1971

CAR SHOP MANUAL

VOLUME ONE
CHASSIS

Ford

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CONTINENTAL MARK III

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Ford SERVICE PUBLICATIONS

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FOREWORD

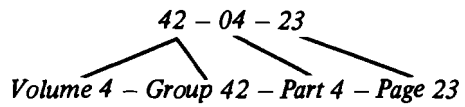
This manual is divided into five volumes: 1 – Chassis, 2 – Engine, 3 – Electrical, 4 – Body, 5 – Maintenance and Lubrication. These volumes should provide Service Technicians with complete information covering normal service repairs on all 1971 model passenger cars (except Pinto) built by the Ford Companies in the U.S. and Canada. Service procedures for the Pinto are covered in the Pinto Car Shop Manual. As changes in the product occur, this information will be updated by Technical Service Bulletins. When issued, TSB information always supersedes that published herein.

Within each volume, information is grouped by system or component plus "General Service" parts which contain information which is common to several similar components.

The table of contents on the first page of each volume indicates the general content of the book and provides a handy tab locater to make it easy to find the first page of each "Group". That page will contain an index to "Parts" and the first page of each "Part" contains a detailed index which gives page location for each service operation covered. Page numbers are consecutive in each "Part".

To make reference easier, information has been broken down into smaller units so that essentially there is now one "Part" for each component or system. Group numbers indicate the volume in which the group may be found.

Indicates:



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Ford SERVICE PUBLICATIONS

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5006
May 1996

Identification Codes

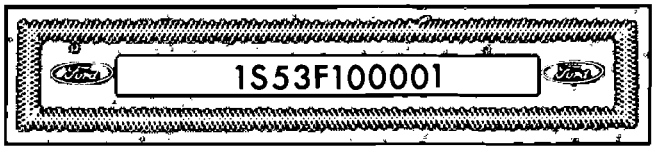
GROUP 10

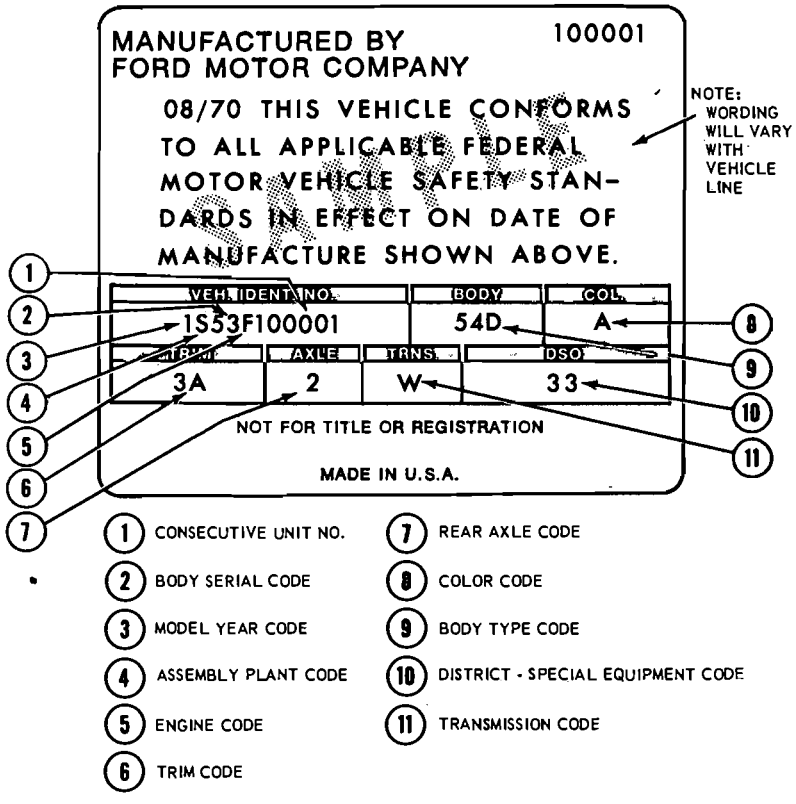
OFFICIAL VEHICLE IDENTIFICATION NUMBER

The official Vehicle Identification Number (VIN) (Fig. 1) for title and registration purposes is stamped on a metal tab that is fastened to the instrument panel close to the windshield on the driver's side of the car and is visible from outside.

VEHICLE CERTIFICATION LABEL

The Vehicle Certification Label (V.C. Label) is attached to the rear face of the driver's door. The upper half of the label contains the name of the manufacturer, the month and year of manufacture and the certification statement. The V.C. label also contains the Vehicle Identification Number.





Y 1298-A

FIG. 1 Vehicle Identification Labels

ASSEMBLY PLANT CODES

Code Letter	
A	Atlanta
B	Oakville (Canada)
E	Mahwah
F	Dearborn
G	Chicago
H	Lorain
J	Los Angeles
K	Kansas City
N	Norfolk
P	Twin Cities
R	San Jose
S	Allen Park
T	Metuchen
U	Louisville
W	Wayne
X	St. Thomas
Y	Wixom
Z	St. Louis

CY1299-B

Assy Plant Codes

This number is also used for Warranty identification of the vehicle. The first number indicates the model year. The letter following the model year number indicates the manufacturing assembly plant. The next two numbers designate the Body Serial Code followed by a letter expressing the Engine Code. The last six digits of the Vehicle Identification Number indicate the Consecutive Unit Number.

The remaining information on the V.C. Label consists of pertinent vehicle identification codes. The BODY code is two numerals and a letter identifying the body style. The COL (color) code is a number or letter (or both) indicating the exterior paint color code. The TRIM code consists of a number-letter combination designating the interior trim. The Axle code is a number or letter indicating the rear axle ratio and standard or locking type axles. The TRNS. code is a number or letter indicating the type of transmission, numerals for manual and letters for automatic. The DSO code consisting of two numbers designates the district in which the car was ordered and may appear in conjunction with a Domestic Special Order or Foreign Special Order number when applicable. Ford of Canada DSO codes consist of a letter and a number.

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

ENGINE CODES

Code	No. of Cyls.	Displacement
U	6	170 CID
T	6	200 CID-1V
2①	6	200 CID-1V
L	6	250 CID-1V
3①	6	250 CID-1V
V	6	240 CID-1V
B	6	240 CID-1V (Police)
E	6	240 CID-1V (Taxi)
F	8	302 CID-2V
6①	8	302 CID-2V
D	8	302 CID-2V (Taxi)
G	8	302 CID-4V (Boss)
H	8	351 CID-2V
M	8	351 CID-4V
Q	8	351 CID-4V GT
Y	8	390 CID-2V
S	8	400 CID-2V
K	8	429 CID-2V
N	8	429 CID-4V
C	8	429 CID-4V CJ
J	8	429 CID-4V CJ Ram-Air
P	8	429 CID-4V Police
A	8	460 CID-4V

①Low Compression Export

TRANSMISSION CODES

Code	Type
1	3-Speed Manual
5	4-Speed Manual—wide ratio
6	4-Speed Manual—close ratio
W	Automatic (C4)
U	Automatic (C6)
X	Automatic (FMX)
Z	Automatic (C6 Special)

REAR AXLE RATIO CODES

Conventional	Lock	Ratio
2	K	2.75:1
3	—	2.79:1
4	M	2.80:1
6	O	3.00:1
9	R	3.25:1
A	S	3.50:1
B	—	3.07:1
—	V	3.91:1
—	Y	4.11:1

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.

LINCOLN-MERCURY

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

FORD

Code	District
11	Boston
13	New York
15	Newark
16	Philadelphia
17	Washington
21	Atlanta
22	Charlotte
24	Jacksonville
25	Richmond
28	Louisville
32	Cleveland
33	Detroit
35	Lansing
37	Buffalo
38	Pittsburgh
41	Chicago
43	Milwaukee
44	Twin Cities
46	Indianapolis
47	Cincinnati
51	Denver
53	Kansas City
54	Omaha
55	St. Louis
56	Davenport
61	Dallas
62	Houston
63	Memphis
64	New Orleans
65	Oklahoma City
71	Los Angeles
72	San Jose
73	Salt Lake City
74	Seattle
75	Phoenix
83	Government
84	Home Office Reserve
85	American Red Cross
87	Body Company
89	Transportation Services
90-99	Export

FORD OF CANADA

Mercury Code	Region	Ford Code
A1	Central	B1
A2	Eastern	B2
A3	Atlantic	B3
A4	Midwestern	B4
A6	Western	B6
A7	Pacific	B7
I2	Export	I2

EXTERIOR PAINT COLOR CODES

Code	M-32-J Number	Color
A	1724-A	Black
M	1619-A	White
1	1730-A	Calypso Coral
T	2008-A	Red
3	3560-A	Bright Red
B	3562-A	Maroon Met.
L	3318-A	Lt. Gray Met.
K	3346-A	Dk. Slat Gray Met.
N	921-A	Platinum
Q	3064-A	Med. Blue Met.
X	1903-A	Dk. Blue Met.
6	3077-A	Bright Blue Met.
J	3657-A	Grabber Blue
Y	3320-A	Bright Astra Blue Met.
F	3321-A	Med. Bright Aqua Met.
H	3472-A	Lt. Green
P	3462-A	Med. Green Met.
C	3542-A	Dk. Green Met.
Z	5002-A	Grabber Green Met.
G	3345-A	Dk. Vintage Green
I	5001-A	Bright Lime Green
8	3198-A	Lt. Gold
S	1736-A	Med. Gray Gold Met.
W	3341-A	Yellow
D	3470-A	Bright Yellow
O	3565-A	Lt. Goldenrod Yellow
E	3492-A	Med. Goldenrod Yellow
U	3659-A	Grabber Orange
2	5003-A	Med. Tan
V	3314-A	Lt. Pewter Met.
R	3342-A	Dk. Brown Met.
5	3564-A	Med. Ginger Met.

GLAMOUR PAINTS

49	5072-A	Med. Ivy Bronze Met.
79	5071-A	Med. Ginger Bronze Met.
E9	5069-A	Med. Ivy Bronze Met.
39	5008-A	Med. Ginger Bronze Met.
D9	5007-A	Med. Blue Met.
C9	5070-A	Med. Red Met.

BODY SERIAL AND STYLE CODES

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

Vehicle	Body Serial Code	Body Style Code	Body Type	Model
TORINO	27	54A	4-Dr. Sedan	Torino
	25	65A	2-Dr. Hardtop	
	34	63C	2-Dr. Hardtop–Sportsroof	Torino 500
	30	65C	2-Dr. Hardtop	
	31	54C	4-Dr. Sedan	
	32	57C	4-Dr. Hardtop	
	36	57E	2-Dr. Hardtop-Formal	Torino Brougham
	33	65E	4-Dr. Hardtop	
	35	63F	2-Dr. Hardtop–Sportsroof	Torino GT
	37	76F	Convertible	
	38	63H	2-Dr. Hardtop–Sportsroof	Cobra
	40	71D	Torino	Station Wagons-4 Dr.
	42	71C	Torino 500	
	43	71E	Torino Squire (Brougham)	
	46	66A	Ranchero	Ranchero
	47	66B	Ranchero 500	
	48	66C	Ranchero GT	
	49	66E	Ranchero Squire	
COMET	30	54B	4-Dr. Sedan	Standard
	31	62B	2-Dr. Sedan	
COUGAR	91	65D	2-Dr. Hardtop④	Standard
	92	76D	Convertible	
	93	65F	2-Dr. Hardtop	XR-7 Luxury
	94	76F	Convertible	
FORD	51	54B	4-Dr. Sedan	Custom
	52	65D	2-Dr. Hardtop (Canada Only)	Custom 500
	53	54D	4-Dr. Sedan	Custom 500
	54	54F	4-Dr. Sedan	Galaxie 500
	58	65F	2-Dr. Hardtop	
	56	57F	4-Dr. Hardtop	
	61	76H	Convertible	LTD
	64	57H	4-Dr. Hardtop	
	62	65H	2-Dr. Hardtop	
	63	53H	4-Dr. Hardtop Sedan	
	66	53K	4-Dr. Hardtop Sedan	LTD Brougham
	67	57K	4-Dr. Hardtop	
	68	65K	2-Dr. Hardtop	
	70	71B	4-Dr. Wagon	Custom Ranch
	72	71D	4-Dr. Wagon	Custom 500 Ranch①
	74	71F	4-Dr. Wagon	Country Sedan①
	76	71H	4-Dr. Wagon	Country Squire①
LINCOLN CONTINENTAL	82	53A	4-Dr. Sedan	
	81	65A	2-Dr. Hardtop	
MARK III	89	65A	2-Dr. Hardtop	
MAVERICK	91	62A	2-Dr. Sedan	Standard
	92	54A	4-Dr. Sedan	
	93	62D	2-Dr. Sport Sedan	Grabber
MERCURY	44	53B	4-Dr. Sedan	Monterey
	46	65B	2-Dr. Hardtop	
MERCURY	48	57B	4-Dr. Hardtop	
	54	53F	4-Dr. Sedan	Monterey–Custom
	56	65F	2-Dr. Hardtop	
	58	57F	4-Dr. Hardtop	
	63	53H	4-Dr. Hardtop Sedan	Marquis
	66	65H	2-Dr. Hardtop	
	68	57H	4-Dr. Hardtop	
	62	53K	4-Dr. Hardtop Sedan	Brougham
	64	65K	2-Dr. Hardtop	
	67	57K	4-Dr. Hardtop	
	72	71B	4-Dr. 6 Pass.①	Monterey Wagon
	74	71H	4-Dr. 6 Pass.①	Marquis
	76	71K	4-Dr. 6 Pass.①	Marquis Colony Park
MERCURY (CANADA ONLY)	40	53X	4-Dr. Hardtop Sedan	Marquis
	41	65X	2-Dr. Hardtop-Formal	
	42	57X	4-Dr. Hardtop	
METEOR (CANADA)	20	53B	4-Dr. Sedan	Rideau
	22	53D	4-Dr. Sedan	Rideau 500
	23	65D	2-Dr. Hardtop-Formal	
	25	53F	4-Dr. Sedan	Montcalm
	26	65F	2-Dr. Hardtop	
	27	57F	4-Dr. Hardtop	
	36	71D	Rideau 500-6 Pass.	Station Wagons-4 Dr.
	38	71F	Montcalm-6 Pass.	
MONTEGO	01	65A	2-Dr. Hardtop	Montego
	02	54A	4-Dr. Sedan	
	05	57B	4-Dr. Hardtop	Montego MX
	06	54B	4-Dr. Sedan	
	07	65B	2-Dr. Hardtop	
	10	54D	4-Dr. Sedan	Montego MX Brougham
	11	65D	2-Dr. Hardtop	
	12	57D	4-Dr. Hardtop	
	15	65F	2-Dr. Hardtop	Cyclone
	17	65G	2-Dr. Hardtop	Cyclone Spoiler
	16	65H	2-Dr. Hardtop	Cyclone GT
	08	71C	Montego MX	Station Wagons-4 Dr.
	18	71A	Montego MX Villager	
MUSTANG	01	65D	2-Dr. Hardtop	Standard
	02	63D	2-Dr. Sportsroof③	
	03	76D	Convertible	
	04	65F	2-Dr. Hardtop	Grande
	05	63R	2-Dr. Sportsroof	Mach I
THUNDERBIRD	83	65A	2-Dr. Hardtop③	
	83	65C	2-Dr. Hardtop	
	84	65B	2-Dr. Landau③	
	84	65D	2-Dr. Landau	
	87	57B	4-Dr. Landau③	
	87	57C	4-Dr. Landau	

① Also available w/Dual Face Rear Seats ② Also "BOSS" ③ Merchandised as options (Bucket seats) ④ Also "GT"

Body Serial and Style Codes

CY1302-A

INTERIOR TRIM CODES

Code	Trim Scheme
1A	Black Vinyl
1A	Black Cloth and Vinyl
1B	Med. Blue Vinyl
1B	Dk. Blue Cloth and Vinyl
1B	Med. Blue Cloth and Vinyl
1D	Dk. Red Vinyl
1D	Dk. Red Cloth and Vinyl
1E	Med. Vermilion Vinyl
1F	Med. Ginger Vinyl
1R	Med. Green Vinyl
1R	Med. Green Cloth and Vinyl
1R	Dk. Green Cloth and Vinyl
1W	White Vinyl
1Y	Lt. Gray Gold Vinyl
1Y	Lt. Gray Gold Cloth and Vinyl
1Z	Dk. Tobacco Cloth and Vinyl
2A	Black Cloth and Vinyl
2A	Black Vinyl
2A	Black Knit Vinyl
2B	Med. Blue Cloth and Vinyl
2B	Med. Blue Vinyl
2B	Dk. Blue Knit Vinyl
2D	Dk. Red Vinyl
2E	Med. Vermilion Cloth and Vinyl
2E	Med. Vermilion Vinyl
2F	Med. Ginger Cloth and Vinyl
2F	Med. Ginger Vinyl
2R	Med. Green Cloth and Vinyl
2R	Med. Green Vinyl
2R	Dk. Green Knit Vinyl
2W	White Vinyl
2W	White Knit Vinyl
2Y	Lt. Gray Gold Cloth and Vinyl
2Y	Lt. Gray Gold Vinyl
3A	Black Knit Vinyl
3A	Black Cloth and Vinyl
3B	Med. Blue Cloth and Vinyl
3B	Med. Blue Knit Vinyl
3B	Dk. Blue Cloth and Vinyl
3D	Dk. Red Cloth and Vinyl
3E	Med. Vermilion Cloth and Vinyl
3F	Med. Ginger Cloth and Vinyl
3F	Med. Ginger Knit Vinyl
3P	Med. Gray Cloth and Vinyl
3R	Dk. Green Cloth and Vinyl
3R	Med. Green Knit Vinyl
3R	Med. Green Cloth and Vinyl
3W	White Knit Vinyl
3Y	Lt. Gray Gold Cloth and Vinyl
4A	Black Cloth and Vinyl
4A	Black Knit Vinyl
4A	Black Vinyl
4A	Black Leather and Vinyl
4B	Med. Blue Cloth and Vinyl
4B	Med. Blue Vinyl
4B	Med. Blue Knit Vinyl
4B	Dk. Blue Knit Vinyl
4B	Dk. Blue Leather and Vinyl
4D	Dk. Red Vinyl
4D	Dk. Red Leather and Vinyl
4E	Med. Vermilion Cloth and Vinyl
4E	Med. Vermilion Knit Vinyl
4F	Med. Ginger Cloth and Vinyl
4F	Med. Ginger Vinyl
4F	Med. Ginger Leather and Vinyl
4K	Lt. Aqua Leather and Vinyl
4P	Med. Gray Leather and Vinyl
4R	Med. Green Cloth and Vinyl
4R	Med. Green Vinyl
4R	Dk. Green Knit Vinyl
4R	Dk. Green Leather and Vinyl
4W	White Vinyl
4W	White Knit Vinyl
4W	White Leather and Vinyl
4Y	Lt. Gray Gold Knit and Vinyl
4Y	Lt. Gray Gold Cloth and Vinyl
4Y	Lt. Gray Gold Vinyl
4Y	Lt. Gray Gold Leather and Vinyl
4Z	Dk. Tobacco Leather and Vinyl
5A	Black Knit Vinyl
5A	Black Cloth and Vinyl
5A	Black Vinyl
5B	Med. Blue Knit Vinyl
5B	Med. Blue Cloth and Vinyl
5B	Med. Blue Vinyl
5D	Dk. Red Knit Vinyl
5D	Dk. Red Cloth and Vinyl
5E	Med. Vermilion Knit Vinyl
5F	Med. Ginger Knit Vinyl
5F	Med. Ginger Cloth and Vinyl
5R	Med. Green Knit Vinyl
5R	Med. Green Cloth and Vinyl
5W	White Knit Vinyl
5Y	Lt. Gray Gold Knit Vinyl
5Y	Lt. Gray Gold Cloth and Vinyl
5Y	Lt. Gray Gold Vinyl
5Z	Dk. Tobacco Cloth and Vinyl
6A	Black Vinyl
6A	Black Cloth and Vinyl
6A	Black Leather and Vinyl
6B	Med. Blue Leather and Vinyl
6B	Med. Blue Vinyl
6D	Dk. Red Leather and Vinyl
6D	Dk. Red Vinyl
6E	Med. Vermilion Vinyl
6F	Med. Ginger Leather and Vinyl
6F	Med. Ginger Vinyl
6R	Med. Green Leather and Vinyl
6R	Med. Green Vinyl
6W	White Leather and Vinyl
6W	White Vinyl
6Y	Lt. Gray Gold Vinyl
7A	Black Cloth and Vinyl
7A	Black Vinyl
7A	Black Leather and Vinyl
7B	Med. Blue Cloth and Vinyl
7B	Med. Blue Vinyl
7B	Dk. Blue Leather and Vinyl
7D	Dk. Red Cloth and Vinyl
7D	Dk. Red Leather and Vinyl
7F	Med. Ginger Cloth and Vinyl
7F	Med. Ginger Vinyl
7R	Med. Green Cloth and Vinyl
7R	Med. Green Vinyl
7R	Dk. Green Leather and Vinyl
7W	White Leather and Vinyl
7Y	Lt. Gray Gold Cloth and Vinyl
8A	Black Cloth and Vinyl
8A	Black Knit Vinyl
8A	Black Leather and Vinyl
8B	Med. Blue Cloth and Vinyl
8B	Med. Blue Knit Vinyl
8D	Dk. Red Knit Vinyl
8D	Dk. Red Leather and Vinyl
8E	Med. Vermilion Cloth and Vinyl
8E	Med. Vermilion Knit Vinyl
8F	Med. Ginger Knit Vinyl
8F	Med. Ginger Leather and Vinyl
8R	Med. Green Knit Vinyl
8W	White Knit Vinyl
8Y	Lt. Gray Gold Cloth and Vinyl
9A	Black Vinyl
9A	Black Cloth and Vinyl
9B	Med. Blue Vinyl
9B	Med. Blue Cloth and Vinyl
9D	Dk. Red Cloth and Vinyl
9D	Dk. Red Vinyl
9E	Med. Vermilion Cloth and Vinyl
9E	Med. Vermilion Vinyl
9F	Med. Ginger Vinyl
9F	Med. Ginger Cloth and Vinyl
9R	Med. Green Vinyl
9R	Med. Green Cloth and Vinyl
9Y	Lt. Gray Gold Cloth and Vinyl
9Y	Lt. Gray Gold Vinyl
9Z	Dk. Tobacco Vinyl
AA	Black Cloth and Vinyl
AB	Dk. Blue Cloth and Vinyl
AD	Dk. Red Cloth and Vinyl
AE	Med. Vermilion Cloth and Vinyl
AF	Med. Ginger Cloth and Vinyl
AK	Lt. Aqua Cloth and Vinyl
AP	Med. Gray Cloth and Vinyl
AR	Dk. Green Cloth and Vinyl
AY	Lt. Gray Gold Cloth and Vinyl
BA	Black Cloth and Vinyl
BA	Black Knit Vinyl
BA	Black Vinyl
BB	Med. Blue Cloth and Vinyl
BB	Med. Blue Vinyl
BE	Med. Vermilion Cloth and Vinyl
BF	Med. Ginger Cloth and Vinyl
BF	Med. Ginger Knit Vinyl
BR	Med. Green Cloth and Vinyl
BR	Med. Green Knit Vinyl
BR	Med. Green Vinyl
BY	Lt. Gray Gold Vinyl
CA	Black Knit Vinyl
CA	Black Vinyl
CA	Black Cloth and Vinyl
CB	Med. Blue Knit Vinyl
CB	Med. Blue Vinyl
CB	Dk. Blue Cloth and Vinyl
CD	Dk. Red Vinyl
CD	Dk. Red Cloth and Vinyl
CE	Med. Vermilion Knit Vinyl
CF	Med. Ginger Knit Vinyl
CF	Med. Ginger Cloth and Vinyl
CF	Med. Ginger Vinyl
CR	Med. Green Knit Vinyl
CR	Med. Green Vinyl
CR	Dk. Green Cloth and Vinyl
CW	White Knit Vinyl
CY	Lt. Gray Gold Cloth and Vinyl
DA	Black Cloth and Vinyl
DB	Med. Blue Cloth and Vinyl
DD	Dk. Red Cloth and Vinyl
DE	Med. Vermilion Cloth and Vinyl
DF	Med. Ginger Cloth and Vinyl
DR	Med. Green Cloth and Vinyl
DY	Lt. Gray Gold Cloth and Vinyl
EA	Black Cloth and Vinyl
EB	Med. Blue Cloth and Vinyl
EB	Dk. Blue Cloth and Vinyl
ED	Dk. Red Cloth and Vinyl
EE	Med. Vermilion Cloth and Vinyl
EF	Med. Ginger Cloth and Vinyl
ER	Med. Green Cloth and Vinyl
ER	Dk. Green Cloth and Vinyl
EY	Dk. Gray Gold Cloth and Vinyl
EZ	Dk. Tobacco Cloth and Vinyl
FA	Black Vinyl
FA	Black Leather and Vinyl
FB	Med. Blue Vinyl
FD	Dk. Red Vinyl
FD	Dk. Red Leather and Vinyl
FF	Med. Ginger Vinyl
FR	Med. Green Vinyl
FW	White Vinyl
FY	Lt. Gray Gold Vinyl
FZ	Dk. Tobacco Leather and Vinyl
GA	Black Vinyl
GA	Black Knit Vinyl
GB	Med. Blue Vinyl
GD	Dk. Red Knit Vinyl
GE	Med. Vermilion Vinyl
GF	Med. Ginger Vinyl
GR	Med. Green Vinyl

CY-1304-A

INTERIOR TRIM CODES Cont'd.

Code	Trim Scheme
GW	White Knit Vinyl
HA	Black Cloth and Vinyl
HB	Med. Blue Cloth and Vinyl
HR	Med. Green Cloth and Vinyl
HY	Lt. Gray Gold Cloth and Vinyl
JA	Black Vinyl
JB	Med. Blue Vinyl
JE	Med. Vermilion Vinyl
JF	Med. Ginger Vinyl
JR	Med. Green Vinyl
JW	White Vinyl
JY	Lt. Gray Gold Vinyl
KA	Black Vinyl
KA	Black Knit Vinyl
KA	Black Cloth and Vinyl
KA	Black Leather and Vinyl
KB	Med. Blue Cloth and Vinyl
KB	Dk. Blue Leather and Vinyl
KD	Dk. Red Cloth and Vinyl
KD	Dk. Red Leather and Vinyl
KF	Med. Ginger Leather and Vinyl
KK	Lt. Aqua Leather and Vinyl
KP	Med. Gray Leather and Vinyl
KR	Dk. Green Leather and Vinyl
KR	Med. Green Cloth and Vinyl
KW	White Knit Vinyl
KW	White Leather and Vinyl
KY	Lt. Gray Gold Knit Vinyl
KY	Lt. Gray Gold Vinyl
KY	Lt. Gray Gold Cloth and Vinyl
KY	Lt. Gray Gold Leather and Vinyl
KZ	Dk. Tobacco Cloth and Vinyl
KZ	Dk. Tobacco Leather and Vinyl
LU	Lt. Beige Vinyl
MA	Black Knit Vinyl
MB	Med. Blue Knit Vinyl
NA	Black Knit Vinyl
PB	Med. Blue Cloth and Vinyl
PE	Med. Vermilion Cloth and Vinyl
PF	Med. Ginger Cloth and Vinyl
QA	Black Knit Vinyl
QF	Med. Ginger Knit Vinyl
QR	Med. Green Knit Vinyl
QW	White Knit Vinyl
RA	Black Knit Vinyl
RA	Black Vinyl
RA	Black Cloth and Vinyl
RB	Med. Blue Knit Vinyl
RB	Med. Blue Vinyl
RD	Dk. Red Cloth and Vinyl
RE	Med. Vermilion Knit Vinyl
RE	Med. Vermilion Vinyl
RF	Med. Ginger Knit Vinyl
RF	Med. Ginger Vinyl
RR	Med. Green Knit Vinyl
RW	White Knit Vinyl
TA	Black Knit Vinyl
TB	Med. Blue Knit Vinyl
TE	Med. Vermilion Knit Vinyl
TF	Med. Ginger Knit Vinyl
TR	Med. Green Knit Vinyl
UA	Black Knit Vinyl
UA	Black Vinyl
UB	Med. Blue Vinyl
UF	Med. Ginger Knit Vinyl
UR	Med. Green Knit Vinyl
UW	White Knit Vinyl
UY	Lt. Gray Gold Knit Vinyl
UY	Lt. Gray Gold Vinyl
VA	Black Knit Vinyl
VA	Black Cloth and Vinyl
VA	Black Vinyl
VB	Med. Blue Vinyl
VD	Dk. Red Cloth and Vinyl
VD	Dk. Red Vinyl
VF	Med. Ginger Vinyl
VR	Med. Green Vinyl
VY	Lt. Gray Gold Vinyl
VZ	Dk. Tobacco Vinyl
WA	Black Cloth and Vinyl
WA	Black Knit Vinyl
WA	Black Vinyl
WB	Med. Blue Cloth and Vinyl
WB	Med. Blue Vinyl
WD	Dk. Red Vinyl
WE	Med. Vermilion Cloth and Vinyl
WF	Med. Ginger Cloth and Vinyl
WF	Med. Ginger Vinyl
WR	Med. Green Cloth and Vinyl
WR	Med. Green Vinyl
WW	White Knit Vinyl
YA	Black Knit Vinyl
YB	Med. Blue Knit Vinyl
YE	Med. Vermilion Knit Vinyl
YF	Med. Ginger Knit Vinyl
YR	Med. Green Knit Vinyl
YW	White Knit Vinyl
ZA	Black Cloth and Vinyl
ZB	Med. Blue Cloth and Vinyl
ZD	Dk. Red Cloth and Vinyl
ZF	Med. Ginger Cloth and Vinyl
ZR	Med. Green Cloth and Vinyl
ZY	Lt. Gray Gold Cloth and Vinyl
ZZ	Dk. Tobacco Cloth and Vinyl

CY-1305-A

Interior Trim Codes Cont'd.

MODEL YEAR CODE

The number 1 designates 1971.

CONSECUTIVE UNIT NUMBERS—1971 Passenger cars

100,001—Ford, Torino, Mustang, Thunderbird, Maverick

500,001—Mercury, Meteor, Montego, Cougar, Comet

800,001—Lincoln Continental and Mark III

Wheels and Tires

GROUP 11

PART 11-01	PAGE	PART 11-10	PAGE
General Wheel and Tire Service	11-01-01	Wheel Hubs and Bearings—Front	11-10-01
PART 11-02		**PART 11-11**	
Wheels and Tires—Drop Center Rim	11-02-01	Wheel Hubs and Bearings—Rear	11-11-01

PART 11-01 General Wheel and Tire Service

Applies to All Models

COMPONENT INDEX	Page	COMPONENT INDEX	Page
FRONT WHEEL BEARING MAINTENANCE	11-01-01	WHEEL BALANCING	11-01-01
		WHEEL INSPECTION	11-01-01

3 ADJUSTMENTS

WHEEL BALANCING

See the instructions provided with the Rotunda Wheel Balancer.

Make certain that the brakes are not dragging before attempting to spin the wheels. On vehicles equipped with disc brakes, push the brake shoes into the caliper to free the rotor.

FRONT WHEEL BEARING MAINTENANCE

Wheel bearings are adjustable to correct for bearing and spindle shoulder wear. Satisfactory operation and long life of bearings depend on proper adjustment and correct lubrication. **If bearings are adjusted too tightly, they will overheat and wear rapidly. An adjustment that is excessively loose will cause pounding and contribute to uneven tire wear, steering difficulties and inefficient brakes.** The bearing adjustment should be checked at regular inspection intervals.

5 CLEANING AND INSPECTION

WHEEL INSPECTION

Wheel hub nuts should be inspected and tightened to specification at predelivery. Loose wheel hub nuts may cause shimmy and vibration. Elongated stud holes in the wheels may also result from loose hub nuts.

Keep the wheels and hubs clean. Stones wedged between the wheel and drum and lumps of mud or grease can unbalance a wheel and tire.

Check for damage that would affect the runout of the wheels. Wobble or shimmy caused by a damaged wheel will eventually damage the wheel bearings. Inspect the wheel rims for dents that could permit air to leak from the tires.

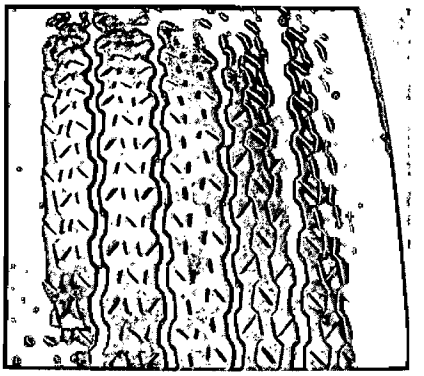
Front hubs and bearings should be cleaned, inspected and lubricated whenever the hubs are removed or at the mileage/time periods indicated in the maintenance schedule.

New hub grease seals should be installed when the hub is removed. An imperfect seal may permit bearing lubricant to reach the brake linings resulting in faulty brake operation and necessitating premature cleaning or replacement of linings.

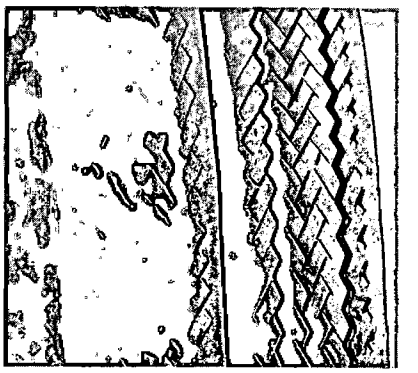
TIRE INSPECTION

Incorrect wheel alignment can cause tire wear. Abnormal or excessive tire wear can also be caused by wheel/tire unbalance or incorrect tire pressure. Typical tire wear patterns are shown in Fig. 1.

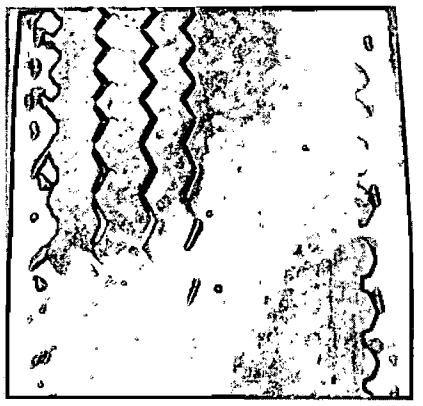
UNDERINFLATION



OVERINFLATION

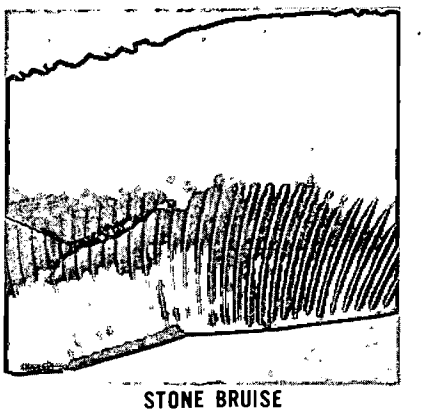


CUPPING—UNDERINFLATION AND/OR MECHANICAL IRREGULARITIES

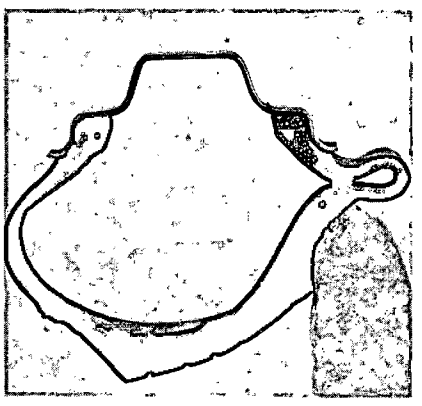


INCORRECT TOE-IN OR EXTREME CAMBER

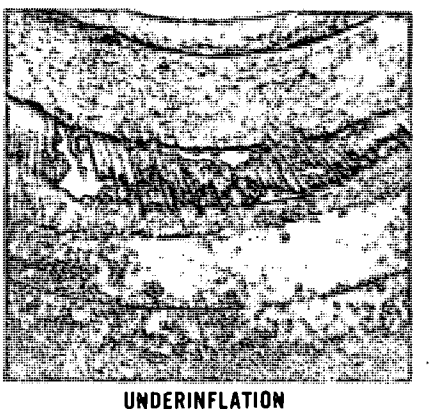
FEATHERING DUE TO MISALIEGNMENT OR SEVERE CORNERING



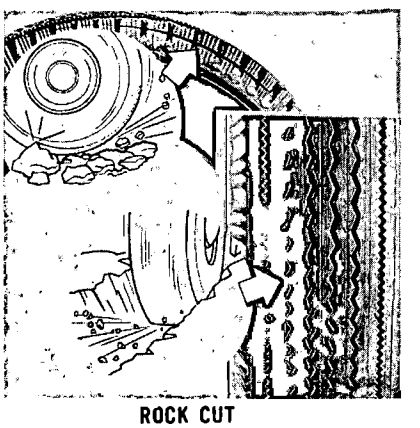
STONE BRUISE



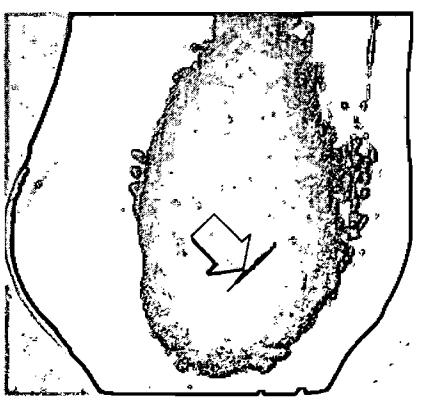
STONE BRUISE



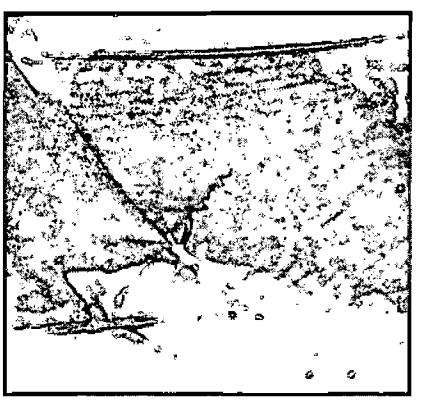
UNDERINFLATION



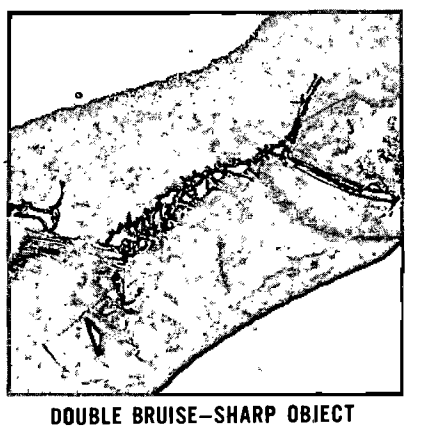
ROCK CUT



BRUISE



HEAT BRUISE



DOUBLE BRUISE—SHARP OBJECT AND RESULTING FATIGUE

F1467-C

FIG. 1 Tire Wear Conditions

PART 11-02 Wheels and Tires—Drop Center Rim

COMPONENT INDEX	Page	COMPONENT INDEX	Page
FRONT WHEEL ASSEMBLY		REAR WHEEL ASSEMBLY	
Description	11-02-01	Description	11-02-01
FRONT WHEEL BEARING		SPACE SAVER SPARE TIRE	
Adjustment	11-02-02	Description	11-02-01
HOISTING INSTRUCTIONS	11-02-02	WHEELS AND TIRES	
		Removal and Installation	11-02-03

1 DESCRIPTION

SPACE SAVER SPARE TIRE

A space saver spare tire is available as a regular production option on Mustang vehicles.

The Space Saver Spare is designed primarily to provide more room in the luggage compartment. The tire is installed on the wheel in a deflated condition and protrudes barely beyond the periphery of the wheel; thereby, leaving extra storage space. Although more storage space is available, the vehicle full rated load specification must not be exceeded. This tire is not designed for extended mileage; therefore, it should not be used as a permanent substitute for conventional tires. The Space Saver Spare will enable the driver to drive at normal speed and load to the nearest service facility for repairs to a flat tire.

To inflate, carefully follow the instructions shown on the tire inflator can which is stowed under the tire and wheel assembly in the trunk

Use FoMoCo Inflator C9WA-19F514-A or Equivalent. Tire warranty for the Space Saver Spare is the same as original equipment tires. This warranty is void if inflators with sealants are used.

While inflating, keep hands off of metal parts of the inflator since the bottle becomes extremely cold during discharge. Read the instructions on the bottle label. **Always dispose of the empty bottle. Do not puncture or incinerate.**

The inflator, when completely used, will inflate the tire within specifications.

The Space Saver Spare can, in case of a puncture, be repaired the same as an original equipment tire.

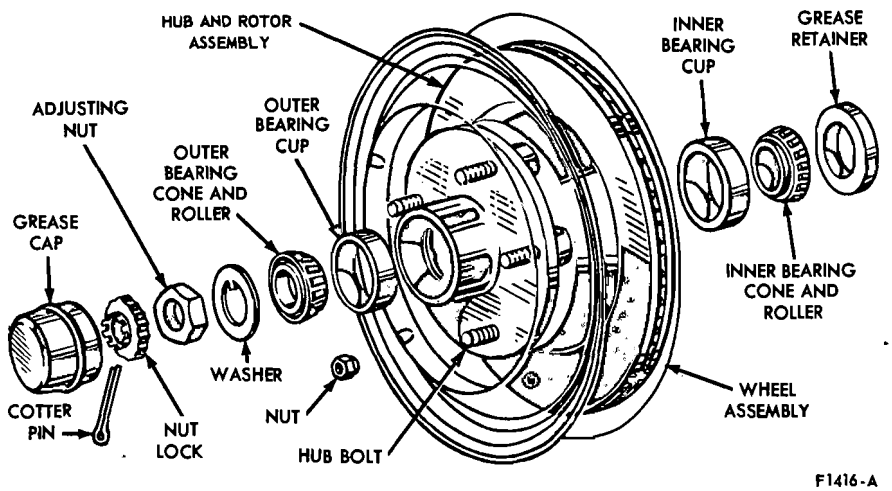


FIG. 2 Front Hub and Rotor Bearing and Grease Retainer Disc Brakes—Typical

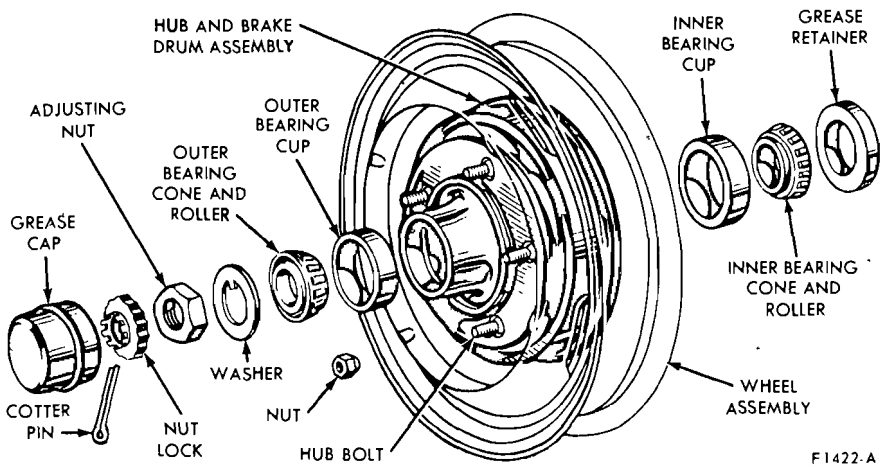


FIG. 1 Front Hub, Bearing and Grease Retainer Drum Brakes

FRONT WHEEL ASSEMBLY

Each front wheel and tire is bolted to its respective front hub and brake drum or rotor assembly. Two opposed tapered roller bearings are installed in each hub. A grease retainer is installed at the inner end of the hub to prevent lubricant from leaking into the drum or on the rotor. The entire assembly is retained to its spindle by the adjusting nut, nut lock and cotter pin (Figs. 1 and 2).

REAR WHEEL ASSEMBLY

The rear wheel hub and brake drum assembly is attached to studs on the rear axle shaft flange by three

speed nuts. The wheel and tire mounts on the same rear axle shaft flange studs and is held against the hub and drum by the wheel nuts. The rear wheel bearing is pressed onto the axle shaft just inside the shaft flange, and the entire assembly is retained to the rear axle housing by the bearing retainer plate which is bolted to the housing flange.

3 ADJUSTMENTS

HOISTING INSTRUCTIONS

Damage to steering linkage components and front suspension struts may occur if care is not exercised when positioning the hoist adapters of 2 post hoists prior to lifting the vehicle.

If a 2 post hoist is used to lift the vehicle, place the adapters under the lower arms or the No. 1 crossmember. Do not allow the adapters to contact steering linkage. If the adapters are placed under the crossmember, a piece of wood (2x4x16 inches) should be placed on the hoist channel between the adapters. This will prevent the adapters from damaging the fror suspension struts.

FRONT WHEEL BEARING ADJUSTMENT

The front wheel bearings should be adjusted if the wheel is loose on the spindle or if the wheel does not rotate freely. The following procedures will bring the bearing adjustment to specification.

Drum Brakes

1. Raise the vehicle until the wheel and tire clear the floor.
2. Pry off the hub cap or wheel cover and remove the grease cap (Fig. 1) from the hub.
3. Wipe the excess grease from the end of the spindle, and remove the cotter pin and nut lock.
4. While rotating the wheel, hub, and drum assembly, torque the adjusting nut to 17-25 ft-lbs to seat the bearings (Fig. 3).
5. Back off the adjusting nut one half turn. Retighten the adjusting nut to 10-15 in-lbs with a torque wrench or finger tight.
6. Position the nut lock on the adjusting nut so that the castellations on the lock are aligned with the cotter pin hole in the spindle, and install a new cotter pin. Bend the ends of the cotter pin around the castellated flange of the nut lock.
7. Check the front wheel rotation. If the wheel rotates properly, install the grease cap and the hub cap or wheel cover. If the wheel still rotates roughly or noisily, clean, inspect or replace the bearings and cups as required.

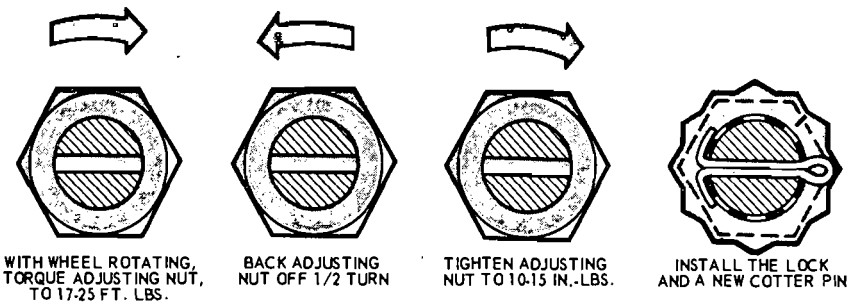


FIG. 3 Front Wheel Bearing Adjustment

Disc Brakes

1. Raise the vehicle until the wheel and tire clear the floor.
2. Pry off the wheel cover and remove the grease cap (Fig. 2) from the hub.
3. Wipe the excess grease from the end of the spindle, and remove the adjusting nut cotter pin and nut lock.
4. Loosen the bearing adjusting nut three turns. Then, rock the wheel, hub, and rotor assembly in and out several times to push the shoe and linings away from the rotor.
5. While rotating the wheel, hub, and rotor assembly, torque the adjusting nut to 17-25 ft-lbs to seat the bearings (Fig. 3).
6. Back the adjusting nut off one half turn. Retighten the adjust ing nut to 10-15 in-lbs with a torque wrench or finger tight.
7. Locate the nut lock on the adjusting nut so that the castellations on the lock are aligned with the cotter pin hole in the spindle.
8. Install a new cotter pin, and bend the ends of the cotter pin around the castellated flange of the nut lock.
9. Check the front wheel rotation. If the wheel rotates properly, install the grease cap and the hub cap or wheel cover. If the wheel still rotates roughly or noisily, clean or replace the bearings and cups as required.
10. Before driving the vehicle, pump the brake pedal several times to obtain normal brake lining to rotor clearance and restore normal brake pedal travel.

4 REMOVAL AND INSTALLATION

HOISTING INSTRUCTIONS

Damage to steering linkage components and front suspension struts may occur if care is not exercised when positioning the hoist adapters of 2 post hoists prior to lifting the vehicle.

If a 2 post hoist is used to lift the vehicle, place the adapters under the lower arms or the No. 1 crossmember. Do not allow the adapters to contact the steering linkage. If the adapters are placed under the crossmember, a piece

of wood (2x4x16 inches) should be placed on the hoist channel between the adapters. This will prevent the adapters from damaging the front suspension struts.

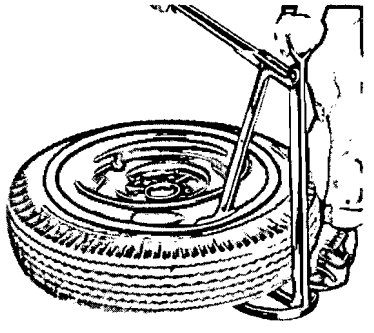
WHEELS AND TIRES

Wheel and Tire Removal

1. Pry off the wheel hub cap or wheel cover. Loosen but do not remove the wheel hub nuts.
2. Raise the vehicle until the wheel and tire clear the floor.
3. Remove the wheel hub nuts from the bolts, and pull the wheel and tire from hub and drum.

Wheel and Tire Installation

1. Clean all dirt from the hub and drum.
2. Position the wheel and tire on the hub and drum. Install the wheel hub nuts and tighten them alternately to draw the wheel evenly against the hub and drum.



F1424 A

FIG. 4 Loosening Tire Bead

3. Lower the vehicle to the floor, and torque the hub nuts to specification.

Removing Conventional Tire From Wheel

The tire can be demounted on a mounting machine. **Be sure that the outer side of the wheel is positioned downward.** If tire irons are used, follow the procedure given here.

1. Remove the valve cap and core, and deflate the tire completely.
2. With a bead loosening tool, break loose the tire side walls from the wheel (Fig. 4).
3. Position the outer side of the wheel downward, and insert two tire irons about eight inches apart between the tire inner bead and the back side of the wheel rim. **Use only tire irons with rounded edges or irons designed for removing tubeless tires.**
4. Leave one tire iron in position, and pry the rest of the bead over the rim with the other iron. Take small bites with the iron around the tire in order to avoid damaging the sealing surface of the tire bead.
5. Stand the wheel and tire upright with the tire outer bead in the drop center well at the bottom of the wheel. Insert the tire iron between the bead and the edge of the wheel rim and pry the wheel out of the tire.

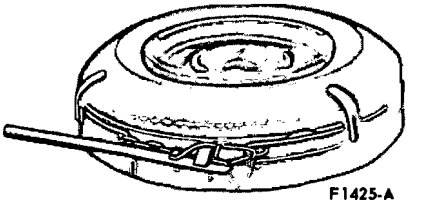
Mounting Conventional Tire To Wheel

1. If a used tire is being installed remove all dirt from the tire.

If a tire is being mounted to the original wheel, clean the rim with emery cloth or fine steel wool. Check the rim for dents.

If a new wheel is being installed, coat a new valve with RUGLYDE or similar rubber lubricant and position the valve to the new wheel. Use a rubber hammer or a valve replacing tool to seat the valve firmly against the inside of the rim.

2. Apply RUGLYDE or a similar rubber lubricant to the sealing surface on both tire beads. With the outer side of the wheel down, pry the beads over the wheel rim with two tire irons. **Do not use a hammer or mallet to force the beads over the rim.**
3. Align the balance mark on the tire with the valve on the wheel.
4. Hold the beads against the rim flanges by positioning a tire mounting band over the tire (Fig. 5). If a mounting band is not available, tie a tourniquet of heavy cord around the circumference and in the center of the tire. Tighten the cord with a tire iron. Center the tire on the wheel with a rubber mallet.
5. Give the tire a few quick bursts of air to seat the beads properly, then inflate the tire to 40 psi pressure. Check to see that the bead positioning rings (outer rings near the side walls) are evenly visible just above the rim flanges all the way around the tire. If the rings are not even, deflate the tire completely and inflate it again.
6. When the rings are properly positioned, deflate the tire to the recommended pressure.



F1425-A

FIG. 5 Tubeless Tire Mounting Band

PART 11-10 *Wheel Hubs and Bearings—Front*

Applies to All Models

COMPONENT INDEX	Page	COMPONENT INDEX	Page
FRONT HUB AND DRUM ASSEMBLY		FRONT WHEEL GREASE SEAL	
Removal and Installation	11-10-03	Removal and Installation	11-10-01
FRONT HUB AND ROTOR ASSEMBLY		HOISTING INSTRUCTIONS	11-10-01
Removal and Installation	11-10-03	SPECIAL TOOLS	11-10-04
FRONT WHEEL ASSEMBLY			
Description	11-10-01		

1 DESCRIPTION

FRONT WHEEL ASSEMBLY

Each front wheel and tire is bolted to its respective front hub and brake drum or rotor assembly. Two opposed tapered roller bearings are installed in each hub. A grease retainer is installed at the inner end of the hub to prevent lubricant from leaking into the drum or on the rotor. The entire assembly is retained to its spindle by the adjusting nut, nut lock and cotter pin (Figs. 1 and 2, Part 11-02, Section 1).

4 REMOVAL AND INSTALLATION

HOISTING INSTRUCTIONS

Damage to steering linkage components and front suspension struts may occur if care is not exercised when positioning the hoist adapters of 2 post hoists prior to lifting the vehicle.

If a 2 post hoist is used to lift the vehicle, place the adapters under the lower arms or the No. 1 crossmember. Do not allow the adapters to contact the steering linkage. If the adapters are placed under the crossmember, a piece of wood (2x4x16 inches) should be placed on the hoist channel between the adapters. This will prevent the adapters from damaging the front suspension struts.

FRONT WHEEL GREASE SEAL AND BEARING REMOVAL, INSTALLATION AND/OR REPACKING

If bearing adjustment will not eliminate looseness or rough and noisy operation, the hub and bearings should be cleaned, inspected, and repacked with specified wheel grease. If the bearing cups or the cone and roller assemblies are worn or damaged, they should be replaced.

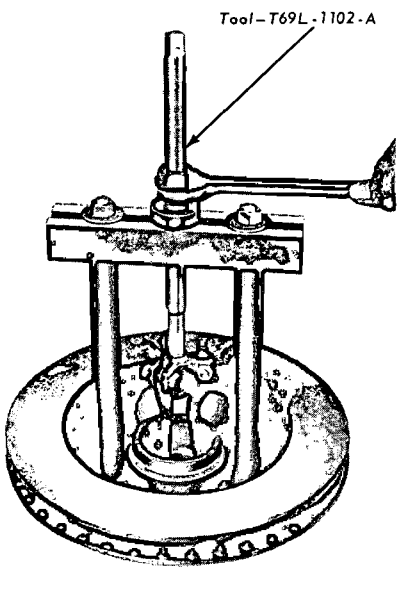


FIG. 1 Removing Front Wheel Bearing Cups— Disc (Drum-Type Similar)

Drum Brakes

1. Raise the vehicle until the wheel and tire clear the floor.
2. Remove the wheel cover or hub cap. 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. 1, Part 11-02, Section 1).
3. Pull the wheel, hub, and drum assembly off the wheel spindle.
4. Remove the grease retainer with Tool 1175AB and discard. Remove the inner bearing cone and roller assembly from the hub.
5. Clean the lubricant off the inner and outer bearing cups with solvent and inspect the cups for scratches, pits, excessive wear, and other damage. If the cups are worn or damaged, remove them with Tool T69L-1102-A (Fig. 1).
6. Thoroughly clean the inner and outer bearing cone and roller assemblies with solvent and dry them thoroughly. **Do not spin the bearings with compressed air.**

Inspect the cone and roller assemblies for wear or damage, and replace them if necessary. The cone and roller assemblies and the bearing cups should be replaced as a unit if damage to either is encountered.

7. Thoroughly clean the spindle and the inside of the hub with solvent to remove all old lubricant.

Cover the spindle with a clean cloth, and brush all loose dust and dirt from the brake assembly. **To prevent getting dirt on the spindle, carefully remove the cloth from the spindle.**

8. If the inner and/or outer bearing cup(s) were removed, install the replacement cup(s) in the hub with the tool shown in Fig. 2. **Be sure to seat the cups properly in the hub.**

9. Pack the inside of the hub with specified wheel bearing grease. Add lubricant to the hub only until the grease is flush with the inside diameter of both bearing cups (Fig. 3).

10. All old grease should be completely cleaned from the bearings and surrounding surfaces before repacking them with new grease (C1AZ19590-B). The new lithium base grease is not compatible with sodium base grease which may have been present on the bearing surfaces. Pack the bearing cone and roller assemblies with wheel bearing grease. A bearing packer is desirable for this operation. If a packer is not available, work as much lubricant as possible between the rollers and cages. Lubricate the cone surfaces with grease.

11. Place the inner bearing cone and roller assembly in the inner cup. Apply a light film of grease to the lip(s) of the grease retainer and install the new grease retainer with the reverse end of the tool shown in Fig. 2. **Be sure that the retainer is properly seated.**

12. Adjust the brake shoes as outlined in Group 12.

13. Install the wheel, hub, and drum assembly on the wheel spindle. **Keep the hub centered on the spindle to prevent damage to the grease retainer or the spindle threads.**

14. Install the outer bearing cone and roller assembly and the flat washer on the spindle, then install the adjusting nut (Fig. 1, Part 11-02, Section 1).

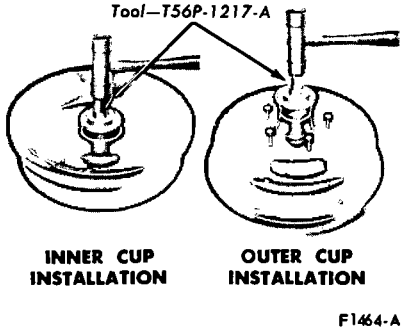


FIG. 2 Installing Front Wheel Bearing Cups—Drum

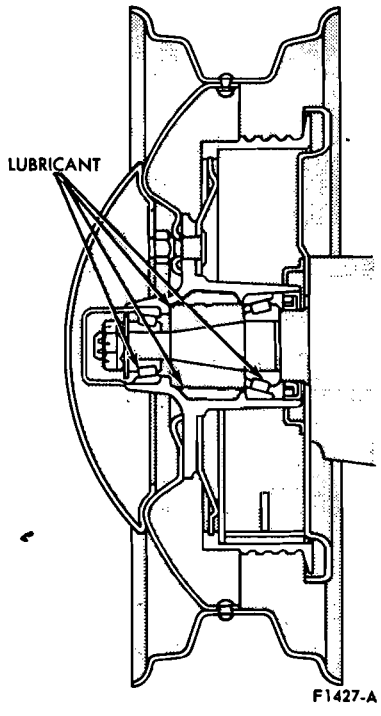


FIG. 3 Front Wheel Hub Lubrication

15. Adjust the wheel bearings as outlined in Part 11-02, Section 3 and install a new cotter pin. Bend the ends of the cotter pin around the castellations of the nut lock. Install the grease cap.

16. Install the hub cap or wheel cover.

Disc Brakes

1. Raise the vehicle until the wheel and tire clear the floor.

2. Remove the wheel cover or hub cap from the wheel.

3. Remove the wheel and tire from the hub and rotor.

4. Remove 2 bolts and washers that attach the caliper to the spindle. Remove the caliper from the rotor and wire it to the underbody to prevent damage to the brake hose.

5. 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. 2, Part 11-02, Section 1).

6. Pull the hub and rotor assembly off the wheel spindle.

7. Remove and discard the old grease retainer. Remove the inner bearing cone and roller assembly from the hub.

8. Clean the lubricant off the inner and outer bearing cups with solvent and inspect the cups for scratches, pits, excessive wear, and other damage. If the cups are worn or damaged, remove them with Tool T69L-1102-A (Fig. 1).

9. Thoroughly clean the inner and outer bearing cones and rollers with cleaning solvent, and dry them thoroughly. **Do not spin the bearings dry with compressed air.**

Inspect the cones and rollers for wear or damage, and replace them if necessary. The cone and roller assemblies and the bearing cups should be replaced as a set if damage to either is encountered.

10. Thoroughly clean the spindle and the inside of the hub with solvent to remove all old lubricant.

Cover the spindle with a clean cloth, and brush all loose dust and dirt from the dust shield. **To prevent getting dirt on the spindle carefully remove the cloth from the spindle.**

11. If the inner and/or outer bearing cup(s) were removed, install

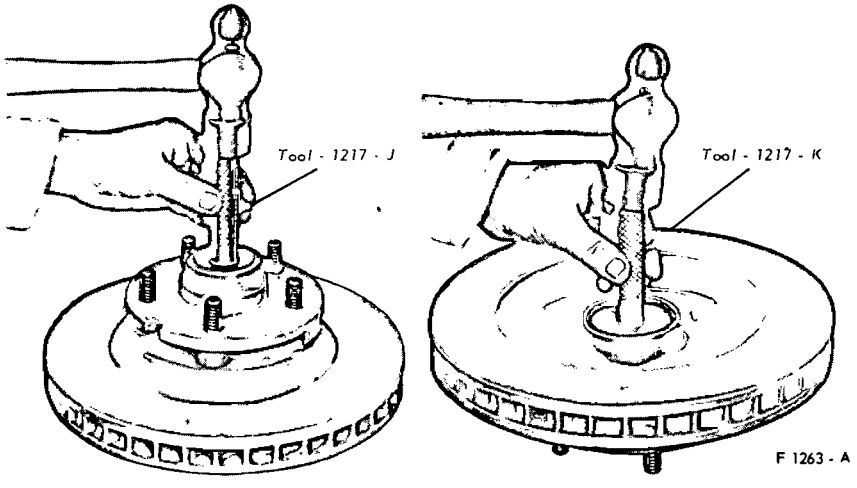


FIG. 4 Installing Front Wheel Bearing Cup—Disc Type

the replacement cup(s) in the hub with the tools shown in Fig. 4. **Be sure to seat the cups properly in the hub.**

12. Pack the inside of the hub with the specified wheel bearing grease. Add lubricant to the hub only until the grease is flush with the inside diameter of both bearing cups.

It is important that all old grease be removed from the wheel bearings and surrounding surfaces because the new Lithium base grease C1AZ19590-B is not compatible with Sodium base grease which may already be present on the bearing surfaces.

13. Pack the bearing cone and roller assemblies with wheel bearing grease. A bearing packer is desirable for this operation. If a packer is not available, work as much lubricant as possible between the rollers and cages. Lubricate the cone surfaces with grease.

14. Place the inner bearing cone and roller assembly in the inner cup. Apply a light film of grease to the lips of the grease retainer and install the new grease retainer with the tool shown in Fig. 5. **Be sure the retainer is properly seated.**

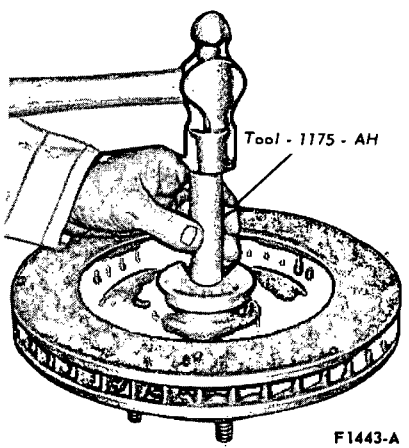


FIG. 5 Installing Grease Retainer—Disc

15. Install the hub and rotor assembly on the wheel spindle. **Keep the hub centered on the spindle to prevent damage to the grease retainer or the spindle threads.**

16. Install the outer bearing cone and roller assembly and the flat washer on the spindle, then install the adjusting nut.

17. Adjust the wheel bearings as outlined in Part 11-02, Section 3 and install a new cotter pin. Bend the ends of the cotter pin around the castellations of the nut lock.

18. Install the caliper to the spindle and torque the attaching bolts to specifications as detailed in Group 12.

19. Install the wheel and tire on the hub.

20. Install the hub cap or wheel cover.

21. Before driving the vehicle, pump the brake pedal several times to obtain normal brake lining to rotor clearance and restore normal brake pedal travel.

FRONT HUB AND DRUM ASSEMBLY REMOVAL AND INSTALLATION

When the hub and drum assembly is replaced, new bearings and a grease retainer must be installed in the new assembly. Coat the new grease retainer with a light film of wheel bearing grease.

1. Raise the vehicle until the wheel and tire clears the floor. Pry off the hub cap or wheel cover, and remove the wheel and tire from the hub and drum assembly.

2. 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. 1, Part 11-02, Section 1).

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

4. Remove the grease retainer and the inner bearing cone and roller assembly from the hub with Tool 1175AB.

5. Remove the protective coating from the new hub and drum with carburetor degreaser.

6. Pack the inside of the hub with specified wheel bearing grease. Add lubricant to the hub only until the grease is flush with the inside diameter of both bearing cups (Fig. 3).

7. All old grease should be completely cleaned from the bearings before repacking them with new grease. Pack the bearing cone and roller assemblies with wheel bearing grease. A bearing packer is desirable for this operation. If a packer is not available, work as much lubricant as possible between the rollers and cages. Lubricate the cone surfaces with grease.

8. Place the inner bearing cone and roller assembly in the inner cup, and install the new grease retainer with the reverse end of the tool shown in Fig. 2. **Be sure that the retainer is properly seated.**

9. Adjust the brake shoes as outlined in Group 12.

10. Install the new hub and drum assembly on the wheel spindle. **Keep the hub centered on the spindle to prevent damage to the grease retainer.**

11. Install the outer bearing cone and roller assembly and the flat washer on the spindle; then, install the adjusting nut (Fig. 1, Part 11-02, Section 1).

12. Position the wheel and tire on the new hub and drum assembly. Install the wheel hub nuts and tighten them alternately in order to draw the wheel evenly against the hub and drum.

13. Adjust the wheel bearings as outlined in Part 11-02, Section 3, and install a new cotter pin. Bend the ends of the cotter pin around the castellations of the nut lock. Install the grease cap.

14. Install the hub cap or wheel cover.

FRONT HUB AND ROTOR ASSEMBLY REMOVAL AND INSTALLATION

When the hub and rotor assembly is replaced, new bearings and a grease retainer must be installed in the new assembly.

1. Raise the vehicle until the wheel and tire clear the floor. Pry off the hub cap or wheel cover, and remove the wheel and tire from the hub and rotor assembly.

2. Remove 2 bolts and washers that attach the caliper to the spindle. Remove the caliper from the rotor and wire it to the underbody to prevent damage to the brake hose.

3. Remove the grease cap from the hub. Remove the cotter pin, nut lock, adjusting nut, and flat washer from the spindle; then, remove the outer bearing cone and roller assembly, (Fig. 2, Part 11-02, Section 1).

4. Pull the hub and rotor off the spindle.

5. Remove the protective coating from the new hub and rotor with carburetor degreaser.

6. Grease and install the inner bearing cone and roller assembly in the inner bearing cup. Apply a light film of grease on the grease retainer and install the grease retainer.

7. Install the new hub and rotor assembly to the wheel spindle. **Keep the hub centered on the spindle to prevent damage to the grease retainer.**

8. Install the outer bearing cone and roller assembly and the flat washer on the spindle; then, install the adjusting nut.

9. Install the caliper to the spindle and tighten the attaching bolts to specifications as detailed in Group 12.

10. Position the wheel and tire on the new hub and rotor. Install the wheel hub nuts and tighten them alternately in order to draw the wheel evenly against the hub and rotor.

11. Adjust the wheel bearings as outlined in Section 2, Part 11-02, Section 3 and install a new cotter pin. Bend the ends of the cotter pin around the castellations of the nut lock. Install the grease cap.

12. Install the hub cap or wheel cover.

13. Before driving the vehicle, pump the brake pedal several times to obtain normal brake lining to rotor clearance and restore normal brake pedal travel.

9 SPECIAL SERVICE TOOLS

SPECIAL TOOLS

Tool No.	Description
Tool 1175-AB	Grease Seal Remover
T69L-1102-A	Front Wheel Bearing Remover
Tool-1217-J	Front Wheel Bearing Cup (Outer) Installer-Disc
Tool-1217-K	Front Wheel Bearing Cup (Inner) Installer-Disc
T56P-1217-A	Front Wheel Bearing Cup (Inner and Outer) Installer-Drum
Tool-1175-AH	Grease Seal Installer-Disc

CF1666-A

PART 11-11 *Wheel Hubs and Bearings—Rear*

Applies To All Models

COMPONENT INDEX	Page	COMPONENT INDEX	Page
BEARING AND SEAL - INTEGRAL CARRIER AXLE Removal and Installation	11-11-02	HOISTING INSTRUCTIONS	11-11-01
BEARING AND SEAL - REMOVABLE CARRIER AXLE Removal and Installation	11-11-02	REAR WHEEL ASSEMBLY Description	11-11-01
		SPECIAL TOOLS	11-11-04

1 DESCRIPTION

REAR WHEEL ASSEMBLY

The rear wheel hub and brake drum assembly is attached to studs on the rear axle shaft flange by three speed nuts. The wheel and tire mounts on the same rear axle shaft flange studs and is held against the hub and drum by the wheel nuts. Except for integral carrier—Ford Light Duty (WER) axle equipped vehicles, the rear wheel bearing is pressed onto the axle shaft just inside the shaft flange and the entire assembly is retained to the rear axle housing by the bearing retainer plate which is bolted to the housing flange.

On integral carrier (WER) axle equipped vehicles (Ford and Meteor with 240-1V and 302-2V, and on Mercury with 351-2V engines), the roller-type wheel bearings have no inner race, and contact the bearing journals of the axle shafts.

The axle shafts do not use an inner or outer bearing retainer. They are held in the axle by means of C-locks, positioned in a slot on the splined end.

4 REMOVAL AND INSTALLATION

HOISTING INSTRUCTIONS

Damage to steering linkage components and front suspension struts may occur if care is not exercised when positioning the hoist adapters of 2 post hoists prior to lifting the vehicle.

If a 2 post hoist is used to lift the vehicle, place the adapters under the lower arms or the No. 1 crossmember. Do not allow the adapters to contact the steering linkage. If the adapters are placed under the crossmember, a piece of wood (2 x 4 x 16 inches) should be placed on the hoist channel between the adapters. This will prevent the adapters from damaging the front suspension struts.

Procedures differ for wheel bearing and seal removal and installation between removable carrier, and integral carrier (WER) type axles.

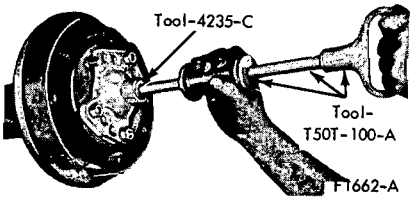


FIG. 1 Removing Axle Shaft

REMOVABLE CARRIER TYPE AXLE

The rear axle shafts, wheel bearings, and oil seal can be replaced without removing the differential assembly from the axle housing.

Removal of Axle Shaft

Synthetic wheel bearing seals are used. Removal and insertion of rear axle shafts must be performed with caution. The entire length of the shaft (including spline) up to the seal journal must pass through the seal without contact. Any roughening or cutting of the seal element during axle removal or installation will result in early seal failure.

1. Remove the wheel cover, wheel and tire from the brake drum.
2. Remove the nuts that secure the brake drum to the axle shaft flange, then remove the drum from flange.
3. Working through the hole provided in each axle shaft flange, remove the nuts that secure the wheel bearing retainer plate. Then pull the axle shaft assembly out of the axle housing (Fig. 1). **The brake backing plate must not be dislodged. Install**

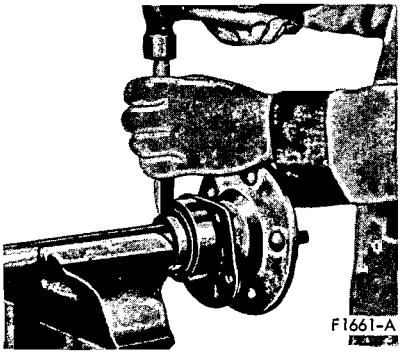


FIG. 2 Removing Rear Wheel Bearing Retainer Ring

one nut to hold the plate in place after the axle shaft is removed.

Removal of Rear Wheel Bearing and Seal

Synthetic seals must not be cleaned, soaked or washed in cleaning solvents.

Removal of the wheel bearings from the axle shaft makes them unfit for further use.

1. On all models except Ford, Mercury or Meteor, if the rear wheel bearing is to be replaced, loosen the inner retainer ring by nicking it deeply with a cold chisel in several places (Fig. 2). It will then slide off easily.

On Ford, Mercury and Meteor models, it is necessary to first drill a 1/4 inch hole **not more than 5/16 inch** deep in the retainer ring surface before using the cold chisel.

2. Remove the bearing from the axle shaft with tool T60K-1225-A.

3. **Whenever a rear axle shaft is replaced, the oil seal must be replaced.** Remove the seal with Tool 1175-AB and a slide hammer.

Installation of Rear Wheel Bearing and Seal

1. Inspect the machined surface of the axle shaft and the axle housing for rough spots or other irregularities which would affect the sealing action of the oil seal. Check the axle shaft splines for burrs, wear or twist. Carefully remove any burrs or rough spots. Replace worn or damaged parts.

2. Lightly coat wheel bearing bores with axle lubricant.

3. Place the bearing retainer plate on the axle shaft, and press the new wheel bearing on the shaft with the tool shown in Fig. 3. **Do not attempt to press on both the bearing and the inner retainer ring at the same time.**

4. Using the bearing installation tool (Tool 4621-A), press the bearing inner retainer ring on the shaft until the retainer seats firmly against the bearing. **On Ford, Mercury, or Meteor models, before assembling the retainer onto the axle shaft, the shaft journal and the inside diameter of the retainer should be wiped clean with a dry cloth. These parts must not be degreased or lubricated.**

5. Install the new oil seal with the tools shown in Fig. 4. Wipe a small amount of oil resistant sealer on the outer edge of the seal before it is installed. **Do not put sealer on the sealing lip.**

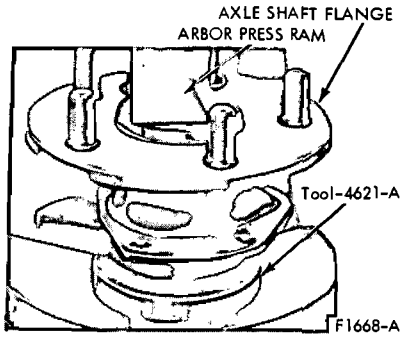


FIG. 3 Installing Rear Wheel Bearing

Installation of Axle Shaft

1. Carefully slide the axle shaft into the housing so that the rough forging of the shaft will not damage the oil seal. Start the axle splines into the side gear, and push the shaft in until the bearing bottoms in the housing.

2. Install the bearing retainer plate and the nuts that secure it. Torque the nuts to specifications.

3. Install the brake drum and the drum attaching (Tinnerman) nuts.

4. Install the wheel and tire on the drum. Install the wheel cover.

INTEGRAL CARRIER (WER) TYPE AXLE

Removal

Synthetic wheel bearing seals are used for production and as service replacements. Removal and insertion of rear axle shafts must be performed with caution. This entire length of the shaft (including spline) up to the seal journal must pass through the seal without contact. Any roughing or cutting of the seal element during axle removal or installation will result in early seal failure.

1. Raise the vehicle on a hoist.

2. Remove the wheel(s) and tire(s) from the brake drum(s).

3. Position a drain pan and loosen the cover to differential housing retaining bolts. Drain the housing.

4. Remove the attaching (Tinnerman) nuts that secure the brake drum(s) to the axle shaft flange(s), and then remove the drum(s).

5. Remove the differential housing cover bolts, cover and gasket. Discard the gasket. Remove the drain pan.

6. Position safety stands under the rear frame member. Lower the hoist and allow the axle to lower as far as possible.

7. Working through the differential case opening, remove the pinion shaft lock bolt and the pinion shaft (Fig. 5).

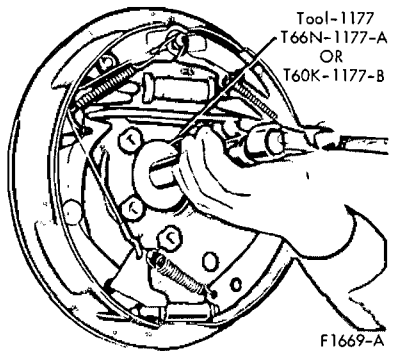


FIG. 4 Installing Rear Wheel Bearing Oil Seal

8. Push the axle shaft(s) inward toward the center of the axle housing. Remove the C-lock(s) (Fig. 6) from the inner end of the axle(s). Remove the axle shaft(s) from the housing. **Extreme care must be used to avoid contact of the axle shaft seal lip with any portion of the axle shaft except the seal journal.**

9. Remove the bearing and oil seal from the housing as shown in Fig. 7.

10. Inspect the machined surface of the axle shaft and the axle housing for rough spots or other irregularities which would affect the sealing action of the oil seal. Check the axle shaft splines for burrs, wear or damage. Carefully remove any burrs or rough spots. Replace worn or damaged parts. A brownish yellow color on the bearing journal of the shaft is normal and the shaft need not be replaced. Slight pitting and wear is also normal.

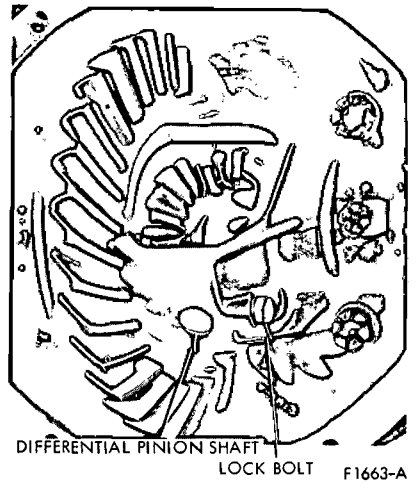


FIG. 5 Differential Pinion Shaft and Lock Bolt

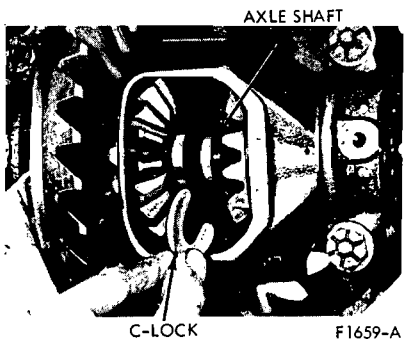


FIG. 6 Removal and Installation of C-Locks and Axle Shaft

Installation

1. Lightly coat the wheel bearing rollers with axle lubricant. Install the bearings in the axle housing with the tool shown in Fig. 8. The bearing should seat firmly against the shoulder.

2. Wipe all lubricant from the oil seal bore before installing the seal.

3. Inspect the original seal for nicks, scuffs or abnormal wear, and replace it if necessary. **The new seals are pre-packed with lubricant and do not require an oil soak before installation.**

4. Install the oil seal with the tool shown in Fig. 9. **Installation without the use of the proper tool will distort the seal and cause leakage.**

5. Place the O-ring in the C-lock groove on the axle shaft.

6. Slide the axle shaft(s) into place in the axle housing. **Exercise care that splines or any portion of the axle shaft(s) do not damage the oil seal(s) and that they engage with the splines of the differential side gear(s).**

7. Install the axle shaft C-lock(s) on the inner end of the shaft(s) (Fig. 6) and push the shaft(s) outward so that the shaft locks seat in the counterbore(s) of the differential side gear(s).

8. Position the differential pinion gears and thrust washers 180 degrees apart to the differential side gears. Revolve the gear assembly until the holes in the differential case are aligned with the pinion gears.

9. Position the differential pinion shaft through the case and pinions, aligning the hole in the shaft with the lock bolt hole. Install the lock bolt and torque it to specification.

10. Install the brake drum and tighten the attaching (Tinnerman) nuts.

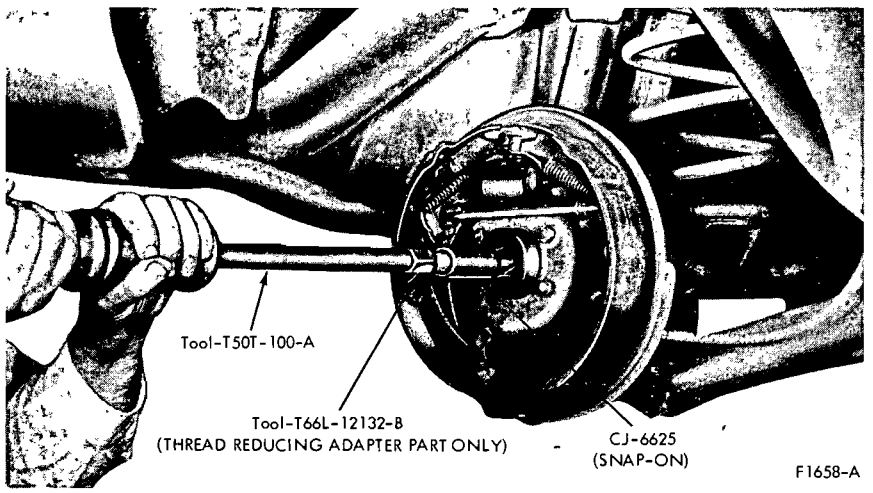


FIG. 7 Removal of Axle Seal or Axle Bearing

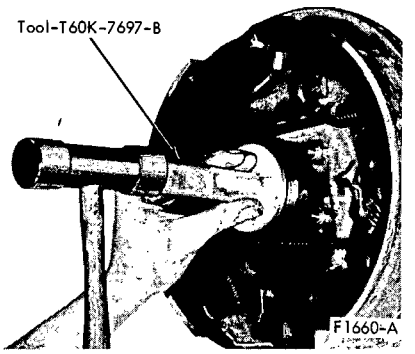


FIG. 8 Installation of Axle Shaft Bearing

11. Install the wheel and tire on the brake drum.

12. Clean the gasket mounting surfaces of the rear axle differential housing and the cover. Install a new cover gasket, cover and the attaching bolts. Torque the bolts to specification.

13. Raise the rear axle. **Make sure the rear axle is in running position.** Add the amount of specified lubricant required to reach 1/2 inch below the bottom of the filler plug hole. Install the filler plug and torque it to specification.

14. Remove the safety support stands and lower the vehicle.

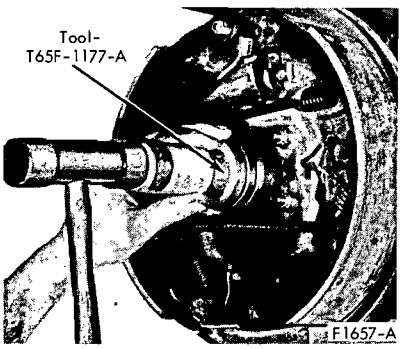


FIG. 9 Rear Axle Shaft Bearing Seal Installation

9 SPECIAL SERVICE TOOLS

SPECIAL TOOLS

Tool Number	Description	Tool Number	Description
Tool 4235-C-Use With T50T-100-A	Axle Shaft Remover	Tool 66L-12132-B Use With T50T-100-A and CJ-6625 (Snap On)	Axle Seal or Wheel Bearing Remover
T60K-1225-A	Rear Wheel Bearing Remover	T60K-7697-B	Bearing Installer
Tool 4621-A	Rear Wheel Bearing Installer	T65F-1177-A	Oil Seal Installer
Tool 1175-AB	Oil Seal Remover		
T66N-1177-A or T60K-1177-B	Oil Seal Installer		

CF1667-A

Brakes

GROUP 12

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General Hydraulic Brake Service **12-01-01**
PART 12-02
Drum Brakes—Single Cylinder, Dual Piston (Bendix) **12-02-01**
PART 12-20
Disc Brakes—Single Piston, Floating Caliper **12-20-01**
PART 12-50 **PAGE**
Vacuum Brake Booster—Single Diaphragm, Dash Mounted (Bendix) **12-50-01**
PART 12-70
Parking Brakes—Cable Actuated, Rear Wheels **12-70-01**

PART 12-01 General Hydraulic Brake Service

COMPONENT INDEX Applies to Models As Indicated	All Models	Ford	Mercury	Meteor	Cougar	Torino	Comet	Maverick	Montego	Mustang	Lincoln-Continental	Thunderbird	Continental-Mark III
BRAKE BOOSTER													
Adjustments		01-05	01-05	01-05	01-05	01-05	01-05	N/A	01-05	01-05	01-05	01-05	01-05
Cleaning and Inspection		01-07	01-07	01-07	01-07	01-07	01-07	N/A	01-07	01-07	01-07	01-07	01-07
Tests		01-03	01-03	01-03	01-03	01-03	01-03	N/A	01-03	01-03	01-03	01-03	01-03
BRAKE PEDAL													
Free Height Test	01-01												
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Centralizing	01-06												
DISC BRAKES													
Cleaning and Inspection		01-06	01-06	01-06	01-06	01-06	01-06	N/A	01-06	01-06	01-06	01-06	01-06
Service Precautions		01-07	01-07	01-07	01-07	01-07	01-07	N/A	01-07	01-07	01-07	01-07	01-07
DRUM BRAKES													
Cleaning and Inspection	01-07												
HYDRAULIC LINES													
Inspection	01-07												
Repair	01-07												
HYDRAULIC SYSTEM BLEEDING	01-04												
PARKING BRAKE CONTROL													
Vacuum Release Test		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	01-03	01-03	01-03
SPECIAL SERVICE TOOLS	01-08												

A page number indicates that the item is for the vehicle(s) listed at the head of the column.
N/A indicates that the item is not applicable to the vehicle(s) listed.

2 DIAGNOSIS AND TESTING

Always check the fluid level in the master cylinder before performing the test procedures. If the fluid level is not within 1/4 inch of the top of the master cylinder reservoirs, add Ford Brake Fluid—Extra Heavy Duty—Part Number C6AZ-19542-A (ESAM6C25-A) or equivalent for all brake applications. **The extra heavy duty brake fluid is colored blue for identification purposes. Do not mix low temperature brake fluids with the specified brake fluid.**

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

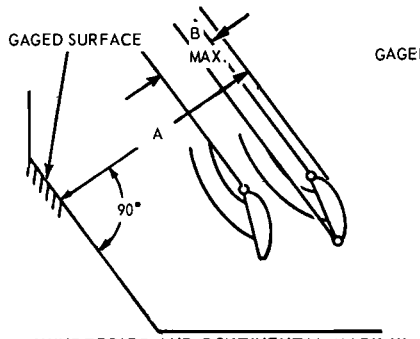
BRAKE PEDAL FREE HEIGHT MEASUREMENTS

With the engine running for full power brake operation and the parking brake fully released, measure the brake pedal free height, and check the brake pedal travel with the use of the Brake Pedal Pressure Gauge, Tool WRE-500-50 as follows:

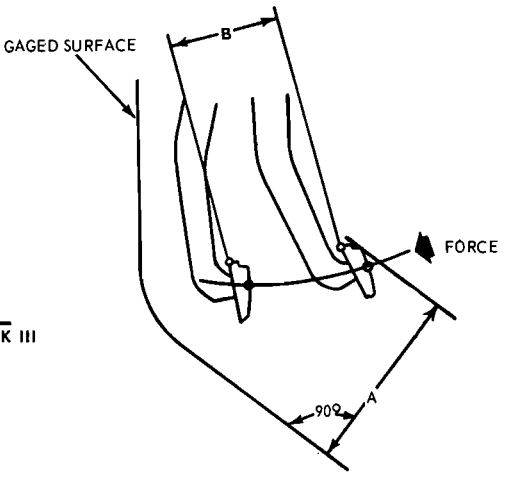
1. Insert a slender, sharp pointed prod through the carpet and sound deadener to the dash panel metal and measure the distance to the brake pedal (Fig. 1).
2. If the position of the pedal is not within specification, check the brake pedal linkage for missing, worn, or damaged bushings, or loose attaching bolts and replace them, if required.
3. If the pedal free height is still out of specification, check the brake pedal booster or master cylinder to be sure the correct parts are installed. Replace the worn or damaged parts as necessary.

BRAKE PEDAL TRAVEL MEASUREMENT

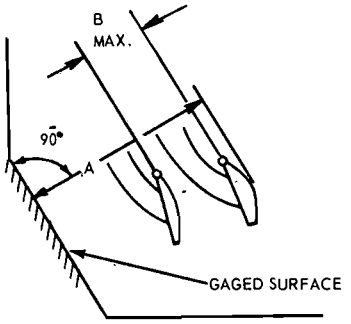
1. Install a Brake Pedal Effort Gauge on the brake pedal pad (Fig. 2).
2. Hook a steel measuring tape to the brake pedal as shown in Fig. 1. Measure and record the distance from the brake pedal free height position to the reference point, which is at the six



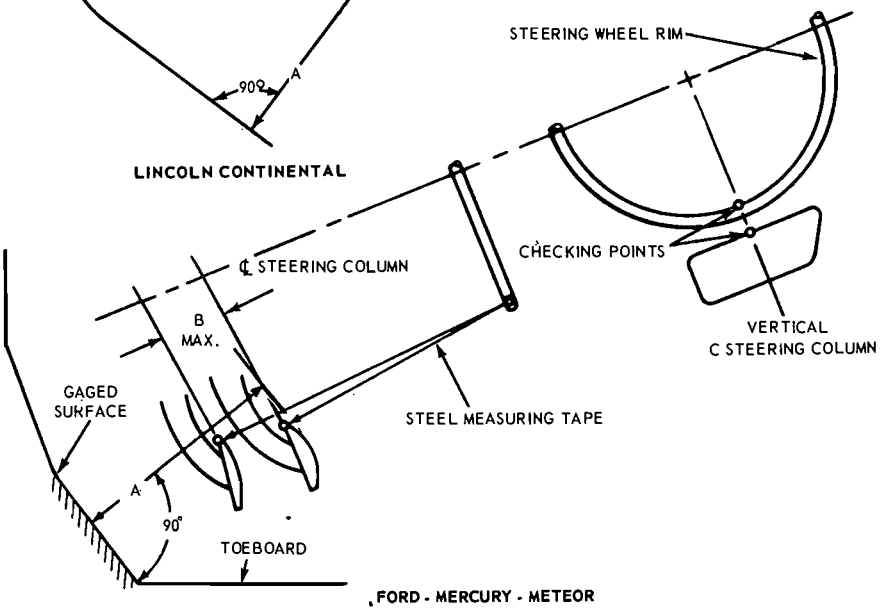
THUNDERBIRD AND CONTINENTAL MARK III
MEASURED FROM CENTER
LINE OF CURVED PEDAL



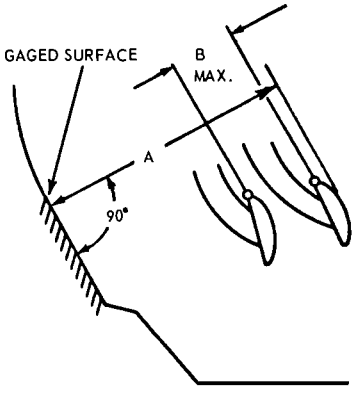
LINCOLN CONTINENTAL



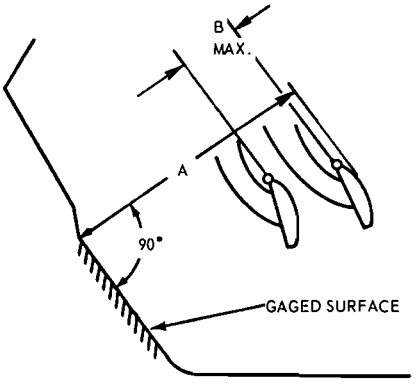
MAVERICK AND COMET



FORD - MERCURY - METEOR



MONTEGO - TORINO



MUSTANG - COUGAR

VEHICLE	TYPE	PEDAL FREE HEIGHT – A	PEDAL TRAVEL – B
FORD, MERCURY AND METEOR	NON-POWER DRUM	9.22–8.22	3.10
FORD, MERCURY AND METEOR	POWER DRUM & DISC	7.37–6.33	3.27
FORD, MERCURY AND METEOR (TAXI)	NON-POWER DISC	9.76–8.34	2.18
FORD, MERCURY AND METEOR	POLICE POWER DISC (U.S.)	7.37–6.33	3.27
FORD, MERCURY AND METEOR	POLICE POWER DRUM (CAN.)	8.94–7.52	3.27
FORD, MERCURY AND METEOR	POWER DISC. (STA. WAG.)	8.94–7.52	3.27
TORINO AND MONTEGO	NON-POWER DRUM	9.04–7.84	2.90
TORINO AND MONTEGO	POWER DISC & DRUM	8.94–7.54	2.80
TORINO AND MONTEGO	POLICE POWER DISC	9.67–8.27	2.80
MUSTANG AND COUGAR	NON-POWER DRUM	8.91–7.74	2.58
MUSTANG AND COUGAR	POWER DISC	7.25–6.40	2.04
THUNDERBIRD	POWER DISC	7.56–6.54	3.35
CONTINENTAL MARK III	POWER DISC	7.56–6.54	3.35
LINCOLN CONTINENTAL	POWER DISC	8.23–7.47	3.27
MAVERICK AND COMET	STD. DRUM	8.24–7.08	2.90

NOTE: A & B DIMENSION TO BE MEASURED TO SHEET METAL

B DIMENSION TO BE MEASURED PARALLEL TO THE VERTICAL CENTERLINE OF THE STEERING COLUMN WITH A 50 POUND LOAD APPLIED TO THE CENTERLINE OF THE BRAKE PEDAL PAD. (CHECKS ON POWER BRAKE VEHICLES MADE WITH ENGINE RUNNING)

H 1630-F

FIG. 1 Brake Pedal Height and Travel Measurements

o'clock position on the steering wheel rim.

3. With the steel tape still hooked to the brake pedal depress the brake pedal by pressing downward on the brake pedal effort gauge. Apply a 50 pound load to the center of the pedal by observing the pressure gauge, and measure the distance from the brake pedal to the fixed reference point on the steering wheel rim parallel to the centerline of the steering column.

4. The difference between the brake pedal free height and the depressed pedal measurement under a 50 pound load should be within the specified maximum pedal travel service specification B in Fig. 1.

5. If the pedal travel is more than the specified maximum shown in Fig. 1, dimension B, make several sharp reverse stops (equivalent to 50 pounds pedal pressure) with a forward stop before each. Move the vehicle in reverse and forward for a distance of approximately ten feet; then, apply the brakes sharply and hold the brake pedal down until the vehicle is completely stopped. This will actuate the brake self-adjusters. If these stops do not bring the brake pedal travel within specification, make several additional forward and reverse stops as outlined above.

6. If the second series of stops do not bring the brake pedal travel within specification, remove the brake drums and check the brake adjusters to make sure they are functioning. Check the brake linings for wear or damage. Repair or replace all worn or damaged parts and non-functioning adjusters. Adjust the brake lining outside diameter to the approximate inside diameter of the brake drum with Rotunda Tool HRE-8650 described in Part 12-02.

7. If all the brake adjusters, brake drums and linings are functional and the brake travel is not within specifications, check the pedal linkage for missing or worn bushings, or loose attachments. Bleed the brakes and centralize the differential valve.

POWER BRAKE FUNCTIONAL TEST

1. Check the hydraulic brake system for leaks or insufficient fluid.

2. With the transmission in neutral, stop the engine and apply the parking brake. Depress the brake pedal several times to exhaust all vacuum in the system.

3. With the engine shut off and all vacuum in the system exhausted, 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.

If the brake pedal movement feels spongy, bleed the hydraulic system to remove air from the system. Refer to Hydraulic System Bleeding, in this Part.

VACUUM TESTS-VACUUM RELEASE PARKING BRAKES

Visually check the operation of the brake linkage as the brake pedal is depressed. Then, check the operation of the brake linkage when the manual release lever is activated. These checks should indicate whether the manual parking brake control linkage is operating properly or requires repair or adjustment due to inability of the parking brake to hold against moderate vehicle movement. Perform tests of the parking brake system and controls after making certain the linkage, and manual controls operate properly.

When testing a parking brake vacuum release system, a minimum of 10 inches of vacuum (Hg.) should be available at all points where vacuum is applied. This can be checked with a Rotunda Fuel Pump Tester Gauge (ARE345) and two Distributor Tester hose adapters (Marked Q) connected together with a coupling. This allows the Fuel Pump Tester Gauge hose to be adapted to any other vacuum hose or rubber connector in the vacuum systems.

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

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

Leaks in the parking brake hoses or a disconnected or improperly connected hose can usually be found by listening for a hissing sound along the hose routings. **Under no circumstances should air pressure be applied to the vacuum system as the actuator diaphragm in the parking brake vacuum motor may be damaged.**

1. Start the engine and run it at idle speed. With the transmission shift control in neutral, depress the parking brake pedal to apply the parking brake. Move the transmission shift control to D range and observe the parking brake pedal to see that the pedal moves upward and the parking brake releases. If the parking brake releases, the parking brake vacuum control is working properly.

2. If the parking brake does not release, test for vacuum at the vacuum lines to the parking brake release vacuum motor. Use the Rotunda Vacuum and Fuel Pump Tester 345. This can be accomplished by removing the hose from each component and attaching it to the vacuum gauge. Connect two distributor tester vacuum hose adapters together with a coupling as a connector to attach the gauge. A minimum of ten inches of vacuum is required to actuate the parking brake vacuum motor. If a minimum reading is not present when checking each of the aforementioned components, they must be replaced.

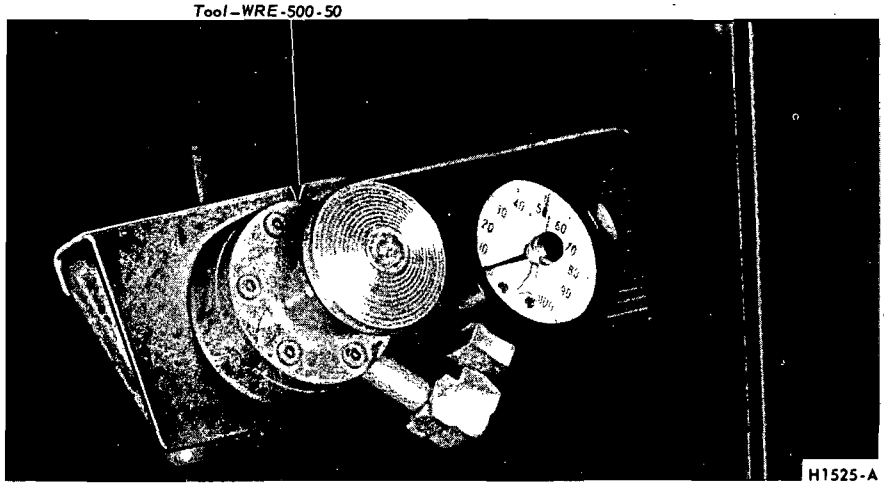


FIG. 2 Brake Pedal Effort Gauge Installed

PARKING BRAKE OPERATION

Check the operation of the parking brake. With the vehicle on a hoist and the parking brake fully released, the cables should not have any slack. Also, the rear brakes should not drag when the wheels are turned. If either of the above conditions exist, adjust as required.

ROAD TEST

A road test should be conducted only when the operator is sure the brakes will stop the vehicle.

If the road test reveals one or more problem conditions, correct all malfunctions of the vacuum system, brake booster and hydraulic system prior to removing brake drums, brake calipers, brake shoes and linings or backing plates.

3 ADJUSTMENTS

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. If the plunger is too long it will prevent the master cylinder piston from completely releasing hydraulic pressure and can cause the brakes to drag. If the plunger is too short it will result in excess pedal travel and an undesirable clunk in the booster area.

The adjustment screw is set to the correct height at the time of original assembly of the power unit. **Under normal service the adjustment screw does not require any further attention providing the original push rod assembly remains in the original unit.**

If a check of the push rod adjustment is necessary, the push rod length may be verified with a push rod length gauge and measured with the engine running to apply vacuum to the booster (Fig. 3).

The push rod length verification of the Bendix power brake booster assemblies is accomplished as follows:

1. Disconnect the master cylinder from the booster assembly and secure away from the booster without disconnecting the brake tubes.

2. Adjust the push rod screw to provide a slight tension against the inner edge of the adjustment gauge slot. (Approximately 5 pounds of tension against the push rod is required to assure that the push rod is firmly seated in the booster assembly). See Figure 4.

3. Install the master cylinder on the brake booster and tighten the retaining nuts to the specified torque.

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 of the master cylinder 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.

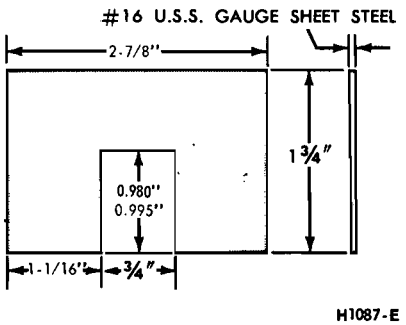


FIG. 3 Push Rod Gauge Dimensions

HYDRAULIC SYSTEM BLEEDING

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

Manual Bleeding

The Ford, Mercury, Meteor, Continental Mark III, Lincoln Continental, Thunderbird models equipped with disc brakes must be bled with pressure bleeding equipment.

The primary and secondary (front and rear) hydraulic brake systems are individual systems and are bled separately. Bleed the longest line first on the individual system being serviced. During the complete bleeding operation. DO NOT allow the reservoir to run dry. Keep the master cylinder reservoirs filled with Ford Fluid-Extra Heavy Duty-Part Number C6AZ19542-A (ESA-M6C 25-A). **The extra heavy duty brake fluid is colored blue for identification purposes. Do not mix low temperature brake fluids with the specified fluid during the bleeding operations. Never re-use brake fluid which has been drained from the hydraulic systems.**

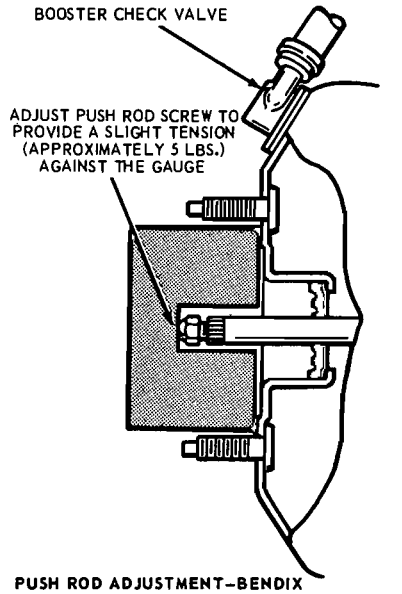


FIG. 4 Brake Booster Push Rod Measurement

1. If the master cylinder is equipped with a bleed screw, loosen the bleed screw. Push the brake pedal down slowly through its full travel. Close the bleeder fitting and return the

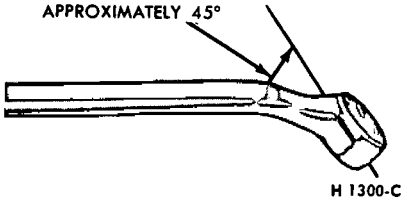


FIG. 5 Wrench for Bleeding Brake Hydraulic System

pedal to the fully released position. Repeat this operation until fluid is free of air bubbles, then tighten the bleeder screw. **Do not use the secondary piston stop screw, located on the bottom of the master cylinder to bleed the brake system. Loosening or removing this screw could result in damage to the secondary piston or stop screw.**

2. To bleed the secondary (rear) brake system, position a suitable 3/8 inch box wrench (Fig. 5) on the bleeder fitting on the brake wheel cylinder. Attach a rubber drain tube to the bleeder fitting. **The end of the tube should fit snugly around the bleeder fitting.**

3. 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.

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

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

6. Repeat this procedure at the brake wheel cylinder on the opposite side. Refill the master cylinder reservoir after each wheel cylinder is bled and install the master cylinder cover and gasket. **Be sure the diaphragm type gasket is properly positioned in the master cylinder cover. When the bleeding operation is completed, the fluid level should be filled to within 1/4 inch of the top of the reservoirs.**

7. If the primary (front brake) system is to be bled. Repeat steps 2 through 6 at the right front brake caliper or cylinder and ending at the left front brake caliper or cylinder.

8. On disc brake equipped models be sure that the front brake pistons are returned to their normal positions and that the shoe and lining assemblies are properly seated by depressing the brake pedal several times until normal pedal travel is established.

9. Centralize the pressure differential valve. Refer to centralizing the Pressure Differential Valve procedures.

Pressure Bleeding All Models

Bleed the longest lines first. The bleeder tank should contain enough new Ford Brake Fluid to complete the bleeding operation. Use Ford Brake Fluid - Extra Heavy Duty Part Number C6AZ-19542-A (ESAM6C25-A) or equivalent for all brake applications. **The brake fluid is colored blue for identification purposes. Do not mix low temperature brake fluid with the specified brake fluid during the bleeding operations. Never re-use brake fluid that has been drained from the hydraulic system. The tank should be charged with approximately 10 to 30 pounds of air pressure. Never exceed 50 pounds pressure.**

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

2. Remove the master cylinder reservoir cover and rubber gasket, and fill the master cylinder reservoir with the specified brake fluid. Install the pressure bleeder adapter tool to the master cylinder, and attach the bleeder tank hose to the fitting on the adapter.

Master cylinder pressure bleeder adapter tools can be obtained from the various manufacturers of pressure bleeding equipment. Follow the instructions of the manufacturer when installing the adapter.

3. If the master cylinder is equipped with a bleed screw, loosen the bleed screw and bleed the master cylinder until the fluid is free of air bubbles; then, tighten the bleed screw. **Do not use the secondary piston stop screw, located on the bottom of the master cylinder, to bleed the master cylinder.**

4. If the rear wheel cylinders, the secondary brake system, are to be bled, position a 3/8 inch box wrench (Fig. 5) on the bleeder fitting on the right rear brake wheel cylinder. Attach a bleeder tube to the bleeder fitting. **The end of the tube should fit snugly around the bleeder fitting.**

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

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

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

8. Repeat steps 3 through 7 at the left rear wheel cylinder.

9. **If the vehicle is equipped with disc brakes,** repeat steps 4 through 7, starting at the right front disc caliper and ending at the left front disc caliper.

On Ford, Mercury, Meteor, Continental Mark III, Lincoln Continental and Thunderbird models the metering

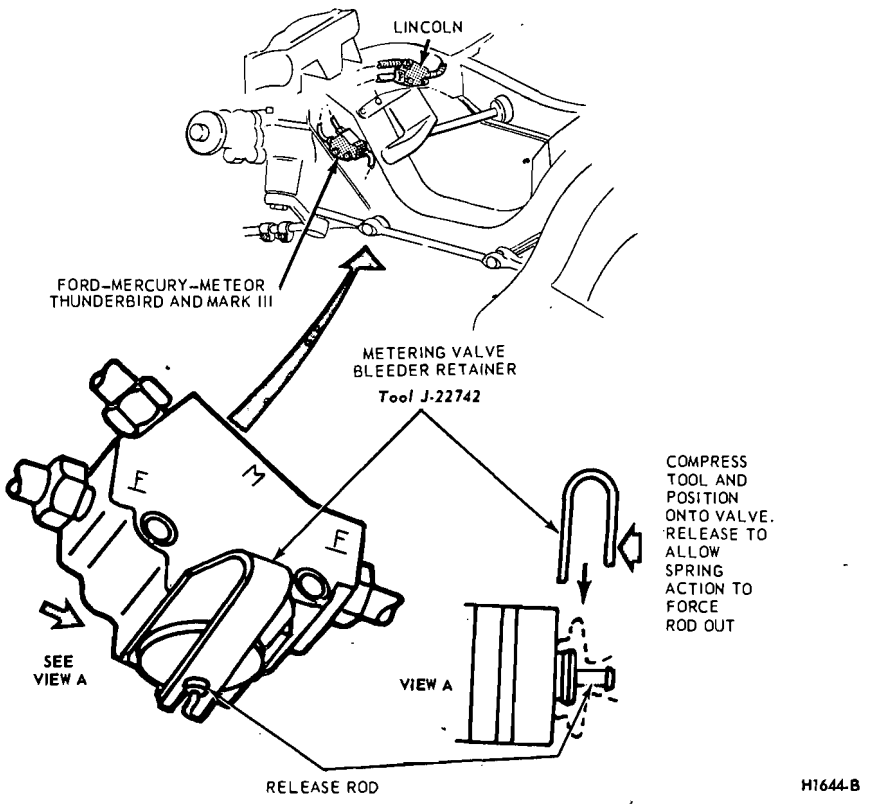


FIG. 6 Disc Brake Metering Valve—Ford, Mercury, Meteor, Lincoln Continental, Continental Mark III and Thunderbird

valve release rod must be pulled outward and held a minimum of 1/16 inch (Fig. 6) while bleeding the primary brake system.

10. If the vehicle contains drumtype front brakes and the primary (front) brake system is to be bled, repeat steps 4 through 7, starting at the right front wheel cylinder ending at the left front wheel cylinder.

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

12. On disc brake equipped vehicles, be sure that the front brake pistons are returned to their normal positions and that the shoe and lining assemblies are properly seated by depressing the brake pedal several times until normal pedal travel is established.

13. Remove the Pressure Bleeder Adapter Tool. Fill the master cylinder reservoirs to within 1/4 inch of the top. Install the master cylinder cover and gasket. **Be sure the Diaphragm type gasket is properly positioned in the master cylinder cover.**

14. Centralize the pressure differential valve. Refer to Centralizing the Pressure Differential Valve procedures.

CENTRALIZING THE PRESSURE DIFFERENTIAL AND/OR PRESSURE CONTROL VALVE

After any repair or bleeding of the primary (front brake) or secondary (rear brake) system, the dual-brake warning light will usually continue to be illuminated due to the pressure differential valve remaining in the offcenter position.

To centralize the pressure differential valve and turn off the warning light after a repair operation:

1. Turn the ignition switch to the ACC or ON position.

2. Check the fluid level in the master cylinder reservoirs and fill them to within 1/4 inch of the top with the specified brake fluid, if necessary.

3. Depress the brake pedal and the piston will center itself causing the brake warning light to go out.

4. Turn the ignition switch to the OFF position.

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

5 CLEANING AND INSPECTION

DISC BRAKES

1. Remove the wheel and tire and the shoe and lining assemblies as outlined in Part 12-20.

2. Inspect the brake shoes and lining for wear. If the lining is worn to within 1/32 inch of the rivet heads or if there is more than 0.125 taper from end to end or if lining shows evidence of brake fluid contamination, replace all (4) shoe and lining assemblies on both front wheels.

3. Check the caliper to spindle attaching bolt wires. If the wires are damaged, re-torque the bolts and replace the wires.

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

5. Clamp a dial indicator to the caliper housing so that the pointer contacts the rotor at a point approxi mately 1 inch from the outer edge. Rotate the rotor and take an indicator reading. If the reading exceeds 0.003 inch on custom vehicles and 0.002 inch on light vehicles total lateral runout on the indicator, replace or resurface the disc brake rotor. **The following requirement must be met when resurfacing disc brake rotors:**

Rotunda Disc Brake Lathe FRE-1466-B should be used to refinish the disc brake rotors. The step-by-step resurfacing procedure provided with the tool must be adhered to.

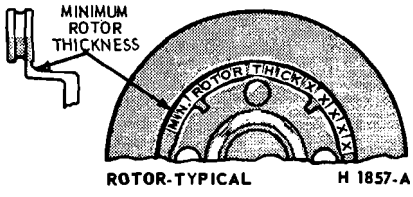


FIG. 7 Disc Brake Rotor Minimum Thickness Marking Location

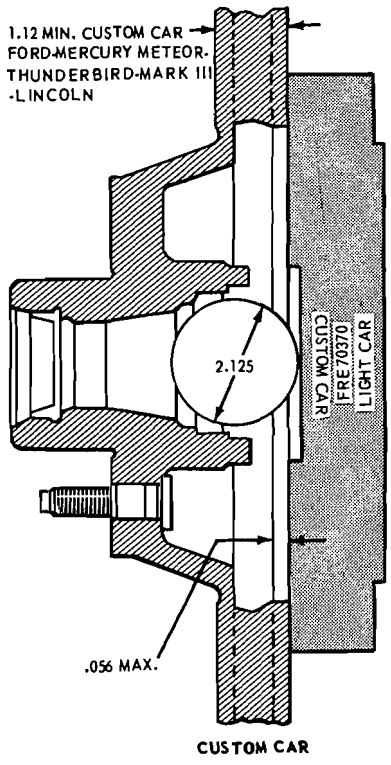
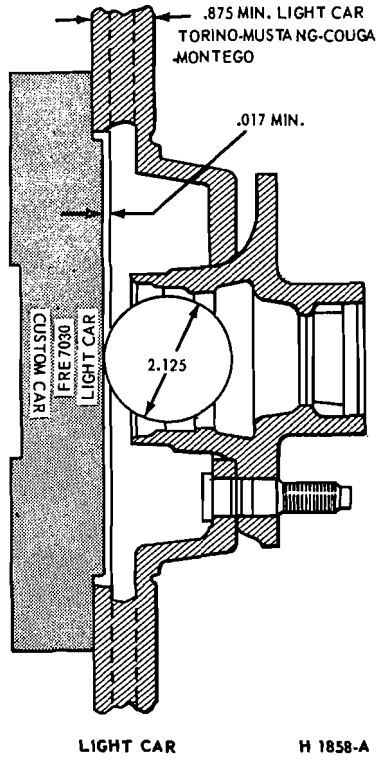


FIG. 8 Disc Brake Rotor Gauge



The finished braking surface of the rotor must be flat and parallel within 0.0007 inch; lateral runout must not exceed 0.003 inch on custom vehicles and 0.002 inch on light vehicles total indicator reading, braking surface are to be 80/15 micro inches.

On all models, the minimum limiting dimension from the inboard bearing cup to the inboard rotor face and the minimum rotor thickness dimension, must be observed when removing material from the rotor braking surfaces. Rotor minimum thickness is shown on each rotor (Fig. 7). If the rotor thickness is less than that shown on the rotor, either through wear or after refinishing, the rotor must be replaced. A ball and gage bar (Rotunda Kit FRE-70170) is to be used when checking minimum dimensions (Fig. 8).

When the runout check is finished be sure to adjust the bearings as outlined in Group 11-02 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, refinish it as outlined in step 5 or replace the rotor, if required.

7. Visually check the caliper. If the caliper housing is leaking it should be replaced. If a seal is leaking the caliper must be disassembled and new seals installed. If a piston is seized in the bore a new caliper housing is required.

Check the brake hoses for signs of cracking, leaks or abrasion. Replace them if necessary.

Disc Brake Service Precautions

1. Grease or any other foreign material must be kept off the caliper assembly, surfaces of the rotor and external surfaces of the hub during service operations. Handling of the rotor and caliper assemblies should be done in a way to avoid deformation of the brake rotor and nicking or scratching of brake linings.

2. If a caliper piston is removed for any reason, the piston seal must be replaced.

3. During removal and installation of a wheel assembly, exercise care not to interfere with and damage the caliper splash shield or the bleeder screw fitting.

4. Front wheel bearing end play is critical and must be within specifications.

5. Be sure the vehicle is centered on the hoist before servicing any front end components, to avoid bending or damaging the rotor splash shield on full right or left wheel turns.

6. Riding of the brake pedal (common on left foot applications) should be avoided during vehicle operation.

7. The wheel and tire must be removed separately from the brake rotor, unlike drum brakes where the wheel, tire and drum are removed as a unit.

8. On floating caliper type disc brakes, whenever the caliper is removed the caliper locating pins should be inspected for wear or damage.

9. On floating caliper type disc brakes, the caliper assembly must be removed from the spindle prior to removal of the shoe and lining assemblies.

10. On floating caliper type disc brakes the calipers must not be interchanged from one side to the other. When the caliper is installed on its proper anchor plate and spindle, the bleeder screw will point to the rear of the vehicle. If a caliper is installed on the wrong side of the vehicle, it is not possible to bleed the system properly.

11. Do not attempt to clean or restore oil or grease soaked brake linings. When contaminated linings are found, brake linings must be replaced in complete axle sets.

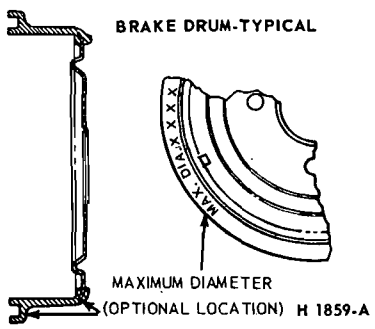


FIG. 9 Brake Drum Maximum Inside Diameter Marking Location

DRUM BRAKES

1. Remove the wheel from the drum, and remove the drum as outlined in Part 12-02.

2. Brush all dust from the backing 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 had been contaminated with oil, grease or brake fluid. Replace lining in axle sets. Prior to replacement of lining, the drum diameter should be checked to determine if oversize linings must be installed.

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

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

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

7. Inspect the brake drum and, if necessary, refinish. Brake drum **maximum Inside** diameter is shown on each drum (Fig. 9). If the maximum inside diameter shown on the drum is exceeded either by wear or refinishing, the drum must be replaced. Refer to Part 12-02 for refinishing.

BRAKE BOOSTER

Check the booster operation as noted in Part 12-01. Power Brake Functional Test. If the brake booster is damaged or inoperative replace it with a new booster. **The brake booster is serviced only as an assembly.**

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 connection.

Always bleed the applicable primary or secondary brake system after primary or secondary brake system hose or line replacement. Centralize the pressure differential valve after bleeding the system.

Brake Tubing

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 double flared properly to provide good leakproof connections. Clean the brake tubing by flushing with clean brake fluid 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 1112144 or equivalent.

Brake Hose

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 thread the hose assembly into the front wheel 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. Thread the hose 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.

9 SPECIAL SERVICE TOOLS

SPECIAL SERVICE TOOLS

Tool No.	Description	Tool No.	Description
Rotunda WRE-500-50	Brake Pedal Effort Gauge	Rotunda FRE-70370	Ball and Bar Gauge
Rotunda ARE-345	Vacuum and Fuel Pump Tester Gauge	Rotunda-FRE-1432	Brake Drum Micrometer
Rotunda 1436	Diaphragm Type Bleeder	Rotunda-FRE-1466-B	Disc Brake Lathe
Tool 4201-C	Universal Dial Indicator and Bracket	Milbar 1112-144	Inch Pound Torque Wrench

CH1860-A

PART 12-02 *Drum Brakes— Single Cylinder, Dual Piston*

COMPONENT INDEX Applies to Models As Indicated	All Models	Ford	Mercury	Meteor	Cougar	Torino	Comet	Maverick	Montego	Mustang	Lincoln-Continental	Thunderbird	Continental-Mark III
BRAKE BACKING PLATE													
Removal and Installation	02-06												
BRAKE BOOSTER													
Cleaning and Inspection - See Part 12-01													
Description		02-03	02-03	02-03	02-03	02-03	N/A	N/A	02-03	02-03	N/A	N/A	N/A
Removal and Installation		02-10	02-10	02-10	02-10	02-10	N/A	N/A	02-10	02-10	N/A	N/A	N/A
BRAKE DRUM													
Cleaning and Inspection - See Part 12-01													
Refinishing													
Removal and Installation (Front)		02-04	02-04	02-04	02-04	02-04	02-04	02-04	02-04	02-04	N/A	N/A	N/A
Romoval and Installation (Rear)	02-05												
BRAKE PEDAL													
Removal and Installation		02-10	02-10	02-10	02-11	02-10	02-10	02-10	02-10	02-11	N/A	N/A	N/A
BRAKE SHOES													
Adjustments	02-03												
Relining	02-11												
Removal and Installation	02-05												
DRUM BRAKE													
Description	02-01												
DUAL BRAKE SYSTEM													
Description	02-01												
MASTER CYLINDER													
Cleaning and Inspection		02-12	02-12	02-12	02-12	02-12	02-12	02-12	02-12	02-12	N/A	N/A	N/A
Disassembly and Overhaul		02-12	02-12	02-12	02-12	02-12	01-12	02-12	02-12	02-12	N/A	N/A	N/A
Removal and Installation - Non-Power		02-07	02-07	02-07	02-08	02-08	02-08	02-08	02-08	02-08	N/A	N/A	N/A
Removal and Installation - Power		02-09	02-09	02-09	02-09	02-09	N/A	N/A	02-09	02-09	N/A	N/A	N/A
PRESSURE DIFFERENTIAL VALVE													
Removal and Installation	02-10												
WHEEL CYLINDER													
Cleaning and Inspection	02-04												
Disassembly and Overhaul	02-04												
Removal and Installation	02-06												
SPECIFICATIONS AND SPECIAL SERVICE TOOLS	02-06												

A page number indicates that the item is for the vehicle(s) listed at the head of the column.
N/A indicates that the item is not applicable to the vehicle(s) listed.

1 DESCRIPTION

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

The self-adjusting brake mechanism consists of a cable, cable guide, adjusting lever, adjusting screw assembly, 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 routed along the webb of 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 vehicle is moving rearward and only when the secondary shoe is free to move toward the drum beyond a predetermined point.

A vacuum booster is used with the power drum brake system.

DUAL MASTER CYLINDER BRAKE SYSTEM

The dual-master cylinder brake system has been incorporated in all models to provide increased safety. The system consists of a dual-master

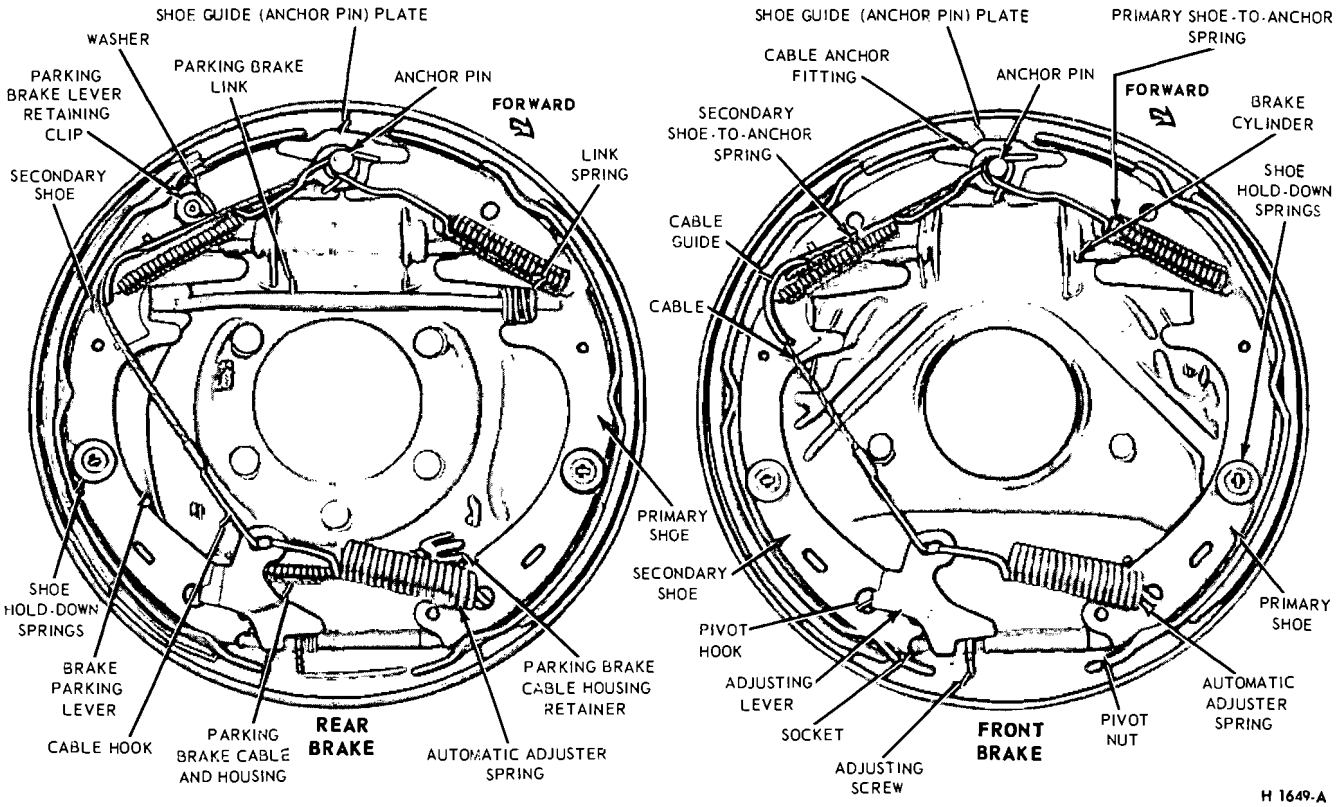


FIG. 1 Self-Adjusting Brake Assemblies

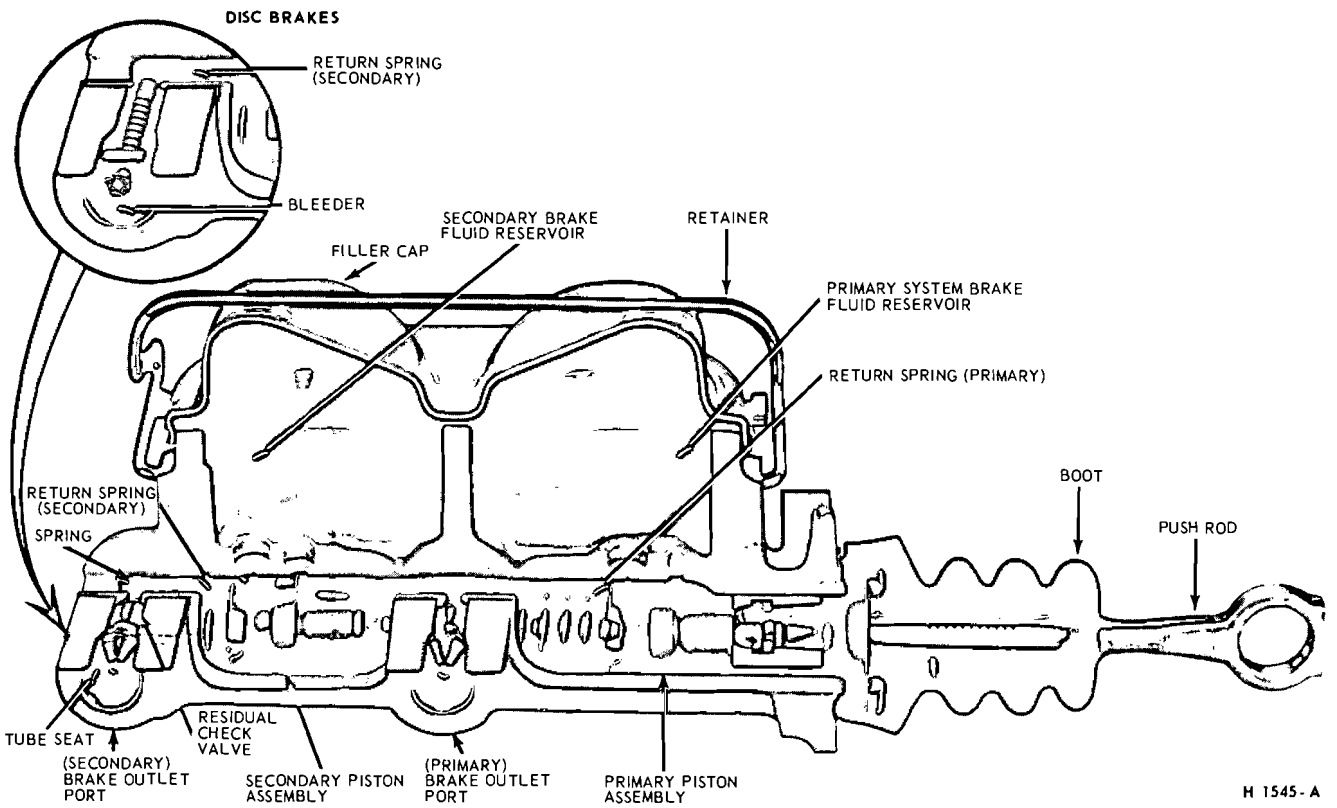


FIG. 2 Dual Master Cylinder— Typical

cylinder (Fig. 2), pressure differential valve assembly and a switch (Fig. 3). The switch on the differential valve activates a dual-brake warning light, located on the instrument panel.

BRAKE BOOSTER SYSTEM

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

The brake booster is of the vacuum suspended-type which utilizes engine intake manifold vacuum and atmospheric pressure for its power.

Adjustment of the push rod and replacement of the check valve and grommet are the only services permitted on the brake booster. The booster unit is to be exchanged when it is inspected, checked and found to be inoperative.

PRESSURE DIFFERENTIAL VALVE

A self centering pressure differential valve assembly is used on all vehicles having power or non-power drum type brakes.

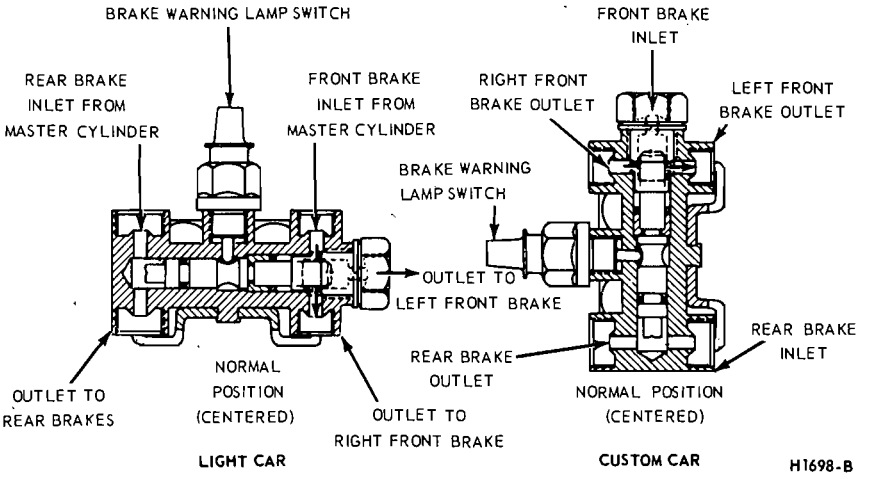


FIG. 3 Pressure Differential Valve and Brake Warning Light Switch

The valve body is step bored to accommodate a sleeve and seal installed over the piston and into the larger valve body bore in the front brake system area. The brake warning light switch is mounted at the center of the valve body and the spring loaded switch plunger fits into a tapered shoulder groove in the center of the piston. In this position the electrical continuity through the switch is interrupted and the brake warning lamp on the instrument panel is out. (Fig. 3)

3 ADJUSTMENTS

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

BRAKE SHOE ADJUSTMENTS

The hydraulic drum 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.**

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. Use Rotunda Tool HRE 8650, (Fig. 4) to determine the inside diameter of the drum braking surface.
2. Reverse the tool as shown in Fig. 4 and adjust the brake shoe diameter to fit the gauge. Hold the automatic adjusting lever out of engagement while rotating the adjusting screw, to prevent burring the

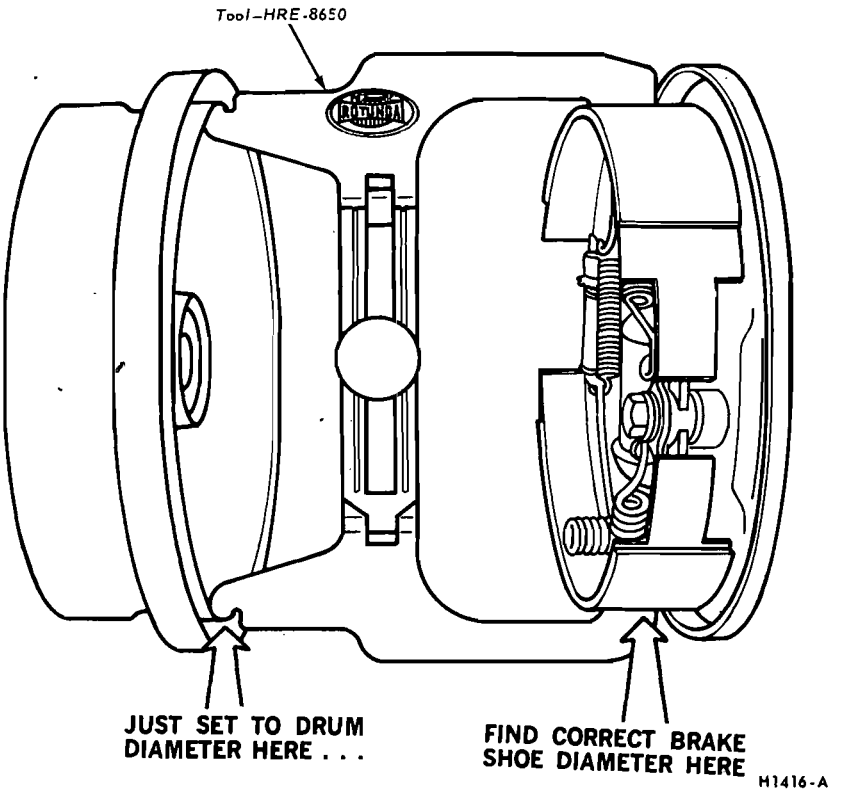


FIG. 4 Adjusting Brake Shoes Using Tool HRE-8650

screw slots. Make sure the adjusting screw rotates freely. If necessary, lubricate the adjusting screw threads with a thin, uniform coating of CIAZ 19590-B Moly Dysulfide.

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 backing plate, being careful not to get the lubricant on the linings.

5. Install the drums. Install Tinnerman nuts and tighten securely.

6. Install the wheels on the drums and tighten the nuts to specification.

7. Complete the adjustment by applying the brakes several times with a minimum of 50 lbs pressure on the pedal while backing the vehicle. After each stop the vehicle must be moved forward.

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

WHEEL CYLINDER REPAIR

Wheel cylinders should not be disassembled unless they are leaking or unless new cups and boots are to be installed. It is not necessary to remove the brake cylinder from the backing plate to disassemble, inspect, or hone and overhaul the cylinder. Removal is necessary only when the cylinder is damaged or scored beyond repair.

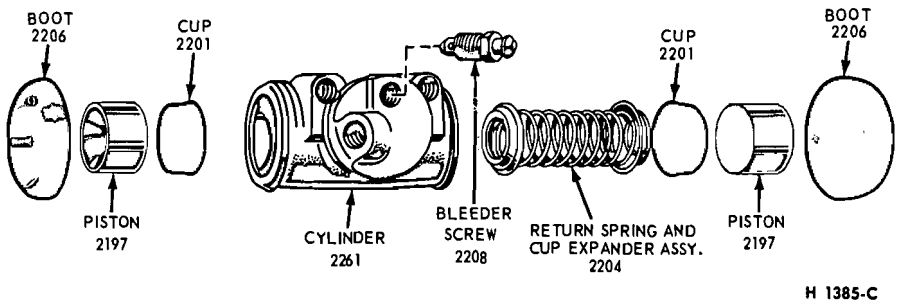


FIG. 5 Brake Wheel Cylinder— Typical

Disassembly

1. Remove the links and the rubber boots from the ends of the brake cylinder. Remove the pistons, cups, and return spring and expander assembly (cup expanders are an integral part of the return spring on Ford, Mercury, Meteor, Lincoln Continental, Continental Mark III and Thunderbird Models) from the cylinder bore (Fig. 5).

2. Remove the bleeder screw from the cylinder.

3. Wash all parts in clean brake fluid. Dry with compressed air.

4. Replace scored pistons. Always replace the rubber cups and dust boots.

5. 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.**

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

Assembly

1. Apply a light coating of heavyduty brake fluid to all internal parts.

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

3. Insert the return spring and expander assembly, cups, and pistons into their respective positions in the cylinder bore (Fig. 5). Place a boot over each end of the cylinder. Bleed the brake system.

4 REMOVAL AND INSTALLATION

FRONT BRAKE DRUM

Removal

1. Raise the vehicle 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 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.

3. Pull the drum off the wheel spindle.

4. If the drum will not come off, pry the rubber cover from the brake backing plate. 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. 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. If the drum is being replaced, remove the protective coating from the new drum with carburetor degreaser. Then, use sandpaper to insure that no residue remains. Wipe the drum with a cloth soaked with denatured alcohol. Install new bearings and grease seal. Pack the wheel bearings, install the inner bearing cone and roller assembly in the inner cup, and install the new grease seal see Part 11-02.

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

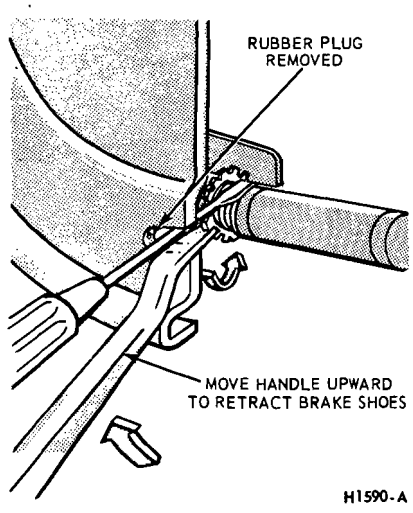


FIG. 6 Backing Off Brake Adjustment

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 11-02, then install the grease cap. Install the wheel and hub cap.

REAR BRAKE DRUM

Removal

1. Raise the vehicle so that the tire 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, pry the rubber cover from the backing plate. Insert a narrow screwdriver through the hole in the backing 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; then sand lightly and wipe with a cloth soaked with denatured alcohol.

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

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

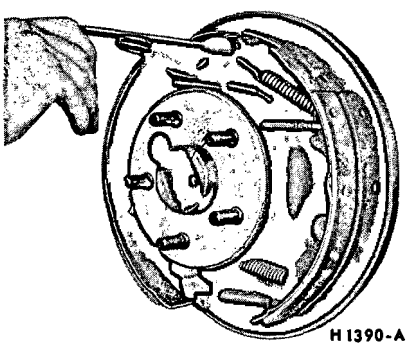


FIG. 7 Retracting Spring Removal

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

3. On Ford, Mercury, Meteor, Thunderbird, Continental Mark III and Lincoln Continental models, remove the shoe guide (anchor pin) plate (Fig. 1).

4. Remove the shoe hold-down springs, shoes, adjusting screw, pivot nut, socket and automatic adjustment parts.

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

6. 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 hightemperature grease at the points where the brake shoes contact the backing plate.

3. Position the brake shoes on the backing plate and secure the assembly with the hold down springs. On the rear brake, install the parking brake link and spring, back off the parking brake adjustment then connect the parking brake cable to the parking brake lever (Fig. 1).

4. Install the shoe guide (anchor pin) plate on the anchor pin when so equipped.

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

6. Install the primary 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 secondary shoe to anchor spring with the tool shown in Fig. 8.

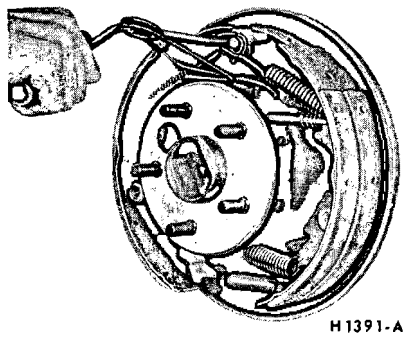


FIG. 8 Retracting Spring Installation

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

9. Apply high-temperature grease CIAZ 19590-B Moly Dysulfide 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 1/2 turn.

Interchanging the brake shoe adjusting screw assemblies from one side of the vehicle 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 vehicle, 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 on the nut indicate a right thread; one groove indicates a left thread.

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 right or left 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 anchor pin 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. On Ford, Mercury, Meteor, Thunderbird, Continental Mark III, and Lincoln Continental models, the cable should measure 11 1/8 inches (plus or minus 1/64 inch) from the end of the cable anchor to the end of the cable hook. On Torino, Montego, Mustang, and Cougar models the cable should measure 8 13/32 inches on 9 inch brakes or 9 3/4 inches on 10 inch brakes from the end of the cable anchor to the end of the cable hook.

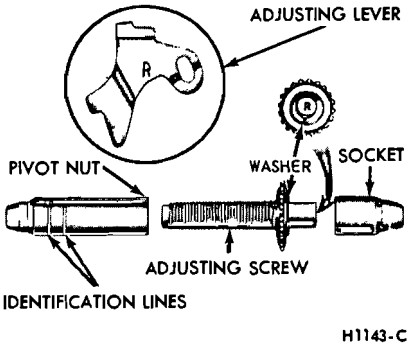


FIG. 9 Adjusting Screw and Lever Identification

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

Removal

1. Remove the wheel and the drum.

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

3. Disconnect the brake line from the brake cylinder. **On a vehicle 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 backing plate.

4. On all except the front wheels on Ford, Mercury, and Meteor models, remove the wheel cylinder attaching bolts and lock washers and remove the cylinder. On the front wheel of Ford, Mercury and Meteor models, remove the nut and washer that attaches the cylinder to the anchor pin. Remove the cylinder from the anchor pin.

Installation

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

1. On all models except Ford, Mercury and Meteor, to install a front wheel cylinder, position the cylinder to the backing plate. Install the two lock washers and attaching bolts. Torque them to specifications.

On Ford, Mercury and Meteor models, to install a front wheel cylinder, position the cylinder on the anchor pin against the backing plate. Install the washer and cylinder attaching nut on the anchor pin, and torque it to specification. Lock the washer retainer securely.

2. Install a new copper gasket over the hose fitting. Thread the hose into the cylinder and tighten it to specified torque.

3. 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.

4. To install a rear wheel cylinder, 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.

5. Secure the cylinder to the backing plate by installing the attaching bolts and lock washers.

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

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

8. Adjust the brakes as described in this part. Install the brake drum and wheel. Bleed the brakes and centralize the differential valve as outlined in Part 12-01.

BRAKE BACKING PLATE

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 backing plate is being replaced, remove the axle shaft from the applicable rear axle as outlined in Group 15 and disengage the parking brake cable retainer from backing plate. Remove the backing plate and gasket.

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

Installation

If a **rear** backing plate is to be replaced, position a new rear backing plate and gasket on the attaching bolts

in the axle housing flange. Insert parking brake cable into backing plate and secure retaining fingers. Install the rear axle shaft for applicable rear axle. Refer to Group 15 for the proper installation procedure.

1. If the front brake backing plate is to be replaced, position a new **front backing plate and gasket 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 as outlined in this section, and install the brake drums and wheels. Bleed the brake system and centralize the differential valve as outlined in Part 1201.

DUAL MASTER CYLINDER- NON POWER BRAKES

Ford, Mercury and Meteor

Removal

Refer to Fig. 10.

1. Disconnect the stoplight switch wires at the connector. Remove the spring retainer. Slide the stop light switch off the brake pedal pin just far enough to clear the end of the pin, then lift the switch straight upward from the pin. **Use care to avoid switch damage during removal.**
2. Slide the master cylinder push rod and the nylon washers and bushings off the brake pedal pin.
3. Remove the brake tube from the primary and secondary outlet ports of the master cylinder.
4. Remove the cap screws and lockwashers that secure the master cylinder to the dash panel and lift the cylinder forward and upward from the vehicle.

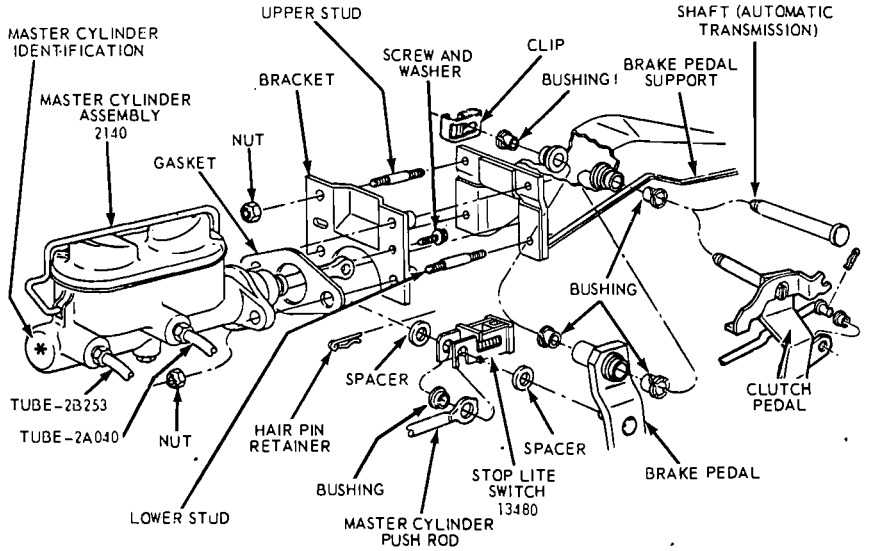


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FIG. 11 Master Cylinder Installation—Non Power Brake—Torino and Montego

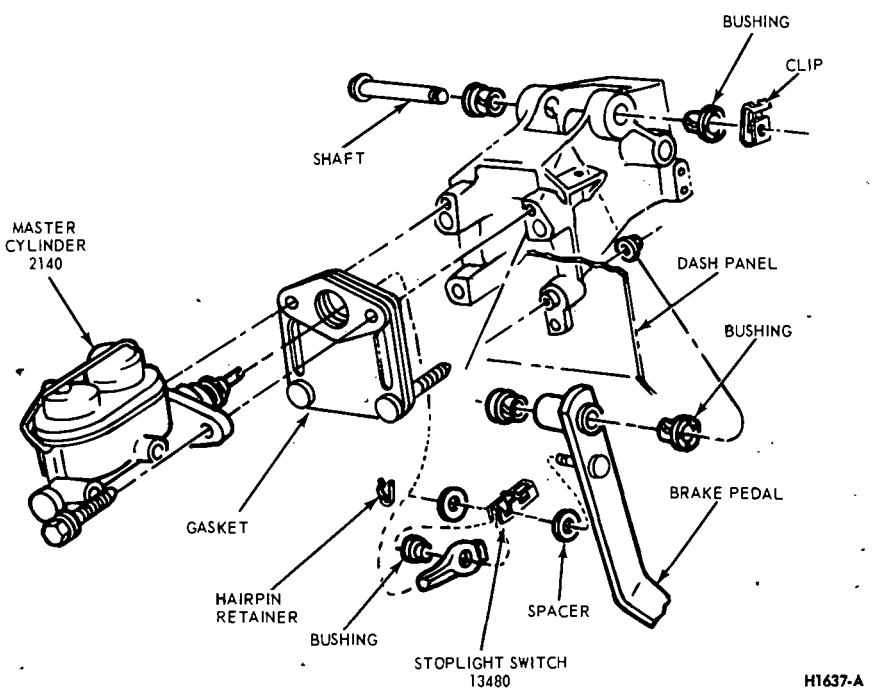

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FIG. 10 Master Cylinder Installation—Non Power Brakes—Ford, Mercury, and Meteor

Installation

1. Position the boot on the push rod and secure the boot to the master cylinder. Carefully insert the master cylinder push rod and boot through the dash panel opening and position the master cylinder on the panel.
2. Install the cap screws at the dash panel and torque them to specification.
3. **Coat the nylon bushings with SAE 10W oil.** Install the nylon washer and bushing on the brake pedal pin.
4. Position the stop light switch on the brake pedal pin, install the nylon bushing and washer and secure them in position with the spring retainer.
5. Connect the wires at the stop light switch connector.
6. Connect the brake lines to the master cylinder leaving the brake line fittings loose.

7. Fill the master cylinder with the specified brake fluid to within 1/4 inch of the top of the dual reservoirs. Use Ford Brake Fluid-Extra Heavy Duty-Part Number C6AZ-19542-A (ESA-M6C25-A) or equivalent for all drum brake applications. **The extra heavy duty brake system fluid is colored blue for identification. Do not mix low temperature brake fluids with the specified fluid for the power disc brake system.**

8. Bleed the dual-master cylinder and the primary and secondary brake systems. Centralize the pressure differential valve. Refer to Hydraulic System Bleeding and Centralizing of the Differential Valve, Part 12-01, for proper procedure.

9. Operate the brakes several times, then check for external hydraulic leaks.

Torino, Montego, Maverick, Mustang and Cougar

Removal

Refer to Figs. 11 and 12.

1. Working from inside the vehicle below the instrument panel, disconnect the master cylinder push rod from the brake pedal assembly. **The push rod cannot be removed from the master cylinder.**

2. Disconnect the stoplight switch wires at the connector. Remove the hairpin retainer. Slide the stop light switch off the brake pedal pin just far enough to clear the end of the pin, then lift the switch straight upward from the pin. **Use care to avoid switch damage during removal.**

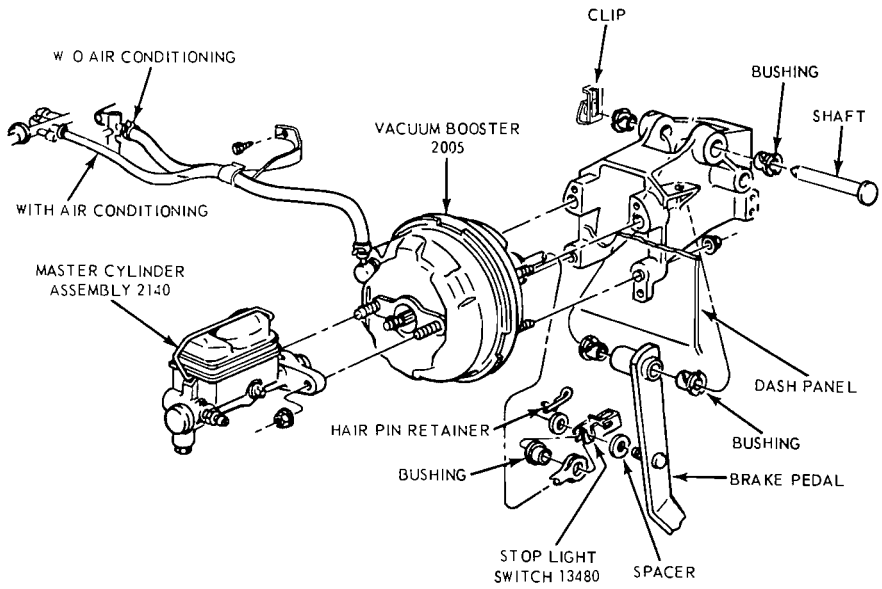

FIG. 13 Master Cylinder Installation —Power Brake—Ford, Mercury and Meteor

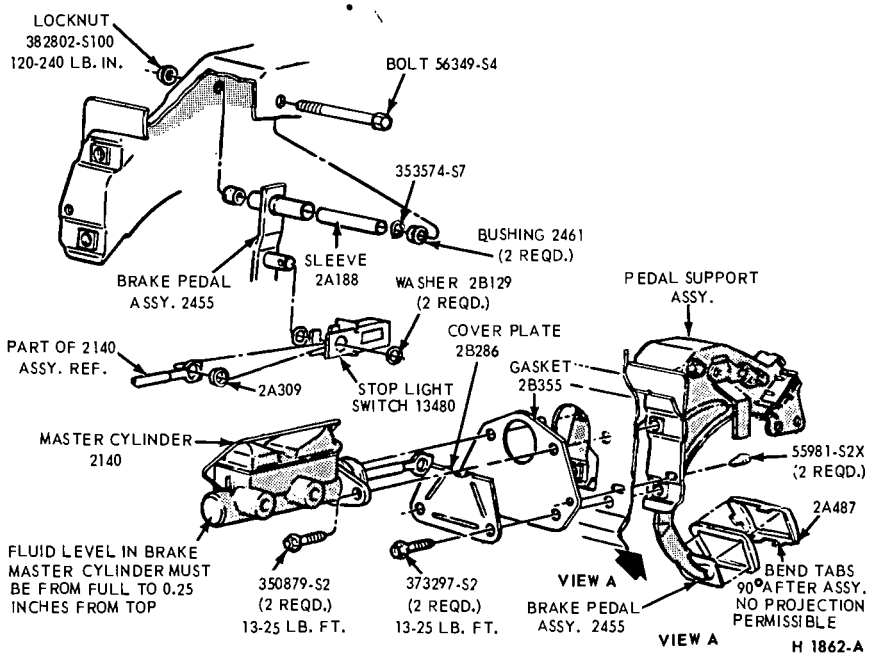

FIG. 12 Master Cylinder Installation—Non Power Brake—Mustang and Cougar

3. Slide the master cylinder push rod and the nylon washers and bushings off the brake pedal pin.

4. Remove the brake tubes from the primary and secondary outlet ports of the master cylinder.

5. Remove the lock nuts or cap screw and lockwashers that secure the master cylinder to the dash panel and lift the cylinder forward and upward from the car.

Installation

Refer to Figs. 11 and 12.

1. Position the boot on the push rod and secure the boot to the master cylinder. Carefully insert the master cylinder push rod and boot through the dash panel opening.

2. On Torino or Montego models, position the gasket and master cylinder on the mounting studs on the dash panel. Install the lock nuts on the studs at the dash panel and torque them to specification.

3. On Mustang or Cougar models, position the master cylin der on the dash panel. Install the retaining screws and torque them to specification. Coat the nylon bushings with SAE 10W oil. Install the nylon washer and bushing on the brake pedal pin.

4. Position the stop light switch and master cylinder push rod on the brake pedal pin, install the nylon

bushing and washer and secure them in position with the spring retainer.

5. Connect the wires at the stop light switch connector.

6. Connect the brake lines to the master cylinder and tighten to specified torque.

7. Fill the master cylinder with the specified brake fluid to within 1/4 inch of the top of the dual reservoirs. Use Ford Brake Fluid-Extra Heavy Duty-Part Number C6AZ-19542-A for all brake applications. **The brake fluid is colored blue for identification. Do not mix low temperature brake fluids with the specified fluid for the brake system.**

8. Bleed the dual-master cylinder and the primary and secondary brake systems. Centralize the pressure differential valve. Refer to Hydraulic System Bleeding and Centralizing of the Differential Valve, Part 2-1, Section 2 for the proper procedure.

9. Operate the brakes several times, then check for external hydraulic leaks.

DUAL MASTER CYLINDER-POWER BRAKES

Removal

1. Remove the brake tubes from the primary and secondary outlet ports of the master cylinder (Figs. 13 thru 15).

2. Remove the two nuts and two lock washers attaching the master cylinder to the brake booster assembly.

3. Slide the master cylinder forward and upward from the vehicle.

Installation

1. Before installing the master cylinder, check the distance from the outer end of the booster assembly push rod to the master cylinder mounting surface. Turn the push rod adjusting screw in or out as required to obtain the specified length. Refer to Part 12-01, Power Brake Master Cylinder Push Rod Adjustment for the proper procedure.

2. Position the master cylinder assembly over the booster push rod and onto the two studs on the booster assembly. (Figs. 13 thru 15).

3. Install the attaching nuts and lock washers and torque them to specifications.

4. Install the front and rear brake tubes to the master cylinder outlet fittings.

5. Fill the master cylinder with the specified brake fluid to within 1/4 inch of the top of the dual reservoirs. Use Ford Brake Fluid-Extra Heavy Duty-Part Number C6AZ-19542-A (ESA-M6C25-A) for all brake appli-

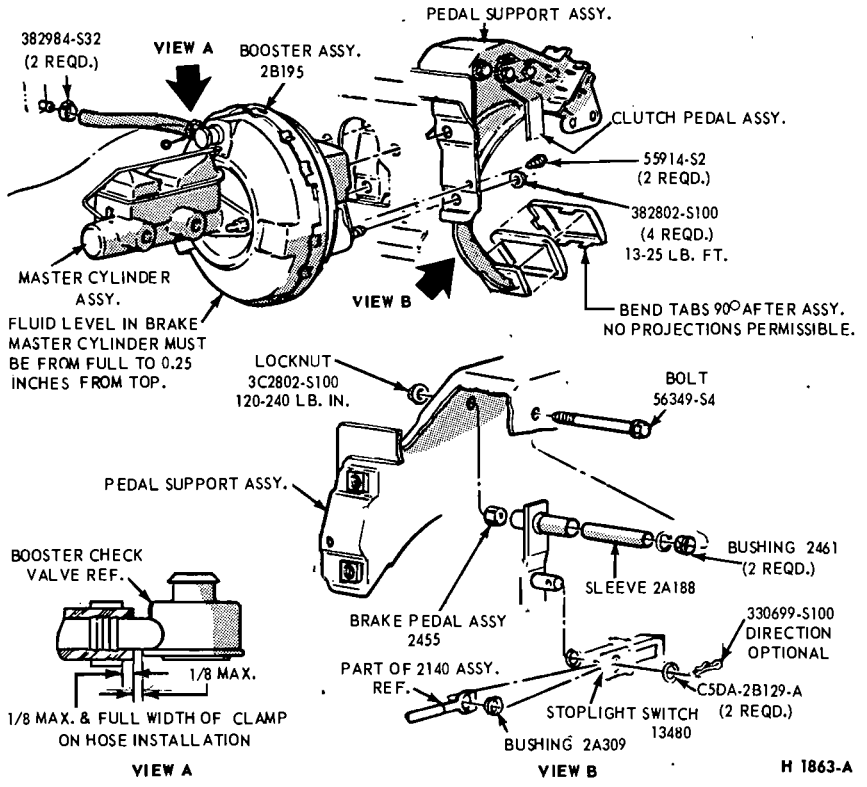

FIG. 15 Master Cylinder Installation—Power Brake—Mustang and Cougar

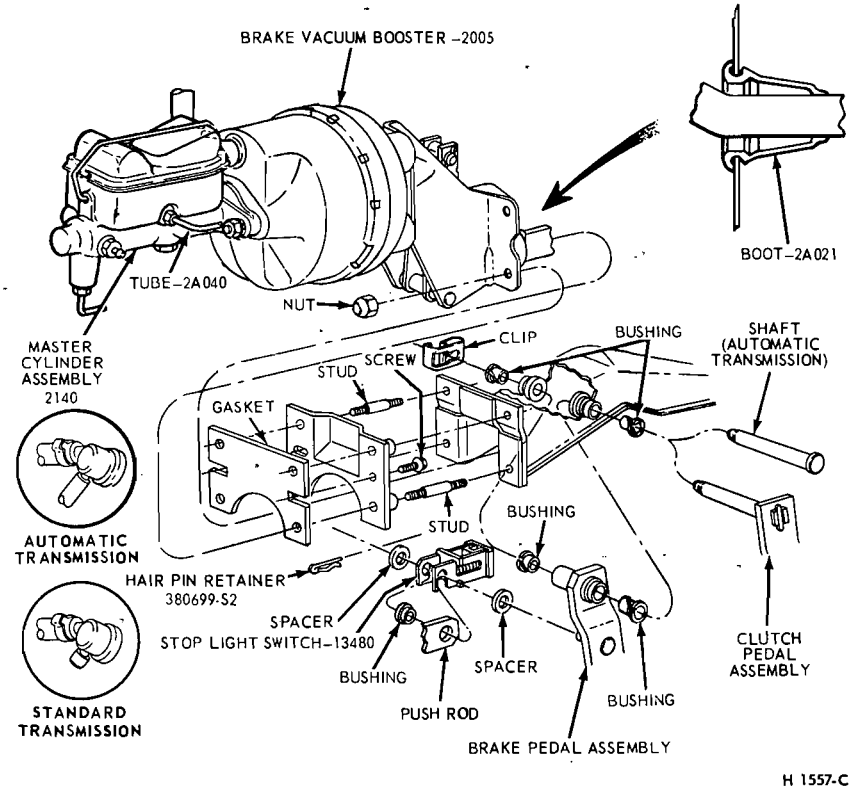

FIG. 14 Master Cylinder Installation—Power Brake—Torino and Montego

cations. **The extra heavy duty brake fluid is colored blue for identification. Do not mix low temperature brake fluids with the specified fluids for the disc brake system.**

6. Bleed the dual-master cylinder and the primary and secondary brake systems. Centralize the pressure differential valve. Refer to Hydraulic System Bleeding and Centralizing of the Differential Valve, Part 12-01, for the proper procedure.

7. Operate the brakes several times, then check for external hydraulic leaks.

PRESSURE DIFFERENTIAL VALVE ASSEMBLY

Removal

The pressure differential valve assembly is serviced as an assembly only. Do not attempt to repair this unit.

1. Disconnect the brake warning light connector from the warning light switch.
2. Disconnect the front inlet and rear outlet tubes from the valve assembly (Fig. 3).
3. Remove the two attaching nuts and bolts from the valve bracket on the underside of the fender apron and remove the valve assembly and bracket from the vehicle.

Installation

1. Position the valve assembly and bracket to the fender apron. Install the attaching nuts and bolts: torque them to specifications.
2. Install the front inlet and rear outlet tubes to the valve assembly. Torque them to specifications.
3. Connect the brake warning light connector to the warning light switch.
4. Bleed the system and centralize the pressure differential valve following the procedures in Centralizing the Pressure Differential Valve.

BRAKE BOOSTER

Removal

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

Disconnect the stop light switch wires at the connector. Remove the hairpin retainer. Slide the stop light switch off from the brake pedal pin **just far enough for the switch outer hole to clear the pin,** and then remove the switch from the pin and booster push rod. Be careful not to damage the switch during removal. Slide the booster push rod and the nylon washers and bushing off the brake pedal pin (Figs 13 thru 15).

2. Open the hood and remove the master cylinder from the booster. Secure it to one side without disturbing the hydraulic lines. **It is not necessary to disconnect the brake lines, but care should be taken that the brake lines are not deformed. Permanent deformation of brake lines can lead to tube failure.**
3. Disconnect the manifold vacuum hose or hoses from the booster unit.
4. Remove the booster-to-dash panel attaching nuts or bolts (Figs. 13 thru 15). Remove the booster and bracket assembly from the dash panel, sliding the push rod link out from the engine side of the dash panel.
5. On Torino and Montego models, remove the push rod link boot from the dash panel.

Installation

1. On Torino and Montego models, install the push rod link boot in the hole in the dash panel as shown in Fig. 14. Install the four spacers on the mounting studs.
2. Mount the booster and bracket assembly to the dash panel by inserting the push rod or push rod link in through the hole and boot in the dash panel. Install the bracket-to-dash panel attaching lock nuts or bolts (Figs. 13 thru 15).
3. Connect the manifold vacuum hose or hoses to the booster.
4. Before installing the master cylinder, check the distance from the outer end of the booster assembly push rod to master cylinder surface. Turn the screw in or out to obtain the specified length. Refer to Part 12-01, Power Brake Master Cylinder Push Rod Adjustment. Install the master cylinder and torque the attaching nuts to specifications.
5. Working from inside the vehicle below the instrument panel, connect the booster push rod link to the brake pedal assembly. To do this, proceed as follows:

Install the inner nylon washer, the booster push rod, and the bushing on the brake pedal pin. Position the switch so that it straddles the push rod with the switch slot on the pedal pin and the switch outer hole just clearing the pin. Slide the switch completely onto the pin, and install the nylon washer as shown in Figs. 13 thru 15. **Be careful not to bend or deform the switch.** Secure these parts to the pin with the hairpin retainer. Connect the stop light switch wires to the connector, and install the wires in the retaining clip.

BRAKE PEDAL

Ford, Mercury and Meteor

Removal

1. Disconnect the stop light switch wires at the connector.
2. Remove the hairpin retainer. Slide the stop light switch off the brake pedal pin **just far enough for the switch outer hole to clear the pin, and then lift the switch straight upward** from the pin. **Be careful not to damage the switch during removal. Slide the master cylinder or booster push rod and the nylon washers and bushing off the brake pedal pin (Figs. 10 and 15).**
3. Remove the hairpin-type retainer and washer from the brake pedal shaft, then remove the shaft, the brake pedal and the bushings from the pedal support bracket.

Installation

1. Apply a coating of SAE 10 Engine oil to the bushings and locate bushings in their proper places on the pedal assembly and pedal support bracket (Figs. 10 and 15).
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 retainer.
3. Install the inner nylon washer, the master cylinder or booster push rod, and the bushing on the brake pedal pin. Position the switch so that it straddles the push rod with the switch slot on the pedal pin and the switch outer hole just clearing the pin. Slide the switch completely onto the pin, and install the nylon washer as shown in Figs. 10 and 13. **Be careful not to bend or deform the switch. Secure these parts to the pin with the hairpin retainer.**
4. Connect the stop light switch wires to the connector, and install the wires in the retaining clip.
5. Check the Brake Pedal Free Height and Travel Measurements, Part 12-01.

Torino, Montego and Maverick— Manual-Shift Transmission

Removal

1. Remove the clutch pedal assist spring.
2. Disconnect the clutch pedal-to-equalizer rod at the clutch pedal by removing the retainer and bushing.

pedal shaft, then remove the clutch pedal and shaft assembly, the brake pedal assembly, and the bushings from the pedal support bracket (Figs. 11 and 14).

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 clip (Figs. 11 and 14).
3. Install the clutch pedal assist spring.
4. Connect the clutch pedalto-equalizer rod to the clutch pedal assembly with the bushing and the spring clip retainer. Apply SAE 10 engine oil to the bushing.
5. Install the inner nylon washer, the master cylinder or booster 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 Figs. 11 and 14. 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.
7. Adjust the clutch pedal free play (Group 16-02) to specification, if required.
8. Check the Brake Pedal Free Height and Travel Measurements (Part 12-01, Section 1).

Torino, Montego, Maverick, Mustang and Cougar—Automatic Transmission or Mustang and Cougar with Standard 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 or booster push rod and the nylon washers and bushing off from the brake pedal pin (Figs. 11, 12, 14 and 15).**
3. On all vehicles except Mustang and Cougar, re move 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. On Mustang and Cougar vehicles, remove the locknut and bolt from the pedal support. Remove the pedal assembly from the support bracket.

Installation

1. Apply a coating of SAE 10 engine oil to the bushings and locate all the bushings in their proper places on the pedal assembly and pedal support bracket (Figs. 11, 12, 14 and 15).
2. Position the brake pedal assembly to the support bracket, then install the pedal shaft or bolt through the support bracket and brake pedal assembly. Install the retainer or locknut.
3. Install the inner nylon washer, the master cylinder or booster 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 Figs. 11, 12, 14 and 15. 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.

Check the Brake Pedal Free Height and Travel Measurements, Part 1201.

5 MAJOR REPAIR OPERATIONS

BRAKE DRUM REFINISHING

Minor scores on a brake drum can be removed with sandpaper. 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. Brake drum maximum inside diameter is shown on each drum (Fig. 16). If the maximum inside diameter shown on the drum is exceeded either through wear or refinishing, the drum must be replaced.

Check the inside diameter of the brake drum with a brake drum micrometer (Tool FRE-1432).

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 head or are less than 0.030 inch thick (bonded lining) or have been contaminated with brake fluid, grease or oil must 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 vehicle.**

Inspect brake shoes for distortion, cracks, or looseness. If this condition exists, the shoe must be discarded. Do not attempt to repair a damaged 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 with a brake drum micrometer (Tool FRE-1432).
3. Position the new lining on the shoe. Starting in the center, insert and secure the rivets, working alternately towards each end. **Replacement linings are ground and no further grinding is required.**
4. Check the clearance between

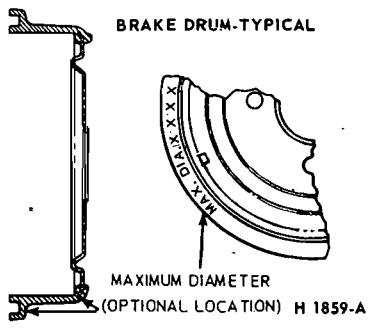

FIG. 16 Brake Drum Maximum Inside Diameter Marking Location

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

DUAL MASTER CYLINDER

When a repair is necessary on the master cylinder, it is required practice during the warranty period to replace the cylinder as a unit instead of overhauling the cylinder with a service repair kit.

Disassembly

1. Clean the outside of the master cylinder and remove the filler cover and diaphragm. Pour out any brake fluid that remains in the cylinder. Discard the old brake fluid.
2. Remove the secondary piston stop bolt from the bottom of the cylinder (Fig. 17).
3. Remove the bleed screw, if required.
4. Depress the primary piston and remove the snap ring from the retaining groove at the rear of the master cylinder bore (Fig. 18). Remove the push rod and the primary piston assembly from the master cylinder bore. **Do not remove the screw that retains the primary return spring retainer, return spring, primary cup and protector on the primary piston. This assembly is factory pre-adjusted and should not be disassembled.**
5. Remove the secondary piston assembly. **Do not remove the outlet tube seats, outlet check valves and outlet check valve springs from the master cylinder body.**
6. Clean all parts in clean isopro pyl alcohol, and inspect the parts for chipping, excessive wear or damage. **When using a master cylinder repair kit, install all the parts supplied.**
7. Check all recesses, openings and internal passages to be sure they are open and free of foreign matter. Use an air hose to blow out dirt and cleaning solvent. Place all parts on a clean pan or paper.
8. Inspect the master cylinder bore for signs of etching, pitting, scoring or rust. If it is necessary to hone the master cylinder bore to repair damage, do not exceed allowable hone specifications.

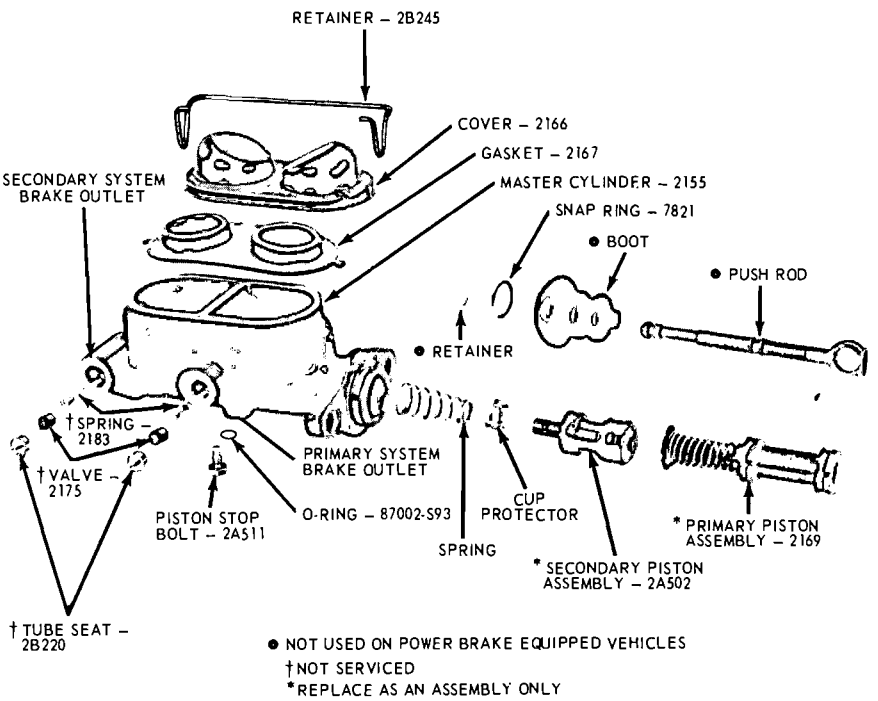

FIG. 17 Dual Master Cylinder Disassembled

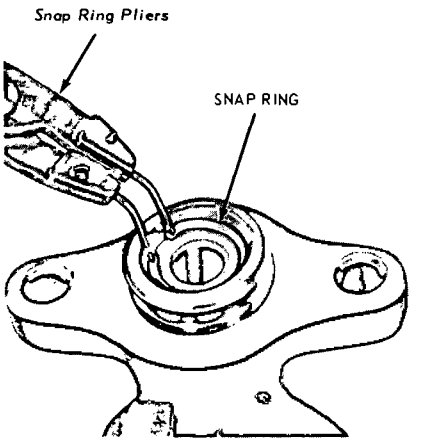

FIG. 18 Removing Snap Ring—Typical

Assembly

1. Dip all parts except the master cylinder body in clean Rotunda Extra Heavy Duty Brake Fluid.
2. Carefully insert the complete secondary piston and return spring assembly in the master cylinder bore.
3. Install the primary piston assembly in the master cylinder bore.
4. Depress the primary piston and install the snap ring in the cylinder bore groove.
5. Install the push rod, boot and retainer on the push rod, if so equipped. Install the push rod assembly into the primary piston. **Make sure the retainer is properly seated and holding the push rod securely.**
6. Position the inner end of the push rod boot (if so equipped) in the master cylinder body retaining groove.
7. Install the secondary piston stop bolt and O-ring in the bottom of the master cylinder.
8. Install the bleed screw (if so equipped). Install the gasket (diaphragm) in the master cylinder filler cover. Position the gasket as shown in Fig. 17. **Make sure the gasket is se curely seated.**
9. Install the cover and gasket on the master cylinder and secure the cover into position with the retainer.

9 SPECIFICATIONS AND SPECIAL SERVICE TOOLS

DRUM BRAKE LINING DIMENSIONS (INCHES)

MODELS	POSITION	COLOR CODE	BRAKE SIZE	LINING SIZE① FRONT	LINING SIZE① REAR
FORD-MERCURY-METEOR					
Mercury passenger car - 351 Monterey & Monterey Custom. Ford-Meteor passenger car. 240-302-351-CID - All except LTD & Lemoyne. 390 & 400 CID Ford - All except LTD.	Primary	Black-Yellow	11	2.50 x 9.34	2.25 x 9.34
	Secondary	Blue-Black	11	2.50 x 12.12	2.25 x 12.12
Ford-Mercury-Meteor Passenger Car. 400 CID - all Meteor except Lemoyne 400 & 429 CID - All Mercury 429 CID - All Ford and Meteor except LTD and Lemoyne.	Primary	Black-Yellow	11	3.00 x 9.34	2.25 x 9.34
	Secondary	Blue-Black	11	3.00 x 12.12	2.25 x 12.12
240-302 CID New York Taxi - Ford. Without A/C - 429 Police Interceptor - Ford. Ford LTD - All Engines	Primary	Black-Yellow	11	NA	2.25 x 9.34
	Secondary	Blue-Black	11	NA	2.25 x 12.12
Mercury Police - All Engines except Police Interceptor - 429 CID	Primary	Black-Yellow	11	NA	2.25 x 9.34
	Secondary	Blue-Black	11	NA	2.25 x 12.12
Mercury Police Interceptor - 429 CID	Primary	Yellow-Yellow	11	NA	2.50 x 9.34
	Secondary	Green-Green	11	NA	2.50 x 12.12
Ford-Mercury-Meteor Station Wagons. 302-351 CID - All Ford-Meteor except Squire. 390 and 400 w/o A/C - All Ford-Rideau-Monterey M71B.	Primary	Black-Yellow	11	3.00 x 9.34	2.25 x 9.34
	Secondary	Blue-Black	11	3.00 x 12.12	2.25 x 12.12
Ford-Mercury-Meteor Station Wagons. 400 CID without A/C - Montcalm & All Mercury except Monterey M71B. 400 CID Meteor and Mercury with A/C. All 429 CID Meteor and Mercury. 390 & 400 CID Ford with A/C. 429 - All Ford. Ford Squire - All Engines.	Primary	Black-Yellow	11	NA	2.25 x 9.34
	Secondary	Blue-Black	11	NA	2.25 x 12.12
TORINO-MONTEGO					
250 & 302 CID Torino-Montego Sedan and Hardtop.	Primary	Yellow-Black	10	2.25 x 8.43	2.00 x 8.43
	Secondary	Blue-Blue	10	2.25 x 10.82	2.00 x 10.82
250 & 302 Torino-Montego Conv. 250 & 302 Torino-Montego Sta. Wag. 351 & 429 CID Fairlane-Montego Sedan & Hdtop. and 351 Conv. 250, 302 & 351 Torino-Montego LPO Police-Maximum Fade Resistant.	Primary	Yellow-Black	10	2.50 x 8.43	2.00 x 8.43
	Secondary	Blue-Blue	10	2.50 x 10.82	2.00 x 10.82
250-302 & 351 Montego Police LPO Maximum Wear Resistant (Bonded)	Primary	Yellow-Black	10	2.50 x 9.51	2.00 x 9.51
	Secondary	Blue-Blue	10	2.50 x 10.75	2.00 x 10.75
351 & 429 CID Torino-Montego Station Wagons.	Primary	Yellow-Black	10	2.50 x 8.43	2.00 x 8.43
	Secondary	Blue-Blue	10	2.50 x 10.82	2.00 x 10.82
MUSTANG AND COUGAR					
Mustang 250 and 302 CID	Primary	Yellow-Black	10	2.25 x 8.43	2.00 x 8.43
	Secondary	2 Blue	10	2.25 x 10.82	2.00 x 10.82
351 and 429 CID Mustang and Cougar	Primary	Yellow-Black	10	2.50 x 8.43	2.00 x 8.43
	Secondary	Blue-Blue	10	2.50 x 10.82	2.00 x 10.82
MAVERICK AND COMET					
200 & 250 CID	Primary	Red-Blue	9	2.25 x 7.62	1.50 x 7.62
	Secondary	Green	9	2.25 x 9.77	1.50 x 9.77
302 CID	Primary	Yellow-Black	10	2.25 x 8.43	1.75 x 8.43
	Secondary	Blue-Blue	10	2.25 x 10.82	1.75 x 10.82
LINCOLN CONTINENTAL					
All Models	Primary	Yellow-Black	11	NA	2.50 x 9.34
	Secondary	Blue-Blue	11	NA	2.50 x 12.12
THUNDERBIRD AND CONTINENTAL MARK III					
All Models	Primary	Yellow-Black	11	NA	2.25 x 9.34
	Secondary	Blue-Blue	11	NA	2.25 x 12.12

① Wear Limits – Riveted: 0.031 from top of rivets. – Bonded: 0.030 total lining thickness.

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BORE DIAMETERS–BRAKE DRUM, WHEEL CYLINDER AND MASTER CYLINDER

	Models	Brake Drum		Wheel Cylinder Bore Dia.		MasterCylinder Bore Dia.	
		Inside Diameter	Boring Limit (Max.) ①	Front③	Rear④	With Power Brake②	Less Power Brake④
Ford, Mercury and Meteor	Taxi and Station Wagon	11.030	11.090	1.093	0.938	1.000	1.000
	Other	11.030	11.090	1.125	0.938	1.000	1.000
Montego and Torino	Pass. except Conv. 250, 302 CID Engines	10.000	10.060	1.125	0.906	0.9375	1.000
	Pass. and Conv. 351, 390, 429 CID Engines	10.000	10.060	1.125	0.906	0.9375	1.000
	Convertible 250, 302 CID Engines	10.000	10.060	1.125	0.906	0.9375	1.000
	Station Wagon	10.000	10.060	1.125	0.968	0.9375	1.000
Maverick and Comet	9 Inch Brake - Passenger Car	9.000	9.060	1.062③	0.844③	0.9375	1.000
	10 Inch Brake - Passenger Car	10.000	10.060	1.125	0.875	0.9375	1.000
Mustang and Cougar	351, 429, 428 CID Engine	10.000	10.060	1.125	0.906	1.000	1.000
	250, 302, CID Engine	10.000	10.060	1.125	0.875	1.000	1.000
Thunderbird	All	11.030	11.090	N/A	0.938	1.000	N/A
Continental Mark III	All	11.030	11.090	N/A	0.938	1.000	N/A
Lincoln Continental	All	11.030	11.090	N/A	0.938	1.000	N/A

①Max. Runout 0.007
②Max. Allowable Hone 0.003
③ Front Wheel Cylinder cannot be honed on Maverick or Mustang with 9 inch Brakes.

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TORQUE LIMITS–GENERAL–FT-LBS

	Ford-Mercury Meteor	Torino Montego Maverick	Mustang-Cougar	Thunderbird Continental Mark III	Lincoln Continental
Master Cylinder to Dash Panel Screw	13-25	13-25	13-25		
Master Cylinder to Booster	13-25	13-25	13-25	13-25	13-25
Booster to Dash Panel	13-25	13-25	13-25	13-25	13-25
Wheel Cylinder to Backing Plate Screws	10-20	10 in. Brake 10-20	10 in. Brake 10-20	10-20	10-20
		9 in. Brake 5-7	9 in. Brake 5-7		
Wheel Cylinder & Backing Plate Anchor Pin Nut	20-30				
Rear Brake Backing Plate to Axle Housing: Removable Carrier	50-70			50-70	30-35
Integral Type	20-40	20-40	20-40		
Front Brake Backing Plate to Spindle	25-45	20-35	20-35		
Pressure Differential Valve Bracket Bolts and Nuts	7-11	7-11	7-11	7-11	7-11
Wheel Cylinder Bleeder Screw	6-15	32-65 Inch-lb.	32-65 Inch-lb.	6-15	6-15
Brake Hose Connection to Front Wheel Cylinder	12-20	12-20	12-20		
Brake Line Connection to Rear Axle Housing: Removable Carrier	30-40	12-19	12-19	30-40	
Integral Type	25-35	12-19	12-19		
Hydraulic Tube Connections① 3/8 x 24	10-15	10-15	10-15	10-15	10-15
7/18 x 24	10-15	10-15	10-15	10-15	10-15
1/2 x 20	10-17	10-17	10-17	10-17	10-17
9/16 x 18	10-17	10-17	10-17	10-17	10-17
Wheel to Hub and Drum	70-115	4 lug 55-85	4 lug 55-85	70-115	70-115
		5 lug 70-115	5 lug 70-115		

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

SERVICE TOOLS

Tool No.	Former No.	Description
HRE 8650 (Rotunda)		Brake Adjusting Gage
BL-41-A (Snap-on)	LM 119	Brake Cylinder Retaining Clamp
B3404-B (Snap-on)	2018-A	Brake Adjusting Tool
	2162	Adapter Cap
BT-11 (Snap-on)	2035N	Brake Shoe R & R Spring
Tool 7000-DE		Rubber Tipped Air Nozzle
Tool 33621	33621	Internal Snap Ring Pliers
	Milbar 1112-144	Inch Pound Torque Wrench
T71P-4234-A (Ford)	4235-C	Axle Shaft Remover
Rotunda FRE 1432		Brake Drum Micrometer

CH1865-A

PART 12-20 *Disc Brakes—Single Piston Floating Caliper*

COMPONENT INDEX Applies to Models As Indicated	All Models	Ford	Mercury	Meteor	Cougar	Torino	Comet	Maverick	Montego	Mustang	Lincoln-Continental	Thunderbird	Continental-Mark III
BRAKE BOOSTER													
Cleaning and Inspection - See Part 12-01													
Description		20-03	20-03	20-03	20-03	20-03	N/A	N/A	20-03	20-03	20-03	20-03	20-03
Removal and Installation		20-09	20-09	20-09	20-09	20-09	N/A	N/A	20-09	20-09	20-09	20-09	20-09
BRAKE PEDAL													
Removal and Installation		20-10	20-10	20-10	20-10	20-10	N/A	N/A	20-10	20-10	20-11	20-10	20-10
DISC BRAKE													
Description		20-02	20-02	20-02	20-02	20-02	N/A	N/A	20-02	20-02	20-02	20-02	20-02
DISC BRAKE CALIPER													
Cleaning and Inspection		20-14	20-14	20-14	20-14	20-14	N/A	N/A	20-14	20-14	20-14	20-14	20-14
Disassembly and Overhaul		20-13	20-13	20-13	20-13	20-13	N/A	N/A	20-13	20-13	20-13	20-13	20-13
Removal and Installation		20-04	20-04	20-04	20-05	20-05	N/A	N/A	20-05	20-05	20-04	20-04	20-04
DISC BRAKE ROTOR AND HUB													
Cleaning and Inspection - See Part 12-01													
Refinishing		20-11	20-11	20-11	20-11	20-11	N/A	N/A	20-11	20-11	20-11	20-11	20-11
Removal and Installation		20-06	20-06	20-06	20-06	20-06	N/A	N/A	20-06	20-06	20-06	20-06	20-06
DISC BRAKE ROTOR SPLASH SHIELD													
Removal and Installation		20-06	20-06	20-06	20-06	20-06	N/A	N/A	20-06	20-06	20-06	20-06	20-06
DISC BRAKE SERVICE PRECAUTIONS													
See Part 12-01													
DISC BRAKE SHOE AND LINING													
Cleaning and Inspection - See Part 12-01													
Removal and Installation		20-04	20-04	20-04	20-04	20-04	N/A	N/A	20-04	20-04	20-04	20-04	20-04
DUAL BRAKE SYSTEM													
Description		20-02	20-02	20-02	20-02	20-02	N/A	N/A	20-02	20-02	20-02	20-02	20-02
MASTER CYLINDER													
Cleaning and Inspection		20-12	20-12	20-12	20-12	20-12	N/A	N/A	20-12	20-12	20-12	20-12	20-12
Disassembly and Overhaul		20-12	20-12	20-12	20-12	20-12	N/A	N/A	20-12	20-12	20-12	20-12	20-12
Removal and Installation - Power		20-07	20-07	20-07	20-07	20-07	N/A	N/A	20-07	20-07	20-07	20-07	20-07
PRESSURE DIFFERENTIAL AND PRESSURE CONTROL VALVE													
Removal and Installation		20-08	20-08	20-08	20-08	20-08	N/A	N/A	20-08	20-08	20-08	20-08	20-08
PRESSURE METERING VALVE													
Removal and Installation		20-08	20-08	20-08	N/A	N/A	N/A	N/A	N/A	N/A	20-08	20-08	20-08
SPECIFICATIONS AND SPECIAL SERVICE TOOLS	02-15												

A page number indicates that the item is for the vehicle(s) listed at the head of the column.

N/A indicates that the item is not applicable to the vehicle(s) listed.

1 DESCRIPTION

Disc brakes are available as optional equipment for the front wheels on Ford, Mercury, Meteor, Torino, Montego, Mustang and Cougar models and are standard on Thunderbird, Continental Mark III, and Lincoln Continental models. The dual-master cylinder equipped hydraulic brake system employs single anchor, internal expanding and self-adjusting drum brake assemblies on the rear wheels of vehicles with disc brakes.

The disc brake consists of a ventilated rotor and caliper assembly. The caliper used is a single piston floating caliper (Fig. 1).

A pressure control valve provides balanced braking action between front and rear brakes.

On Ford, Mercury, Meteor, Continental Mark III, Lincoln Continental and Thunderbird models a metering valve, in the hydraulic line between the differential valve and the front wheel disc brakes, prevents the front brakes from applying until approximately 125 psi is obtained in the system (Fig. 1). This delaying action is required to prevent the front brakes from performing all the braking action on low speed stops and thereby increasing the rate of lining wear, and from locking on ice and slippery pavement.

A vacuum booster is used with the power disc brake system.

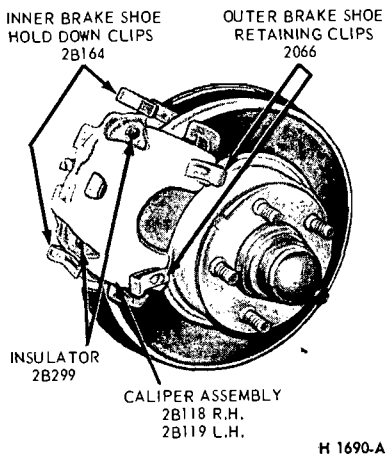

FIG. 1 Disc Brake Assembly—Floating Caliper

DUAL MASTER CYLINDER BRAKE SYSTEM

The dual-master cylinder brake system has been incorporated in all models to provide increased safety. The system consists of a dual-master cylinder (Fig. 2), pressure differential valve assembly and a switch (Fig. 3). The switch on the differential valve activates a dual-brake warning light, located on the instrument panel.

Floating Caliper

The caliper assembly is made up of a floating caliper housing assembly and an anchor plate. The anchor plate is bolted to the wheel spindle arm by two bolts. The floating caliper is attached to the anchor plate by steel stabilizers on Ford, Mercury, Meteor, Lincoln Continental, Thunderbird and Continental Mark III models and by one stabilizer on Torino, Montego, Mustang and Cougar models. The floating caliper slides on two locating pins which also attach to the stabilizers. The floating caliper contains the single cylinder and piston assembly. The cylinder bore contains a

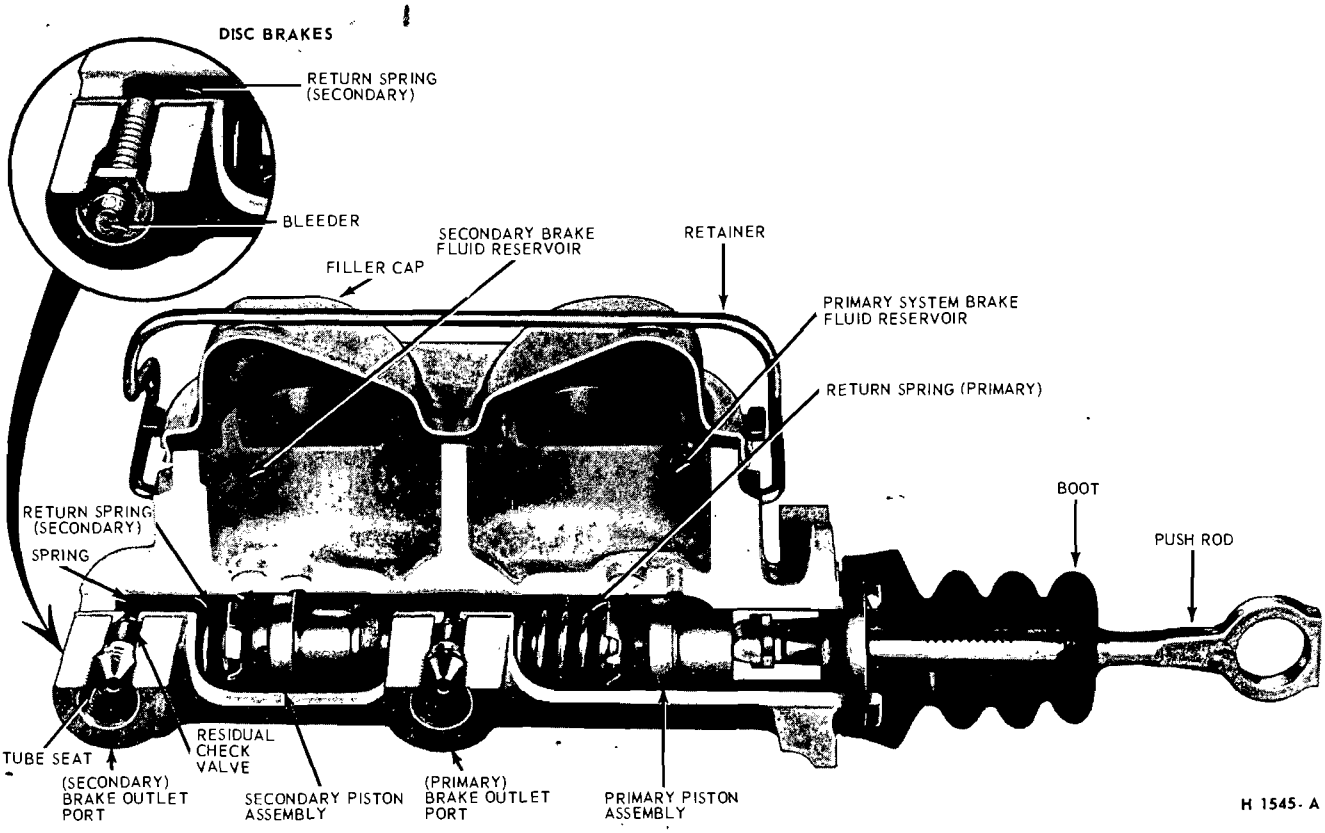

FIG. 2 Dual Master Cylinder— Typical

piston with a molded rubber dust boot to seal the cylinder bore from contamination (Fig. 4). A square section rubber piston seal is positioned in a groove in the cylinder bore and is used to provide sealing between the cylinder and piston (Fig. 5).

The outer brake shoe and lining assembly is longer than the inner assembly, and the shoe and lining assemblies are not interchangable. The outboard shoe and lining is fixed to the floating caliper and is retained by two pins and spring clips. The shoe and lining assembly consists of friction material bonded to a metal plate called the shoe. It is replaced as a unit.

Rotor

The cast iron disc is of the ventilated rotor-type incorporating forty fins and is attached to, and rotates with the wheel hub. A splash shield bolted to the spindle is used primarily to prevent road contaminants from contacting the inboard rotor and lining surfaces. The wheel provides protection for the outboard surface of the rotor.

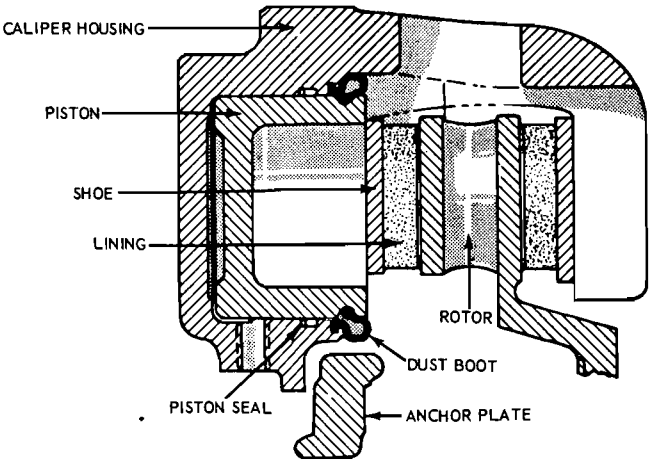

FIG. 4 Floating Caliper Assembly— Sectional View

BRAKE BOOSTER SYSTEM

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

The brake booster is of the vacuum suspended-type which utilizes engine intake manifold vacuum and atmospheric pressure for its power.

Adjustment of the push rod and replacement of the check valve and grommet are the only services permitted on the brake booster. The booster unit is to be exchanged when it is inspected, checked and found to be inoperative.

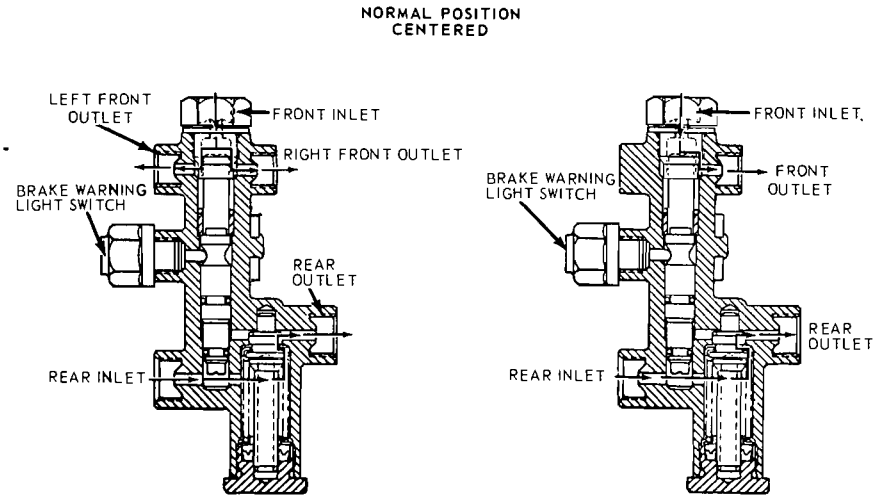

FIG. 3 Pressure Differential Valve and Brake Warning Light Switch

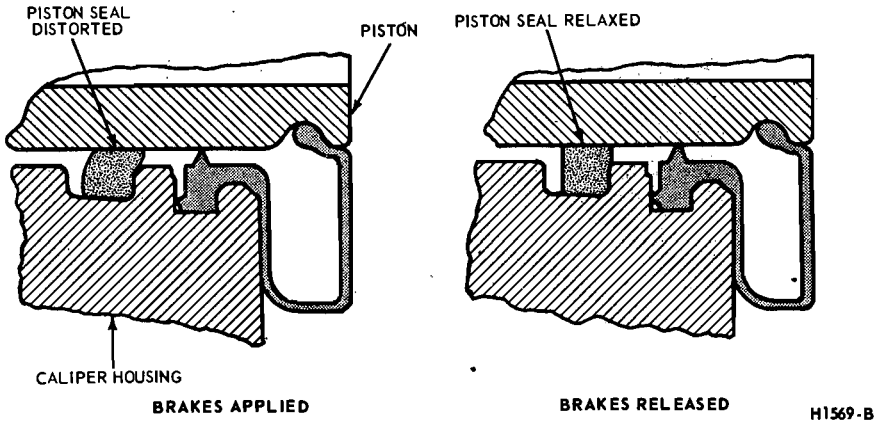

FIG. 5 Function of Piston Seal

4 REMOVAL AND INSTALLATION

DISC BRAKE CALIPER ASSEMBLY

Removal

1. Remove the wheel and tire assembly from the hub. **Use care to avoid damage or interference with the bleeder screw fitting during removal.**
2. Disconnect the brake hose from the caliper. Cap the hose fitting to prevent brake system contamination and loss of brake fluid from the master cylinder. Mark the left and right caliper assemblies with chalk prior to removal from the vehicle.
3. Remove the caliper locating pins and lower stabilizer attaching bolts and discard the stabilizer (Figs. 3 and 6).
4. Lift the caliper from the anchor plate.

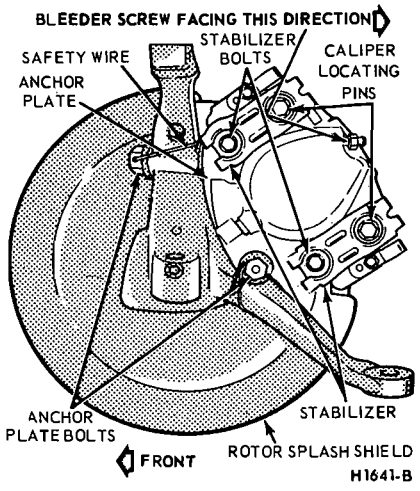

FIG. 6 Floating Caliper Installed— Rear View

Installation

1. Install the caliper assembly over the rotor with the outer brake shoe against the rotor braking surface during installation in the anchor plate to prevent pinching the piston boot between the inner brake shoe and the piston. Check that the correct caliper is installed on the correct anchor plate as marked during disassembly.
2. Position the new stabilizer (supplied in the brake kit). Apply water to the locating pins and attach the stabilizer to the caliper. **Be sure the locating pins are free of oil, grease or dirt.** Torque the caliper locating pins to specifications.
3. Install the stabilizer to anchor plate attaching screws and torque to specifications.
4. Remove the cap from the brake hose fitting. Install a new copper washer on each side of the hose fitting and install the brake hose to the caliper. Torque the attaching bolt to specifications.
5. Bleed the brake system and centralize the brake pressure differential valve as outlined in Part 12-01.
6. Fill the master cylinder as required to within 1/4 inch of the top of the reservoir.
7. Install the wheel and tire assembly and torque the wheel nuts to specifications.
8. Apply the brake pedal prior to moving the vehicle to position the brake linings.
9. Road test vehicle.

DISC BRAKE SHOE AND LINING

Ford, Mercury, Meteor, Thunderbird, Continental Mark III, Lincoln Continental

Removal

1. Remove the master cylinder cap and check the fluid level in the primary (large) reservoir. Remove enough fluid until the reservoir is half full. **Discard this fluid.**
2. Remove the wheel and tire assembly from the hub. **Be careful to avoid damage or interference with the caliper splash shield or bleeder screw fitting.**
3. Remove the inner shoe hold down clips (Fig. 1).
4. Place a small screwdriver under the outer shoe retaining clip tang and lift away from the pin groove and slide the clip from the shoe retaining pin. Remove the other brake shoe retaining clip. See Fig. 1 and remove the outer brake shoe.
5. Remove the caliper locating pins (Fig. 6).
6. Remove the upper stabilizer to anchor plate attaching bolt and remove the upper stabilizer to avoid interference with the brake hose during caliper removal (Fig. 6).

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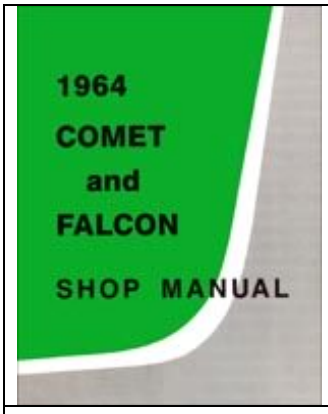

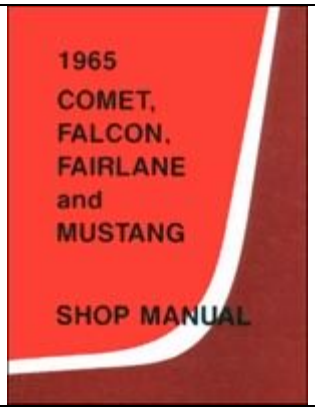

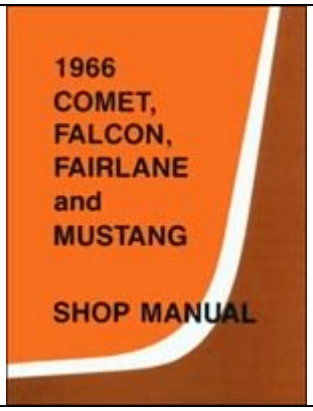

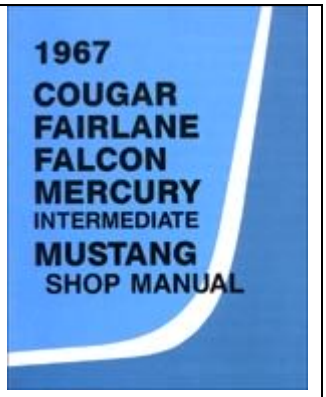

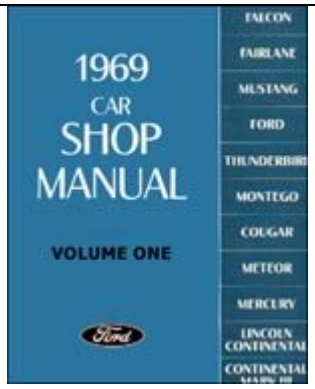

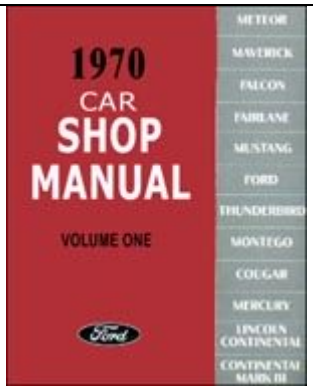

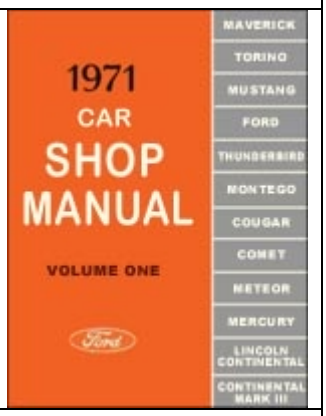

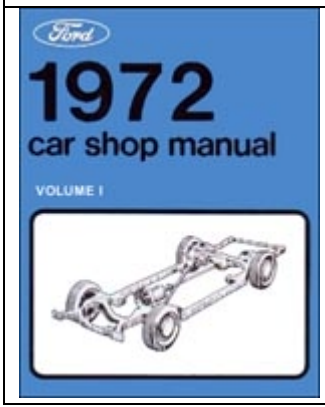

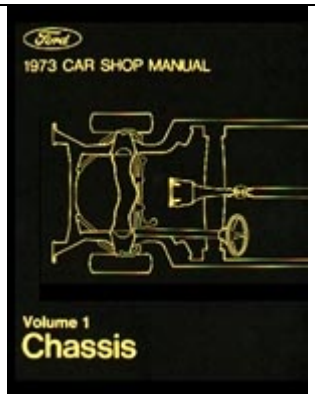

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