Z	1630	Med. Beige Met.	Chantilly Beige

*"M-32-J" Acrylic Paint Alternate with "M-30-J"

TRIM

Deviation trim sets will use existing trim codes plus a suffix. A trim code with a numerical suffix is not serviced, while a trim code with an alphabetical suffix is serviced.

Code	Trim Schemes
	Rib Vinyl and Crush Vinyl
03	Med. Green and Med. Green
04	Med. Beige and Med. Beige
	Chain Weave Fabric and Crush Vinyl
12	Blue and Lt. Blue D/L*
14	Beige and Beige
15	Red and Red
16	Black and Black
17	Turquoise and Lt. Turquoise D/L*
	Louvre Fabric and Crush Vinyl
22	Blue and Lt. Blue Met.
24	Beige and Beige
25	Red and Red
27	Turquoise and Lt. Turquoise Met.
	Bar Dot Fabric and Crush Vinyl
32	Blue and Lt. Blue
34	Beige and Pale Beige
35	Red and Red
	Mosaic Vinyl and Crush Vinyl
42	Med. Blue Met. and Lt. Blue Met.
44	Med. Beige Met. and Beige
45	Red and Red
47	Med. Turquoise Met. and Lt. Turquoise Met.
	Crush Vinyl (Bench Seat)
71	Med. Silver Blue D/L and Lt. Silver Blue D/L*
72	Med. Blue D/L and Lt. Blue D/L*
74	Lt. Beige D/L and Beige
75	Red
76	Black
77	Med. Turquoise D/L and Turquoise D/L*
	Crush Vinyl (Bucket Seat)
80	White
81	Med. Silver Blue D/L and Silver Blue D/L*
82	Med. Blue D/L and Lt. Blue D/L
84	Lt. Beige D/L and Beige
85	Red
86	Black
87	Med. Turquoise D/L and Lt. Turquoise D/L*
89	Med. Palomino (Crinkle)

*D/L—Diamond Lustre

a numeral to show the day
second year code letters are
months.

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

DSO

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

DISTRICT CODE

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	Cincinanti	71	Los Angeles
32	Cleveland	72	San Jose
33	Detroit	73	Salt Lake City
34	Indianapolis	74	Seattle
35	Lansing	81	Ford of Canada
36	Louisville	83	Government
41	Chicago	84	Home Office Reserve
42	Fargo	85	American Red Cross
43	Rockford	89	Transportation Services
44	Twin Cities	90	Export

AXLE

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

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

TRANSMISSION

Code	Type
1	3-Speed Manual-Shift
2	Overdrive
4	Cruise-O-Matic
5	4-Speed Manual-Shift
6	C-4 Automatic Dual Range

VEHICLE WARRANTY NUMBER

Example (Fig. 1): 4Z61X100001

4	1964 Year Model
Z	St. Louis Plant Assembly
61	2-Door Sedan
X	8-Cylinder 352 Cubic Inch Engine
100001	First Unit Built (Consecutive Unit Number)

MODEL YEAR

The numeral "4" designates 1964.

ASSEMBLY PLANT

Code Letter	Assembly Plant	Code Letter	Assembly Plant
A	Atlanta	P	Twin Cities
D	Dallas	S	Pilot Plant
E	Mahwah	U	Louisville
G	Chicago	W	Wayne
J	Los Angeles	Z	St. Louis
N	Norfolk		

MODEL

The model code number identifies the product line series and the particular body style: the first of the two digits shows the product line, and the second digit shows a two-door style by an odd number or a four-door style by an even number.

Ford Custom
53 ..... 2-Door Sedan
54 ..... 4-Door Sedan

Ford Custom 500
51 ..... 2-Door Sedan
52 ..... 4-Door Sedan

Galaxie 500
61 ..... 2-Door Sedan
62 ..... 4-Door Sedan
64 ..... 4-Door Hardtop
65 ..... 2-Door Convertible
66 ..... 2-Door Fastback

Galaxie 500XL
60 ..... 4-Door Fastback
68 ..... 2-Door Fastback
69 ..... 2-Door Convertible

Station Wagons
72 ..... 4-Door 6-Passenger Country Sedan
74 ..... 4-Door 9-Passenger Country Sedan
76 ..... 4-Door 6-Passenger Country Squire
78 ..... 4-Door 9-Passenger Country Squire

ENGINE

Code
B ..... 6-Cylinder 223 Cubic Inch (Police)
C ..... 8-Cylinder 289 Cubic Inch (2-barrel)
E ..... 6-Cylinder 223 Cubic Inch (Taxi)
P ..... 8-Cylinder 390 Cubic Inch (Police)
Q ..... 8-Cylinder 427 Cubic Inch (4-barrel High Perf.)
R ..... 8-Cylinder 427 Cubic Inch (8-barrel High Perf.)
V ..... 6-Cylinder 223 Cubic Inch
X ..... 8-Cylinder 352 Cubic Inch (4-barrel)
Z ..... 8-Cylinder 390 Cubic Inch (4-barrel)

Low Compression
3 ..... 8-Cylinder 289 Cubic Inch
5 ..... 6-Cylinder 223 Cubic Inch
9 ..... 8-Cylinder 390 Cubic Inch

CONSECUTIVE UNIT NUMBER

Each assembly plant, with each model year, begins with consecutive unit number 100001 and continues on for each car built.

MERCURY IDENTIFICATION

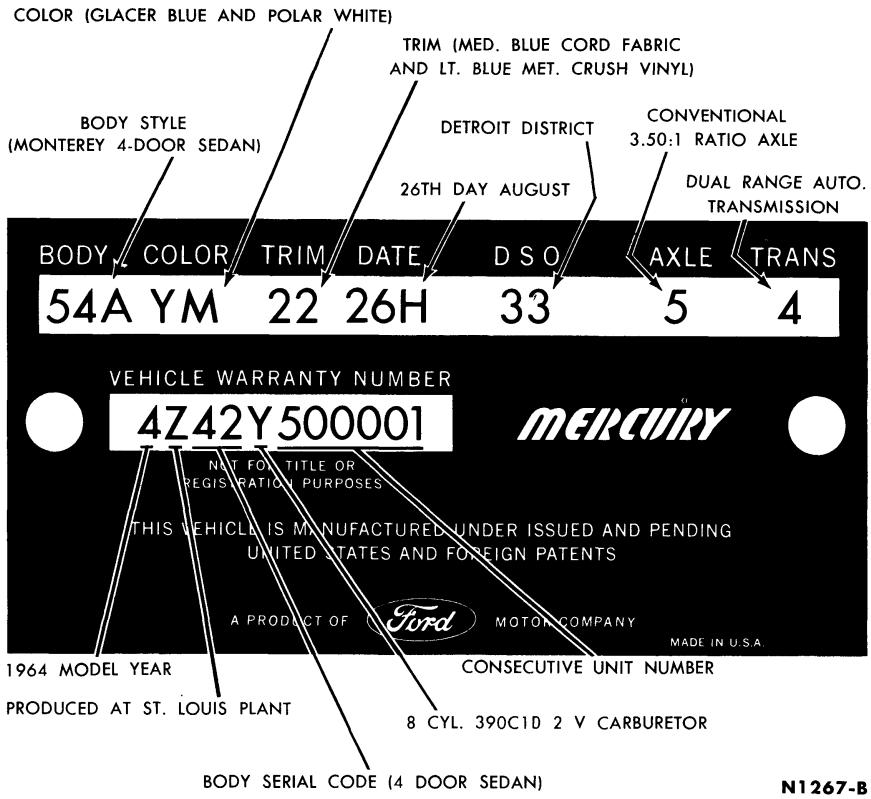


FIG. 3—Mercury Warranty Plate

The plate is located

gistration purposes

is stamped on a tab attached to the top right side (weld flange) of the dash panel in the engine compartment (Fig. 4). Do not use the "Vehicle Warranty Number" which appears on the Warranty plate for title or registration purposes.

FIG. 4—Mercury Vehicle Identification Number Location

VEHICLE DATA

Example (Fig. 3):

(54A YM 22 26H 33 5 4)

54A....4-Door Sedan
YM....Glacier Blue and Polar White
22....Med. Blue Cord Fabric and Lt. Blue Met. Crush Vinyl
26H....26th Day of August
33....Detroit District
5....3.50:1 Ratio
4....Dual Range Automatic Transmission

BODY

Monterey

54A....4-Door Sedan
62A....2-Door Sedan
63A....2-Door Hardtop Fastback
65A....2-Door Hardtop
76A....2-Door Convertible

Montclair

54B....4-Door Sedan
57D....4-Door Hardtop Fastback
63D....2-Door Hardtop Fastback
65B....2-Door Hardtop

Parklane

54F....4-Door Sedan
57C....4-Door Hardtop Fastback (Bucket Seats)
57F....4-Door Hardtop Fastback
63C....2-Door Hardtop Fastback (Bucket Seats)
65C....2-Door Hardtop (Bucket Seats)
65F....2-Door Hardtop
75F....4-Door Hardtop
76C....2-Door Convertible (Bucket Seats)
76F....2-Door Convertible

Station Wagons

71A....4-Door 6-Pass. Commuter
71B....4-Door 6-Pass. Colony Park
71C....4-Door 9-Pass. Commuter
71D....4-Door 9-Pass. Colony Park

the single colors except that ode will appear first in the

ill not be stamped.

Code	*M-30-J Number	Color	Sales Name
A	1724	Black	Onyx
B	1638	Peacock	Peacock
D	1625	Med. Turquoise Met.	Silver Turquoise
F	1622	Med. Blue Met.	Pacific Blue
G	1636	Buff	Palomino
I	1635	Aztec Gold	Aztec Gold
J	1515	Red	Carnival Red
K	1621	Silver Blue Met.	Anniversary Silver
L	1637	Bittersweet	Bittersweet
M	1619	White	Polar White
R	1633	Yellow	Yellow Mist
T	1631	Lt. Beige	Fawn
W	1555	Lt. Pink Met.	Pink Frost
X	1632	Maroon Met.	Burgundy
Y	1623	Lt. Blue	Glacier Blue
Z	1630	Med. Beige Met.	Platinum Beige

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

TRIM

Deviation trim sets will use existing trim codes plus a suffix. A trim code with a numeral suffix is not serviced, while a trim code with an alphabetical suffix is serviced.

Code	Trim Schemes
	Discus Fabric and Crush Vinyl (Bench-Pleated)
11	Med. Silver Blue and Lt. Silver Blue Met.
12	Med. Blue and Lt. Blue Met.
14	Med. Beige and Lt. Beige Met.
16	Black and Black
	Cord Fabric and Crush Vinyl (Bench-Plain)
22	Med. Blue and Lt. Blue Met.
24	Med. Beige and Lt. Beige Met.
26	Black and Black
	Stitch Rib Vinyl and Crush Vinyl (Crinkle) (Bench-Plain)
32	Med. Blue Met. and Lt. Blue Met.
35	Red and Red
36	Black and Black
39	Med. Palomino and Med. Palomino (*)
	Ostrich Vinyl and Crush Vinyl (Crinkle) (Bucket-Biscuit)
52	Med. Blue Met. and Lt. Blue D/L*
55	Red and Red
56	Black and Black
59	Med. Palomino and Med. Palomino
82	White Pearl and White Pearl
85	(W/Red) White and White Pearl
86	(W/Black) White Pearl and White Pearl
87	(W/Turq.) White Pearl and White Pearl)
89	(W/Palomino) White Pearl and White Pearl
	Caspian Fabric and Crush Vinyl (Bench-Biscuit)
61	Med. Silver Blue and Lt. Silver Blue D/L*
62	Med. Blue and Lt. Blue D/L*
64	Med. Beige and Lt. Beige D/L*
66	Black and Black
67	Med. Turquoise and Med. Turquoise Met.
	Crush Vinyl (Crinkle) (Bench-Pleated)
72	Med. and Lt. Blue Met.
75	Red
76	Black
79	Medium Palomino
	Ostrich Vinyl and Crush Vinyl (*Crinkle) (Bench-Biscuit)
92	Lt. Blue Met. and Med. Blue Met.
95	Red and Red
96	Black and Black
97	Lt. Turquoise Met. and Med. Turquoise Met.
99	Med. Palomino and Med. Palomino (*)

*D/L—Diamond Lustre

DATE

The code letters for the month are preceded by a numeral to show the day of the month when the car was completed. The second year code letters are to be used if 1964 model production exceeds 12 months.

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

DSO

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

DISTRICT CODE

Code	District	Code	District
11	Boston	41	Chicago
12	Philadelphia	44	St. Louis
13	New York	45	Twin Cities
14	Washington	51	Denver
21	Atlanta	52	Los Angeles
22	Dallas	53	Oakland
24	Jacksonville	54	Seattle
25	Memphis	81	Ford of Canada
31	Buffalo	84	Home Office Reserve
32	Cincinnati	90-99	Export
33	Cleveland		
34	Detroit		

AXLE

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

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

TRANSMISSION

Code	Type
1	3-Speed Manual-Shift
2	Overdrive
4	Automatic (Multi-Drive)
5	4-Speed Manual-Shift

VEHICLE WARRANTY NUMBER

Example (Fig. 3): 4W42Y 500001

4	1964 Model Year
W	Wayne Plant Assembly
42	Monterey 4-Door Sedan
Y	8-Cylinder 390 Cubic Inch Engine
500001	First Unit Built

MODEL YEAR

The numeral "4" designates 1964.

ASSEMBLY PLANT

Code Letter	Assembly Plant
S	Pilot Plant
Z	St. Louis
W	Wayne

MODEL

The model code number identifies the product line series and the particular body style: the first of the two digits shows the product line, and the second digit shows a two-door style by an odd number or a four-door style by an even number.

Monterey	
41	2-Door Sedan
42	4-Door Sedan
43	2-Door Hardtop
45	2-Door Convertible
47	2-Door Hardtop Fastback
Montclair	
52	4-Door Sedan
53	2-Door Hardtop
57	2-Door Hardtop Fastback
58	4-Door Hardtop Fastback
Parklane	
62	4-Door Sedan
63	2-Door Hardtop
64	4-Door Hardtop
65	2-Door Convertible
67	2-Door Hardtop Fastback
68	4-Door Fastback
Station Wagon	
72	4-Door 6-Pass. Commuter
72	4-Door 9-Pass. Commuter
76	4-Door 6-Pass. Colony Park
76	4-Door 9-Pass. Colony Park

ENGINE

Code	
H	8-Cylinder 390 Cubic Inch (2-barrel Special)
P	8-Cylinder 390 Cubic Inch (4-barrel Police)
Q	8-Cylinder 427 Cubic Inch (4-barrel High Perf.)
R	8-Cylinder 427 Cubic Inch (8-barrel High Perf.)
Y	8-Cylinder 390 Cubic Inch (2-barrel)
Z	8-Cylinder 390 Cubic Inch (4-barrel)
9	8-Cylinder 390 Cubic Inch (4-barrel, Low Compression)

CONSECUTIVE UNIT NUMBER

Each assembly plant, with each model year, begins with consecutive unit number 500001 and continues on for each car built.

BRAKES

GROUP 2

PART 2-1 GENERAL BRAKE SERVICE

1 DIAGNOSIS AND TESTING

PRELIMINARY TESTS

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

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

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

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

3. On cars with power brakes, 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". With the engine shut off, exhaust all vacuum in the system. Depress the brake pedal and hold it in the applied position. If the pedal gradually falls away under this pressure, the hydraulic system is leaking. Check all tubing hoses, and connections for leaks.

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

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

ROAD TEST

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

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

TABLE 1—Brake Trouble Symptoms and Possible Causes

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

BRAKE BOOSTER TROUBLE DIAGNOSIS GUIDE

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

2 COMMON ADJUSTMENTS AND REPAIRS

PARKING BRAKE LINKAGE ADJUSTMENT

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

1. Fully release the parking brake pedal by pushing down on the manual release lever.

2. Raise the car.

3. Adjust the pedal cable to the dimensions shown in Fig. 1.

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

5. Loosen the lock nut on the equalizer rod (Fig. 2), and then turn the nut in front of the equalizer several turns forward.

6. Turn the lock nut forward against the equalizer until a moderate drag is felt when turning the rear wheels.

7. When the cables are properly adjusted, tighten both nuts against the equalizer.

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

POWER BRAKE MASTER CYLINDER PUSH ROD ADJUSTMENT

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

To check the adjustment of the

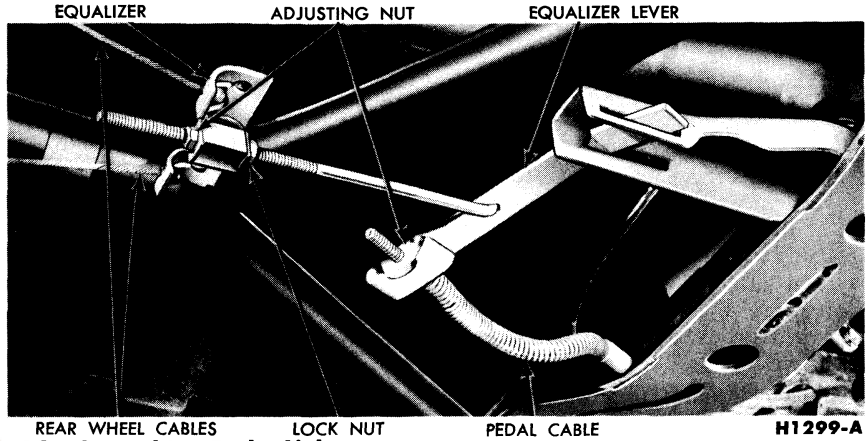


FIG. 2—Parking Brake Linkage

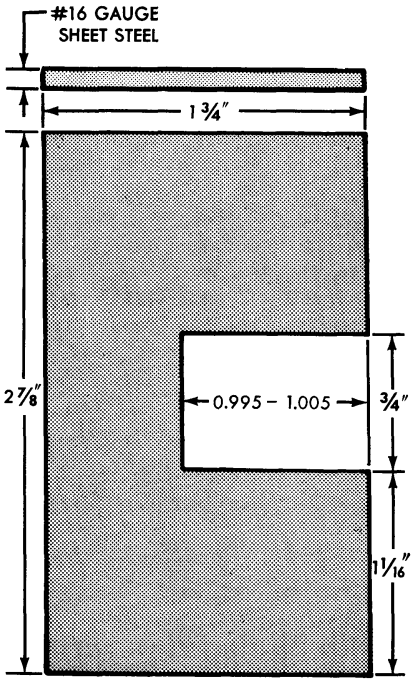


FIG. 3—Push Rod Gauge Dimensions

screw, fabricate a gauge of the dimensions shown in Fig. 3. Then place the gauge against the master cylinder mounting surface of the booster body as shown in Fig. 4. The push rod screw should be adjusted so that the end of the screw just touches the inner edge of the slot in the gauge. Do not set up side forces on the push rod as it may break the valve plunger.

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

HYDRAULIC SYSTEM BLEEDING

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

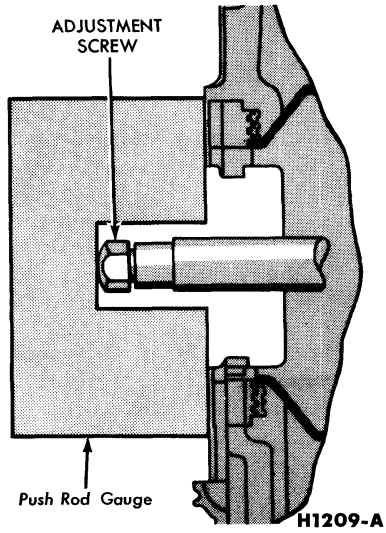


FIG. 4—Push Rod Adjustment

MANUAL BLEEDING

Bleed the longest lines first. Keep the master cylinder reservoir filled with new heavy-duty brake fluid during the bleeding operation.

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

1. Position a bent 3/8-inch box wrench on the bleeder fitting on the right rear brake wheel cylinder (Fig. 5). Attach a rubber drain tube to the bleeder fitting. **The end of the tube should fit snugly around the bleeder fitting.**

2. Submerge the free end of the tube in a container partially filled with clean brake fluid, and loosen the bleeder fitting approximately 3/4 turn.

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

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

5. Repeat this procedure at each brake wheel cylinder in order: left rear, right front, and left front. Refill the master cylinder reservoir after each brake cylinder is bled and when the bleeding operation is completed. The fluid level should be within 3/8 inch of the top of the reservoir.

PRESSURE BLEEDING

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

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

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

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

3. Position a 3/8-inch box wrench on the bleeder fitting on the right rear brake wheel cylinder (Fig. 5). Attach a rubber drain tube to the bleeder fitting. **The end of the tube should fit snugly around the bleeder fitting.**

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

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

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

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

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

9. Remove the adapter cap, refill the master cylinder reservoir to within 3/8 inch from the top of the reservoir, and install the filler cap.

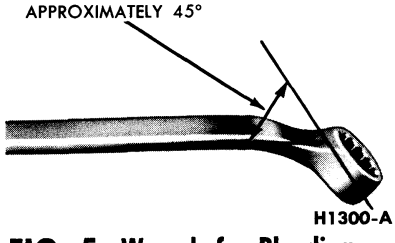


FIG. 5—Wrench for Bleeding Brake

3 CLEANING AND INSPECTION

BRAKE ASSEMBLY

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

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

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

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

5. If the car has 24,000 or more miles of operation on the brake linings or signs of overheating are present when relining brakes, the wheel cylinders should be disassembled and inspected for wear and entrance of dirt into the cylinder. The cylinder cups should be replaced, thus avoiding future problems.

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

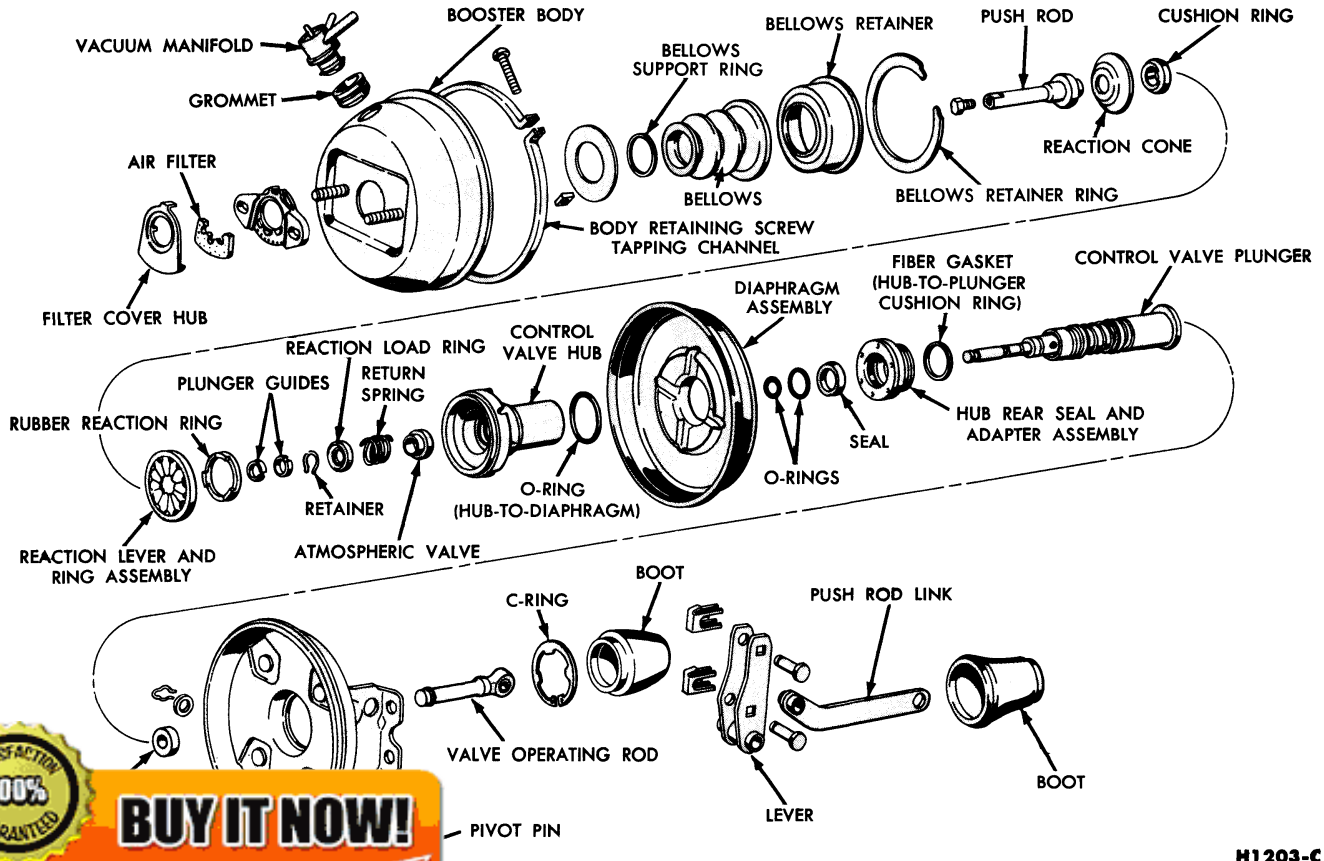
7. Inspect the brake drums and, if necessary, refinish. Refer to Part 2-2, Section 4 for refinishing.

BOOSTER UNIT

A disassembled view of the brake booster is shown in Fig. 6.

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. Replace the body shell when scored.



H1203-C

PART 2-2 BRAKE SYSTEM

1 DESCRIPTION AND OPERATION

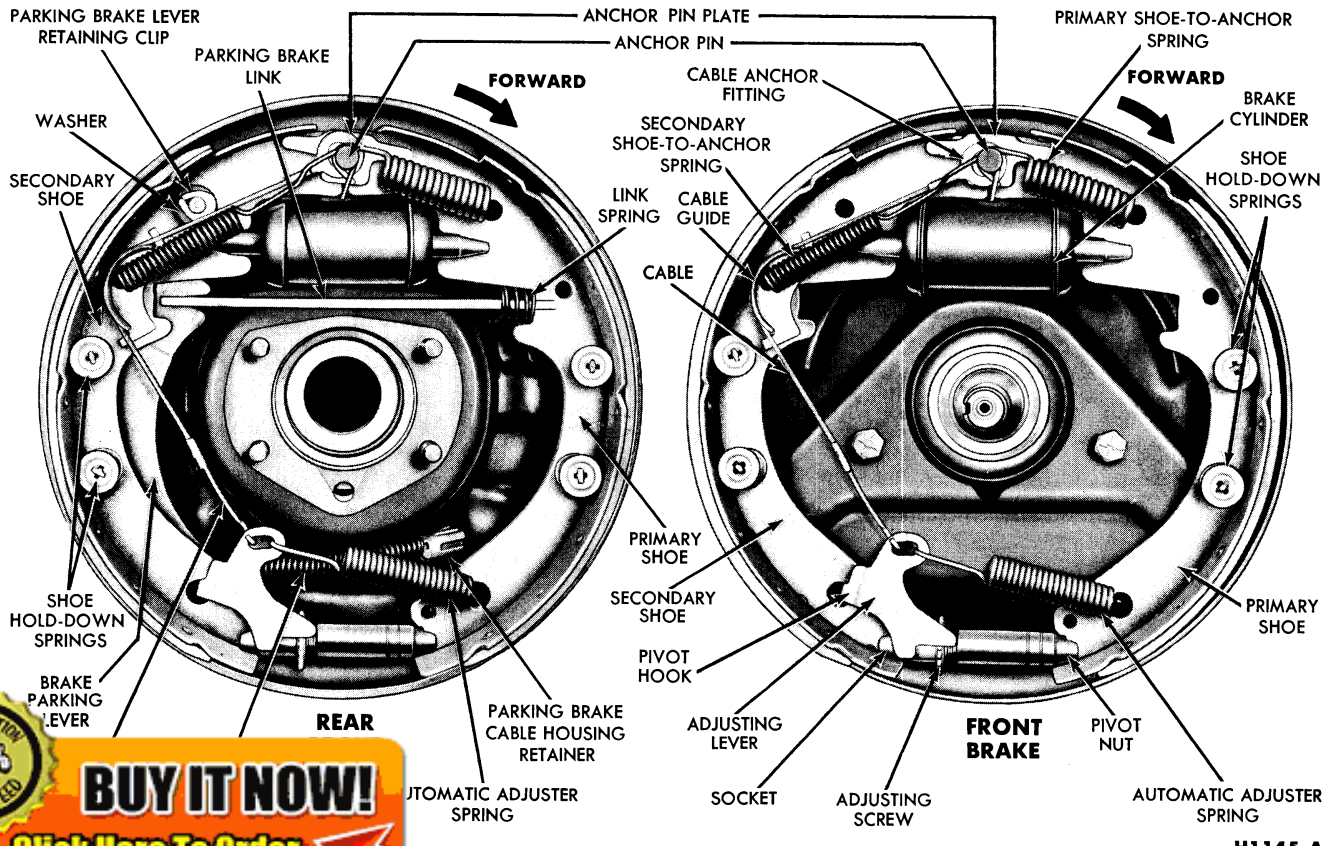
HYDRAULIC SELF ADJUSTING BRAKE SYSTEM

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

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

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

With the car moving rearward and the brakes applied, the "wrap-around" action of the shoes following the drum forces the upper end of the primary shoe against the anchor pin. The action of the wheel cylinder moves the upper end of the secondary shoe away from the anchor pin. The movement of the secondary shoe causes the cable to pull the adjusting lever upward and against the end of a tooth on the adjusting screw star-wheel. The upward travel of the lever increases as lining wear increases. When the lever can move upward far enough, it passes over the end of the tooth and engages the tooth. When the brakes are released, the adjusting



spring pulls the lever downward causing the starwheel to turn and expand the shoes. The star-wheel is turned one tooth at a time as the linings progressively wear.

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

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

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

BOOSTER SYSTEM

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

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

Atmospheric pressure is present 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 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.

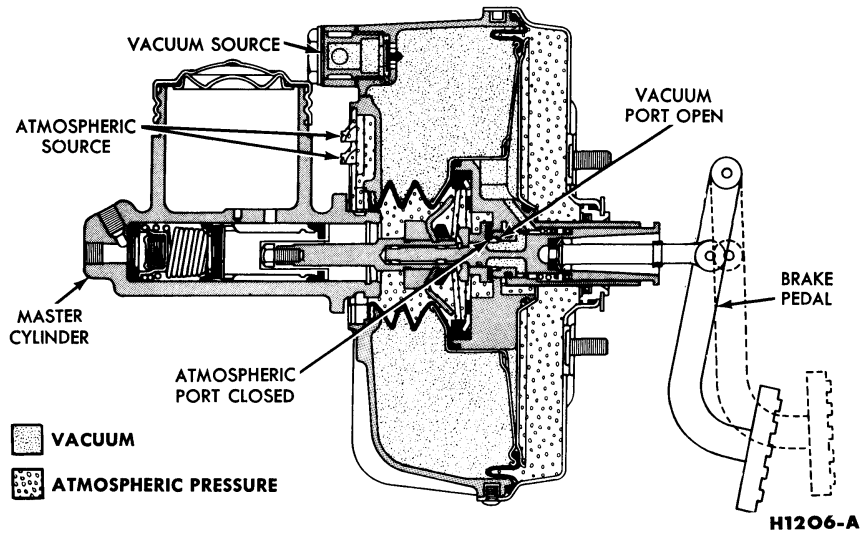


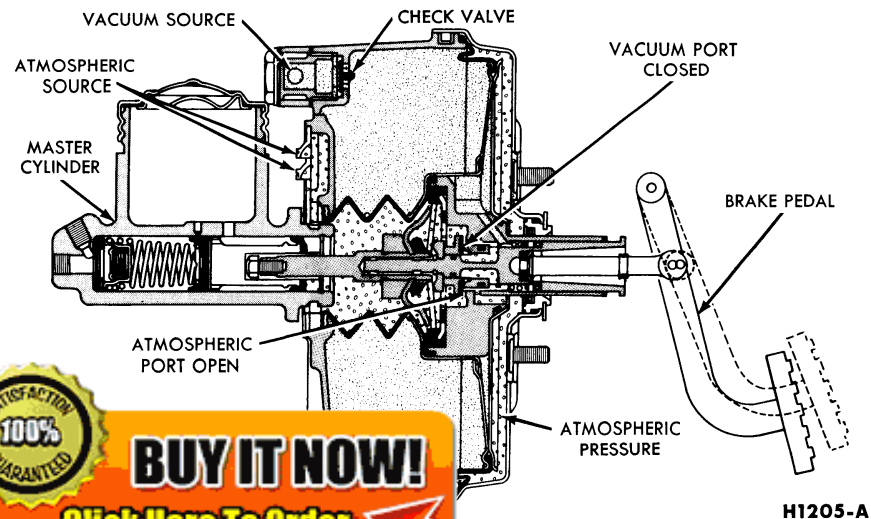
FIG. 3—Booster in Holding Position

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

APPLYING POSITION

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

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

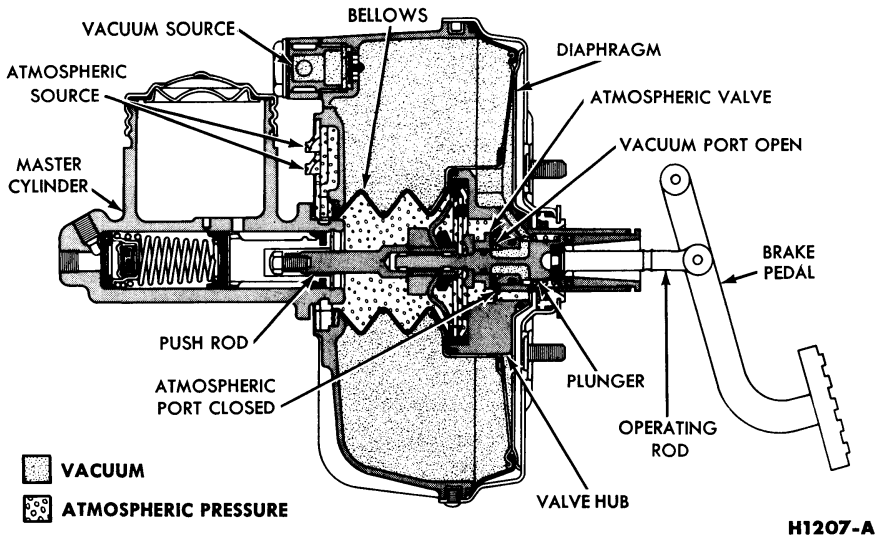


FIG. 4—Booster in Released Position

the control valve plunger forward. However, the unbalanced forces of atmospheric pressure and vacuum on each side of the diaphragm will continue to move the outer sleeve of the control valve plunger forward keeping the vacuum porting closed. At the same time, the reaction force acting through the reaction ring and lever assembly will tend to move the atmospheric valve to the closed position (Fig. 3). When these combined forces balance, the porting to the vacuum supply will remain closed and the atmospheric valve will cut off any further passage of atmospheric pressure to the area behind the diaphragm. Therefore, the power assist force acting on the master cylinder piston will stabilize and the hydraulic force applying the brakes will be maintained at a constant level.

RELEASED POSITION

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

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

PARKING BRAKE

An independent foot-operated parking brake control actuates the rear wheel brake shoes through a cable linkage. The operating cable is routed from the parking brake control assembly to the equalizer lever which is attached to the equalizer assembly. 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. Pushing down on the release handle disengages the pawl from the ratchet to release the brakes.

2 IN-CAR ADJUSTMENTS AND REPAIRS

BRAKE SHOE ADJUSTMENTS

The car should be raised with the wheels off the floor. **If the car is raised on a frame-contact hoist, disconnect the parking brake cables to prevent the rear brakes from being partially applied due to rear axle and spring sag on the hoist.**

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 opera-

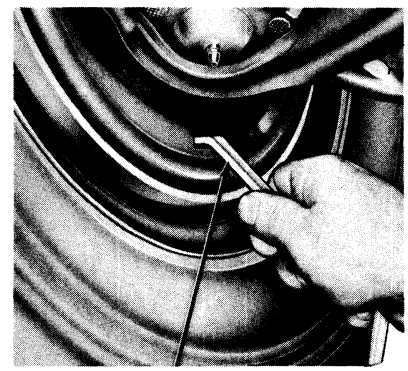
drag when the drums are cool and contracted.

1. After the shoes have been installed or the adjusting screw has been turned, install the drum. Be sure that all excess grease, oil, and other foreign material are wiped off the carrier plate and drum.

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

2. Remove the adjusting hole cover from the carrier plate and, from the carrier plate side, turn the adjusting screw upward to expand the shoes (Fig. 5). Expand the shoes until a drag is felt when the drum is rotated.

3. Remove the drum. Mark the tooth on the star wheel where the lever contacts the adjusting screw. While holding the adjusting lever



Brake Shoe Adjusting Tool H1122-A

FIG. 5—Expanding Brake Shoes

out of engagement with the adjusting screw, back off the adjusting screw ¾ of a turn with the fingers. If finger movement will not turn the screw, free it up; otherwise, the self-adjusting lever will not turn the screw. Lubricate the screw with a thin uniform coating of Stanolube–HD Moly Grease–Grade 2.

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

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

On a front wheel, install the wheel outer bearing, washer, and adjusting nut, then adjust the wheel bearings as outlined in Part 3-4, Section 2.

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

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

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

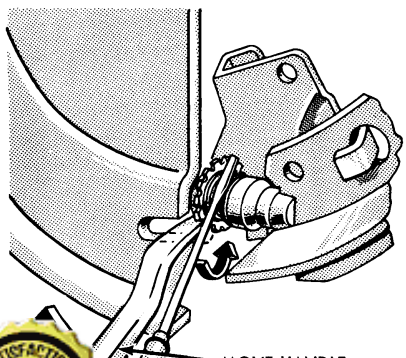
7. When adjusting the rear brake shoes, check the parking brake cables for proper adjustment. Make sure that the equalizer lever operates freely.

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

FRONT BRAKE DRUM

REMOVAL

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



2. Insert a narrow screwdriver through the brake adjusting hole at the inner side of the brake carrier plate, and disengage the adjusting lever from the adjusting screw. While holding the adjusting lever away from the screw, back off the adjusting screw with the brake adjusting tool (Fig. 6). **Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise the self-adjusting mechanism will not function properly.**

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

4. Pull the hub and drum assembly of 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. Pack the wheel bearings, install the inner bearing cone and roller assembly in the inner cup, and install the new grease retainer. See Part 3-4, Section 4.

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

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

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

4. Adjust the wheel bearing as outlined Part 3-4, Section 2, then install the 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. Insert a narrow screwdriver through the brake adjusting hole in the carrier plate, and disengage the adjusting lever from the adjusting screw. While holding the adjusting lever away from the adjusting screw, back off the adjusting screw with the brake adjusting tool (Fig 6). **Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise, the self-adjusting mechanism will not function properly.**

INSTALLATION

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

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

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

BRAKE SHOES AND ADJUSTING SCREW

REMOVAL

1. With the wheel and drum removed, install a clamp over the ends of the brake cylinder as shown in Fig. 7.

2. Contract the shoes as follows:

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

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

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

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

5. Remove the primary shoe to anchor spring with the tool shown in Fig. 7. With the same tool, remove the secondary shoe to anchor spring and unhook the cable eye from the anchor pin.

6. Remove the anchor pin plate.

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

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

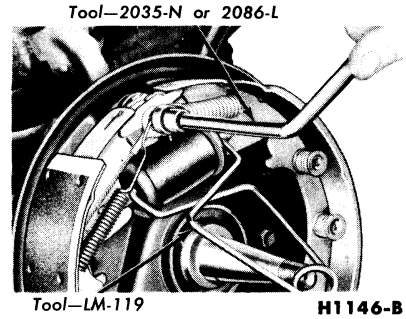


FIG. 7—Retracting Spring Removal

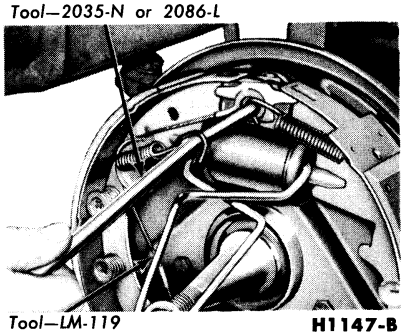


FIG. 8—Retracting Spring Installation

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

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

INSTALLATION

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

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

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

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

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

6. Install the secondary shoe to anchor spring (Fig. 8).

7. Install the cable guide on the secondary shoe web with the flanged hole fitted into the hole in the secondary shoe web. Thread the cable around the cable guide groove (Fig. 1).

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

8. Install the primary shoe to anchor spring with the tool shown in Remove the brake cylinder clamp.

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

Interchanging the brake shoe adjusting screw assemblies from one side of the car to the other would cause the brake shoes to retract rather than expand each time the automatic adjusting mechanism operated. To prevent installation on the wrong side of the car, the socket end of the adjusting screw is stamped with an R or L (Fig. 9). The adjusting pivot nuts can be distinguished by the number of grooves machined around the body of the nut. Two grooves indicate a right hand nut; one groove indicates a left hand nut.

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

11. Hook the cable hook into the hole in the adjusting lever. The adjusting levers are stamped with an R or L to indicate their installation on a right or left hand brake assembly (Fig. 9).

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

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

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

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

To determine the cause of this condition:

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

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

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

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

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

WHEEL CYLINDER REPAIR

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

DISASSEMBLY

1. Remove the links and the rubber boots from the ends of the brake cylinder. Remove the pistons, cups, and return spring from the cylinder bore (Fig. 10).

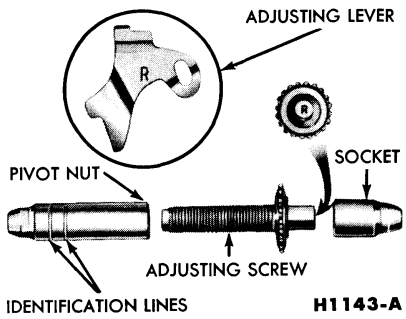


FIG. 9—Adjusting Screw and Lever Identification

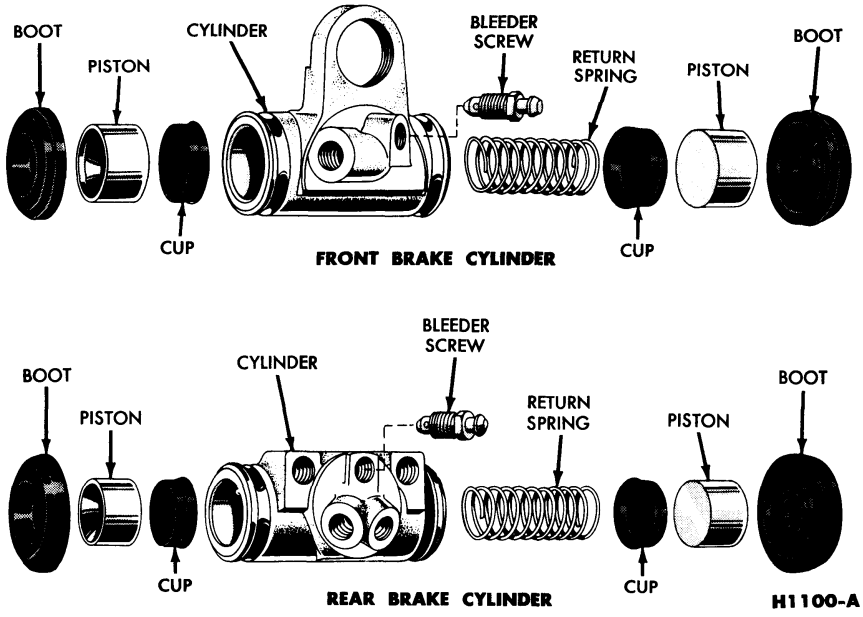


FIG. 10—Front and Rear Wheel Cylinders

2. Remove the bleeder screw from the cylinder.

INSPECTION

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

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

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

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

ASSEMBLY

1. Apply a coating of heavy-duty 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. 10). Place a boot over each end of the cylinder. Bleed the brake system.

WHEEL CYLINDER REPLACEMENT

REMOVAL

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. On the rear wheel, remove the wheel cylinder retaining bolts and lock washers and remove the cylinder. On the front wheel, remove the nut and washer that retains the cylinder to the anchor pin. Remove the cylinder from the anchor pin, and remove the clamp from 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 on the anchor pin against the carrier plate. Install the washer and cylinder retaining nut on the anchor pin, and torque to specification.

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

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

2. To install a rear cylinder:

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

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

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

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

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

BRAKE CARRIER PLATE REPLACEMENT

REMOVAL

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

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

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

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

INSTALLATION

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

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

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

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

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

HYDRAULIC LINES

Steel tubing is used throughout the brake system with the exception of the flexible hoses at the front wheels and at the rear axle housing brake tube connector (Fig. 11).

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

BRAKE TUBE REPLACEMENT

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

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

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

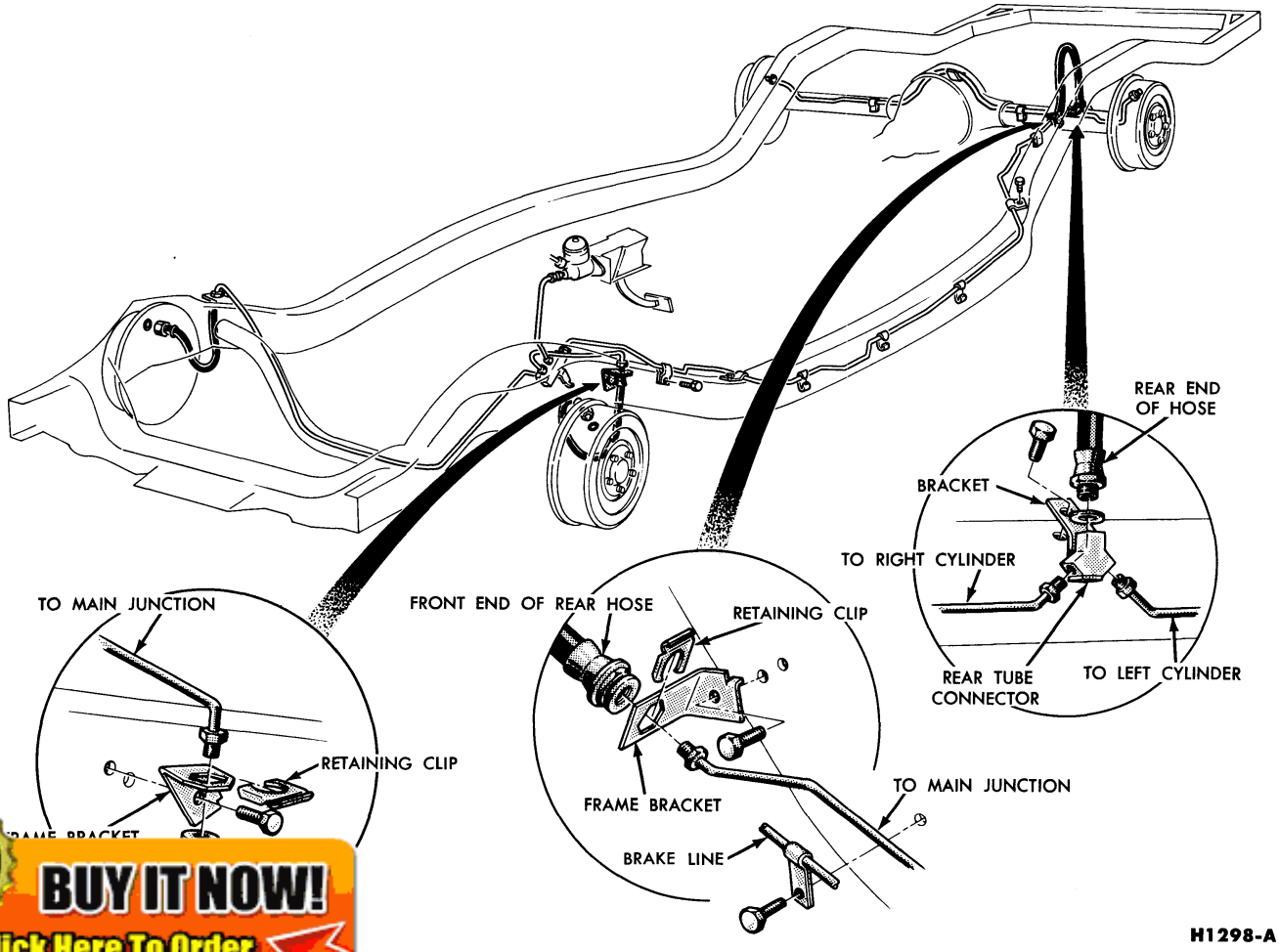
BRAKE HOSE REPLACEMENT

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

When installing a new front brake hose, position the hose to avoid contact with other chassis parts. Place a new copper gasket over the hose fitting and screw the hose assembly into the front brake cylinder. Engage the opposite end of the hose to the bracket on the frame. Install the horseshoe-type retaining clip, and connect the tube to the hose with the tube fitting nut. (Fig. 11).

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

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



3 REMOVAL AND INSTALLATION

MASTER CYLINDER—STANDARD BRAKES

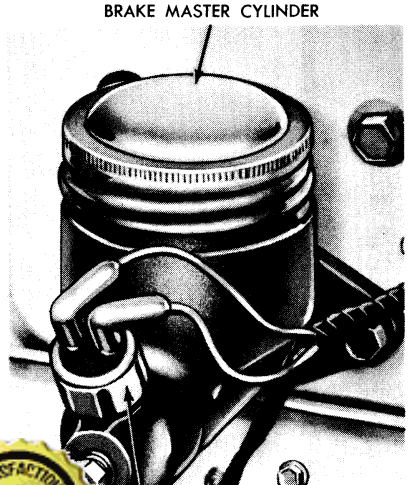
REMOVAL

1. Disconnect the rubber boot from the rear end of the master cylinder in the passenger compartment.
2. Disconnect the brake line from the master cylinder. Disconnect the stop light switch wires from the switch (Fig. 12).
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 to the master cylinder fitting, but leave the brake line fitting loose.
4. Fill the master cylinder reservoir with heavy-duty brake fluid to within ¼ 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. Then tighten the fitting.
6. Remove the filler cap and fill the reservoir to the level specified. Install the cap and wipe off any fluid from the cylinder.
7. Connect the wires to the stop light switch and the rubber boot to the master cylinder.

BRAKE MASTER CYLINDER



MASTER CYLINDER—POWER BRAKES

REMOVAL

1. Remove the hydraulic line outlet fitting from the master cylinder.
2. Disconnect the stop light switch wires. **It is not necessary to remove the stop light switch.**
3. Remove the retaining nuts, lockwashers, and the master cylinder from the booster unit (Fig. 14).
4. Remove the rubber seal from the outer groove at the end of the master cylinder.

INSTALLATION

1. Before installing the master cylinder, check the distance from the outer end of the push rod to the master cylinder mounting surface at the end of the vacuum cylinder (Fig. 4, Part 2-1). If the push rod dimension is not correct, see "Master Cylinder Push Rod Adjustment," Part 2-1, Section 2.
2. When the push rod adjustment is correct, replace the rubber seal in the groove at the end of the master cylinder.
3. Position the master cylinder over the push rod onto the two studs that are integral with the booster body.
4. Install the attaching nuts and lockwashers and torque the nuts to specifications.
5. Replace the stop light switch wires.
6. Install the master cylinder hydraulic line outlet fitting.
7. Bleed the brake system. Fill the master cylinder within ¼ inch from the top of the filler opening. Install the filler cap and gasket.

BOOSTER UNIT

REMOVAL

1. Working inside the car below the instrument panel, disconnect the booster push rod link from the brake pedal assembly. To do this, remove the C-washer (retaining clip) and slide the push rod link and bushings off the pin that is integral with the pedal (Fig. 13). Remove the push rod link boot.
2. Open the hood and disconnect the wires and retaining clip from the stop light switch at the brake master cylinder (Fig. 14).
3. Disconnect the brake line at the master cylinder outlet fitting.
4. Disconnect the manifold vacuum hose from the booster unit. Disconnect the transmission vacuum throttle valve hose, if the car is so equipped.
5. Remove the four bracket-to-dash panel retaining nuts and washers (Fig. 14). Remove the booster and bracket assembly from the dash panel, sliding the push rod link out from the engine side of the dash panel.

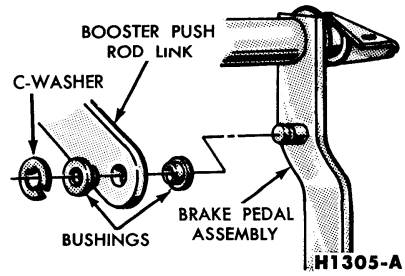


FIG. 13—Booster-to-Pedal Connections

INSTALLATION

1. Mount the booster and bracket assembly to the dash panel by sliding the bracket holes on the mounting studs and the push rod link in through the hole in the dash panel. Install the bracket-to-dash panel retaining nuts and washers (Fig. 14).
2. Connect the manifold vacuum hose to the booster. Connect the transmission vacuum throttle valve hose, if so equipped.
3. Connect the brake line to the master cylinder outlet fitting and connect the wires and retaining clip to the stop light switch and brake booster.
4. Working inside the car below the instrument panel, install push rod

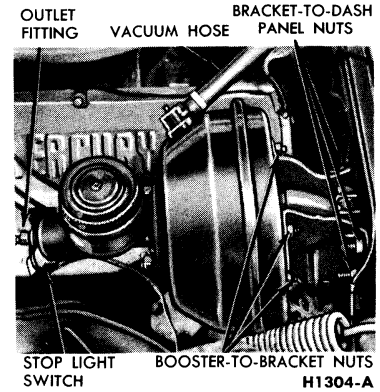


FIG. 14—Master Cylinder and Booster Installation

link boot, and connect the booster push rod link to the brake pedal assembly. To do this, lubricate the bushings with specified lubricant and install the bushings and the push rod link onto the pin that is integral with the pedal (Fig. 13). Secure the link to the pin with a C-washer.

5. Bleed the brake system.

BRAKE PEDAL—MANUAL SHIFT TRANSMISSION

REMOVAL

1. Back off the clutch pedal assist spring adjusting nut to the last few threads (Fig. 15).

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

3. Remove the clutch pedal bumper bracket from the pedal support bracket. Remove the assist spring adjusting nut, and disconnect the retainer and spring from the pedal support bracket.

4. Remove the C-washer and nylon bushings (Fig. 16), and disconnect the master cylinder push rod from the brake pedal assembly.

5. Remove the hairpin type retainer and spring 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. 16).

INSTALLATION

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

2. Position the brake pedal to the 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. 16).

3. Hook the clutch assist spring to its retainer, and connect the retainer to the pedal support bracket with the adjusting nut (Fig. 15).

4. Mount the clutch pedal bumper bracket to the pedal support bracket (Fig. 15). Adjust the bumper for clutch total travel.

5. Connect the clutch pedal-to-equalizer rod to the clutch pedal assembly with the bushing and hairpin tainer. Apply Lubriplate to the

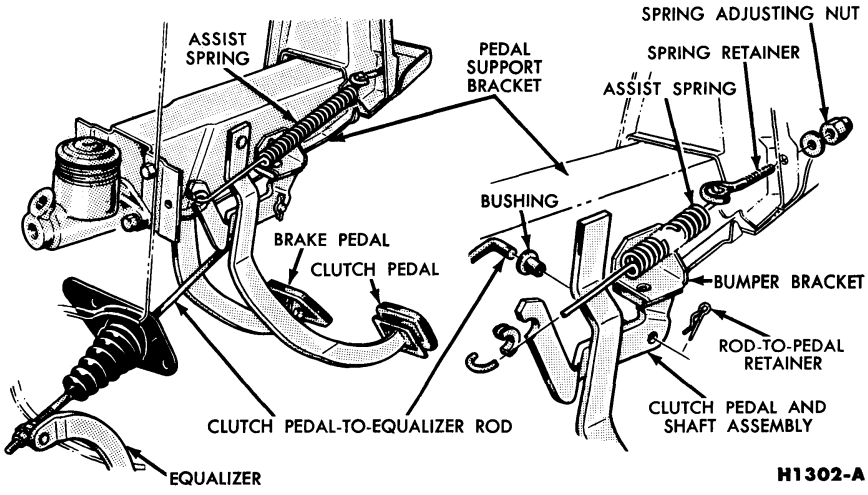


FIG. 15—Clutch and Brake Pedal Assembly

Fig. 15 by loosening or tightening the adjusting nut on the retainer at the pedal support bracket.

7. Connect the master cylinder push rod to the brake pedal assembly with a C-washer and nylon bushings (Fig. 16). Apply Lubriplate to the bushings.

BRAKE PEDAL—AUTOMATIC TRANSMISSION

REMOVAL

1. Remove the C-washer and nylon bushings, and disconnect the master cylinder push rod from the brake pedal assembly (Fig. 16).

2. Remove the hairpin type retainer and spring 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 Lubriplate to the bushings and locate all the bushings in their proper places on the pedal assembly and pedal support bracket (Fig. 16).

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 spring washer and retainer.

3. Connect the master cylinder push rod to the brake pedal assembly with a C-washer and nylon bushings (Fig. 16).

PARKING BRAKE PEDAL ASSEMBLY

REMOVAL

1. Remove the bolts that retain the parking brake control assembly to the dash side panel.

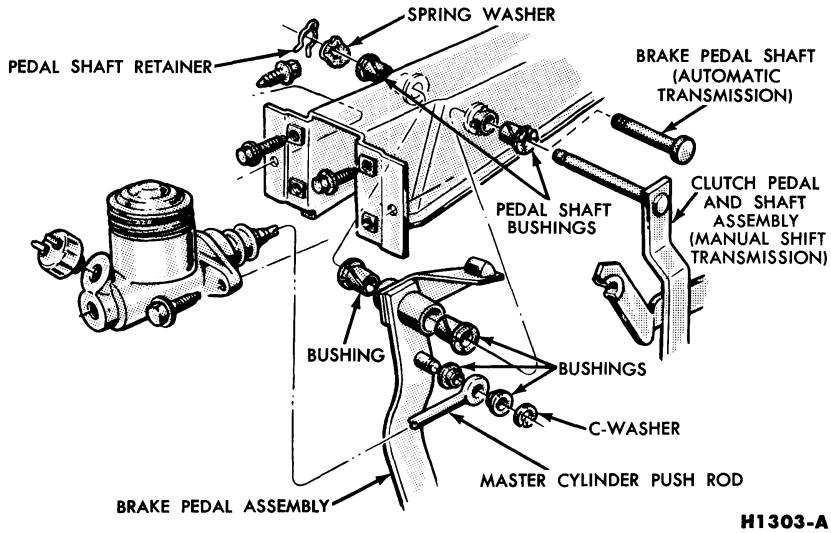


FIG. 16—Brake Pedal Removal and Installation

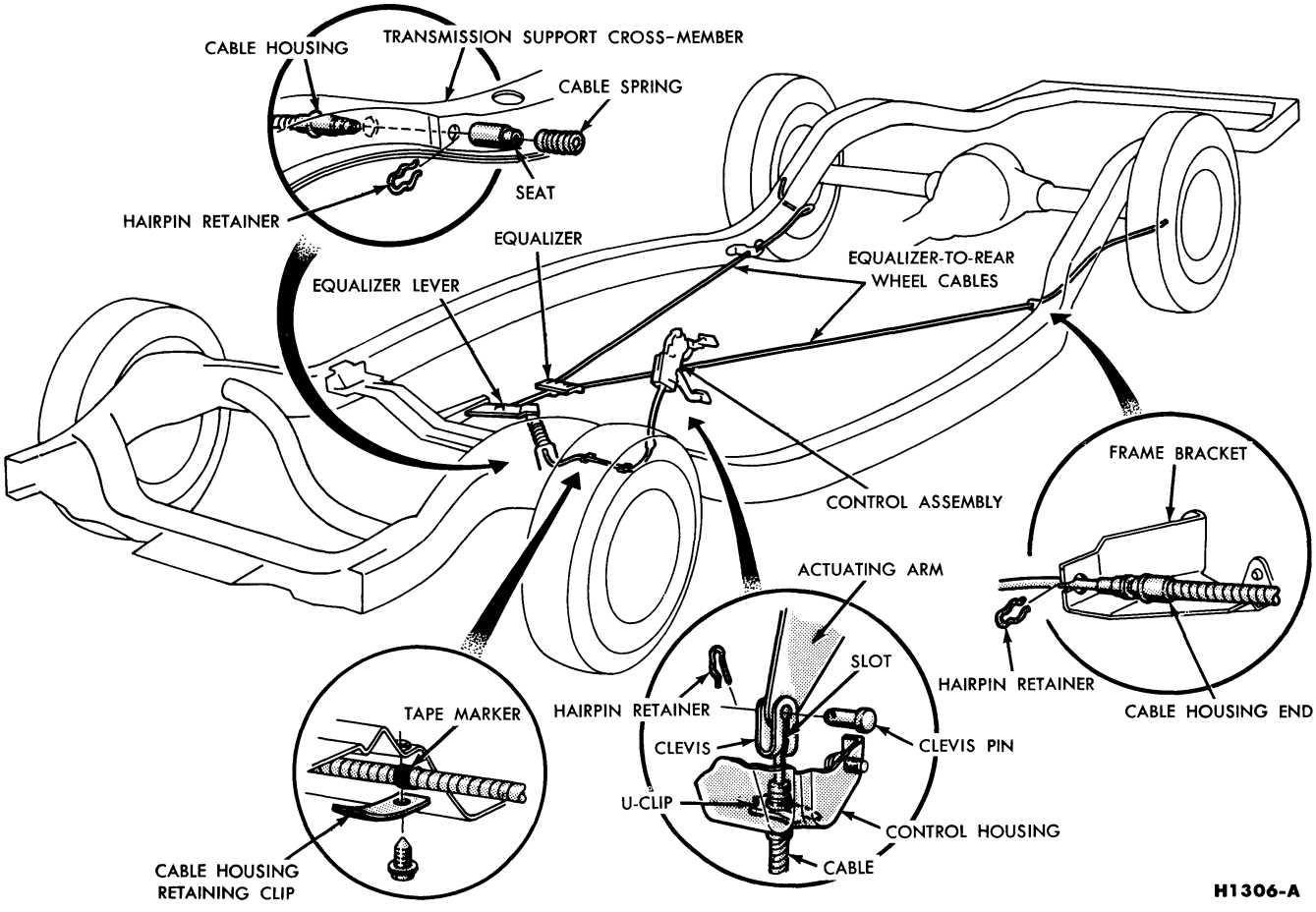


FIG. 17—Parking Brake System

2. Remove the U-clip that retains the cable housing to the parking brake control housing (Fig. 17).

3. Remove the hairpin retainer and clevis pin from the clevis. Disengage the clevis from the ball end of the cable, then remove the control assembly from the cable and housing.

INSTALLATION

1. Insert the parking brake cable and housing through the hole in the control housing and install the U-clip (Fig. 17).

2. Install the clevis over the ball on the end of the cable, and attach the clevis to the actuating arm by inserting the clevis pin. The head of the clevis pin must be assembled on the slotted side of the clevis as shown in Fig. 17. Secure the clevis by installing the hair pin retainer.

PARKING BRAKE EQUALIZER TO CONTROL CABLE

REMOVAL

1. Raise the car on a hoist. Move the parking brake equalizer lever forward far enough to permit removal of the half moon-type adjusting nut, then remove the adjusting nut from the end of the cable (Fig. 2, Part 2-1).

2. Remove the hairpin retainer from the cable housing at the transmission rear support crossmember. Remove the cable spring and seat (Fig. 17).

3. Remove the attaching screws and the two cable housing retaining clips at the underside of the floor pan (one retaining clip at each side of the frame side rail).

4. Pull the cable through the cross member and over the frame side rail, then lower the car.

5. Working inside the car, pull back the upper left hand corner of the floor mat. Remove the retaining bolts and the parking brake control assembly from the dash side panel.

6. Remove the U-clip that retains the cable housing to the parking brake control housing (Fig. 17).

7. Remove the hairpin retainer and clevis pin from the clevis. Rotate and remove the clevis, then remove the cable and housing from the control assembly.

8. Push the parking brake cable and grommet down through the floor pan.

INSTALLATION

1. Guide the lower end of the replacement cable and grommet down through the floor pan.

2. Position the upper end of the cable into the control housing assembly, and secure the cable housing with the U-clip (Fig. 17).

3. Install the clevis over the ball on the end of the cable, and attach the clevis to the actuating arm by inserting the clevis pin. The head of the clevis pin must be assembled on the slotted side of the clevis as shown. Secure the clevis by installing the hair pin retainer.

4. Position the parking brake

control assembly to the dash side panel and secure with the retaining bolts.

5. Raise the car on a hoist. Route the cable over the frame side rail and through the cross member.

6. Secure the cable housing to the frame side rail by installing two retaining clips, one on each side of the side rail. Position the cable assembly so that the tape marker is located at the in-board clip.

7. Secure the cable housing to the rear side of the transmission rear support cross member by installing the hairpin retainer (Fig. 17). Install the spring seat and cable spring on the cable.

8. Assemble the rear end of the cable to the equalizer lever, and install the half moon-type adjusting nut on the end of the cable.

9. Adjust the parking brake linkage as outlined in Part 2-1, Section 2, and check the operation.

PARKING BRAKE EQUALIZER TO REAR WHEEL CABLE

REMOVAL

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

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

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

4. Remove the hair pin retainer that holds the cable housing to the frame bracket and pull the cable and housing out of the bracket (Fig. 17).

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

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

INSTALLATION

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

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

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

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

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

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

4 MAJOR REPAIR OPERATIONS

BRAKE DRUM REFINISHING

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

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

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

BRAKE SHOE RELINING

Brake linings that are worn to within 1/32 inch of the rivet or have been saturated with grease or oil should be replaced. Failure to re- worn linings will result in a

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

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

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

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

4. Check the clearance between the shoe and lining. The lining must seat tightly against the shoe with not more than 0.005-inch clearance between any two rivets.

MASTER CYLINDER

DISASSEMBLY

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

2. Remove the stop light switch and the brake line fitting from the forward end of the cylinder (Figs. 18 and 19).

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

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

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

CLEANING, INSPECTION, AND REPAIR

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

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

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

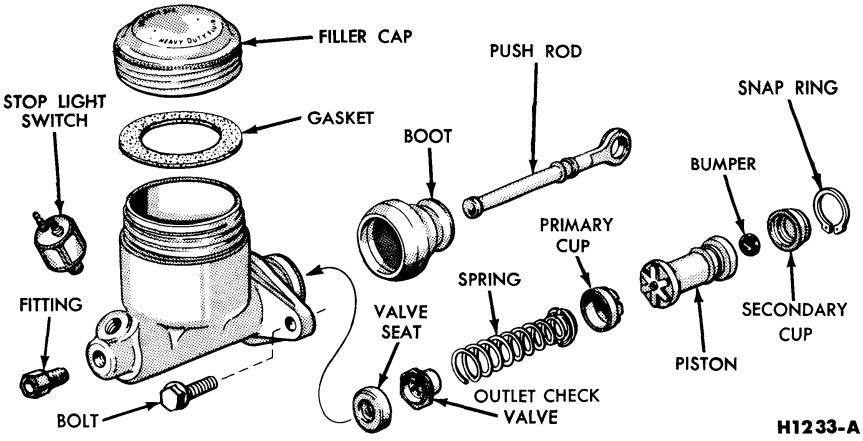


FIG. 18—Master Cylinder with Standard Brake System

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

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

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

ASSEMBLY

1. Dip all parts except the master cylinder body in clean FoMoCo **heavy-duty brake fluid.**

2. Install the brake line fitting and the stop light switch 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. 18).

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

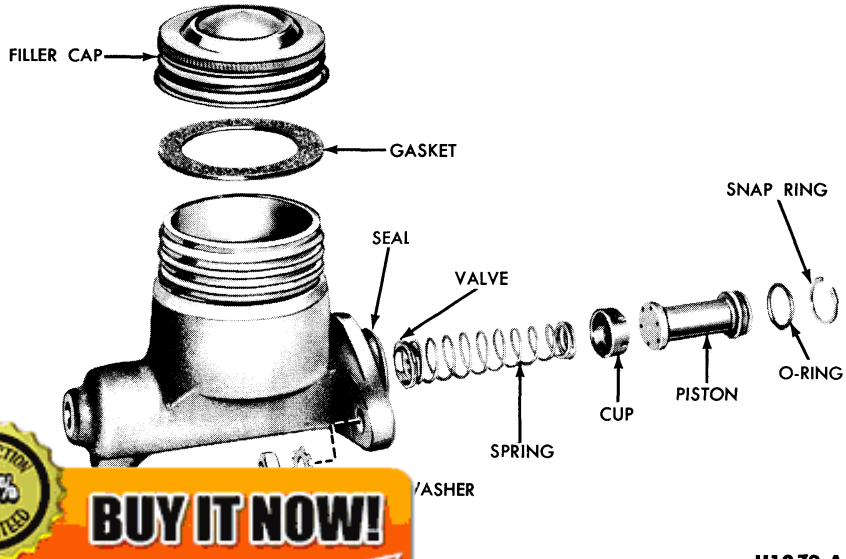
4. Install the snap ring in the back of the bore (Fig. 20).

DISASSEMBLY OF BOOSTER

REMOVAL OF EXTERNAL PARTS

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

2. Remove the filter cover and hub and the air filter from the booster body (Fig. 6, Part 2-1).



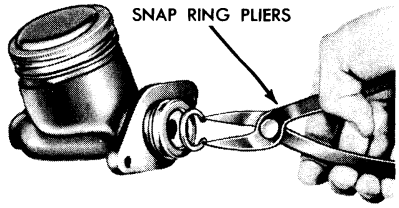


FIG. 20—Removing Snap Ring from Master Cylinder

3. Remove the vacuum manifold and check valve assembly and the rubber grommet from the booster body (Fig. 6, Part 2-1).

4. Disconnect the valve operating rod from the lever assembly by removing the retainer clip and connecting pin (Fig. 6, Part 2-1).

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

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

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

SEPARATION OF MAJOR COMPONENTS

1. Remove the large C-ring that retains the rear seal adapter assembly to the booster end plate (Fig. 6, Part 2-1).

2. Scribe a line across the booster body and end plate to facilitate proper alignment at reassembly. Remove the booster body-to-end plate retaining screws, tap the outside of the end plate with a fibre hammer, and separate the end plate from the booster body, leaving the rear seal and adapter assembly on the control valve hub.

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

4. Remove the outer O-ring from the rear seal adapter assembly (Fig. 6, Part 2-1).

DISASSEMBLY OF BELLOWS, PUSH ROD AND VALVE ASSEMBLY FROM DIAPHRAGM

1. Remove the large bellows retaining ring, bellows, bellows retainer and support ring from the diaphragm and valve assembly (Fig. 22).

2. Remove the retainer and support ring from the bellows (Fig. 6, Part 2-1).

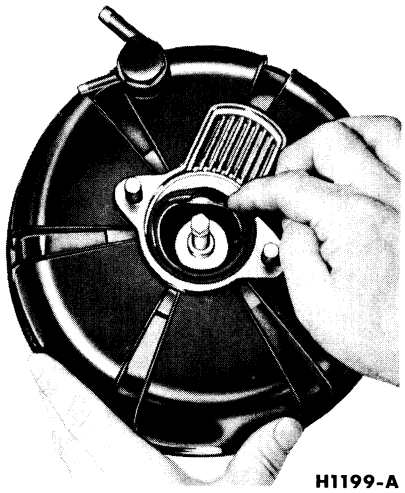

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FIG. 21—Separation of Bellows, Control Valve, and Diaphragm Assembly from Booster Body

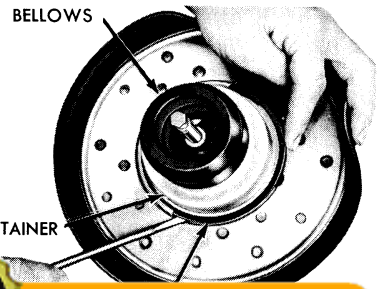
3. Remove the push rod assembly, the reaction lever and ring from the control valve hub (Fig. 23).

4. Remove the retainer, the cushion ring and the reaction cone from the push rod assembly, and disassemble the reaction levers from the rings (Fig. 23). Also see Fig. 6, Part 2-1.

5. Remove the 2 plastic plunger guides from the control valve plunger, then remove the retainer that holds the reaction load ring, return spring, and atmospheric valve to the control valve hub (Fig. 23).

6. Slide the reaction load ring, the return spring and the atmospheric valve from the control valve hub (Figs. 23 and 24).

7. Separate the control valve hub and the control valve plunger assembly from the diaphragm by sliding the valve plunger and rear seal adapter from the rear of the valve hub (Fig. 24). Remove the hub outer O-ring from the front side of the diaphragm.



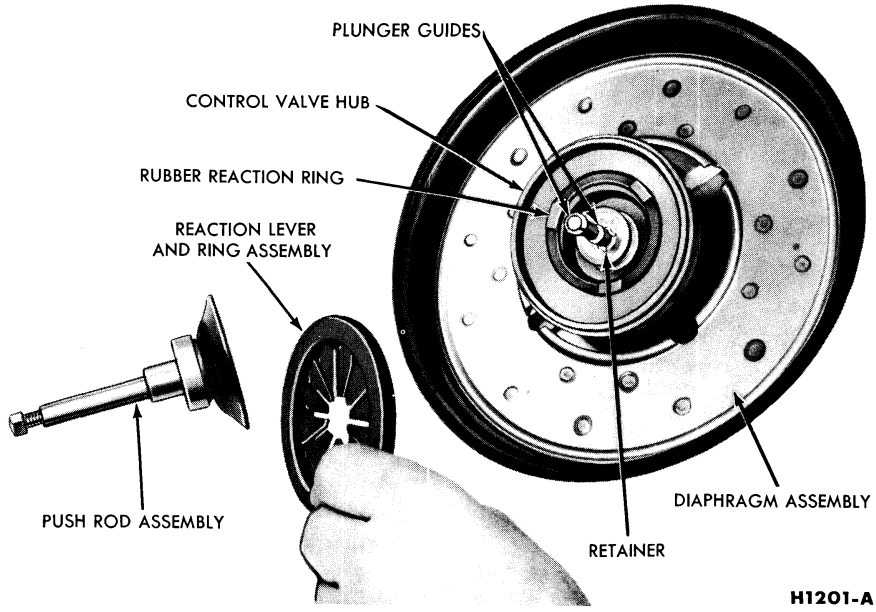


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FIG. 23—Assembly of Reaction Components and Push Rod to Valve Hub

DISASSEMBLY OF CONTROL VALVE PLUNGER

1. Remove the hub rear seal adapter from the valve plunger assembly, and remove the seal from the adapter.

2. Remove the O-rings, the seal, and the fibre gasket from the valve plunger (Fig. 25).

3. Do not remove the valve operating rod from the control valve plunger unless the plunger assembly or the rod is to be replaced. To remove, hold the rod firmly and force the plunger off the rod, breaking the plastic retainer. Remove all the broken pieces of the plastic retainer from the groove in the plunger, if the plunger is to be used again with a replacement rod.

ASSEMBLY OF BOOSTER

ASSEMBLY OF CONTROL VALVE PLUNGER

1. If the valve operating rod was removed from the plunger, assemble a new plastic retainer to the end of the rod (Fig. 6, Part 2-1). Insert the rod into the plunger so that the retainer engages the groove in the

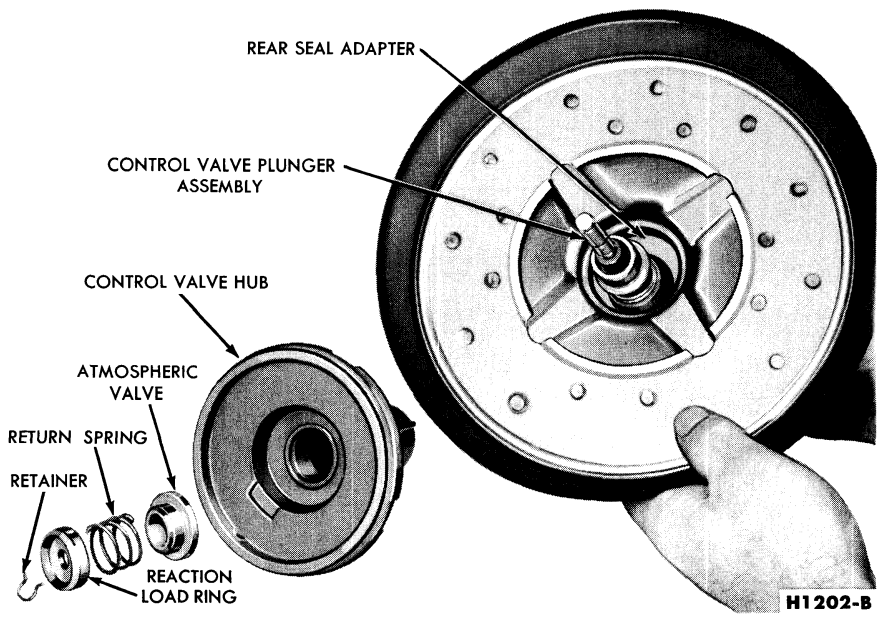

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FIG. 24—Disassembly of Control Valve Components from Diaphragm

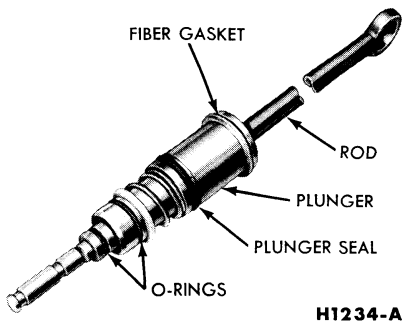


FIG. 25—Valve Operating Rod and Plunger Assembly

plunger.

2. Install the fibre gasket, the plunger seal, and the O-rings to the valve plunger assembly (Fig. 25).

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

1. Insert the control valve plunger into the control valve hub from the rear of the hub (Fig. 26).

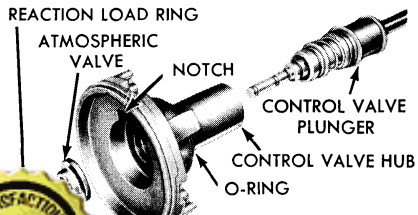
2. Assemble the atmospheric valve, the return spring and the reaction load ring to the valve plunger and hub.

3. Push the control valve plunger assembly forward and the reaction load ring backward against the return spring in order to install the retainer in the groove of the plunger.

4. Install the O-ring in the groove on the outer circumference of the valve hub. Assemble the valve plunger and hub assembly to the diaphragm so that the operating rod and the small-diameter end of the hub enter the front side of the diaphragm and protrude from the rear side.

5. Install the two plastic plunger guides in their grooves on the valve plunger assembly (Fig. 23).

6. Install the rubber reaction ring in the valve hub so that the ring locating knob indexes in the notch in the hub (Fig. 26), with the ring tips toward the front (Fig. 23).



7. Assemble the reaction lever and ring assembly, then install the assembly in the valve hub (Fig. 23).

8. Assemble the reaction cone and cushion ring to the push rod, and secure to the rod with the retainer (Fig. 6, Part 2-1). Install the push rod assembly to the valve hub so that the valve plunger indexes in the push rod (Fig. 23).

9. Assemble the bellows, retainer, and support ring (Fig. 6, Part 2-1). The support ring is positioned on the middle fold of the bellows.

10. Position the bellows assembly and secure it to the diaphragm by installing the retaining ring (Fig. 22). **Make sure that the retaining ring is fully seated.**

ASSEMBLY OF MAJOR COMPONENTS

1. With a screw driver, slightly move the booster body retaining screw tapping channel in order to provide a new surface for the self-tapping attaching screws (Fig. 6, Part 2-1).

2. Install the diaphragm, the control valve components, and the bellows as an assembly to the booster body. **Make sure that the lip of the diaphragm is evenly positioned on the retaining radius of the booster body.**

3. Install the O-ring in the front side of the end plate.

4. Install the valve hub rear seal in the adapter assembly with the sealing lip toward the rear, then install the adapter assembly into the front side of the end plate with the small diameter end of the adapter protruding from the rear side of the end plate (Fig. 27).

5. Install the large C-ring to the rear seal adapter at the rear side of the end plate (Fig. 27).

6. Position the end plate to the booster body. Align the scribe lines, compress the two assemblies together with a clamp, then install the attaching screws.

7. Pull the front lip of the bellows through the booster body, and position it around the outer groove of the booster body (Fig. 27).

8. Adjust the push rod as outlined in Part 2-1, Section 2.

INSTALLATION OF EXTERNAL PARTS

1. Install the rubber boot to the valve operating rod (Fig. 6, Part 2-1).

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

3. Connect the lever assembly to the lower end of the mounting brackets with the pivot pin. Install the retainer clip.

4. Connect the valve operating rod to the upper end of the lever with the connecting pin and clip.

5. Install the rubber grommet in the vacuum port in the booster body. The large diameter side of the grommet should be to the outside of the booster. Force the vacuum manifold and check valve assembly through the grommet. **Do not push the grommet into the vacuum chamber.**

6. Install the following parts to the booster body in the order indicated: first the air filter; then the filter cover and hub; and finally the brake master cylinder. Torque the master cylinder mounting nuts to specification.

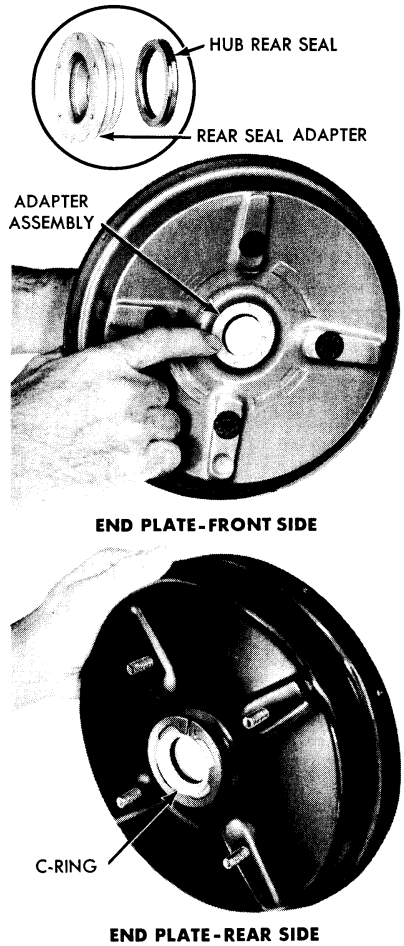


FIG. 27—Installation of Hub Rear Seal and Adapter Assembly

PART 2-3 SPECIFICATIONS

DIMENSIONS—INCHES

Model		Drum Inside Diameter	Drum Maximum Boring Limit	Lining Length		Lining Width		Wheel Cylinder Bore Diameter	Master Cylinder Bore Diameter
				Primary	Secondary	Primary	Secondary		
Sedan	Front	11.030	11.090	9.34	12.12	2½	2½	1 3/32	Standard 1.000
	Rear							⅞*	
Station Wagon, Police Interceptor, and Taxi	Front					3	3	1 3/32	Power 0.875
	Rear					2½	2½	15/16 ⅞*	

*For Taxi, (Max. Wear) only

BRAKE CHECKS AND ADJUSTMENTS

Type of Check or Adjustment	Specification	
Brake Shoe Repair	Drum Diameter	Brake Lining Required
	11.030-11.060 inch	Standard
	11.060-11.090 inch	Oversize
	Maximum Brake Lining Clearance (Midway between Rivets)—0.005 inch	
	Maximum Lining Wear Limit (From Top of Rivets)—1/32 inch	
Master Cylinder	Hydraulic Master Cylinder Bore Maximum Honed Diameter (1.003 inch stand.) (0.878 Power)	
Power Unit	Push-Rod Adjustment—0.995-1.005 inch	
Drum Out of Round	Refinish if Total Indicator Run-Out Exceeds 0.007 inch	
Self Adjustment Cable Length	End of Cable Anchor to End of Cable Hook—11⅛ inch ± 1/64	

TORQUE LIMITS

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

FRONT BRAKES

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

TORQUE LIMITS (Cont.)

REAR BRAKES

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

POWER BRAKES

Master Cylinder to Booster Body	10-13
Brake Booster to Pedal Support Bracket	15-25

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

SUSPENSION, STEERING WHEELS AND TIRES — GROUP 3

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

1 DIAGNOSIS AND TESTING

MANUAL STEERING

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

POWER STEERING

PRELIMINARY TESTS

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

Check Pump Belt. If the pump belt is broken, glazed, or worn, replace it with a new belt. **Use only the specified type of belt.**

Check the belt tension. If the belt is too loose or too tight, it should be adjusted to the proper tension. The following procedure is for necessary ment.

1. Check the power steering belt tension, using tool T62L-8620-A. See Part 3-6 for specified tension on new and on used belts.

2. If necessary, loosen the power steering pump bracket adjusting bolt and the pivot bolt.

3. Increase or decrease tension as required by adjusting the pump position.

4. Torque the adjusting bolt and the pivot bolt to specification, and check the power steering belt tension.

Check Fluid Level. Start the engine, turn the steering wheel all the way to the left and right several times, and shut off the engine.

Check the fluid level in the reservoir. If the level is low, add enough fluid (Part 3-4) to raise the level to a point ¼ inch from the top or to the F mark on the dip stick. **Do not overfill the reservoir.**

Check for Fluid Leaks

1. If the power steering fluid does not already include yellowish green dye, pre-mix one teaspoonful of oil-soluble aniline dye with 2 pints of automatic transmission fluid. Then refill the reservoir with the dye solution.

2. With the engine running at idle speed, turn the steering wheel from stop to stop several times to distribute the dye solution throughout the hydraulic system. Do not hold the wheel against each wheel stop more than 3 seconds.

3. Shut off the engine, and check for leaks.

FITTING AND TUBE SEAT LEAK INSPECTION. Since most fluid leaks occur at the fittings and connections in a power steering hydraulic system, these parts should be checked before any other part is replaced.

1. With the engine running at idle speed, raise the car on a hoist.

2. Clean the outside of the control valve and the power cylinder, the bottom surfaces of the pump, and all lines and fittings. Dirt, oil, and grease should be removed from all areas where leaks may exist.

3. Tighten all fittings, using a special 5-flat tube wrench. **Do not tighten the fittings with a standard open end wrench.** If a properly tightened fitting leaks, replace the seat.

PUMP, CONTROL VALVE, AND POWER CYLINDER LEAK INSPECTION. If the fittings and