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1970 TRUCK SHOP MANUAL

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Volume 2 - Engine

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Forel Publishing Company, LLC

3999 Peregrine Ridge Ct.

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1970 TRUCK SHOP MANUAL

VOLUME ONE CHASSIS



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SERVICE PUBLICATIONS

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FOREWORD

This manual is divided into four volumes: 1 – Chassis, 2 – Engine, 3 & 4 – Body and Electrical, 5 – Maintenance and Lubrication. These volumes should provide Service Technicians with complete information covering normal service repairs on all 1970 model trucks built by Ford Motor Company in the U.S. and Canada. As changes in the product occur, this information will be updated by Technical Service Bulletins. When issued, TSB information always supersedes that published here.

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 locator 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.”

Those who have previously used Ford Shop Manuals will find a major change this year in the division of information into “Groups” and “Parts.” 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 have been changed so that the first digit of the number indicates the volume in which the group may be found.

Example

36 – 05 – 13
Volume 3 – Group 6 – Part 5 – Page 13

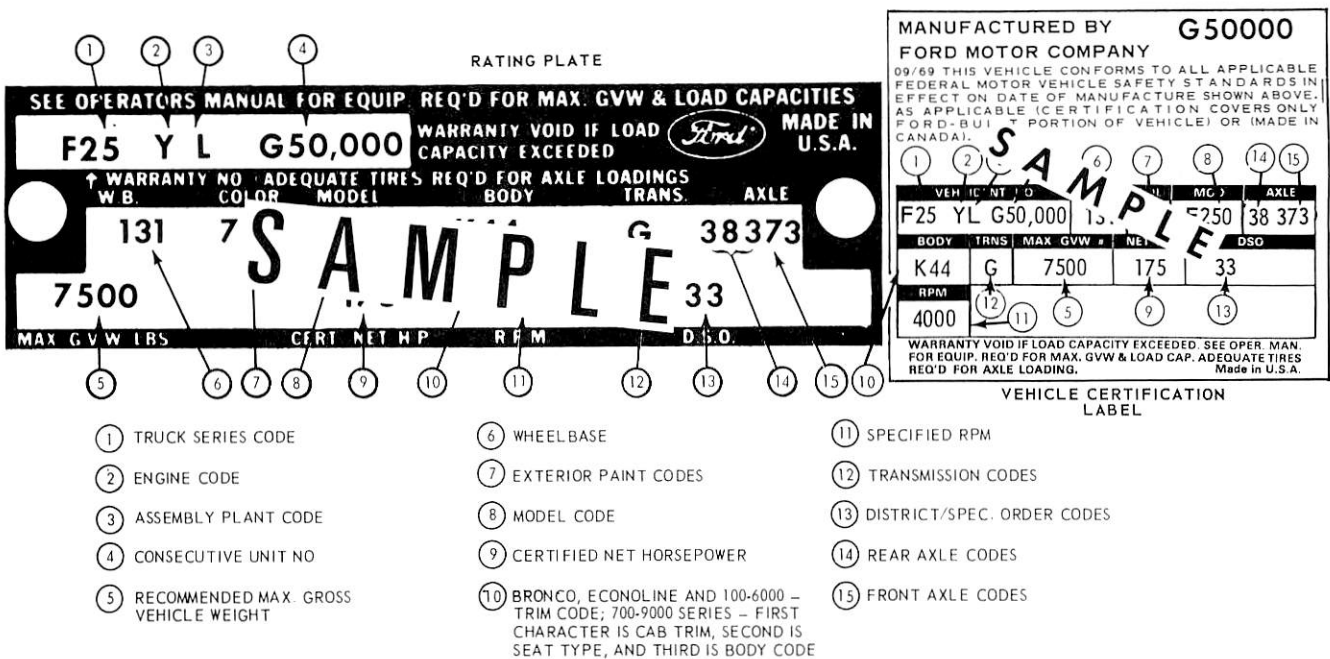
We hope that this change in indexing will make it easier and quicker to locate desired information within these manuals.

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



SERVICE PUBLICATIONS

Index and Identification



W1017-B

FIG. 1—Typical Truck Rating Plate and 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.

The remaining information codes on the V.C. Label are the same as the Truck Rating Plate Codes (Fig. 1). Vehicle codes shown on the Truck Rating Plate are explained in the following paragraphs. Some early production vehicles will not have complete information on the vehicle certification label.

RATING PLATE

Figure 1 illustrates a typical truck Rating Plate. On light and medium cowl and windshield vehicles, the Rating Plate is mounted on the right side of the cowl top panel or upper cowl panel under the hood. On Parcel Delivery vehicles, the rating plate is mounted on the right side of the radiator support. On Bronco models, the plate is mounted on the inside panel of the glove compartment door. On all other vehicles, the Rating Plate is mounted on the rear face of the left front door.

VEHICLE WARRANTY NUMBER

The Warranty Number is the first line of numbers and letters appearing on the Rating Plate (Fig. 1). The first letter and two numbers indicate the truck model and series (the letter prefix identifies the type of body or cab and the

numbers are the first two numbers of a truck series. The letter following the truck series code designates the engine identification code. The letter following the engine identification code indicates the assembly plant at which the vehicle was built. The remaining numbers indicate the consecutive unit number. The charts that follow list the various vehicle warranty number codes.

VEHICLE DATA

The Vehicle Data appears on the Rating Plate on the two lines following the Warranty Number. The first three digits under W.B. designate the wheelbase in inches. The one or two letters under COLOR identify the exterior paint color (two letters designate a two-tone). The letter and three digits under MODEL designate the truck model within a series. The letter and numerals under BODY designate the interior trim and body type (the letter identifies the interior trim scheme and the numerals identify the body or cab type). The transmission installed in the vehicle is identified under TRANS by either a numeric or alphabetical code (if two symbols appear, the first identifies the auxiliary transmission, if so equipped, and the second symbol identifies the main transmission). A letter and a number or two numbers under AXLE identify the rear axle ratio (when required, a letter is also stamped behind the rear axle code to identify the front axle capacity). The maximum gross vehicle weight in pounds is stamped under MAX. G.V.W. Following MAX. G.V.W., the horsepower rating of the engine with which the vehicle is equipped is stamped under CERT. NET H.P.

and the rpm required to develop the given horsepower is stamped under R.P.M. A two-digit number is stamped under D.S.O. to identify the district which ordered the vehicle. If the vehicle is built to special order (Domestic Special Order, Foreign Special Order, Limited Production Option, or other special order), the complete order number will also appear under D.S.O. The charts that follow list the various vehicle data codes.

W.B. (Wheelbase)

The wheelbase in inches is entered in this space.

MAX. G.V.W. Lbs.

The maximum gross vehicle weight in pounds is recorded in this space.

CERT. Net H.P.

The certified net horsepower at specified rpm is marked at this location.

SPECIFIED RPM

The rpm required to develop the certified net horsepower is marked at this location.

D.S.O.

If vehicle is built on a D.S.O., F.S.O., L.P.O. (special orders) the complete order number will be reflected under the D.S.O. space including the District Code Number.

ASSEMBLY PLANT CODES

Code Letter	Assembly Plant	Code Letter	Assembly Plant
C.....	Ontario	N.....	Norfolk
D.....	Dallas	P.....	Twin Cities
E.....	Mawah	R.....	San Jose
H.....	Lorain	S.....	(Pilot Plant) Allen Park
K.....	Kansas City	U.....	Louisville
L.....	Michigan Truck	V.....	Kentucky Truck

CW1034-A

EXTERIOR PAINT COLOR CODES

Code	M-30J/M-32J Spec. Number ⊙	Color
A.....	1724-A.....	Black
B.....	3059-A.....	Maroon
C.....	1525-A.....	Special White
D.....	3439-A.....	Lt. Yellow
E.....	1906-A.....	Lt. Blue
F.....	3466-A.....	Lt. Beige
G.....	1526-A.....	Chrome Yellow
H.....	3414-A.....	Med. Ivy Green
I.....	2041-A.....	Med. Lime Metallic
J.....	1515-A.....	Red
K.....	3340-A.....	Yellow Metallic
L.....	1237-A.....	Dark Green
M.....	1619-A.....	White
N.....	3282-A.....	Dk. Green
N (Econoline only) ...	1911-A.....	Med. Beige Metallic
P.....	3150-A.....	Med. Ivy Green
Q.....	1624-A.....	Med. Blue Metallic
R.....	1635-A.....	Lt. Yellow Green
S.....	3199-A.....	Nugget Gold Metallic
T.....	2008-A.....	Red
U.....	3217-A.....	Yellow
W.....	3341-A.....	Yellow
X.....	1742-A.....	Med. Blue
Y.....	3216-A.....	Med. Aqua
Z.....	3569-A.....	Med. Beige
2.....	3071-A.....	Lt. Ivy Yellow
2 (Econoline only)	1878-A.....	Med. Beige
3.....	1635-A.....	Gold
4.....	3416-A.....	Lt. Ivy Green
5.....	921-A.....	Platinum
6.....	3077-A.....	Med. Blue Metallic
7.....	2098-A.....	Med. Blue
8.....	3198-A.....	Lt. Gold

⊙ M-32J Acrylic Enamel Alternate with M-30J Alkyd.

CW1038-A

TRUCK MODEL CODE PREFIX ⊙

Prefix	Type
B.....	Bus Chassis Cowl 2 Axle—Gas
C.....	Tilt Cab 2 Axle—Gas
D.....	Tilt Cab 2 Axle—Diesel
E.....	Econoline
F.....	Conventional 2 Axle—Gas
G.....	Parcel Delivery Chassis 2 Axle—Diesel
J.....	Bus Chassis Cowl 2 Axle—Diesel
K.....	Conventional 2 Axle—Diesel
L.....	Tilt Cab Tandem Rear Axle—Gas
N.....	Conventional 2 Axle—Gas
P.....	Parcel Delivery Chassis 2 Axle—Gas
Q.....	Tilt Cab Tandem—Diesel
R.....	Conventional 2 Axle—Diesel
S.....	Conventional Tandem Rear Axle—Gas
T.....	Conventional Tandem Rear Axle—Gas
U.....	Conventional Tandem Rear Axle—Diesel
U14, U15.....	Bronco
W.....	Conventional Tandem Rear Axle—Diesel
X.....	Fwd. Axle Tilt Cab Tandem Rear Axle—Diesel
Z.....	Fwd. Axle Tilt Cab 2 Axle—Diesel

⊙ The next two numbers of the truck model code given in the warranty number (Fig. 1) are the first two numbers of the truck series.

CW1032-A

ENGINE CODE

Bronco-Econoline-Club Wagon-Parcel Delivery-School Bus- Light and Medium Trucks			
Code	Cylinders	Engine C.I.D.	
A	6	240-1V	Gas
B	6	300-1V	
B	6	300-1V H.D.	
C	8	330-2V M.D.	
D	8	330-2V H.D.	
E	8	361-2V	
F	6	170-1V	
G	8	302-2V	
H	8	390-2V	
Y	8	360-2V	
1	6	240-1V	Gas Low Compression
2	6	300-1V H.D.	
3	8	330-2V	
4	8	330-2V H.D.	
5	8	361-2V	
6	6	170-1V	
7	8	302-2V	
8	8	360-2V	
J	4	242 Dorset	Diesel
U	8	552 CAT. (150)	
V	8	552 CAT. (175)	
W	6	363 Dorset	
Heavy and Extra Heavy Truck—Series 700 Through 9000 LN-500-9000 and C-500-900			
Code	Cylinders	Engine C.I.D.	
A	6	240-1V	Gas
B	6	300-1V	
C	8	330-2V M.D.	
D	8	330-2V H.D.	
E	8	361-2V	
F	8	391-4V	
H	8	401-4V	
K	8	477-4V	
L	8	534-4V	
U	8	330-2V H.D.	
W	8	361-2V	
9	8	534-4V	Gas Low Compression
1	6	240-1V	
3	8	330-2V M.D.	
4	8	330-2V H.D.	
5	8	361-2V	

Heavy and Extra Heavy Truck—Series 700 Through 9000 LN-500-9000 and C-500-900 (Continued)			
Code	Cylinders	Engine C.I.D.	
A		855 Cummins-NHC-250	Diesel
B		903 Cummins-V903-320 H.P.	
C		636 Ford-V8-225 H.P.	
D		743 Cummins-NHE-195	
E		903 Cummins-V903-270 H.P.	
F		855 Cummins-NHCT-270-270 H.P.	
G		903 Cummins-V903-290 H.P.	
H		855 Cummins-NHC-250 (DSO)	
J		855 Cummins-NHC-250	
K		855 Cummins-NHCT-270-240 H.P.	
L		855 Cummins-NHCT-270-255 H.P.	
M		855 Cummins-NTC-260	
N		855 Cummins-NTC-280	
O		638 Ford-V-8-1673C-250 H.P.	
P		855 Cummins-NTC-300	
Q		855 Cummins-NTC-320	
R		855 Cummins-NTC-335	
S		426 Detroit 6-71N	
T		568 Detroit 8V-71N	
U		522 Ford V8-150 H.P.	
V		522 Ford V8-175 H.P.	
W		363 Dorset	
X		464 Cummins-CF-160	
Y		464 Cummins C-180	
Z		464 Cummins-C-160	
1		855 Cummins-NH-230	
2		426 Detroit 6-71N	
3		638 Ford-V-8-1674	
4		573 Ford-V8-200 H.P.	
5		855 Cummins-NHCT-270	
6		568 Detroit 8V-71N	
7		568 Detroit 8V-71NE	
8		318 Detroit 6V-53N	
9		426 Detroit 6-71NE	

CW1033-A

D.S.O. CODES

Code	District	Code	District	Code	District	Code	District
11.....	Boston	51.....	Denver	Ford of Canada			
13.....	New York	53.....	Kansas City	Ford Regions			
15.....	Newark	54.....	Omaha	B1.....	Central	B4.....	Midwestern
16.....	Philadelphia	55.....	St. Louis	B2.....	Eastern	B6.....	Western
17.....	Washington	56.....	Davenport	B3.....	Atlantic	B7.....	Pacific
21.....	Atlanta	61.....	Dallas	I2.....	Export		
22.....	Charlotte	62.....	Houston	Mercury Regions			
24.....	Jacksonville	63.....	Memphis	A1.....	Central		
25.....	Richmond	64.....	New Orleans	A2.....	Eastern		
28.....	Louisville	65.....	Oklahoma City	A3.....	Atlantic		
32.....	Cleveland	71.....	Los Angeles	A4.....	Midwestern		
33.....	Detroit	72.....	San Jose	A6.....	Western		
35.....	Lansing	73.....	Salt Lake City	A7.....	Pacific		
37.....	Buffalo	74.....	Seattle	I2.....	Export		
38.....	Pittsburgh	75.....	Phoenix				
41.....	Chicago	83.....	Government				
43.....	Milwaukee	84.....	Home Office Reserve				
44.....	Twin Cities	85.....	American Red Cross				
46.....	Indianapolis	87.....	Body Company				
47.....	Cincinnati	89.....	Transportation Services				
		90's.....	Export				

CW1044-A

CONSECUTIVE UNIT NUMBERS

Bronco, Econoline, Light and Medium Trucks Except as shown

The uniform sequential serial and numbering system for the 1970 model truck program is as follows:	
1969 (Calendar year)	
Aug.—1969 Model	G10,000 Thru G29,999
Aug.—1970 Model ⊙	G30,000 Thru G49,999
Sept. ⊙	G50,000 Thru G69,999
Oct. ⊙	G70,000 Thru G89,999
Nov.	G90,000 Thru H09,999
Dec.	H10,000 Thru H29,999
1970 (Calendar year)	
Jan.	H30,000 Thru H49,999
Feb.	H50,000 Thru H69,999
Mar.	H70,000 Thru H89,999
Apr.	H90,000 Thru J09,999
May.	J10,000 Thru J29,999
June.	J30,000 Thru J49,999
July.	J50,000 Thru J69,999
Aug.	J70,000 Thru J89,999
⊙ Starting with serial number G30,000 and continuing through August, September and October 1969, the following trucks will be 1970 models: FB 700, 750 and 7000 The following will be 1969 models: F 800 thru F 1000 (Gas and Diesel) All N, NT and T series (Gas and Diesel)	

Heavy and Extra Heavy Truck

1969 (Calendar year)	
Nov.	G90,000 Thru H09,999
Dec.	H10,000 Thru H29,999
1970 (Calendar year)	
Jan.	H40,000 Thru H49,999
Feb.	H60,000 Thru H69,999
Mar.	H80,000 Thru H89,999
Apr.	J00,000 Thru J09,999
May.	J20,000 Thru J29,999
June.	J40,000 Thru J49,999
July.	J60,000 Thru J69,999
Aug.	J80,000 Thru J89,999
FB 500—600	
1969 (Calendar year)	
Nov.	N/A
Dec.	N/A
1970 (Calendar Year)	
Jan.	H30,000 Thru H39,000
Feb.	H50,000 Thru H59,000
Mar.	H70,000 Thru H79,000
Apr.	H90,000 Thru H99,000
May	J10,000 Thru J19,000
June	J30,000 Thru J39,000
July	J50,000 Thru J59,000
Aug.	J70,000 Thru J79,000

CW1035-A

INTERIOR TRIM CODES

Code	Color	Trim	Code	Color	Trim
BRONCO			LIGHT AND MEDIUM TRUCKS (F-B-P-100 THROUGH 600 AND F6000)		
3.....	Light and Pastel Parchment..	Arkon and Corinthian Vinyl	2,1B	Lt. Blue/Med. Blue	Glendale/Kiwi Vinyl
9, 94, 9U..	Pastel Parchment	Rosette and Corinthian Vinyl	3,1U	Pastel Parchment	Glendale/Kiwi Vinyl
CLUB WAGON			4,1A	Black	Glendale/Kiwi Vinyl
23, 24, 25	Light Blue	Kenton & Corinthian Vinyl	5,1D	Red/Dk. Red	Glendale/Kiwi Vinyl
33, 34, 35	Light Nugget Gold	Kenton & Corinthian Vinyl	6,1G	Lt. Ivy Green/Med. Ivy Green	Glendale/Kiwi Vinyl
43, 44, 45	Light Ivy Green	Kenton & Corinthian Vinyl	2B,2C,BB,4A	Black with Blue	Leather Grain H.D. Vinyl
53, 54, 55	Red	Kenton & Corinthian Vinyl	3B,3C,CB,4A	Black with Parchment	Leather Grain H.D. Vinyl
13, 14, 15	White	Corinthian Vinyl	4B,4C,DB,4A	Black with Black	Leather Grain H.D. Vinyl
23, 24, 25	Light Blue	Corinthian Vinyl	5B,5C,EB,4A	Black with Red	Leather Grain H.D. Vinyl
43, 44, 45	Light Ivy Green	Corinthian Vinyl	6B,6C,FB,4A	Black with Ivy	Leather Grain H.D. Vinyl
ECONOLINE			23,B,K,GB,BB,7B,AB	Lt. Blue/Med. Blue	Diamond Basketweave/Kiwi Vinyl
2, 21, 22	Light Blue	Kenton & Corinthian Vinyl	AA,33,C,L,GU,BU,7U,AU	Pastel Parchment	Diamond Basketweave/Kiwi Vinyl
3, 31, 32	Light Nugget Gold	Kenton & Corinthian Vinyl	43,D,M,GA,BA,7A,AA	Black	Diamond Basketweave/Kiwi Vinyl
4, 41, 42	Light Ivy Green	Kenton & Corinthian Vinyl	53,E,N,GD,BD,7D,AD	Red/Dk. Red	Diamond Basketweave/Kiwi Vinyl
5, 51, 52	Red	Kenton & Corinthian Vinyl	63,F,O,GG,BG,7G,AG	Lt. Ivy Green/Med. Ivy Green	Diamond Basketweave/Kiwi Vinyl
A, A1, A2	White	Corinthian Vinyl	AU	Green	Diamond Basketweave/Kiwi Vinyl
B, B1, B2	Light Blue	Corinthian Vinyl	S,6B,FB	Med. Blue; Med. Blue	Corinthian Vinyl
D, D1, D2	Light Ivy Green	Corinthian Vinyl	T,6U,FU	Lt. Parchment; Pastel Parchment	Buckingham B/C and Kiwi Vinyl
26, 27, 28	Light Blue	Corinthian Vinyl	U,6A,FA	Black; Black	Buckingham B/C and Kiwi Vinyl
16, 7, 18	Light Nugget Gold (with white seat)	Corinthian Vinyl	V,6D,FD	Dk. Red; Dk. Red	Buckingham B/C and Kiwi Vinyl
46, 47, 48	Light Ivy Green	Corinthian Vinyl	W,6G,FG	Med. Ivy Green; Med. Ivy Green	Buckingham B/C and Kiwi Vinyl
			C4,L4,T4,SU,EU,9U	Pastel Parchment	Kiwi/Corinthian Vinyl

CW1039-A

**TRUCK SERIES CODE, MODEL CODE
RECOMMENDED MAX. GROSS VEHICLE WEIGHT**

Bronco

Series	Model Code	Rating G V W (lbs.)	Type
U-100	U-140	3,900	(Pickup) (Heavy Duty) Wagon (Heavy Duty)
	U-142	4,700	
	U-150	3,900	
	U-152	4,700	

CW1036-A

Econoline Club and Chateau Wagon

Series	Model Code	Rating G V W (lbs.)
E-100	E-140	4,000
	E-141	4,200
	E-142	4,500
	E-150	4,000
	E-151	4,200
	E-152	4,500
	E-160	4,000
	E-161	4,200
	E-162	4,500
	E-200	E-240
E-241		4,950
E-242		5,400
E-243		5,100
E-244		5,400
E-250		5,100
E-251		4,950
E-252		5,400
E-253		5,100
E-254		5,400
E-260		5,100
E-261		4,950
E-262		5,400
E-263		5,100
E-264		5,400

Series	Model Code	Rating G V W (lbs.)
E-300	E-340	6,050
	E-341	6,800
	E-342	7,400
	E-343	7,400
	E-344	7,600
	E-345	7,600
	E-349	6,800 (Export)
	E-350	6,050
	E-351	6,800
	E-352	7,400
	E-353	7,400
	E-354	7,600
	E-355	7,600
	E-359	6,800 (Export)
	E-360	6,050
	E-361	6,800
	E-362	7,400
	E-363	7,400
	E-364	7,600
	E-365	7,600
E-369	6,800 (Export)	

Series	Model Code	Type
E-100	E-110	Club Wagon
	E-120	Custom Club Wagon
	E-130	Chateau Wagon
	E-140	Regular Van
	E-150	Window Van
	E-160	Display Van
E-200	E-210	Club Wagon
	E-220	Custom Club Wagon
	E-230	Chateau Wagon
	E-240	Regular Van
	E-250	Window Van
	E-260	Display Van
E-300	E-310	Club Wagon
	E-320	Custom Club Wagon
	E-330	Chateau Wagon
	E-340	Regular Van
	E-350	Window Van
	E-360	Display Van
E-300 HD	E-311	Club Wagon
	E-321	Custom Club Wagon
	E-331	Chateau Wagon

CW1037-A1

F-100, F-350 and P Series

Series	Model Code	Rating G V W (lbs.)
F-100	F-100	5,000
	F-101	4,200
	F-102	5,000
	F-103	4,500
	F-104	4,800
F-100 (4 x 4)	F-110	5,600
	F-111	5,000
	F-112	5,600
	F-113	4,600
F-250	F-250	7,500
	F-252	7,500
	F-253	6,100
	F-254	6,900
	F-255	6,100
	F-256	6,900
F-250 (4 x 4)	F-260	6,800
	F-262	7,700
	F-263	6,300
	F-264	7,700

Series	Model Code	Rating G V W (lbs.)
F-350	F-350	8,000
	F-351	10,000
	F-352	8,000
	F-353	6,600
	F-354	8,300
	F-355	9,000
P-350	P-350	8,000
	P-351	6,100
	P-352	6,500
	P-353	8,000
P-400	P-400	10,000
	P-401	7,700
	P-402	8,000
	P-403	7,000
P-500	P-500	15,000
	P-501	10,100
	P-502	8,000
	P-503	12,000

Series	Model Code	Rating G V W (lbs.)
P-600	P-600 (DSO)	17,000
	P-601 (DSO)	15,000
P-3500 (Diesel)	G-350	8,000
	G-351	6,100
	G-352	6,500
	G-353	8,000
P-4000 (Diesel)	G-400	10,000
	G-401	7,700
	G-402	8,000
	G-403	7,000
P-5000 (Diesel)	G-500	15,000
	G-501	10,100
	G-502	8,000
	G-503	12,000
P-6000 (Diesel)	G-600 (DSO)	17,000
	G-601 (DSO)	15,000

CW1037-A2

500-8000 Series

Series	Model Code	Rating G V W (lbs.)	
B-500	B-500	15,000	
	B-501	10,000	
	B-502	16,000	
	B-503	17,000	
	B-504	18,000	
	B-505	20,000	
B-600	B-600	19,500	
	B-601	15,000	
	B-602	20,000	
	B-603	17,000	
	B-610	21,000	
	B-611	22,000	
	B-612	23,000	
	B-613	24,000	
	B-614	19,700	
	B-6000	J-600	20,000
J-601		15,000	
J-602		19,500	
J-603		17,000	
J-610		21,000	
J-611		22,000	
J-612		23,000	
J-613		24,000	
J-614		19,700	
B-700		B-700	20,500
		B-701	17,000
		B-702	21,000
		B-703	22,500
		B-704	23,000
	B-705	24,000	
	B-706	25,500	
	B-707	23,000	
	B-708	23,000	
	B-709	21,000	
B-7000	J-700	20,500	
	J-701	17,000	
	J-702	21,000	
	J-703	22,500	
	J-704	23,000	
	J-705	24,000	
	J-706	25,500	
	J-707	23,000	
	J-708	23,000	
	J-709	22,000	
B-750	B-750	22,500	
	B-751	17,000	
	B-752	23,000	
	B-753	24,000	
	B-754	25,500	
	B-756	23,000	
C-500	C-500	15,000	
	C-501	10,100	
	C-502	17,000	
	C-503	19,000	
	C-504	20,000	
C-600	C-600	20,000	
	C-601	15,000	
	C-610	21,000	
	C-611	22,000	
	C-612	23,000	
	C-615	19,700	
C-6000	D-600	20,000	
	D-601	15,000	
	D-610	21,000	
	D-611	22,000	
	D-612	23,000	
C-700	C-700	24,000	
	C-701	17,000	
	C-702	25,500	

500-8000 Series (Continued)

Series	Model Code	Rating G V W (lbs.)
C-7000	D-700	24,000
	D-701	17,000
	D-702	25,500
C-750	C-750	24,000
	C-751	17,000
	C-752	25,500
	C-760	27,500
C-800	C-800	27,000
	C-801	20,000
	C-802	27,500
C-8000	D-800	27,000
	D-801	20,000
	D-802	27,500
	D-804	26,000
	D-805	24,000
CT-800	L-800	43,000
	L-801	27,000
	L-802	39,000
	L-803	45,000
	L-804	49,000
	L-805	41,000
CT-8000	Q-800	43,000
	Q-801	27,000
	Q-802	39,000
	Q-803	45,000
	Q-804	49,000
F-500	F-500	15,000
	F-501	10,000
	F-502	16,000
	F-503	17,000
	F-505	20,000
F-600	F-600	19,500
	F-601	15,000
	F-602	20,000
	F-603	17,000
	F-610	21,000
	F-611	22,000
	F-612	23,000
	F-613	23,000
	F-614	23,000
	F-615	24,000
	F-616	19,700
	F-617	20,000
	F-6000	K-600
K-601		15,000
K-602		19,500
K-603		17,000
K-610		21,000
K-611		22,000
K-612		23,000
K-613		23,000
K-614		23,000
K-615		24,000
K-616		19,700
F-700	F-700	22,000
	F-701	17,000
	F-702	23,000
	F-703	24,000
	F-704	25,500
F-7000	K-700	22,000
	K-701	17,000
	K-702	23,000
	K-703	24,000
	K-704	25,500

500-8000 Series (Continued)

Series	Model Code	Rating G V W (lbs.)
F-750	F-750	22,500
	F-751	17,000
	F-752	23,000
	F-753	24,000
	F-754	25,500
L-800	F-800	23,500
	F-801	20,000
	F-802	24,500
	F-803	25,500
	F-804	27,500
	F-805	29,000
	F-806	31,000
	F-807	33,000
L-8000	K-800	24,500
	K-801	20,000
	K-802	25,500
	K-803	27,500
	K-804	29,000
	K-805	31,000
	K-806	32,000
	K-807	34,000
LN-500	N-500	15,000
	N-501	10,100
	N-502	16,000
	N-503	17,000
	N-504	18,000
LN-600	N-600	19,500
	N-601	15,000
	N-602	20,000
	N-603	17,000
	N-610	21,000
	N-611	22,000
	N-612	23,000
	N-615	24,000
	N-616	19,700
	N-617	20,000
LN-6000	R-600	20,000
	R-601	15,000
	R-610	21,000
	R-611	22,000
	R-612	23,000
LN-700	N-700	22,000
	N-701	17,000
	N-702	23,000
	N-703	24,000
LN-7000	R-700	22,000
	R-701	17,000
	R-702	23,000
	R-703	24,000
LN-750	N-750	22,500
	N-751	17,000
	N-752	23,000
	N-753	24,000
LN-800	N-800	23,500
	N-801	20,000
	N-802	24,500
	N-803	25,500
	N-804	27,500
LN-8000	N-805	29,000
	N-806	31,000
	N-807	33,000
	N-808	34,000

500-8000 Series (Continued)

Series	Model Code	Rating G V W (lbs.)
LN-8000	R-800	24,500
	R-801	20,000
	R-802	25,500
	R-803	27,500
	R-804	29,000
	R-805	31,000
	R-806	32,000
	R-807	34,000
	R-808	35,000
	LNT-800	S-800
S-801		27,000
S-802		39,000
S-803		42,000
S-804		43,000
S-805		45,000
S-806		46,000
S-807		50,000
LNT-8000	W-800	39,000
	W-801	27,000
	W-802	42,000
	W-803	43,000
	W-804	45,000
	W-805	46,000
	W-806	50,000
LT-800	T-800	37,000
	T-801	27,000
	T-802	39,000
	T-803	42,000
	T-804	43,000
	T-805	45,000
	T-806	46,000
	T-807	50,000
LT-8000	U-800	39,000
	U-801	27,000
	U-802	42,000
	U-803	43,000
	U-804	45,000
	U-805	46,000
	U-806	50,000

900-9000 Series

C-900	C-900	27,000
	C-901	20,000
	C-902	24,000
	C-903	26,000
C-904	C-904	27,500

900-9000 Series (Continued)

Series	Model Code	Rating G V W (lbs.)	
C-900	C-905	30,000	
	C-906	31,000	
	C-907	32,000	
	C-908	32,000	
	C-909	33,000	
	C-910	34,000	
	C-911	34,000	
	C-912	36,000	
	CT-900	L-900	39,000
		L-901	27,000
L-902		30,000	
L-903		41,000	
L-904		43,000	
L-905		45,000	
L-906		47,000	
L-907		49,000	
L-908		49,000	
L-909	51,000		
L-900	F-900	25,500	
	F-901	24,000	
	F-902	27,500	
	F-903	29,000	
	F-904	30,000	
	F-905	31,000	
	F-906	32,000	
	F-907	33,000	
	F-908	34,000	
F-909	35,000		
L-9000	K-900	27,500	
	K-901	24,000	
	K-902	32,000	
	K-903	34,000	
L-9000	K-904	35,000	
	N-900	25,500	
	N-901	24,000	
	N-902	27,500	
LN-900	N-903	29,000	
	N-904	30,000	
	N-905	31,000	
	N-906	32,000	
	N-907	33,000	
	N-908	34,000	
	N-909	35,000	
	LN-9000	R-900	27,500
		R-901	24,000
R-902		32,000	
R-903		34,000	
R-904	R-904	35,000	

900-9000 Series (Continued)

Series	Model Code	Rating G V W (lbs.)	
LNT-900	S-900	39,000	
	S-901	27,000	
	S-902	41,000	
	S-903	42,000	
	S-904	43,000	
	S-905	45,000	
	S-906	46,000	
	S-907	50,000	
	S-908	50,000	
LNT-9000	W-900	43,000	
	W-901	27,000	
	W-902	45,000	
	W-903	46,000	
	W-904	50,000	
	W-905	50,000	
	W-906	54,000	
	LT-900	T-900	39,000
		T-901	27,000
T-902		41,000	
T-903		42,000	
T-904		43,000	
T-905		45,000	
T-906		46,000	
T-907		50,000	
T-908		50,000	
T-909		54,000	
T-910		56,000	
T-911	60,000		
LT-9000	U-900	43,000	
	U-901	27,000	
	U-902	45,000	
	U-903	46,000	
	U-904	50,000	
	U-905	50,000	
	U-906	54,000	
	U-907	56,000	
W-9000	Z-900	32,000	
	Z-901	26,000	
	Z-902	34,000	
Z-903	Z-903	36,000	
	WT-9000	X-900	41,000
		X-901	32,000
X-902		45,000	
X-903	X-903	49,000	

CAB TRIM

Custom	Standard	Color
A	1	Gray
B	—	Blue
C	3	Parchment
D	4	Black
E	—	Red
F	6	Green

BODY CODE

Cab	Aluminum Sleeper	Steel Sleeper	Body
		2	Chassis Cab W/Butterfly Hood
		7	Cowl
H	Q	Y	8 Chassis Cab

SEAT TYPE

HD							HD							
Black	Knitted	W/Comp.	W/L-S	Single			Black	Knitted	W/Comp.	W/L-S	Single			
Vinyl	Vinyl	Pass.	Folding	Driver	Bench		Vinyl	Vinyl	Pass.	Pass.	Driver	Bench		
A	J				1	Full Seat								
B	K				2	Full Foam Seat								
		C	L	3		L-S (Unison Action)				E	N	5		Bostrom Westcoaster
		D	M	4		L-S#675				F		6		Bostrom T-Bar
										*G		7		National Cush-N-Aire
										*L-S Pass. seat only with Cush-N-Aire.				

CW1040-A

TRANSMISSION CODES

Bronco, Econoline, Club Wagon,
Parcel, School bus, and F.B.P-
100-600 Series

Code	Description	Code	Description
A.....	4-Speed New Process 435	M.....	5-Speed Clark 285-V Direct
B.....	3-Speed O/Drive T-85	O.....	5-Speed New Process 542-FL Direct
C.....	3-Speed Ford L.D.	P.....	4-Speed Warner T19
D.....	3-Speed Warner M.D. T89F	T.....	5-Speed New Process 542-FO O/Dr.
E.....	3-Speed Warner H.D. T87G	2.....	5-Speed Clark 282-V Direct
F.....	4-Speed Syn. Warner T18	4.....	5-Speed Clark 280-VO O/Dr.
G.....	Automatic	9.....	5-Speed New Process 542-FD Direct

CW1041-A

700-9000-LN500-9000-
C500-900 Series

Code	Description	Code	Description
A.....	4-Speed New Process 435 ⊕	U.....	5-Speed Spicer 6852G Direct ⊕
B.....	16-Speed Spicer 8516 O/Drive ⊕	V.....	10-Speed Fuller RT910 Direct ⊕
C.....	10-Speed Fuller RT610 Direct ⊕	W.....	5-Speed Spicer 6352B Direct ⊕
D.....	5-Speed Clark 387V Direct ⊕	X.....	6-Speed Transmatic MT30 ⊕
E.....	5-Speed Fuller 5H74 Direct ⊕	X.....	5-Speed Fuller T905A Direct ⊕
F.....	Fuller 5HA74 (Aluminum) ⊕	Y.....	6-Speed Transmatic MT41 ⊕
G.....	5-Speed Clark 380VO O/Drive ⊕	Z.....	6-Speed Transmatic MT40 ⊕
H.....	13-Speed Fuller RT0913 O/Drive ⊕	1.....	5-Speed Spicer 8552A Direct ⊕
K.....	5-Speed Spicer 6453A Direct ⊕	1.....	6-Speed Transmatic MT42 ⊕
M.....	5-Speed Clark 285V Direct ⊕	2.....	5-Speed Clark 282V Direct ⊕
N.....	5-Speed Spicer 6352 Direct ⊕	3.....	6-Speed Fuller RT906 Direct ⊕
O.....	5-Speed Fuller T905B Direct ⊕	4.....	5-Speed Clark 280VO O/Drive ⊕
O.....	5-Speed New Process 542-FL Direct ⊕	5.....	10-Speed Fuller RTO 910 O/Drive ⊕
P.....	4-Speed Warner T-19 ⊕	6.....	15-Speed Fuller RTO 915 O/Drive ⊕
Q.....	5-Speed Spicer 5652 Direct ⊕	7.....	5-Speed Clark 385V Direct ⊕
R.....	16-Speed Spicer 8716 O/Drive ⊕	9.....	15-Speed Fuller RT915 Direct ⊕
S.....	5-Speed Spicer 5756B Direct ⊕	P.....	5-Speed New Process 542-FD Direct ⊕
T.....	5-Speed New Process 542-FO O/Drive ⊕		

⊕ Gasoline or Diesel engines ⊕ Diesel only ⊕ Gasoline only

CW1042-A

AUXILIARY TRANSMISSION CODES

Code ⊕	Type	Ratio	Code ⊕	Type	Ratio
2	3-Speed Spicer	5831-D 2.0 / .85	6	3-Speed Spicer	8031-C 2.59 / .79
3	3-Speed H.D. Spicer	7231-B 1.24 / .86	8	4-Speed Spicer	7041 2.31 / 1.21 / .83
4	3-Speed H.D. Spicer	7231-D 2.14 / .86	C	3-Speed Fuller	3K65 1.17 / .86
5	4-Speed Spicer	8341-C 2.40 / 1.29 / .84	D	3-Speed Fuller	4E75 2.22 / 1.18 / .85

NOTE: When required, the auxiliary transmission code will be stamped directly in front of the transmission code.

⊕ If the "New Process" transmission is installed, the auxiliary transmission code will bear the suffix "N".

CW1043-A

FRONT AXLE CODES

w/Power Steering	w/o Power Steering	Capacity (Pounds)	w/Power Steering	w/o Power Steering	Capacity (Pounds)
J.....	1.....	5000	-.....	8.....	12,000 Steer Ease
K.....	2.....	5500	R.....	9.....	15,000
L.....	3.....	6000	S.....	A.....	16,000
M.....	4.....	7000	T.....	-.....	18,000
N.....	5.....	9000	U.....	-.....	20,000
-.....	6.....	12,000 Center Point	Z.....	-.....	DSO Front Axle
P.....	7.....	12,000			

CW1046-A

REAR AXLE CODES

Bronco, Econoline, Club Wagon,
Parcel, School Bus and F-B-P-100 thru 600 Series

Code	Identification	Ratio and Capacity (Pounds)	Code	Identification	Ratio and Capacity (Pounds)
03	Ford	4.11-2780	53	Rockwell H-170	6.14-17,500
04	Ford	4.57-2780	54	Rockwell H-170	6.83-17,500
05	Ford	4.11-3300	55	Rockwell H-170	7.17-17,500
06	Ford	4.57-3300	62	Rockwell F106	6.20-15,000
07	Ford	3.00-3050	64	Rockwell F-106	6.80-15,000
08	Ford	3.50-3300	66	Rockwell F-106	7.20-15,000
09	Ford	3.70-3300	A1	Ford	3.25-3300 ⊕
10	Ford	3.25-3050	A2	Ford	3.70-3300 ⊕
11	Ford	3.50-3050	A3	Ford	4.11-2780 ⊕
12	Ford	4.11-3050	A5	Ford	4.11-3300 ⊕
17	Ford	3.25-3300	B4	Dana #60	4.10-5200 ⊕
18	Ford	3.50-2780	B5	Dana #60	4.56-5200 ⊕
22	Dana #70	4.88-7400	B8	Ford	3.50-2780 ⊕
23	Dana #70	5.13-7400	B9	Ford	3.50-3300 ⊕
24	Dana #60	4.10-5200	C1	Dana	3.54-4800 ⊕
25	Dana #60	4.56-5200	C3	Dana	3.73-4800 ⊕
27	Dana #70	4.10-7400	C5	Dana	4.10-4800 ⊕
28	Dana #70	4.56-7400	C6	Dana	4.56-4800 ⊕
30	Rockwell C-100	5.29-11,000	C7	Dana #60	3.54-5200 ⊕
31	Dana	3.54-4800	C8	Dana #60	3.73-5200 ⊕
32	Rockwell C-100	6.20-11,000	D2	Dana #70	4.88-7400 ⊕
33	Dana	3.73-4800	D6	Dana #70	3.73-7400 ⊕
34	Rockwell C-100	6.80-11,000	D7	Dana #70	4.10-7400 ⊕
35	Dana	4.10-4800	D8	Dana #70	4.56-7400 ⊕
36	Dana	4.56-4800	E1	Eaton 16244	5.57/7.75-17,500 ⊕
36	Dana #70	3.73-7400	E2	Eaton 16244	6.17/8.58-17,500 ⊕
37	Dana #60	3.54-5200	E3	Eaton 16244	6.50/9.04-17,500 ⊕
38	Dana #60	3.73-5200	F1	Eaton 15201	5.14/7.17-15,000 ⊕
41	Rockwell D-100	5.83-13,000	F2	Eaton 15201	5.83/8.12-15,000 ⊕
42	Rockwell D-100	6.20-13,000	F3	Eaton 15201	6.33/8.81-15,000 ⊕
44	Rockwell D-100	6.80-13,000	H1	Ford	3.25 ⊕
52	Rockwell H-170	5.86-17,500	H2	Ford	3.50 ⊕
			H3	Ford	4.09 ⊕

⊕ Locking ⊕ 2-Speed

CW1045-A1

700-9000 Series, LN500-9000 and C500-900

Code	Identification	Ratio and Capacity (Pounds)	Code	Identification	Ratio and Capacity (Pounds)
32	Rockwell C-100	6.20-11,000	E3	Eaton 16244	6.50/9.04-17,500 ⊕
34	Rockwell C-100	6.80-11,000	F1	Eaton 15201	5.14/7.17-15,000 ⊕
41	Rockwell D-100	5.83-13,000	F2	Eaton 15201	5.83/8.12-15,000 ⊕
42	Rockwell D-100	6.20-13,000	F3	Eaton 15201	6.33/8.81-15,000 ⊕
44	Rockwell D-100	6.80-13,000	H1	Rockwell R-171	4.11-23,000
52	Rockwell H-170	5.86-17,500	H2	Rockwell R-171	4.33-23,000
53	Rockwell H-170	6.14-17,500	H3	Rockwell R-171	4.63-23,000
54	Rockwell H-170	6.83-17,500	H4	Rockwell R-171	4.88-23,000
55	Rockwell H-170	7.17-17,500	H5	Rockwell R-171	5.29-23,000
62	Rockwell F-106	6.20-15,000	H6	Rockwell R-171	5.86-23,000
64	Rockwell F-106	6.80-15,000	H7	Rockwell R-171	6.14-23,000
66	Rockwell F-106	7.20-15,000	H8	Rockwell R-171	6.83-23,000
B1	Rockwell SLHD Hendrickson	4.11-34,000	H9	Rockwell R-171	3.70-23,000
B2	Rockwell SLHD Hendrickson	4.44-34,000	L2	Rockwell Q246	5.63-22,000
B3	Rockwell SLHD Hendrickson	4.63-34,000	L3	Rockwell Q246	6.04-22,000
B4	Rockwell SLHD Hendrickson	4.88-34,000	L4	Rockwell Q246	6.39-22,000
B5	Rockwell SLHD Hendrickson	5.29-34,000	L5	Rockwell Q246	7.27-22,000
B6	Rockwell SLHD Hendrickson	5.83-34,000	P5	Rockwell RT241	7.21-23,000
B7	Rockwell SLHD Hendrickson	6.17-34,000	T3	Rockwell Q346	5.63/7.73-22,000
B8	Rockwell SLHD Hendrickson	6.83-34,000	T4	Rockwell Q346	6.39/8.78-22,000
B9	Rockwell SLHD Hendrickson	7.80-34,000	T5	Rockwell Q346	7.33/10.07-22,000 ⊕
B0	Rockwell SLHD Hendrickson	8.60-34,000	W3	Rockwell SHHD	6.17-30,000
D1	Rockwell SQHD Hendrickson	4.11-38,000	W4	Rockwell SHHD	6.80-30,000
D2	Rockwell SQHD Hendrickson	4.44-38,000	W5	Rockwell SHHD	7.20-30,000
D3	Rockwell SQHD Hendrickson	4.63-38,000	X1	Rockwell RT-341	4.68/5.88-23,000 ⊕
D4	Rockwell SQHD Hendrickson	5.29-38,000	X2	Rockwell RT-341	5.06/6.35-23,000 ⊕
D5	Rockwell SQHD Hendrickson	5.83-38,000	X4	Rockwell RT-341	6.18/7.76-23,000 ⊕
D6	Rockwell SQHD Hendrickson	6.83-38,000	X5	Rockwell RT-341	7.01/8.80-23,000 ⊕
D7	Rockwell SQHD Hendrickson	7.80-38,000	Y4	Rockwell R-302	6.42/8.38-23,000 ⊕
D8	Rockwell SQHD Hendrickson	8.60-38,000	Y5	Rockwell R-302	7.09/9.07-23,000 ⊕
D0	Rockwell SQHD Hendrickson	4.88-38,000	AC	Eaton 30 DSC	4.62-32,000
E1	Eaton 16244	5.57/7.75-17,500 ⊕	AD	Eaton 30 DPC	6.43-32,000
E2	Eaton 16244	6.17/8.58-17,500 ⊕	AG	Eaton 19121	4.11-23,000

⊕ 2-Speed ⊕ 3-Speed

CW1045-A2

700-9000 Series, LN-500-9000 and 500-900 (Continued)

Code	Identification	Ratio and Capacity (Pounds)	Code	Identification	Ratio and Capacity (Pounds)
AI	Eaton 38 DSC	4.56-38,000	EC	Eaton 30 DSC	6.50-32,000
AK	Eaton 18101	4.88-22,000	EF	Eaton 34 DSC	5.29-34,000
AP	Eaton 19221	4.33/5.90-23,000 ①	EG	Eaton 19121	6.17-23,000
AR	Eaton 38 DPC	5.05-38,000	EH	Eaton 17221	5.57/7.60-18,500 ①
AT	Eaton 34 DTC-3	4.11/4.86/5.61-34,000 ②	EI	Eaton 38 DSE	6.50-38,000
AV	Eaton 42 DPB	7.60-44,000	EK	Eaton 18121	7.17-22,000
AW	Eaton 34 DTC	4.11/5.61-34,000	EL	Eaton 30 DTC	6.50/9.04-32,000 ①
AZ	Eaton 38 DTC	4.11/4.86/5.61-38,000 ①	EN	Eaton 34 DPC	6.65-34,000
BA	Rockwell SLHD Hendrickson	3.55-34,000	EP	Eaton 19221	6.67/9.08-23,000 ①
BB	Eaton 18201	4.56/6.21-22,000 ①	EQ	Eaton 17121	5.57-18,500
BC	Eaton 30 DSC	4.88-32,000	ER	Eaton 38 DPC	6.65-38,000
BD	Eaton 30 DPC	6.78-32,000	FB	Eaton 18221	6.50/8.87-22,000 ①
BF	Eaton 34 DSC	4.33-34,000	FC	Eaton 30 DSC	7.17-32,000
BG	Eaton 19121	4.33-23,000	FF	Eaton 34 DSC	5.57-34,000
BH	Eaton 17201	4.56/6.21-18,500 ①	FG	Eaton 19121	6.67-23,000
BI	Eaton 38 DSC	4.88-38,000	FH	Eaton 17221	6.14/8.38-18,500 ①
BK	Eaton 18121	5.57-22,000	FI	Eaton 38 DSC	4.11-38,000
BN	Eaton 34 DPC	5.60-34,000	FK	Eaton 18101	5.29-22,000
BP	Eaton 19221	4.88/6.64-23,000 ①	FL	Eaton 30 DTC	7.17/9.97-32,000 ①
BR	Eaton 38 DPC	5.61-38,000	FN	Eaton 34 DPC	7.60-34,000
BT	Eaton 34 DTC-3	4.33/5.12/5.91-34,000 ②	FO	Eaton 19221	3.70/5.04-23,000 ①
BV	Eaton 42 DPD	8.38-44,000	FQ	Eaton 17121	6.14-18,500
BW	Eaton 34 DTC	4.33/5.91-34,000	FR	Eaton 38 DPC	7.60-38,000
BZ	Eaton 38 DTC	4.33/5.12/5.91-38,000 ②	FS	Eaton 34 DTE	6.14/8.38-34,000 ①
CB	Eaton 18201	4.88/6.65-22,000 ①	FW	Eaton 18221	7.17/9.77-22,000 ①
CC	Eaton 30 DSC	5.57-32,000	GC	Eaton 30 DSC	7.60-32,000
CD	Eaton 30 DPC	7.75-32,000	GF	Eaton 34 DSE	6.14-34,000
CE	Eaton 34 DSC	4.56-34,000	GG	Eaton 19121	3.70-23,000
CG	Eaton 19121	4.88-23,000	GH	Eaton 17221	6.50/8.87-18,500 ①
CH	Eaton 17201	4.88/6.65-18,500 ①	GI	Eaton 38 DSC	4.33-38,000
CI	Eaton 38 DSC	5.57-38,000	GN	Eaton DPE	8.38-34,000
CJ	Eaton 18301	6.65-22,000	GP	Eaton 19221	4.11/5.60-23,000 ①
CK	Eaton 18121	6.14-22,000	GQ	Eaton 17121	6.50-18,500
CL	Eaton 30 DTC	5.57/7.75-32,000 ①	GR	Eaton 38 DPE	8.38-38,000
CN	Eaton 34 DPC	5.91-34,000	GW	Eaton 34 DTE	6.50/8.87-34,000 ①
CP	Eaton 19221	5.43/7.39-23,000 ①	HB	Eaton 18201	5.29/7.21-22,000 ①
CQ	Eaton 17101	4.88-18,500	HF	Eaton 34 DSE	6.50-34,000
CR	Eaton 38 DPC	5.91-38,000	HG	Eaton 19121	4.56-23,000
CV	Eaton 42 DPB	5.05-44,000	HH	Eaton 17221	7.17/9.77-18,500 ①
DA	Rockwell SQHD Hendrickson	6.17-38,000	HI	Eaton 38 DSC	5.29-38,000
DB	Eaton 18221	5.57/7.60-22,000 ①	HP	Eaton 19221	4.56/6.21-23,000 ①
DC	Eaton 30 DSC	6.14-32,000	HQ	Eaton 17121	7.17-18,500
DD	Eaton 30 DPC	8.55-32,000	HT	Eaton 34 DTC-3	3.70/4.37/5.05-34,000 ②
DF	Eaton 34 DSC	4.88-34,000	HW	Eaton 34 DTE	7.17/9.77-34,000 ①
DG	Eaton 19121	5.43-23,000	IF	Eaton 34 DSE	7.17-34,000
DH	Eaton 17201	5.29/7.21-18,500 ①	IQ	Eaton 17121	7.60-18,500
DI	Eaton 38 DSE	6.14-38,000	IT	Eaton 34 DTC-3	5.29/6.25/7.21-34,000 ②
DK	Eaton 18121	6.50-22,000	IW	Eaton 34 DTC	3.70/5.05-34,000 ①
DL	Eaton 30 DTC	6.14/8.55-32,000 ①	JF	Eaton 34 DSC	4.11-34,000
DN	Eaton 34 DPC	6.21-34,000	JJ	Eaton 38 DSE	7.17-38,000
DP	Eaton 19221	6.17/8.40-23,000 ①	JT	Eaton 34 DTE	6.50/7.68/8.86-34,000 ②
DQ	Eaton 17101	5.29-18,500	KF	Eaton 34 DSE	7.60-34,000
DR	Eaton 38 DPC	6.22-38,000	KI	Eaton 38 DSE	7.60-38,000
DV	Eaton 42 DPB	5.91-44,000	KW	Eaton 34 DTC	5.29/7.21-34,000 ①
DW	Eaton 34 DTC	4.88/6.66-34,000	LF	Eaton 34 DSC	3.70-34,000
EB	Eaton 18221	6.14/8.38-22,000 ①			

① 2-Speed

② 3-Speed

<h1 style="margin: 0;">Wheels And Tires</h1>	<p>GROUP</p> <h1 style="margin: 0;">11</h1>
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PART 11-01	PAGE	PART 11-03	PAGE
General Wheels and Tires		Tires	11-03-01
Service	11-01-01		
PART 11-02			
Wheels	11-02-01		

PART 11-01 General Wheels and Tires Service

COMPONENT INDEX This Information: Applies to All Models	All Models	COMPONENT INDEX This Information Applies to All Models	All Models
FRONT WHEEL BEARING MAINTENANCE	01-01	WHEEL INSPECTION	01-01
TIRE INSPECTION	01-01		
<p>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.</p>			

1 CLEANING AND INSPECTION

WHEELS

Wheel stud nuts should be inspected and tightened twice in the first 500 miles, and again after 1,000 miles to avoid accidental loosening of the wheels. Loose wheel stud nuts may cause shimmy and vibration. Elongated stud holes in the wheels may also result from loose stud nuts.

When inspecting cast wheels, special note should be taken to be sure that the proper wheel rim clamps and wheel rim spacers are being used.

Keep the wheels and hubs clean. Stones or lumps of mud wedged between the dual wheels or wheel and drum will 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.

TIRES

The tires should be checked frequently to be sure that the air pressures agree with those specified for the tires and vehicle model.

Inspect the tire threads, and remove all stones, nails, glass, or other objects that may be wedged in the tread. Check for holes or cuts that may permit air leakage from the tire, and make the necessary repairs.

Inspect the tire side walls for cuts, bruises, and other damage. If internal damage is suspected, demount the tire from the wheel for further inspection and repair or replacement.

Check the tire valve for air leaks, and replace the valve if necessary. Replace any missing valve caps.

On F-100, 250, 350 and Econoline models, it is important that the front tires and wheels be balanced.

Fig. 1 describes common tire wear conditions.

FRONT WHEEL BEARINGS

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.

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.

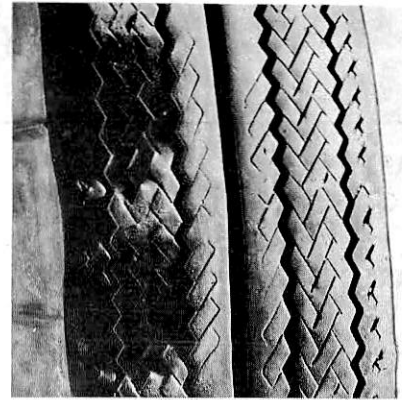
Bearing adjustment is described in Part 11-02.



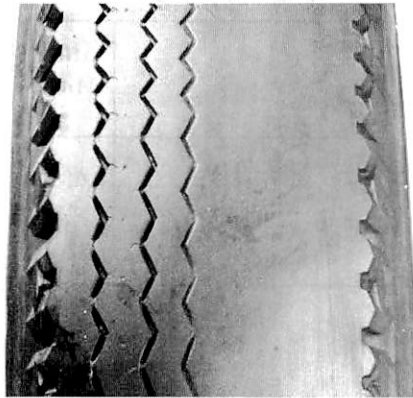
UNDERINFLATION



OVERINFLATION



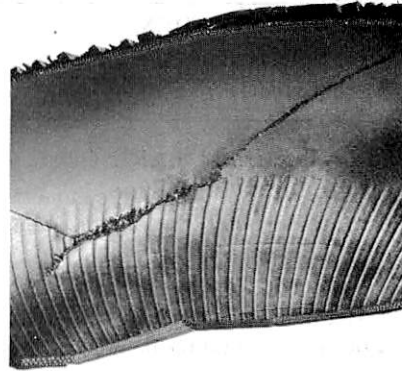
CUPPING—UNDERINFLATION AND/OR MECHANICAL IRREGULARITIES



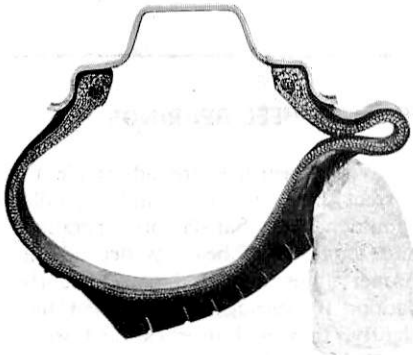
INCORRECT TOE-IN OR EXTREME CHAMBER



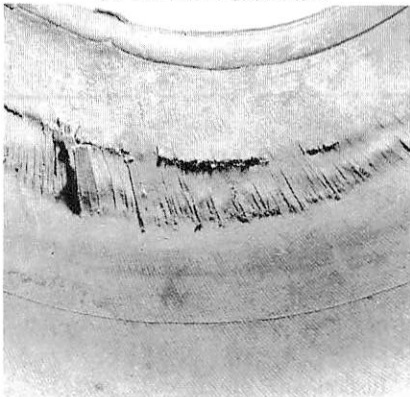
FEATHERING DUE TO MISALIGNMENT OR SEVERE CORNERING



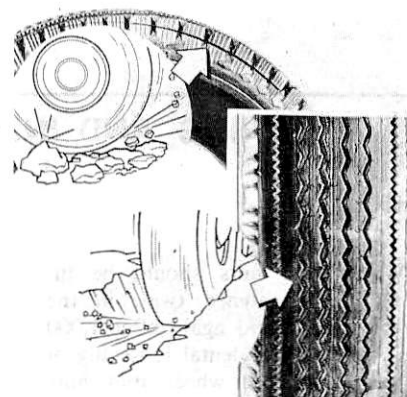
STONE BRUISE



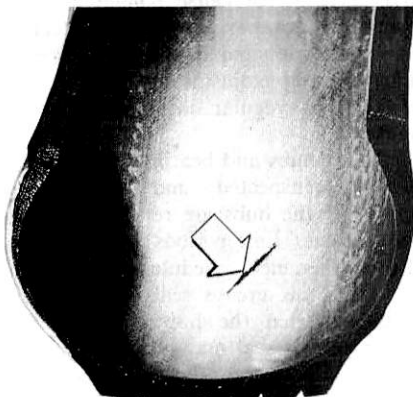
STONE BRUISE



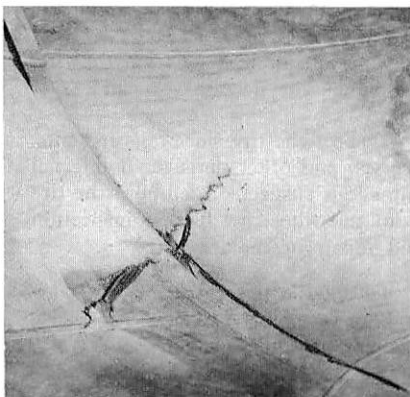
UNDERINFLATION



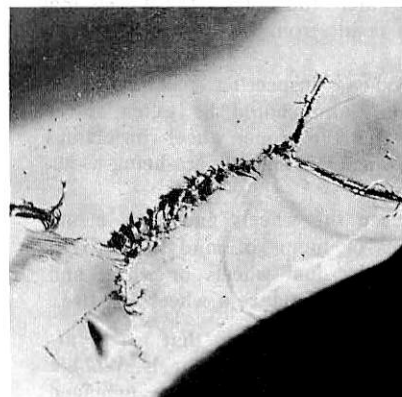
ROCK CUT



BRUISE



HEAT BRUISE



DOUBLE BRUISE—SHARP OBJECT AND RESULTING FATIGUE F1467-B

FIG. 1—Tire Wear Conditions

PART 11-02 Wheels

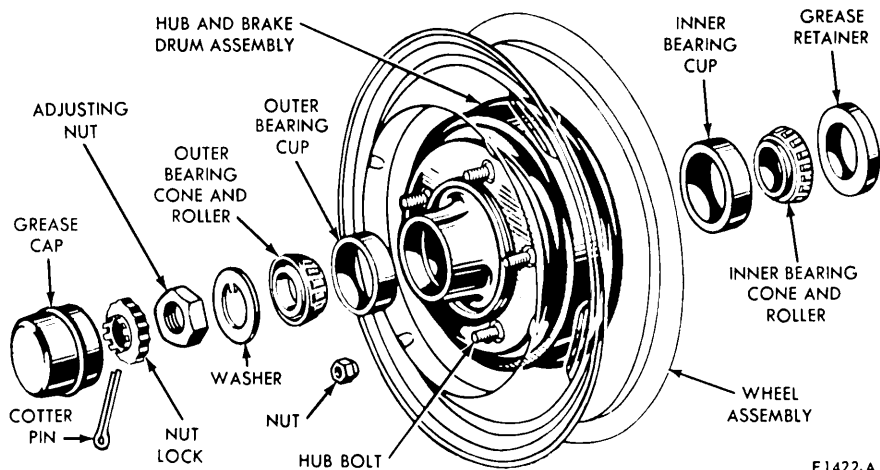
COMPONENT INDEX Applies to Models As Indicated	All Models	F-100-350, Econoline	F-250-350, Bronco 4 x 4	P-350-500	F-500-750	L-800-9000	LT-800-9000	B-500-750	L.N-500-9000	L.N.T-800-9000	C-CT-500-900	W-WT-9000
FRONT WHEEL ASSEMBLY Description	02-01											
FRONT WHEEL BEARING Adjustment		02-03	02-03	02-03	02-03	02-03	02-03	02-03	02-03	02-03	02-03	02-03
FRONT WHEEL GREASE SEAL AND BEARING Removal, Installation, Repacking		02-05	02-06	02-05	02-06	02-06	02-06	02-06	02-06	02-06	02-06	02-06
REAR WHEEL ASSEMBLY Description	02-01											
WHEEL REPLACEMENT	02-04											

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

FRONT WHEEL ASSEMBLY

Each front wheel and tire assembly is bolted to its respective front hub and brake drum assembly. Two opposed tapered roller bearings are installed in each hub (Figs. 1, 2 and 3). A grease retainer is installed at the inner end of the hub to prevent lubricant from leaking into the drum. The entire assembly is retained to its spindle by the lock nut and/or adjusting nut and cotter pin.



F1422-A

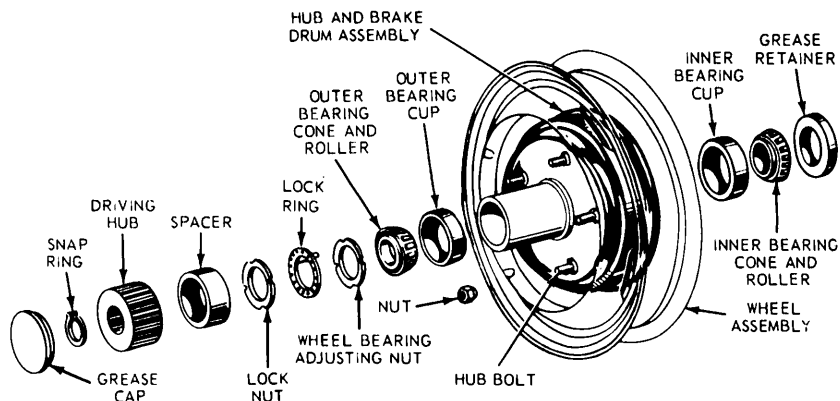
FIG. 1—Front Hub, Bearings and Grease Retainer—F-100 Through F-350, Econoline

FRONT WHEEL ASSEMBLY —4—WHEEL DRIVE

The front Axles used on 4-wheel drive models are covered in Group 15, Parts 15-08 and 15-09 of this manual.

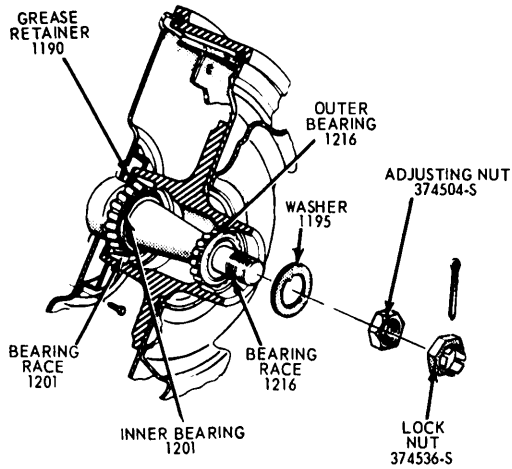
REAR WHEEL ASSEMBLY

The rear wheel, hub, and drum assemblies are connected to the rear axle shaft flanges and ride on two opposed tapered roller bearings. The inner end of each axle shaft is splined to the engine powered differential.

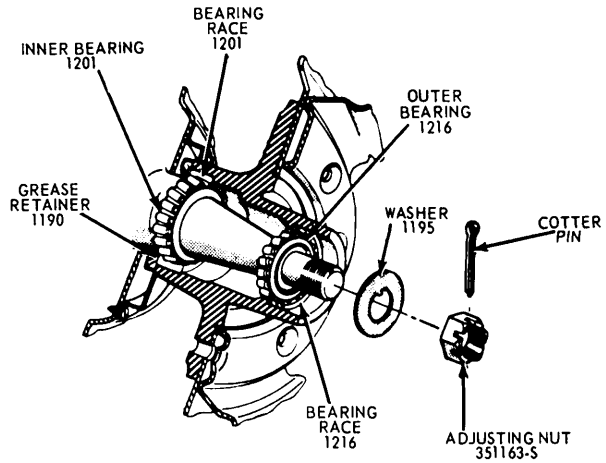


F 1300-A

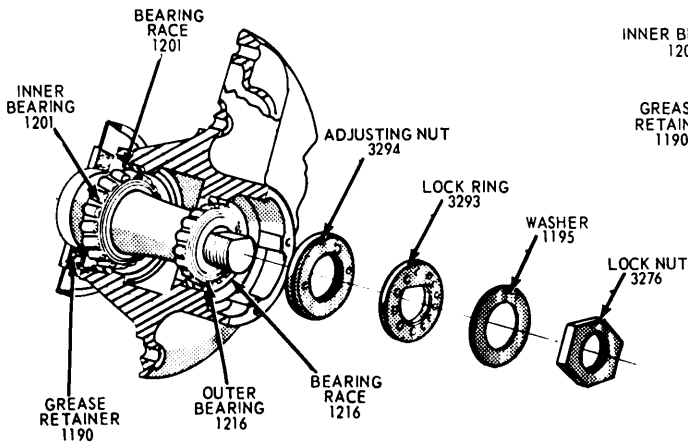
FIG. 2—Front Wheel and Hub Installation—4—Wheel Drive



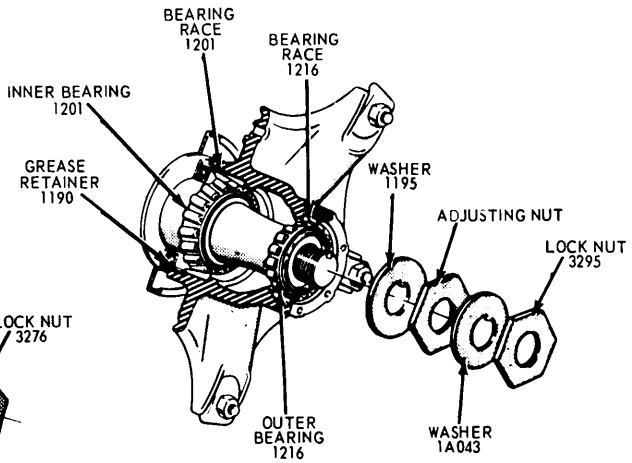
P - SERIES



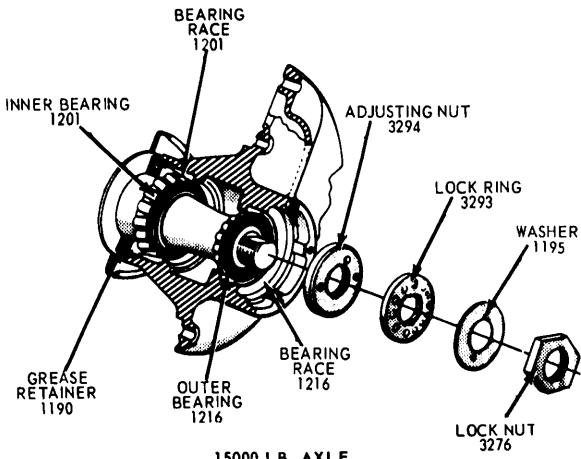
5000 - 5500 - 6000 - 7000 LB. AXLES



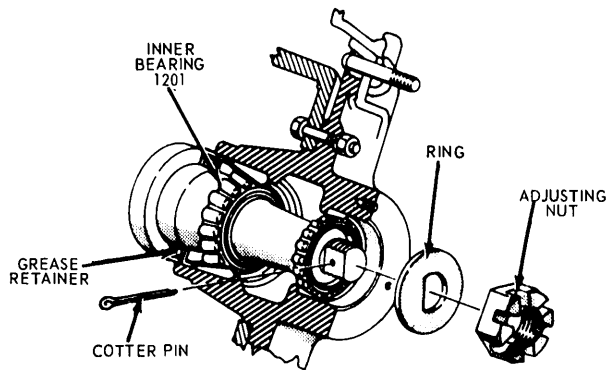
9000 - 12000 LB. AXLES



12000 LB. AXLE
(CENTER POINT)



15000 LB. AXLE



16000, 18000, 20000 LB. AXLES

FIG. 3—Front Hub, Bearings and Grease Retainer

2 IN—VEHICLE ADJUSTMENTS AND REPAIRS

FRONT WHEEL BEARING ADJUSTMENT

To check the wheel bearing adjustment, raise the front of the vehicle, grasp the tire at the sides, and alternately push inward and pull outward on the tire. If any looseness is felt, adjust the front wheel bearings.

F—100, 250, 350, ECONOLINE

1. Remove the hub cap and remove the grease cap from the hub.
2. Wipe any excess grease from the end of the spindle and remove the cotter pin and nut lock.
3. While rotating the wheel, torque the adjusting nut (Fig. 1) to 17–25 ft–lb to seat the bearings.
4. Install the nut lock so that the cotter pin hole in the spindle is aligned with a slot in the nut lock.
5. Back off the adjusting nut and nut lock two slots of the nut lock and install the cotter pin.
6. Check the front wheel rotation. If the wheel rotates freely with no noticeable end play, install the grease cap. If the wheel is still loose, or it rotates roughly or noisily, the bearing cones and rollers and the cups are dirty or worn and should be cleaned or replaced.
7. Install the hub cap.

4—WHEEL DRIVE

1. Raise the vehicle and install safety stands.
2. Back off the brake adjusting screw, if necessary. Remove the wheel cover, if installed.
3. Remove the front hub grease cap. Remove the driving hub retaining snap ring and slide the splined driving hub from between the axle shaft and the wheel hub (Fig. 2). Remove the driving hub spacer. (If equipped with freerunning lock-out hubs, refer to Front Wheel Drive Lock—Out Hub Removal in Group 15).
4. With Tool T59T—1197—B, remove the lock nut and lock ring from the spindle.
5. Using Tool T59T—1197—B and a torque wrench, tighten the bearing adjusting nut (Fig. 2) to 50 ft–lb, while rotating the wheel back and forth to seat the bearings.
6. Continue rotating the wheel and then, loosen and re-torque the adjusting nut to 30–40 ft–lb.

7. Back the adjusting nut off approximately 1/2 turn (135–150 degrees). Assemble the lock ring by turning the nut to the nearest hole where the dowel pin will enter.

8. Install the outer lock nut and torque to 50 ft–lb. Final end-play of the wheel on the spindle should be 0.001 to 0.010 inch.

9. Install the driving hub, spacer, snap ring and hub grease cap. Apply a thin coat of non-hardening sealer to the seating edge of the grease cap, before installation. (If equipped with free-running lock-out hubs, refer to Front Wheel Drive Lock—Out Hub Installation in Group 15).

10. Adjust the brake, if backed off to permit drum removal.

P—350 THRU 500

1. Remove the hub cap, if so equipped, and remove the grease cap from the hub.
2. Remove any excess grease from the end of the spindle and remove the adjusting nut cotter pin.
3. While rotating the wheel, torque the adjusting nut (Fig. 3) to 40–55 ftlbs to seat the bearings.
4. Back off the adjusting nut to the next castellation if necessary to align the nut with the cotter pin hole. Then, back off the adjusting nut two castellations and install the cotter pin.
5. Check the front wheel rotation. If the wheel rotates freely with no noticeable end play, install the grease cap. If the wheel is still loose, or it rotates roughly or noisily, the bearing cones and rollers and the cups are dirty or worn and should be cleaned or replaced.
6. Install the hub cap, if used.

ALL MEDIUM, HEAVY AND EXTRA HEAVY TRUCKS

Single Nut With Cotter Pin (5000—7000 Pound Front Axles)

1. While rotating the wheel, torque the adjusting nut to 70–100 ft–lb to seat the bearings.
2. Back off the adjusting nut 180 degrees (one half turn).
3. Hand tighten the adjusting nut finger tight (13–17 in–lb) while moving the top part of the tire in and out.
4. If the cotter pin hole lines up with a castellation in the nut, insert

and secure a new cotter pin. If they do not line up, back off the adjusting nut to align a castellation with the first available cotter pin hole. Final bearing adjustment must provide .001–.010 end play.

5. Install the gasket and grease cap and adjust the brakes. **The final adjustment must not result in a pre-loaded bearing.**

Double Nut With Lock Ring (15000 Pound Front Axle)

1. While rotating the wheel in both directions, torque the adjusting nut to 100–125 ft–lb to seat the bearings.
2. Back off the adjusting nut one complete turn (Fig. 3).
3. Again while rotating the wheel in both directions, retorque the adjusting nut to 40–55 ft–lb.
4. Back off the adjusting nut to obtain an initial .004 to .010 inch end play between the wheel hub and spindle.
5. Install the lock ring.
6. Install the washer with the dimple indexed in one of the holes in the locking ring.
7. Install the lock nut and torque to 100–125 ft–lb.
8. Recheck the end play (final limit .001 to .010 inch). Re-adjust if necessary.
9. Bend the washer outward to lock the nut in position.
10. Install the gasket and grease cap and adjust the brakes. **The final adjustment must not result in a pre-loaded bearing.**

Double Nut With Double Washer (12000 Pound Center Point Axle)

1. While rotating the wheel in both directions, torque the adjusting nut to 100–125 ft–lb to seat the bearings.
2. Back off the adjusting nut one complete turn (Fig. 3).
3. Again while rotating the wheel in both directions, retorque the adjusting nut to 40–55 ft–lb.
4. Back off the adjusting nut to obtain an initial .004 to .010 inch end play between the hub and spindle.
5. Install the outer washer and lock nut and torque to 100–125 ft–lb.
6. Recheck the end play (final limit .001 to .010 inch). Re-adjust if necessary.

7. Install the gasket and grease cap and adjust the brakes. **The final adjustment must not result in a pre-loaded bearing.**

Single Nut With Cotter Pin (16000, 18000 and 20000 Pound Front Axle)

1. While rotating the wheel in both directions, torque the adjusting nut to 100–125 ft–lb to seat the bearings.

2. Back off the adjusting nut one complete turn (Fig. 3).

3. Again while rotating the wheel in both directions, retorque the adjusting nut to 40–55 ft–lb.

4. Back off the adjusting nut if necessary to align the nut castellations with the first available cotter pin hole.

5. Using the same cotter pin hole as a reference point, back off the adjusting nut **one additional castellation** to allow the wheel to rotate freely within the limits of .001 to .010 inch end play.

6. Insert and secure the cotter pin.

7. Install the gasket and grease cap and adjust the brakes. **The final adjustment must not result in a pre-loaded bearing.**

Double Nut With Lock Ring (9000 and 12000 Pound Front Axle)

1. While rotating the wheel in both directions, torque the adjusting nut to 100–125 ft–lb to seat the bearing.

2. Back off the adjusting nut one complete turn (Fig. 3).

3. Again while rotating the wheel in both directions, retorque the adjusting nut to 40–55 ft–lb.

4. Back off the adjusting nut to obtain an initial .004 to .010 inch end play between the wheel hub and spindle.

5. Install the lock ring making sure the adjusting nut dowel is inserted into the lock ring.

6. Install the outer washer and lock nut. Torque to 100–150 ft–lb.

7. Recheck the *end play* (final limit .001 to .010 inch). Re-adjust if necessary.

8. Bend the washer outward to lock the outer nut in position.

9. Install the gasket and grease cap and adjust the brakes. **The final adjustment must not result in a pre-loaded bearing.**

3 REMOVAL AND INSTALLATION

WHEEL REPLACEMENT

LIGHT VEHICLES

Removal

1. Pry off the hub cap (if the vehicle is so equipped), and loosen but do not remove the wheel stud nuts.

2. Raise the truck until the wheel and tire clear the floor.

3. Remove the wheel stud nuts and the wheel and tire from the hub and drum.

Installation

1. Clean all dirt from the hub and drum. The replacement wheel and tire must be clean.

2. Position the wheel and tire on the hub and drum, and install the wheel stud nuts. For proper balance, line up the notch on the drum with the valve stem on the wheel. Tighten the stud nuts enough to hold the wheel firmly in place. **Always tighten alternate nuts to draw the wheel evenly against the hub and drum.**

On dual wheels, be sure to back off the outer nut before tightening the inner nut. Then tighten the outer nut. Some dual wheels have mounting bolt holes which are alternately flared inward and outward. These surfaces must be mated when the wheels are mounted.

3. Lower the vehicle to the floor, and tighten the wheel stud nuts to the specified torque. **On a new vehicle, and each time a wheel and tire is installed, the wheel nuts should be checked for tightness.**

MEDIUM VEHICLES

Removal

1. Loosen but do not remove the wheel stud nuts.

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

3. Remove the wheel stud nuts and the wheel and tire from the hub and drum.

Installation

1. Clean all dirt from the hub and drum. The replacement wheel and tire must be clean.

2. Position the wheel and tire on the hub and drum, and install the wheel stud nuts. For proper balance, line up the notch on the drum with the valve stem on the wheel. Tighten the stud nuts enough to hold the wheel firmly in place. **Always tighten alternate nuts to draw the wheel evenly against the hub and drum.**

On dual wheels, be sure to back off the outer nut before tightening the inner nut. Then tighten the outer nut.

3. Lower the truck to the floor,

and tighten the wheel stud nuts to the specified torque. **On new vehicles, and each time a wheel and tire is installed, the wheel nuts should be checked for tightness.**

HEAVY VEHICLES

Removal

1. To remove the rim and tire from a cast wheel, apply the parking brake, and block at least one wheel. Raise the vehicle and remove the rim clamps.

2. With dual rear wheels, lift off the outer rim and tire, remove the spacer rim, and the inside rim and tire assembly.

Installation

1. To install the tire and rim on a dual wheel, place the inner tire and rim on the wheel hub. The rim must ride high enough up on the tapered retainer flange of the inner section of the wheel to prevent the assembly from sliding down on the tapered surface.

2. Position the spacer between the inner and outer rim.

3. Place the outer rim and tire assembly on the wheel, and install the 6 clamps (Fig. 4). First, draw up the top clamp tightly so that the spacer will push the inner rim up on the ta-

pered surface of the inner section of the wheel, and then tighten the bottom clamp. This procedure tends to center the rim on the wheel.

4. Tighten the remaining clamps alternately and evenly, and torque all wheel nuts to specification. Lateral or side run-out should not exceed 1/8 inch for front rims and 1/4 inch for dual rear rims.

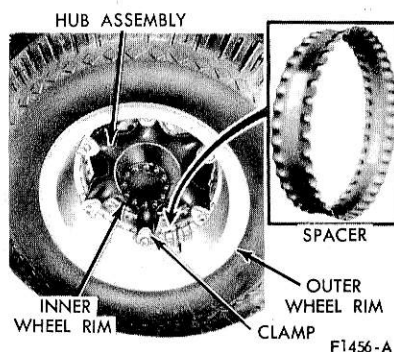


FIG. 4—3—Piece Rim Installed on Cast Wheel

4 MAJOR REPAIR OPERATIONS

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

Wheel bearing lubricant has been changed from sodium base grease to lithium base grease.

Sodium base grease is not compatible with lithium base grease and should not be intermixed. Therefore, do not lubricate front and/or rear wheel bearings without first ascertaining the type of original wheel bearing lubricant. Usage of incompatible bearing lubricants could result in premature lubricant breakdown.

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.

LIGHT VEHICLE

1. Raise the vehicle until the wheel and tire clear the floor and remove the wheel and tire from the hub. If the drums will not remove easily, back off the brake shoe adjusting screw so that the shoes do not contact the brake drum. Remove the grease cap from the hub.

2. Remove the cotter pin, nut lock, adjusting nut and washer from the spindle (Fig. 1).

3. Remove the outer bearing cone and roller. Pull the hub and drum assembly off the wheel spindle. Then, remove and discard the grease retainer and the inner bearing cone and

roller from the hub. Remove all traces of old lubricant from bearings, hubs, and axle spindle.

4. Inspect the cups for scratches, pits or cracks. If the cups are worn or damaged, remove them with a drift. Clean the inner and outer bearing cones and rollers with solvent and dry them thoroughly. Do not spin the bearings dry with compressed air.

5. Inspect the cones and rollers for cracks, nicks, brinelling, or seized rollers. Inspect the grease retainer and replace it if it is cracked, nicked, or dented. If the new grease retainer is leather, soak it in light engine oil for about 30 minutes before installation.

6. Cover the spindle with a clean cloth and brush all loose dust and dirt from the brake assembly. Remove the cloth from the spindle carefully to prevent dirt from falling on the spindle.

7. Install the inner and outer bearing cups in the hub with the appropriate installing tool (Fig. 5). Be sure to seat the cups properly in the hub. The cups will be properly seated when they are fully bottomed. Pack the inside of the hub with C1AZ19590—B wheel bearing grease. Fill the hub until the grease is flush with the inside diameters of both bearing cups. Pack the bearing cones and rollers with wheel bearing grease. Use a bearing packer 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 in the inner cup and install the grease retainer (Fig. 6) with the appropriate driving tool. Be sure that

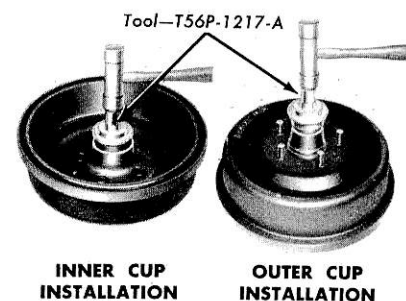


FIG. 5—Installing Bearing Cups

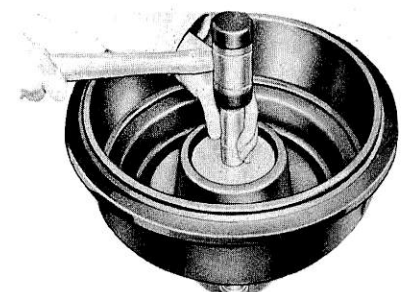


FIG. 6—Installing Grease Retainer

the retainer is fully bottomed. Install the hub and drum on the wheel spindle. Keep the hub centered on the spindle to prevent damage to the grease retainer or the spindle threads.

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

10. Adjust the wheel bearing as outlined in Section 2.

4—WHEEL DRIVE

1. Raise the vehicle and install safety stands.

2. Back off the brake adjusting screw, if necessary. Remove the wheel cover, if installed.

3. Remove the front hub grease cap. Remove the driving hub retaining snap ring (Fig. 2) and slide the splined driving hub from between the axle shaft and the wheel hub. Remove the driving hub spacer. (If equipped with free-running lock-out hubs, refer to Front Wheel Drive Lock-Out Hub Removal.)

4. With Tool T59T-1197-B, remove the lock nut, washer, and wheel bearing adjusting nut (Fig. 2) from the spindle. Remove the wheel, hub and drum as an assembly. The wheel outer bearing will be forced off the spindle at the same time. Protect the spindle and inner bearing cone from dirt.

5. Remove the grease retainer and the inner bearing cone and roller assembly from the hub with Tool 1175AB, and T50T-100-A.

6. 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 a drift.

7. Soak a new grease retainer in light engine oil at least 30 minutes before installation. Thoroughly clean the inner and outer bearing cones and rollers 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.

8. 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.

9. If the inner bearing cup was removed, install the cup or a new cup in the hub. Be sure to seat the cup properly in the hub.

10. Install the outer bearing cup in the hub with a suitable tool. Be sure the cup is properly seated in the hub.

11. 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.

12. 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.

13. Place the inner bearing cone and roller assembly in the inner cup, and install the new grease retainer. Be sure that the retainer is properly seated.

14. 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.

15. Install the wheel outer bearing cone and adjusting nut. Adjust the front wheel bearings as detailed in Section 2 under Front Wheel Bearing Adjustment.

MEDIUM, HEAVY AND EXTRA HEAVY VEHICLES

There are two basic types of hub, disc and cast, shown in Fig. 7. The basic design of the hub bearings is the same in all hubs, but minor differences in size exist between the various models. The outer bearing attaching parts differ according to front axle

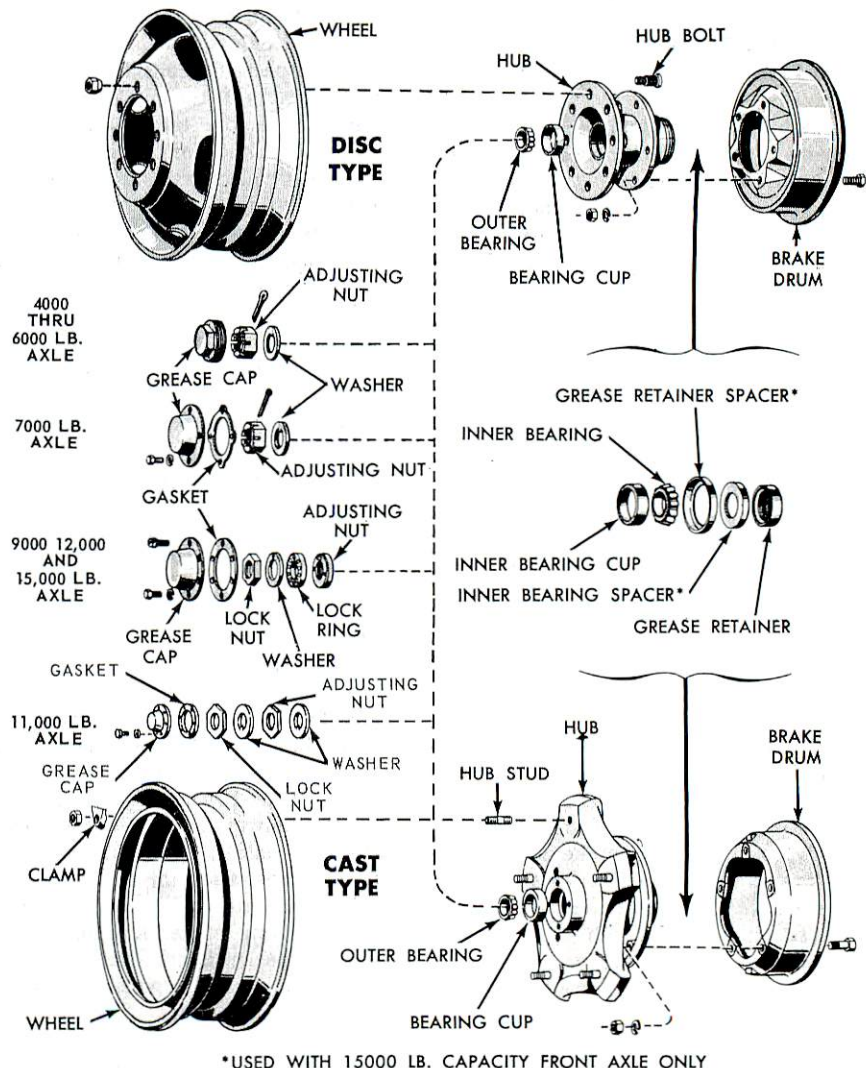


FIG. 7—Typical Front Hubs and Bearings

weight capacity as indicated in Fig. 7.

1. Raise the vehicle until the tires clear the floor and install safety stands to support the front axle. Remove the grease cap and gasket from the hub.

2. To check the wheel bearing adjustment, alternately push inward and outward on the tire. If any excessive looseness is felt or there is no end play, adjustment of the front wheel bearings is necessary.

3. With 5000, 5500, 6000, 7000, 16000, 18000 or 20000 pound capacity front axles, remove the cotter pin, adjusting nut and flat washer from the spindle. With 9000, 12000 or 15000 pound capacity front axles, remove the lock nut, washer, locking ring and the adjusting nut and pin. With a 12000 pound capacity center point front axle, remove the lock nut, inner washer, adjusting nut and outer washer.

4. Inspect the condition of the spindle and nut threads to insure a free running nut when reassembling.

5. Remove the outer bearing cone and roller. Pull the hub and drum assembly off the spindle. Remove the inner bearing and seal using a brass drift. **Be careful not to damage the bearing cage.**

6. Remove all traces of old lubricant from the bearings, hubs and axle

spindle. Inspect the cups for pitting, galling or unusual wear. If either cup is worn or damaged, remove it with a brass drift. Clean the inner and outer bearing cones and rollers with solvent and dry them thoroughly. **Do not spin the bearings dry with compressed air.**

7. Inspect the cones and rollers for pitting, galling or unusual wear. Particularly inspect the rollers for end wear and flat or rough spots. Replace all worn or damaged assemblies. It is recommended that the cone and roller assemblies and cups be replaced in sets.

8. Replace the grease retainer.

9. Cover the spindle with a clean cloth and brush all loose dust and dirt from the brake assembly. Remove the cloth from the spindle carefully to prevent dirt falling on the spindle.

10. Install the inner and outer bearing cups in the hub with the appropriate tool (Fig. 5). Check for proper seating of the new bearing cups by trying to insert a 0.0015 inch feeler gauge between the cup and wheel hub. The feeler gauge should not enter.

11. Pack the inside of the hub with Lithium base wheel bearing grease (C1AZ-19590-B). Fill the hub until the grease is flush with the inside diameters of both bearing cups. Pack the bearing cones and rollers

with wheel bearing grease. Use a bearing packer 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.

12. Place the inner bearing cone and roller in the inner cup and install the grease retainer with the appropriate tool. Be sure the retainer is fully bottomed. On all synthetic type seals, coat the seal lips with wheel bearing grease (C1AZ-19590-B) before installing the hub and drum. On seals which are not coated on the OD with sealer by the supplier, coat the grease seal bore in the hub with a thin coat of non-hardening sealer prior to installing the grease seal.

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

14. With 5000, 5500, 6000, 7000, 16000, 18000 or 20000 pound capacity front axles, install the outer bearing cone and roller and the flat washer on the spindle. Then, install the adjusting nut. With 9000, 12000 and 15000 pound capacity front axles, install the outer bearing cone and roller and the bearing adjusting nut. With a 12000 pound capacity center point front axle, install the washer and adjusting nut.

5 SPECIFICATIONS

WHEEL TORQUE LIMITS - F-100 THRU F-350,
ECONOLINE, BRONCO, P-SERIES

Model	Nut Size	Ft.-Lbs
E-100, E-200, F-100 (4 x 4), U-100 (Std. Wheel) F-250-250 (4 x 4) P-350-3500 (W-5200 lb. Axle)	1/2-20	70-115
E-300 (Std. Wheel) F-350, P-350, P-3500, P-400, P-4000 (W/8-Stud Wheel and 7400 lb. Axle)	9/16-18	125-175
F-350, P-350, P-450, P-3500, P-4000 (W/Dual Wheels and 7400 lb Axle)	9/16-18	175-250
P-350, P-400, P-3500, P-4000 (W/17" Wheels)	5/8-18	175-250
P-500	3/4-16 or 1 1/8-16	400-500
Wheel Bearing Lock Rear (All)		100-150

CF1568-A

WHEEL TORQUE LIMITS-500 THRU 9000 SERIES

Description	Nut Size	Ft-Lbs
Front Wheel Nut	All	400-500
Rear Wheel Nut-Inner (Disc)	All	400-500
Rear Wheel Nut-Outer (Disc)	All	400-500
Cast Wheel Rim Nut	5/8 - 11 3/4 - 10	170-200 170-220

CF1569-A

SPECIAL SERVICE TOOLS

Tool No.	Description
T59T-1197-B	Front Wheel Bearing Adjustment Spanner Wrench
Tool 1175-AB	Grease Seal Remover Head
T50T-100-A	Impact Slide Hammer
T56P-1217-A	Front Hub Bearing Cup Replacer

CF1561-A

PART 11-03 Tires

COMPONENT INDEX This Information Applies to All Models		All Models
TIRE REMOVAL AND INSTALLATION Drop Center Rim Three-Piece Rim Two-Piece Rim Two-Piece Semi-Drop Center Rim		03-01 03-03 03-01 03-02
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 REMOVAL AND INSTALLATION

TIRE REPLACEMENT PRECAUTIONS

The tire must be completely deflated before removal, and the bead must not be damaged by a tire iron.

After installation, a tube tire should be inflated to recommended pressure, deflated, and then inflated again to insure that the tube is not folded inside the tire. Be sure the tube flap is properly positioned before inflating the tire. On F-100 and 250 series, it is important that each front tire and wheel be balanced.

When installing tires on vehicles equipped with Safety Ledge rims, thoroughly lubricate the tire beads. Inflate the tire until the bead seats against the rim of the wheel, then deflate to the specified pressure.

TIRE REMOVAL AND MOUNTING — DROP CENTER RIM

REMOVING TIRE FROM WHEEL

The drop center rim (Fig. 1) is used for either tube or tubeless tires.

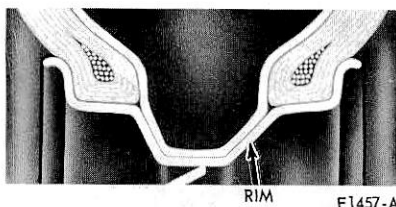


FIG. 1—Drop Center Rim

1. After completely deflating the tire by removing the valve core, loosen the beads, and force them into the drop center of the rim.

2. Using a pair of tire irons, pry the wheel out of the tire.

MOUNTING TIRE TO WHEEL

1. After inspection and cleaning of the tire and wheel, install the valve core in the inner tube and inflate the tube until it is barely rounded out.

2. Position the tube in the tire, soap the tire beads, and force the bottom bead into the drop center.

3. At a point on the wheel opposite the valve, insert a tire iron between the top bead and the rim, prying the bead over the rim.

4. Hold this iron in position, and with another iron, pry the bead into position all the way around the rim. Do not use a hammer or mallet to force the beads over the rim.

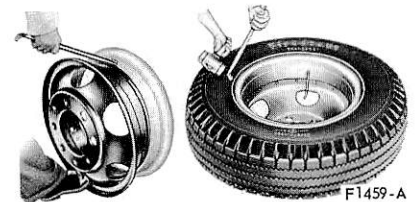
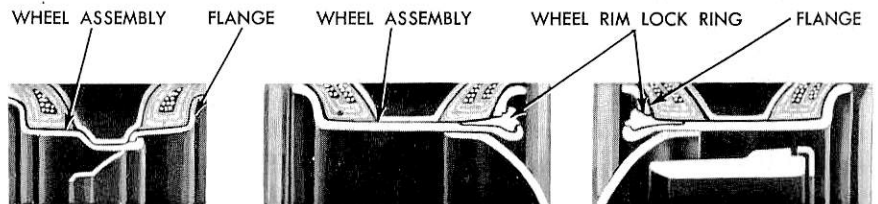


FIG. 3—Removing Ring and Loosening Tire Bead—2—Piece Rim

TIRE REMOVAL AND MOUNTING—TWO—PIECE RIM

REMOVING TIRE FROM WHEEL

To remove the rim ring (Fig. 2), from a rim without a tire, stand the wheel up so that the tool slot of the ring is at the top, and the lower portion of the ring is in the rim well. Insert the rim tool between the rim slot and the gutter of the rim, lift the ring over the gutter, and pry the ring off



2-PIECE RIM

3-PIECE RIM, DUAL WHEELS

F1458-A

FIG. 2—2— and 3—Piece Rim Installation



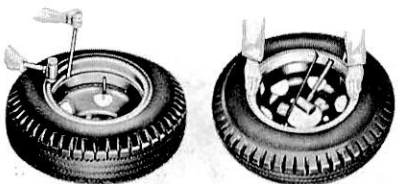
F1460-A

FIG. 4—Removing Ring and Removing Tire—2—Piece Rim



F1027-A

FIG. 5—Positioning and Starting Ring—2—Piece Rim



F1028-A

FIG. 6—Installing and Checking Ring—2—Piece Rim

the rim (Fig. 3).

1. Place the wheel (ring side up) on the floor. Insert the hook end of the rim tool between the ring flange and the tire bead, and continuing around the ring, pry the tire off the tapered seat of the ring (Fig. 3).

2. Press the side of the ring opposite the double embossing down into the ring well. Insert the straight end of the rim tool into the notch between and below the double embossing (Fig. 4).

3. Force the tool downward to disengage the ring from the rim gutter. Work the tool around the rim, freeing the ring from the rim, and remove the ring.

4. Turn the wheel over and loosen the opposite tire bead from the rim by hammering the hook end of the rim tool between the rim flange and the tire bead. Pry the tire bead away from the taper, and remove the tire from the rim (Fig. 4).

MOUNTING TIRE TO WHEEL

1. After positioning the tube in the tire, place the wheel (gutter side up) on the floor, soap both beads of the tire and position the tire on the rim.

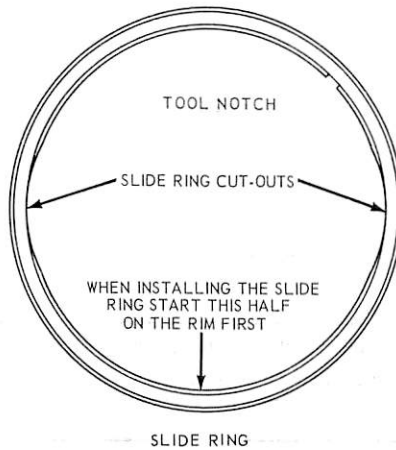


FIG. 7—2—Piece Wheel Rings

2. Position the ring with the notch about 3 inches from the valve stem (Fig. 5). Hook the section opposite the notch under the gutter so that the cut-away portions of the ring retaining bead span the rim gutter (Fig. 5).

3. Insert the straight end of the rim tool in the notch, and pull the ring onto the rim, at the same time forcing the ring over the gutter with a soft hammer (Fig. 6). Remove the tool, and continue to drive the ring down until it is entirely engaged in the gutter. Press down on the ring (as shown in Fig. 6) to make certain that it will rock. If there is no movement, the ring is not completely seated and will be forced off violently, either during inflation or when the truck is operated. When inflating the tire, do not stand in front of the ring.

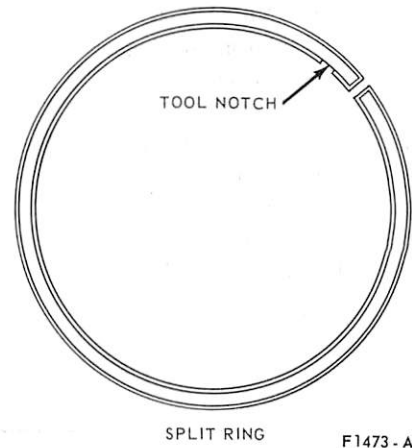
TIRE REMOVAL AND MOUNTING

TWO—PIECE SEMI—DROP CENTER WHEEL

The two—piece wheel uses a continuous slide ring which has two cut—outs directly opposite each other and a single tool notch located approximately 45 degrees from one cutout (Fig. 7). The cutouts enable the continuous slide ring to be installed on the rim without deforming either the ring or the rim.

REMOVING TIRE FROM WHEEL

1. To remove the ring, be sure the tire is completely deflated and both beads are broken free from the rim (Fig. 8). The slide ring is ready to re



F1337-A

FIG. 8—Loosening Tire Bead

move if it is loose and rotates easily in the rim gutter.

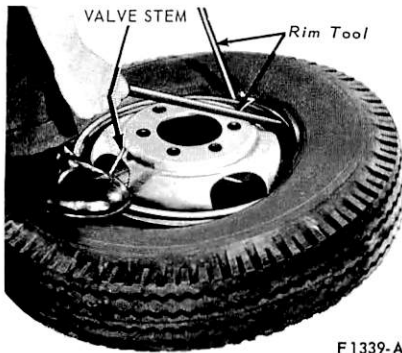
2. Locate the tool notch in the side ring and insert a rim tool or a long husky screw driver in the notch. Pry up with the tool making sure the opposite side of the slide ring is fitting into the rim gutter (Fig. 9). On vehicles with a split side ring, locate the tool notch and follow the instructions outlined above for the slide ring. Do not bend the ring.

3. Insert a second tool under the slide ring and work in a counter-



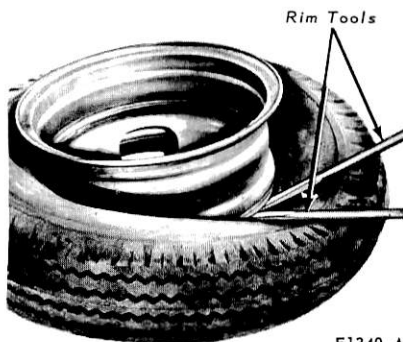
F1338-A

FIG. 9—Removing Slide Ring



F1339-A

FIG. 10—Removing Tire Upper Bead



F1340-A

FIG. 11—Removing Tire From Rim

clockwise direction from the tool notch to disengage the ring from the wheel. With the split side ring, pry off the ring with a rim tool.

4. When the tools reach the slide ring cutout, the ring will usually spring off. If necessary, a light tap with a mallet will free the last half of the ring after both cutouts are visible.

5. Force the tire upper bead into the valve slot. Then, pry the opposite portion of the bead over the edge of the rim with tire tools (Fig. 10).

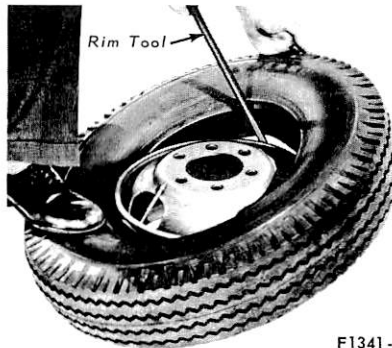
6. Turn the wheel and tire over.

7. With one portion of the bead in the rim well, pry the opposite portion of the bead over the edge of the rim (Fig. 11) and remove the tire from the rim.

MOUNTING TIRE TO WHEEL

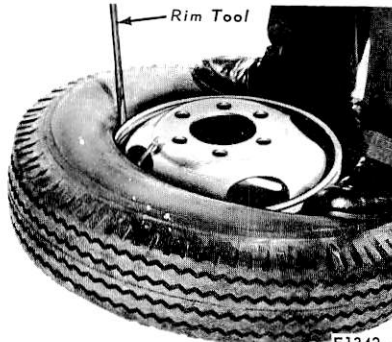
1. Place the tire and tube on the rim so that the valve stem is in line with valve hole. Insert the valve stem through the valve hole.

2. Force the first (lower) bead of the tire down into the well of the rim just to the side of the valve (Fig. 12). Mount the first bead over the rim gutter with a rim tool, progressing from each side of the valve to a point opposite the valve.



F1341-A

FIG. 12—Installing Tire First Bead on Wheel



F1342-A

FIG. 13—Installing Tire Second Bead on Wheel

3. Starting at a point opposite the valve, press the tire bead over the rim gutter and into the well with foot pressure. Mount the remainder of the bead over the rim gutter with a tire tool, being careful not to pinch the tube (Fig. 13).

4. Start the slide ring half opposite the tool notch in the rim gutter, making sure that the flat ring surface is facing the tire. On split side ring vehicles, position the ring on the wheel rim gutter starting at the split.

5. Push until the slide ring is half on and the crescent shaped cutouts in the slide ring straddle the rim gutter. With the split side ring, walk the ring into place, then tap with a plastic or rubber mallet until the ring is properly seated in gutter.

6. Insert a rim tool or large screw driver in the tool notch and pull the ring on and down toward the rim gutter (Fig. 14).

7. While pulling on the rim tool or screwdriver, strike the slide ring a sharp blow with a mallet in the area A between the tool notch and the nearest cutout. The second half of the ring will now be started over the rim gutter.

8. Remove the rim tool and continue the mallet blows (Fig. 14), start ing at the tool notch and progress

counterclockwise until the entire ring is in the rim gutter. The ring will turn easily on the rim after it is fully assembled.

9. When the slide ring is completely seated on the wheel, inflate the tire. The tire should be inflated in a safety cage or with the use of a clip-on type air chuck so that the operator can stand aside during inflation. Do not stand in front of the slide ring while inflating the tire.

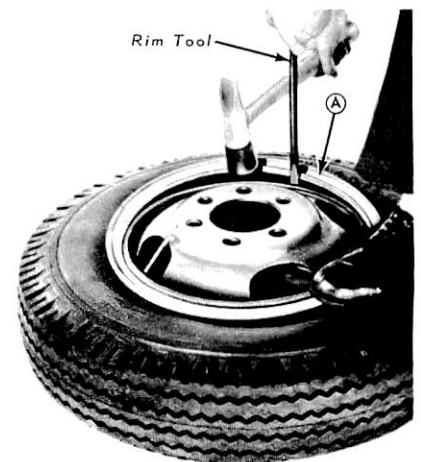
TIRE REMOVAL AND MOUNTING—THREE—PIECE RIM

Tire mounting procedures are the same for disc wheels and for cast wheels equipped with the three-piece rim.

REMOVING TIRE FROM WHEEL

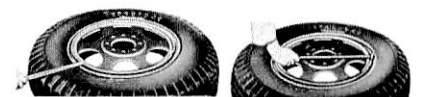
1. Place the wheel and deflated tire on the floor, with the ring up. Insert the straight end of the rim tool in the depression in the locking ring, and loosen the tire bead by pressing down on the side ring (Fig. 15).

2. Insert the straight end of the rim tool in the notch provided in the locking ring, and pry the locking ring



F1343-A

FIG. 14—Installing Slide Ring



F1461-A

FIG. 15—Loosening Tire Bead and Locking Ring—3—Ring Rim



F1462-A

FIG. 16—Removing Locking Ring and Positioning Locking Ring—3—Piece Rim

out of the gutter (Fig. 15). Lift out the locking ring, and remove the slide ring (Fig. 16).

3. Turn the wheel over and loosen the tire bead from the rim by hammering the hooked end of the rim tool between the rim flange and the tire

bead. Pry the tire bead away from the taper all the way around the rim until the tire is free. Remove the tire.

MOUNTING TIRE TO WHEEL

1. Position the wheel (gutter side up) on the floor. Soap both beads of the tire and position the tire on the rim.

2. Position the solid side ring on the tire, and insert the tapered toe of the split locking ring between the rim and the side ring (Fig. 16).

3. Using a soft hammer, drive the locking ring into place (Fig. 17). Start at one end of the split ring and progressively drive the ring into the gutter until the entire ring is seated (Fig.



F1463-A

FIG. 17—Starting Locking Ring and Locking Ring Installed—3—Piece Rim

17). **The ring must be entirely seated around the entire circumference of the rim. The split ends must be engaged in the gutter, or the ring will be forced off violently during inflation or when the truck is driven. When inflating the tire do not stand in front of the ring.**

Brakes

GROUP
12

PART 12-01	PAGE	PART 12-05	PAGE
General Brake Service	12-01-01	Vacuum Booster	12-05-01
PART 12-02		PART 12-06	
Hydraulic Drum Brakes	12-02-01	Air Supply System	12-06-01
PART 12-03		PART 12-07	
Hydraulic Disc Brakes	12-03-01	Air Brakes	12-07-01
PART 12-04			
Parking Brakes	12-04-01		

PART 12-01 General Brake Service

COMPONENT INDEX Applies to Models As Indicated	All Models	Econoline & Bronco	P-350-400, 3500-4000	P-500, 5000	B-500-750, 6000-7000	F-100-350	F-500-750, L-800-900	L-8000-9000	L-T-800-900, 8000, 9000	C-550-900, 6000-7000	C-900, C-8000 CT8000-900	L-N-500-900, 8000-9000	L-N-800-900, 8000-9000 LNT Series W & WT Series
	BRAKE DRUM												
Cleaning and Inspection	01-10												
Removal and Installation	01-08												
Repair	01-09												
BRAKE PEDAL ADJUSTMENT Ⓞ		N/A	N/A	01-06	N/A	N/A	01-06	N/A	01-06	01-06	N/A	01-06	N/A
BRAKE SHOE													
Cleaning and Inspection	01-08												
Relining	01-07												
CAM TYPE AIR BRAKE CLEANING AND INSPECTION Ⓞ		N/A	N/A	N/A	01-08	N/A	01-08	01-08	01-08	01-08	01-08	01-08	01-08
DISC BRAKES													
Adjustment Ⓞ		N/A	N/A	N/A	N/A	01-06	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cleaning and Inspection Ⓞ		N/A	N/A	N/A	N/A	01-07	N/A	N/A	N/A	N/A	N/A	N/A	N/A
MASTER CYLINDER CLEANING AND INSPECTION Ⓞ		01-08	01-08	01-08	01-08	01-08	01-08	N/A	01-08	01-08	N/A	01-08	N/A
TESTS													
Air Brake System		N/A	N/A	N/A	01-06	N/A	01-06	01-06	01-06	01-06	01-06	01-06	01-06

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

COMPONENT INDEX Applies to Models As Indicated	Model Series												
	Econoline & Bronco	P-350-400, 3500-4000	P-500, 5000	B-500-750, 6000-7000	F-100-350	F-500-750, L-800-900	L-8000-9000	L-T-800-900, 8000-9000-950	C-550-900, 6000-7000	C-900, C-8000 CT 800-900	L-N-500-900, 8000-9000	L-N-800-900, 8000-9000	L-N-T Series W & WT Series
Control Valve ①	N/A	N/A	N/A	01-05	N/A	01-05	01-05	01-05	01-05	01-05	01-05	01-05	01-05
Quick Release Valve ①	N/A	N/A	N/A	01-05	N/A	01-05	01-05	01-05	01-05	01-05	01-05	01-05	01-05
Relay Valve	N/A	N/A	N/A	N/A	N/A	N/A	N/A	01-05	N/A	01-05	N/A	01-05	01-05
Service Chamber ①	N/A	N/A	N/A	01-05	N/A	01-05	01-05	01-05	01-05	01-05	01-05	01-05	01-05
Stop Light Switch ①	N/A	N/A	N/A	01-05	N/A	01-05	01-05	01-05	01-05	01-05	01-05	01-05	01-05
Air Supply System													
Air Compressor ①	N/A	N/A	N/A	01-04	N/A	01-04	01-04	01-04	01-04	01-04	01-04	01-04	01-04
Governor, Air Compressor ①	N/A	N/A	N/A	01-04	N/A	01-04	01-04	01-04	01-04	01-04	01-04	01-04	01-04
Low Pressure Indicator ①	N/A	N/A	N/A	01-04	N/A	01-04	01-04	01-04	01-04	01-04	01-04	01-04	01-04
Moisture Ejector Valve, Air Reservoir ①	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	01-04
Safety Valve, Air Reservoir ①	N/A	N/A	N/A	01-04	N/A	01-04	01-04	01-04	01-04	01-04	01-04	01-04	01-04
Hydraulic Brake System													
Check Valve, Vacuum Booster ①	N/A	01-03	01-03	01-03	01-03	01-03	N/A	01-03	01-03	N/A	01-03	N/A	N/A
Dual Brake Warning Light	01-03	01-03	N/A	01-03	01-03	01-03	N/A	N/A	01-03	N/A	01-03	N/A	N/A
Power Brake Function Test ①	N/A	01-03	01-03	01-03	01-03	01-03	N/A	01-03	01-03	N/A	01-03	N/A	N/A
Preliminary Checks ①	01-03	01-03	01-03	01-03	01-03	01-03	N/A	01-03	01-03	N/A	01-03	N/A	N/A
Vacuum Booster ①	N/A	01-03	01-03	01-03	01-03	01-03	N/A	01-03	01-03	N/A	01-03	N/A	N/A
VACUUM BOOSTER													
Adjustment (Air Check)	N/A	01-05	01-05	01-05	01-05	01-05	N/A	01-05	01-05	N/A	01-05	N/A	N/A
Cleaning and Inspection	N/A	01-08	01-08	01-08	01-08	01-08	N/A	01-08	01-08	N/A	01-08	N/A	N/A
WHEEL CYLINDER CLEANING AND INSPECTION ①	01-08	01-08	01-08	01-08	01-08	01-08	N/A	01-08	01-08	N/A	01-08	N/A	N/A
<p>A page number indicates that the item is for the vehicles listed at the head of the column. N/A indicates that the item is not applicable to the vehicles listed. ① Does not apply to F-100 ② Does not apply to W & WT Series ③ Does not apply to L-900, 8000-9000 ④ F-LN 500-600 Series with dash mounted booster ⑤ Does not apply to L-LN & B 500 or C550 Series</p>													

I TESTING

A new improved Truck Diagnosis Manual is in process of preparation and should be available in 1970. Until this becomes available, use the diagnosis information from your previous Truck Shop Manual containing this information.

Hydraulically operated service brakes are standard equipment on all 100 through 800 Series and on some 900 Series Ford trucks.

Automatic brake shoe adjusters are used on all 100 thru 900 Series Ford trucks with hydraulic brakes.

A dual-master cylinder brake system is used as standard equipment on F-100 through F-350, E-100 through E-300, Bronco, and P350-400-3500-4000 vehicles. The dualmaster cylinder is also used on F500, L-900, LN-500-750, C-550-950, F-60007000, LN-6000-7000, C-6000-7000 and B-500-750 Series vehicles equipped with split-hydraulic brakes.

Front Disc brakes are available on F-250 and F-350 trucks.

The standard hydraulic brake system on some vehicles may be assisted by a vacuum booster installed as either standard or optional equipment. Service information on the vacuum booster unit is given in Part 12-05.

The full air brake system, optional on some models and standard on most 800 through 1000 models, is covered in Part 12-07. Automatic brake shoe adjusters are also included on some air brake systems.

HYDRAULIC BRAKE SYSTEM TESTS

BRAKE SYSTEM PRELIMINARY CHECKS

1. Always check the fluid level in the brake master cylinder reservoir(s) 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.

Push the brake pedal down as far as it will go. If the pedal travels more than halfway between the released

position and the floor, adjust the brakes. If the vehicle is equipped with automatic brake adjusters, several sharp brake applications while backing up may be necessary to adjust the brakes.

Road test the vehicle and apply the brakes at a speed of about 20 mph to see if the vehicle stops evenly. If not, the brakes should be adjusted. Perform the road test only when the brakes will apply and the vehicle can be safely stopped.

DUAL BRAKE WARNING LIGHT SYSTEM TESTS

1. Turn the ignition switch to the ACC or ON position. If the light on the brake warning lamp remains on, the condition may be caused by a shorted or broken switch, grounded switch wires or the differential pressure valve is not centered. Centralize the differential pressure valve as outlined under Hydraulic System Bleeding and Centralizing of the Differential Valve in this section of the manual. If the warning light remains on, check the switch connector and wire for a grounded condition and repair or replace the wire assembly. If the condition of the wire is good, replace the brake warning lamp switch.

2. Turn the ignition switch to the start position. If the brake warning lamp does not light, check the light and wiring and replace or repair wiring as necessary.

When both brake systems are functioning normally, the equal pressure at the pressure differential valve during brake pedal application keeps the valve centered. The brake warning light will be on only when the ignition key is in the START position.

3. If the brake warning lamp does not light when a pressure differential condition exists in the brake system, the warning lamp may be burned out, the warning lamp switch is inoperative or the switch to lamp wiring has an open circuit. Check the bulb and replace it, if required. Check the switch to lamp wires for an open circuit and repair or replace them, if required. If the warning lamp still does not light, replace the switch.

POWER BRAKE FUNCTION TEST

With the engine stopped, eliminate all vacuum from the system by pumping the brake pedal several times. Then push the pedal down as far as it will go, and note the effort

required to hold it in this position. If the pedal gradually moves downward under this pressure, the hydraulic system is leaking and should be checked by a hydraulic pressure test.

With the brake pedal still pushed down, start the engine. If the vacuum system is operating properly, the pedal will move downward. If the pedal position does not change, the vacuum system is not operating properly and should be checked by a vacuum test.

FRAME MOUNTED VACUUM BOOSTER CHECK VALVE TEST

Disconnect the line from the bottom of the vacuum check valve, and connect a vacuum gauge to the valve. Start the engine, run it at idle speed, and check the reading on the vacuum gauge.

The gauge should register 17-19 inches with standard transmission and 14-15 inches in Drive range if equipped with an automatic transmission. Stop the engine and note the rate of vacuum drop. If the vacuum drops more than one inch in 15 seconds, the check valve is leaking. If the vacuum reading does not reach 18

Remove the gauge and reconnect the vacuum line to the check valve.

VACUUM BOOSTER TEST—BENDIX PISTON TYPE

Disconnect the vacuum line from the booster end plate. Install a tee fitting in the end plate, and connect a vacuum gauge (No. 1) and the vacuum line to the fitting. Install a second vacuum gauge (No. 2) in place of the pipe plug in the booster control valve body.

Start the engine, and note the vacuum reading on both gauges. If both gauges do not register manifold vacuum, air is leaking into the vacuum system. If both gauges register manifold vacuum, stop the engine and note the rate of vacuum drop on both gauges. If the drop exceeds one inch in 15 seconds on either gauge, air is leaking into the vacuum system. Tighten all vacuum connections and repeat the test. If leakage still exists, the leak may be localized as follows:

1. Disconnect the vacuum line and gauge No. 1 from the booster.

2. Connect vacuum gauge No. 1 directly to the vacuum line. Start the engine and note the gauge reading. Stop the engine and check the rate of vacuum drop. If gauge No. 1 does not register manifold vacuum, or if the vacuum drop exceeds 1 inch in 15

seconds, the leak is in the vacuum line or check valve connections.

3. Reconnect vacuum gauge No. 1 and the vacuum line to the tee fitting. Start the engine, and run it at idle speed for one minute. Depress the brake pedal sufficiently to cause vacuum gauge No. 2 to read from zero to 1 inch of vacuum. Gauge No. 1 should register manifold vacuum of 17–19 inches with standard transmission and 14–16 inches in Drive range if equipped with an automatic transmission. If the drop of vacuum on gauge No. 2 is slow, the air cleaner, or air cleaner line, may be plugged. Inspect and if necessary, clean the air cleaner.

4. Release the brake pedal and observe the action of gauge No. 2. Upon releasing the pedal, the vacuum gauge must register increasing vacuum until manifold vacuum is reached. The rate of increase must be smooth, with no lag or slowness in the return to manifold vacuum. If the gauge readings are not as outlined, the booster is not operating properly and should be removed and overhauled.

VACUUM BOOSTER TEST— DIAPHRAGM TYPE

This procedure can be used to test all diaphragm boosters which are equipped with a pipe thread outlet on the atmosphere portion of the diaphragm chamber.

Remove the pipe plug from the rear half of the booster chamber, and install a vacuum gauge. Start the engine and run it at idle speed. The gauge should register 18–21 inches of vacuum.

1. With the engine running, depress the brake pedal with enough pressure to show a zero reading on the vacuum gauge. Hold the pedal in the applied position for one minute. Any downward movement of the pedal during this time indicates a brake fluid leak. Any kickback (upward movement) of the pedal indicates brake fluid is leaking past the hydraulic piston check valve.

2. With the engine running, push down on the brake pedal with sufficient pressure to show a zero reading on the vacuum gauge. Hold the pedal down, and shut the engine off. Maintain pedal position for one minute. A kickback of the pedal indicates a vacuum leak in the vacuum check valve, in the vacuum line connections, or in the booster.

AIR SUPPLY SYSTEM

The air supply system is used with the full air brake system (Part 12–07). In the full air system, air pressure is applied directly to the shoes through a diaphragm and mechanical linkage.

If the brake system is not operating properly, the air supply system should be checked first.

OPERATING TESTS

Before performing any of the following tests, operate the engine until the air pressure builds up to 90 psi. With the air brake system charged, open the drain cocks in each reservoir. Close the drain cocks after all moisture is drained from the reservoirs. Some models have automatic moisture ejector valves and do not require manual draining.

Low Pressure Indicator

Exhaust the brake system pressure and observe the pressure at which the warning buzzer sounds. The contacts in the indicator should close the circuit to the buzzer, when reservoir pressure is between 58 psi minimum and 65 psi maximum. If the buzzer does not start to sound within this pressure range during discharge, or if a sounding buzzer does not stop within this pressure range during the pressure buildup, the electrical connections are loose or the indicator valve is not operating properly.

Reservoir Safety Valve

To determine if the safety valve is operative, pull the exposed end of the valve stem. If the safety valve does not blow off when the stem is pulled, the valve ball is probably stuck in its seat. In such a case, remove and disassemble the valve for cleaning.

Automatic Moisture Ejector Valve

With the system charged, make several foot valve applications and note each time an application is made if an exhaust of air occurs at the exhaust port of the drain valve. If no air comes out, push the wire stem. If no air comes out, the filter is plugged and the valve should be removed and cleaned.

Note: Because the automatic moisture ejector valve functions as reservoir pressure is reduced, excessive leakage in the system will cause

constant exhausting of the valve.

Governor

With the engine running, build up air pressure in the system, and observe at what pressure reading on the dash gauge the pressure stops climbing. This is the point of governor cutout which should be between 118 and 125 pounds.

With the engine still running, slowly reduce the air pressure in the system by applying and releasing the brakes. Observe the pressure reading on the dash gauge at the point where the pressure starts to build up again. This is the point of governor cut—in which should be between 98 and 104 pounds.

If the governor does not cut the compressor in and out according to these specifications, adjust the governor pressure settings. Before adjusting the governor, check the accuracy of the dash gauge with a test gauge.

Check Pressure Build—Up

With the engine running at fast idle speed, observe the time required to raise system pressure from 50 to 90 pounds. If more than five minutes is required, perform the leak tests as outlined in the following paragraphs.

Also check for low engine idle speed, a slipping compressor drive belt, excessive carbon in the compressor cylinder head, or a worn out air compressor.

LEAK TESTS

Compressor

With the engine stopped, discharge valve leakage can be detected by carefully listening at the compressor for the sound of escaping air. With air pressure applied to the unloader cavity (with governor cut—out), remove the air filter or the air pick up tube on SD V–8 engines and check for air leaks by squirting oil around the unloader plunger and stem. If excessive air leaks are found, replace the unloader mechanism.

Governor

With the governor in the cutout position, test for leakage at the exhaust valve by applying soap suds to the exhaust vent in the body.

With the governor in the cut—in position, test for leakage of the inlet

valve by applying soap suds to the exhaust vent in the body.

In either of the foregoing tests, leakage in excess of 1-inch soap bubble in three seconds indicates the governor should be replaced.

Reservoir Safety Valve

Coat the end of the safety valve with soap suds. Leaks causing not more than a 3-inch soap bubble in three seconds are permissible.

Automatic Moisture Ejector Valve

With the system charged and pressure stabilized in the system, there should be no leaks at the drain valve exhaust. A constant slight exhaust of air at the drain valve exhaust could be caused by excessive leakage in the air brake system.

AIR BRAKES

Some of the air brake system components vary slightly from one vehicle model to another in design or location. However, all components are essentially the same in principle and service procedure.

OPERATING TESTS

Check Stop Light Switch

With all air pressure exhausted

from the air brake system, start the engine and move the brake valve to the applied position. Stop lights should light before the dash gauge registers 5 psi pressure. Release the brakes.

Quick Release Valve and Relay Valve

With the air brake system fully charged, apply the brakes. Inspect the brake action on the wheels controlled by the quick release valve or relay valve in question. The brakes should apply promptly. Release the brakes and inspect to be sure that the air pressure is exhausted rapidly from the exhaust port. Be sure the exhaust port is not restricted.

LEAK TESTS

With the engine stopped and the brakes fully applied, watch the rate of drop in air pressure as registered by the dash gauge. With the engine stopped and the reservoirs charged to the governor cutout pressure (118–125 psi), the rate of drop should not exceed 2 psi per minute. The rate of drop should also not exceed 2 psi per minute after the initial drop with brakes fully applied. If the pressure drops faster than specified, check the items outlined in the following paragraphs.

Brake Control Valve

With the pedal fully released, coat the exhaust port with soap suds to check for leaks. With the pedal fully applied, coat the exhaust port with soap suds and check for leaks. Leaks causing not more than a three inch soap bubble in three seconds are permissible.

Brake Chambers

With the brakes fully applied, coat the clamp ring and bolt flanges holding the diaphragm in place with soap suds. No leaks are permissible.

Quick Release Valve

With brakes applied, coat the exhaust port with soap suds to detect leakage. Leakage in excess of a 3-inch soap bubble in three seconds is not permissible.

Relay Valve

With the brakes released, coat the exhaust port with soap suds and observe the leakage.

With the brakes fully applied, coat the exhaust port with soap suds and observe the leakage.

Leakage in either of the foregoing tests should not exceed a 3 inch soap bubble in three seconds.

2 COMMON ADJUSTMENTS AND REPAIRS

AIR CHECK BOOSTER PUSH ROD ADJUSTMENT— MIDLAND ROSS BOOSTER (DASH MOUNTED—HEAVY TRUCKS ONLY)

Whenever the master cylinder or booster has been repaired or replaced, the brake system must be checked for proper return flow of hydraulic brake fluid from the wheel cylinders to the reservoir of the master cylinder. This check will assure that the brake booster to master cylinder push rod is properly adjusted to allow the master cylinder compensating valve to open

when the brake pedal is in the fully-released position.

The air check is made after the brake booster and master cylinder has been installed and before the master cylinder hydraulic line connection is made and the reservoir is filled with brake fluid.

1. Connect the brake vacuum line to the vacuum booster, if required. Start the engine.

2. Carefully position the nozzle of an air hose to the master cylinder discharge port. Place a hand over the master cylinder reservoir and apply air pressure through the air hose nozzle.

cylinder reservoir, the brake booster push rod is properly adjusted.

If no air pressure is felt on the hand located over the reservoir, the master cylinder must be removed and the push rod length shortened. To shorten the push rod length, turn the acorn-type screw on the brake booster push rod inward, one turn at a time, until the air check shows the brake master cylinder compensating valve is open.

Be careful not to allow dirt to enter into the system.

If free passage air pressure is felt on the hand located over the master



FIG. 1—Pedal Free Travel Check

BRAKE PEDAL ADJUSTMENT

On dual-brake master cylinder or brake mounted vacuum booster equipped vehicles, the brake systems are designed to permit full stroke of the master cylinder when the brake pedal is fully depressed. A brake pedal clearance adjustment is not required.

In order to release the brakes, fluid in a hydraulic brake system must flow back to the master cylinder when pedal pressure is released. A port is provided in the master cylinder to allow this flow, but the piston must move back far enough to expose the return port. To be sure that this will always happen, free-travel is built into the pedal linkage on standard and on frame-mounted booster systems. This free-travel prevents the piston from becoming trapped in a partially released position. Pedal free travel is not always perceptible in dashmounted booster systems, however, because the operating clearance for the piston is adjusted at the booster push-rod, rather than the pedal linkage. (Refer to Part 12-05 for instructions on dash-mounted booster pushrod adjustments).

Pedal free travel is not adjustable on 500-900 series trucks with a dash-mounted booster and a single or dual system or units with a dual system and a frame-mounted booster.

If the pedal free travel in a standard hydraulic brake system or frame mounted hydraulic booster system is less than 3/16 inch or more than 3/8 inch (Fig. 1), the pedal should be adjusted.

To adjust free-travel:

1. Push the brake pedal down by hand pressure, and check the free travel.

2. Loosen the lock nut on the eccentric bolt, and rotate the eccentric bolt until the free travel is within 3/16-3/8 inch.

On a P-Series truck, turn the hex head of the push rod to obtain the required free-travel.

3. Hold the bolt securely, and torque the lock nut to 30-35 ft-lbs.

4. Recheck the pedal free-travel to make sure that the adjustment did not change when the lock nut was tightened.

FRONT DISC BRAKES F-250 AND F-350

The front disc brake assembly is designed so that it is inherently self-adjusting. Refer to Part 12-03, Removal and Installation, Section 3 or Major Repair Operations, Section 4 for the required service procedures.

BRAKE DRUM REMOVAL AND INSTALLATION THROUGH 1000 SERIES

The service procedures covered here apply to both hydraulic and air brakes. Since the F-100 through 350, E-100 through 300, Bronco or the P350, 400, 3500 and 4000 (front and rear) and the 4-wheel drive front brake drum procedures apply to hydraulic brakes only, they are covered in Section 3 of Part 12-02.

FRONT BRAKE DRUM

1. Raise the truck until the wheel and tire clear the floor and remove the wheel and tire from the hub. Back off the brake shoe adjusting screw so that the shoes do not contact the brake drum. Remove the grease cap and the gasket (if so equipped) from the hub.

2. With 4,000 through 7,000 lb. and 18,000 lb. front axles, remove the cotter pin, adjusting nut and flat washer from the spindle.

On trucks with a 9,000 lb. or 11,000 or 15,000 lb. axle, remove the lock nut, the dimpled washer, the locking ring and the adjusting nut and pin assembly.

3. Remove the outer bearing cone and roller. Pull the hub and drum assembly off the wheel spindle.

4. Remove the front wheel to hub retaining nuts or rim and tire attaching nuts. Remove the wheel or rim and tire from the hub and drum.

5. Remove the brake drum retainers and attaching bolts, screws, or bolts and nuts.

6. Remove the brake drum from the hub.

7. Check the drum for damage or wear, and repair or replace as necessary. If a new drum is to be installed, be sure to remove the protective coating with a suitable degreaser.

New grease retainer seals should be installed whenever a wheel and hub is removed.

8. Place the brake drum to the hub and install the retainers and retaining bolts, screws, or bolts and nuts.

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

10. With 4,000 through 7,000 lb. and 18,000 lb. front axles, install the outer bearing cone and roller and the flat washer on the spindle, then install the adjusting nut. With front axles of 9,000 lbs., 11,000 or 15,000 lbs. capacity, install the outer bearing cone and roller and the bearing adjusting nut and pin assembly.

11. Install the wheel and tire on the hub, then install the clamps (if applicable) and the wheel stud nuts.

12. Torque the adjusting nut to specifications while rotating the wheel. Refer to Group 11-02 for the wheel bearing adjustment procedure.

Install the dimpled washer with the dimple indexed in one of the holes in the adjusting nut. Install the lock nut and torque to specifications. Bend the dimpled washer over a flat of the lock nut.

13. Install the gasket (if so equipped) and the grease cap, and torque the wheel stud nuts to specifications. Install the hub cap if so equipped, and adjust the brakes.

REAR BRAKE DRUM

1. Raise the truck and install stands.

2. Remove the wheel and tire as an assembly. Then back off the rear brake shoe adjustment.

3. Remove the rear axle shaft retaining nuts, adapters, axle shaft, and grease seal.

4. Remove the wheel bearing locknut, lock washer, and adjusting nut.

5. Remove the hub and drum from the axle.

6. Remove the brake drum to hub retaining screws, bolts, or bolts and nuts. Then remove the brake drum

from the hub.

7. Check the drum for damage or wear, and repair or replace as necessary. If a new drum is to be installed, be sure to remove the protective coating with a suitable degreaser.

New grease retainer seals should be installed whenever a wheel and hub is removed.

8. Position the brake drum to the hub and install the attaching screws, bolts, or bolts and nuts.

9. Position the hub and drum as an assembly on the axle and start the adjusting nut.

10. Adjust the wheel bearing nut and then install the wheel bearing lock washer and locknut.

11. Install a new rear axle oil seal, axle shaft and gasket, stud adapters, and attaching nuts.

12. Install the wheel and tire as an assembly.

13. Adjust the brake shoes and then remove the stand and lower the truck.

BRAKE DRUM REFINISHING

Minor scores on a brake drum can be removed with fine emery cloth, provided the emery is thoroughly cleaned off the drum after the operation.

A badly scored, rough, or out-of-round drum should be ground or turned on a drum lathe. Do not remove any more material from the drum than is necessary to provide a smooth surface for the brake shoe contact. Brake drums up to and including 14 inches nominal diameter should not be machined to more than .060 inch beyond the original diameter.

Brake drums larger than 14 inches nominal diameter should not be machined to more than .080 inch beyond the original diameter.

If the diameter of the drum is less than .030 inch oversize after refinishing, install standard linings on the brake assemblies. If the diameter is over 0.030 inch, install oversize or shimmed linings.

BRAKE SHOE AND BAND RELINING

1. Remove the rivets and remove the old lining.

2. Clean the shoe or band thoroughly with cleaning fluid, especially the rim surface. Wipe the shoe or band dry and remove all burrs or rough spots from the shoe.

3. On service brake, check the inside diameter of the brake drum. If the diameter is less than 0.030 inch oversize, install standard linings. If the diameter is 0.030–0.060 inch oversize, install oversize or shimmed linings.

4. Position the new lining on the shoe or band and install new rivets, beginning with the rivet holes near the center of the shoe. On some vehicles, the primary lining is shorter than the secondary lining. If this condition exists, position the shorter (primary) lining to line up with the heel end of the shoe. **Do not let brake fluid oil or grease touch the brake lining. If a brake lining kit is used to replace the worn linings, install all the parts supplied in the kit.**

5. Check the clearance between the lining and shoe rim. The lining must seat snugly against the rim with not more than 0.005 inch separation midway between any two rivets. If only the linings are replaced on duo-servo single anchor brakes with fixed anchor pins, the brake linings must be cam ground 0.010 inch at the ends after the linings are riveted to the brake shoe.

3 CLEANING AND INSPECTION

FRONT DISC BRAKES

1. Remove the wheel and tire, brake shoe retainers, and the shoe and linings as outlined in Part 12-03.

2. Make three thickness measurements with a micrometer across the middle section of the shoe and lining. Take one reading at each side and one in the center. If the assembly has worn to a thickness of 0.210 inch (Shoe and lining together) at any one of the three measuring locations, or if the lining shows evidence of brake fluid or oil contamination that is causing a brake pull, Replace all (4) shoe and lining assemblies.

3. Check caliper to spindle attaching bolt torque. Torque them to specification if required.

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 spindle so that the stylus contacts the rotor at a point approximately 1 inch from the outer edge. Rotate the rotor and take an indicator reading. If the reading exceeds 0.010 inch total lateral runout on the indicator, replace or resurface the disc brake rotor. **The following requirements must be met when resurfacing disc brake rotors (Fig. 2).**

Rotunda Disc Brake Attachment FRE-2249-2 is the only approved tool to be used to refinish the disc brake rotors. The step-by-step resurfacing procedure provided with the tool must be adhered to.

A maximum of 0.020 inch material may be machined equally off each surface (A and B) maintaining a 0.940 inch minimum thickness.

The finished braking surfaces of the rotor must be flat and parallel

within 0.001 inch; lateral runout must not exceed 0.003 inch total indicator reading, and the surface finish of the braking surfaces are to be 15–80 micro inches.

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

6. Check the rotor for scoring. Minor scores can be removed with a fine emery cloth. If the rotor is excessively scored, refinish it as outlined in step 5 or replace the rotor if required.

7. Visually check the caliper. If it is cracked or if any leakage is evident, it should be replaced. Any leakage around the dust boot indicates the need for removal and disassembly.

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

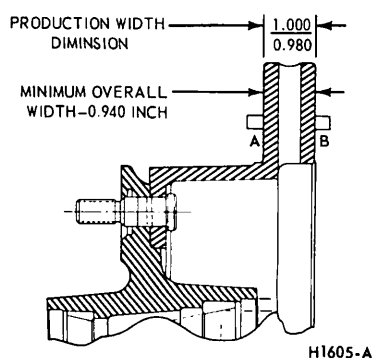


FIG. 2—Disc Brake Rotor Service Limits

BRAKE CYLINDER

1. Clean all brake cylinder parts in clean isopropyl alcohol. Inspect all parts for wear or damage. Check the cylinder bore for rust, scores, or other damage. Be sure that the bleeder screw passage is clean and open. Replace all parts that are worn or damaged.

2. If dirt is found in any part of the hydraulic system, flush the entire system with clean isopropyl alcohol.

MASTER CYLINDER

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

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

3. On a single brake system master cylinder, check to see if the spring valve (riveted to the front end of the piston) is loose or has moved so that the piston ports are open, replace the piston.

4. Inspect the cylinder walls for scores or rust, and recondition them if necessary. Hone the cylinder walls no more than necessary (0.003 inch maximum), either to remove scores and rust, or to obtain a smooth wall surface. Remove any burrs or loose metal that may have resulted from the honing operation, and clean the cylinder with clean isopropyl.

BRAKE DRUMS AND LININGS

1. After removing one front wheel and drum and one rear wheel and drum from the vehicle, inspect the drums and brake shoe linings for wear or damage that would affect brake operation. Do not let brake fluid, oil or grease touch the drum or linings.

2. A brake shoe should be relined when the lining face is worn to within 1/32 inch of any rivet head, or when the lining has been soaked with brake fluid, oil or grease. If a worn lining is not replaced, the brake drum may become severely damaged. Always replace the primary and secondary brake shoe lining assemblies on both front or both rear brake assemblies at the same time.

3. Before relining a brake shoe, inspect the shoe for distortion, cracks, or looseness between the rim and web. If one of these conditions exists, replace the shoe. Do not attempt to repair a damaged brake shoe.

4. If the drum and linings are in good condition, install the wheel and drum. The condition of the drums and linings of the opposite wheel will usually be about the same as that found at the wheel that was removed.

5. Add enough of the specified brake fluid to the master cylinder reservoir to bring the level to within 1/4 inch of the top of the filler neck.

6. Check to be sure that the parking brake handle is fully released before making any brake adjustment.

7. Check the front brake anchor pin nut with a wrench (on brake assemblies with an adjustable anchor pin). If the bolt is loose, torque it to 80–100 ft–lbs.

BRAKE BOOSTER

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

2. Inspect all other parts for damage or excessive wear. Replace damaged or excessively worn parts. If the inside of the booster body is rusted or corroded, polish it with steel wool or fine emery cloth. On piston type booster, replace the body shell when scored. Inspect the master cylinder bore for signs of scoring, rust, pitting or etching. Any of these conditions will require replacement of the cylinder.

CAM—TYPE AIR BRAKES

1. Inspect the camshaft bushings and replace if worn or damaged.

2. Check the anchor pins and shoe-to-cam rollers for wear or damage, and replace, if required.

3. Check thickness of the brake lining at the center of the shoe, and replace, if necessary.

4. Clean, inspect, and replace worn or damaged parts. Coat the anchor pins and cam lobes with Lubriplate before installing the shoes.

4 SPECIAL TOOLS

SPECIAL TOOLS

Ford Tool No.	Description
Rotunda ARE 345	Fuel Pump Tester Gauge
Rotunda FRE 1431	Brake Drum Micrometer

PART 12-02 Hydraulic Drum Brakes

COMPONENT INDEX Applies to Models As Indicated	Bronco	Econoline	P-350-400, 3500-4000	P-500, 5000	B-500-750, 6000-7000	F-100-350	F-500-750	L-800-900 L-8000-9000	C-550-950, 6000-7000	L.N-500-900, 8000-9000 L.N.T-800-900, 8000-9000
	BLEEDING, HYDRAULIC SYSTEM	02-08	02-08	02-08	02-08	02-08	02-08	02-08	02-08	02-08
BRAKE BACKING PLATE										
Removal and Installation	02-20	02-20	02-20	02-20	02-20	02-20	02-20	02-20	02-20	02-20
BRAKE DRUM										
Cleaning and Inspection-See Part 12-01										
Removal and Installation	02-12	02-11	02-11	02-12	02-12	02-11	02-12	02-12	02-12	02-12
Repair-See Part 12-01										
BRAKE PEDAL										
Removal and Installation	02-26	02-26	02-26	02-27	02-28	02-25	02-26	02-26	02-28	02-26
BRAKE SHOES										
Adjustments	02-07	02-07	02-07	02-07	02-08	02-07	02-08	02-08	02-08	02-08
Cleaning and Inspection-See Part 12-01										
Removal and Installation	02-12	02-12	02-14	02-16	02-16	02-12	02-16	02-16	02-16	02-16
Repair-See Part 12-01										
BRAKE WHEEL CYLINDER										
Cleaning and Inspection-See Part 12-01										
Disassembly and Overhaul	02-29	02-29	02-29	02-29	02-29	02-29	02-29	02-29	02-29	02-29
Removal and Installation	02-19	02-19	02-19	02-19	02-19	02-19	02-19	02-19	02-19	02-19
DESCRIPTION	02-02	02-02	02-02	02-04	02-02	02-02	02-04	02-04	02-04	02-04
HYDRAULIC LINE REPAIR	02-10	02-10	02-10	02-10	02-10	02-10	02-10	02-10	02-10	02-10
MASTER CYLINDER										
Cleaning and Inspection-See Part 12-01										
Disassembly and Overhaul	02-29	02-29	02-29	02-29	02-29	02-29	02-29	02-29	02-29	02-29
Removal and Installation	02-22	02-22	02-21	02-24	02-22	02-21	02-21	02-22	02-25	02-21
PRESSURE DIFFERENTIAL VALVE										
Adjustment	02-10	02-10	02-10	N/A	02-10	02-10	02-10	02-10	02-10	02-10
Removal and Installation	02-25	02-25	02-25	N/A	02-25	02-25	02-25	02-25	02-25	02-25

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

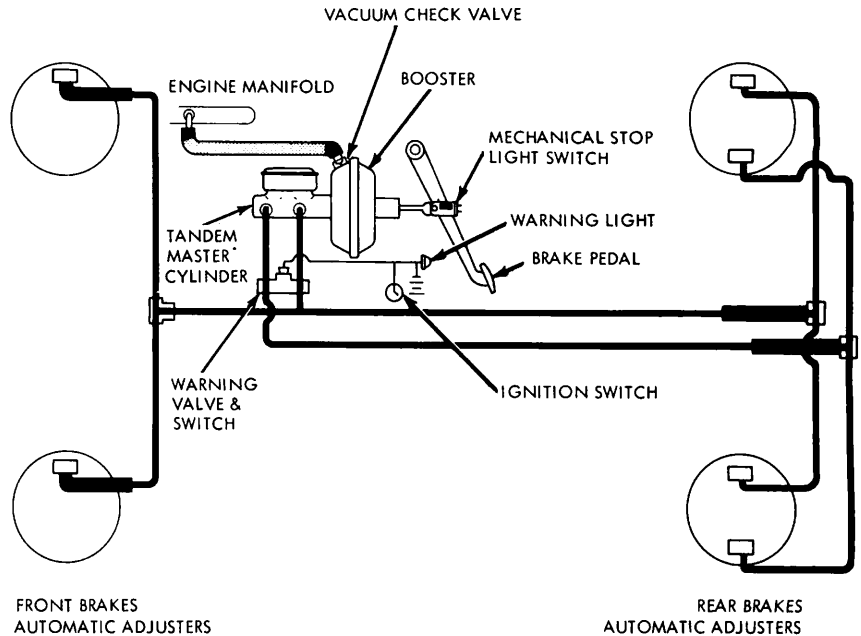
1 DESCRIPTION

DUAL-MASTER CYLINDER BRAKE SYSTEM

A dual-master cylinder brake system (Figs. 1 and 4) is used on all F-100 through 350, E-100 through 300, Bronco, and P-350-400-3500-4000 and B-500-750 Series Models and is available on certain 500-900 Series Models.

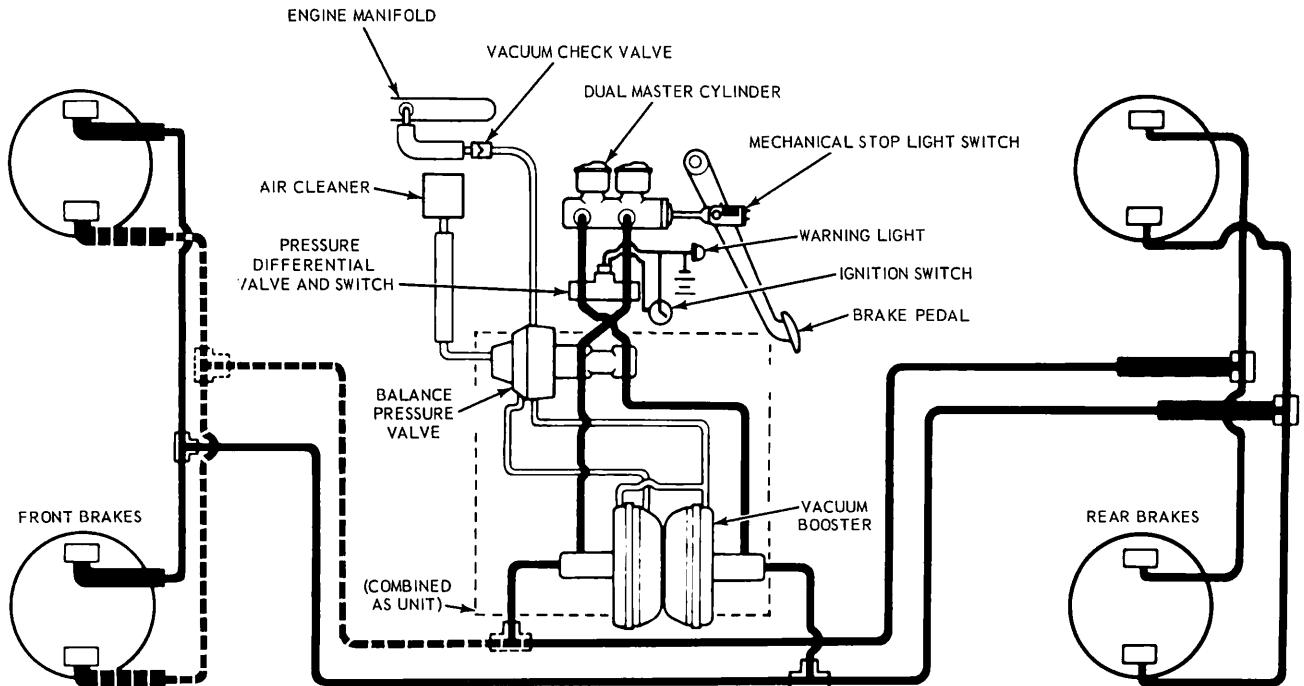
A code letter is stamped on the side of each dual-master cylinder body casting (except F and LN-Series with a dash-mounted booster) for easy service identification.

The dual-master cylinder contains a double hydraulic cylinder with two fluid reservoirs, two hydraulic pistons (a primary and secondary) and two residual check valves, located in the outlet ports (Fig. 5). The master cylinder secondary systems outlet port is connected to the secondary hydraulic circuit and the primary system brake outlet port is connected to the primary hydraulic circuit.



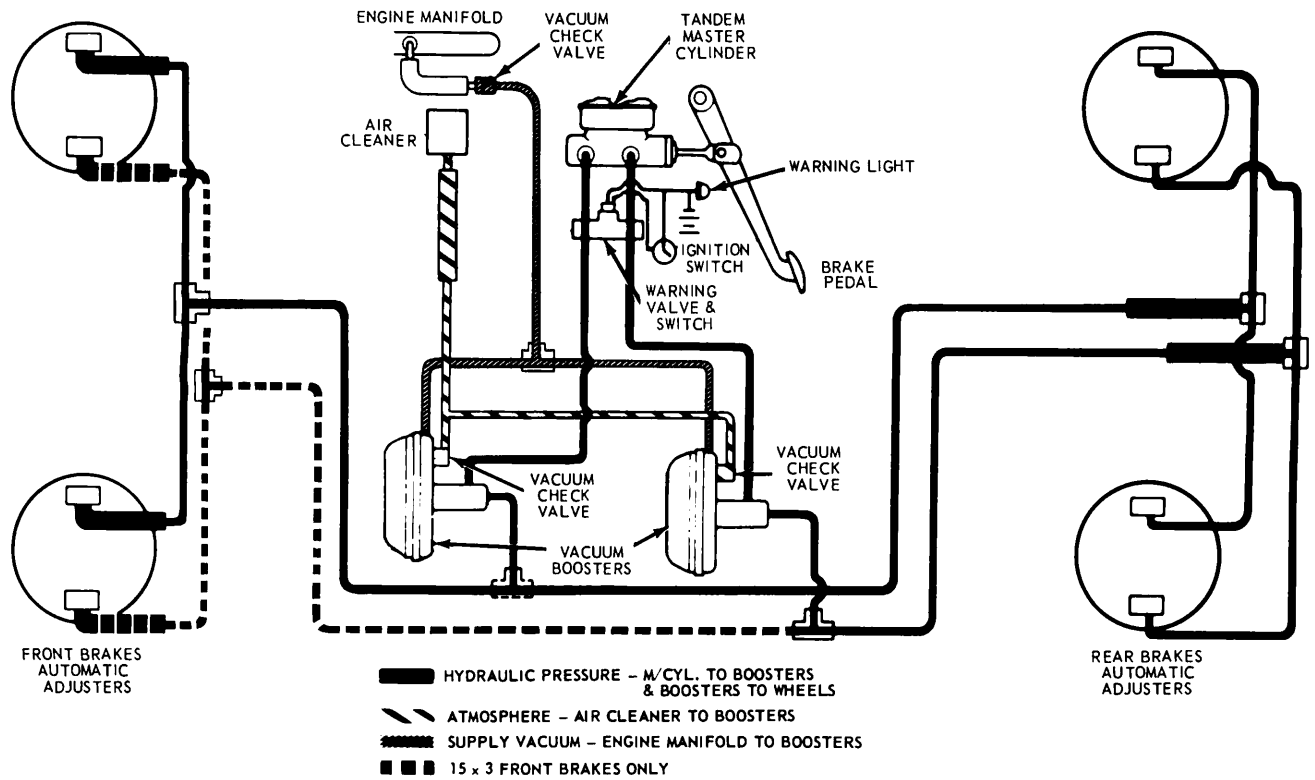
H1706-A

FIG. 2—Split Hydraulic-Vacuum Brake System with Dash Mounted Booster



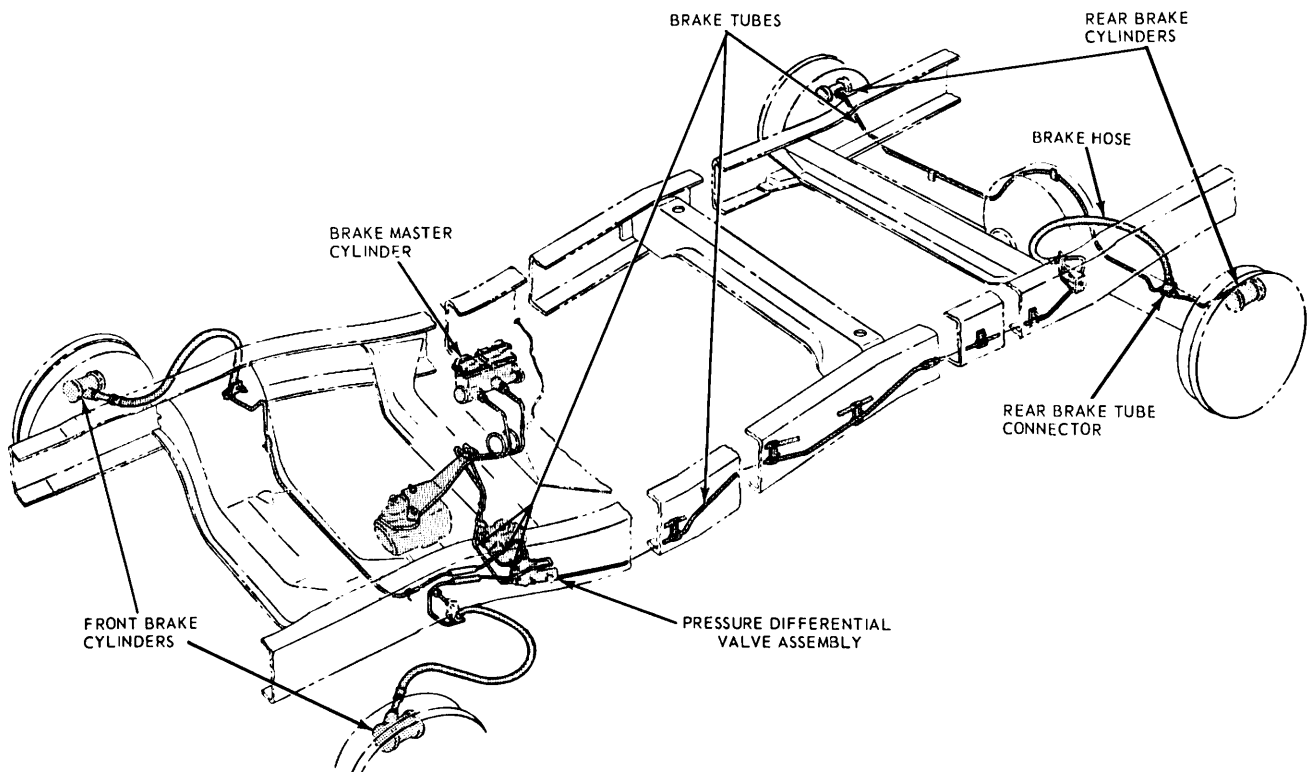
H1617-B

FIG. 1—Split Hydraulic Brake System Schematic—500-850 Series with Frame-Mounted Booster



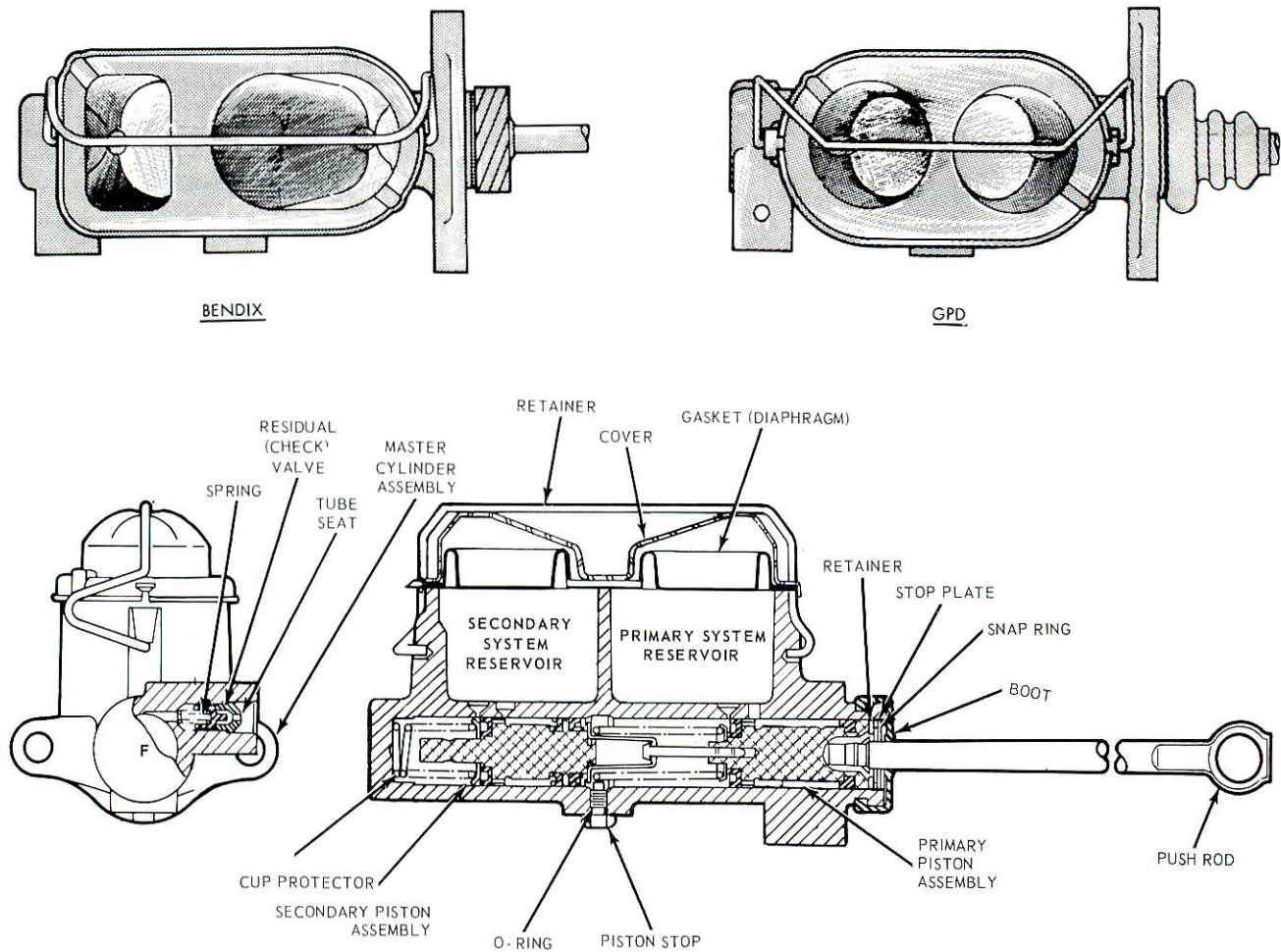
H1732-A

FIG. 3—Split Hydraulic Vacuum Brake System with Frame Mounted Boosters—600—900 Series



H 1676-A

FIG. 4—Typical Hydraulic Brake System—Dual Brake Master Cylinder F—100—350



H1503-B

FIG. 5—Dual Master Cylinder—Typical

The master cylinder primary and secondary pistons function together when the primary and secondary systems are fully operative.

Brake lines (tubes) are connected from the brake master cylinder primary and secondary system outlet ports to the pressure differential valve assembly (Figs. 6 and 7). The electrical brake warning switch, and the brake lines (tubes) leading from the differential valve assembly to the front and rear wheel brake cylinders are also shown in Figs. 6 and 7.

On all 100-400 Series trucks the dual master cylinder primary and secondary circuits actuate either the front or rear wheel brakes.

On 500-900 Series trucks with a split hydraulic system, each of the two lines from the dual-master cylinder actuates one brake cylinder at each wheel (front and rear) for vehicles with 15 by 3-inch front brakes. On vehicles with 14 by 2-12-inch front duo-servo brakes, the single brake cylinders in both front wheels are actuated by one line that also operates one cylinder at each rear wheel. The line from the other master cylinder outlet port actuates the remaining brake wheel cylinder at each rear wheel. Power boosters are dash-mounted or frame-mounted on L and LN-500-600 Series models. Other 500-900 Series Models have frame-mounted boosters.

SINGLE MASTER CYLINDER BRAKE SYSTEM— 500-900 SERIES

The standard hydraulic brake system on 500-900, L, LN, LT, C and P Series Models is equipped with a single master cylinder and internal drum brakes at all wheels. On all models except P-500 and P-5000, the drum brakes are self adjusting.

The standard hydraulic brake system on some trucks is assisted by a vacuum booster which may be installed as either standard or optional equipment.

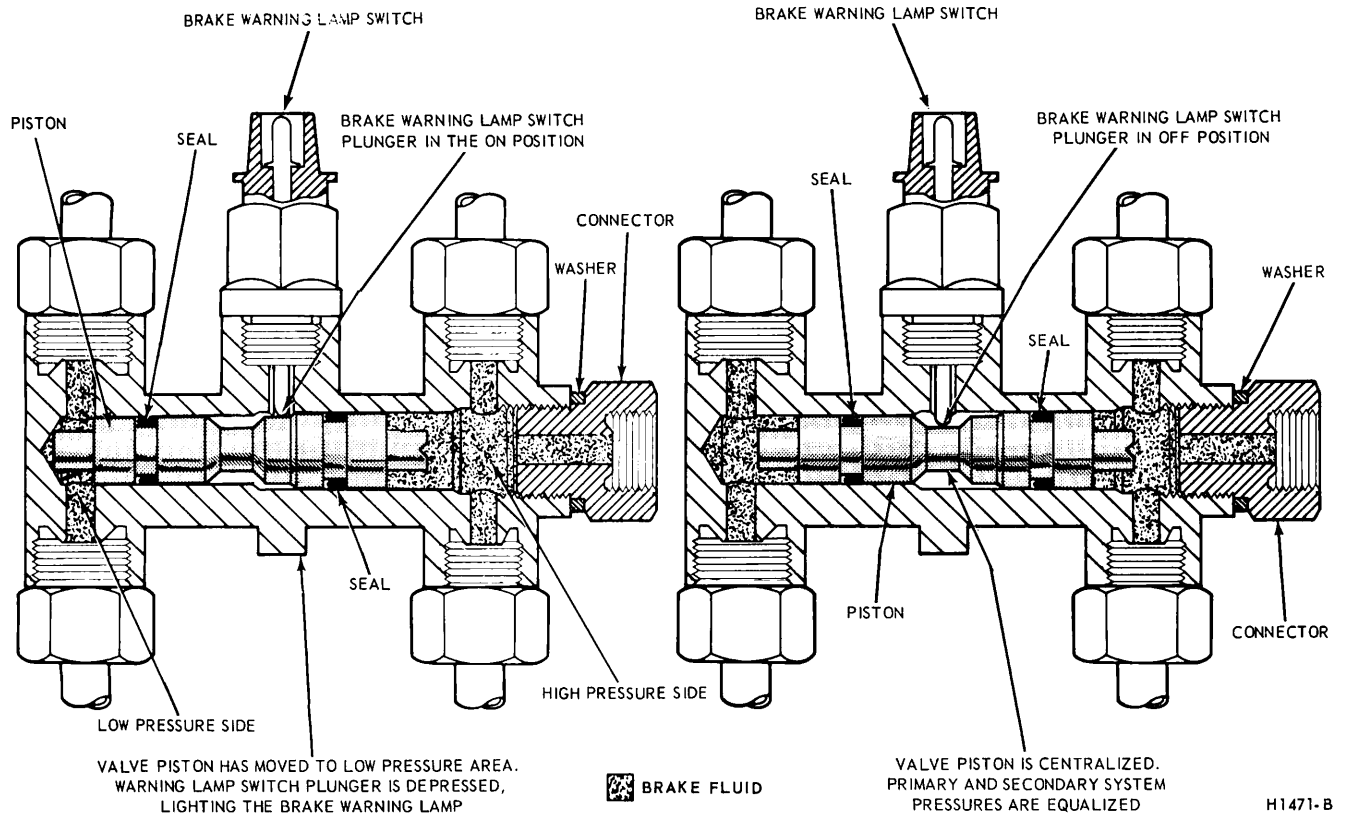


FIG. 6—Differential Valve System—100—400 Series

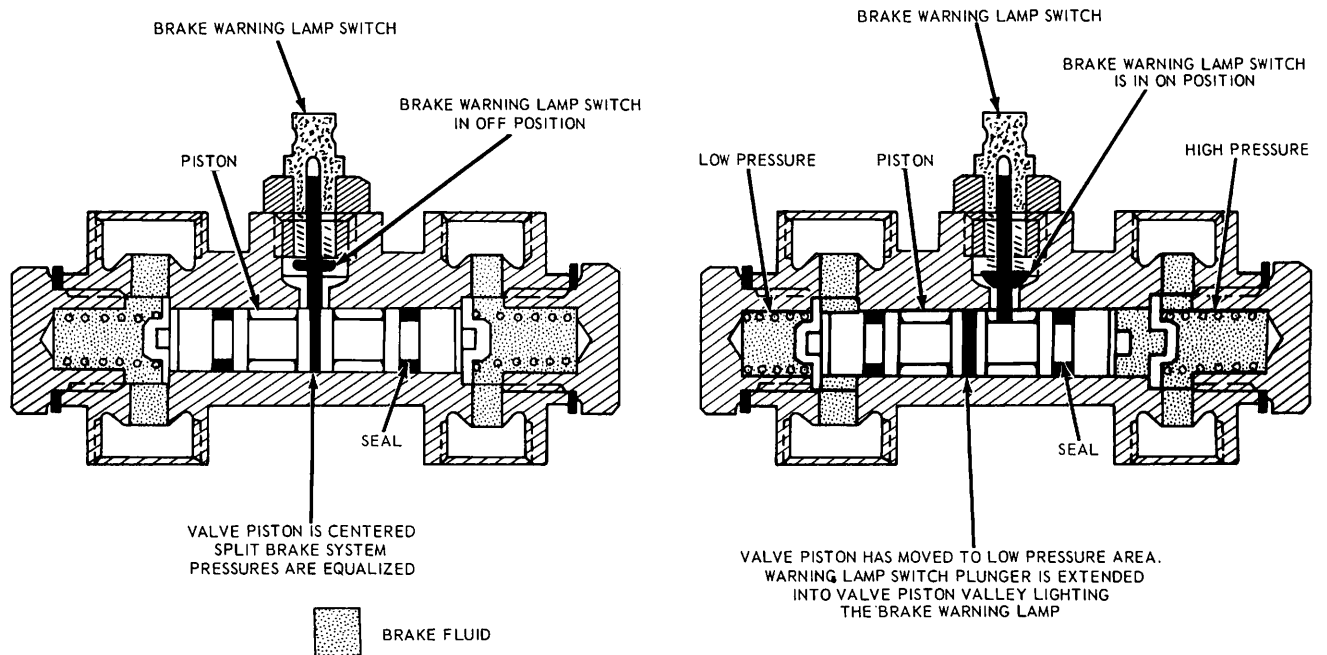


FIG. 7—Differential Valve System—500—900 Series With Split Hydraulic Brakes

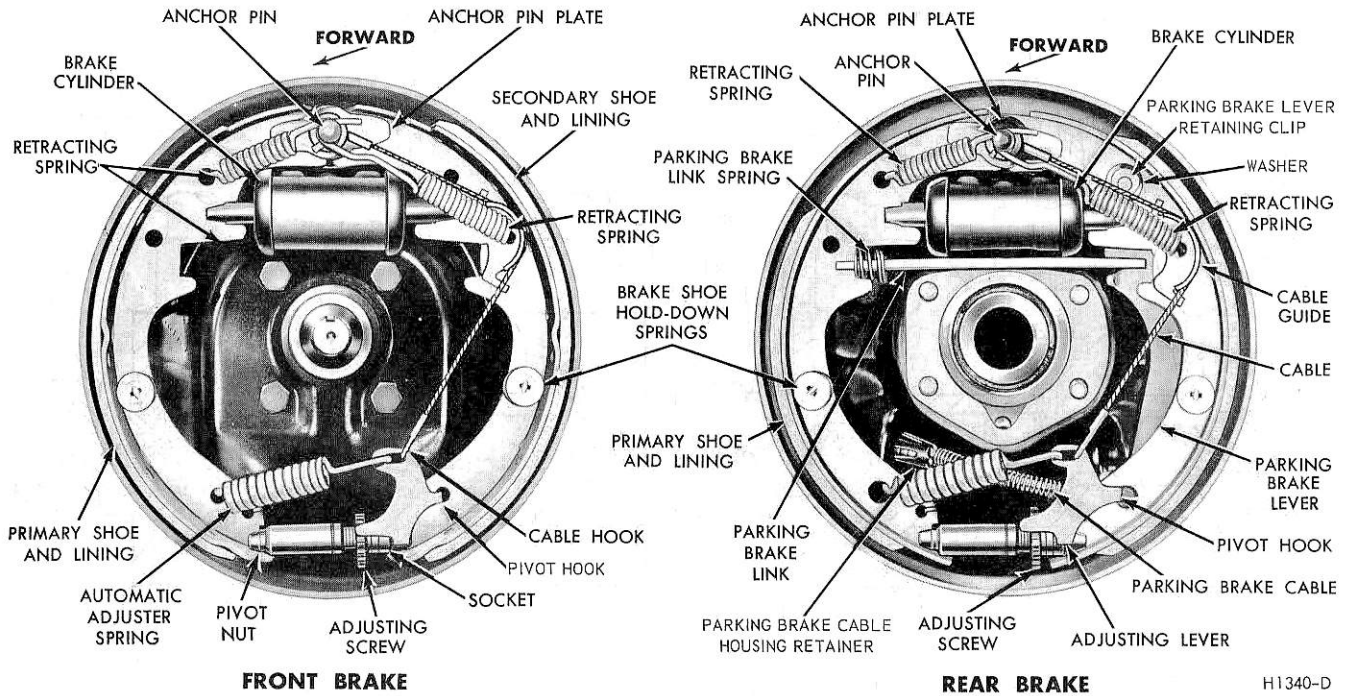


FIG. 8—Self Adjusting Brake Assemblies—F—100—250, E—100—200, and Bronco

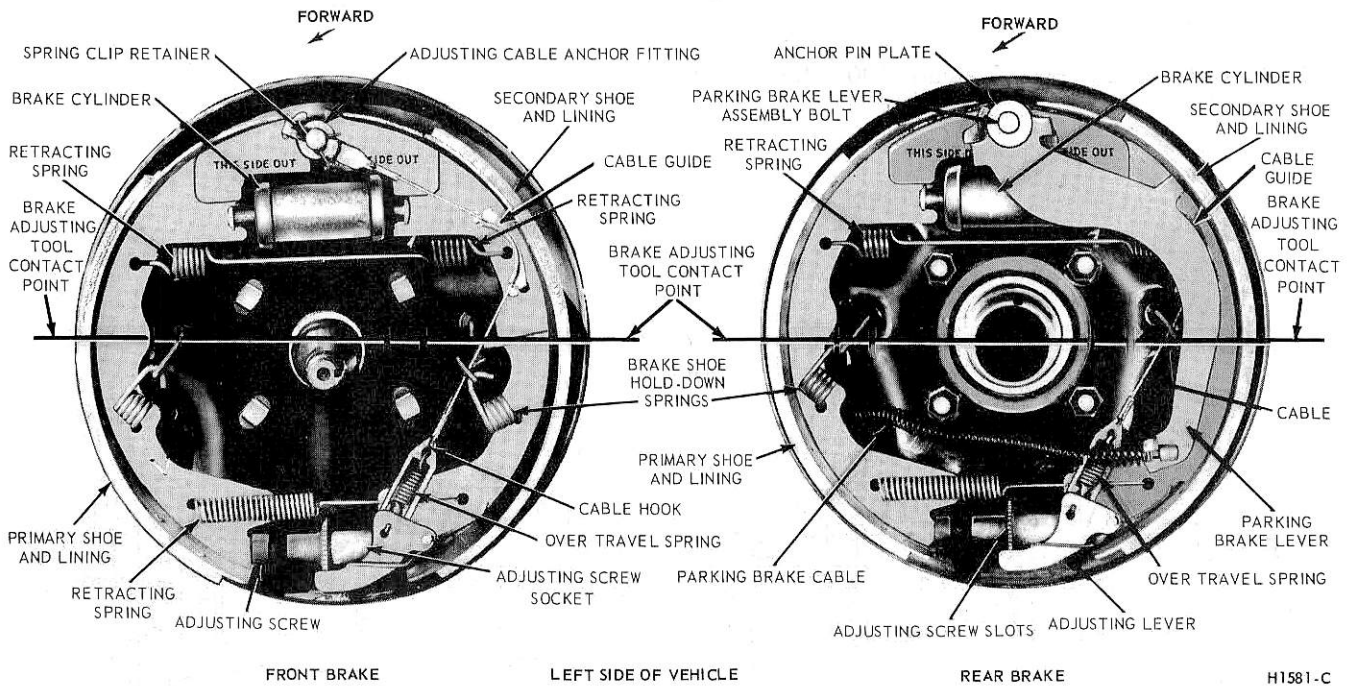


FIG. 9—Self Adjusting Brake Assemblies—F—250 (Heavy Duty)—350, E—300, and P—350—400—3500—4000

DRUM BRAKES

All Ford truck models have internal expanding shoes, except the F-250 and F-350 which may have front disc brakes. The different types of brake assemblies vary in the way

that the shoes are anchored, in the number of wheel cylinders used at each wheel, and in the number of pistons in the wheel cylinder.

In the single anchor type, both brake shoes are mounted to the same anchor and are actuated by one wheel

cylinder. In the duo-servo, single anchor brake, the wheel cylinder has two pistons. One piston exerts force against the upper end of the primary shoe; the other piston exerts force against the upper end of the secondary shoe (Figs. 8 and 9).

In the double anchor type, each shoe is mounted to a separate anchor. The shoes are actuated by one duoservo (two piston) cylinder at the upper end.

The front wheels of some trucks

are equipped with two cylinders, each having one piston. The piston in one cylinder exerts force against one end of one shoe; the piston in the other cylinder exerts force against the opposite end of the other shoe.

The rear wheels of some vehicles are equipped with two cylinders, each having two pistons (four pistons total). Each of the four pistons exert force against one end of one shoe (Fig. 25).

2 IN—VEHICLE ADJUSTMENTS AND REPAIRS

BRAKE SHOE ADJUSTMENT

The brake drums should be at normal room temperature, when the brake shoes are adjusted. If the shoes are adjusted when the shoes are hot and expanded, the shoes may drag as the drums cool and contract.

A brake adjustment re-establishes the brake lining-to-drum clearance and compensates for normal lining wear.

Adjustment procedures for each type of brake assembly are given under the applicable heading.

SELF ADJUSTING BRAKES— F-100-350, E-100-300, P-350-4000 AND BRONCO

The brake shoes are automatically adjusted when the vehicle is driven in reverse and the brakes applied. A manual adjustment is required only after the brake shoes have been relined or replaced. **The manual adjustment is performed while the drums are 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:

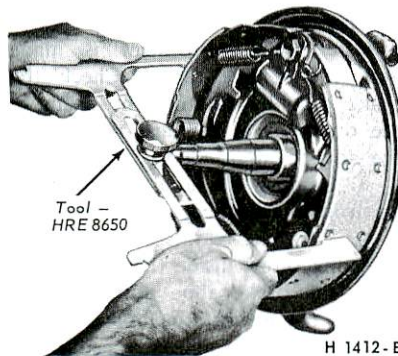
1. Use Rotunda Tool HRE 8650, (Fig. 10) and adjust to the inside diameter of the drum braking surface.



H 1411-B

FIG. 10—Measuring Drum

2. Reverse the tool as shown in Fig. 11 and adjust the brake shoes to touch the gauge. The gauge contact points on the shoes (Fig. 11) must be parallel to the vehicle with the center line through the center of the axle. Hold the automatic adjusting lever out of engagement while rotating the adjusting screw, to prevent burring the screw slots. Make sure the adjusting screw rotates freely. If necessary, lubricate the adjusting screw threads with a thin, uniform coating of C1AZ-19590-B Grease.



H 1412-B

FIG. 11—Measuring Shoes

3. Apply a small quantity of C1AZ-19590-B high temperature grease to the points where the shoes contact the carrier plate, being careful not to get the lubricant on the linings.

4. Install the drums. Install the retaining nuts and tighten securely.

5. Install the wheels on the drums and tighten the mounting nuts to specification.

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

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

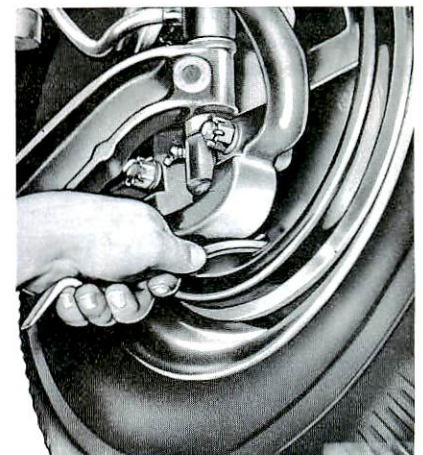
FRONT BRAKE—P-500-5000 SERIES

Manual Adjustment

The single anchor brake is adjusted by turning an adjusting screw located between the lower ends of the shoes.

1. Raise the vehicle until the wheels clear the floor.

2. Remove the cover from the adjusting hole at the bottom of the brake carrier plate, and turn the adjusting screw inside the hole to expand the brake shoes until they drag against the brake drum and lock up the drum. Back off the adjusting screw until a slight drag is noted (Fig. 12).



H1006-B

FIG. 12—Single Anchor Brake Shoe Adjustment

3. When the shoes are against the drum, back off the adjusting screw 10 to 12 notches so that the drum rotates freely without drag. If the drum does not rotate freely, remove the wheel and drum, and then blow out the dust and dirt from the linings. With sandpaper, remove all rust from the points where the shoes contact the carrier

plate and apply a light coating of high temperature grease (CIAZ-19590-B). Be careful not to get the lubricant on the linings.

4. Install the wheel and drum, and adjust the shoes. Install the adjusting hole cover on the brake backing plate.

5. Check and adjust the other three brake assemblies.

6. Apply the brakes. If the pedal travels more than halfway down between the released position and the floor, too much clearance exists between the brake shoes and the drums. Repeat steps 2 and 3 above.

7. When all brake shoes have been properly adjusted, lower the vehicle. Road test the vehicle and check the operation of the brakes. Perform the road test only when the brakes will apply and the vehicle can be safely stopped.

REAR BRAKE— P-500-5000 SERIES

The two-cylinder brake assembly brake shoes are adjusted by turning adjusting wheels reached through slots in the backing plate.

The brake adjustment is made with the vehicle raised. Check the brake drag by rotating the drum in the direction of forward rotation as the adjustment is made.

1. Remove the adjusting slot covers from the backing plate (Fig. 13).

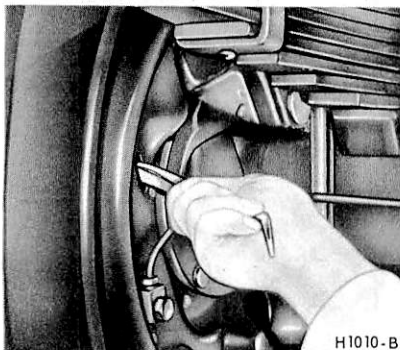


FIG. 13—Two-Cylinder Brake (Rear) Shoe Adjustment

2. Turn the rear (secondary shoe) adjusting screw inside the hole to expand the brake shoe until it drags against the brake drum.

3. Back off the adjusting screw so that the drum rotates freely without drag. Depress the brake pedal to center the brake shoes, and back off the adjusting screw an additional notch to

provide operating clearance.

4. Repeat the above procedure on the front (primary) brake shoe.

5. Replace the adjusting hole covers.

SELF ADJUSTING BRAKES—REAR—500-900 SERIES (EXCEPT P-500)

The brake shoes are automatically adjusted when the vehicle is driven in reverse and the brakes applied. A manual adjustment is required only after the brake shoes have been relined or replaced.

The two-cylinder brake assembly (Figs. 25 and 26) brake shoes are adjusted by turning adjusting wheels reached through slots in the backing plate.

Two types of two-cylinder brake assemblies are used on truck rear wheels. The assemblies differ primarily in the retracting spring hookup, and in the design of the adjusting screws and locks. However, the service procedures are the same for both assemblies.

The brake adjustment is made with the vehicle raised. Check the brake drag by rotating the drum in the direction of forward rotation as the adjustment is made.

1. Remove the adjusting slot covers from the backing plate (Fig. 13).

2. Turn the rear (secondary shoe) adjusting screw inside the hole to expand the brake shoe until a slight drag is felt against the brake drum.

3. Repeat the above procedure on the front (primary) brake shoe.

4. Replace the adjusting hole covers.

5. Complete the adjustment by applying the brakes several times while backing the vehicle.

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

If a brake drum will not come off, remove the adjusting slot covers and back off the adjuster screws to free the drum from the shoes.

SELF ADJUSTING BRAKES—TWO-CYLINDER— FRONT—600-900 SERIES

Two-Cylinder front brakes are adjusted by means of exposed, hex-head, self-locking cam adjusters. The brakes are to be manually adjusted initially. Subsequent adjustment is automatic. To adjust this

brake:

1. Raise the vehicle and check the front brakes for drag by rotating the wheels.

2. Adjust one shoe by rotating the wheel backward and forward while turning the cam hex-head with a wrench. Bring the shoe out to the drum until a light drag is felt. **Do not apply excessive force on the hex head cam, as automatic adjuster parts can be damaged.** Back off the adjustment until the wheel turns freely. Adjust the other cam on the same wheel in the same manner.

3. Adjust the other front wheel brake using the procedure above.

4. Apply the brakes and recheck the adjustment.

SELF ADJUSTING BRAKES—ONE-CYLINDER— FRONT—500-800 SERIES (EXCEPT P-500)

The brake shoes are automatically adjusted when the vehicle is driven in reverse and the brakes applied. A manual adjustment is required only after the brake shoes have been relined or replaced.

1. With the vehicle raised, check the front brakes for drag by rotating the wheels.

2. Remove the cover from the adjusting hole at the bottom of the brake carrier plate, and turn the adjusting screw inside the hole to expand the brake shoes until a slight drag is felt at the wheel.

3. Complete the adjustment by applying the brakes several times while backing the vehicle.

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

If a brake drum will not come off, insert a narrow screwdriver through the brake adjusting hole in the carrier plate, and disengage the adjusting lever from the adjusting screw. While thus holding the adjusting lever away from the adjusting screw, back off the adjusting screw with the brake adjusting tool (Fig. 17). Back off the adjustment only if the drum cannot be removed. Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise, the self adjusting mechanism will not function properly.

HYDRAULIC SYSTEM BLEEDING

When any part of the hydraulic

system has been disconnected for repair or replacement, air may get into the lines and cause spongy pedal action. This requires the bleeding of the hydraulic system after it has been properly connected to be sure all air is expelled from the brake cylinders and lines. The hydraulic system can be bled manually or with pressure bleeding equipment.

When bleeding the brake system, bleed one brake cylinder at a time, beginning at the cylinder with the longest hydraulic line first. If the brake assembly is equipped with two cylinders, always bleed the upper cylinder first. Keep the master cylinder reservoir filled with the specified C6AZ-19542-A extra heavy duty brake fluid during the bleeding operation. Never use brake fluid which has been drained from the hydraulic system.

The procedure for bleeding the single master cylinder on a C-Series truck is presented separately from the standard hydraulic system bleeding procedures.

If the hydraulic system is equipped with a vacuum booster, bleed the hydraulic section of the booster before bleeding the rest of the system. On vehicles equipped with a frame mounted booster and split hydraulic brake system, bleed the two booster slave cylinders first then again after bleeding all the wheel cylinders. The bleeding operation must be done with the engine off and with no vacuum in the system. If the brake pedal is still spongy after the first bleeding, repeat the bleeding procedure.

To bleed the hydraulic section of a vacuum booster, follow steps 1 through 4 of the manual bleeding procedure, attaching the drain tube to the bleeder screw at the end plate of the booster (or the bleeder screw nearest the power chamber). Repeat this procedure at the other bleeder screw if the booster is so equipped.

On dual-brake system hydraulic master cylinder equipped vehicles, it will be necessary to centralize the pressure differential valve after a brake hydraulic system malfunction has been corrected and the hydraulic system has been bled. Before any attempt is made to bleed the split hydraulic brake system on 500-950 Series trucks, remove the brake light warning switch from the pressure differential valve. Failure to remove the switch from the valve could result in possible damage to the switch assembly.

MANUAL BLEEDING— CONVENTIONAL, SINGLE— BRAKE SYSTEM HYDRAULIC MASTER CYLINDER

1. Attach a rubber drain tube to the bleeder screw of the brake wheel cylinder. The end of the tube should fit snugly around the bleeder screw.

2. Submerge the free end of the tube in a container partially filled with clean brake fluid. Loosen the bleeder screw.

3. Push the brake pedal down slowly by hand, allowing it to return slowly to the fully-released position. Repeat this operation until air bubbles cease to appear at the submerged end of the tube.

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

5. Repeat this procedure at each brake cylinder. Refill the master cylinder reservoir after each brake cylinder is bled with C6AZ-19542-A extra heavy duty brake fluid and when the bleeding operation is completed.

MANUAL BLEEDING— DUAL—BRAKE SYSTEM HYDRAULIC MASTER CYLINDER

The primary and secondary 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 the specified brake fluid. Never use brake fluid that has been drained from the hydraulic system.

1. Remove the brake light warning light switch from the pressure differential valve (Fig. 7) on 500-900 Series trucks.

2. Bleed the master cylinder at the outlet port side of the system being serviced.

On a master cylinder without bleed screws, loosen the master cylinder to hydraulic line nut. Operate the brake pedal slowly until the brake fluid at the outlet connection is free of bubbles, then tighten the tube nut to the specified torque. 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. Operate the brake pedal slowly until the brake fluid at the outlet connection is free of

air bubbles, then tighten the bleed screw.

3. Position a suitable 3/8 inch box wrench (Fig. 14) 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.

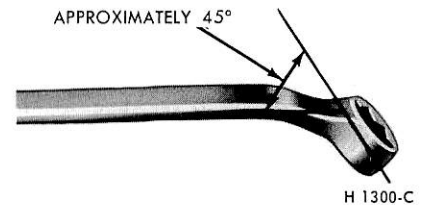


FIG. 14—Wrench for Bleeding Brake Hydraulic System

4. 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.

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

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

7. Repeat this procedure at the brake wheel cylinder on the opposite side. Refill the master cylinder reservoir after each wheel cylinder is bled.

When the bleeding operation is complete, the master cylinder fluid level should be filled to within 1/4 inch from the top of the reservoirs.

8. Centralize the pressure differential valve. Refer to the Centralizing of the Pressure Differential Valve procedures in this section.

9. Install the brake warning light switch on the pressure differential valve on 500-900 Series trucks.

PRESSURE BLEEDING— CONVENTIONAL SINGLE— BRAKE SYSTEM HYDRAULIC MASTER CYLINDER

Be sure that the tank is clean and there is enough of the specified brake fluid (C6AZ-19542-A extra heavy duty) in the bleeder tank to complete the bleeding operation and that the tank is charged with 10-30 pounds of air pressure. Never exceed 50 pounds pressure.

On a C-Series truck with a single master cylinder, the master cylinder can only be bled manually. Therefore, bleed the entire hydraulic system first before bleeding the master cylinder.

1. On a L-, LN-, or LT-Series truck, clean all dirt from around the filler hole on the top of the master cylinder reservoir, and attach the bleeder tank hose to the filler hole.

On a C-Series truck with a single master cylinder, disconnect the line from the bottom of the master cylinder and connect the line to the pressure bleeder tank hose. Install a 5/16 inch Weatherhead plug into the bottom of the master cylinder.

2. Attach a rubber drain tube to the bleeder screw of the brake cylinder. The end of the tube should fit snugly around the bleed screw.

3. Submerge the free end of the tube in a container partially filled with clean brake fluid and then loosen the bleeder screw.

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

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

6. Repeat this procedure at each brake cylinder.

7. When the bleeding operation is completed, close the bleeder tank valve and remove the tank hose from the filler hole.

On a C-Series truck with a single master cylinder, remove the line from the tank hose and connect it to the master cylinder.

8. On all vehicles, refill the master cylinder reservoir to within 1/4 inch from the top of the filler neck.

C-SERIES TRUCK SINGLE MASTER CYLINDER BLEEDING

1. Loosen the fittings at the bottom of the master cylinder, approximately one turn.

2. Wrap a shop cloth, or a piece of clean waste material, around the tubing below the fitting to absorb expended brake fluid.

3. Push the brake pedal down slowly by hand to the floor of the cab. This will force air which may be trapped in the master cylinder to escape at the fitting.

4. Hold the pedal down and tighten the fitting. Release the brake pedal. Do not release the brake pedal until the fitting is tightened as additional air will be introduced into the

master cylinder.

5. Repeat this procedure until air ceases to escape at the fitting and a firm pedal is obtained.

PRESSURE BLEEDING-DUAL BRAKE SYSTEM HYDRAULIC MASTER CYLINDER

Bleed the longest lines first. The bleeder tank should contain enough of the specified brake fluid (6AZ-19542-A extra heavy duty) to complete the bleeding operation. The tank should be charged with approximately 10 to 30 pounds of air pressure. Never exceed 50 pounds pressure. **Never use brake fluid that has been drained from the hydraulic system.**

1. Remove the brake warning light switch from the pressure differential valve on 500-900 Series trucks (Fig. 7).

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

3. 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.

4. Position a 3/8 inch box wrench (Fig. 14) 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 6 at the opposite wheel cylinder of the system being bled.

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

10. **Remove the Pressure Bleeder Adapter Tool. Fill the master cylinder reservoirs to within 1/4 inch from the top. Install the master cylinder cover**

and gasket.

11. **Centralize the pressure differential valve.**

12. Install the brake warning light switch on the pressure differential valve on 500-900 Series trucks.

CENTRALIZING THE PRESSURE DIFFERENTIAL VALVE

F-100-350, E-100-300,
P-350-400-3500-4000, AND
BRONCO

1. Turn the ignition switch to the ACC or ON position. Loosen the pressure differential valve inlet tube nut of the system that remained operative, or the side opposite the system that was bled last. Operate the brake pedal carefully and gradually until the pressure differential valve is returned to a centralized position and the brake warning light goes out. Tighten the tube nut.

2. Check the fluid level in the master cylinder reservoirs and fill them to within 1/4 inch of the top with the specified C6AZ-19542-A extra heavy duty brake fluid.

3. Turn the ignition switch to the OFF position.

500-900 SERIES TRUCKS WITH SPLIT HYDRAULIC BRAKES

The pressure differential valve used with the split hydraulic brake system has a self-centering spring. Use the following procedure to reset the valve:

1. Remove the switch connector wire.

2. Remove the threaded hex-shaped electrical switch body from the center of the valve. This allows the valve centering springs to reposition the valve.

3. Install the electrical switch and connect the wire.

4. Apply the brakes a few times and check the operation of the warning light. The light should go on with the ignition switch in the START position only.

HYDRAULIC LINE REPAIR

Steel tubing is used in the hydraulic lines between the master cylinder and the front brake tube connector (Fig. 15), and between the rear brake tube connector (Fig. 16) and the rear brake cylinders. Flexible hoses connect the brake tube to the front brake cylinders and to the rear brake tube connector.

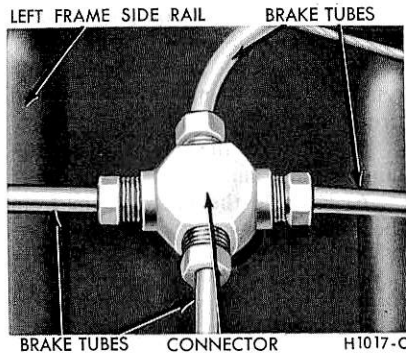


FIG. 15—Front Brake Tube Connector—Typical

When replacing hydraulic brake tubing, hoses, or connectors, tighten all connections securely. After replacement, bleed the brake system at the wheel cylinders and at the booster, if so equipped.

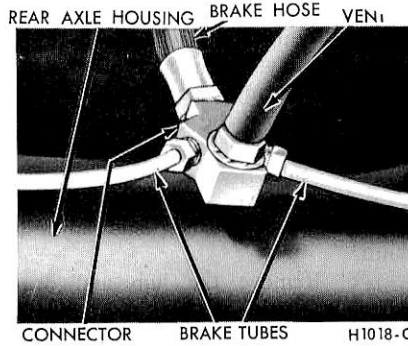


FIG. 16—Rear Brake Tube Connector

BRAKE TUBE

If a section of the brake tube 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 the hydraulic system. When bending brake tubing to fit the frame or rear-axle contours, be careful not to kink or crack the tube.

All brake tubing should be double flared to provide a good leak-proof connection. Always clean the inside of a new brake tube with clean isopropyl alcohol.

BRAKE HOSE

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

When installing a new brake hose, position the hose to avoid contact with other truck parts.

3 REMOVAL AND INSTALLATION

BRAKE DRUMS

FRONT BRAKE DRUM—
F-100-350 (4 x 2), E-100-300,
AND P-350-4000 SERIES

Removal

1. Raise the vehicle so that the wheel is clear of the floor.
2. Remove the wheel cover or hub cap, wheel, and bearing dust cap. Remove the cotter pin, nut lock, nut, and washer.
3. Pull the brake drum approximately two inches forward and push back into position. Remove the wheel bearing and withdraw the brake drum.

If the brake drum will not come off, insert a narrow screwdriver through the brake adjusting hole in the carrier plate, and disengage the adjusting lever from the adjusting screw. While thus holding the adjusting lever away from the adjusting screw, back off the adjusting screw with the brake adjusting tool (Figs. 17 and 18). Back off the adjustment only if the drum cannot be removed. Be very careful not to burr, chip, or damage the notches in the adjusting screw; otherwise, the self adjusting mechanism will not function properly.

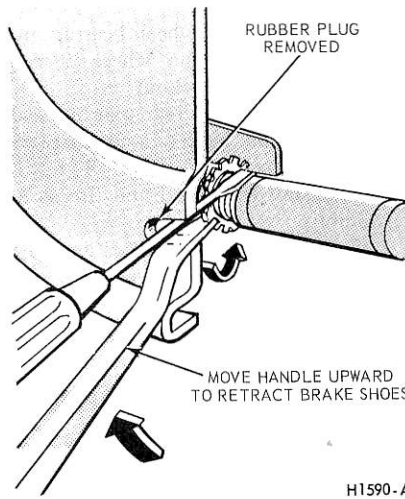


FIG. 17—Backing Off Brake Adjustment—F-100-250, E-100-200, and Bronco

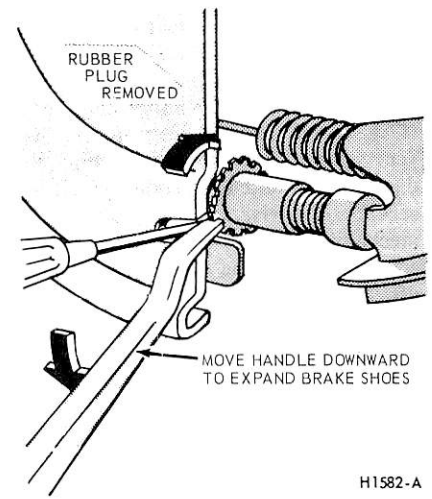


FIG. 18—Backing Off Brake Adjustment—F-250-350, E-300 and P-350-400-3500-4000

If the adjusting screw was backed off, check to make sure the adjusting lever is still in contact with the shoe web.

Installation

1. If the hub and axle is being replaced, re-

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