

INSTRUMENTS, GAGES, AND MISCELLANEOUS ELECTRICAL EQUIPMENT

opening in the roof and install the eight screws which hold the assembly in place. Place a toothed lock washer under the head of each screw. Install the ventilator deflector over the assembly with the high portion of the deflector forward. Install the three attaching screws with a toothed lock washer under the head of each screw.

123. TRAILER CONNECTOR.

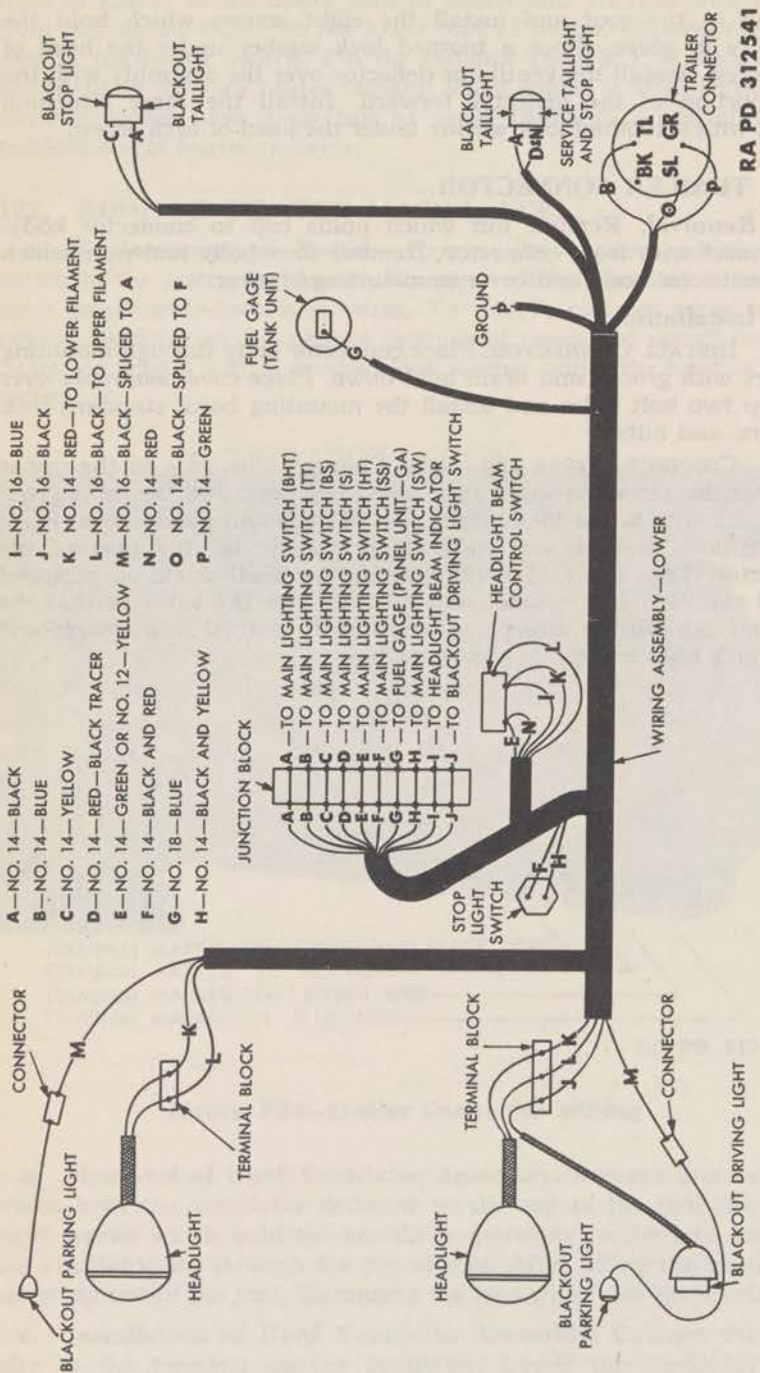
a. Removal. Remove nut which holds cap to connector body. Disconnect wire from connector. Remove four bolts and nuts which hold connector body and cover to mounting bracket.

b. Installation.

(1) **INSTALL CONNECTOR.** Place connector body through mounting bracket with groove and drain hold down. Place cover assembly over the top two bolt holes and install the mounting bolts, standard lock washers, and nuts.

(2) **CONNECT WIRES** (fig. 134). Connect blue wire to the upper left post; longer green wire to the lower left post; and the short green and black wire to the lower right post. Attach wires as follows: Place toothed lock washer and small plain washer on the post of the connector. Then place wire terminal and terminal shield on post and install standard lock washer and nut. Arrange the wires so that the terminal cap will go into place, and install toothed lock washer and nut which hold cap to the connector body.

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RA PD 312541

Figure 135—Wiring From Junction Block to Lights and Fuel Gage

Section XXVI

WIRING

	Paragraph
Description	124
Lower wiring assembly (junction block to lights)	125
Upper wiring assembly (junction block to instrument panel)	126
Body wiring assembly (filter to instrument panel)	127
Generator to regulator wiring assembly	128

124. DESCRIPTION.**a. General.**

(1) All electrically operated units on the vehicle, except the ignition coil and the horn, are constantly grounded to the vehicle chassis through their mounting. The coil is intermittently grounded to the chassis when the breaker points in the distributor are closed. The horn is grounded when the horn button is depressed. The negative post of the battery is also constantly grounded to the chassis.

(2) A single cable, connected to the positive post of the battery, runs directly to the feed post on the cranking motor switch. When the switch is closed, current flows from the battery through the cranking motor to ground. No other wiring is involved in the starting circuit.

(3) From the feed post on the cranking motor switch and the generator regulator, single feed wires run through the radio interference filter to the ammeter. From the ammeter, single feed wires, which are built into assemblies, run indirectly through switches to all electrically operated units, except the cranking motor. When the switch which controls any unit, except the cranking motor, is closed, current flows from the battery through the ammeter, through the switch and single wire in the wiring assemblies, then through the unit to ground.

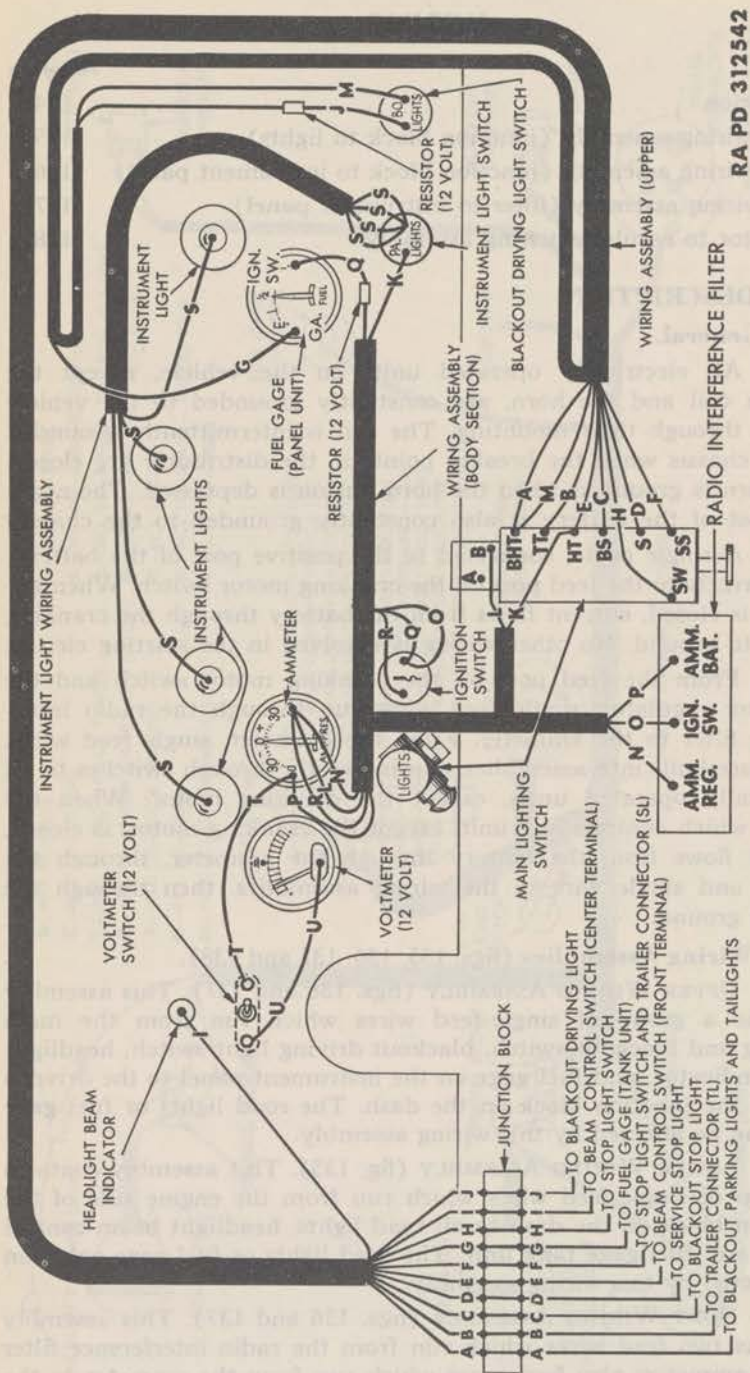
b. Wiring Assemblies (figs. 135, 136, 137 and 138).

(1) **UPPER WIRING ASSEMBLY** (figs. 136 and 137). This assembly contains a group of single-feed wires which run from the main lighting and blackout switch, blackout driving light switch, headlight beam indicator, and fuel gage on the instrument panel to the driver's side of the junction block on the dash. The road lights or fuel gage only can be affected by this wiring assembly.

(2) **LOWER WIRING ASSEMBLY** (fig. 135). This assembly contains a group of single-feed wires which run from the engine side of the junction block on the dash to all road lights, headlight beam control switch and fuel gage tank unit. The road lights or fuel gage only can be affected by this wiring assembly.

(3) **BODY WIRING ASSEMBLY** (figs. 136 and 137). This assembly contains two feed wires which run from the radio interference filter to the ammeter; also feed wires which run from the ammeter to the

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Figure 136—Instrument Panel Wiring (Open Bodies)

WIRING

A-NO. 14-BLACK	M-NO. 14-BLACK
B-NO. 14-BLUE	N-NO. 10-BLACK (6 VOLT)
C-NO. 14-YELLOW	N-NO. 8-BLACK (12 VOLT)
D-NO. 14-RED-BLACK TRACER	O-NO. 14-BLACK
E-NO. 14-GREEN OR NO. 12-YELLOW	P-NO. 10-RED (6 VOLT)
F-NO. 14-BLACK AND RED	P-NO. 8-RED (12 VOLT)
G-NO. 18-BLUE	Q-NO. 12-BLUE OR
H-NO. 14-BLACK AND YELLOW	NO. 12-GREEN
I-NO. 16-BLUE	R-NO. 12-BROWN
J-NO. 16-BLACK	S-NO. 16-BLACK
K-NO. 16-RED	T-NO. 16-RED
L-NO. 12-BROWN	U-NO. 16-RED
	RA PD 312542B

Legend for Figure 136-Instrument Panel Wiring (Open Bodies)

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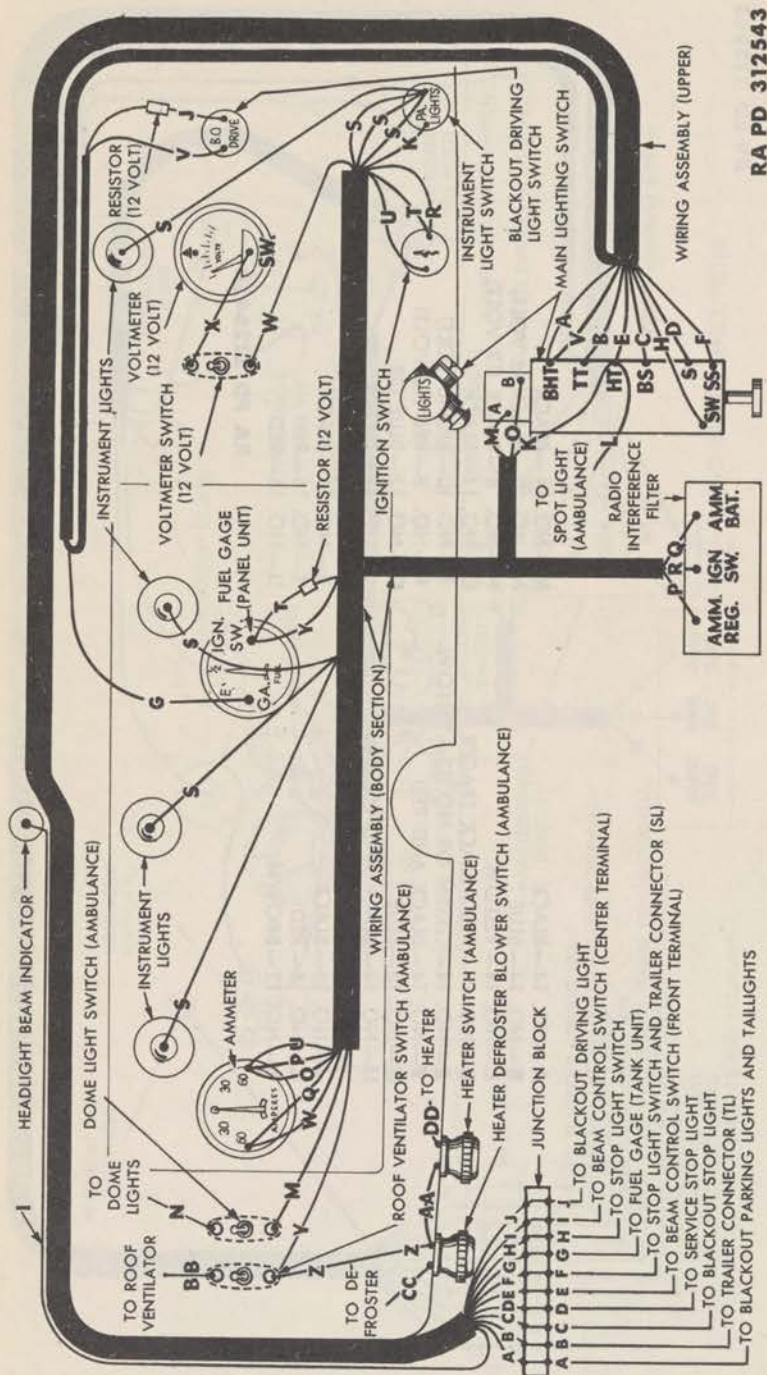


Figure 137—Instrument Panel Wiring (Closed Bodies)

WIRING

A —NO. 14—BLACK	P —NO. 8—BLACK (12 VOLT)
B —NO. 14—BLUE	Q —NO. 10—RED (6 VOLT)
C —NO. 14—YELLOW	Q —NO. 8—RED (12 VOLT)
D —NO. 14—RED—BLACK TRACER	R —NO. 14—BLACK
E —NO. 14—GREEN OR NO. 12—YELLOW	S —NO. 16—BLACK
F —NO. 14—BLACK AND RED	T —NO. 12—BLUE OR NO. 12—GREEN
G —NO. 18—BLUE	U —NO. 12—BROWN
H —NO. 14—BLACK AND YELLOW	V —NO. 14—BLACK
I —NO. 16—BLUE	W —NO. 16—RED
J —NO. 16—BLACK	X —NO. 16—RED
K —NO. 16—RED	Y —NO. 12—RED
L —NO. 18—RED	Z —NO. 12—RED
M —NO. 16—GREEN	AA —NO. 12—RED
N —NO. 18—YELLOW	BB —NO. 18—RED
O —NO. 12—BROWN	CC —NO. 18—BLACK
P —NO. 10—BLACK (6 VOLT)	DD —NO. 12—RED

RA PD 312543B

**Legend for Figure 137—Instrument Panel Wiring
(Closed Bodies)**

main lighting and blackout switch, instrument light switch, ignition switch, fuel gage; and a wire which runs from the ignition switch to the radio interference filter. Any electrical unit on the vehicle, except the cranking motor, can be affected by this wiring assembly.

(4) **GENERATOR TO REGULATOR WIRING ASSEMBLY** (fig. 138). This assembly contains two wires which run from the generator to the generator regulator. Only the charging rate of the generator will be affected by this assembly.

c. Words "Right" and "Left." Use of these words in this section to designate location of wires and terminals is defined in the following steps:

(1) **"RIGHT."** The side of the vehicle opposite the driver's side where the steering gear is mounted. For example, the use of the words "right post of ignition switch" (par. 127 c (2) (a)) means the post on the side of the ignition switch opposite the steering gear side of the vehicle when the switch is installed in its normal position on the vehicle. The word "right" is not used in this manual to refer to positions or locations in relation to the body of the mechanic doing the work.

(2) **"LEFT."** The driver's side of the vehicle where the steering gear is mounted. The side opposite the right side. For example, the use of the words "left light upper socket" (par. 125 c (2)) means the upper socket of the taillight on the driver's side (steering gear side) of the vehicle when the taillight is installed in its normal position on the vehicle. The word "left" is not used in this manual to refer to positions or locations in relation to the body of the mechanic doing the work.

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125. LOWER WIRING ASSEMBLY (JUNCTION BLOCK TO LIGHTS).

a. Description (fig. 135). The lower wiring assembly contains only lighting system wires and a wire to the fuel gage tank unit. Feed wires from the junction block to all road lights are built into the assembly.

b. Removal (fig. 135).

(1) **DISCONNECT WIRES.** Disconnect all wires from engine side of the junction block. Then open wire clips on dash and steering gear housing. Remove headlight beam control switch and disconnect wires (par. 106). Pull wire connector straight up and off post on stop light switch.

(2) **REMOVE REAR SECTION OF WIRING ASSEMBLY.** Open seven clips which hold wire assembly to frame side member. Remove fuel tank to get to clip opposite the end of the fuel tank (par. 71). Remove two clips which hold right taillight wires, and two clips which hold fuel gage wire to frame cross member. On all vehicles (except Ambulance) open clip which holds left taillight wires to end of frame cross member. Turn taillight wire connectors clockwise and pull them out of lights. Disconnect ground wire from frame (all models except Ambulance). If vehicle is equipped with a trailer connector, remove cap from connector and disconnect wires.

(3) **REMOVE FRONT SECTION OF WIRING ASSEMBLY.** Open clip which holds wiring assembly to frame side member just forward of stop light switch, and three clips which hold wiring assembly to the frame front cross member. Disconnect wires from headlight terminal blocks one at a time and put wire from light back on post to facilitate installation. Disconnect blackout parking light wires by separating the connectors in the wires. Then remove the wiring assembly.

c. Installation (fig. 135).

(1) **INSTALL FRONT SECTION OF WIRING ASSEMBLY.** String the shorter section of the assembly forward through the clip on the frame side member and the three clips on the frame cross member and close the clips. Connect the wires to the blackout parking lights. Connect the headlight and blackout driving light wires to the terminal blocks so that the color of each wire matches the color of the feed wire which runs to the light.

(2) **INSTALL REAR SECTION OF WIRING ASSEMBLY.** String the rear section of the wiring assembly through the eight clips on the channel of the frame side member and close the clips. Install the two clips which hold the right taillight wires, and two clips which hold the fuel gage wires to the frame cross members and (all models except Ambulance) put the left taillight wires through clip on the end of frame side member and close the clip. Connect taillight wires. Connect the yellow wire to right light upper socket and the black wire to the lower socket. Connect the two red wires to the left light upper socket and the black wire to the lower socket. If vehicle is equipped with trailer connector, connect three wires which are taped

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together to trailer connector and install cap. Refer to paragraph 123 for position of wires. If vehicle (except Ambulance) is not equipped with trailer connector, tape ends of trailer connector wires separately, then together, and place them in frame rear cross member. On all models (except Ambulance) connect single taped ground wire to the rear end of frame side member.

(3) **INSTALL FUEL TANK** (par. 71).

(4) **CONNECT WIRES AND INSTALL HEADLIGHT BEAM CONTROL SWITCH** (par. 106).

(5) **CONNECT WIRES TO STOP LIGHT SWITCH AND JUNCTION BLOCK.** Push connector straight down on stop lamp switch post.

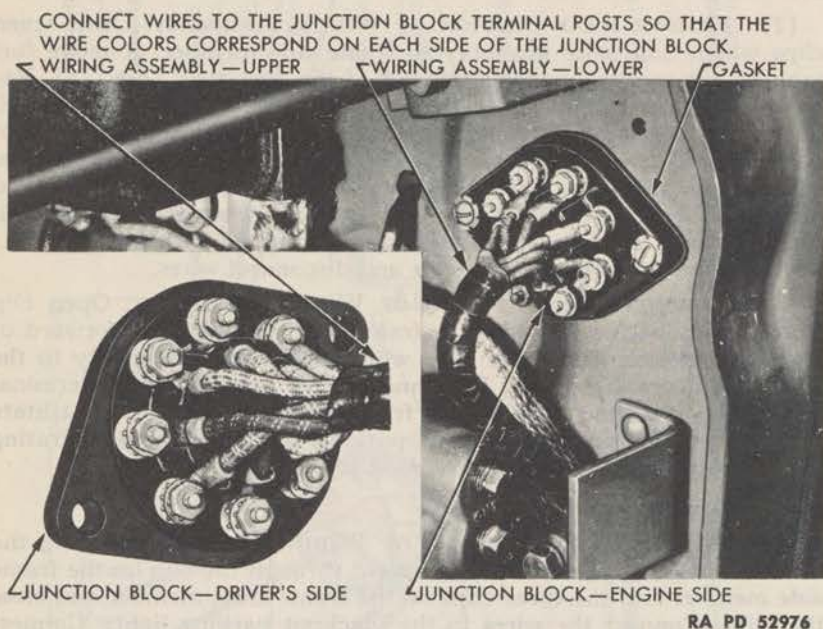


Figure 139—Wiring Junction Block

Remove two screws which hold the junction block in place and pull the block forward a few inches. Connect the wires to the junction block so that the color of each wire matches the color of the wire on the other end of the block terminal (fig. 139). Install junction block in dash. Put wire assembly in clips on dash and steering gear housing and close the clips.

126. UPPER WIRING ASSEMBLY (JUNCTION BLOCK TO INSTRUMENT PANEL).

a. **Description** (figs. 136 and 137). The upper wiring assembly contains only light wires and the fuel gage instrument panel unit

WIRING

wire. No difficulty other than with road lights or the fuel gage can occur in this assembly.

b. Removal (figs. 136 and 137).

(1) REMOVE MAIN LIGHT SWITCH (par. 113 a).

(2) DISCONNECT WIRES. Disconnect the wires of the assembly from the main lighting and blackout switch. Disconnect wire from fuel gage instrument panel unit. Pull socket and bulb from headlight beam indicator and remove the bulb. Remove blackout driving light switch (par. 108) and disconnect two wires from it. Disconnect nine wires from junction block at driver's side of dash and remove wire assembly.

c. Installation (figs. 136 and 137).

(1) CONNECT WIRES TO JUNCTION BLOCK (fig. 139). Remove two screws which hold junction block to engine side of dash and pull block away from dash. Insert end of wire assembly through dash and connect nine wires to the junction block so that the color of each wire matches the color of the wire on the other end of the terminal, then install the junction block in the dash.

(2) CONNECT WIRES TO SWITCHES, HEADLIGHT BEAM INDICATOR, AND FUEL GAGE. String wiring assembly over the steering column brace and the two longer wires, which are taped together, onto the blackout driving light switch. Connect the two wires to the blackout driving light switch and install the switch in the instrument panel (par. 108). Install the bulb in socket on the longest wire and push the socket into the headlight beam indicator. Connect the next longest wire to the fuel gage instrument panel unit. Connect the remaining wires of approximately the same length to the main lighting and blackout switch. Refer to figure 136 or 137 for proper position of wires.

(3) INSTALL MAIN LIGHTING AND BLACKOUT SWITCH (par. 113).

127. BODY WIRING ASSEMBLY (FILTER TO INSTRUMENT PANEL).

a. Description (figs. 136 and 137). The body wiring assembly carries current from the battery and generator through the ammeter to the switches which control all electrical units on the vehicle, except the cranking motor. Current furnished by the generator in excess of the immediate demand passes back from the ammeter through this wiring assembly and is stored in the battery.

b. Removal (figs. 136 and 137).

(1) DISCONNECT BATTERY CABLE (par. 88).

(2) DISCONNECT WIRES.

(a) *All Models*. Disconnect three wires from radio interference filter on driver's side of dash and one wire from main lighting and blackout switch. Disconnect one wire from the circuit breaker (all models except Ambulance; two wires on Ambulance). Disconnect single wire from fuel gage (all models except Ambulance; two wires on Ambulance). Disconnect single wire from left side and double

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wire from right side of ignition switch. Disconnect single wire from right side and group of wires from left side of instrument light switch. Remove all instrument light lamps. Disconnect three-wire group from right side, and single wire from left side of ammeter on all 6-volt systems. Disconnect single wire and two groups of two wires each from right side, and two single wires from left side of ammeter on all 12-volt systems.

(b) *Ambulance Only.* Disconnect single wire from upper terminal of roof ventilator switch and group of two wires from upper terminal of dome light switch. Also disconnect group of two wires from heater switch, and one wire from defroster switch.

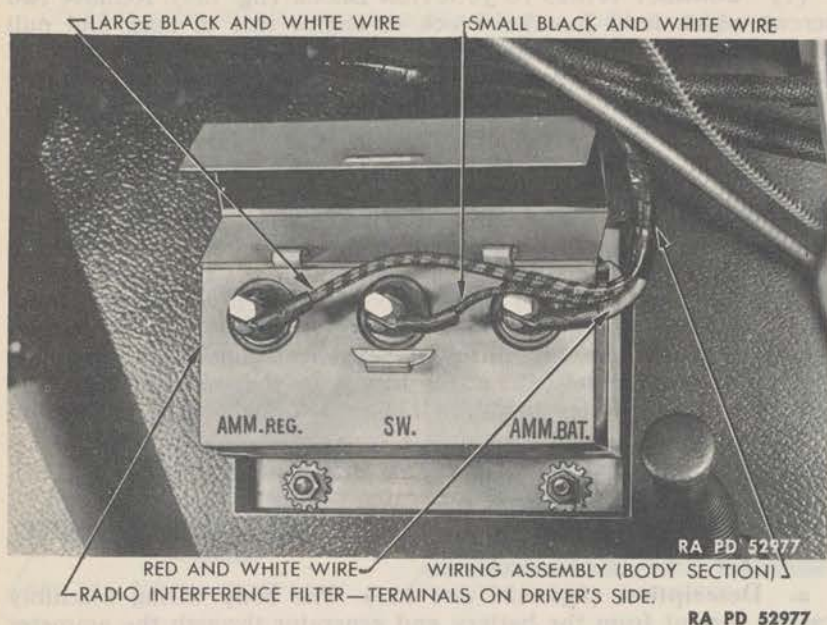


Figure 140—Radio Interference Filter—Driver's Side

(3) **REMOVE WIRING ASSEMBLY.** Open two clips that hold wiring assembly to steering column brace, one clip which holds assembly to lower flange of instrument panel, and one clip at speedometer mounting bracket. Then remove assembly.

c. Installation (figs. 136 and 137).

(1) **INSTALL WIRING ASSEMBLY.** String wiring assembly through two clips on steering column brace; one clip on lower flange of instrument panel and clip at speedometer mounting bracket. String the branch which runs to the right of the panel through hole in cowl ventilator handle bracket. When assembly is in place, close all clips.

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(2) CONNECT WIRES.

(a) *All Models.* Connect large black and white wire to left post of radio interference filter (fig. 140), small black and white wire to center post of filter and large red and white wire to right post of filter. Connect brown wire on upper post of circuit breaker. On Ambulance only, connect green wire to lower post of circuit breaker. On all models except Ambulance, connect green and white wire to fuel gage. On Ambulance only, connect green and white, and red and white wires to same terminal on fuel gage. Connect red wire to main lighting and blackout switch terminal marked "HT". Connect single brown wire to left post of ignition switch; connect black and white, and green and white wires to right post of ignition switch. Connect single red wire to right side, and group of black wires to left side of instrument light switch. Install all instrument light bulbs.

(b) *Six-volt System.* Connect single red wire to left post of ammeter, and connect two brown, and one black and white wires to right post of ammeter.

(c) *Twelve-volt System.* Connect one large red wire, and one small red wire to left post of ammeter; and connect large black wire, and two brown wires to right post of ammeter.

(d) *Ambulance Only.* Connect single wire to upper terminal of roof ventilator switch. Connect wire to upper terminal of dome light switch, pair of red wires to heater switch, and single red wire to the defroster switch.

(3) CONNECT CABLE TO BATTERY (par. 88).

128. GENERATOR TO REGULATOR WIRING ASSEMBLY.

a. *Removal* (fig. 138). Disconnect two wires from generator regulator. Disconnect two wires from generator. Remove wire clips which hold wire assembly to generator and regulator and open clip at dash. Then remove three clips which hold the assembly to the fender. On vehicles with 6-volt electrical systems, remove clip from battery hold-down bolt.

b. *Installation* (fig. 138). String wiring assembly into place with longer terminal on small wire to the regulator. Install three clips and special washers which hold the assembly to the fender. Attach wire clips to generator and regulator with toothed lock washer below and above each clip, and close the clip at the dash. On vehicles with 6-volt electrical system, install wire clip on battery hold-down bolt with toothed lock washer below and above clip. Connect large wire to center terminal strap with a standard lock washer under head of screw. Connect small wire to lower post of regulator with a toothed lock washer under head of screw. Connect wires to generator terminal post with a standard lock washer under each nut.

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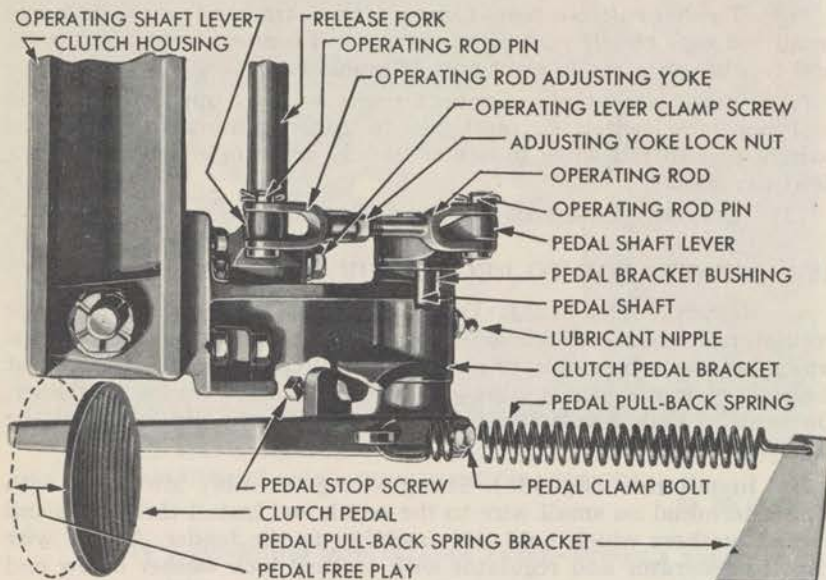
Section XXVII

CLUTCH

	Paragraph
General description	129
Clutch pedal	130
Clutch disk and release bearing	131

129. GENERAL DESCRIPTION.

a. The clutch is the single dry plate type. A steel cover bolted to the flywheel encloses the clutch disk, the pressure plate, the pressure springs, and fingers. A composition facing is riveted to each side of the clutch disk. Coiled springs assembled around the hub of the disk absorb power shocks and torsional vibration.



RA PD 52904

Figure 141—Clutch Pedal Adjustments

130. CLUTCH PEDAL.

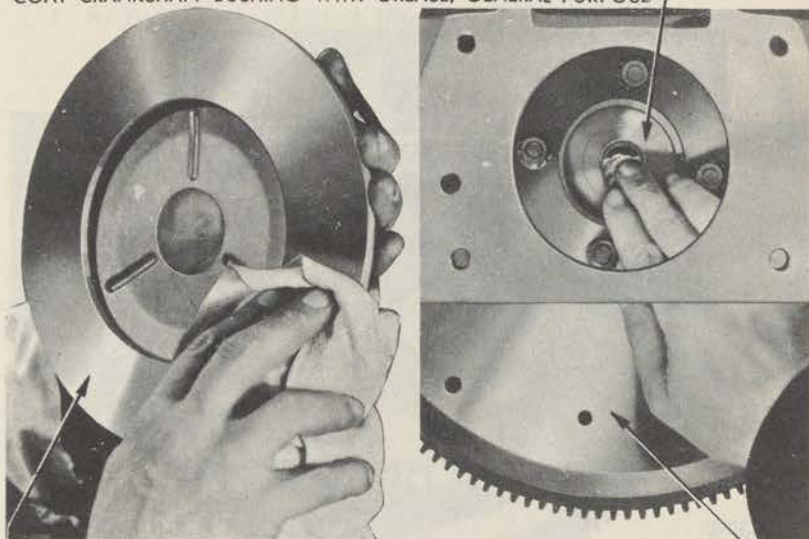
a. **Description** (fig. 141). The backward travel of the clutch pedal is limited by a stop screw so that the pedal has $\frac{1}{2}$ inch clearance between the pedal and the bottom of the floor plate. Clutch pedal free play should be adjusted when the clutch pedal pad has less than $1\frac{1}{8}$ inch free movement from the released position to the point where the clutch starts to release.

CLUTCH**b. Adjustment.**

(1) **DISCONNECT CLUTCH OPERATING ROD** (fig. 141). Remove cotter pin and rod pin to disconnect clutch operating rod from the clutch operating shaft lever.

(2) **ADJUST LOCATION OF PEDAL.** Loosen the lock nut on the stop screw which is screwed into a pad on the pedal and contacts the clutch pedal bracket. Adjust the stop screw so that the pedal (when in the released position) has $\frac{1}{2}$ inch clearance with the bottom of the floor plate. Tighten the adjusting screw lock nut.

COAT CRANKSHAFT BUSHING WITH GREASE, GENERAL PURPOSE



WIPE CONTACT SURFACES OF FLYWHEEL AND PRESSURE PLATE CLEAN

RA PD 52906

Figure 142—Cleaning Clutch Friction Surfaces and Lubricating Pilot Bushing

(3) **ADJUST PEDAL FREE PLAY** (fig. 141). Loosen the lock nut on the clutch operating rod. Push the clutch shaft lever forward to take up its free movement and adjust the yoke on the rod so that the pin will slide through the clutch operating shaft lever when the clutch pedal pad is held down $1\frac{1}{8}$ inches from its released position. (This operation can be facilitated if the pedal is held down $1\frac{1}{8}$ inches with a pedal jack.) Install the pin and cotter pin and tighten the yoke lock nut. The clutch pedal pad will then have $1\frac{1}{8}$ inch free movement from the released position to the point where the clutch starts to release.

3/4-TON 4 x 4 TRUCK (DODGE)**131. CLUTCH DISK AND RELEASE BEARING.****a. Removal.**

(1) REMOVE TRANSMISSION (par. 133).

(2) REMOVE CLUTCH RELEASE BEARING. Remove the six cap screws which hold the clutch housing pin. Disconnect the spring from the pull-back screw in the clutch housing and remove the clutch release bearing and sleeve.

(3) REMOVE CLUTCH DISK. Remove the clutch cover to flywheel cap screws. Loosen the screws a turn or two at a time to avoid distorting the cover. Remove the clutch cover and pressure plate assembly and clutch disk from the clutch housing.

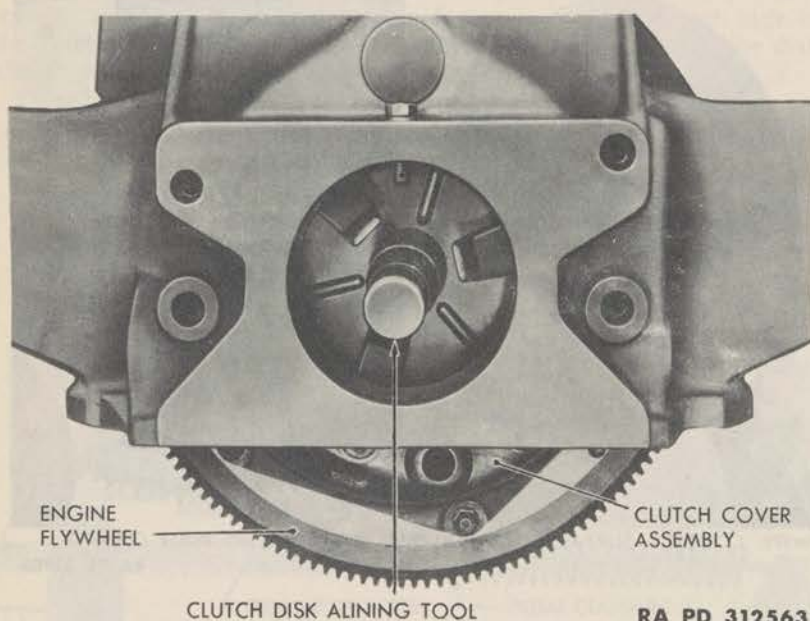


Figure 143—Installation of Clutch Disk

b. Cleaning of Parts (fig. 142). The clutch release bearing is packed with lubricant and sealed when manufactured and no further lubrication is required. **CAUTION:** *Never wash clutch release bearing in kerosene, gasoline, or other dry-cleaning solvent which would dissolve the lubricant in the bearing.* Keep oil and grease off friction surfaces of clutch parts to avoid chattering and grabbing of clutch.

c. Installation.

(1) **INSTALL CLUTCH DISK.** Coat the bushing in the end of the crankshaft with general purpose grease No. 2 (fig. 142). Wipe the contact surfaces of the flywheel and pressure plate thoroughly with

CLUTCH

a clean dry cloth, to make certain that the surfaces are clean and free from oil. Hold the clutch cover and disk in place and install the cover attaching cap screws with lock washers, but do not tighten.

(2) **ALINE CLUTCH DISK** (fig. 143). Center the clutch disk with the clutch alining tool. Tighten the clutch cover cap screws, a turn or two at a time to avoid distorting the cover. Finally tighten the screws to 15 to 20 foot-pounds. Remove the clutch alining tool.

(3) **INSTALL CLUTCH RELEASE BEARING**. Install the clutch release bearing and sleeve and connect the spring to the pull-back spring screw in the clutch housing. Install the cap screws with lock washers for the clutch housing pan.

(4) **INSTALL TRANSMISSION** (par. 133).

(5) **ADJUST CLUTCH PEDAL FREE PLAY** (par. 130).

3/4-TON 4 x 4 TRUCK (DODGE)**Section XXVIII****TRANSMISSION AND POWER TAKE-OFF**

	Paragraph
General description	132
Transmission	133
Power take-off control linkage	134

132. GENERAL DESCRIPTION.

a. The transmission is known as a four-speed, selective sliding gear type. Its purpose is to provide different gear ratios for forward motion of the vehicle and a means of reversing the motion of the vehicle. A power take-off assembly is mounted on the side of the transmission case and provides a means of taking power from the engine to operate the winch on the Weapon Carrier (model WC-52) and Command (model WC-57).

133. TRANSMISSION.

a. **Removal of Transmission Assembly** (fig. 144).

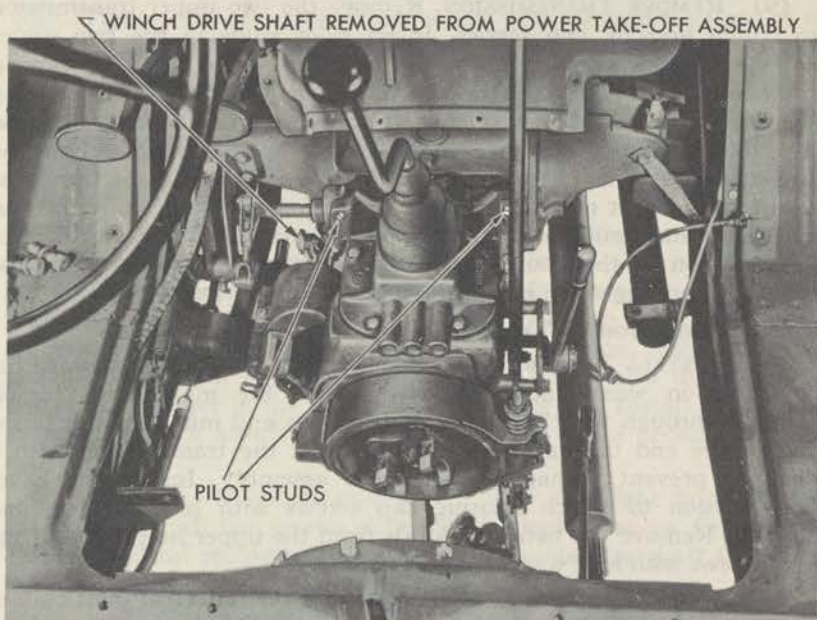
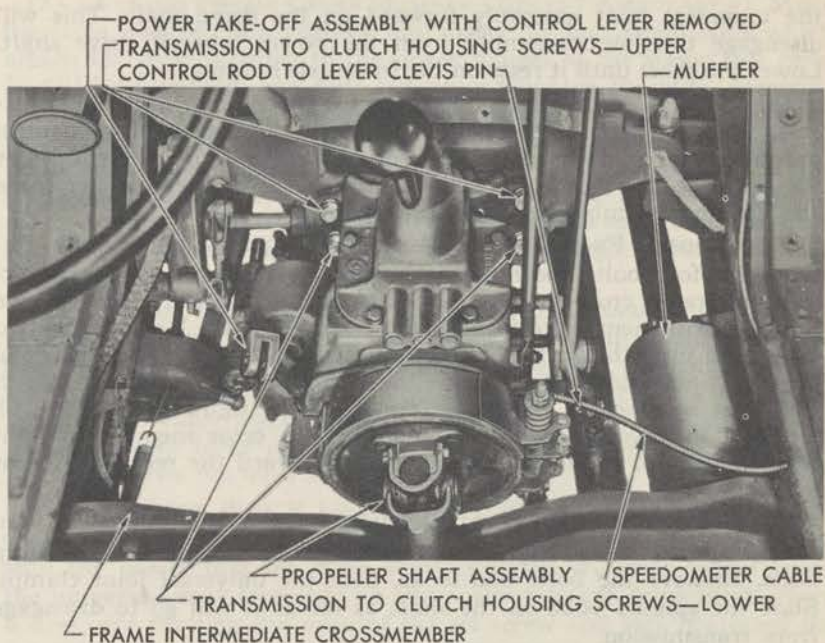
(1) **REMOVE FLOOR MAT (AMBULANCE ONLY).** Tilt the attendant's seat forward and remove the four cap screws from the seat support brackets. Raise the driver's seat to its highest position and tilt forward. Remove the seat adjusting mechanism to floor cap screws. Remove the cotter pin and pin from the accelerator pedal at the accelerator pedal rod. Remove the floor mat front section. Remove the center and two end linoleum retainer angles, remove the screws from the floor mat and lift out the mat.

(2) **REMOVE LEFT FLOOR PLATE.** Remove the clutch and brake pedal draft pads and retainers. Remove the left floor plate screws and lift out the floor plate.

(3) **REMOVE RIGHT FLOOR PLATE.** Disconnect the throttle control spring from the clip on the accelerator shaft to throttle bell crank rod, located under the hood at the right rear side. Remove the right floor plate screws and lift out the floor plate.

(4) **REMOVE CENTER FLOOR PANEL.** Remove the cotter pin and yoke pin from the shifter lever end plate, also the cotter pin from the shifter shaft eyebolt pin where it is attached at the power take-off control lever. Lower the control lever down through the opening in the floor panel. Remove the cotter pin and pin from the accelerator pedal rod at the pedal. Remove the center floor panel cap screws. Move the hand brake lever and transfer case control lever into position so that the center panel can be lifted out.

(5) **DISCONNECT WINCH DRIVE SHAFT.** Remove the lock wire and loosen the set screw which holds the drive shaft collar on the drive shaft just ahead of the splined yoke at power take-off. Remove the lock wire and loosen the set screw which holds the rear universal joint assembly on the power take-off drive shaft. Slide the collar and

TRANSMISSION AND POWER TAKE-OFF

RA PD 312564

Figure 144—Removal of Transmission

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the universal joint assembly forward on the drive shaft. This will disengage the joint assembly from the power take-off drive shaft. Lower the shaft until it rests on the front axle housing.

(6) DISCONNECT TRANSFER CASE CONTROL ROD AND SPEEDOMETER CABLE. Remove the cotter pin from the transfer case control rod clevis pin at the transmission end and remove the clevis pin. Let the rod drop down out of the way. Disconnect the speedometer cable and housing assembly from the transmission.

(7) LOOSEN FRAME CROSS MEMBER (EXCEPT AMBULANCE). Remove the four bolts and nuts that attach the rear gusset to the intermediate frame cross member and left frame side rail. Also remove the two cross member to front gusset bolts and nuts. Remove the two bolts and nuts that attach the cross member to the upper flange of the left frame side rail. Remove the two bolts and nuts that attach the cross member to the upper flange of the right frame side rail. Remove the two large bolts and nuts from cross member to right frame side rail. Move the cross member toward the rear axle as far as possible.

(8) DISCONNECT PROPELLER SHAFT. Open the universal joint clamp bolt nut locks. Remove the nuts from the universal joint clamp bolts. Remove the bolts and locks, then the universal joint clamps. Slide the splined yoke on the shaft as far as it will go to disengage from transmission.

(9) REMOVE TRANSMISSION. Remove the two upper transmission to clutch housing cap screws. Insert pilot studs in the two upper holes and screw studs in place. (Pilot studs can be made by sawing the heads from two $\frac{9}{16}$ inch—12 x $1\frac{3}{4}$ inch—cap screws and slotting the ends with a hack saw so that a screwdriver can be used to screw the studs in place.) Remove the two lower cap screws which hold the transmission to the clutch housing. Place a jack under the transmission to support it and move the transmission rearward sufficiently to pull the transmission main drive pinion out of the clutch disk. Lower transmission to the floor. Care must be exercised to prevent transmission dropping down and springing the clutch assembly.

b. Installation of Transmission Assembly (fig. 144).

(1) INSTALL TRANSMISSION. Use the pilot studs installed when the transmission was removed to help guide the main drive pinion straight through the clutch disk hub splines and into the pilot bushing in the end of the crankshaft. Support the transmission with a jack to prevent damaging the clutch assembly. Install the lower transmission to clutch housing cap screws with lock washers and tighten. Remove the two pilot studs from the upper holes. Install the cap screws with lock washers and tighten.

(2) CONNECT PROPELLER SHAFT. Place the universal joint clamps in position, install the clamp bolt locks on the bolts and install the bolts in the universal joint. Place new clamp bolt nut locks on the bolts, then install the nuts and tighten to 20 to 25 foot-pounds. Bend over the lugs of all the clamp bolt locks and nut locks.

TRANSMISSION AND POWER TAKE-OFF

(3) **ATTACH FRAME CROSS MEMBER (EXCEPT AMBULANCE).** Move the cross member into position and insert the four small bolts which attach the cross member to the upper flanges of the frame side rails. Install lock washers and nuts but do not tighten the nuts. Assemble the rear cross member to frame gusset to the cross member with two of the large bolts and nuts with lock washers, also the two large bolts and nuts with lock washers, to attach the cross member to the front gusset. Install the two rear gussets to frame side rail bolts and nuts with lock washers, also the two large bolts and nuts with lock washers, attaching the cross member to the right frame side rail. Tighten all bolts and nuts securely.

(4) **CONNECT SPEEDOMETER CABLE AND TRANSFER CASE CONTROL ROD.** Insert the speedometer cable drive shaft in the transmission main shaft rear bearing retainer. Make sure the cable engages with the drive pinion before the retaining nut is screwed into place. Tighten the cable housing nut. Attach the transfer case control rod to the control lever on the transmission and insert the clevis pin. Lock the clevis pin with a cotter pin.

(5) **CONNECT WINCH DRIVE SHAFT.** Make sure the power take-off drive shaft key is in place. Slide the drive shaft joint assembly onto the power take-off drive shaft. Tighten set screw which holds the universal joint assembly on the power take-off drive shaft. Place a new wire through the head of the set screw and lock it around the joint. Set the drive shaft collar from $\frac{3}{8}$ to $\frac{1}{2}$ inch ahead of the splined yoke. Tighten the set screw. Place a new wire through the head of the set screw and lock it around the collar.

(6) **FILL TRANSMISSION WITH LUBRICANT.** Remove the transmission filler plug and fill the transmission to $\frac{1}{2}$ inch below the level of filler hole with universal gear lubricant (par. 24). Use seven pints if vehicle is equipped with power take-off and $5\frac{1}{2}$ pints if not equipped with power take-off. Install filler plug.

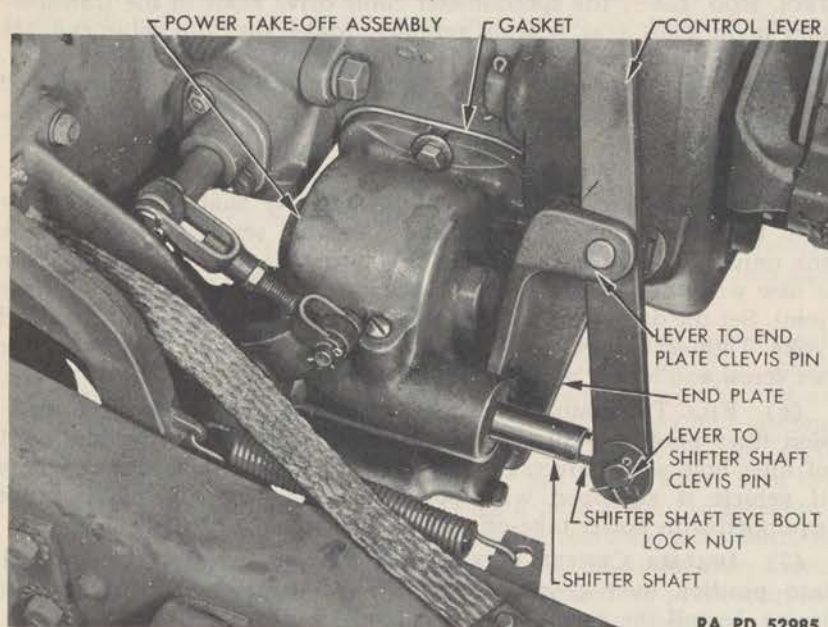
(7) **INSTALL CENTER FLOOR PANEL.** Lower the center floor panel into position over gearshaft lever, hand brake, and transfer case levers. Install the cap screws with toothed lock washers and tighten. Slide the end of the power take-off control lever up through the opening in the center floor panel and hold it in position. Install the yoke pin and cotter pin at the shifter lever end plate, also the cotter pin with plain washer in the shifter shaft eyebolt pin. Install the pin and cotter pin which attach the accelerator pedal to the accelerator pedal rod.

(8) **INSTALL RIGHT FLOOR PLATE.** Lay the right floor plate in place and install the screws with toothed lock washers. Connect the throttle control spring to the clip on the accelerator shaft to throttle bell crank rod.

(9) **INSTALL LEFT FLOOR PLATE.** Lay the left floor plate in place and install the screws with toothed lock washers. Install the clutch and brake pedal draft pads and pad retainers. Tighten the screws with toothed lock washers.

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(10) **INSTALL FLOOR MAT (AMBULANCE ONLY).** Place the rear section of the floor mat in position and install the screws with plain washers. Install the center and two end linoleum retainer angles. Work the front section of the floor mat into place so that the openings in the mat will slide down over the gearshift, hand brake, transfer case levers, and accelerator pedal. Attach the accelerator pedal to the accelerator pedal rod. Install floor mat screws. Position the driver's seat so that it is raised to its highest position and install the cap screws with lock washers. Install the one short cap screw in the right rear screw hole of the seat adjusting mechanism. Place the attendant's seat in position in the cab and tilt it forward. Install the seat support bracket cap screws with lock washers.



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Figure 145—Power Take-off Control Lever and Linkage

134. POWER TAKE-OFF CONTROL LINKAGE.

a. **Removal of Control Lever** (fig. 145). Remove the cotter pin and clevis pin from the control lever end plate, also the cotter pin from the shifter shaft clevis pin where it is attached at the power take-off control lever. Pull the control lever down through the opening in the floor panel.

b. **Installation of Control Lever** (fig. 145). Slide the end of the power take-off control lever up through the opening in the center floor panel and hold it in position. Install the clevis pin and cotter pin at the control lever end plate, also the cotter pin with plain washer in the shifter shaft clevis pin.

TRANSMISSION AND POWER TAKE-OFF**c. Adjustment of Control Lever Linkage (fig. 145).**

(1) Whenever the control lever is replaced, adjust the location of the neutral position control lever lock on the center floor panel or the eyebolt in the end of the shifter shaft so that the power take-off will be in neutral, and the shifter shaft poppet ball indexed with the indent in the shifter shaft when the control lever is locked in the neutral position.

(2) If the control lever lock cannot be locked without moving the control lever out of the neutral position, loosen the control lever lock cap screws, and move the lock forward or to the rear on the elongated holes. Adjustment can also be made at the shifter shaft eyebolt. Remove control lever. Loosen eyebolt lock nut. Turn eyebolt clockwise to adjust control lever rearward and counterclockwise to adjust control lever forward. Tighten lock nut and install control lever.



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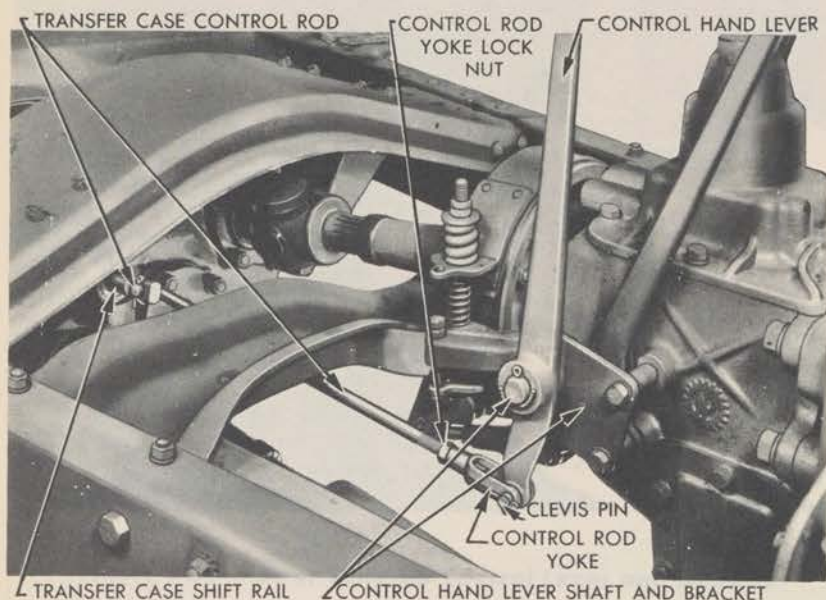
Section XXIX

TRANSFER CASE

	Paragraph
General description	135
Control lever and linkage	136
Transfer case assembly	137

135. GENERAL DESCRIPTION.

a. The transfer case is located back of the transmission. It is connected with the transmission by means of a short propeller shaft through which power is transmitted from the engine. The transfer case transmits the engine power to the front and rear axles by means



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Figure 146—Transfer Case Control Lever and Linkage

of the propeller shafts. It is in constant mesh for transmitting power to the rear axle and a means is provided whereby the drive to the front axle can be engaged or disengaged by a control lever in the driver's compartment (par. 5).

136. CONTROL LEVER AND LINKAGE.

a. **Removal** (fig. 146). Remove the cotter pin and clevis pin from the front end of the control rod yoke at the control rod hand

TRANSFER CASE

lever and the cotter pin from the transfer case control rod at the transfer case. Remove the cotter pin from the control lever bracket shaft. Remove three cap screws that hold the control lever bracket to the transmission. Lower lever and bracket and slide lever off bracket. Loosen the control rod yoke lock nut and unscrew the yoke from the rod.

b. Installation (fig. 146). Insert the control rod end in the shift rail at the transfer case and install the cotter pin. Screw the yoke on the control rod up to the lock nut. Slide the control lever onto the control lever bracket shaft. Install the three cap screws and lock washers that hold control lever bracket to transmission. Place the plain washer on the shaft and install the cotter pin. Position the control lever with the control rod yoke and install the clevis pin.

c. Adjustment of Linkage.

(1) When the control hand lever is shifted to the engaged or disengaged positions, the shift rail poppet ball must index with the indent on the shift rail to prevent disengagement of the front axle drive. If the control lever can be shifted to the engaged or disengaged positions without the control lever striking the ends of the lever opening in the floor panel, the adjustment is satisfactory.

(2) To adjust, loosen the lock nut, remove the cotter pin and clevis pin from the yoke at the control lever. Then turn the yoke on the control rod clockwise to shorten the rod, or counterclockwise to lengthen the rod for correct adjustment of control lever. Install clevis pin and cotter pin and tighten lock nut.

137. TRANSFER CASE ASSEMBLY.

a. Transfer Case Misalignment. The transfer case may become misaligned due to severe shock, contact with stumps, stones, banks of streams, or other obstructions. Transfer case misalignment often causes the propeller shaft spline to be partially withdrawn from the propeller shaft companion yoke spline, causing propeller shaft whip and/or destructive wear of the propeller shaft splines and propeller shaft compound yoke splines.

(1) **CHECKING MISALIGNMENT.** Transfer case misalignment may be determined by measuring the front propeller shaft from the center of the rear universal joint cross bearing to the center of the front universal joint cross bearing. The correct measurement is 34 inches. If the dimension varies more than plus $\frac{1}{4}$ inch or minus $\frac{1}{8}$ inch, check the front axle for alignment (par. 141). If the front axle alignment is correct, the transfer case is misaligned. Notify higher authority.

b. Removal.

(1) **DISCONNECT PROPELLER SHAFTS.** Open the universal joint clamp bolt nut locks. Remove the nuts from the universal joint clamp bolts. Remove the bolts and locks, then the universal joint clamps.

(2) **DISCONNECT CONTROL ROD.** Remove cotter pin from the transfer case control rod at the transfer case, and the cotter pin and clevis pin from the control lever end of the control rod.

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(3) **REMOVE TRANSFER CASE.** Remove the lock wires from the four cap screws which attach the transfer case to the mounting brackets. Support the transfer case with jack to prevent personal injury. Remove the four transfer case to mounting bracket cap screws.

c. Installation.

(1) **INSTALL TRANSFER CASE.** Place the transfer case under the vehicle and raise it into position with jack. Install the transfer case to frame bracket cap screws and lock washers. Lock the screws in place with a piece of wire.

(2) **CONNECT PROPELLER SHAFTS TO TRANSFER CASE.** Place the universal joint clamps in position, then install the clamp bolt locks on the bolts, and install the bolts in the universal joint. Place new clamp bolt nut locks, then install the nuts and tighten to 20 to 25 foot-pounds. Bend over the lugs of all the clamp bolt and nut locks.

(3) **CONNECT CONTROL ROD.** Insert the control rod end in the shift rail and install the cotter pin. If it is necessary to adjust the control rod, refer to paragraph 134 for procedure.

(4) **FILL TRANSFER CASE WITH LUBRICANT.** Remove the transfer case filler plug and fill with lubricant to $\frac{1}{2}$ inch below filler opening, with transfer case and lubricant at room temperature (70°F) (par. 24). Do not overfill, as this will cause overheating and leakage of lubricant.

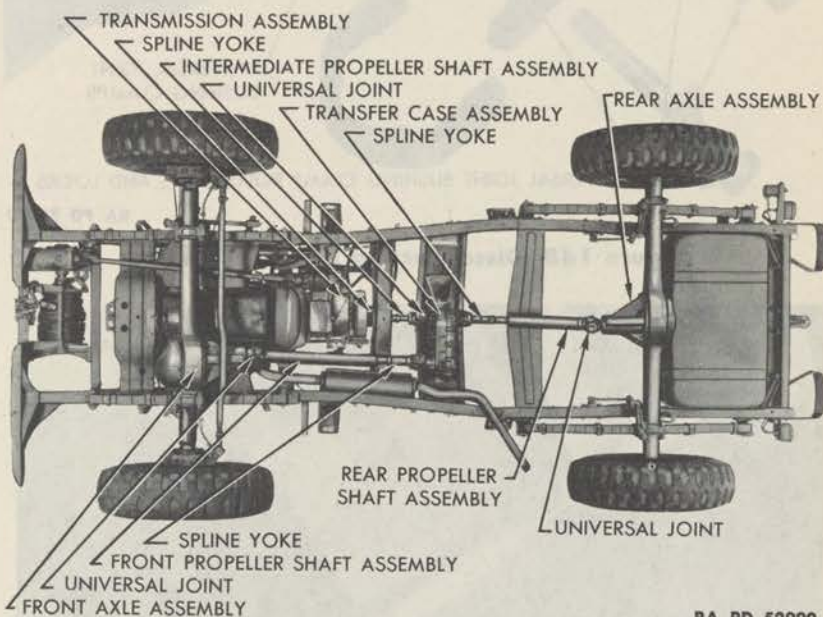
Section XXX

PROPELLER SHAFTS

	Paragraph
General description	138
Propeller shafts	139

138. GENERAL DESCRIPTION.

a. Three propeller shafts are used in each vehicle: One extends from the transmission to the transfer case; one from the transfer case to the rear axle; one from the transfer case to the front axle. Each propeller shaft has one universal joint that slides on the splined end of the shaft, and one that is welded to the other end of the shaft (fig. 147).



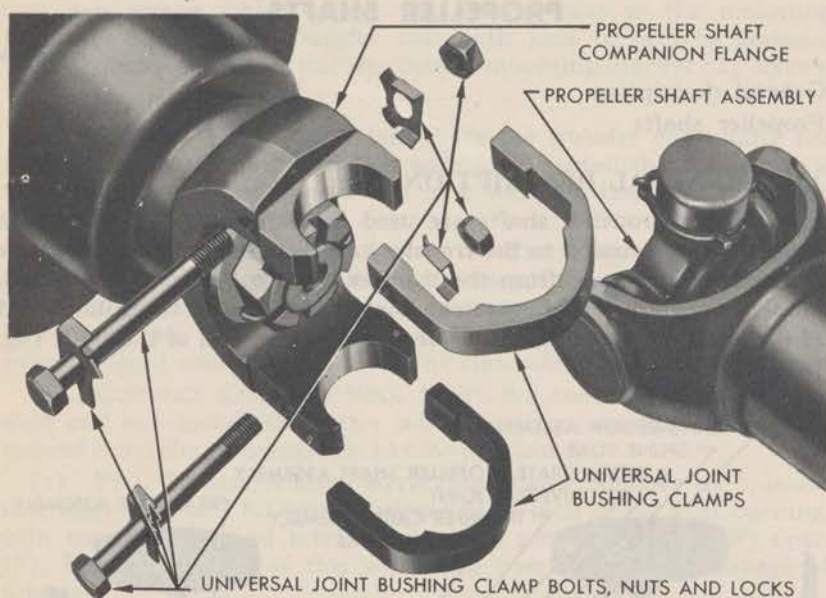
RA PD 52990

Figure 147—Propeller Shafts and Universal Joints

139. PROPELLER SHAFTS.

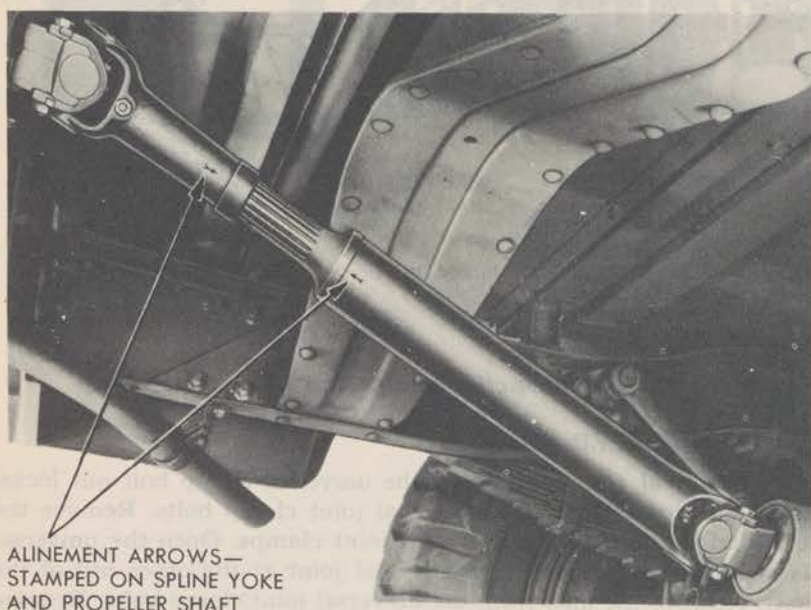
a. **Removal** (fig. 148). Open the universal clamp bolt nut locks. Remove the nuts from the universal joint clamp bolts. Remove the bolts and locks, then the universal joint clamps. Open the universal clamp bolt nut locks on the universal joint at the other end of the shaft. Remove the nuts from the universal joint clamp bolts. Remove the bolts and locks, then the universal joint clamps. Remove the assembly from the vehicle.

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RA PD 52989

Figure 148—Disconnecting Propeller Shaft



RA PD 312565

Figure 149—Propeller Shaft Alinement Arrows

PROPELLER SHAFTS**b. Installation.**

(1) **INSTALL SPLINE YOKE** (fig. 149). Coat the splines of the propeller shaft with general purpose grease and slide the universal joint and spline yoke assembly onto the propeller shaft. Make sure that the two arrows, one on the splined yoke and the other on the propeller shaft, point directly toward each other so that the yokes at the ends of the propeller shaft are in alignment. If the yokes are not alined with each other, failure of the joints or shaft will result.

(2) **INSTALL UNIVERSAL JOINT CLAMPS** (fig. 148). Lift the propeller shaft assembly in place. Place the universal joint clamps in position. Install the clamp bolt locks on the bolts and install the bolts in the universal joint. Place the clamp bolt nut locks on the bolts, then install the nuts and tighten to 20 to 25 foot-pounds. Bend over the lugs of all the clamp bolt locks and nut locks.

3/4-TON 4 x 4 TRUCK (DODGE)**Section XXXI****FRONT AXLE**

	Paragraph
General description	140
Front wheel alinement	141
Front wheel bearings	142
Universal drive shaft bushings and oil seals	143
Steering arm and tie rod	144
Front axle assembly	145

140. GENERAL DESCRIPTION.

a. The front axle as well as the rear axle is a driving unit. The front axle drive shafts have universal joints at the steering knuckles through which power is transmitted to the wheels. It is of the full-floating type so that only the torque or driving power is carried by the axle drive shafts. The differential and carrier assembly in the front axle is identical with that used in the rear axle.

b. The differential lubricant is confined to the differential and drive pinion sections of the axle housing by the drive pinion bearing oil slinger, the drive pinion oil seal, and the universal drive shaft oil seal. The universal drive shaft joint lubricant is retained in the universal joint and steering knuckle housings by the trunnion socket bushing and the steering knuckle bushing. Wheel bearing lubricant is retained by the front wheel bearing oil seal.

141. FRONT WHEEL ALINEMENT.

a. **General.** Front wheel alinement is governed by four factors commonly known as camber, king pin angle, caster, and wheel toe-in.

(1) **CAMBER AND KING PIN ANGLES.** The correct camber and king pin angles are built into the front axle and will change only if the axle housing or steering knuckles are distorted by accidental damage. Therefore, no adjustments are provided.

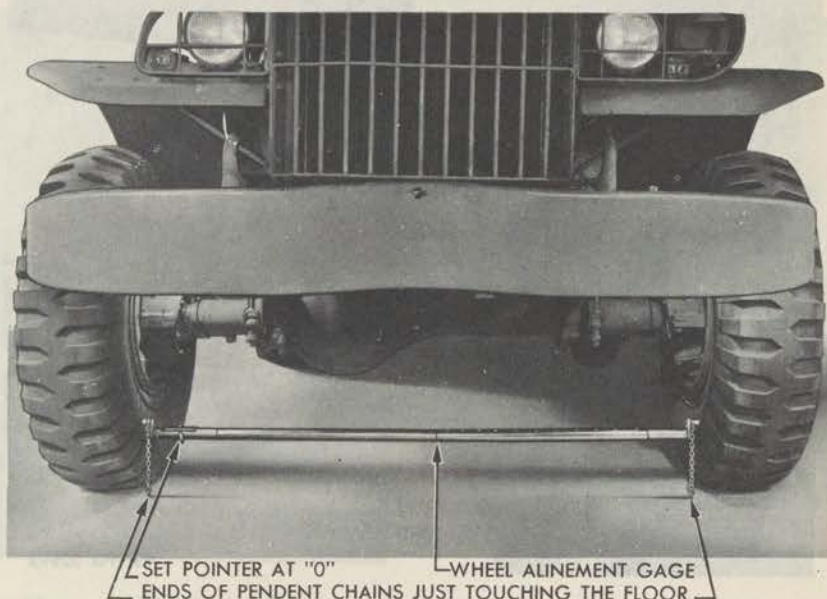
(2) **CASTER.** Caster is governed by the chassis springs and the mounting of the front axle to the front springs. Correct caster is established by design and will be changed only by shifting of the front axle on the springs or by distortion of the chassis frame or springs or by the use of caster shims. No adjustment of caster is provided.

(3) **TOE-IN.** Front wheel toe-in is the most important factor in front wheel alinement. It is governed by the angle of the steering knuckle arms and the length of the steering tie rod. Inasmuch as wheel toe-in can be accidentally altered without serious damage to the vehicle, an adjustment is provided so that the tie rod may be lengthened or shortened to maintain correct front wheel toe-in of 0 to $\frac{1}{8}$ inch ($\frac{1}{16}$ in. preferred).

FRONT AXLE

b. Checking and Adjusting Toe-in.

(1) **CHECK TOE-IN** (fig. 150). With the front wheels in a straight forward position, move the vehicle at least three feet forward to get the tires in free rolling condition. Place the wheel alignment gage between the tires forward of the axle with both pendant chains barely touching the floor. Set the scale so that the pointer registers with zero. Move the vehicle forward until the gage is back of the axle with the pendant chains barely touching the floor, and read the gage. The amount the scale has moved in relation to the pointer will indicate the amount of wheel toe-in or toe-out. Since toe-out is never desirable, the gage is calibrated in inches for toe-in only.



RA PD 52992

Figure 150—Front Wheel Toe-in Adjustment

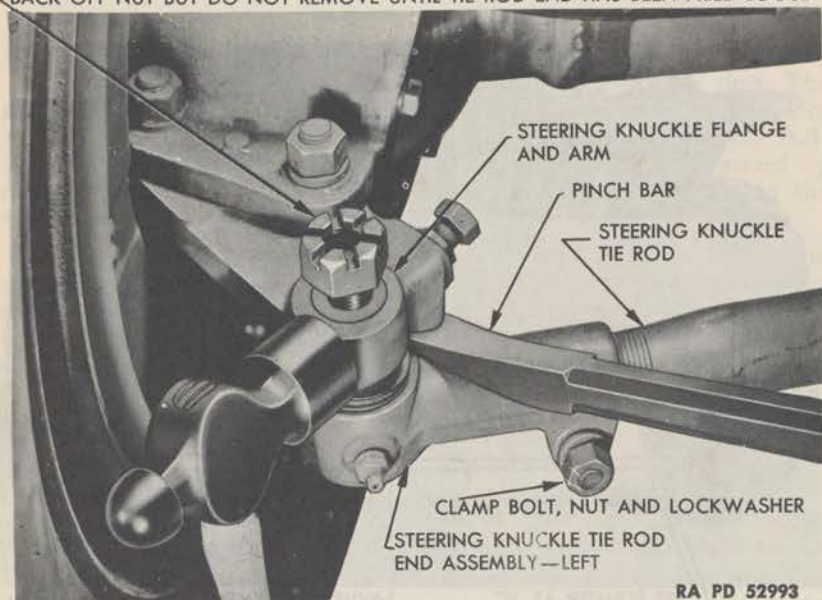
(2) **ADJUST TOE-IN** (fig. 151). Remove cotter pin and nut which hold the left tie rod end to the steering knuckle arm. Insert a pinch bar between the tie rod end and the arm and strike the arm with a hammer. Loosen tie rod end clamp bolt. Turn tie rod end clockwise to shorten tie rod and decrease toe-in, or counterclockwise to lengthen tie rod and increase toe-in. After each adjustment of tie rod length, install tie rod end to the steering knuckle arm, and recheck the wheel toe-in. When correct toe-in adjustment has been made, tighten the tie rod clamp bolt. Install nut and cotter pin which hold the tie rod end to the steering knuckle arm, and tighten securely.

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c. Front Wheel Turning Radius.

(1) **GENERAL.** Ability to maneuver the vehicle in close quarters and the life of the front axle universal drive assemblies depend upon correct turning radius being maintained. It is desirable that a vehicle turn in as small a circle as is practicable; however, if the inside wheel (when on a turn) is turned more than 28 degrees from a straight forward position, the front axle universal drive assemblies may be damaged. Turning radius is governed by stop screws which are adjusted, then tack-welded, to the steering knuckle arms. If inspection shows the screw to be loose or missing, notify higher authority.

←BACK OFF NUT BUT DO NOT REMOVE UNTIL TIE ROD END HAS BEEN PRIED LOOSE



RA PD 52993

Figure 151—Removing Steering Knuckle Tie Rod End

142. FRONT WHEEL BEARINGS.

a. Adjustment of Front Wheel Bearings.

(1) **REMOVE DRIVE FLANGE FROM WHEEL HUB** (fig. 152). Place a jack under the axle housing and raise wheel until tire clears the ground. Remove the six stud nuts which hold the drive flange to the wheel hub. Remove two flange puller screws from a rear axle shaft flange, remove the lock nuts from the screws, and use the screws to pull the drive flange off the hub.

(2) **ADJUST BEARINGS** (fig. 153). Remove the wheel bearing outer adjusting nut and the adjusting nut lock. Turn the inner adjusting nut tight to seat the bearings and then back it off about one-sixth of a turn. Wheel should rotate freely with no end play. Install the

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adjusting nut lock, making sure that the dowel pin in the inner adjusting nut enters a hole in the lock. It may be necessary to turn the lock over or even turn the inner adjusting nut slightly to permit the dowel pin to enter one of the holes in the lock. With the lock over the dowel pin, install the outer adjusting nut and tighten it securely.

(3) **INSTALL DRIVE FLANGE.** Remove flange puller screws from flange and install the screws and lock nuts in rear axle drive shaft flange. Place the drive flange over the splines of the drive shaft and over the studs in the wheel hub. Install the flange attaching nuts with a standard lock washer back of each nut and tighten the nuts securely. Remove the jack from under axle housing.

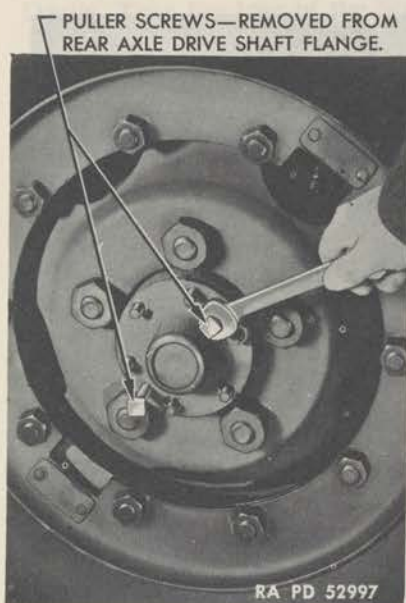


Figure 152—Removing Drive Flange



Figure 153—Adjusting Front Wheel Bearing

b. Removal of Front Wheel Bearings and Oil Seal. Before removing the wheel bearings or oil seals, put a new wheel bearing oil seal in thin oil and allow it to soak while the following operations are being performed.

- (1) **JACK UP WHEEL.** Raise wheel with jack and place stand under axle housing.
- (2) **REMOVE AXLE DRIVE FLANGE** (subpar. a (1) above).
- (3) **REMOVE WHEEL AND TIRE ASSEMBLY** (par. 163).
- (4) **REMOVE WHEEL HUB AND BEARINGS** (fig. 154). Turn the brake shoe adjusting cams to increase the clearance between the brake shoes and the drums (par. 151). Remove wheel bearing outer

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adjusting nut, adjusting nut lock, and inner adjusting nut with wheel bearing adjusting nut wrench. Remove the wheel outer bearing and pull drum, hub, and wheel inner bearing from steering knuckle.

(5) **REMOVE OIL SEAL, CONE AND CUPS** (fig. 154). Remove wheel bearing oil seal snap ring from inner end of hub. Remove wheel bearing inner cone and oil seal from hub by driving against the hub of the bearing cone. Drive inner and outer bearing cups from hub.

c. Installation of Front Wheel Bearings and Oil Seals.

(1) **INSTALL WHEEL BEARINGS AND OIL SEAL** (figs. 155 and 156). Install inner and outer bearing cups in hub, thick edge first. Pack

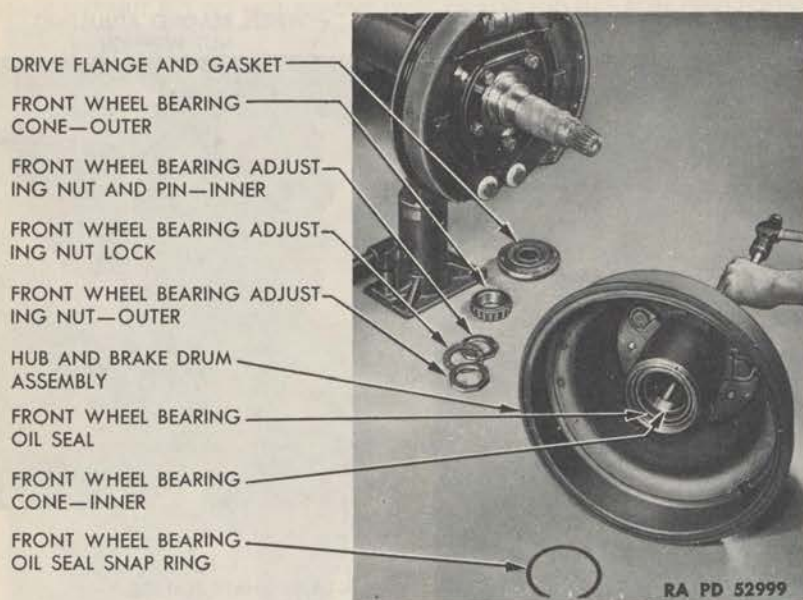


Figure 154—Removing Front Wheel Inner Bearing and Oil Seal

the wheel inner bearing cone with wheel bearing grease and place the bearing cone in the bearing cup. Work the oil seal, after soaking in thin oil, by rolling with pressure applied by a smooth bar. Drive the seal in the hub with oil seal drift just far enough so that the oil seal snap ring can be installed, to prevent interference with the bearing.

(2) **INSTALL HUB AND DRUM AND ADJUST BRAKE SHOES.** Clean the steering knuckle and inspect the oil seal bearing surface. Remove any roughness that may exist on that surface. Slide the hub and drum straight onto the steering knuckle. Exercise care to prevent damage to oil seal. Pack the outer bearing cone with wheel bearing grease and install the bearing and inner bearing adjusting nut on the steering knuckle. Adjust the wheel bearings (subpar. a (2) above). Turn brake

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shoe adjusting cams until brake drags and then back off just enough to free the drum.

- (3) INSTALL WHEEL AND TIRE ASSEMBLY (par. 163).
- (4) INSTALL AXLE DRIVE FLANGE (subpar. a (3) above).

143. UNIVERSAL DRIVE SHAFT, BUSHINGS, AND OIL SEALS.

a. Removal.

- (1) REMOVE WHEEL AND TIRE ASSEMBLY (par. 163).
- (2) REMOVE HUB AND DRUM; CHECK END PLAY IN UNIVERSAL DRIVE. Turn the tops of the brake shoe adjusting cams toward each



Figure 155—Conditioning Oil Seal



Figure 156—Installing Wheel Bearing Oil Seal with Drift 41-D-1535-50

other to increase the clearance between the shoes and drums. Remove the nuts which hold the drive flanges to the hubs and install puller screws. Pull the flanges from the hubs and remove the wheel bearing outer adjusting nuts and adjusting nut locks. Remove the inner adjusting nuts and outer bearings and pull the hubs from the steering knuckles. Check end play in universal drive assembly. If the end play exceeds 0.059 inch, replace the housing bushing and the steering knuckle bushing.

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(3) **REMOVE UNIVERSAL DRIVE ASSEMBLY** (fig. 157). Remove five cap screws which hold the brake support and steering knuckle to the steering knuckle flange. Lay the brake support to rear of axle without damaging the brake hose. Tap the steering knuckle with hammer and pull it off. Pull the universal drive assembly, keeping it as straight as possible. *If the joint is allowed to flex excessively, it may fall apart.* If the inner drive shaft is broken between the oil seal and four inches from the differential, fish the inner piece out with a wire snare. If breakage is within four inches of differential, remove differential carrier assembly and remove broken piece.

(4) **REMOVE OIL SEALS AND BUSHINGS.** Pull the trunnion socket bushing and drive shaft oil seal located in the housing assembly with



Figure 157—Removing Universal Drive Assembly

a slide hammer type puller (41-P-2957). Drive the bushing out of the steering knuckle with a drift and hammer.

(5) **REMOVE STEERING KNUCKLE FLANGE OIL SEAL** (fig. 158). Remove cap screws which hold the oil seal retainer to the steering knuckle flange and pull the felt seal and pressure spring out of the retainer. Twist the retainer open at the joint and remove it from the axle housing.

b. Cleaning and Inspection of Universal Drive Assembly. Clean the joint thoroughly in dry-cleaning solvent to remove all traces of

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STEERING KNUCKLE FLANGE
OIL SEAL RETAINER

STEERING KNUCKLE FLANGE
OIL SEAL FELT

STEERING KNUCKLE FLANGE
OIL SEAL FELT PRESSURE
SPRING

STEERING KNUCKLE FLANGE
JOINT OIL SEAL FELT
AND RETAINER

STEERING KNUCKLE FLANGE
OIL SEAL GASKET

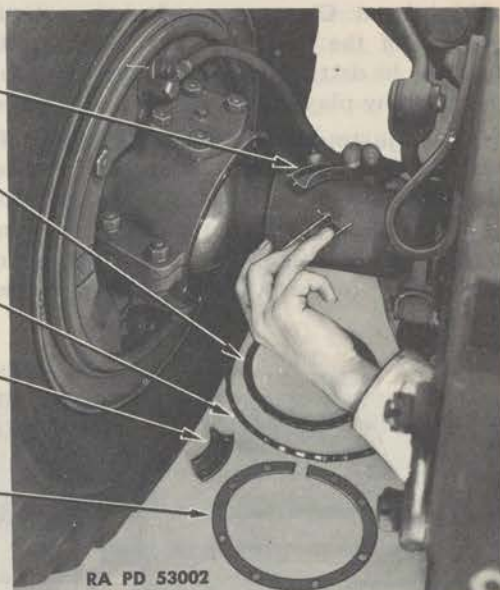
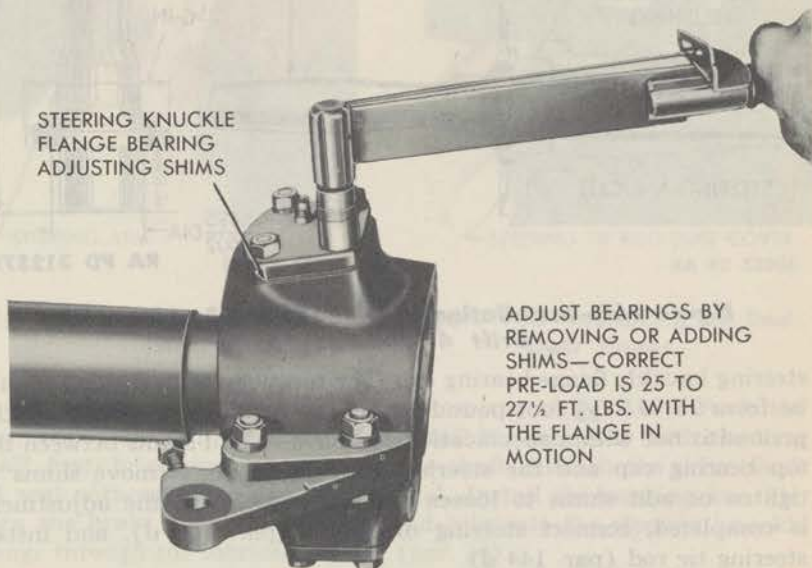


Figure 158—Removing Steering Knuckle Flange Oil Seal Retainer

STEERING KNUCKLE
FLANGE BEARING
ADJUSTING SHIMS



ADJUST BEARINGS BY
REMOVING OR ADDING
SHIMS—CORRECT
PRE-LOAD IS 25 TO
27½ FT. LBS. WITH
THE FLANGE IN
MOTION

RA PD 312579

Figure 159—Adjusting Steering Knuckle Flange Bearing

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old lubricant. Clamp one end of the assembly in a vise. Push the two sections of the joint together and twist the section not clamped in the vise to determine if any play exists between the races and drive balls. If any play is evident, notify higher authority.

c. **Adjustment of Steering Knuckle Flange Bearings (fig. 159).** With all parts removed as outlined in subparagraph a above, remove steering tie rod (par. 144 c) and disconnect steering drag link (par. 169 b). Make sure that bearing caps and bearings are seated by tapping with a hammer. Check the preload of the bearings with a foot-pound torque wrench attached to one of the cap screws of the

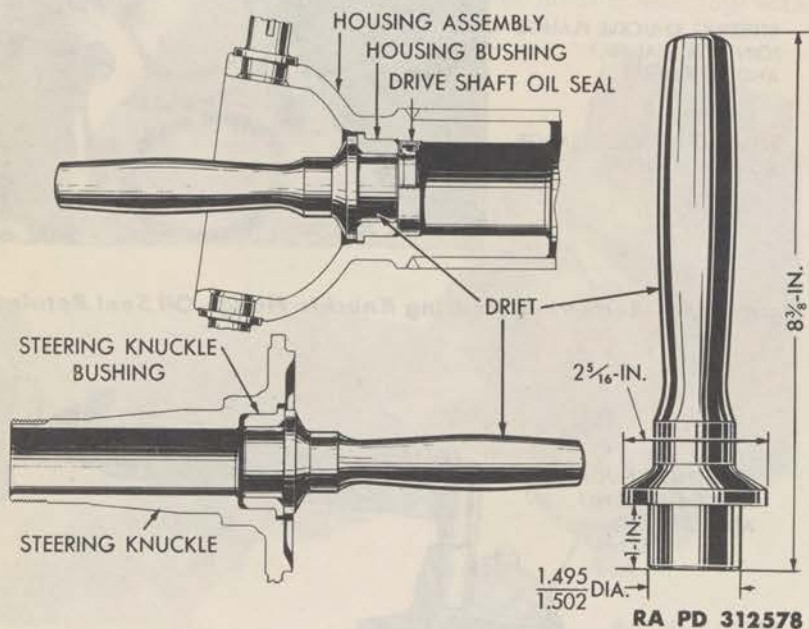


Figure 160—Installation of Oil Seal and Bushing with Drift 41-D-1535-25

steering knuckle flange bearing cap. The torque wrench reading should be from 25 to 27½ foot-pounds while the flange is in motion. If the preload is not within specifications, remove or add shims between the top bearing cap and the steering knuckle flange. Remove shims to tighten or add shims to loosen the bearings. When the adjustment is completed, connect steering drag link (par. 169 d), and install steering tie rod (par. 144 d).

d. Installation.

(1) **INSTALL OIL SEALS AND BUSHINGS (fig. 160).** Drift the oil seal and bushing into the front axle housing with special drift

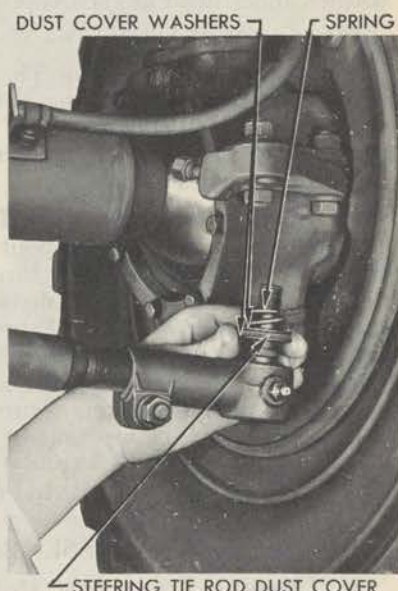
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(41-D-1535-25). Use same drift to install bushing in steering knuckle.

(2) **INSTALL STEERING KNUCKLE FLANGE OIL SEAL (fig. 158).** Clean the sealing surfaces and the seal retainer. Install the pressure spring in the retainer so that the ends of the spring are even with the ends of the retainer. Soak the felt seal in light oil and install it in the retainer with the ends even with the ends of the retainer. Twist the retainer open at the joint and put it over the axle housing. Place a new felt on the joint seal retainer and a new gasket on the steering knuckle flange. Install the seal assembly with the joint seal retainer at the top. Tighten the cap screws evenly to avoid distorting the retainer.



RA PD 53004



RA PD 53005

Figure 161—Removing Steering Arm

Figure 162—Installing Tie Rod Dust Cover

(3) **INSTALL UNIVERSAL DRIVE ASSEMBLY (fig. 157).** Pack the universal joint with lubricant and install the assembly with the long shaft first, being careful to insert the shaft through the drive shaft oil seal without damaging the oil seal. Install the steering knuckle, then the brake support assembly and lubricate the steering knuckle flange through the lubricant fitting (par. 24).

(4) **INSTALL HUB AND DRUM ASSEMBLY (par. 142 c (2)).**

(5) **INSTALL WHEEL AND TIRE ASSEMBLY (par. 163).**

(6) **INSTALL AXLE DRIVE SHAFT FLANGE (par. 142 a (3)).**

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144. STEERING ARM AND TIE ROD.

a. Removal of Steering Arm.

(1) DISCONNECT DRAG LINK FROM STEERING ARM (par. 169).

(2) REMOVE STEERING ARM (fig. 161). Remove four cap screws which hold the steering arm to the flange and raise arm off the flange. Be sure to leave all the adjusting shims on the steering knuckle flange.

b. Installation of Steering Arm.

(1) INSTALL STEERING ARM (fig. 161). Place the arm over the steering knuckle flange bearing shims, making sure all original shims are in place. Install the four attaching cap screws with toothed lock washer under head of each cap screw.

(2) CONNECT DRAG LINK TO STEERING ARM (par. 169).

c. Removal of Steering Tie Rod (fig. 151). Remove cotter pins and two nuts which hold tie rod ends to the steering knuckle arms. Insert pinch bar between tie rod end and steering knuckle and strike the steering knuckle arm with hammer. Loosen clamp bolt nut and screw tie rod ends off tie rod.

d. Installation of Steering Tie Rod (fig. 162). Screw the tie rod ends onto tie rod, leaving about six threads exposed at the left end of the tie rod, and about 10 threads exposed at the right end of the tie rod. Place the dust washers, covers, and springs over the ball studs. Insert tie rod end ball studs up through steering knuckle arms and install nuts. Tighten right-hand nut securely and install cotter pin. Tighten the left-hand nut sufficiently to draw the ball stud into place, but do not tighten securely. Turn tie rod so that the offset is down. Tighten clamp bolt at right-hand tie rod end. Check and adjust front wheel toe-in (par. 141). When toe-in has been adjusted, tighten left tie rod end ball stud nut securely.

145. FRONT AXLE ASSEMBLY.

a. Cleaning Front Axle Housing Vent (fig. 163). Remove the vent assembly and wash in dry-cleaning solvent. Blow through vent with compressed air to make sure it is not plugged, and install vent assembly.

b. Removal of Differential and Carrier Assembly.

(1) REMOVE WHEEL AND TIRE ASSEMBLIES (par. 163).

(2) REMOVE DRIVE FLANGE FROM WHEEL HUB (par. 142 a (1)).

(3) REMOVE HUB AND DRUM ASSEMBLIES (par. 142 a (3)).

(4) REMOVE UNIVERSAL DRIVE ASSEMBLIES (par. 143 a (3)).

(5) DISCONNECT STEERING TIE ROD AT ONE END (par. 144 c).

(6) DISCONNECT PROPELLER SHAFT (par. 139).

(7) REMOVE DIFFERENTIAL AND CARRIER ASSEMBLY. Remove drain plug and drain lubricant. Remove the attaching stud nuts and lower the assembly from the axle housing.

FRONT AXLE

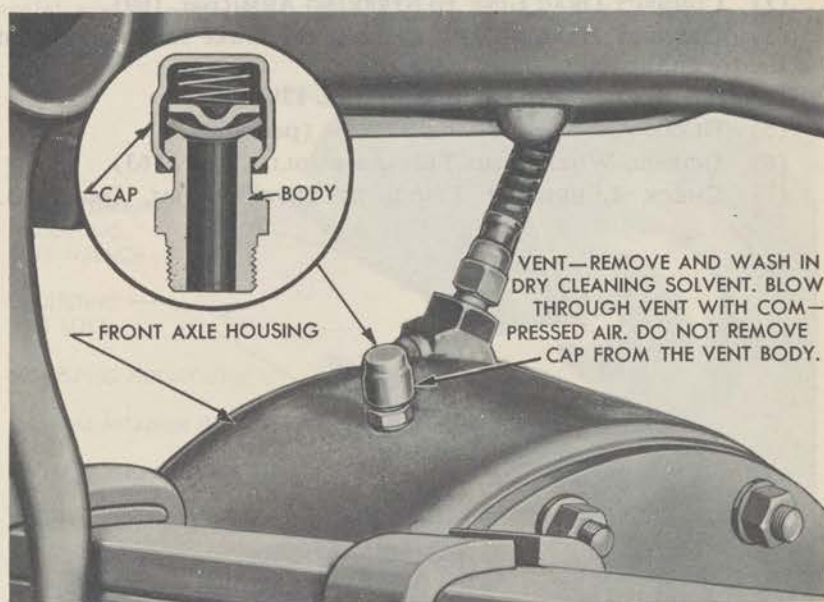
c. Installation of Differential and Carrier Assembly.

(1) **INSTALL DIFFERENTIAL AND CARRIER ASSEMBLY.** If the differential side bearing caps are attached with cap screws, place one new gasket over the housing studs. If the differential side bearing caps are attached with studs and nuts use three new gaskets. Install the carrier in the housing and securely tighten all attaching nuts.

(2) **INSTALL UNIVERSAL DRIVE ASSEMBLIES** (par. 143 d (3)).

(3) **INSTALL HUB AND DRUM ASSEMBLIES** (par. 142 c (2)).

(4) **ADJUST FRONT WHEEL BEARINGS AND INSTALL DRIVE FLANGE** (par. 142 a).



RA PD 52996

Figure 163—Front Axle Housing Vent

(5) **INSTALL WHEEL AND TIRE ASSEMBLIES** (par. 163).

(6) **CONNECT PROPELLER SHAFT** (par. 139).

(7) **CONNECT STEERING TIE ROD** (par. 144 d).

(8) **ADJUST BRAKES** (par. 151).

d. Removal of Front Axle Assembly.

(1) **REMOVE WHEEL AND TIRE ASSEMBLIES** (par. 163).

(2) **DISCONNECT PROPELLER SHAFT** (par. 139).

(3) **DISCONNECT BRAKE TUBE.** Disconnect the brake tube from the front of the tee at the top of the axle housing.

(4) **DISCONNECT FRONT END OF DRAG LINK** (par. 169).

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(5) **DISCONNECT SHOCK ABSORBER LINK EYEBOLTS.** Remove nut from lower end of shock absorber link eyebolts and raise eyebolts out of the spring clip plates.

(6) **REMOVE AXLE ASSEMBLY.** Remove nut from each end of four spring clips (U-bolts) and raise the clips out of spring clip plates. Then lower axle assembly and remove it from under vehicle.

e. Installation of Front Axle Assembly.

(1) **INSTALL AXLE AND CONNECT SHOCK ABSORBER LINKS.** Move axle assembly under vehicle and jack it into place. Install the spring clips and nuts with a standard lock washer above each nut. Connect the shock absorber link eyebolts to the spring clip plates.

(2) **CONNECT DRAG LINK TO STEERING ARM** (par. 169).

(3) **CONNECT BRAKE TUBE.** Connect the brake tube to the front of the tee on the top of the axle housing.

(4) **CONNECT PROPELLER SHAFT** (par. 139).

(5) **BLEED AIR FROM BRAKE SYSTEM** (par. 152).

(6) **INSTALL WHEEL AND TIRE ASSEMBLIES** (par. 163).

(7) **CHECK LUBRICANT LEVEL IN DIFFERENTIAL** (par. 24).

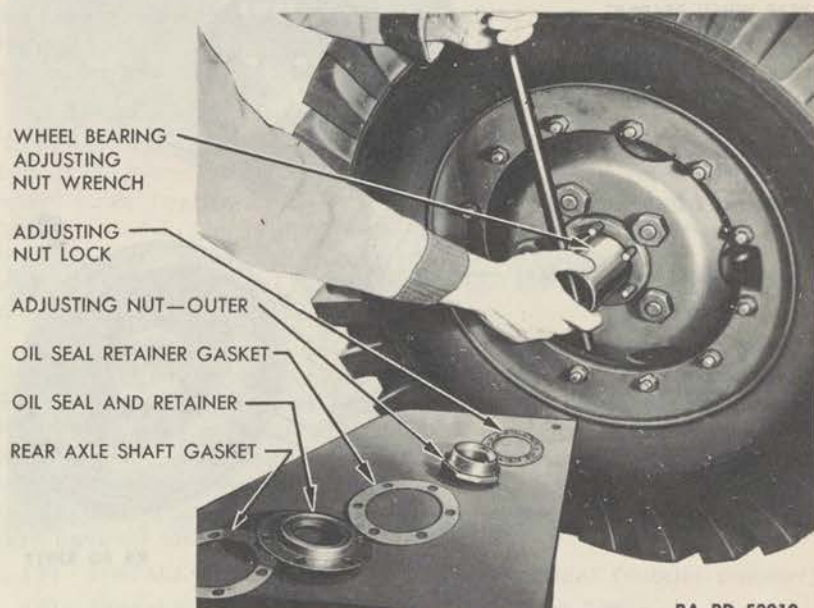
Section XXXII

REAR AXLE

	Paragraph
General description	146
Rear wheel bearings	147
Rear axle drive shafts	148
Rear axle assembly	149

146 GENERAL DESCRIPTION.

a. The rear axle is of the full-floating type with a hypoid ring gear and drive pinion. With this type axle it is possible to remove or replace the axle drive shaft without removing the wheels. The differential carrier assembly in the rear axle is identical with that used in the front axle.



RA PD 53010

Figure 164—Adjusting Rear Wheel Bearing**147. REAR WHEEL BEARINGS.****a. Adjustment of Rear Wheel Bearings.**

- (1) **JACK UP WHEEL.** Place a jack under the axle housing and raise the vehicle until the tire clears the ground.
- (2) **REMOVE AXLE DRIVE SHAFT** (par. 148).
- (3) **REMOVE WHEEL BEARING OUTER OIL SEAL** (subpar. b below).
- (4) **ADJUST BEARINGS** (fig. 164). Remove the wheel bearing outer adjusting nut, with wheel bearing adjusting nut wrench, and the

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adjusting nut lock. Turn the inner adjusting nut tight and then back it off about $\frac{1}{6}$ of a turn. Install the adjusting nut lock, making sure that the dowel pin in the inner adjusting nut enters a hole in the lock. It may be necessary to turn the lock over or even turn the inner adjusting nut slightly to permit the dowel pin to enter one of the holes in the lock. With the lock over the dowel pin, install the outer adjusting nut and tighten it securely.

(5) **INSTALL WHEEL BEARING OUTER OIL SEAL** (subpar. c below).

(6) **INSTALL AXLE DRIVE SHAFT** (par. 148).

b. Removal of Outer Oil Seal (fig. 164). Remove axle drive shaft (par. 148). Slide the wheel bearing outer oil seal retainer off the axle shaft drive studs.

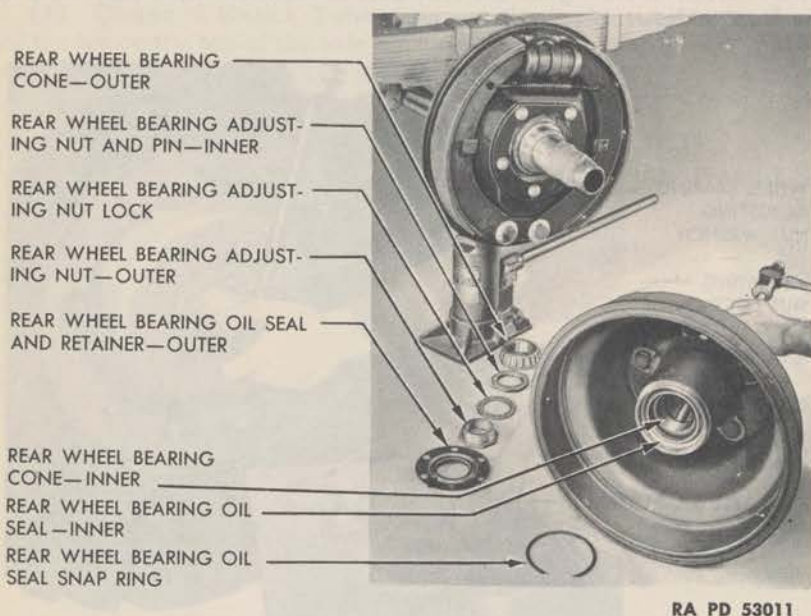


Figure 165—Removing Rear Wheel Bearing and Oil Seal

c. Installation of Outer Oil Seal (fig. 164). Soak the oil seal in light engine oil to make it pliable. Clean the outer end of the wheel hub and drive shaft studs. Install a good paper gasket over the drive studs. Inspect the wheel bearing outer adjusting nut. If the oil seal bearing surface is rough or grooved, replace the nut. Install the oil seal over the adjusting nut and the axle shaft drive studs. Install the axle drive shaft (par. 148).

d. Removal of Inner Oil Seal and Bearings (fig. 165). Before removing the wheel bearings or oil seals, put a new wheel bearing oil seal in thin oil and allow it to soak while the following operations are being performed.

REAR AXLE

(1) **JACK UP WHEEL.** Raise vehicle with jack and place stand under axle housing.

(2) **REMOVE AXLE DRIVE SHAFT** (par. 148).

(3) **REMOVE WHEEL AND TIRE ASSEMBLY** (par. 163).

(4) **REMOVE WHEEL BEARING OUTER OIL SEAL** (subpar. b above).

(5) **REMOVE BRAKE DRUM AND HUB** (fig. 165). Turn the brake shoe adjusting cams to increase the clearance between the brake shoes and the drum. Remove the outer wheel bearing adjusting nut, adjusting nut lock, and inner adjusting nut with wheel bearing adjusting nut wrench. Remove the outer wheel bearing and pull the drum, hub, and inner wheel bearing, from the axle housing.

(6) **REMOVE OIL SEAL, CONE AND CUPS** (fig. 165). Remove the rear wheel bearing oil seal snap ring from the inner end of the hub. Remove wheel inner bearing cone and oil seal from the hub by driving against the hub of the bearing cone with a large drift. Drift inner and outer bearing cups out of hub.

e. Installation of Inner Oil Seal and Bearings.

(1) **INSTALL WHEEL BEARINGS AND OIL SEAL** (figs. 155 and 156). Install inner and outer bearing cups in hub, thick edge first. Pack the wheel inner bearing cone with wheel bearing grease and place the bearing cone in the bearing cup. Work the oil seal, after soaking in thin oil, by rolling with pressure applied by a smooth bar. Install the seal in the hub with oil seal drift (41-D-1535-50) and install the oil seal snap ring.

(2) **INSTALL HUB AND DRUM AND ADJUST BRAKE SHOES.** Inspect the oil seal bearing surface and remove any roughness that may exist. Slide the hub and drum straight onto the axle housing. Exercise care to prevent damaging the oil seal. Pack the outer wheel bearing cone with wheel bearing grease and install the bearing and inner bearing adjusting nut on the housing. Adjust the wheel bearings (subpar. a (4) above). Turn brake shoe adjusting cams until brake drags and then back off just enough to free the drum.

(3) **INSTALL WHEEL BEARING OUTER OIL SEAL** (subpar. c above).

(4) **INSTALL REAR AXLE DRIVE SHAFT** (par. 148).

(5) **INSTALL WHEEL AND TIRE ASSEMBLY** (par. 163).

148. REAR AXLE DRIVE SHAFTS.

a. **Removal** (fig. 152). Remove the six rear axle drive shaft flange retaining stud nuts. Remove the two flange puller screws from the axle shaft flange; remove the lock nuts from the screws and use the screws to pull the drive flange off the hub. Pull the drive shaft out of the housing. If the rear axle drive shaft is broken, and the break is less than four inches from the inner end of the shaft, it will be necessary to remove the differential carrier assembly; and the condition should be referred to ordnance personnel. If the break in the shaft is more than four inches from the inner end of the shaft, it will be

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necessary to snare the inner end of the shaft, pulling it through the housing with a wire loop.

b. Installation.

(1) **INSPECT DRIVE SHAFT CONTACTING SURFACES.** Make sure all contacting surfaces are clean and free of foreign matter which would prevent the shaft flange, the oil seal retainer and the wheel hub seating properly against the gasket when tightened down with the retaining nuts.

(2) **INSTALL PULLER SCREWS AND LOCK NUTS.** Remove the puller screws from the drive shaft flange and install the lock nuts. Reinstall the screws in the flange so that the ends of the screws do not protrude through the flange, and tighten the lock nuts.

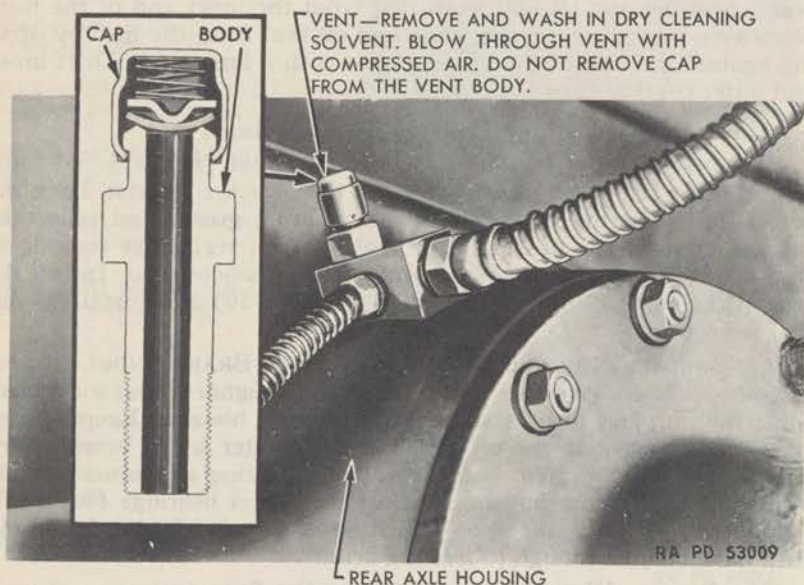


Figure 166—Rear Axle Housing Vent

(3) **INSTALL DRIVE SHAFT.** Place a new gasket on the drive studs and install the drive shaft in the housing. Engage the splines on the inner end of the shaft with the differential side gear and push the shaft into place. Install standard lock washers and flange attaching nuts on the drive studs and tighten evenly.

149. REAR AXLE ASSEMBLY.

a. Cleaning Rear Axle Housing Vent. Remove the vent assembly and wash in dry-cleaning solvent. Blow through vent with compressed air to make sure it is not plugged and install vent assembly (fig. 166).

REAR AXLE

b. Removal of Differential and Carrier Assembly.

- (1) REMOVE AXLE DRIVE SHAFTS (par. 148 a).
- (2) DISCONNECT PROPELLER SHAFT (par. 139).
- (3) REMOVE DIFFERENTIAL AND CARRIER ASSEMBLY. Remove drain plug and drain lubricant. Remove the attaching stud nuts and lower the assembly from the axle housing.

c. Installation of Differential and Carrier Assembly.

- (1) INSTALL DIFFERENTIAL AND CARRIER ASSEMBLY. If the differential side bearing caps are attached with cap screws, place one new gasket over the housing studs. If the differential side bearing caps are attached with studs and nuts, use three new gaskets. Install the carrier in the housing and securely tighten all attaching nuts.

- (2) INSTALL AXLE DRIVE SHAFTS (par. 148 b).

- (3) CONNECT PROPELLER SHAFT (par. 139).

d. Removal of Rear Axle Assembly.

- (1) DISCONNECT BRAKE TUBE. Disconnect the brake tube from the brake hose at the brake tube to hose bracket located on the frame cross member. Disconnect the hose from the brake tube to hose bracket by removing the attaching nut.

- (2) DISCONNECT PROPELLER SHAFT AT DRIVE PINION FLANGE (par. 139).

- (3) REMOVE WHEEL AND TIRE ASSEMBLY (par. 163).

- (4) REMOVE REAR AXLE ASSEMBLY. Remove the spring clip nuts. Remove the spring clips and clip plates. Lower the axle from the vehicle with the jack.

e. Installation of Rear Axle Assembly.

- (1) INSTALL REAR AXLE ASSEMBLY. Place the rear axle on the jack and roll it into position under the vehicle. Jack up the axle until it contacts the rear springs. Make certain that the center bolts line up properly in the holes provided in the pads that are a part of the rear axle housing. Install the spring clips down through the plates. Install standard lock washers and nuts and tighten the nuts securely.

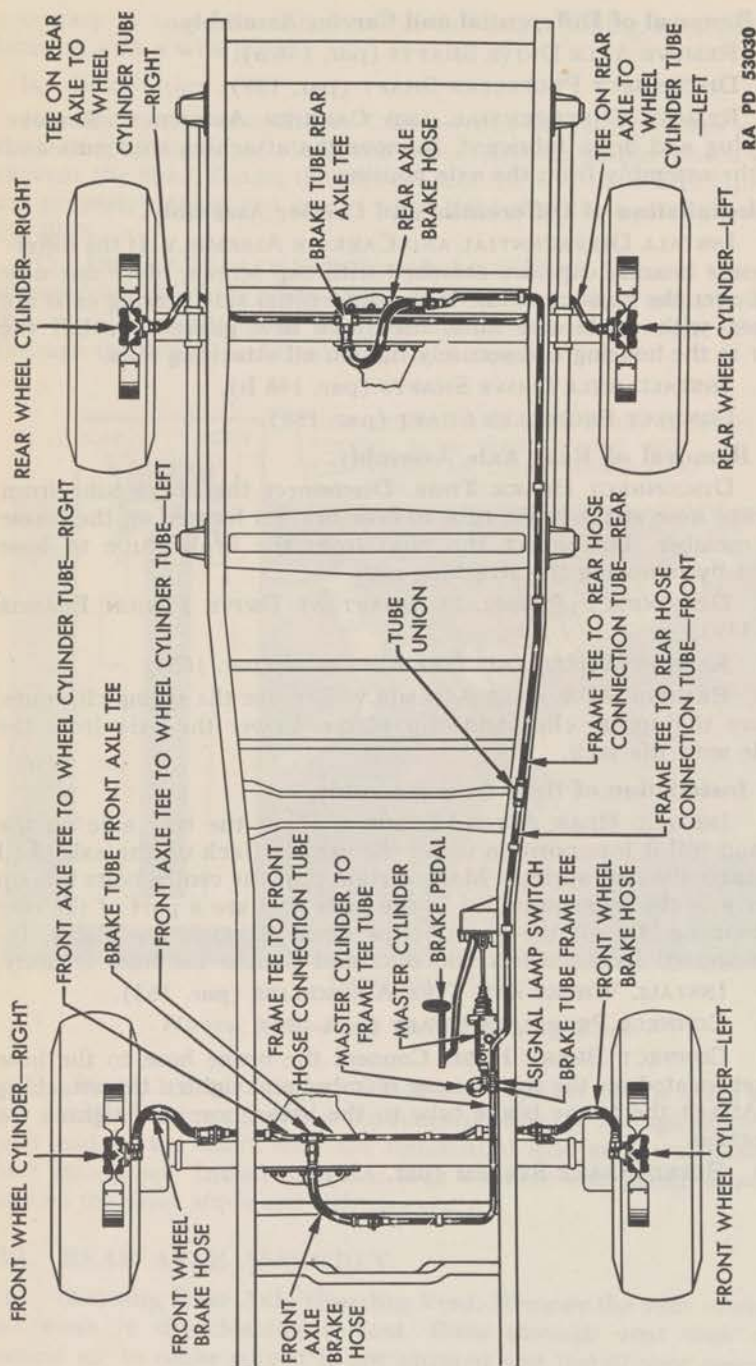
- (2) INSTALL WHEEL AND TIRE ASSEMBLIES (par. 163).

- (3) CONNECT PROPELLER SHAFT (par. 139).

- (4) CONNECT BRAKE HOSE. Connect the brake hose to the hose bracket located on the frame cross member and tighten the attaching nut. Attach the frame brake tube to the brake hose and tighten the connection.

- (5) BLEED BRAKE SYSTEM (par. 152).

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RA PD 53030

Figure 167—Brake System

Section XXXIII

FOOT BRAKES

	Paragraph
General description	150
Brake adjustments	151
Bleeding brake system	152
Brake shoes, linings, and drums	153
Wheel cylinders	154
Master cylinder	155

150. GENERAL DESCRIPTION.

a. The foot brakes (fig. 167) are of the hydraulic expanding type and operate on all four wheels. The brake pedal is connected to a piston which operates within a master cylinder. When the brake pedal is depressed, the master cylinder piston forces fluid under equal pressure to all four wheel cylinders. The fluid enters the wheel cylinders between two pistons, causing the pistons to move in opposite directions and push the brake shoes against the brake drums. Adjustments are provided to compensate for wear of the brake shoe linings. However, because the hydraulic pressure is always equal to all four wheels, no adjustment is provided or required to equalize the brake shoe pressure.

151. BRAKE ADJUSTMENTS.

a. **Minor Brake Adjustment.** A minor brake adjustment consists of adjusting the brake shoe cams which control only the released position of the brake shoes. The minor adjustment will reduce brake pedal travel caused by brake lining or drum wear, or will relieve brake drag caused by lack of clearance between the brake shoes and drum. Before attempting to adjust the brakes, make certain the master cylinder piston rod is properly adjusted (subpar. c (3) below) and that wheel bearings have no play. *Do not adjust brake shoes when brake drums are hot, because the drums will contract when they cool off and cause the brakes to drag.*

(1) **ADJUST BRAKE SHOE CAMS** (fig. 168). Jack up wheel until the tire is clear of the ground. Revolve the wheel and turn one brake shoe cam pin until the brake shoe contacts the drum and causes the brake to drag. Then turn the cam pin in the opposite direction just enough to eliminate the brake drag. Adjust the other shoe in the same manner and repeat the operation on the other three wheels.

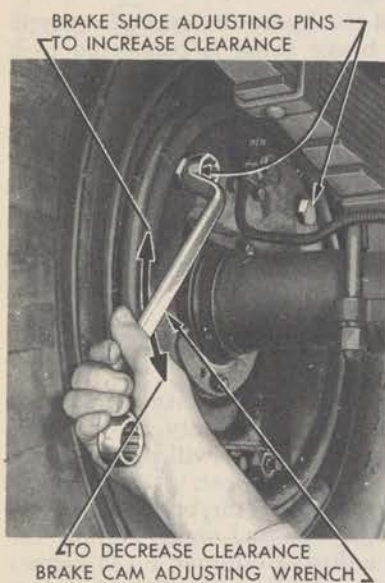
(2) **CHECK FLUID LEVEL IN MASTER CYLINDER** (fig. 169). Remove the filler plug from top of the master cylinder. If fluid level is more than $\frac{3}{4}$ inch below top of opening, add fluid to proper level and install filler plug.

b. **Major Brake Adjustment.** A major brake adjustment consists of adjusting the brake shoe anchor bolts so that the full area of the shoe lining will contact the brake drum when the brakes are applied.

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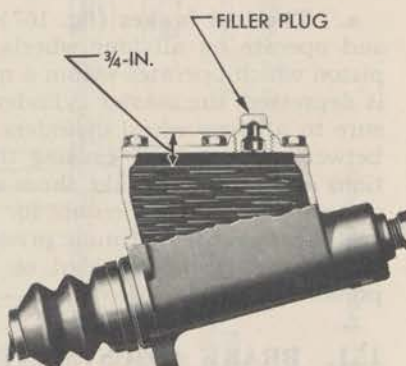
A major brake adjustment may be required when the brake shoe and lining assemblies are replaced or when the brake drums are resurfaced or replaced. Before attempting to make a major adjustment, make certain the master cylinder piston rod is properly adjusted (subpar. c (3) below) and that the wheel bearings have no play. **CAUTION:** While making a brake adjustment, do not apply the brakes as the resulting distortion of the various parts will make it impossible to accomplish an accurate adjustment.

(1) **REMOVE WHEEL AND TIRE ASSEMBLY** (par. 163). Install two of the wheel stud nuts and tighten with wheel wrench so that brake drums will be held in proper alinement.



RA PD 53013

Figure 168—Adjusting Brake Shoe Cam



REMOVE THE FILLER PLUG. IF THE FLUID LEVEL IS MORE THAN 3/4-IN. BELOW TOP OF OPENING, ADD BRAKE FLUID UP TO THE 3/4-IN. LEVEL AND INSTALL FILLER PLUG

RA PD 53012

Figure 169—Master Cylinder Fluid Level

(2) **POSITION ANCHOR BOLTS** (fig. 170). Loosen anchor bolt lock nuts. Turn anchor bolts to the fully released position so that the dots on any pair of anchor bolts face toward each other and the flats of the anchor bolts are in the same horizontal plane. This can best be determined by placing a straightedge across the flats of the anchor bolts.

(3) **ADJUST BRAKE SHOE CAMS** (fig. 170). Turn the brake shoe adjusting cams so that a 0.006-inch feeler gage will be a snug fit between the toe of the brake shoe lining and drum.

(4) **ADJUST ANCHOR BOLTS** (fig. 170). Turn the anchor bolts in the direction indicated by the arrows in figure 170, to decrease the

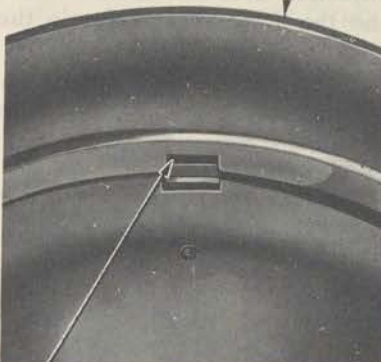
FOOT BRAKES

BRAKE DRUM INSPECTION HOLE COVER

SCREW

LOCKWASHER

WHEEL
BRAKE
DRUM

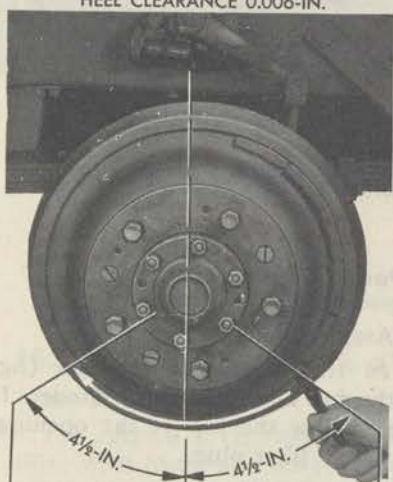


INSPECTION OPENING WITH
THE COVER REMOVED
DRUM INSPECTION HOLE

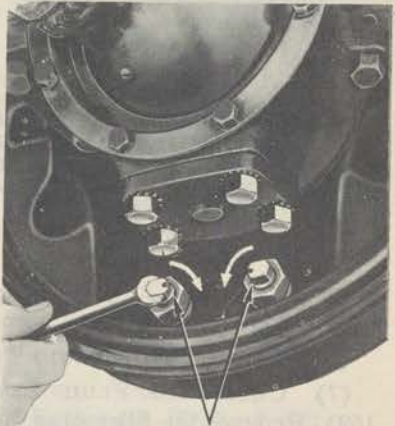


TOE CLEARANCE 0.012-IN.
TOE ADJUSTMENT

HEEL CLEARANCE 0.006-IN.



HEEL OF REAR SHOE
HEEL OF FRONT SHOE—
HEEL ADJUSTMENT



TURN THE BRAKE SHOE ANCHOR
BOLTS IN THE DIRECTION OF ARROWS
TO DECREASE CLEARANCE BETWEEN
THE HEEL OF THE SHOE AND THE
BRAKE DRUM—TURN IN THE
OPPOSITE DIRECTION TO INCREASE
CLEARANCE.

ANCHOR BOLT ADJUSTMENT

RA PD 58366

Figure 170—Brake Shoe Adjustments

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clearance between the heel of the brake shoe lining and drum to 0.006 inch. This will cause the brake shoe to move down and out, increasing the clearance at the toe of the brake shoe lining to approximately 0.012 inch, resulting in proper centralization of the brake shoes. When the shoes have been adjusted, hold the anchor bolt from turning and tighten the lock nuts securely. If the pedal travel is too great after the adjustments have been completed, decrease the clearance between the toe of the shoe lining and the drum. Make certain the brakes do not drag.

(5) **INSTALL COVER OVER INSPECTION HOLE.** Place the cover over the inspection hole in the drum and install the attaching screw with a standard lock washer under the head of the screw.

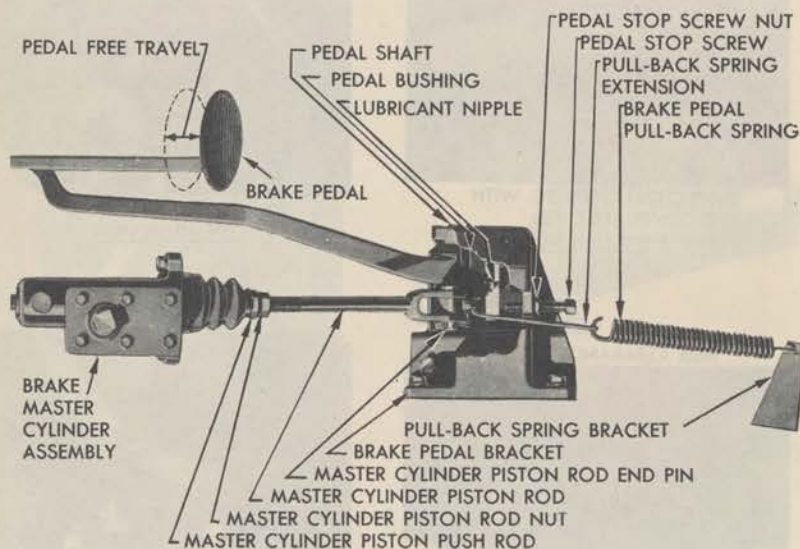


Figure 171—Brake Pedal Adjustments

(6) **INSTALL WHEEL AND TIRE ASSEMBLY** (par. 163).

(7) **CHECK THE FLUID LEVEL IN THE MASTER CYLINDER** (fig. 169). Remove the filler plug from the top of the master cylinder. If the fluid level is more than 3/4-inch below the top of the opening, add brake fluid to proper level and install filler plug.

c. Adjustment of Brake Pedal Free Travel.

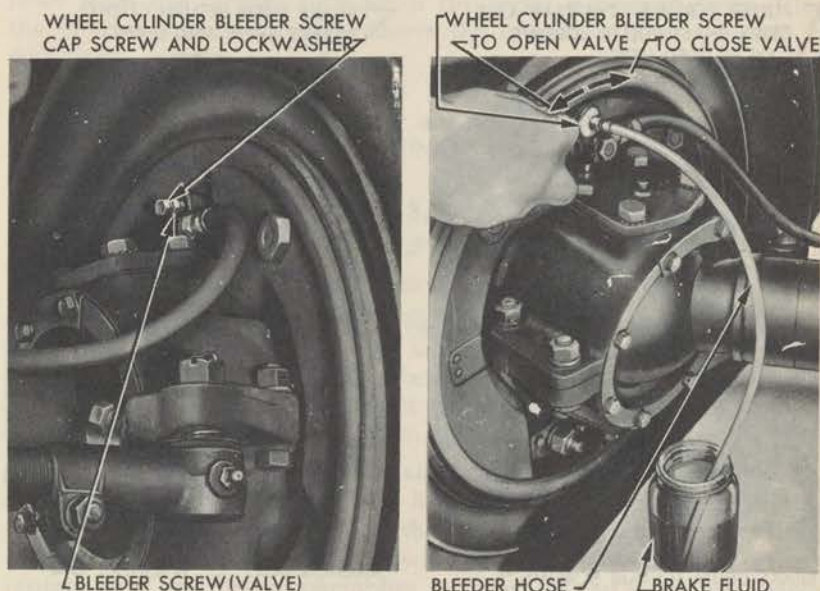
(1) **DESCRIPTION** (fig. 171). The backward travel of the brake pedal is limited by a stop screw so that the pedal will not strike the engine rear support when released. The pedal free travel is the amount of movement of the pedal from its fully released position to the point where noticeable resistance is felt in the downward movement of the

FOOT BRAKES

pedal. This free travel is controlled by the length of the master cylinder piston rod.

(2) **CHECK PEDAL STOP SCREW ADJUSTMENT** (fig. 171). Depress and release the brake pedal and note whether it contacts the engine rear support. If so, loosen the lock nut on the pedal stop screw and turn the stop screw in the bracket so that the pedal does not contact the engine support when the pedal is released.

(3) **ADJUST MASTER CYLINDER PISTON ROD** (fig. 171). Loosen the lock nut at the front end of the rod between the pedal and the master cylinder and turn the master cylinder piston rod until the pedal has $\frac{7}{16}$ -inch free travel.



RA PD 65956

Figure 172—Bleeding Brake At Wheel Cylinder

152. BLEEDING BRAKE SYSTEM.

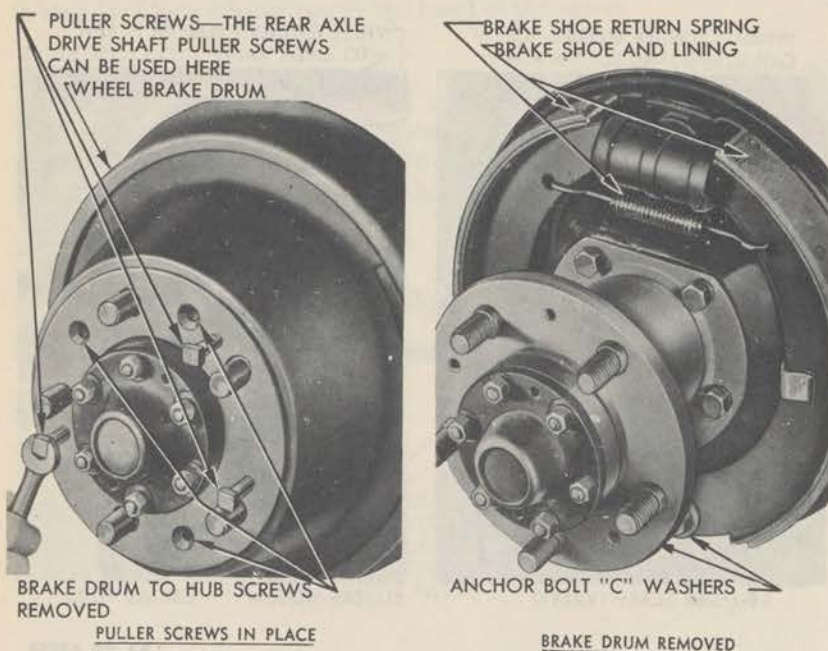
a. Bleeding Brake System with Hydraulic Brake Filler.

(1) **ATTACH HYDRAULIC BRAKE FILLER.** Partially fill the brake filler with hydraulic brake fluid. Attach air hose to connection at top of the filler and apply 25 pounds air pressure to the filler tank. Remove the plug from the top of the master cylinder. Place end of filler hose in master cylinder, open the shut-off valve in the filler hose slightly and fill the master cylinder to top of the opening. Install tapped fitting in master cylinder filler opening. Install threaded nipple into the tapped fitting and connect the filler hose to the nipple. Before tight-

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ening the hose to nipple connection, open the shut-off valve slightly and when fluid, free of air, is forced out of the loose connection, tighten the connection and open the shut-off valve fully.

(2) **BLEED BRAKE SYSTEM** (fig. 172). Remove the cap screw from the wheel cylinder bleeder screw and attach the bleeder tube. Submerge the free end of the bleeder tube in brake fluid in a receptacle. Open the bleeder screw and allow fluid to flow into the receptacle until fluid coming from the brake system is clear and free of air bubbles. Then close the bleeder screw securely, remove the bleeder tube and install cap screw. Follow this procedure at all four wheel cylinders.



RA PD 65955

Figure 173—Removing Brake Drum

(3) **LOWER FLUID LEVEL IN MASTER CYLINDER.** When the last of the four wheel cylinders has been completely bled and while the bleeder screw is still open and the bleeder tube is still in the receptacle of fluid, close the shut-off valve in the filler hose and disconnect the hose from the master cylinder. Push the brake pedal all the way down and hold it down while the bleeder screw at the wheel cylinder is being closed. Then release the brake pedal. This will lower the fluid in the master cylinder to approximately $\frac{3}{4}$ inch below the top of the filler opening. Remove fittings and install filler plug in master cylinder.

FOOT BRAKES**b. Bleeding Brake System without Use of Hydraulic Filler Tank.**

(1) **FILL MASTER CYLINDER.** Remove the filler plug from the top of the master cylinder and fill the cylinder with clean fresh brake fluid.

(2) **BLEED EACH OF THE FOUR WHEEL CYLINDERS** (fig. 172). Remove the cap screw from the wheel cylinder bleeder screw and attach the bleeder tube. Submerge the free end of the bleeder tube in brake fluid in a receptacle and open the bleeder screw. Push the brake pedal down slowly about half way, then allow the pedal to return to its released position. Keep refilling the master cylinder and repeat the brake pedal operation until clear fluid, free of air bubbles, flows from the bleeder tube when the pedal is pushed down. Close the bleeder screw securely; remove the bleeder tube and install the cap screw.

(3) **CHECK FLUID LEVEL IN MASTER CYLINDER.** Measure the fluid level in the master cylinder and add fluid if necessary to bring fluid to $\frac{3}{4}$ inch from top of the filler opening. Install filler plug.

153. BRAKE SHOES, LININGS, AND DRUMS.**a. Cleaning and Inspection of Brakes.**

(1) **REMOVE WHEEL AND TIRE ASSEMBLY** (par. 163).

(2) **REMOVE BRAKE DRUM** (fig. 173). Turn brake shoe cams to increase clearance between shoes and drum (fig. 168). Remove three countersunk screws which hold brake drum to hub. Remove puller screws from rear axle drive shaft flange, remove lock nuts and use the screws in holes provided in drum to pull the drum from the hub.

(3) **CLEAN AND INSPECT BRAKES.** Brush dust or dirt from the brake shoes and interior of the brake drum. Inspect brake return spring and brake anchor "C" washers for being intact. Inspect brake shoe lining. If linings are worn down to rivets, loose on shoe, or greasy, replace shoe and lining assemblies (subpars. b and c below). Inspect brake drum. If badly scored or cracked, notify ordnance personnel.

(4) **INSTALL BRAKE DRUM.** Remove puller screws from drum and install the screws and lock nuts in the rear axle drive shaft flange. Lubricate hub with water pump lubricant to facilitate future removal of the drum. Place drum over the hub so that the attaching screw holes line up with the tapped holes in the hub. Install the attaching screws and draw the drum into place. Make sure the drum is tight against the flange of the hub by tapping with a hammer, and tighten the screws securely.

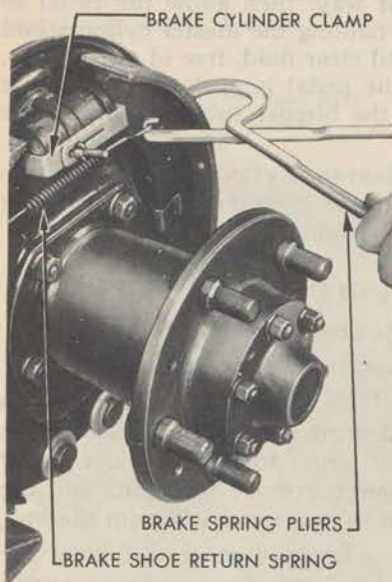
(5) **CHECK BRAKE ANCHOR BOLT ADJUSTMENT** (par. 151).

(6) **CHECK FLUID LEVEL IN MASTER CYLINDER** (fig. 169). Measure fluid level in master cylinder and add fluid if necessary to bring fluid to $\frac{3}{4}$ inch from top of filler opening.

(7) **INSTALL WHEEL AND TIRE ASSEMBLY** (fig. 163).

3/4-TON 4 x 4 TRUCK (DODGE)**b. Removal of Brake Shoes.**

- (1) REMOVE WHEEL AND TIRE ASSEMBLY (par. 163).
- (2) REMOVE BRAKE DRUM (subpar. a (2) above).
- (3) REMOVE BRAKE SHOES (figs. 174 and 175). Place clamp over brake cylinder to hold pistons in brake cylinder and remove brake shoe return spring. Remove shoe anchor bolt nuts and washers and tap out anchor bolts. Swing brake shoes out of brake cylinder and remove from brake support.



RA PD 53026



RA PD 312567

Figure 174—Removing Brake Shoe Return Spring**Figure 175—Removing Brake Shoe and Lining**

- (4) INSPECT BRAKE DRUM. If the brake drum is excessively scored or cracked, notify higher authority.

c. Installation of Brake Shoes.

- (1) INSTALL BRAKE SHOES. Place the brake shoes in position on the support assembly, forcing them into the guide springs on each side. Lubricate anchor bolts with a thin coating of chassis grease and install them complete with oil washers, retainers, and "C" washers. Install the anchor bolt lock washers and nuts. Attach the brake shoe return spring and remove the brake cylinder clamp.

- (2) INSTALL BRAKE DRUM (subpar. a (4) above). Turn the anchor bolts so that the prick punch marks on the inner end of the

FOOT BRAKES

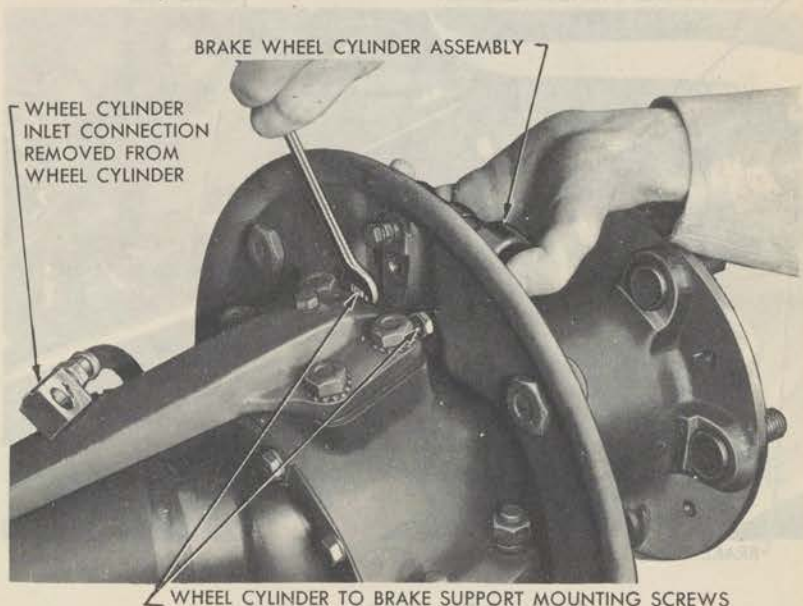
bolts are toward each other (fig. 170). The drum can then be installed. Make major brake adjustment (par. 151).

- (3) INSTALL WHEEL AND TIRE ASSEMBLY (par. 163).

154. WHEEL CYLINDERS.

a. Removal.

- (1) REMOVE WHEEL AND TIRE ASSEMBLY FROM HUB (par. 163).
- (2) REMOVE BRAKE DRUM FROM HUB (par. 153).
- (3) REMOVE CYLINDER (fig. 178). Disconnect brake hose from brake cylinder. Remove two cap screws which hold brake cylinder to brake support. Remove brake shoe return spring. Swing brake shoes out of brake cylinder.



RA PD 53028

Figure 176—Removing Wheel Cylinder

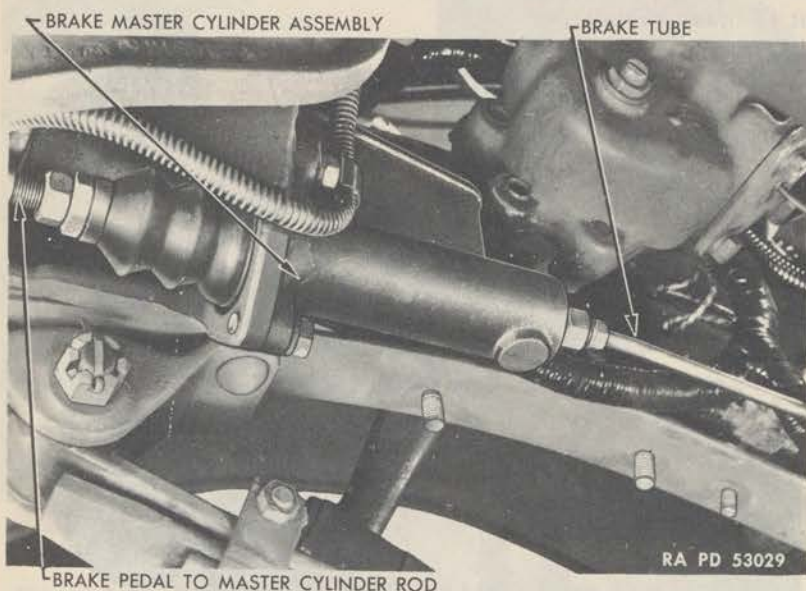
b. Installation.

- (1) INSTALL BRAKE CYLINDER (fig. 176). Place brake cylinder on brake support and install two cap screws. Then connect brake hose with washers on both sides of inlet connection. Swing brake shoes into position and attach brake shoe return spring.
- (2) INSTALL BRAKE DRUM ON HUB (par. 153).
- (3) BLEED AIR FROM BRAKE SYSTEM (par. 152).
- (4) INSTALL WHEEL AND TIRE ASSEMBLY (par. 163).

3/4-TON 4 x 4 TRUCK (DODGE)**155. MASTER CYLINDER.****a. Removal (fig. 177).**

(1) **REMOVE LEFT ENGINE DUSTPAN.** Disconnect the chassis wiring cable from the engine dustpan and remove the clip, bolt and nut. Remove the front spring torque arrester assembly. Remove the cap screws that hold the dustpan to the frame side member and the front cap screw that holds the dustpan to rear of front frame cross member.

(2) **REMOVE MASTER CYLINDER.** Disconnect hydraulic brake tube from the master cylinder. Remove the three cap screws which hold the master cylinder to the mounting bracket. Pull the cylinder forward and disconnect the push rod from the brake pedal.

**Figure 177—Master Cylinder****b. Installation (fig. 177).**

(1) **INSTALL MASTER CYLINDER.** Insert the push rod through the brake cylinder mounting bracket and install the clevis pin and cotter pin in the brake pedal. Install the three cap screws which hold the cylinder to the bracket with a toothed lock washer under the head of each cap screw. Connect the brake tube to the master cylinder.

(2) **INSTALL LEFT ENGINE DUSTPAN.** Place the dustpan in position and insert battery box drain hose in hole provided for it on vehicle with 6-volt electrical systems. Install the toothed lock washers on the two dustpan cap screws and tighten the screws. Tighten the frame tee bracket bolt. Place torque arrester in position on the frame

FOOT BRAKES

side member and attach it with the bolts, toothed lock washers and nuts. Attach the chassis wiring cable with the wiring clip to the dustpan. Install the screw that attaches the dustpan to the frame front cross member. Insert the screw by reaching down between the radiator and engine. Place the wiring and fuel line clip and lock washer on the screw and tighten.

(3) BLEED THE BRAKE SYSTEM (par. 152).

3/4-TON 4 x 4 TRUCK (DODGE)

Section XXXIV

HAND BRAKE

	Paragraph
General description	156
Hand brake adjustment	157
Band and lining	158
Hand brake lever and linkage	159
Hand brake drum	160

156. GENERAL DESCRIPTION.

a. The hand brake consists of a drum mounted at the rear of the transmission with a contracting band. The hand brake operates independently of the foot brakes and applies equal braking force to the wheels through the differentials.

157. HAND BRAKE ADJUSTMENT.

a. Procedure.

(1) **ADJUST HAND BRAKE ROD.** Set hand brake lever in the fully released position. Remove the cotter pin and clevis pin from the rear end of the hand brake rod. Loosen the lock nut and adjust the rod so that with the hand lever in the fully released position, the cam levers bear squarely against the brake band. Install the clevis and cotter pin and tighten the lock nuts with $\frac{5}{8}$ inch open-end wrench (41-W-3579).

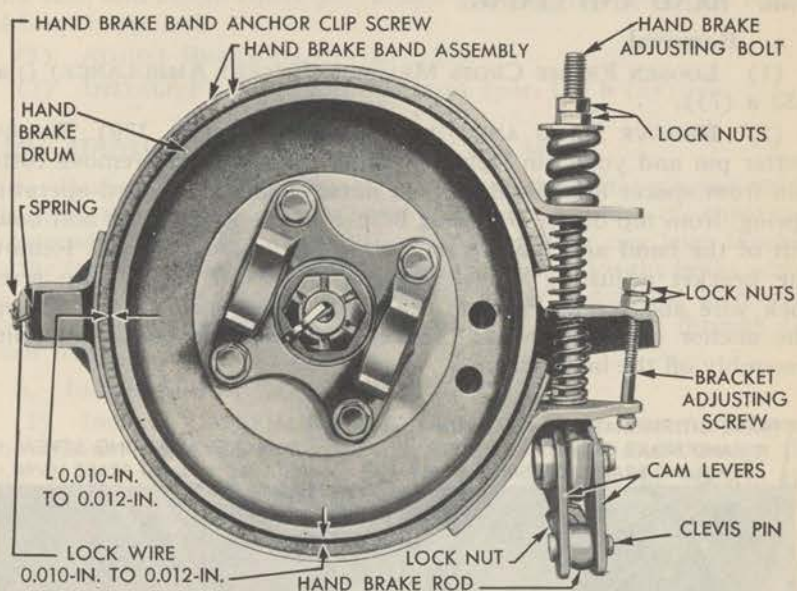
(2) **ADJUST ANCHOR CLIP SCREW** (fig. 178). Remove the anchor clip screw lock wire. Adjust the anchor clip screw so there is 0.010 inch to 0.012 inch clearance between the drum and the lining at the anchor. Install a lock wire through the anchor clip and screw.

(3) **ADJUST BRACKET ADJUSTING SCREW** (fig. 178). Back off the adjusting bolt lock nuts until free with $\frac{5}{8}$ -inch box wrench (41-W-635). Adjust the bracket adjusting screw so there is 0.010 inch to 0.012 inch clearance between the drum and the bottom of the band and lock the nuts together.

(4) **ADJUST ADJUSTING BOLT NUTS** (fig. 178). Turn adjusting bolt nuts down until the bracket adjusting screw is just relieved of tension with $\frac{5}{8}$ inch box wrench (41-W-635). If a new band and lining assembly does not form a true circle, it may be necessary to alter the adjustment slightly to establish clearance all the way around the drum. In that case readjust the band after the lining has worn to a true circle.

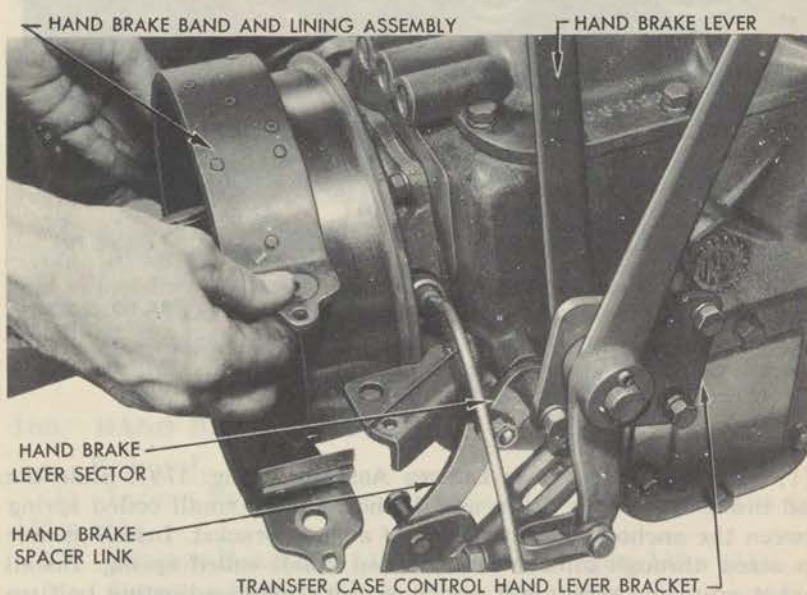
(5) **LOCK ADJUSTING BOLT NUTS** (fig. 178). Place a $\frac{5}{8}$ inch open-end wrench (41-W-3579) between the hand brake and transfer case levers and on the lower nut to hold it from turning. With a short $\frac{5}{8}$ inch box wrench (41-W-635) reach between the frame cross member and the floor plate and tighten the lock nut.

HAND BRAKE



RA PD 53031

Figure 178—Hand Brake Adjustments



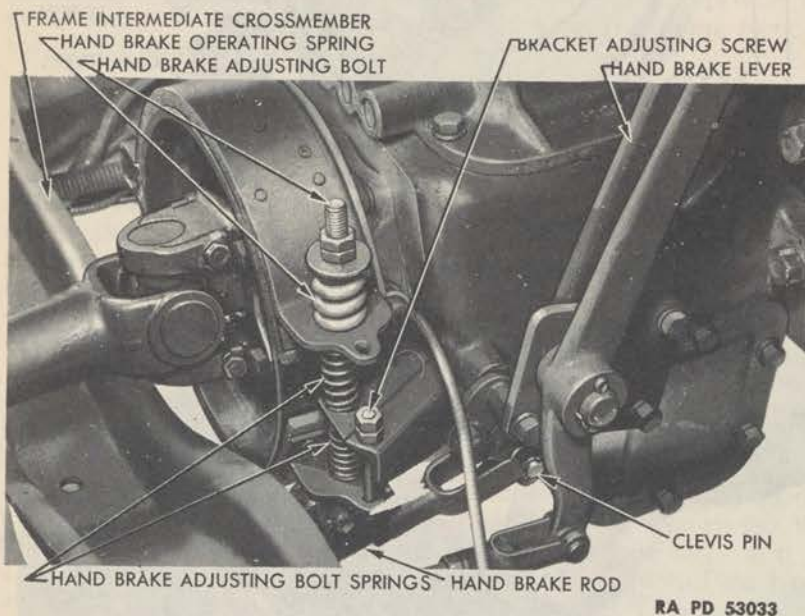
RA PD 53032

Figure 179—Removing Hand Brake Band

3/4-TON 4 x 4 TRUCK (DODGE)**158. BAND AND LINING.****a. Removal.**

(1) **LOOSEN FRAME CROSS MEMBER (EXCEPT AMBULANCE)** (par. 133 a (7)).

(2) **REMOVE BAND AND LINING ASSEMBLY** (fig. 179). Remove cotter pin and yoke pin from the hand brake rod and remove cotter pin from spacer link. Remove lock nuts, plain washer, and operating spring, from top of the adjusting bolt. Pull the adjustment bolt down out of the band and remove the two adjusting bolt springs. Remove the bracket adjusting screw. Remove the band anchor clip screw lock wire and screw. Remove the small coiled spring from between the anchor and the anchor bracket and slide the band and lining assembly off the brake drum.



RA PD 53033

Figure 180—Hand Brake Linkage**b. Installation.**

(1) **INSTALL BAND AND LINING ASSEMBLY** (fig. 179). Slide the hand brake band over drum and anchor. Install small coiled spring between the anchor and outer edge of anchor bracket. Install anchor clip screw through anchor bracket and small coiled spring. Install bracket adjusting screw, nut and lock nut. Install adjusting bolt up through the band and bracket, with coiled springs above and below the bracket. Install operating spring, plain washer, and adjusting bolt lock nuts on upper end of the adjusting bolt. Place spacer link over

HAND BRAKE

link stud and install cotter pin. Install yoke pin and cotter pin in end of hand brake rod.

(2) ADJUST BRAKE BAND (par. 157).

(3) INSTALL FRAME CROSS MEMBER (par. 133 b (3)).

159. HAND BRAKE LEVER AND LINKAGE.

a. **Removal of Lever** (fig. 180). Remove the cotter pin and clevis pin from the front end of the hand brake rod. Remove the three cap screws which hold the brake sector and the transfer case lever bracket to the transmission case. Remove the nut which holds the brake sector to the brake band spacer link. Lift the lower end of the lever over the front axle propeller shaft and pull the lever down through the floor pan.

b. **Installation of Lever** (fig. 180).

(1) INSTALL LEVER AND LEVER BRACKET. Raise lever up between the exhaust pipe and the front axle propeller shaft and through the slot in the floor plate. Place the lever sector over the stud in the spacer link and install toothed lock washer and nut.

(2) ASSEMBLE LEVER BRACKET TO TRANSMISSION CASE. Insert three cap screws which hold the brake lever sector and the transfer case lever bracket to the transmission through the transfer case lever bracket. Place the short spacer tubes over each of the two lower cap screws. Insert the two cap screws through the bracket and sector and start them into the transmission case. Place the longer spacer tube over the upper cap screw and tighten the three cap screws.

(3) CONNECT HAND BRAKE ROD. Install clevis pin through hand brake rod clevis and brake lever. Install cotter pin through clevis pin.

c. **Removal of Hand Brake Rod.** Remove cotter pins from clevis pins at each end of the hand brake rod and remove the rod.

d. **Installation and Adjustment of Hand Brake Rod.**

(1) INSTALL ROD. Install clevis pin through the hand brake rod yoke and the hand lever and install cotter pin.

(2) ADJUST PULL ROD. Loosen lock nut on the hand brake rod and adjust the rod so that when the hand lever is in the fully released position, the brake cam levers squarely contact the brake band. Install clevis pin through the brake cam levers and the eye at the rear end of the hand brake rod and install cotter pin through the clevis pin.

160. HAND BRAKE DRUM.

a. **Removal.**

(1) LOOSEN FRAME CROSS MEMBER (EXCEPT AMBULANCE) (par. 133 a (7)).

(2) REMOVE BAND AND LINING ASSEMBLY (par. 158 a (2)).

(3) DISCONNECT PROPELLER SHAFT (par. 139).

(4) REMOVE BRAKE DRUM. Remove cotter pin from nut which holds universal joint companion flange to transmission main shaft.

3/4-TON 4 x 4 TRUCK (DODGE)

Remove the nut. Drive the brake drum off transmission main shaft.

(5) **REMOVE UNIVERSAL JOINT COMPANION FLANGE.** Remove four bolts and nuts which hold flange and drum together. Tap drum from the flange.

b. Installation.

(1) **CONNECT UNIVERSAL JOINT COMPANION FLANGE.** Place companion flange through brake drum and install four bolts and nuts with a toothed lock washer under each nut.

(2) **INSTALL BRAKE DRUM.** Place brake drum over splines on transmission main shaft. Install attaching nut. Install cotter pin through nut and shaft.

(3) **CONNECT PROPELLER SHAFT** (par. 139).

(4) **INSTALL AND ADJUST BRAKE BAND** (pars. 158 b (1) and 157).

(5) **INSTALL FRAME CROSS MEMBER** (par. 133 b (3)).

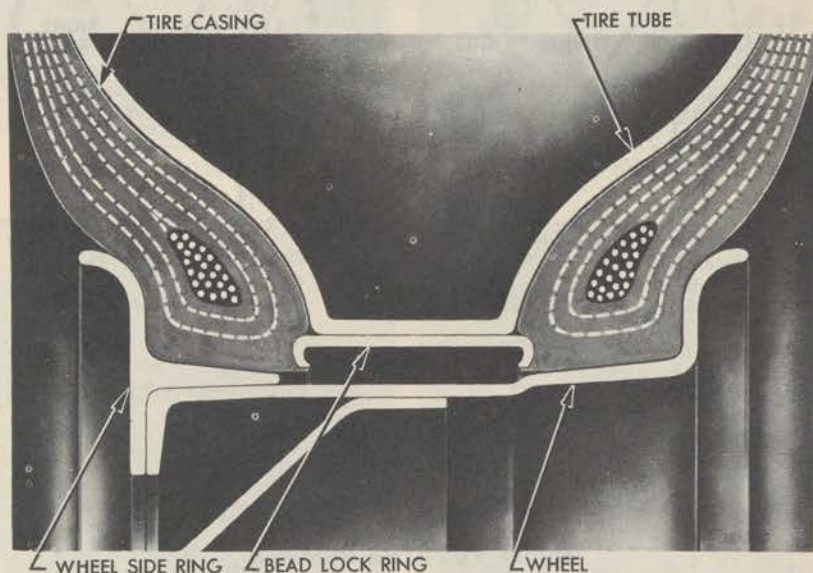
Section XXXV

WHEELS AND TIRES

	Paragraph
General description	161
Tire inflation and care	162
Wheel and tire assembly	163
Spare wheel and tire assembly	164
Tire casing and tube	165

161. GENERAL DESCRIPTION.

a. Wheel and tire assemblies are interchangeable, front and rear. The tires are retained on the wheels by a side ring which is attached to the wheel by studs and nuts. A bead lock ring (fig. 181) is assembled between the beads of the tire to prevent the tire from coming off the wheel when deflated.



RA PD 53036

Figure 181—Cross-Section of Tire Mounted on Wheel

162. TIRE INFLATION AND CARE.

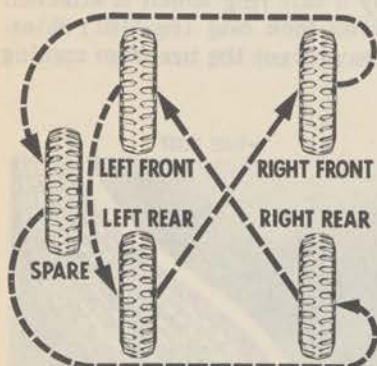
a. **Tire Inflation.** The life of the tire depends largely upon load and inflation. Inflate all tires to 40 pounds pressure. This is particularly important so as to maintain the same rolling radius of all four tires when in four-wheel drive.

(1) **KEEP TIRES INFLATED.** An under-inflated tire causes the cords to pull loose from the position in which they were originally vulcan-

3/4-TON 4 x 4 TRUCK (DODGE)

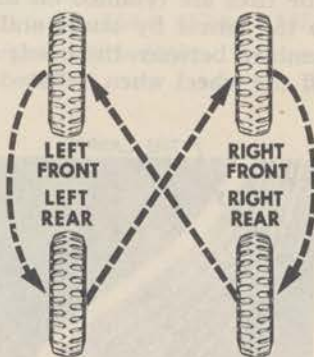
ized, as well as irregular tread wear. When a tire is over-inflated, only the center of the tread comes in contact with the road. Wear is then more rapid because it is concentrated on a small section of the tread. The wheels will also bounce and spin causing the rubber to scuff off. Tire cords are easily broken when an over-inflated tire runs over a sharp cornered chuckhole or other obstacle.

(2) **INSTALL VALVE CAPS.** After tire pressures are checked, see that all valve caps are securely in place. The tire valve is actually a check valve and although its sealing efficiency is high, the valve cap is the sealing unit. The valve cap contains an inside rubber washer and plate to insure positive sealing. Be sure to keep valve caps in place at all times.



CHANGE THE SPARE TO THE
RIGHT REAR.
CHANGE THE RIGHT REAR TO
LEFT FRONT.
CHANGE THE LEFT FRONT TO
LEFT REAR.
CHANGE THE LEFT REAR TO
RIGHT FRONT.
CHANGE THE RIGHT FRONT
TO THE SPARE.

TIRE ROTATION WITH SPARE



CHANGE THE RIGHT FRONT TO
RIGHT REAR.
CHANGE THE RIGHT REAR TO
LEFT FRONT.
CHANGE THE LEFT FRONT TO
LEFT REAR.
CHANGE THE LEFT REAR TO
RIGHT FRONT.

TIRE ROTATION WITH NO SPARE
RA PD 58367

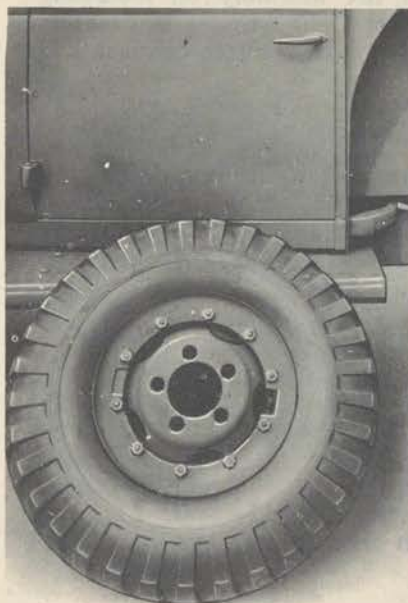
Figure 182—Tire Rotation

b. **Care of Tires.** Change the position of the tire and wheel assemblies as shown in figure 182. Changing the direction of rotation increases tire life. Repair any damage to tires as soon as possible after damage is discovered. Prompt repairs of small damage will save tires that might otherwise be ruined in a short distance. Do not allow oil or grease to contact tires unnecessarily.

163. WHEEL AND TIRE ASSEMBLY.

a. **Removal.** Jack up wheel and remove the five large nuts which hold the wheel to the hub. Turn the nuts on the left wheel clockwise and the nuts on the right wheel counterclockwise to remove.

WHEELS AND TIRES



FIRST POSITION



SECOND POSITION



THIRD POSITION



FINAL POSITION

RA PD 58369

Figure 183—Installing Spare Wheel on Carrier

3/4-TON 4 x 4 TRUCK (DODGE)

b. **Installation.** Install wheel and tire assembly on mounting studs. Turn nuts clockwise to install on right wheel and counter-clockwise to install on left wheel. Tighten nuts, then remove jack and tighten each nut securely.

164. SPARE WHEEL AND TIRE ASSEMBLY.

a. **Removal.** Insert key in lock, turn key clockwise and pull lock off the mounting stud. Remove the large retaining nut, plain washer, and plate which hold the wheel to the carrier bracket. **CAUTION:** *Lower wheel and tire assembly carefully to avoid possible personal injury.*

b. **Installation** (fig. 183). Roll the wheel and tire assembly against the running board with the outside of the wheel out. To make mounting the wheel to the carrier bracket easier and avoid possible personal injury, lift the bottom of the tire out, and up until the tire rests on the running board with the inside of the wheel out. Then lift the wheel and tire assembly to the carrier bracket. On the Ambulance, hook the center opening in the wheel disk over the clip on the carrier bracket. Place the retaining plate and plain washer over the carrier bracket stud. Install the large stud nut and push the lock into place.

165. TIRE CASING AND TUBE.

a. **Removal** (fig. 184).

(1) **REMOVE TIRE FROM WHEEL.** Deflate inner tube if not already deflated. Remove the 10 nuts which hold the side ring to the wheel. Pry the side ring away from the tire and off the studs. Drive the tire away from the inner flange and off the wheel.

(2) **REMOVE TUBE FROM CASING.** Pry open the bead lock ring hinge, thus reducing the diameter of the ring. Turn the bead lock ring at right angles to the tire and slide it off the valve stem. Remove the tube from the casing.

b. **Inspection.** Inspect the inner and outer surfaces of the casing for cuts, breaks, or any foreign material that would damage the tube. If possible, repair any damage to casing before installing the tire. Inspect the tube and valve for leaks by inflating the tube and holding a portion of the tube at a time under water. A leak will be indicated by air bubbles rising to the surface of the water.

c. **Installation.**

(1) **COAT TIRE BEADS WITH SOAPY WATER.** Installation of the bead lock ring in the casing and assembly of tire on the wheel is made easier by coating the base of the tire beads with soapy water. Do not use oil or grease.

(2) **INSTALL TUBE AND BEAD LOCK RING IN CASING** (fig. 185).

(a) Install the inner tube in the tire with valve stem opposite balance dot on tire to maintain balance of the tire and wheel assembly. Inflate the tube sufficiently to just round it out to prevent the tube falling out of the tire or being pinched during the mounting oper-

WHEELS AND TIRES



WHEEL SIDE RING BOLT NUTS



PRYING WHEEL SIDE RING



DRIVING WHEEL FROM TIRE



SLIDING TIRE BEAD LOCK RING OFF

VALVE STEM RA PD 301080

Figure 184—Removing Tire from Wheel

$\frac{3}{4}$ -TON 4 x 4 TRUCK (DODGE)



COLLAPSING TIRE BEAD
LOCK RING



SLIDING TIRE BEAD LOCK
RING ON VALVE STEM



EXPANDING TIRE BEAD
LOCK RING IN TIRE



TIRE BEAD LOCK RING
INSTALLED

RA PD 65948

Figure 185—Installing Tire Bead Lock Ring

WHEELS AND TIRES

ation. This will also facilitate installation of the bead lock ring. With a quick pressure on the bead lock ring about eight inches from the hinge, collapse it to the limit which the hinge will allow.

(b) Hold the tire with the tube installed, upright with valve stem at point nearest the ground, and insert the valve stem through the driving lug of the bead lock ring with ring at right angle to the tire. Pull the stem up through the bead lock ring so that the valve stem rests on top of the lug. Then apply pressure to the bead lock ring until the point opposite the valve opening is centered between the beads of the tire.

(c) Apply air pressure to the tube to spread the beads of tire apart for a distance approximately equal to the width of the bead lock ring. Then swing the ring, using the valve opening as an axis, until it slips into place between the beads of the tire. With the bead lock ring in this position, release enough air from the tube to permit the ends of the bead lock ring to be returned to their normal position. To do this, hold the extended end of the lock ring in place with one foot and give the depressed end a quick upward pull with both hands.

(d) Inspect the complete assembly to make sure that the bead lock ring is properly centered with its edges below the base of the tire bead.

(3) **INSTALL TIRE ON WHEEL.** Place the wheel on blocks high enough to prevent the tire sidewalls touching the ground when the tire is in place on the wheel. Drop the tire down over the wheel, carefully centering the valve stem in the slot in the wheel. Be sure neither the tire nor the valve stem is cocked as this would cause difficulty in mounting the tire. Install the tire side ring so that the valve stem is centered in one of the valve slots in the side ring. Tap the side ring down and start the side ring nuts on the studs. Proper installation of the tire side ring nuts will avoid distortion of the side ring. Begin by drawing down at least three side ring nuts on each side of ring. Do not draw down the nuts at the cut-outs first, as this would cause distortion of the side ring at these points. Draw down all nuts evenly and alternately until they are all tight and inflate the tire to 40 pounds pressure.

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Section XXXVI

STEERING

	Paragraph
General description	166
Steering gear	167
Steering gear (Pitman) arm	168
Drag link	169

166. GENERAL DESCRIPTION.

a. The steering gear is the worm and sector type. Adjustments for proper mesh and elimination of end play can be made without removing the assembly from the vehicle.

167. STEERING GEAR.

a. Adjustment of Steering Gear in Vehicle.

(1) PRELIMINARY CHECKS.

(a) *Check for Backlash.* Turn the steering wheel all the way to right or left, then $\frac{1}{4}$ turn in the opposite direction. With the wheel in that position there will be backlash in the steering gear. If the steering wheel can be moved back and forth through the backlash without noticeable resistance, the steering post is in alinement.

(b) *Check for Bend in Steering Post.* If the steering wheel does not move freely through the backlash, there is excessive friction in the steering post, caused by misalignment of the post, excessive end thrust on the steering gear, worn bearings or a tight steering column jacket bushing. Remove the bracket which holds the steering post to the instrument panel. If the post shifts when the bracket is removed and the excessive friction is relieved or if the post bears up against the instrument panel, realine the post (step (2) below).

(c) *Check Worm Adjustment.* If the excessive friction is not relieved by removing the clamp from the instrument panel and the post does not bear against the panel, loosen the four cap screws which hold the steering gear housing cap to the steering gear housing (fig. 186). If the friction is then relieved, adjust the steering gear worm bearings (step (3) below). If friction still exists, with the post bracket clamp removed, post not bearing against the instrument panel and the steering gear housing cap loose, the steering column jacket bushing is binding. Notify higher authority. Install post bracket clamp and tighten the steering gear housing cap screws.

(2) STEERING POST ALINEMENT.

(a) *Adjust Bracket.* If the steering post moves down or bears against the instrument panel when the bracket is removed, loosen the bolts which hold the steering gear housing to the frame. Move the steering post into position and install bracket. Tighten the steering housing to the frame. If the steering post moves sidewise when

STEERING

the bracket is removed, shift the clamp on the instrument panel to meet the post by elongating the bolt holes in the clamp and the instrument panel.

(b) *Install Bracket.* Install the steering post bracket. Place a toothed lock washer on each of the two attaching bolts. Insert the right bolt through the clamp and instrument panel, install another toothed lock washer over the bolt, and install the nut. Install the left bolt through the ground strap, place another toothed lock washer over the bolt, then insert the bolt through the clamp and instrument panel. Install a third toothed lock washer over the bolt and install the nut.



**Figure 186—Worm and Shaft
End Play Adjustments**

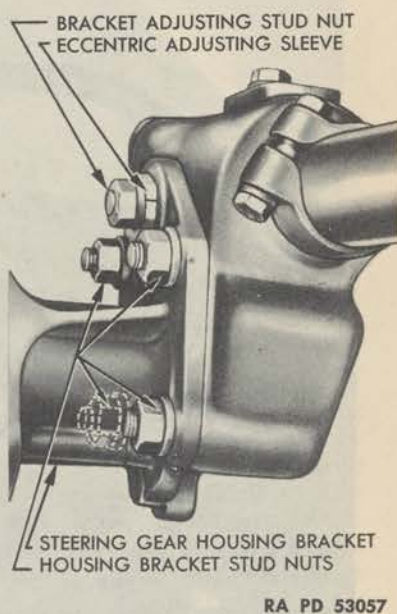


**Figure 187—Worm and Sector
Mesh Adjustment**

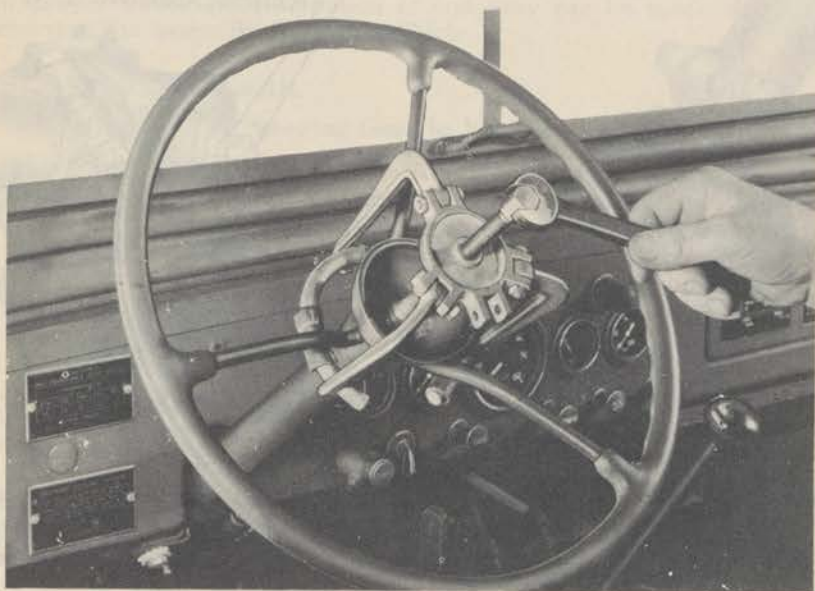
(3) WORM BEARING ADJUSTMENT (fig. 186).

(a) *Check Adjustment.* Turn the steering wheel all the way to right or left, then $\frac{1}{4}$ turn in the opposite direction. With the wheel in that position, side thrust on the worm bearings will be relieved and there will be some backlash in the steering gear. Separate the connector in the horn wire between the steering gear and the horn. Remove the four cap screws which hold the cap to the lower end of the steering gear housing and remove the cap. Shims of three different thicknesses (0.010 in., 0.005 in., and 0.003 in.) are used at this point.

3/4-TON 4 x 4 TRUCK (DODGE)

(b) *Remove or Install Shims as Required.* When the cap is tightened into place there should be slight resistance to the backlash in the wheel and no end play in the worm. Use a knife to separate top shims, passing the blade all the way around between the shims, taking care not to mutilate the remaining shims. Check end play by lifting up and pushing down on the steering wheel while holding a finger against the joint between the bottom of the steering wheel hub and the steering column jacket. Any end play in the worm can be felt at that point. When adjustment is completed, connect the horn wire and make sure the insulator is over the connector.

(4) **STEERING GEAR SHAFT ADJUSTMENT** (fig. 186). Loosen lock nut on steering gear shaft adjusting screw. Loosen the screw so that



RA PD 312568

Figure 188—Removing Steering Wheel

end play can be felt in the shaft by pushing in and pulling out on the steering gear arm. Turn the adjusting screw in just enough to eliminate the end play and tighten the lock nut.

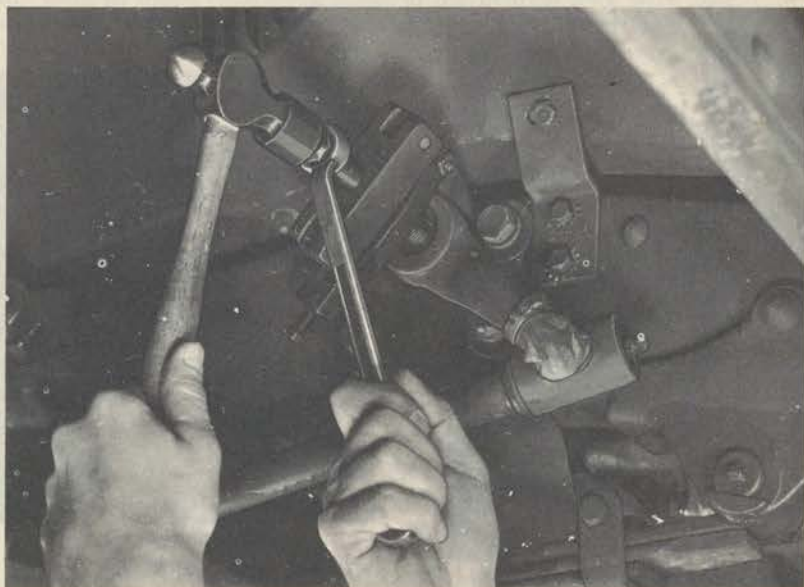
(5) **WORM AND SECTOR ADJUSTMENT** (fig. 189).

(a) *Locate Steering Gear Mid-Position.* Remove rear end of drag link from steering gear arm (par. 169). With drag link disconnected, turn the steering wheel to the extreme right or left. Then turn it all the way in the opposite direction, counting the number of turns required to make the turn from one extreme to the other. Then turn the steering wheel back $\frac{1}{2}$ that number of turns. At this position, the spoke with the trade mark (composition type wheels)

STEERING

should point directly down. On later model vehicles having a steel spoke wheel, the spoke adjacent to the two square openings in the lower edge of the wheel hub should point straight down. If the spoke does not point straight down, rotate the steering wheel the nearest way to bring the spoke straight down. The steering gear will then be in mid-position.

(b) *Adjust Worm and Sector.* Loosen the housing bracket to frame bolts. Loosen the four housing bracket stud nuts $\frac{1}{4}$ turn and the bracket adjusting stud nut $\frac{1}{2}$ turn. Turn the eccentric adjusting sleeve clockwise very slowly, checking at each movement the amount



RA PD 53065

Figure 189—Removing Steering Gear Arm

of lost motion still existing at the steering gear arm. Adjust to a point where a slight resistance is felt in mid-position as the wheel is moved back and forth. With this adjustment correctly made, tighten the housing bracket stud nuts and the bracket adjusting stud nut. Turn the steering wheel throughout full travel and test for free operation. Backlash will be noticeable when the wheel is turned from the mid-position. Tighten the housing bracket to frame bolts. Install drag link to the steering gear arm (par. 169).

b. *Removal of Steering Wheel* (fig. 188). Remove horn button and cable assembly (par. 120 d). Remove nut which holds the steering wheel on the tube. Pull steering wheel off the tube.

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c. **Installation of Steering Wheel.** Install the steering wheel key in the steering gear tube and install the steering wheel on the tube. Install the horn button lower retainer plate, steering wheel nut, and tighten the nut. Place the horn button retainer plate spring on the lower retainer plate and install horn button and cable assembly (par. 120 e).

168. STEERING GEAR (PITMAN) ARM.

a. **Removal** (fig. 189). Disconnect drag link at steering gear arm (par. 169). Remove the steering gear arm nut. Install the steering gear arm puller and pull the arm from the steering gear shaft.



Figure 190—Adjusting Drag Link End

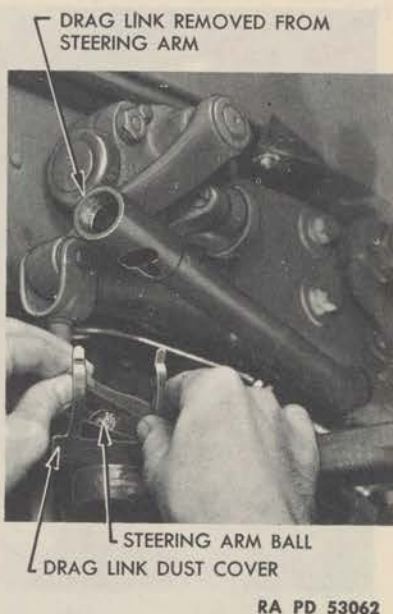


Figure 191—Removing Drag Link from Steering Arm

b. **Installation.** Turn the front wheels by hand so they are set in the straight ahead position. Locate the mid-position of the steering gear (par. 167 a (5) (a)). Connect drag link to steering gear arm (par. 169). Install the steering gear arm on the steering gear shaft and drive the arm on the shaft. Install the steering gear arm lock washer and nut and tighten securely.

169. DRAG LINK.

a. **Adjustment** (fig. 190). Remove lubricating fitting. Remove lock wire. Screw end plug in tight, then back it off to the nearest lock wire hole. Install lock wire and lubricating fitting.

STEERING

b. Removal and Disassembly (fig. 191). Remove lubricating fitting. Remove lock wire. Unscrew and remove the end plug. Remove the metal dust cover. Turn the steering wheel back and forth to loosen the ball socket and allow the drag link to be lifted off the ball of the steering arm.

c. Inspection. Inspect the ball on the steering arm and the steering gear arm. If either ball is damaged or worn excessively out of round, replace the arm.

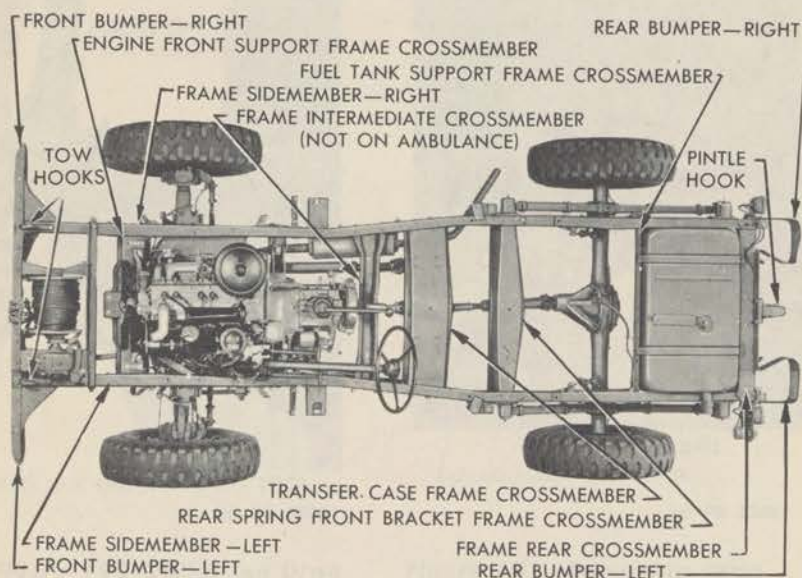
d. Assembly and Installation. Place drag link end over ball on the steering arm and install the metal dust cover. Install the ball socket, spring, and end bumper in order. Install end plug and screw the plug in tight, then back it off to the nearest lock wire hole. Install wire lock and lubricating fitting. Lubricate through lubricating fitting.

3/4-TON 4 x 4 TRUCK (DODGE)**Section XXXVII****FRAME**

	Paragraph
General description	170
Bumpers	171

170. GENERAL DESCRIPTION.

a. The frame (fig. 192) is constructed of pressed steel channel section side rails reinforced by cross members. A pintle hook is mounted on the rear cross member of the frame and a tow hook is attached to each of the frame front horns.



RA PD 53068

Figure 192—Frame**171. BUMPERS.**

a. **Removal of Front Bumper (Vehicles without Winch).** Remove the two tow hook to frame bolts and nuts. Loosen the two tow hook to frame rear bolts and nuts and swing the tow hook to one side. Remove the two upper bumper to frame bolts and nuts and the four upper bumper to bumper reinforcement bracket bolts and nuts. Remove the four lower bumper to bumper support bracket bolts and nuts.

FRAME

b. Installation of Front Bumper (Vehicles without Winch). Install the two upper bumper to frame bolts and nuts with lock washers. Install the four upper bumper to reinforcement bracket bolts and nuts with lock washers. Install the two tow hook to frame front bolts and nuts with lock washers. Tighten the two tow hook to frame rear bolts and nuts.

c. Removal of Front Bumper (Vehicles with Winch). Remove the two upper front bumper to frame bolts and nuts. Remove the two upper winch cable guide to bumper bolts. Remove the four upper bumper to reinforcement bracket bolts and nuts and the eight lower support bracket to bumper bolts and nuts. Pull right and left bumpers from frame.

d. Installation of Front Bumper (Vehicles with Winch). Insert upper flange of right and left bumpers between winch cable guide and frame. Install the two bolts and nuts with lock washers through the winch cable guide, the bumper and frame. Install the two winch cable guide to bumper bolts. Install the four upper bumper to reinforcement bracket bolts and nuts with lock washers and the eight lower support bracket bolts and nuts with lock washers.

e. Removal of Rear Bumper (Except Carryall). Remove the four bolts and nuts which attach the tail and signal lamp brackets to the frame. Remove the two remaining bolts and nuts which attach the bumper to the rear of the frame side member. Remove the four bumper to cross member bolts and nuts. Disconnect the ground strap (if so equipped) at the bumper.

f. Installation of Rear Bumper (Except Carryall).

(1) **INSTALL BUMPER.** Install the plain washers on the two upper bolts or eyebolts and the two lower bolts and attach the bumper to the frame rear cross member. Install the lock washers and nuts. Install the two bolts and nuts with lock washers, attaching the bumper to the frame side member. Attach the tail and signal lamp bracket with the four bolts and nuts through the bracket, the bumper and frame.

(2) **INSTALL GROUND STRAP (IF SO EQUIPPED).** Install a toothed lock washer on the bolt that attaches the ground strap to the bumper and insert the bolt through the bumper bar. Install another toothed lock washer over the end of the bolt and place the ground strap over the bolt. Then install the remaining toothed lock washer over the bolt and install the nut.

g. Removal of Rear Bumper (Carryall). Remove the four cap screws that attach the tail and signal lamp brackets to the frame. Remove the two bolts and nuts attaching the bumper to the side member and remove the four bumper to rear cross member bolts and nuts. Disconnect the ground strap at the bumper.

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h. Installation of Rear Bumper (Carryall). Install the plain washers on the two upper and two lower bolts and attach the bumper to the frame rear cross member. Install the lock washers and nuts. Install the two bolts and nuts with lock washers to attach the bumper to the frame side member. Attach the tail and signal lamp bracket with the four cap screws through the bracket, the bumper and into the frame. Attach ground strap (subpar. f (2) above).

Section XXXVIII

SPRINGS AND SHOCK ABSORBERS

	Paragraph
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Spring assemblies	175
Shock absorbers	176

172. GENERAL DESCRIPTION.

a. **Springs.** The chassis springs (fig. 193) are all of the semi-elliptical type. The front end of the front springs and the rear end of the rear springs pivot in shackles to allow for variant lengths of the springs as they are flexed by load or rebound. The rear end of the front springs and the front end of the rear springs are mounted on pivot bolts in rigid brackets on the frame. The driving and braking forces are transmitted from the axles to the frame through this end of the springs.

b. **Types of Springs Used.** Trucks (other than Ambulance) bearing serial number 81623727 or a lower serial number, excepting serial numbers 81607816 through 81619000 were originally equipped with eight-leaf front springs. Trucks (other than Ambulance) bearing serial number 81623728 or a higher serial number and trucks with serial numbers 81607816 through 81689000 were originally equipped with nine-leaf front springs. The spring clips used with the eight-leaf springs are $8\frac{5}{8}$ inches long. The clips used with most of the nine-leaf springs are $8\frac{13}{16}$ inches long. When a front spring is replaced, use springs with the same number of leaves on both sides of the truck. If $8\frac{13}{16}$ inch clips are not available, when installing a nine-leaf spring, use thin toothed lock washers instead of the heavy-duty lock washers used with the $8\frac{5}{8}$ inch clips.

c. **Shock Absorbers.** The hydraulic double-acting shock absorbers control the movement of the frame and body of the vehicle in relation to the wheels and axles. By restricting rapid action of the chassis springs, shock absorbers improve the riding qualities and steering stability of the vehicle.

d. Data.

Springs, front:

Length	39 in.
Width	$1\frac{3}{4}$ in.

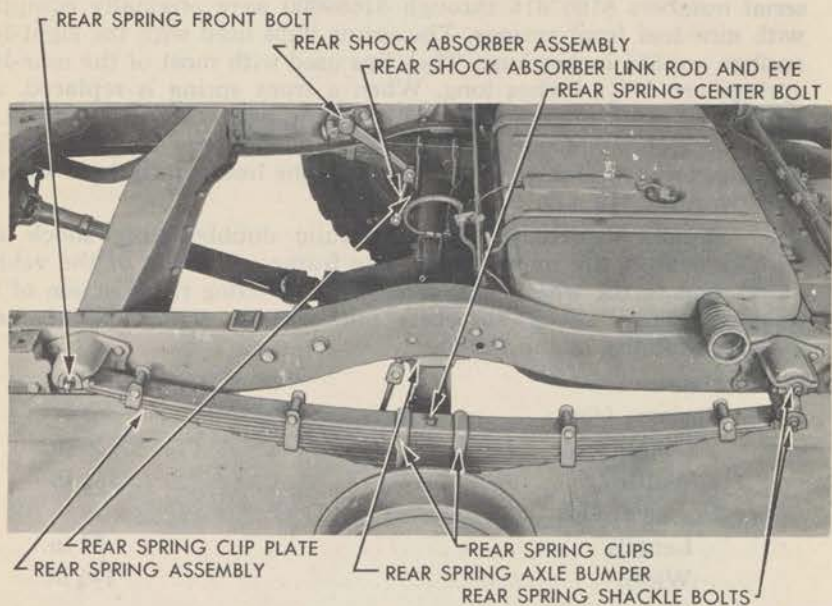
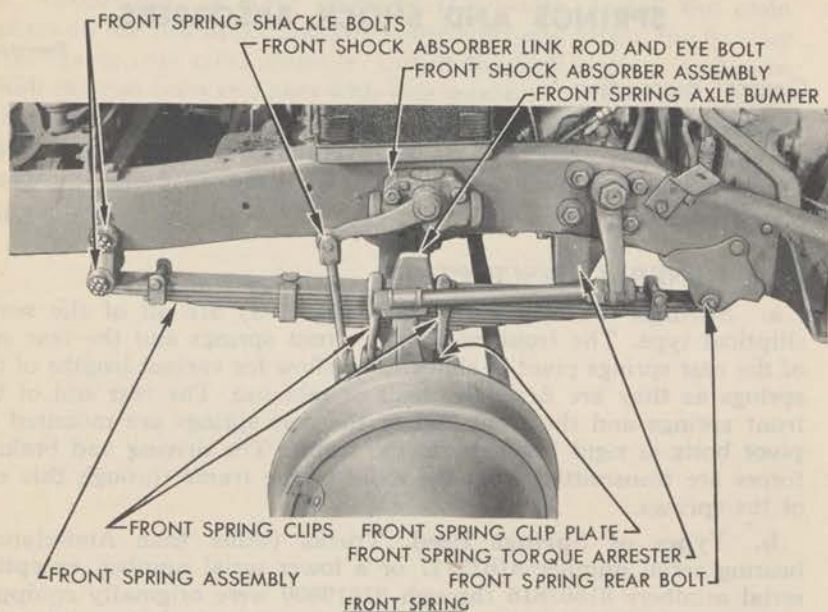
Springs, rear:

Length	52 in.
Width	$1\frac{3}{4}$ in.

173. SHACKLE BOLTS.

a. **Removal of Front Spring Shackle Bolts** (fig. 194). Place a jack under the bumper and raise the front of the frame enough to

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RA PD 65950

Figure 193—Front and Rear Spring Assemblies

SPRINGS AND SHOCK ABSORBERS

take the load off the shackle bolts. Remove the cotter pins from the slotted nuts at the outer end of the shackle bolts. Remove the slotted nuts and drift out the bolts.

b. Installation of Front Spring Shackle Bolts (fig. 194).

(1) **INSTALL SHACKLE.** Place the offset shackle to the inside of the spring and frame with the long offset up. Install the bolts through the shackle, spring and frame, raising or lowering the jack to align the holes. Place the straight shackle over the ends of the bolts and install the nuts.

(2) **ADJUST SHACKLE BOLTS.** Tighten the shackle bolt nuts up tight, using a 12-inch wrench, then back each nut off one slot and

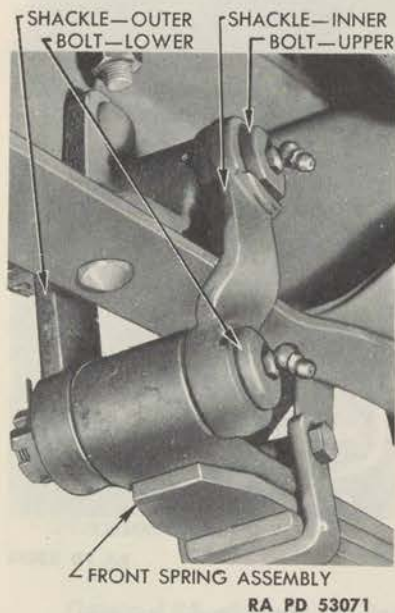


Figure 194—Front Spring Shackle

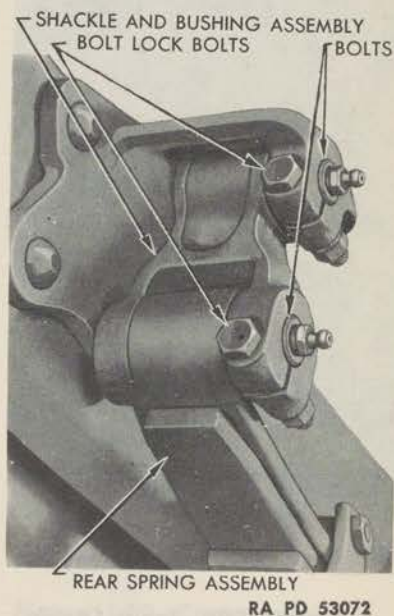


Figure 195—Rear Spring Shackle

install the cotter pins. Do not adjust the bolts tighter than specified. Too tight an adjustment will cause hard riding and spring breakage.

c. **Removal of Rear Spring Shackle Bolt** (figs. 195 and 199). Remove lubrication fitting from end of bolt. Remove lock bolt from bracket. Insert puller screw through puller barrel from closed end and screw large nut back to head of puller screw. Screw the threaded end of the puller screw tightly into the hole in the spring bolt from which the lubrication fitting was removed. Center the open end of the puller barrel around the end of the spring bolt. Hold the puller screw from turning and screw the large nut against the closed end of the puller barrel to pull the bolt.

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d. **Installation of Rear Spring Shackle Bolt** (fig. 195). Install the spring bolt so that the lock bolt can be installed through the groove in the bolt. Install the lock bolt with standard lock washer and nut. Tighten nut securely. Remove jack from under frame.

174. SPRING BOLTS.

a. **Removal of Front Spring Bolt** (fig. 196). Place jack under front bumper or frame and raise front of frame enough to take load off spring bolt. Remove cotter pin and nut from outer end of spring bolt. Remove the bolt from the bracket and spring eye.

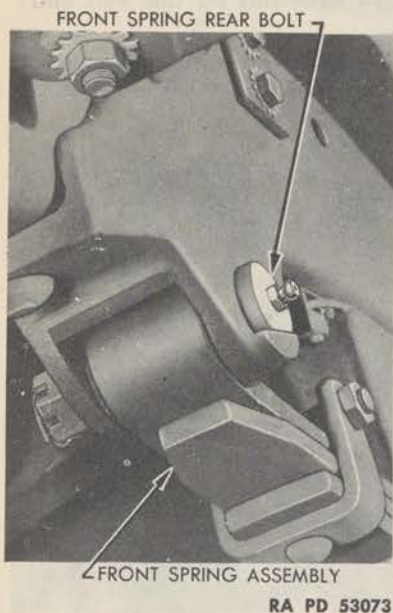


Figure 196—Front Spring Rear Bolt

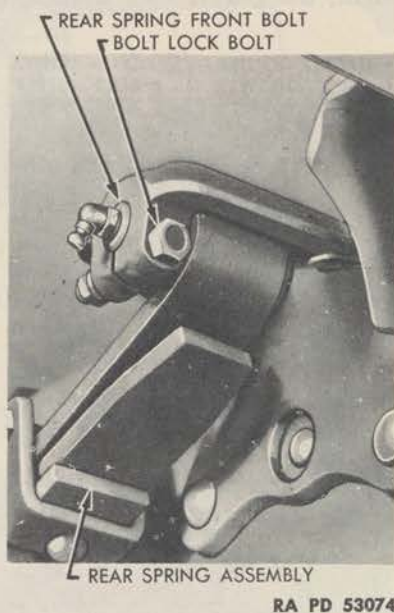


Figure 197—Rear Spring Front Bolt

b. **Installation of Front Spring Bolt** (fig. 196). Insert the spring bolt through the bracket and spring eye from the inside of the bracket. Install the slotted nut on the spring bolt. Tighten the nut up tight, then back it off one slot and install the cotter pin.

c. **Removal of Rear Spring Bolt** (figs. 197 and 198). Remove lubrication fitting from end of bolt. Remove lock bolt from bracket. Insert puller screw through puller barrel from closed end and screw large nut back to head of puller screw. On Command and left side of Carryall, use washers 1/2 inch thick between puller barrel and spring bolt bracket to extend puller out past edge of body. Remove battery to get to bolt on right side of Carryall. Screw the threaded end of the puller screw tightly into the hole in the spring bolt from which the

SPRINGS AND SHOCK ABSORBERS

lubrication fitting was removed. Center the open end of the puller barrel around the end of the spring bolt. Hold the puller screw from turning and screw the large nut against the closed end of the puller barrel to pull the bolt.

d. **Installation of Rear Spring Bolt** (fig. 197). Install the spring bolt so that the lock bolt can be installed through the groove in the bolt. Install the lock bolt with standard lock washer and nut. Tighten the nut securely. Remove jack from under the frame. Install battery (Carryall only).



SPRING BOLT PULLER

RA PD 53075

Figure 198—Removing Rear Spring Front Bolt with Puller
41-P-2951-70



SPRING BOLT PULLER
LOCK BOLT REMOVED

RA PD 53076

Figure 199—Removing Rear Spring Shackle Bolt with Puller
41-P-2951-70

175. SPRING ASSEMBLIES.

a. **Removal of Front Spring Assembly.** Remove four nuts from spring clips. Drive the clips up and off the spring. Remove spring lower shackle bolt (par. 173 a). Remove spring rear bolt (par. 174 a) and lift out spring assembly.

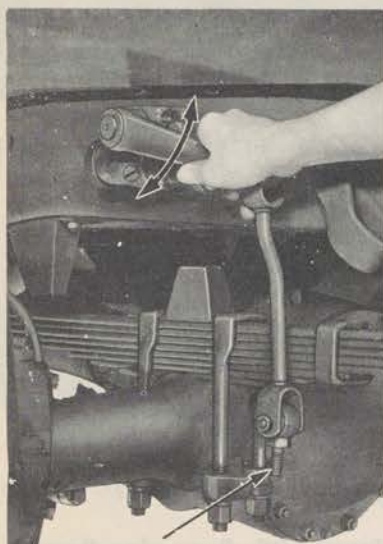
b. **Installation of Front Spring Assembly.** Install spring rear bolt (par. 174 b). Install spring lower shackle bolt (par. 173 b). Locate the axle so that when the jack is lowered the spring center bolt will enter the recess in the spring pad of the axle. Place rubber bumper on top of the spring at the center and install the spring clips over the rubber bumper, spring and through the bracket on the axle.

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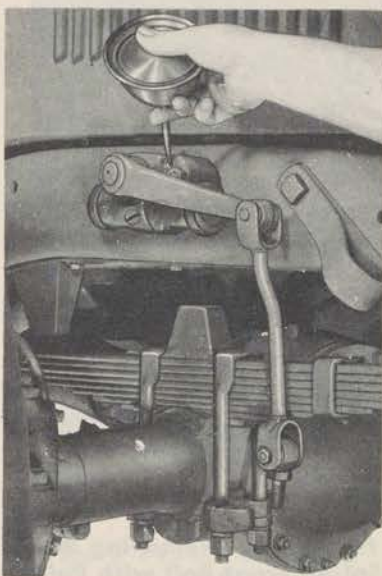
Remove the jack, then install standard lock washers and nuts on the clips and securely tighten the nuts.

c. Removal of Rear Spring Assembly. Remove the four nuts from the spring clips. Drive the clips up and off the spring. Remove rear spring front bolt (par. 174 c). Remove shackle bolt (par. 173 c) and lift out spring assembly.

d. Installation of Rear Spring Assembly. Install rear spring front bolt (par. 174 d). Install shackle bolt (par. 173 d). Locate the axle so that when the jack is lowered the spring center bolt will enter the recess in the spring pad of the axle. Place the spring clips over the spring and through the bracket on the axle. Remove the jack, then install standard lock washers and nuts on the clips and securely tighten the nuts.



LINK DISCONNECTED FROM PLATE
PUMPING



FILLING RA PD 65951

Figure 200—Filling Shock Absorber with Fluid

176. SHOCK ABSORBERS.

a. Filling Shock Absorber (fig. 200). Use only shock absorber fluid when filling shock absorbers. Do not use other fluids such as ordinary engine oil or brake fluid. Disconnect the link at the lower end (subpar. d below). Wipe off all dirt around the filler plug and remove the plug. Fill the shock absorber to capacity as shown in figure 200. Move the shock absorber arm to the extreme positions several times to pump any air out of the cylinders. Add fluid and repeat the pumping until all air is expelled and the reservoir filled to overflowing. Allow excess fluid to drain out to the level of the

SPRINGS AND SHOCK ABSORBERS

filler plug hole and install the filler plug, using a new gasket. Connect the link assembly (subpar. e below).

b. Removal of Shock Absorber Assembly. Disconnect link from shock absorber arm (subpar. d below). Remove two nuts and bolts which hold shock absorber to the frame and lift off shock absorber.

c. Installation of Shock Absorber. Place the shock absorber in the channel of the frame side rail and insert the bolts through the frame and shock absorber body. Place standard lock washers over the bolts and install the nuts. Connect link to shock absorber arm (subpar. e below).

d. Removal of Shock Absorber Link Assembly. Remove nut from the pin which connects the link to the arm. Remove the pin. Remove nut from pin which connects link to eyebolt at axle. Remove the pin and lift off link assembly.

e. Installation of Shock Absorber Link Assembly. Place the link yoke, with the larger bolt hole, over the eyebolt and bushing at the axle. Install the bolt and nut. Move the yoke at upper end of the link over the bushing in end of shock absorber arm and install bolt and nut.

3/4-TON 4 x 4 TRUCK (DODGE)**Section XXXIX****BODY AND SHEET METAL**

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Windshield wiper assembly (closed bodies)	184
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Fire extinguisher	187

177. GENERAL DESCRIPTION.

a. The vehicle bodies covered by this section of the manual include all of the types described and illustrated in paragraph 3. Sheet metal units such as rear fenders and running boards vary in design to conform with the different body types. The Carryall and Command are equipped with a 12-volt battery mounted at the rear end of the right running board. Other models are equipped with a 6-volt battery located under the hood. Splash shields between the front fenders and the chassis frame can be removed to make the lower part of the engine more accessible.

178. HOOD.

a. **Removal.** Remove the two screws from the hood hinge front support. Remove the support and tapping plate from the hood hinge. Disconnect the hood to dash ground strap at the dash. Slide the hood forward out of the rear support and remove it from the vehicle.

b. **Installation.** Slide the center hinge rod into the rear support. Slide the front hinge support over the end of the hinge rod, and, with toothed lock washers between the shell and tapping plate, tighten the screws. Place a toothed lock washer on each side of the ground strap. Install the bolt and nut and tighten securely.

179. FENDERS AND SPLASH SHIELDS.**a. Removal of Front Fenders.****(1) REMOVE LIGHTS AND CABLE ASSEMBLIES.**

(a) *Right or Left Front Fender.* Slide the rubber insulator off the blackout parking light cable connector located near the terminal block on the front frame cross member. Disconnect the two head-

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light cable wires at the terminal block. Remove the two screws which attach the headlight cable grommet to the fender and release the cables from the clip holding them to the radiator shell, then pull cables away from radiator shell and through opening between shell and fender splash shield. Screw out blackout parking light cable loom end from mounting stud and remove mounting stud nut. Remove blackout parking light and cable assembly. Remove the nut from the headlight mounting stud and remove the headlight and cable assembly.

(b) *Left Front Fender Only.* Disconnect blackout driving light cable wire at the terminal block. Remove the two screws which attach the blackout driving light cable grommet to the fender. Remove the nut from the blackout driving light and remove blackout driving light and cable assembly.

(2) **DISCONNECT FENDER.** Remove the five upper cap screws that attach the fender to the fender splash shield. Remove the three cap screws that attach the fenders to the front support and remove the three cap screws that attach the fender to the rear support.

b. Installation of Front Fender.**(1) INSTALL FENDER.**

(a) *Right or Left Front Fender.* Place fender in position on front support and install the three rear support to fender cap screws with toothed lock washers. Install the three front support to fender cap screws assembled with toothed lock washers. Install the five upper splash shield to fender cap screws assembled with the special washers.

(b) *Left Front Fender Only.* Assemble the three upper splash shield to fender cap screws with the special washers and cable clips, to the three center screw holes and attach wiring cable under the three clips.

(2) INSTALL LIGHTS AND CABLE ASSEMBLIES.

(a) *Right or Left Front Fender.* Install the blackout parking light and cable assembly. Connect cable at connector, then slide rubber insulator over connector to prevent short circuit. Install the headlight and cable assembly. Attach the two wires to the terminal on the terminal block, located on the frame front cross member matching the colors of the wires with those attached to terminal block. Attach the grommet with the two screws.

(b) *Left Front Fender Only.* Install the blackout driving light and cable assembly. Attach the wire to the terminal block matching the color of the wire with the wire attached to terminal block. Attach the grommet with the two screws.

(3) AIM LIGHTS (par. 105 or 107).**c. Removal of Rear Fenders.**

(1) **RIGHT OR LEFT REAR FENDER.** Remove the bolts which attach the fender to the running board. Remove the cap screws which attach the fender to the body wheel housing.

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(2) **RIGHT REAR FENDER (CARRYALL ONLY).** Remove the cap screw which attaches the battery cover to the running board. Remove the cap screw which attaches the cover to the battery hold-down bracket. Remove the battery hold-down bracket.

d. Installation of Rear Fenders.

(1) **RIGHT OR LEFT REAR FENDER.** Install the cap screws with toothed lock washers which attach the fender to body wheel housing. Install the bolts assembled with toothed lock washers which attach the fender to the running board and install the nuts with toothed lock washer.

(2) **RIGHT REAR FENDER (CARRYALL ONLY).** Install the plain washers between the fender and running board when installing the bolts and nuts which attach the fender to the running board. Install the battery hold-down bracket on fender. Then close the battery cover and install the battery cover hold-down cap screws.

e. **Removal of Front Fender Splash Shields.** Remove the cap screws which attach the lower sides of the splash shield to the front and rear brackets. Remove the five cap screws which attach the upper side of the splash shield to the fender. Pull out shield under fender.

f. Installation of Front Fender Splash Shields.

(1) **INSTALL RIGHT SPLASH SHIELD.** Place splash shield in position and install the five cap screws with special washers, attaching the upper side of shield to the fender. Install the right front bracket cap screw and both rear bracket cap screws assembled with toothed lock washers.

(2) **INSTALL LEFT SPLASH SHIELD.** Assemble the five upper splash shield to fender cap screws with the special washers and cable clips under the three center screws and attach the wiring cable under the clips. Install the left front bracket cap screw with a toothed lock washer assembled through the ground strap. Install another toothed lock washer on the cap screw and install the cap screw through the front bracket to attach the shield.

180. COWL VENTILATOR.

a. **Replacement of Ventilator Lid.** Remove the two screws which attach the lid to the lid hinge and the two screws which attach the lid to the linkage and lift off the lid. To install, insert the two screws with lock washers that attach the lid to lid hinge and the two screws with lock washers that attach the lid linkage to lid, but do not tighten until the lid is adjusted (subpar. b below).

b. **Adjustment of Ventilator Lid.** Loosen the two screws which attach the lid to the hinge and the two screws which attach the lid to the linkage. Close the ventilator in position and hold it tightly centered in the body opening while tightening the lid to hinge screws from underneath the cowl. Then tighten the lid to linkage screws.

c. **Replacement of Ventilator Weatherstrip.** Remove ventilator lid (subpar. a above), and insert a screwdriver between the ends of

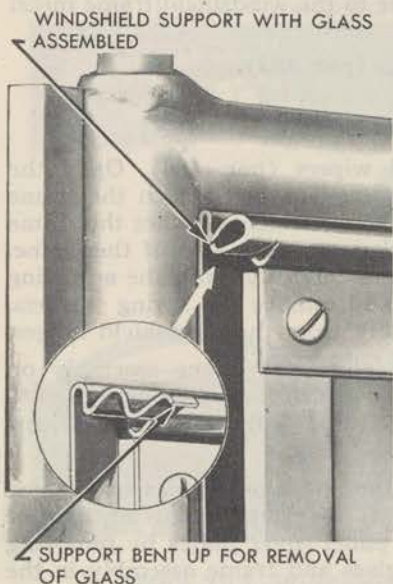
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the weatherstrip. Pull the weatherstrip out of the cowl recess and clean out the recess thoroughly. Coat the recess and contacting surface of weatherstrip with cement and install the weatherstrip in the recess, so the two ends are butted together at the front of the ventilator. Install ventilator lid (subpar. a above) and adjust (subpar. b above).

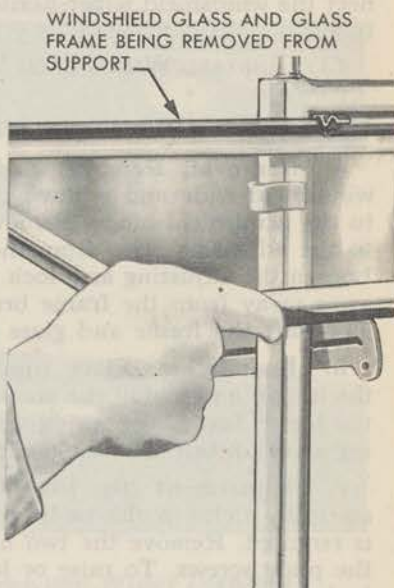
181. WINDSHIELD ASSEMBLY (OPEN BODIES).

a. Removal.

- (1) REMOVE WINDSHIELD WIPERS (par. 183).



RA PD 53080



RA PD 53081

**Figure 201—Windshield Support
(Open Bodies)**

**Figure 202—Removing Wind-
shield Glass Assembly
(Open Bodies)**

(2) REMOVE ADJUSTING ARM SCREWS. Remove the screw which attaches the frame to the adjusting arms from the brackets on each side of the frame. Loosen the adjusting arm lock nuts and carefully move the adjusting arm away from the frame bracket and remove the spring washers.

(3) REMOVE WINDSHIELD ASSEMBLY (figs. 201 and 202). Open either end of the windshield support hinge where the hinge is bent over to retain the windshield frame. Disconnect the windshield wiper flexible tube where it attaches to the metal tube across the top of the windshield frame. Open the windshield glass and frame assembly wide and pull the assembly out of the open side of the support hinge.

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b. Installation.

(1) **INSTALL WINDSHIELD ASSEMBLY.** Hold the glass and frame assembly in the fully opened position, with the pull-to handle down and insert the frame hinge flange into the open end of the support hinge, then push the glass and frame assembly all the way into the support hinge.

(2) **ATTACH ADJUSTING ARMS AND LINE UP ASSEMBLY.** Install the spring washers on the windshield frame adjusting arm brackets and attach the arms with the screws. Open and close the glass and frame assembly to line it up and then tighten the adjusting arm lock nuts. Bend the end of the support hinge to close the hinge opening. Connect the windshield wiper flexible tube to the windshield frame metal tube.

(3) **INSTALL WINDSHIELD WIPERS** (par. 183).

182. WINDSHIELD ASSEMBLY (CLOSED BODIES).

a. **Removal.** Remove windshield wipers (par. 184). Open the windshield wide and remove the six screws which attach the frame to the windshield hinge. Remove the screw which attaches the frame to the adjusting arms from the brackets on each side of the frame. Loosen the adjusting arm lock nuts and carefully move the adjusting arms away from the frame bracket and remove the spring washers. Then lift the frame and glass assembly from the windshield hinges.

b. **Installation.** Place windshield glass and frame assembly on the hinges and install the six screws to attach the frame and glass to the hinge. Install the spring washers on the windshield frame adjusting arms. Install windshield wipers (par. 184).

c. **Adjustment** (fig. 203). Close the windshield glass and frame assembly tight in the body opening to determine what adjustment is required. Remove the two header panel cover plates by removing the plate screws. To raise or lower glass and frame assembly in the body opening, loosen the adjusting arm lock nuts and open the glass and frame slightly. Loosen the four screws which attach the body hinges to the glass and frame hinge brackets. Raise or lower the assembly to center it in the opening as required; then tighten the screws. To adjust the glass and frame assembly closer to the body opening, loosen the four hinge cap screws which attach the hinges to the body header brackets. Close the glass and frame assembly and hold it into the opening tightly, while tightening the hinge to body bracket screws. Replace the two header panel cover plates and install plate screws.

183. WINDSHIELD WIPER ASSEMBLY (OPEN BODIES).

a. **Removal.** Remove the nut that attaches the wiper arm and blade assembly to the motor shaft and remove the arm and blade assembly. Remove the motor mounting nut and the outer spacer. Pull the wiper motor toward the inside of the windshield frame and twist back and forth to release the motor from the flexible tube. Then pull

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the wiper and inner spacer from the windshield frame upper cross-piece.

b. Installation. Install the inner spacer on the wiper motor. Install the motor in the windshield frame upper crosspiece and attach the flexible tube. Install the outer spacer with the spacer flange against the upper crosspiece and install the motor mounting nut. Attach the blade and arm assembly to the motor shaft and move the arm to the right or left as far as it will go. Remove and reset the blade arm if it is not properly centered in the glass.



**Figure 203—Windshield Hinge and Wiper Location
(Closed Bodies)**

184. WINDSHIELD WIPER ASSEMBLY (CLOSED BODIES).

a. Removal (fig. 203). Remove the header panel cover plate screws and remove the plate. Remove the nut that attaches the wiper arm and blade assembly to the motor shaft and remove the arm and blade assembly. Remove the motor mounting nut and the outer spacer. Pull the wiper motor toward the inside of the vehicle and release the flexible tube. Remove the inner spacer.

b. Installation. Install the inner spacer over the motor mounting hub. Install the motor in the header opening and attach the flexible tube to the motor. Install the outer spacer over the motor hub and install the mounting nut. Attach the arm and blade assembly to the motor shaft and move the arm to the right or left as far as it will go. Remove and reset the blade arm if it is not properly centered in the glass. Install the header panel cover plate.

3/4-TON 4 x 4 TRUCK (DODGE)**185. BODY MOUNTING BOLTS.**

a. **Weapon Carrier, Telephone Maintenance, and Emergency Repair Bodies.** The front section or open cab composing windshield, cowl, and bucket seat assembly is mounted on the frame solidly with a bolt at the left front corner and with spring-loaded bolts at the other three corners. The rear body section of the Weapon Carrier and Telephone Maintenance is solidly mounted to the chassis frame at six points; the Emergency Repair body is mounted solidly to frame at four points.

b. **Carryall, Ambulance, and Command.** The bodies of these vehicles are mounted solidly to the chassis frame as follows:

- (1) Carryall, 10 points.
- (2) Ambulance, 14 points.
- (3) Command, 8 points.

c. **Tightening and Adjusting.** To tighten and adjust open cab mounting bolts, tighten the left front bolt nut securely. Compress the springs of the three spring-loaded bolts to $3\frac{1}{2}$ inches with the bolt nut. Keep the mounting bolts of the body sections which are mounted solidly on frame tightened securely.

186. INTERCHANGING BRACKET POSITIONS (AMBULANCE).

a. In trying to slide two litters on the floor of the Ambulance, interference occurs between the litter legs, and the rear litter strap and the bracket assembly. This is particularly true on the older type wooden litters (the legs on the later type litters have been changed to provide additional side clearance). Because of this interference, it is necessary to lift the litter over the rear floor strap bracket before the litter can be slid into place.

b. To prevent interference between rear floor litter strap brackets and litter legs, interchange the rear floor litter strap brackets and the brackets mounted on top of the locker boxes on the sides of the body. To do this, proceed as follows (fig. 204).

(1) Use same center line for this installation. Drill one $1\frac{1}{32}$ -inch hole in the top of the locker box. This hole should be $7\frac{1}{2}$ inches from the end of the locker, and 1 inch from the outer edge.

(2) Drill two $\frac{7}{32}$ -inch holes in the side of the locker box for the bracket that was on the top of the locker box. These holes should be $2\frac{3}{4}$ inches up from the floor of the vehicle.

(3) Install the strap and brackets in the same manner as shown in figure 204, using the same attaching bolts.

(4) This correction should be performed on both sides of the body in the rear.

187. FIRE EXTINGUISHER.

a. Test the fire extinguisher as explained in paragraph 11. If the extinguisher contains dirty fluid, empty it and refill with one quart

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of underwriter's approved SOS liquid (Specification OF 380) made especially for this type extinguisher. Do not use water or any other chemical intended for other types of fire extinguishers in this extinguisher.

b. To refill, remove filler hole plug and pull handle out to full extent of travel. Pour liquid through filler hole until extinguisher is full. Install filler hole plug and pump extinguisher plunger up and down once or twice to remove trapped air. Push handle down and lock in position. Remove filler hole plug and add sufficient liquid to fill the extinguisher. Install filler plug and gasket.

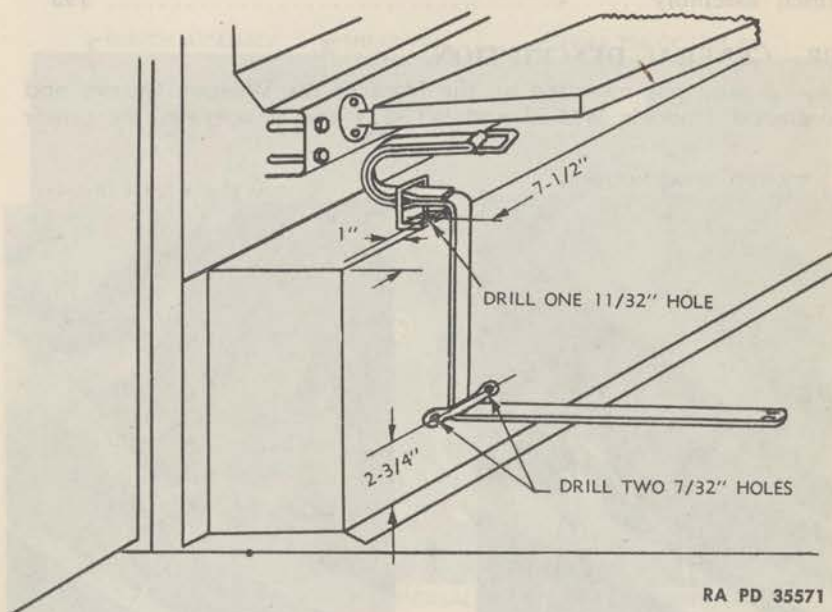


Figure 204—Interchanging Bracket Positions (Ambulance)

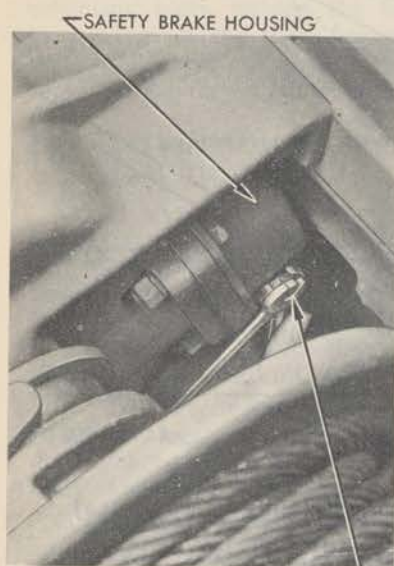
c. If the test indicates the fluid is clean, but insufficient in quantity, discharge part of the liquid in the extinguisher and fill to level of lower edge of filler plug opening. Replace plug and tighten securely.

3/4-TON 4 x 4 TRUCK (DODGE)**Section XL****WINCH**

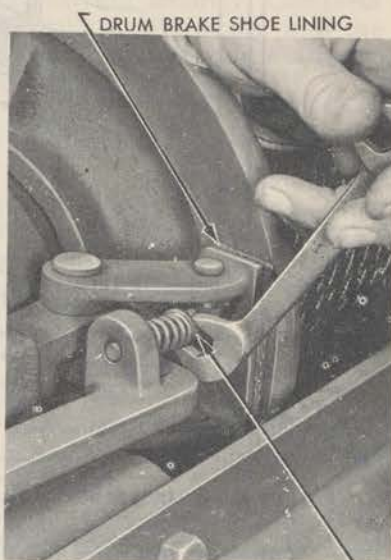
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188. GENERAL DESCRIPTION.

a. A winch is mounted on the front of the Weapon Carrier and Command (models WC-52 and WC-57) and is operated by power



BAND ADJUSTING AND LOCK NUTS
RA PD 53083



SHOE ADJUSTING AND LOCK NUTS
RA PD 53084

**Figure 205—Adjusting Winch
Safety Brake**

**Figure 206—Adjusting Winch
Drum Brake**

from the engine of the vehicle. The power is transmitted through the vehicle transmission to a power take-off unit, mounted on the side of the transmission case, then through a drive shaft to the winch assembly. Operation of the winch is controlled from the driver's compartment. A shear pin located in the front universal joint of the winch drive shaft is expected to shear off before damage occurs, should the winch be excessively overloaded.

WINCH

189. BRAKE ADJUSTMENTS.

a. **Adjustment of Safety Brake** (fig. 205). If load slips when take-off is in neutral or when shear pin has failed, increase spring tension on brake spring by turning the adjusting nut on underside of brake case clockwise. Tighten $\frac{1}{2}$ turn, then tighten lock nut and test. Tighten more (by $\frac{1}{2}$ turns) if necessary. Even if correctly adjusted, the brake will heat somewhat but if the hand cannot be held on the brake case, the brake adjustment is too tight.

b. **Adjustment of Drum Brake** (fig. 206). If the winch drum spins when the cable is being released, it will be necessary to adjust

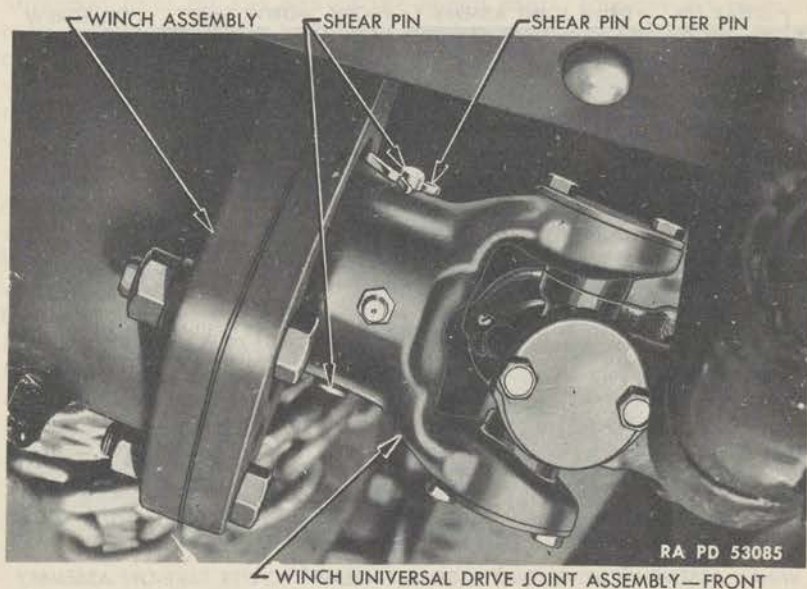


Figure 207—Winch Universal Drive Joint Shear Pin

the brake. The brake shoe link and adjusting nuts are mounted at the inner end of the sliding clutch shifter lever and are accessible for adjustment from the underside of the winch when the sliding clutch is engaged. Loosen the lock nut and turn the adjusting nut to increase tension on the spring to tighten the brake. Reduce the tension on the spring to loosen the brake. When adjustment is completed, hold the adjusting nut and tighten the lock nut.

190. DRUM BRAKE SHOE AND LINING.

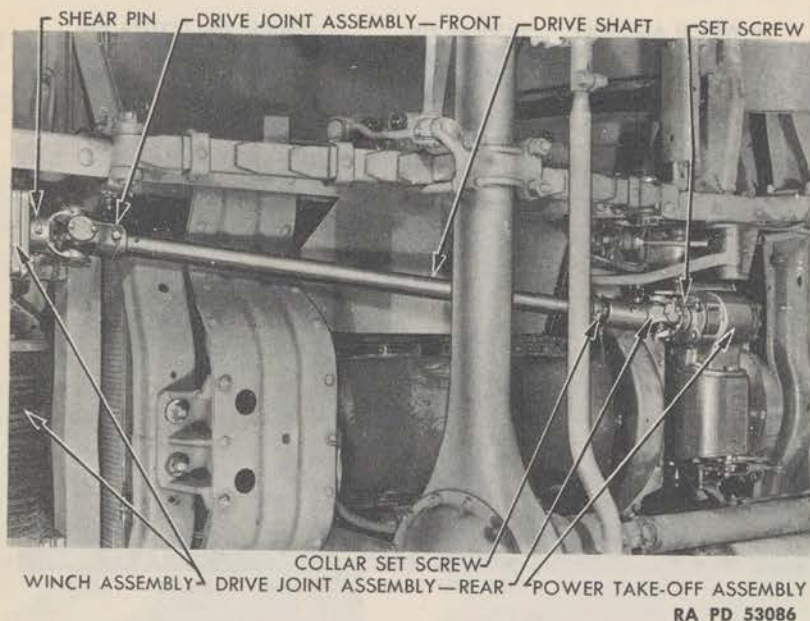
a. **Removal.** Remove cotter pin from lower end of the pin around which the sliding clutch shifter lever pivots. Pull the pin out and remove the brake shoe. Remove the rivets which hold the lining to the shoe.

3/4-TON 4 x 4 TRUCK (DODGE)

b. **Installation.** Rivet new lining to the shoe. Install coiled spring over adjustment screw and put the shoe in place. Install the pivot pin through the brake shoe link and the shifter lever. Place cotter pin through lower end of the pivot pin. Adjust drum brake (par. 189).

191. DRIVE JOINT SHEAR PIN.

a. **Removal** (fig. 207). Remove lock wire from set screw in collar at rear end of winch drive shaft. Loosen set screw in the collar and slide the drive shaft universal joint of the winch shaft. Drift broken shear pin out of winch shaft and universal joint.



RA PD 53086

Figure 208—Winch Universal Drive Shaft and Joint

b. **Installation** (fig. 207). Slide the universal joint over the winch shaft with the pin holes in line. Use drift to align holes. Insert shear pin through universal and winch shaft and install cotter pin through end of the shear pin. Slide the collar at the rear end of the drive shaft to $\frac{3}{8}$ to $\frac{1}{2}$ inch from the universal joint yoke on the rear end of the drive shaft. Tighten the set screw and install lock wire.

192. WINCH DRIVE SHAFT.

a. **Removal** (fig. 208). Remove lock wires from set screws in collar at rear end of winch drive shaft and rear universal joint. Loosen set screws and pull the joint off the power take-off shaft. Remove drive shaft shear pin (par. 191) and pull the front universal joint and drive shaft off the winch shaft.

WINCH

b. Installation (fig. 208). Slide the front universal joint yoke over the winch shaft and install the drive shaft shear pin (par. 191). Move the rear universal joint onto the power take-off shaft to $\frac{1}{16}$ inch from the power take-off housing and tighten the set screws; also, slide collar at rear end of drive shaft to $\frac{3}{8}$ to $\frac{1}{2}$ inch from the universal joint yoke and tighten set screws. Install lock wires.

193. WINCH ASSEMBLY.

a. Removal. Remove lock wire from set screw in collar at rear end of the drive shaft. Loosen the set screw. Remove cotter pin from end of the shear pin. Remove the shear pin. Slide the drive shaft universal joint off the end of the winch shaft. Remove six nuts and bolts which hold the winch assembly to the frame. Attach chain or rope from hoist around the left end of the winch drum. Raise winch slightly and swing it to the right enough so that its frame will clear the tow hook on the frame left side rail. Lift the winch assembly out of the chassis frame.

b. Installation. Attach chain or rope from hoist around the left end of the winch drum and hoist the winch above chassis frame and a little to the right of its installed position, so that when it is lowered, its frame will clear the tow hook on the frame left side rail. Lower the winch into the chassis and swing it to the left and into position. Install the six mounting bolts with standard lock washers and nuts. Place the drive shaft universal over end of winch shaft with shear pin holes in line, and align holes. Insert shear pin through the hole and install cotter pin through end of the shear pin. Slide the collar at the rear end of the drive shaft back to within $\frac{3}{8}$ to $\frac{1}{2}$ inch of the rear universal joint yoke, tighten set screw, and install lock wire.

3/4-TON 4 x 4 TRUCK (DODGE)**PART THREE—STORAGE AND SHIPMENT****Section XLI****STORAGE AND SHIPMENT**

	Paragraph
Storage and shipment (general)	194
Special precautions for storage	195
Methods of securing vehicle on freight cars	196
Overseas shipment	197
Shipment with combat units	198

194. STORAGE AND SHIPMENT (GENERAL).

a. The 3/4-ton truck will usually be shipped uncrated for domestic shipment. For overseas shipment trucks will usually be shipped crated in pairs. Preparation for temporary storage (less than 60 days) will be the same as preparation for domestic shipment, and preparation for indefinite storage (over 60 days) will be the same as the preparation for overseas shipment.

b. Preparation for Domestic Shipment and Temporary Storage.

(1) **LUBRICATION.** Lubricate the vehicle completely before storage or shipment.

(2) **FUEL IN TANKS.** It will not be necessary to remove the fuel from the tanks nor to label these tanks under Interstate Commerce Commission Regulations.

(3) **WATER IN RADIATOR.** Drain the radiator only when there is a possibility of freezing during storage or shipment. If the water is drained from the radiator, tie a conspicuous tag to the steering wheel of each vehicle indicating that the radiator is empty.

(4) **BATTERY.** Disconnect the battery by removing the positive battery cable. Tape the cable and tie it away from the battery.

(5) **UNPAINTED SURFACES.** Treat all unpainted and exposed surfaces with rust-preventive before the vehicle is stored or shipped. After cleaning the surface with solvents or a soap solution, treat all exterior surfaces with a thin film of rust-preventive compound. Apply preventive cold by spraying or brushing. It will harden to a tough thin film. Treat surfaces from which it would be difficult to remove rust-preventives, such as the bore of a gun, with rust-preventive compound, light. Apply this compound by brushing or slushing.

(6) **TIRES.** For domestic shipment, inflate the tires to about 10 pounds above normal.

(7) **INSPECTION.** Make systematic inspection just before shipment or storage. Make a list of all missing items or broken items that are not repaired, and attach the list to the steering wheel.

STORAGE AND SHIPMENT

RA PD 52565

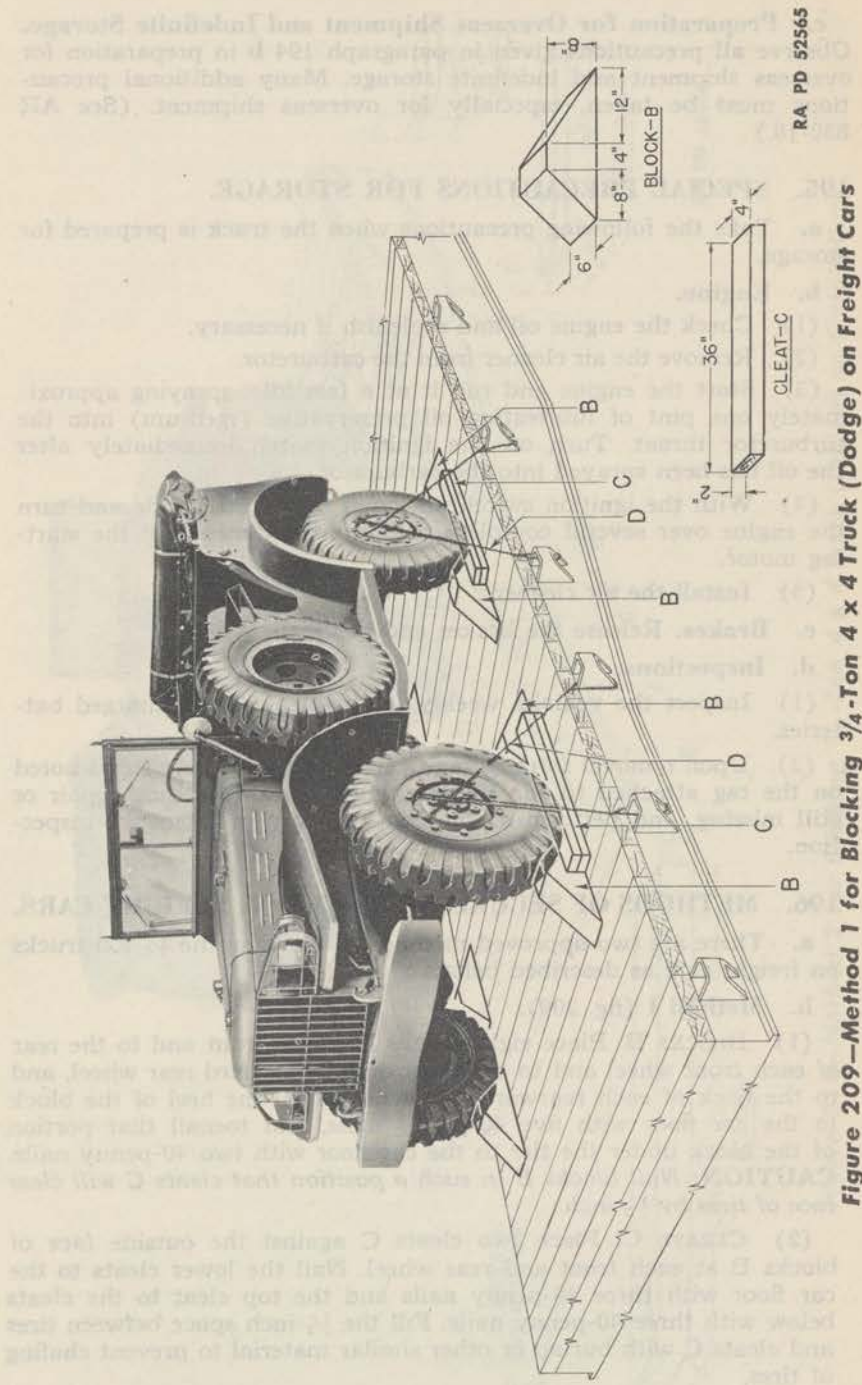


Figure 209—Method 1 for Blocking 3/4-Ton 4 x 4 Truck (Dodge) on Freight Cars

3/4-TON 4 x 4 TRUCK (DODGE)

c. **Preparation for Overseas Shipment and Indefinite Storage.** Observe all precautions given in paragraph 194 b in preparation for overseas shipment and indefinite storage. Many additional precautions must be taken, especially for overseas shipment. (See AR 850-18.)

195. SPECIAL PRECAUTIONS FOR STORAGE.

a. Take the following precautions when the truck is prepared for storage.

b. **Engine.**

- (1) Check the engine oil and replenish if necessary.
- (2) Remove the air cleaner from the carburetor.
- (3) Start the engine and run it at a fast idle, spraying approximately one pint of lubricating oil preservative (medium) into the carburetor throat. Turn off the ignition switch immediately after the oil has been sprayed into the carburetor.
- (4) With the ignition switch off, open the throttle wide and turn the engine over several complete revolutions by means of the starting motor.
- (5) Install the air cleaner.

c. **Brakes.** Release the brakes and block the wheels.

d. **Inspections.**

- (1) Inspect the vehicles weekly for tire leaks or discharged batteries.
- (2) Upon removal from storage, repair or replace any items noted on the tag attached to the steering wheel as still needing repair or still missing, and perform a complete monthly maintenance inspection.

196. METHODS OF SECURING VEHICLE ON FREIGHT CARS.

a. There are two approved methods of blocking the 3/4-ton trucks on freight cars as described below.

b. **Method 1 (fig. 209).**

(1) **BLOCKS B.** Place eight blocks B to the front and to the rear of each front wheel and to the front of each forward rear wheel, and to the back of each rearward rear wheel. Nail the heel of the block to the car floor with five 40-penny nails, and toenail that portion of the block under the tire to the car floor with two 40-penny nails. **CAUTION:** *Nail blocks B in such a position that cleats C will clear face of tires by 1/2 inch.*

(2) **CLEATS C.** Place two cleats C against the outside face of blocks B at each front and rear wheel. Nail the lower cleats to the car floor with three 40-penny nails and the top cleat to the cleats below with three 40-penny nails. Fill the 1/2-inch space between tires and cleats C with burlap or other similar material to prevent chafing of tires.

STORAGE AND SHIPMENT

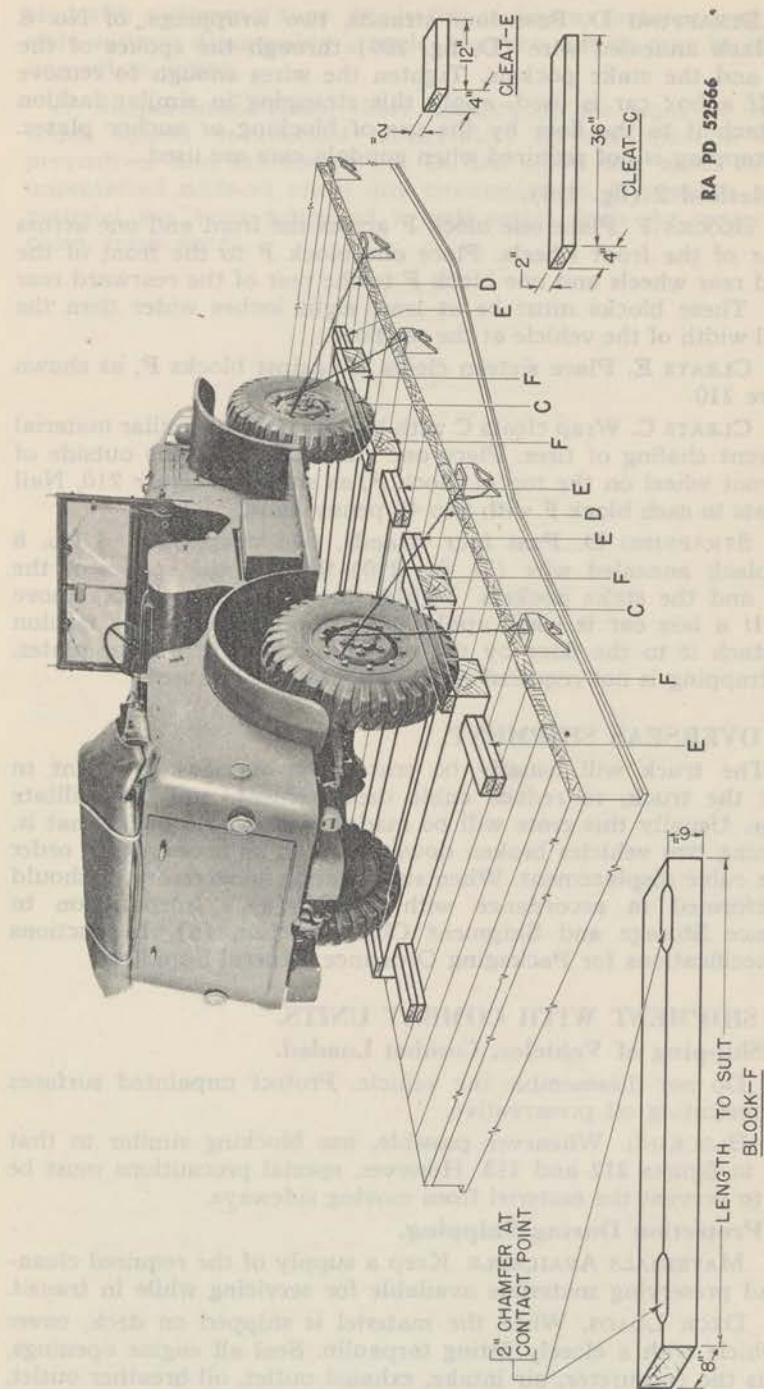


Figure 210—Method 2 for Blocking 3 1/4-Ton 4 x 4 Truck (Dodge) on Freight Cars

3/4-TON 4 x 4 TRUCK (DODGE)

(3) **STRAPPING D.** Pass four strands, two wrappings, of No. 8 gage, black annealed wire (D, fig. 209) through the spokes of the wheels and the stake pockets. Tighten the wires enough to remove slack. If a box car is used, apply this strapping in similar fashion and attach it to the floor by the use of blocking or anchor plates. This strapping is not required when gondola cars are used.

c. Method 2 (fig. 210).

(1) **BLOCKS F.** Place one block F across the front and one across the rear of the front wheels. Place one block F to the front of the forward rear wheels and one block F to the rear of the rearward rear wheels. These blocks must be at least eight inches wider than the over-all width of the vehicle at the car floor.

(2) **CLEATS E.** Place sixteen cleats E against blocks F, as shown in figure 210.

(3) **CLEATS C.** Wrap cleats C with burlap or other similar material to prevent chafing of tires. Place one cleat C against the outside of each front wheel on the top of block F, as shown in figure 210. Nail the cleats to each block F with two 40-penny nails.

(4) **STRAPPING D.** Pass four strands, two wrappings, of No. 8 gage, black annealed wire (D, fig. 210) through the spokes of the wheels and the stake pockets. Tighten the wires enough to remove slack. If a box car is used, apply this strapping in similar fashion and attach it to the floor by the use of blocking or anchor plates. This strapping is not required when gondola cars are used.

197. OVERSEAS SHIPMENT.

a. The truck will usually be crated for overseas shipment to protect the truck, to reduce cubic measurement, and to facilitate stowage. Usually this crate will be made up as a twin pack; that is, containing two vehicles broken down as much as necessary in order to save cubic displacement. When such crating is necessary, it should be performed in accordance with IOSSC-(a), "Introduction to Ordnance Storage and Shipment Chart, Section (a), Instructions and Specifications for Packaging Ordnance General Supplies."

198. SHIPMENT WITH COMBAT UNITS.

a. Shipping of Vehicles, Combat Loaded.

(1) Do not disassemble the vehicle. Protect unpainted surfaces with lubricating oil preservative.

(2) **BLOCKING.** Whenever possible, use blocking similar to that shown in figures 212 and 213. However, special precautions must be taken to prevent the materiel from moving sideways.

b. Protection During Shipping.

(1) **MATERIALS AVAILABLE.** Keep a supply of the required cleaning and preserving materials available for servicing while in transit.

(2) **DECK LOADS.** When the materiel is shipped on deck, cover the vehicle with a closely fitting tarpaulin. Seal all engine openings, such as the carburetor, air intake, exhaust outlet, oil breather outlet,

STORAGE AND SHIPMENT

etc., with waterproof tape. Apply this sealing so that it is easily accessible without disassembly in order that the vehicle may be ready for immediate action.

c. **Inspections.** Make daily inspections for signs of corrosion which should be checked immediately by reapplication of rust-preventives and lubricating oil. Do not allow salt water to dry on unprotected surfaces under any circumstances. If possible, after the materiel has been subjected to salt water flush the materiel with clean, fresh water.

3/4-TON 4 x 4 TRUCK (DODGE)

REFERENCES

PUBLICATIONS INDEXES.

The following publications indexes should be consulted frequently for latest changes or revisions to the publications given in this list of references and for new publications relating to materiel covered in this manual:

Ordnance publications for supply index (index to SNL's)	ASF Cat. ORD-2 OPSI
Index to Ordnance publications (lists FM's, TM's, TC's, and TB's of interest to Ordnance personnel, FSMWO's, BSD, S of SR's, OSSC's and OFSB's. Includes alphabetical listing of Ordnance major items with publications pertaining thereto)	OFSB 1-1
List of publications for training (lists MR's, MTP's, T/BA's, T/A's, FM's, TM's, and TR's, concerning training)	FM 21-6
List of training films, film strips, and film bulletins (lists TF's, FS's, and FB's by serial number and subject)	FM 21-7
Military training aids (lists graphic training aids, models, devices, and displays)	FM 21-8

STANDARD NOMENCLATURE LISTS.

3/4-ton 4 x 4 truck (Dodge)	SNL G-502
Cleaning, preserving, and lubricating materials; recoil fluids, special oils, and miscellaneous related items	SNL K-1
Interchangeability chart of organization tools for Ordnance vehicles	SNL G-19
Soldering, brazing, and welding materials, gases, and related items	SNL K-2
Tool sets (motor transport)	SNL N-19

EXPLANATORY PUBLICATIONS.

Fundamental Principles.

Automotive brakes	TM 10-565
Automotive electricity	TM 10-580
Automotive lubrication	TM 10-540
Automotive power transmission units	TM 10-585
Basic Maintenance Manual	TM 38-250
Chassis, body, and trailer units	TM 10-560
Desert operation	FM 31-25
Driver's manual	TM 10-460
Electrical fundamentals	TM 1-455

REFERENCES

Fuels and carburetion	TM 10-550
Military motor vehicles	AR 850-15
Motor transport	FM 25-10
Motor vehicle inspections and preventive maintenance services	TM 9-2810
Operations in snow and extreme cold	FM 31-15
Precautions in handling gasoline	AR 850-20
Sheet metal work, body, fender, and radiator repairs	TM 10-450
Standard military motor vehicles	TM 9-2800
The internal combustion engine	TM 10-570
The motor vehicle	TM 10-510

Maintenance and Repair.

Cleaning, preserving, lubricating, and welding materials, and similar items issued by the Ordnance Department	TM 9-850
Cold weather lubrication and service of combat vehicles and automotive materiel	OFSB 6-11
Maintenance and care of pneumatic tires and rubber treads	TM 31-200
Ordnance maintenance: Carburetors (Zenith) ..	TM 9-1826C
Ordnance maintenance: Electrical equipment (Auto-Lite)	TM 9-1825B
Ordnance maintenance: Electrical equipment (Delco-Remy)	TM 9-1825A
Ordnance maintenance: Fuel pumps	TM 9-1828A
Ordnance maintenance: Hydraulic brake system (Wagner)	TM 9-1827C
Ordnance maintenance: Power plant, clutch, and electrical systems for basic vehicles, 3/4-ton 4 x 4, and 1½-ton 6 x 6 (Dodge)	TM 9-1808A
Ordnance maintenance: Power train, chassis, and body for basic vehicles, 3/4-ton 4 x 4, and 1½-ton 6 x 6 (Dodge)	TM 9-1808B
Ordnance maintenance: Speedometers and tachometers (Stewart-Warner)	TM 9-1829A
Tune-up and adjustment	TM 10-530

Protection of Materiel.

Camouflage	FM 5-20
Chemical decontamination, materials and equipment	TM 3-220
Decontamination of armored force vehicles	FM 17-59

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Defense against chemical attack	FM 21-40
Explosives and demolitions	FM 5-25

Storage and Shipment.

Ordinance storage and shipment chart, group G major items	OSSC-G
Registration of motor vehicles	AR 850-10
Rules governing the loading of mechanized and motorized army equipment, also, major caliber guns, for the United States Army and Navy, on open top equipment published by Operations and Maintenance Department of Association of American Railroads.	
Storage of motor vehicle equipment	AR 850-18

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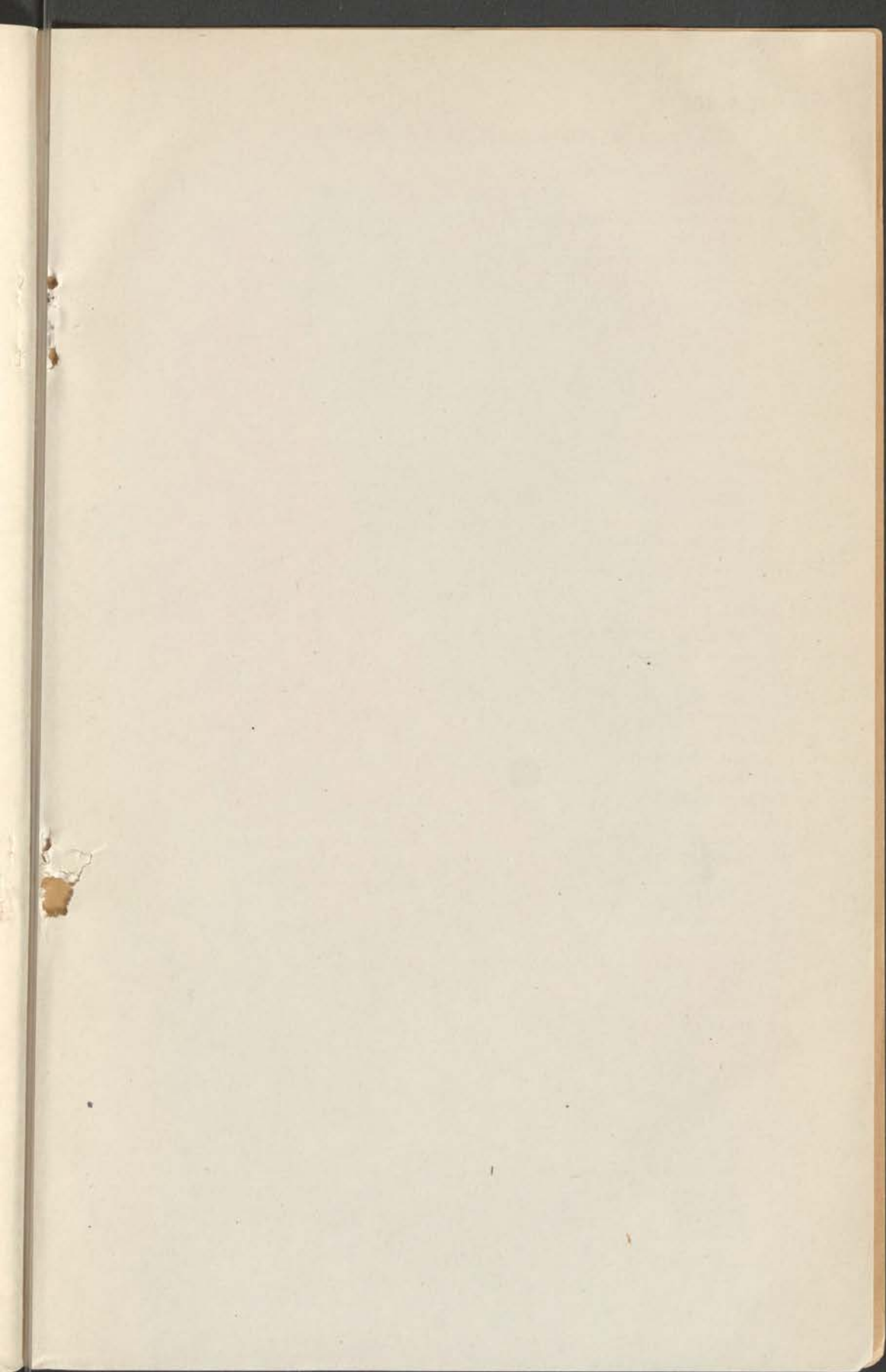
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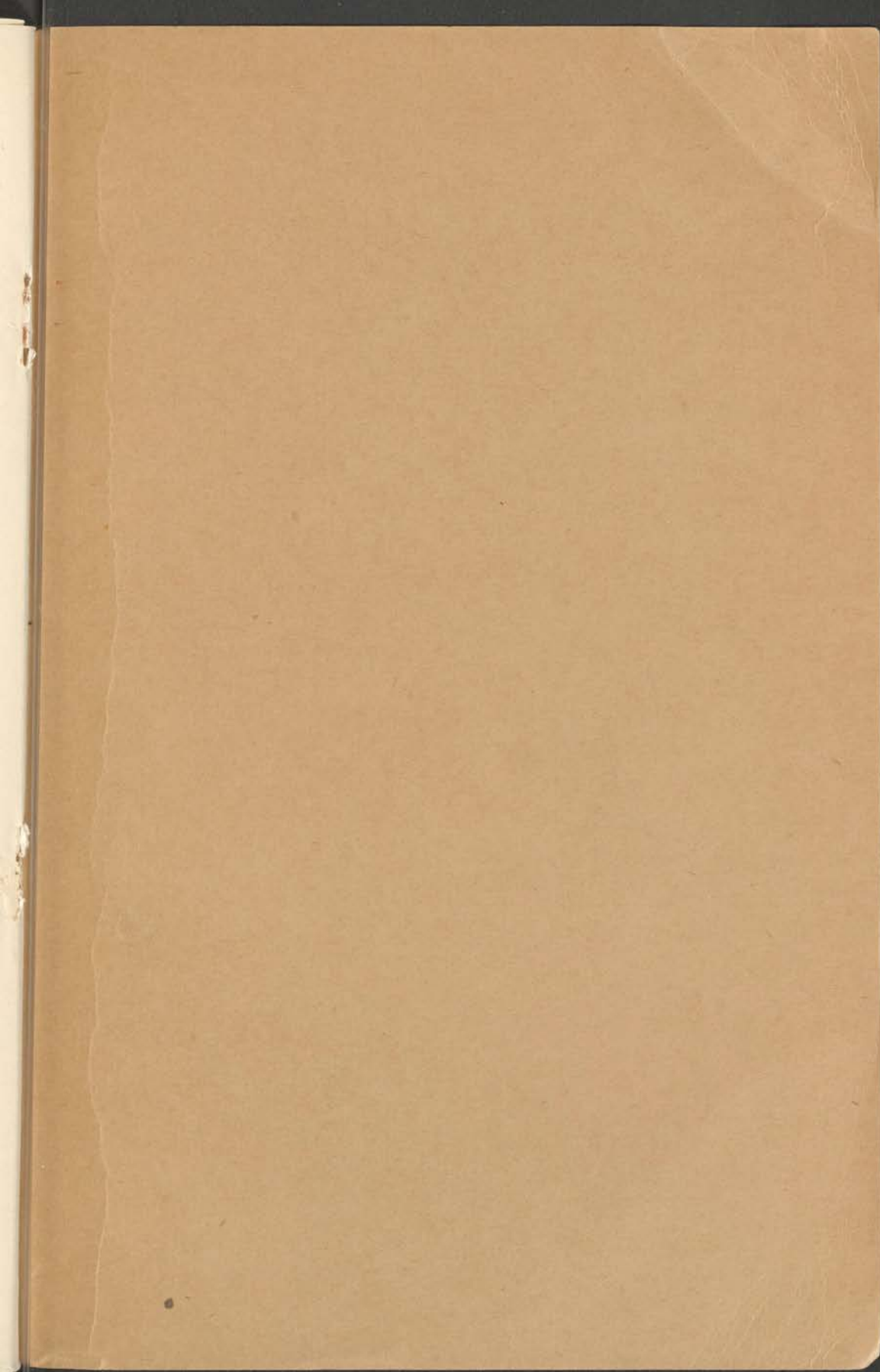
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