

DEPARTMENT OF THE ARMY TECHNICAL MANUAL  
DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

POWER TRAIN, BODY, AND FRAME FOR ¼-TON 4 x 4  
UTILITY TRUCK **M38A1** AND ¼-TON 4 x 4 FRONT LINE  
AMBULANCE M170

TM 9-8015-2  
TO 19-75CAJ-5

CHANGES No. 1

DEPARTMENTS OF THE ARMY AND  
THE AIR FORCE

WASHINGTON 25, D. C., November 1954

TM W-8015-2/70 19-75CAJ-5, 2 August 1954, *is* changed as follows :

The title is changed to **POWER TRAIN, BODY, AND FRAME FOR ¼-TON 4 x 4 UTILITY TRUCK M38A1 AND ¼-TON 4 x 4 FRONT LINE AMBULANCE M170.**

1. Scope

b. This manual contains a description of and procedures for removal, disassembly, inspection, repair, rebuild, and assembly of the power train, body, and frame of the 1/4-ton 4 x 4 utility truck **M38A1** (figs. 1, 2, and 3) and the ¼-ton 4 x 4 front line ambulance M170 (figs. 3.1 and 3.2). The appendix contains a list of current references, including supply manuals, technical manuals, and other available publications applicable to the materiel.

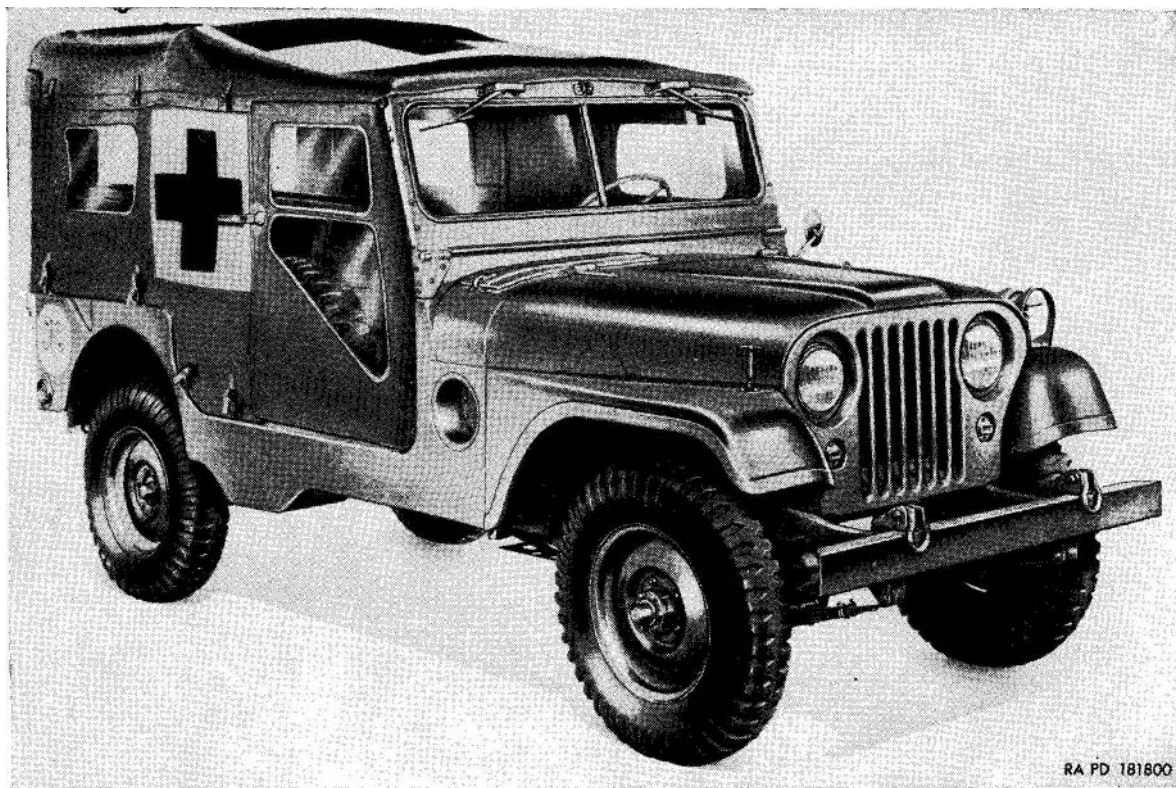
4. Description **M38A1**

4.1 Description M170

(Added)

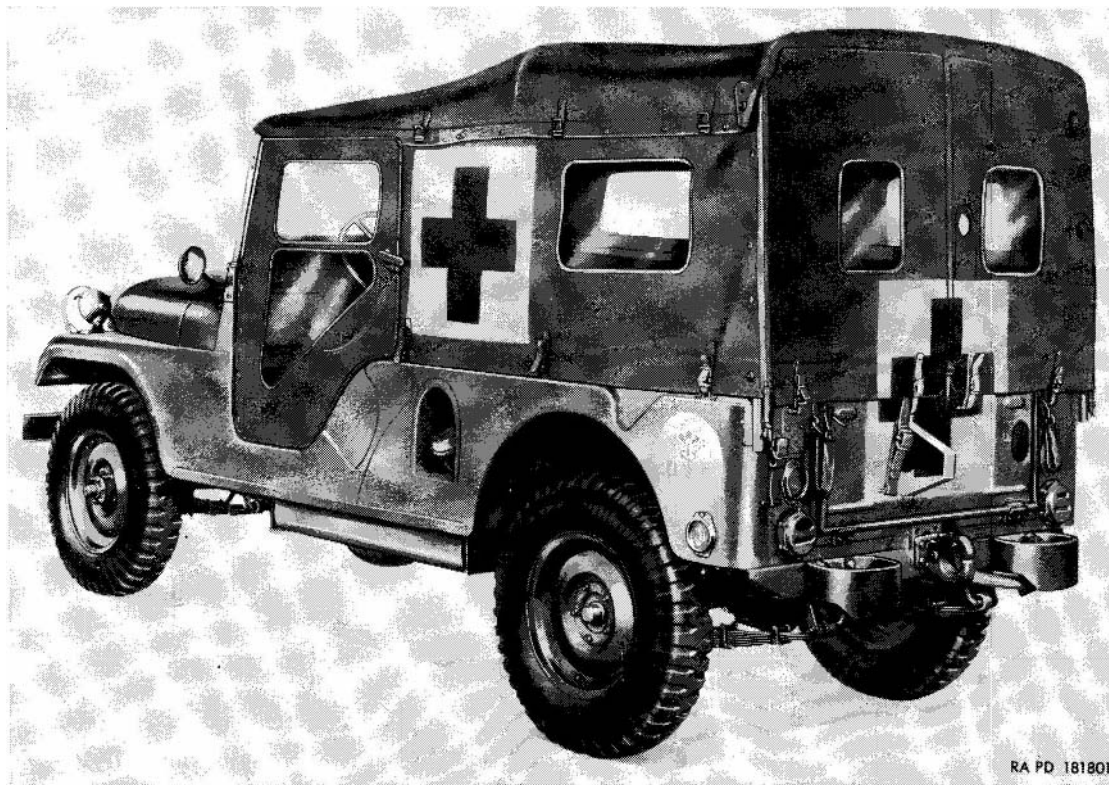
a. The front line ambulance M170 can be distinguished from the utility truck **M38A1** by its longer body and frame, designed for use as an ambulance. The longer wheel base and body of the M170 provides accommodation for three litters. The litter carriers can be removed to convert the vehicle to a personnel carrier, accommodating six ambulatory patients in addition to the driver.

b. The tailgate of the ambulance can be lowered to facilitate the loading of the litters. The spare wheel is located inside the ambulance at the right rear of the front passenger seat.



RA PD 181800

Figure 3.1. (Added) 1/4-Ton 4 4 front line ambulance M170— right front view.



RA PD 181801

Figure 3.2 (Added) 1/4-Ton 4 x 4 front line ambulance M170—left rear view.

c. The ambulance is equipped with lower rate springs and shock absorbers for easier riding. The hand brake handle is installed in such a manner as to avoid interference with the lower litter. Additional accessories included with the ambulance consist of crash pads and an interior emergency light.

5. Power Train

(fig. 5)

\* \* \*

g. (Added) *Stabilizer Bar Assemblies M170* (fig. 40.1). Stabilizer bar assemblies are installed at the front and rear of the vehicle. The bracket of the front stabilizer bar assembly is mounted to the frame side rail. The bracket of the rear stabilizer bar assembly is mounted to the stabilizer bracket-to-frame bracket. The stabilizer bracket-to-frame bracket is mounted to the frame side rail. Stabilizer bar links connect the bar to a shaft on the U-bolt plates on the springs. The bars help to eliminate body sway and lean when the vehicle is in motion.

6. Body M38A1

(fig. 158)

\* \* \* \* \*

6.1. Body M170

(fig. 158.1)

(Added)

a. *General.* The body is an all steel, open-type, of seamed and welded construction. The body is equipped with a driver's seat, front passenger seat, and two rear seats for ambulatory patients or passengers, tool compartment, two medical supplies stowage compartments, battery stowage box, and bows for the installation of a top cover, side curtains, and doors. A well in front of the right wheel house provides for mounting the spare wheel and tire inside the body. A two-piece, folding-type windshield, with two windshield wiper vacuum motors, is also a part of the body. The formed sheetmetal hood and front fenders are removable. Access to the rear of the engine compartment, transmission, transfer, master cylinder, and steering gear is provided by removable front floor pan covers and access plates. Reflex reflectors are bolted to the rear and sides of the body.

b. *Ambulance Equipment.*

- (1) *Litter racks.* The lower litter rack is located on the floor on the right side of the body. The upper litter rack is a removable type suspended by a hanger, supports, and retainers above the right wheel house. An auxiliary litter can be mounted above the left wheel house and tailgate. An eye on the right side of the driver's seat, a bracket left of the

driver's seat, and two brackets on the tail gate support the litter. Two hold-down straps are provided to tie down the rear of the auxiliary litter.

- (2) *Seats and crash pads.* The vehicle is equipped with a driver's seat, a front passenger seat, and four wheel house cushions which serve as seats for rear passengers. The rear of the driver's seat is equipped with a crash pad and cover for the protection of the patient's head when the auxiliary litter is being used. The front passenger seat is designed to be used either as a passenger seat or, in crash pad arrangement, as a protection for patients when the lower and upper litter racks are in use.
- (3) *Tailgate.* A tailgate is provided for ease of loading patients. Two holes in the tailgate permit the handles of the litter on the lower litter tack to protrude outside the vehicle when the tailgate is in raised position.
- (4) *Medical supplies storage compartments.* Two medical supplies storage compartments are provided; one in the rear of the right wheelhouse and the other in the front of the left wheelhouse.

## 7. Frame M38A1

(fig. 178)

### 7.1. Frame M170

(Added)

The frame of the M170 is constructed of two heavy channel steel side rails and five cross members. The side rails and cross members are reinforced with welded plates. Two rear reinforcements of a V-shape design are welded to the side rails and rear cross member. All cross members, except the engine rear support cross member, are welded to the side rails. Stabilizer bar assemblies are mounted on the frame at the front and the rear of the vehicle to reduce swaying. Two front lifting shackles and a bumper bar are mounted on the front of the frame. A towing pintle, two rear lifting shackles, and two bumperettes are mounted on the rear of the frame. Brackets and supports provide mounts for the engine, body, shock absorbers, springs, and stabilizer bar assemblies.

## 8. Engine, Clutch, and Electrical System

\* \* \* \* \*

### c. Electrical System M38A1.

\* \* \* \* \*

- d. (Added) *Electrical System M 170.* The 12-volt lead and acid-type batteries, connected in series, supply 24-volts for operating the

electrical components of the vehicle. All components of the electrical system are waterproofed for operation while completely submerged. Two headlights, a blackout driving light, and two signal blackout marker and service parking lights are installed on the front of the vehicle. The blackout tail and stoplight and the service tail and stoplight are located at the rear of the vehicle. An emergency reel lamp is mounted on the body of the front line ambulance at the rear of the driver's seat. Voltage can be obtained at the emergency reel lamp switch only when any one of the switch levers of the light switch is in ON position.

9. Data M38A1

\*

\*

9.1. Data M170

( Added)

Refer to list below for tabular data pertaining to general characteristics and performance of the vehicle, and major components. TM 9-8015-1 contains descriptive information and tabular data pertaining to the engine and clutch. For detailed information and tabular data pertaining to components covered in this manual refer to the following paragraphs :

	Paragraph
Body	2111.1
Frame	245.1
Front axle assembly	110
Propeller shafts	1-11
Rear axle assembly	108
Shock absorbers	195
Springs -----	195
Steering system	201
Transfer -----	110
Transmission	
Universal	141

35. Trouble Shooting Before Removal or Operation

\*

b. *Inspect the Vehicle for Sagging.* See if the vehicle sags to one side. Sagging of the vehicle may be caused by one of the following faults:

- (3) *Broken spring shackle M38A 1.* Replace shackle (ch. 4).
- (3.1) (Added) *Broken. spring shackle M170.* Replace shackle (par. 62.1 c).

c. *Inspect the Vehicle for High Setting on One Side M38A1.* If the vehicle \* \* \* installation. Check and correct as necessary (par. 62)

c.1. (Added) *Inspect the Vehicle for High Setting on One Side 161170.* If the vehicle sits high on one side, the spring assembly may have shifted on the axle assembly. Correct as necessary. Be sure U bolts are securely tightened. Check stabilizer bar links for looseness or breakage, and correct as needed (par. 57.1).

### 39. Troubleshooting Before Removal or Operation

\* \* \* \*

b. *Inspect for Abnormal Wear of Front Tires.* Excessive or abnormal wear of the front tires can be caused by one of the following:

(4) *Front springs loose, shifted, or broken M38A1.* Examine springs for proper mounting and damage. Correct malfunction as necessary (pars. 197 and 198).

(5) (Added) *Front Springs Loose, Shifted, or Broken M170.* Examine springs for proper mounting and damage. Correct malfunction as necessary (par. 62.1c).

c. *Inspect for Abnormal Wear of Rear Tires.*

(3) *Rear springs shifted, loose, or broken M38A1.*

\*

(4) (Added) *Rear springs shifted, loose, or broken 31170.* Check springs for proper mounting and damage. Repair broken or damaged parts (par. 62.1c).

### 41. General

a. This section contains information for the guidance of personnel performing major rebuild work on the 1/4-ton 4 x 4 utility truck M38A1 and the 1/4-ton 4 x 4 front line ambulance M170. It provides an \* \* \* must be done.

### 44. Remove Batteries

(fig. 13)

\* \* \* \*

a.1. (Added) *Unclamp and Remove the Cover* (fig. 13.1) *on the M170.*

\* \* \* \*

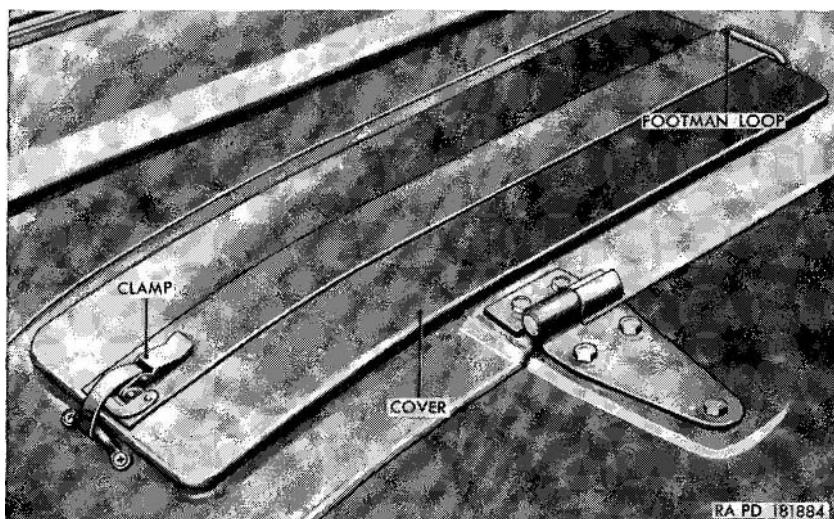


Figure 13.1. (Added) Batteries location—batteries cover installed M170.

#### 45. Remove Spare Wheel and Tire Assembly M38A1 (fig. 14)

\* \* \*

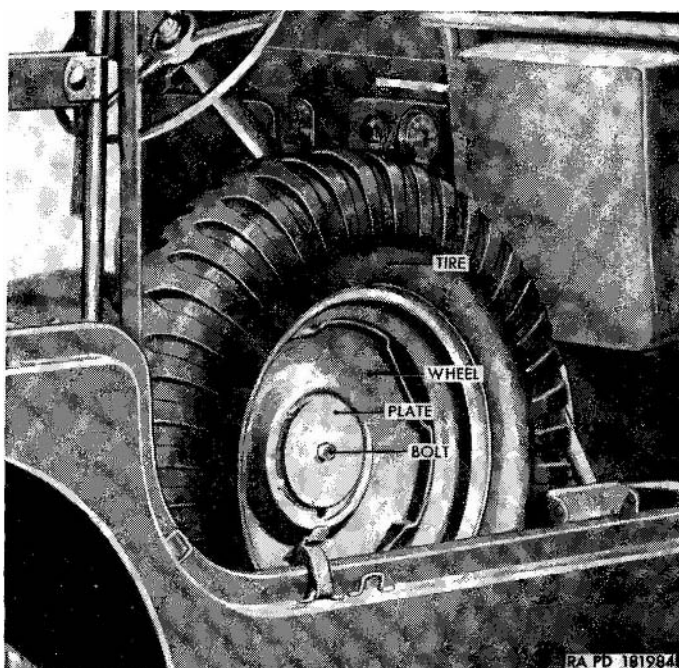


Figure 14.1. (Added) Spare wheel and tire assembly M170—installed.



#### **45.1. Remove Spare Wheel and Tire Assembly M170**

(fig. 14.1)

( Added)

Remove the bolt and plate securing the spare wheel and tire to the spare wheel support bracket (fig. 162.1), and remove spare wheel and tire.

#### **46. Remove Fender M38A1**

(fig. 15)

\* \*

#### **46.1. Remove Fender M170**

( Added)

Follow procedure in paragraph 46 except *a* (6).

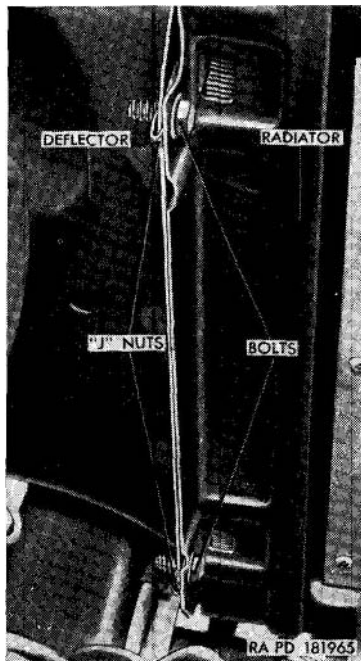
#### **47. Remove Radiator Guard Assembly M38A1**

(fig. 16)

#### **47.1. Remove Radiator Guard Assembly M170**

( Added)

*a.* Remove two bolts from J nuts (fig. 16.1) securing radiator to guard panel on each side of radiator.



*Figure 16.1. ( Added) Radiator to guard panel J nuts M170—installed.*

- b. Loosen nuts and slide tie rod (fig. 16.2) out of slot in radiator guard and off bolt and flat washer (fig. 16.3) at front bottom of guard.
- c. Remove the three screws and flat washers securing the fender to the radiator guard.

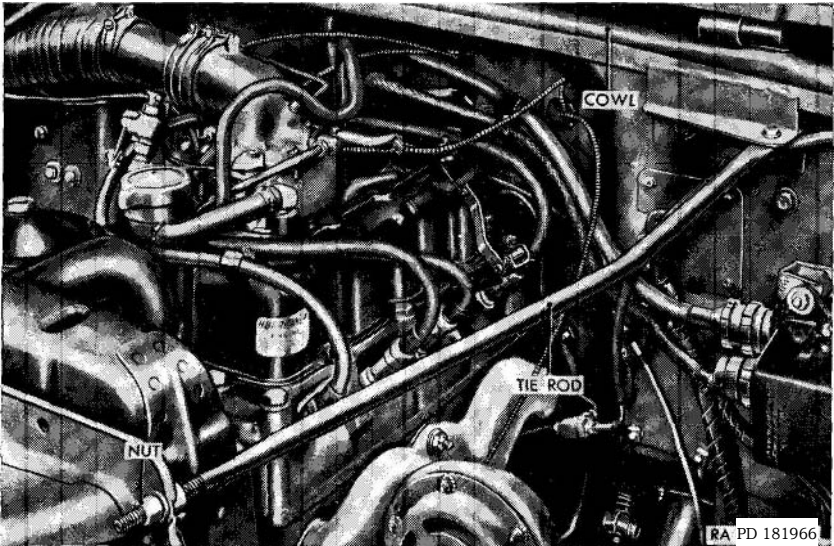


Figure 16.2. (Added) Dash-to-air deflector tie rod M170—installed—left side.

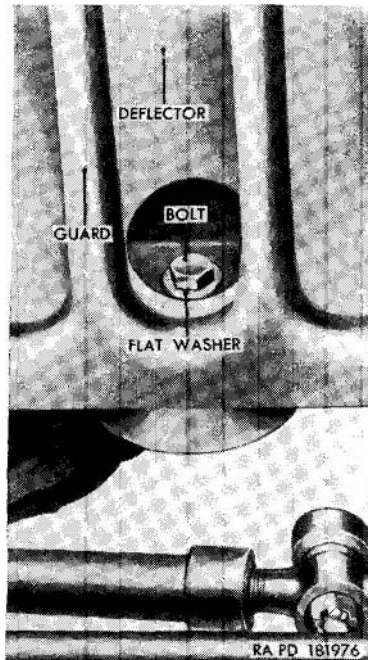
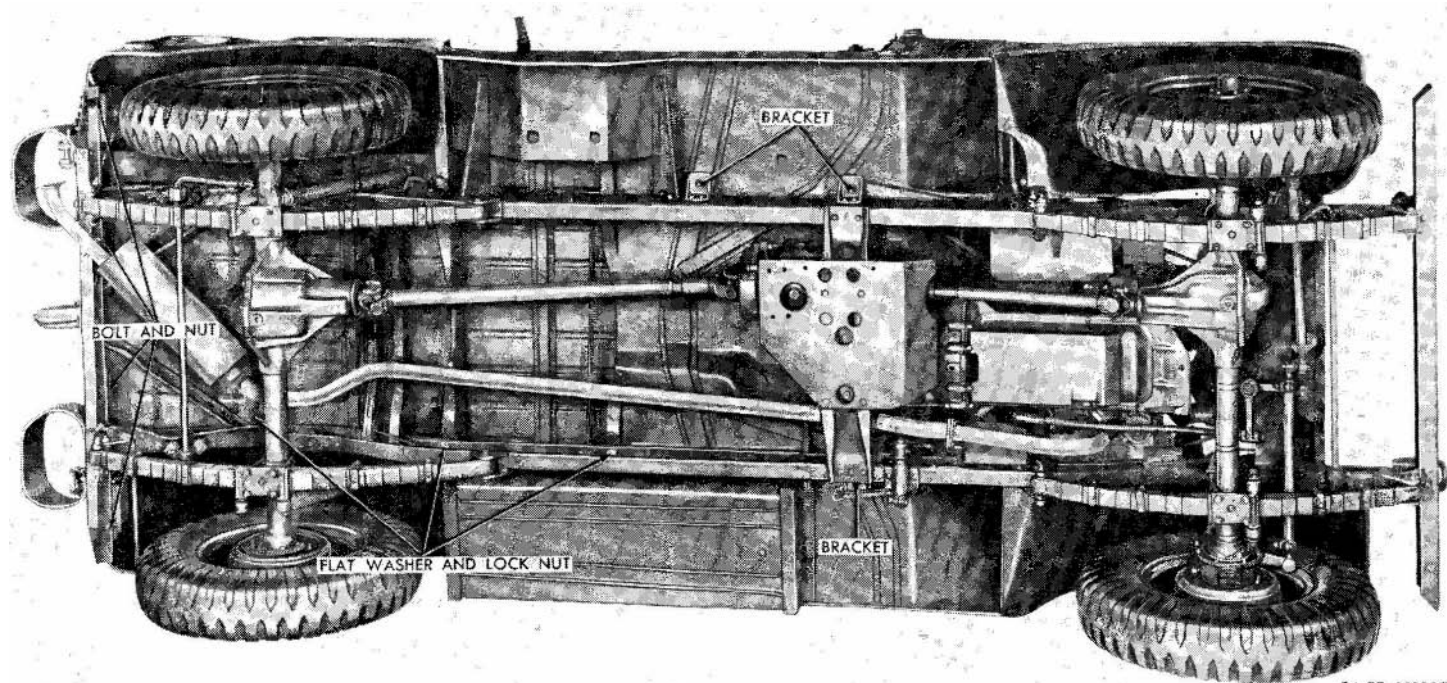


Figure 16.3. (Added) Radiator guard and deflector M.170.



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Figure 26.1. (Added) Under side of body—showing hold-down brackets and disconnect points MI70.

d. Disconnect the headlight and blackout marker and parking light cables (C, fig. 15) at the left side of the vehicle.

## 48. Remove Body From Frame M38A1

### 48.1. Remove Body From Frame M170

(Added)

a. *Make Disconnects at Right Side of Engine.* Refer to paragraph 48a.

5. *Make Disconnects at Left Side of Engine.* Refer to paragraph 48b.

c. *Make Disconnects Inside of Driver's Compartment.* Refer to paragraph 48c.

d. *Disconnect Body from Frame if 170.* Refer to figure 26.1 for general location of body hold-down brackets and other disconnect points at bottom of body.

(1) *Disconnect points right side.*

(a) Remove the locknuts and flat washers from the bolts in the brackets (fig. 26.2). Pull the bolts with flat washers out of the body and brackets.

*Note.* The bolts are accessible from the right side of the driver's compartment and the tool box, respectively.

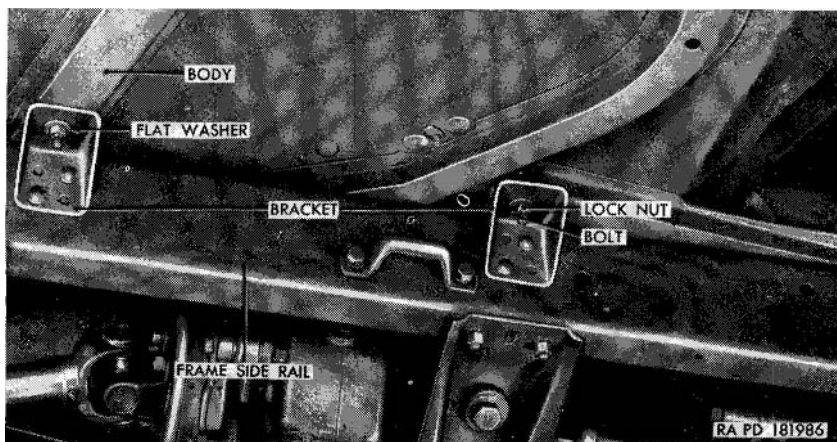


Figure 2G.2. (Added) Body hold-down brackets M170—right side.

(b) Remove three locknuts and fiat washers from the bolts (fig. 26.3) securing the body to the frame side rail and remove the bolts with flat washers.

(c) Remove four lockwasher bolts from the front and rear spare wheel well-to-frame side rail brackets (fig. 26.4).

(2) *Disconnect points left side.*

(a) Remove the locknut (fig. 26.5) and flat washer from the bolt in the bracket and remove the bolt with flat washer.

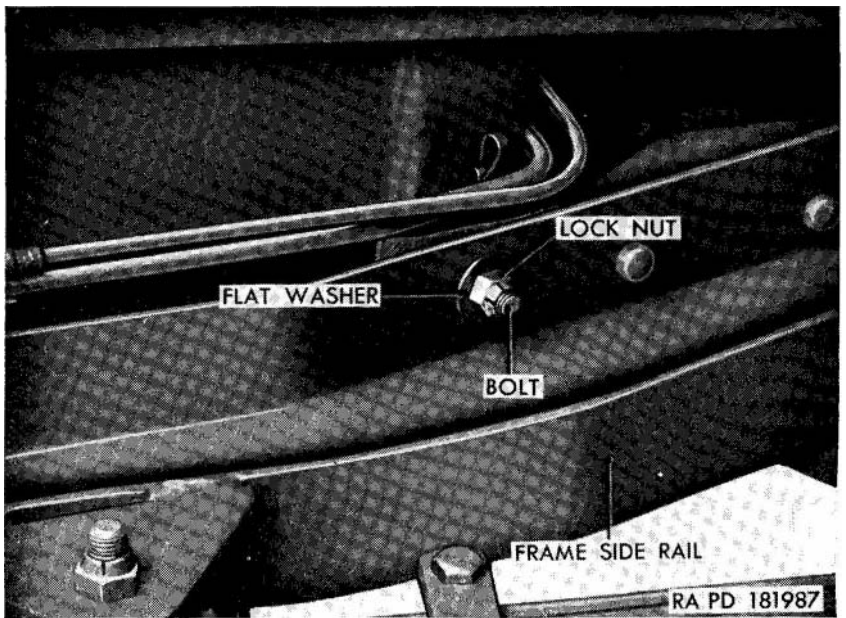


Figure 26.3. (Added) Body hold-down bolts M170—from side rail.

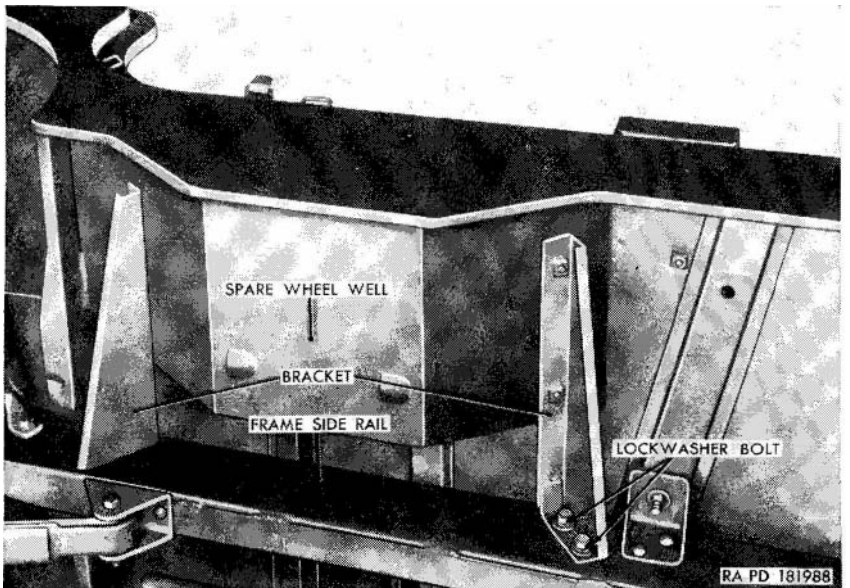


Figure 26.4. (Added) Spare wheel well-to-frame side rail brackets M170.

- (b) Remove four locknuts and flat washers (fig. 26.3) from the bolts securing the body to the frame side rail and remove the bolts with flat washers.

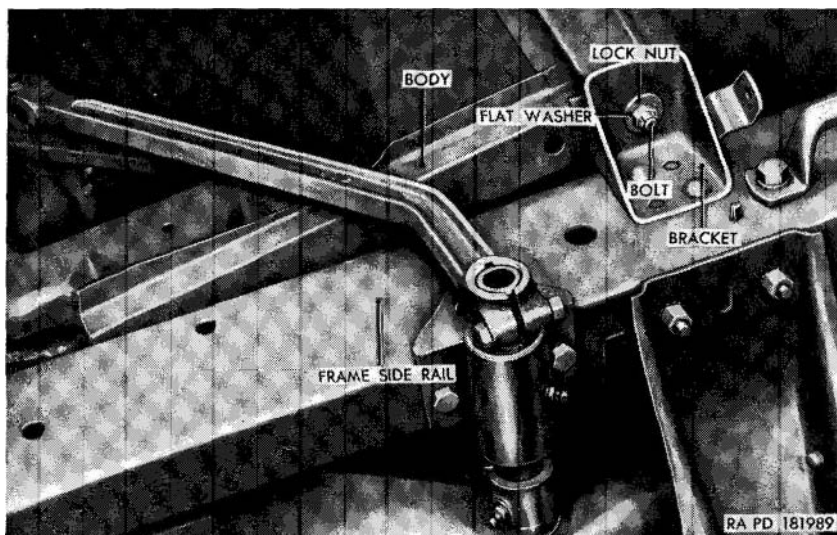


Figure 2G.5. (Added) Body hold-down bracket M170—left side.

- (3) *Disconnect points frame, rear cross member.* Remove four lock nuts and flat washers from the bolts securing the body to the frame rear cross member and remove the bolts with flat washers.
- (4) *Disconnect electrical cables* (fig. 26.6).
  - (a) *Blackout tail and stoplight (right side).* Disconnect the two blackout tail and stoplight cables at the connectors under the body. Remove the cables from the clips on the mounting bracket.

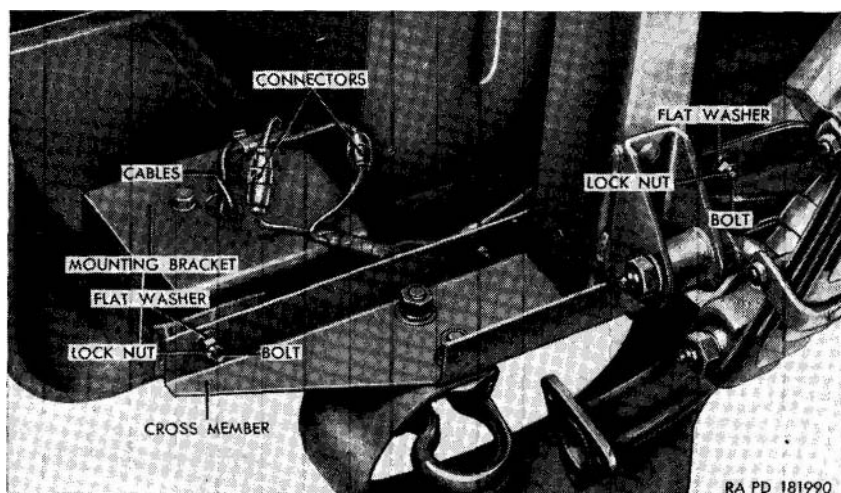
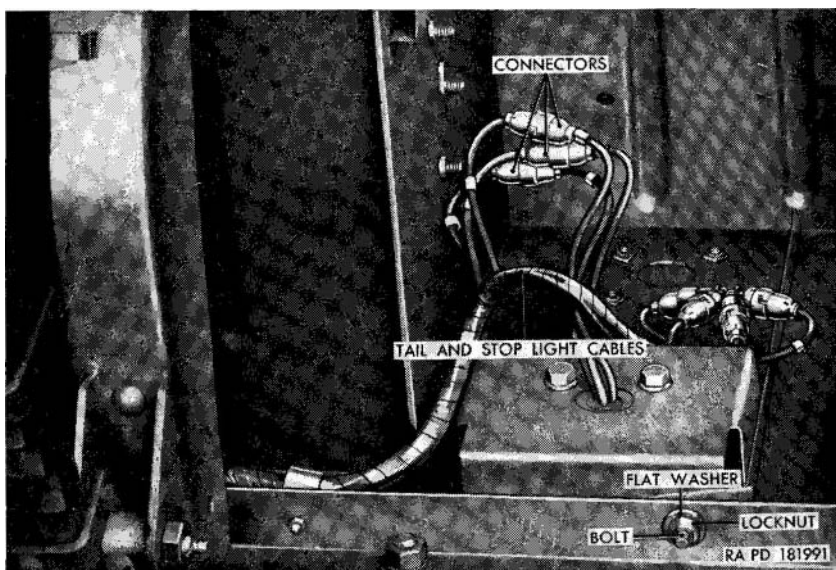


Figure 26.6. (Added) Body hold-down bolts rear cross member and blackout tail and stoplight cables M170.

*(b) Service tail and stoplight (left side).*

1. Raise the wheelhouse cushion (fig. 158.1) at the left rear side and remove the two lockwasher screws from the wheelhouse.
2. Remove the two lockwasher screws from the inner panel of the wheelhouse (fig. 158.1) from the inside of the body.
3. Remove the lockwasher screw from the bracket on the outer edge of the taillight and trailer connection guard under the wheelhouse and remove the guard.
4. Disconnect the three cables at the connectors for the service tail and stoplight (fig. 26.7). Remove the bolt and nut securing each trailer receptacle cable to the body.



*Figure 26.7. (Added) Body hold-down bolts rear cross member, service tail and stoplight, and trailer electrical coupling cables M170.*

*(5) Make disconnects under body.*

- (a) Remove the tension spring (fig. 26.8) from the skid plate and the cotter pin through the hand brake cable.
- (b) Remove the cotter pin and clevis pin from the yoke of the hand brake cable and the hand brake lever.
- (c) Remove the lockwasher screw securing the hand brake cable to the bracket on the rear of the transfer.
- (d) Disconnect the tee-to-elbow fuel line (fig. 26.t)) at the elbow and tie line down to the propeller shaft.



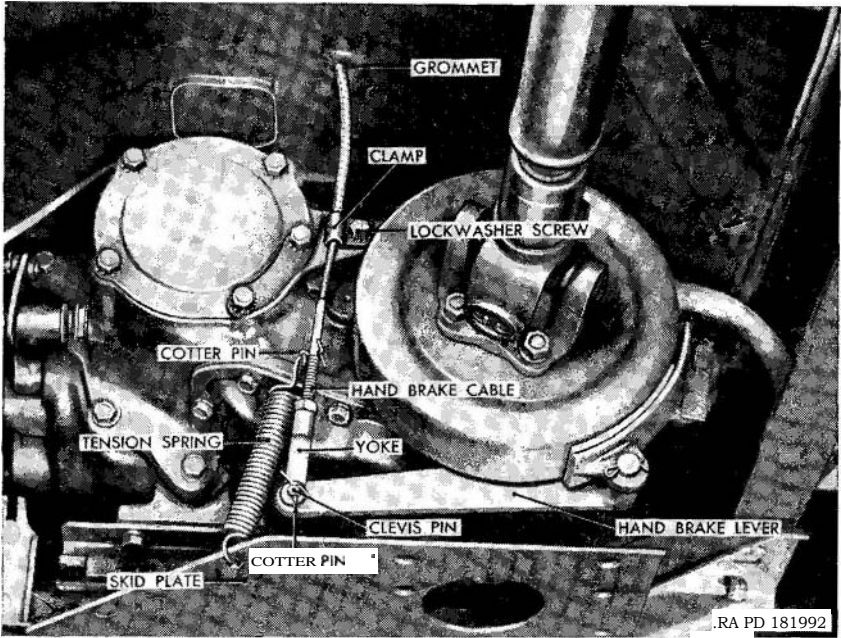


Figure 26.8. (Added) Disconnect points under body 111170.

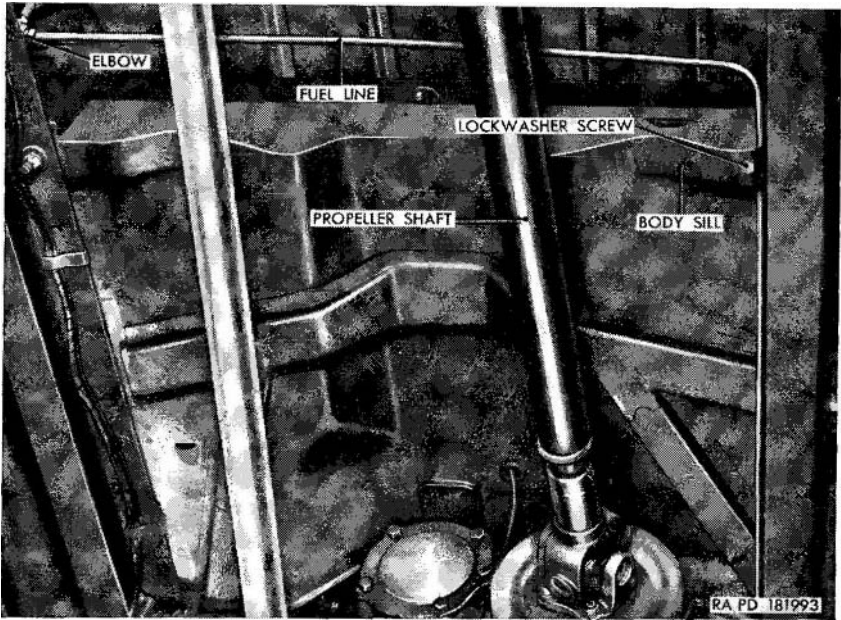
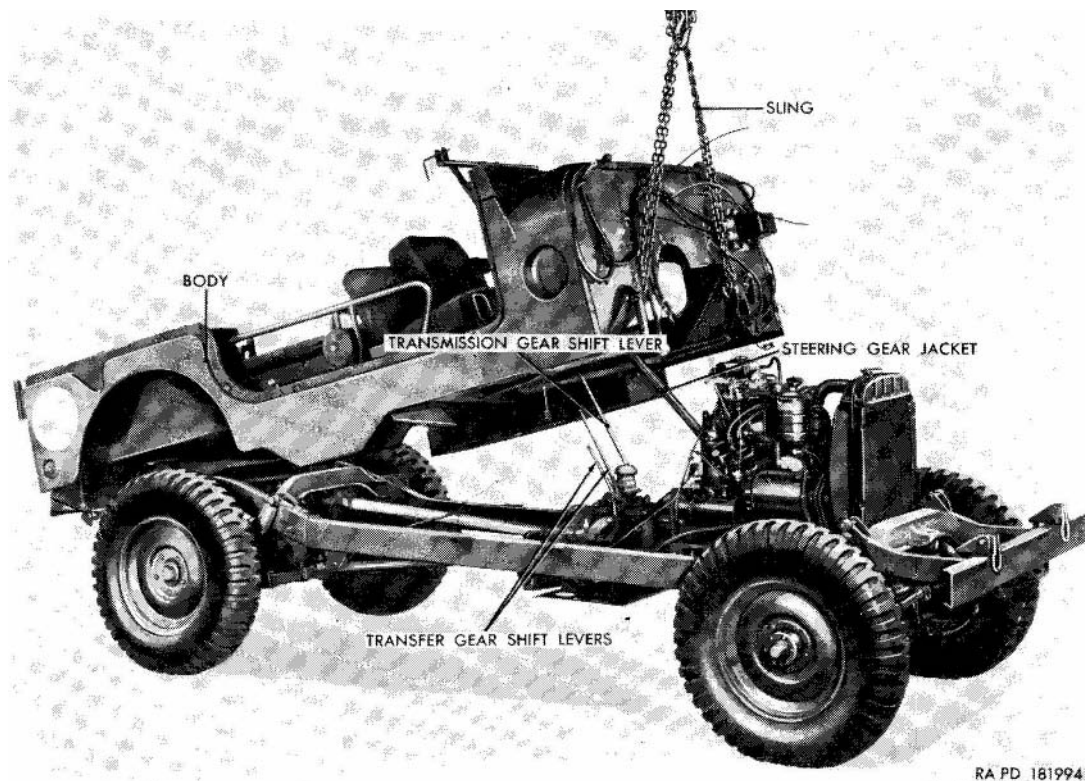


Figure 26.9. (Added) Fuel line disconnect point under body 111170.





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Figure 26.10. (Added) Front of body lifted front Frame M170.

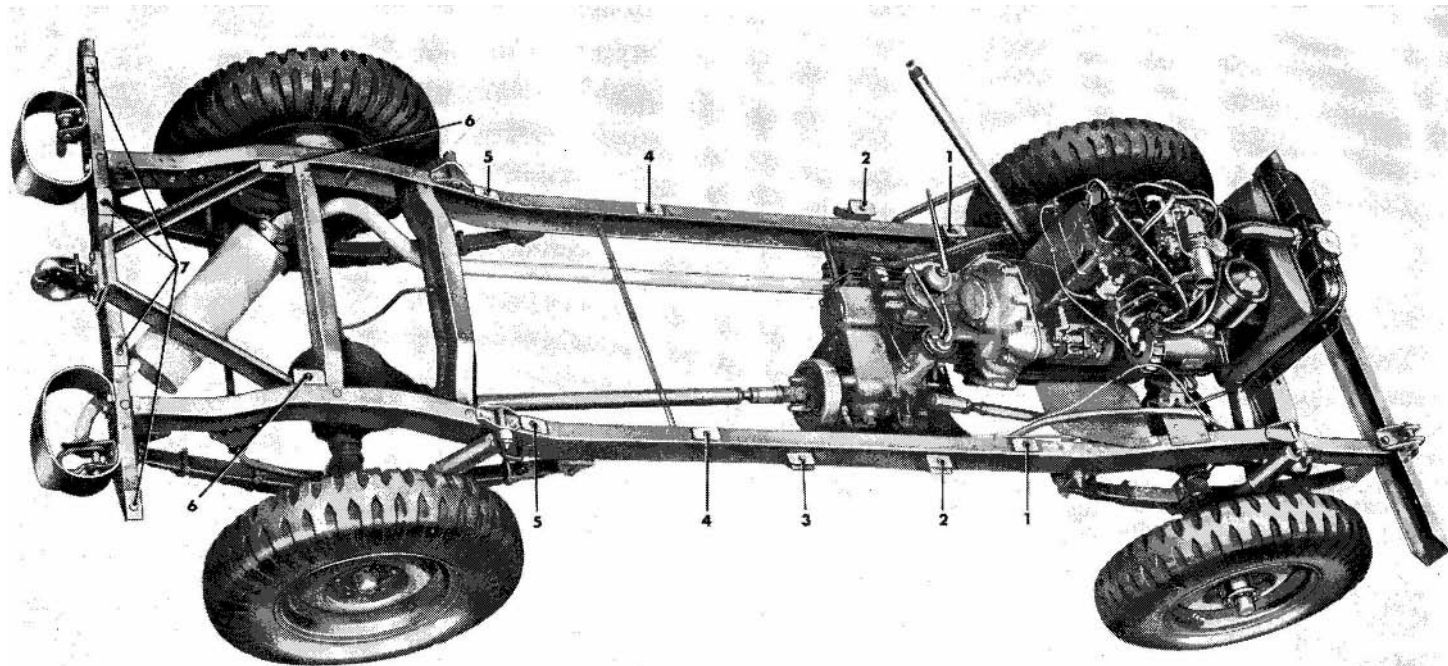


Figure 26.11. (Added) Body 81 11 liner positions and hold-down location points M170.

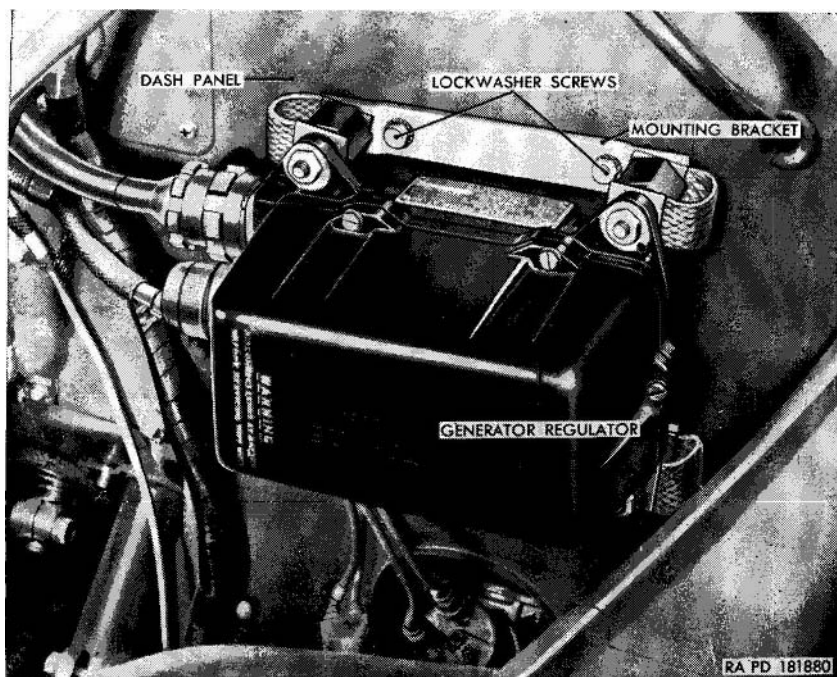
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- (6) *Lift body f i orraf Pannē.* Attach a suitable sling to dash panel as shown in figure 26.10. Raise front end of body until opening in front floor panel clears transmission gear shift lever, transfer gear shift levers, and steering gear jacket. Have two men lift rear of body while another pushes chassis out from under body. When chassis is clear of body, lower rear end of body to floor or suitable support. Then lower front end of body. Remove the nine body mounting bracket shims and six body mounting cushions (fig. 26.11).

#### **49. Remove Generator Regulator Assembly M38A1** (fig. 27)

##### **49.1. Remove Generator Regulator Assembly M170** (fig. 27.1) (Added)

Remove four lockwasher screws securing the generator regulator and mounting brackets to the dash panel and remove the regulator and brackets from the dash panel.



*Figure 27.1. (Added) Generator regulator assembly 11170—installed.*

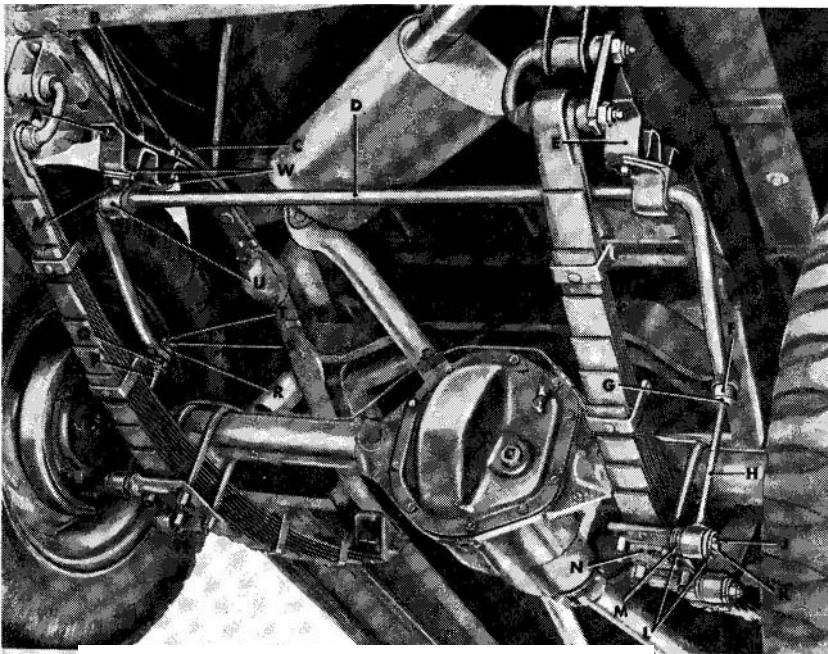
## 57.1. Remove Stabilizer Bars, Brackets, and Links M170

(Added)

*Note.* The key letters noted in parentheses are in figure 40.1.

### a. Bar (Rear).

- (1) Remove the cotter pin (5) and nut (T) at the upper end of the links (H and P) on the right and the left side of the vehicle.
- (2) Remove the cup shaped washer (R) and the link grommet (Q) from the links (H and P).
- (3) Swing the stabilizer bar (D) up and off the links and remove the grommet (F) and cup shaped washer ( ) from the links.
- (4) Remove the four nuts (W), lockwashers, and bolts (V) securing the bracket (U) of the bar assembly to the bracket-to-frame bracket (E), and remove the bar assembly from the vehicle.



A—BOLT  
B—NUT  
C—FRAME SIDE RAIL  
D—STABILIZER BAR  
E—BRACKET-TO-FRAME BRACKET  
F—GROMMET  
G—WASHER  
H—LINK  
J—COTTER PIN  
K—LINK SHAFT  
L—FLAT WASHER

M—BUSHING  
N—"U" BOLT PLATE  
P—LINK  
Q—GROMMET  
R—WASHER  
S—COTTER PIN  
T—NUT  
U—BRACKET  
V—BOLT  
W—NUT

RA PD 1819/7A

Figure 40.1 Stabilize bar, brackets, and link 31170-rear.

b. *Frame Bracket (Rear)*. Remove the six nuts (B), lockwashers, and bolts (A) securing the bracket-to-frame brackets (E) to the frame side rail (C), and remove the brackets from the vehicle.

c. *Links*. Remove the cotter pin (J) and one flat washer (L) from the link shaft (K) of the U-bolt plate (N), and slide the link (H) with the bushing (M) off the link shaft (K). Remove other flat washer (L).

d. *Bat (Front)*. The procedure for removing the front stabilizer bar is the same as that for removing the rear (a above), except that the brackets of the bar are mounted directly to the frame side rail.

## 58.1. Remove Front and Rear Springs and Axle Assemblies

### M170

(Added)

#### a. *Spring Shackles Removal* (fig. 41.1).

- (1) Remove the lock nut and the flat washer securing the lower end of the shock absorber (fig. 40) to the U-bolt plate. Pull the lower end of the shock absorber and the two mounting pin bushings off the shaft of the U-bolt plate. Remove the two bushings out of the eye of the shock absorber.
- (2) Disconnect stabilizer link from stabilizer bar (par. 57.1 a (1) and (2)).
- (3) Raise the frame of the vehicle until both tires clear the ground. Using safety stands or suitable blocking, support the weight of the vehicle. Place a jack under the axle hous-

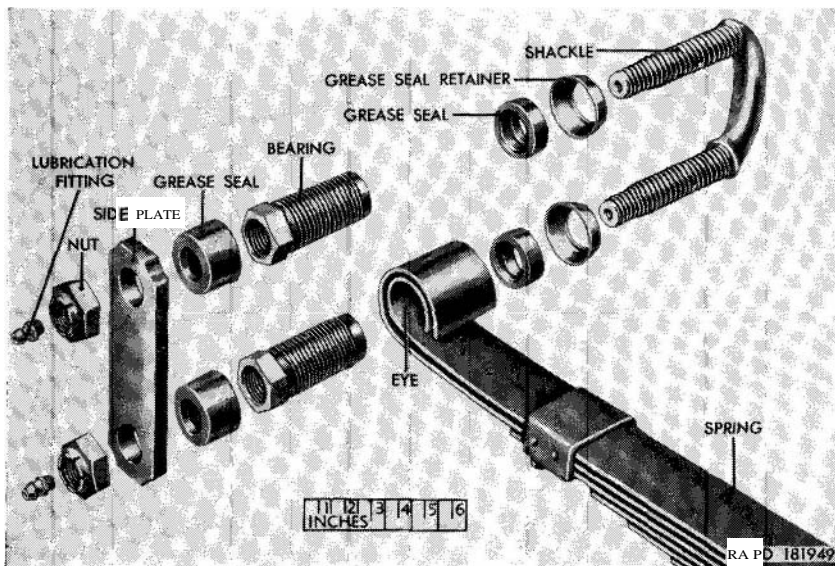


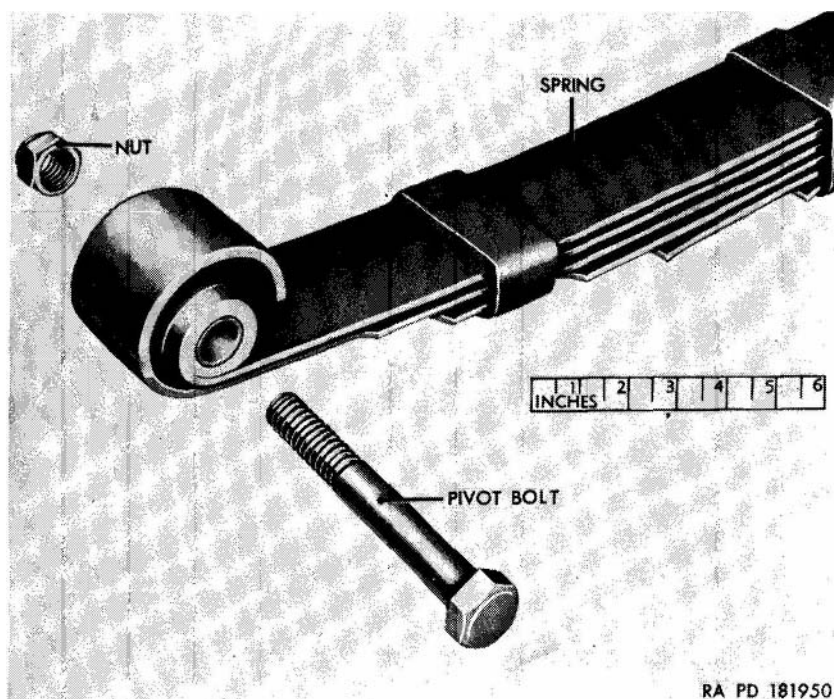
Figure 41.1. (Added) Spring shackle and spring shackle end of spring M170—exploded

ing and adjust the height of the jacks as necessary to take the tension off the spring.

- (4) Remove the nuts securing the side plate to the spring shackle and remove the plate and grease seals. Unscrew and remove the bushing-type shackle bearing front the shackle, spring eye, and frame side rail.
- (5) Pull the spring shackle, with the grease seals and grease seal retainers, from the eye of the spring assembly and frame side rail (for front spring) or spring bracket (for rear spring).
- (6) Slip the grease seals and the grease seal retainers off the shackle. Remove the lubrication fittings from the shackle.

*b. Pivot Bolts Removal (fig. 41.2).* Unscrew the safety nut from the pivot bolt. Withdraw the bolt from the spring bracket and bushing-type eye bearing in the spring eye.

*Note.* It may be necessary to drive the bolt out of the eye bearing with a suitable drift pin.



*Figure 41.2. (Added) Pivot bolt and pivot bolt end of spring M170—Exploded view.*

*c. Steering Bellerank Disconnection.* Remove the cotter pin, slotted nut (H, fig. 41), and tie rods from the steering bellerank assembly (J, fig. 41) when removing the front assemblies.

*d. Spring and Axle Assemblies Renzoral from Vehicle.* Remove the jack from the axle assembly and remove the spring, axle, brake, and drum and hub assemblies from the frame.

## **62. Install Front and Rear Springs and Axle Assemblies M38A1** (fig. 41)

### **62.1. Install Front and Rear Springs and Axle Assemblies M170** (Added)

*a. General.* Support the frame at a suitable height to offer working space for installation of spring and axle assemblies. Position the spring and axle assemblies under frame and support it on a jack.

*b. Pivot Bolts Installation* (fig. 41.2). Raise the axle and spring assemblies sufficiently to position the pivot bolt end of spring into pivot bolt bracket. Aline the hole in the spring and the bracket and install the pivot bolt. Install the safety nut on the bolt.

*Spring Shackle Installation* (fig. 41.1).

- (1) Slip a grease seal retainer and a grease seal in the order named over each of the threaded parts of the shackle. Start the small inside diameter of the retainers on the shackle.
- (2) Insert the ends of the shackle into the inner side of the spring assembly and the inner side of the frame rail (for front spring) or the spring bracket (for rear spring), and push the shackle in until *the* ends are almost protruding from the spring eye and frame side rail or spring bracket.
- (3) Insert the bushing-type shackle bearings into the spring eye and frame side rail or bracket, and start the bearings onto the shackle before the bearings start threading into the eye or frame side rail or spring bracket. Take up on both bearings equally until they are tight. Back off the lower bearing about one thirty-second of an inch ( $\frac{1}{3}$  of a turn).
- (4) Place a grease seal over the hex-head of each bearing. Slide the side plate over the ends of the shackle and secure with two nuts. Install the lubrication fittings in the end of the shackle.
- (5) Raise the axle assembly with the jack until the upper end of the link (H or P, fig. 40.1) between the U-bolt plate and the stabilizer bar (D, fig. 40.1) enters the hole in the end of the bar. Install a grommet (Q, fig. 40.1) and a washer (R, fig. 40.1) over the end of the link. Secure the link, grommet, and washer to the bar with a nut (T, fig. 40.1) and cotter pin (S, fig. 40.1).
- (6) Install one mounting pin bushing, with the taper facing out, on the shaft of the U-bolt plate (fig. 40). Install the lower end of the shock absorber assembly (fig. 40) on the shaft.

Install another mounting pin bushing, with the taper facing in, on the shaft. Seat the two bushings in the eye on the end of the shock absorber. Secure the shock absorber to the shaft with one  $\frac{1}{2}$ -inch ID flat washer and a  $\frac{7}{16}$ -inch lock nut. Tighten until a slight bulge is noted in the bushings.

- (7) Remove the safety stands, or blocking, and lower the vehicle to the ground.

### 63.1. Install Stabilizer Links, Brackets, and Bars M170

(Added)

*Note.* The key letters noted in parentheses are in figure 40.1.

*a. Links.* Install one flat washer (L) on the link shaft (K). Install the link (H or P) with the bushing (M) over the link shaft (K) of the U-bolt plate (N). Install other flat washer (L) over the link shaft and secure with a  $\frac{1}{8}$  x 1 cotter pin (J).

*b. Frame Bracket (Rear).* Position the bracket-to-frame brackets (E) on the frame side rails (C). Install three  $\frac{7}{16}$  x 1 bolt (A) through each bracket and the side rail and secure with a  $\frac{7}{16}$ -inch lock washer and  $\frac{7}{16}$ -inch nut (B).

*c. Bar (Rear).*

- (1) Position the brackets (U) of the stabilizer bar (D) on the bracket-to-frame brackets (E), and install two  $\frac{7}{16}$  x 1 bolts through the brackets on each side. Install a  $\frac{7}{16}$ -inch lock washer and  $\frac{7}{16}$ -inch nut on the bolts (V) securing the stabilizer bar (D) to the frame brackets.
- (2) Install a cup shaped washer (G) and a grommet (F) over the link (H or P) on each side.
- (3) Swing the bar down and slide the eyelet on each end of the bar over the links.
- (4) Install a grommet (Q) and cup shaped washer (R) over the end of each link.
- (5) Install a  $\frac{3}{8}$ -inch nut (T) on each link and tighten until a slight bulge appears in the grommets and the slot in the nut is aligned with the hole in the link ; and install a  $\frac{3}{32}$  x 1 cotter pin (S).

*d. Bar (Front).* The procedure for installing the front stabilizer bar is the same as the rear (c above) except that the brackets of the bar are mounted directly to the frame side rail.

### 71.1. Install Generator Regulator Assembly M170

(fig. 27.1)

(Added)

Position the generator regulator with the generator regulator mounting brackets on the dash panel and secure with four  $\frac{1}{4}$  x lockwasher screws.



## 72. Install Body on Frame

a. (Superseded) *Attach Sling to Body*. Attach a suitable sling to dash panel as illustrated in figures 25 and 26.10.

b. *Install Body Mounting Cushions and Mounting Bracket Shims M38A1* (fig. 26).

b.1. (Added) *Install Body Sill Liners M170* (fig. 26.11). Cement new body sill liners (thick) at positions 1, 3, and 5. Cement new body sill liners (thin) at positions 2, 4, 6, and 7.

c. *Install Body on Frame M38A1* (fig. 25).

\* \* \* \* \*

c.1. (Added) *Position Body on Frame M170* (fig. 26.10). Raise front of body with sling. Have two men lift rear of body while another pushes chassis under body. Rest rear of body on frame and lower front end of body making sure the opening in the front floor pan cover clears the transmission gear shift lever, transfer gear shift levers, and steering gear jacket.

d. *Connect Body to Frame M38A1*.

\* \* \* \* \*

di. (Added) *Connect Body to Frame M170* (fig. 26.11).

(1) *Install body holddown bolts right and left side.*

(a) Place a  $\frac{3}{8}$ -inch flat washer over a  $\frac{3}{8} \times 2$  bolt and insert the bolt through the front cover floor pan and the No. 2 location point. Install a  $\frac{3}{8}$ -inch flat washer and  $\frac{3}{8}$ -inch lock nut on the bolt.

(b) Place a  $\frac{3}{8}$ -inch flat washer over a  $\frac{3}{8} \times 2$  bolt and insert the bolt through the body and the No. 3 location point from the inside of the tool compartment. Install a  $\frac{3}{8}$ -inch flat washer and  $\frac{3}{8}$ -inch lock nut on the bolt.

(c) Place a  $\frac{3}{8}$ -inch flat washer over a  $\frac{3}{8} \times 1\frac{1}{4}$  bolt and insert the bolt through the sill of the body and the No. 4 location point from under the vehicle. Install a  $\frac{3}{8}$ -inch flat washer and  $\frac{3}{8}$ -inch lock nut on the bolt.

(d) Place a  $\frac{3}{8}$ -inch flat washer over a  $\frac{3}{8} \times 1\frac{1}{4}$  bolt and insert the bolt through the sill of the body and the No. 5 location point from under the vehicle. Install a  $\frac{3}{8}$ -inch flat washer and  $\frac{3}{8}$ -inch lock nut on the bolt.

(e) Insert a  $\frac{5}{16} \times 1\frac{1}{2}$  step bolt through the body rear floor pan and the No. 6 location point. Install a  $\frac{5}{16}$ -inch flat washer and  $\frac{5}{16}$ -inch lock nut on the bolt.

(2) *Install body holddown bolts in rear cross member.* Place a  $\frac{5}{16}$ -inch flat washer over a  $\frac{5}{16} \times \frac{7}{8}$  bolt and insert the bolt through the body sill and the No. 7 location from under the vehicle. Install a  $\frac{5}{16}$ -inch flat washer and  $\frac{5}{16}$ -inch lock nut on the bolt.

(3) *Make connections under body.*

- (a) Secure the four connectors of the trailer receptacle cables to the body with a bolt and nut (*fig. 26.7*).
- (b) Connect the three connectors of the cables for the service tail and stoplight (*fig. 26.7*).
- (c) Position the taillight and trailer connection guard under the wheel house and secure with a  $1/4 \times \%$  **lockwasher** screw through the bracket on the outer edge of the guard and to the outer panel of the wheel house.
- (d) Insert and start two  $1/4 \times 5/8$  lockwasher screws through the inner panel of the wheel house (*fig. 158.1*) and into the welded nuts of the guard.
- (e) Insert and start two  $1/4 \times 5/8$  lockwasher screws through the wheel house (*fig. 158.1*) and into the welded nuts of the guard.
- (f) Tighten the screws.
- (g) Connect the two connectors of the blackout tail and stoplight cables at the right side of the vehicle (*fig. 26.6*). Place the cables under the clip on the mounting bracket.
- (h) Position the yoke of the hand brake cable on the hand brake lever (*fig. 26.8*), and secure with clevis pin and cotter pin.
- (i) Connect the fuel line (*fig. 26.9*) to the elbow. Secure the fuel line to the body sill with a clip and lockwasher screw.

## 73. Install Radiator Guard Assembly M38A1

(*fig. 16*)

\* \* \* \* \*

### 73.1. Install Radiator Guard Assembly M170

(Added)

a. Position the radiator guard assembly in front of the radiator, on the front fenders and the frame cross member.

b. Install three  $3/16$ -inch flat washers and  $3/16 \times 7/8$  screws on each side of the vehicle securing the radiator guard to the front fenders.

c. Install two bolts on each side of the radiator into the J nuts (*fig. 16.1*).

d. Position the front of the two tie rods (*hg. 16.2*) on each side of the vehicle in the slots in the deflector. Tighten the nuts on the ends of the tie rods.

e. Connect the headlight and the blackout marker and parking light cables (C, *fig. 15*).

74. Install Fenders M38A1

(fig. 15)

\* \*

74.1. Install Fenders M170

(Added)

Follow procedure in paragraph 74 except *a (1)*.

75. Install Spare Wheel and Tire Assembly M38A1

(fig. 14)

\*

75.1 Install Spare Wheel and Tire Assembly M170

(fig. 14.1)

(Added)

Position the spare wheel and tire assembly in the spare wheel well on the right side of the vehicle. Install the bolt and plate securing the spare wheel to the spare wheel support bracket (fig. 162.1).

76. Install Batteries

(fig. 13)

\* \* \* \* \*

*h.* (Added) Install cowl batteries box lid M170 (fig. 13.1). Hook the cover into the footman loop on the cowl. Lower the cover and secure with clamp.

184. Description

\* \* \* \* \*

*c.* (Superseded) *Hand brake.* The mechanical hand brake system is independent of the hydraulic service brake system. The hand brake serves primarily as a parking brake but can also be used to slow or stop the vehicle should the service brakes fail. When the brake is applied, an inner and outer shoe (fig. 143.1) contacts a brake drum mounted on the transfer companion flange. Drag on the drum slows or prevents rotation of the flange and rear propeller shaft, to slow or stop the vehicle. The hand brake handle is at the right of the driver's seat as shown in figure 142 for the M38A1 and figure 142.1 for the M170. The hand brake handle of the M170 is mounted to avoid interference with a patient on the lower litter rack. Difference in linkage can be seen by comparing figures 143 and 143.1.

190. Disassembly M38A1

\* \* \*

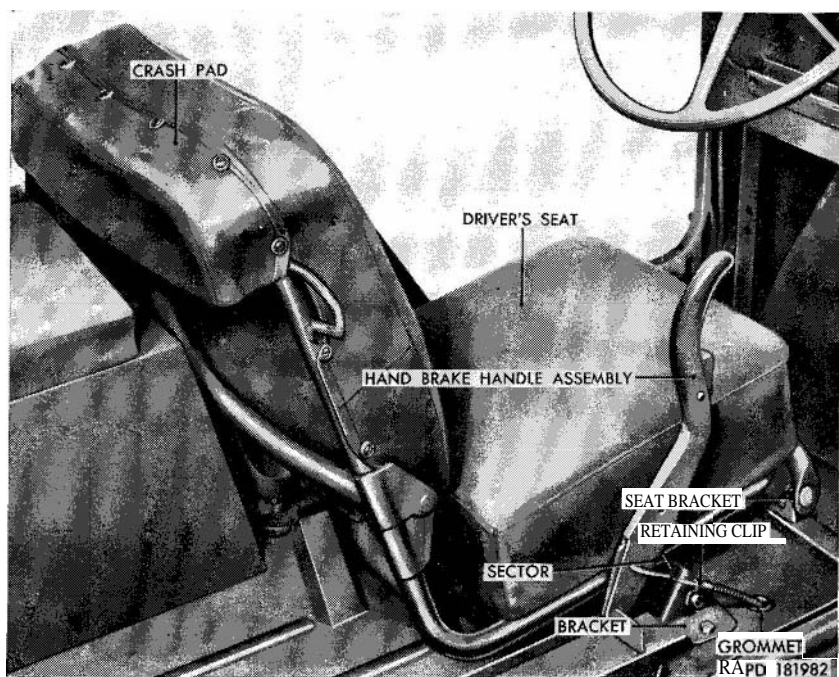


Figure 142.1. (Added) Hand Brake Handle and Driver's Seat Assemblies 1117 Installed.

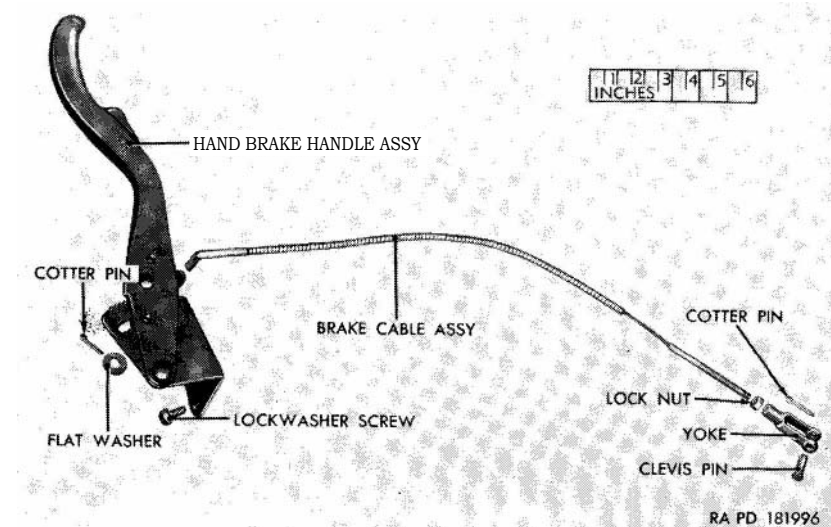


Figure 143.1. (Added) Hand Brake Assembly M170—Partially Exploded View.

## 1 90.1. Disassembly M170

( Added )

### a. Remove Brake Cable Assembly.

- (1) Remove cotter pin and flat washer from cable assembly end (fig. 143.1) in driver's compartment. Remove grommet (fig. 142.1) from floor pan. Remove lockwasher screw from cable housing retaining clip (fig. 142.1). Spread clip and remove from cable housing.
- (2) Remove hand brake cable tension spring (fig. 26.8) from the the skid plate and the cotter pin in the cable from underside of vehicle. Remove cotter pin from clevis pin and remove pin from yoke and hand brake lever. Remove lockwasher screw from cable housing clamp (fig. 26.8) at rear of transfer. Remove grommet (fig. 26.8) from floor pan. Remove cable from the vehicle.

### b. Remove Hand Brake Handle Assembly (fig. 142.1).

- (1) Remove the cotter pin and flat washer securing the brake cable to the hand brake handle assembly and remove the cable from the handle.
- (2) Remove the three lockwasher screws securing the sector of the brake handle assembly to the bracket on the floor pan cover and remove the assembly from the vehicle.

c. *Remove Brake Drum, Operating Lever, and Inner and Outer Shoe Assemblies* (fig. 143). Refer to paragraph 111 and 117 for removal procedures.

d. *Disassembly.* It is not necessary to disassemble the brake and brake cable assemblies unless inspection (par. 191) reveals them to be unserviceable.

- (1) *Brake cable assembly.* Loosen yoke lock nut (fig. 143.1). Unscrew the yoke from the cable assembly.
- (2) *Hand brake handle assembly.* Procedure for disassembly of the hand brake handle assembly M170 is the same as that for the M38A1 (par. 190d (2) ).

## 1 91. Inspection and Repair

### a. Inspection.

- (6) *Brake rod and retracting spring M38A1* (fig. 143). Replace a broken \* \* \* its intended manner.
- (6.1) (Added) *Brake cable assembly M 170* (fig. 143.1). Replace a broken, frayed, or kinked brake cable assembly.
- (7) *Rod adjusting yoke M38A 1* (fig. 143). Replace a broken or otherwise damaged rod adjusting yoke (H).

(7.1) (Added) *Cable adjusting yoke M170* (fig. 143.1). Replace a broken or otherwise damaged cable adjusting yoke.

192. Assembly

\*

b.1. (Added) *Assemble Brake Cable Assembly M170* (fig. 143.1). Install yoke lock nut on threaded end of cable.

\* \* \* \* \*

c.1. (Added) *Install Hand Brake Handle Assembly M170* ( fig. 142.1). Position the sector of the brake handle assembly on the bracket on the floor pan cover. Install the three lockwasher screws securing the brake handle assembly to the bracket.

\* \* \* \* \*

d.1. (Added) *Install Brake Cable Assembly M170*.

- (1) Push brake cable up through holes in floor pans (fig. 26.8) with the yoke end down. Install retaining clip on cable housing (fig. 142.1). Position clamp (fig. 26.8) at rear of transfer and install lockwasher screw. Install clevis pin in yoke and hand brake lever (fig. 26.8) and secure with cotter pin. Install the cotter pin (fig. 26.8) in the cable assembly. Connect. the tension spring to the skid plate and cotter pin in the cable. Install grommet in floor pan.
- (2) Insert the upper end of the brake cable assembly in the brake handle assembly and secure with a flat washer and cotter pin (fig. 142.1).
- (3) Insert a lockwasher screw (fig. 142.1) in the retaining clip and install the screw in the bracket.

\* \* \* \* \*

194. Description

a. *Springs M38A1*.

\* \* \* \* \*

a.1. (Added) *Springs M170*. Both the front and rear spring assemblies are of the semi-elliptic-type with wrapped eyes on the two top leaves. The front spring (fig. 145.1) is a 10 leaf spring and the rear spring is an 11 leaf spring. One center bolt and four rebound clips secure the spring leaves of each spring assembly. Each spring assembly is suspended lengthwise from the frame by a shackle at the rear and a pivot bolt at the front. The pivot bolts ride in bushing-type eye bearings while the shackles are mounted in internally and externally threaded bushing-type shackle bearings. U bolts and U-bolt plates secure each spring assembly to its respective axle.

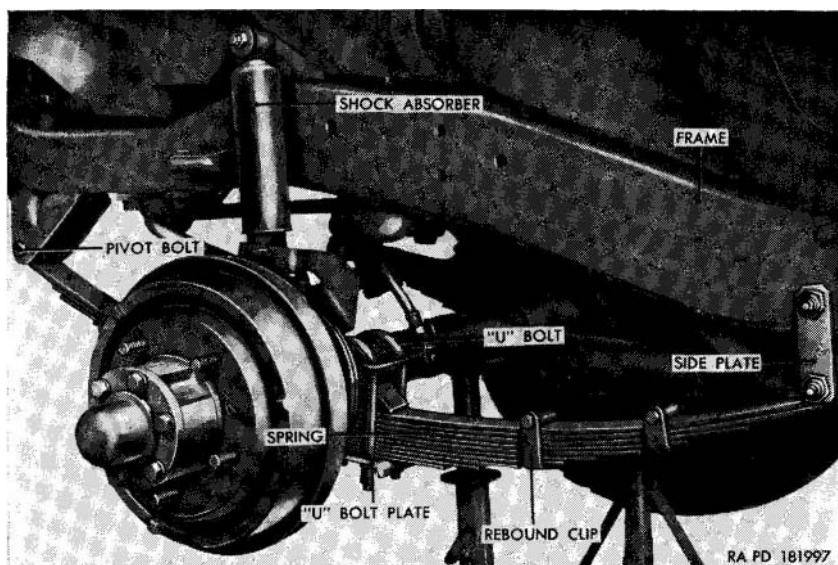


Figure 145.1. (Added) Front spring and shock absorber M170—installed.

## 195. Data

### a. Front Springs **M38A1**.

(Added) Front Springs **M170**.

Manufacturer	-----	Mather Spring Co.
Number of leaves	-----	10
Length (center of spring eyes, arched)	-----	39 1/2 in.
Rebound clips	-----	4

### b. Rear Springs **M38A1**.

h.1. (Added) Rear Springs **M170**.

Manufacturer	-----	Mather Spring Co.
Number of leaves	-----	11
Length (center of spring eyes, arched)	-----	46 in.
Rebound clips	-----	4

### e. Shock Absorbers **M38A1**.

\* \* \* \* \*

c.1. (Added) Shock Absorbers **M170**.

Manufacturer	-----	Monroe
Type	-----	double action, hydraulic
Collapsed length :		
Front	-----	11.44 in.
Rear	-----	11.94 in.
Extended length :		
Front	-----	18.44 in.
Rear	-----	19.44 in.

196. Disassembly

a. *Springs* (figs. 145 and 146).

\* \* \*

(2) *Remove rebound clips.* Remove rebound clip nut, spacer, and bolt securing each of the six rebound clips **on the M38A1 and four rebound clips on the M170.** Remove the spring leaves.

198. Assembly

a. *Springs* (figs. 145 and 146) .

\* \* \* \* \*

(2) *Secure rebound clips.* Secure each of the six rebound clips **on the M38A1 or four rebound clips on the M170** with a rebound clip spacer,  $\frac{7}{16}$ -24 NF-2 x 21½ bolt, and nut. Peen ends of rebound clip bolts.

\* \* \* \* \*

215. Description

(fig. 158)

a. *General M38A1.*

\* \* \* \* \*

a.1. (Added) *General M170.* The all steel, open-type body (fig. 158.1) of the ambulance is of seamed and welded construction. The body is equipped with a driver's seat (fig. 142.1), front passenger seat, and wheel house cushions (fig. 158.2), tool compartment, two medical supplies stowage compartments, battery stowage box, and bows for the installation of the top cover, side curtains, and doors. A well in front of the right wheel house provides for mounting the spare wheel and tire inside the body. A two-piece, folding-type windshield, with two windshield wiper vacuum motors, is secured to the body cowl. The formed sheetmetal hood and front fenders are removable. Access to the rear of the engine compartment, transmission, transfer, master cylinder and steering gear is provided by removable front floor pan covers and access plates. Reflex reflectors are bolted to the rear and sides of the body.

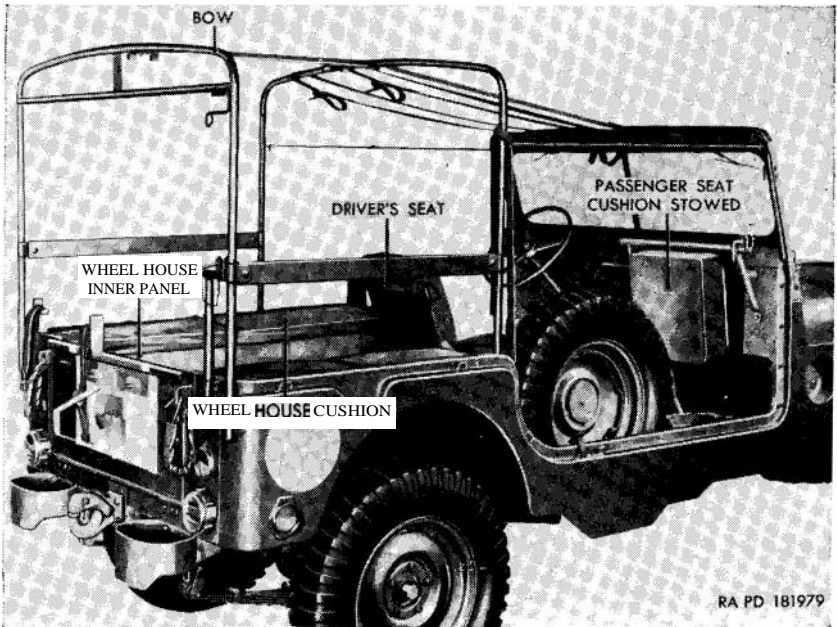
\* \* \* \* \*

c. *Seat Assemblies M38A1.*

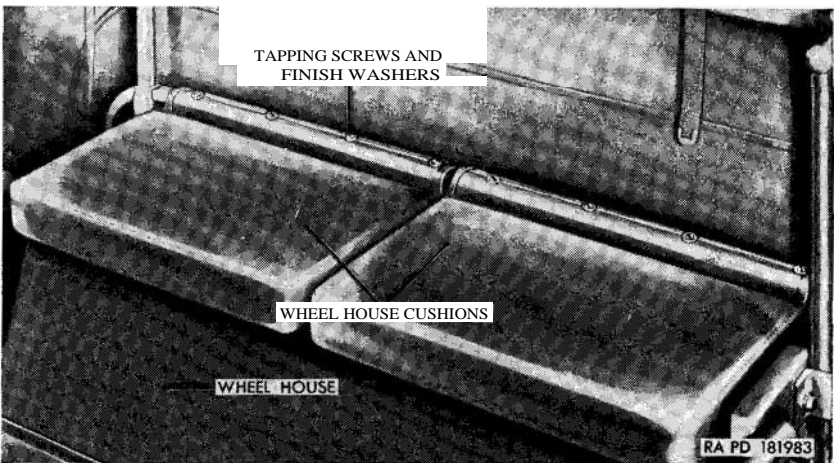
\* \* \* \* \*

d. (Added) *Seat Assemblies M170.* The vehicle is equipped with a driver's seat, a front passenger seat (fig. 158.1), and four wheel house cushions (fig. 158.2) that serve as seats for rear passengers. The rear of the driver's seat is equipped with the driver's seat frame crash pad and cover (fig. 142.1).





*Figure 158.1. (Added) Body 3/4-ton 4 4 front line ambulance M170*



*Figure 158.2. (Added) Right wheel house cushions M170—installed.*

## 216. Data M38A1

\*

\*

\*

216.1. Data M170

(Added)

Type -----	all steel, open
Construction -----	welded
Type of steel -----	No. 18 gage
Width (edge of reflex reflectors) -----	60½ in.
Length (to inside of dash panel) -----	88% in.

217. General

\* \* \* \* \*

b. Preliminary Instructions M38A1.

\* \*

b.1. (Added) Preliminary Instruction. M170. Disassembly instructions included in this chapter cover major items. Removal instructions for seat and fuel tank assemblies are covered in paragraph 220.1 for the seats, and paragraph 220.3 for the fuel tank. Refer to paragraph 48.1 for instructions relative to removal of body from vehicle. Paragraph 72 prescribes body installation instructions.

219. Remove Spare Wheel Support and Fuel Can Bracket Assemblies

a. Spare Wheel Support Bracket M38A1 (fig. 162).

\* \* \* \* \*

a.1. (Added) Spare Wheel Support Bracket M 170 (fig. 162.1). Remove the spare wheel and tire assembly (par. 45.1). Remove the three bolts securing the bracket to the lower floor pan cover, rear compartment floor pan cover, and medical supplies stowage compartment and remove bracket from vehicle.

220.1. Remove Seat Assemblies M170

(Added)

a. Front Seats. Tilt the seat forward until flat side of hinge pin is alined with slot in seat bracket (fig. 142.1) on floor pan cover, and lift seat out of bracket.

b. Wheel House Seats. Remove the four oval-head tapping screws and finish washers (fig. 158.2) that secure each of the two right wheel house cushions to the top of the right wheel house seat and remove cushions from within vehicle. Remove the five oval-head tapping screws and finish washers that secure each of the two left wheel house cushions to the top of the left wheel house seat and remove the cushions from the vehicle.

220.2. Remove Hand Brake Handle Assembly M170

(Added)

Refer to paragraph 190.1b.

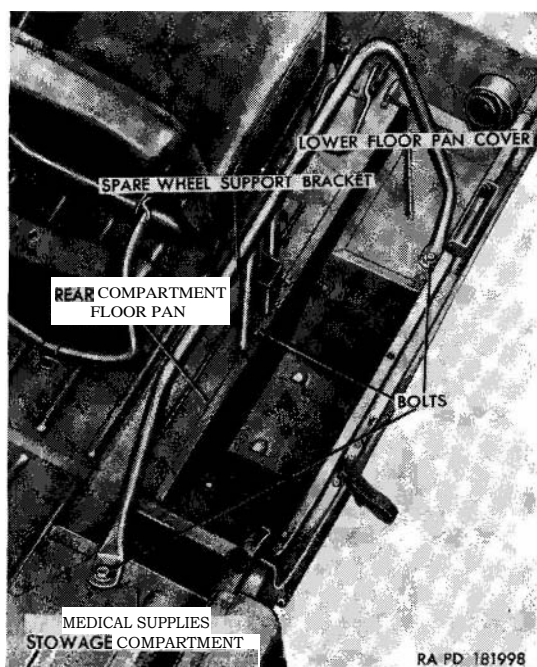


Figure 162.1. (Added) Spare wheel support bracket M170.

### 220.3. Remove Fuel Tank M170

(fig. 163.1)

(Added)

- a. Place a suitable container under the fuel tank. Remove the drain plug from the bottom of the tank and drain the fuel.
- b. Tilt the driver's seat forward and remove from vehicle.
- c. Unscrew the seven lockwasher screws securing the fuel tank units access plate to the floor of the vehicle.
- d. Unscrew the fuel line nut.
- e. Disconnect the cable bayonet connector from the fuel level sending unit.
- f. Place a stand or blocking under the tank making certain that such stand or blocking clears the fuel tank support strap.
- g. Remove the four nuts and flat washers from the studs on the fuel tank support strap attaching brackets at each end of the fuel tank, and remove the two fuel tank shields and support straps.
- h. Remove the stands or blocking and remove the tank from the vehicle.

### 223. Seat Assemblies

a. *Disassembly.*

\*

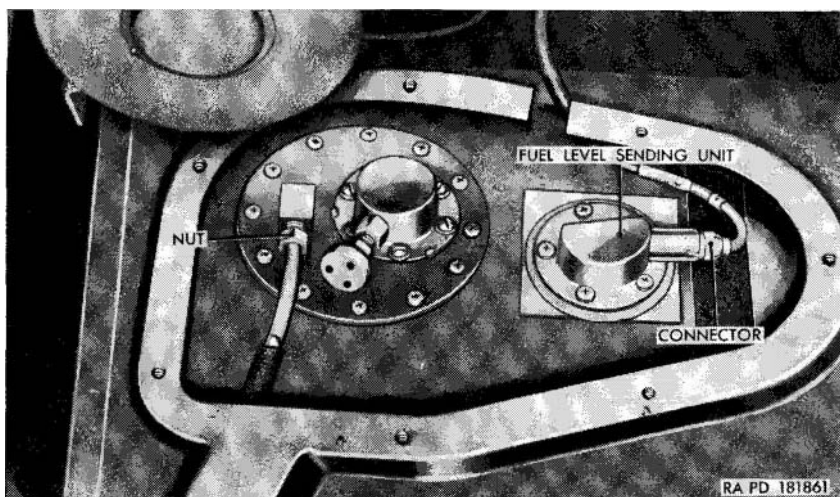


Figure 163.1. Fuel tank, fuel filter, and fuel level sending unit M170—installed—driver's seat and fuel tank units access plate—removed.

(1) Front seats **M38A1**.

(1.1) (Added) Front seats M170.

- (a) Remove the sheet metal screws securing the seat cushions, seat backs, and crash pads to the seat frames.
- (b) Remove the coverings from the cushions, backs, and crash pads. Remove the padding and springs.

\* \* \* \* \*

e. Assembly.

(1) Front seats M38A1.

- (1.1) (Added) Front seats M170. Install the padding and springs on the inside of the coverings for the cushions, backs, and crash pads. Position the cushions, backs, and crash pads on the seat frames and secure with sheet metal screws.

## 224. Fuel Tank Assembly

(fig. 172)

a. *Disassembly*. It is not necessary to disassemble fuel tank unless inspection (b below) reveals damage. Refer to TM 9-804A for removal of fuel tank from body **on the M38A1 or paragraph 220.3 on the M170**.

\* \* \* \* \*

c. Assembly.

(4) *Install fuel tank in vehicle.* Refer to TM 9-804A **on the M38A1** or paragraph 227.1 **on the M170.**

## **226. Install Spare Wheel Support and Fuel Can Bracket Assemblies**

*a. Spare Wheel Support Bracket M38A1* (fig. 162).

\* \* \* \* \*

*a.1. (Added) Spare Wheel Support Bracket 111170* (fig. 162.1).

Position the spare wheel support bracket in the right side of the body to the rear of the passenger seat and secure with three bolts to the body.

### **226.1. Install Seat Assemblies M170**

(Added)

*a. Front Seats.* Position the hinge pins on the seats over the seat brackets (fig. 142.1) on the front floor pan cover. Tilt the seat forward until the flat side of the hinge pin is alined with the slot in the bracket. Install the pin in the bracket and tilt the seat to the rear of the vehicle.

*b. Wheel House Seats.* Position the two left wheel house seat cushions (fig. 158.2) in the vehicle and install the five oval-head tapping screws and finish washers in each cushion securing the cushions to the vehicle. Position the two right wheel house seat cushions in the vehicle and install four oval-head screws and washers in each cushion.

### **227.1. Install Fuel Tank M170**

(Added)

*a.* Install new antisqueak strips to top of tank with adequate adhesive.

*b.* Raise the tank between the fuel tank support strap attaching brackets and support the tank with stands or suitable blocking. Make certain the fuel tank support straps will clear stands or blocking when being installed.

**Caution:** Make sure fuel line and fuel level sending unit cable are accessible through the fuel tank units access plate opening and are free from binding.

*c.* Install the two fuel tank support straps and one tank shield on the fuel tank support bracket studs at one end of the fuel tank and start. *a.  $\frac{3}{8}$ -inch* nut with washer on the studs. Repeat the procedure at the opposite end of the tank and tighten all four nuts evenly.

*d.* Remove the stands or blocking.

*e.* *Install* the drain plug in the bottom of the tank.

*f.* Connect the bayonet connector of the fuel level sending unit cable to the sending unit (fig. 163.1).

- g. Install the fuel line nut to the fuel filter assembly (fig. 162.1).
- h. Position the fuel tank units access plate over the opening in the floor pan and secure with seven 1/4 x 1/2 **lockwasher** screws.
- i. Install the driver's seat by tilting seat forward until pin on seat frame will slide into brackets on the floor of the vehicle. Then tilt seat to the rear of the vehicle.

### 228. Description

\*

*b. Fenders* (figs. 174 and 175). Both front fenders are similar in design and construction. They are secured to the body, radiator guard assembly, and frame on the M38A1 in an identical manner. **On the M170 the fender-to-frame bracket has been removed and the fender is not secured to the frame.** The left front fender, however, mounts the blackout driving light and guard, horn, and clips for securing the vehicle wiring harness and fuel line.

### 236. Description

(fig. 177)

\*                   \*                   \*                   \*

*b. Radiator Guard With Hinges and flood Liner* **M38A1.**

\*                   \*                   \*                   \*                   \*                   \*                   \*

*c. (Added) Radiator Guard With Hood Liner M170* (fig. 177.1). The radiator guard is of stamped and welded construction. It is provided with recess-type housings for mounting the service headlights and signal blackout marker and service parking lights (fig. 177.1). The single bolt, washers, and nut (*fig. 16.3*) secure the radiator guard to the frame. On each side, at the top of the radiator guard, are tie rods (fig. 16.2) connecting the radiator guard to the cowl. Two bolts (fig. 16.1) on each side of the radiator secure the deflector of the guard assembly to the radiator. The hood liner (fig. 16.2) is attached to the upper edge of the guard with split rivets.

### 237. Data

\*                   \*                   \*

*b. Radiator Guard With Hinges and Hood Liner* **M38A1.**

\*                   \*                   \*                   \*                   \*                   \*                   \*

*c. (Added) Radiator Guard With, Hood Liner M170.*

Width (across service headlight recesses) -----	39 in.
Height -----	20 1/8 in.
Depth -----	8 in.

### 241. Disassembly M38A1

(fig. 177)

\*                   \*                   \*                   \*                   \*                   \*                   \*

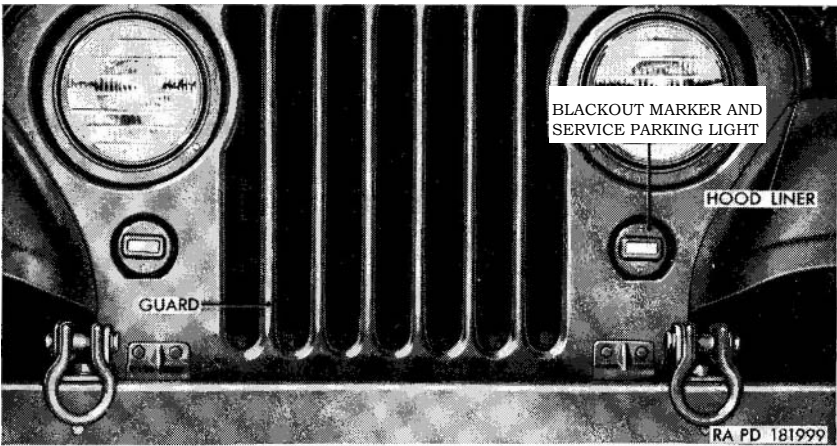


Figure 177.1. (Added) Radiator guard with hood liner 11170.

**241.1. Disassembly M170**

(Added)

Disassembly procedure for the M170 is the same as that for the M38A1 (par. 241) except that *b* and *e* are omitted.

**242. Inspection and Repair M38A1**

**242.1. Inspection and Repair M170**

(Added)

Inspection and repair procedures for the M170 are the same as for the M38A1 (par. 242) except that *a* (3) and (4) and *b* (2) are omitted.

**243. Assembly M38A1**

(fig. 177)

\* \* \* \* \*

**243.1 Assembly M170**

(Added)

Assembly procedure for the M170 is the same as that for the M38A1 (par. 243) except that *e* and *d* are omitted.

**244. Description**

*a. Frame M38A1* (fig. 178) .

\* \* \* \* \*

*a.1. (Added) Frame M170.* The frame is constructed of two heavy channel steel side rails and five cross members . The side rails and cross members are reinforced with welded plates. Two rear reinforcements of a V-shaped design are welded to the side rails and rear cross member. All cross members, except engine rear support cross member,

are welded to the side rails. A stabilizer bar is mounted at the front and the rear of the frame to reduce swaying. Two front lifting shackles and a bumper bar are mounted on the front of the frame. A towing pintle, two rear lifting shackles, and two bumperettes are mounted on the rear of the frame. Brackets and supports provide mounts for the engine, body, shock absorbers, springs, and stabilizer bars.

245. Data M38A1

245.1. Data M170

( Added)

Material -----	Steel, SAE 950
Length (overall) -----	148.44 in.
Width (outside edges of side rails) -----	29.25 in.
Number of cross members -----	5
Distance between right and left front holdddown brackets -----	31.50 in.
Distance from center line of frame to center line of holdddown bracket.	10.063 in.

[AG 451.2 (9 Aug 54) ]

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Log Comd (3)	Mil Msn (1)
MDW (1)	units organized under following T/O
Armies (3)	& E's:
Corps (2)	9-12A, Hq & Hq Co, Maint & Sup Gp
Div (2)	Ammo (1)
Ord Gp (2)	9-17, Amino Co, Army (1)
Ord Bn (2)	9-45A, Sp Wpns Spt or Depot Bn (1)
Ord Co (2)	9-40A, Hq & Hq Det, Sp Wpns Spt or
Ft & Cp (2)	Depot En (1)
Gen & Br Svc Sch (2)	9-47A, Sp Wpns Spt or Depot Co (1)
Ord Sch (50)	9-49, Sp Wpns Dir Spt Co (1)
PMST Ord ROTC units (1)	9-57A, Fld Sup Co (1)
Gen Depots (2)	9-227, GM Dir Spt Co (1)
Ord Sec, Gen Depots (10)	9-347A, Tire Rep Co (1)
Ord Depots (10)	9-367, Sup Depot Co (1)
POE (2)	9-387, Ammo Depot Co (1)

**NG:** Same as active Army except allowance is one copy for each unit.

**USAR:** None.

Unless otherwise noted, distribution applies to ConUS and overseas.

For explanation of abbreviations used, see SR 320-50-1.

DEPARTMENT OF THE ARMY TECHNICAL MANUAL  
DEPARTMENT OF THE AIR FORCE TECHNICAL ORDER

POWER TRAIN, BODY, AND FRAME  
FOR **¼-TON** 4 x 4 UTILITY TRUCK M38A1 AND  
**¼-TON** 4 x 4 FRONT LINE AMBULANCE M170

**TM** 9-8015-2                      DEPARTMENTS OF THE ARMY  
TO 36Y23-3-12                      AND THE AIR FORCE  
CHANGES No. 2                      WASHINGTON 25, D. C., 15 April 1955

TM 9-8015-2/TO 19-75CAJ-5, 2 August 1954, is changed as follows :

44. Remove Batteries  
(fig. 13)

**Caution:** Exercise extreme caution \* \* \* the 24-volt system.

\*

e. Remove four front **holddown** frame nuts (J). Lift the two **holddown** frames (E) from batteries. Remove the two batteries (K).

**Caution:** (Added) : Do not use a lifting strap which fastens to battery posts as damage to battery will result.

\*                      \*                      \*                      \*                      \*

**48. Remove Body** From Frame M38A1

a. *Make Disconnects at Right Side of Engine (fig. 17).*

\*

(2) (Superseded) *Disconnect distributor to ignition switch cable.* Unscrew electrical cable coupling nut (H) at distributor with coil assembly (G) and disconnect cable to ignition switch (circuit number 12) from distributor with coil assembly,

\*

(4) (Superseded) *Disconnect generator regulator cable.* Unscrew small cable connector coupling nut (M) at front

of generator regulator assembly. Disconnect the cable connection. Pull wiring harness (N) free of open clip (P). Disconnect cable at generator and remove cable.

\* \* \* \* \*

*b. Make Disconnects at Left Side of Engine.*

\* \* \* \* \*

- (4) *Disconnect master brake cylinder vent line (fig. 18).*  
Disconnect master brake cylinder vent line (L). Remove lockwasher screw (M) and pull master brake cylinder vent line-to-dash clip (N) away from dash panel.  
**Remove vent line.**

\*

*c. Make Disconnects Inside of Driver's Compartment.*

\* \* \*

- (11) *Remove steering wheel.* Remove rubber horn button cap from steering wheel nut. Remove horn disk button. Remove steering wheel nut and remove steering wheel with suitable puller.

**49. Remove Generator Regulator Assembly M38A1 and Support Plate** (fig. 27)

Remove four lockwashers screws (A). Remove generator regulator assembly (B) and mounting bracket from support. **Remove one lockwasher screw and remove support plate.**

**50. Remove Muffler, Exhaust Pipe, and Exhaust Pipe Extension** (fig. 28)

\*

*c. (Added) Remove Exhaust Pipe.* Remove two bolts securing exhaust pipe to manifold. Remove exhaust pipe and gasket. Discard gasket.

**64. Install Master Cylinder, Brake Lines, Control Lever, Brake Pedal, and Clutch Pedal**

*a. Install Master Cylinder Assembly and Brake Lines.*

*Note.* The key letters noted in parentheses are in figure 38, except where otherwise indicated.

- (2) *Install rear tee to rear wheel lines and rear axle tee to master cylinder flexible line.* Install closed clip (Z) on the rear tee to right rear wheel cylinder line (Y). Con-

nett the rear tee to right rear wheel cylinder line (Y), to the rear axle tee (X), and to right wheel cylinder. Secure closed clip (Z) to axle With one  $\frac{5}{16}$ -18NC-2 x lockwasher bolt (AA). Connect the rear tee to left rear wheel cylinder line (W), to rear axle tee (X), and to left rear wheel cylinder. Secure rear tee \* \* \* rear axle tee (X).

\* \* \* \*

- (9) *Install master cylinder assembly.* Position master cylinder assembly (D), shield assembly (E), and master cylinder tie bar (B) on frame left side rail. Install, but **do not tighten**, two  $\frac{1}{4}$ -24NF x 3 tie bar bolts and  $\frac{1}{8}$ -inch lockwashers (G). Install the  $\frac{1}{4}$ -20NF brake pedal master cylinder eyebolt (A). Connect brake lines (A and J, fig. 37) at outlet fitting (K, fig. 37).

*Note.* Servicing of brake system is covered in paragraph 79b.

\* \* \* \*

## 70. Install Muffler, Exhaust Pipe, and Exhaust Pipe Extension (fig. 28)

a. *Install Exhaust Pipe Extension.* Place new exhaust \* \* \* plain nut (J). Insert new flange gasket at manifold end of exhaust pipe, and secure with **one bolt and two nuts for stud and bolt.**

\* \* \* \*

## 71. Install Generator Regulator Assembly and Support Plate M38A1 (fig. 27)

Install support plate with **one** lockwasher screw. Secure mounting bracket and generator regulator assembly (B) to support with four 1/4-28NF-2A x  $\frac{3}{4}$  lockwasher screws (A).

## 72. Install Body on Frame

\* \* \* \*

b. *Install Body Mounting Cushions and Mounting Bracket Shims M38A1 (fig. 26).* Cement new thin body mounting cushion at number 2 holddown brackets, number 4 holddown brackets, number 5 holddown brackets, and at number 6 **holddown** brackets. Cement new thick \* \* \* **holddown** brackets.

\* \* \* \*

d. *Connect Body to Frame M38A1.* Refer to figure 22 for general location of body **holddown** brackets and other connect points at bottom of body. Figures 23 and 24 illustrate the points **in** detail.

\* \* \* \*

- (4) *Make connections at bottom of body (fig. 24).* Install the hand brake rod (**P**) through hole in body and secure it to the hand brake operating lever with  $\frac{3}{16}$ -inch clevis pin (**M**) and  $\frac{1}{8} \times \frac{3}{4}$  cotter pin (**Q**). **Install retracting spring (**N**).** Connect fuel tank-to-air cleaner vent line (**R**) to flared tube elbow (**U**). Connect fuel line (**S**) to flared tube elbow (**T**). Secure fuel line by push-on-type clip (**V**).

*Note.* Secure skid plate to engine rear support crossmember with four  $\frac{3}{8}$ -16NC-2  $\times \frac{7}{8}$  square-neck carriage bolts and  $\frac{3}{8}$ -16NC-2 lockwasher nuts.

*e. Make Connections Inside of Driver's Compartment.*

\*

- (8) *Install mounting tube jacket to instrument panel clamp (fig. 21).* Install liner (**M**). Secure mounting tube jacket to instrument panel clamp (**L**) with two  $\frac{5}{16}$  6-24NF-2  $\times \frac{7}{8}$  lockwasher bolts and  $\frac{3}{4}$  6-24NF-2 plain nuts (**K**). **Tighten three bolts securing steering gear to frame side rail.**

\*

*g. Make Connection at Right Side of Engine (fig. 17).*

\* \* \* \* \*

- (7) (Superseded) *Connect distributor to ignition switch cable.* Connect the ignition switch cable (circuit number 12) to distributor with coil assembly (**G**). Tighten electrical cable coupling nut (**H**).

\* \* \* \*

## 96. Assembly

(fig. 59)

\*

*b. Install Second Speed and First and Reverse Speed Sliding Gear.* Install main shaft \* \* \* against speed gear. Slide synchronizer hub (**F**), with assembled parts, onto main shaft, **install the second and third speed synchronizer hub snap ring (**C**), and follow with the second blocking ring (**A**).**

## 102. Install Reverse Idler Shaft Gear

(fig. 45)

\* \* \* \* \*

*b. Install Countershaft Cluster Gear Oil Collector.* Rescinded.

### 103. Install Transmission Countershaft Cluster Gear

a. *Install Countershaft Cluster Gear.* Coat the countershaft \* \* \* of transmission case. Slide the rear thrust washer (K) between thrust washer on cluster gear and transmission case.

b. *Check Countershaft Cluster Gear End Play.* The countershaft cluster \* \* \* install cluster gear.

### 104. Install Input Shaft With Integral Gear

a. (Superseded) *Install Input Shaft With Integral Gear (fig. 45).* Place input shaft with integral gear in position through opening in front of transmission case. Tap input shaft (BB) into case until the snap ring installed in the groove of ball bearing rests against transmission case. Install countershaft cluster gear oil collector (F) so it is engaged in groove of input shaft gear. Be sure that the gear can turn without binding on oil collector. (Loosen oil collector mounting bolts to aid in installation of **countershaft** cluster gears.) Coat main shaft front bearing rollers (CC) with general purpose grease (GO) to aid in assembly. Install the 14 bearing rollers in the recess at gear end of input shaft (BB).

b. *Secure Countershaft Cluster Gear Oil Collector.* Secure countershaft cluster \* \* \* of 15 pound-feet. Lift **cluster gear into position and start the transmission countershaft (MM) into rear of transmission case. Drive countershaft through case and bore of cluster gear, driving out the arbor used for securing bearing rollers (M, P, T, and V), bearing roller spacer (R), and bearing roller spacer washers (L, N, Q, S, U, and W). Drive countershaft in until one-half inch of shaft protrudes from the case. Be sure that all thrust washers are installed and secured by countershaft.**

### 112. Remove Transfer Rear Axle Output Shaft Retainer With Bearing Assembly

\* \* \*  
b. Remove the speedometer drive gear (fig. 65) and the bearing retainer shims.

### 115. Remove Transfer Rear Axle Output Shaft

c. (Superseded) Use a suitable remover to remove rear axle output shaft bearing cup (CC, fig. 73) from recess in side of transfer case.

## 121. Inspection and Repair

(fig. 74)

### a. Inspection.

(3) *Front axle output shaft clutch gear.* Inspect the front axle output shaft clutch gear (LL) for damaged or worn splines or other damage. Replace, if necessary. Place clutch gear on output shaft and **check-backlash**. Clearance between clutch gear and output shaft must not exceed 0.005 inch (par. 271b). If clutch gear does not slide smoothly over output shaft or is not within dimensions, replace either the gear or shaft.

## 131. Install Transfer Rear Axle Output Shaft Assembly

c. *Install Rear Axle Output Shaft Driven and Sliding Gears* (fig. 73). Place the rear \* " and driven gears. Slide the rear axle output shaft thrust washer (FF) and **snap ring** (EE) onto the shaft. **Push snap ring into position in groove of shaft with replacer 41-R-2384-540** (fig. 78).

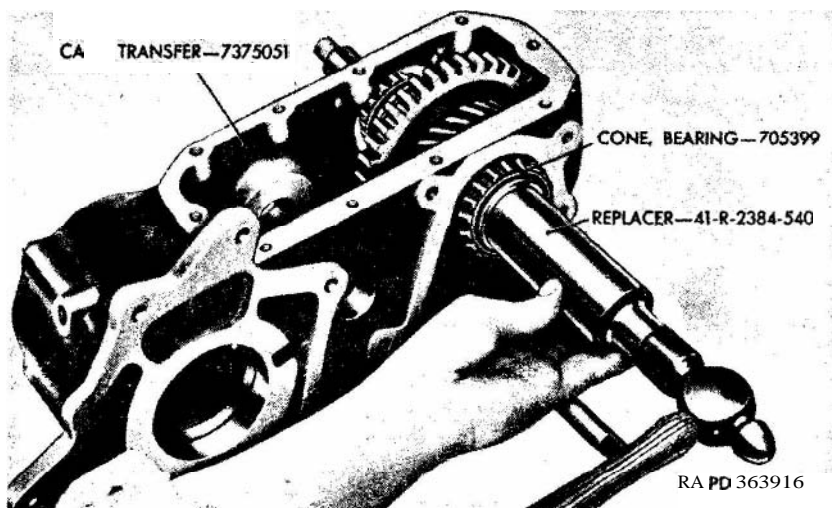


Figure 79. (Superseded) Installing transfer rear axle output shaft inner bearing cone.

## 140. Description

b. *Universal Joints.* Both the front \* \* (V) figure 88. Except for this difference, the parts of all four universal joints are the same and consist of a journal, aring assemblies, and snap rings.

145. Description and Operation

e. *Rzeppa Universal Joint* (fig, 93). The Rzeppa joint consists of a hollow end of an axle shaft which fits over a solid member of the mating axle shaft. The Rzeppa universal joint comprises a ball cage and race in conjunction with **six** universal joint balls which are held in place by the universal joint inner shaft retainer. The end play \* \* \* of the kingpins.

\* \* \* \*

148. Remove Front Axle Shaft Assembly

\* \* \* \* \*

c. *Remove Spindle With Bearing Assembly* (fig. 95). **Disconnect brake line from brake cylinder.** Remove six bolts \* \* \* with bearing assembly.

\*

149. Remove Front Axle Steering Knuckle Flanges

a. *Remove Front Brake Flexible Line Guard.* Remove the two \* \* \* flange cap assembly. Remove tie rods from **steering knuckle flanges.**

\*

152. Disassembly

*Note.* It is not \* \* \* proceed as follows:

\* \* \* \* \*

d. *Disassemble Axle Shaft With Rzeppa Universal Jcint.*

\* \* \* \* \*

(2) *Remove universal joint balls.* Push universal joint \* \* universal joint cage. Repeat the above operation until the **five** remaining universal joint balls are removed.

\* \* \* \*

154. Assembly

\* \* \*

b. *Assemble Axle Shaft With Rzeppa Universal Joint.*

\* \* \* \* \*

(3) *Install universal joint balls* (fig. 105). Tilt the universal \* \* \* universal joint ball. Repeat the above operation for the remaining four universal joint balls.

\* \* \* \* \*



158. Disassembly  
(fig. 108)

\* \* \* \* \*

c. Remove Differential Pinions and Side Gears. Using a long nose drift, drive the lock pin (AA-9) out of the differential case with brass drift and hammer. Tap out pinion shaft (AA-10). Roll the pinions \* \* \* from differential case.

166. Install Steering Knuckle Flange With Arm Assemblies

\* \* \* \* \*

d. Install Opposite Steering Knuckle Flange. Install opposite steering knuckle flange in the same manner as prescribed above. Install tie rods to steering knuckle flanges.

167. Install Shaft Assembly

\* \* \* \* \*

b. Install Spindle With Rearing Assembly (fig. 94). Position spindle with \* \* \* and  $\frac{3}{8}$ –24NF 3 x  $\frac{3}{4}$ A, bolts (T). **Connect brake line to brake cylinder.**

\* \* \* \* \*

171. Remove Axle Shafts

\* \* \* \* \*

b. Remove Brake Assembly (fig. 127). Remove hub cap \* \* \* from axle shaft. **Disconnect brake line from brake cylinder.** Remove six bolts \* \* \* of shims removed.

\* \* \* \* \*

183. Install Axle Shafts  
(fig. 127)

\* \* \* \* \*

c. Install Brake Assembly. Install bearing shims \* \* \* of 25 to 35 pound-feet. Connect brake line to brake cylinder.

\* \* \* \* \*

188. Assembly  
(fig. 141)

\* \* \* \* \*

b. Install the anchor end shoe retainer spring (AA) on the front and rear brake shoes. Place the front shoe (C), having the long **lining**, and the rear shoe (Q), **having the short lining**, on the back. ing plate assembly (T). Install shoes so that their lower ends engage slots behind plate anchor and their upper ends contact wheel cylinders.

\* \* \* \* \*

190. Disassembly M38A1

\* \* \*  
d. *Disassembly.* It is not necessary to disassemble the brake and brake rod assemblies unless inspection (par. 191a) reveals them to be unserviceable.

\* \* \* \* \*  
(2) *Hand brake assembly (fig. 144).* Drive out the \* \* \* to release lever (J).

*Note.* (Added) Hand brake levers are furnished as an assembly only. Field repairs will be made from parts generated in the field.

\*

196. Disassembly

a. *Springs* (figs. 145 and 146). The front and \* \* proceed as follows:

\* \* \* \* \*  
(2) *Remove rebound clips.* Remove rebound clip nut, spacer, and bolt securing each of the two outer and two intermediate rebound clips on the M38A1 and four rebound clips on the M170. Pry off the clinched ends of the two inner rebound clips. Remove the spring leaves.

\* \*

197. Inspection and Repair

a. *Inspection.*

(1) *Spring leaves.* Inspect all spring leaves for cracks and and breaks. A faulty spring leaf must be replaced. Replace rebound clips if they are broken, cracked, or otherwise damaged. Check **to see if the** bolt, spacer, and nut from inner (long) rebound clips of both front springs *have* been removed and discarded and the ends of the *clips* bent inward to clinch over the top of the No. 1 **spring leaf.**

\*

198. Assembly

a. *Springs (figs. 145 and 146).* Assembly operations for front and rear springs are similar.

\* \* \* \* \*  
(2) *Secure rebound clips.* Secure each of the two outer and **two intermediate** rebound clips on the M38A1 or four rebound clips on the M170 with a rebound clip spacer,

x 2 1/2 bolt, and nut. Peen ends of rebound clip bolts. **Secure each of the two inner rebound clips by bending both ends of the clip inward, to clinch over the top of the No. 1 spring leaf.**

*Note.* ( Added) The clip spacer, bolt, and nut are not installed on the two inner rebound clips.

202. Disassembly  
(fig. 150)

\* \* \* \* \*

*d. Remove Pitman Arm.* Unscrew the nut (A) from pitman shaft with integral cam (JJ) and remove lockwasher (B). Pull pitman arm (C) from end of pitman shaft. It may be necessary to **use a suitable puller** to free it from serrations on pitman shaft. Check pitman shaft for burrs and raised metal or nicks. Smooth as necessary. Rough surface on pitman shaft can damage pitman shaft bearings during removal of shaft from housing. Pull shaft (JJ) from housing.

*Note.* Once the worm bearing snap rings are removed, the balls will readily fall out of cups unless pressure is exerted.

\* \* \* \* \*

221. Body

\* \* \* \* \*

*b. Inspection and Repair.*

(1) *Inspection.* Inspect body for \* \* \* or bent condition. **Inspect glove compartment door striker. Position vertical striker so that latch of door lock will contact center of striker plate. Tighten retainer screw. Adjust striker to hold door securely, bending striker in or out to obtain proper latch position.**

\* \* \* \* \*

222. Windshield Assembly

*a. Disassembly.* It is not necessary to disassemble the windshield assembly unless inspection reveals unserviceable parts.

\*

(10) *Disassemble windshield wiper motor (fig. 168).*

*Note.* Do not disassemble windshield wiper motor unless it is faulty. Remove handle set \* \* \* from paddle assembly.

*Note.* ( Added) Windshield wiper motors are replaced as a unit unless repair kits are available.

\* \* \* \* \*

## 224. Fuel Tank Assembly

(fig. 172)

a. *Disassembly.* It is not necessary to disassemble fuel tank unless inspection (*b* below) reveals damage. Refer to TM 9-804A for **removal** of fuel tank from body on the M38A1 or paragraph 220.3 on the M170.

(3) *Disassemble fuel filter assembly.* Remove nut (K), lock-washer (L), and screw (P). **Remove screw (H), washer (G), and nut (F),** which secure cover plate bracket around the **fuel filter element (M).** Remove end plate \* \* \* plate assembly (E).

\*

## 238. Disassembly

(fig. 177)

a. *Remove Radiator Assembly From Power Plant.* Remove the radiator filler neck cap (D) and gasket (E) and open drain cock (P) to drain cooling system. **Provide suitable container** if anti-freeze has been installed. Disconnect radiator hose \* \* \* support rods (S and V).

BY ORDER OF THE SECRETARIES OF THE ARMY AND THE AIR  
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OS Sup Agencies (1)

ORD PG (10)  
Ord Arsenal (5)  
Mil Dist (1)  
Ord Proc Dist (10)  
MAAG (1)  
Mil Msn (1)

Units organized under following TOE:

9-12A, Hq & Hq Co, Maint &  
Sup Co Ammo (1)  
9-17, Ammo Co, Army (1)  
9-45A, Sp Wpn Spt or Depot Bn  
(1)  
9-46A, Hq & Hq Det, Sp Wpns  
Spt or Depot Bn (1)  
9-47A, Sp Wpns Spt or Depot Co  
(1)  
9-49, Sp Wpns Dir Spt Co (1)  
9-57A, **Fld** Sup Co (1)  
9-229, ORD GM Dir Spt Co (1)  
9-347, Ord Tire Rebuild Co (1)  
9-367, Sup Depot Co (1)  
9-387, Ammo Depot Co (1)

*NG*: Same as Active Army except allowance is one copy to each unit.

*USAR*: None.

For explanation of abbreviations used see SR 320-50-1.

No. 3

CHANGE

HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., *21 September 1966*

**DS and GS Support Maintenance, for  
POWER TRAIN, BODY, AND FRAME, FOR ¼-TON, 4 X 4,  
UTILITY TRUCK M38A1 AND M38A1C, AND ¼-TON,  
4 X 4, FRONT LINE AMBULANCE M170**

TM 9-8015-2, 2 August 1954, is changed as follows :

Title is changed as shown above.

Chapter 19 is added.

**CHAPTER 19**

**SPECIAL PURPOSE EQUIPMENT KIT**

**Section I. INSTRUCTIONS**

**278. Scope**

This chapter contains installation and field maintenance instructions for special purpose kit designed for use on the ¼-Ton, 4x4, Truck, Utility, M38A1, M38A1C and Ambulance M170. No instructions for modifying the vehicle are included herein. This chapter also contains a listing of kit components. These listings are not to be used for requisitioning purposes. Refer to TM 9-2320-208-34P for initial requisitioning of kit.

**279. Authorization**

Installation of kit is authorized under criteria defined in SB 11-131 for the 100 ampere generator kit when certain radios are authorized by instructions contained therein.

**Section II. RADIO POWER FEED KIT**

**280. Installation Instructions**

*a. Preliminary Operations*

- (1) Remove the front passenger seat in accordance with pertinent manual.

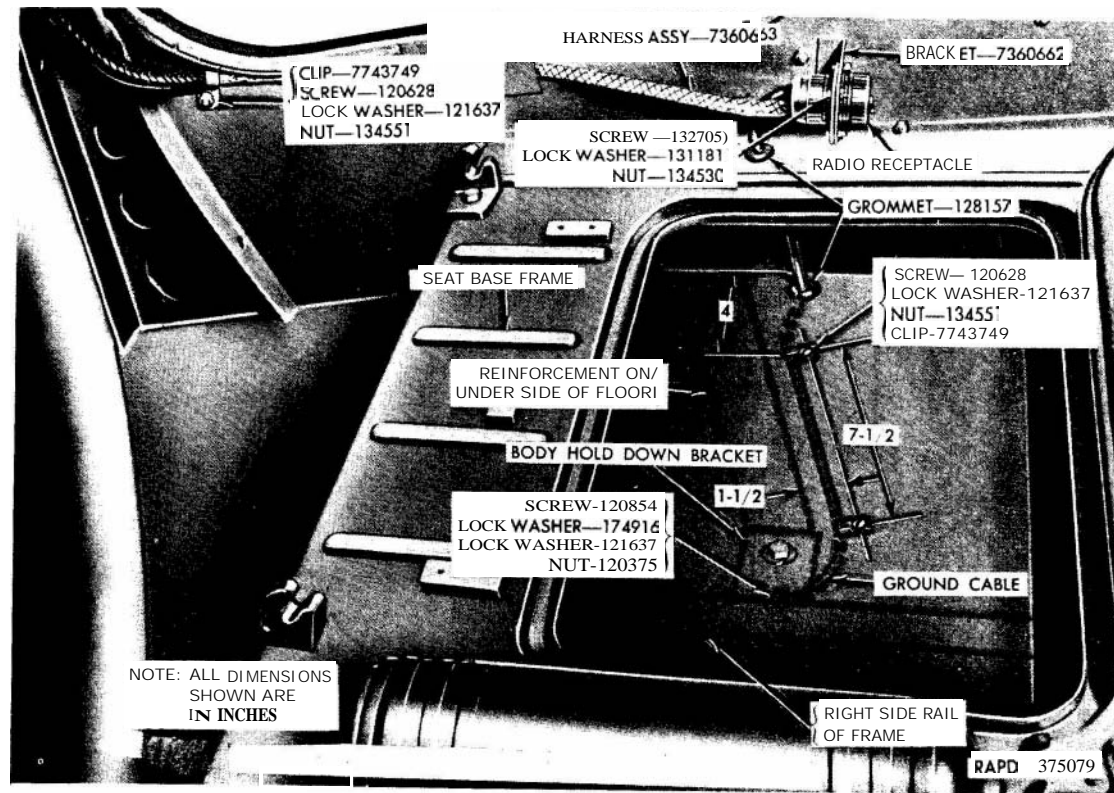


Figure 196. Radio receptacle and ground cable.

- (2) Position bracket 7360662 on the right side of body approximately 11 inches back from the forward edge of the seat base frame as shown in figure 196.

*b. Installation of Radio Receptacle*

- (1) Using the bracket as a template, drill two 0.81-inch diameter holes through the side of the vehicle body.
- (2) Fasten the bracket to the side of the vehicle body using two screws 120628, lockwashers 121637 and nuts 134551.
- (3) Fasten the receptacle located on the end of the harness assembly 7360663, to the bracket (2 above), using four screws 132705, ~~lockwashers~~ 131181, and nuts 134530 (*fig. 196*) use one of these screws to fasten the chain of the receptacle cap 7261674 to bracket.
- (4) Drill two 0.687-inch diameter holes, one in the seat base frame and one in the vehicle floor as shown in figure 196. Install a grommet 128157 in each hole.
- (5) Insert the ground cable from the receptacle and pull the cable down until all the slack is under the floor of the vehicle (*fig. 196*) .
- (6) Drill two 0.281-inch diameter holes in floor of the vehicle for screws to secure cable clips as indicated in figure 196.
- (7) Attach the ground cable to the underside of the vehicle floor using two clips, 7743749, screws 120628, ~~lockwashers~~ 121637 and nuts 134551.
- (8) Attach the end of the ground cable to the right side rail of the frame as indicated in figure 196. The <sup>n</sup>ale near the body hold-down bracket will be used for attaching screw 120584. Install the cable terminal under the head of the screw with one lockwasher ~~174916~~ between the head of the screw and the terminal and another one between the terminal and the side rail. Use lockwasher 121637 and nut 120375 to secure screw.
- (9) Remove the cowl battery box cover in accordance with the pertinent manual.
- (10) Remove battery ground cable.
- (11) Remove the plug from the round hold which provides access to the battery box through the dash panel.
- (12) Install a 90° connector 8365411 in the opening in the dash panel as shown in figure 197.
- (13) Pull the radio power feed harness assembly through the 90° connector into the battery box. Remove the terminal nut from the battery positive post to which the battery-to-starter cable is attached and attach the radio power



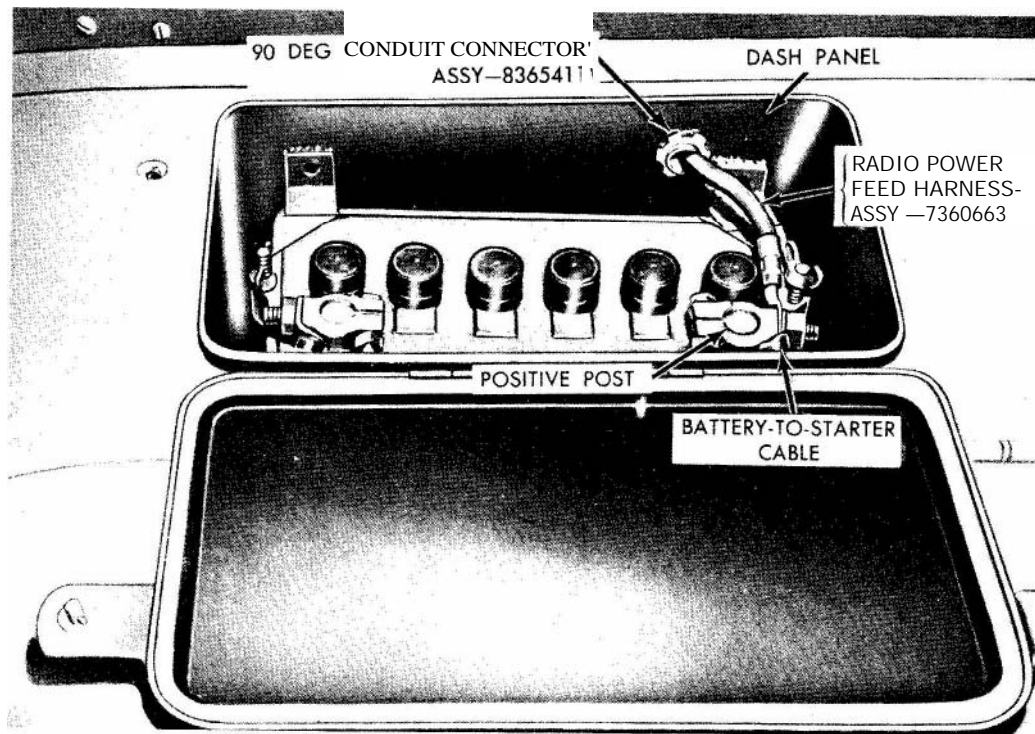


Figure 197. Radio power feed harness to battery.

feed harness on the same post. Install the terminal nut to secure the two cables. Connect battery ground cable.

- (14) Install the battery box cover in accordance with pertinent technical manual.
- (15) Position two clips 7743749 (fig. 196) on the right side of the vehicle to hold the harness against the side of the vehicle. Drill two  $\frac{9}{32}$ -inch diameter holes at location of clips and secure the clips with two screws 120628, lock-washers 121637, and nuts 134551 (fig. 196). If the harness is too long, the excess will be looped and fastened under the instrument panel.

### Section III.

#### AC-DC 100 AMPERE 28 VOLT GENERATOR ASSEMBLY

*Note.* The capitalized key letters shown below in parentheses refer to figure 198.

#### 281. Removal Procedures

##### a. Preliminary Operations.

- (1) Drain cooling system.
- (2) Disconnect battery terminals.
- (3) Remove radiator guard (AA) and radiator (K) ; save attaching parts,
- (4) Remove and discard ~~regulator-to-generator~~ cable 8329736. Disconnect battery-to-regulator wiring harness.
- (5) Remove and discard regulator 7524309 (save nuts and washers), brackets 7374832, straps 7374965, and shield.

*Note.* Vehicle may be equipped with regulator 7524473, 7351952, 8360020, or 8699216.

- (6) Remove and discard fan belts 590897.
- (7) Remove and retain fan blade (KK) and bolts (HH).
- (8) Remove and discard generator 7716654 and pulley 7375071 ; save adjusting brace, bolt ,and washer.  
*Note.* Vehicle may be equipped with generator 7524474, 7355736, 7374750, or 7356736.
- (9) Remove and discard generator support 7375389 and insulator 7375175.
- (10) Remove and discard water pump pulley 7372816. Remove and save water pump (RR) and bolts.
- (11) Remove and discard crankshaft pulley 7372558 ; save nut.

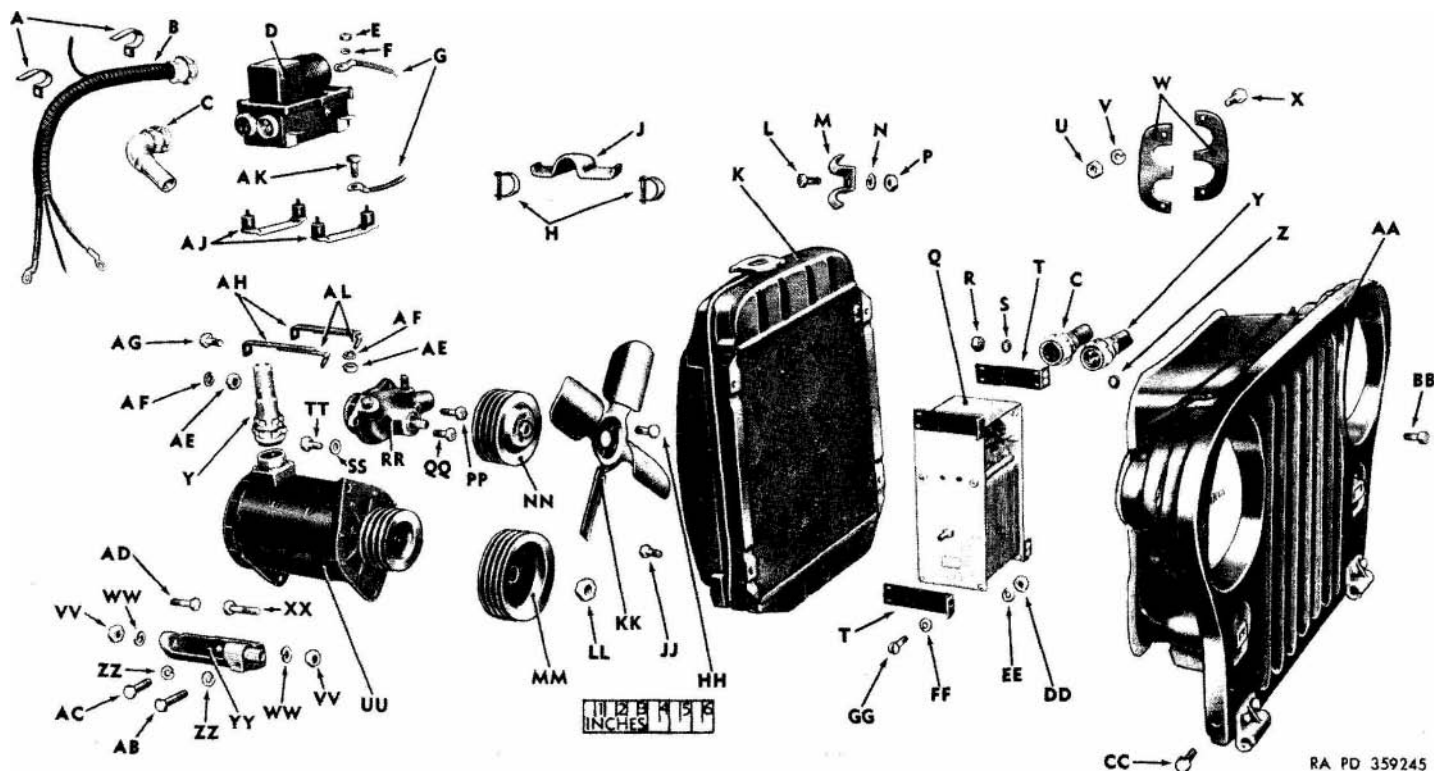


Figure 198. Exploded view of kit and components of vehicle.

*b. Installation Procedures.*

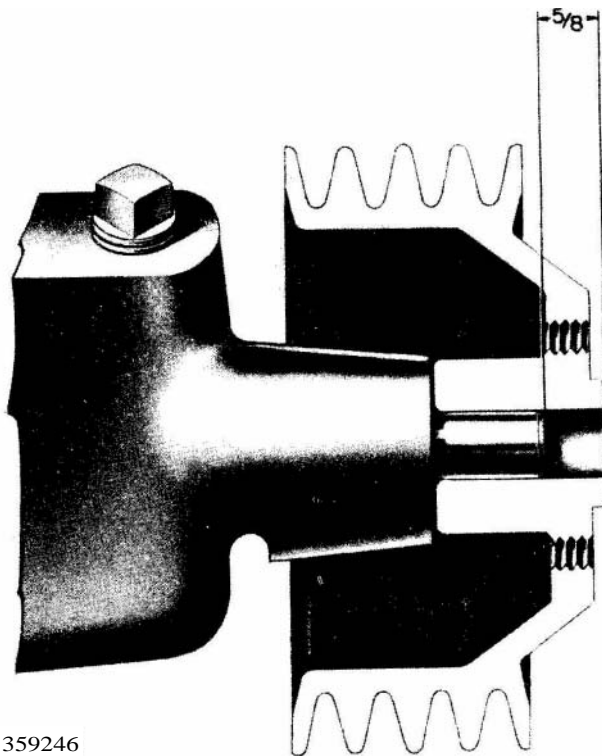
- (1) Press water pump and fan pulley 8699725 (NN) on water pump shaft as shown in figure 199.

**Caution:** Support the shaft at impeller end when pressing on the new pulley.

- (2) Install water pump (RR), using bolts (AM) and (QQ) removed in a (10) above.
- (3) Install crankshaft pulley 8699713 (MM) on crankshaft, using nut (LL) removed in a (11) above.
- (4) Install bracket 8699706 (YY) on vehicle, using screw 122201 (AB), screw 120233 (AC), and two washers 120381 (ZZ).
- (5) Install generator pulley 8699715 (PP) on generator 7954720 (UU), using woodruff key 124553, washer 7720442, and nut 503449.

**Caution:** Do not use force to install pulley.

- (6) Install generator (UU) on mounting bracket (YY), using screw 181680 (XX), screw 181670 (AD), washers 121621 (WW), and nuts 271506 (VV). Attach adjusting



RA PD 359246

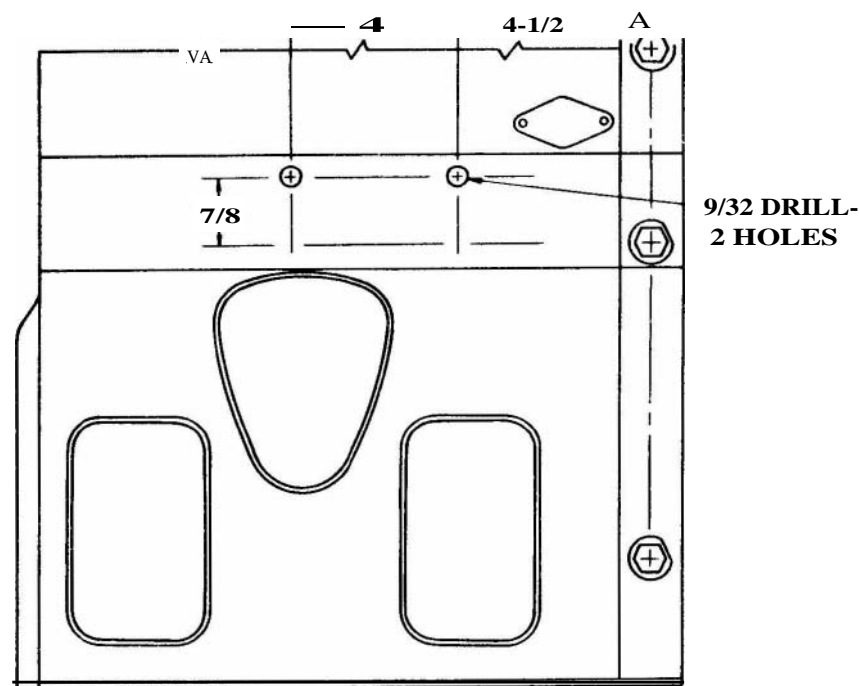
*Figure 199. Water pump and fan pulley installation.*

brace with bolt (TT) and washer (SS) removed in a (8) above.

- (7) Install fan blade (KK), using bolts (HEI) removed in a (7) above.

*Note.* If fan interfere with generator pulley, increase dimensions shown in figure 199.

- (8) Install four fan belts 8699837.
- (9) With a lever, and using engine block as a fulcrum, apply 100 foot-pounds pressure against DRIVE END HOUSING of generator. Lock generator to maintain proper tension.
- (10) Position two  $\frac{3}{8}$ -inch diameter holes in left side of firewall in accordance with figure 200.
- (11) Attach regulator mounting bracket 8699722 (AH) to slotted regulator mounting bracket 8699721 (AL), using screw 120854 (AK), washer 121753 (AF), and nut 120375 (AE).



NOTE: ALL DIMENSIONS  
SHOWN ARE  
IN INCHES

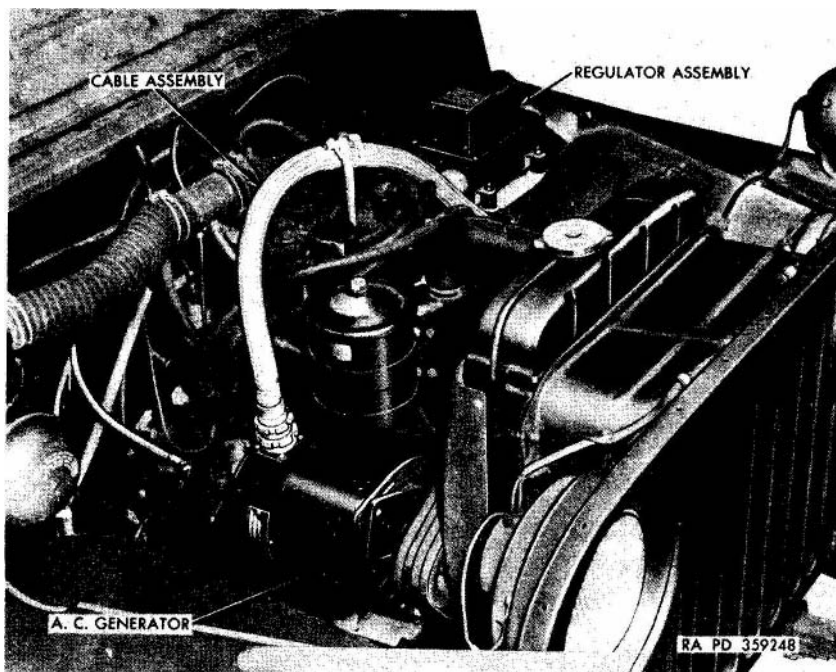
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Figure 200. Location of regulator mounting holes in left side of firewall.

- (12) Install assembled brackets on firewall, using two screws 120233 (AC), washers 121753 (AF), and nuts 120375 (AE).
- (13) Using assembled brackets as a template, locate and install two  $\frac{9}{16}$ -inch diameter holes in left fender. Secure brackets to fender, using two screws 120854 (AG), washers 121753 (AF), and nuts 120375 (AE).
- (14) Remove regulator support 8672823 (AJ) from regulator 8699744 (D). Install supports (AJ) on assembled brackets, using four screws 120854 (AK), washers 121753 (AF), and nuts 120375 (AE).

*Note.* One terminal of lead 8690328 detached from regulator must be secured under head of one of the screws (AK). Free end of lead is secured under washer and nut on top of one of the regulator supports (AJ).

- (15) Install regulator (D) on supports (AJ), using four nuts (E) and washers (F) removed in a(5) above (*fig. 201*).
- (16) Install radiator (K), using attaching parts removed in a(3) above.



*Figure 201. Generator and regulator installed.*

- (17) Install two mounting brackets 8699708 (T) on top of rectifier 7954343 (Q), using four washers 8699709 (FF) and existing screws on rectifier.
- (18) Install two brackets (T) on bottom of rectifier (Q), using four screws 132760 (GG), washers (FF), washers 138530 (EE), and nuts 120622 (DD).
- (19) Locate upper two  $\frac{1}{2}$ -inch diameter holes in guard (AA) in accordance with figure 202 ; using rectifier as a template, locate and install lower two  $\frac{1}{2}$ -inch diameter holes.
- (20) Cut a  $3\frac{1}{2}$ -inch  $\times$   $2\frac{1}{4}$ -inch opening through side of radiator guard (AA) in accordance with figure 203.
- (21) Install rectifier (Q) on guard (AA), using four screws 121906 (BB), washers 121753 (S), washers 8699719 (Z), and nuts 120375 (R).
- (22) Connect cable 8699711 (C) and cable 8699723 (Y) to rectifier (Q) (fig. 202) . Secure cables with two supports 8699726 (W) to left side of guard, using four screws 121887 (X), washers 120423 (V), and nuts 120375 (U) .
- (23) Install modified radiator guard on vehicle, using attaching parts removed in a (3) above.

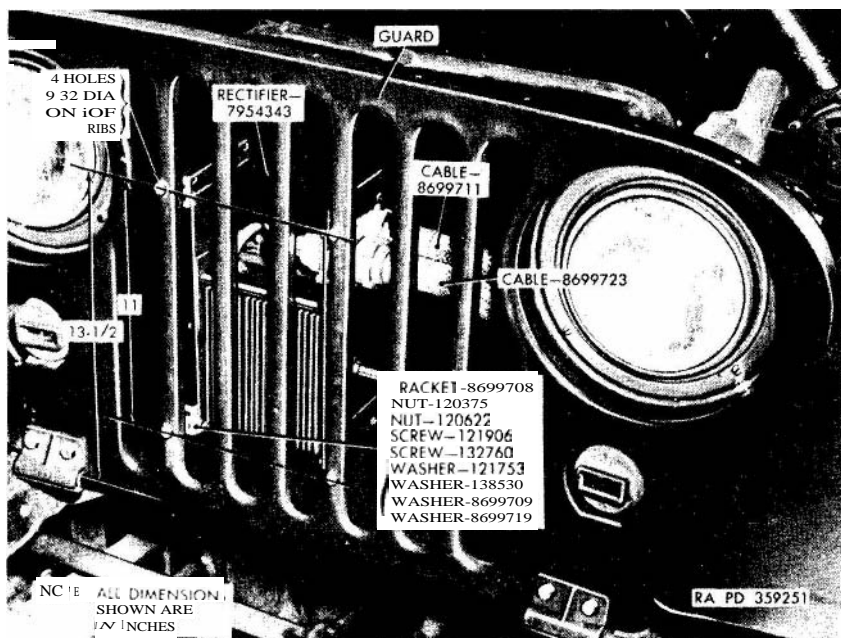
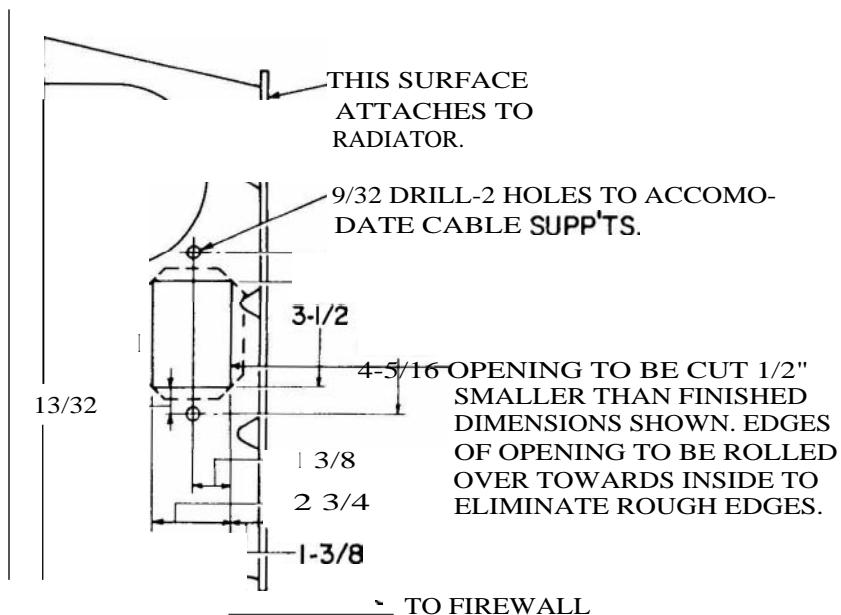


Figure 202. Rectifier installation details.

- (24) Connect free end of cable (C) to regulator (D). Connect free end of cable (Y) to generator (UU). Secure cables to fender with support 8699728 (M), using screw 121887 (L), washer 120423 (N), and nut 120375 (P).
- (25) Install support 8699727 (J) on lift hook on engine block (fig. 201). Secure cable (Y) to support (J), using two clamps 502913 (H).
- (26) Connect regulator-to-battery cable assembly 8699724 (B) to regulator (D).
  - (a) Connect positive lead (No. 4 wire) from connector pin "A" to starter battery terminal.
  - (b) Connect negative lead (No. 3 wire) from connector pin "C" to screw holding battery ground cable to frame.
- (27) Cut off connector from original battery-to-regulator wiring harness disconnected in *a* (4) above.
  - (a) Remove and discard No. 4 (regulator-to-starter) and No. 8 (regulator-to-ammeter negative terminal) wire.
  - (b) Remove and save No. 9 (regulator-to-ammeter negative terminal) wire.



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NOTE ALL DIMENSIONS  
SHOWN ARE  
IN INCHES

Figure 203. Radiator guard details.



- (c) Strip one inch of insulation from No. 10 wire of original harness and splice to No. 10 wire of new regulator-to-battery cable (B) ; solder and tape.
- (d) Strip one inch of insulation from No. 12 wire behind instrument panel and splice and solder to No. 12 wire of new regulator-to-battery cable (B).

*Note.* Do not tape unless instrument panel is equipped with a voltmeter.

- (28) If instrument panel is equipped with an ammeter, follow procedure (a) through (c) below.
  - (a) Remove and discard ammeter 7728854.
  - (b) Install voltmeter 8376488.
  - (c) Connect original No. 9 wire (removed in (27) (b) above) to voltmeter and splice free end to connection on No. 12 wire ( (27 (b) and (d) above) ; solder and tape.
- (29) Secure regulator cables (B) and (C) to firewall, using clamp 572926 (A) and existing screws.
- (30) Clean and paint as required.
- (31) Connect battery terminals.
- (32) Fill radiator.

### *c. Inspection and Test.*

- (1) After installation of kit, connect a test voltmeter across output wires of regulator. The negative (NEG) wire of regulator is connected to engine front mounting support and the positive (POS) wire is connected to starter terminal.

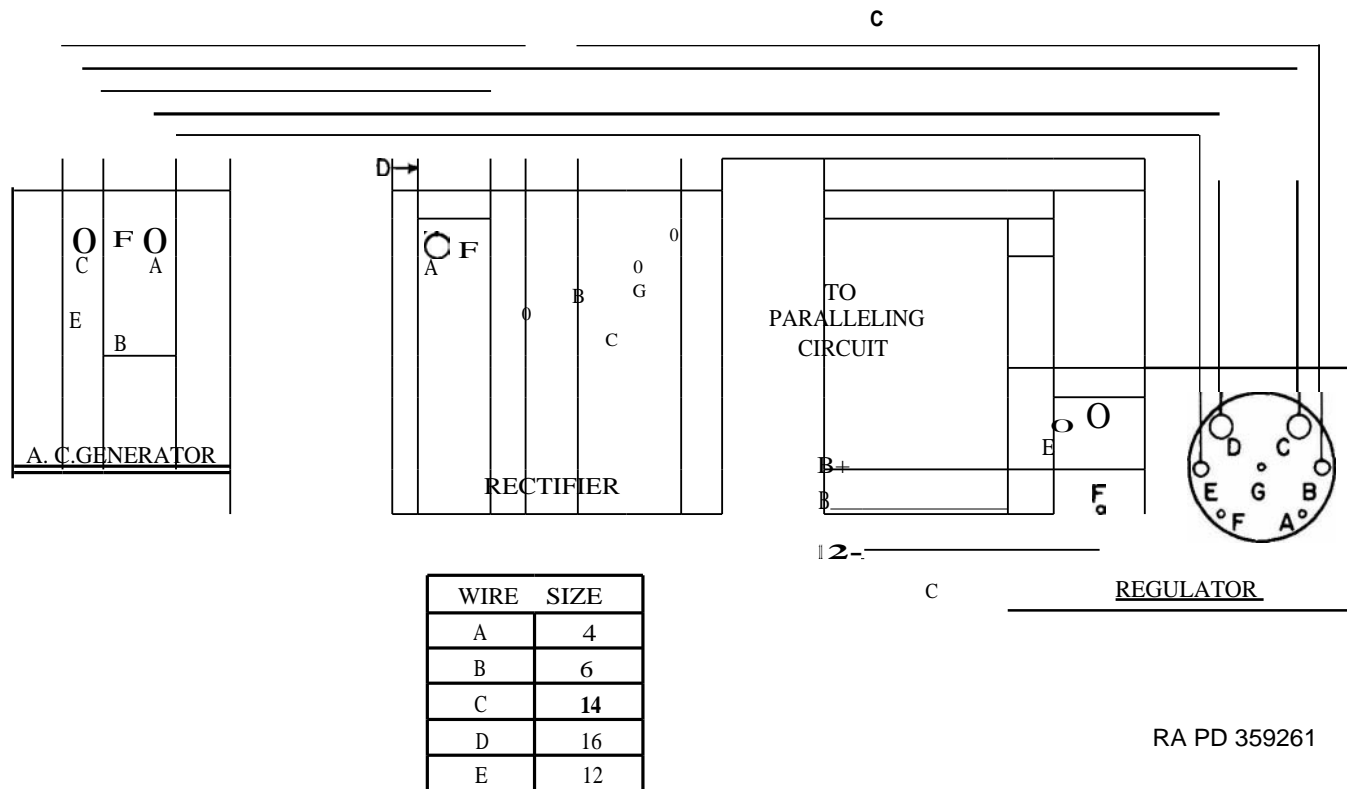
**Caution:** Make certain that the battery negative (—) cable No. 7 is connected to the chassis and the battery positive (+) cable No. 82 is connected to the starter terminal.

- (2) Start engine and let idle. If voltmeter reading is between 27 and 28 volts, generating system is functioning satisfactorily. Permit engine to run at fast idle for 15 to 20 minutes to fully charge the battery. Remove 1/8-inch pipe plug on regulator housing and use a small screwdriver to adjust voltage rheostat to 27.5 volts.

**Caution:** The corner flap on winterization radiator cover opposite the rectifier must remain open to provide ventilation to cool rectifier.

- (3) If generating system fails to function properly upon starting engine, follow procedures (a) through (c) below.

- (a) See that all cables are connected properly and securely.
  - (b) Inspect fan belts for proper tension.
  - (c) Make certain that load relay in regulator box closes when ignition switch is turned on. Relay will function with cover removed.
- (4) If system 'still fails to function properly upon starting engine, follow procedures (a) through *(f)* below, using ac-dc volt-ohmmeter to determine the defective unit.
- (a) Disconnect regulator-to-battery harness at regulator. With meter set on 50 volt dc scale, check for contact "A" to ground. Meter should indicate battery voltage. Connect jumper from contact "A" to "B", turn on ignition, and check for contact "F" to ground. Meter should indicate battery voltage.
  - (b)* With meter set on "RX100" scale, check from pin "F" to "C". Meter should indicate 175 plus or minus 10 ohms. Check from pin "A" to socket "C". Meter should indicate open circuit.
  - (c)* Remove regulator-to-rectifier harness from rectifier and regulator. With meter set on "RX100" scale, check from pin "C" at one end of harness to socket "C" at other end, from pin "D" to socket "D", and so on for each circuit. Check each pin to outer shield and from each pin to the other pins. Meter should indicate no resistance.
  - (d)* Remove rectifier-to-generator harness from rectifier and generator and test as indicated in *(c)* above. Meter should indicate no resistance.
  - (e)* With meter set on "RX100" scale, connect red lead (+) to pin "D" of rectifier-to-regulator side of rectifier and touch other lead (—) to each of three large sockets, "A", "B", "C" on the rectifier-to-generator side (fig. 204). Meter should indicate 100 to 250 ohms. This tests half of the rectifier. To test the other half, connect the black lead (—) to pin "C" of rectifier-to-regulator side and touch other lead (+) to each of three large sockets, "A", "B", and "C" on rectifier-to-generator side. Meter should indicate approximately same readings. Variation of more than 25 ohms indicates defective rectifier. If rectifier is defective, replace. Check from small pin "B" of rectifier-to-regulator side to small socket "D" on rectifier-to-generator side and from small pin "E" of rectifier-to-regulator side to small socket "E" of recti-



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Figure 204. Wiring diagram of 100 ampere generator.

fier-to-generator side (fig. 203). Meter should indicate **no resistance**.

- (f) With meter set on **"RX100"** scale, check from pin "D" to pin "E" connector on generator. Meter should indicate between 1/7 and 5 ohms. Check from any one of the large pins, "A", "B", or "C" on generator to other pins. Meter should indicate no resistance. Check each pin to generator ground. Meter should indicate no resistance.

By Order of the Secretary of the Army :

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*Chief of Staff.*

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