

8113
2
T M
1943

U.S. Dept of Army

TM 5-9056

Combined
**OPERATOR'S MANUAL,
MAINTENANCE MANUAL**

and

PARTS CATALOG

for

**SEMI-TRAILER, ACETYLENE CHARGING
PLANT, MODEL FF428DF SPECIAL
WITH DC4 DOLLY**

Manufactured for
THE LINDE AIR PRODUCTS COMPANY
(ENGINEER BOARD P. O. W145ENG437)

by
THE FRUEHAUF TRAILER COMPANY
Detroit, Michigan

THIS BOOK COVERS:

Purchase Order No. E. B. P. O. W145ENG437

Serial Nos. O-98318 thru O-98342 (Trailer)

Serial Nos. O-98343 thru O-98367 (Dolly)

JUNE 15, 1943

U113
 2
 7 MIS. 9
 1943

I N D E X

PART I—OPERATOR'S MANUAL

Section	Paragraph	Page
I DESCRIPTION AND CHARACTERISTICS		
	1 General Description	3
	2 Axles	3
	3 Brakes	3
	4 Coupler	3
	5 Drawbar	3
	6 Electrical System	4
	7 Underconstruction	4
	8 Tire Carrier	4
	9 Wheels and Tires	4
II CONTROLS		
	1 Controls	5
III DRIVER'S INSTRUCTIONS		
	1 Coupling Truck to Semi-Trailer	9
	2 Uncoupling Truck from Semi-Trailer	10
	3 Coupling Dolly to Towing Vehicle	10
	4 Uncoupling Dolly from Towing Vehicle	10
	5 Coupling Dolly to Trailer	12
	6 Uncoupling Dolly from Trailer	12
	7 Driving Truck-Trailer Combination	13
IV INSPECTION—LUBRICATION—ADJUSTMENT		
	1 Daily Inspection when in Operation	17
	2 Lubrication	18
V TOOLS AND EQUIPMENT		
	1 Introduction	18
	2 Tools	18

PART II—MAINTENANCE MANUAL

I SAFETY INSTRUCTIONS		
	1 Safety Instructions	21
II AXLES		
	1 General Description	22
	2 Axle Removal—Semi-Trailer	22
	3 Axle Replacement—Semi-Trailer	24
	4 Axle Alignment—Semi-Trailer	24
	5 Axle Removal—Dolly	25
	6 Axle Replacement—Dolly	27
	7 Axle Alignment—Dolly	27
	8 Checking Axle for Bend	27
	9 Checking Axle for Camber	28
	10 Axle—Service Diagnosis and Remedy	29
III BRAKES		
	1 General	30
	2 Minor Brake Adjustment	30
	3 Major Brake Adjustment	30
	4 Brake Lining Inspection	31
	5 Replacement of Lining	33

INDEX—(Continued)

Section	Paragraph	Page Nos.
	6 Brake Shoes	35
	7 Cams	35
	8 Slack Adjusters	37
	9 Servicing Slack Adjuster	37
	10 Brake Drum Removal	39
	11 Brake Drum Replacement	39
	12 Brake Chambers	39
	13 Brake Chamber Diaphragm	40
	14 Relay-Emergency Valve	41
	15 Tubing	47
	16 Hose Coupling	47
	17 Air Filter	48
	18 Quick Release Valve	48
	19 Hand Parking Brake	49
	20 Adjusting Hand Parking Brake	49
	21 Disassembly of Cross Shaft	50
	22 Reassembly of Cross Shaft	50
	23 Removal of Lever Assembly	50
	24 Replacement of Lever Assembly	50
	25 Brakes—Service Diagnosis and Remedy	51
IV COUPLER (5TH WHEEL)		
	1 General	52
	2 Removal	52
	3 Replacement	52
	4 Testing and Correcting Play in Hook	52
	5 Coupler Mounted on Towing Vehicle	54
	6 Plunger Lock and Plunger Spring	54
	7 Jaws	54
	8 Leveling Springs	55
	9 Support Bracket Shaft	56
	10 Lateral Shaft	56
	11 Fifth Wheel Mounted on Towing Vehicle—Service Diagnosis and Remedy	56
	12 Coupler Mounted on Dolly—Service Diagnosis and Remedy	56
V ELECTRICAL SYSTEM—LIGHTS		
	1 General	57
	2 Locating Trouble	57
	3 Lights	59
	4 Replacing Bulb Unit	60
	5 Clearance Lights Disassembly	60
	6 Reassembly of Clearance Lights	61
	7 Blackout Switch	61
	8 Fuse Panel	63
	9 Lights—Service Diagnosis and Remedy	63
VI FRAME AND “RIVETED AND BOLTED TO FRAME” PARTS		
	1 General	64
	2 Removal of Rivets	64
	3 Straightening Bent Frame Members	64
	4 Replacing Frame Members	65
	5 Repairing Section of a Member	65

I N D E X—(Continued)

<i>Section</i>	<i>Paragraph</i>	<i>Page Nos.</i>
	6 Removal of Hangers—Dolly	66
	7 Spring Hangers—Semi-Trailer	67
	8 King Pin	69
	9 Drawbar Eye	70
	10 Replacing and Repairing Safety Chains	70
VII	BODY	
	1 General	72
	2 Body Frame Work	72
	3 Body Panels	72
	4 Roof Repairs	72
	5 Complete Body Replacement	73
	6 Screw Hole Chart	75
	7 Window Glass Removal	75
VIII	PINTLE HOOK	
	1 Removal	77
	2 Disassembly	77
	3 Replacement and Reassembly of Pintle Hook	77
	4 Pintle Hook Spring and Sleeve Removal	78
	5 Pintle Hook Spring and Sleeve Replacement	78
IX	RADIUS RODS	
	1 General	79
X	SPRINGS	
	1 Main Spring Removal—Semi-Trailer	81
	2 Removing Auxiliary Spring—Semi-Trailer	82
	3 Spring Removal—Dolly	84
	4 Spring Replacement—Dolly	84
	5 Spring Repair	84
	6 Replacing Both Springs	84
	7 Maintenance	85
	8 Rebushing Springs and Hangers—Semi-Trailer	85
	9 Rebushing Springs and Spring Hangers—Dolly	86
	10 Springs—Service Diagnosis and Remedy	86
XI	SUPPORTS	
	1 General	87
	2 Removal of Operating Assembly Attached to I-Beam	87
	3 Replacement of Operating Assembly Attached to I-Beam	87
	4 Disassembly of Operating Assembly	89
	5 Reassembly of Operating Assembly	90
	6 Disassembly of Wheel and Axle Assembly	90
	7 Reassembly of Wheel and Axle Assembly	91
	8 Connection Rod Repairs	92
	9 Repairing Support I-Beam	92
	10 Replacing Damaged Wheels	92
XII	TIRES AND TIRE CARRIER	
	1 Removing Tire from Tire Carrier	93
	2 Replacing Tire Carrier	94
	3 Tire Carrier Cable Replacement	94
	4 Replacing Tire Carrier Ratchet Release Handle	94
	5 Tire Repairs	94
	6 Removing Tire from Wheel	94
	7 Care and Inspection of Tires and Tubes	95

INDEX—(Continued)

Section	Paragraph	Page Nos.
XIII	• WHEELS, HUBS AND DRUMS	
	1 General	96
	2 Replacement of Worn or Broken Studs	96
	3 Removing Hub Assembly	97
	4 Installing Hub Assembly	97
	5 Removing Bearing Cups	98
	6 Installing Bearing Cups	99
	7 Loose Cups	99
	8 Bearing and Cup Inspection	99
PART III—SPARE PARTS LIST		
I	AXLE with WHEEL PARTS—Dolly and Trailer	101
II	BRAKE	102 thru 106
	Brake Chamber—Dolly and Trailer	102
	Hand Parking Brake—Trailer	103
	Internal Brakes—Dolly and Trailer	104
	Operating Brake Parts—Dolly	105
	Operating Brake Parts—Trailer	106
III	COUPLER—Fifth Wheel	107, 108
	Coupler—Dolly	107
	Coupler—Towing Vehicle	108
IV	DRAWBAR	109
V	ELECTRICAL	110 thru 112
	Wiring and Lights—Dolly	110
	Wiring and Lights—Trailer	111
	Lights—Dolly and Trailer	112
	Socket—Coupling	113
VI	FILTER—AIR	113
VII	HOOK CONNECTION (Pintle Type)	114
VIII	UNDERCONSTRUCTION	115, 116
	Spring Underconstruction—Dolly	115
	Spring Underconstruction—Trailer	116
IX	SUPPORT—Trailer	117, 118
	Support Leg Assembly	117
	Support Operating Mechanism	118
X	TIRE CARRIER	119
XI	TOOL KIT	120
XII	VALVE—RELAY EMERGENCY	121
XIII	WHEELS, HUBS AND DRUMS—Dolly and Trailer	122

INDEX OF ILLUSTRATIONS

<i>Fig. No.</i>	<i>Name</i>	<i>Page No.</i>
1	Full View—Semi-Trailer—Acetylene Charging Plant, Model FF428DF Special	1
2	Full View—Dolly—DC-4	2
3	Controls—Rear View—Dolly	5
4	Controls—Full View—Right Side	6
5	Controls—Drawbar Lock	7
6	Controls—Dolly Coupler	9
7	Controls—Coupler Mounted on Towing Vehicle	9
8	Controls—Left View of Semi-Trailer	11
9	Lubrication—Semi-Trailer	14
10	Lubrication—Dolly	16
11	Tools	19
12	Axle Dowel Pin Layout—Dolly	22
13	Axle Dowel Pin Layout—Semi-Trailer	22
14	Axle Removal—Semi-Trailer	23
15	Removing Brake Assembly from Axle	24
16	Axle Alignment—Semi-Trailer	25
17	Axle Removal—Dolly	26
18	Axle Alignment—Dolly	26
19	Checking Axle for Bend	27
20	Checking Axle for Camber	28
21	Minor Brake Adjustment	30
22	Loosening Brake Anchor Pins	31
23	Brake Lining Inspection	32
24	Replacement of Lining	33
25	Dust Shield—Removal	32
26	Brake Assembly	34
27	Removing Brake Shoes	34
28	Cam Assembly	35
29	Slack Adjuster—Removal	36
30	Slack Adjuster—Exploded	38
31	Drum—Removal	38
32	Brake Chamber—Sectional View	40
33	Brake Chamber—Disassembly	41
34	Brake Chamber—Push Rod Replacement	41
35	Relay-Emergency Valve	43
36	Relay-Emergency Valve—Removing Top Cover	44
37	Relay-Emergency Valve—Removing Diaphragm Guide Ring	45
38	Relay-Emergency Valve—Replacing Intake Valve	44
39	Relay-Emergency Valve—Removing Cap, Spring, and Diaphragm..	45
40	Relay-Emergency Valve—Diaphragm Cover Body	46
41	Relay-Emergency Valve—Spring and Strainer	46
42	Relay-Emergency Valve—Removing Lock Nut From Valve Stem..	46
43	Relay-Emergency Valve—Valve Stem and Diaphragm	46
44	Air Filter	47
45	Air Filter—Disassembled	47
46	Quick Release Valve	48
47	Hand Parking Brake—Exploded	49
48	Coupler Removal—Dolly	52
49	Coupler—Exploded—Dolly	53
50	Coupler—Exploded—Towing Vehicle	55
51	Wiring Diagram—Semi-Trailer	57
52	Wiring Diagram—Dolly	58
53	Replacing Bulb Unit	59
54	Clearance Lights—Disassembly, Step 1	60
55	Clearance Lights—Disassembly, Step 2	61
56	Clearance Lights—Disassembly, Step 3	62
57	Fuse Panel—Dolly	62
58	Fuse Panel—Semi-Trailer	63
59	Hanger—Dolly	65

<i>Fig. No.</i>	<i>Name</i>	<i>Page No.</i>
60	Hanger—Semi-Trailer	66
61	Removing Shackle and Pin Assembly	68
62	Rivet Size Chart	69
63	Drawbar	71
64	Removing Blackout Panel and Frame	74
65	Removing Guide Channel Screws	75
66	Removing Window Glass	76
67	Pintle Hook	77
68	Pintle Hook—Exploded	78
69	Radius Rod—Removal	79
70	Radius Rod—Exploded	80
71	Spring Removal—Semi-Trailer	81
72	Spring Removal—Dolly, Step 1	82
73	Spring Removal—Dolly, Step 2	83
74	Removing Connecting Rod Pin	87
75	Removing Dust Shield	88
76	Removing Support Slide Bracket	89
77	Removing Gear Housing	88
78	Support Operating Mechanism—Exploded	89
79	Support Wheel Assembly	91
80	Dimension Layout for Support Connecting Rods	92
81	Tire Carrier—Exploded	93
82	Removing Wheel Assembly	96
83	Installing Wheel Assembly	97
84	Removing Cup	98
85	Axle with Wheel Parts—Dolly and Trailer	101
86	Brake Chamber—Dolly and Trailer	102
87	Hand Parking Brake Parts—Trailer	103
88	Internal Brakes—Dolly and Trailer	104
89	Operating Brake Parts—Dolly	105
90	Operating Brake Parts—Trailer	106
91	Coupler Assembly—Dolly	107
92	Coupler Assembly—Towing Vehicle	108
93	Drawbar	109
94	Wiring—Dolly	110
95	Wiring—Trailer	111
96	Lights	112
97	Socket, Coupling	113
98	Filter, Air	113
99	Hook Connection (Pintle Type)	114
100	Spring Underconstruction—Dolly	115
101	Spring Underconstruction—Trailer	116
102	Support Leg Assembly	117
103	Support Operating Mechanism	118
104	Tire Carrier	119
105	Tools	120
106	Relay Emergency Valve	121
107	Wheels, Hubs and Drums—Dolly and Trailer	122

PART I

OPERATOR'S MANUAL

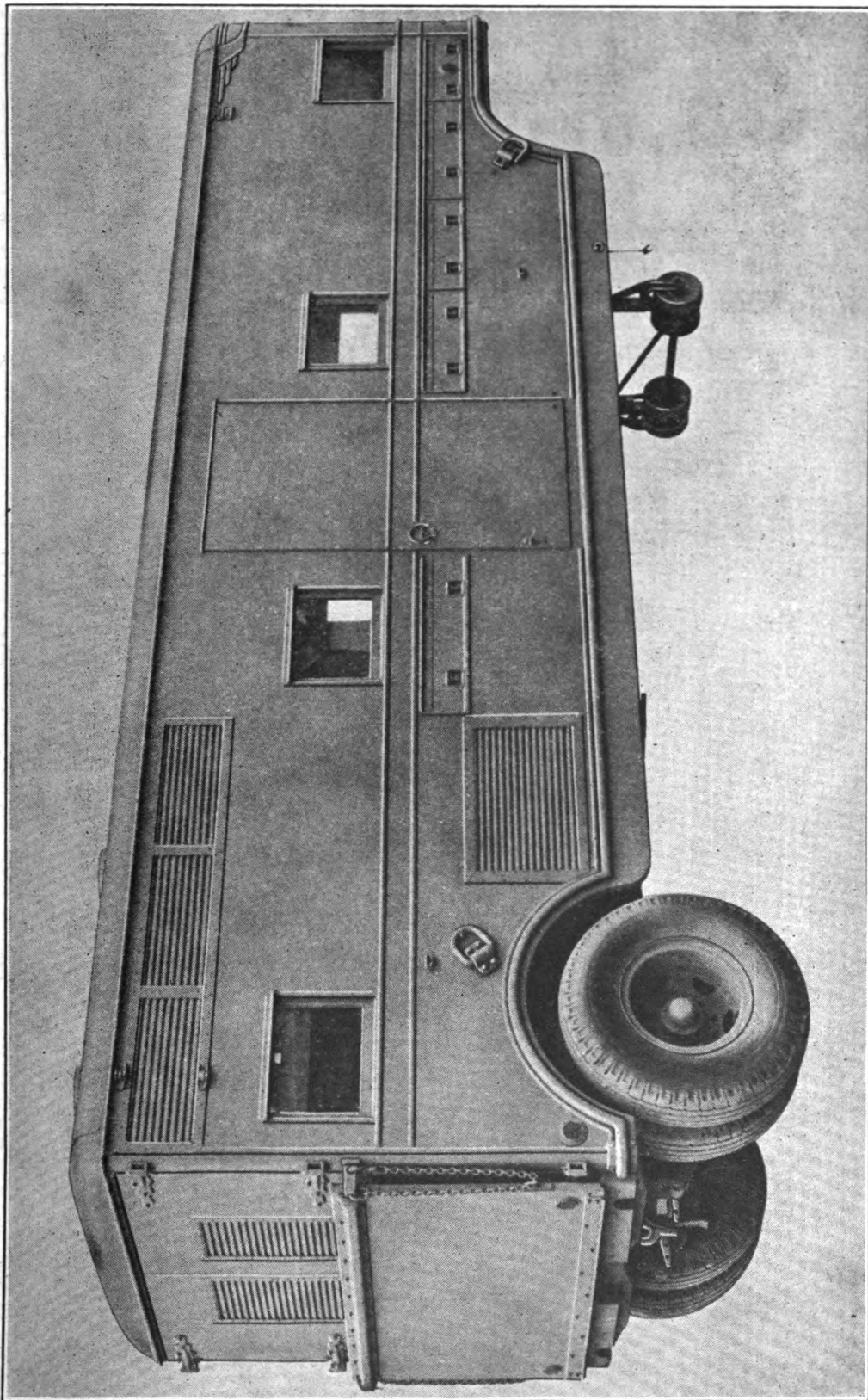


FIGURE 1. FULL VIEW—SEMI-TRAILER—ACETYLENE CHARGING PLANT
FF-428-DF Sp.

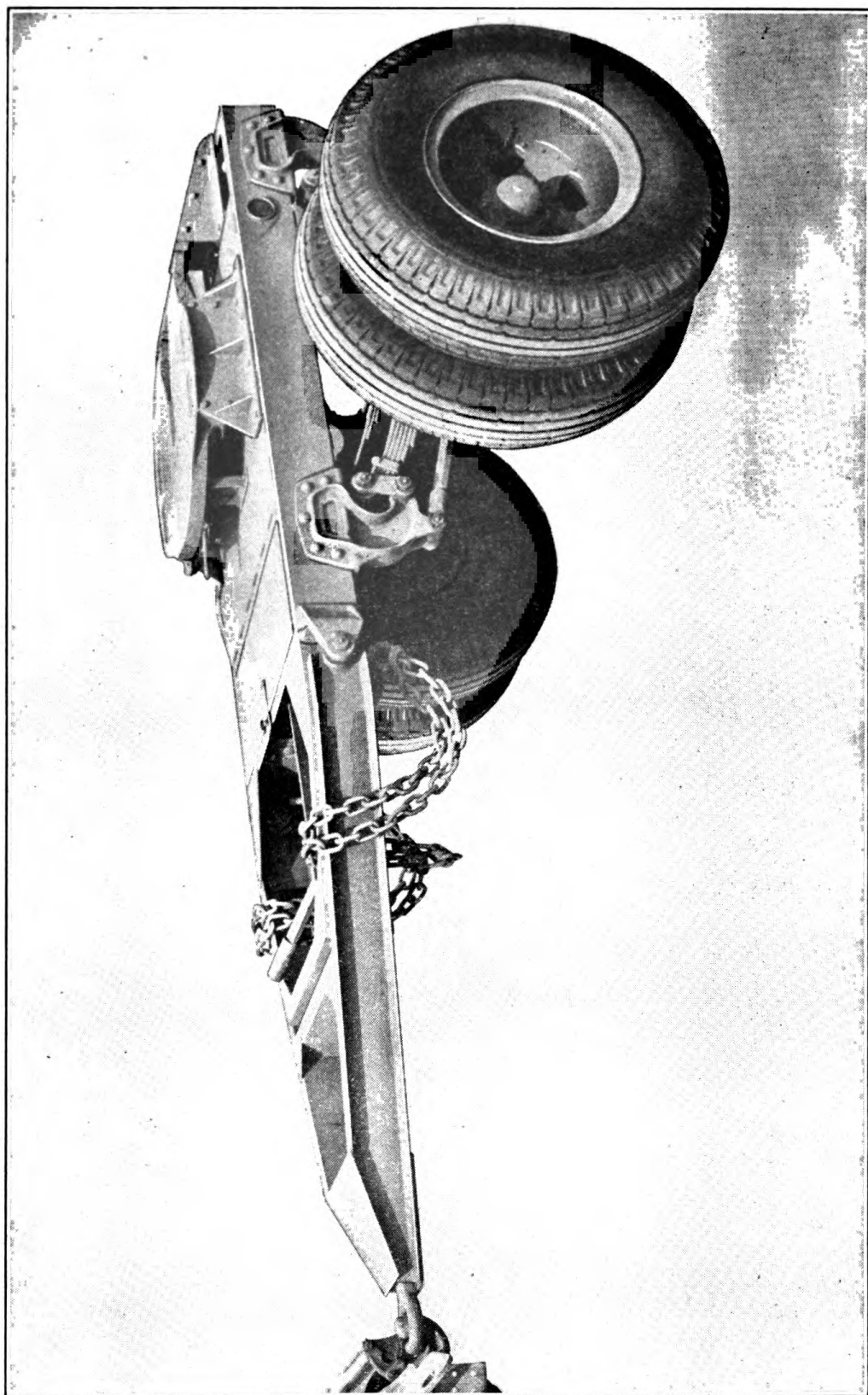


FIGURE 2. FULL VIEW—DOLLY—DC-4.

SECTION I

Description and Characteristics

1. **GENERAL DESCRIPTION.**—This trailer is of the van type and is designed so that it may be pulled behind any type of heavy duty towing vehicle which is equipped with a suitable pintle hook. Dolly can be disconnected from the trailer thus converting the trailer into a semi-trailer. The semi-trailer can then be pulled behind a tractor-truck equipped with a 5th wheel.

a. Identification (Figs. 1 and 2).—This trailer may be identified by its drop-frame van type body; the all-welded construction of the frame and body. Trailer is mounted on dual wheels at rear. It is normally employed with a dual wheel dolly.

b. Designation.—Serial and name plates are located on the main side rails toward the front; one on the semi-trailer and one on the dolly.

c. Mobility.—Trailer is designed for highway travel. Its ability to travel crosscountry depends on the tractive ability of the towing vehicle and the terrain over which it is to travel. Maximum speed is 35 M.P.H.

2. **AXLES.**—The dolly and semi-trailer axles are of the one-piece type, cambered, drop forged, heat treated, chrome molybdenum steel. They are made of S.A.E. 4140 steel with a 4" x 4" square section. The spindle diameter is ground to accurate limits. The axles and wheels are equipped with heavy-duty tapered roller bearings. Simple adjustments of the bearings are made through large castellated nuts and a hardened D-washer. These two axles are identical in construction. Dowel pin holes in semi-axle have $40\frac{1}{16}$ " centers, top and bottom—those in dolly axle are $36\frac{1}{2}$ " top only.

3. **BRAKES.**—The brakes are double-anchor, two-shoe, heavy duty internal expanding type. They have a 16" diameter and a 6" width. The brake lining is $\frac{3}{4}$ " thick with a braking area of 420 square inches. The brake shoes are provided with eccentric adjustment in addition to slack adjuster on the cam shaft. This slack adjuster provides for 360° adjustment on the cam shaft. The cam shaft bearings are of the self-aligning ball bearing type. Actuation of the brakes is by air chambers mounted on the axle. The braking system includes an air tank reservoir for full emergency feature. A hand parking brake, taken off the cam shaft through the slack adjuster, is also provided. Trailer hose connections are provided at the front with dummy couplings fastened to the trailer with chains.

4. **COUPLER.**—Coupler is semi-automatic. Base is 36" in diameter and rigid in its mounting. A pick-up ramp fastened to the gear frame facilitates coupling dolly to semi-trailer.

5. **DRAWBAR.**—Drawbar is all-welded structural steel design hinged at the side of the dolly main frame. A dropped forged eye is riveted to it.

6. **ELECTRICAL SYSTEM.**—The wiring system is the 6-8 volt type. The fuse box is located at the drop in the frame on the curb side. Fuses are $1\frac{1}{2}$ amperes capacity. The lighting equipment includes standard clearance lights and blackout clearance light, a commercial stop and tail light with blackout stop light attached, blackout stop and tail light, an enclosed manually operated blackout switch, and reflectors. A jumper cable supplies current to the semi-trailer through a socket on the front frame member. Jumper cable supplies current from semi-trailer to dolly.

7. **UNDERCONSTRUCTION.**—*a.* Spring hangers are cast metal. They are equipped with bronze bushings and are riveted to side of frame members of both the dolly and semi-trailer. Main and auxiliary springs on dolly are combined. All leaves are cupped to protect the nickle steel spring center bolts. Springs are attached to the axle with two heavy heat-treated U-bolts. Springs are shackled at both ends, thus providing maximum deflection without danger of breakage.

b. Shackle pins are 1" in diameter on semi-trailer and $1\frac{1}{4}$ " on dolly and are case hardened. They are ground to accurate limits and are grooved for alemite lubrication.

c. Each underconstruction is equipped with two radius rods; one is fixed and the other adjustable on semi-trailer. Both radius rods are adjustable on the dolly. Radius rods on semi-trailer are rubber mounted at both ends. Those on the dolly are rubber mounted at axle end only.

8. **TIRE CARRIER.**—The tire carrier is located on the left side of trailer. Operating shaft protrudes through a hole in skirting of the body frame. By removing the stud nuts on the spare tire and releasing the catch on the ratchet the tire can be lowered to the ground with the aid of a wheel wrench and handle.

9. **WHEELS AND TIRES.**—Wheels are 20 x 9-10 Budd on both the dolly and semi-trailer and are interchangeable. Tires are 12.00/20—14 ply on both dolly and semi-trailer.

SECTION II

Controls

1. **CONTROLS.**—The controls are employed according to the usual trailer-truck combination practice. The driver must become thoroughly familiar with the location and use of all control devices before attempting to operate the vehicle.

a. *Blackout switch* (Figs. 3 and 4).—Two blackout switches are provided; one on rear crossmember of dolly, and one on body panel on right front side of trailer. There is no “off” position on these switches.

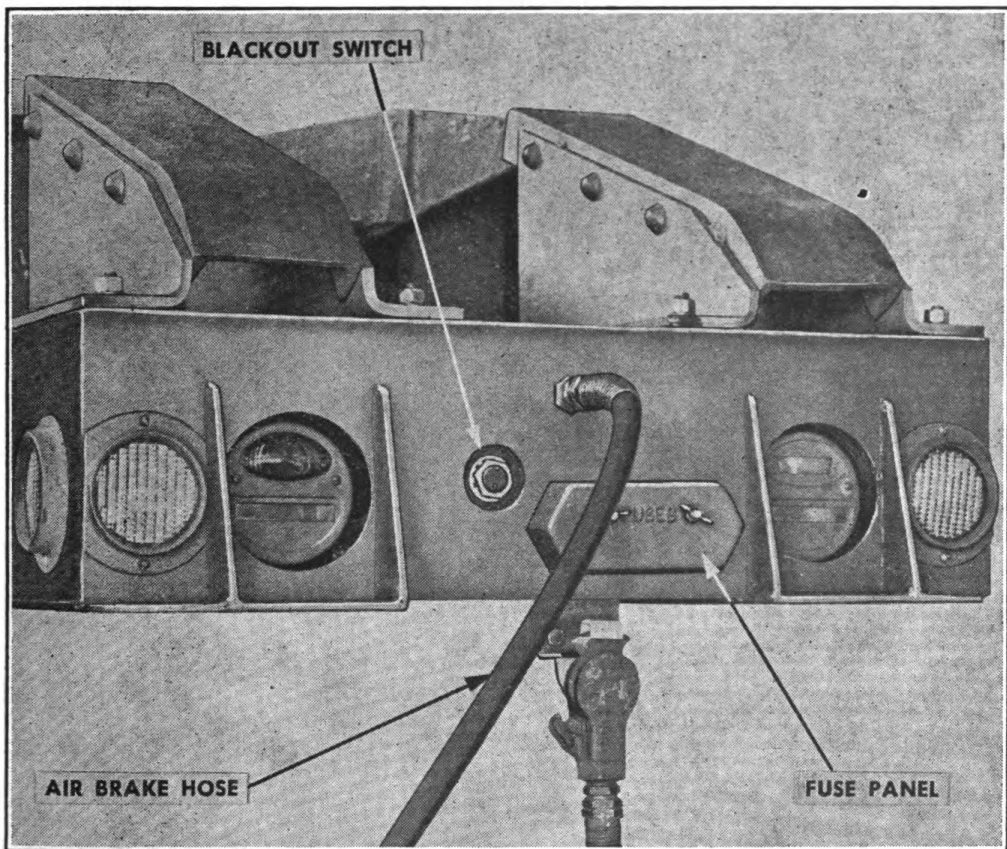


FIGURE 3. CONTROLS—REAR VIEW—DOLLY.

They are either at “blackout” position or at “standard light” position. Switches are operated by means of a screwdriver, coin, key, or any other small flat object. Flow of current is controlled at the towing vehicle.

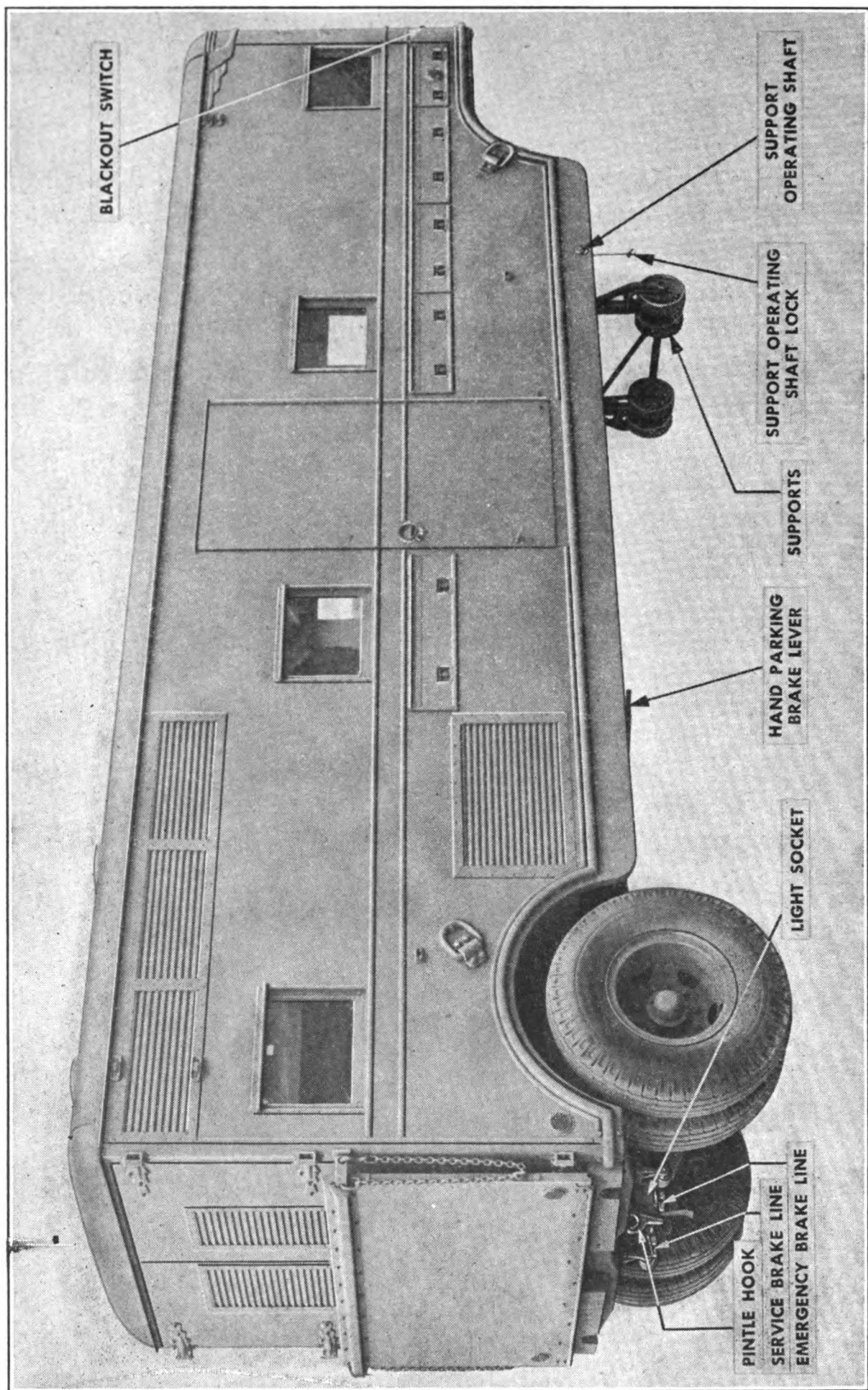


FIGURE 4. CONTROLS—FULL VIEW—RIGHT SIDE.

b. *Drawbar lock* (Fig. 5).—A lock is provided to prevent drawbar from hinging. Drawbar is locked only when dolly is being towed alone. Never attempt to pull the dolly when coupled to the trailer with the drawbar locked.

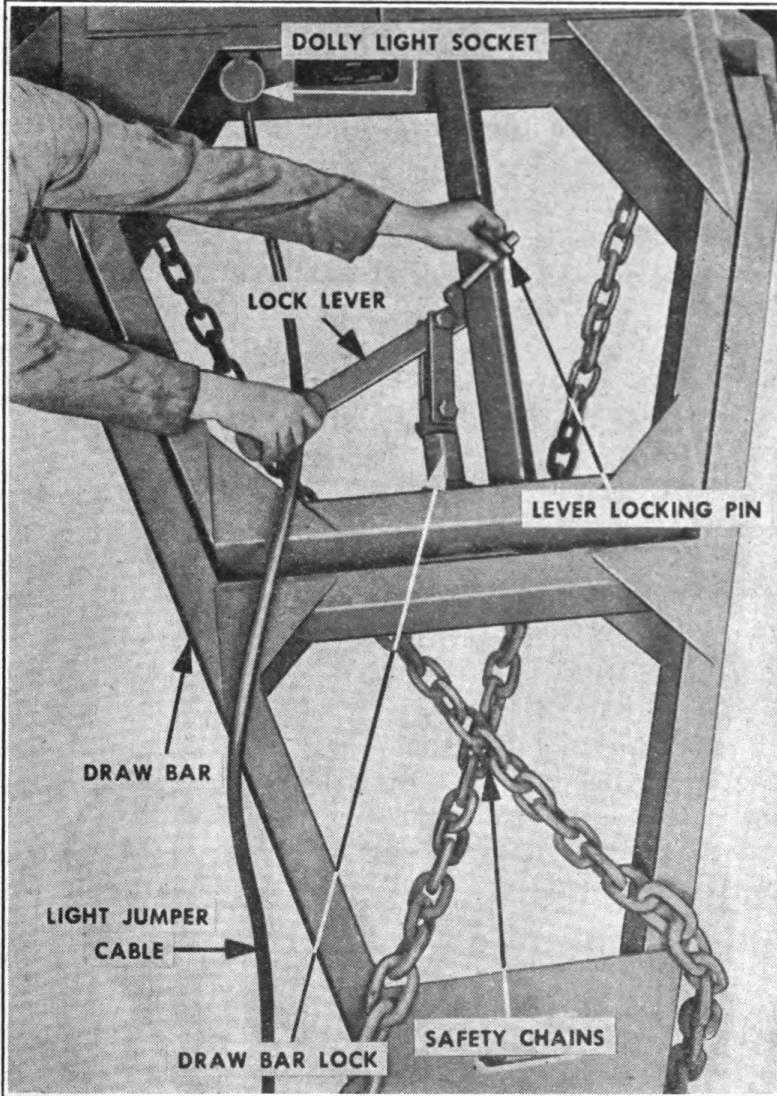


FIGURE 5. CONTROLS—DRAWBAR LOCK.

c. *Coupler hook lock handle* (Fig. 6).—Coupler is mounted on dolly. The coupler hook lock handle is on the right side of the coupler. Pull out on this handle to unlock the coupler hook which permits dolly to become uncoupled from semi-trailer. The unlocked hook automatically becomes locked when the dolly is backed under the trailer.

*d. Coupler operating handle mounted on towing vehicle (Fig. 7).—*To uncouple towing vehicle from the semi-trailer, push back the operating handle until you hear the latch drop in behind the lug on the plunger. This holds the plunger in the unlocked position until the towing vehicle is withdrawn. During this operation the entire mechanism is cocked for recoupling.

*e. Hand brake (Fig. 4).—*The hand brake is located at the extreme rear of the trailer. By pulling the brake lever toward the rear, the brakes are applied. The hand brake can be used as a parking brake or as a supplement to the truck brakes, when slowly descending steep grades.

*f. Light sockets (Figs. 4, 5 and 8).—*This unit is equipped with three light sockets: one in the center of the trailer at the front, one on the front crossmember of the dolly frame, and one at the rear of unit next to pintle hook. A jumper cable connection between these sockets provides current from the towing vehicle for either the dolly or the trailer lighting system, or any vehicle which may be towed behind the semi-trailer.

*g. Supports (Fig. 4).—*Supports are manually operated by a detachable crank which is inserted through hole in the skirting on the right side of trailer. Supports may be lowered or raised by turning the crank. Supports should be lowered prior to disconnecting tractor-truck or dolly. A lock, inserted into the support or crank shaft, prevents supports from vibrating to the down position when unit is in motion.

*h. Tire carrier (Fig. 8).—*Tire carrier is located on the left side of trailer. Tire carrier operating shaft protrudes through skirting of main frame. By removing stud nuts from spare wheel and tire assembly; and holding the operating shaft with the square end of wheel wrench and handle, the ratchet lever can be released. The tire can then be lowered to the ground. To raise the tire to the carrier, fasten the saddle to stud holes in wheel, and turn shaft until rope has pulled tire up to carrier. Install lug nuts.

*i. Air brake couplings (Figs. 4 and 8).—*The semi-trailer is equipped with five air hose brake couplings, two at the rear of unit, two at front of unit, and one in center of trailer at the drop in the frame on the under side. Air is supplied to dolly and semi-trailer and to vehicle towed behind the semi-trailer through these couplings. Each coupling is provided with a dummy coupling to prevent foreign matter from entering the braking system when air hoses are not coupled. Shut off valves are provided at the two rear couplings on the semi-trailer and at the coupling used to couple semi-trailer and dolly. This arrangement permits the operator to shut off the air prior to disconnecting air hose.

SECTION III

Driver's Instructions

1. COUPLING TRUCK TO SEMI-TRAILER.—*a.* Before attempting to couple truck to semi-trailer be sure coupler is cocked for coupling. This is accomplished by pushing back the operating handle until latch can be heard to drop in behind lug on the plunger.

b. Set the hand parking brake on the semi-trailer.

c. Back truck under the trailer so that the upper king pin, which protrudes below the upper 5th wheel plate on the trailer, is centered, or nearly so, on the jaws of the lower 5th wheel. Continue backing until the coupler jaws lock firmly to the king pin.

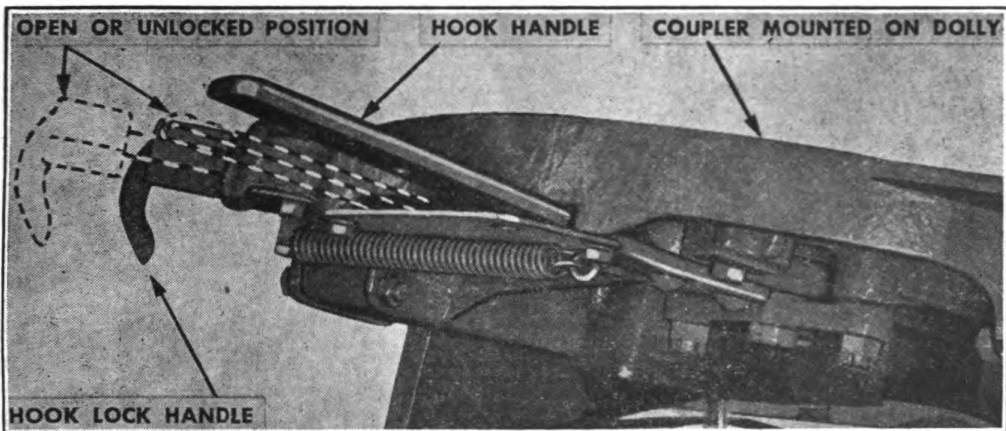


FIGURE 6. CONTROLS—DOLLY COUPLER.

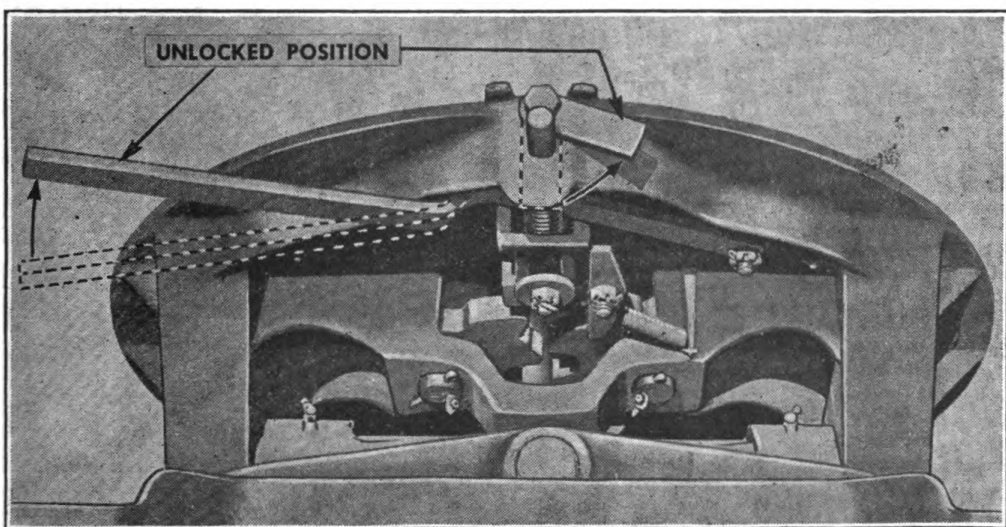


FIGURE 7. CONTROLS—COUPLER MOUNTED ON TOWING VEHICLE.

d. Try pulling the trailer ahead. If coupling is complete, movement of the trailer will be extremely difficult.

e. Inspect the trailer connection. If the 5th wheel hook lock handle is in the "in" position and the hook lever is practically at the centerline of the 5th wheel, the unit is properly coupled.

f. Connect air hoses to the trailer. Care should be taken to be sure that the service air hose connection is coupled up with the service trailer air line and the emergency air hose with the emergency trailer air line. Both hoses and trailer connections are tagged. Open air valves on truck. Connect light jumper cable.

g. Raise the supports. Turn the support handle in a clockwise direction until the stop is reached. Insert support shaft lock, and cover support shaft port.

h. Release the parking brake on the semi-trailer.

2. UNCOUPLING TRUCK FROM SEMI-TRAILER.—*a.* Set the parking brake on the trailer.

b. Lower the supports.

c. Shut off the air valves between tractor and trailer.

d. Disconnect both air hoses. Breaking the emergency air line first automatically sets the semi-trailer brakes. Make sure that all dummy hose couplings are installed on the trailer and that tractor hoses are coupled together, thus eliminating the danger of dirt or foreign matter entering the braking system. Disconnect light jumper cable.

e. Push back on operating handle on coupler until the latch can be heard to drop in behind the lug on the plunger. Plunger will then be held in the unlocked position until tractor-truck is withdrawn.

f. Check again to be sure parking brake on the trailer is set and that supports are completely down.

g. Pull the tractor-truck ahead until the two units are separated.

3. COUPLING DOLLY TO TOWING VEHICLE.—*a.* With the drawbar in the "locked" position couple drawbar eye to pintle hook on towing vehicle.

b. CAUTION.—Never pull dolly behind the tractor alone with the drawbar in the "unlocked" position.

c. Attach the hook end of right hand safety chain to the eye on left side of tractor-truck. Do not cross the chains over or under drawbar. Instead, thread them through opening at front of drawbar eye (Fig. 5). Repeat the same operation with the other chain, coupling it to the eye on the right side of truck.

d. NOTE: It is very important that safety chains be coupled as instructed above. By coupling safety chains in that manner they will support the drawbar should pintle hook on towing vehicle let go.

e. Connect jumper cable between the dolly and towing vehicle. Unit is now ready to be moved.

4. UNCOUPLING DOLLY FROM TOWING VEHICLE.—*a.* When uncoupling dolly reverse the coupling instructions outlined in the preceding paragraph.

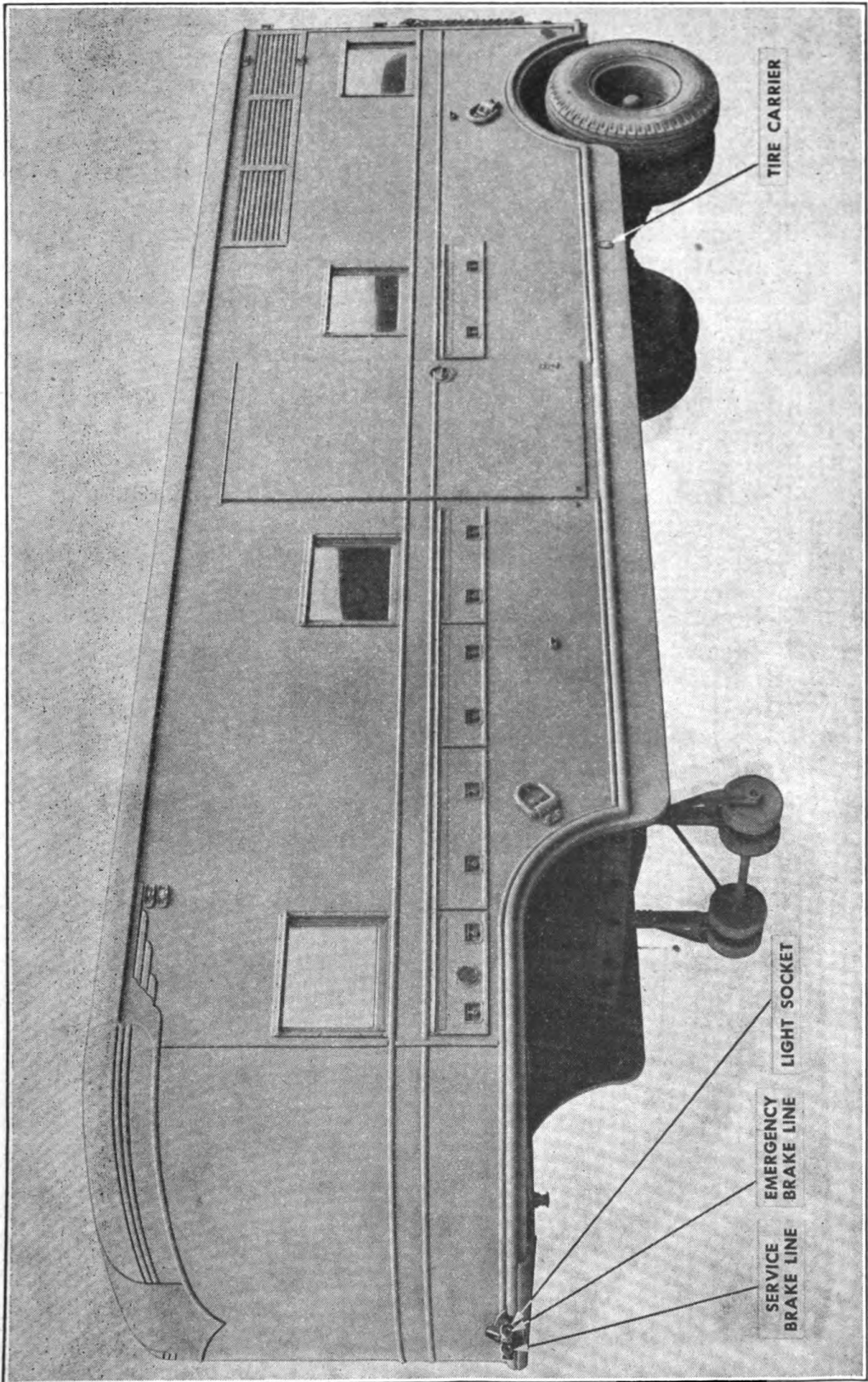


FIGURE 8. CONTROLS—LEFT VIEW OF SEMI-TRAILER.

5. **COUPLING DOLLY TO TRAILER.**—*a.* Couple dolly to the towing vehicle. Back the dolly up to the front of trailer so that the ramps on dolly are just started under the trailer. Be sure king pin on trailer is centered, or nearly so, with the jaws of lower fifth wheel (coupler).

b. Pull pin out of drawbar lock (Fig. 5) and put the drawbar lock lever into the "unlocked" position. Install pin in the drawbar. This will keep drawbar in the "unlocked" position.

c. Inspect the coupler to ascertain whether or not hook lock is in the "unlocked" position. (Pull out on hook lock handle to unlock hook lock.)

d. Set the hand parking brake on the trailer.

e. Back dolly up until coupler hook engages king pin on upper fifth wheel plate.

f. Try pulling unit forward. If coupling is complete movement of the unit will be extremely difficult.

g. Connect the two air lines between towing vehicle and trailer. Be sure air line tagged "SERVICE" on the tractor is coupled to right side of trailer. Open the two air valves at rear of towing vehicle. Couple air line between dolly and trailer and open air valve. Couple the light jumper cable between trailer and towing vehicle.

h. Wind up supports until stop is reached.

i. **CAUTION:** Before releasing the parking brake give coupler a visual inspection to make certain trailer and dolly are properly coupled. See that supports are in the "up" position. Make certain support lock is installed, and support shaft port is closed.

6. **UNCOUPLING DOLLY FROM TRAILER.**—*a.* Apply the parking brake on semi-trailer.

b. **CAUTION:** Be sure to lower the support wheels until the stop is reached.

c. Shut off the air valve between dolly and semi-trailer. Disconnect air line and install dummy coupler to air line coupler.

d. Disconnect jumper cable.

e. Shut off the two air valves at the rear of the towing vehicle and disconnect the two air lines.

f. **CAUTION:** When disconnecting air lines do not allow them to drag on the ground. Fasten them to the cab of the towing vehicle and install dummy couplers to the air line couplers.

g. Pull out on hook lock handle and hook will release. In case it does not release move the hook handle to the right side of trailer using hand power.

h. **NOTE:** At times, difficulty may be encountered when uncoupling. This is no fault of the functional parts of the coupler. The trouble lies in the fact that the trailer king pin is binding on the hook. This is caused by the trailer and tractor being as far apart as possible without

actually being uncoupled. All that is necessary to overcome the difficulty is to apply a light pull by hand on the hook handle prior to uncoupling.

i. Pull dolly out from under trailer to the point where ramps on dolly are still about four inches under semi-trailer. Place the drawbar in the "locked" position. Pull dolly forward until the trailer and dolly are completely separated.

7. DRIVING TRUCK-TRAILER COMBINATION.—*a.* The truck and trailer combination, either as a truck and semi-trailer or full trailer with dolly, is driven in much the same manner as the straight truck. The following hints, however, should prove helpful:

(1) It is good driving practice to test the operation of the trailer brakes before stepping up to full operating speed. Check the air supply on the dash gauge. It should not be less than 60 lbs. for proper application.

(2) The operation of the lights should be tested.

(3) When turning corners, care should be taken to allow for the fact that the trailer rear wheels turn "inside" the turning circle of the truck. This is because the tractor-trailer is a "hinged-in-the-middle" unit.

(4) When backing, the truck should be steered in the opposite direction to which it is desired that the trailer be turned.

(5) The trailer brakes should be applied in coordination with the truck brakes. The trailer brakes should not be expected to carry the entire braking load. Such abuse will result in rapid lining wear and greatly reduce the life of the trailer brakes. The following braking procedure is recommended:

(*a*) Trailer brakes should be applied easily and released when they grab, as a grabbing brake is not operating with maximum efficiency. For maximum braking efficiency, keep tires just short of the skidding point.

(*b*) When parking the trailer for an extended period, set the hand brake.

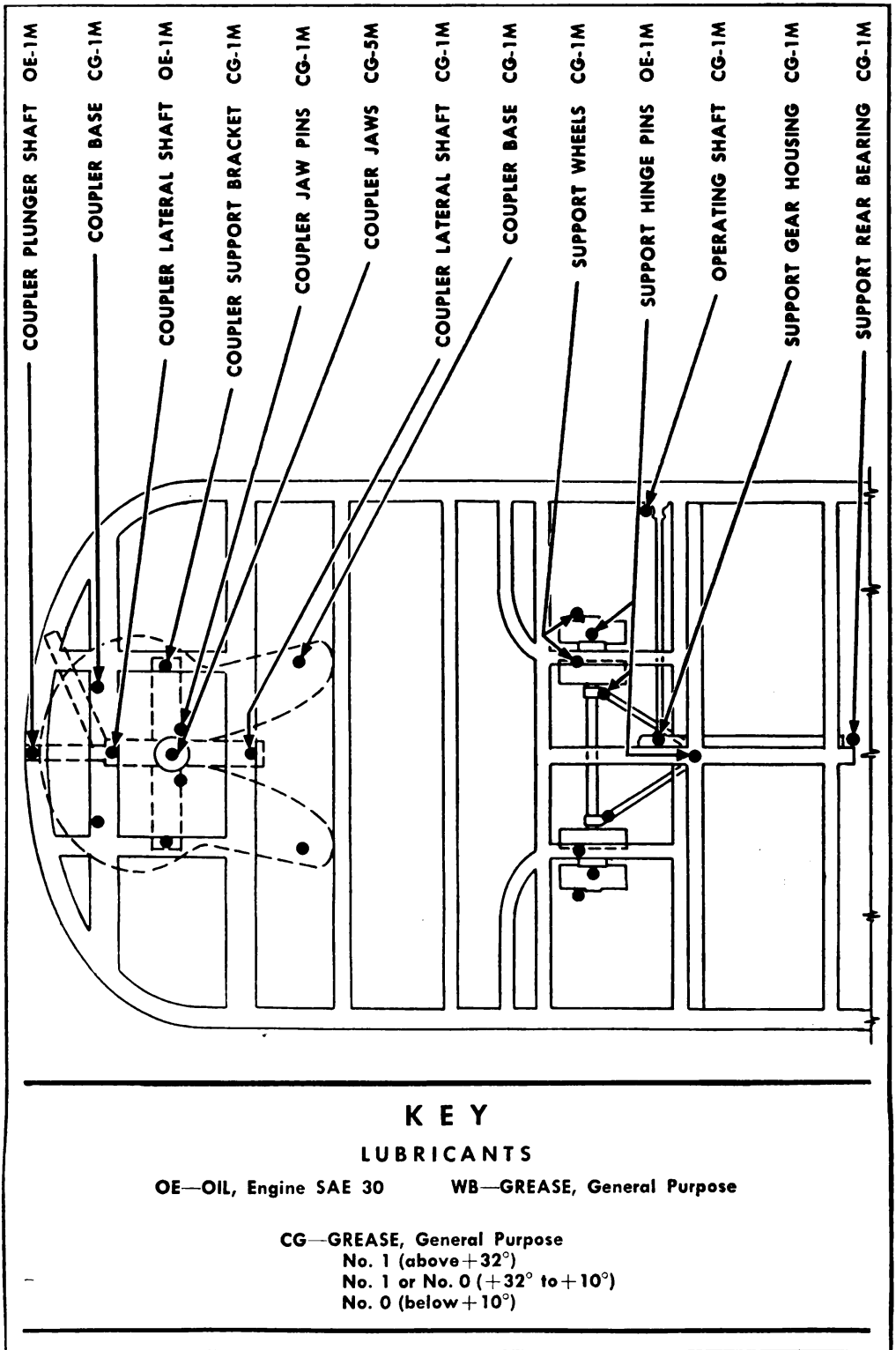


FIGURE 9. LUBRICATION—SEMI-TRAILER.

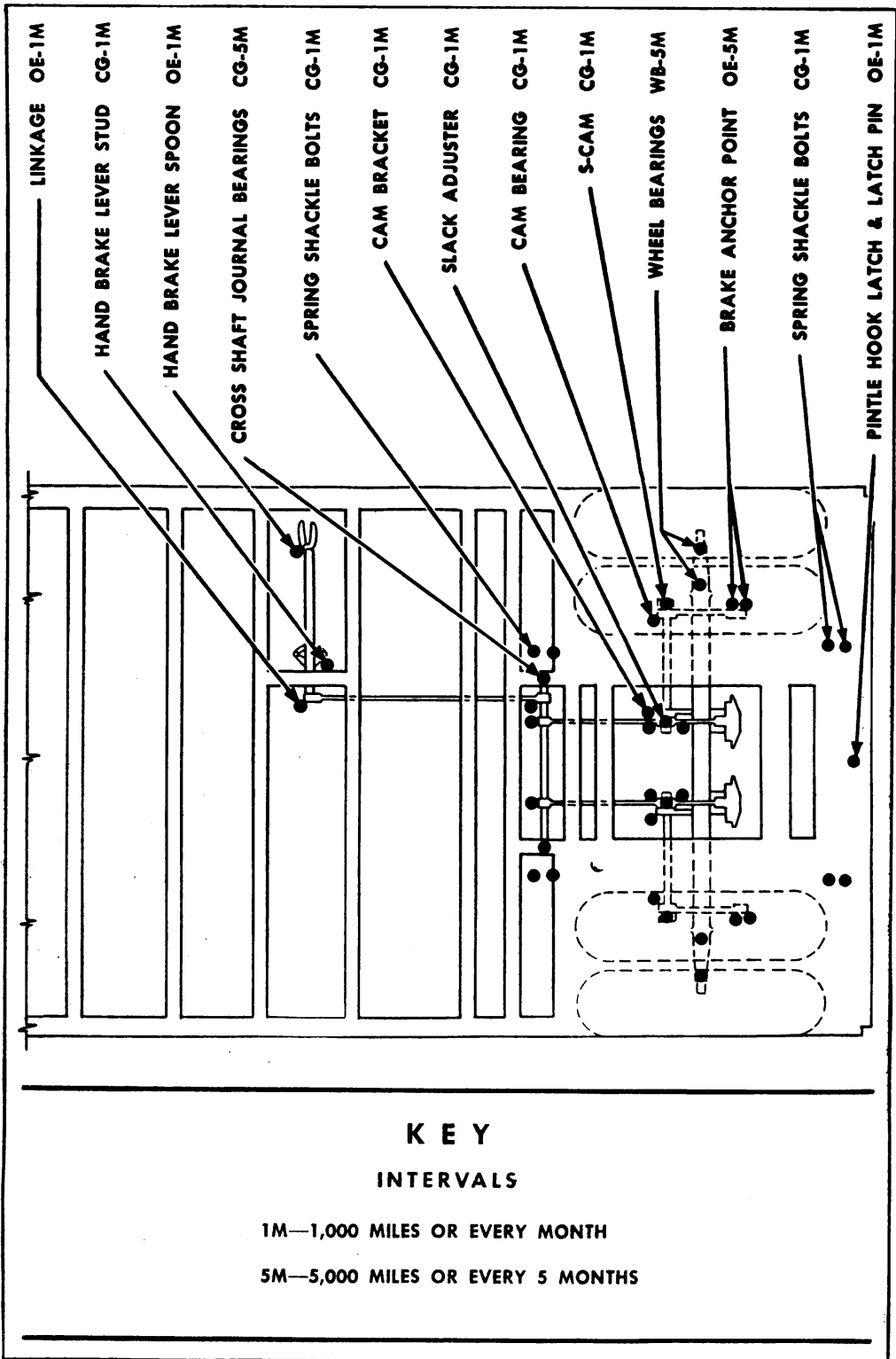


FIGURE 9. LUBRICATION—SEMI-TRAILER (Continued)

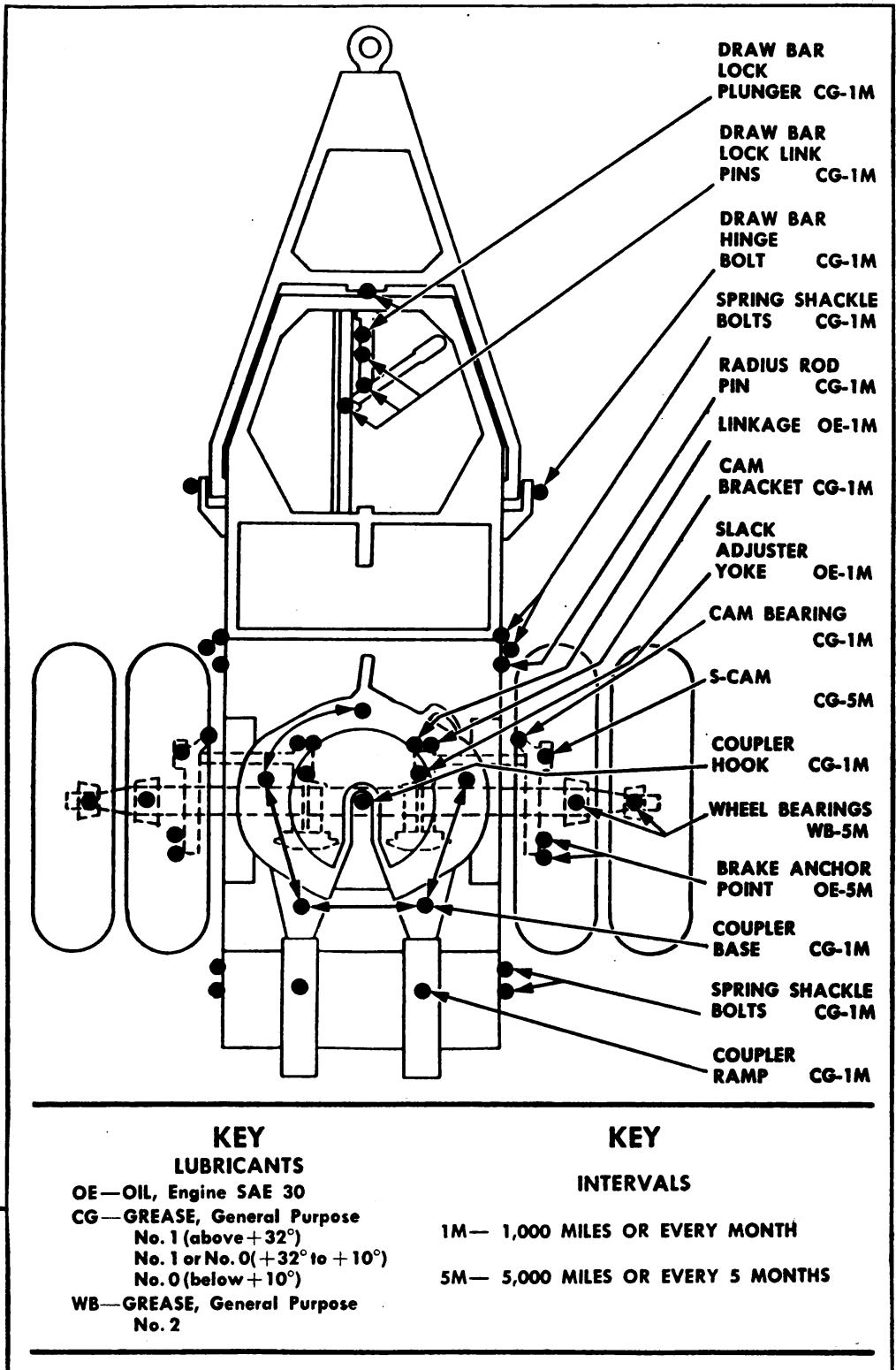


FIGURE 10. LUBRICATION—DOLJ Y

SECTION IV

Inspection—Lubrication—Adjustment

1. **DAILY INSPECTION, WHEN IN OPERATION.**—*a. Purpose.*
—(1) To insure mechanical efficiency, it is necessary that vehicles be systematically inspected at intervals in order that defects may be discovered and corrected before they result in serious damage.

(2) Cracks that develop in castings or other metal parts may often be detected upon the completion of a run, through the medium of dust and oil deposits.

(3) Suggestions toward changes in design prompted by chronic failure or malfunction of a unit or group of units; pertinent changes in inspection or maintenance methods; and changes involving safety, efficiency, economy and comfort should be forwarded through technical channels at the time they develop. Such action is encouraged in order that other organizations may profit thereby.

b. Prestarting inspection.—(1) Check drawbar to make sure it is not locked (when dolly is coupled to semi-trailer).

(2) Inspect tires for inflation and casing injuries.

(3) Check lights, both standard and blackout.

(4) Check tools and equipment.

(5) Check to see that coupler is properly hooked and locked.

(6) Be sure supports are locked in the "up" position and that support crank is not left on operating shaft.

(7) Check all doors and windows to make certain they are closed and properly fastened.

(8) Inspect air gauge on instrument panel to make certain it reads 60 lbs. pressure or better.

(9) Make two or three brake applications to make certain brake chambers are functioning properly.

(10) Be sure drawbar is properly coupled to pintle hook and that safety chains are properly fastened (when dolly is coupled to semi-trailer).

(11) Check parking brake to make sure it is in the full release position.

c. Inspection during operation.—(1) During operation, the driver should be alert to detect unusual sounds, noises or driving characteristics which indicate abnormal functioning of the unit.

(2) Only under exceptional circumstances should a trailer be operated after indications of trouble have been observed. When in doubt, the vehicle should be stopped and assistance obtained. Inspection during operation applies to the entire vehicle and should be emphasized throughout the driving instruction period.

d. Inspection at the halt.—At each halt the operator should make careful inspection of the vehicle to determine its general mechanical condition. Minor defects detected during the march together with defects discovered at the halt should be corrected during the halt, and proper disposition of the vehicle should be made so that unnecessary delay may be avoided and major failure prevented.

e. Inspection after operation.—At the conclusion of the day's operation an inspection should be made similar to that made at halts, but more thorough and detailed. The inspection should be followed by preventive maintenance. If defects cannot be corrected, they should be reported promptly to the Chief of section or other designated individual. The following points should be covered:

- (1) Check springs and spring hangers.
- (2) Check tires for cuts and bruises and for imbedded objects.
- (3) Check wheel studs, tighten loose stud nuts.
- (4) Inspect frame for cracked welds.
- (5) Check spare wheel and tire; secure replacement if necessary.
- (6) Drain moisture from the reserve air tank by means of the pet-cock at the bottom of the tank.

2. LUBRICATION.—*a. Lubrication.*—(See lubrication charts.) Figure 9 illustrates semi-trailer and coupler mounted on towing vehicle. Figure 10 illustrates dolly.

SECTION V

Tools and Equipment

1. INTRODUCTION.—Because the trailer has very few wearing parts, the tools have been kept to a minimum. Moreover, the trailer is operated with trucks carrying tools suitable for general care, maintenance and preservation. Accessories should not be used for purposes other than as prescribed and when not in use should be stored in the places or receptacles provided.

2. TOOLS.—Tools issued with the vehicle are illustrated in (Fig. 11). $\frac{3}{16}$ " x $\frac{7}{8}$ " screw driver supplied with this vehicle is not illustrated.

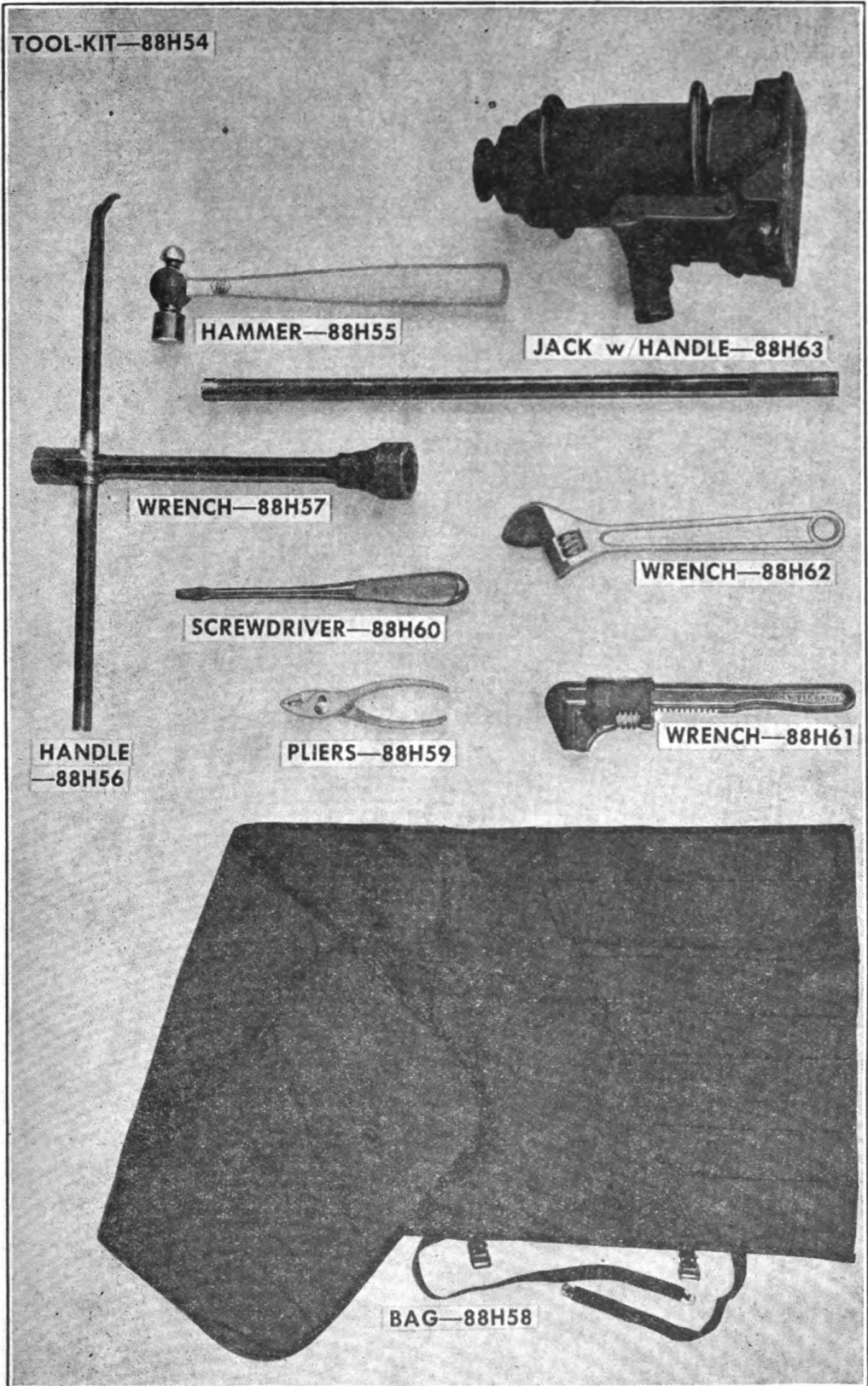


FIGURE 11. TOOLS.

PART II

MAINTENANCE MANUAL

PART II

MAINTENANCE MANUAL

SECTION I

Safety Instructions

1. SAFETY INSTRUCTIONS.—*a.* Before working on the wheel assembly, springs and axles of this unit, it is strongly recommended that the following procedure be followed at all times.

b. When making major repairs on dolly, do not attempt to hoist front of semi-trailer with dolly attached, rather, uncouple dolly from semi-trailer.

c. When raising semi-trailer with a hoist, never connect hoist chain to side rails of trailer frame; use bull rings at the side of unit or couple chains at holes in underside of upper 5th wheel plate.

d. Never disassemble any part of the supports unless semi-trailer is coupled to dolly or towing vehicle, or properly blocked up at front.

e. In changing axles or making spring repairs, when jacks are used, put the jacks on firm wood or other suitable material which will make a sound footing, thus preventing jack from sinking into ground. When jacking unit, place jacks in such a position that no slippage can take place.

f. Never attempt to work under trailer when trailer is suspended from hoist, until blocking is placed under trailer to catch the load should the chain hoist fail.

g. When working on shackle bolts or pins, do not hit them with a steel hammer. The bolts are hardened and chip very easily. Flying chips may cause serious injury. Use a copper hammer, or place a piece of wood over head of bolt and use it as a buffer.

SECTION II

Axles

1. **GENERAL DESCRIPTION.**—Dolly and semi-trailer are identical in construction and are interchangeable providing dowel pin holes are redrilled according to dowel pin layout (Figs. 12, 13). Checking for camber, checking for bend, all disassembly, reassembly and maintenance procedures are identical, unless otherwise stated.

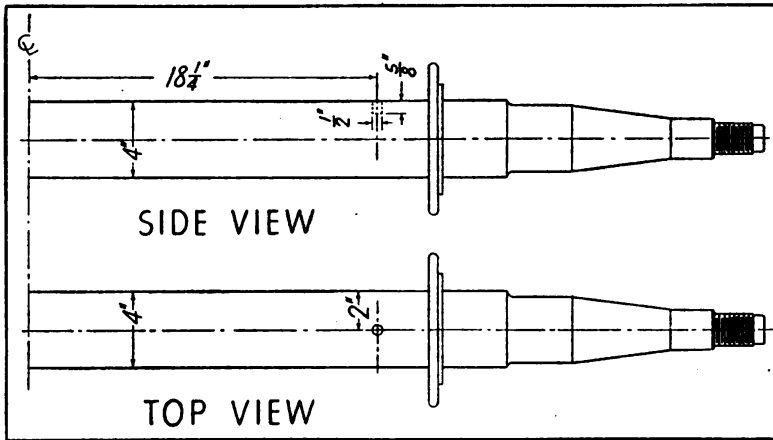


FIGURE 12. AXLE DOWEL PIN LAYOUT—DOLLY.

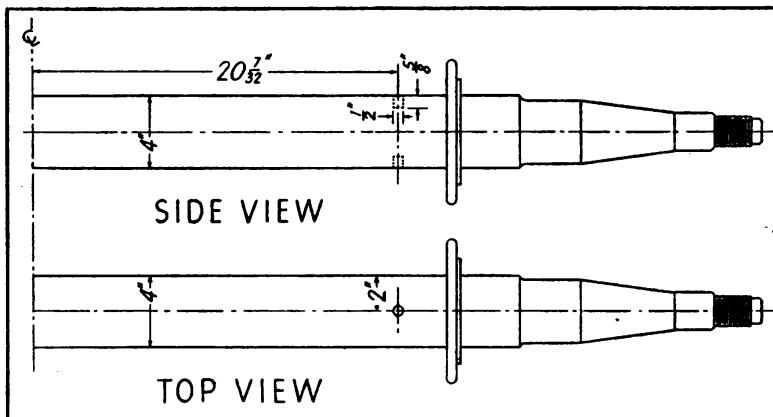


FIGURE 13. AXLE DOWEL PIN LAYOUT—SEMI-TRAILER

2. **AXLE REMOVAL—SEMI-TRAILER (Fig. 14).**—*a.* Place two jacks, plus wood blocking, under the rear crossmember. Jack the unit up until weight of frame and body rests on jacks.

b. Place a mobile or hydraulic jack under center of axle and remove

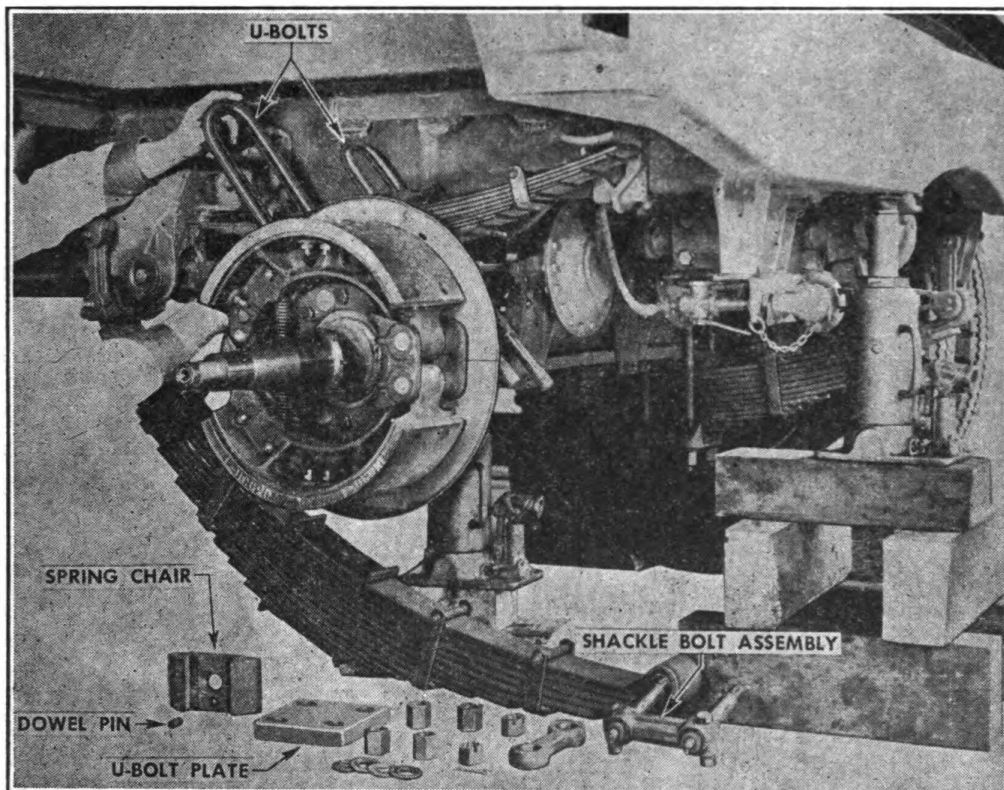


FIGURE 14. AXLE REMOVAL—SEMI-TRAILER.

U-bolt nuts from right and left hand side of axle and tap U-bolt plate off U-bolts.

c. Remove wheel and hub assemblies from right and left side of axle.

d. Remove cotter keys and nuts from upper and lower shackle bolts at the rear end of both springs.

e. Drive out upper and lower shackle bolt assemblies (Fig. 14).

f. **CAUTION:** When driving out shackle assembly, stay clear of spring, as rear end of spring will fall to ground.

g. Tap both U-bolts upwards and remove the U-bolt spacer cap located on top of the auxiliary spring.

h. Remove the U-bolts. Pull the U-bolts forward at an angle of about 60° as you lift them out in order to secure clearance under the frame member.

i. Disconnect air lines at brake chambers; remove parking brake, and brake rods at top of slack adjuster.

j. Lower jack under axle and pull axle assembly out.

k. Place axle assembly on two wood horses and strip the axle of all brake operating parts by removing the bolts holding the brake chambers and cam brackets to the axle.

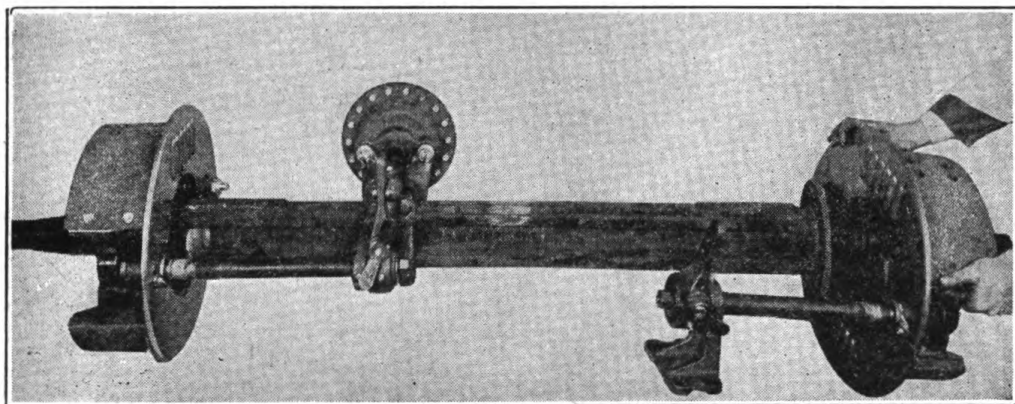


FIGURE 15. REMOVING BRAKE ASSEMBLY FROM AXLE.

1. Mark an "L" on the left hand brake assembly and an "R" on the right hand assembly for identification when reassembling. Remove the brake assemblies by taking out the eight bolts holding brake adaptor mounting plate to axle flange on both sides (Fig. 15). Lift the complete brake assembly off axle.

3. AXLE REPLACEMENT—SEMI-TRAILER.—*a.* Replacement of axle is in reverse of removal instructions outlined in paragraph 2, this section.

b. When installing new axle make certain dowel pin holes are drilled in the top and bottom of axle (Fig. 13).

c. Make certain dowel pins are installed in the dowel pin holes, and that dowel pin holes in main and auxiliary spring chair are placed over dowel pins in axle.

d. It is very important that axle be installed with top side up. There is a readily observable arch in the axle—install the axle with this arch up.

e. Prior to installing the wheel assemblies check axle alignment (paragraph 4, sub-paragraph *b*, this section).

4. AXLE ALIGNMENT—SEMI-TRAILER (Fig. 16).—*a.* Jack up unit using two jacks, one on right side and the other on left side, under axle. Remove both wheel assemblies.

b. Using a steel tape, measure the distance from king pin to center line of rear axle at both sides of trailer. Distance from king pin to center line of outer end of axle spindle on right side of trailer should be $\frac{1}{4}$ inch *shorter* than the same distance on the left side.

c. If adjustment is required, use the adjustable radius rod. Loosen the two pinch bolts on the rod and turn the hex adjusting nut to either shorten or lengthen distance between center line of rear axle and king pin as required. The ideal distance is one which is $\frac{1}{4}$ " shorter, king pin to center line of rear axle, on the right side than on the left side. Center line, of course, if figured to the outside of the spindle.

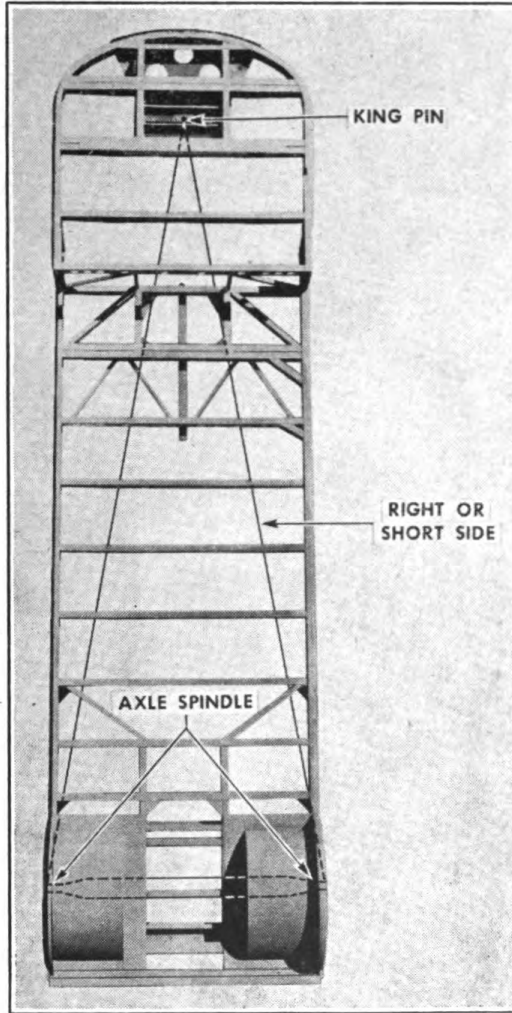


FIGURE 16. AXLE ALIGNMENT—SEMI-TRAILER.

5. **AXLE REMOVAL—DOLLY** (Fig. 17).—*a.* Fasten chain hoist to dolly frame using a double spread chain. Place a mobile jack under center of axle.

b. Remove wheel and hub assemblies.

c. Remove air lines at brake chambers.

d. Remove U-bolt nuts, and tap U-bolt plates off U-bolts. Hoist dolly frame high enough to clear U-bolts and pull axle assembly out.

e. Place axle across two wood horses and strip the axle of all brake operating parts by removing the bolts holding the brake chambers and cam brackets to the axle.

f. Mark an “L” on the left hand brake assembly and an “R” on the right hand assembly for identification when reassembling. Remove the brake assemblies by taking out the eight bolts holding brake adapter

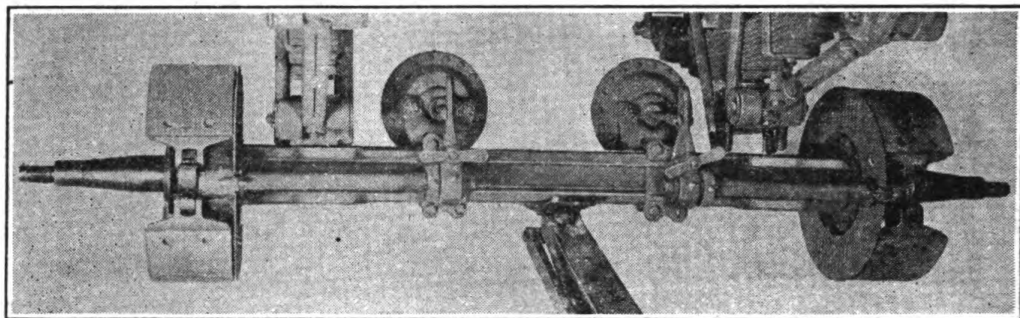


FIGURE 17. AXLE REMOVAL—DOLLY.

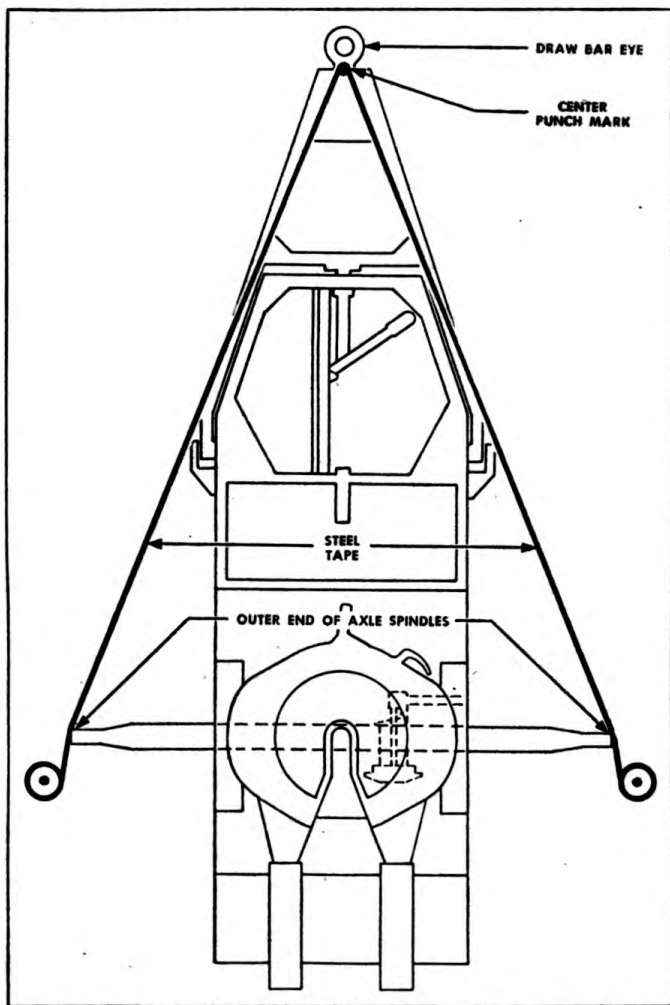


FIGURE 18. AXLE ALIGNMENT—DOLLY.

mounting plate to axle flange on both sides (Fig. 15). Lift the complete assembly off axle.

6. AXLE REPLACEMENT—DOLLY.—*a.* Replacement of axle is in reverse of removal instructions (paragraph 5, this section).

b. When installing new axle make certain dowel pin holes are drilled in top side of axle (Fig. 12).

c. Make certain dowel pins are installed in the dowel pin holes, and that dowel pin hole in spring chair is over dowel pin in axle.

d. Tighten U-bolts using wrench with about 36" leverage. It is very important that these nuts be drawn up extremely tight; stripping of these nuts is impossible.

e. Before installing hub and wheel assemblies check axle alignment (paragraph 7, this section).

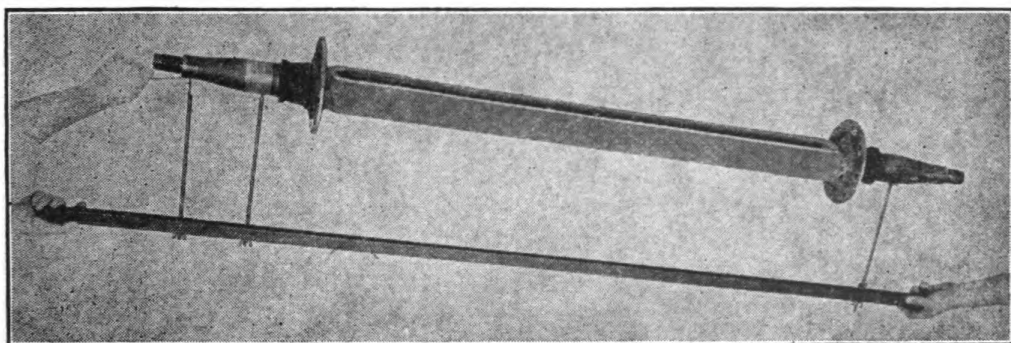


FIGURE 19. CHECKING AXLE FOR BEND.

7. AXLE ALIGNMENT—DOLLY (Fig. 18).—*a.* Place drawbar in the locked position.

b. Place a center punch mark in center of eye one inch back from eye hole.

c. Remove wheel and hub assemblies.

d. Using a steel tape, measure the distance from center punch mark on drawbar eye to outer end of axle spindle on both sides. The measurement should be identical.

e. If an adjustment is required, use the adjustable radius rods. Loosen the two pinch bolts on the rod and turn the adjustable spacer to move the spindle on that side forward or backward as required (Fig. 59).

f. Once the required adjustment has been secured, tighten down the pinch bolts on the adjustable radius rod to fix the axle in position.

8. CHECKING AXLE FOR BEND (Fig. 19).—Procedure for checking either dolly or semi-trailer axle is identical.

a. Place the axle gauge in position on front side of axle.

b. With the single pronged end of the gauge held firmly against the inner bearing surface, adjust the double prongs on the other end of the gauge until they contact the inner and outer bearing surface.

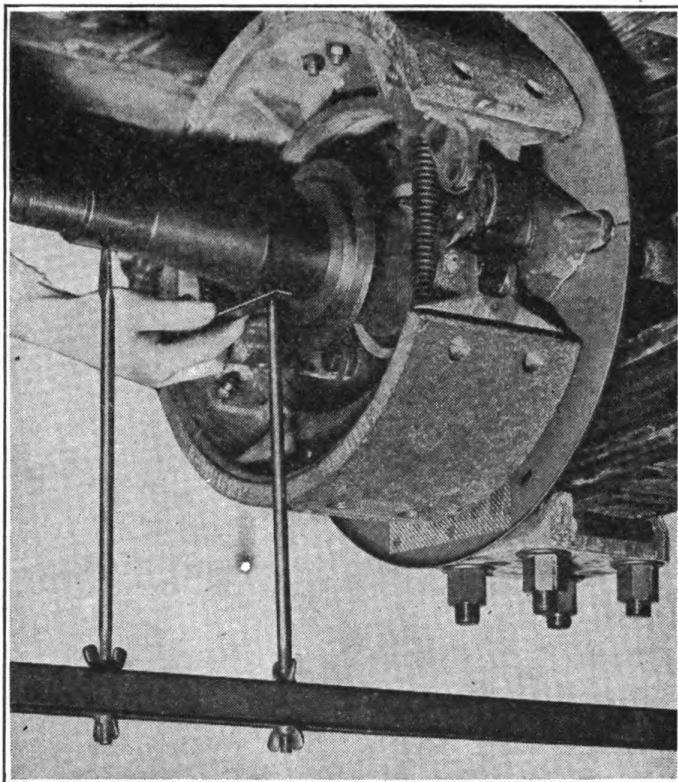


FIGURE 20. CHECKING AXLE FOR CAMBER.

c. Now move the gauge over to the rear side of the axle. If either of the two prongs fails to make contact, a bent spindle is indicated. Use a feeler gauge to determine the amount of the bend. If it is in excess of .002 replace the axle.

d. If checking both sides of one spindle reveals no bend in the axle, turn the gauge end for end and check the other spindle without disturbing the setting of the prongs.

e. If there is clearance at either bearing surface, check with a feeler gauge. If the prongs are in contact at both points, the axle is not bent.

9. CHECKING AXLE FOR CAMBER (Fig. 20).—*a.* Set the points of the axle gauge in exactly the same position on the axle and in the same manner as outlined in (paragraph 8, sub-paragraph *b*, this section).

b. Place the gauge directly under the axle.

c. Clearance will exist between the inner prong and the bearing surface. Clearance should not exceed .080 or be less than .060. If camber is not within the proper limits, replace the axle.

10. AXLE—Service Diagnosis and Remedy

SYMPTOM AND PROBABLE CAUSE

PROBABLE REMEDY

a. Hard pulling—"Wandering."

(1) Out of alignment.

(1) Re-align axle by means of adjustable radius rod (paragraph 4 and 7, this section).

(2) Bent axle.

(2) Replace.

(3) Out of camber.

(3) Replace.

b. Inside tire wear.

(1) Out of camber.

(1) Replace.

c. Scuffed Tires (Both Sides).

(1) Out of line.

(1) Re-align axle.

(2) Bent axle.

(2) Replace.

d. Scuffed Tires (One Side).

(1) Bent axle.

(1) Replace.

(2) Loose wheel.

(2) Tighten wheels and adjust bearings.

SECTION III

Brakes

1. GENERAL.—All braking parts which are attached to the axles are interchangeable between dolly and semi-trailer. All maintenance, adjustment, disassembly and reassembly instructions are identical. The relay-emergency valve which is bolted to semi-trailer main frame, operates both semi-trailer and dolly brake mechanism. Therefore, throughout this brake section all instructions will apply to both dolly and semi-trailer brakes.

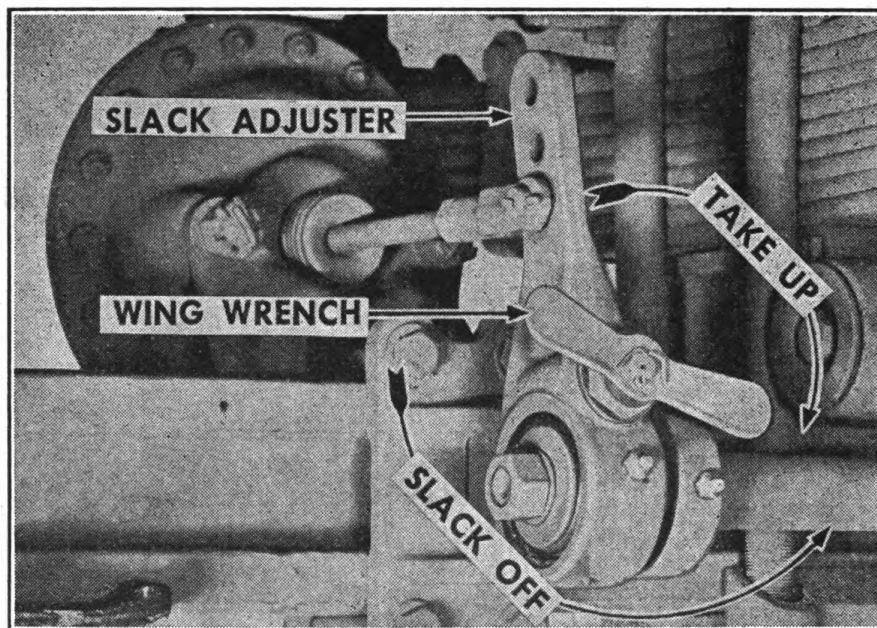


FIGURE 21. MINOR BRAKE ADJUSTMENT.

2. MINOR BRAKE ADJUSTMENT (Fig. 21).—*a.* Jack up wheel until it clears the ground.

b. Turn the wing wrench which is attached to slack adjuster in a clockwise direction until the wheel cannot be turned.

c. Back the adjusting wing wrench off two notches—try turning wheel. If no drag is felt, the brakes are properly adjusted. Should a drag be felt, continue backing off on the wing wrench nut until drag is eliminated.

3. MAJOR BRAKE ADJUSTMENT.—The instructions which follow apply only when new linings or drums have been installed.

a. Loosen both nuts on both anchor pins so that the anchor pins can be moved freely (Fig. 22).

b. Replace the wheel and drum assembly. If it fails to move on freely, slack off on the slack adjusters through counter-clockwise movement of the slack adjuster wing wrench and centralize anchor pin eccentrics.

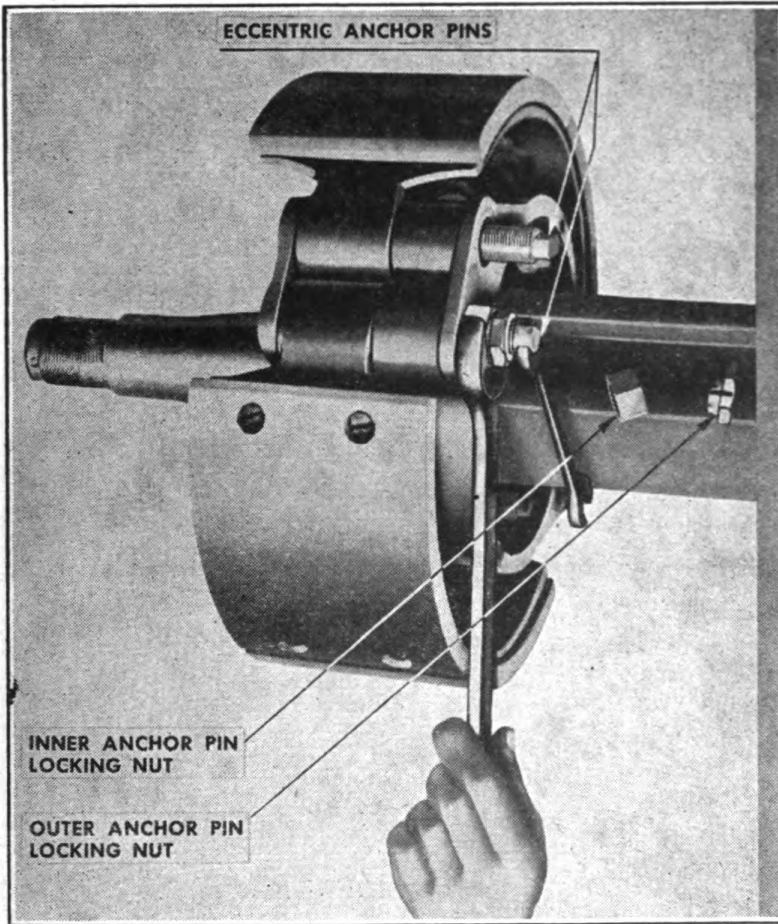


FIGURE 22. LOOSENING BRAKE ANCHOR PINS.

c. With the wheel in place, turn the slack adjuster wing wrench clockwise until the shoes are tight in the drum.

d. Turn the eccentric anchor pin to right and left as you tighten up on the slack adjuster until the brake shoes are centralized in the drum.

e. Using a feeler gauge, set the clearance at .010 at the eccentric end and .015 at the cam end of the brake shoes.

f. Tighten lock nuts on the anchor pins while holding anchor pins firmly in position with a wrench.

4. BRAKE LINING INSPECTION (Fig. 23).—*a.* Visual inspection of brake shoes and linings can be made without removing wheels from the axle. Simply remove the two dust shields, which are bolted to brake adaptor with six $\frac{1}{4}$ " cap screws (Fig. 25). This exposes the assembly to check for lining thickness and grease on the lining.

b. It is essential that linings on all brake shoes be of the same material to assure equalized braking.



FIGURE 23. BRAKE LINING INSPECTION.

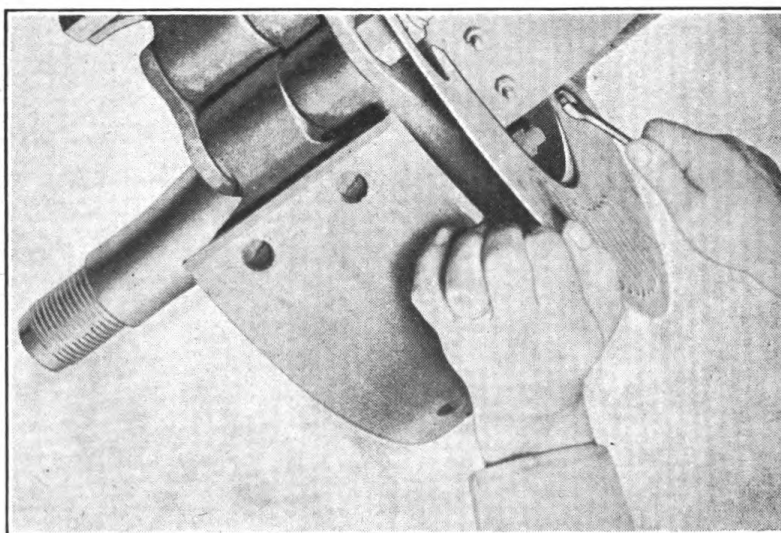


FIGURE 25. DUST SHIELD—REMOVAL

c. If lining is found to be grease-soaked, all four brake blocks on that axle should be replaced.

d. Never use wire brush on brake lining surfaces. This procedure increases the time required for linings to acquire burnished surface so essential to satisfactory braking.

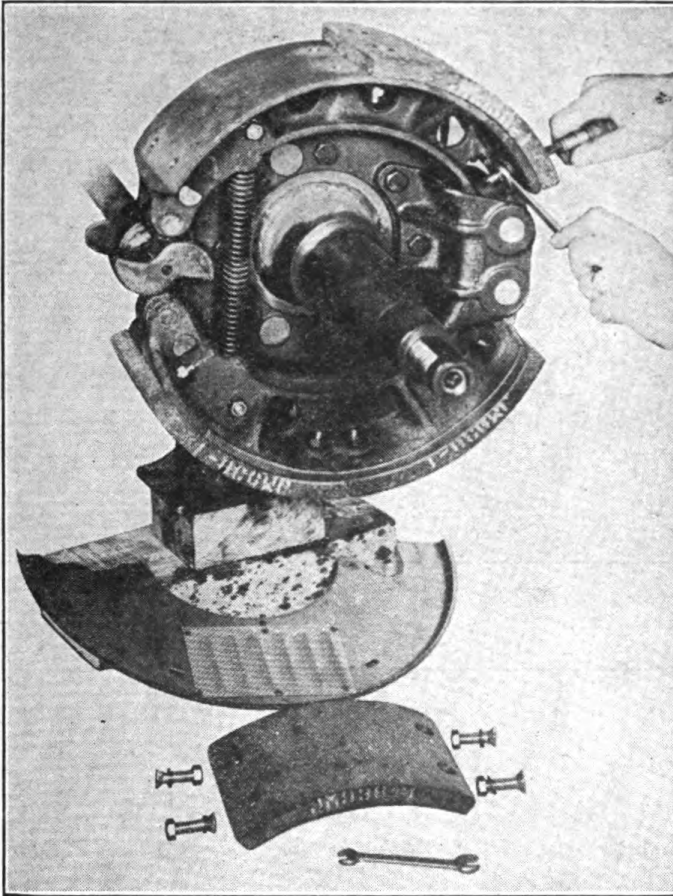


FIGURE 24. REPLACEMENT OF LINING.

5. REPLACEMENT OF LINING (Fig. 24).—*a.* Remove the wheel and hub assemblies in one unit.

b. NOTE: It is not necessary to remove the brake shoes from the assembly to reline. It is necessary, however, to remove the dust shields (Fig. 25).

c. Remove the bolts holding brake lining to the shoes.

d. Clean all foreign matter from the surface of brake shoes.

e. Install the lining, making certain that the bolts holding lining to shoes are properly tightened and that lockwashers are used.

f. Prior to installing wheels, loosen the two anchor pins (Fig. 22). Make certain they move freely and easily. It is essential that the anchor pins move freely so that the major brake adjustment can be properly accomplished.

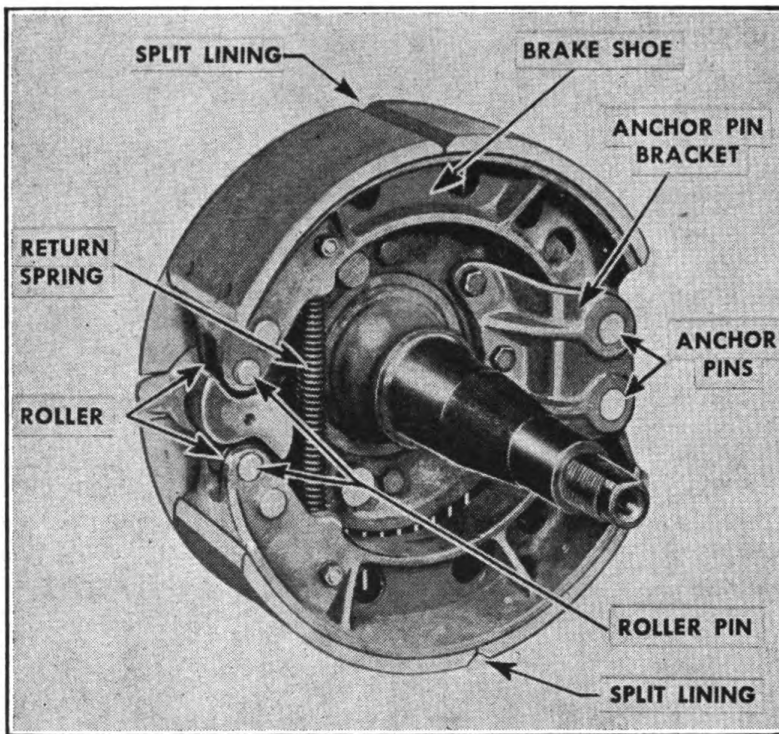


FIGURE 26. BRAKE ASSEMBLY.

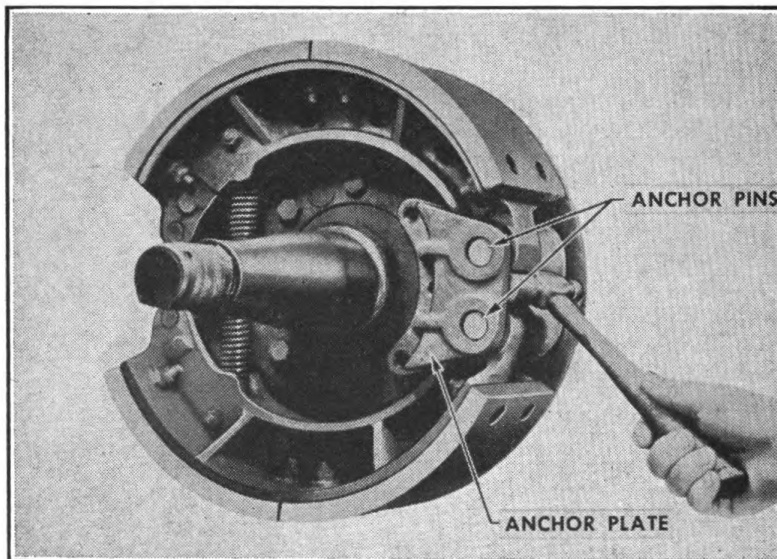


FIGURE 27. REMOVING BRAKE SHOES.

g. Lubricate the anchor pin using a light grade of engine oil or a penetrating oil, place grease around the "S" portion of cam.

h. Install wheel and adjust brakes in accordance with the Major Brake Adjustment procedure (paragraph 5, this section).

6. BRAKE SHOES.—*a. Removal* (Fig. 26).—(1) Remove the three bolts holding the anchor pin bracket to the brake mounting plate.

(2) Tap the anchor pin bracket free of the anchor pins and pull both shoes off cam and anchor pins (Fig. 27).

(3) Remove the brake shoe return spring by removing the bolt holding it to each shoe.

(4) To install, reverse the procedure outlined above after cleaning the S-cam and anchor pins; spread a thin coat of grease over both.

b. Rebushing brake shoes.—Each shoe has two Oilite bushings at the anchor pin end. To replace worn bushings:

(1) Drive out the old bushing.

(2) Press or drive in new. Drive new bushings in with care as a mushroomed or burred bushing will retard free movement of brake shoes, both in application and release. These bushings come reamed to proper dimensions. However, if reaming is necessary, ream to 1 1/8" dia.

c. Replacing brake shoe rollers (Fig. 26).—The brake shoe roller on each shoe is held in place by a shaft fastened by three heavy prick punch marks on each side. Roller shafts may be driven out and rollers replaced without removing the shoes from the assembly.

7. CAMS (Fig. 28).—*a. Replacing cam.*—Cams come in rights and lefts. When replacing them, care should be taken to place the proper cam on the proper side. Cams are stamped on inner end with a number, even number is right, odd number is left.

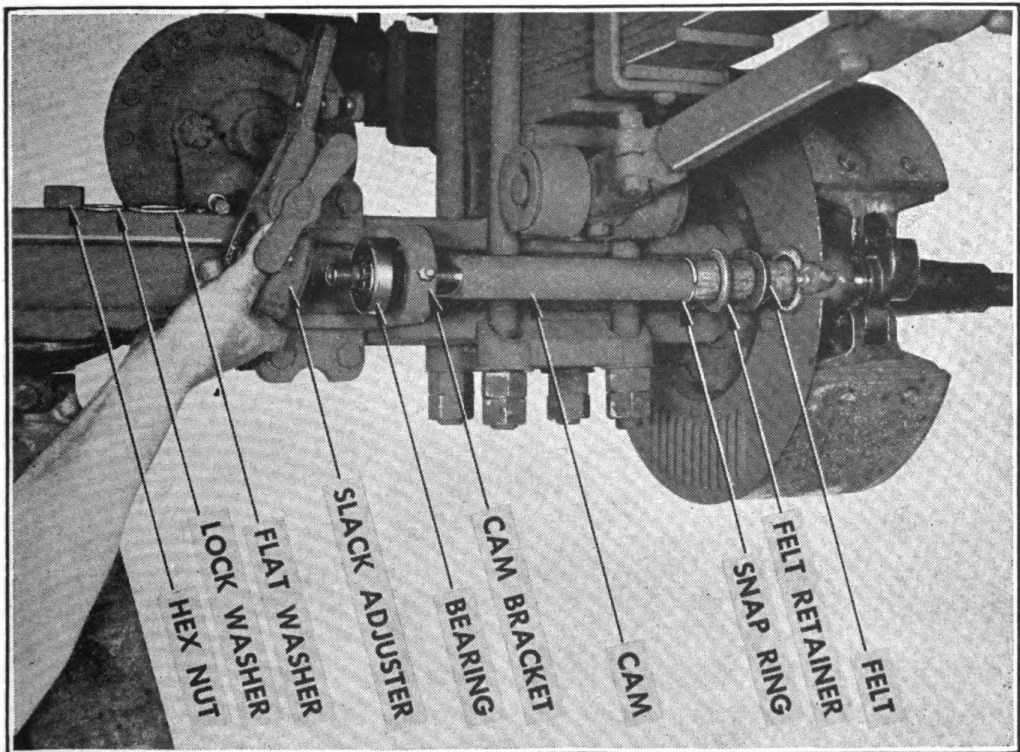


FIGURE 28. CAM ASSEMBLY.

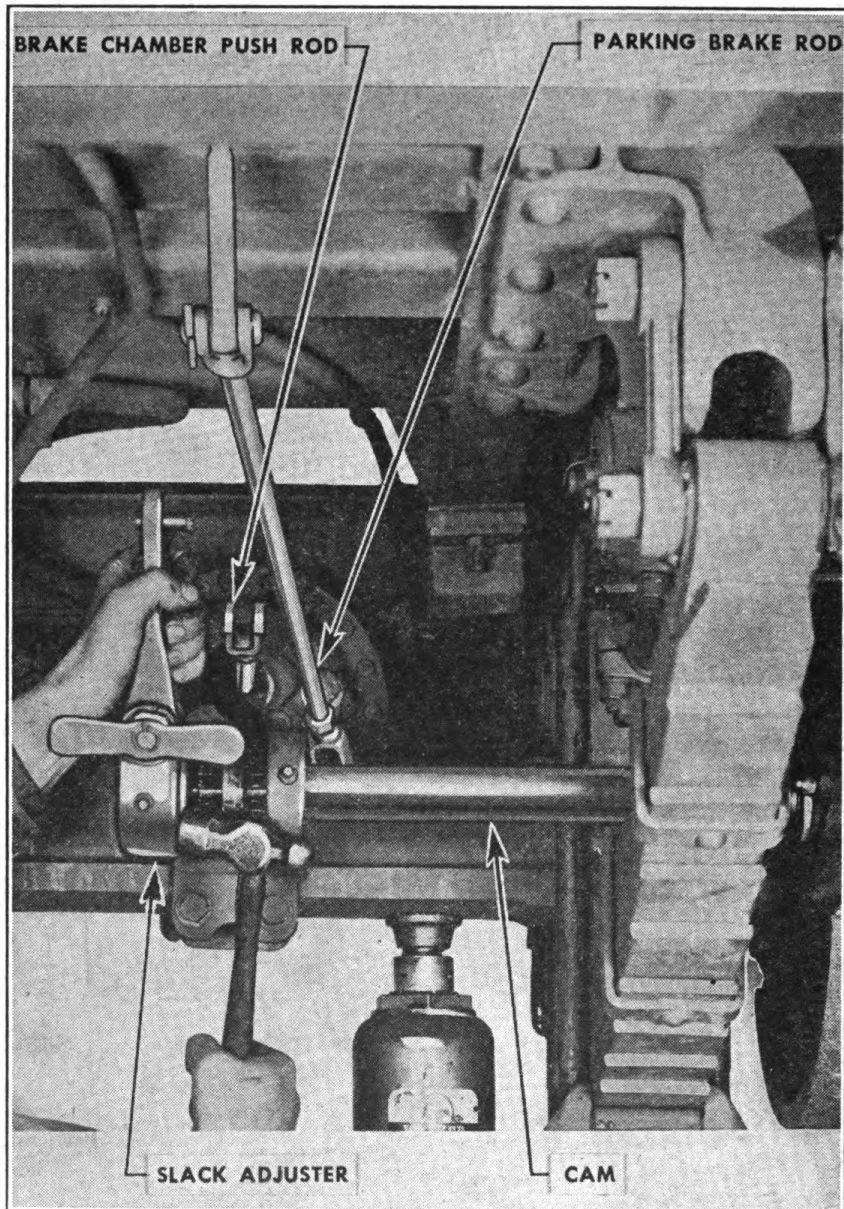


FIGURE 29. SLACK ADJUSTER—REMOVAL.

- (1) Remove wheel and hub assembly.
- (2) Remove nut and lock washer at the slack adjuster end of the cam.
- (3) Remove brake rods from slack adjuster arm and tap slack adjuster off cam spline.
- (4) Pry the snap ring free and drive out the cam.
- (5) To replace cam, pack needle bearings with a medium light chassis grease, working grease into bearings with finger. Hold the brake shoes apart and insert cam in position. Care should be taken not to

harm the needle bearings in the mounting plate brake adapter. Reverse the procedure outlined above.

b. Replacing cam needle bearings.—Cam needle bearings will usually last indefinitely if properly lubricated. However, if they are damaged through accident, or in removing and replacing cam, proceed as follows to replace them:

(1) Remove the two bearings in each mounting plate adaptor either individually or both at one time by driving them out with a hammer.

(2) Place the new needle bearings into position and tap gently to start them evenly.

(3) Place pieces of flat wood against both brake adaptor and bearing and press the bearings into position with a C-clamp. Bearings should be flush with the outer edges of the adaptor.

(4) Inspect to make sure bearings do not cover lubricating hole.

c. Replacing Nice ball bearing in cam bracket.—(1) Remove the slack adjuster (paragraph 5, sub-paragraph 2, this section) (Fig. 28).

(2) Tap the outer side of the cam bracket and the ball bearing will usually work out.

(3) If this fails, remove the alemite fitting, insert a small screwdriver in the alemite fitting hole and pry outward against the bearing. Continue tapping the slack adjuster bracket with a small hammer.

8. SLACK ADJUSTERS.—*a.* Slack adjusters are interchangeable between dolly and semi-trailer, and from right to left.

(1) *Removal* (Fig. 29).—(a) Disconnect the rods at slack adjuster. Remove the $\frac{3}{4}$ " nut, lockwasher and flat washer from cam. With a small hammer, drive the slack adjuster off the cam.

(2) *Replacement* (Fig. 29).—(a) Place slack adjuster on spline of cam shaft, with the wing adjusting wrench towards the front of unit. Install the flat washer, lockwasher and nut. Turn the wing wrench to align the hole in slack adjuster with hole in brake chamber push rod yoke. Place a light film of grease on yoke pin and install pin. If working on semi-trailer, place the hand brake rod in the top hole of slack adjuster, and the push rod of brake chamber in the center hole.

(b) NOTE: It is very important that the brake be given a minor brake adjustment after slack adjuster has been installed (paragraph 2, this section).

9. SERVICING SLACK ADJUSTER (Fig. 30).—*a.* If turning up on the slack adjuster wing wrench fails to bring the brake shoes up against the drum, the worm or worm gear is usually worn or stripped. To replace these parts, proceed as follows:

(1) *Replacing worm and worm gear.*—(a) Remove the worm (1) at the wing wrench adjuster by turning out on the hex nut holding it in position.

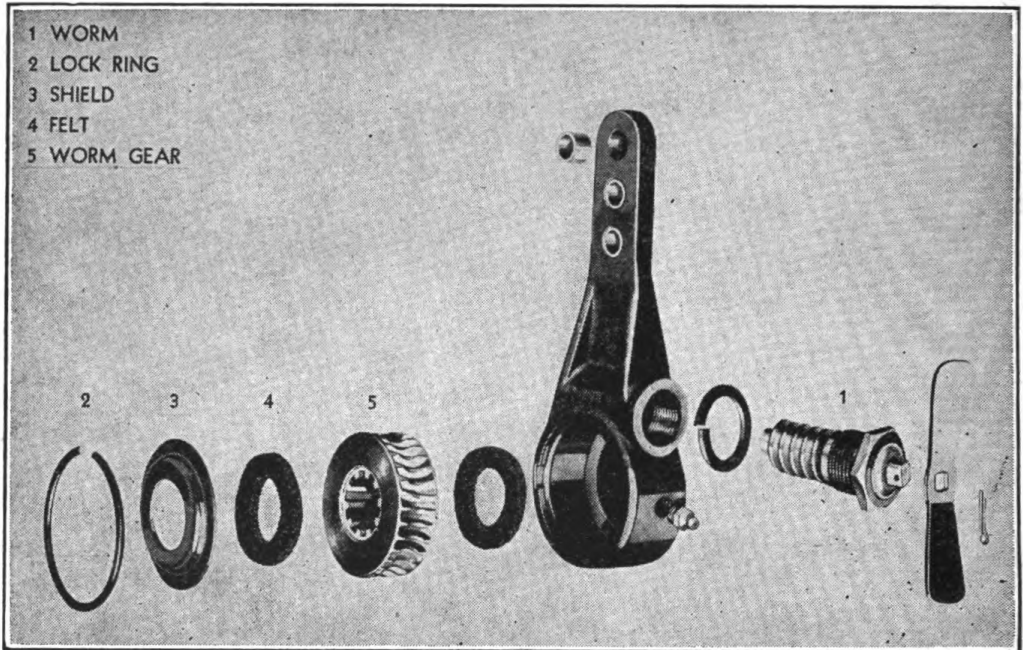


FIGURE 30. SLACK ADJUSTER—EXPLODED.

(b) Inspect the worm. If it is stripped, replace it as an assembly.

(c) If the worm is in good condition, pry the lock ring (2) free on the slack adjuster end, remove the shield (3), felt (4) and worm gear (5). If the worm gear is stripped, replace.

(2) *Rebushing slack adjuster.*—(a) Drive out the old bushing. Insert the new bushing.

(b) Ream to $\frac{1}{2}$ " diameter.

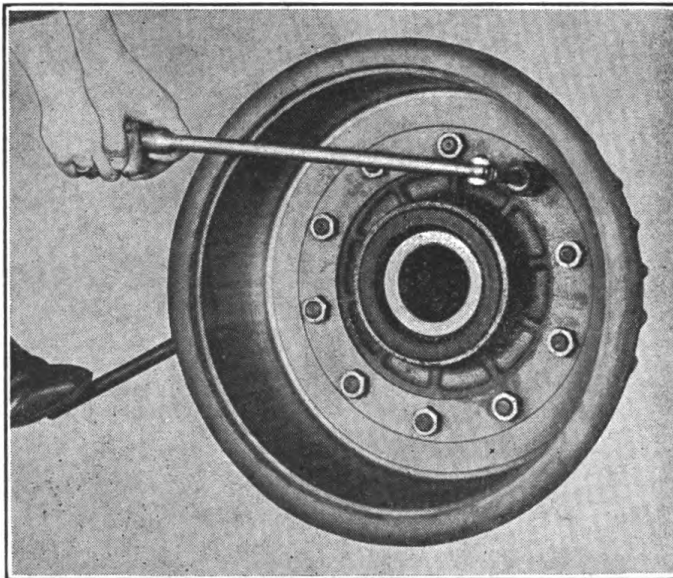


FIGURE 31. DRUM—REMOVAL.

10. BRAKE DRUM REMOVAL.—*a.* Brake drums should be replaced when cracked or badly scored. Heat checking, unless severe, does not call for brake drum replacement. Brake drums may be machined to .030 inches more than original diameter without necessitating use of shim stock between shoe and lining. If necessary to machine beyond .030 inches, shims should be used between lining and shoe to maintain lining to drum contour.

(1) Remove wheel and hub assembly.

(2) Brake drums are secured to hub flange by six bolts. Remove inner and outer tire and wheel assembly.

(3) Remove the six bolts, nuts and lockwashers and lift drum off hub pilot (Fig. 31).

11. BRAKE DRUM REPLACEMENT.—*a.* Check drum pilot to make certain it is free from rust and all foreign matter.

b. Place drum over drum pilot, making certain it is down on pilot face.

c. Install the six bolts, lockwashers and nuts.

d. Successively tighten opposite nuts to bring drum down evenly, to prevent cocking.

e. Install wheel assembly on axle and make major brake adjustment (paragraph 3, this section).

12. BRAKE CHAMBERS (Fig. 32).—*a.* This unit is equipped with four brake chambers. They are all interchangeable.

b. Function.—The function of the brake chamber is to convert the energy of compressed air into the mechanical force necessary to expand the brake shoes against the brake drum and apply the brakes. Air pressure from relay emergency valve enters port (1) behind the flexible diaphragm (2). The force developed moves the flexible diaphragm, moves the push plate (3) and attached push rod (6), so as to rotate the brake cam and apply the brakes.

c. Adjustment.—(1) The stroke of the brake chamber push rod is limited, therefore, the brake must be adjusted (see Brake Minor Adjustment) to keep the push rod stroke within the correct limits. The stroke should never be permitted to exceed $1\frac{3}{4}$ " and when the brakes are adjusted, the stroke should be as short as possible without the brakes dragging. This minimum stroke is usually about $\frac{3}{4}$ ".

(2) When installing new chamber, slack adjuster should be so adjusted to permit push rod (6) to line up with brake lever. Do not attempt to pull out or push in on rod (6) to align with brake arm—adjust slack adjuster by turning slack adjuster adjusting nut.

d. Removal.—(1) Uncouple air hose from chamber.

(2) Remove the two cotter keys and nuts from chamber studs.

(3) Remove the cotter key and clevis pin from push rod, and lift chamber out of mounting brackets.

e. *Replacement.*—Replacement of chamber is in reverse of removal. When replacing, be sure port in chamber is up.

13. BRAKE CHAMBER DIAPHRAGM.—a. Chamber diaphragm should be replaced once every two years.

b. *Test for and correcting leaks in the brake diaphragm.*—(1) Apply the brakes.

(2) Paint the edge of the diaphragm with soapy water.

(3) When making test with soapy water, a 3-inch bubble in three seconds is permissible.

(4) If leakage is detected, tighten the bolts uniformly around the diaphragm until it disappears. Never tighten the bolts to the point where the edge of the diaphragm starts to bulge, inasmuch as this greatly weakens the diaphragm.

(5) If the diaphragm is defective, air will escape around the rubber boot on the brake rod when the brakes are applied and the diaphragm must be replaced as follows:

c. *Disassembly.*—(1) Remove the brake chamber from the trailer by removing the two chamber nuts which hold it to the mounting bracket, disconnect the air hose assembly and pull the clevis pin at the brake lever.

(2) Place the chamber in a vise and draw a nail or other sharp object across the chamber edge to mark it for reassembly (Fig. 33).

(3) Remove the bolts, replace the diaphragm and tighten bolts.

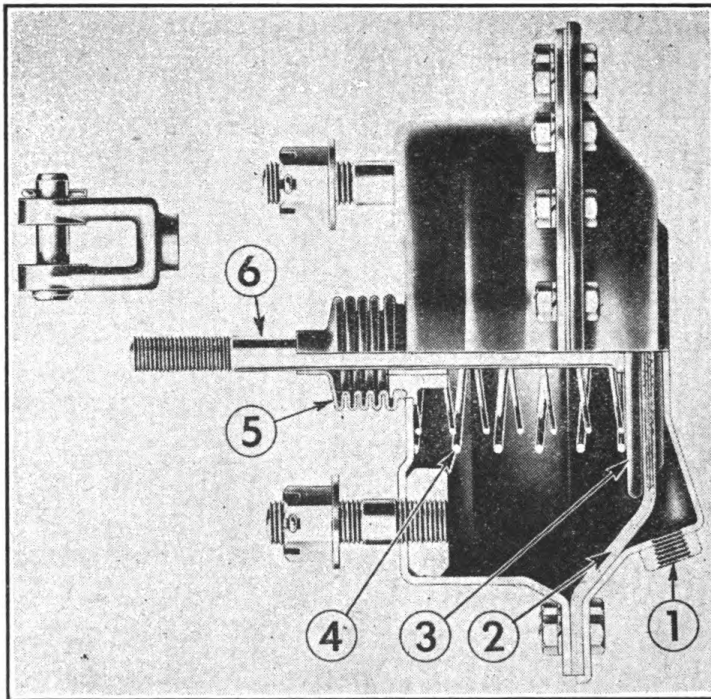


FIGURE 32. BRAKE CHAMBER—SECTIONAL VIEW.

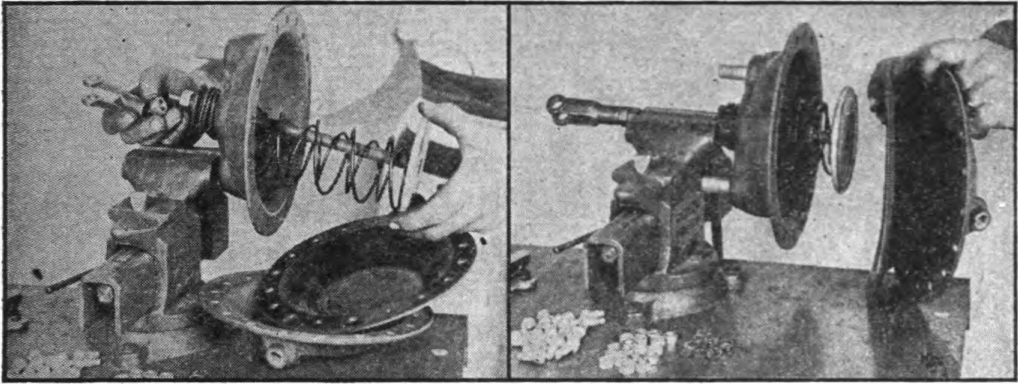


FIGURE 34. BRAKE CHAMBER—PUSH ROD REPLACEMENT.
 FIGURE 33. BRAKE CHAMBER—DISASSEMBLY.

d. Replacing brake chamber springs, pressure plate, rods, boots.—

- (1) Follow the procedure outlined above for the disassembly of the brake chamber.
- (2) Remove the brake push rod and install the new spring. Make sure the spring is seated properly on push rod plate (Fig. 34).
- (3) Bent or worn pressure plates should be replaced.
- (4) Slightly bent brake push rods may be straightened; if severely bent should be replaced.
- (5) Worn boots should be replaced.

14. RELAY-EMERGENCY VALVE (Fig. 35).—*a. Function.*—The relay-emergency valve serves as a relay station to speed up the application or release of the trailer brakes and also provides a means of automatically applying the trailer brakes in case the trailer breaks away from the tractor.

Fundamentally, its function is to operate so as to deliver and maintain the same air pressure in the trailer brake chambers as the brake valve on the tractor delivers to it.

b. Operation (Fig. 35).—The operation of the relay-emergency valve is dependent upon the air pressure delivered to it by the brake valve on the tractor.

This brake valve pressure is delivered to the relay-emergency valve through the service line and enters the cavity above the rubber diaphragm through port (1). Because this cavity is small and, therefore, subject to quick changes in air pressure, the action of the valve in changing its delivered pressure is also very rapid.

The mechanism inside the relay-emergency valve assumes three positions during normal operation. These three positions are the:

- (1) Applying Position—When the valve is actually delivering air pressure to the brake chambers.
- (2) Holding Position—When the valve is maintaining or holding a constant pressure in the brake chambers.

(3) **Releasing Position**—When the valve is reducing or releasing air pressure in the trailer brake chambers.

The mechanism inside the valve is so arranged that it can assume another position called the Emergency Position. The mechanism only assumes this position when some abnormal condition, such as a trailer break-away, causes a drop in the air pressure in the trailer emergency line. Under these conditions, the valve permits full trailer reservoir pressure to pass into the trailer brake chamber, applying the trailer brakes; and at the same time, prevents loss of trailer reservoir pressure through the broken trailer emergency line.

Operation of the valve in each of these position is as follows:

c. Applying position.—As air pressure from the brake valve on the tractor passes through the service line on the trailer and enters port (1) to the cavity above diaphragm (2), the pressure developed depresses the diaphragm. The diaphragm thus seals the exhaust port (3) underneath its outer edge and its center is deflected, forcing the diaphragm guide (4) down against the top of supply valve (5). Continued movement forces this supply valve off its seat and permits air pressure from the trailer reservoir, entering port (6), to flow through cavity A, past emergency valve (7) and out port (8) to the trailer brake chambers.

d. Holding position.—As soon as the air pressure being delivered to the brake chambers equals the pressure being delivered to the relay-emergency valve by the brake valve, the pressure above and below diaphragm (2) is equalized and the center of the diaphragm lifts and resumes its normal position. This permits the supply valve spring to close supply valve (5) limiting the air pressure being delivered to the trailer brake chambers to the same pressure being delivered to the relay-emergency valve by the tractor brake valve. In this position, action of the spring on top of diaphragm (2) makes the outer edge of the diaphragm seal the exhaust port (3). Thus the valve is in its Holding Position maintaining the same air pressure in the trailer brake chambers as the brake valve on the tractor is delivering to it. A rise in brake valve pressure causes the same action until the higher pressure in the trailer brake chambers is similarly established.

e. Releasing position.—If the brake valve pressure above diaphragm (2) is reduced, the trailer brake chamber pressure below the diaphragm overcomes the pressure above the diaphragm and the diaphragm lifts still further. This opens exhaust port (3) permitting the pressure in the trailer brake chambers to exhaust until a lower balanced pressure is reached. If the brake valve pressure on top of the diaphragm is released entirely, the relay-emergency valve also releases all pressure from the trailer brake chambers thus fully releasing the brakes.

f. Emergency position.—The trailer emergency line, connected to port (9) of the relay-emergency valve is directly connected through the trailer emergency line to the tractor reservoir. Any sudden drop in

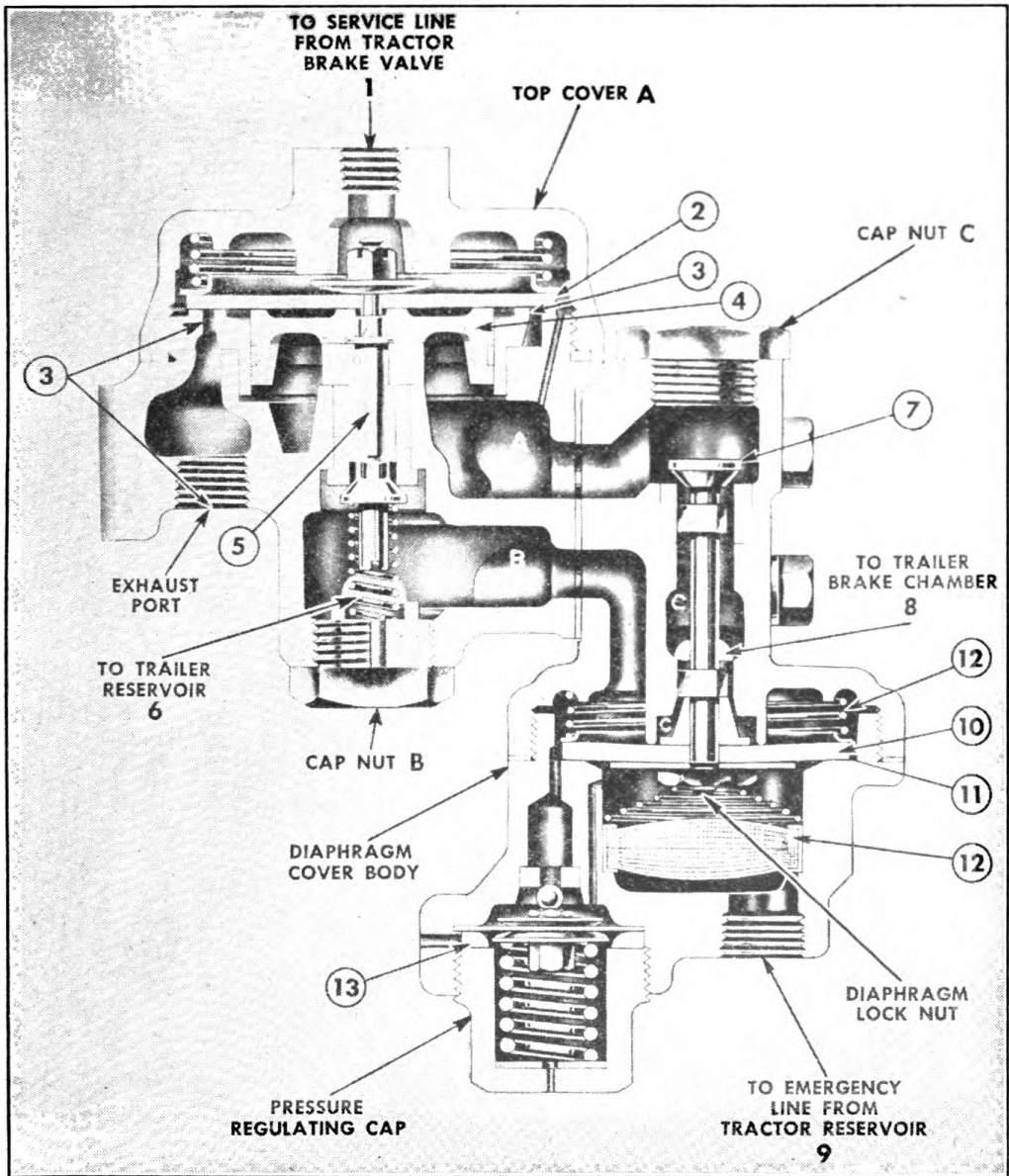


FIGURE 35. RELAY—EMERGENCY VALVE.

pressure in this trailer emergency line will cause the relay-emergency valve to go to emergency position and apply the trailer brakes. Normally, the same air pressure is present above and below the emergency diaphragm (10). If a sudden drop in pressure in the trailer emergency line occurs, the pressure trapped above diaphragm (10) forces its outer edge to seal at (11) preventing the further loss of air through port (9) and the trailer emergency line. This pressure also depresses the center of the diaphragm, breaking the seal at (12) and closing the emergency valve (7).

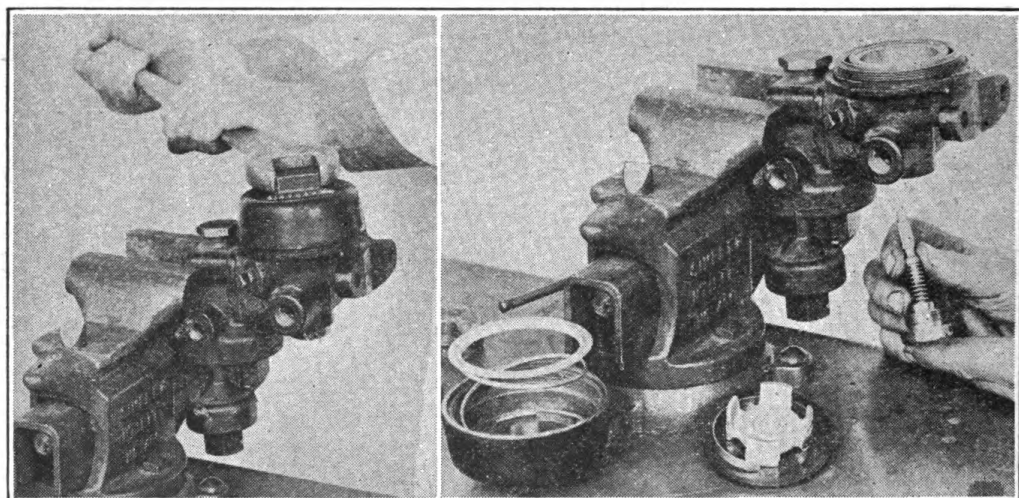
When this occurs, air flows from the trailer reservoir through cavities B and C and out port (8) to the trailer brake chambers, applying

the trailer brakes. The trailer brakes are thus applied automatically, due to an abnormal drop in emergency line pressure.

During normal operating conditions, it sometimes happens that the air pressure in the tractor reservoir will fall below the air pressure in the trailer reservoir. If this difference in pressure develops to a sufficient degree, it can be seen how an undesired emergency application might result. In order to guard against this, a pressure regulating cap is included in the assembly. The valve in this cap normally remains open as long as the pressure is above 70 to 80 pounds. This permits pressure above diaphragm (10) to equalize with pressure below the diaphragm as long as the pressure is above 70 to 80 pounds. However, should the pressure drop below this point, the valve in the pressure regulator cap will close, preventing any further equalization of pressure and a continued gradual drop in pressure below diaphragm (11) will also cause an emergency trailer brake application. Thus if leakage develops in the tractor brake system or the trailer emergency line beyond the capacity of the compressor and such leakage causes the air pressure in the tractor brake system to drop below a safe limit, the trailer brakes will be automatically applied to stop both vehicles.

FIGURE 36. RELAY-EMERGENCY VALVE—REMOVING TOP COVER.

FIGURE 38. RELAY-EMERGENCY VALVE—REPLACING INTAKE VALVE.



g. Disassembly.—Diaphragms (2) and (10) should be replaced once a year.

(1) *To clean or replace diaphragm (2).* (Fig. 35):

(a) With the valve held firmly in a vise, remove top cover (A). (Fig. 36.)

(b) Lift out the diaphragm guide ring (Fig. 37), remove cotter key, nut and washer holding the diaphragm to the guide. Lift out the diaphragm and replace.

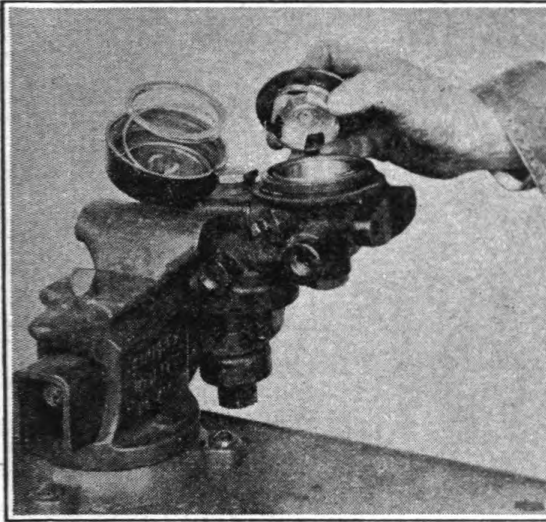


FIGURE 37. RELAY-EMERGENCY VALVE—REMOVING DIAPHRAGM GUIDE RING.

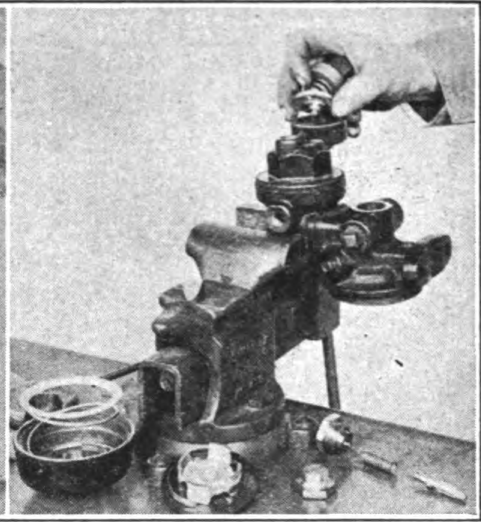


FIGURE 39. RELAY-EMERGENCY VALVE—REMOVING CAP, SPRING, AND DIAPHRAGM.

- (c) Reassemble by reversing the procedure outlined above.
 - (2) *Cleaning or replacing intake valve (5).* (Fig. 35.)
 - (a) Remove the cap nut (B).
 - (b) Extract the intake valve with a pair of long nose pliers.
 - (c) Clean. Replace. (Fig. 38.)
 - (3) *Cleaning or replacing diaphragm (13).* (Fig. 35)
 - (a) Remove pressure regulating cap, spring and diaphragm. (Fig. 39.)
 - (b) Remove stem lock nut. Lift diaphragm and diaphragm follower from stem. Clean and replace.
 - (c) Reassemble by reversing the procedure outlined above.
 - (4) *Cleaning or replacing diaphragm (10) and washing strainer (12).* (Fig. 35.)
 - (a) Remove diaphragm cover body (Fig. 40).
 - (b) Lift out spring and strainer (Fig. 41).
 - (c) Remove cap nut (C). (Fig. 35.) Insert screw driver into slotted top of valve and remove diaphragm lock nut (Fig. 42). Pull out the valve stem and diaphragm (Fig. 43).
 - (d) Clean the strainer and diaphragm in cleaning fluid. Install a new diaphragm if necessary.
 - (e) Reassemble by reversing the procedure outlined above.
 - h. Maintenance* (Fig. 35).—The complete valve should be removed from the trailer, dismantled, thoroughly cleaned, and diaphragms (2) and (10) should be replaced at least once a year.
- Strainer (12) should be removed and cleaned in cleaning fluid about every six months.



FIGURE 41. RELAY—EMERGENCY VALVE—SPRING AND STRAINER

FIGURE 40. RELAY—EMERGENCY VALVE—DIAPHRAGM COVER BODY

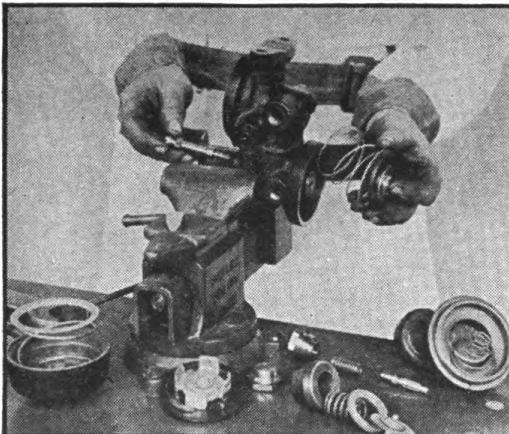
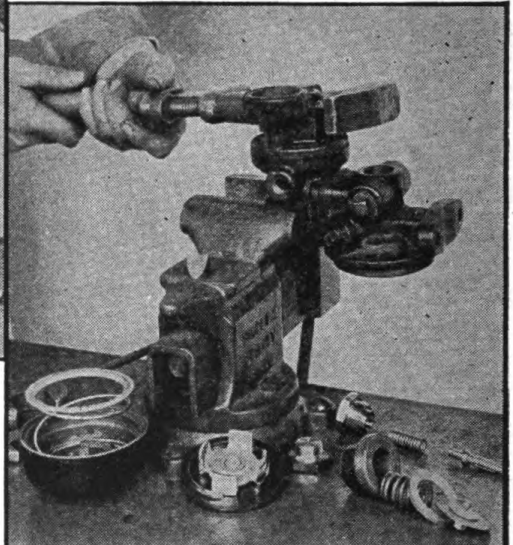


FIGURE 43. RELAY—EMERGENCY VALVE—VALVE STEM AND DIAPHRAGM

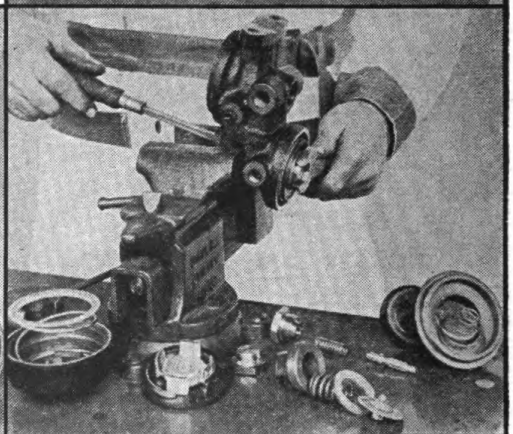


FIGURE 42. RELAY—EMERGENCY VALVE—REMOVING LOCK NUT FROM VALVE STEM

i. Leakage tests (Fig. 35).—(1) With brakes released, cover exhaust port with soap suds. Leakage is caused by supply valve (5) not seating properly.

(2) With brakes applied, cover exhaust port with soap suds. Leakage is caused by diaphragm (2) not seating properly.

j. Emergency feature tests (Fig. 35).—(1) With full pressure in the trailer reservoir, disconnect emergency line between tractor and trailer. Trailer brakes should apply automatically. This feature should be checked daily.

(2) Cover emergency line hose coupling at front of trailer with soap suds to check for leakage. Leakage is caused by diaphragm (10) not seating properly at (11).

(3) With valve still in emergency position, cover exhaust port with soap suds. Leakage in excess of that evident in test one is caused by valve (7) not seating properly.

When making leakage tests with soap suds, a 3-inch bubble in three seconds is permissible. Leakage may be caused by dirt on the valves, valve seats, diaphragms, or diaphragm seats and may be corrected by cleaning. It may also be caused by worn diaphragms, valves, or seats. Worn diaphragms should be replaced. Worn valves or valve seats may be reclaimed by grinding with Bendix-Westinghouse (Grade 1000) Grinding Compound unless the wear is excessive. If such procedure fails to correct the leakage, the valves and valve seats should be replaced or the complete assembly replaced with a repair exchange unit.

15. TUBING.—*a. Repair.*—When air line tubing becomes kinked or bent, cut out the damaged section and splice in a new one, using standard brass Westinghouse sleeve type $\frac{3}{8}$ " tube union.

16. HOSE COUPLING.—*a. Replacement of packing rings.*—Hose couplings are provided with rubber packing rings which act as gaskets to seal coupled hoses. In time, usually about a year, these become worn or distorted and should be replaced. Simply pry out the old packing rings and push in new ones.

Use of dummy hose couplers prevents the entrance of foreign matter into the braking system. They should be used whenever the hoses are not coupled.

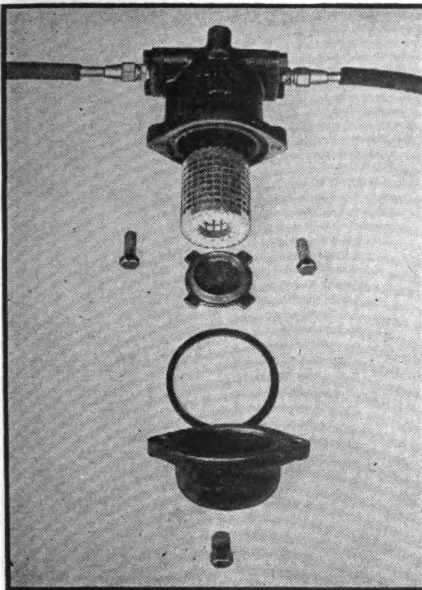


FIGURE 45. AIR FILTER—DISASSEMBLED.

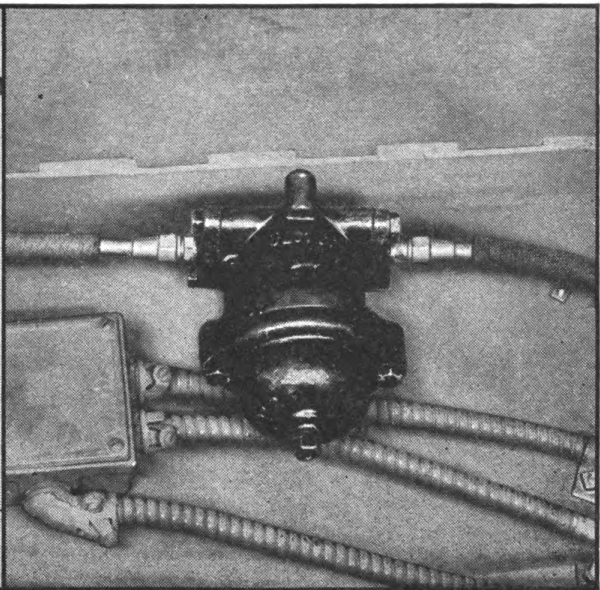


FIGURE 44. AIR FILTER.

17. AIR FILTER.—*a. Function* (Fig. 44).—Air filters are mounted on underside of semi-trailer main frame, toward rear of unit near axle, one filter in service line and one in emergency line. Filter is designed to remove dirt, water, and oil from air, thereby increasing the life of the functional parts of the emergency relay valve.

b. Maintenance.—No adjustments are necessary. However, filter should be drained every 2,000 miles. Draining of filter is accomplished by removing plug in bottom of filter. The filter should be disassembled and air cleaner washed in cleaning fluid every 5,000 miles.

c. Disassembly.—(1) Disconnect the lines leading into the filters. Remove the two bolts holding filter to bracket.

(2) Remove the two cap screws (1) holding cup (2) to upper section of filter. Tap down on cup, separating cup from upper section.

(3) Remove rubber gasket (3); remove cleaner seat (4) and pull out cleaner (5) (Fig. 45).

d. Reassembly.—Reassembly is in reverse of disassembly. When replacing rubber gasket be sure to insert it in the groove provided, in upper section.

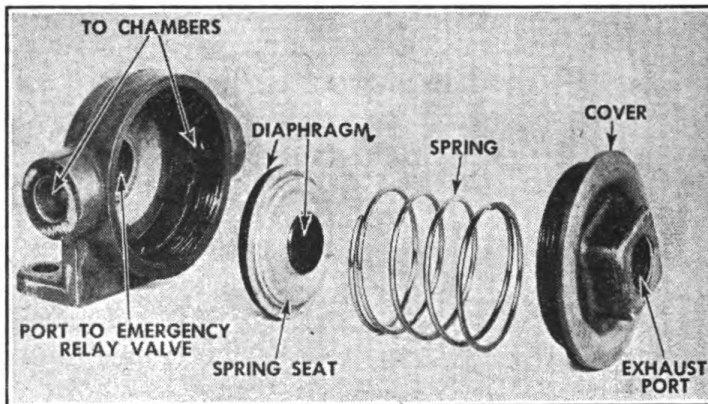


FIGURE 46. QUICK RELEASE VALVE.

18. QUICK RELEASE VALVE.—*a. Operation.*—(1) Quick release valve is mounted on dolly frame between the brake chambers.

(2) The quick release valve is operated by air pressure from the brake valve entering into the cavity above the diaphragm. As the air pressure enters this cavity it forces the exhaust seat of the diaphragm against the edges of the exhaust port, sealing the exhaust and permitting the air pressure from the brake valve to pass to the brake chambers. As the brake valve is released the air pressure and the force of the spring lift the diaphragm, removing the exhaust seat from the exhaust port and releasing the air pressure accumulated in the brake chambers to atmosphere.

b. Test for leakage.—Apply brakes, cover exhaust port (open only port on valve) with soap suds to detect leakage. A three-inch bubble every three seconds is permissible. Leakage is caused either by dirt on the diaphragm exhaust valve seat or by a worn exhaust valve seat. Dirt leakage may be remedied by cleaning the exhaust valve seat. However, if leakage is caused by a worn exhaust valve seat, replace entire valve assembly.

c. Disassembly.—This valve can be disassembled without removing unit from trailer. Screw off cover, remove spring and lift valve assembly out (Fig. 46).

19. **HAND PARKING BRAKE.**—*a. General.*—The hand parking brake is located on the right side of semi-trailer, ahead of the rear wheel. The brake is applied by pulling the lever toward the rear of the trailer.

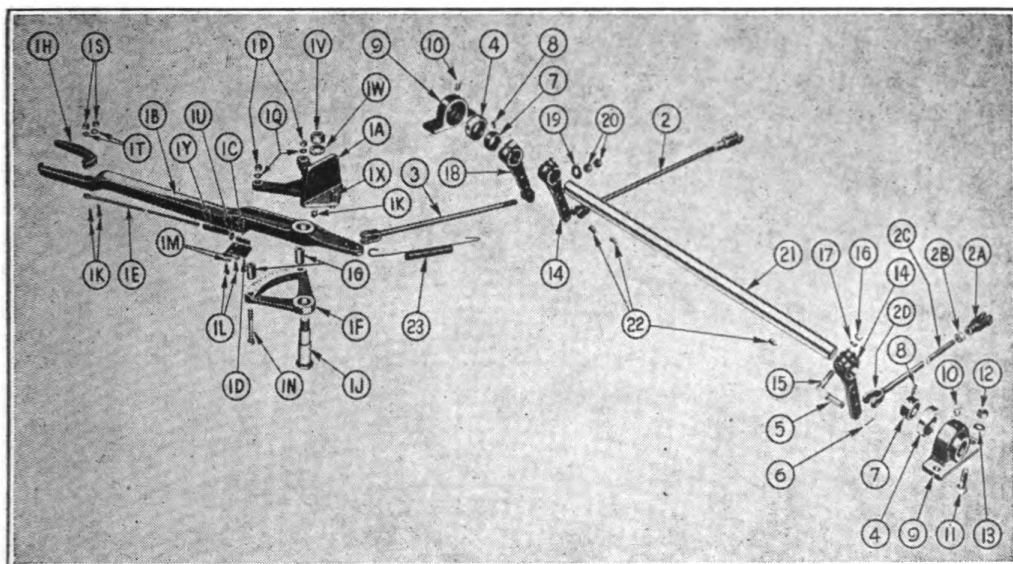


FIGURE 47. HAND PARKING BRAKE—EXPLODED.

20. **ADJUSTING HAND PARKING BRAKE** (Fig. 47).—*a.* Usually the hand parking brake requires little attention, the minor brake adjustment taking care of parking brake adjustments. However, when an adjustment is required, it consists, essentially, of shortening the brake rod.

b. Remove clevis pin in top hole of the slack adjuster arm.

c. Loosen clevis locknut (2B) on brake rod and turn clevis (2A) so as to shorten the rods about 1/4".

d. Install brake rod in the slack adjuster arm and turn wheels with the parking brake lever in "off" position to determine whether they still turn freely. Drag usually indicates that the brake rod has been shortened too much and should be adjusted accordingly.

e. Assuming that the wheel still turns freely, set the parking brake lever. If the wheels fail to hold firmly shorten the brake rod until they do.

21. **DISASSEMBLY OF CROSS SHAFT (Fig. 47).**—*a.* Disconnect the brake rods (2) and (2C) at the levers (14).

b. Remove nuts (20) from brake rod (3).

c. Remove the bolts (11) holding cross shaft journals (9) to frame, and lift the cross shaft assembly (21) out.

d. Loosen the three pinch bolts (15) in two levers (14) and (18).

e. Loosen set screws (8) in collars (7) and tap the two collars (7) and the three levers (14 and 18) off shaft (21).

22. **REASSEMBLY OF CROSS SHAFT (Fig. 47).**—*a.* Reassembly of cross shaft is in reverse of disassembly (paragraph 21, this section).

b. **NOTE:** It is very important that cross shaft works freely. Before coupling brake rods (2C, 2 and 3) test the operation of the cross shaft by moving the levers and cross shaft assembly forward and backward. If cross shaft binds, and a drag is felt, tap the journals (9) forward or backward until the cross shaft works freely.

c. Before installing brake rods, place a light film of grease on the clevis pins.

d. Lubricate the cross shaft journals (9).

e. Give brakes a minor adjustment (paragraph 2, this section).

23. **REMOVAL OF LEVER ASSEMBLY (Fig. 47).**—*a.* Disconnect brake rod (3) from lever (1B).

b. Remove the three bolts (1X), uncouple spring (23) and lift the assembly off frame.

24. **REPLACEMENT OF LEVER ASSEMBLY.**—*a.* Reverse removal instructions outlined in the preceding paragraph.

25. BRAKES.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE

PROBABLE REMEDY

a. Slow brake application.

- | | |
|--|---|
| <ul style="list-style-type: none"> (1) Low brake line pressure. (2) Bent rod in chamber or cylinder. (3) Excessive travel in chamber or cylinder push rod. (4) Restriction in line. (5) Leaking diaphragm in brake application chamber, or leaking cylinder. (6) Binding levers and slack adjuster. (7) Dirt under relay exhaust valve or diaphragm. (8) Dirty air filter. | <ul style="list-style-type: none"> (1) Check air pressure at tractor coupling ends. Air supply should not be less than 70 lbs. for proper application. (See tractor manual on maintenance for service procedure.) (2) Straighten or replace. (3) Give brakes minor adjustment. (4) Clean or replace tubing or hose. (5) Tighten chamber bolts or replace diaphragm. (6) Oil—loosen. (7) Clean relay valve diaphragm. (8) Clean. |
|--|---|

b. Slow brake release.

- | | |
|---|---|
| <ul style="list-style-type: none"> (1) Low brake line pressure also results from slow brake application. (2) Dirty air filter. (3) Brake valve lever on tractor not returning fully to stop. (4) Binding cam or binding slack adjuster or brake arm. (5) Brake chamber rod travel is excessive. (6) Restriction in tubing or hose. (7) Improper seating of valves and relay emergency valve. | <ul style="list-style-type: none"> (1) See tractor maintenance manual. (2) Clean. (3) Adjust operating rod. See tractor maintenance manual. (4) Lubricate and align properly. (5) Give brake adjustment. (6) Clean or replace. (7) Clean or replace valve with reconditioned unit. |
|---|---|

c. Emergency brake failing to hold.

- | | |
|---|---|
| <ul style="list-style-type: none"> (1) Dirt under emergency valve, diaphragm and emergency valve stem. | <ul style="list-style-type: none"> (1) Clean or replace emergency valve diaphragm or valve stem. |
|---|---|

d. No brakes on one or more wheels.

- | | |
|--|--|
| <ul style="list-style-type: none"> (1) Sheared key in brake lever on cross shaft. (2) Clevis pin out of levers or rods. (3) Broken cam shaft. (4) Out of adjustment. (5) Chamber diaphragm leaking. (6) Lining worn. | <ul style="list-style-type: none"> (1) Replace. (2) Replace. (3) Replace. (4) Adjust. (5) Replace diaphragm. (6) Reline. |
|--|--|

e. One or more brakes running hot.

- | | |
|---|---|
| <ul style="list-style-type: none"> (1) Return spring broken in hub. (2) Key sheared in brake lever. (3) Return spring missing on levers. (4) Rust on clevis and clevis pins. (5) Rusty anchor pin. (6) Hand brake not in complete off position. (7) Binding brake lever or rods. (8) Brake return spring worn. (9) Lever return springs loose, not enough tension. | <ul style="list-style-type: none"> (1) Replace. (2) Replace. (3) Replace. (4) Lubricate. (5) Lubricate. (6) Release. (7) Lubricate. (8) Replace. (9) Replace spring, or lengthen the distance between the two coupling points. |
|---|---|

SECTION IV

Coupler
(5th Wheel)

1. **GENERAL.**—THE FOLLOWING INSTRUCTIONS APPLY TO COUPLER MOUNTED ON DOLLY GEAR FRAME ONLY.

2. **REMOVAL** (Fig. 48).—Remove the bolts holding base and side brackets to mounting plate. Lift the coupler assembly off converter gear.

3. **REPLACEMENT.**—*a.* Replacement of coupler is in reverse of removal procedure.

b. **NOTE:** Before putting replacement coupler in use, spread a heavy film of grease over the embossed portion of coupler and work a little grease around the hook.

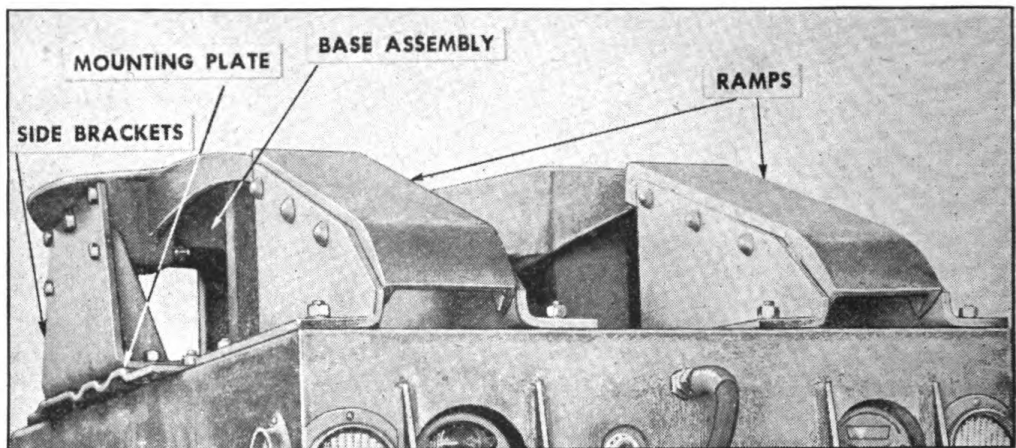


FIGURE 48. COUPLER REMOVAL—DOLLY.

4. **TESTING AND CORRECTING PLAY IN HOOK** (Fig. 49).—

a. **NOTE:** At times, difficulty may be encountered when uncoupling. This is no fault of the functional parts of the coupler. The trouble lies in the fact that the trailer king pin is binding on the hook. This is caused by the trailer and tractor being as far apart as possible without actually being uncoupled. All that is necessary to overcome the difficulty is to apply a light pull by hand on the hook handle prior to uncoupling.

b. If the hook pin (17) becomes worn, the coupler will develop an excessive “slap” and lost motion. The following repairs should then be made:

(1) **NOTE:** These repairs may be made with coupler attached to converter gear but as the coupler is easily removed, we recommend that it be taken off the converter gear and turned upside down, when performing these operations.

(2) **Hook** (Fig. 57).—(a) *Removal.*—1. Remove cotter pins (12 and 18) and nuts (11).

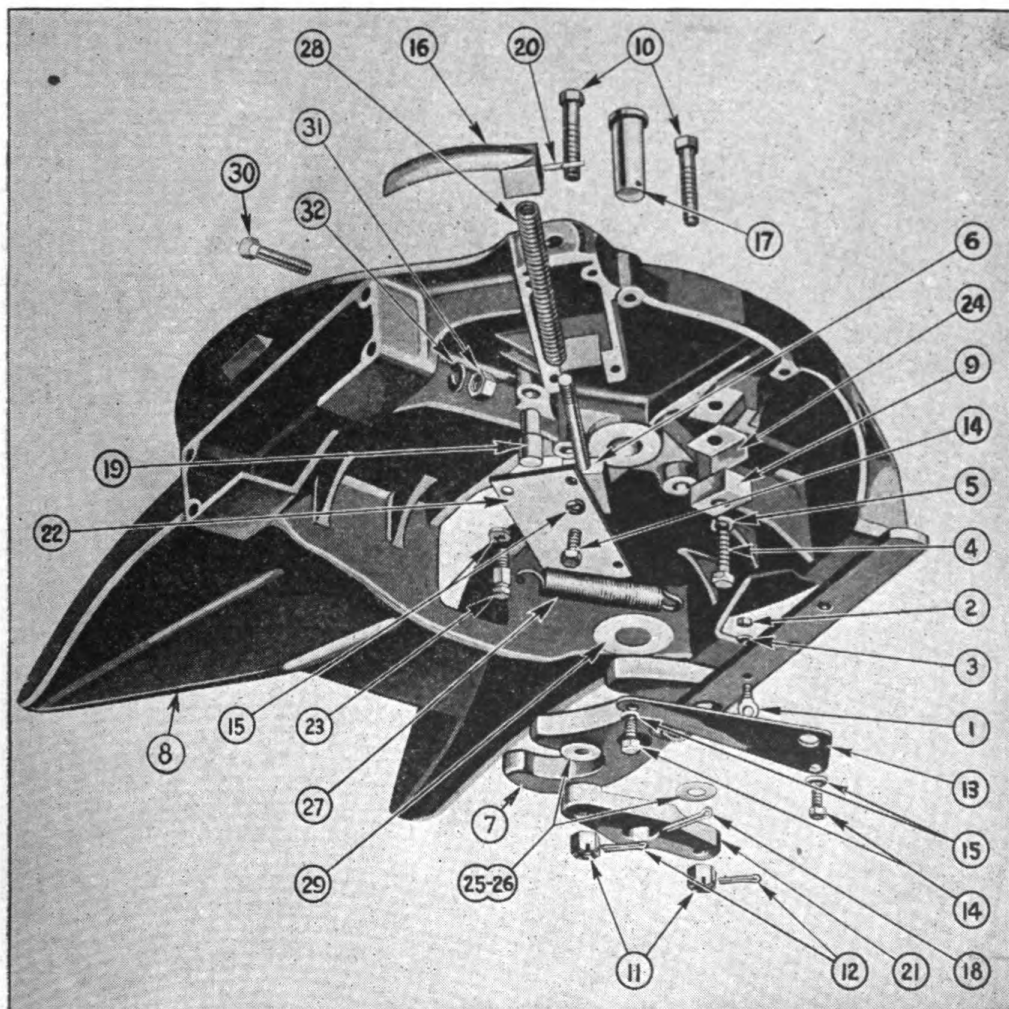


FIGURE 49. COUPLER—EXPLODED—DOLLY.

2. Pull the hook handle (16) out to the unlocked position.
3. Remove the two cap screws (14) and lift hook handle guide off coupler.
4. Uncouple spring (27) and remove eye bolt (1).
5. Lift the shims (25 and 26) off bolts (10) and lift the hook (7) out.

(b) *Replacement* (Fig. 57).—1. Place a light film of grease around pin (17), over washers (29), and on the surface of hook plate.

2. Place washers (29) over hook pin (17).
3. Place hook (7) over hook pin (17).
4. Place shims (25 and 26) over bolts (10).
5. Place hook plate (21) over hook pin (17) with the embossed surface down and install the two nuts (11) on the bolts (10).
6. Install the eye bolt (1) to hook handle (7).

7. Couple the spring (27) between the eye bolt in hook handle and special hook spring cap screw (23).

8. **CAUTION:** Test operation of hook. It should move freely without any up and down play. If the hook moves too freely and there is up and down play remove a shim (25 and 26). If hook binds add a shim on each of the bolts (10). After proper adjustment continue the reassembly.

9. Install the cotter key (18) through pin (17).

10. Install the two keys (12), place guide plate (13) in position, and tighten, using the two cap screws (14).

(c) *Installation of hook lock handle* (Fig. 49).—1. When performing this operation disconnect converter gear from trailer.

2. Remove the hook lock handle (16) by removing the drive pin (20) which holds it to the threaded lock stem (6).

3. Remove hook spring (27).

4. Remove the hook lock cover plate (22).

5. Put the hook (7) in "locked" position.

6. Pry down on the hook lock (6) and tap the end of the hook lock stem. The hook lock and lock spring (28) will come out.

7. When reassembling, the slanted or beveled part of the lock must be in toward the hook handle.

5. **COUPLER MOUNTED ON TOWING VEHICLE** (Fig. 50).—*a. General.*—Lower coupler (5th wheel) is of a semi-automatic universal type, equipped with two heavy coil springs (25) which hold 5th wheel base at a level position when disengaged from trailer.

Sidewise movement of the 5th wheel can be eliminated by adjustment of wedges (20) located under walking beam (26).

Fifth wheel is of all steel construction. Support bracket shaft (30) and lateral shaft (24) are machined and ground to accurate limits.

Lock is of the two-jaw (15 and 16) semi-automatic type which embraces entire surface of the king pin when locked.

Very little servicing is required by 5th wheel except for the usual lubrication.

6. **PLUNGER LOCK AND PLUNGER SPRING.**—*a. Removal.*—

(1) Remove cotter key and slotted nut from plunger stud (35).

(2) Lift plunger (32) and stud washer off stud.

(3) Pull plunger lock and spring assembly out of coupler base.

(4) Pull spring (34) off plunger shaft.

b. Replacement.—(1) Coat plunger shaft, plunger, and washer with a film of grease before reassembling.

(2) Rest of operation is a reversal of removal instructions (paragraph 2, this section).

7. **JAWS.**—*a. Removal.*—(1) Remove the two 1/4" cotter keys from jaw pins (3).

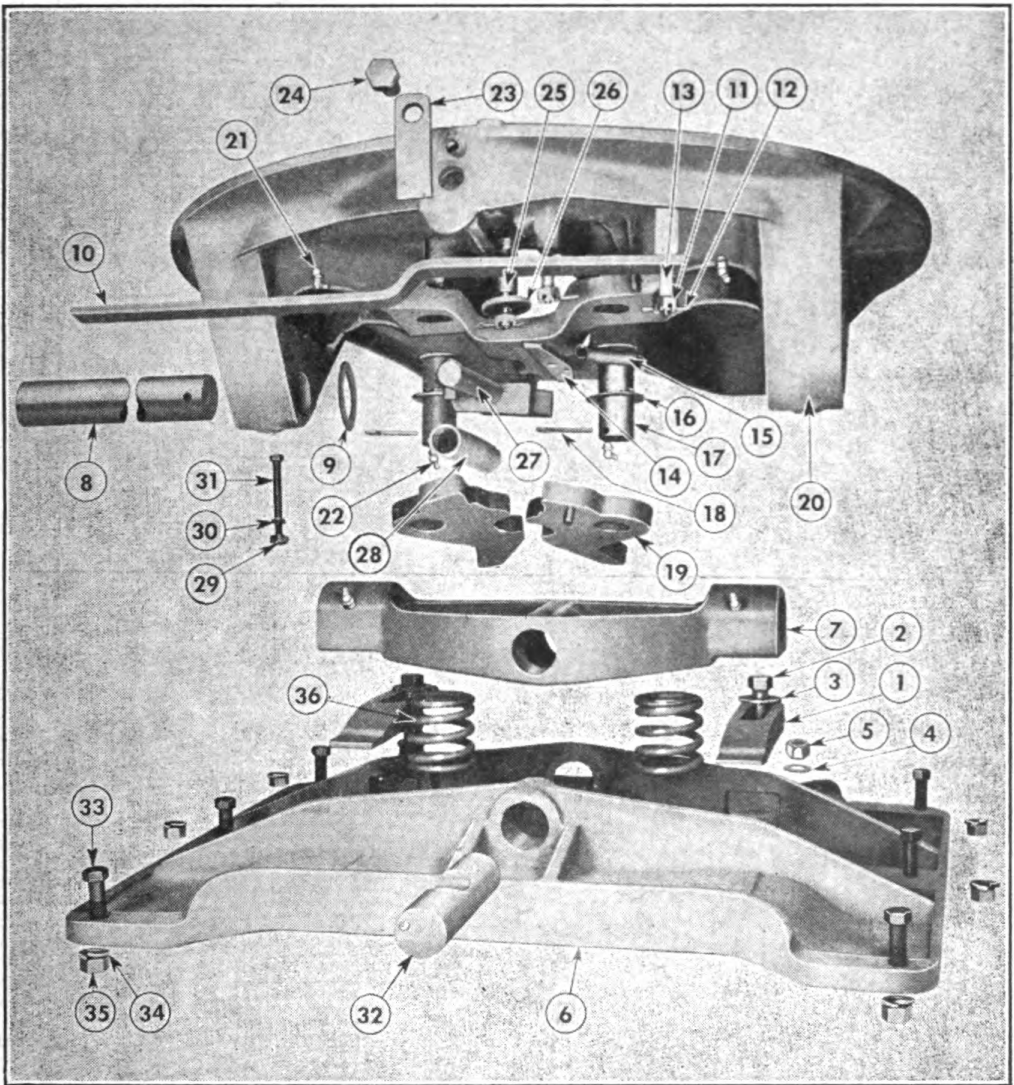


FIGURE 50. COUPLER—EXPLODED—TOWING VEHICLE.

- (2) Drive up on jaw pin.
- (3) Pull out jaws (15 and 16) and jaw pin washers (13).

b. Replacement.—(1) Coat bottom and top sides of jaws with grease.

(2) Make sure right and left-hand jaws are placed on proper sides. (Correct positions may be determined by posts which protrude from bottom of left hand side (15)).

(3) Rest of procedure is in reverse of removal instructions (paragraph 7, this section).

8. LEVELING SPRINGS.—*a. Removal.*—(1) Remove the eight bolts holding sub base to truck frame assembly.

(2) Hoist coupler off coupler mounting plate.

(3) Lift spring out of spring seats.

b. Replacement.—Procedure is a reversal of instructions for removal (paragraph 4, this section).

9. SUPPORT BRACKET SHAFT.—*a. Removal.*—(1) Remove the $\frac{3}{8}$ " bolt (29) from right side of walking beam.

(2) Drive the shaft (30) out, using a flat end bar and sledge hammer. (Flat end bar should be about $1\frac{1}{2}$ " in diameter.)

(3) NOTE: When driving out shaft care should be taken not to harm the shim washer (14). A bent shim washer will be difficult to reinstall. Shim washer installations may be found between walking beam (26) and base (5).

b. Replacement.—Reverse the procedure outlined in paragraph 9, this section.

c. NOTE: When reassembling there should be no side motion between base (5) and walking beam (26) as it will cause excessive wear of these two parts. If side play is detected, place more shim washers between base and walking beam.

10. LATERAL SHAFT.—*a. Removal.*—Remove the support bracket shaft as instructed in paragraph 9, this section, and drive shaft out.

b. Replacement.—Replacement of lateral shaft is a reversal of removal instructions (paragraph 9, this section).

c. NOTE: When installing lateral shaft be sure section milled out at center is at top, otherwise, support bracket shaft will not pass over lateral shaft.

11. FIFTH WHEEL MOUNTED ON TOWING VEHICLE.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
<i>a. Excessive end play.</i>	
(1) Worn jaws on jaw pins.	(1) Replace.
<i>b. Coupler not level.</i>	
(1) Leveling spring broken.	(1) Replace.
<i>c. Coupling difficulty.</i>	
(1) Bent jaws.	(1) Replace.
(2) Bent operating handle.	(2) Straighten.
(3) Lack of lubrication.	(3) Lubricate.
<i>d. Excessive up and down play.</i>	
(1) Worn support bracket shaft.	(1) Replace.
(2) Worn lateral shaft.	(2) Replace.
<i>e. Excessive side play.</i>	
(1) Worn shim washer.	(1) Replace and add more shims.

12. COUPLER MOUNTED ON DOLLY.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
<i>a. Excessive lash between coupler and trailer.</i>	
(1) Coupler hook or hook pin worn out.	(1) Replace.
(2) King pin worn.	(2) Replace.
<i>b. Excessive wear on coupler base.</i>	
(1) Coupler base scored and gouged.	(1) Check upper coupler for burrs in metal which may cause gouging. Grind smooth and lubricate.
<i>c. Coupler noisy.</i>	
(1) Loose mounting bolts or nuts.	(1) Check nuts (11 and 31), tighten.
<i>d. Semi-trailer whips.</i>	
(1) Loose coupler.	(1) Tighten mountings.

SECTION V

Electrical System—Lights

1. GENERAL.—a. The general electrical circuit diagram shown in Figs. 51 and 52 illustrates all of the electrical circuits used on this vehicle. With this diagram, the various circuits can be traced and wiring replacements made. All electrical units are shown in their relative positions. Each wire in the electrical system is of a distinctive color. A key to these colors will be found on the circuit diagram.

2. LOCATING TROUBLE.—a. Battery and wiring system of towing vehicle will not be discussed in this manual. Source of current

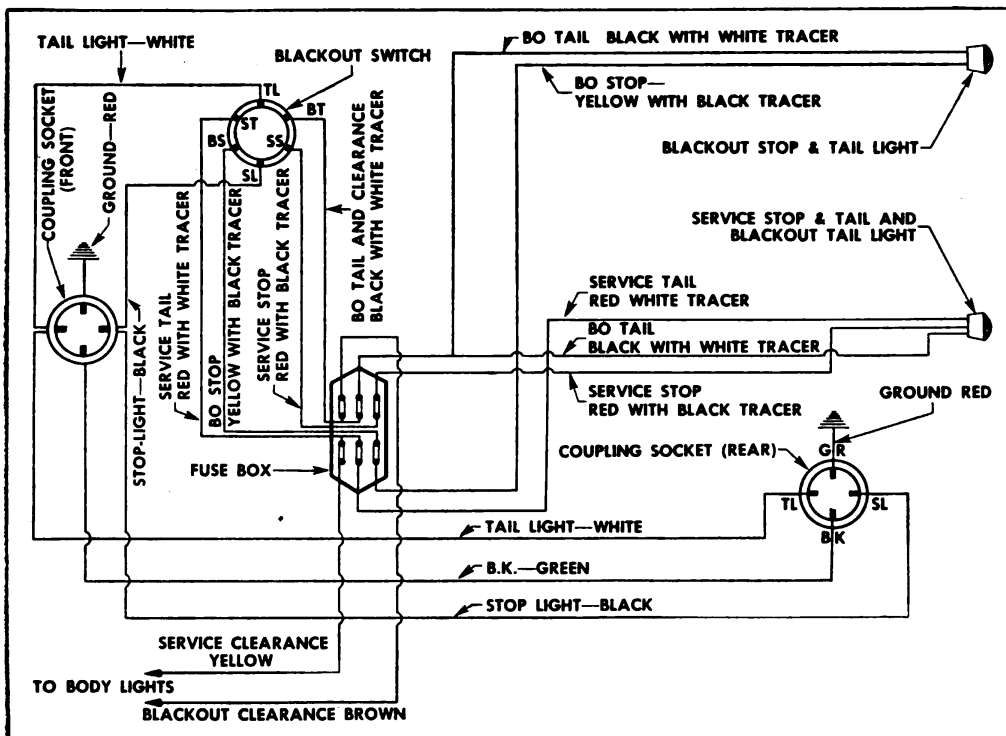


FIGURE 51. WIRING DIAGRAM—SEMI-TRAILER.

will hereafter be considered as being a jumper cable socket at rear of towing vehicle. Therefore, in locating trouble start at this socket. The fundamental principle of trouble shooting is the elimination of one possible source of trouble after another until the trouble has been localized.

b. As an example, turn the light switch to the “on” position. Place the foot brake in the “applied” position. With the use of a low reading voltmeter or a test light, test each light blade in socket at rear of towing vehicle. Assuming that there is a flow of current in each light blade, plug the jumper cable into the socket. Test the flow of current at the opposite end of jumper cable. If current flows through jumper cable it may be assumed the jumper cable is in good condition.

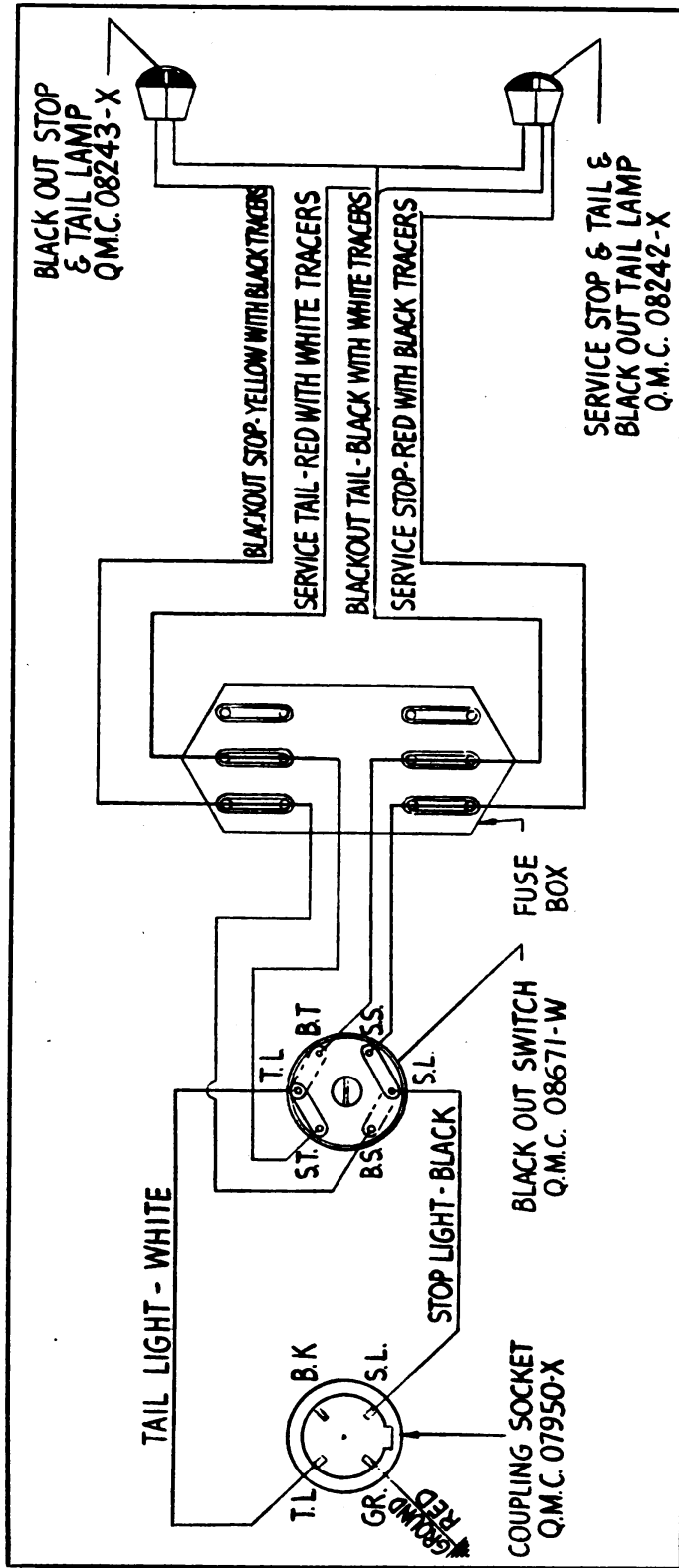


FIGURE 52. WIRING DIAGRAM—DOLLY.

c. Turn gear frame to the left as far as possible. This will give access to the rear of light socket. Remove the cap from the socket and test each light terminal. (Light terminals are marked “SL” for stop-light, “G” for ground, “TL” for taillight, and “BK” for brake.) Should current fail to flow through any of these terminals it indicates something is wrong in the socket or that particular blade of socket which leads to the terminal. If current flows through the socket it indicates socket is in good condition. Continue to make similar tests throughout the unit until source of trouble is located. Terminal marked “BK” is hot but not used, except where towing vehicle is equipped with an electric brake—hand or foot controller.

3. LIGHTS.—a. The lighting equipment on this semi-trailer includes four commercial clearance lights, four clearance blackout lights, one combination blackout stop and tail light, one combination service stop and tail light and blackout tail light.

b. The combination service stop and tail light and blackout tail light is mounted at the left hand rear of the trailer. The combination blackout stop and tail light is mounted at the right hand rear of the

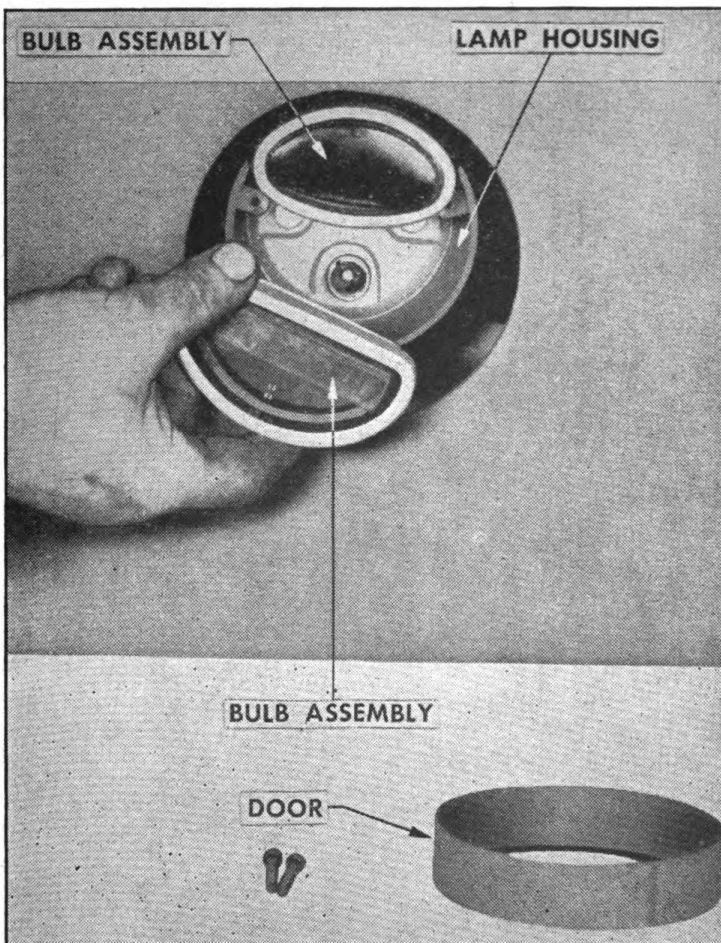


FIGURE 53. REPLACING BULB UNIT.

trailer. Dolly lights are the same as those on semi-trailer, except dolly is equipped with two blackout and standard clearance lights.

c. The lens on each blackout tail lamp is designed to produce two beams. This design is such that when one truck is following another truck at a specified safe distance, these two beams will merge into a single highly visible beam.

d. To insure the accuracy of construction necessary to produce this effect, the bulb is soldered to the lens retainer and the lens and filter are crimped to the retainer to form a complete unit. When the bulb is burned out, it is necessary to replace the complete bulb unit.

4. REPLACING BULB UNIT (Fig. 53).—a. Remove the two screws from lamp door.

b. Pull the door off lamp housing.

c. Pull bulb assembly out.

5. CLEARANCE LIGHTS DISASSEMBLY.—a. Turn the two screws holding lens housing to light assembly in a counter-clockwise direction until housing is free of assembly (Fig. 54).

b. Pull clip, which holds lens to housing, toward the outer edge of housing, and lift lens out (Fig. 55).

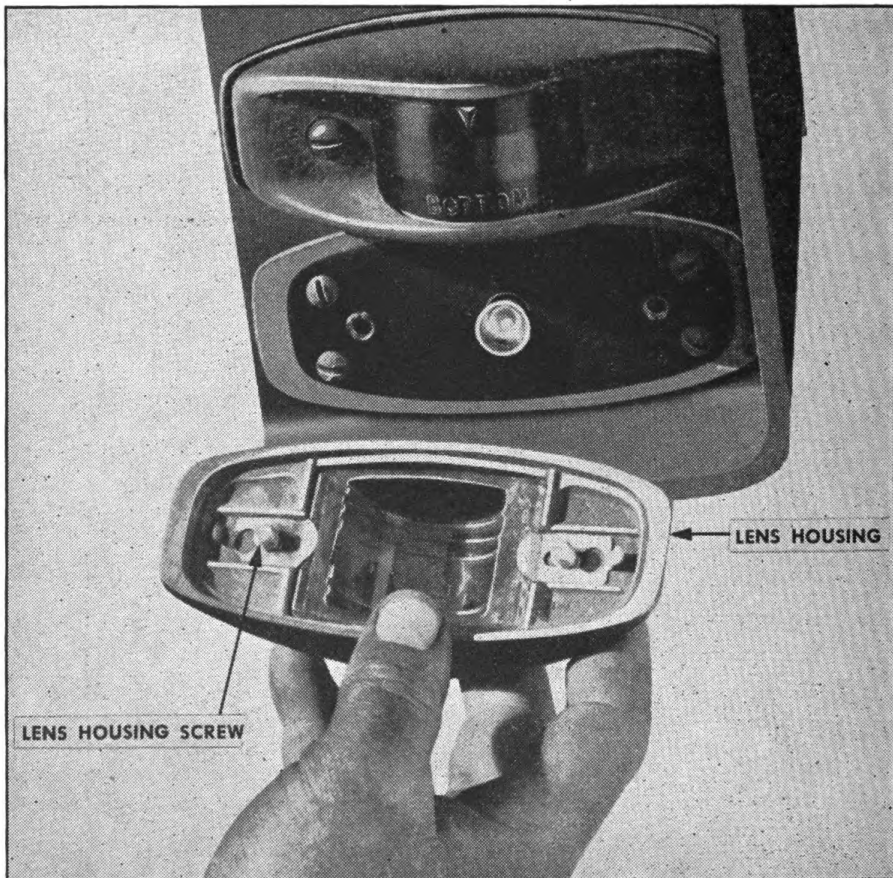


FIGURE 54. CLEARANCE LIGHTS—DISASSEMBLY, STEP 1.

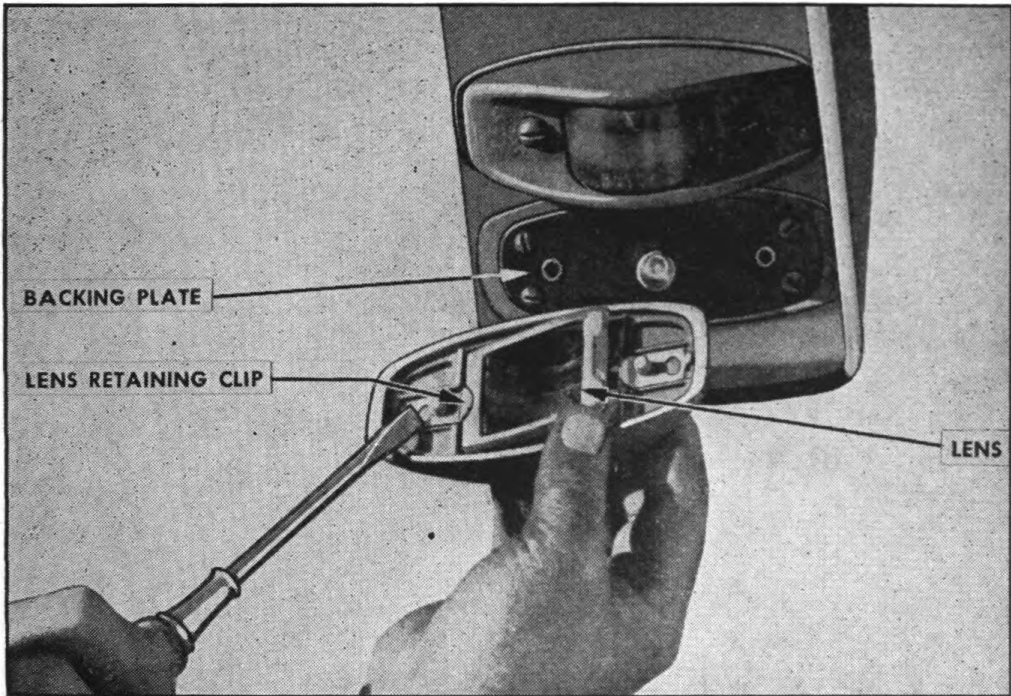


FIGURE 55. CLEARANCE LIGHTS—DISASSEMBLY, STEP 2.

c. Remove the four screws from plate (Fig. 55) and pull the assembly out of frame.

d. Disconnect the pigtail wire from main line, and separate the rubber gasket from plate (Fig. 56).

e. NOTE: Disassembly procedure for either blackout or standard clearance light is the same.

6. REASSEMBLY OF CLEARANCE LIGHTS.—a. Reassembly of clearance light is in reverse of removal procedure.

b. NOTE: When replacing lens in blackout light be sure the "arrow" on lens is pointing down and that the word "BOTTOM" is at the bottom of the light as shown in (Fig. 56).

7. BLACKOUT SWITCH.—a. The dolly blackout switch is located in rear crossmember (Fig. 3). Semi-trailer blackout switch is located in body panel at right front side (Fig. 4).

b. The switch is operated with a coin or screwdriver. It is either at a service or blackout light position. There is no "off" position. Flow of current is controlled by the light switch on the truck.

(1) Blackout switch removal.—(a) Remove nut on outside of switch which holds switch to frame.

(b) NOTE: Before removing wire from terminals mark wires for reassembly.

(c) Remove cover from back of assembly and remove nuts holding wires to terminals. Pull wires off and switch is free.

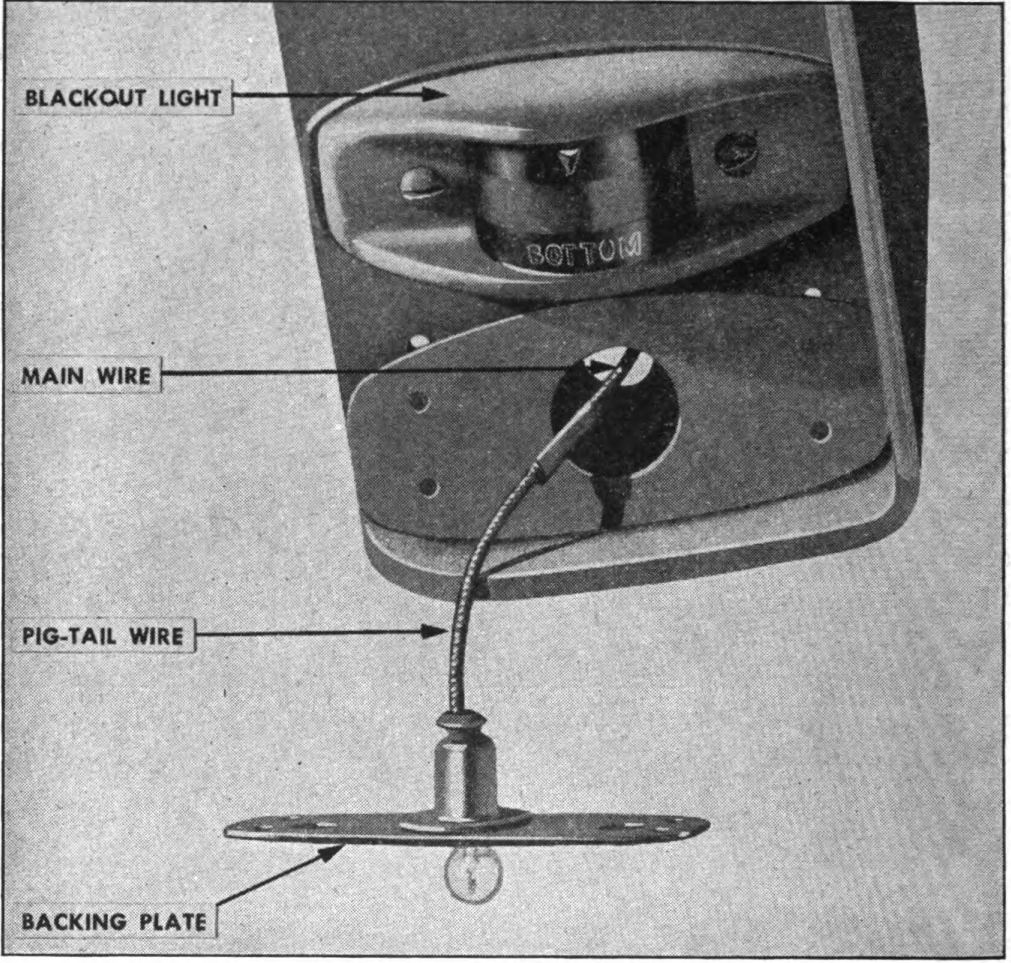


FIGURE 56. CLEARANCE LIGHTS—DISASSEMBLY, STEP 3.

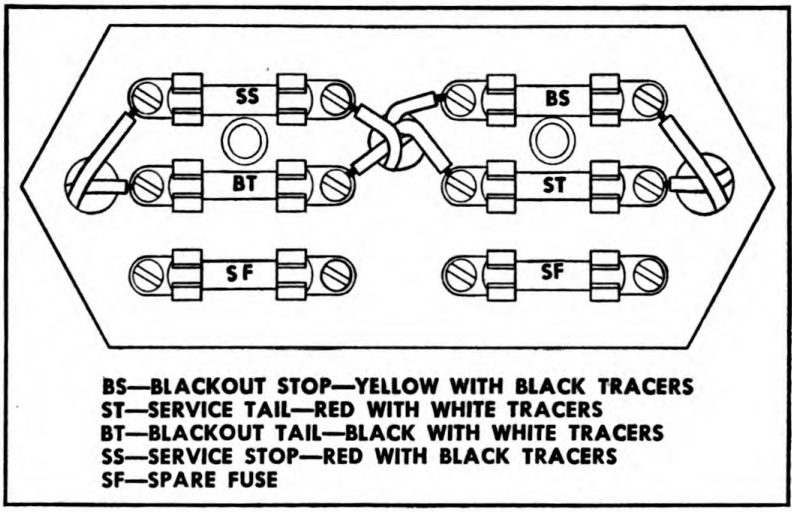


FIGURE 57. FUSE PANEL—DOLLY.

8. FUSE PANEL.—*a.* The dolly fuse panel is located on the rear crossmember. Semi-trailer fuse panel is located at left side on main frame member toward front. The panel is protected by a steel box cover, held to the panel by two wing nuts. Fuses are of 1½ amperes capacity.

b. Figures 57 and 58 illustrate fuse panel diagrams, with each wire marked as to color and purpose.

9. LIGHTS.—Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE	PROBABLE REMEDY
<i>a. No lights.</i>	
(1) Jumper cable not connected at socket of towing vehicle or trailer.	(1) Connect jumper cable.
(2) Jumper cable partly broken.	(2) Repair—replace.
(3) Defective wiring.	(3) Check wiring with voltmeter as instructed in paragraph 2, this section.
<i>b. One or more lamps not burning.</i>	
(1) Lamps burned out.	(1) Replace lamp.
(2) Defective wiring.	(2) Check wiring with voltmeter as instructed in paragraph 2, this section.
(3) Corroded blades in socket or jumper cable.	(3) Clean, using fine emery cloth.
<i>c. Dim lights.</i>	
(1) Dirty lens.	(1) Clean.
(2) Corroded blades in socket or jumper cable.	(2) Clean, using fine emery cloth.
(3) Wrong lamps.	(3) Replace—should be 6-8 volt.
(4) Lamp damaged.	(4) Tape—replace.
(5) Lamp loose in its socket.	(5) Tighten.
<i>d. Lamps flicker.</i>	
(1) Insulation damaged.	(1) Tape or replace wiring.
(2) Wire broken or partly broken.	(2) Tape or replace wiring.
(3) Lamp loose in its socket.	(3) With pair of pliers make socket diameter smaller.

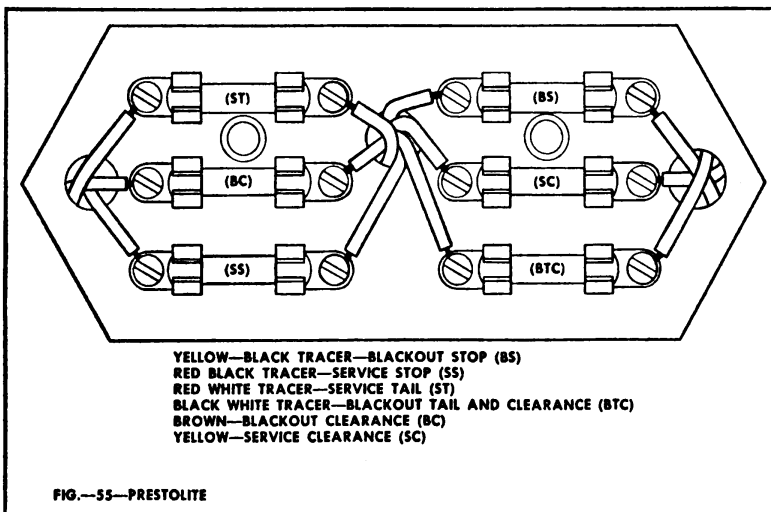


FIGURE 58. FUSE PANEL—SEMI-TRAILER.

SECTION VI

Frame and "Riveted and Bolted to Frame" Parts

1. **GENERAL.**—Due to the exceptionally rugged design of the frame used in this unit, very little attention is required to maintain its dependability. However, trailers which have been in a collision, upset or accident of a major nature may have bent or twisted crossmembers which will require attention.

2. **REMOVAL OF RIVETS.**—*a.* There are three methods of rivet removal which may be followed when servicing this unit: Drilling, cold cut and sledge hammer method, or acetylene torch method.

b. Three sizes of rivets ($\frac{1}{2}$ " , $\frac{5}{8}$ " , $\frac{3}{4}$ ") made up in several lengths are used on this unit.

c. **NOTE:** If riveting facilities are not available bolts may be used provided they are the proper size. When determining the size of the bolt to be used it will be well to remember that it should not be the same size as the rivet it replaces. For example, a $\frac{1}{2}$ " rivet would be used in a $1\frac{7}{32}$ " hole. Before a bolt can be used in the same hole the hole should be reamed to $\frac{9}{16}$ " and a $\frac{9}{16}$ " bolt should be used. The reason for this is that a bolt requires a tight fit. Do not bolt king pin. Use rivets. (See paragraph 8, Sub. paragraph C.)

d. **Drilling method.**—(1) Place a heavy center punch mark in center of rivet head.

(2) Drill a $\frac{1}{4}$ " hole through the rivet. (This hole may then be used as a pilot hole.)

(3) If rivet is $\frac{1}{2}$ " in diameter use a $1\frac{7}{32}$ " drill and finish drilling the rivet out. For a $\frac{5}{8}$ " rivet use a $2\frac{1}{32}$ " drill. For a $\frac{3}{4}$ " rivet use a $2\frac{5}{32}$ " drill.

e. **Cold cut method.**—(1) Cut head of rivet off with a cold cut chisel and sledge hammer.

(2) Drive the rivet out with a punch and sledge hammer.

f. **Acetylene cutting torch method.**—(1) Cut outer heads of rivets off with an acetylene cutting torch equipped with a No. 2 cutting tip.

(2) Drive the rivets out with a heavy punch and hammer.

(3) **NOTE:** If rivet is stuck in the hole and will not come out, do not try to force it out as the metal around it may become bent and damaged. Instead, cut the inner head off and blow the remainder of the rivet through. Clean slag out with a $\frac{3}{8}$ " long tapered punch.

(4) **CAUTION:** When blowing through a rivet do not hold torch too close to the metal as heat will back up and cause the tip to become over-heated and damaged.

(5) If difficulty is encountered when blowing the rivet through from one side then it should be blown from both sides.

3. **STRAIGHTENING BENT FRAME MEMBERS.**—*a.* Frame members may be straightened through the use of heavy I-beam, jacks and chains. The use of heat is recommended provided the metal is not

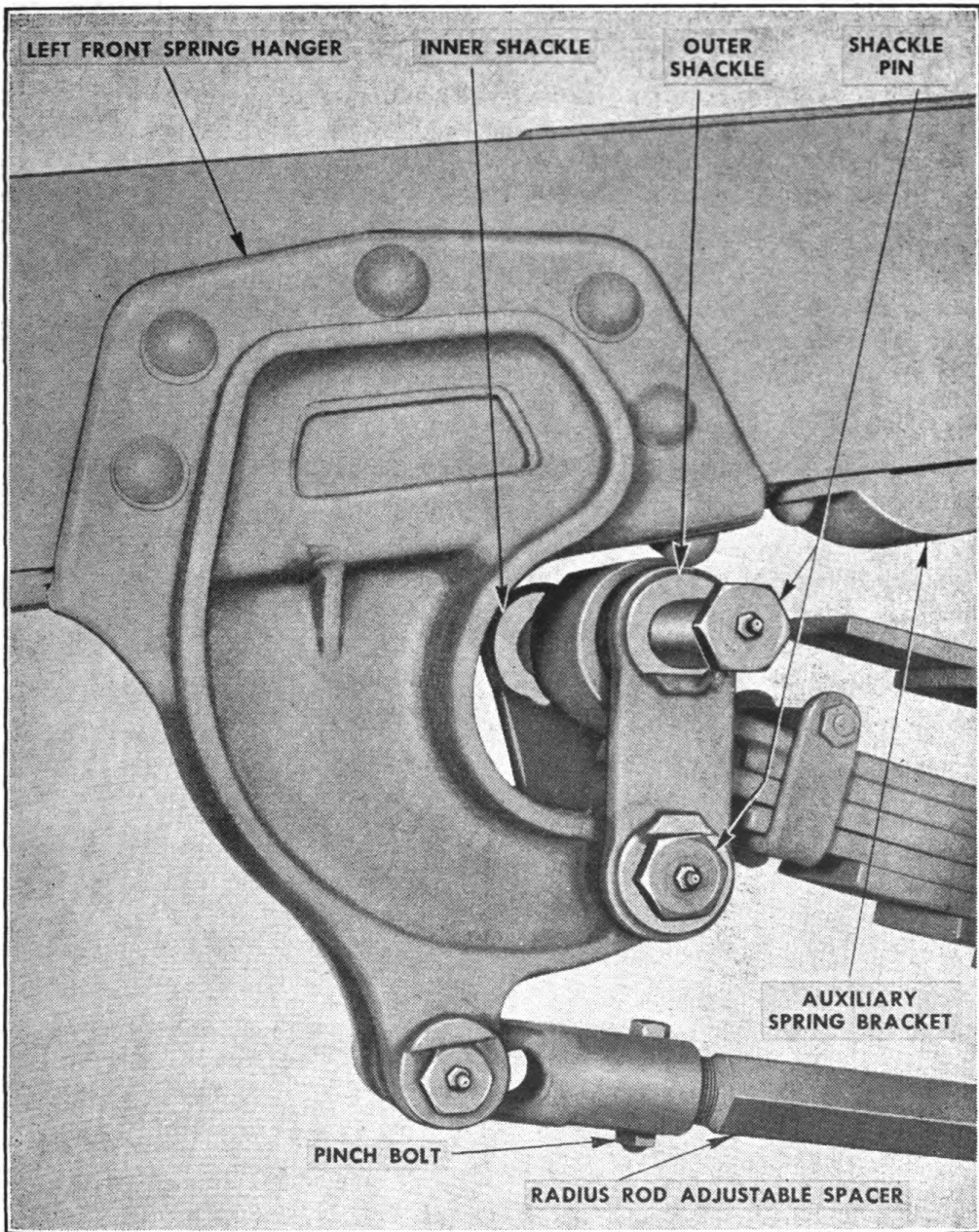


FIGURE 59. HANGER—DOLLY.

heated to an extreme. Do not concentrate heat in a short space, spread it out. Heat only to a dull red. Extreme heat weakens the structural characteristics of the frame members.

4. REPLACING FRAME MEMBERS.—Severely bent and twisted members should be cut out and replaced.

5. REPAIRING SECTION OF A MEMBER.—*a.* Cut across the outside of the damaged section at a 30 degree angle, insert the splice

section, and arc weld. By cutting at a 30 degree angle the cut and weld are distributed over a greater area, the result is a stronger weld.

b. Back up all spliced joints with a plate or channel reinforcement extending about 6" on each side of the joint on the inner side of the channel. Put one 1" diameter hole in every four square inches of space on the splice plate or channel. These holes are to be used for plug welding.

c. Whenever possible, all section splices and reinforcements should be arc welded. This method is recommended for all frame repairs. One inch plug welding hole should be welded solid with bare welding rod. For the remainder of the welding use a coated rod.

6. REMOVAL OF HANGERS-DOLLY (Fig. 59):—a. NOTE. When replacing spring hangers or auxiliary spring brackets disconnect dolly from semi-trailer.

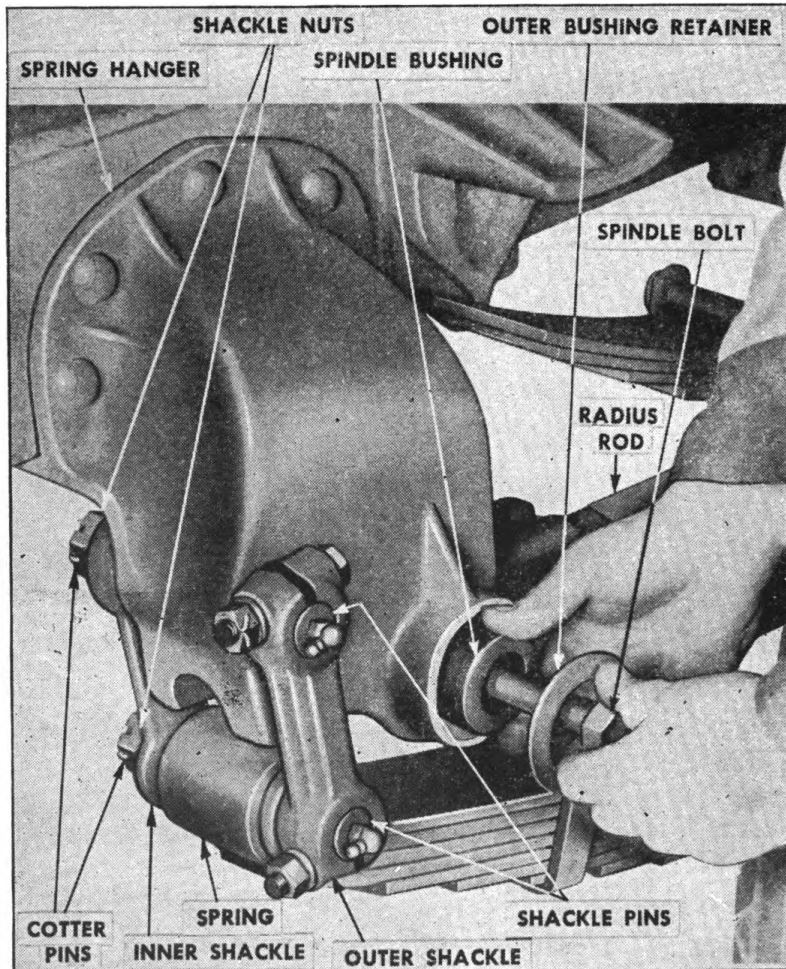


FIGURE 60. HANGER—SEMI-TRAILER

b. Removal, rear spring hanger.—Removal procedure for rear spring hanger is identical to that of front spring hanger except that there is no radius rod to be removed.

c. Removal, front hanger (Fig. 59).—(1) Remove outer and inner wheels on both sides. With wheels removed the hanger is much more easily worked on, especially when rivets are being driven.

(2) Turn gear over and rest it on three horses; two at rear lengthwise and one at front, crosswise of frame.

(3) Disconnect radius rod at front end only.

(4) Place a jack between frame and axle to hold weight of the spring off hanger.

(5) *Remove rivets.*—*a.* (See paragraph 2, this section.) It is recommended that rivets be used on dolly spring hangers.

(6) NOTE: See paragraph 7, sub-paragraph 8, this section for general riveting instructions.

(7) NOTE: After front spring hanger has been replaced, it is necessary to check axle alignment (Paragraph 6, section II).

7. SPRING HANGERS—SEMI-TRAILER (Fig. 60).—*a.* NOTE: When replacing spring hangers or auxiliary spring brackets it is not necessary to disconnect dolly from semi-trailer.

b. Removal, rear spring hanger.—Removal procedure for rear spring hanger is identical to that of front spring hanger except that there is no radius rod to be removed.

c. Removal, front hanger (Fig. 60).—(1) Remove outer and inner wheels on both sides. With wheels removed the hanger is much more easily worked on, especially when rivets are being driven.

(2) Disconnect radius rod at front end only (Fig. 61).

(3) Remove inner shackle and drive upper and lower shackle bolt out as an assembly (Fig. 61).

(4) Place a jack between frame and axle to hold weight of the spring off hanger.

(5) *Removing rivets.*—(a) Using an acetylene torch, with a No. 2 cutting tip, cut inner and outer heads off rivets.

(b) NOTE: Do not attempt to drive rivets out with a punch; but blow through the remaining portion, thus cleaning the hole.

(c) Clean the slag out of the holes using a $\frac{3}{8}$ " long tapered punch and a hammer.

(d) Tap spring hanger off frame with a hammer.

(6) NOTE: Rear hangers are interchangeable from right to left. Front hangers come in right and left hand and are not interchangeable. Before installing, check to make certain hanger is mounted properly by checking with Fig. 60 which illustrates left hand front hanger.

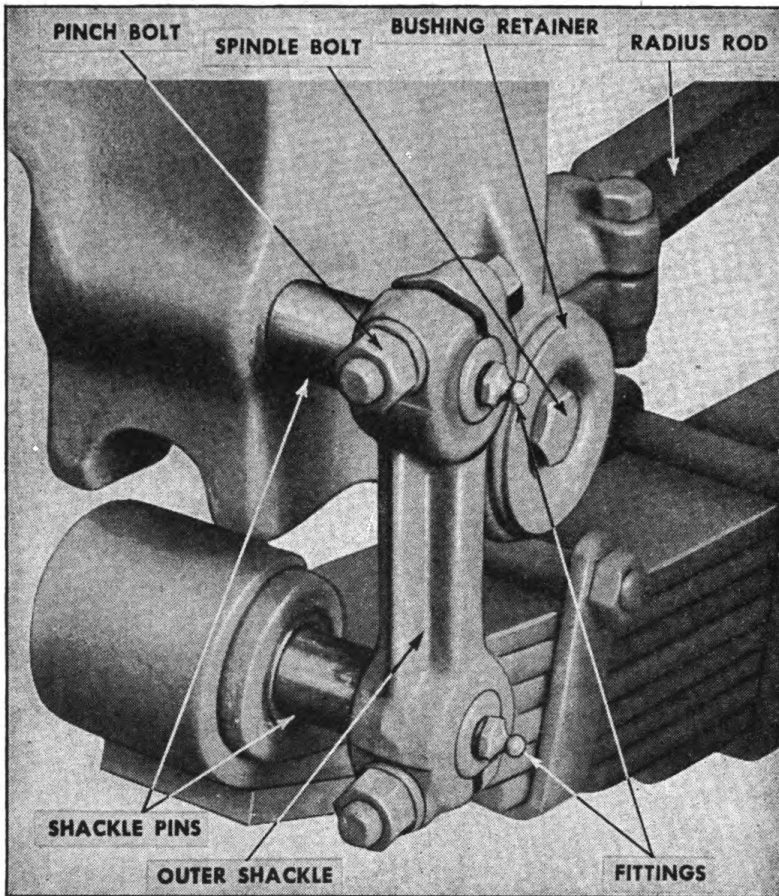


FIGURE 61. REMOVING SHACKLE AND PIN ASSEMBLY.

(7) *Bolting and reaming.*—(a) Bolt the replacement hanger into position, using three $\frac{1}{2}$ " bolts. Place one bolt in the center of vertical hole and the other two in the second hole from the top at each side of hanger. Draw these bolts up tight, and check to make certain spring hanger is up tight against frame.

(b) Ream the five open holes with a $1\frac{7}{32}$ " tapered reamer.

(8) *Riveting.*—(a) CAUTION: When driving rivets drive the vertical ones first.

(b) NOTE: If riveting hammer is not available ream holes to $\frac{9}{16}$ " and use $\frac{9}{16}$ " bolts and lockwashers.

(c) When riveting, hot rivets should be used as they can be properly driven with air hammer and bucking bars. Length of rivet to be used depends on condition or oversize of the hole to be used and thickness of pieces to be riveted. Condition of the riveting jack is also a factor. Ordinarily, $1\frac{1}{8}$ " stock, projecting past the surface of the part

RIVET CHART

<i>Part</i>	<i>Dia.</i>	<i>Lgth.</i>	<i>Type</i>	<i>Remarks</i>	<i>Quan.</i>
King Pin	1/2"	1 3/8"	RH	Drive, using flush riveting jack	6
Front and Rear Dolly Spring Hanger	3/4"	2 1/2"	RH	Vertical holes	2
	3/4"	2 1/8"	RH	Horizontal holes	3
	3/4"	2 1/2"	RH	Horizontal holes at crossmember	2
Dolly Coupler Hook Lock Handle	1/2"	1 5/8"	RH		
Support Bracket	1/2"	1 5/8"	RH	Horizontal holes through bracket at gusset	2
	1/2"	1 3/4"	RH	Horizontal holes	1
	1/2"	1 7/8"	RH	Vertical holes	2
Front Semi-Trailer Spring Hanger	1/2"	1 5/8"	RH	Horizontal holes	1
	1/2"	1 3/4"	RH	Vertical holes	1
	1/2"	1 7/8"	RH	Horizontal at cross-member	4
	1/2"	2"	RH	Vertical at crossmember	2
Sub Frame Crossmember	1/2"	1 1/2"	RH		4
Drawbar Eye	5/8"	3 1/2"	RH		7
Dolly Auxiliary Spring Bracket	1/2"	1 3/4"	RH		2
Semi-Trailer Auxiliary Spring Bracket	1/2"	1 3/4"	RH		3
Rear Semi-Trailer Spring Hanger	1/2"	1 5/8"	RH	Horizontal holes	2
	1/2"	1 3/4"	RH	Horizontal holes at cross-member	2
	1/2"	2"	RH	Vertical holes at cross-member	2

FIGURE 62

to be riveted is sufficient on all 1/2" rivets. As stated before, the 1 1/8" stock should be sufficient for a proper head. However, if a collar forms on the first rivet as it is being driven, this indicates that the rivet is too long. The remaining rivets should be shortened by 1/8". If the rivet has a head that is not full and down, it is too short and 1/2" should be added to the remainder to be driven.

(d) Before making any changes in length of rivets inspect the inner heads to make sure bucking has been done properly. See that rivet head is snug all around. See Figure 62 for rivet size.

(9) NOTE: Whenever front spring hanger has been replaced check axle alignment (paragraph 4, section II).

8. KING PIN.—a. King pin is riveted to upper 5th wheel plate on semi-trailer. Coupler on towing vehicle engages this pin; all pulling is done directly from this point (king pin). King pin is riveted in with six 1/2" rivets.

b. Removal.—(1) Uncouple dolly from semi-trailer.

(2) Cut a 7" x 7" hole in floor of trailer directly above king pin.

(3) **CAUTION:** When cutting off or driving these rivets, guard against fire, clean all wood chips out of upper coupler prior to using cutting torch. Have someone stand by hole in floor to act in the event of fire.

(4) Cut out the six rivet heads from counter-sunk using acetylene cutting torch.

(5) With heavy sledge hammer drive up on king pin, and remove it through hole in floor.

c. Replacement.—(1) Clean all slag, grease and other foreign matter from the top of the upper 5th wheel plate next to the king pin hole.

(2) Install king pin through hole with small flange extending out through under side of trailer.

(3) Revolve king pin slowly in king pin hole until rivet holes in king pin and rivet holes in upper 5th wheel plate are in alignment.

(4) Install two $\frac{1}{2}$ " bolts, opposite each other, and tighten.

(5) Ream the four open holes to $1\frac{7}{32}$ " diameter.

(6) Drive four rivets, bucking them through hole in floor (paragraph 7, sub-paragraph (d), this section).

(7) Remove two bolts, ream holes to $1\frac{7}{32}$ " diameter, and continue driving rivets.

(8) Grind countersunk side of rivets flush with 5th wheel plate.

(9) Make a steel plate $\frac{1}{8}$ " x $8\frac{1}{2}$ " x $8\frac{1}{2}$ ", and install plate over king pin hole using eight flat head screws.

9. **DRAWBAR EYE.**—*a. Replacement* (Fig. 63).—Remove drawbar by simply removing the two bolts holding drawbar to drawbar frame bracket.

b. Cut off rivet heads from under side of drawbar using acetylene cutting torch.

c. Place drawbar across anvil with bottom side up.

d. Do not attempt to drive rivets out with punch, rather drive down on the eye using heavy sledge hammer.

e. Bolt replacement eye in position using two $\frac{5}{8}$ " bolts and ream open holes to $2\frac{1}{32}$ ".

f. Drive five rivets, using an offset bucking bar.

g. Remove two bolts and continue driving rivets.

10. **REPLACING AND REPAIRING SAFETY CHAINS** (Fig. 63).—*a.* Safety chains are held to the front crossmember with eye bolts. By removing weld from inner side of eye bolt with an acetylene cutting torch, a complete safety chain can be replaced.

b. Bent hooks can be heated and bent back to their natural shape. Hooks can be replaced by cutting the link next to the hook and by using a $\frac{1}{2}$ " cold shut link. Any part of the chain can be spliced, or links replaced through the use of cold shut links. Whenever cold shut links are used, the open ends should be clamped together and welded.

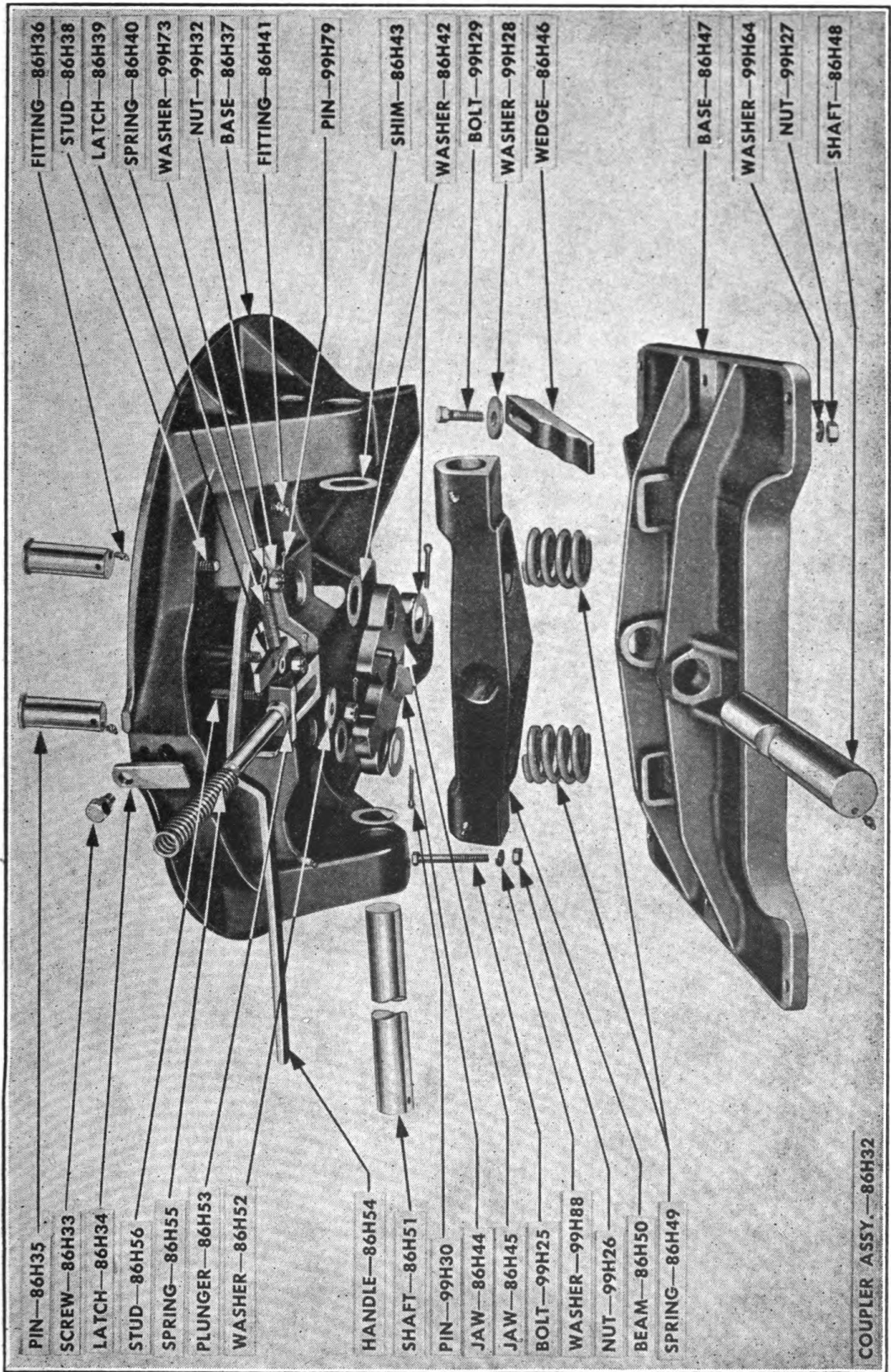


FIGURE 63. DRAWBAR.

SECTION VII

Body

1. GENERAL.—*a.* Framework of body of this unit is of all-welded tubular steel construction welded integral with chassis. Steel outer panels, phenaloid lining and fibre-glass insulation are its other major parts.

b. Body repairs should be attempted only by experienced body mechanics working with proper tools. No attempt will be made here to detail the various operations incident to all types of body repair, inasmuch as practically all body repairs arise from accidental causes, and very few accidents are identical.

c. However, there are a few tips which will prove helpful even to the experienced mechanic. These are included here.

2. BODY FRAMEWORK.—*a.* As mentioned before body framework is of tubular truss all-welded construction. Slightly bent or bowed tubing can be straightened without impairing strength of the unit.

b. Crushed or twisted tubing must be replaced. Cut out damaged tubing at closest undamaged weld point and replace with new. When fitting new tubing, cut to a very close fit. This will insure strongest possible weld joint. If it becomes necessary to butt two pieces of tubing together, reinforce weld with two pieces of $\frac{1}{8}$ " x $1\frac{1}{4}$ " x 3" hi-tensile steel plate welded across the joint on both sides of tube.

3. BODY PANELS.—Minor body dings may be worked out of panels in much the same manner in which they are removed from truck bodies, by removing plywood lining. Major dings will require removal of panel from unit.

4. ROOF REPAIRS.—*a.* *Repairing small holes.*—Roof sections need not be replaced.

(1) Screw a galvanized steel patch, with a lap of 3" over hole using round headed metal screws.

(2) Screw into place at 1" intervals around patch, 1" from edge. A thin layer of caulking compound directly under each screw will seal against water.

(3) Solder around edge of patch to complete seal.

b. Replacing damaged sections.—Even when damage is severe only that portion of roof which actually requires it need be replaced, inasmuch as roof is built up in sections locked together by coin-pressed seams.

(1) Remove drip molding around damaged section.

(2) Pull nails holding damaged section to body plus three sections on either side. Freeing additional sections provides more working room, prevents roof panel kinking while replacements are being made.

(3) Using pliers and screwdriver open coin-pressed seams holding damaged roof sections in place.

(4) With a piece of 4" channel steel under joint from end to end, put new sections into place and seal up seam. Use a rubber mallet working against a piece of oak or similar hard wood.

5. COMPLETE BODY REPLACEMENT.—This is a major operation and should only be attempted in completely equipped repair stations. Often, order of assembly is the key to efficient repair. It is with this thought that the information which follows is included. It should also prove helpful in replacement of major body units.

a. *Body assembly procedure.*—(1) Weld tubular side frame assemblies to rub rail of base frame.

(2) Weld tubular front end assembly to base frame and side frame assemblies.

(3) Bolt roof assembly to body side frame using a 1" wood filler between the two.

(4) Screw plywood to inner side of roof.

(5) Install wood vent frames.

(6) Bolt down tongue and grooved flooring.

(7) Install rear body opening frame assembly with hardware.

(8) Install anti-rattle paper on outside of tubing.

(9) Install insulating paper.

(10) Nail outer steel panels, after painting their inner surfaces, in the following order:

(a) Front lower.

(b) Front upper.

(c) Side lower panels.

(d) Side upper panels.

(11) Install insulation between roof bows.

(12) Install rear roof cap.

(13) Stretch roof on and nail down.

(14) Using a caulking gun, make weather tight all joints.

(15) Install a band iron to lap joint between roof and rear roof cap.

(16) Nail front roof cap on.

(17) Install a band iron to lap joint between roof and front roof cap.

(18) Screw drip molding on.

(19) Working from inside, cut out window holes.

(20) Paint and install molding retainers.

(21) Install window frames and windows.

(22) Install snap-on molding.

(23) Install fiber-glass insulation between body frame tubing and put in phenaloid lining over insulation paper.

(24) Install doors.

(25) Clean.

(26) Paint.

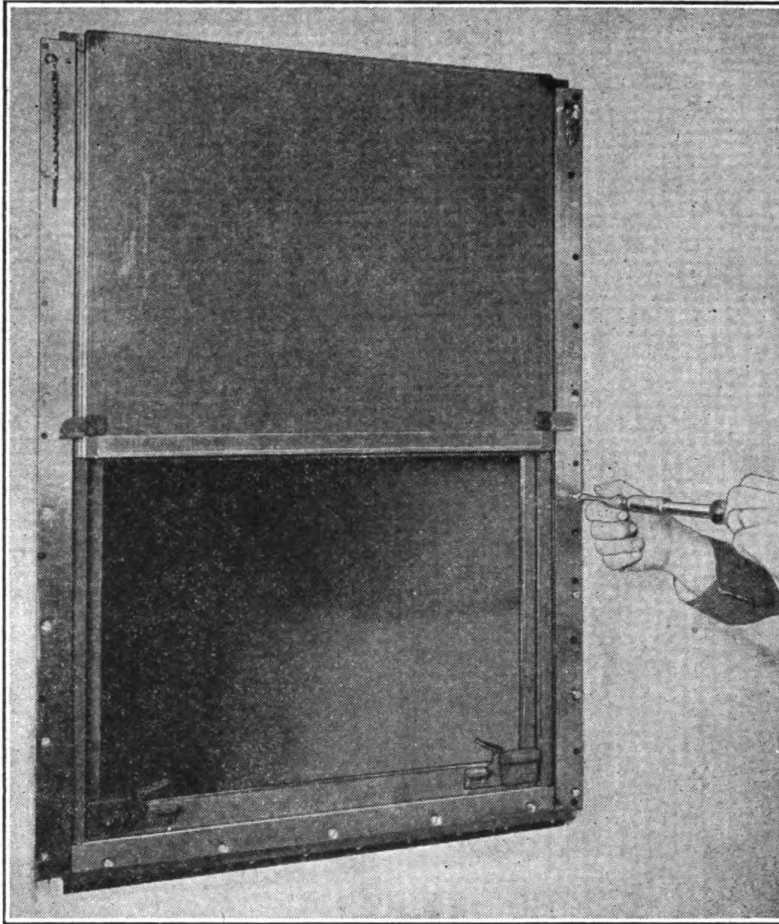


FIGURE 64. REMOVING BLACKOUT PANEL AND FRAME.

<i>Application</i>	<i>Type and Size of Screw</i>	<i>Drill Size</i>
a. Plywood to roof assembly...No. 10—1"	Self-tapping countersunk flat head	9/64"
b. Wood fillers to roof bows...No. 14—2 1/2"	Self-tapping countersunk flat head	7/32"
c. Drip molding to roof.....No. 14—1"	Round-head self-tapping	7/32"
d. Molding retainer to tubing...No. 10—1"	Binding head self-tapping	No. 21
e. Molding retainer to rub rail.....No. 10—1/2"	Binding head self-tapping	No. 19
f. Window frames.....No. 10—1"	Binding head self-tapping	11/64"
g. Angle to wheel housing.....No. 12	Flat head wood screws	7/32"
h. Wood filler to tubing— inside.....No. 14	Flat head self-tapping	7/32"
i. Front door header.....No. 8—3/4"	Flat head self-tapping	5/32"
j. Front door plate.....No. 14—1"	Flat head self-tapping	7/32"
k. Steel nailed to door frames...	Hardened screw nail	1/8"
l. Molding around wheel housing.....No. 10—3/4"	Oval head self-tapping	No. 21
m. Interior plywood to tubing...No. 10—1"	Flat head self-tapping	No. 21
n. Front roof cap molding.....No. 10—3/4"	Oval head self-tapping	No. 21
o. Inner door gasket retainer...No. 10—1"	Flat head self-tapping	No. 21
p. Door drip caps.....No. 10—3/4"	Binding head self-tapping	No. 21

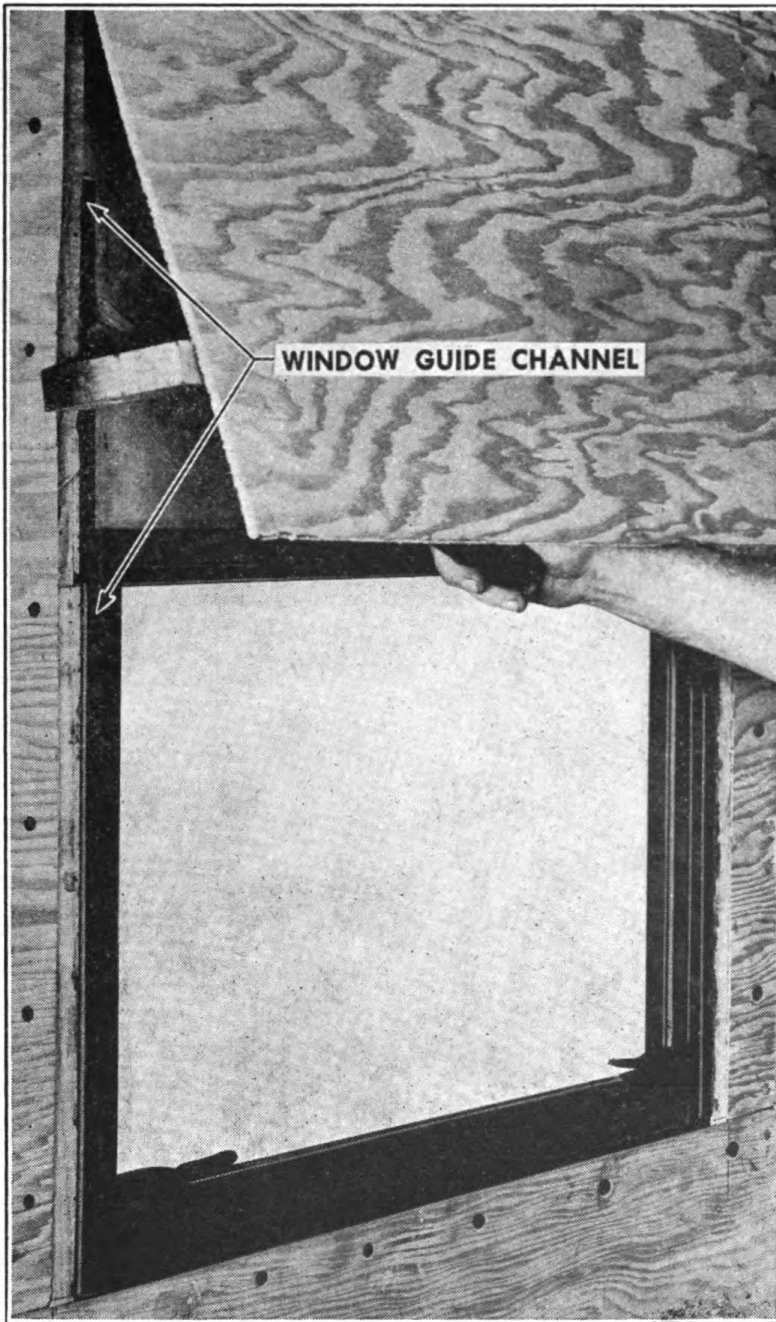


FIGURE 65. REMOVING GUIDE CHANNEL SCREWS.

6. **SCREW HOLE CHART.**—Because proper screw hole size is absolutely essential to sound assembly, we have prepared the chart which follows: It can be used in connection with major and minor body repairs where screw holes are called for.

7. **WINDOW GLASS REMOVAL** (Fig. 64.)—*a.* Remove screws from blackout panel guide assembly; lift blackout guide and panel assembly off wall.

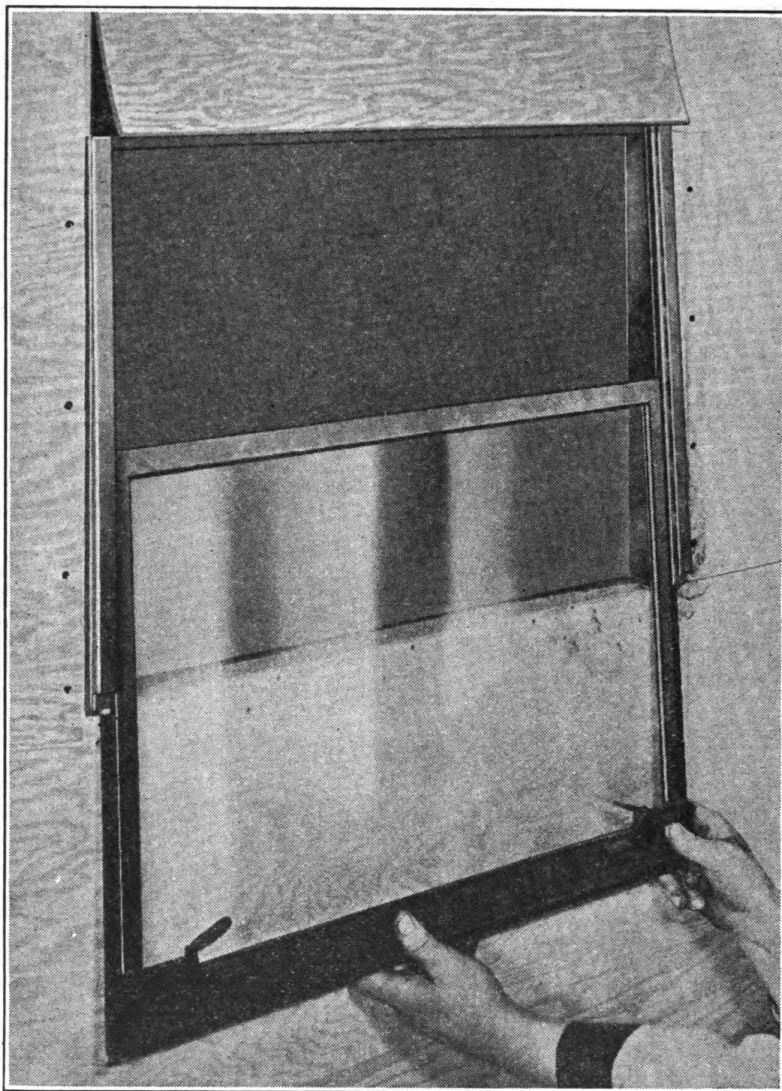


FIGURE 66. REMOVING WINDOW GLASS.

b. Remove screws from slit wood panel, pull out on panel and place a short object between slit and window frame (Fig. 65).

c. Remove two screws from both sides of window guide channel. Leave top screw in place (Fig. 65). Raise window and continue removing screws from lower section of window guide channel.

d. Pull out on window guide channel and lower window frame assembly (Fig. 66).

(1) *Window glass replacement.*—*a.* NOTE: Window glass is not removable from window frame—glass and frame assembly are built into one unit.

b. Replacement of window unit is in reverse of removal instructions outlined in paragraph 7, sub-paragraph a, this section. When replacing, make certain screws in window guide channels are driven home.

SECTION VIII

Pintle Hook

1. REMOVAL (Fig. 67).—*a.* The pintle hook is bolted to a mounting plate at rear of trailer. By removing the nut and washer from hook shaft, the hook assembly can be pulled out of sleeves and spring which are held within the box section.

2. DISASSEMBLY (Fig. 68).—*a.* Place shaft end of hook (1) firmly in vise.

b. Remove cap screw (10) from latch and drive out latch pin (7).

c. Lift out the latch (3).

d. Remove cotter key (15) and nut (12) from the lock bolt (9) and pull bolt out.

3. REPLACEMENT AND REASSEMBLY OF PINTLE HOOK.—

a. Reverse the disassembly procedure.

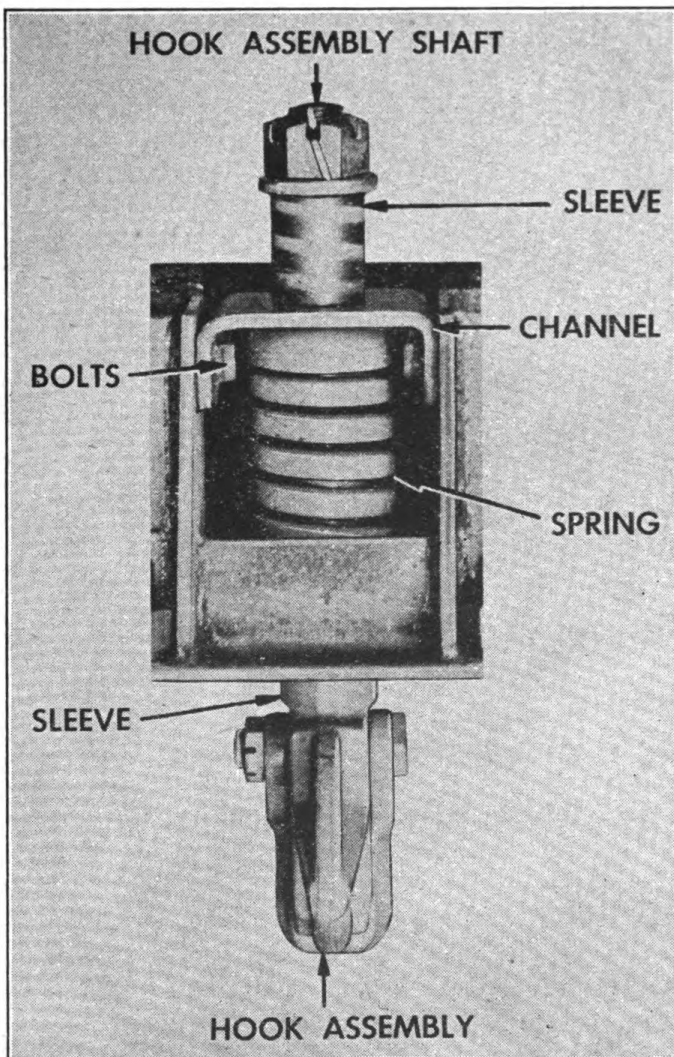


FIGURE 67. PINTLE HOOK.

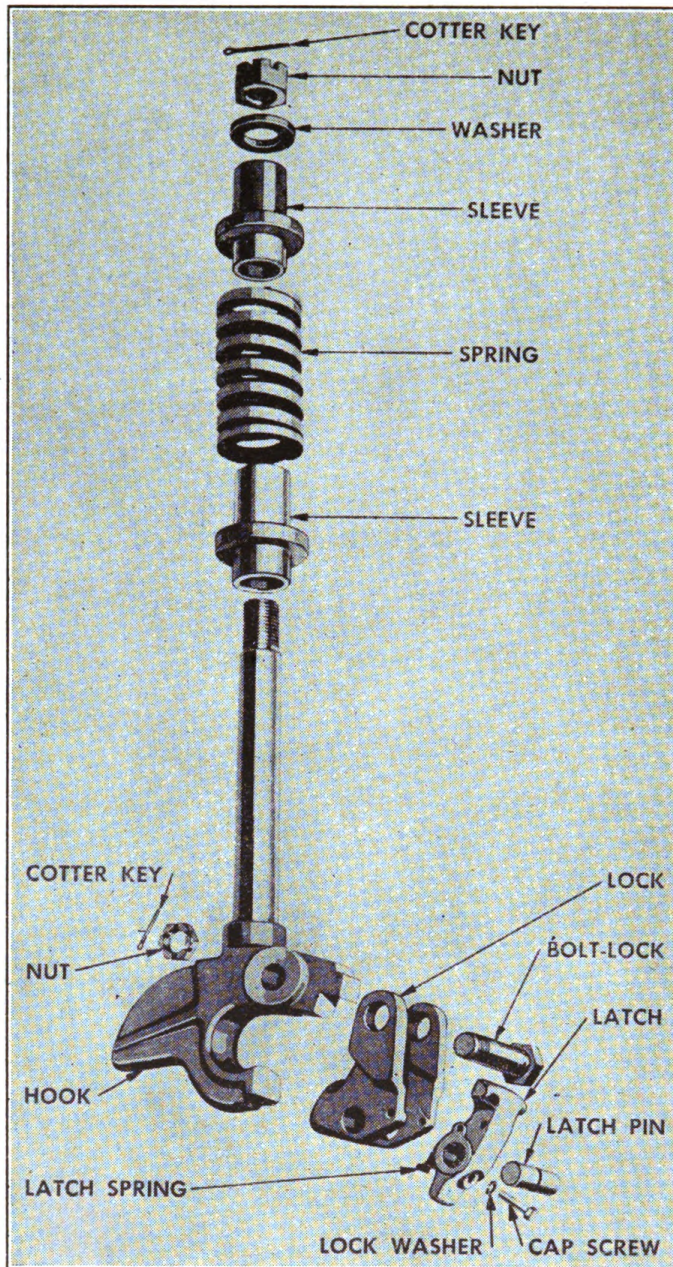


FIGURE 68. PINTLE HOOK—EXPLODED.

b. When reassembling, place a light film of grease on latch pin, and between lock and latch. This will prevent rust from forming and insure free operation of latch and lock.

4. PINTLE HOOK SPRING AND SLEEVE, REMOVAL (Fig. 67).

- a. Remove four bolts holding channel to box section.
- b. Remove the nut and washer from shaft of hook.
- c. Pull hook assembly out of spring and sleeves.

5. PINTLE HOOK SPRING AND SLEEVE, REPLACEMENT.—

Reverse the removal procedure.

SECTION IX

Radius Rods

1. GENERAL.—*a.* Semi-trailer and dolly underconstruction are equipped with two radius rods each, those on dolly are adjustable. One is fixed, the other adjustable on the semi-trailer. Service, removal and adjustment procedure for each is identical except that the front end of the radius rods on the dolly are not mounted in rubber bushing.

(1) *Removal.*—(a) Remove spindle lock screws from each end of radius rod (Fig. 69).

(b) Remove cotter key, nut, spindle boot, and the two concave retainer washers (Fig. 60).

(c) Using a pair of pliers, twist the rubber bushings off the spindle.

(d) Drive spindle out of radius rods with a punch and a heavy hammer.

(2) *Replacement* (Fig. 70).—(a) NOTE: One end of radius rod has spindle lock screw hole in the end. The other end has lock screw hole at the bottom. Place radius rod in position with the end hole to front in the spring hanger. The other end, which fits into bracket at axle, should be down. Axle end of radius rod is more difficult to connect, therefore it should be coupled first.

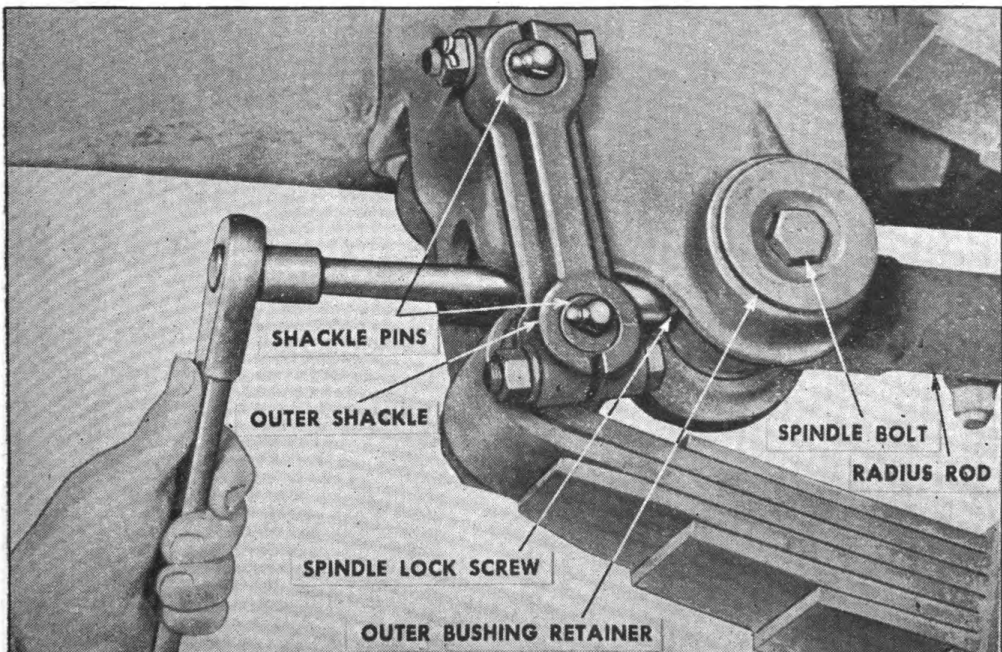


FIGURE 69. RADIUS ROD—REMOVAL.

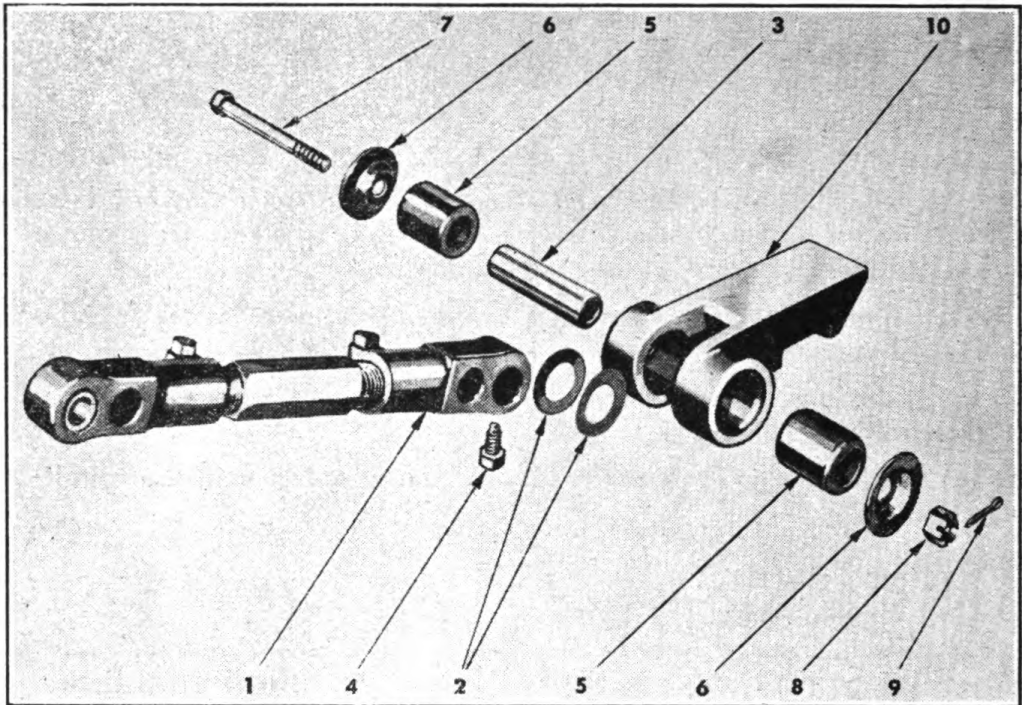


FIGURE 70. RADIUS ROD—EXPLODED.

- (b) Place radius rod (1) in position in radius rod (10).
- (c) Install spindle (3). (Make sure the two inner flat retainer washers are on spindle between each side of radius rod (2).)
- (d) Using a pair of pliers turn spindle until lock screw hole in spindle is in alignment with hole in radius rod.
- (e) Install lock screw (4) and tighten.
- (f) Place inner and outer rubber bushings (5) over spindle.
- (g) Install the outer concave retainer washers (5) and spindle bolts (7). (Do not tighten spindle bolt until after both ends of radius rod have been fastened.)
- (h) NOTE: Rubber bushings are interchangeable as all four are identical.
- (i) CAUTION: If difficulty is encountered when installing rubber bushings do not use any lubricant to work bushings into position. With the aid of a pry bar squeeze bushings into place.

SECTION X

Springs

1. MAIN SPRING REMOVAL—SEMI-TRAILER (Fig. 71).—*a.* Place jack under rear crossmember at side from which you intend to remove the spring. Place another jack under axle to hold the axle in position.

b. Remove the four nuts from U-bolts.

c. Remove upper and lower shackle bolt nuts, and drive upper and lower shackle bolts out in one unit.

d. CAUTION: When driving out shackle bolt assembly keep clear as one end of spring will fall to ground.

e. Remove shackle assembly from opposite end and pull spring out.

(1) *Installing main spring.*—(a) Replacement of main spring is in reverse of removal.

(b) NOTE: When replacing spring make certain spring chair is properly placed on spring and that dowel pin is placed in spring chair. Install spring with heads of clip bolts toward center of trailer. When tightening U-bolt nuts use a wrench with at least 3 ft. of leverage. It is very important these nuts be very tight. It is impossible to strip these nuts by hand.

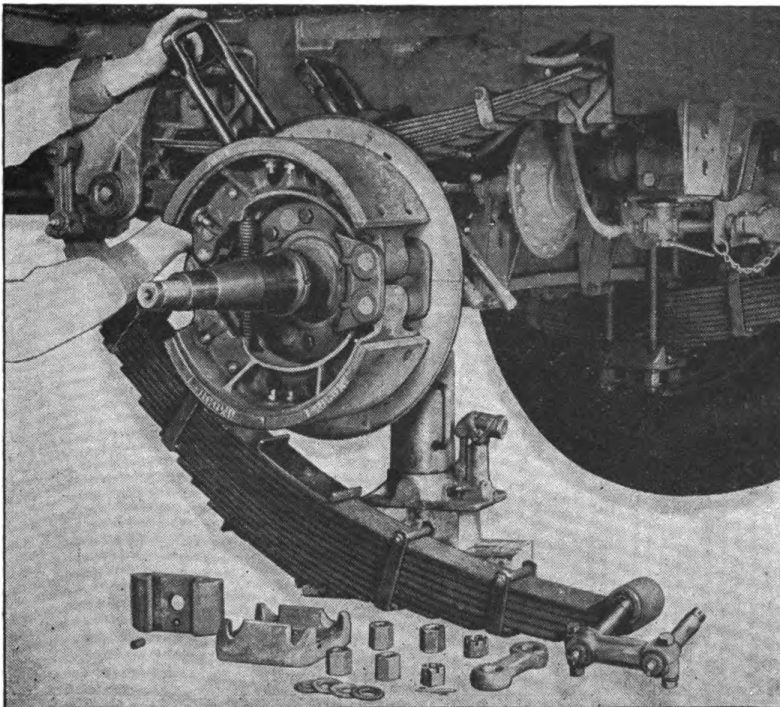


FIGURE 71. SPRING REMOVAL—SEMI-TRAILER.

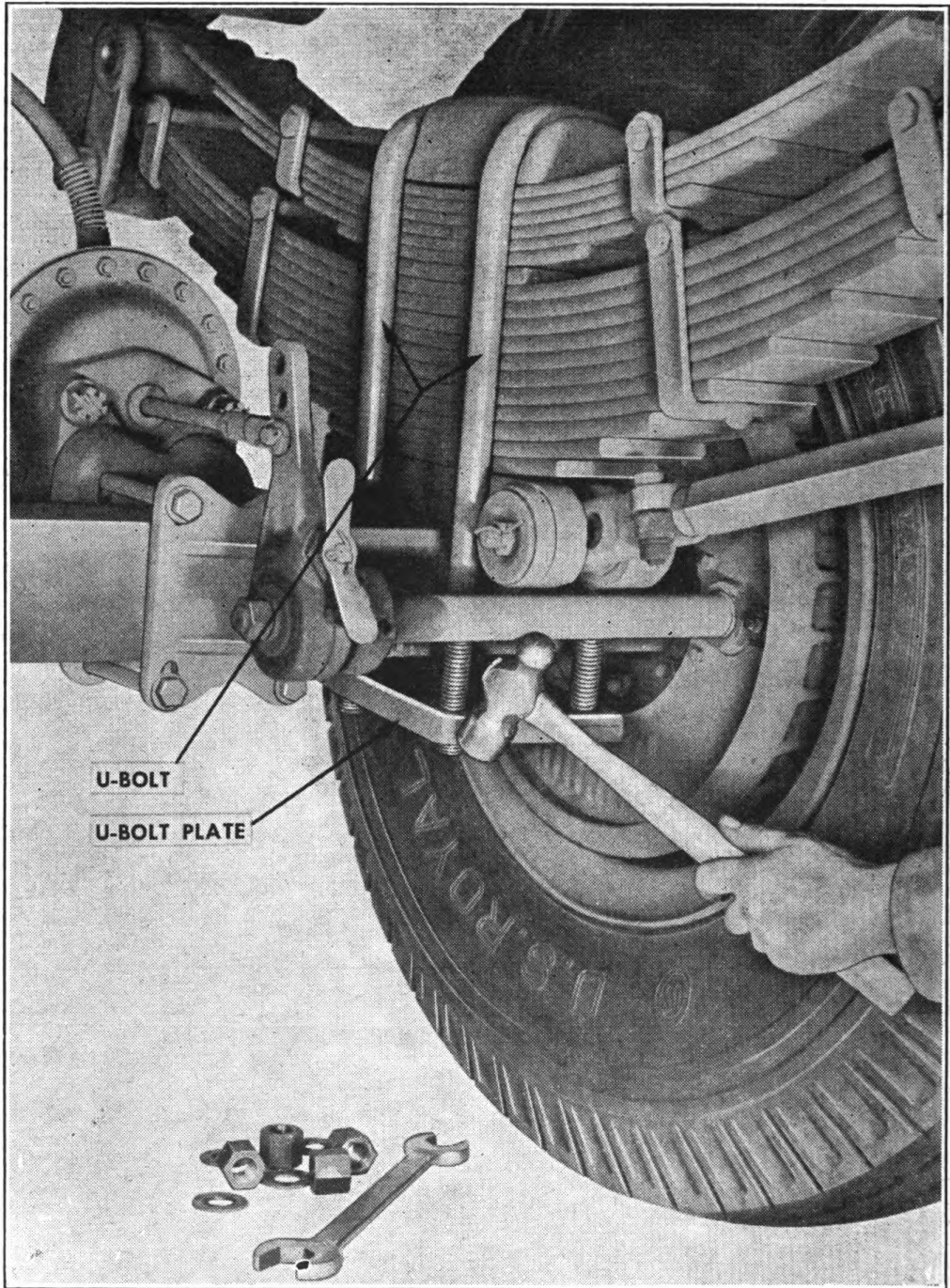


FIGURE 72. SPRING REMOVAL—DOLLY, STEP 1.

2. REMOVING AUXILIARY SPRING—SEMI-TRAILER (Fig. 71).—*a.* Jack under rear crossmember. Do not jack under axle.
b. Remove U-bolt nuts.
c. Tap both U-bolts upwards and remove U-bolt spacer plate located on top of auxiliary spring.

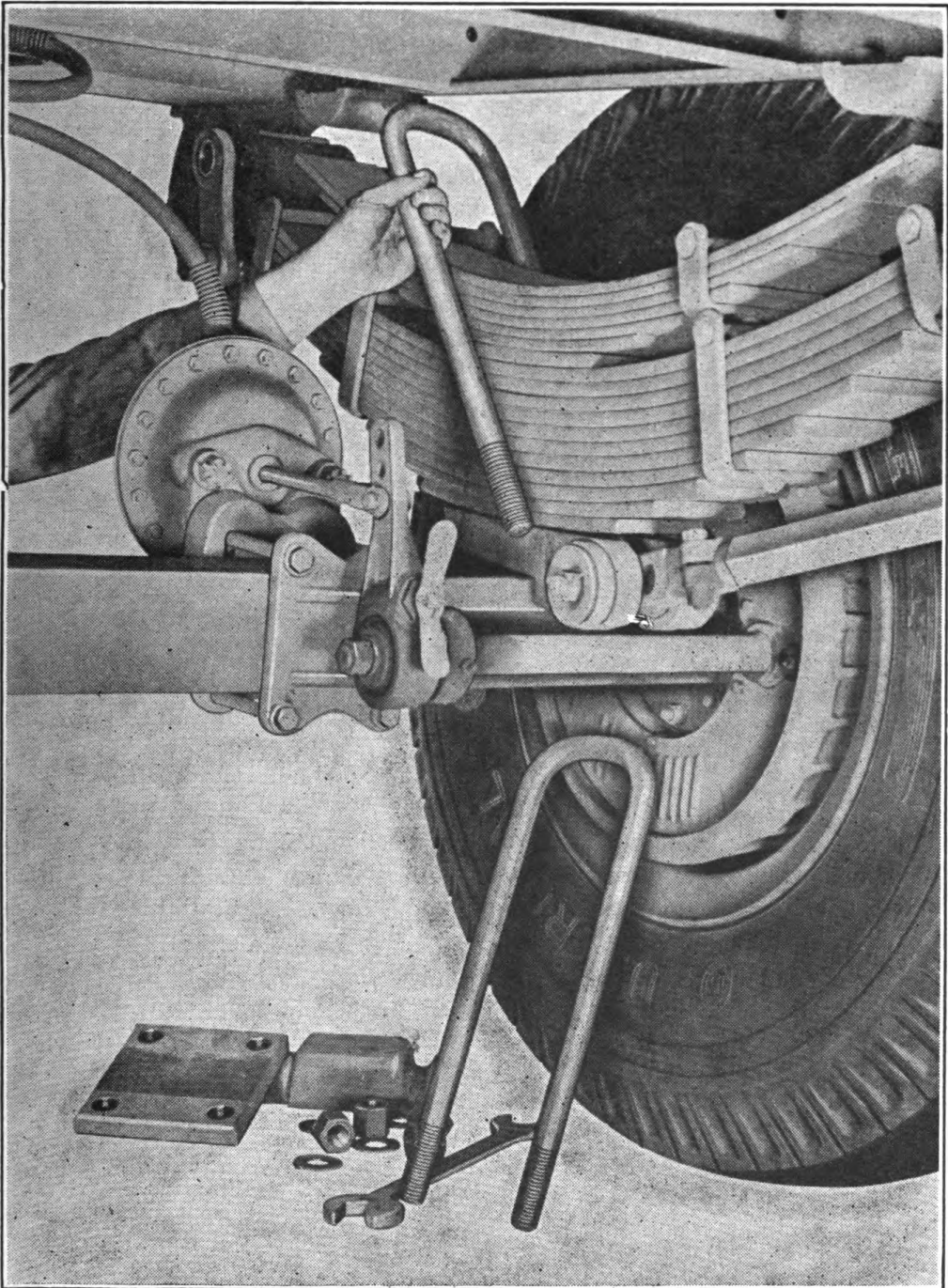


FIGURE 73. SPRING REMOVAL—DOLLY, STEP 2.

- d. Remove U-bolts. Pull U-bolts forward at an angle of about 60° as you lift them out in order to secure clearance under frame member.**
- e. Lift auxiliary spring off spring chair.**

(1) *Replacement.*—*a.* Reverse removal instructions, outlined in paragraph 2, this section.

3. **SPRING REMOVAL—DOLLY.**—*a.* Spring replacement can be made with the dolly coupled to the semi-trailer and with the hub and wheel assembly intact.

b. Place jack under dolly frame and jack unit up until tension has been relieved from the spring. Place second jack under axle.

c. Remove U-bolt nuts and drive down on U-bolt plate (Fig. 72).

d. NOTE: When driving down on U-bolt plate hit front and rear side of plate alternately. By driving plate off in this manner possibility of damaging U-bolt threads is minimized.

e. Remove front and rear shackle bolts from upper end of shackle.

f. Pull U-bolts up and towards rear of trailer (Fig. 73).

g. Tap inner shackles to rear of unit, and pull spring assembly out of spring hangers toward brake chamber, resting spring on axle.

h. CAUTION: Due to the weight of the spring it will require three men to lift spring off axle—two at front end and one at rear. Move spring out toward front of dolly, using care not to damage brake chamber.

4. **SPRING REPLACEMENT—DOLLY.** — *a.* Replacement of spring is in reverse of removal instructions (paragraph 1, this section).

b. NOTE: Install spring with the heads of clip bolts in toward center of trailer.

c. CAUTION: When installing shackle bolts do not hit them with a steel hammer. The bolts are hardened and will chip very easily. Flying chips might cause the loss of an eye or other injury. Instead of a steel hammer use a copper one or place a piece of wood over the head of the bolt and use it as a buffer.

d. CAUTION: When tightening U-bolt nuts make sure they are drawn up tight. (Use a wrench with about 36" of leverage.) It is impossible to strip these nuts by hand.

5. **SPRING REPAIR.**—*a.* With the spring on two wood horses place a C-clamp on spring near spring center bolt.

b. Remove nut from spring center bolt and drive out the bolt using a long tapered punch and heavy hammer.

c. Remove the four clip bolts and clip spacers.

d. Remove C-clamp.

e. Inspect all leaves for cracks and breaks. Replace.

f. Check all spring clips; if loose, heat rivets with a heating torch and tighten. Use a ball peen hammer.

6. **REPLACING BOTH SPRINGS.**—*a.* When replacing both springs, check the arch of the springs prior to installation—it can vary as much as $\frac{1}{4}$ "—and install the spring with the greatest amount of arch

on the curb side. Always keep the spring clip bolts to the inside and nuts to the outside when springs are mounted. This eliminates possible tire damage.

b. Using a piece of straight board as a level, place it across the main leaf from end to end. Measure the distance at the center bolt from board to bottom of spring to determine the arch.

7. MAINTENANCE.—a. Springs should be given frequent visual inspection under hard service. Springs should be checked immediately if trailer does not ride level.

b. Spring shackles should be drawn up tight enough to take up all play caused by wear, but not so tight as to prevent free action of shackles and shackle bolts.

c. U-bolts should be kept tight—checked frequently. Loose U-bolts are a possible source of spring breakage.

d. The spring center bolt should also be kept tight at all times.

e. Spring clips which hold leaves in alignment should be tight, but not so tight as to restrict free movement of leaves. Frequent inspection of clips should be made and they should be tightened up when necessary. Loose clips permit leaves to shift, which may cause shearing of spring center bolt.

f. NOTE: When springs have lost some of their resilience or elastic properties it is best to replace them with new ones. Any attempt at restoring spring camber or arch by heating, bending, and tempering is inadvisable, unless they are in the hands of a competent blacksmith.

8. REBUSHING SPRINGS AND HANGERS—SEMI-TRAILER.

a. Jack up at frame until spring tension is relieved on springs.

b. Remove shackle pin nuts and lift inner shackle off shackle bolts on one end of spring only.

c. Drive upper and lower shackle pins out in one unit using a copper hammer.

d. Inspect the shackles for wear. If worn, reverse them when reassembling. In other words, place the smooth side of each shackle toward the wearing surface. Do not change the position of the shackle from the inner to the outer side of the spring.

e. Outer shackles are easily removed. Remove the two pinch bolts and drive out the shackle pins.

f. Place a $1\frac{5}{16}$ " x $1\frac{3}{16}$ " bushing driver in bushing hole and drive the old bushing out with a heavy hammer.

g. Place the new bushing over the small end of the bushing driver and drive in. A 1" washer between the shoulder of the bushing driver and the new bushing will act as a stop when driving, prevent the bushing from going in too far, and prevent the end of the bushing from becoming "mushroomed."

h. After the new bushing has been installed, ream to 1" diameter.

9. **REBUSHING SPRING AND SPRING HANGERS—DOLLY.—***a.* Uncouple dolly from semi-trailer.

b. Couple hoist to dolly frame using a double spread chain and hoist dolly until tension is relieved from springs.

c. Remove rear shackle bolts and shackles.

d. Drive out old bushing using a 1 $\frac{1}{8}$ " x 1 $\frac{1}{2}$ " bushing driver.

e. Install new bushings and ream to 1 $\frac{1}{4}$ " diameter.

f. Prior to installing shackle bolts and shackles, inspect for wear. Replace if necessary. Inner shackles can be reversed by placing smooth side next to spring and hanger.

g. Repeat operation at front end of spring assembly.

10. **SPRINGS.—**Service Diagnosis and Remedy.

SYMPTOM AND PROBABLE CAUSE

PROBABLE REMEDY

a. Hard riding.

(1) Insufficient lubrication.

(2) Overloaded.

(3) Uneven load distribution.

b. Over flexible.

(1) Over lubricated.

(2) Spring leaf clips broken.

(3) Broken spring leaf or leaves.

(4) Loose spring shackles.

c. Uneven riding.

(1) Broken spring leaf or leaves.

(2) Uneven load distribution.

(1) Lubricate spring shackles.

(2) Load vehicle only to rated capacity.

(3) Distribute load evenly.

(1) Spring leaves do not require lubrication.

(2) Replace.

(3) Replace.

(4) Tighten.

(1) Replace.

(2) Distribute load evenly.

SECTION XI

Supports

1. GENERAL.—*a.* If kept properly lubricated supports will rarely require service. The usual source of damage comes when trailer is uncoupled without letting supports down, and also when the vehicle is moved with the supports in the “down” position.

b. CAUTION: Do not attempt to work on support unless trailer is coupled to either dolly, tractor, or else properly blocked up at its front end.

2. REMOVAL OF OPERATING ASSEMBLY ATTACHED TO I-BEAM.—*a.* Wind supports down until stop is reached. Place screwdriver into slot of lock ring; open lock ring and pry it off connecting rod pin (Fig. 74), and drive pin out.

b. Remove dust shield by removing two cap screws (Fig. 75).

c. Remove three drilled bolts and one cap screw holding connecting rod slide bracket to riser nut housing (Fig. 76).

d. Remove the $\frac{3}{8}$ " bolt at outer end of operating shaft which holds shaft bushing to shaft brackets. Remove four bolts from gear housing (Fig. 77) and lift the complete assembly off I-beam.

3. REPLACEMENT OF OPERATING ASSEMBLY ATTACHED TO I-BEAM (Fig. 78).—*a.* Fill gear housing with a light grade of chassis lubricant.

b. Install bearing (11) and bearing sleeve (10) into rear bearing cap (12) (Fig. 78). Place a small daub of chassis lubricant into bearing.

c. Reverse removal instructions as outlined in paragraph 2, this section.

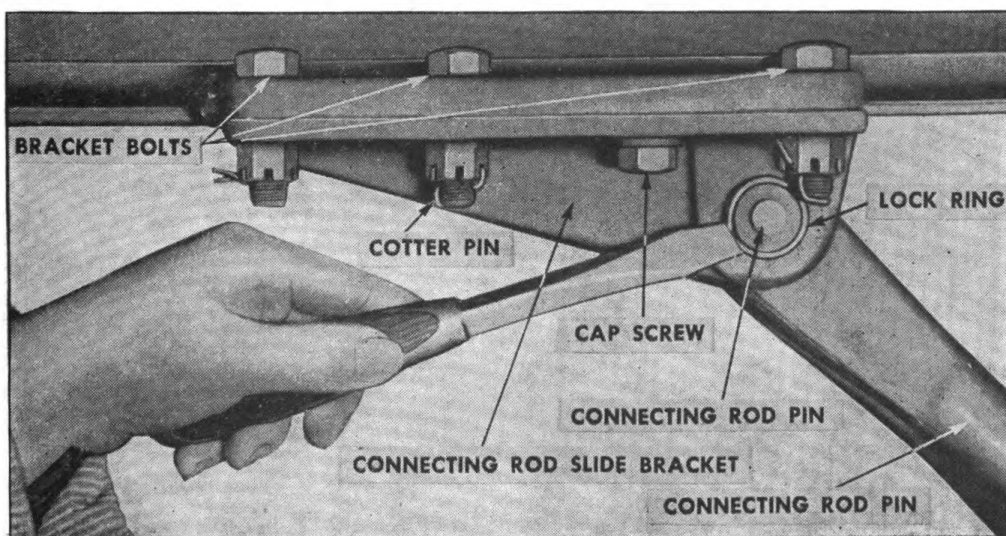


FIGURE 74. REMOVING CONNECTING ROD PIN.

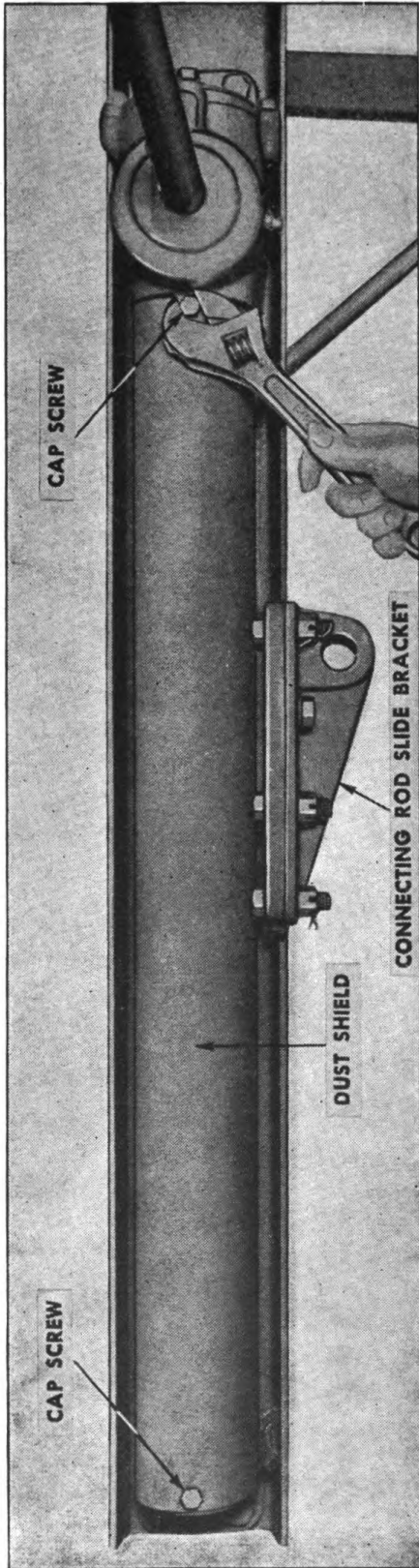


FIG. 75. REMOVING DUST SHIELD.

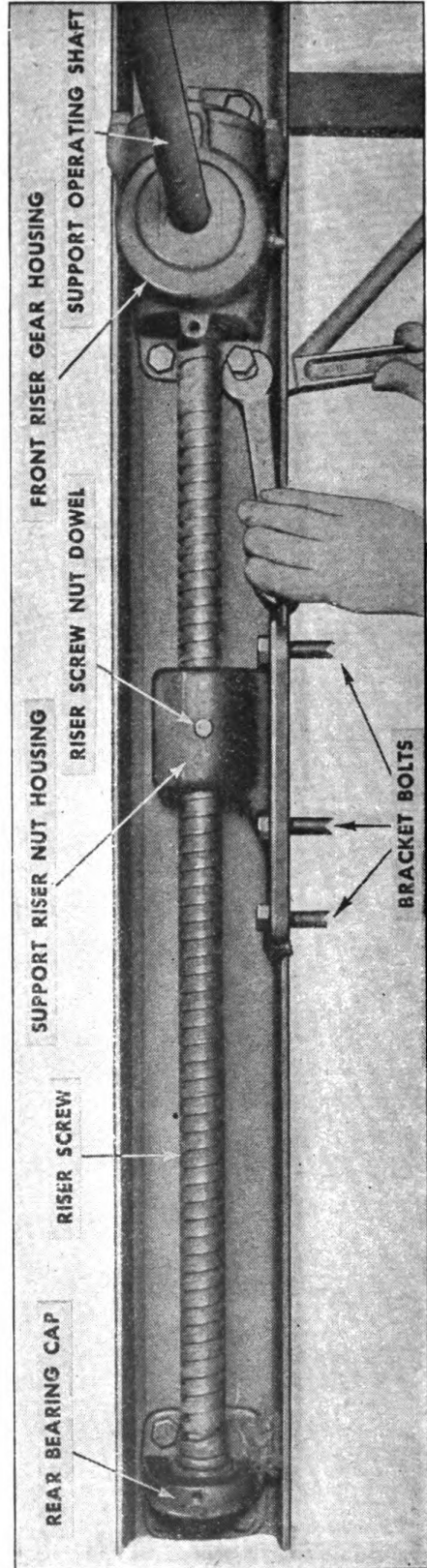


FIGURE 77. REMOVING GEAR HOUSING.

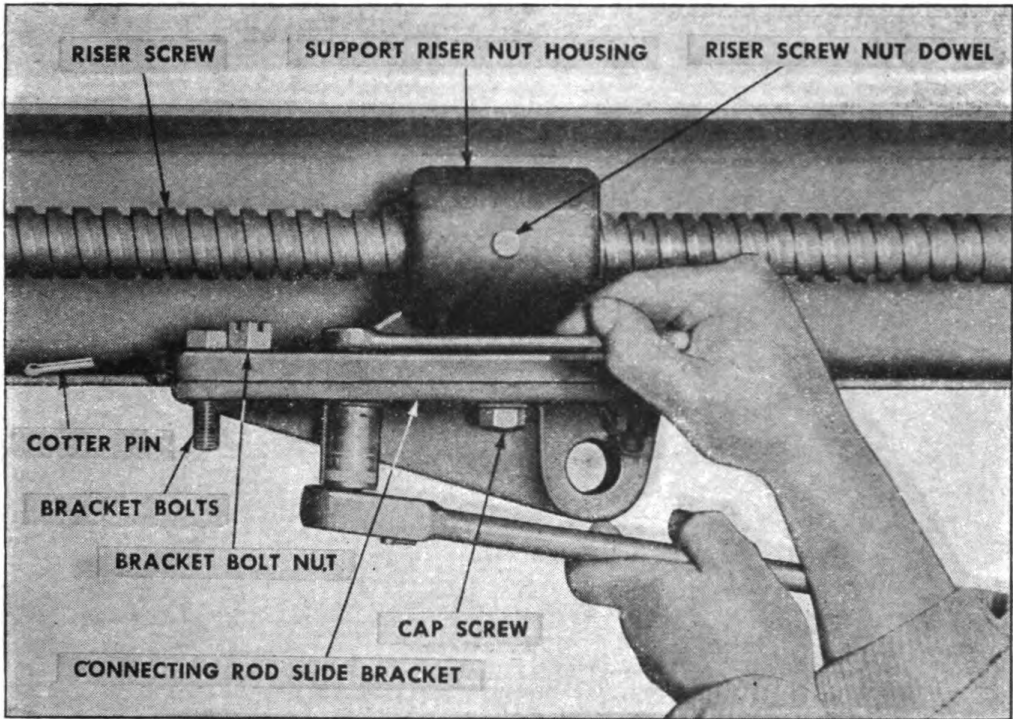


FIGURE 76. REMOVING SUPPORT SLIDE BRACKET.

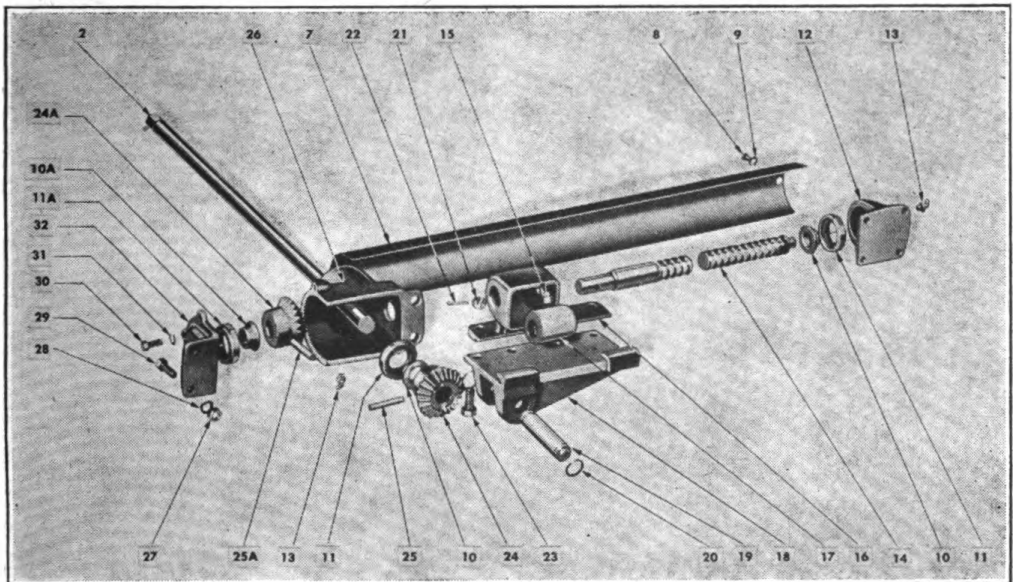


FIGURE 78. SUPPORT OPERATING MECHANISM—EXPLODED.

4. DISASSEMBLY OF OPERATING ASSEMBLY (Fig. 78).—*a.* Remove assembly as outlined in paragraph 2, this section.
b. Remove three cap screws (30), lift cap (32) off of gear housing (26).
c. Turn nut housing (16) off screw (14).

- d. Pull screw (14) with gear (24A) attached, out of gear housing (26).
- e. Place screw (14) across wood block and drive pin (25A) out of gear (24A) using a long tapered $\frac{5}{16}$ " punch.
- f. Pull operating shaft (2) with gear (24) attached, out of housing (26).
- g. Place operating shaft across wood block and with the aid of a $\frac{5}{16}$ " long tapered punch, drive pin (25) out of gear (24) and tap gear off shaft.

5. REASSEMBLY OF OPERATING ASSEMBLY (Fig. 78).—*a.* Place gear (24) over shaft (2) with gear teeth to outside (Fig. 78). Drive drive pin (25) through hole in gear and shaft.

b. Place bearing sleeve (10) over end of operating shaft (2) with flange toward gear. Place bearing (11) over operating shaft (2) with concave surface over convex surface of bearing sleeve. Place shaft assembly through gear housing (26).

c. NOTE: Gears (24) and (24A) are interchangeable; bearings (11) and (11A) are interchangeable; drive pins (25) and (25A) are interchangeable; bearing sleeve (10) and (10A) are interchangeable.

d. Place gear (24A) over riser screw (14) with teeth facing thread on riser screw; fasten gear to riser screw, using drive pin (25A).

e. Place riser screw through hole in gear housing (26) so that teeth on both gears jibe.

f. Place bearing (11A) into bearing cap (32) with concave surface out and install sleeve (10A) into bearing with flat surface out.

g. Place bearing cap over end of riser screw and fasten cap, using three cap screws (30).

h. Fill gear housing with a light grade of chassis lubricant—assembly is now ready to be bolted on I-beam.

6. DISASSEMBLY OF WHEEL AND AXLE ASSEMBLY (Fig. 79).—*a.* Disconnect connecting rods (19) and slide bracket (20). (See illustration Fig. 74.)

b. Remove lock ring (2) from outer side of pin (5) and drive out the pins.

c. Remove bolts (8) from strut (9) and with a heavy hammer drive strut and wheels off axle.

d. Remove lock ring (3) from pin (6); remove bolt (7) and tap connecting rod link (16) off axle.

e. NOTE: All parts, as illustrated in Fig. 79 are interchangeable from right to left and vice versa.

f. CAUTION: Make final inspection, prior to placing this unit in operation after supports have been worked upon, to make certain all bolts are in their proper place, and tighten down. Check to make certain lock rings have been placed on all hinge pins, see Fig. 79 for position of all hinge pins and lock rings.

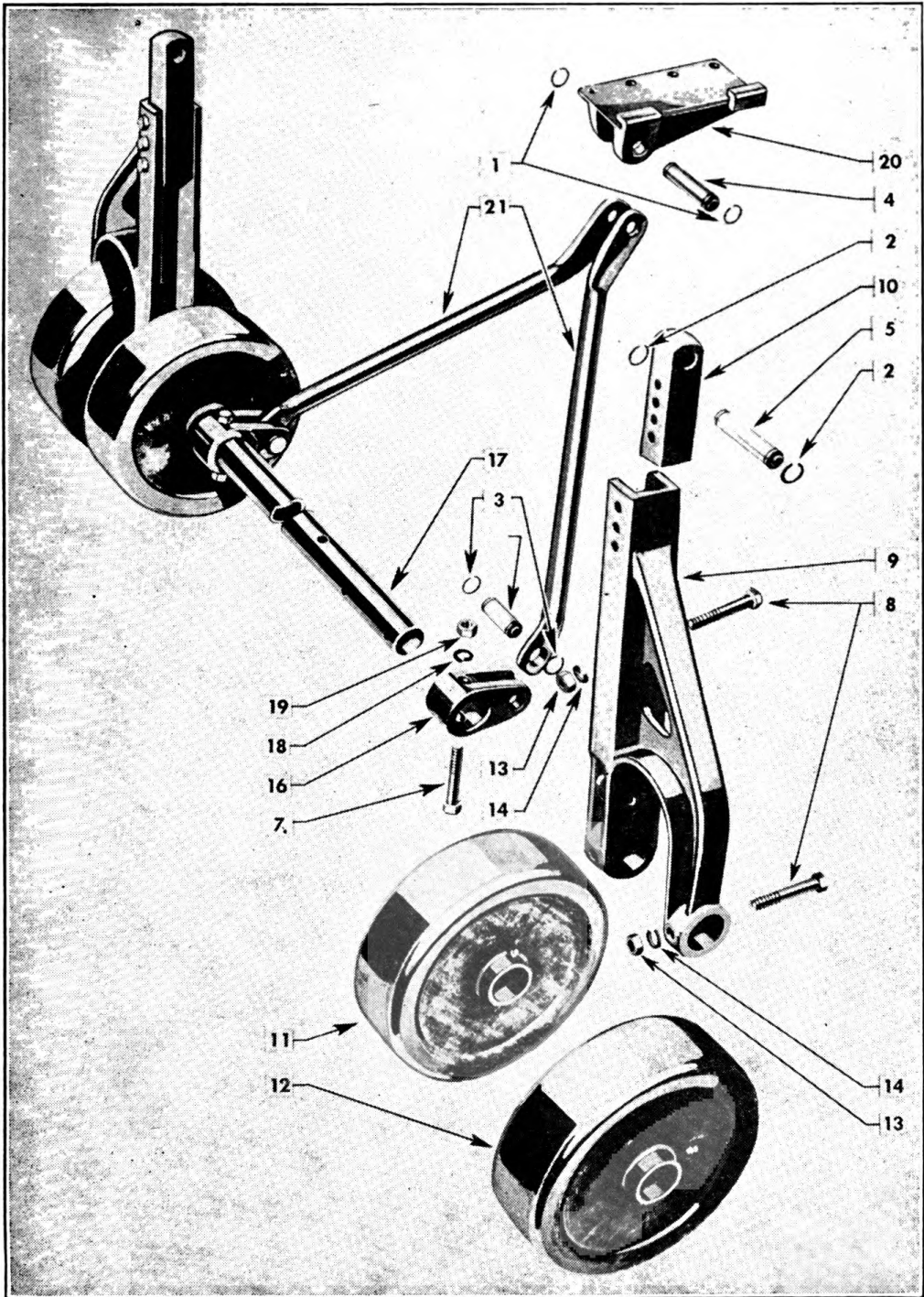


FIGURE 79. SUPPORT WHEEL ASSEMBLY.

7. REASSEMBLY OF WHEEL AND AXLE ASSEMBLY.—*a.* Reassembly of wheel and axle assembly is in reverse of disassembly instructions outlined in paragraph 6, this section. Be sure that all lock rings

are properly installed, and all bolts are tight. Place a light film of grease on axle prior to installing wheels.

8. CONNECTION ROD REPAIRS.—Bent support connection rods may be heated and straightened. Measurement of the straightened rod should conform to the dimensions outlined in Fig. 80.

9. REPAIRING SUPPORT I-BEAM.—Minor deflections in the support I-beam may be straightened with a sledge hammer and acetylene torch.

Badly bent I-beams must be replaced.

- a. Cut the I-beam at the welds holding it to crossmembers.
- b. Grind smooth.
- c. Clamp I-beam in position; I-beam should be centralized at both front and rear end. To do this, measure the distance from the frame side rails.

10. REPLACING DAMAGED WHEELS.—a. Remove the bolts holding the axle to the straddle mounted struts.

b. Remove the hinge pin at the top of the straddle mounted strut and adjusting bar assembly.

- c. Drive the struts from the axle and the wheels can be slid off.

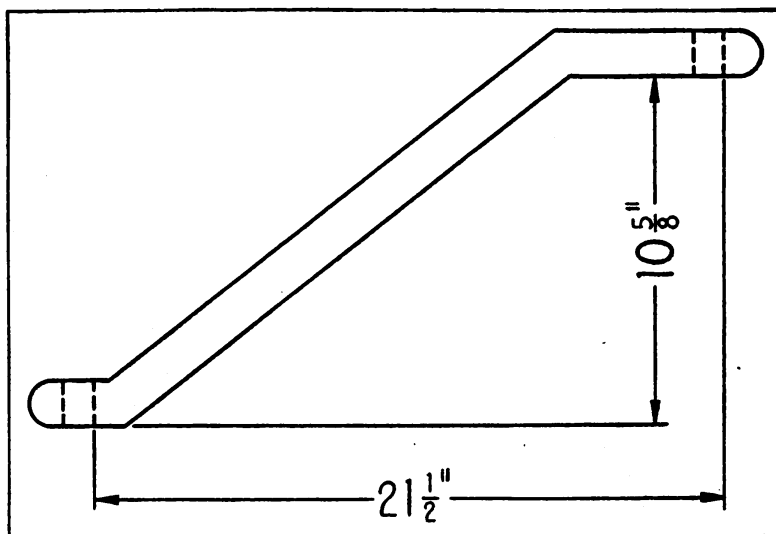


FIGURE 80. DIMENSION LAYOUT FOR SUPPORT CONNECTING RODS.

SECTION XII

Tires and Tire Carrier

1. REMOVING TIRE FROM TIRE CARRIER (Fig. 81).—*a.* Remove the four lug nuts (7) from stud bolts (14), using large end of wheel wrench.

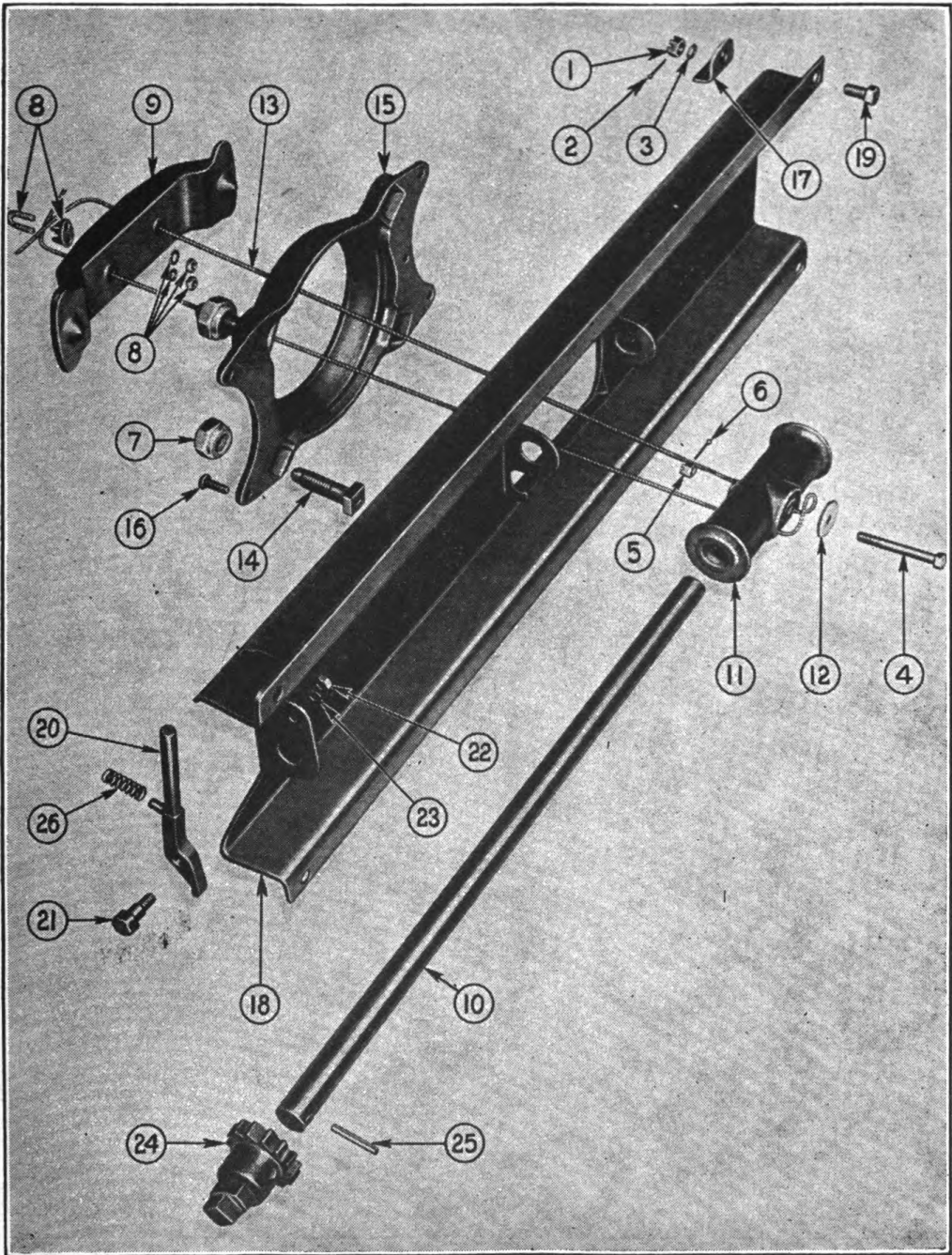


FIGURE 81. TIRE CARRIER—EXPLODED.

b. Place small end of wheel wrench over end of ratchet (24). Shove ratchet release handle (20) down to the released position. Lower tire to ground holding firmly to wheel wrench handle.

c. NOTE: Do not allow tire to fall to ground; instead, unwind slowly.

2. REPLACING TIRE CARRIER (Fig. 81).—*a.* Remove the tire from the tire carrier. Remove the four bolts (19) holding tire carrier to frame and lift out.

3. TIRE CARRIER CABLE REPLACEMENT.—*a.* Remove bolt (4) and washer (12) from drum (11). Remove the cable clamp (8) and pull cable (13) out of saddle (9).

b. NOTE: When replacing cable, place center of cable on bolts (4), making sure both sides are the same length. Should one side of cable be longer than the other, the tire will not wind up level; extra stress, apt to cause failure, will be placed on short end of cable.

4. REPLACING TIRE CARRIER RATCHET RELEASE HANDLE.—*a.* Remove nut (22) and washer (23). Pull bolt (21) out of ratchet release handle (20). Pull spring (26) off handle.

5. TIRE REPAIRS.—*a.* When removing wheels for tire repairs, it will be seen that all studs and nuts are marked with letters "L" or "R" which indicate left and right. While nuts are not interchangeable, wheels themselves are. They may be used as inner or outer, right or left.

b. NOTE: The type of stud determines whether the hub is right or left hand. Hubs are interchangeable. Studs are not, due to the fact that they have "right" or "left" hand threads, depending upon the side of the vehicle on which they are to be mounted.

c. Since the entire load is carried out to wheels through the studs, care should be taken to draw up wheel nuts tight and with equal pressure at all studs. To insure a tight wheel fit, follow this simple procedure:

d. Make sure all countersunk holes in wheels are clean, free from dirt or "piled up" paint.

e. Draw up the sleeve shaped nuts which hold inner wheel in place. Apply pressure evenly on all nuts by progressively tightening opposite nuts until all are down very tight.

f. Slide on outer wheel and draw up outer stud nuts in the same manner as outlined above.

g. NOTE: It is good practice when mounting wheels to place valve stems opposite each other to facilitate tire inflation.

6. REMOVING TIRE FROM WHEEL.—*a.* Remove wheel from hub assembly. Permit air to escape from tire by removing core from valve stem. Then insert a tire tool in slot provided for the purpose on rim and pry down while tapping opposite side of rim with a hammer.

b. When reinstalling tire, inflate before installing tire and wheel on hub. Before inflation make sure that lock ring is properly seated in the groove.

c. CAUTION: *Always wrap a safety chain loosely around tire prior to inflating. This safeguards against possible serious injury should outer lock ring let go during inflation. Lacking this, inflate tires with the locking ring away from you.*

7. CARE AND INSPECTION OF TIRES AND TUBES.—*a.* All tires on this trailer are built to sustain weight of the loaded trailer.

b. However, unless recommended pressure is maintained, tires will not function as they should and consequently safe, economical operation of trailer will be affected.

c. The following points must be followed if excessive tire wear is to be avoided:

- d.* Check tires daily for correct air pressure (75 lbs.).
- e.* Check wheels weekly for true running.
- f.* Check valve stems for caps.
- g.* Match tires for size and design.
- h.* Keep speed down.
- i.* Anticipate stops—don't slide tires.
- j.* Inspect tires daily for cuts, etc.
- k.* Keep grease and oil off tires.
- l.* See that tires are mounted correctly.
- m.* If brakes grab, make minor adjustments.
- n.* Distribute load evenly.
- o.* Take corners slowly.

SECTION XIII

Wheels, Hubs and Drums

1. **GENERAL.**—Wheels used on this unit require no service—barring damage due to accident. Should any wheel become damaged due to collision, replacement rather than any attempt at repair is recommended.

2. **REPLACEMENT OF WORN OR BROKEN STUDS.**—*a.* Remove inner and outer wheels.

b. Remove hub from axle and place on the floor with the inside of the drum up.

c. Remove nut from stud (or studs) which you wish to replace.

d. Using a $\frac{5}{8}$ " punch, drive out broken or worn stud.

e. Turn hub and drum over and place new stud in position. Make sure that shoulder on stud is placed so that it will fit into groove in hub.

f. Drive stud into position, using a copper hammer.

g. Turn wheel over with drum up, and tighten nut.



FIGURE 82. REMOVING WHEEL ASSEMBLY.

3. REMOVING HUB ASSEMBLY.—To remove axle hub assembly from axle, the following procedure is recommended.

a. Place a greased steel plate or wood plank under both dual tires to utilize as a skid for removal of hub and wheel assembly.

b. Take out the four cap screws on hub cap, pull cotter key from axle nut and remove axle nut by turning it in a counter-clockwise direction.

c. Now, place a screwdriver under outer bearing, pry gently and tap D-washer with a hammer (Fig. 82). D-washer and bearing may also be removed as wheel is pulled off.

d. Pull wheel off, using greased skid plate to facilitate its removal. If wheel will not slide off freely once outer bearing is removed, it is usually because brake shoes are dragging. This drag is easily removed by slacking off the brake adjustment through counter-clockwise movement of slack adjuster wing wrench.

4. INSTALLING HUB ASSEMBLY.—Before installing wheels on axle, all bearings should be washed in cleaning fluid, a stiff brush employed to remove all foreign matter, and bearings thoroughly inspected for pits, chips and signs of wear. All dirt apt to get into hubs should also be removed.

To install hub, proceed as follows (Fig. 83):

a. Repack space in the hub between the two cups with new grease about one inch thick. Put about a 1/8" layer of grease on inner and outer bearing cups and repack both inner and outer bearings.

b. Now, place inner bearing (5) in hub.

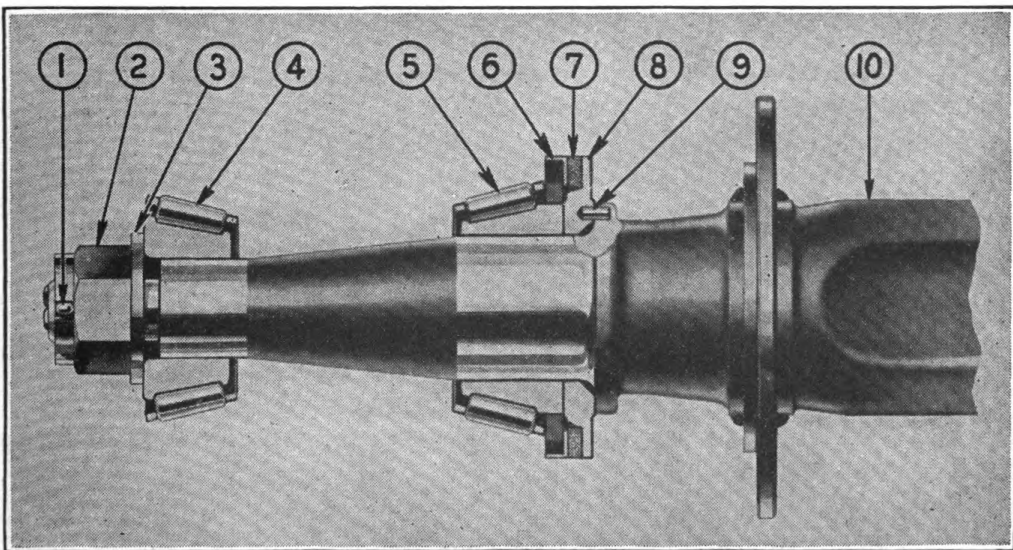


FIGURE 83. INSTALLING WHEEL ASSEMBLY.

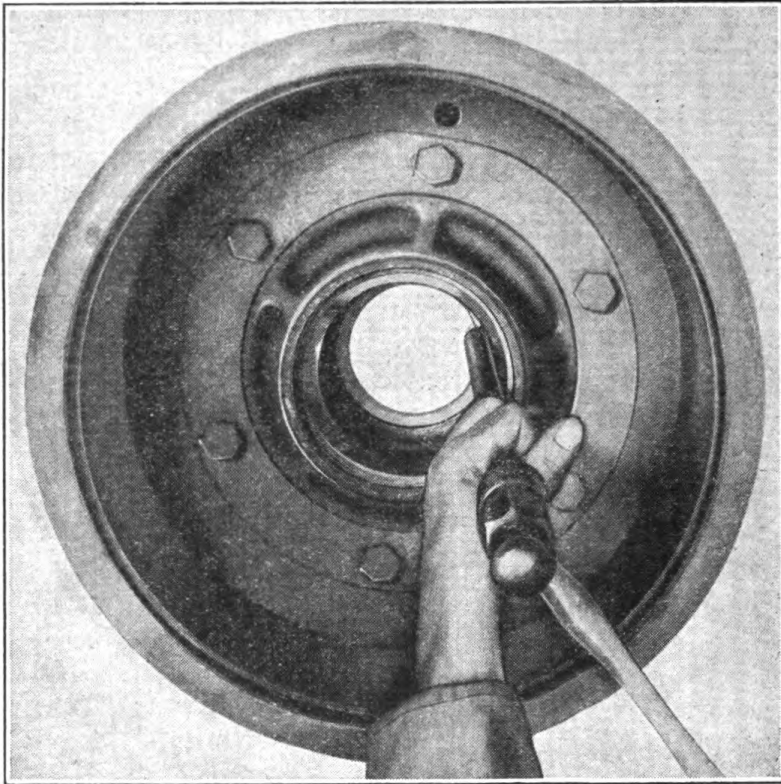


FIGURE 84. REMOVING CUP.

c. Insert compression ring (6) with its flanged side toward the *inside* of hub. Place felt grease retainer (7) next to compression ring.

d. Place dust collar (8) on axle spindle and lock into place by means of the metal dowel (9) which fits into a slot on spindle and a hole in dust collar. Wheel is now ready to slip on.

e. Using a greased skid plate, slide wheel on spindle. Place outer bearing (4) in hub and install D-washer (3).

f. Turn axle nut (2) up tight, then slack off about 1/3 turn. Test for excessive end play. Use a bar. Rest one end on floor and lift up on outside tire. By working bar up and down while holding one finger on cage of outer bearing, excessive play is quickly detected.

g. With bearings properly adjusted, fit cotter key (1) into wheel nut, fill hub cap 1/3 full of grease and reinstall with cap screws. Turn wheel. If wheel fails to turn freely check for brake drag by means of slack adjusters. If this fails to correct the trouble, felt grease retainer probably slipped out of place during assembly. To correct this difficulty, remove hub assembly and reinstall.

5. REMOVING BEARING CUPS (Fig. 84).—Place a soft steel bar on inside shoulder or edge of cup to be removed. Using a heavy hammer, hit first one side of cup and then the other. By alternating in this manner, cup will come out straight with cup bore. Danger of wedging of cup in bore is minimized.

6. **INSTALLING BEARING CUPS.**—*a.* With wheel on its side, start new cup square with bore so that its smallest inside diameter will be on the inside when in place.

b. With a piece of hard wood or soft steel over cup, drive it in until it is flush with outer edge of hub.

c. Now, place the old cup over the new one in the same manner as in step one and drive new cup in until it is absolutely tight with cup bore flange. Be sure that cup is properly seated because if it is not it will alter distance between bearing centers and make impossible proper reassembly of wheel.

7. **LOOSE CUPS.**—When bearing cup becomes loose in hub, replace hub. Emergency repair of loose cups can be accomplished by using a center punch to reduce diameter of bore. Simply use a heavy center punch and put about 12 punch marks per square inch about the diameter of the side wall of cup bore where cup normally fits.

8. **BEARING AND CUP INSPECTION.**—Bearings and cups should be cleaned and inspected wherever wheels are removed. Pitted or chipped bearings or cups should be replaced.

PART III

SPARE PARTS LIST

State PERIOD designation by use of one of the following terms:

- (1) "INITIAL" - first requisition of authorized allowances.
- (2) "REPLENISHMENT" - subsequent requisitions to maintain authorized allowances.
- (3) "SPECIAL" - requisitions for necessary repairs not covered by allowances.

Emergency requisitions sent by telephone, telegraph, or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)"

Prepare a separate requisition for each different machine. Type "SPARE PARTS" in upper right hand corner of requisition form.

Give complete shipping instructions. Special instructions for packing, marking, routing, etc. should be given at the end of the requisition.

State proper nomenclature of machine, and make, model, serial number and registration number.

State basis or authority, and date delivery is required, immediately below description of machine.

State manufacturers' parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.

Group parts required under group headings as shown in manufacturers' parts catalogs.

Double space between items.



WAR DEPARTMENT
Q. M. C. Form No. 499
Revised April 9, 1911

(SAMPLE) (SPARE PARTS)

REQUISITION

To: Engineer Supply Officer No. of Sheets 1 Sheet No. 1

Requisition No. E-531-7-43 Date June 1, 1943 Period Special

SHIP TO Engineer Property Officer, Pine Camp, New York

MARKED FOR, Engineer Supply Officer, 802nd Engr. Battalion, Pine Camp, New York

REQUISITIONED BY (show Signature, Rank, Organization, Destination. If different from "SHIP TO" include address):

Robert E. Roe,
Major, C. E.,
Engineer Property Officer

APPROVED BY: For the Commanding Officer:

John E. Doe
Col., C. E.,
Executive Officer

CHECKED Mfg. No.	NOMENCLATURE Nomenclature & Unit	AUTHORIZED AMOUNT or Maximum Level	ON HAND QUANTITY	UNORDERED DUE IN	REQUIRED	APPROVED
PARTS FOR SEMI-TRAILER, ACETYLENE CHARGING PLANT, MODEL FFL28DF SPECIAL WITH DOLLY.						
Basis: Repair of Disabled Equipment Delivery is requested by July 15, 1943						
AXLE						
FF50844	BEAM, axle, w/ADAPTER	0	0	0	1	
FF530371	RING, compression, axle	0	0	0	1	
UNDERCONSTRUCTION - DOLLY						
FF53315	ROD, radius, adj. ass'y.	0	0	0	1	
FF56048	SHACKLE, spring, outer	0	0	0	4	
FF56049	SHACKLE, spring, inner	0	0	0	4	
FF56050	BOLT, spring, shackle	0	0	0	8	
BRAKES						
FF51200	ADJUSTER, slack, ass'y brake	0	0	0	4	
FF51054	HAND BRAKE, lever, ass'y.	0	0	0	1	

U. S. GOVERNMENT PRINTING OFFICE 43-5925

Nonexpendable items such as tolls must be accounted for, when requisitioned, by a statement that they have been placed on REPORT OF SURVEY OR STATEMENT OF CHARGES.

PREPARATION OF REQUISITIONS

A sample requisition in the correct form for submission by the Engineer Property Officer is shown on the opposite page.

THIS SHALL BE FOLLOWED IN MAKING OUT REQUISITIONS

In order to eliminate duplication of work, Property Officers may authorize organizations to prepare requisitions in final form, leaving requisition number space blank for completion by Property Officer.

THE FOLLOWING RULES WILL BE OBSERVED CAREFULLY IN PREPARING REQUISITIONS FOR SPARE PARTS:

- a. Prepare a separate requisition for each different machine.
- b. Type "SPARE PARTS" in upper right hand corner of requisition form.
- c. State PERIOD designation by use of one of the following terms:
 - (1) "INITIAL"—first requisition of authorized allowances.
 - (2) "REPLENISHMENT"—subsequent requisitions to maintain authorized allowances.
 - (3) "SPECIAL"—requisitions for necessary repairs not covered by allowances.
- d. Give complete shipping instructions.
- e. State proper nomenclature of machine, and make, model, serial number and registration number.
- f. State basis of authority, and date delivery is required, immediately below description of machine.
- g. Group parts required under group headings as shown in manufacturer's parts catalogs.
- h. State manufacturers' parts numbers and nomenclature descriptions accurately and completely. Do not use abbreviations.
- i. Double space between items.
- j. Emergency requisitions sent by telephone, telegraph, or radio must always be confirmed immediately with requisition marked: "Confirming (state identifying data)."
- k. Nonexpendable items must be accounted for.

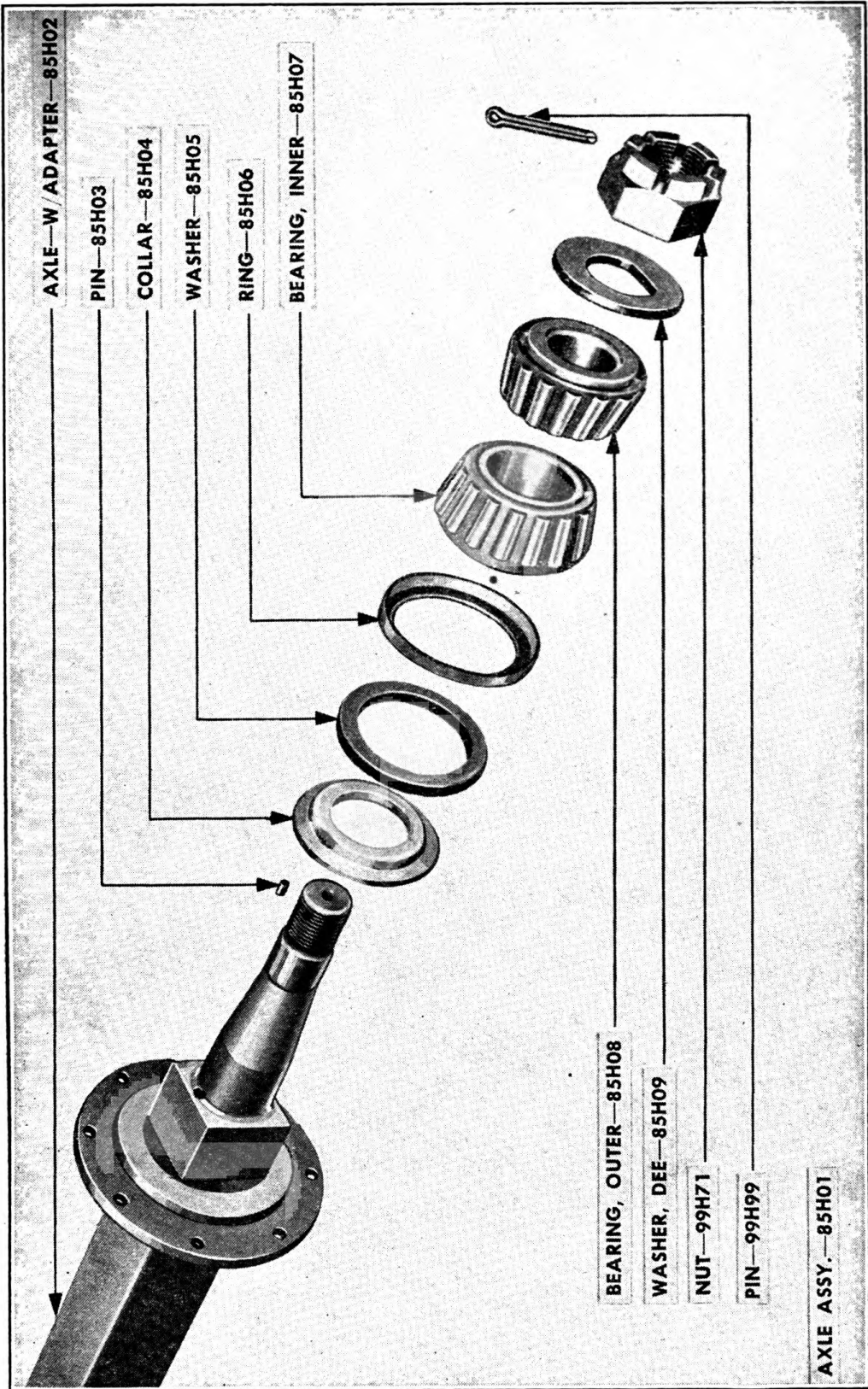


FIGURE 85. AXLE ASSEMBLY

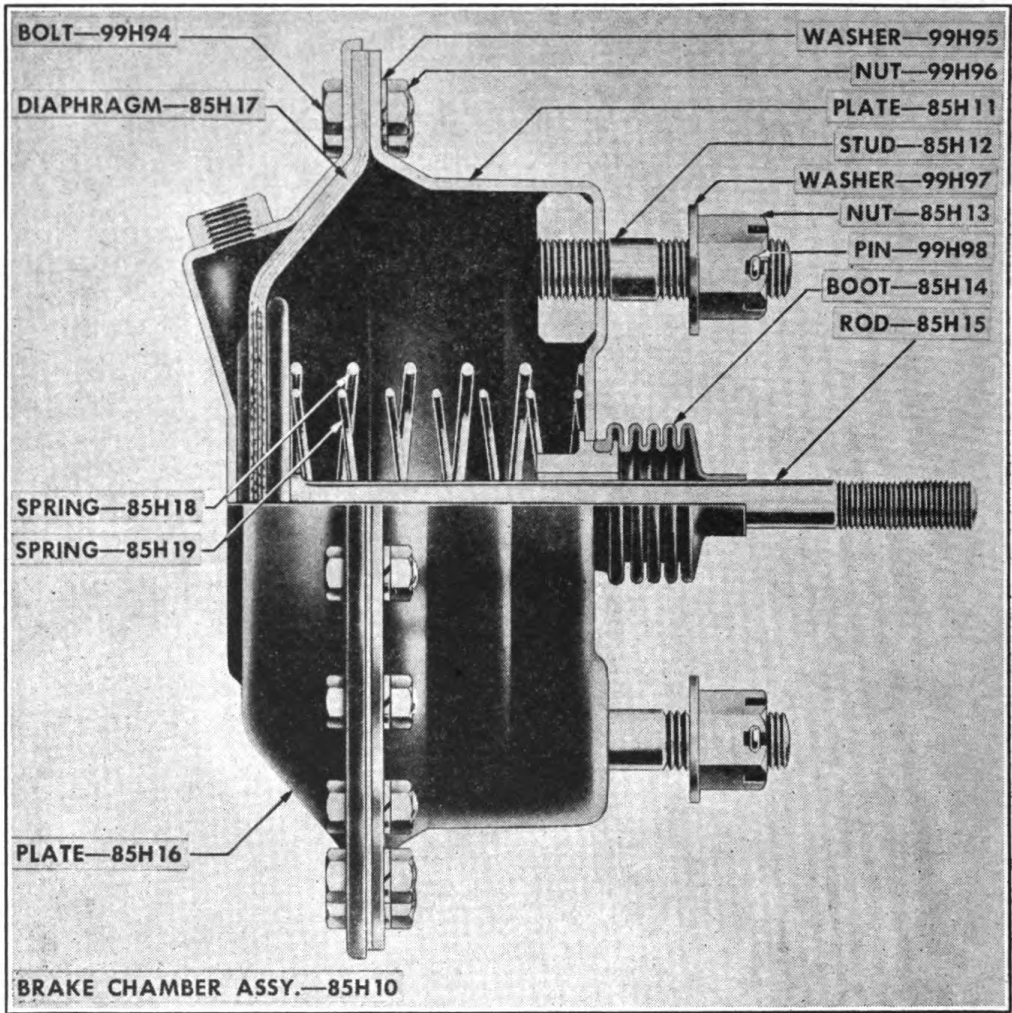


FIGURE 86. BRAKE CHAMBER ASSEMBLY

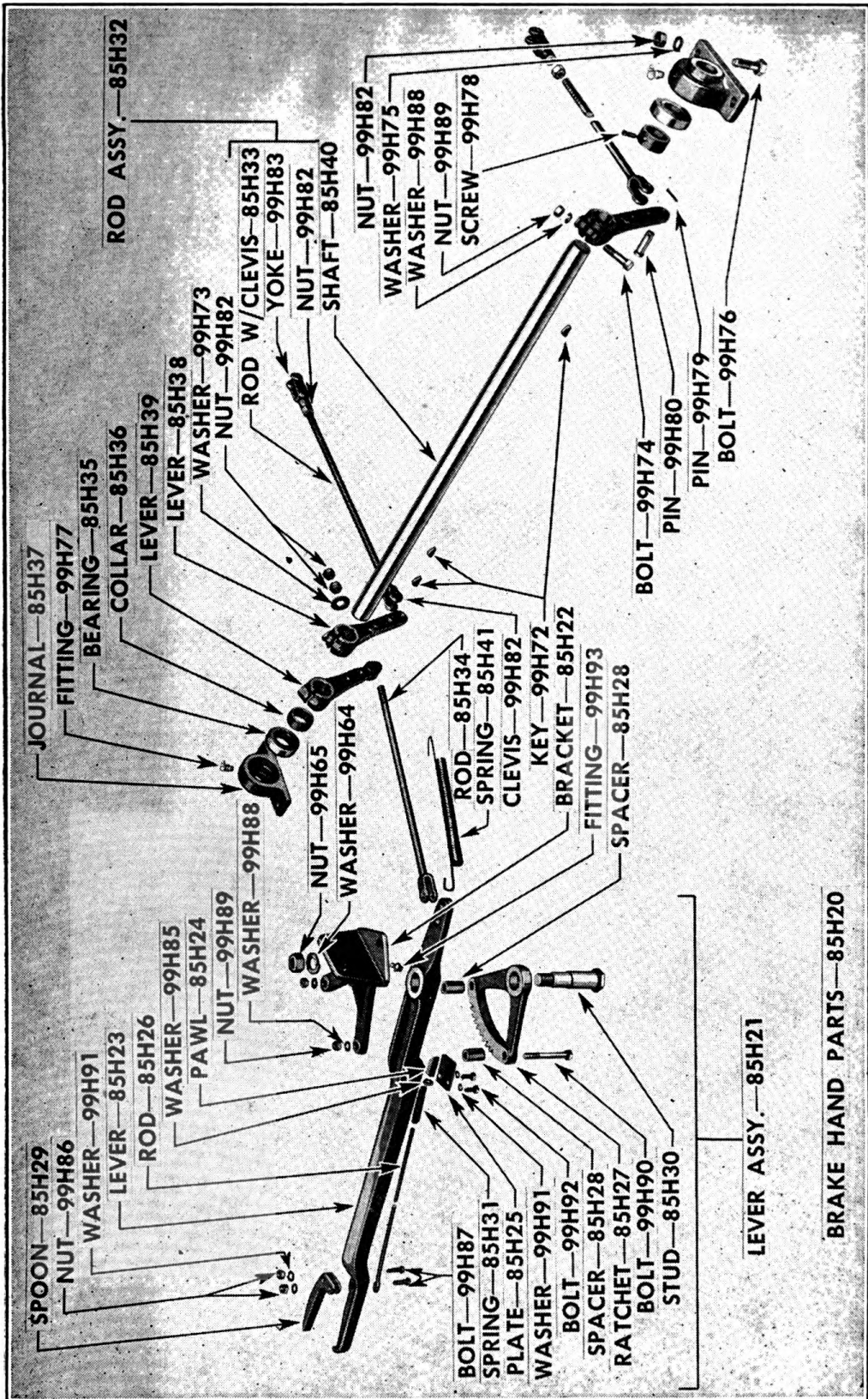


FIGURE 87. HAND PARKING BRAKE—TRAILER

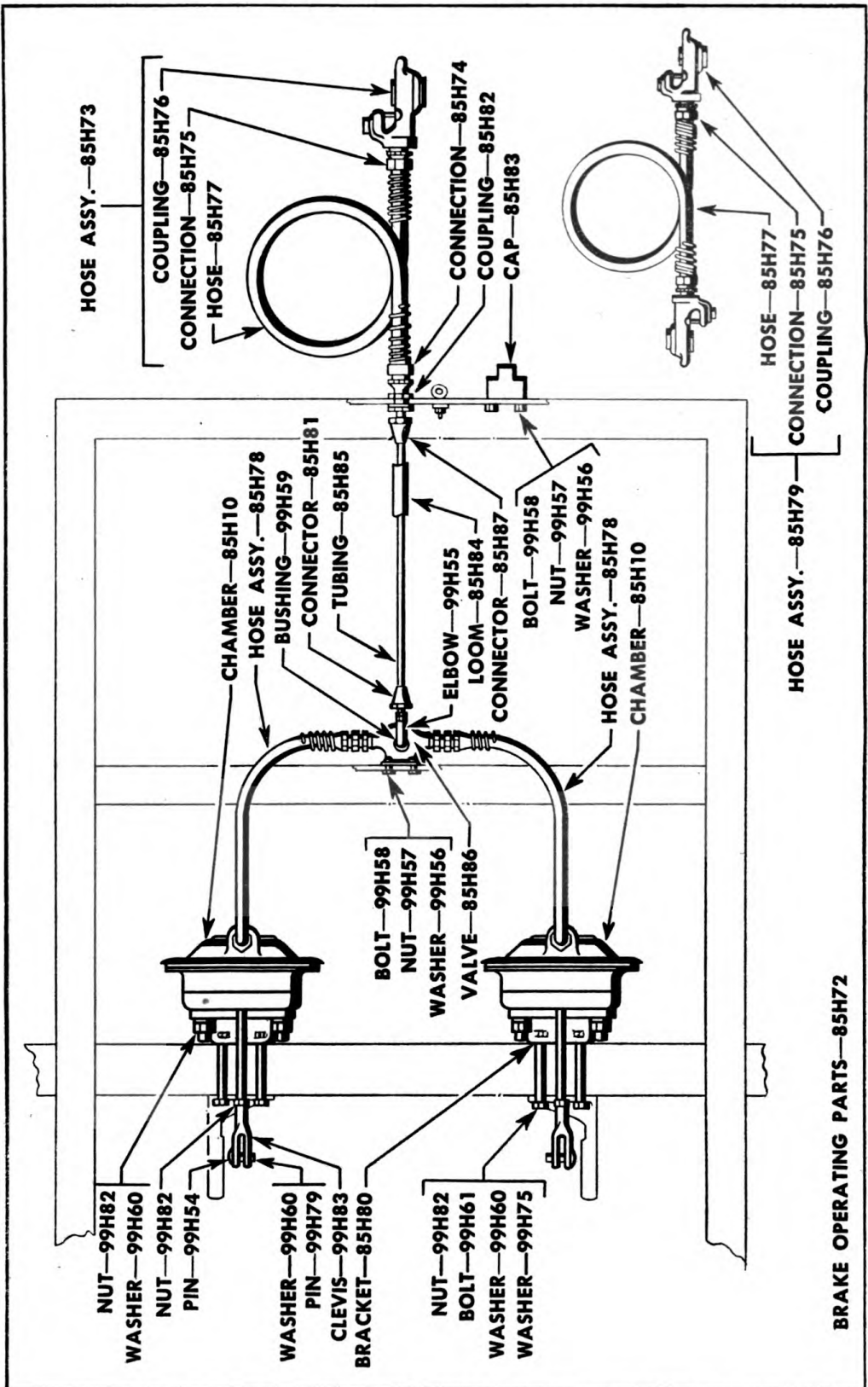


FIGURE 89. BRAKE OPERATING PARTS—DOLLY

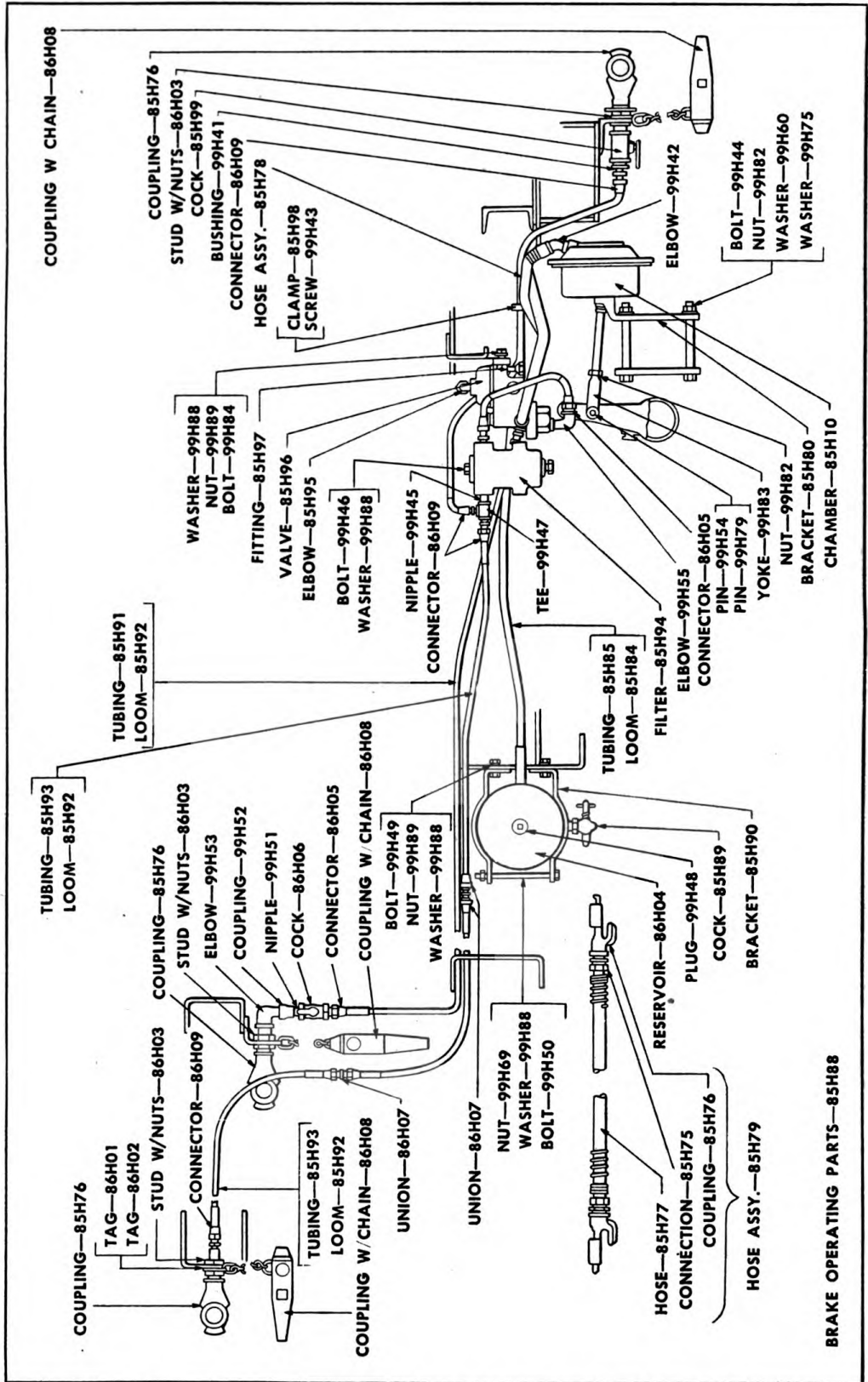


FIGURE 90. BRAKE OPERATING PARTS-TRAILER

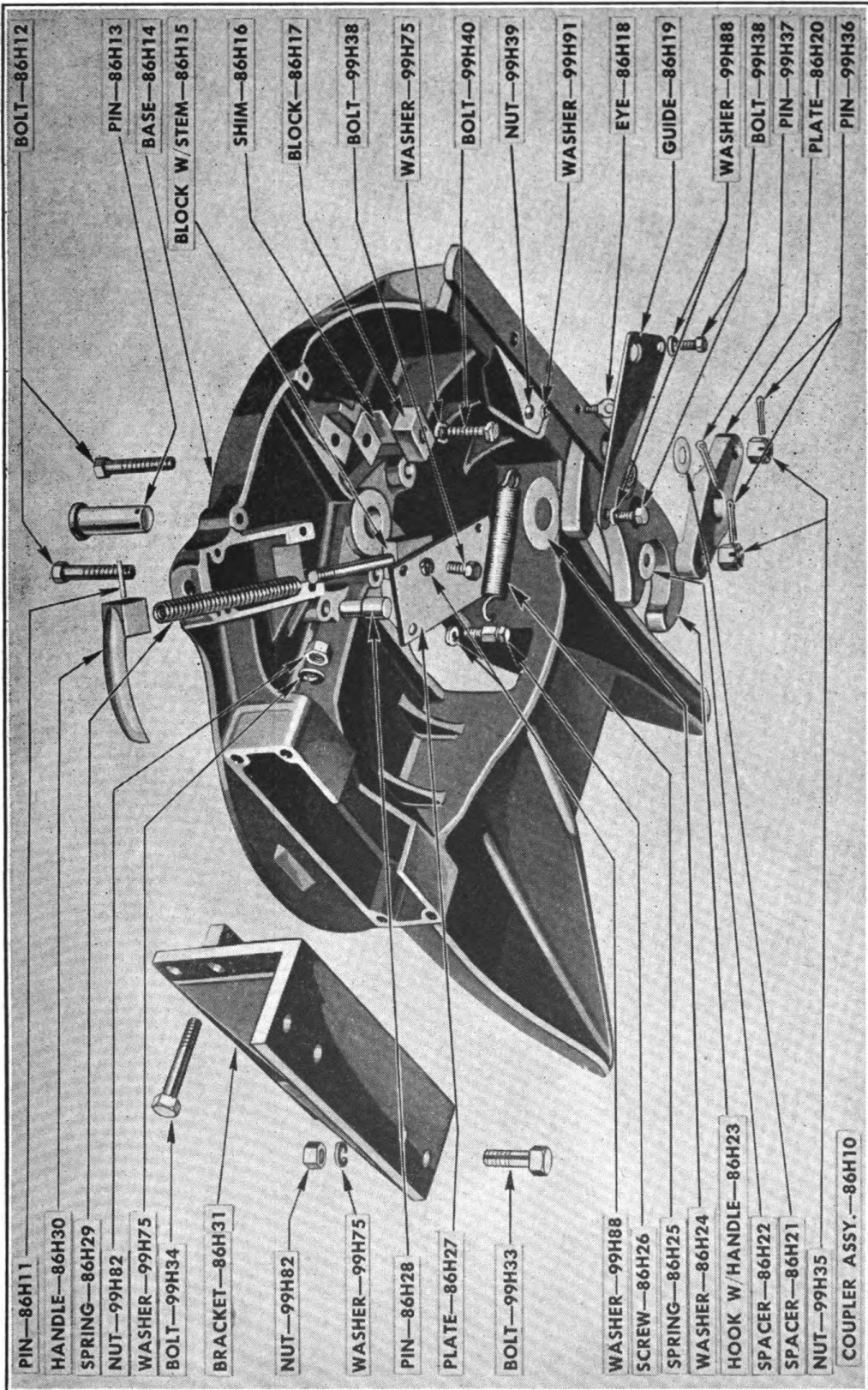


FIGURE 91. COUPLER ASSEMBLY—DOLLY

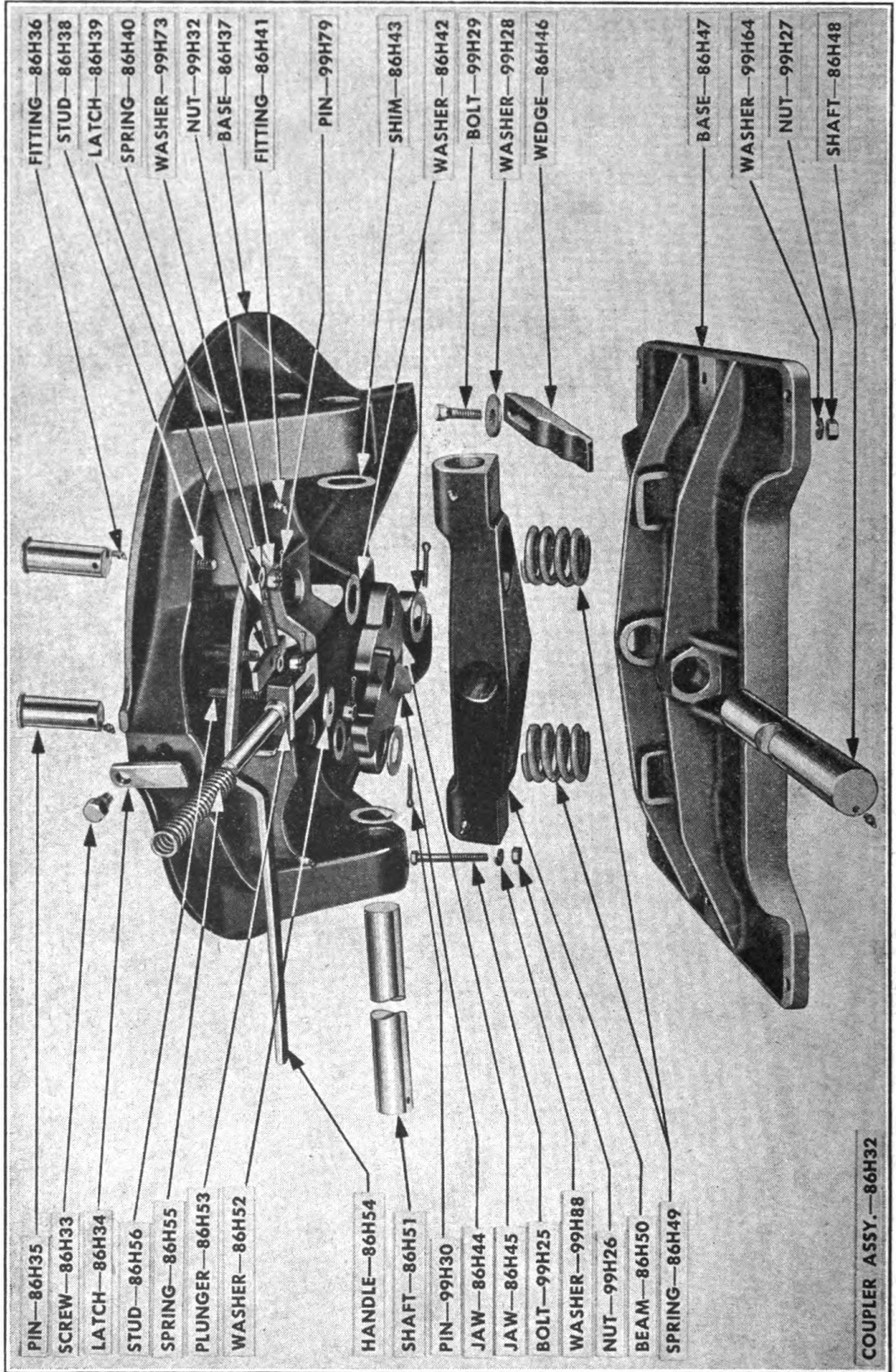


FIGURE 92. COUPLER ASSEMBLY—TOWING VEHICLE

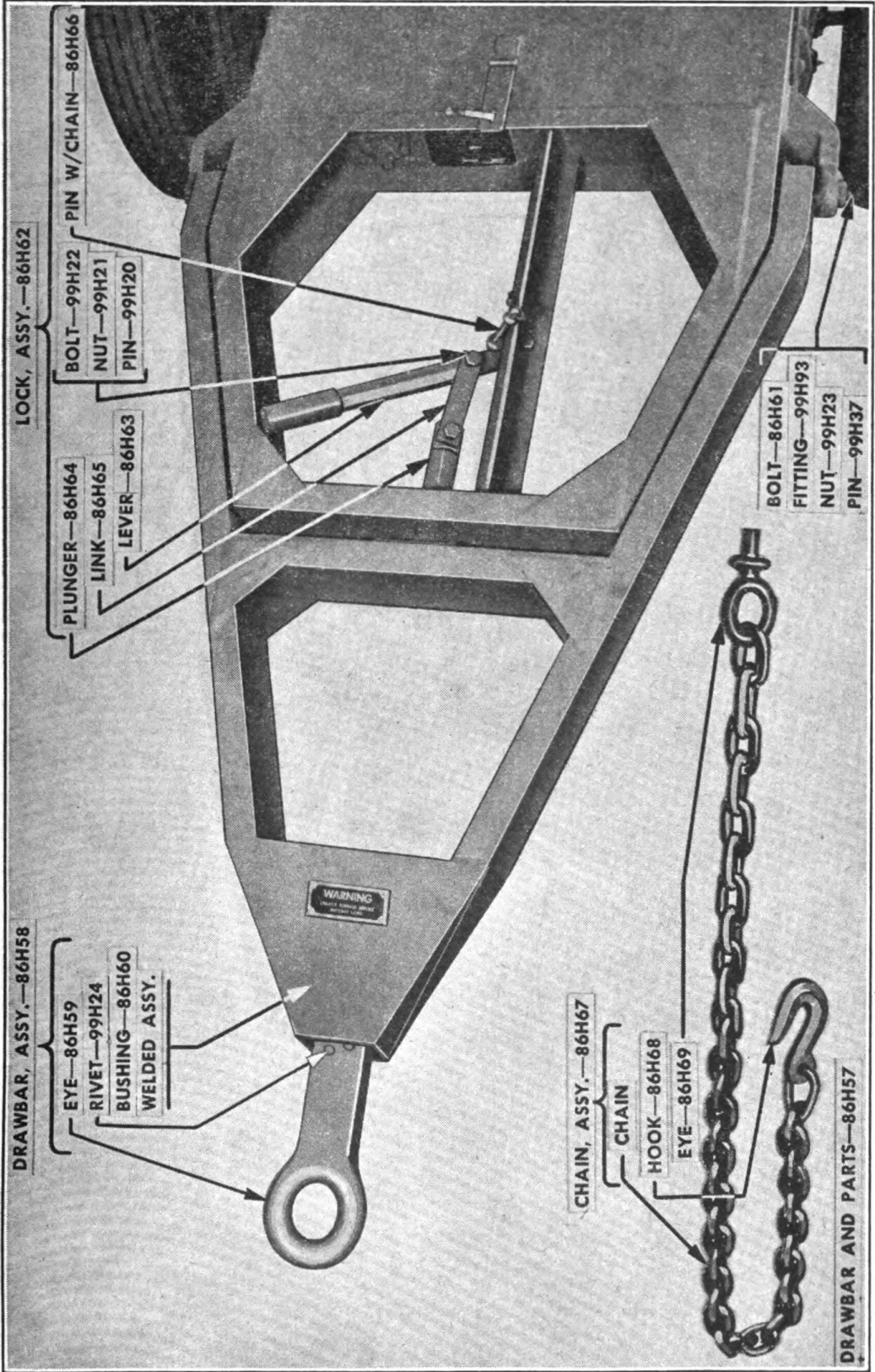


FIGURE 93. DRAWBAR AND PARTS

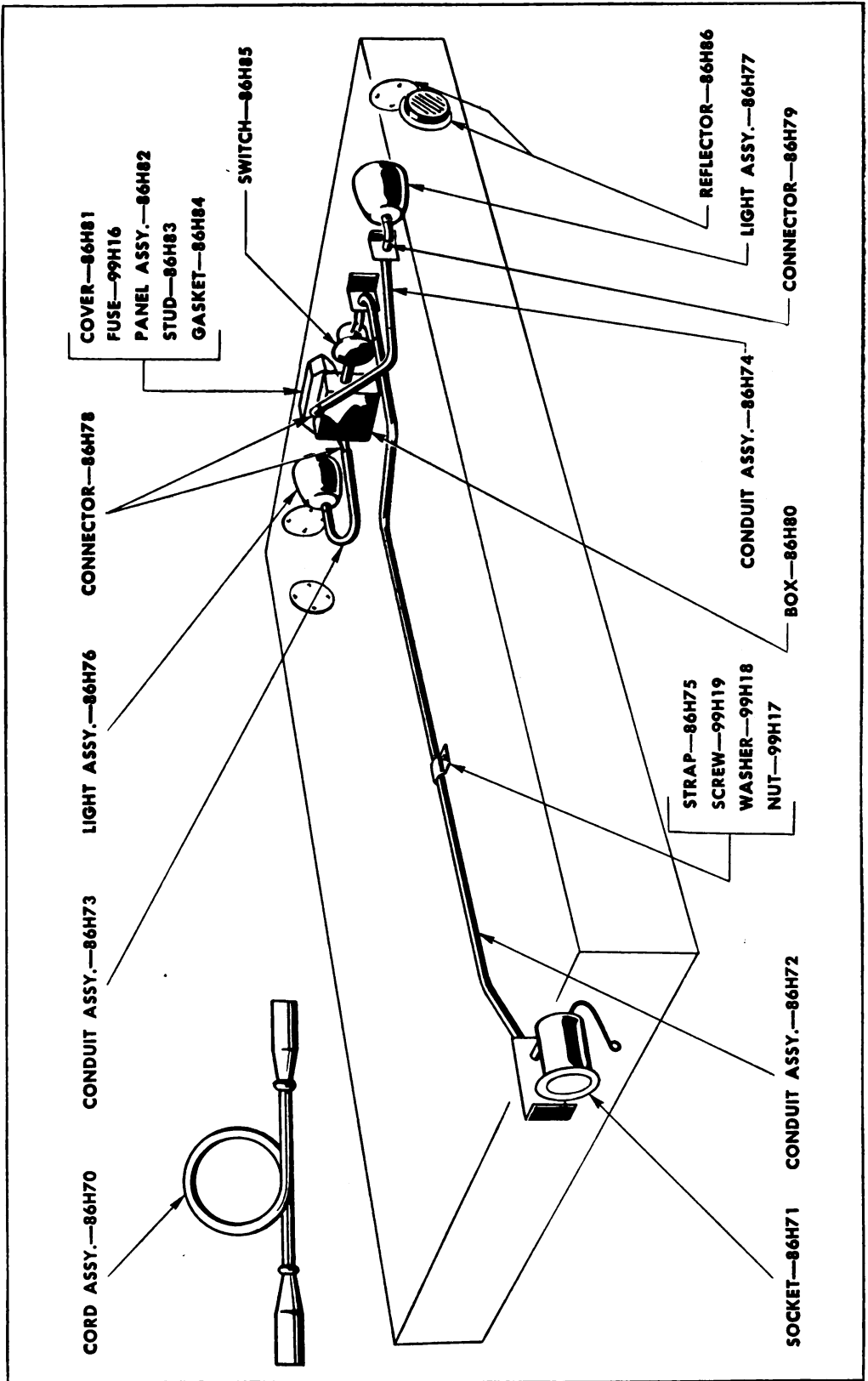


FIGURE 94. WIRING—DOLLY

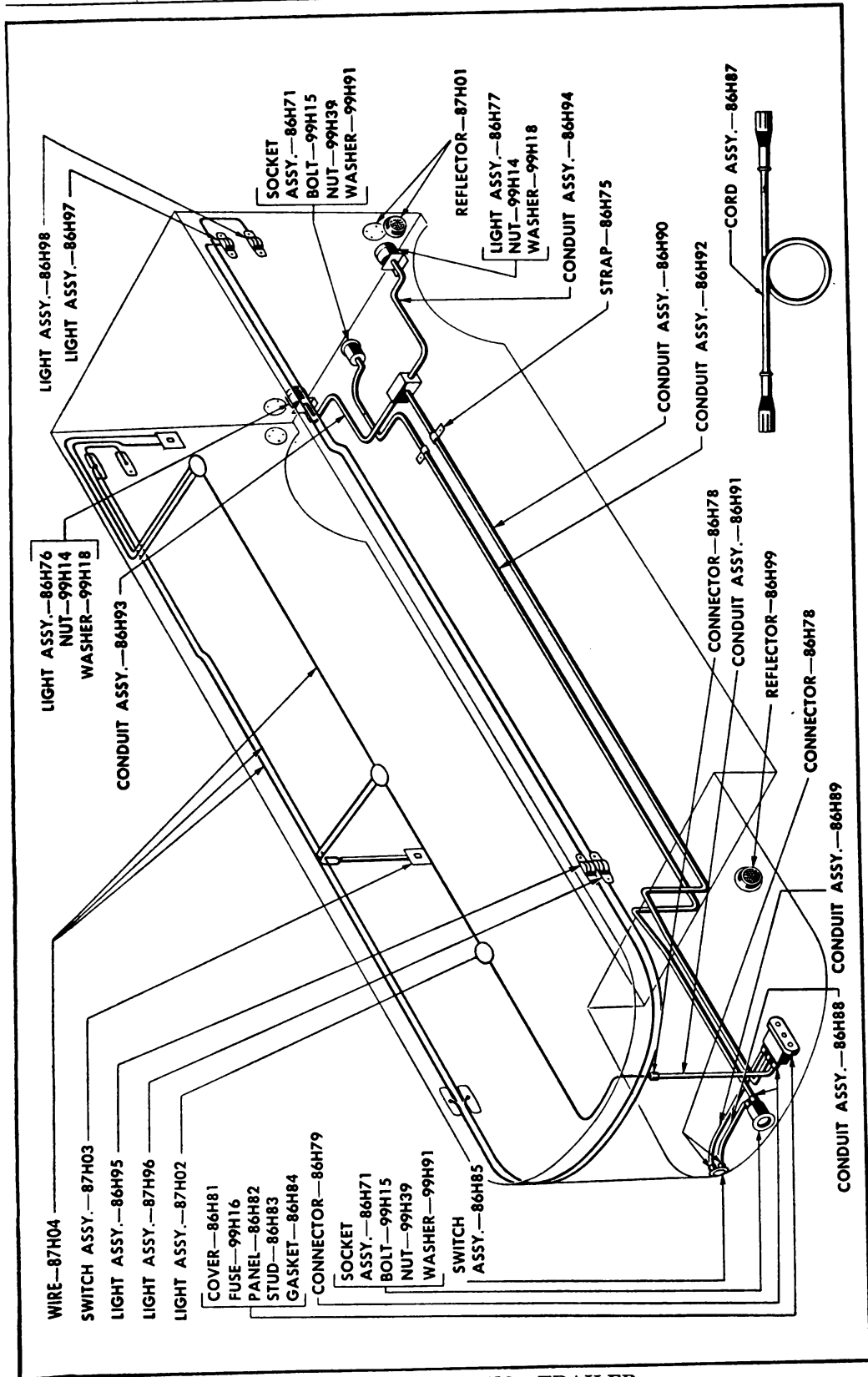


FIGURE 95. WIRING—TRAILER

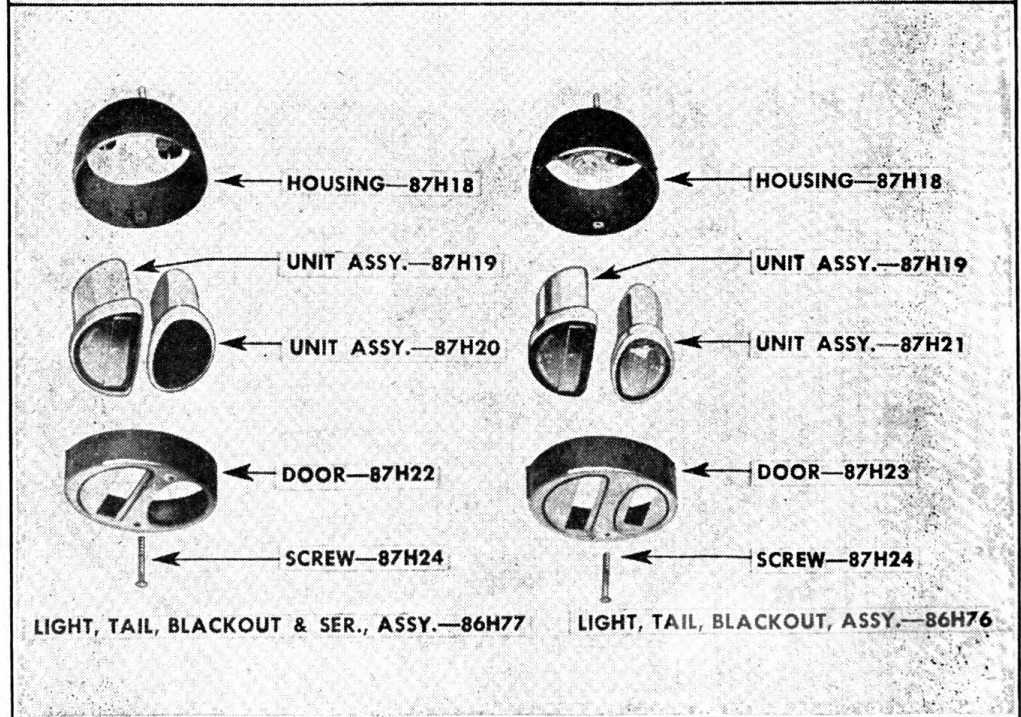
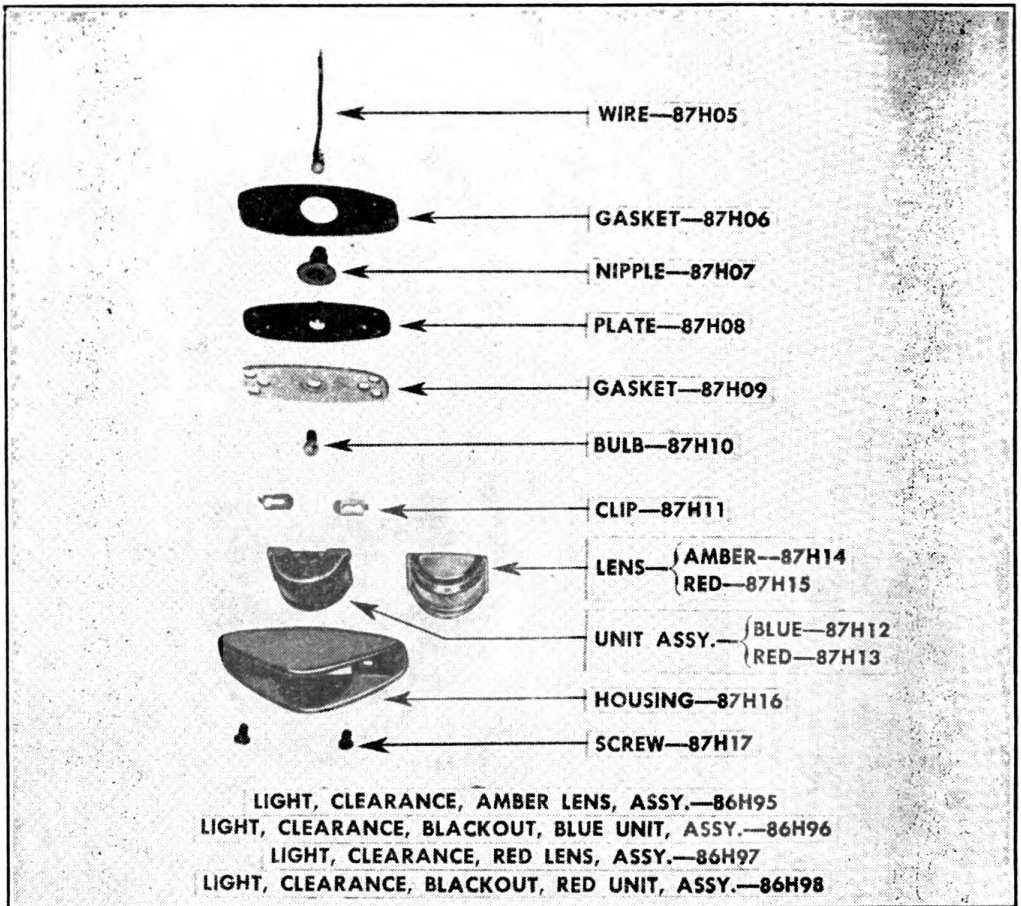


FIGURE 96. LIGHTS

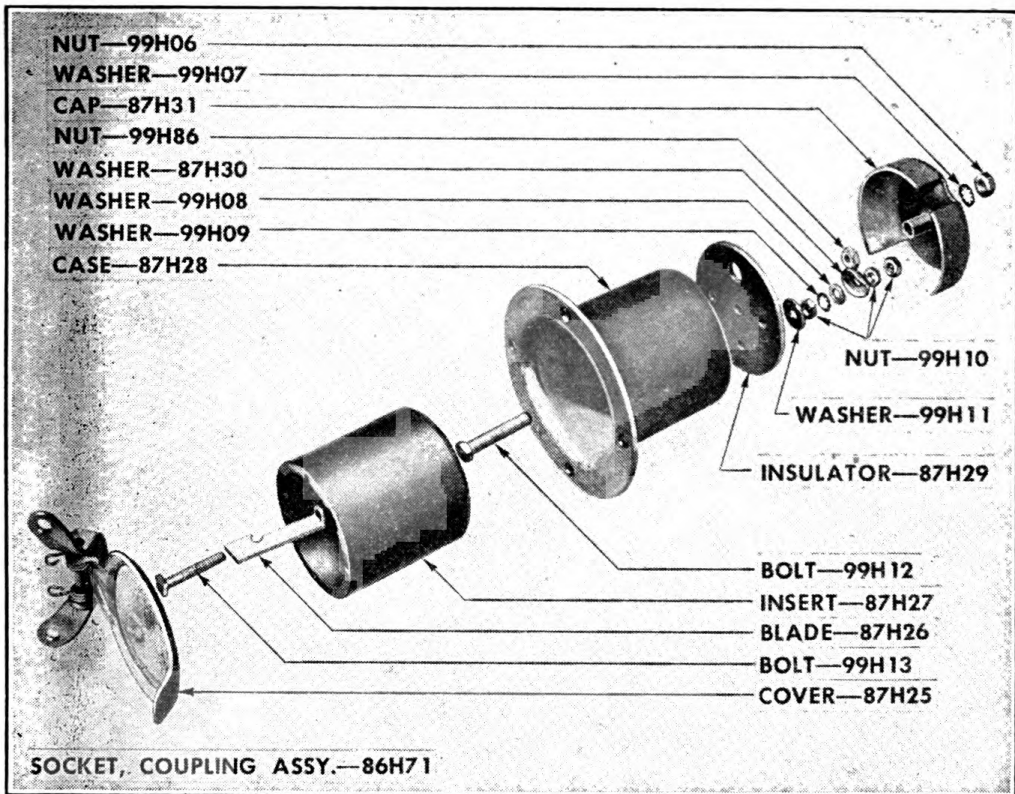


FIGURE 97. SOCKET, COUPLING ASSEMBLY

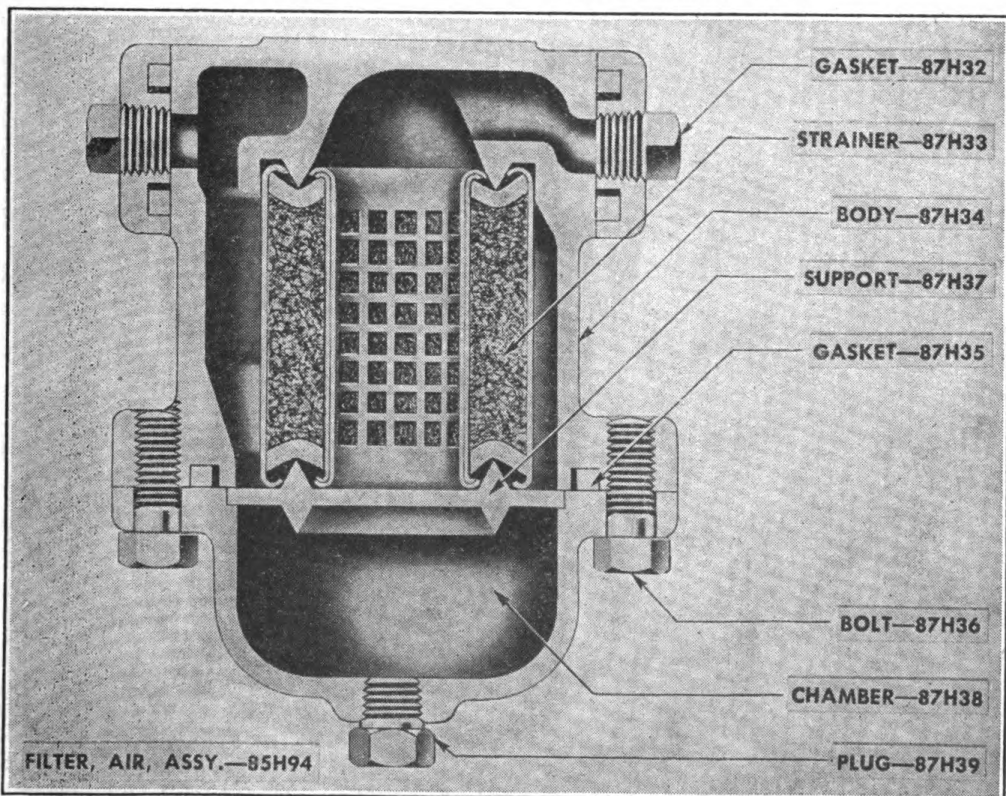


FIGURE 98. FILTER, AIR, ASSEMBLY

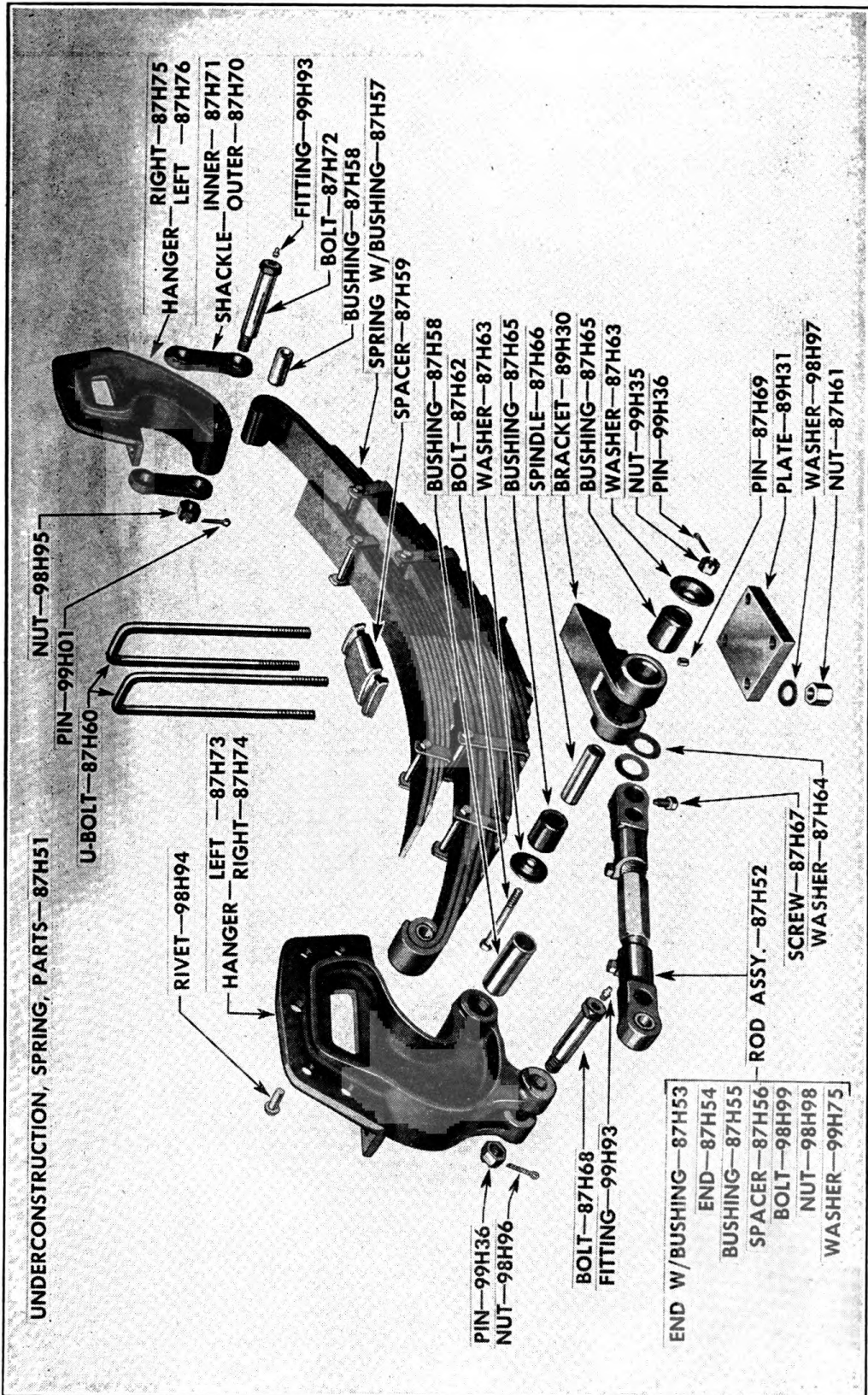


FIGURE 100. UNDERCONSTRUCTION—DOLLY

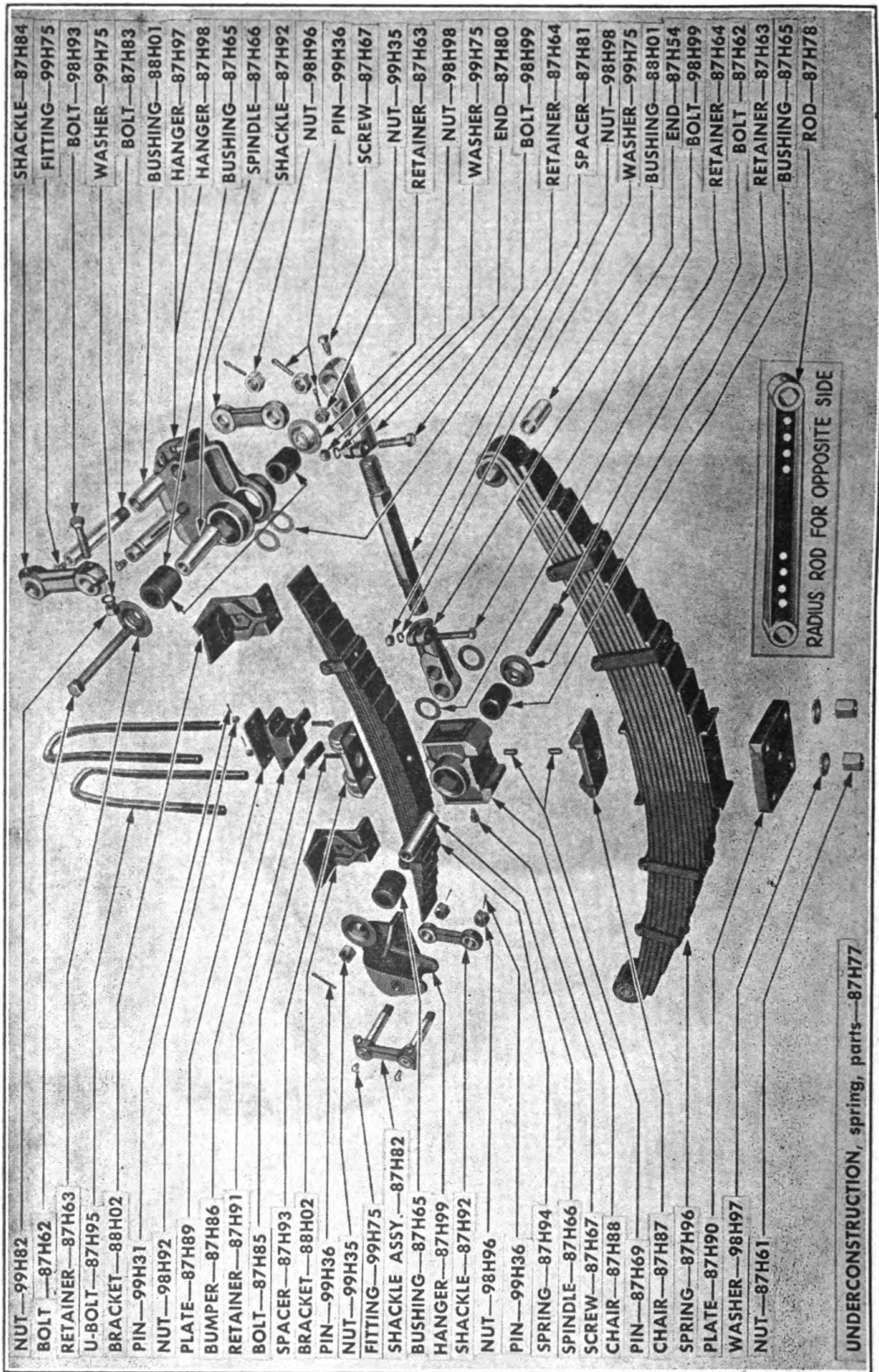


FIGURE 101. UNDERCONSTRUCTION—TRAILER

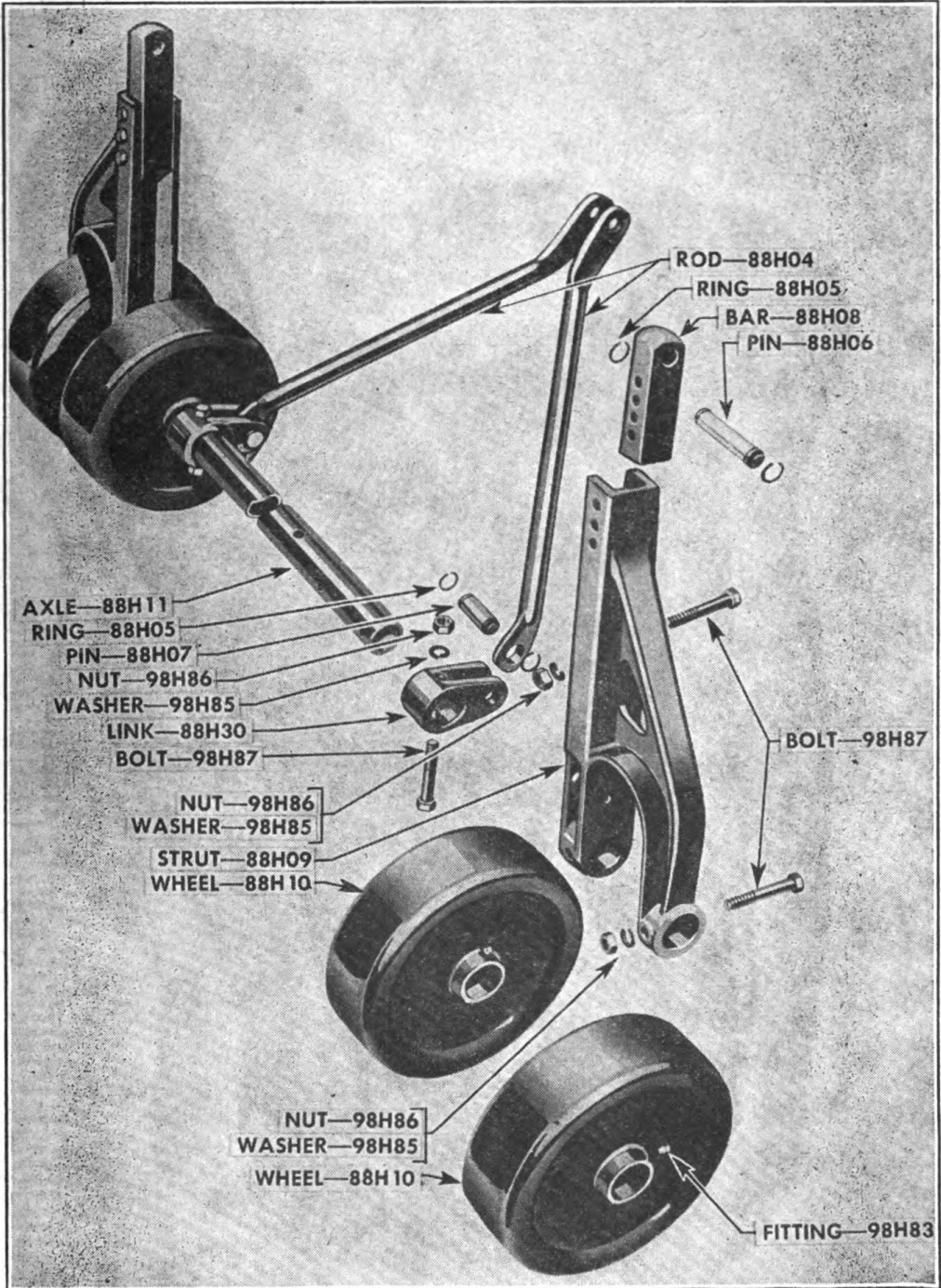


FIGURE 102. SUPPORT LEG ASSEMBLY

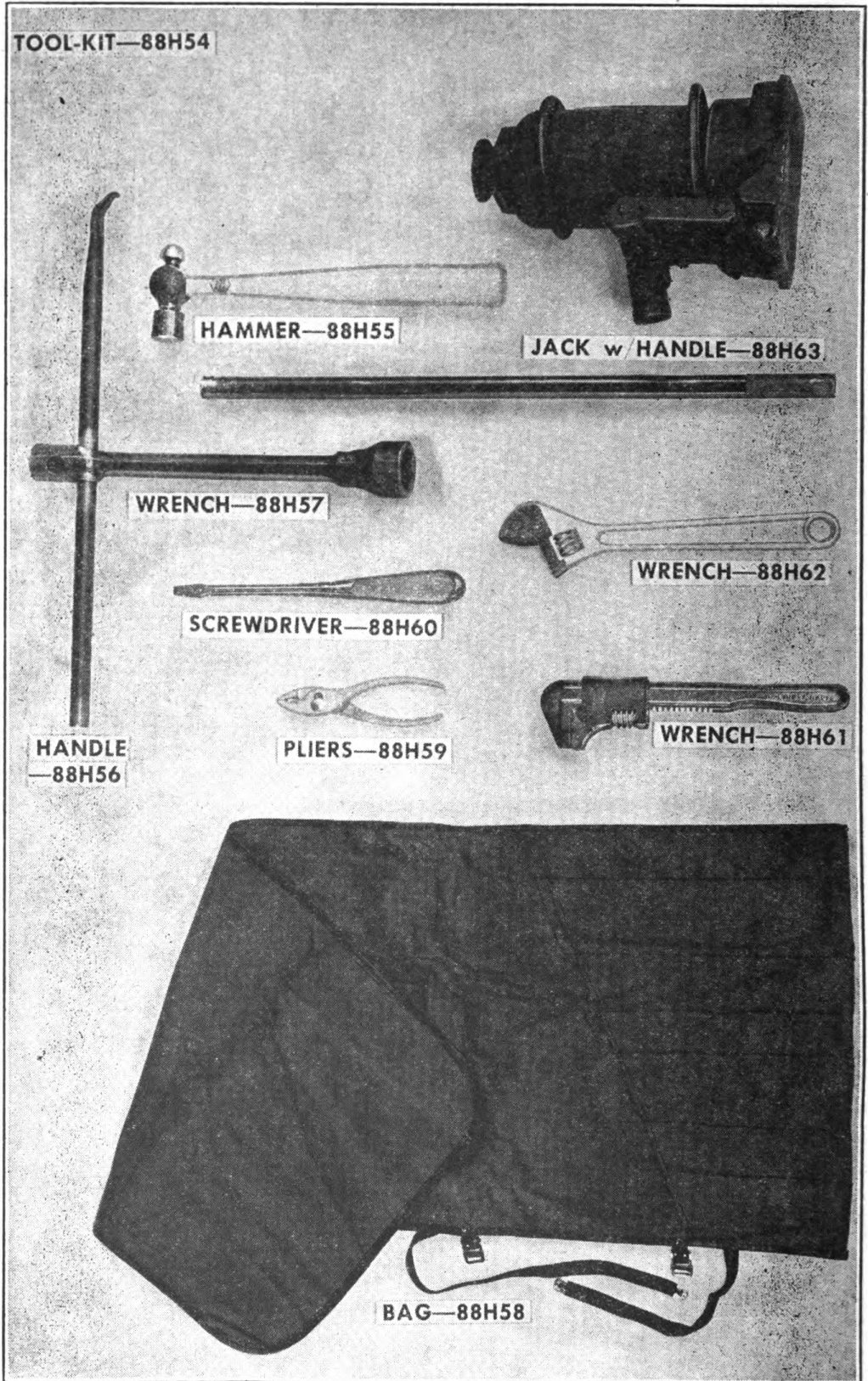


FIGURE 105. TOOLS

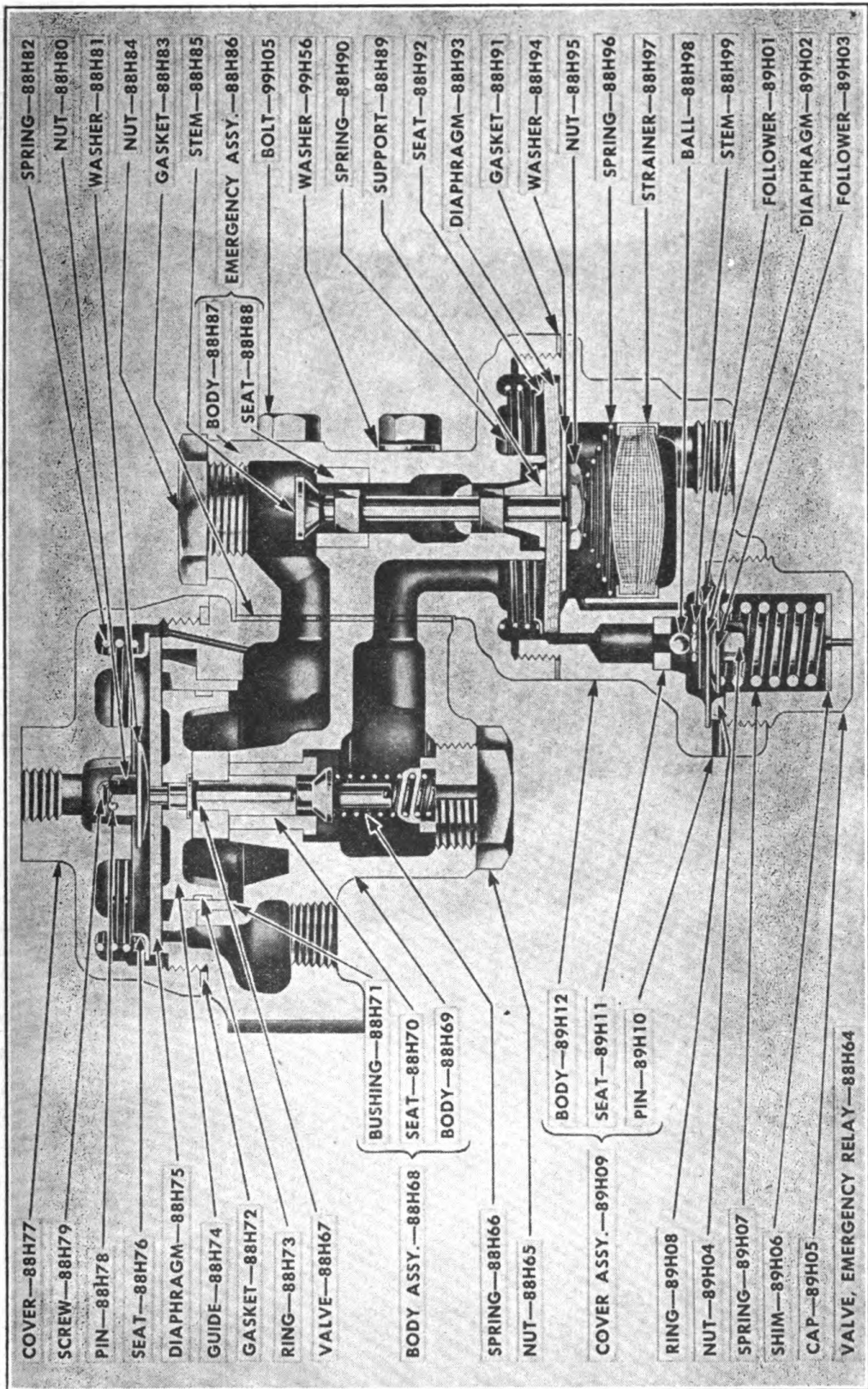


FIGURE 106. RELAY—EMERGENCY VALVE

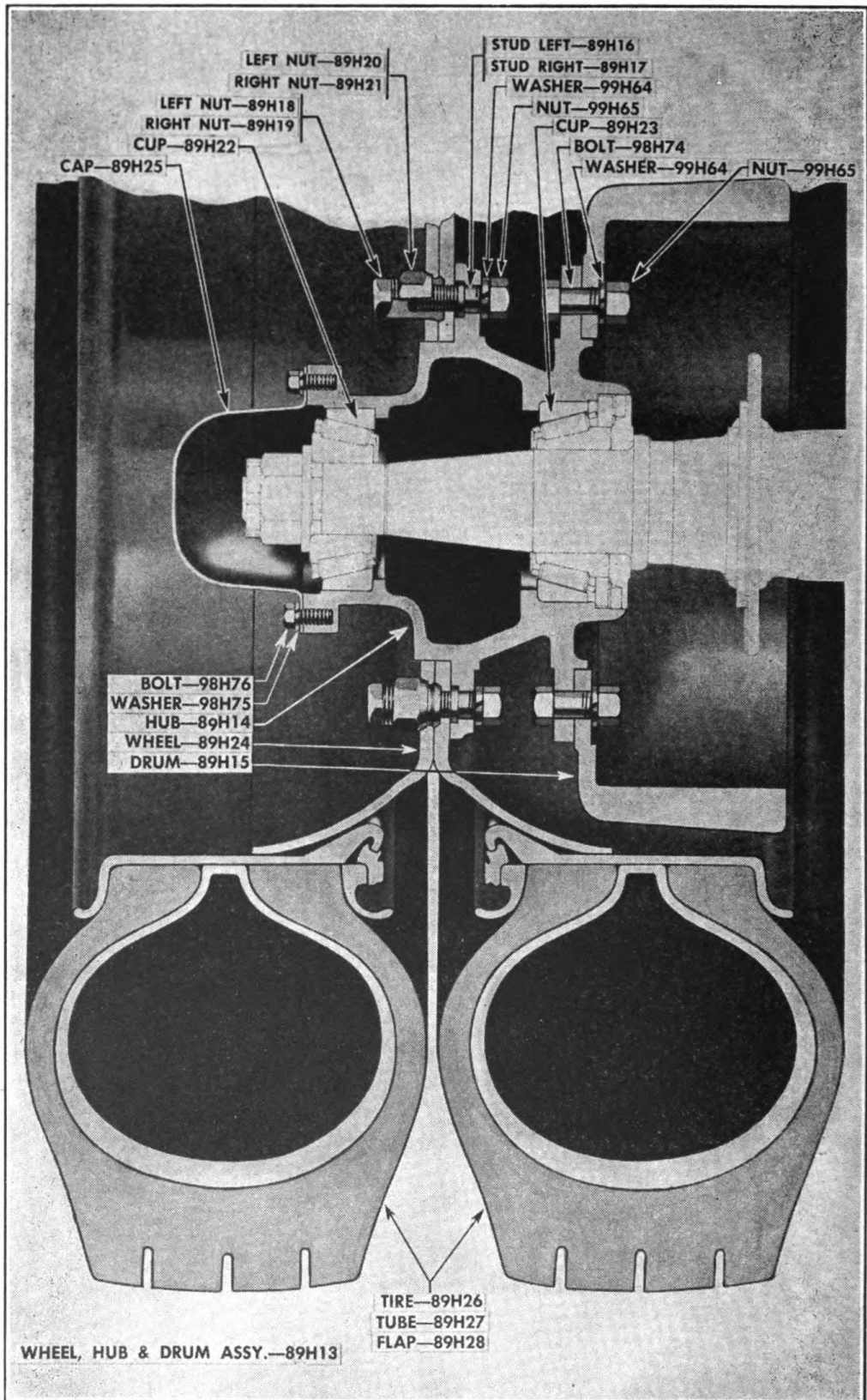


FIGURE 107. WHEELS, HUBS AND DRUMS

NUMERICAL PARTS LIST

MANUFACTURERS' IDENTIFICATION SYMBOLS

ATE	AUSTIN TRAILER EQUIPMENT— MUSKEGON, MICHIGAN	NC	NICE BALL BEARING COMPANY— PHILADELPHIA, PENNSYLVANIA
BW	BUDD WHEEL COMPANY—DETROIT, MICHIGAN	TB	THOMAS & BETTS COMPANY— ELIZABETH, NEW JERSEY
DFS	DAYTON STEEL FOUNDRY COMPANY— DAYTON, OHIO	TIM	TIMKEN ROLLER BEARING COMPANY— CANTON, OHIO
FF	FRUEHAUF TRAILER COMPANY— DETROIT, MICHIGAN	VL	VLCHERK TOOL COMPANY—CLEVELAND, OHIO
KD	K-D LAMP COMPANY—CINCINNATI, OHIO	WAB	BENDIX WESTINGHOUSE AUTO., AIR-BRAKE COMPANY—ELYRIA, OHIO
KHW	KELSEY HAYES WHEEL COMPANY— DETROIT, MICHIGAN	WAK	WALKER MFG. COMPANY—RACINE, WISCONSIN
		WEB	WARNER ELECTRIC BRAKE MFG. COMPANY— BELOIT, WISCONSIN

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
85H01	AXLE, w/WHEEL PARTS—Complete	FFSP-PL-514	2 sets	101	341.52	\$281.65
85H02	BEAM, axle, w/ADAPTER, 4 x 4 (69 $\frac{3}{4}$ thd.)	FF50844	2	101	313.0	281.65
85H03	PIN, dust collar, axle	FF534591	4	101	.01	.01
85H04	COLLAR, dust, axle	FF534998	4	101	19.0	3.70
85H05	WASHER, felt, axle	FF530373	4	101	.062	.50
85H06	RING, compression, axle	FF530371	4	101	.312	.40
85H07	BEARING, inner, wheel, axle (FF534751)	TIM6552	4	101	8.0	22.81
85H08	BEARING, outer, wheel, axle (FF534750)	TIM6375	4	101	6.0	13.49
85H09	WASHER, dec, axle	FF530086	4	101	1.44	.25
85H10	CHAMBER, brake, assy. (FF534374)	WAB215092	6	105, 106	9.0	18.50
85H11	PLATE, non-pressure, brake chamber	WAB217269	4	102	4.0	8.00
85H12	STUD, brake chamber	WAB202941	8	102	.156	.25
85H13	NUT, hex., cad., $\frac{5}{8}$ -18 (brake chamber)	WAB203172	8	102	.062	.07
85H14	BOOT, brake chamber	WAB201687	4	102	.062	.40
85H15	ROD, push, brake chamber	WAB205129	4	102	1.5	2.45

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
85H16	PLATE, pressure, brake chamber.	WAB202380	4	102	1.875	\$ 1.75
85H17	DIAPHRAGM, brake chamber.	WAB200001	4	102	.625	2.50
85H18	SPRING, inner, brake chamber.	WAB212294	4	102	.07	.40
85H19	SPRING, outer, brake chamber.	WAB212295	4	102	.100	.50
85H20	HAND BRAKE, parts—complete.	FFSP-PL527	1 set	103		40.15
85H21	HAND BRAKE, lever, assy.	FF51054	1	103	7.0	13.85
85H22	BRACKET, hand brake lever.	FF533279	1	103	4.0	1.95
85H23	LEVER, hand brake.	FF533271	1	103	9.0	5.10
85H24	PAWL, hand brake lever.	FF533275	1	103	.078	.85
85H25	PLATE, latch, hand brake lever.	FF533276	1	103	.093	.15
85H26	ROD, hand brake lever.	FF533273	1	103	.25	.60
85H27	RATCHET, hand brake lever.	FF533277	1	103	1.828	1.30
85H28	SPACER, hand brake ratchet.	FF533278	2	103	.11	.25
85H29	SPOON, hand brake lever.	FF533272	1	103	.5	.30
85H30	STUD, hand brake lever.	FF533280	1	103	.468	1.40
85H31	SPRING, hand brake lever latch.	FF533274	1	103	.022	.05
85H32	ROD, hand brake, assy.	FF51265	2	103	1.625	1.35
85H33	ROD, with/104044 CLEVIS, 1/2, hand brake.	FF530613	2	103	2.125	3.15
85H34	ROD, lock, hand brake (39 1/2" long).	FF50860	1	103	2.468	1.55
85H35	BEARING, ball, hand brake, and cam brkt. (FF53368)	NC517	4	103, 104	.468	1.70
85H36	COLLAR, cross shaft, hand brake.	FF533677	2	103	.187	.45
85H37	JOURNAL, rear cross shaft, hand brake.	FF532492	2	103	2.0	1.50
85H38	LEVER, rear cross shaft, hand brake.	FF532062	2	103	1.312	2.85
85H39	LEVER, slide bar, hand brake.	FF532750	1	103	1.515	2.00
85H40	SHAFT, cross, hand brake.	FF501243	1	103	10.25	3.20
85H41	SPRING, hand brake.	FF532146	1	103*	.5	.20
85H42	BRAKE, internal, parts—complete (dolly or trailer).	FFPL-3000-40	2 sets	104		157.90
85H43	ADJUSTER, slack, assy., brake.	FF51200	4	104	3.0	9.50
85H44	LEVER, adjusting, slack adjuster, brake.	FF535927	4	104	.125	.10
85H45	WORM, assy., slack adjuster, brake.	FF51240	4	104	.562	2.70
85H46	WASHER, lock, 1 1/8.	FF534014	4	104	.031	.05
85H47	HOUSING, slack adjuster, brake (not serviced separately).		4	104		

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
85H48	BUSHING, slack adjuster, brake.....	FF533066	12	104	.015	\$.05
85H49	WASHER, felt, slack adjuster, and cam shaft.....	FF534730	12	104	.015	.02
85H50	GEAR, worm, slack adjuster, brake.....	FF534725	4	104	1.25	2.50
85H51	RETAINER, felt, slack adjuster, brake.....	FF534731	4	104	.125	.05
85H52	RING—SNAP, felt retainer, slack adjuster, brake.....	FF534732	4	104	.062	.02
85H53	ADAPTER, brake, mounting plate (FF535098).....	FF51220	4	104	16.	13.15
85H54	BEARING, needle, brake adapter (2216-X).....	FF535017	4	104	.218	.65
85H55	FITTING, alemitte, straight, 1/8 (Keystone BB Combination).....	FF536393	4	104	.035	.58
85H56	SHIELD, dust, left, brake.....	FF535772	4	104	1.256	.95
85H57	SHIELD, dust, right, brake.....	FF535773	4	104	1.256	.95
85H58	SHOE, brake, assy., 16 x 6.....	FF51262	8	104	24.5	14.70
85H59	BUSHING, shoe brake.....	FF532866	16	104	.125	.15
85H60	LINING, brake shoe.....	FF535348	16	104	3.0	7.34
85H61	ROLLER, brake shoe.....	FF533979	8	104	.437	.30
85H62	SHAFT, roller, brake shoe.....	FF533980	8	104	.156	.15
85H63	BRACKET, cam, brake.....	FF535226	4	104	7.0	4.05
85H64	BRACKET, eccentric anchor pin, brake.....	FF533974	4	104	4.0	1.80
85H65	CAM, medium, left, brake.....	FF535105	2	104	9.5	9.60
85H66	CAM, medium, right, brake.....	FF535106	2	104	9.5	9.60
85H67	NUT, lock (brake).....	FF534079	8	104	.187	.30
85H68	PIN, anchor, eccentric, brake.....	FF533975	8	104	1.562	.60
85H69	RETAINER, felt, brake.....	FF535018	4	104	.031	.04
85H70	RING—SNAP, brake camshaft.....	FF535019	4	104	.031	.01
85H71	SPRING, brake shoe.....	FF530135	4	104	.60	.25
85H72	BRAKE, operating parts—complete—for dolly.....	FFSP-PL-513	1 set	105		127.75
85H73	HOSE, assy., 7' long, brake—dolly to trailer.....	FF50864	1	105	4.5	13.60
85H74	CONNECTION, w/WIRE, 1/4 I.D. hose, 1/4 pipe thd. (dolly brake) (FF535309).....	WAB215536	1	105	.343	.95
85H75	CONNECTION, w/WIRE, 1/4 I.D. hose, 1/2 pipe thd. (brake) (FF535308).....	WAB215535	1	105, 106	.812	.95
85H76	COUPLING, air hose, brake (FF534533).....	WAB220165	10	105, 106	1.2	3.15
85H77	HOSE, 1/4 I.D., brake (order by footage).....	FF1045	14'	105, 106	.156	.34

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
85H78	HOSE, flexible, assy., brake (FF51469)	WAB217097	4	105, 106	.40	\$ 5.10
85H79	HOSE, jumper, assy., brake (FF51028)	WAB215603	2	105, 106	4.75	11.20
85H80	BRACKET, mounting, brake chamber	FF501245	4	105	6.0	2.90
85H81	CONNECTION, 1/2 tubing, 3/8 pipe thd., brake (FF535306)	WAB217525	3	105	.218	.40
85H82	COUPLING, tubing, dolly brake (FF536214)	WAB205465	1	105	.312	.80
85H83	CAP, dummy, hose, dolly brake (FF535705)	WAB212227	1	105	.312	.75
85H84	LOOM, tubing, 1/2" I.D. (order by footage)	FF1044	5'-2"	105, 106	.375	.05'
85H85	TUBING, copper, 1/2" (order by footage)	FF1042	5'-2"	105, 106	.25	.20'
85H86	VALVE, quick release (FF535310)	WAB205000	1	105	1.25	5.00
85H87	CONNECTOR, 1/2" tubing, 1/4" pipe thd. (FF535739)	WAB217690	1	105	.187	.40
85H88	BRAKE, operating parts—complete (trailer)	FFSP-PL-518	1	106		293.30
85H89	COCK, drain, 1/4" (FF534434)	WAB215310	1	106	.406	1.00
85H90	BRACKET, reservoir	FF532827	4	106	.781	.20
85H91	TUBING, copper, 3/8" (order by footage)	FF1041	23'	106	.345'	.15'
85H92	LOOM, for 3/8" tubing (order by footage)	FF1043	87'	106	.375'	.04'
85H93	TUBING, steel, 3/8" (order by footage)	FF1814	64'	106	.25'	.12'
85H94	FILTER, air (FF536108)	WAB221022	4	106	6.375	19.60
85H95	ELBOW, 3/8" tubing, 1/4" pipe thd. (FF535304)	WAB205102	3	106	.125	.30
85H96	VALVE, relay, emergency (FF535303)	WAB220353	1	106	10.0	48.50
85H97	FITTING, exhaust (FF536110)	WAB221087	1	106	.125	2.00
85H98	CLAMP, tubing	FF532894	4	106	.008	.01
85H99	COCK, cut-out (FF534439)	WAB217799	2	106	1.75	2.45
86H01	TAG, service (FF535301)	WAB201500	2	106	.031	.20
86H02	TAG, emergency (FF535302)	WAB201499	2	106	.031	.20
86H03	STUD, clamping, w/NUTS (FF536213)	WAB205730	5	106	.593	1.50
86H04	RESERVOIR, 7" x 24" (FF535277)	WAB215660	1	106	17.0	11.60
86H05	CONNECTOR, 3/8" tubing, 3/8" pipe thd. (FF536187)	WAB205824	2	106	.093	.25
86H06	COCK, cut-off (FF535738)	WAB220745	1	106	1.25	4.20
86H07	UNION, tubing (FF535314)	WAB205134	4	106	.125	.35
86H08	COUPLING, dummy, w/CHAIN (FF535910)	WAB220636	5	106	.80	.80
86H09	CONNECTOR, 3/8" tubing, 1/4" pipe thd. (FF535300)	WAB205053	9	106	.125	.25
86H10	COUPLER, assy., less side angle brackets (mounted on dolly)	FFSP-PL 461	1	107	410.0	110.70

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
86H11	PIN, coupler hook lock handle (dolly)	FF650162	1	107	.015	\$.05
86H12	BOLT, hex-hd., dld., f/c pin, $\frac{5}{8}$ "-18 x $3\frac{1}{4}$ ", dolly coupler hook plate	FF650058	2	107	.343	.10
86H13	PIN, coupler hook (dolly)	FF650014	1	107	1.65	1.45
86H14	BASE, main, 36" (dolly coupler)	FF650561	1	107	198.66	70.45
86H15	BLOCK, w/STEM, lock, assy. (dolly coupler)	FF50668	1	107	1.	2.35
86H16	SHIM, coupler hook stop pin wear block (dolly)	FF650592	2	107	.074	.10
86H17	BLOCK, wear, coupler hook stop pin (dolly)	FF650566	1	107	.62	.60
86H18	EYE, bolt, $\frac{1}{4}$ " (dolly coupler)	FF532147	1	107	.031	.15
86H19	GUIDE, coupler hook handle (dolly)	FF650282	1	107	.98	.20
86H20	PLATE, coupler hook (dolly)	FF650155	1	107	2.031	1.05
86H21	SPACER, coupler hook plate, $\frac{5}{8}$ " I.D., $1\frac{1}{2}$ " O.D., $\frac{1}{4}$ " thick (dolly) (as req'd.)	FF650070	2	107	.026	.01
86H22	SPACER, coupler hook plate, $\frac{5}{8}$ " I.D., $1\frac{1}{2}$ " O.D., $\frac{1}{8}$ " thick (dolly) (as req'd.)	FF650070-A	2	107	.046	.02
86H23	HOOK, w/HANDLE, assy. (dolly coupler)	FF50667	1	107	9.0	6.25
86H24	WASHER, coupler hook spacer, $1\frac{1}{4}$ " I.D. x 3" O.D. (dolly)	FF650009	1	107	.186	.05
86H25	SPRING, coupler hook (dolly)	FF650114	1	107	.264	.10
86H26	SCREW, coupler hook spring (dolly)	FF650115	1	107	.113	.10
86H27	PLATE, coupler lock cover guide (dolly)	FF650116	1	107	.775	.10
86H28	PIN, stop, coupler hook (dolly)	FF650584	1	107	.35	.60
86H29	SPRING, coupler lock (dolly)	FF650118	1	107	.58	1.05
86H30	HANDLE, coupler hook lock (dolly)	FF500400	1	107	1.156	.95
86H31	BRACKET, angle, coupler side arm (dolly)	FF50883	2	107	12.0	15.75
86H32	COUPLER, Dayton, assy.—complete (FF50803) (mounted on tractor)	DSFFWU-33QB	1	108	452.0	180.00
86H33	SCREW, safety latch, Dayton coupler	DSFFWX-3018	1	108	.125	1.00
86H34	LATCH, safety, plunger, Dayton coupler	DSFFWX-3019	1	108	.437	1.25
86H35	PIN, jaw, Dayton coupler	DSFFWZ-3011	2	108	1.812	1.40
86H36	FITTING, alemite, 90°, Dayton coupler	DSFFWU-6824	2	108	.75	.25
86H37	BASE, 33", Dayton coupler	DSFFWU-330Q	1	108	182.0	60.00
86H38	STUD, Dayton coupler	DSFSD-5240S	2	108	.125	.15

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
86H39	LATCH, plunger lock, Dayton coupler.....	DSFFWX-3015	1	108	.78	\$.80
86H40	SPRING, lock latch, Dayton coupler.....	DSFSP-582	1	108	.062	.25
86H41	FITTING, alemite, 67½, Dayton coupler.....	DSFFWU-6823	6	108	.046	.25
86H42	WASHER, jaw pin, Dayton coupler.....	DSFFW-3022	2	108	.125	.03
86H43	SHIM, Dayton coupler.....	DSFFWU-6825	2	108	.125	.01
86H44	JAW, left, Dayton coupler.....	DSFFWZ-3010L	1	108	5.0	4.40
86H45	JAW, right, Dayton coupler.....	DSFFWZ-3010R	1	108	5.0	4.15
86H46	WEDGE, adjusting, Dayton coupler.....	DSFFWU-6786	2	108	3.0	2.00
86H47	BASE, sub, Dayton coupler.....	DSFFWU-6766B	1	108	164.0	57.60
86H48	SHAFT, lateral, Dayton coupler.....	DSFFWU-305QA	1	108	6.0	1.75
86H49	SPRING, leveling, Dayton coupler.....	DSFSP-33	2	108	1.25	1.75
86H50	BEAM, walking, Dayton coupler.....	DSFFWU-6765	1	108	24.0	30.00
86H51	SHAFT, support bracket, Dayton coupler.....	DSFFWU-305Q	1	108	23.0	4.18
86H52	WASHER, plunger stud, Dayton coupler.....	DSFFWX-3020	1	108	.187	.13
86H53	PLUNGER, lock, assy., Dayton coupler.....	DSFFWZ-306A	1	108	3.0	3.40
86H54	HANDLE, operating, Dayton coupler.....	DSFFWX-308	1	108	1.5	2.20
86H55	STUD, plunger, Dayton coupler.....	DSFSP-112512	1	108	.25	.80
86H56	DRAWBAR and PARTS—less safety chains.....	DSFSD-3023	1	108	.75	.90
86H57	DRAWBAR, assy.—less lock assy. and chains.....	FFSP-PL-697	1	109		147.75
86H58	EYE, drawbar.....	FF51890	1	109		112.35
86H59	BUSHING, drawbar.....	FF675557	1	109	40.0	42.75
86H60	BOLT, drawbar.....	FF601350	2	109	.312	.55
86H61	LOCK, drawbar, assy., complete.....	FF560503	2	109	2.125	1.40
86H62	LEVER, lock, drawbar, assy.....	FF521151	1	109	46.0	25.15
86H64	PLUNGER, lock, drawbar.....	FF601333	1	109	6.203	3.60
86H65	LINK, lock, drawbar.....	FF601334	1	109	3.0	8.45
86H66	PIN, lock w/chain, drawbar.....	FF16001	2	109	.5	1.10
86H67	CHAIN, safety, drawbar, assy.....	FF52110	1	109	.21	.75
86H68	HOOK, drawbar, chain, ½" x 3½"	FF675503	2	109	30.0	12.95
86H69	EYE, drawbar safety chain.....	FF600874	2	109	.9	.70
86H70	CORD, jumper, assy., 9' long—tractor to dolly (FF54887).....	WEB3737	2	109	.6	.85
			1	110	3.1	18.30

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
86H71	SOCKET, coupling, and COVER, assy.—complete (FF51310) . . .	WEB3604	3	110, 111, 113	2.1	\$ 2.50
86H72	CONDUIT, w/WIRE, assy.—socket to switch (dolly)	FF50852	1	110		1.90
86H73	CONDUIT, w/WIRE, assy.—box to blackout light (dolly)	FF54963	1	110		1.75
86H74	CONDUIT, w/WIRE, assy.—box to service light (dolly)	FF54964	1	110		2.60
86H75	STRAP, pipe, conduit	FF320493	35	110, 111	.05	.05
86H76	LIGHT, tail, blackout stop and tail, assy., 6-volt (FF320593)	KD951-I-6	2	110, 111, 112	1.3	3.03
86H77	LIGHT, tail, blackout tail and service stop and tail, 6-volt (FF320592)	KD950-I-6	2	110, 111, 112	1.3	2.87
86H78	CONNECTOR, 90° angle, 3/8" (FF675060)	TB321	7	110, 111	.16	.65
86H79	CONNECTOR, straight, 3/8" (FF675059)	TB3100	12	110, 111	.15	.15
86H80	BOX, junction	FF675101	2	110	1.0	3.65
86H81	COVER, fuse panel	FF690085	1	110, 111	1.718	.45
86H82	PANEL, fuse, w/TERMINALS, assy.	FF690006	2	110, 111	.156	.70
86H83	STUD, fuse panel, 5/8—18	FF690008	4	110, 111	.062	.10
86H84	GASKET, fuse panel	FF690007	2	110, 111	.031	.02
86H85	SWITCH, blackout, light, assy.	FF320518	2	110, 111	.59	1.75
86H86	REFLECTOR, red, assy. (dolly)	FF320658	4	110	.39	.80
86H87	CORD, jumper, assy., 8' long—tractor to trailer (FF54851)	WEB3169	1	111	3.0	15.90
86H88	CONDUIT, w/WIRE, assy.—socket to switch	FF54840	1	111		2.75
86H89	CONDUIT, w/WIRE, assy.—switch to fuse panel	FF54841	1	111		3.50
86H90	CONDUIT, w/WIRE, assy.—fuse panel to box	FF54842	1	111		9.00
86H91	CONDUIT, w/WIRE, assy.—fuse panel to body roof	FF54843	1	111		1.50
86H92	CONDUIT, w/WIRE, assy.—socket to rear socket	FF54844	1	111		12.40
86H93	CONDUIT, w/WIRE, assy.—box to blackout light	FF54873	1	111		2.65
86H94	CONDUIT, w/WIRE, assy.—box to service light	FF54874	1	111		1.55
86H95	LIGHT, clearance, amber lens, assy. (FF320487)	KD541	2	111, 112	.437	1.15
86H96	LIGHT, clearance, blackout, blue unit, assy. (FF320488)	KD541	2	111, 112	1.062	1.15
86H97	LIGHT, clearance, red lens, assy. (FF320624)	KD541	2	111, 112	.625	1.15
86H98	LIGHT, clearance, blackout, red unit, assy. (FF320625)	KD541	2	111, 112	1.062	1.55
86H99	REFLECTOR, amber, assy.	FF320657	2	111	.39	.80
87H01	REFLECTOR, red, assy.	FF320658	4	111	.39	.80
87H02	LIGHT, dome, assy.—w/21 C.P. bulb	FF320856	3	111	.30	2.15

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
87H03	SWITCH, dome light, w/PLATE	FF320331	2	111	.031	\$.35
87H04	WIRE, stranded, No. 14 ga., single conductor, brown (for re- placement of interior wiring)	FF1130	as req'd.	111	.02'	.03'
87H05	WIRE, pig-tale, assy., clearance light	KD7136	8	112	.015	.08
87H06	GASKET, rubber, clearance light	KD-5140	8	112	.03	.05
87H07	NIPPLE, rubber, clearance light	KD4684	8	112	.005	.08
87H08	PLATE, backing, clearance light	KD9526	8	112	.19	.20
87H09	GASKET, lexide, clearance light	KD2878	8	112	.005	.05
87H10	BULB, 1½ C.P., 6-8 volt	No. 55	8	112	.25	.07
87H11	CLIP, retaining, lens, clearance light	KD1996	16	112	.001	.05
87H12	UNIT, blackout, blue lens, clearance light	KD8014	2	112	.125	.80
87H13	UNIT, blackout, red lens, clearance light	KD8013	2	112	.125	.80
87H14	LENS, amber, clearance light	KD4393	2	112	.06	.25
87H15	LENS, red, clearance light	KD4392	2	112	.06	.25
87H16	HOUSING, clearance light	KD1135	8	112	.63	.20
87H17	SCREW, rnd-hd., brass, ¼—28, special clearance light	KD6777	16	112	.015	.05
87H18	HOUSING, tail light	KD8045	4	112	.50	.68
87H19	UNIT, blackout tail light, assy., lower, 6-volt (FF320678)	KD8040—6-V.	4	112	.28	1.10
87H20	UNIT, service, tail light, assy., upper, 6-volt (FF320676)	KD8039—6-V.	2	112	.26	.87
87H21	UNIT, blackout tail light, assy., upper, 6-volt (FF320677)	KD8041—6-V.	2	112	.21	1.00
87H22	DOOR, blackout and service tail light	KD2461	2	112	.19	.32
87H23	DOOR, blackout tail light	KD2460	2	112	.19	.32
87H24	SCREW, machine, rnd-hd., No. 8 x 1¼"	KD-6798	8	112	.01	.04
87H25	COVER, coupling socket, assy.	WEB11935-B	3	113	.25	.40
87H26	BLADE, contact, safety switch, coupling socket	WEB110247	12	113	.03	.04
87H27	INSERT, coupling socket—bakelite	WEB3528	3	113	.25	.40
87H28	CASE, coupling socket	WEB20102	3	113	.85	.66
87H29	INSULATOR, coupling socket case, back	WEB110417	3	113	.06	.15
87H30	WASHER, terminal cup, coupling socket	WEB110242	12	113	.01	.05
87H31	CAP, coupling socket, assy.	WEB110634	3	113	.16	.18
87H32	GASKET, flange, air filter	WAB214174	4	113	.004	.35
87H33	STRAINER, air filter	WAB221053	2	113	.125	2.50

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
87H34	BODY, air filter.....	WAB214169	2	113	4.0	\$ 9.90
87H35	GASKET, body, air filter.....	WAB214173	2	113	.008	.28
87H36	BOLT, hex-hd., air filter.....	WAB210897	4	113	.05	.05
87H37	SUPPORT, strainer, air filter.....	WAB214171	2	113	.187	.73
87H38	CHAMBER, dirt, air filter.....	WAB214172	2	113	1.5	3.60
87H39	PLUG, pipe, air filter.....	WAB213530	2	113	.041	.25
87H40	HOOK, pintle, assy. (FF52872).....	ATET-110	1	114	50.0	25.75
87H41	HOOK, pintle.....	ATET-101-2	1	114	21.0	7.50
87H42	LOCK, pintle hook.....	ATET-102-2	1	114	5.0	3.60
87H43	LAICH, pintle hook.....	ATET-103-3	1	114	2.0	1.30
87H44	SLEEVE, pintle hook.....	ATET-104	2	114	4.5	2.10
87H45	SPRING, pintle hook.....	ATET-105	1	114	7.5	2.00
87H46	SPRING, pintle hook, latch.....	ATET-106	1	114	.312	.15
87H47	PIN, pintle hook, latch.....	ATET-107	1	114	.5	.30
87H48	WASHER, pintle hook.....	ATET-108	1	114	.5	.20
87H49	BOLT, pintle hook.....	ATET-109	1	114	1.0	.80
87H50	NUT, hex., slotted, pintle hook, 1½" - 6.....	ATET-59	1	114	1.0	.45
87H51	UNDERCONSTRUCTION, spring, parts - less hangers (dolly).....	FFSP-PL-511	1 set	115		247.05
87H52	ROD, radius, adjustable, assy. (dolly underconstruction).....	FF53315	2	115	23.14	10.45
87H53	END, adjustable radius rod, w/BUSHING right thd. (dolly underconstruction).....	FF53316	2	115	7.21	4.55
87H54	END, adjustable radius rod, left thd., underconstruction.....	FF564621	3	115, 116	7.0	2.50
87H55	BUSHING, radius rod end.....	FF560754	2	115	.21	.50
87H56	SPACER, adjustable radius rod-dolly underconstruction.....	FF565157	2	115	8.93	4.55
87H57	SPRING, main and auxiliary, w/BUSHINGS (dolly).....	FF501244	2	115	290.04	67.15
87H58	BUSHING, main spring, 4" long (dolly).....	FF560760	8	115	1.75	1.00
87H59	SPACER, spring U-bolt (dolly).....	FF560106	2	115	2.0	3.85
87H60	U-BOLT, spring, 18½" long (dolly).....	FF501247	4	115	9.17	1.75
87H61	NUT, double, 1" (dolly).....	FF560245	8	115, 116	.92	.15
87H62	BOLT, spindle, radius rod, 5/8" - 18 x 5 7/8" (underconstruction).....	FF563825	6	115, 116	.625	.35
87H63	RETAINER, outer, underconstruction rubber bushing.....	FF563823	12	115, 116	.178	.03
87H64	RETAINER, inner, underconstruction rubber bushing.....	FF564270	12	115, 116	.187	.05

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
87H65	BUSHING, radius rod spindle.	FF563400	12	115, 116	.2	\$.25
87H66	SPINDLE, radius rod.	FF563824	6	115, 116	1.125	.55
87H67	SCREW, lock, spindle.	FF563497	6	115, 116	.031	.05
87H68	BOLT, radius rod.	FF560602	2	115	1.125	.70
87H69	PIN, dowel, 1/2" x 1", underconstruction.	FF560836	6	115, 116	.062	.15
87H70	SHACKLE, spring, outer (dolly).	FF560418	4	115	5.0	2.70
87H71	SHACKLE, spring, inner (dolly).	FF560419	4	115	2.5	2.75
87H72	BOLT, spring shackle (dolly).	FF560503	8	115	2.5	1.40
87H73	HANGER, spring, w/BUSHING, assy., left front (dolly).	FF50405	1	115	38.0	16.55
87H74	HANGER, spring, w/BUSHING, assy., right front (dolly).	FF50406	1	115	38.0	16.55
87H75	HANGER, spring, w/BUSHING, assy., right rear (dolly).	FF50407	1	115	38.0	12.90
87H76	HANGER, spring, w/BUSHING, assy., left rear (dolly).	FF50408	1	115	38.0	12.90
87H77	UNDERCONSTRUCTION, spring, parts—complete (trailer).	FFSP-PL-530	1 set	116		189.80
87H78	ROD, radius (trailer underconstruction).	FF53149	1	116	9.0	3.15
87H79	ROD, radius, adjustable, assy., trailer underconstruction.	FF53157	1	116	16.0	8.55
87H80	END, adjustable radius rod, right thd.	FF564622	1	116	7.0	2.50
87H81	SPACER, adjustable radius rod, trailer underconstruction.	FF564625	1	116	6.83	1.80
87H82	SHACKLE, spring, outer, assy., trailer.	FF53060	4	116	5.140	4.60
87H83	BOLT, spring shackle (trailer).	FF563961	8	116	1.312	1.10
87H84	SHACKLE, spring, outer (trailer).	FF563912	4	116	2.0	1.90
87H85	BOLT, retaining, bumper, trailer underconstruction.	FF564425	4	116	.062	.05
87H86	BUMPER, rubber, trailer underconstruction.	FF564425	2	116	.76	1.40
87H87	CHAIR, spring, 5/8" rise (trailer).	FF564425	2	116	3.5	2.85
87H88	CHAIR, spring, auxiliary (trailer).	FF501324	2	116	10.75	4.70
87H89	PLATE, mounting, bumper, 4 1/2" (trailer underconstruction).	FF564503	2	116	.79	.20
87H90	PLATE, spring, U-bolt (trailer).	FF501326	2	116	5.0	5.35
87H91	RETAINER, rubber bumper, trailer underconstruction.	FF564424	4	116	.21	.05
87H92	SHACKLE, spring, inner (trailer).	FF560502-A	4	116	3.10	.70
87H93	SPACER, U-bolt spring (trailer).	FF560103	2	116	5.0	1.15
87H94	SPRING, auxiliary (trailer).	FF563839	2	113, 116	45.36	8.25
87H95	U-BOLT, spring (trailer).	FF501327	4	116	9.375	1.90
87H96	SPRING, main (trailer).	FF501334	2	116	140.0	42.10

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
87H97	HANGER, spring, w/BUSHING, left front (trailer)	FF53033	1	116	20.75	\$6.90
87H98	HANGER, spring, w/BUSHING, right front (trailer)	FF53034	1	116	20.0	6.90
87H99	HANGER, spring, w/BUSHING, rear (trailer)	FF53035	2	116	18.0	4.55
88H01	BUSHING, spring and spring hanger (trailer)	FF560750	8	116	.5	.55
88H02	BRACKET, auxiliary spring (trailer)	FF563814	4	116	5.0	1.50
88H03	SUPPORTS, w/LEGS and OPERATING MECHANISM— complete	FFSP-PL-528	1 set	102, 103		152.60
88H04	ROD, connecting, supports	FF631359	2	117	8.34	4.80
88H05	RING, lock, support	FF630838	10	117, 118	.007	.02
88H06	PIN, support hinge	FF630020	3	117, 118	.97	.20
88H07	PIN, support hinge	FF630457	2	117	.72	.15
88H08	BAR, adjusting, support	FF631150	2	117	6.8	2.10
88H09	STRUT, wheel, support	FF631152	2	117	30.0	10.65
88H10	WHEEL, support, w/FITTING	FF53578	4	117	20.0	4.45
88H11	AXLE, support	FF631895	1	117	15.79	6.10
88H12	STOP, crankshaft, assy., support	FF53826	1	118	.375	1.50
88H13	FERRULE, crank, assy., support	FF53824	1	118	.312	2.20
88H14	SHAFT, support crank	FF631893	1	118	9.7	3.05
88H15	CRANK, support, w/HANDLE, assy.	FF50163	1	118	8.0	4.45
88H16	HANDLE, support crank	FF630027	1	118	.531	.25
88H17	PIN, support crank handle	FF630028	1	118	.59	.25
88H18	GEAR, support, plain	FF630070	2	118	5.1	2.20
88H19	PIN, grooved, mitre gear, support	FF630298	2	118	.093	.05
88H20	CAP, rear bearing, support	FF630576	1	118	5.0	1.60
88H21	BEARING, support (FF532633)	NC517	3	118	.3	.70
88H22	SLEEVE, bearing, support	FF630573	3	118	.55	.15
88H23	SCREW, riser, support	FF630572	1	118	13.65	4.10
88H24	SHIELD, dust, support	FF630579	1	118	2.011	.55
88H25	HOUSING, support riser nut	FF630568	1	118	9.0	2.35
88H26	DOWEL, riser screw nut, support	FF630589	1	118	.07	.05
88H27	NUT, riser, screw, support	FF630574	1	118	1.343	1.65
88H28	BRACKET, connecting rod, support	FF630569	1	118	6.938	2.25

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
88H29	HOUSING, riser gear.....	FF630570	1	118	6.250	\$ 4.60
88H30	LINK, connecting rod, support.....	FF631669	2	117	2.26	3.50
88H31	CAP, bearing, support.....	FF630575	1	118	5.0	1.35
88H32	BRACKET, support crankshaft, assy.....	FF50457	1	(Not Illus.)	1.187	.85
88H33	BRACKET, support, shaft, left.....	FF631312	1	(Not Illus.)	1.0	.85
88H34	BRACKET, support, shaft, right.....	FF631313	1	(Not Illus.)	1.0	.85
88H35	BUSHING, support crankshaft bracket.....	FF630661	1	(Not Illus.)	.500	.45
88H36	TIRE CARRIER, assy. (Budd 10 stud).....	FF54501	1	119	48.0	19.05
88H37	NUT, cap, 3/4" (FF534768).....	BW37888	4	119	.35	.20
88H38	CLIP, wire rope, w/NUTS and WASHERS, tire carrier.....	FF674772	1	119	.156	.10
88H39	SADDLE, lifting, tire carrier.....	FF674775	1	119	8.0	.15
88H40	SPRING, tire carrier crankshaft release handle.....	FF674759	1	119	.0125	.02
88H41	DRUM, spare tire carrier rope.....	FF675170	1	119	6.0	1.00
88H42	WASHER, retainer, spare tire carrier rope.....	FF675180	1	119	.103	.05
88H43	ROPE, wire, spare tire carrier.....	FF675191	1	119	.60	.25
88H44	BOLT, tire carrier.....	FF674774	4	119	1.77	.95
88H45	BRACKET, spare tire carrier.....	FF674776	1	119	7.75	2.05
88H46	REINFORCEMENT, corner, tire carrier, crossmember.....	FF674753	4	119	.52	.05
88H47	CROSSMEMBER, tire carrier.....	FF674778	1	119	24.75	3.35
88H48	HANDLE, release, tire carrier crankshaft.....	FF674756	1	119	.531	.30
88H49	BOLT, shoulder, tire carrier crankshaft release handle.....	FF-674758	1	119	.238	.15
88H50	SHAFT, crank, w/RATCHET, assy., tire carrier.....	FF52985	1	119	10.0	2.05
88H51	SHAFT, tire carrier.....	FF675179	1	119	6.1	1.88
88H52	RATCHET, tire carrier crankshaft.....	FF674757	1	119	.906	.65
88H53	PIN, taper groove, 1/4" x 1 1/2", tire carrier.....	FF142358	1	119	.1	.05
88H54	TOOL KIT, assy.....	FF56487	1	120	6.5	14.80
88H55	HAMMER, round pattern, ballpeen, 1 1/2 lbs.....	FF676277	1	120	2.0	1.75
88H56	HANDLE, wheel wrench (FF675081).....	KHW25564	1	120	1.5	.71
88H57	WRENCH, wheel (FF675164).....	BW18806	1	120	4.5	1.25
88H58	BAG, tool kit.....	FF676327	1	120	.5	2.25
88H59	PLIERS, combination 6".....	FF676276	1	120	1.844	.60
88H60	SCREWDRIVER, perfect handle, 5/16" x 6".....	FF676278	1	120	.5	.80

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
88H61	WRENCH, auto, 11' (FF676275)	VLWA-511-S	1	120	1.2	\$ 3.02
88H62	WRENCH, diamond adjusting callk, 12'	FF676279	1	120	1.594	4.05
88H63	JACK w/HANDLE, assy., 12-ton hydraulic (FF54929)	WAK945	1	120	21.0	26.35
88H64	VALVE, relay, emergency, assy. (FF535303)	WAB220353	1	121	10.0	48.50
88H65	NUT, cap, relay valve	WAB202692	1	121	.187	.70
88H66	SPRING, relay valve	WAB202699	1	121	.046	.15
88H67	VALVE, intake, relay valve	WAB202693	1	121	.023	2.15
88H68	BODY, complete, relay valve	WAB216071	1	121	2.62	13.20
88H69	BODY, relay valve, not serviced separately	WAB204568	1	121	2.62	8.75
88H70	SEAT, valve, relay valve	WAB202690	1	121	.062	.45
88H71	BUSHING, diaphragm guide, relay valve	WAB212135	1	121	.500	.90
88H72	GASKET, cover, relay valve	WAB211367	1	121	.002	.15
88H73	RING, diaphragm guide, relay valve	WAB202869	1	121	.012	.25
88H74	GUIDE, diaphragm, relay valve	WAB204650	1	121	.125	1.30
88H75	DIAPHRAGM, relay valve	WAB202695	1	121	.062	.35
88H76	SEAT, spring, relay valve	WAB202697	1	121	.031	.30
88H77	COVER, relay valve	WAB202691	1	121	.390	1.75
88H78	PIN, cotter, relay valve	WAB203016	1	121	.006	.01
88H79	SCREW, diaphragm, relay valve	WAB204651	1	119, 121	.012	.25
88H80	NUT, diaphragm, relay valve	WAB203227	1	121	.062	.03
88H81	WASHER, diaphragm, relay valve	WAB202696	1	121	.25	.30
88H82	SPRING, relay valve	WAB202698	1	121	.048	.65
88H83	GASKET, relay valve	WAB202735	1	121	.015	.15
88H84	NUT, cap, relay valve	WAB202741	1	121	.156	.55
88H85	STEM, valve, relay valve	WAB203379	1	121	.062	1.45
88H86	EMERGENCY, assembly, relay valve	WAB215204	1	121	2.375	7.90
88H87	BODY, relay valve, not serviced separately	WAB202746	1	121	.031	6.95
88H88	SEAT, valve, relay valve	WAB202736	1	121	.062	.25
88H89	SUPPORT, diaphragm, relay valve	WAB202743	1	121	.015	.25
88H90	SPRING, relay valve	WAB202738	1	121	.015	.30
88H91	GASKET, cover, relay valve	WAB202747	1	121	.015	.15
88H92	SEAT, upper spring, relay valve	WAB202737	1	121	.02	.15

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
38H93	DIAPHRAGM, relay valve.....	WAB202744	1	121	.031	\$.15
38H94	WASHER, relay valve.....	WAB213387	1	121	.033	.11
38H95	NUT, lock, relay valve.....	WAB200029	1	121	.01	.11
38H96	SPRING, relay valve.....	WAB204056	1	121	.012	.20
38H97	STRAINER, relay valve.....	WAB204055	1	121	.04	1.00
38H98	BALL, relay valve.....	WAB211539	1	121	.031	.35
38H99	STEM, relay valve.....	WAB211538	1	121	.005	.50
89H01	FOLLOWER, diaphragm, upper, relay valve.....	WAB211595	1	121	.021	.40
89H02	DIAPHRAGM, relay valve.....	WAB213227	1	121	.001	.16
89H03	FOLLOWER, diaphragm, lower, relay valve.....	WAB211541	1	121	.016	.40
89H04	NUT, lock, stem, relay valve.....	WAB211542	1	121	.006	.20
89H05	CAP, relay valve.....	WAB213230	1	121	.25	.40
89H06	SHIM, relay valve.....	WAB213229	1	121	.001	.05
89H07	SPRING, relay valve.....	WAB213228	1	121	.055	.15
89H08	RING, relay valve.....	WAB213226	1	121	.218	.15
89H09	COVER, diaphragm, assy., relay valve.....	WAB220304	1	121	1.25	3.50
89H10	PIN, relay valve.....	WAB213224	1	121	.001	.04
89H11	SEAT, valve, relay valve.....	WAB211537	1	121	.008	.30
89H12	BODY, cover, relay valve, not serviced separately.....	WAB213225	1	121	1.25	2.10
89H13	WHEEL, HUB, and DRUM, assy. — complete (dolly or trailer)	FFSP-PL-517	2 sets	122	492.0	656.76
89H14	HUB, wheel.....	FF536211	4	122	96.0	55.40
89H15	DRUM, brake, wheel.....	FF535830	4	122	109.0	27.60
89H16	STUD, left (FF534771).....	BW12248	20	122	.40	.25
89H17	STUD, right (FF534770).....	BW12247	20	122	.40	.25
89H18	NUT, cap, double, inner, left-hand thd. (FF536078).....	BW43809	20	122	.37	.35
89H19	NUT, cap, double, inner, right-hand thd. (FF536079).....	BW43808	20	122	.37	.35
89H20	NUT, cap, double, outer, left-hand thd. (FF536080).....	BW43812	20	122	.22	.20
89H21	NUT, cap, double, outer, right-hand thd. (FF536081).....	BW43811	20	122	.22	.20
89H22	CUP, bearing, outer (FF534762).....	TIM6321	4	122	.7	6.83
89H23	CUP, bearing, inner (FF534763).....	TIM6521	4	122	1.0	10.24
89H24	WHEEL, 20 x 9-10 (FF536075).....	BW45530	8	122	108.0	38.00
89H25	CAP, hub.....	FF530057	4	122	.7	.45

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
89H26	TIRE, 12.00/20, 14 ply	FF501278	8	122	169.0	\$ 104.26
89H27	TUBE, tire, 12.00/20	FF675459	8	122	19.0	8.60
89H28	FLAP, tire tube	FF675460	8	122	4.0	1.15
89H29	EXTENSION, valve (for airing tires) (Schrader No. 6284)	FF675980	4	(Not Illus.)	.2	.75
89H30	BRACKET, radius rod, dolly under construction	FF501296	2	115	192.0	7.95
89H31	PLATE, U-bolt (dolly)	FF563383	2	115	12.0	5.90
89H40	COVER, tool box, w/HINGE, assy.—for dolly	FF50831	1	(Not Illus.)	6.	9.30
89H41	BRACKET, drawbar—drawbar to dolly frame	FF55111	2	(Not Illus.)	8.	13.80
89H42	BRACKET, auxiliary spring—spring bumper on dolly frame	FF563386	4	(Not Illus.)	2.	2.15
89H43	CHANNEL, pick-up assy.—for dolly (channel over which trailer slides when hooking dolly)	FF50882	2	(Not Illus.)	12.	20.35
89H44	PLATE, apron, 42" wide—for trailer (plate to which kingpin is attached)	FF501227	1	(Not Illus.)	157.380	31.20
89H45	PIN, king—for trailer (dolly to trailer hook-up pin)	FF651305	1	(Not Illus.)	10.	6.20
89H46	I-BEAM, support—for trailer	FF261457	1	(Not Illus.)	47.9	9.30
89H47	BRACKET, leg, support—for trailer (bracket to which support legs are attached)	FF631001	1	(Not Illus.)	12.0	3.30
89H48	PLATE, hook connection, assy.—for trailer (rear plate on which hook is mounted)	FF52065	1	(Not Illus.)	8.	1.15
89H49	PLATE, serial and model number	FF590100	1	(Not Illus.)	.39	.75
89H50	RAMP, assy.—for tractor (coupler mounted on tractor pick-up ramp)	FF50798	1	(Not Illus.)	15.	15.40
89H51	BOW, roof—for trailer (crossing members)	FF300355	13	(Not Illus.)	7.52	1.35
89H52	BOW, roof—for trailer (one in extreme front and extreme rear)	FF11412	2	(Not Illus.)	8.	1.35
89H53	PANEL, roof, assy.—complete (cover for roof frame)	FF16879	1	(Not Illus.)	56.40	56.40
89H54	PANEL, roof, 24" wide, 101" long	FF300500	12	(Not Illus.)	15.1	2.50
89H55	STRIP, clincher, 101" long—for trailer roof panels	FF300466	13	(Not Illus.)	1.61	.45
89H56	CAP, roof, front	FF300734	1	(Not Illus.)	96.00	21.40
89H57	CAP, roof, rear	FF300371	1	(Not Illus.)	15.538	5.15
89H58	BOW, front roof cap, left side (reinforcing roof cap)	FF300568	1	(Not Illus.)	3.5	.70
89H59	BOW, front roof cap, right side (reinforcing roof cap)	FF300569	1	(Not Illus.)	3.5	.70

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
89H60	*MOULDING, roof cap (top seam on roof cap, front and rear)	FF2234	8'-4"	(Not Illus.)	.5	\$.04'
89H61	MOULDING, front roof cap, left side (seam at curved section)	FF300397	1	(Not Illus.)	3.450	1.90
89H62	MOULDING, front roof cap, right side (seam at curved section)	FF300398	1	(Not Illus.)	3.450	1.90
89H63	*MOULDING, drip, roof, rear	FF1014	11'-6"	(Not Illus.)	1.	.11'
89H64	*MOULDING, drip, roof, side	FF1014	24'	(Not Illus.)	1.	.11'
89H65	*MOULDING, snap-on cover (on side of trailer)	FF1008	150'	(Not Illus.)	2.25	.075'
89H66	*MOULDING, snap-on retainer (on side of trailer)	FF1009	150'	(Not Illus.)	1.5'	.075'
89H56	BUMPER, rear corner—for trailer	FF260693	2	(Not Illus.)	7.0	.75
89H68	RING, bull (trailer side tie ring)	FF590284	4	(Not Illus.)	11.0	1.05
89H69	BRACKET, bull ring	FF590284-A	4	(Not Illus.)	9.0	1.55
89H70	CLIP, bull ring	FF598924	4	(Not Illus.)	.2	.50
89H71	PANEL, plain, 48" x 145", 22 ga. (suggested for servicing only) (18 used)	FF282020	as req'd	(Not Illus.)	75.	9.20
89H72	DOOR, rear, left side, assy.—complete	FF16860	1	(Not Illus.)	300.	286.70
89H73	DOOR, rear, right side, assy.—complete	FF16861	1	(Not Illus.)	300.	302.70
89H74	HOUSING, door hold-back hook	FF200862	2	(Not Illus.)	.125	.10
89H75	PLATE, backing, door hold-back hook housing	FF201472	2	(Not Illus.)	.05	.21
89H76	HOOK, door hold-back, w/PIN	FF12047	2	(Not Illus.)	.093	.15
89H77	HINGE, rear door	FF200964	6	(Not Illus.)	6.46	1.05
89H78	PIN, rear door hinge	FF200463	6	(Not Illus.)	.25	.15
89H79	BRACKET, rear door hinge	FF200966	6	(Not Illus.)	6.0	.70
89H80	DOOR, left side, assy.	FF16930	1	(Not Illus.)	350.	138.95
89H81	HINGE, left side door	FF202114	1	(Not Illus.)	6.	11.70
89H82	HANDLE, inside, side door	FF201709	1	(Not Illus.)	1.	.75
89H83	LOCK, side door, w/RODS, assy.	FF16882	2	(Not Illus.)	4.	12.40
89H84	HANDLE, outside, side door	FF201111	2	(Not Illus.)	1.	2.55
89H85	DOOR, right side, assy.	FF16931	1	(Not Illus.)	350.	139.05
89H86	HINGE, right side door	FF202115	1	(Not Illus.)	6.	11.70
89H87	WINDOW, assy.	FF15698	8	(Not Illus.)	20.	56.95
89H88	TAILGATE, assy.—complete	FF16853	1	(Not Illus.)	520.	96.70

*Order by Footage.

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
89H89	CHAIN, guide, tailgate, w/HOOKS, assy.—each side.	FF14206	2	(Not Illus.)	55.	\$2.85
89H90	HINGE, tailgate (at bottom of tailgate).	FF220430	1	(Not Illus.)	62.200	10.80
89H91	PANEL, blackout, assy.—for window.	FF16335	8	(Not Illus.)	3.	4.75
89H92	STEP, removable, assy.	FF16854	1	(Not Illus.)	10.	14.80
98H73	RIVET, rnd-hd., $\frac{1}{2}$ " x $\frac{1}{4}$ "	FF104133	34	(Not Illus.)	.156	.03
98H74	BOLT, mounting, brake drum, $\frac{3}{4}$ "—16 x 2" (heat treated)	FF534955	24	122	.20	.20
98H75	WASHER, lock, reg., $\frac{1}{16}$ "	FF103322	16	122	.031	.01
98H76	BOLT, hex-hd., $\frac{1}{16}$ "—14 x $\frac{3}{4}$ "	FF100145	16	122	.062	.03
98H77	BOLT, hex-hd., dld., f/c pin, $\frac{1}{2}$ "—20 x $1\frac{1}{4}$ "	FF674913	4	119	.125	.15
98H78	BOLT, hex-hd., dld., f/c pin, $\frac{3}{8}$ "—24 x 3"	FF630605	1	119	.125	.05
98H79	RIVET, rnd-hd., $\frac{3}{8}$ " x $1\frac{3}{8}$ "	FF104116	8		.062	.02
98H80	PIN, cotter, $\frac{3}{8}$ " x $1\frac{1}{8}$ "	FF108636	4	119	.007	.001
98H81	NUT, hex., slotted, $\frac{1}{2}$ "—20	FF102647	4	119	.09	.02
98H82	BOLT, connecting rod bracket, dld., f/c pin, $\frac{1}{2}$ "—20 x $1\frac{3}{4}$ "	FF630663	3	116, 118	.156	.05
98H83	FITTING, alemitte, short, taper thd., $\frac{1}{4}$ "—28	FF110347	4	117	.015	.04
98H84	BOLT, hex-hd., $\frac{5}{16}$ "—18 x $\frac{3}{8}$ "	FF106973	2	118	.031	.85
98H85	WASHER, lock, reg., $\frac{5}{8}$ "	FF103325	12	117	.031	.01
98H86	NUT, hex., $\frac{5}{8}$ "—18	FF103030	12	117	.077	.03
98H87	BOLT, hex-hd., $\frac{5}{8}$ "—18 x $3\frac{3}{4}$ "	FF113850	12	117	.406	.10
98H88	BOLT, hex-hd., $\frac{1}{2}$ "—20 x $1\frac{1}{4}$ "	FF100051	10	118	.125	.04
98H89	BOLT, hex-hd., $\frac{1}{2}$ "—13 x 1"	FF100158	1		.093	.03
98H90	NUT, hex., slotted, $\frac{1}{2}$ "—20	FF119254	3	118	.031	.02
98H91	BOLT, hex-hd., $\frac{3}{8}$ "—24 x $2\frac{1}{4}$ "	FF106288	1		.093	.03
98H92	NUT, hex., slotted, $\frac{3}{8}$ "—24	FF119252	5	116, 119	.031	.02
98H93	BOLT, hex-hd., $\frac{1}{2}$ "—20 x $2\frac{1}{2}$ "	FF181440	8	116	.248	.07
98H94	RIVET, rnd-hd., $\frac{3}{4}$ " x $2\frac{3}{8}$ "		28	115	.06	
98H95	NUT, slotted, $1\frac{1}{8}$ "—12		8	115	.06	.28
98H96	NUT, hex., slotted, $\frac{7}{8}$ "—14		10	115, 116	.187	.10
98H97	WASHER, plain, 1"	FF103348	16	116	.077	.03
98H98	NUT, hex., $\frac{1}{2}$ "—20	FF240826	6	115, 116	.02	.06
98H99	BOLT, hex-hd., $\frac{1}{2}$ "—20 x $2\frac{1}{4}$ "	FF181436	6	115, 116	.187	.06

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
99H01	PIN, cotter, $\frac{1}{8}$ " x 2"	FF103389	9	114, 115	.015	\$.005
99H02	PIN, cotter, $\frac{3}{16}$ " x 3"	FF103415	1	114	.025	.01
99H03	NUT, hex., $\frac{1}{2}$ " thick x 1" - 14	FF145019	1	114	.09	.27
99H04	SCREW, cap, $\frac{5}{16}$ " - 24 x 1 $\frac{1}{2}$ "	FF100015	1	114	.031	.02
99H05	BOLT, hex-hd., $\frac{5}{16}$ " - 18 x 2 $\frac{1}{4}$ "	FF106328	1	121	.06	.03
99H06	NUT, hex., cad., $\frac{1}{4}$ " - 28	FF174852	3	113	.031	.01
99H07	WASHER, lock, internal teeth, $\frac{1}{4}$ "	FF115547	4	113	.001	.01
99H08	WASHER, plain, brass, $\frac{1}{8}$ "	WEB110110	12	113	.001	.005
99H09	WASHER, lock, internal teeth, $\frac{3}{16}$ "	FF115545	12	113	.001	.01
99H10	NUT, hex., brass, No. 10 - 32	WEB110477-A	36	113	.01	.02
99H11	WASHER, large, brass, $\frac{1}{32}$ "	WEB110346	12	113	.001	.007
99H12	BOLT, sq-hd., cad., $\frac{1}{4}$ " - 28 x 1 $\frac{5}{16}$ "	WEB110589	3	113	.05	.04
99H13	BOLT, sq-hd., No. 10 - 32 x 1 $\frac{1}{4}$ "	WEB110243	12	113	.02	.06
99H14	NUT, hex., cad., $\frac{1}{4}$ " - 20	FF120375	4	111	.015	.007
99H15	BOLT, hex-hd., $\frac{1}{4}$ " - 28 x $\frac{7}{8}$ "	FF106275	8	111	.031	.02
99H16	FUSE, 20 amperes, 1 $\frac{1}{2}$ "	FF106653	10	110, 111	.01	.01
99H17	NUT, hex., $\frac{1}{4}$ " - 20	FF123179	5	110	.015	.01
99H18	WASHER, lock, cad., reg., $\frac{1}{4}$ "	FF120380	9	110, 111	.007	.01
99H19	SCREW, rnd-hd., $\frac{1}{4}$ " - 20 x $\frac{3}{4}$ "	FF133043	5	110	.015	.01
99H20	PIN, cotter, $\frac{3}{8}$ " x 1 $\frac{1}{2}$ "	FF103398	3	109	.005	.005
99H21	NUT, slotted, $\frac{3}{4}$ " - 16	FF122816	3	109	.093	.05
99H22	BOLT, $\frac{3}{4}$ " - 16 x 2 $\frac{1}{2}$ "	FF242130	3		.06	.35
99H23	NUT, slotted, 1 $\frac{1}{8}$ " - 12	FF123096	2	109	.06	.22
99H24	RIVET, rnd-hd., $\frac{5}{8}$ " x 3 $\frac{1}{2}$ "	FF138072	7	109	.06	.05
99H25	BOLT, hex-hd., $\frac{3}{8}$ " - 24 x 3 $\frac{1}{2}$ "	FF100033	2	108	.15	.04
99H26	NUT, hex., $\frac{3}{8}$ " - 24	FF117049	1	108	.031	.01
99H27	NUT, hex., $\frac{3}{4}$ " - 16	FF117054	2	108	.125	.04
99H28	WASHER, plain, $\frac{3}{4}$ "	FF103346	2	108	.052	.025
99H29	BOLT, hex-hd., $\frac{3}{4}$ " - 16 x 3"	FF100092	2	108	.20	.15
99H30	PIN, cotter, $\frac{1}{4}$ " x 2"	FF103422	2	108	.02	.007
99H31	PIN, cotter, $\frac{3}{8}$ " x 1"	FF103374	5	116, 119	.007	.005
99H32	NUT, castle, $\frac{1}{2}$ " - 13	FF123865	3	108	.08	.03

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfgs. Part No.	Quan.	Page	Unit Weight	Price
99H33	BOLT, hex-hd., 1/2" - 20 x 2"	FF100054	8	107	.171	\$.05
99H34	BOLT, hex-hd., 1/2" - 20 x 4 1/2"	FF100059	8	107	.342	.09
99H35	NUT, hex., slotted, 5/8" - 16	FF119256	8	107, 115, 116	.077	.05
99H36	PIN, cotter, 1/8" x 1 3/4"	FF103388	18	107, 115, 116	.007	.004
99H37	PIN, cotter, 3/16" x 2"	FF103411	1	107, 109	.031	.01
99H38	BOLT, hex-hd., 3/8" - 16 x 5/8"	FF106329	5	107	.031	.02
99H39	NUT, hex., 1/4" - 28	FF103024	9	107, 111	.015	.01
99H40	BOLT, hex-hd., 1/2" - 13 x 2"	FF100162	1	107	.156	.05
99H41	BUSHING, reducing, 1/4" to 1/2"	FF116524	2	106	.093	.10
99H42	ELBOW, street, 1/4" to 45°	FF119113	2	106	.093	.20
99H43	SCREW, self tappg., No. 10 x 1"	FF144754	4	106	.01	.005
99H44	BOLT, hex-hd., 1/2" - 20 x 6 1/4"	FF120666	8	106	.513	.13
99H45	NIPPLE, pipe, 1/4" x 1 1/8"	FF144590	3	106	.125	.60
99H46	BOLT, hex-hd., 3/8" - 16 x 1"	FF100134	7	106, 118	.062	.02
99H47	TEE, pipe, 1/4"	FF105417	3	106	.156	.17
99H48	PLUG, pipe, sq-hd., 3/8" - 18	FF103867	2	106	.062	.08
99H49	BOLT, 3/8" - 24 x 1"	FF100026	4	106	.062	.02
99H50	BOLT, hex-hd., 3/8" - 16 x 6 1/4"	FF116399	2	106	.30	.08
99H51	NIPPLE, pipe, 3/8" to 1 3/8"	FF144601	1	106	.125	.06
99H52	COUPLING, reducing pipe, 1/2" to 3/8"	FF142834	1	106	.125	.20
99H53	ELBOW, street, 1/2" x 90°	FF103686	1	106	.281	.16
99H54	PIN, clevis, 1/2" x 1 7/16" (hardened)	FF103498	4	105, 106	.062	.043
99H55	ELBOW, street, 3/8" x 90°	FF120063	4	105, 106	.187	.15
99H56	WASHER, lock, reg., 5/16"	FF103320	8	105, 114, 118, 121	.007	.01
99H57	NUT, hex., 5/16" - 24	FF103025	4	105	.031	.01
99H58	BOLT, hex-hd., 5/16" - 24 x 1"	FF100014	4	105	.046	.02
99H59	BUSHING, reducing, 3/8" to 1/4"	FF119931	1	105	.046	.14
99H60	WASHER, flat, small, 1/2"	FF103343	36	105, 106, 119	.031	.01
99H61	BOLT, hex-hd., 1/2" - 20 x 5 3/4"	FF120912	8	105	.375	.11
99H62	BOLT, hex-hd., 3/8" - 24 x 2 1/2"	FF100031	8	104	.125	.03
99H63	WASHER, plain, 3/4"	FF106268	4	104	.093	.03
99H64	WASHER, lock, reg., 3/4"	FF103326	71	103, 104, 108, 122	.031	.01

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
99H65	NUT, hex., $\frac{3}{8}$ "-16.	FF103031	71	103, 104, 122	.125	\$.05
99H66	BOLT, hex-hd., $\frac{1}{2}$ "-20 x 2" (heat treated).	FF535028	12	104	.171	.05
99H67	BOLT, hex-hd., $\frac{1}{2}$ "-20 x 1 $\frac{1}{2}$ " (heat treated).	FF535027	20	104	.125	.05
99H68	SCREW, flat-hd., $\frac{3}{8}$ "-16 x 1 $\frac{1}{4}$ ".	FF114687	64	104	.062	.06
99H69	NUT, hex., $\frac{3}{8}$ "-16.	FF102635	64	104, 106	.031	.02
99H70	BOLT, hex-hd., $\frac{1}{4}$ "-20 x $\frac{1}{2}$ ".	FF106972	24	104	.031	.01
99H71	NUT, castle, 2"-12.	FF530087	4	101	1.937	1.25
99H72	KEY, Woodruff, $\frac{1}{4}$ " x 1", No. 15.	FF113782	3	103	.031	.05
99H73	WASHER, plain, flat, $\frac{1}{2}$ ".	FF106265	3	103, 108	.062	.01
99H74	BOLT, hex-hd., $\frac{3}{8}$ "-24 x 2".	FF100030	3	103, 121	.093	.02
99H75	WASHER, lock, reg., $\frac{1}{2}$ ".	FF103323	94	103, 104, 105, 106 107, 115, 116, 118	.007	.01
99H76	BOLT, hex-hd., $\frac{1}{2}$ "-20 x 1 $\frac{1}{2}$ ".	FF100052	4	103	.125	.04
99H77	FITTING, alemite, 90° angle, $\frac{1}{8}$ ".	FF109462	11	103, 118	.031	.05
99H78	SCREW, set, sq-hd., cone-point, $\frac{1}{4}$ "-20 x $\frac{5}{8}$ ".	FF102926	1	103	.009	.04
99H79	PIN, cotter, $\frac{1}{8}$ " x 1".	FF103385	19	103, 104, 105 106, 108, 118	.007	.001
99H80	PIN, clevis, $\frac{1}{2}$ " x 1 $\frac{7}{64}$ ".	FF114787	5	103	.125	.05
99H81	CLEVIS, rod end, $\frac{1}{2}$ ".	FF104044	2		.187	.25
99H82	NUT, hex., $\frac{1}{2}$ "-20.	FF103028	96	103, 104, 105 106, 107, 118	.031	.02
99H83	YOKE, adjusting, $\frac{1}{2}$ ".	FF104039	6	103, 105, 106	.343	.30
99H84	BOLT, hex-hd., $\frac{3}{8}$ "-24 x 1 $\frac{1}{4}$ ".	FF100027	2	106	.062	.02
99H85	WASHER, plain, flat, $\frac{1}{4}$ ".	FF106261	1	103	.015	.01
99H86	NUT, hex., $\frac{1}{4}$ "-28.	FF109084	5	103, 113, 117	.031	.01
99H87	BOLT, hex-hd., $\frac{1}{4}$ "-28 x $\frac{1}{8}$ ".	FF113958	2	103	.007	.01
99H88	WASHER, lock, reg., $\frac{3}{8}$ ".	FF103321	100	103, 104, 106, 107, 108, 118, 119	.007	.01
99H89	NUT, hex., $\frac{3}{8}$ "-24.	FF103026	21	103, 104, 106, 119	.031	.02
99H90	BOLT, hex-hd., $\frac{3}{8}$ "-24 x 3".	FF100032	2	103	.125	.04
99H91	WASHER, lock, reg., $\frac{1}{4}$ ".	FF103319	37	103, 104, 107, 111	.003	.10
99H92	BOLT, hex-hd., $\frac{1}{4}$ "-20 x $\frac{5}{8}$ ".	FF106319	2	103	.031	.01

NUMERICAL PARTS LIST

Part No.	Part Name	Primary Mfg. Part No.	Quan.	Page	Unit Weight	Price
99H93	FITTING, alemite, straight, $\frac{1}{8}$ "	FF109461	21	103, 104, 109, 115, 118	.031	\$.03
99H94	BOLT, hex-hd., cad., $\frac{5}{16}$ " - 24 x $\frac{3}{4}$ "	WAB203151	72	102	.031	.02
99H95	WASHER, lock, cad., $\frac{5}{16}$ "	WAB201318	72	102	.031	.005
99H96	NUT, hex., cad., $\frac{5}{16}$ " - 24	WAB203145	72	102	.05	.02
99H97	WASHER, lock, cad., $\frac{9}{8}$ "	WAB203173	8	102, 115	.02	.02
99H98	PIN, cotter, $\frac{1}{8}$ " x $1\frac{1}{2}$ "	WAB203156	8	102	.009	.03
99H99	PIN, cotter, $\frac{1}{4}$ " x 3"	FF103426	5	101, 114	.031	.02

