

POWER TRAIN
BODY AND FRAME
FOR
3/4 -TON 4x4 CARGO TRUCK M37;
COMMAND TRUCK M42;
AMBULANCE TRUCK M43;
AND TELEPHONE MAINTENANCE
TRUCK V41

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DEPARTMENTS OF THE ARMY AND
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CHAPTER 1

INTRODUCTION

Section I. GENERAL

1. Scope

a. This manual is published for the information and guidance of personnel responsible for field and depot maintenance of this materiel. It contains information on maintenance which is beyond the scope of the tools, equipment, or supplies normally available to using organizations. This manual does not contain information which is intended primarily for the using organization, since such information is available to ordnance maintenance personnel in the pertinent operators technical manual or field manual.

b. This manual contains a description of and procedures for removal, disassembly, inspection, repair, rebuild, and assembly of the power train, body, and frame for ~~¼-ton~~ 4 x 4 truck M37, M42, M43, and V41 (figs. 1, 2, 3, and 4). The appendix contains a list of current references, including supply catalogs, technical manuals, and other available publications applicable to the materiel.

c. This first edition manual is being published in advance of complete technical review of all concerned. Any errors or omissions will be brought to the attention of Chief of Ordnance. Washington 25, D. C., ATTENTION: ORDFM-Pub.

d. TM 9-840 contains operating and lubricating instructions for the materiel and contains all maintenance operations allocated to using organizations in performing maintenance work within their scope. TM 9-840 also contains tabular data pertaining to general characteristics and performance.

e. TM 9-1825B contains maintenance procedures on the generator, starter, ignition distributor, voltage regulator, and horn.

f. TM 9-1840A contains a description of and procedures for

removal, disassembly, inspection, repair, rebuild, and assembly of the engine, clutch, and cooling system used in this materiel.

g. TM 9-1825E contains a description of and procedures for disassembly, inspection, repair, and assembly of the light switch assembly.

2. Field and Depot Maintenance Allocation

The publication of instructions for complete disassembly and rebuild is not to be construed as authority for the performance by field maintenance units of those functions which are restricted to depot shops and arsenals. In general, the prescribed maintenance responsibilities will be reflected in the allocation of maintenance parts listed in the appropriate columns of the current ORD 8 supply manual pertaining to these vehicles. Instructions for depot maintenance are to be used by maintenance companies in the field only when the tactical situation makes the repair functions imperative. Supply of parts listed in the depot guide column of ORD 8 supply catalogs will be made to field maintenance only when the emergency nature of the maintenance to be performed has been certified by a responsible officer of the requisitioning organization and upon express authorization by the chief of the service concerned. Those operations which can be performed as "emergency field maintenance" are specifically covered as such in this manual.

3. Forms, Records, and Reports

a. General. Responsibility for the proper execution of forms, records, and reports rests upon the officers of all units maintaining this equipment. However, the value, of accurate records must be fully appreciated by all persons responsible for their compilation, maintenance, and use. Records, reports, and authorized forms are normally utilized to indicate the quantity, and condition of materiel to be inspected, to be repaired, or to be used in repair. Properly executed forms convey authorization and serve as records for repair or replacement of materiel in the hands of troops and for delivery of materiel requiring further repair to ordnance shops in arsenals, depots, etc. The forms, records, and reports establish the work required, the progress of the work within the shops, and the status of the materiel upon completion of its repair.

b. Authorized Forms. The forms generally applicable to units maintaining this equipment are listed in the appendix. For current and complete listing of all forms, refer to current SR 310-20-G. Additional forms applicable to the using personnel are



Figure 1. $\frac{1}{4}$ -ton 4 cargo truck M37.

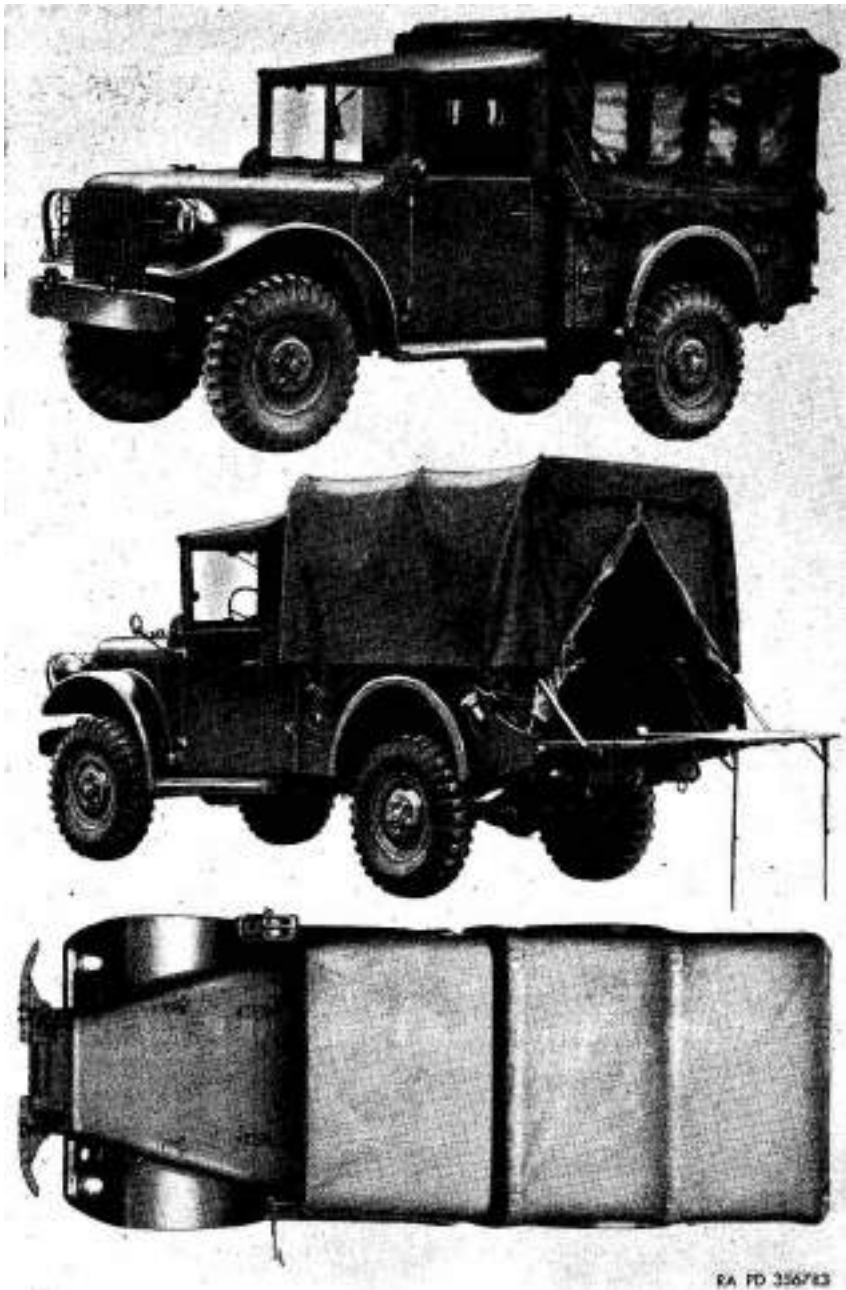


Figure 2. 1/2-ton 4 x 4 command truck M42.

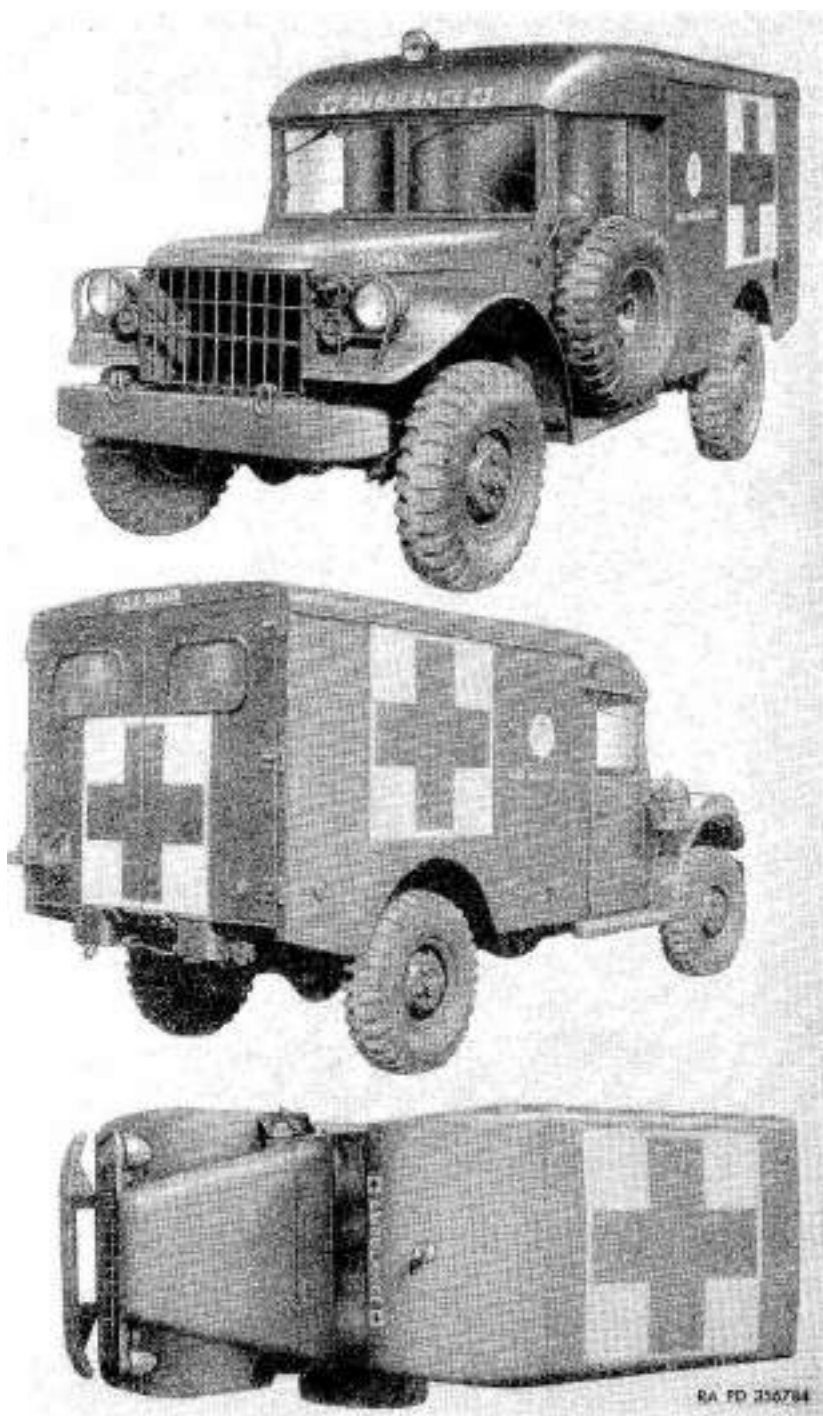


Figure 3. 1/4-ton 4 x 4 ambulance M43.



Figure 4. 1/2-ton 4 x 4 telephone maintenance truck V41.

listed in the operators manual. For instructions on use of these forms, refer to FM 9-10.

c. Field Reports of Accidents. The reports necessary to comply with the requirements of the Army safety program are prescribed in detail in the SR 385-10-40 series of special regulations. These reports are required whenever accidents involving injury to personnel or damage to materiel occur.

d. Report of Unsatisfactory Equipment or Materials. *Suggestions* for improvement in design and maintenance of equipment and spare parts, safety and efficiency of operation, or pertaining to the application of prescribed petroleum fuels, lubricants, and/or preserving materials, or technical inaccuracies noted in Department of the Army publications, will be reported through technical channels as prescribed in SR 700-45-5 to the Chief of Ordnance, Washington 25, D. C., ATTN: ORDFM, using DA Form 468, Unsatisfactory Equipment Report. Such suggestions are encouraged in order that other organizations may benefit.

Note. Do not report all failures that occur. Report only REPEATED or RECURRENT failures or malfunctions which indicate unsatisfactory design or material. However, reports will always be made in the event that exceptionally costly equipment is involved. See also SR 700-45-5 and the printed instructions on DA Form 468.

Section II. DESCRIPTION AND DATA

4. Description

a. General. The ~~3/4-ton~~ 4 x 4 trucks consist of four body models, cargo M37 (fig. 1), command M42 (fig. 2), ambulance M43 (fig. 3), and telephone maintenance V41 (fig. 4). Aside from the bodies, the various major components, with the exception of frames and rear propeller shafts, are interchangeable.

b. Engine and Clutch. Refer to TM 9-1840A.

c. Front Axle (fig. 44). The front axle is a full-floating, driving type and power is transmitted to the hubs by constant velocity universal drive assemblies.

d. Rear Axle (fig. 72). The rear axle is also of full-floating construction. Power is transmitted from the differential to the hubs by the drive shafts.

e. Transmission Assembly (fig. 96). The transmission has four forward speeds and one reverse. Sliding gears on the main shaft are controlled by the gearshift lever and provide a means of changing gear ratios or speeds.

f. Power-Take-Off (fig. 119). On vehicles so equipped, the

power-take-off is installed on left side of transmission and transmits power to the winch.

g. Transfer Assembly (fig. 123). The transfer has two speed ranges and transmits power to both front and rear axles. Control of the two speed ranges and front axle drive is provided by shift levers in the driver's compartment.

h. Propeller Shaft Assemblies (fig. 141) . The propeller shafts transmit power from transmission to transfer and from transfer to front and rear axles.

i. Brake System (fig. 147) . The service brakes are of the hydraulic internal-expanding type and operate on all four wheels. The hand brake is mounted on the rear of the transfer and is an external-contracting type.

j. Steering Gear and Drag Links (fig. 159) . The steering gear is a worm and sector type and is connected to the front axle through two drag links and an idler arm assembly.

k. Springs and Shock Absorbers (fig. 173).

- (1) Both front and rear springs are semielliptic type. They are attached to the axles by spring clips and to the frame side rails by shackles and bolts.
- (2) Front and rear axles are equipped with hydraulic type shock absorbers, which are mounted between the frame and axles on rubber bushing-type bearings.

l. Frame Assembly (fig. 177) . The frame is constructed of pressed-steel, channel-section side rails, reinforced by cross members.

m. Cab (fig. 181) . The cab is a steel open-type assembly equipped with a removable canvas top cover. Two seats are provided, and the windshields and door glasses are adjustable.

n. Body.

- (1) The cargo and command body is a steel open-type assembly and is equipped with a paulin and end curtains for protection from the weather. Hinged troop seats, which can be raised when the full space of the body is required, are provided on each side.
- (2) The ambulance body is of steel construction. It incorporates the driver's compartment and litter compartment as a single unit. Litter racks are provided on each side of the body and a folding step is attached to rear body sill to facilitate loading. A heating and ventilating system is built into the body and a surgical lamp is provided in the litter compartment.
- (3) The telephone maintenance body is an all steel assembly and is equipped with closed compartments for stowing miscellaneous materiel. A ladder rack, pole rack,

and wire spool are provided and the equipment includes a canvas cover for the center compartment when protection from the weather is required.

o. Hood, Fenders, and Guards (fig. 218). The hood is one-piece, pressed-steel construction and is hinged at the rear. It is fastened by two clamps, one on each side, and is equipped with a safety catch at the front. Fenders are held in position on frame, cowl, and body with screws. Guards are provided to protect the radiator and lights from brush damage during cross-country operation.

p. Winch (fig. 222). The winch is mounted on the frame side rails at the front of the vehicle. It is driven from a power-take-off, which is mounted on left side of transmission, and is controlled from the driver's seat.

q. Wheels and Hubs. Wheels are disk type and are held in place by five studs and nuts. All hubs are mounted on opposed tapered roller bearings.

5. Data

TM 9-840 contains data pertaining to general characteristics and operation of the vehicle. Data on major components of the vehicle is indicated at the beginning of each chapter.

6. Differences Between Models

The difference in models is confined to body types and wheelbase. A complete description of the various body types is given in paragraph 4n. The various body types, model designations, and wheelbases are as follows:

<i>Body type</i>	<i>Model</i>	<i>Wheelbase</i>
Cargo	M37	112 inches
Command	M42	112 inches
Ambulance	M43	126 inches
Telephone maintenance	V41	126 inches

CHAPTER 2

PARTS, SPECIAL TOOLS, AND EQUIPMENT FOR FIELD AND DEPOT MAINTENANCE

7. General

Tools and equipment and maintenance parts over and above those available to the using organization are supplied to ordnance field maintenance units and depot shops for maintaining, repairing, and/or rebuilding the materiel.

8. Parts

Maintenance parts are listed in Department of the Army Supply Manual ORD 8 SML G-741, which is the authority for requisitioning replacements. Parts not listed in the ORD 8 manual, but required by depot shops in rebuild operations may be requisitioned from the manual listing in the corresponding ORD 9 manual and will be supplied if available. Requisitions for ORD 9 parts will contain a complete justification of requirements.

9. Common Tools and Equipment

Standard and commonly used tools and equipment having general application to this materiel are listed in ORD 6 SNL J-8, sections 7 and 13; Ord 6 SNL J-9, sections 1, 2, 6, 8, and 10; and ORD 6 SNL J-10, sections 4, 7 and 15 and are authorized for issue by T/A and T/O&E.

10. Special Tools and Equipment

The special tools and equipment tabulated in table I are listed in Department of the Army Supply Manual ORD 6 SNL J-16, section 15. This tabulation contains only those special tools and equipment necessary to perform the operations described in this manual, is included for information only, and is not to be used as a basis for requisitions.

Table I. Special Tools and Equipment for Field and Depot Maintenance

Item	Identifying NO	References		Use
		Figure	Paragraph	
ADAPTER, puller, 2-inch OD, 3/4-inch long.	41-A-18-46	K, 5; 90	95	To remove differential bearing cone with PULLER 41-P-2902-775.
ADAPTER, puller*	41-A-18-173	D, 5; 7, 14	40	To remove steering wheel with steering wheel puller.
ADAPTER, puller, shackle bolt.	41-A-18-241	L, 5	50, 187	To remove front spring bolts and steering idler arm shaft.
ARBOR, idler shaft, transfer case.	41-A-338	Q, 5; 134	148,150	To remove or install transfer idler shaft.
DRIFT, bushing and oil seal installing.	41-D-1535-25	V, 5; 53; 66	74, 79	To install front axle drive shaft oil seals and bushing-type bearings in front axle housing and steering knuckles. Also to remove hub bearing oil seal (used w/HANDLE 41-11-1397).
CAGE, bearing cap spread; differential case.	41-O-17-800	C, 5; 93	97	To check spread of differential bearing caps.
GAGE, turning radius.	41-O-449	Y, 5; 69	79	To check turning radius (front axle in or out of vehicle).
HANDLE, remover and replacer, size of shank inch, lgh 8 1/4 inch.	41-H--1397	W, 5; 53; 66; 162	74, 79, 183, 185	Use with DRIFT 41 - D -1535 - 25 and REMOVER and REPLACER 41-R-2374-878.
LOCATOR, interlock, 3/4-inch diam, 5-inch long.	41-L-1607-325	AA, 5; 115	123	To install transmission shifter shaft interlock plungers.

Table I. Special Tools and Equipment for Field and Depot Maintenance—Continued

Item	Identifying NO	References		Use
		Figure	Paragraph	
PLATE, axle drive shaft, pinion bearing pulley.	41-P-1527	J, 5; 81	92	To remove drive pinion rear bearing cone.
PULLER, bearing, split-cup type, 6-inch OD.	41-P-2902-775	H, 5; 90	95	To remove differential bearing cone (used w/ADAPTER 41-A-18-16).
PULLER, front axle oil seal and bushing (inner).	41-P-2909-10	A, 5; 59	77	To remove front axle drive shaft oil seal and bushing-type bearing from front axle housing.
KIT, repair, windshield wiper.	41-K--280	189, 191, 193, 194, 196	230, 231, 232	Contains tools and gages necessary for depot maintenance of windshield wipers.
PULLER, $\frac{3}{8}$ x 53x inch, 1$\frac{3}{4}$-16NF-2 female thread.	41-P-2956-30	X, 5; 99	110	To remove transmission input shaft.
PULLER, transmission reverse idler gear shaft.	41-P-2956-50	P, 5; 104	112	To remove reverse idler gear shaft from transmission.
REMOVER, oil seal	41-R-2372-215	M, 5; 77; 125	91,141	To remove transfer and axle drive pinion bearing oil seals.
REMOVER, bearing, 1$\frac{1}{2}$-inch diam opng, 2 $\frac{1}{2}$ -inch OD, $\frac{3}{4}$-inch wide.	41-R-2367-825	U, 5; 105	112	To remove transmission counter-shaft front ball bearing.
REMOVER AND REPLACER, bushing, 1$\frac{1}{2}$-inch long, 1.247-inch diam pilot, 0.751-inch diam hole.	41-R-2374-878	Z, 5; 162	183, 185	To remove or install bushing -type bearing in steering gear housing (used w /HANDLE 41-H-1397).

Table 1. Special Tools and Equipment for Field and Depot Maintenance—Continued

Item	Identifying NO	References		Use
		Figure	Paragraph	
REPLACER, oil seal, 3 1/4 -inch OD, 1.810-inch diam pilot, 1 1/4 -inch diam hole.	41-11-2392-405	T, 5; 56; 87	76, 94, 323	To install axle drive pinion bearing oil seal and hub bearing oil seal.
REPLACER, bearing (steering knuckle flange), lgh 4 inch.	41-11-2382-915	R, 5; 67	79	To install flange bearing cones on front axle housing.
SLEEVE, drive gear bearing, transmission case.	41-S-3776-40	N, 5; 140	150	To install transfer input shaft gear rollers.
SPACER, bearing preload checking, differential drive pinion .	41-S-3868-72	S, 5; 83	94	To check axle drive pinion front bearing assembly.
SPACER, idler shaft bearing, transmission case.	41-S-3868-500	B, 5; 137; 138	150	To check idler gear shaft bearing adjustment.
WRENCH, differential case cap (single-end, tubr, pronged, OD 3.944 inch, No of prongs 3, lgh 4 inch).	41-W-3724-100	E, 5; 91	95, 97	To remove or install differential case cap.
WRENCH, pinion bearing lock nut (single-end, tubr, pronged, OD 3 1/4 inch, No. of prongs 4, lgh 3% inch).	41-W-3724-130	G, 5; 79; 80	91, 92 94, 97	To remove or install axle drive pinion front bearing cup nut and differential bearing adjusting nuts.
WRENCH, differential case cap and pinion shaft holding.	41-W-3277-40	75,124	91,141	To remove or install companion flanges.
WRENCH, wheel bearing nut, (single-end, oct, size of opng 2 inch , lgh 5 inch.	41-W-1991-17	F, 5; 46	72, 82 80, 103	To remove or install hub bearing adjusting nuts.

ADAPTER ~~41-1-15-171~~ may be modified as shown in figure 7

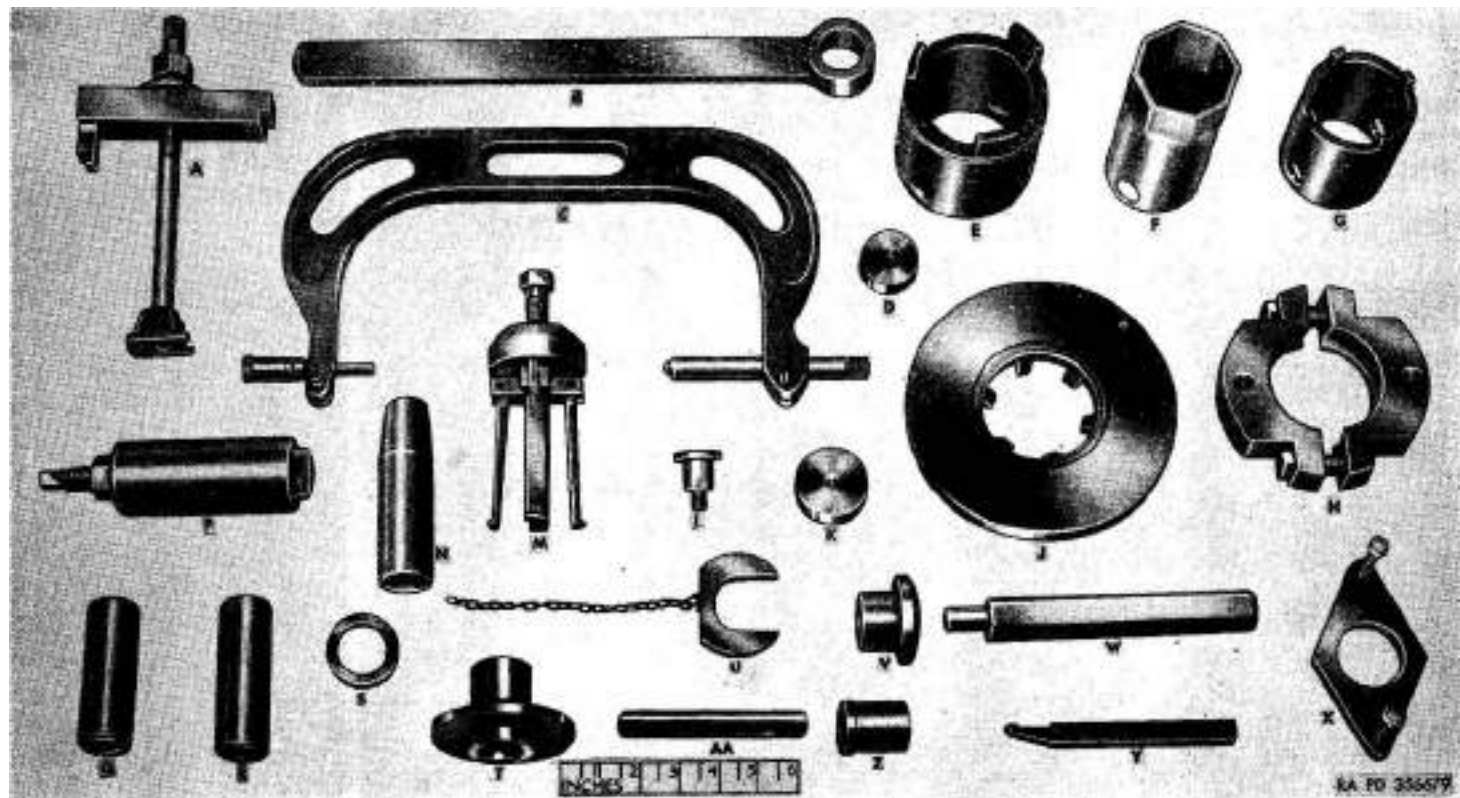


Figure 5. Special tools and equipment.

A—Puller, front axle oil seal and bushing (inner)—41-P-2909-10
 B—Spacer, idler shaft bearing, transmission case—41-S-3868-500
 C—Gage, bearing cap spread, differential case—41-G-17-800
 D—Adapter, puller—41-A-18-173
 E—Wrench, differential case cap (sgle-end, tubr, pronged, OD 3.944 inch, No. of prongs 3, lgh 4 inch)—41-W-3724-100
 F—Wrench, wheel bearing nut (sgle-end, oct, size of opng 2 37/64 inch, lgh 5 inch)—41-W-1991-17
 G—Wrench, pinion bearing lock nut (sgle-end, tubr, pronged, OD 3 1/8 inch, No. of prongs 4, lgh 3 1/4 inch)—41-W-3724-130
 H—Puller, bearing, split-cup type, 6-inch OD—41-P-2902-775
 J—Plate, axle drive shaft, pinion bearing pulley—41-P-1527
 K—Adapter, puller, 2-inch OD, 3/8-inch long—41-A-18-16
 L—Adapter, puller, shackle bolt—41-A-18-241
 M—Remover, oil seal—41-R-2372-215
 N—Sleeve, drive gear bearing, transmission case—41-S-3776-40
 P—Puller, transmission reverse idler gear shaft—41-P-2956-50
 Q—Arbor, idler shaft, transfer case—41-A-338
 R—Replacer, bearing (steering knuckle flange), length 4 inch—41-R-2382-915
 S—Spacer, bearing preload checking, differential drive pinion—41-S-3868-72
 T—Replacer, oil seal, 3 3/4-inch OD, 1.810-inch diameter pilot, 1 1/4-inch diameter hole—41-R-2392-405
 U—Remover, bearing, 1 13/32-inch diameter opening, 2 3/4-inch OD, 5/16-inch wide—41-R-2367-825
 V—Drift, bushing and oil seal installing—41-D-1535-26
 W—Handle, remover and replacer, size of shank 4 inch, length 8 1/8 inch—41-H-1397
 X—Puller, 3/8 x 3 x 5 1/4, 1 3/8-16NF-2 female thread
 Y—Gage, turning radius—41-G-449
 Z—Remover and replacer, bushing, 1 1/2-inch long, 1.247-inch diameter pilot, 0.751-inch diameter hole—41-R-2374-875
 A A—Locator, interlock, 3/8-inch diameter, 5-inch long—41-L-1607-325

Figure 5-Continued.

11. Improvised Tools

The improvised tools listed in table II and the dimensioned detail drawings furnished herein apply only to field and depot shops in order to enable these maintenance organizations to fabricate these tools locally, if desired. These tools are of chief value to maintenance organizations engaged in rebuilding a large number of identical components ; however, they are not essential for rebuild and are not available for issue. The following data are furnished for information only.

Table II. Improvised Tools for Field and Depot Maintenance

Item	References		Use
	Fig	Par.	
REMOVER, steering gear housing upper bearing cup.	6,161	183	To remove worn upper bearing cup from steering gear housing.
ADAPTER, puller, steering wheel.*	7,14	40	To remove steering wheel with steering wheel puller.
REPLACER, weatherseal insert.	8,208	258,276	To install rubber insert in weatherseals on ambulance partition and rear doors.

See ADAPTER, puller., steering wheel in table II.

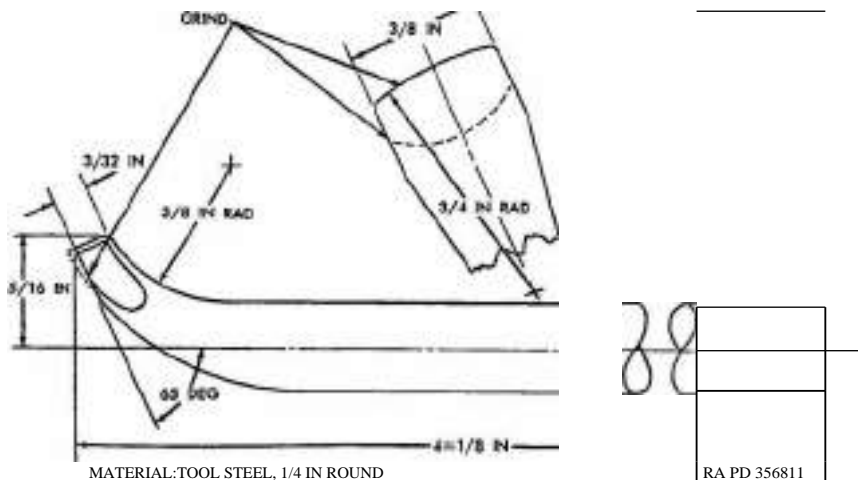


Figure 6. Steering gear housing upper bearing cup remover,

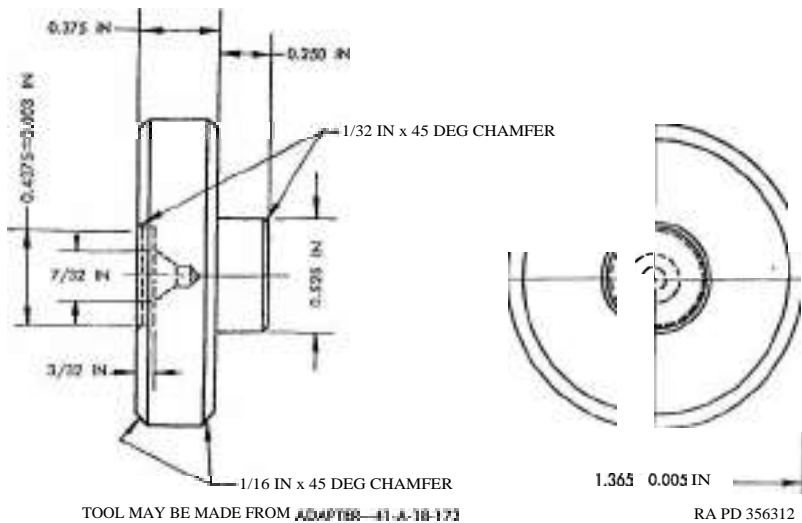


Figure 7. Steering wheel puller adapter.

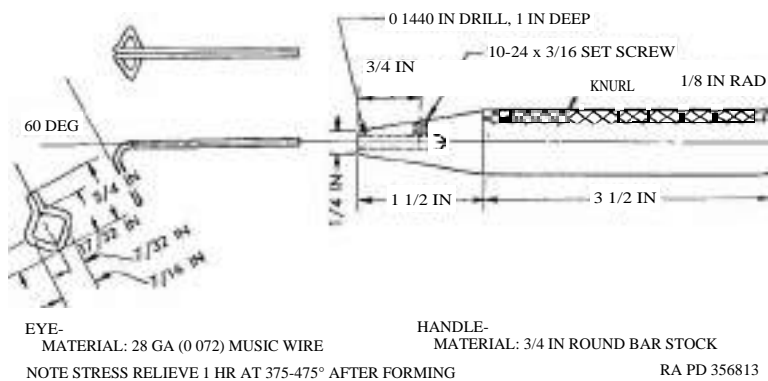


Figure 8. Weatherseal insert replacer.

CHAPTER 3

TROUBLE SHOOTING

Section I. GENERAL

12. Purpose

Note. Information in this chapter is for use of ordnance maintenance personnel in conjunction with and as a supplement to the trouble-shooting section in the pertinent operator's manual (TM 9-840). It provides the continuation of instructions where a remedy in the operator's manual refers to ordnance maintenance personnel for corrective action.

Operation of a deadlined vehicle without a preliminary examination can cause further damage to a disabled component and possible injury to personnel. By careful inspection and trouble shooting such damage and injury can be avoided and, in addition, the cause of faulty operation of a vehicle or component can often be determined without extensive disassembly.

13. General Instructions and Procedures

This chapter contains inspection and trouble shooting procedures to be performed while a disabled component is still mounted in the vehicle and after it has been removed.

a. The inspections made while the component is mounted in the vehicle are for the most part visual and are to be performed before attempting to operate the vehicle. The object of these inspections is to avoid possible damage or injury and also to determine the condition of and, when possible, what is wrong with the defective component.

b. The trouble shooting performed while the component is mounted in the vehicle is that which is beyond the normal scope of the using organization. Check the trouble shooting section of TM 9-840; then proceed as outlined in this chapter. These trouble shooting operations are used to determine whether the fault can be remedied without removing the component from the vehicle

and also, when subsequent removal is necessary, to indicate when repair can be made without disassembly of the component.

c. Inspection after the component is removed from the vehicle is performed to verify the diagnosis made when the component was in the vehicle, to uncover further defects, or to determine faults if the component alone is received by the ordnance establishment. This inspection is particularly important in the last case because it is often the only means of determining the trouble without completely disassembling the component.

Section II. FRONT AXLE

14. Trouble Shooting Before Removal or Operation

a. General. Do not operate the vehicle prior to completing the procedures given in this paragraph. Refer to paragraph 13a for the purpose of these inspections.

b. Lubricant Leakage at Drive Pinion Bearing Oil Seal.

- (1) Replace drive pinion bearing oil seal (pars. 91a and 94g).
- (2) Replace companion flange if hub is worn or scored (pars. 91a and 94g) .

c. Differential Lubricant Leakage at Flange Oil Seals. Replace drive shaft oil seal assembly (pars. 77h and 79b) .

d. Worn Tires Indicating Improper Camber. Check camber (par. 84b) and replace axle housing if bent (ch. 5) .

e. Further Procedure. If these inspections do not disclose the fault, and the vehicle is operable, proceed as described in paragraph 15.

15. Trouble Shooting Before Removal and During Operation

a. General. If the inspections in paragraph 14 do not reveal causes of failure and the vehicle is operable, trouble shoot it. Refer to paragraph 13b for the purposes and scope of these trouble shooting procedures.

b. Steering Wander Due to Improper Caster. Check caster (par. 84b) .

c. Gear Hum or Growl Indicating Worn Parts in the Differential With Carrier Assembly. Install new matched drive gear set or replace differential with carrier assembly (ch. 6) .

d. General Noise. Any unusual noises in the front axle during operation indicates unsatisfactory adjustments or worn parts and disassembly will be required to effect a correction. Refer to chapter 5.

e. Further Procedure. If these trouble shooting procedures do not disclose the fault, proceed as described in paragraph 16.

16. Trouble Shooting After Removal and Before Operation

a. General. After the component has been removed from the vehicle or if it has been received already removed, further inspection is necessary. Refer to paragraph 13c for purpose and scope of these procedures. If the front axle alone has been received by the ordnance unit for a preliminary check before being installed in the vehicle or if the front axle has not been satisfactory due to unknown causes, a complete disassembly of the front axle will be necessary.

b. Inspection of Differential With Carrier Assembly. If differential with carrier assembly is removed from a vehicle because of noise, inspect drive gear teeth, drive pinion teeth, and bearings for wear. Replace parts as required. Refer to chapter 6.

Section III. REAR AXLE AND DIFFERENTIAL WITH CARRIER ASSEMBLY

17. Trouble Shooting Before Removal or Operation

a. General. Do not operate the vehicle prior to completing the procedures given in this paragraph. Refer to paragraph 13a for the purpose of these inspections.

b. Lubricant Leakage at Drive Pinion Bearing Oil Seal.

- (1) Replace drive pinion bearing oil seal (pars. 91a and 94g).
- (2) Replace companion flange if hub is worn or scored (pars. 91a and 94g).

c. Further Procedure. If these inspections do not disclose the fault and the vehicle is operable, proceed as described in paragraph 18.

18. Trouble Shooting Before Removal and During Operation

a. General. If the inspections in paragraph 17 do not reveal causes of failure and vehicle is operable, trouble shoot it. Refer to paragraph 13b for the purpose and scope of these trouble shooting procedures.

b. Gear Hum or Growl Indicating Worn Parts in the Differential With Carrier Assembly. Install new matched drive gear set or replace differential with carrier assembly (ch. 6) .

c. Further Procedures. If these trouble shooting procedures do not disclose the fault, proceed as described in paragraph 19.

19. Trouble Shooting After Removal and Before Operation

a. General. After the component has been removed from the

vehicle or if it has been received already removed, further inspection is necessary. Refer to paragraph 13c for purpose and scope of these procedures. If the differential with carrier assembly or axle assembly have been received by the ordnance unit for a preliminary check before being installed in the vehicle or if the operation of either assembly has not been satisfactory due to unknown causes, completely disassemble and rebuild as outlined in chapter 6.

b. *Inspection of Differential With Carrier Assembly.* If differential with carrier assembly is removed from a vehicle because of noise, inspect drive gear teeth, pinion teeth and bearings for wear. Replace parts as required. Refer to chapter 6.

Section IV. TRANSMISSION

20. Trouble Shooting Before Removal or Operation

a. *General.* Do not operate the vehicle prior to completing the procedures given in this paragraph. Refer to paragraph 13a for the purpose of these instructions.

b. *Lubricant Leakage at Main-Shaft Oil Seal.*

- (1) Replace main-shaft oil seal (pars. 118d and 125f).
- (2) Replace companion flange if hub is worn or scored (pars. 111a and 125g).

c. *Lubricant Leakage at Shifter Shaft Expansion Plugs.* Replace shifter shaft expansion plugs (pars. 121b, c and d, and 123f).

d. *Lubricant Leakage Because of Cracked Transmission Case.* Install new transmission case (ch. 7).

e. *Lubricant Leakage at Input Shaft Bearing Retainer Gaskets or Screws.* Replace unsatisfactory input shaft bearing retainer gaskets and screws (pars. 110a and 125f).

f. *Lubricant Leakage at Power-Take-Off Gaskets or Studs.* Replace unsatisfactory power-take-off gaskets (pars. 133 and 134).

g. *Lubricant Leakage at Main Shaft Bearing Retainer Gaskets or Screws.* Replace unsatisfactory main shaft bearing retainer gaskets or screws (pars. 111b and 125f).

h. *Further Procedures.* If these inspections do not disclose the fault and the vehicle is operable, proceed as described in paragraph 21.

21. Trouble Shooting Before Removal and During Operation

a. *General.* If the inspections in paragraph 20 do not reveal causes of failures and vehicle is operable, trouble shoot it. Refer to paragraph 13b for the purpose and scope of these trouble shooting procedures, Refer to chapter 7.

b. *Hard Shifting.* Hard shifting indicates worn or damaged parts in the transmission and an internal inspection of the transmission will be necessary. Refer to chapter 7.

c. *Gear Clash.* Gear clash is caused by an unsatisfactory clutch or worn synchronizers and an internal inspection of the transmission will be necessary. Refer to chapter 7.

d. *Transmission Slips Out of Gear.* If the transmission slips out of gear, the transmission case may not be properly aligned on the clutch housing. Worn parts in the transmission will also cause the synchronizer sliding clutch or first and second speed sliding gear to slip out of engagement and an internal inspection of the transmission will be necessary. Refer to chapter 7.

e. *Transmission Locks in Gear.* If the transmission locks in gear for any reason, an internal inspection of the transmission will be necessary. Refer to chapter 7.

f. *Gear Chatter and Noise.* Gear chatter and noise is caused by worn gear teeth and bearings and an internal inspection of the transmission will be necessary. Refer to chapter 7.

g. *Further Procedure.* If these trouble shooting procedures do not disclose the fault, proceed as described in paragraph 22.

22. Trouble Shooting After Removal and Before Operation

a. *General.* After the component has been removed from the vehicle or if it has been received already removed, further inspection is necessary. Refer to paragraph 13c for the purpose and scope of these procedures. If the transmission alone has been received for a preliminary check before being installed in the vehicle or if the operation of the transmission has not been satisfactory due to unknown causes, the unit should be completely disassembled and the necessary inspections and repairs performed.

b. *Inspect for Cause of Hard Shifting.* If hard shifting was encountered during operation, inspect the following parts :

- (1) Inspect shifter shafts for scores and damage. Replace required parts (pars. 121b, c, and d and 123c, d, and e).
- (2) Inspect shifter forks for misalignment. Replace required parts (pars. 121c and d and 123d and e).
- (3) Inspect main-shaft splines for wear and damage. Replace required parts (pars. 118 and 125) .

c. *Inspect for Cause of Gear Clash.*

- (1) Inspect synchronizer inner and outer stop rings for wear and damage. Replace parts as required (pars. 111d and 120d).
- (2) Inspect transmission for worn gear teeth and bearings. If gear teeth or bearings are worn, rebuild transmission (ch. 7).

Section V. POWER-TAKE-OFF

23. Trouble Shooting Before Removal or Operation

- a. General.* Do not operate vehicle prior to completing procedures given in this paragraph. Refer to paragraph 13a for purpose of these inspections.
- b. Lubricant Leakage at Shifter Shaft Oil Seals.* Replace shifter shaft oil seals (pars. 129i and 131a).
- c. Lubricant Leakage at Drive Shaft Oil Seal Assembly.* Replace drive shaft oil seal assembly (pars. 129i and 131a).
- d. Lubricant Leakage at Drive-Shaft-End Plate and Drive Shaft Plate Gaskets.* Replace unsatisfactory drive shaft end plate and drive shaft plate gaskets (pars. 129f and g and 131d).
- e. Lubricant Leakage Due to Crack in Power-Take-Off Housing.* Replace power-take-off housing (ch. 8).
- f. Further Procedures.* If these inspections do not disclose the fault and the vehicle is operable, proceed as described in paragraph 24.

24. Trouble Shooting Before Removal and During Operation

- a. General.* If the inspections in paragraph 23 do not reveal causes of failure and vehicle is operable, trouble shoot it. Refer to paragraph 13b for the purpose and scope of these trouble shooting procedures.
- b. Gear Whine.* If a pronounced gear whine or hum is apparent with engine running, clutch engaged, and transmission in neutral, insufficient clearance is indicated between the transmission-countershaft gear and the power-take-off idler gear. Effect correction by installing proper amount of gaskets between power-take-off and transmission (pars. 133 and 134).
- c. Noisy Operation.* Noise in the power-take-off is the result of loose bearings or worn gear teeth. Replace parts as required (ch. 8).
- d. Power-Take-Off Slips Out of Engagement.* If power-take-off slips out of engagement, eye bolt adjustment is incorrect or internal wear has affected the alinement of gears and shafts. Adjust eye bolt and replace parts as required (ch. 8).

Section VI. TRANSFER

25. Trouble Shooting Before Removal or Operation

- a. General.* Do not operate the vehicle prior to completing the procedures given in this paragraph. Refer to paragraph 13a for purpose of these inspections.

b. Lubricant Leakage at Companion Flange Oil Seals.

- (1) Replace companion flange oil seals (pars. 141b, 142c, 144h, 147g, 148g, and 150f).
- (2) Replace companion flanges if hubs are worn or scored (pars. ~~141b~~, 142c, 144f, 147g, 148e, 148f, 150h, 150i).

c. Lubricant Leakage at Brake Support Gasket. Replace brake support gasket (pars. 142c and 144c).

d. Lubricant Leakage at Brake Output Shaft Bearing Retainer Gasket. Replace brake output shaft bearing retainer gasket (pars. 140b and 152).

e. Lubricant Leakage at Idler Gear Shaft Cover Gasket. Replace idler gear shaft cover gasket (pars. 148h and 150e).

f. Lubricant Leakage Between Rear Axle Output Shaft Bearing Retainer and Transfer Case. Replace rear axle output shaft bearing retainer gasket (pars. 141b and 153).

g. Lubricant Leakage Between Front Axle Output Shaft Bearing Retainer and Transfer Case. Replace front axle output shaft bearing retainer gasket (pars. 148g and 150f).

h. Lubricant Leakage Between Input Shaft Bearing Retainer and Front of Transfer Case. Replace input shaft bearing retainer gasket (pars. 148g and ~~150f~~).

i. Lubricant Leakage at Poppet Ball Screw Gaskets. Replace poppet ball screw gaskets (pars. 148b and c and 150m).

j. Lubricant Leakage Due to Crack in Transfer Case. Repair or replace transfer case (ch. 9).

k. Lubricant Leakage at Shifter Shaft Oil Seals. Replace shifter shaft oil seals (pars. 148d and 150j).

l. Damaged or Bent Transfer Frame Cross Members. Repair or replace transfer frame cross members (pars. 206b and 208b).

m. Further Procedure. If these inspections do not disclose the fault and the vehicle is operable, proceed as described in paragraph 26.

26. Trouble Shooting Before Removal and During Operation

a. General. If inspections in paragraph 25 do not reveal causes of failure and vehicle is operable, trouble shoot it. Refer to paragraph 13b for the purpose and scope of these trouble shooting procedures.

b. Hard Shifting in and Out of Front Axle Drive. Hard shifting in and out of front axle drive indicates scored or damaged internal parts and it will be necessary to disassemble transfer to inspect parts (ch. 9).

c. Front Axle Drive Slips Out of Engagement. Disengagement of front axle drive is due to inadequate poppet ball spring tension

or worn parts. Inspect poppet ball and poppet ball spring (par. 149d) and replace parts as required (pars. 148b and c, and 150m). If worn parts are the cause of the trouble, it will be necessary to disassemble transfer for further inspection (ch. 9).

d. Transfer Slips Out of High and/or Low Range. If transfer slips out of high and/or low range, play exists in the brake output shaft, or internal parts are worn, recondition brake output shaft bearing retainer assembly (ch. 9).

e. Pronounced Gear Whine. Pronounced gear whine is indicative of worn gear teeth or improperly adjusted taper roller bearings. Transfer will require disassembly and an inspection of the internal parts (ch. 9).

f. Pronounced Gear Rattle. Pronounced gear rattle is generally indicative of improperly adjusted idler gear bearings. A complete disassembly of the transfer is required to adjust the idler gear bearings (ch. 9).

g. Further Procedure. If these trouble shooting procedures do not disclose the fault, proceed as prescribed in paragraph 27.

27. Trouble Shooting After Removal and Before Operation

a. General. After the component has been removed from the vehicle or if it has been received already removed, further inspection is necessary. Refer to paragraph 13c for the purpose and scope of these procedures. If the transfer alone has been received for a preliminary check before being installed in the vehicle or if the operation of the transfer has not been satisfactory due to unknown causes, a complete disassembly of the transfer will be necessary.

b. Internal Inspection. Disassemble transfer and inspect internal parts for causes of troubles (ch. 9).

Section VII. BRAKE SYSTEM

28. Trouble Shooting Before Removal or Operation

a. General. Do not operate the vehicle prior to completing the procedures given in this paragraph. Refer to paragraph 13a for purpose of these inspections.

b. Fluid Leakage at Front End of Master Cylinder. Fluid leakage at front end of master cylinder indicates that the secondary cup requires replacement. Replace master cylinder secondary cup (pars. 173c and 175c).

c. Fluid Leakage at Brake Drums. Fluid leakage at brake drums indicates unsatisfactory wheel cylinders or cups. Recondition wheel cylinders (pars. 170, 171, and 172).

d. Worn Bushing-Type Bearings in Brake Pedal or Pedal Bracket. Replace bushing-type bearings in brake pedal or pedal bracket (pars. 176c and *d* and 178a and *b*).

e. Worn Hand Brake Sector and/or Lever Pawl Rod Assembly. Replace hand brake sector and/or lever pawl rod assembly (pars. 164b and 166b).

f. Brakes Do Not Release Because of Swollen Piston Cup in Master Cylinder. Rebuild master cylinder (pars. 173c and 175c) .

g. Further Procedure. If these inspections do not disclose the fault and the vehicle is operable, proceed as described in paragraph 29.

29. Trouble Shooting Before Removal and During Operation

a. General. If the inspections in paragraph 28 do not reveal causes of failure and vehicle is operable, trouble shoot it. Refer to paragraph 13b for the purpose and scope of these trouble shooting procedures.

b. Brake Pedal Goes to Floor Board. Loss of brake pedal during operation indicates an unsatisfactory valve assembly in the master cylinder and master cylinder will require rebuilding (pars. 173c and 175c) .

c. Brakes Do Not Immediately Release During Operation. If brakes do not immediately release during operation, piston stop in master cylinder is probably corroded on the piston side. If this condition exists, master cylinder will require rebuilding (pars. 173c and 175c).

Section VIII. STEERING GEAR AND DRAG LINKS

30. Trouble Shooting Before Removal or Operation

a. General. Do not operate the vehicle prior to completing the procedures given in this paragraph. Refer to paragraph 13a for purpose and scope of these procedures. In many cases, steering difficulties can be traced to front axle troubles.

b. Lubricant Leakage at Housing Lower Cover Assembly. Replace housing lower cover assembly (pars. 183e and 185e).

c. Lubricant Leakage Between Housing Cover or Housing Lower Cover and Steering Gear Housing. Replace housing cover gasket or housing lower cover shim as required (pars. 183e and 185h).

d. Lubricant Leakage at Pitman Arm Shaft Seal. Replace pitman arm shaft seal (pars. 183e and 185k).

e. Loose Steering Idler Arm Shaft in Frame Bracket. Tighten steering idler arm frame bracket clamp screw and if this does not

correct the trouble, replace frame bracket and shaft (pars. 187b and 189b).

f. Steering Idler Arm Loose on Steering Idler Arm Shaft. Replace steering idler arm bushing-type bearing (pars. 187c and 189a) and steering idler arm shaft (pars. 187b and 189b) .

g. Further Procedure. If these inspections do not disclose the fault and the vehicle is operable, proceed as described in paragraph 31.

31. Trouble Shooting Before Removal and During Operation

a. General. If the inspections in paragraph 30 do not reveal causes of failure and vehicle is operable, trouble shoot it. Refer to paragraph 13b for the purpose and scope of these trouble shooting procedures.

b. Rough Steering During Operation. Rough steering during operation indicates worn or scored internal parts and the steering gear will require rebuilding (pars. 183, 184, 185, and 186).

Section IX. SPRINGS AND SHOCK ABSORBERS

32. Trouble Shooting Before Removal or Operation

a. General. Do not operate the vehicle prior to completing the procedures given in this paragraph. Refer to paragraph 13a for purpose of these inspections.

b. Worn Spring Bolts, Spring Shackles, and Bushing-Type Bearings. If the spring bolts, spring shackles, and bushing-type bearings are worn, replace necessary parts (pars. 196, 198, 199, and 201).

c. Shifted Spring Leaves Indicating a Broken Spring Center Bolt. Replace spring center bolt (pars. 196, 198, 199, and 201).

d. Spring Bolts Loose in Frame Brackets. If holes in frame brackets are elongated, it will be necessary to install new spring bolts and frame brackets (pars. 206c and 208c).

e. Further Procedure. If these inspections do not disclose the fault and the vehicle is operable, proceed as described in paragraph 33.

33. Trouble Shooting Before Removal and During Operation

a. General. If the inspections in paragraph 32 do not reveal causes of failure and vehicle is operable, trouble shoot it. Refer to paragraph 13b for purpose and scope of these trouble shooting procedures.

b. Lack of Shock Absorber Control. Lack of shock absorber control indicates failure of internal parts. Shock absorbers cannot be repaired and must be replaced if defective. Refer to TM 9-840.

Section X. WINCH AND DRIVE SHAFT

34. Trouble Shooting Before Removal or Operation

a. General. Do not operate the vehicle prior to completing the procedures given in this paragraph. Refer to paragraph 13a for purpose of these inspections.

b. Lubricant Leakage at Worm Shaft Grease Seal Assemblies. Lubricant leakage at worm shaft grease seal assemblies is the result of worn seal assemblies or loose worm shaft bearings. If bearings are satisfactory, install new grease seal assemblies (pars. 324b and 326d) . If worm shaft bearings require adjustment, refer to paragraph 326.

c. Lubricant Leakage at Clutch Housing Grease Seal. Replace clutch housing grease seal (pars. 318b and 320c).

d. Lubricant Leakage at Cable Drum Grease Seal. Replace cable drum grease seal (pars. 321a and 323b).

e. Excessive Clearance Between Cable Drum Shaft and Cable Drum Bushing-Type Bearings. Replace cable drum bushing-type bearings and cable drum shaft if necessary (par. 322).

f. Ineffective Cable Drum Drag Brake. If the cable drum drag brake is ineffective, install new cable drum drag brake assembly (pars. 318b and 320c).

g. Worn Safety Brake Band Lining. Replace safety brake band lining (pars. 324c, and 326f and *j*).

h. Further Procedure. If these inspections do not disclose the fault, and the vehicle is operable, proceed as described in paragraph 35.

35. Trouble Shooting Before Removal and During Operation

a. General. If the inspections in paragraph 34 do not reveal causes of failure and vehicle is operable, trouble shoot it. Refer to paragraph 13b for purpose and scope of these trouble shooting procedures.

b. Winch Noisy During Operation. Noise in winch during operation indicates worn or damaged internal parts and it will be necessary to rebuild winch. Refer to chapter 18 for information pertaining to rebuild of winch.

c. Further Procedure. If these trouble shooting procedures do not disclose the fault, proceed as prescribed in paragraph 36.

36. Trouble Shooting After Removal and Before Operation

After the component has been removed from the vehicle or if it has been received already removed, further inspection is necessary. Refer to paragraph 13c for purpose and scope of these procedures. If the winch alone has been received by the ordnance unit for a preliminary check before being installed in the vehicle or if the operation of the winch has not been satisfactory due to unknown causes, disassemble it and replace required parts as described in chapter 18.

CHAPTER 4

REMOVAL AND INSTALLATION OF MAJOR COMPONENTS

Section I. DISASSEMBLY OF VEHICLE INTO MAJOR COMPONENTS

37. General

This section contains information for the guidance of personnel performing major rebuild work on the ~~3 1/2~~-ton 4 x 4 trucks M37, M42, M43, and V41. It provides an assembly line procedure for the disassembly of the vehicles into major components. It designates what constitutes a major component, illustrates the points of connection between major components, and states briefly what must be done. The points of connection are indicated on many of the items by a circle on the illustrations.

38. Batteries (Field and Depot Maintenance)

a. Remove Seat and Battery Box Cover. Refer to TM 9-840 for instructions on removing drivers seat and battery box cover.

b. Remove Batteries (All Trucks and Ambulance M43 After Serial No. 80025984) (fig. 9). Disconnect the clamp-type battery terminals (B) and push cables aside to prevent interference when batteries are removed. Remove nuts and washers from battery hold-down cover bolts (A). Remove hold-down cover and batteries.

c. Remove Batteries (Ambulance M43 Through Serial No. 80025984) (fig. 9). Disconnect battery cable assemblies from clamp-type terminals, but do not disturb clamp-type terminals on battery posts. Refer to paragraph 43a for balance of removal procedure.

39. Hood, Front Fenders, and Radiator Guard Assembly (Field and Depot Maintenance)

a. Remove Hood Assembly. Disconnect the horn wire connec-

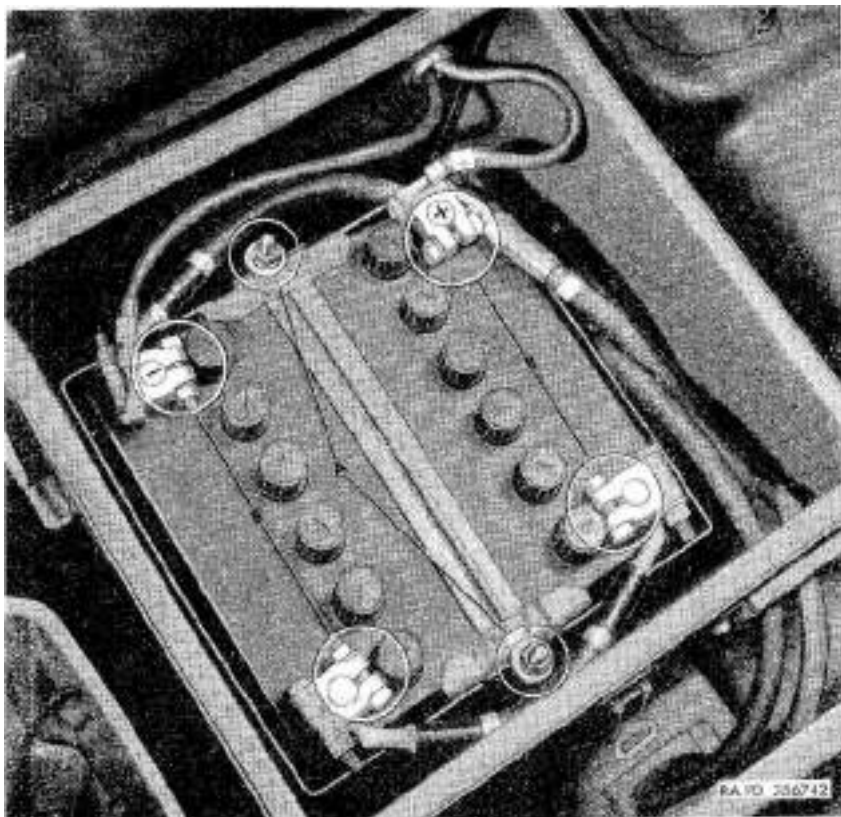


Figure 9. Battery disconnect points.

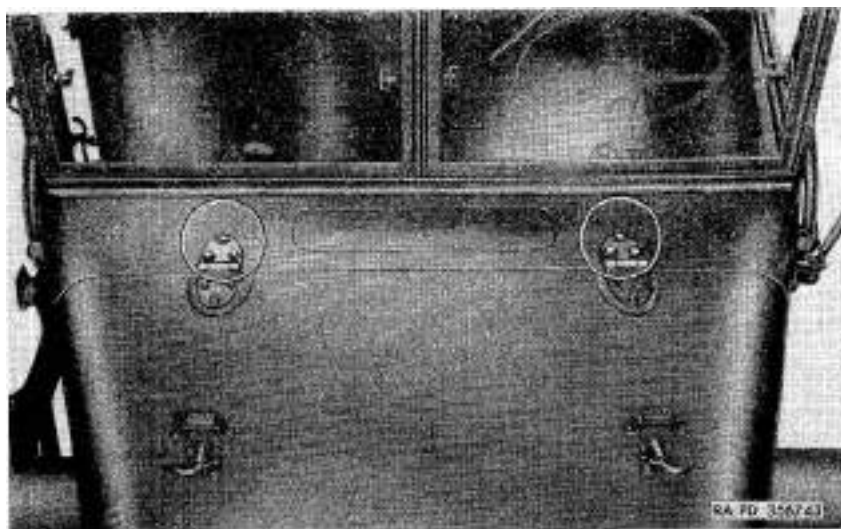


Figure 10. Hood hinge disconnect points.

tors under hood. Remove the screws and lock washers, which attach hood hinges (*fig. 10*) to cowl, and remove hood assembly.

b. Remove Wiring Harness and Cables (fig. 11). Remove wiring harness and cables from clips (A, B, C, D, E, F, H, and J) on right and left fender splash shields and left fender. Separate cable connector shells and connectors (A, C, and J). Remove horn button cable from clip (G) and separate connector shells and connector.

c. Remove Front Fenders and Radiator Guard Assembly (fig. 12). Remove lock washer screws from fender supports (C and D). Remove lock washer screws from rear of hood panel (A). Remove lock washer screws from radiator-tie rods at front end (B). Remove fenders (with headlight and marker light) and radiator guard assembly.

40. Steering Gear and Drag Link Assemblies (Field and Depot Maintenance)

a. Horn Button and Cable Assembly (fig. 13).

- (1) Withdraw horn button cable from frame. Slide metal bushing from grommet and pull grommet, metal bushing, and connector shell from end of cable (B). Unscrew tube nut (A) from bottom of steering gear and pull horn button cable hose assembly with tube, horn button cable seal plain washer, and horn button cable seal from horn button cable. It may be necessary to pry the rubber seal from the recess in steering gear housing lower seal plate.
- (2) Remove rubber horn button seal from steering wheel. Depress horn button and turn clockwise to disengage it from the horn button lower retaining plate. Pull horn button and cable from steering wheel. Remove horn button retainer plate spring, steering wheel nut, and lower retaining plate.

b. Remove Steering Wheel. Remove steering wheel with puller and adapter 41—A-18-173 (*figs. 5, 7, and 14*).

c. Remove Steering Gear Assembly and Pitman-Arm-to-Idler-Arm Drag Link.

- (1) Remove steering column cut-out cover (four lock washer screws) (A, *fig. 14*).
- (2) Remove steering post clamp and steering post clamp insulator (two cap screws, nuts, and lock washers) (A, *fig. 15*).
- (3) Apply grease on upper portion of steering gear column jacket and remove steering post collar (B, *fig. 15*).
- (4) Disconnect pitman-arm-to-idler-arm drag link assembly at steering idler arm (D, *fig. 16*).

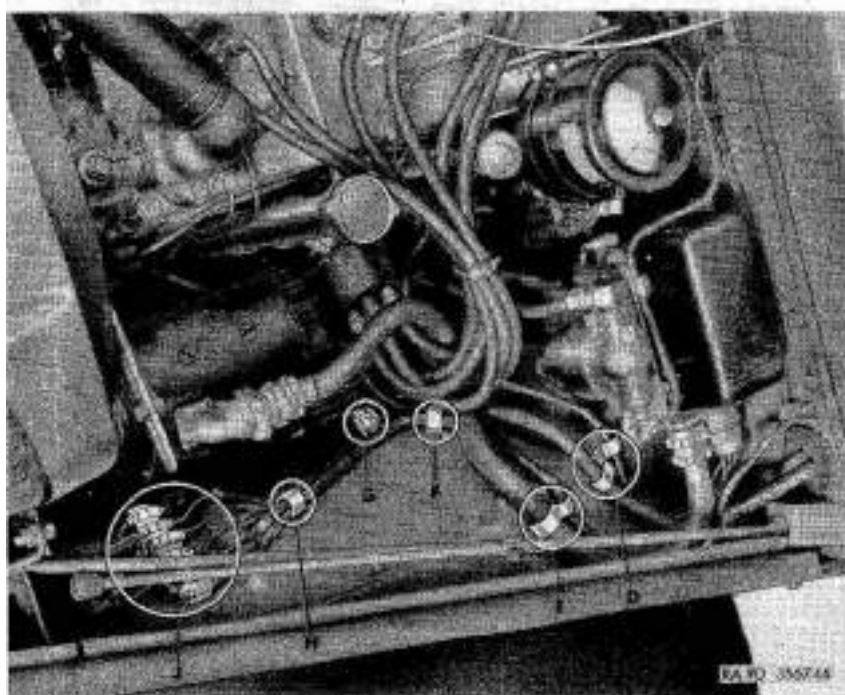
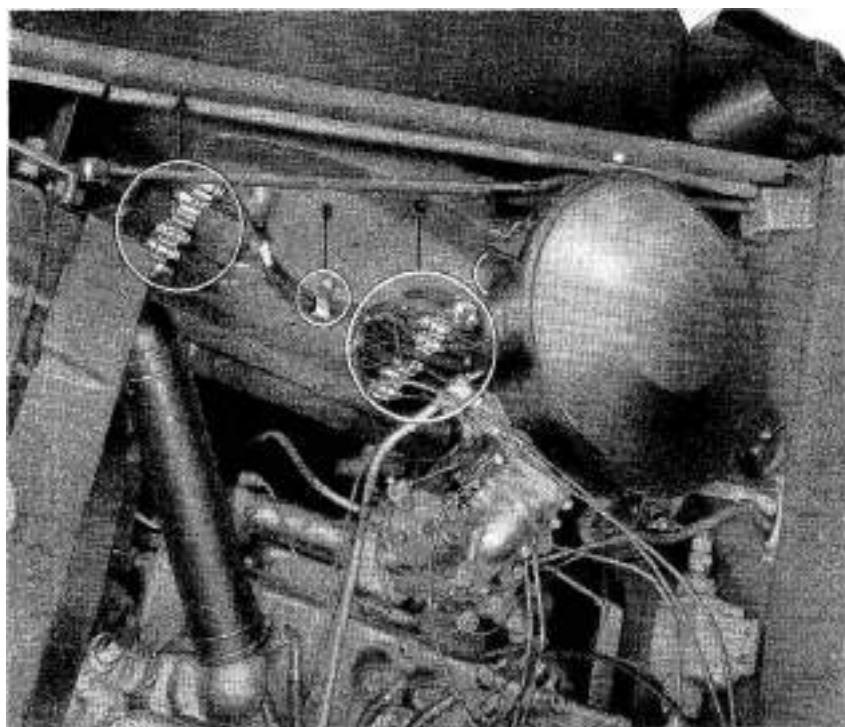


Figure 11. Wiring harness and cable disconnect points.

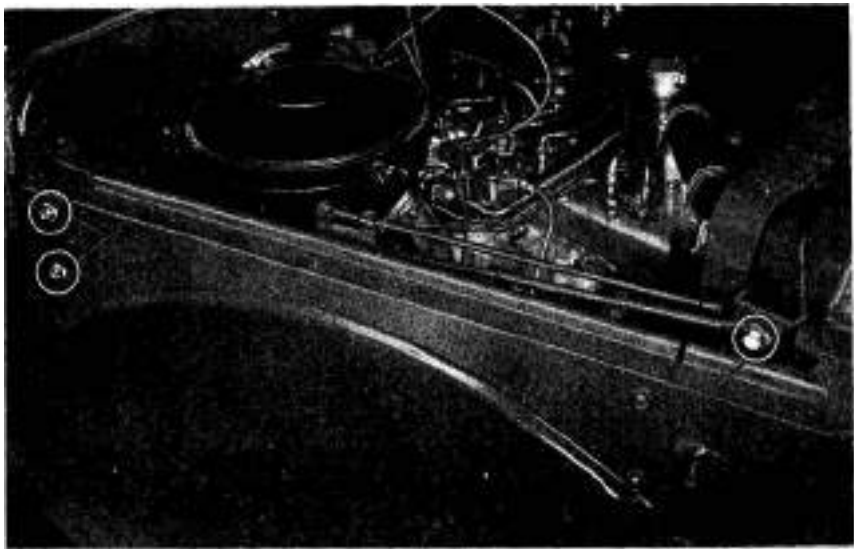


Figure 12. Fender and radiator guard assembly disconnect points.

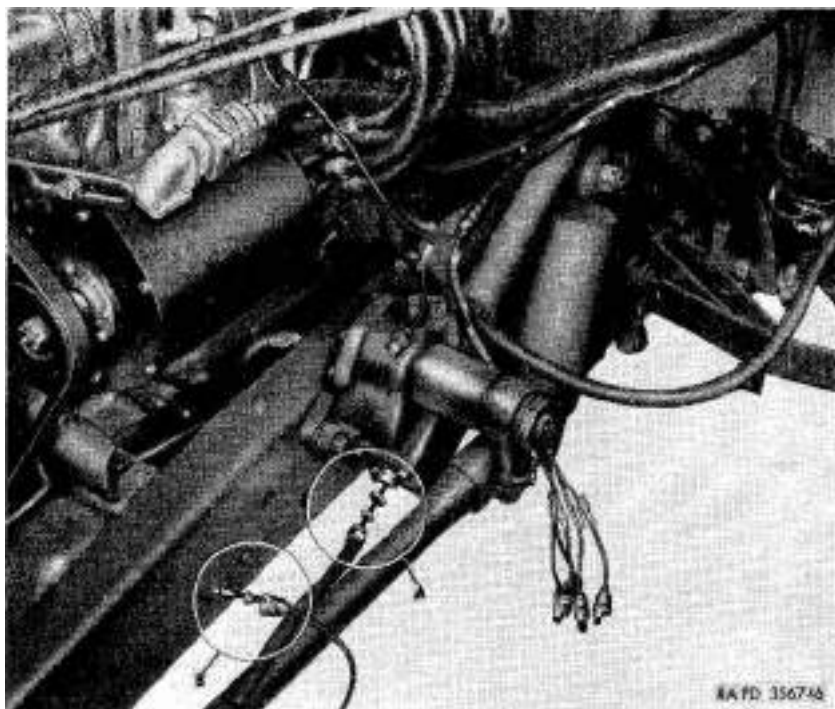


Figure 13. Horn button cable disconnect points.

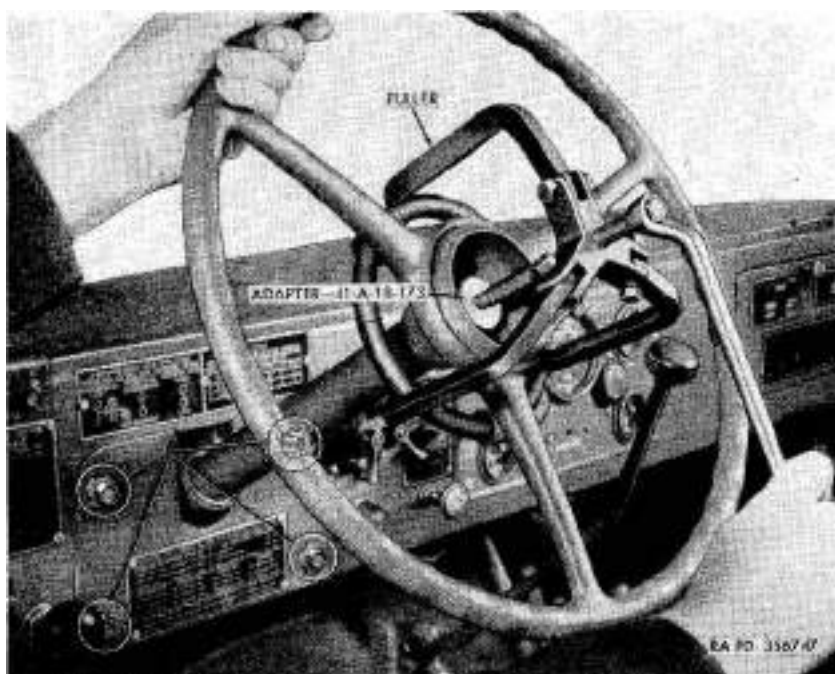


Figure 14. Removing steering wheel.



Figure 15. Steering column jacket disconnect points.

- (5) Disconnect steering gear housing at frame (three cap screws, plain washers, lock washers, and nuts) (B, *fig. 16*). Remove steering gear assembly from front end of cab.

41. Cargo, Command, and Telephone Maintenance Bodies (Field and Depot Maintenance)

a. Remove Cargo and Command Bodies.

- (1) Remove radio cable receptacle and cover from body front panel (four large screws, four small screws, and lock washers) (*fig. 17*).
- (2) Remove right and left rear lifting shackle bracket assemblies from frame (two lock washers and nuts, each side).
- (3) Remove nuts, lock washers, and plain washers from body hold-down bolts (three each side).
- (4) Disconnect fuel tank filler pipe and vent line hose connections under body.
- (5) Remove body from frame.

Note. Proper radio receptacle hole alignment between the body and cab depends on the correct installation of the body-to-frame pads. Attach all pads to the body hold-down brackets in their original positions to facilitate assembly.

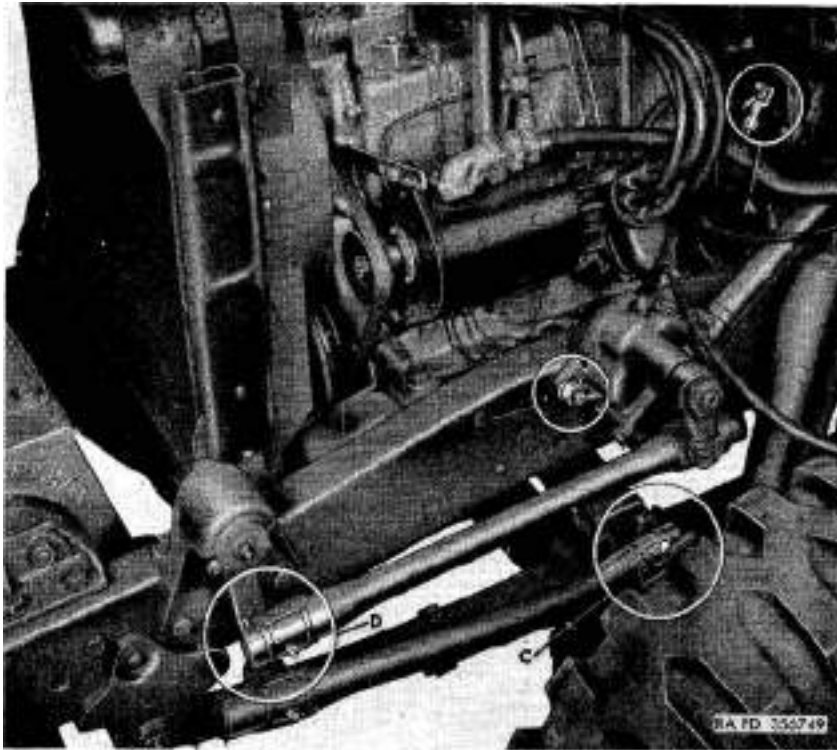


Figure 16. Steering gear and drag link disconnect points.

b. Remove Telephone Maintenance Body. The telephone maintenance body is removed in the same manner as outlined in a above, with the exception of the radio receptacle connection.

42. Cab (Field and Depot Maintenance)

a. Remove Cab Top Cover Assembly.

- (1) Disconnect bottom rear of cab top cover from cab by releasing hold-down rope from rear-panel hooks.
- (2) Pull top cover from right and left top side rails (fig. 18) as metal retainers in cover must be disengaged from side rails.
- (3) Pull top cover up from left and right top side rail-support retainers (fig. 19).
- (4) Disconnect top-bow-to-windshield straps. Fold top cover toward windshield and pull cover from windshield support frame retainer (fig. 20), left side of vehicle.
- (5) Remove top bow from side rail supports.
- (6) Loosen nuts on J- and U-bolts located in the cab lock pillar. Remove right and left top side rail panel and

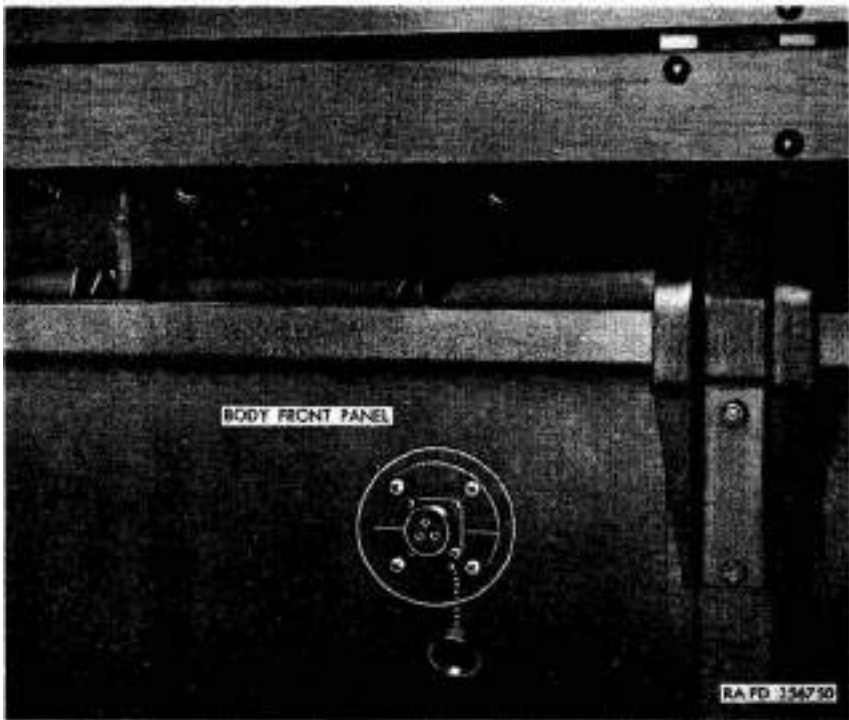
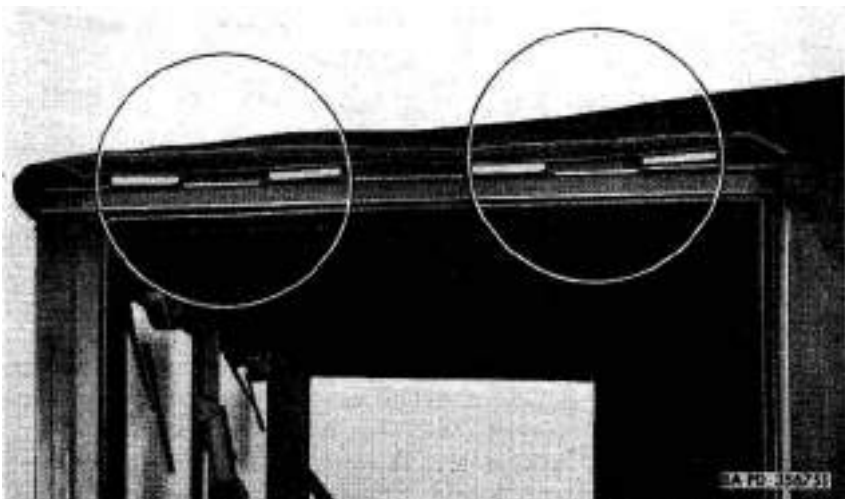


Figure 17. Radio receptacle disconnect points.



*Figure 18. Top cover to top **side rail** disconnect points.*



Figure 19. Removing top cover from top side rail supports.

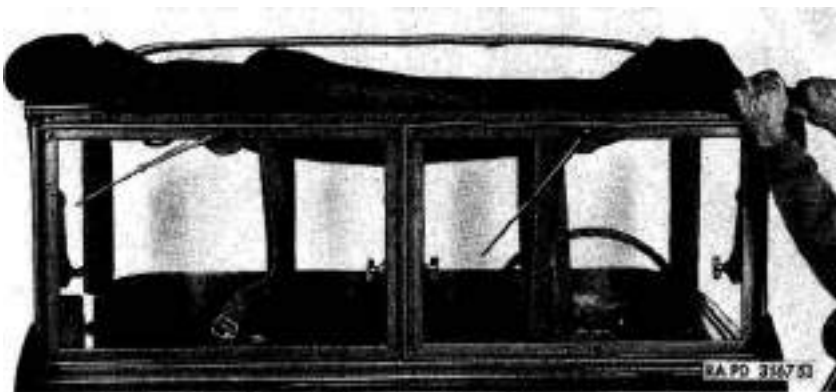


Figure 20. Removing top cover from windshield support frame retainer.

support assemblies from cab (two screws and lock washers each side) at windshield support frame.

b. Remove Cab.

- (1) Remove clutch and brake pedal cover from cab (eight lock washer screws) (E, *fig. 21*).
- (2) Remove power-take-off upper shift lever (on vehicles so equipped) (two screws and lock washers). Pull power-take-off shift lever weatherseal from floor transmission cover (D, *fig. 21*).
- (3) Remove transmission upper shift lever (one screw, lock washer, and nut). Remove shift lever weatherseal from floor transmission cover (B, *fig. 21*).
- (4) Remove brake-and-transfer lever weatherseal retainer assembly from floor transmission cover (four screws and lock washers) (C, *fig. 21*).
- (5) Remove light switch from instrument panel (four screws and lock washers). Disconnect body wiring harness from right side of light switch (A, *fig. 21*) with a spanner wrench. Disconnect cable at fuel gage. Remove harness from clips on cowl inside panel and engine side of cowl front panel. Remove grommet from right side of cowl front panel and pull body cable (light switch) harness from cab (B, *fig. 22*).
- (6) Loosen nuts (A and E, *fig. 22*). Remove radiator tie rods from cowl brackets.
- (7) Disconnect cables from starter switch terminal stud (A, *fig. 16*).
- (8) Disconnect slave receptacle ground cable at left running board front hanger (one cap screw, three lock washers, and nut).

- (9) Disconnect speedometer cable at transfer and remove cable from frame side rail clips.
- (10) Disconnect water temperature gage cable at water temperature gage sending unit, rear of cylinder head.
- (11) Disconnect generator-to-regulator harness assembly at generator regulator (D, fig. 22) with a spanner wrench.
- (12) Disconnect fuel filter flexible lines at line fittings (F, fig. 22).
- (13) Disconnect ignition distributor cable at filter (C, fig. 22).
- (14) Disconnect accelerator pedal rod at accelerator bell crank lever (one clevis pin and cotter pin).
- (15) Disconnect choke control at carburetor (G, fig. 22).
- (16) Disconnect throttle control at throttle linkage bell crank on intake manifold.
- (17) Disconnect fording controls (H and J, fig. 22) at crank-case ventilator shut off valves.
- (18) Disconnect carburetor throttle spring at cowl.
- (19) Disconnect engine primer inlet line at intake manifold tee.
- (20) Disconnect windshield wiper hose from windshield wiper manifold tube.
- (21) Remove cotter pins, nuts, springs, and plain washers

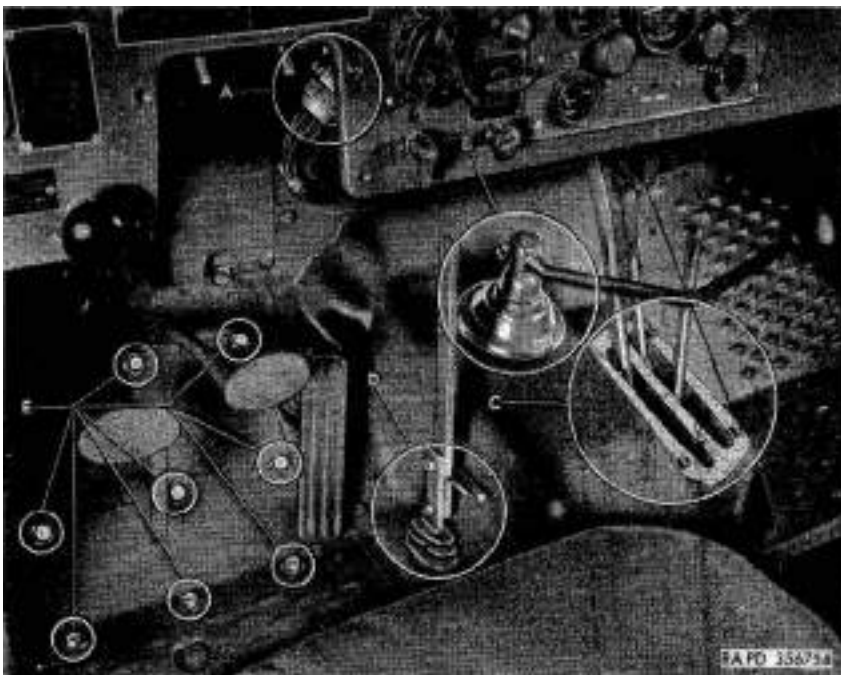


Figure 21. Cab disconnect points.



Figure 22. Cab disconnect points.

from three cab hold-down bolts. Remove the two nuts and lock washers from cab left forward hold-down bolt. Lift cab from chassis. Save body-to-frame pads on running board hangers (four pads) .

43. Ambulance Body (Field and Depot Maintenance)

a. Remove Batteries (Ambulance M43 Through Serial No. 80025984).

- (1) Remove battery hold down cover and batteries (two nuts, lock washers, and plain washers) .
- (2) Remove battery cable weatherseal retainer and battery cable weatherseal (two screws and lock washers) . Pull cables down through body floor.

b. Remove Ambulance Body.

- (1) Remove grille from lower right litter support at heater (two screws and washers). Disconnect fuel line at heater and push fuel line down through body floor.
- (2) Disconnect three cable terminals at connections inside frame right side rail, to rear of transfer.
- (3) Remove right and left rear lifting-shackle bracket assemblies from frame to facilitate removal of body rear hold-down bolts (two lock washers and nuts, each side) .
- (4) Remove nuts, lock washers, and plain washers from body hold-down bolts (five each side).
- (5) Disconnect fuel tank filler pipe and filler vent tube hose connections at fuel tank.
- (6) Balance of disconnect points are the same as indicated for removal of the cab. Refer to paragraph 42.
- (7) Remove ambulance body from frame.

Note. Tie all body-to-frame pads to body hold-down brackets in their original positions to facilitate assembly.

44. Winch and Winch Drive Shaft Assemblies (Field and Depot Maintenance)

a. Remove Winch and Winch Drive Shaft Assemblies.

- (1) Remove cotter pin and shear pin from winch end yoke on winch drive shaft (A, *fig. 23*).
- (2) Remove locking wire and loosen set screw on collar at splined end of drive shaft assembly. Push drive shaft assembly to rear to disengage front universal joint assembly from winch worm shaft.
- (3) Remove cap screws and lock washers from *winch-to-frame* brackets and *winch-to-bumper* brackets (10 cap screws and lock washers) (B, C, and D, *fig. 23*). Lift winch from frame.

b. Remove Winch Drive Shaft. Remove locking wire and loosen set screw in front universal joint assembly. Drive front universal joint assembly from shaft. Pull shaft forward to disengage it from splined yoke of rear universal joint assembly. Remove drive shaft from rear of frame front cross member.

45. Power Plant (Field and Depot Maintenance)

a. General. The power plant, consisting of radiator, engine, clutch, and transmission, is removed as a major component. The

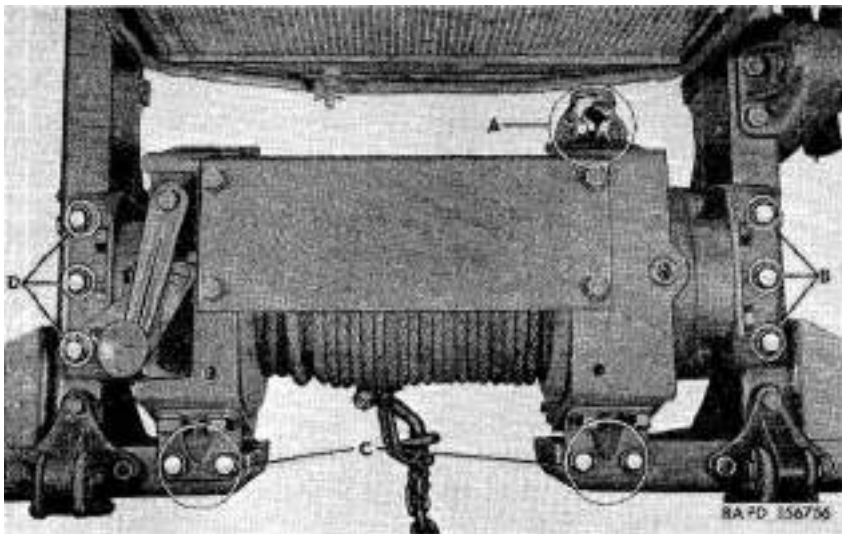


Figure 23. Winch disconnect points.

engine lifting bracket, mounted on the cylinder head, is positioned to provide proper balance of the power plant during removal. It is not necessary to drain the cooling system, oil pan, or transmission for removal of the power plant.

b Remove Power Plant

- (1) Remove transmission-to-transfer propeller shaft assembly (four bolts, nuts, and lock washers, each companion flange) (D, *fig. 24*).
- (2) Disconnect transfer shift lever control rods from transfer shifter shafts and hand brake rod from hand brake (E, F, and L, *fig. 24*) (three cotter pins and one clevis pin). Remove levers and bracket assembly from transmission (three screws and lock washers) (C, *fig. 24*).
- (3) Disconnect bonding ground strap on clutch housing at frame side rail (B, *fig. 24*) (one cap screw, nut, and two lock washers).
- (4) Close fuel filter-to-fuel pump shut off cock near fuel pump and disconnect fuel filter-to-fuel pump flexible line at shut-off cock (*fig. 25*).
- (5) Loosen nuts on eye bolts at exhaust pipe connection and disconnect upper and lower exhaust pipes (*fig. 26*).
- (6) Remove cotter pin and clevis pin and disconnect clutch operating rod from clutch release fork lever (A, *fig. 24*).
- (7) Disconnect fuel tank and brake master cylinder vent lines at flexible lines under generator (B, *fig. 27*).
- (8) Remove locking wire from radiator support cap screws. Remove cap screws, plain washers, and lock washers from radiator support (C, *fig. 33*).
- (9) Remove nuts, lock washers, plain washers, and cap screws from the engine front support plate and engine front support plate brackets on frame side rails (A, *fig. 27*).
- (10) Remove cotter pins from engine rear support bolts. Remove nuts, plain washers, bolts, plain washers, and rear support lower insulators (C, *fig. 27*).
- (11) Lift power plant from frame. Remove rear support upper insulator spacers and rear support upper insulators from engine rear support brackets.
- (12) Wire the plain washers, which serve as alinement spacers, on the radiator support bracket (C, *fig. 33*). The plain washers must be retained at their original locations to insure proper hood alinement when the parts are assembled.

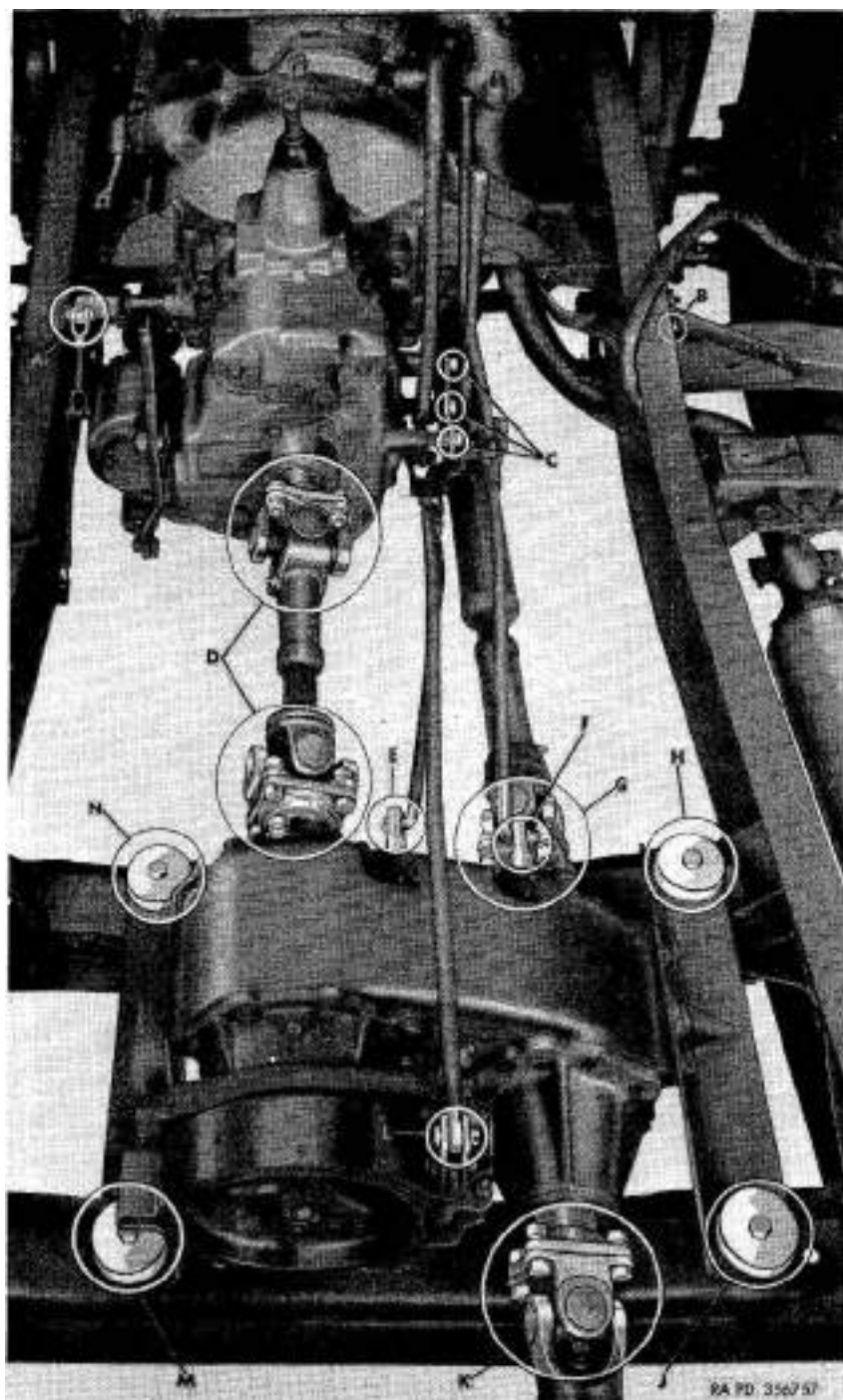


Figure 24. Power plant and transfer disconnect points.

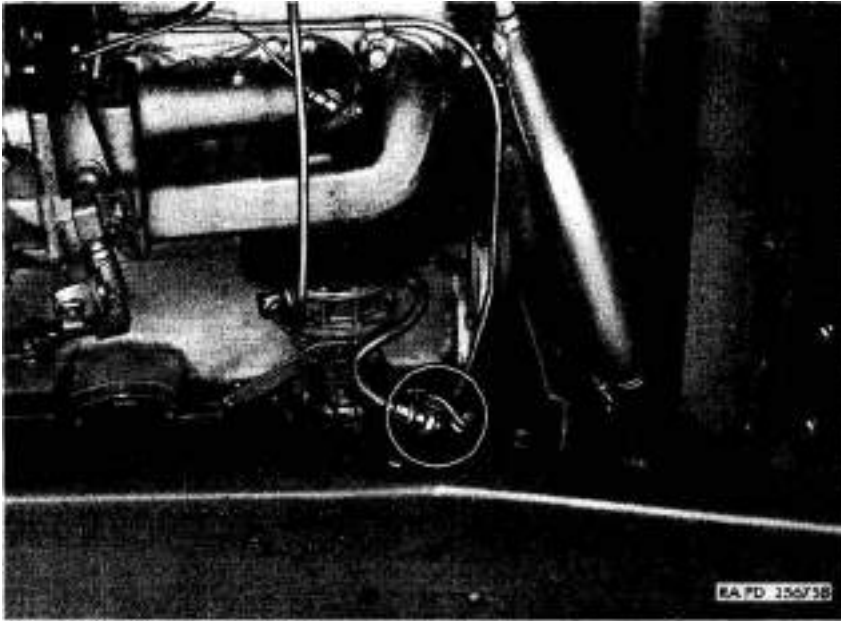


Figure 25. Fuel line disconnect points.

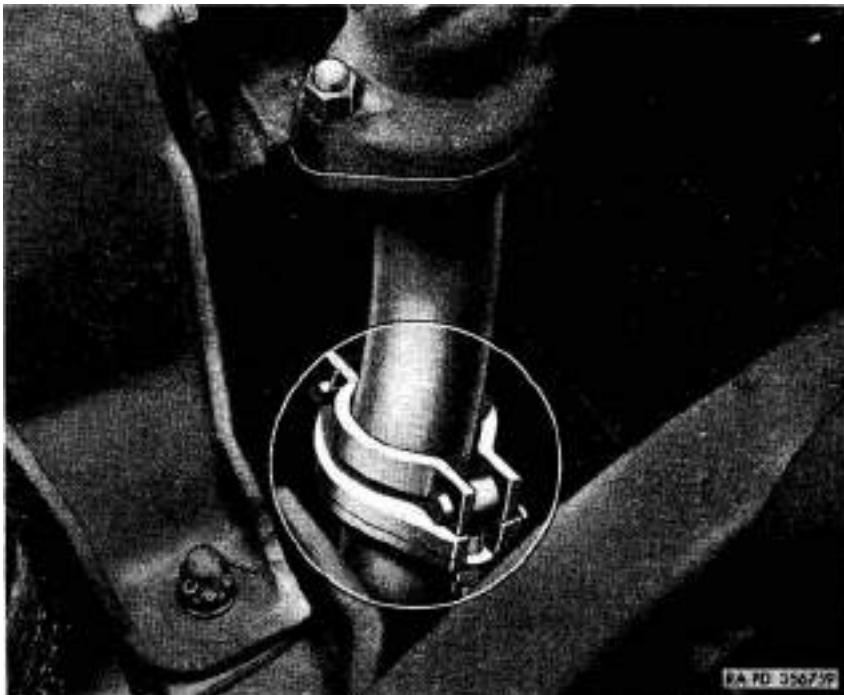


Figure 26. Exhaust pipe disconnect points.

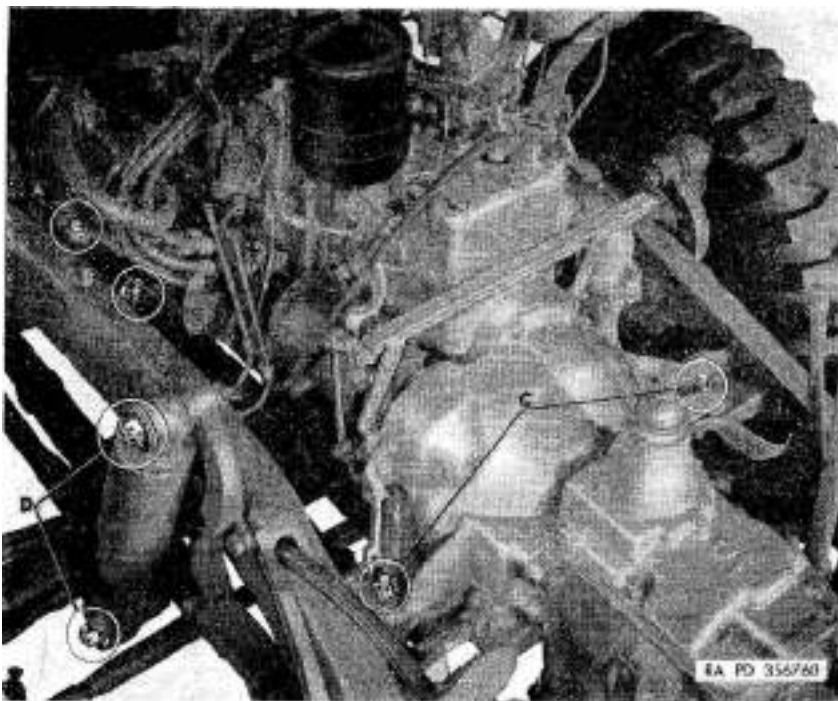


Figure 27. Power plant disconnect points.

46. Front Axle and Rear Axle Propeller Shaft Assemblies (Field and Depot Maintenance)

Remove front axle and rear axle propeller shaft assemblies (four bolts, nuts, and lock washers, each companion flange) (G and K, fig. 24).

47. Transfer (Field and Depot Maintenance)

Remove nuts, plain washers, and lock washers from the bolts (H, J, M, and N, fig. 24), which attach transfer assembly to frame cross members (fig. 28). Lift transfer from frame cross members and remove transfer mounting bracket insulators, mounting bracket insulator spacers, and bolts.

48. Front Axle (Field and Depot Maintenance)

a. Support Frame. Place supports under frame to relieve load on front and rear axles.

b. Remove Front Axle.

- (1) Disconnect idler-arm-to-steering-arm drag link assembly (C, fig. 16) at steering arm on front axle,

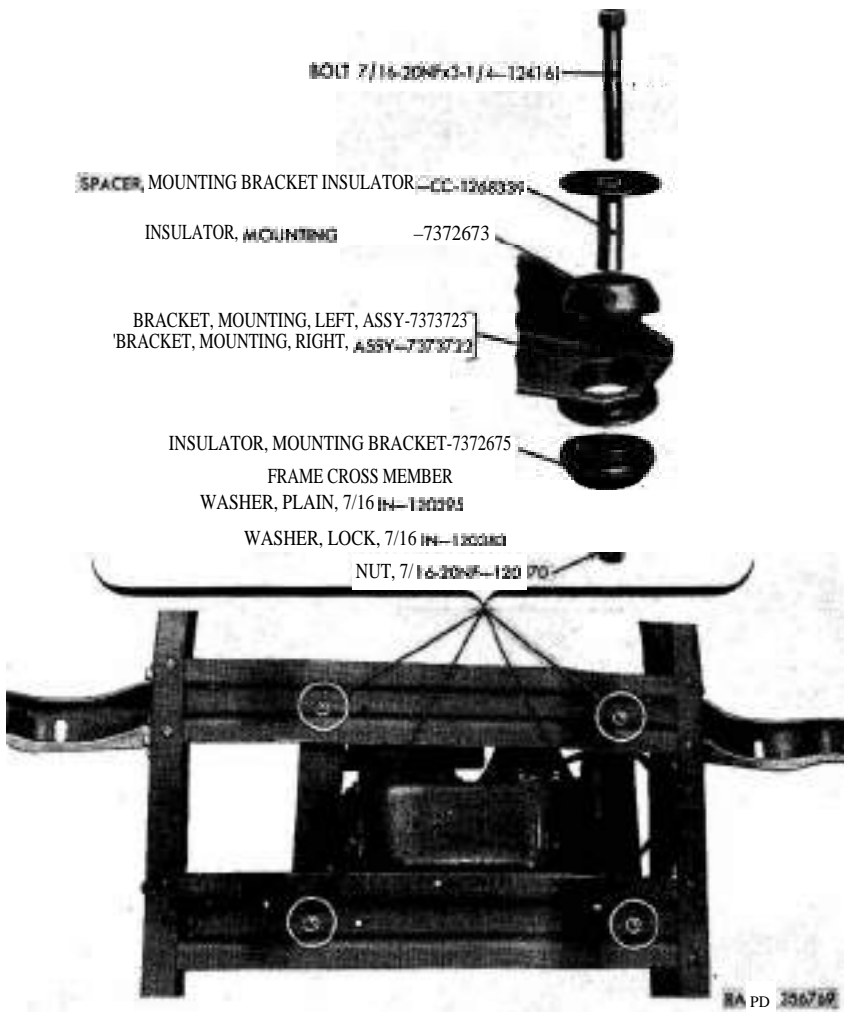


Figure 28. Transfer mounting parts.

- (2) Disconnect brake flexible line at brake line bracket (*fig. 29*) on frame front cross member.
- (3) Remove cotter pins, shock absorber bearing retainers, and shock absorber bushing-type bearings (rubber) from each shock absorber frame bracket and spring clip plate stud (D, *fig. 27*). Remove shock absorbers from frame and spring clip plate studs.
- (4) Remove nuts and lock washers from spring clips (four each side). Remove spring clips, front axle bumper assemblies, and spring clip plate at left side. Remove front axle from vehicle.

49. Rear Axle (Field and Depot Maintenance)

Remove shock absorbers as described in paragraph 48b. Disconnect brake flexible line at brake line bracket (fig. 29) on frame fuel tank support cross member. Remove nuts and lock washers from rear spring clips (four each side) . Remove spring clips and spring clip seats. Remove rear axle from vehicle.

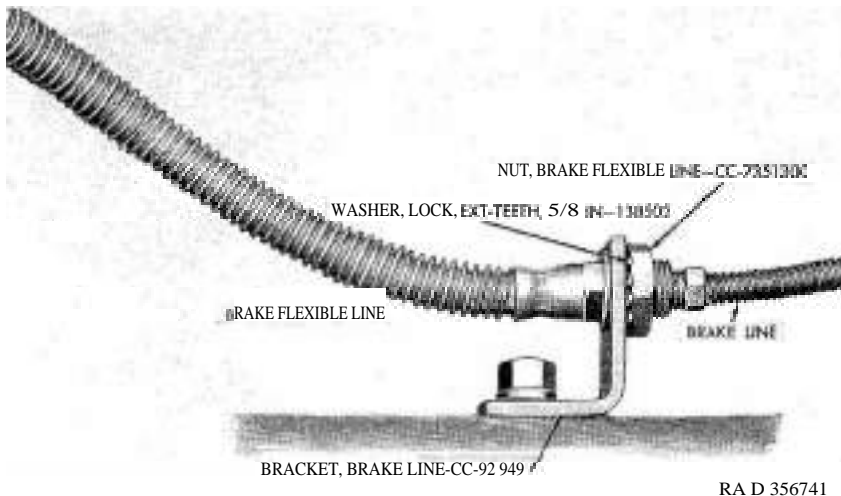


Figure 29. Brake flexible line disconnect points.

50. Springs and Shock Absorber Brackets (Field and Depot Maintenance)

a. *Remove Front Spring Assemblies and Shock Absorber Frame Brackets (fig. 30).*

- (1) Remove cotter pins and nuts from spring bolts at upper end of shackles and front of springs (A, C, D, and F). Remove spring bolts with adapter — 41-A-18-241 (L, fig. 5) and a slide hammer type puller. Remove both front springs complete with shackles.
- (2) Remove front spring torque arrester assemblies from frame (three nuts, lock washers, and cap screws, each side) (E).
- (3) Remove front shock absorber frame brackets (two nuts, lock washers, and cap screws each side) (B and G).

b. *Remove Rear Spring Assemblies and Shock Absorber Frame Brackets (fig. 31).*

- (1) Remove nuts, lock washers, and cap screws from frame

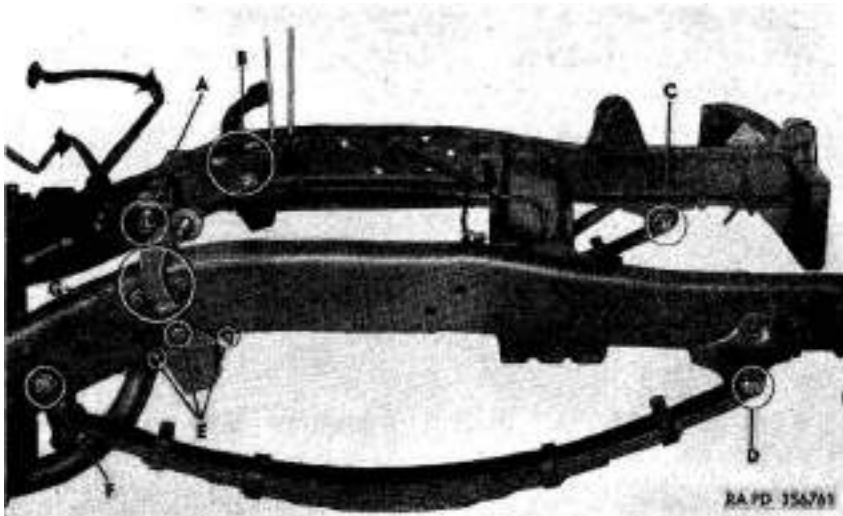


Figure 30. Front suspension disconnect points.

rear spring brackets (A and E) (two each side). Screw front and rear spring bolts (A and E) from frame brackets and remove right and left rear springs complete with shackles.

- (2) Remove rear axle bumpers (B) from frame (two nuts, lock washers, and cap screws, each side).
- (3) Remove shock absorber frame brackets (three nuts, lock washers, and cap screws, each side) (C and D) .

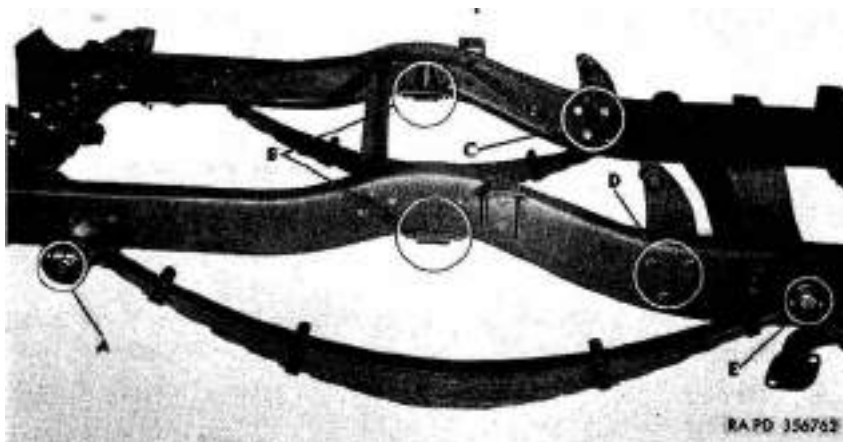


Figure 31. Rear suspension disconnect points.

51% Frame and Miscellaneous Parts (Field and Depot Maintenance)

a. General. Several miscellaneous parts remain on the frame after removal of major components. The removal of these parts is necessary to reduce the frame to a major component.

b. Remove Miscellaneous Parts From Frame.

- (1) Remove front bumper and lifting shackle assemblies (vehicles without winch) (five nuts, lock washers, plain washers, and cap screws, each side).
- (2) Remove right and left front bumpers complete with frame side rail extensions and lifting shackle assemblies (vehicles with winch) (four nuts, lock washers, and cap screws, each side) (A and B, *fig. 32*).
- (3) Remove steering idler arm bracket, steering idler arm, and steering-arm-to-idler-arm drag link as an assembly (four nuts, lock washers, and cap screws) (B, *fig. 33*).
- (4) Remove right and left engine dust pans (A, *fig. 33*) (eight screws).
- (5) Remove right and left running boards (four nuts, lock washers, and step bolts, each side).
- (6) To remove master cylinder (*fig. 34*), remove clevis pin (J, *fig. 34*) at forward end of master cylinder-to-pedal rod, and disconnect master cylinder-to-frame link at brake line frame tee (E, *fig. 34*), stop light cable at stop light switch (C, *fig. 34*), and master cylinder-to-air cleaner elbow vent line (B, *fig. 34*) at master cylinder. Remove the three nuts, lock washers, and screws, which attach master cylinder to running board hanger (G, *fig. 34*). Remove master cylinder.
- (7) Remove clutch pedal shaft lever, clutch operating rod, pull-back spring, and pull-back spring bracket (two nuts, lock washers, and cap screws) (A and B, *fig. 35*).
- (8) Remove brake pedal pull-back spring, spring extension, and pull-back spring bracket (D, *fig. 34*) (two nuts, lock washers, and cap screws).
- (9) Remove clutch and brake pedals with pedal bracket assembly from frame (three nuts, lock washers, and cap screws) (H, *fig. 34*).
- (10) Disconnect front and rear muffler support clamps. Remove tail pipe bracket at frame (five nuts, lock washers, and cap screws) (A and B, *fig. 36*), lower exhaust pipe, muffler, and muffler tail pipe.

- (11) Remove right and left front fender rear support brackets (two nuts, lock washers, and cap screws, each side) (K, *fig. 34*).
- (12) Remove right and left running board hangers (nine nuts, lock washers, and cap screws, each side) (A, *fig. 34*).
- (13) Remove four frame hold-down brackets (F, *fig. 34*) (two nuts, lock washers, and cap screws, each bracket).
- (14) To remove fuel tank (*fig. 37*), disconnect fuel gage sending unit cable (H, *fig. 37*), fuel tank-to-air cleaner elbow vent line (K, *fig. 37*), and fuel line (J, *fig. 37*). Remove nuts, lock washers, and screws (A and G, *fig. 37*) from the support straps and hold-down straps. Remove fuel tank.
- (15) Disconnect wiring harness at tail light cable terminal connector shells (C and N, *fig. 7*). Remove guards from blackout tail light mounting brackets (five screws and lock washers) (C, M, and N, *fig. 37*). Remove trailer receptacle (L, *fig. 37*) from left mounting bracket (four nuts, lock washers, and cap screws).
- (16) Remove blackout tail lights and mounting brackets (two lock washers, nuts, and cap screws, each side).
- (17) Remove right and left rear bumpers (two nuts, lock washers, and cap screws, each side) (D, *fig. 37*).
- (18) To remove pintle assembly, remove cotter pin, large slotted nut, pintle shaft, and pintle shaft bracket (four nuts, lock washers, and screws) (E, *fig. 37*). Remove pintle assembly.
- (19) Remove brake line brackets (*fig. 29*) from fuel tank support cross member (one nut, lock washer, and cap screw, each bracket).

c. Remove All Vent, Brake, and Fuel Lines.

- (1) Remove nut and lock washer from brake line frame tee (E, *fig. 34* and B, *fig. 38*). Remove all vent, brake, and fuel lines from clips at right and left frame side rails, frame transfer front cross member, and frame front cross member (*figs. 38 and 39*). Disconnect line unions (A, *fig. 38*) and remove lines and clips.
- (2) Remove wiring harness from frame right side rail, frame transfer front cross member, and frame rear cross member clips (*fig. 39*). Remove harness and clips. Remove three open-tension-type clips at frame rear cross member (F, *fig. 37*).

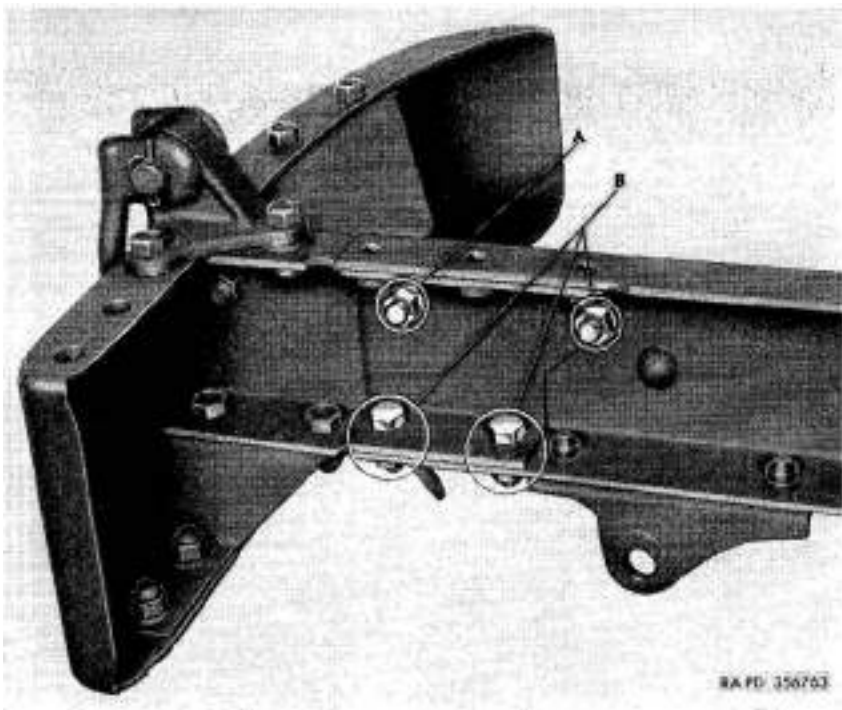


Figure 32. Front bumper assembly (w/winch) disconnect points.

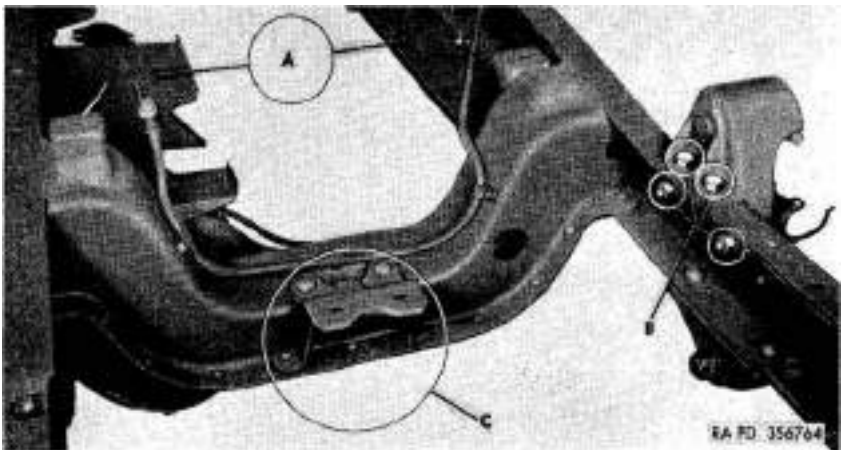


Figure 33. Steering idler arm bracket disconnect points.

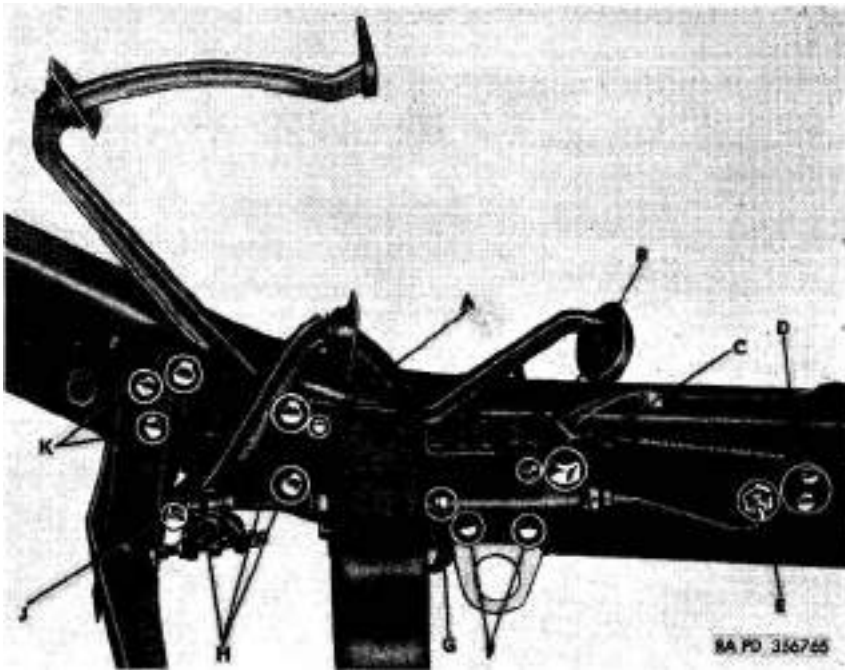


Figure 34. Pedals and brake master cylinder disconnect points.

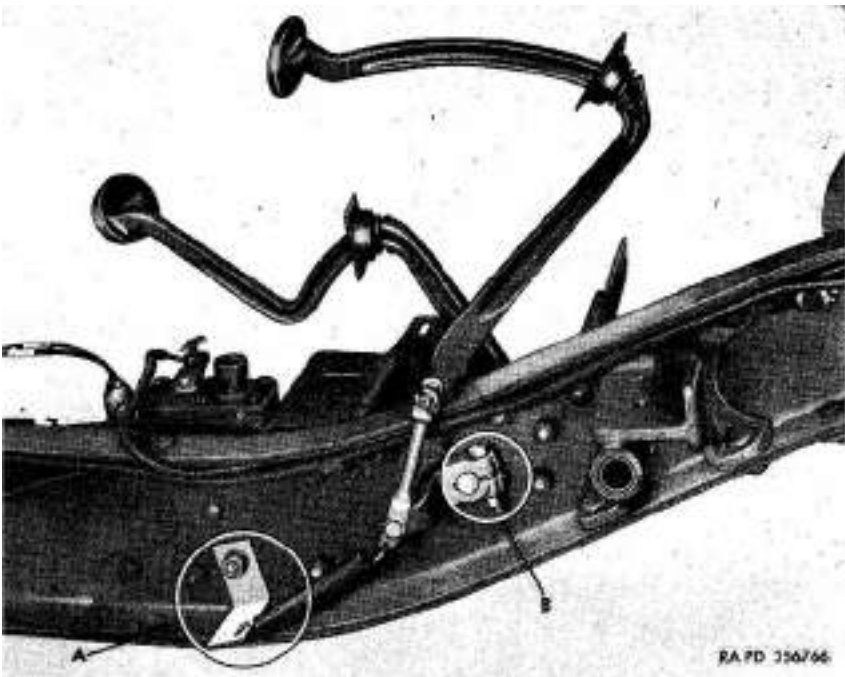


Figure 35. Clutch and brake pedal shaft disconnect points.

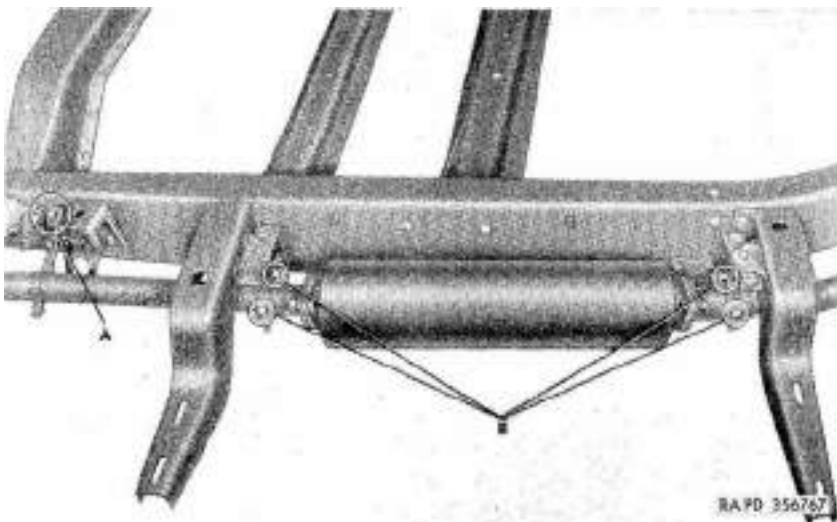


Figure 36. Exhaust system disconnect points.

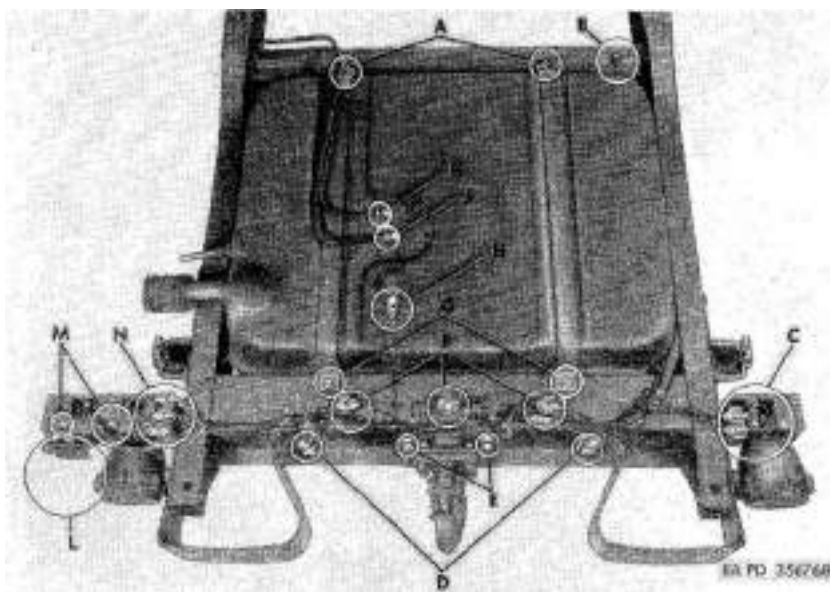


Figure 37. Fuel tank and miscellaneous disconnect points.

Section II. ASSEMBLY OF VEHICLE FROM MAJOR COMPONENTS

52. General

This section provides information on an assembly line procedure for the assembly of the $\frac{3}{4}$ -ton 4 x 4 trucks M37, M42, M43,

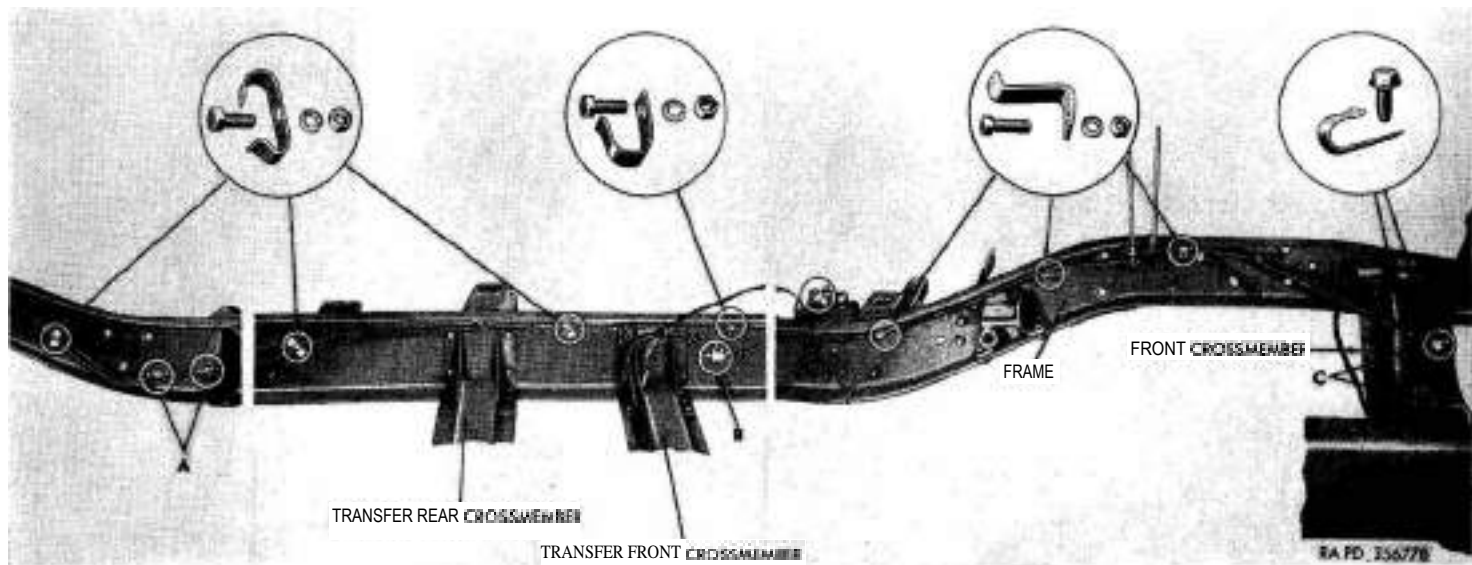


Figure 38. Fuel, brake, and vent lines disconnect points.

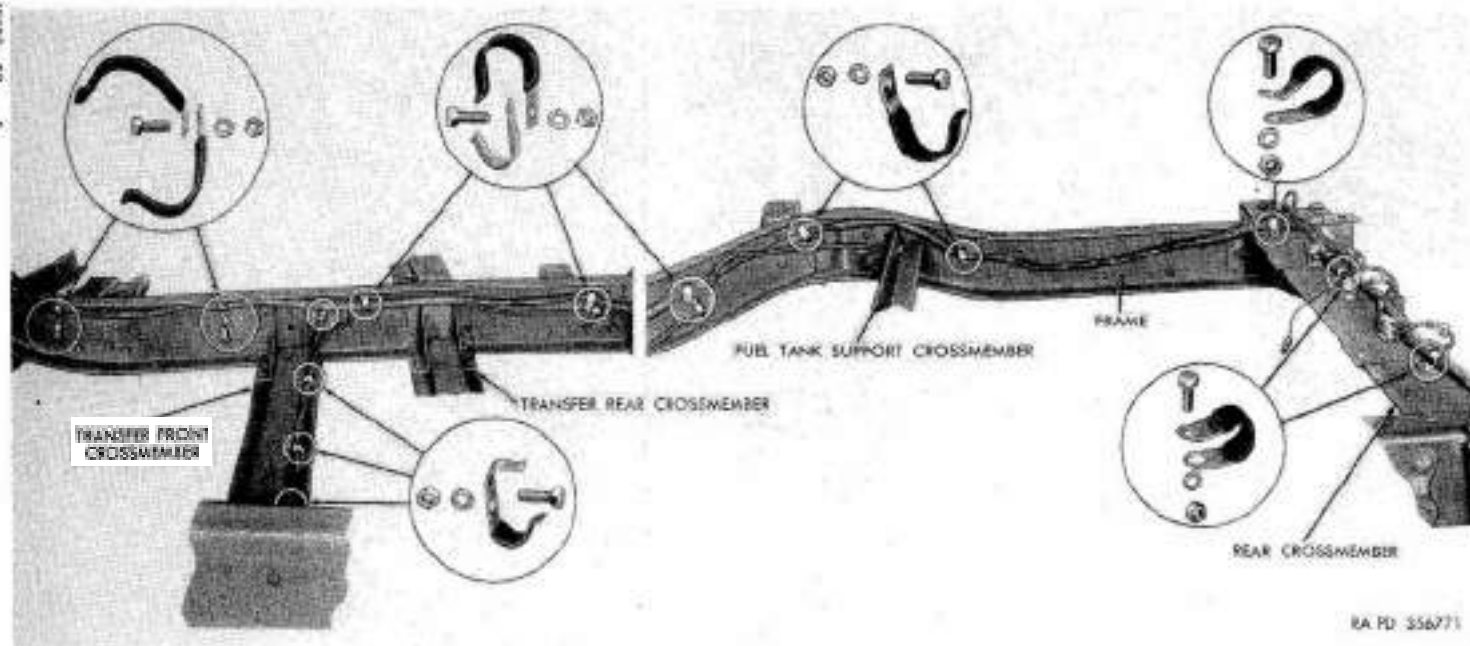


Figure 39. Wiring harness and brake line disconnect points.

and V41 from their major components. The points of connection not illustrated in this section are contained in section I.

53. Frame and Miscellaneous Parts (Field and Depot Maintenance)

a. *General.* It is assumed that a new frame is required ; therefore, the installation of the miscellaneous items removed in section I that are not a part of the various major components must be attached to the frame.

b. *Position Frame for Attachment of Parts.* Place frame on suitable supports.

c. *Install Brake Line Brackets* (fig. 29) . Install rear bracket on right side of fuel tank support cross member and front bracket on right rear flange of front cross member (one $\frac{3}{8}$ -24NF x 1 cap screw, $\frac{3}{8}$ -inch lock washer, and $\frac{3}{8}$ -24NF nut, each bracket).

d. *Install Fuel Lines, Brake Lines, Vent Lines, and Wiring Harness.*

- (1) Place fuel lines, brake lines, and vent lines in frame side rails on front cross member and transfer front cross member. Connect unions (A, fig. 38). Install lock washer and nut on brake line frame tee (E, fig. 34 and B, fig. 38).
- (2) Position wiring harness in frame right side rail, across transfer front cross member and rear cross member (fig. 39).
- (3) Insert a 7/16-20NF x 1 1/2 cap screw for the running board rear hanger (head of screw inside) through each frame side rail, just below upper flange, between the transfer rear cross member gussets. Insert a 7/16-20NF x 11/4 cap screw through upper rear hole in frame left side rail (head of screw inside) for running board front hanger.

Note. These cap screws must be installed with heads at inside of frame side rails to prevent possible damage to fuel and brake lines.

- (4) Install clips, or combination of clips, as indicated on figures 38 and 39 for attachment of fuel, brake, and vent lines, and wiring harness to frame side rails and cross members (twenty 1/4-28NF x 1 cap screws, 1/4-inch lock washers, and 1/4-28NF nuts). Attach two clips (C, fig. 38) to the front cross member with 5/16-18NC x 9/16 self-tapping, washer face screws. Install three open-tension-type clips on frame rear cross member (three 1/4-28NF x 1 cap screws, 1/4-inch lock washers, and 1/4-28NF

nuts). Install three wiring harness connector shells (F, fig. 37) in the open tension-type clips.

e. Install Pintle Assembly. Install pintle shaft bracket on inside of frame rear cross member (four $\frac{1}{2}$ -20NF x $1\frac{5}{8}$ cap screws, $\frac{1}{2}$ -inch lock washers, and $\frac{1}{2}$ -20NF nuts) (E, fig. 37). Install pintle shaft, with pintle hook, in pintle shaft bracket. Install plain washer and slotted nut on pintle shaft. Tighten slotted nut so that pintle rotates freely and does not bind. Install new $7/32$ x $2\frac{1}{4}$ cotter pin.

f. Install Right-and-Left-Rear Bumpers (fig. 37). Position bumpers on frame side rails and rear cross member. Attach bumpers to rear cross member with four $\frac{3}{8}$ -18NF x 2 cap screws, $3/4$ -inch lock washers, and $\frac{3}{8}$ -18NF nuts (D). Do not tighten nuts until blackout taillights and mounting brackets are installed. Insert two $\frac{3}{8}$ -18NF x 2 cap screws through each bumper at the end of the frame side rails. Do not install lock washers and nuts until the two rear body bolts and lifting shackles are installed.

g. Install Right and Left Blackout Taillights and Mounting Brackets (fig. 37).

- (1) Install blackout taillights and mounting brackets as assemblies on rear of frame side rails (two $\frac{3}{8}$ -18NF x 2 cap screws, $5/8$ -inch lock washers, and $\frac{3}{8}$ -18NF nuts, each side). Tighten nuts.

Note. Mount bracket with trailer receptacle on frame left side rail.

Tighten nuts on cap screws, which attach rear bumpers to rear cross member.

- (2) Install trailer receptacle (L) in left mounting bracket (four $\frac{1}{4}$ -28NF x 1 cap screws, $\frac{1}{4}$ -inch lock washers, and $\frac{1}{4}$ -28NF nuts). Connect wiring harness and taillight cable terminal connector shells (C and N). Insert connector shells in tension-type clips.

h. Install Guards on Blackout Taillight Mounting Brackets (fig. 37). Install guards on right and left taillight mounting brackets (five $\frac{1}{4}$ -28NF x $5/8$ cap screws and $1/4$ -inch internal external teeth lock washers) (C, M, and N).

Note. The clips for wiring harness at each end are attached to mounting brackets by inside screw (C) on the right side and center screw (N) on the left side.

i. Install Fuel Tank (fig. 37).

- (1) Position hold-down straps on rear cross member and fuel tank support cross member with weld nuts at rear. Attach support straps to rear cross member with $7/16$ -20NF x $11/4$ cap screws and $7/16$ -inch lock washers ; then

engage cap screws with weld nuts (G) on hold-down straps. Screw lock nuts down on support straps to expose maximum threads. Position fuel tank in support straps and insert threaded ends of support straps through fuel tank support cross member and hold-down straps. Install 7/16-inch lock washers and 7/16-20NF nuts (A) . Tighten nuts, but exercise care to prevent distortion of fuel tank. Tighten lock nuts against cross member.

- (2) Connect fuel gage sending unit cable (H), fuel-tank-to-air-cleaner elbow vent line (K), and fuel line (J) to fuel tank.

j. *Install Frame Hold-Down Brackets (fig. 34).* Install four frame hold-down brackets on frame side rails (two 7/16-20NF x 1 1/8 cap screws (F), 7/16-inch lock washers, and 7/16-20NF nuts, each bracket).

k. *Install Running Board Hangers.* Install right and left running board hangers on frame side rails (A, fig. 34) (nine 7/16—20NF x 1 1/2 cap screws for rear hangers and seven 7/16-20NF x 1 1/4, cap screws for front hangers, eighteen 7/16-inch lock washers, and eighteen 7/16-20NF nuts).

Note. The running board hangers, with muffler support assemblies, must be installed on the frame right side rail (fig. 36). The clutch pull-back spring bracket (A, fig. 35) must be installed on lower rear screw of the left forward running board hanger.

l. *Install Front Fender Rear Support Brackets (fig. 34).* Install right and left front fender rear support brackets (two 7/16-20NF cap screws (K), 7/16-inch lock washers, and 7/16-20NF nuts, each side).

m. *Install Lower Exhaust Pipe, Muffler, and Muffler Tail Pipe (fig. 36).* Install lower exhaust pipe, muffler, and tail pipe as an assembly. This includes the tail pipe bracket and muffler support clamps (four 5/16-24NF x 3/4 cap screws (B) , 5/16-inch lock washers, and 5/16-24NF nuts for the muffler support clamps ; one 1/4-20 x 1 cap screw (A), 3/4-inch lock washer, and 3/8-24NF nut for the tail pipe bracket) .

n. *Install Clutch Pedal, Brake Pedal, and Pedal Bracket Assembly (fig. 34).*

- (1) Install clutch and brake pedals, with pedal bracket assembly, on frame left side rail (three 1/2-20NF x 1 1/2 cap screws (H), 1/2-inch lock washers, and 1/2-20NF nuts).
- (2) Install clutch pedal shaft lever, clutch operating rod, and pull-back spring (B, fig. 35) (one 3/8-16NC x 1 1/2 cap screw, 3/8-inch lock washer, and 3/8-16NC nut).

Note. Make certain that 3/16 x 7/8 Woodruff key is in clutch pedal shaft before lever is installed.

o. *Install Master Cylinder* (fig. 34) . Install master cylinder on left front running board hanger (three $\frac{3}{8}$ -24NF x $1\frac{1}{2}$ cap screws (G) , $\frac{3}{8}$ -inch lock washers, and $\frac{3}{8}$ -24NF nuts) . Connect master cylinder-to-pedal rod to brake pedal with $\frac{1}{2}$ x 1% clevis pin (J) and $\frac{1}{8}$ x $\frac{7}{8}$ cotter pin. Connect master cylinder-to-frame line to brake line frame tee (E), stop light cable connector (C), and master cylinder-to-air-cleaner elbow vent line (B) .

p. *Install Brake Pedal Pull-Back Spring* (fig. 34) . Install brake pedal pull-back spring bracket (D) , pull-back spring, and spring extension (two $\frac{3}{8}$ -24NF x $1\frac{1}{8}$ cap screws, $\frac{3}{8}$ -inch lock washers, and $\frac{3}{8}$ -24NF nuts) .

q. *Install Running Boards*. Install right and left running boards (four 5/16-18NC x $\frac{3}{4}$ step bolts, 5/16-inch lock washers, and 5/16-18NC nuts, each side) .

r. *Install Engine Dust Pans* (A, fig. 33) . Install right and left engine dust pans. Pans with cut-outs is attached to the frame right side rail (eight 5/16-18NC x $\frac{3}{4}$ self-tapping hex-head screws).

s. *Install Steering Idler Arm Bracket* (fig. 33) . Install steering idler arm bracket, steering idler arm, and steering-arm-to-idler-arm drag link as an assembly (four $\frac{1}{2}$ -20NF x $1\frac{1}{4}$ cap screws (B), $\frac{1}{2}$ -inch lock washers, and $\frac{1}{2}$ -20NF nuts) .

t. *Install Front Bumper* (fig. 32).

- (1) Install front bumper and lifting shackle assemblies (vehicles without winch) (four $\frac{1}{2}$ -20NF x $1\frac{1}{8}$ cap screws at side and bottom of frame side rails and one $\frac{1}{2}$ -20NF x $1\frac{3}{8}$ cap screw at lifting shackle, $\frac{1}{2}$ -inch plain washer between lifting shackle and frame, $\frac{1}{2}$ -inch lock washers, and $\frac{1}{2}$ -20NF nuts, each side).
- (2) Install right and left front bumpers, frame side rail extensions, and lifting shackles as assemblies (vehicles with winch) (three $\frac{1}{2}$ -20NF x $1\frac{1}{4}$ cap screws (B), one $1\frac{1}{2}$ -20NF x $1\frac{1}{2}$ cap screw (A) at upper front hole, $\frac{1}{2}$ -inch lock washers, and $\frac{1}{2}$ -20NF nuts, each side) .

54. Springs and Shock Absorber Brackets (Field and Depot Maintenance)

a. *Install Shock Absorber Frame Brackets*.

- (1) Install front shock absorber frame brackets and front spring torque arrester assemblies (fig. 30) (two 5/8-18NF x 2 cap screws (G, fig. 30) , two $\frac{5}{16}$ -inch internal-external-teeth lock washers, three $\frac{3}{8}$ -18NF nuts (B, fig. 30), two $\frac{3}{8}$ -24NF x 1 cap screws, (E, fig. 30), two $\frac{3}{8}$ -inch lock washers, and two $\frac{3}{8}$ -24NF nuts, each side).
- (2) Install rear shock absorber frame brackets (fig. 31)

(three $\frac{3}{8}$ -18NF x 1" cap screws (D, fig. 31), $\frac{5}{8}$ -inch internal-external-teeth lock washers, and $\frac{5}{8}$ -18NF nuts (C, fig. 31), each side).

b. Install Spring Assemblies and Rear Axle Bumper Assemblies.

- (1) Install rear axle bumper assemblies (B, fig. 31) on lower flange of both frame side rails (two $\frac{3}{8}$ -24NF x 1" cap screws (head down), $\frac{1}{2}$ -inch lock washers, and $\frac{3}{8}$ -24NF nuts).
- (2) Install front spring assemblies complete with shackles (fig. 30). This includes installation of spring bolts (D and F, fig. 30), $\frac{3}{4}$ -16NF tri-slot nuts, and new $1\frac{1}{8}$ x $1\frac{1}{4}$ cotter pins (A and C, fig. 30).
- (3) Install rear spring assemblies complete with shackles (fig. 31). This includes spring bolts (A and E, fig. 31) ; four $\frac{3}{8}$ -24NF x $2\frac{1}{2}$ " cap screws (A and E, fig. 31) in the frame rear spring brackets, which lock the spring bolts in their operating position ; $\frac{1}{2}$ -inch lock washers ; and $\frac{3}{8}$ -24NF nuts.

Note. On early type vehicles, tighten the spring bolts in the frame rear spring brackets and shackles to 140 to 160 pound-feet torque. On late type vehicles equipped with spring bolts that incorporate a groove for the cap screws which lock the spring bolts in their operating position, tighten the spring bolts until groove is alined with the cap screw holes and install cap screws.

Tighten cap-screw nuts to 30 to 35 pound-feet torque.

55. Axle Assemblies

a. Install Front Axle Assembly.

- (1) Position front axle assembly under front springs so that spring center bolts are properly engaged with axle housing. Place front axle bumper assemblies on top of each spring, offset toward center of vehicle. Install spring clips and position left spring clip plate on axle housing. Install $\frac{9}{16}$ -inch lock washers and $\frac{9}{16}$ -18NF nuts on spring clips. Tighten nuts to 130 to 140 pound-feet torque.
- (2) Place metal drag link ball dust cover retainer over front axle steering arm ball, followed by the metal drag link ball inner dust cover and felt drag link ball dust cover. Connect idler-arm-to-steering-arm drag link assembly at steering arm (C, fig. 16) on front axle. Bend over ends of drag link ball dust cover retainer and lock them in place on the opposite side of retainer to assure a tight fit of the felt dust cover. Assemble drag link ball seat and drag link end plug in drag link and tighten plug until

spring is fully compressed ; then back off plug one-half turn from nearest cotter pin hole and install a new 5/32 x 2 3/4 cotter pin.

- (3) Connect brake flexible line at brake line bracket (*fig. 29*) on frame front cross member.

b. Install Rear Axle Assembly.

- (1) Position rear axle assembly under rear springs to engage spring center bolts in axle housing.
- (2) Place rear spring clip seats over center bolts of each spring and install spring clips, spring clip plates, 9/16-inch lock washers, and 9/16-18NF nuts. Tighten nuts to 130 to 140 pound-feet torque.
- (3) Connect brake flexible line (*fig. 29*) at bracket on frame fuel tank support cross member.

56. Shock Absorbers (Field and Depot Maintenance)

a. Identification of Shock Absorbers. The front and rear shock absorbers are not interchangeable. They are identified by the words "front" and "rear" stamped on the top of each shock absorber.

b. Install Front and Rear Shock Absorbers (fig. 27). Install a shock absorber bearing retainer and shock absorber bushing-type bearing (rubber) on each shock absorber frame bracket and spring clip plate stud, followed by shock absorbers, bushing-type bearing, bearing retainer, 3/4-16NF tri-slot nut (D), and new 5/32 x 1 3/4 cotter pin (D).

57. Transfer (Field and Depot Maintenance)

Install transfer assembly (*figs. 24 and 28*). Place four mounting bracket insulators on the transfer front cross member and transfer rear cross member. Position transfer assembly on cross members followed by other mounting bracket insulators, mounting bracket insulator spacers, 7/16-20NF x 3 1/2 bolts, 7/16-inch plain washers, 7/16-inch lock washers, and 7/16-20NF nuts. Tighten nuts.

58. Front and Rear Axle Propeller Shafts (Field and Depot Maintenance)

Install front and rear axle propeller shaft assemblies (G and K, *fig. 24*) (four 7/16-20NF x 3 1/2 bolts, 85,000 psi, yield strength cap screws, 7/16-inch lock washers, and 7/16-20NF nuts, each companion flange).

59. Power Plant (Field and Depot Maintenance)

a. *General.* The power plant is a major component consisting of the radiator, engine, clutch and transmission (*fig. 27*). The cooling system, oil pan, and transmission were not drained when the power plant was removed ; therefore, these services will not be required in the installation of the power plant.

b. *Install Power Plant.*

- (1) Place rear support upper insulators on engine rear support brackets followed by rear support upper insulator spacers. Place plain washers on radiator support bracket (C, *fig. 33*). Quantity, thickness, and position of washers must be the same as originally removed.
- (2) Position power plant on support brackets.
- (3) Place $\frac{1}{2}$ -inch plain washers on $\frac{1}{2}$ -20NF x $2\frac{1}{2}$ engine rear support bolts followed by round insulators. Install bolts from under side. Install $\frac{1}{2}$ -inch plain washers and $\frac{1}{2}$ -20NF slotted nuts. Tighten nuts and install new $3/32$ x $1\frac{1}{3}$ cotter pins (C, *fig. 27*).
- (4) Place $\frac{1}{2}$ -inch plain washers on $\frac{1}{2}$ -20NF x $1\frac{1}{4}$ cap screws for front support plate. Install screws from top (A, *fig. 27*) ; then install $\frac{1}{2}$ -inch lock washers and $\frac{1}{2}$ -20NF nuts. Tighten nuts.
- (5) Place $\frac{1}{2}$ -inch lock washers and $\frac{1}{2}$ -inch plain washers on the $\frac{1}{2}$ -20NF x $1\frac{3}{4}$ drilled-for-locking-wire-head cap screws. Install screws through radiator support bracket and in radiator support. Tighten cap screws and install $1/16$ -inch diameter x $8\frac{1}{2}$ -inch long locking wire.
- (6) Connect fuel tank and brake master cylinder vent lines to flexible lines under generator (B, *fig. 27*) .
- (7) Connect clutch operating rod to clutch release fork lever and install $3/8$ x $15/16$ clevis pin and new $3/32$ x $3/4$ cotter pin (A, *fig. 24*).
- (8) Place new upper-to-lower exhaust pipe gasket on lower exhaust pipe flange and connect lower exhaust pipe to upper exhaust pipe. Position eye bolts with plain washers on upper exhaust pipe flange. Install and tighten $7/16$ -20NF Seez-proof nuts (*fig. 26*).
- (9) Connect fuel filter-to-fuel-pump flexible line at fuel filter-to-fuel-pump shut-off cock (*fig. 25*). Open shut-off cock.
- (10) Connect bonding ground strap on clutch housing to frame right side rail (B, *fig. 24*) (one $3/8$ -24NF x 1 cap screw, two $3/8$ -inch internal-external-teeth lock washers, and one $3/8$ -24NF nut).
- (11) Install transfer declutch shift lever, transfer shift con-

trol lever, hand brake lever, and shift lever bracket on transmission as an assembly (three $\frac{3}{8}$ -16NC x $2\frac{3}{4}$ cap screws and $\frac{3}{8}$ -inch lock washers) (C, fig. 24). Connect transfer shift lever control rods to transfer shifter shafts (two new $\frac{1}{8}$ x 1% cotter pins) (E and F, fig. 24). Connect hand brake rod to hand brake (one $\frac{1}{4}$ x clevis pin and new $\frac{5}{32}$ x 1 cotter pin) (L, fig. 24).

- (12) Install transmission-to-transfer propeller shaft assembly (four $\frac{7}{16}$ -20NF x $1\frac{1}{4}$ 85,000 psi yield strength cap screws, $\frac{7}{16}$ -inch lock washers, and $\frac{7}{16}$ -20NF nuts, each companion flange) (D, fig. 24).

Note. Cap screws must be inserted from companion flange end.

60. Winch and Winch Drive Shaft Assemblies (Field and Depot Maintenance)

a. Install Winch Drive Shaft Assembly.

- (1) Insert front end of winch drive shaft through frame front cross member and engage splined end of drive shaft assembly in rear universal joint splined yoke. Make certain $\frac{1}{4}$ x $2\frac{1}{8}$ Woodruff key is in front end of winch drive shaft assembly and install front universal joint assembly.
- (2) Install $\frac{3}{8}$ -16NC x $\frac{7}{8}$ square-head, drilled-for-locking-wire-head set screw in front universal joint yoke. Tighten screw and install $\frac{1}{16}$ -inch diameter x $8\frac{1}{2}$ -inch long locking wire.

b. Install Winch Assembly (fig. 23).

- (1) Position winch assembly on frame side rails and front bumpers (six $\frac{1}{2}$ -20NF x $1\frac{1}{2}$ cap screws and $\frac{1}{2}$ -inch lock washers in winch-to-frame brackets (B and D) ; four $\frac{1}{2}$ -20NF x 1 cap screws and $\frac{1}{2}$ -inch lock washers in winch-to-bumper brackets (C)).
- (2) Position front universal joint assembly on winch worm shaft (A) ; then install shear, pin and new $\frac{3}{32}$ x cotter pin.
- (3) Position collar on splined end of winch drive shaft assembly (on trucks so equipped), 1 inch from rear universal joint yoke. Tighten $\frac{3}{8}$ -16NC x $\frac{7}{8}$ square-head, drilled-for-locking-wire-head set screw and install $\frac{1}{16}$ diameter x $8\frac{1}{2}$ long locking wire.

61. Cab (Field and Depot Maintenance)

a. Install Cab Assembly (fig. 40) .

- (1) Place three large body-to-frame pads (B) on the two running board hangers and left running board rear

hanger. Position small body-to-frame pad (K) on left running board front hanger.

- (2) Place $\frac{5}{8}$ -inch plain washer (J) on the ~~$\frac{1}{8}$ -18NF~~ x 4 cap screw (N). Install cap screw through left front hole in cab underbody. Place $\frac{1}{2}$ -inch plain washers (A) on the ~~$\frac{1}{2}$ -20NF~~ x $7\frac{5}{8}$ body hold-down bolts (H) and insert bolts in other three holes in cab underbody.
- (3) Attach cab assembly to a hoist and lower it into position on vehicle chassis. Make certain body hold-down bolts and cap screw properly enter the body-to-frame pads and the holes in the hangers.
- (4) Place internal-external-teeth spring-steel lock washer (L) on cap screw at left front of cab and install 5/8-18NF nut (M). Tighten nut. Install and tighten light ~~$\frac{5}{16}$ -NF~~ jam nut (P). Install ~~$\frac{1}{2}$ -inch~~ plain washer (C) and the shorter of the three body hold-down bolt compression springs (D) on the body hold-down right front bolt, followed by a $\frac{1}{2}$ -inch plain washer (E) and ~~$\frac{1}{2}$ -20NF~~ nut (F). Tighten nut until it just clears the third cotter pin hole and install new 3/32 x 11/2 cotter pin (G). Install ~~$\frac{1}{2}$ -inch~~ plain washers (C) and two longer body hold-down bolt compression springs (Q) on body hold-down rear bolts followed by $\frac{1}{2}$ -inch plain washers (E) and ~~$\frac{1}{2}$ -20NF~~ nuts (F). Tighten nuts until they just clear the first cotter pin hole and install new 3/32 x 11/8 cotter pins (G).

b. *Install Body Wiring Harness and Light Switch.* Insert body wiring harness through opening in right side of cowl and connect harness to right side of light switch (A, fig. 21). Tighten connector nut on switch with a spanner wrench. Install light switch in instrument panel (four No. 10-32NF x $\frac{1}{2}$ round-head machine screws and No. 10 internal-teeth lock washers). Connect cable at fuel gage. Place body wiring harness in three clips on cowl inside panel. Insert body wiring harness grommet (B, fig. 22) in cowl front panel and position harness in clips on cowl front panel.

c. *Connect Windshield Wiper Hose.* Connect windshield wiper hose to windshield wiper manifold tube.

d. *Connect Tubes, Cables, and Controls to Engine Accessories.*

- (1) Connect engine primer inlet line to manifold tee. Connect carburetor throttle spring to cowl.
- (2) Connect fording controls at crankcase ventilator shut-off valve assemblies (H and J, fig. 22). Refer to TM 9-840 for correct adjustment procedure.
- (3) Connect throttle control at throttle control bell crank on intake manifold.
- (4) Connect choke control at carburetor (G, fig. 22).

- (5) Connect accelerator pedal rod to accelerator bell crank lever (one 5/16 x 13/16 clevis pin and new 3/32 x 3% cotter pin).
- (6) Connect ignition distributor cable at filter (C, *fig. 22*).
- (7) Connect fuel filter flexible lines at line fittings (F, *fig. 22*).
- (8) Connect generator regulator harness assembly to generator regulator (D, *fig. 22*) and tighten nut with a spanner wrench.
- (9) Connect water temperature gage cable to water temperature gage sending unit at rear of cylinder head.
- (10) Connect speedometer cable to transfer and place cable in the two clips (*fig. 39*) provided on frame right side rail, just ahead of transfer front cross member.
- (11) Connect slave receptacle ground cable at left running-board front hanger (one $\frac{3}{8}$ -24NC x 1 cap screw, three $\frac{3}{8}$ -inch internal-external-teeth lock washers, and $\frac{3}{8}$ -24NC nut). One lock washer must be on each side of the cable terminal to insure a good connection.
- (12) Connect cables from battery, slave receptacle, and voltage-regulator-to-starter-switch terminal stud (one $\frac{3}{8}$ -inch lock washer and starter switch terminal stud nut brass) (A, *fig. 16*).

e. Attach Radiator Tie Rods to Cowl Brackets. Position radiator tie rods in cowl brackets (A and E, *fig. 22*) and make certain the plain washers are located on both sides of each bracket. Do not tighten nuts.

Note. Tie rod with offset must be installed on right side to provide clearance for air cleaner.

f. Install Brake-and-Transfer Lever Weatherseal Assembly. Install weatherseal assembly (C, *fig. 21*) on transmission floor cover (four 5/16-24NC x lock-washer screws).

g. Install Transmission Upper Shift Lever and Shift Lever Weatherseal (*fig. 21*).

- (1) Install shift lever weatherseal in floor transmission cover (B).
- (2) Install upper portion of shift lever (B) (one 7/16-20NF x 2 cap screw, 7/16-inch lock washer, and 7/16-20NF nut)

h. Install Power-Take-Off Shift Lever Weatherseal and Power-Take-Off Upper Shift Lever (*fig. 21*).

- (1) Install shift-lever weatherseal in floor transmission cover (I) .
- (2) Install shift lever (D) (on vehicles with winch) (two 7/16-20NF x $\frac{7}{8}$ lock washer screws).

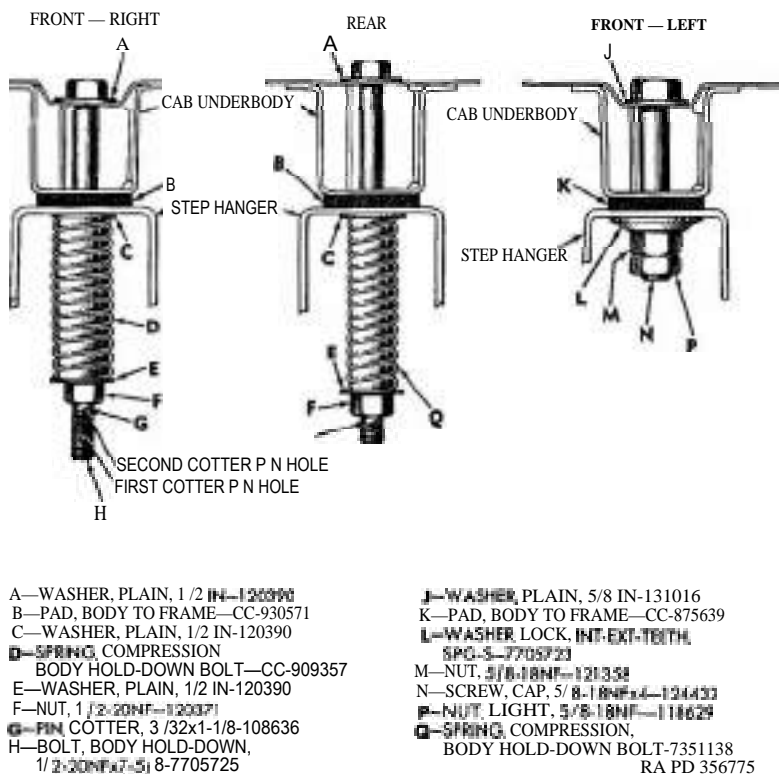


Figure 40. Cab hold-down bolt and cap screw assemblies.

i. *Install Clutch and Brake Pedal Cover.* Install clutch and brake-pedal cover on cab underbody (E, fig. 21) (eight 7/16-20NF x 7/8 lock washer screws).

62. Cargo and Command Bodies (Field and Depot Maintenance)

a. *Install Cargo and Command Bodies (fig. 41).*

- (1) Insert two 1/2-20NF x 6 step bolts (N) in rear holes in underbody, two 1/2-20NF x 23/4 step bolts (G) in center holes, and two 1/2-20NF x 11 1/2 cap screws (A) in the front bracket holes. Attach body-to-frame pads (B, F, H, M, and P) to body support brackets with plastic-type gasket cement.

Note. On vehicles equipped with radio receptacle, the four thick pads are required at the front to provide proper alinement between cab and body openings for the radio receptacle.

- (2) Lower body on frame and guide hold-down bolts and cap screw through body hold-down brackets and holes in

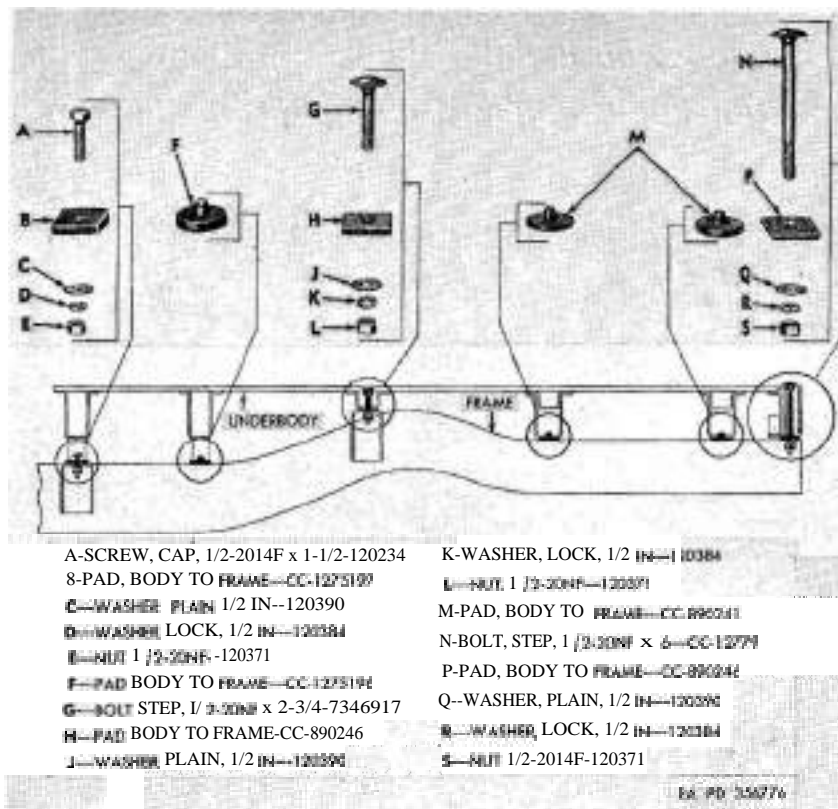


Figure 41. Cargo and command body hold-down bolt, cap screw, and pad locations.

frame. Install $\frac{1}{2}$ -inch plain washers (C, J, and Q), $\frac{1}{2}$ -inch lock washers (D, K, and R), and $\frac{1}{2}$ -20NF nuts (E, L, and S) on screws and bolts. Tighten nuts.

- (3) Install right and left rear lifting shackle bracket assemblies at rear of frame (two $\frac{1}{2}$ -inch lock washers and $\frac{1}{2}$ -20NF nuts, each side).
- (4) Connect fuel tank filler pipe and vent line hose connections at fuel tank.

b. Install Radio Cable Receptacle and Cover. Install radio cable receptacle and cover in body front panel (fig. 17) (four $\frac{1}{4}$ -28NF x $\frac{3}{4}$ round head lock washer screws and four No. 8-32NC x round head lock washer screws). Screw dust cover on radio receptacle.

63. Ambulance Body (Field and Depot Maintenance)

a. General. Various body hold-down bolt combinations have been used on the ambulance body, but the bolts described in *b*

below must be installed whenever it is necessary to replace the original bolts for any reason.

b. Install Ambulance Body (fig. 42).

- (1) Place ~~1/4-inch~~ plain washers (B) on the two ~~1/4-20NF~~ x 4 body hold-down bolts (A) and insert them in the front holes of the underbody.
- (2) Place ~~1/4-inch~~ plain washers (G) on the two ~~1/4-20NF~~ x 4 body hold-down bolts (F) and insert them in the second holes of the underbody.
- (3) Place 9/16 ID, 17/8 OD plain washers (N) on the two ~~1/4-20NF~~ x 2 1/2 body hold-down bolts (M) and insert them in the holes in tool compartment floor.
- (4) Place the two ~~1/4-20NF~~ x 57/8 body hold-down bolts (Z) in the rear holes in the underbody.
- (5) Attach all body-to-frame pads (C, H, L, P, S, V, Y, and AA) to the body support brackets with plastic-type gasket cement.
- (6) Lower body on frame and guide hold-down bolts through pads, brackets, and frame holes.
- (7) Place 9/16 ID, 1 7/8 OD plain washers (W) on the two ~~1/4-20NF~~ x 3 1/4 body hold-down bolts (X) and insert them from the bottom (heads down to prevent interference with rear springs) up through the body support brackets, pads, and underbody.
- (8) Install internal-external-teeth spring steel lock washers (D, J, Q, and U) and ~~1/4-20NF~~ nuts (E, K, R, and T) on the eight body hold-down forward bolts, and tighten nuts.
- (9) Install ~~1/4-inch~~ lock washers (BB) and ~~1/4-20NF~~ nuts (CC) on the two body rear bolts, and tighten nuts.
- (10) Connect fuel tank filler pipe and filler vent tube connections at fuel tank.
- (11) Install right and left rear lifting shackle bracket assemblies (~~3/8-inch~~ lock washers and ~~5/4-18NF~~ nuts, each side).
- (12) Connect three cable terminals at connections inside frame right side rail at rear of transfer assembly.
- (13) Push fuel line up through body floor and connect line to heater. Install grille on lower right litter support at heater (two 5/16-inch lock washers and 5/16-24NF x 3/4 cap screws).
- (14) The remaining connect points are the same as indicated for the cab. Refer to paragraph 61.

c. Install Batteries (Ambulance M43 Through Serial No. 80025984).

- (1) Pull battery-to-ground cable and battery-to-starter cable assemblies up through body floor and install cable weatherseal and cable weatherseal retainer (two $\frac{1}{4}$ -20NC x $\frac{3}{8}$ washer face header point screws).
- (2) Install batteries and hold-down cover (two $\frac{7}{8}$ -inch plain washers, $\frac{1}{2}$ -inch lock washers, and $\frac{3}{4}$ -24NF nuts) .
- (3) Connect battery cables, except battery-to-ground cable assembly, to battery clamp terminals. Do not connect battery-to-ground cable assembly until all electrical connections are completed.

d. Install Telephone Installation Body. The telephone installation body is installed in the same manner as the ambulance body (*b* above), but only six body hold-down bolts are required (fig. 43).

Note. The two body hold-down bolts must be installed with heads down to prevent interference with rear springs.

64. Steering Gear and Steering Drag Link Tube (Field and Depot Maintenance)

a. Install Steering Gear and Pitman-Arm-to-Idler-Arm Drag Link Assembly.

- (1) Place $\frac{5}{8}$ -inch plain washers on $\frac{5}{8}$ -18NF x $1\frac{7}{8}$ cap screws and insert screws through steering gear mounting holes in frame left side rail (heads inside).
- (2) Insert steering gear column jacket through cowl opening and position steering gear over cap screws against frame side rail. Install three $\frac{5}{8}$ -inch lock washers and $\frac{5}{8}$ -18NF nuts on cap screws, but do not tighten nuts (B, fig. 16) .
- (3) Apply grease on upper portion of steering gear column jacket and install column jacket rubber collar (B, fig. 15).
- (4) Install steering post clamp rubber insulator and attach steering post clamp on instrument panel (A, fig. 15) (two $\frac{3}{8}$ -24NF x 1 cap screws, $\frac{3}{8}$ -inch lock washers, and $\frac{1}{2}$ -24NF nuts).
- (5) install steering column cut-out cover on instrument panel (four $7/16$ -20NF x $\frac{7}{8}$ lock washer screws) (A, fig. 14).
- (6) Tighten nuts on cap screws, which support the steering gear (B, fig. 16).
- (7) Connect Pitman-arm-to-idler-arm drag link assembly to steering idler arm (D, fig. 16). Refer to paragraph 55a(2) for assembly and adjustment of drag link end.

b. Install Steering Wheel, Horn Button, and Cable.

- (1) Position vehicle front wheels straightahead and place steering wheel on steering gear shaft (spoke adjacent to two square indentations, pointing down) . Install horn

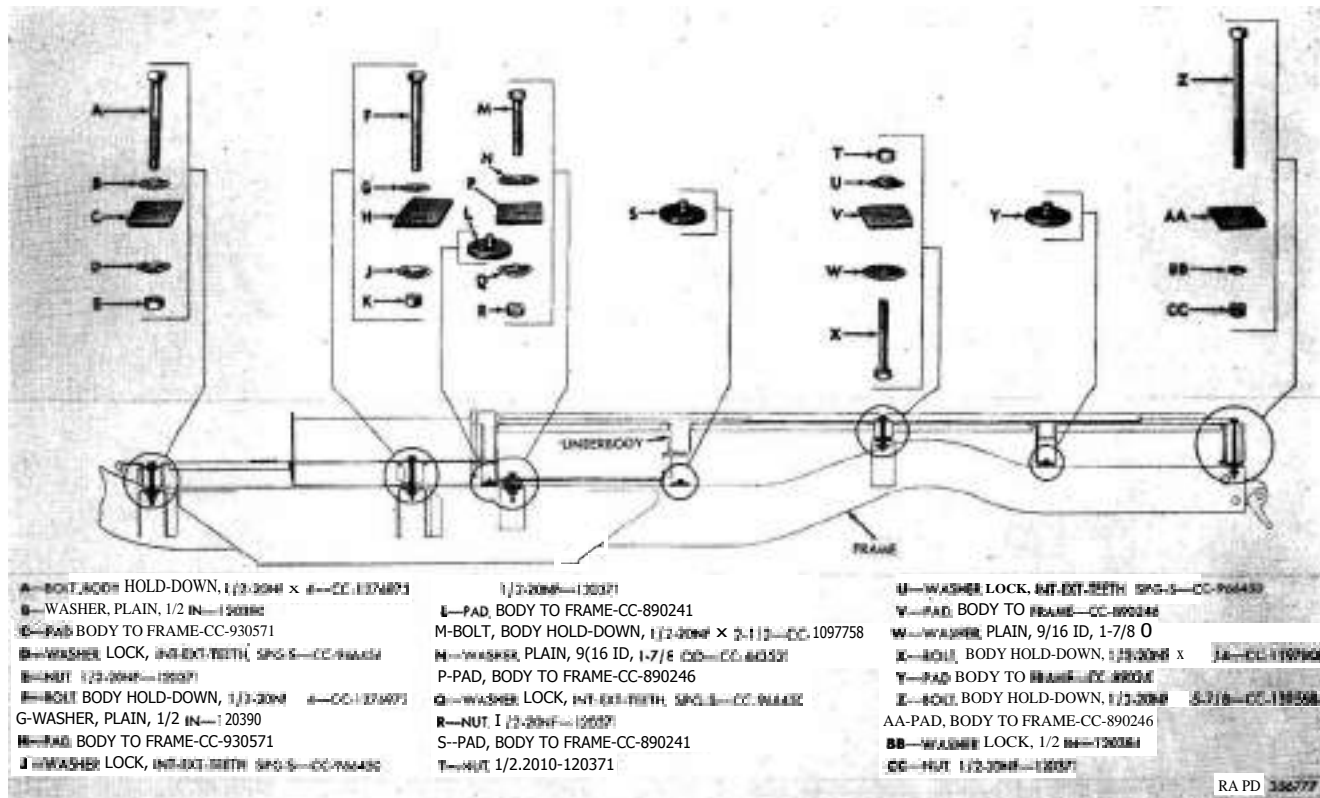


Figure 42. Ambulance body hold-down bolt and pad locations.

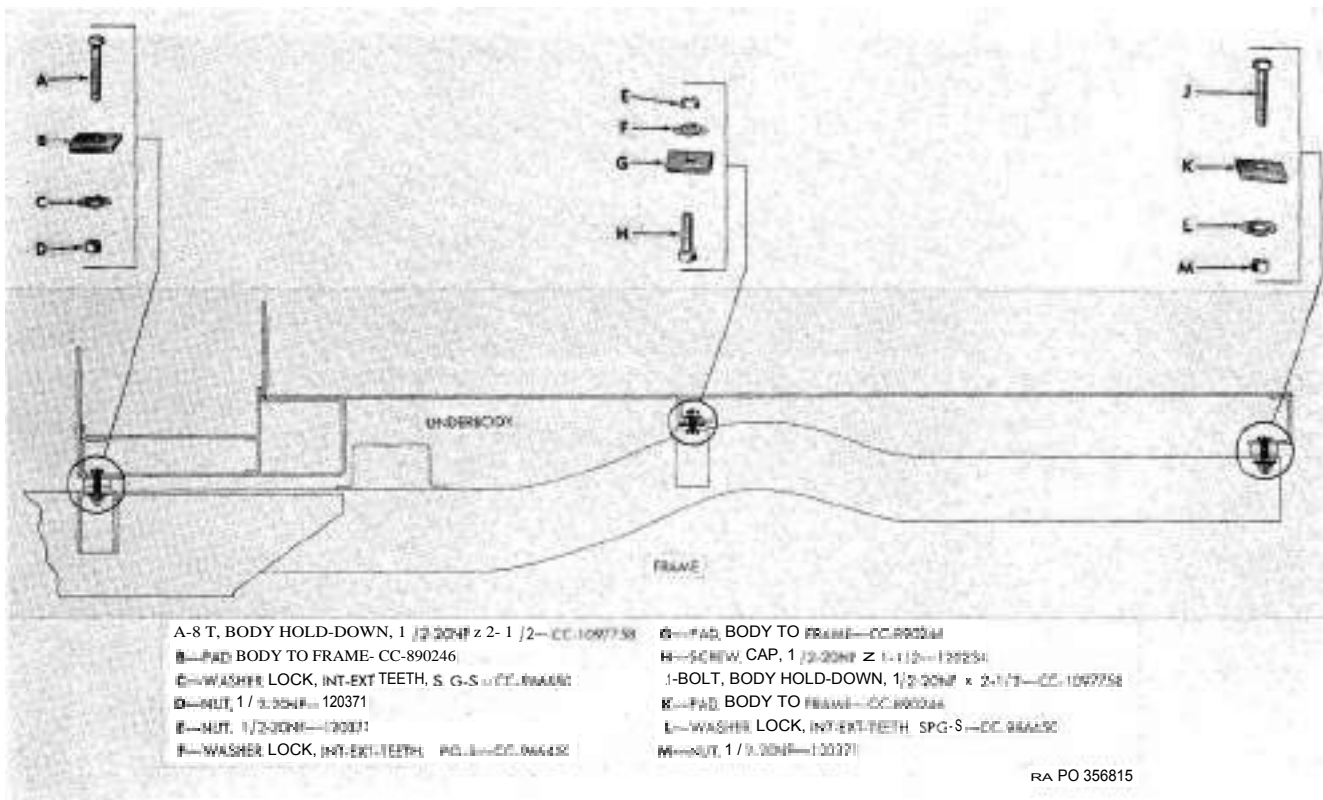


Figure 43. Telephone installation body hold-down bolt and pad locations.

button lower retaining plate and steering wheel nut. Tighten nut.

- (2) Install horn button retainer plate spring (coil). Insert horn button cable in steering gear shaft. Depress horn button assembly and turn counterclockwise to engage it in the horn button lower retainer plate. Install horn button rubber seal on steering wheel.
- (3) Slide horn button cable rubber seal, horn button cable seal plain washer, and horn button cable hose assembly with tube over end of horn-button cable and install the parts in steering gear housing lower seal plate (A, *fig. 13*). Tighten tube nut.
- (4) Slide connector shell over horn button cable, followed with metal bushing (flange down) and grommet, large end down (B, *fig. 13*). Insert hose and cable assembly through frame side rail opening.

65. Hood, Front Fenders, and Radiator Guard Assembly (Field and Depot Maintenance)

a. *Install Front Fenders and Radiator Guard Assembly.*

- (1) Make certain original quantity and thickness $\frac{1}{4}$ -inch plain washers are placed on the radiator support bracket (C, *fig. 33*) to insure proper hood and fender alignment.
- (2) Position front fenders and radiator guard assembly on vehicle.
- (3) Place $\frac{1}{2}$ -inch lock washers and $\frac{1}{2}$ -inch plain washers on the two $\frac{1}{4}$ -20NF x 134 drilled-for-locking-wire-head cap screws and insert them through the radiator support bracket and plain washers. Screw them into the radiator support, but do not tighten.
- (4) Install two $\frac{1}{4}$ -20NF x 1 $\frac{1}{2}$ lock-washer screws (C, *fig. 12*) at front fender front support, each side, but do not tighten screws. Install three $\frac{1}{4}$ -20NF x 1 lock-washer screws (D, *fig. 12*) at front fender rear support, each side, but do not tighten screws.
- (5) Install two $\frac{3}{8}$ -24NF x $\frac{3}{4}$ lock washer tapping screws in cowl at rear of front fender to hood panel, each side (A, *fig. 12*).
- (6) Attach radiator tie rods to radiator support (B, *fig. 12*) (two $\frac{1}{4}$ -20NF x 1 lock washer screws).
- (7) Place the various cables and two wiring harness assemblies in the clips provided on the right and left fender splash shields (B, D, E, F, and H, *fig. 11*). Connect

harness connections and place them in the respective clips on splash shield (A, C, and J, fig. 11).

Note. All cables equipped with connectors are identified by a number, which is attached to the cables. The numbers must correspond when connecting each terminal.

- (8) When cables and harness assemblies are in the various clips, bend clips to retain parts.
- (9) Connect horn button cable (G, fig. 11). Insert horn button cable terminal in clip provided on splash shield. Connect oil pressure gage cable to sending unit.

b. Install Hood Assembly.

- (1) Position hood on vehicle and install six $\frac{3}{8}$ -24NF x $\frac{7}{8}$ lock washer screws to attach hood hinges to cowl (fig. 10).
- (2) Adjust radiator tie rods to provide proper hood fit and tighten nuts.
- (3) Connect horn wire connectors.
- (4) Check alinement of hood and fenders. If it is not satisfactory, change adjustment on radiator tie rods or add or remove $\frac{1}{2}$ -inch plain washers between radiator support and radiator support bracket. When alinement is satisfactory, tighten cap screws at front fender front supports, front fender rear supports, rear end of hood panel, and radiator support bracket.
- (5) Install $\frac{1}{16}$ diameter x $8\frac{1}{2}$ long locking wire through heads of cap screws, which attach the radiator support to the radiator support bracket.

66. Batteries (Field and Depot Maintenance)

a. Install Batteries (All Trucks and Ambulance M43 After Serial No. 80025984) (fig. 9). Install batteries and battery hold-down cover ($\frac{3}{8}$ -inch plain washers, $\frac{3}{8}$ -inch lock washers, and $\frac{1}{2}$ -16NC nuts (A)). Tighten nuts. Attach clamp-type battery terminals to batteries (B). Tighten nuts on terminal bolts.

b. Connect Ambulance Battery Cables (Ambulance M43 Through Serial No. 80025984). Connect battery-to-ground cable to battery clamp terminals on battery negative post. Tighten nuts.

67. Cab-Top Cover Assembly (Field and Depot Maintenance)

a. Install Top Side Rail and Support Assemblies.

- (1) Place J- and U- bolts in cab lock pillars and aline them for insertion of top side rail and support assemblies.

Install right and left top side rail panels and support assemblies (**two** $3/8$ -24NF x $3/4$ lock-washer-tapping screws, each side, at windshield frame). Raise windows to square top side rail supports and tighten screws at windshield frame. Tighten J- and U-bolt nuts, right and left side.

(2) Install top bow in side rail supports.

b. Install Cab Top Cover Assembly.

- (1) Pull front of cab top cover across windshield frame retainer from left to right (*fig. 20*).
- (2) Pull cab top cover through right and left top side rail support retainers (*fig. 19*). Insert cab top cover metal retainers in top side rail slots (four each side) (*fig. 18*).
- (3) Connect bottom rear of cab top cover to cab with rope, through rear panel hooks.
- (4) Install top bow-to-windshield frame straps.

CHAPTER 5

FRONT AXLE

Section I. DESCRIPTION AND DATA

68. Description

a. *Front Axle* (fig. 44). The front axle is a full-floating, driving type. It is equipped with universal drive assemblies (fig. 64), which transmit power from the differential to the front wheels without affecting customary steering.

b. *Steering Knuckles and Flange Assemblies*. The steering knuckles and flange assemblies function in the same manner as the ordinary steering knuckles. The flange assemblies provide operating space for the universal drive joints. They operate on tapered bearings, which are mounted on pivot pins welded to the other ends of the front axle housing.

c. *Universal Drive Assemblies* (fig. 64). The universal drive assemblies are equipped with constant velocity universal joints, which are easily serviced. These assemblies operate in bushing-type bearings, which are pressed in the front axle housing and steering knuckles.

d. *Differential With Carrier Assembly* (fig. 44). The differential with carrier assembly is a self-contained unit, which can be removed from the axle housing for service. Refer to chapter 6 for description, disassembly, inspection, and assembly procedures.

69. Data

Make	Chrysler Corporation
Type	full-floating
Universal drive joint assemblies (make)	New Process
Lubricant capacity	6 pt
Bearings:	
Flange:	
Lower (2)	tapered roller
Upper (2)	tapered solid
Hub:	
Inner	tapered roller
Outer	tapered roller

Section II. DISASSEMBLY OF FRONT AXLE INTO SUBASSEMBLIES

70. General

The front axle is divided into three subassemblies : hubs with brake drums, differential with carrier, and front axle housing with related steering, drive, and brake parts. The following procedures are based on the assumption that the front axle assembly (fig. 44) is removed from the vehicle. Many of the following operations can be performed with the axle assembly installed. For servicing of differential with carrier assembly, refer to chapter 6.

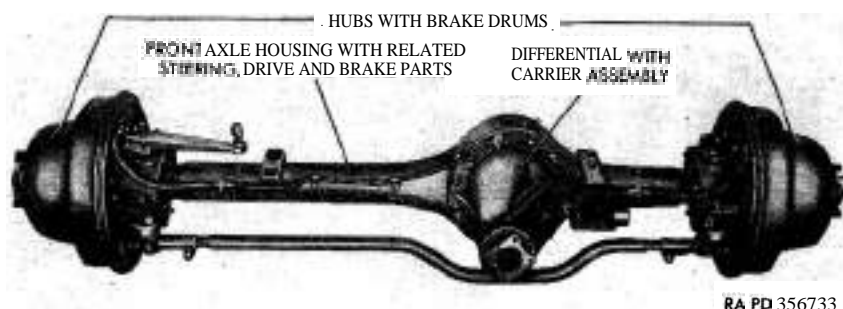


Figure 44. Front axle.

71. Draining and Cleaning (Field and Depot Maintenance)

- a. *Draining.* Remove drain plug (PP, fig. 62) from front axle housing and drain lubricant.
- b. *Cleaning.* Clean exterior of unit with volatile mineral spirits or dry-cleaning solvent.

72. Hub With Brake Drum Assemblies (Field and Depot Maintenance)

- a. *Remove Drive Flange Assemblies (fig. 45).*
 - (1) Apply punch marks on drive flange assemblies and hub assemblies with a center punch and hammer.

Caution: This is important as the flanges must be installed on hubs in the same position as before removal, to prevent possible peeling of drive flange studs.
 - (2) Remove nuts and lock washers from drive flange studs.
 - (3) Loosen nuts and remove puller set screws from drive flanges. Remove nuts from screws and install screws in drive flanges.

- (4) Pull each flange from hub studs by tightening puller screws.

b. Remove Hub With Brake Drum Assemblies. Remove right and left bearing outer adjusting nuts with wrench 41-W-1991-17 (fig. 46). Remove right and left bearing adjusting nut locks with diagonal-cutting pliers (fig. 47). Remove right and left bearing inner adjusting nut assemblies with wrench 41—W--1991-17 (fig. 46). Remove hub outer bearing cones and hub with brake drum.

73. Differential With Carrier Assembly (Field and Depot Maintenance)

a. Remove Brake Line Assemblies and Front Axle Brake Line Tee (fig. 48).

- (1) Disconnect brake lines from brake flexible lines at brake line brackets (fig. 29).
- (2) Remove nut and lock washer from upper drive pinion carrier stud. Open brake line C-type clips. Remove brake lines and brake line tee from axle housing.

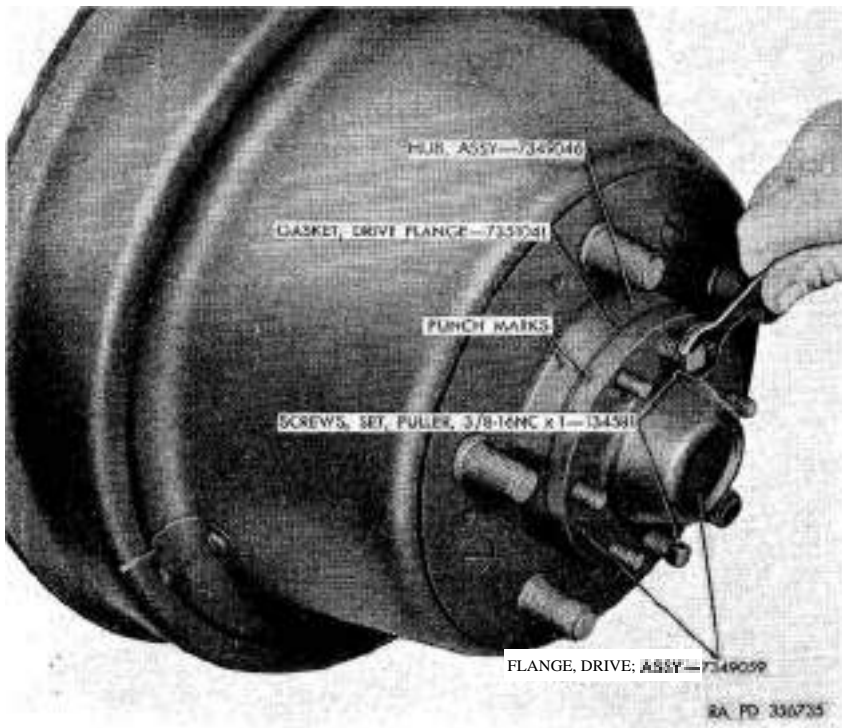


Figure 45. Removing drive flange assembly.

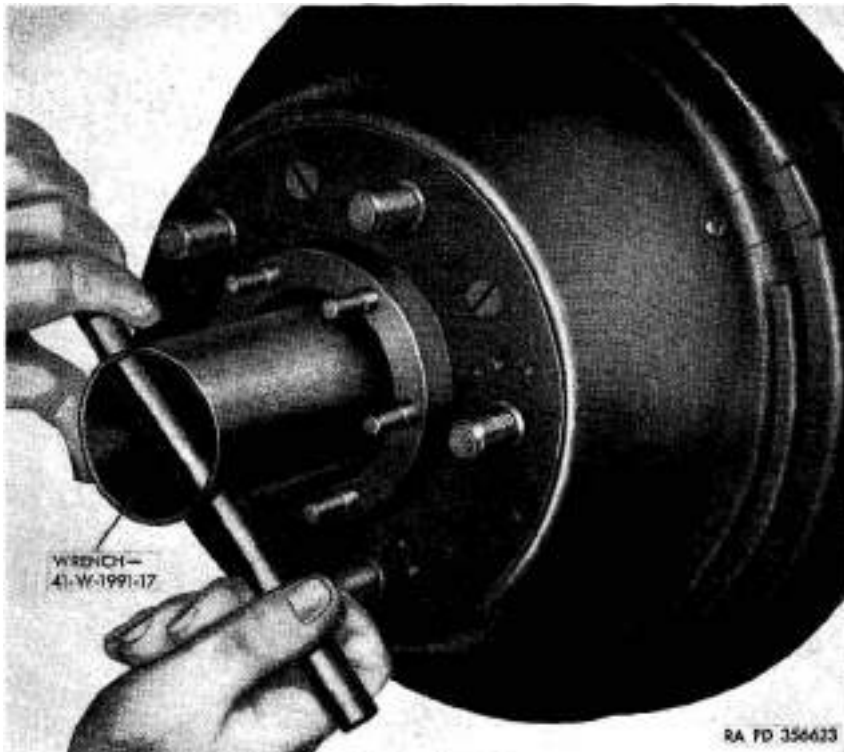


Figure 46. Removing bearing adjusting nuts.

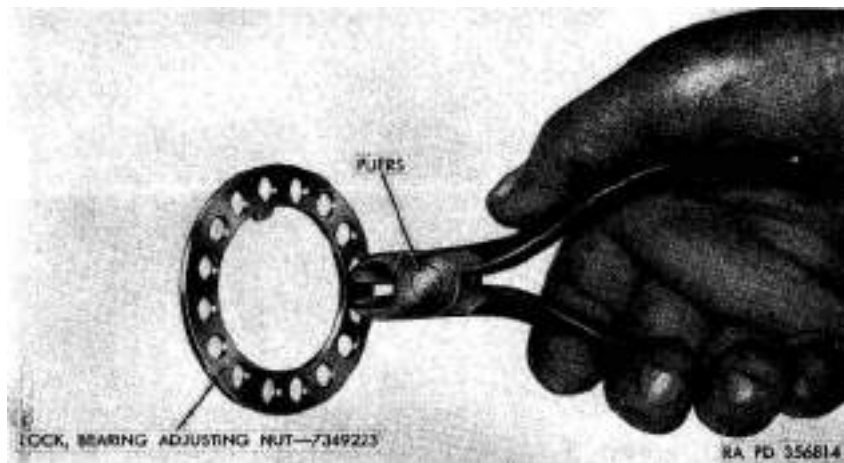


Figure 47. Handling bearing adjusting nut lock with pliers.

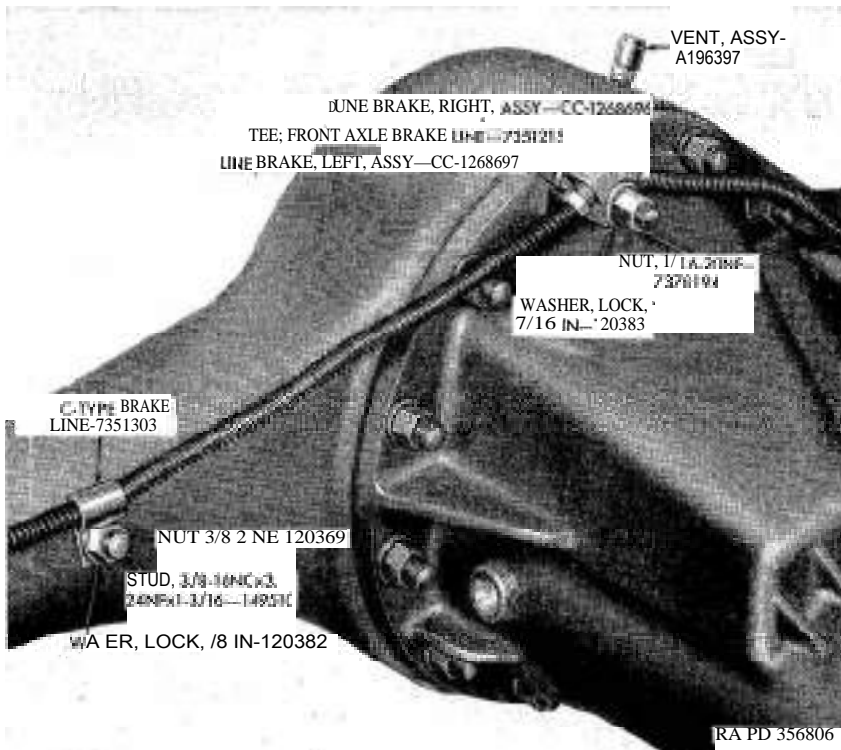


Figure 48. Front axle brake line tee and connections.

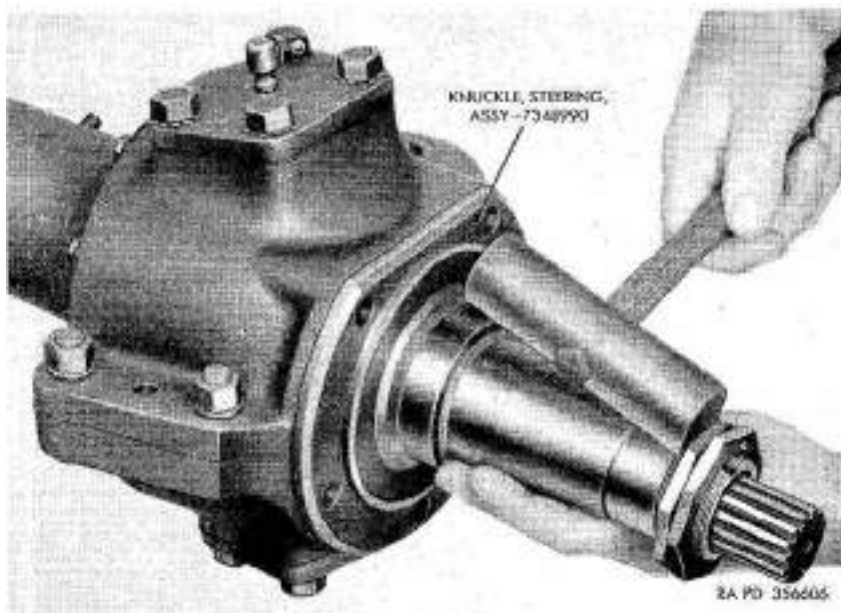


Figure 49. Removing steering knuckles.

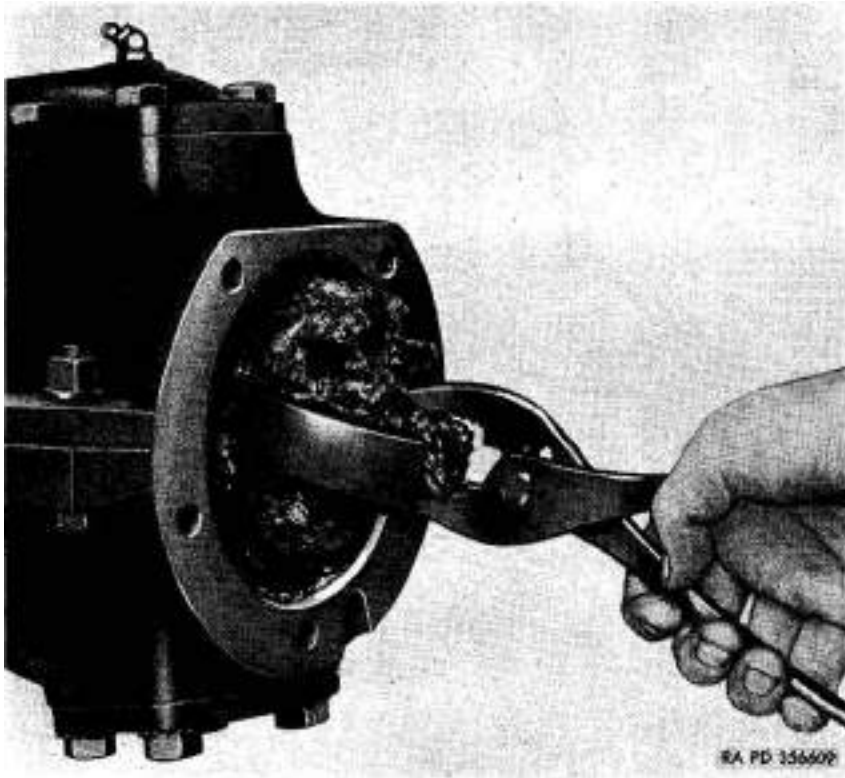


Figure 50. Removing universal drive male joint and inner shaft.

- (3) Remove brake flexible line nuts (*fig. 29*) and lock washers from flexible lines at brackets.
- (4) Remove flexible lines from wheel cylinders.

b. Remove Brake Support Assemblies, Steering Knuckles, and Universal Drive Assemblies. Remove cap screws, lock washers, and brake support assemblies. Temporarily install one or both bearing outer adjusting nuts on steering knuckles. Strike adjusting nuts with a plastic hammer and remove steering knuckles (*fig. 49*). Remove universal drive outer shafts and universal drive female joints. Remove both universal drive male joints and universal drive inner shafts (*fig. 50*).

c. Remove Tie Rod Assembly. Remove cotter pins and loosen tie rod end ball stud nuts, but do not remove nuts. Insert pinch bar between tie rod and flange assembly. Apply pressure on pinch bar (*fig. 51*) and strike flange assembly with a hammer to loosen ball studs. Remove nuts, tie rod end dust covers, tie rod end dust cover washers, tie rod end dust cover springs, and tie rod assembly.

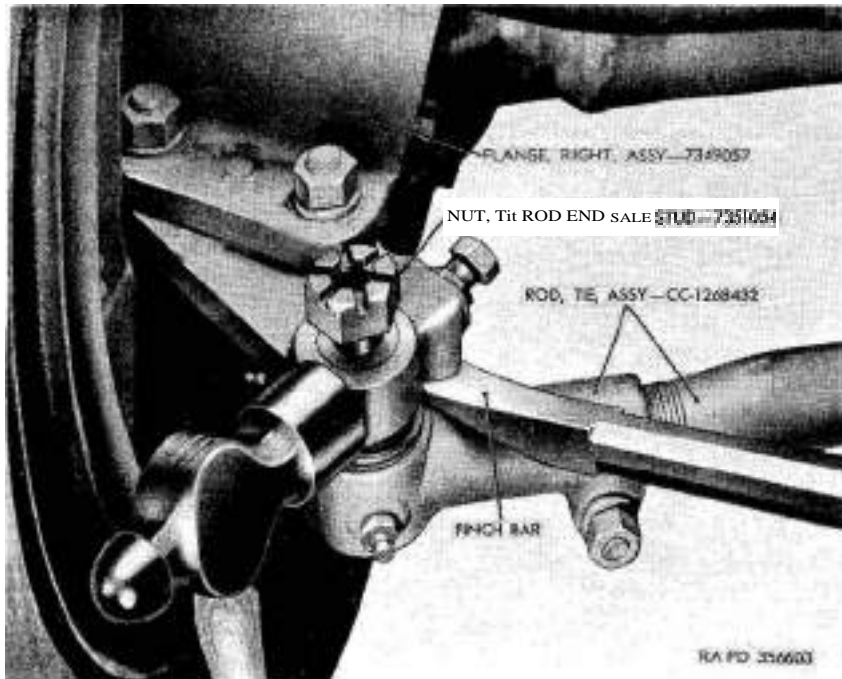


Figure 51. Removing tie rod end from flange assembly.

d. Remove Differential With Carrier Assembly. Remove drive pinion carrier stud nuts and lock washers. Remove differential with carrier assembly (fig. 44) from axle housing.

Section III. REBUILD OF HUB WITH BRAKE DRUM ASSEMBLIES

74. Disassembly (Field and Depot Maintenance)

a. General. The hub inner and outer bearing cups can be inspected in the hubs and should not be removed unless inspection (par. 75b) reveals replacement is necessary.

b. Remove Brake Drums From Hubs.

- (1) Insert a blunt chisel in each of the three machine screw slots (fig. 52) and strike the chisel a few sharp blows with a medium size hammer to loosen screws. Remove screws.
- (2) Install three $\frac{3}{8}$ -16NC x $1\frac{1}{2}$ cap screws in the three puller screw holes (fig. 52) of each brake drum. Pull brake drums from hubs by tightening screws. If the brake drums are rusted to the hub flanges, shock the puller screws with a hammer as they are tightened.

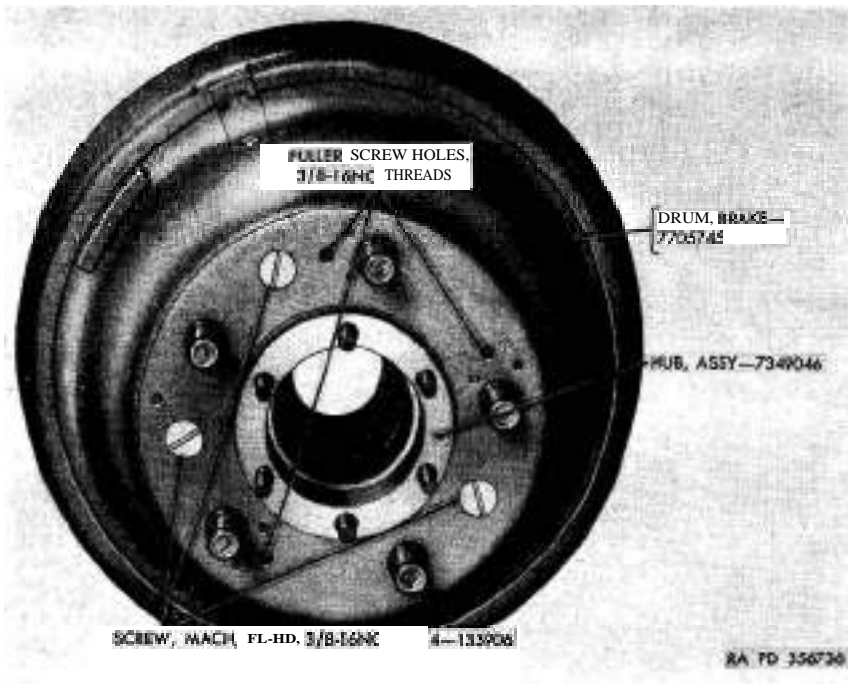


Figure 52. Brake drum with hub.

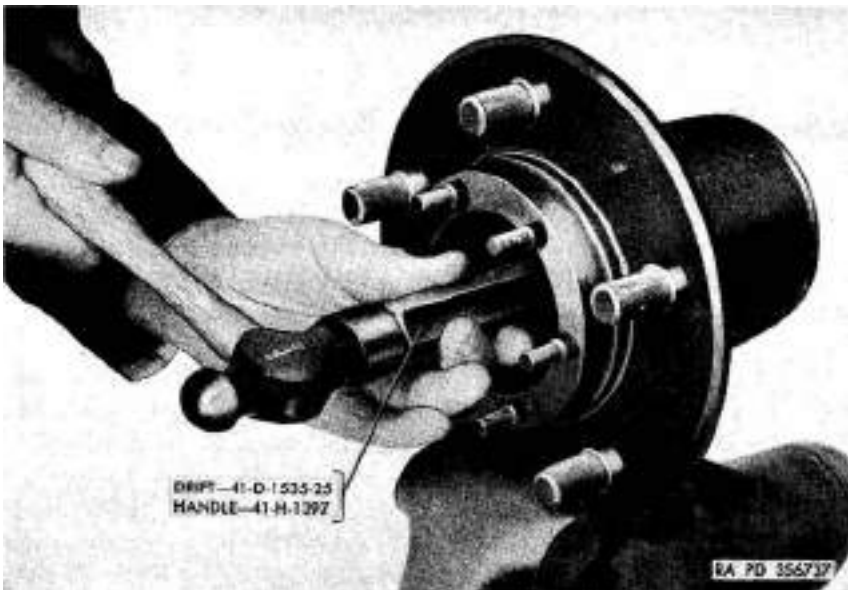


Figure 53. Removing hub inner bearing cone and hub bearing oil seal assembly.

c. *Disassemble Hub Assemblies (fig. 54).* Remove bearing oil seal snap rings (BB). Insert drift 41-D-1535-25 and handle 41-H--1397 (fig. 53) into hub from outer end and drive hub inner bearing cone (U) and hub bearing oil seal assembly (V) from hub in one operation.

d. *Remove Hub Inner and Outer Bearing Cups (fig. 54).* If inspection (par. 75b) of hub inner and outer bearing cups (P and T) reveals that replacement is necessary, remove them with a brass drift and hammer. Openings are provided in the hub forgings for the drift.

e. *Cleaning.* Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearing cones, with dry compressed air.

Caution: Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

75. Inspection (Field and Depot Maintenance)

a. *Inspect Hubs (fig. 54).* Inspect hubs without bearing cups (S) for damage and loose bearing cups. Inspect drive flange studs (Q) and wheel studs (R) for damaged threads. If hub is damaged or there is evidence of a loose bearing cup, replace hub. If the wheel studs or drive flange stud threads are worn or damaged, replace studs (par. 76b).

b. *Inspect Hub Rearing Cups and Hub Bearing Cones (fig. 54).* Inspect hub outer and inner bearing cups (P and T) and hub outer and inner bearing cones (N and U) for cracks, chipped spots, pitting, or wear. If any of these conditions exist, replace bearing cups (pars. 74d and 76a) and bearing cones (pars. 74c and 76c).

c. *Inspect Brake Drums (fig. 54).* Refer to chapter 11 for inspection information on brake drums (C).

76. Assembly (Field and Depot Maintenance)

a. *Install Hub Bearing Cups.* If replacement of hub bearing cups is necessary (par. 75b), remove dirt and burrs from hub counterbores and press cups in hubs with an arbor press. Make certain cups are firmly seated against shoulder of counterbores.

b. *Install Wheel Stud.* If replacement of a wheel stud (R, fig. 54) is necessary (par. 75a), install stud with an arbor press making certain flat portion of head corresponds with the shoulder on hub.

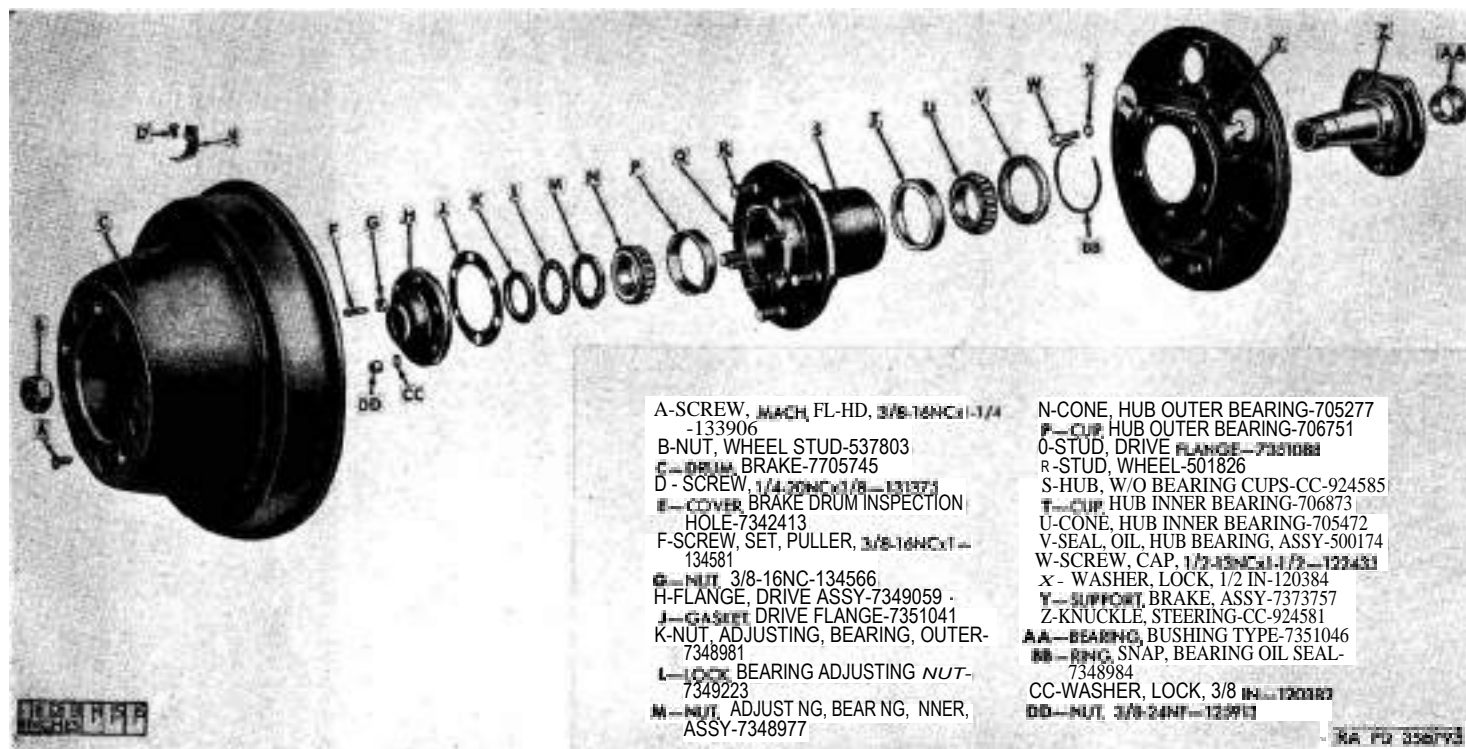


Figure 54. Hub with brake drum assembly—exploded view.

c. Install Hub Inner Bearing Cones, Hub Bearing Oil Seal Assemblies, and Bearing Oil Seal Snap Rings (fig. 54).

Note. When installing new hub bearing oil seal assemblies, the leather must be in good condition, soft, and pliable. Soak new oil seals in castor oil or neatsfoot oil for about 30 minutes and work leather by rolling with a round smooth bar (fig. 55) before installing.

Pack hub inner bearing cones (U, fig. 54) with specified lubricant (refer to TM 9-840). Coat interior of hubs with a small quantity of specified lubricant and place bearing cones in hub. Position the newly prepared hub bearing oil seals (V, fig. 54) so that lip of seals face roller bearings. Drive oil seals squarely into hub with replacer 41—R-2392-405 (fig. 56) just far enough to permit installation of bearing oil seal snap ring (BB, fig. 54).

Note. Do not drive oil seal into hub beyond snap ring groove; otherwise, interference will occur between the oil seal and hub inner bearing cone.

d. Install Brake Drums. Coat flange of hub assemblies with water pump grease to prevent corrosion. Position the brake drums on hubs so that the attaching screw holes are in alignment. Install and tighten $\frac{3}{8}$ –16NC x 1 1/4 flat-head machine screws (fig. 52).

Section IV. REBUILD OF FRONT AXLE HOUSING, RELATED STEERING, DRIVE, AND BRAKE PARTS

77. Disassembly (Field and Depot Maintenance)

a. General. Extreme care must be exercised in all phases of disassembly and assembly of the axle housing to insure satisfactory operation.

b. Remove Flange Oil Seal Retainers (fig. 57). Remove cap screws, lock washers, flange oil seal joint seal retainer, and flange oil seal joint seals. Twist the ends of the flange oil seal retainers apart and remove them from front axle housing. Remove flange oil seals and flange oil seal pressure springs from retainers.

c. Remove Flange Assemblies From Front Axle Housing (fig. 58).

Note. The upper and lower sections of the flanges are machined as an assembly and must be assembled as such. Therefore, the flange sections will not interchange with like parts of any other assembly.

- (1) Apply punch marks on the two sections of each flange assembly with a center punch and hammer before disassembly.
- (2) Drive dowel pins from flange assemblies with a punch and hammer.
- (3) Remove nuts, lock washers, and cap screws. This will separate the two sections of each flange assembly. Remove flange assemblies from axle housing.



Figure 55. Rolling leather oil seal with round smooth bar.

d. Disassemble Flange Assemblies (fig. 62).

- (1) Clamp the upper sections of the left and right flange assemblies (Z and AD) between copper jaws of a vise and remove 90° 1/8 NPT lubricating fitting elbows (T and AM) and 1/8 NPT lubricating fittings (U and AN) from flange upper bearing cap (AJ) and steering arm (R).
- (2) Remove flange upper bearing cap screws (AL) and lock washers from right flange assembly. Remove flange upper bearing cap (AJ). Remove flange bearing upper shims (AF, AG, and AI).
- (3) Remove steering arm screws (S) from left flange assembly (Z) and remove steering arm (R). Remove flange bearing upper shims (V, W, and X).



Figure 56. Installing hub bearing oil seal assembly.

- (4) Remove flange bearing cups (M and AT) from flange assemblies. Remove flanges from vise.
- (5) Clamp the lower sections of the left and right flange assemblies (Z and AD) between copper jaws of a vise and remove cap screws, lock washers, and flange bearing lower caps (CC and ZZ).
- (6) Remove flange bearing cups (M and AT) and VV) from flange assemblies. Remove flanges from vise.

e. Remove Vent Assembly. Remove vent assembly (fig. 48) from axle housing.

f. Remove Brake Line C-Type Clips (fig. 48). Remove nuts, lock washers, brake line C-type clips and studs from axle housing.

g. Remove Brake Line Bracket (fig. 29). Remove nuts, lock washers, brake line brackets, and studs from axle housing.

h. Remove Bushing-Type Bearings and Drive Shaft Oil Seal Assemblies From Front Axle Housing. Install puller 41-P-2909-10 (fig. 59) and remove bushing-type bearings and drive shaft oil seal assemblies (fig. 59).

Note. These oil seals must be replaced whenever the axle housing requires rebuilding.



Figure 57. Flange oil seal retainer and related parts.

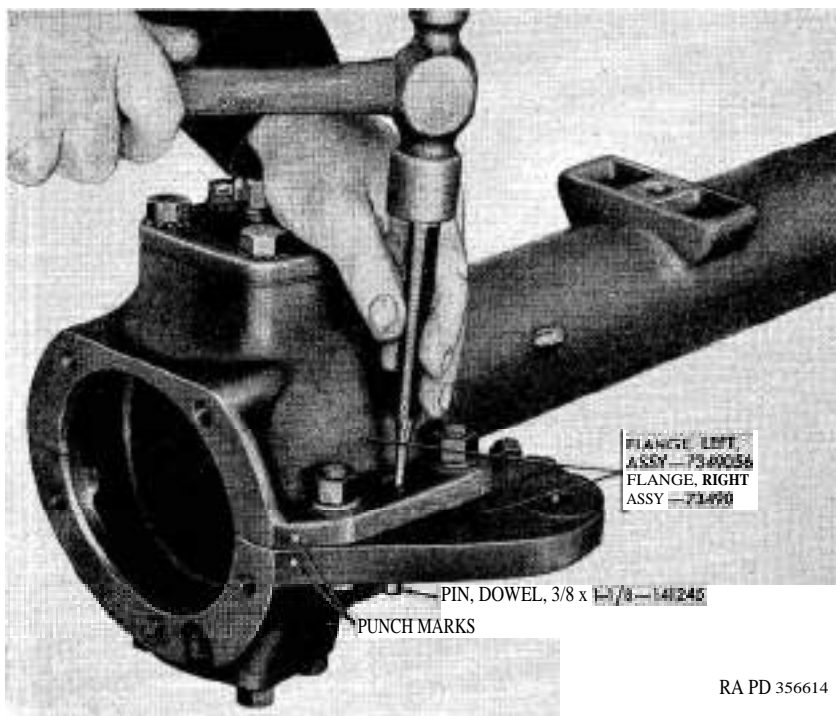


Figure 58. Removing dowel pin from flange assembly.

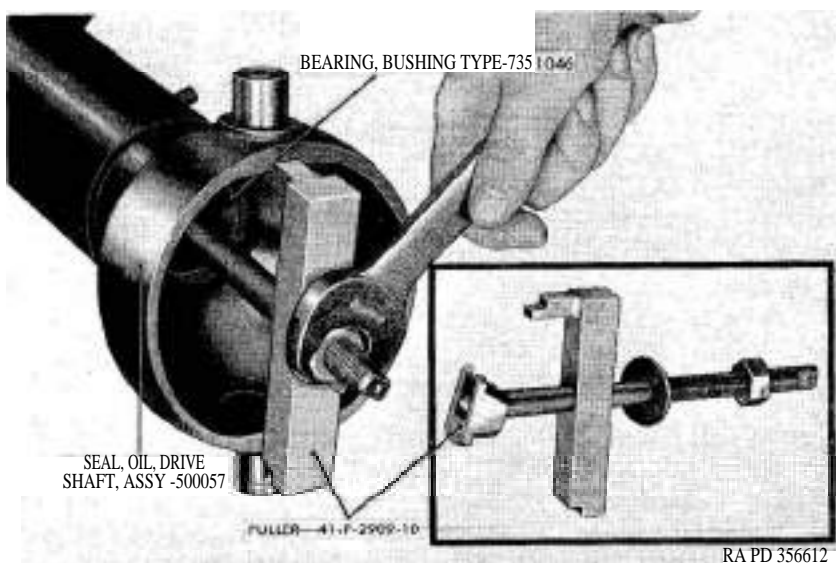


Figure 59. Removing bushing-type bearing and oil seal assembly from front axle housing.

i. *Remove Bushing-Type Bearings From Steering Knuckles (Z, fig. 54).* If inspection (par. 78c) reveals that replacement is necessary, remove bushing-type bearings (AA, fig. 54) with a puller (fig. 60).



Figure 60. Removing bushing-type bearing from steering knuckle with a puller.

j. *Remove Flange Upper and Lower Bearing Cones.* If inspection (par. 78b (4)) reveals that replacement of flange upper and lower bearing cones is necessary, remove cones and plates with a puller (fig. 61).

k. *Cleaning.* Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearing cones, with dry compressed air.

Caution: Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

78. Inspection (Field and Depot Maintenance)

a. *Check Front Axle Housing Alinement (fig. 63).* With the spring seats in a horizontal position, the top of the front axle housing center line tilts forward 12° and 45'. The top of the axle housing pivot pin center line tilts to the front 2° and 15'. The top of the axle housing pivot pin center line also tilts toward the center of the axle 8° to provide pivot pin inclination. If the housing alinement does not meet these specifications, replace housing.

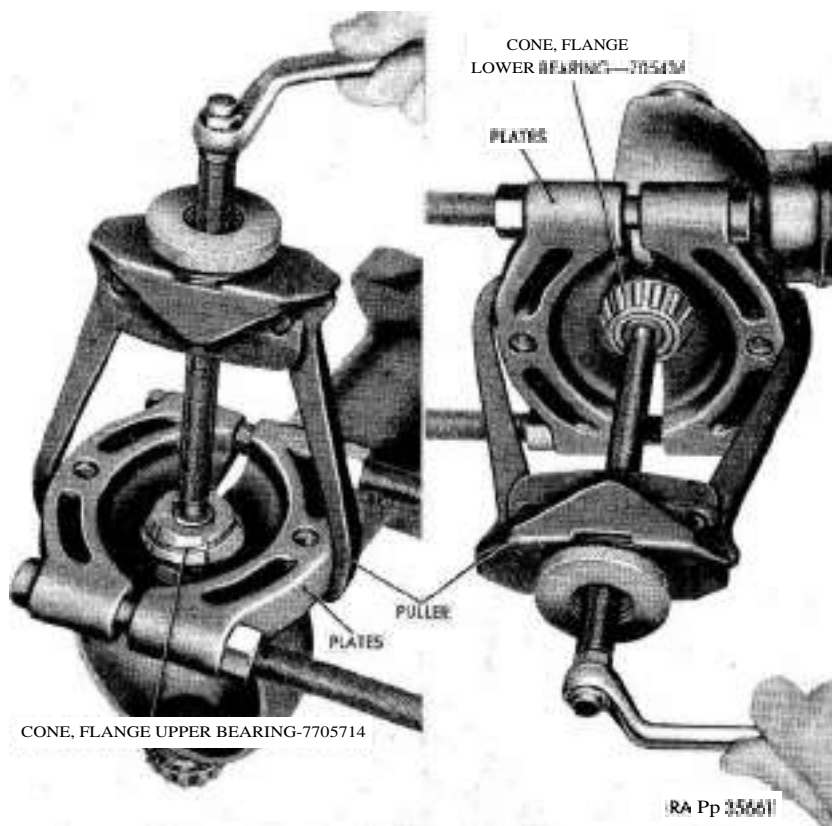


Figure 61. Removing upper and lower flange bearing cones with puller.

b. Inspect Front Axle Housing Assembly (fig. 62) .

- (1) Inspect front axle housing assembly (D) for damage or broken welds. Inspect axle housing pivot pin-to-housing welds for breakage. If any of these conditions exist, replace axle housing.
- (2) Inspect outer spherical ends of front axle housing for corrosion or scored spots. If either condition exists, clean or replace housing as required.
- (3) Inspect drive pinion carrier studs and front axle housing mounting flange for damage or wear. Replace damaged studs. The axle housing must be replaced if mounting flange is damaged.
- (4) Inspect flange upper and lower bearing cones (L, JJ, UU, and AS) for scores, wear, pitting, or damaged roller cages. If any of these conditions exist, replace bearings (pars. 77j and 79c).

A—Differential, w/carrier, assy — 7373714
 B—Vent, assy — A196397
 C—Gasket, drive pinion carrier — CC-929877
 D—Housing, front axle, assy — 7373742
 E—Screw, cap, 5/16-18NC x % 120228
 F—Washer, lock, 5/16-inch — 120214
~~G—Retainer, seal, flange oil seal joint — 7348991~~
 H—Seal, flange oil seal joint — CC-924637
 J—Gasket, flange oil seal retainer — 7348989
 K—Seal, oil, flange — 7349109
 L—Cone, flange upper bearing — 7705714
 M—Cup, flange bearing — 706845
 N—Key, Woodruff, 5/32 x % — 106750
 P—Washer, lock, $\frac{1}{2}$ -inch — 120384
 Q—Nut, $\frac{1}{4}$ -20NF — 120371
 R—Arm, steering — 7342833
 S—Screw, steering arm — 7373746
 T—Elbow, lubricating fitting, 90-degree, $\frac{1}{8}$ NPT — 504202
 U—Fitting, lubricating, 1/2 NPT — 504208
 V—Shim, flange bearing, upper (0.005-inch thk) — 7348994
 W—Shim, flange bearing, upper (0.007-inch thk) — 7349269
 X—Shim, flange bearing, upper (0.020-inch thk) — 7349268
 Y—Pin, dowel, % x 1 $\frac{1}{4}$ 1245
~~Z—Flange, left, assy — 7349056~~
 AA—Screw, cap, $\frac{1}{2}$ -13NC x 1 — 122408
 BB—Washer, lock, $\frac{1}{2}$ -inch — 135629
 CC—Cap, flange bearing, lower — 7349097
~~DD—Gasket, flange bearing cap, lower — 7348988~~
 EE—Screw, cap, $\frac{1}{2}$ -20NF x 2 — 124169
~~FF—Bearing, bushing-type — 7351046~~
 GG—Seal, oil, drive shaft, assy — 500057
 HH—Cup, flange bearing — 706845
 JJ—Cone, flange lower bearing — 705436
 KK—Plug, pipe, headless, slotted, 1/2-inch — 118831
~~LL—Spring, pressure, flange oil seal — 7348995~~
~~MM—Retainer, flange oil seal — 7348992~~
 NN—Gasket, annular, copper and asbestos, $\frac{1}{8}$ -inch — 105456
 PP—Plug, drain — 7373671
 QQ—Screw, cap, 5/16-18NC x % 120228
 RR—Washer, lock, 5/16-inch — 120214
 SS—Gasket, flange oil seal retainer — 7348989
 TT—Plug, pipe, headless, slotted, $\frac{1}{4}$ -inch — 118831
 UU—Cone, flange lower bearing — 705436
 VV—Cup, flange bearing — 706845
~~WW—Screw, stop — 7348993~~
 XX—Nut, 7/16-14NC — 124573
 YY—Gasket, flange bearing cap, lower — 7348988
 ZZ—Cap, flange bearing, lower — 7349097
 AB—Washer, lock, $\frac{1}{2}$ -inch — 135629
 AC—Screw, cap, $\frac{1}{2}$ -13NC x 1 — 122408
 AD—Flange, right, assy — 7349057
 AE—Pin, dowel, % x 1 $\frac{1}{4}$ — 141245

Figure 62—Continued on following page.

AF—Shim, flange bearing, upper (0.020-inch thk) — 7349268
 AG—Shim, flange bearing, upper (0.007-inch thk) — 7349269
 AH—Shim, flange bearing, upper (0.005-inch thk) — 7348994
 AJ—Cap, flange upper bearing — 7349098
 AK—Washer, lock, $\frac{1}{16}$ -inch — 135629
 AL—Screw, flange upper bearing cap — 7348987
 AM—Elbow, lubricating fitting, 90-degree, NPT — 504202
 AN—Fitting, lubricating, $\frac{1}{8}$ NPT — 504208
 AP—Bearing, bushing-type — 7351046
 AQ—Seal, oil, drive shaft, assy — 500057
 AR—Key, Woodruff, $\frac{5}{32}$ x $\frac{5}{16}$ — 106750
 AS—Cone, flange upper bearing — 7705714
 AT—Cup, flange bearing — 706845
 AU—Seal, oil, flange — 7349109
 AV—Spring, pressure, flange oil seal — 7348995
 AW—Retainer, flange oil seal — 7348992
 AX—Seal, flange oil seal joint CC-924637
 AY—Retainer, seal, flange oil seal joint — 7348991
 AZ—Stud, S, $\frac{7}{16}$ -14 ($\frac{1}{2}$) x $\frac{7}{16}$ -20 (1) x 1 $\frac{15}{16}$ — CC929855
 BC—Washer lock, medium, S, cadmium- or zinc-plated, $\frac{7}{16}$ -inch — 120383
 BD—Nut, hex, S, cadmium- or zinc-plated or phosphate-coated, $\frac{7}{16}$ -20NF
 7378194

Figure 62-Continued.

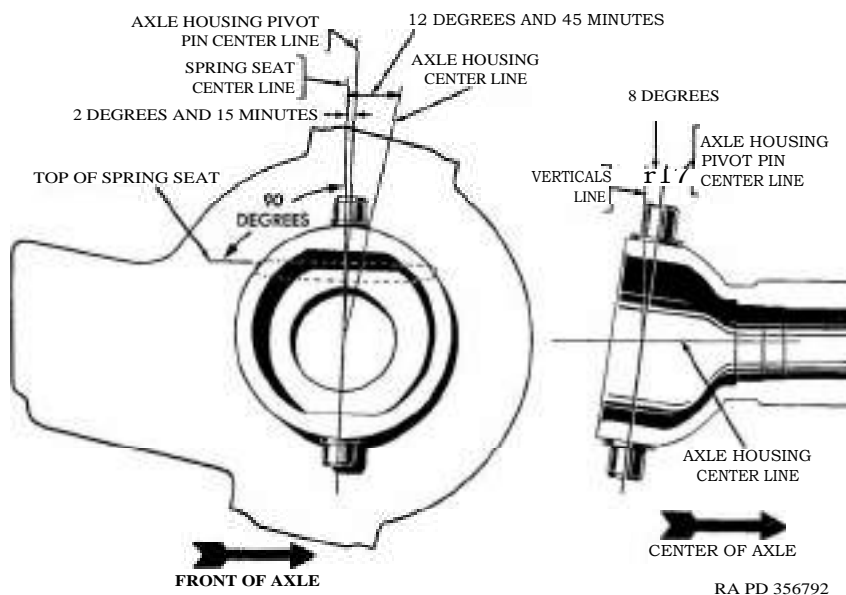


Figure 63. Front axle housing alinement.

c. *Inspect Bushing-Type Bearings.* Inspect bushing-type bearings (AA, fig. 54, and FF and AP, fig. 62) for wear. If the bore diameter of bearings exceeds the specified wear limit in paragraph 342, replace bearings (pars. 77i and 79i).

d. *Inspect Flange Bearing Upper Shims.* Inspect flange bearing upper shims (V, W, X, AF, AG, and All, fig. 62) for corrosion or damage. Replace as required.

e. *Inspect Flange Assemblies (fig. 62).* Inspect left and right flange assemblies (Z and AD) for damage or cracks. Replacement of the assembly is required if either condition is apparent.

f. *Inspect Flange Bearing Cups (fig. 62).* Inspect flange bearing cups (M, III, VV, and AT) for cracks, pits, scores, or wear. Replace bearing cups if any of these conditions exist.

g. *Inspect Vent Assembly (fig. 48).* Inspect vent assembly for damage and cheek cap and spring for free movement. Replace vent, if necessary.

h. *Inspect Flange Oil Seal Retainers and Related Parts (fig. 57).* Discard flange oil seals, flange oil seal joint seals, and flange oil seal retainer gaskets. Inspect retainers and flange oil seal pressure springs for damage. Replace parts, if necessary.

i. *Inspect Universal Drive Assemblies.*

- (1) Inspect all shaft splines, bearing surfaces, and oil seal contact surfaces. If there is evidence of twisting, scoring, wear, cracks, or chipping, the shafts must be replaced. Measure diameter of inner and outer universal drive shafts at bearing and oil seal contact surfaces with a micrometer. If the wear limits exceed that specified in paragraph 342, replace drive shafts.
- (2) Inspect universal drive joint assemblies for wear, scoring, chipping, or cracks. If the parts appear satisfactory for further service, assemble universal drive joint in the sequence shown in figure 64 and check the clearance between parts (fig. 65). The clearance at any of the checking points should not exceed wear limits indicated in paragraph 342. If clearance exceeds specified wear limit, replace the joints or shafts as required.

Note. At time of manufacture, the female and male drive joints are matched as an assembly and etched matching numbers 1, 2, or 4 may appear on the parts. From a reclamation standpoint, the various parts are interchangeable, providing operating clearance conforms to the dimensions in paragraph 342.

j. *Inspect Steering Knuckles.* Inspect bearing surfaces of steering knuckles (Z, fig. 54), for wear. Check threads for wear or damage. If there is evidence of wear or damage, replace knuckles. Measure diameter of steering knuckle at hub oil seal-contact sur-

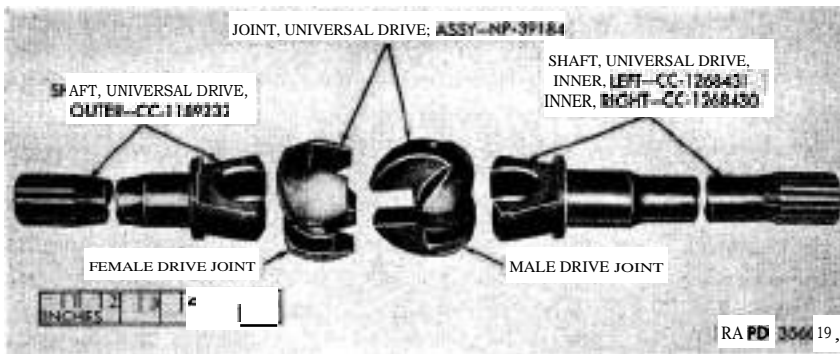


Figure 64. Universal drive assembly.

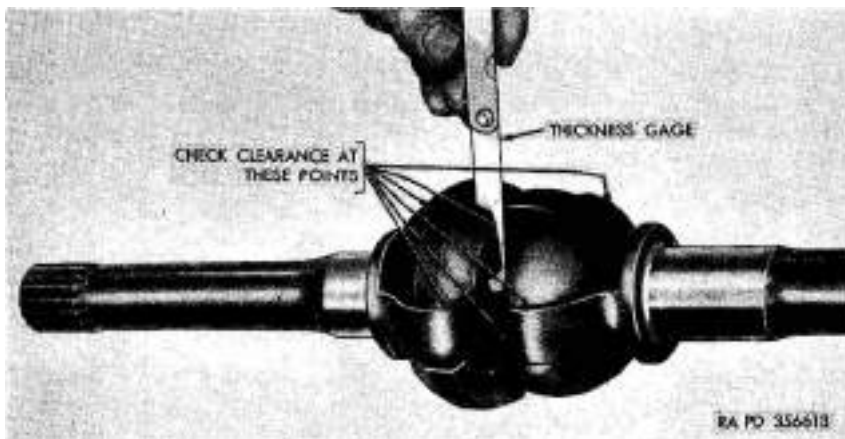


Figure 65. Checking universal drive joint assembly clearance with thickness gage.

face with a micrometer. Replace knuckle if wear limit exceeds that specified in paragraph 342.

k. Inspect Brake Support Assemblies. Refer to chapter 11 for inspection of brake supports, brake lines, and brake line fittings.

l. Inspect Tie Rod Assembly (fig. 70).

Note. It is not necessary to disassemble the tie rod assembly unless inspection reveals that tie rod or tie rod end assemblies require replacement.

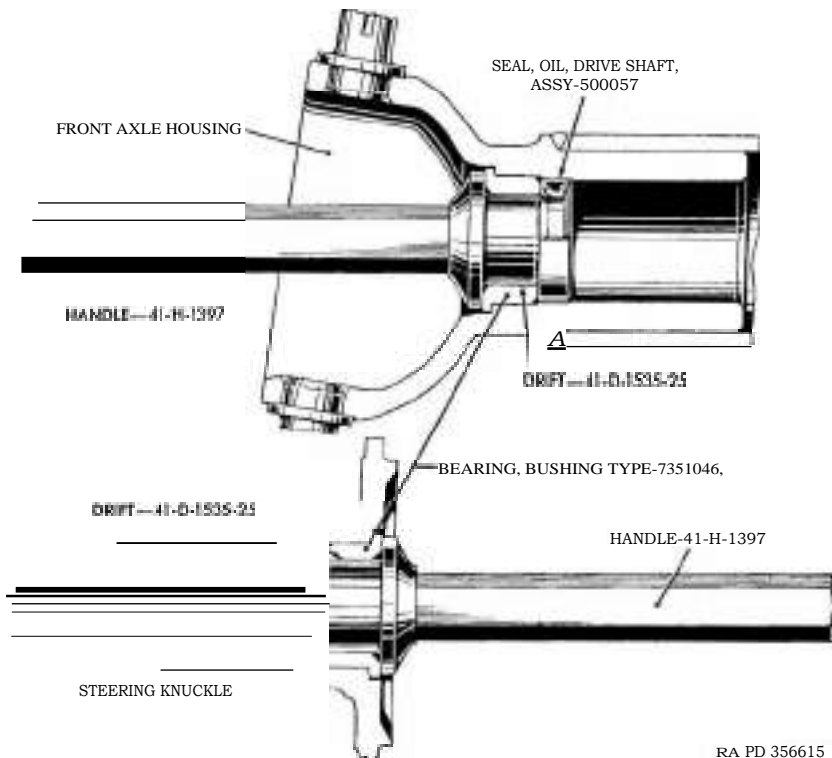
- (1) Inspect tie rod for misalignment and worn threads. If the tie rod is bent, it can be straightened ; however, if the threads are worn, tie rod must be replaced.
- (2) Inspect tie rod end assemblies for wear and, if any play is evident, replace tie rod ends. Inspect tie rod end dust covers, tie rod end dust cover washers, and tie rod end dust cover springs. Replace unsatisfactory parts.

79. Assembly (Field and Depot Maintenance)

a. *General.* Use new gaskets and seals to avoid possible lubricant leaks.

b. *Install Bushing-Type Bearings and Drive Shaft Oil Seal Assemblies in Front Axle Housing.* Prepare drive shaft oil seal assemblies (GG and AQ, *fig. 62*) by soaking in castor oil or neats-foot oil for about 30 minutes and work leather by rolling with a round smooth bar (*fig. 55*) before installing. Position oil seals in axle housing with lip of leather toward differential. Place bushing-type bearings on drift 41—D-1535-25 (*fig. 66*). With handle 41-R-1397 (*fig. 66*) and hammer, drive bearings and seals into front axle housing (*fig. 66*).

c. *Install Flange Upper and Lower Bearing Cones.* If inspection (par. 78b (4)) reveals that replacement of upper and lower flange bearing cones is necessary, install $5/32 \times \frac{5}{8}$ Woodruff keys (N and AR, *fig. 62*) in axle housing upper pivot pins. Start flange upper and lower bearing cones on pins and drive in place with replacer 41- R-2382-915 (*fig. 67*).



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Figure 66. Installing bushing-type bearings and drive shaft oil seal assembly.

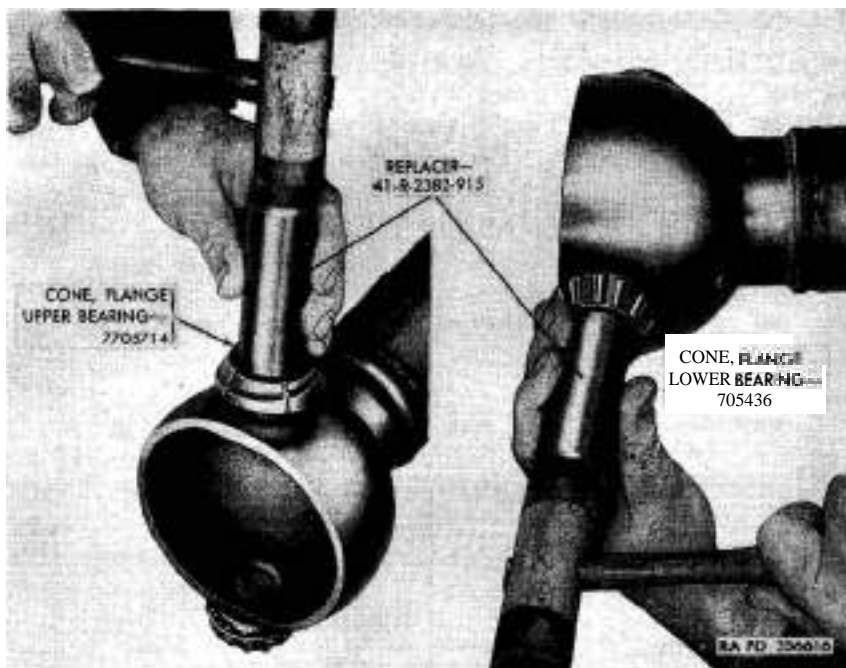


Figure 67. Installing flange bearing cones.

d. Assemble Flange Assemblies on Front Axle Housing (fig. 62).

- (1) Clamp upper sections of the left and right flange assemblies (Z and AD) between copper jaws of a vise and install flange bearing cups (M and AT).
- (2) Place flange bearing upper shims totaling 0.052-inch thickness on each flange assembly. This can be accomplished with two 0.020-inch flange bearing upper shims (X and AF), one 0.007-inch flange bearing upper shim (W and AG), and one 0.005-inch flange bearing upper shim (V and AH).

Note. The correct amount of shims required for a proper adjustment of the flange bearings cannot be determined until the flange assemblies are installed on the front axle housing.

- (3) Position flange upper bearing cap (AJ) on right flange assembly. Install ~~1/4-inch~~ lock washers (AK) and flange upper bearing cap screws (AL). Tighten screws to 60 to 80 pound-feet torque.
- (4) Make certain shims are properly aligned and position steering arm (R) on left flange assembly. Install steer-

ing arm screws (S) (no lock washers) and tighten screws to 60 to 80 pound-feet torque.

Note. The steering arm screws (S) are self-locking screws and can be identified by the concavity in the head.

- (5) Install $\frac{1}{8}$ NPT, 90°, lubricating fitting elbows (T and AM) and $\frac{1}{8}$ NPT lubricating fittings (U and AN) in flange upper bearing cap and steering arm. Remove flange assemblies from vise.
- (6) Clamp the lower sections of the flange assemblies between copper jaws of a vise and install flange bearing cups (MI and VV).
- (7) Position flange bearing cap lower gaskets (DD and YY) and flange bearing lower caps (CC and ZZ) on flange assemblies. Install $\frac{1}{2}$ -inch lock washers (BB and AB) and $\frac{1}{4}$ -13NC x 1 cap screws (AA and AC). Tighten screws to 60 to 80 pound-feet torque.

Note. Install gasket only between lower section of flange assemblies and bearing caps (no shims).

Remove flange assemblies from vise.

- (8) Lubricate bearings with general purpose grease (GAA).

e. Install Flange Assemblies on Front Axle Housing (fig. 62).
Position upper and lower sections of the left and right flange assemblies (Z and AD) on their respective sides of front axle housing. Install eight $\frac{1}{2}$ -20NF x 2 cap screws (EE) (head down), $\frac{1}{2}$ -inch lock washers (P), and $\frac{1}{2}$ -20NF nuts (Q). Do not tighten nuts until the four $\frac{3}{8}$ x $1\frac{1}{4}$ dowel pins (Y and AE) have been installed. Install dowel pins, and tighten nuts to 80 to 85 pound-feet torque.

f. Adjust Flange Bearings.

Note. There must be an apparent drag when the flange assemblies are oscillated on front axle housing. This drag is specified in pound-feet torque and is considered the preload on flange bearings. To obtain a correct adjustment, the preload must be checked with a torque indicating wrench (fig. 68), attached to one of the steering arms or flange upper bearing cap screws.

- (1) Oscillate the flange assemblies on the front axle housing until the bearings roll smoothly and note the preload reading on the torque wrench while wrench is in motion.
- (2) If the preload does not conform to the specifications in paragraph 342, add or remove flange bearing upper shims at the steering arm or flange upper bearing cap as required.

Note. Accurate preload readings can not be obtained with the universal drive assemblies, flange oil seal assemblies, or tie rod assembly installed.

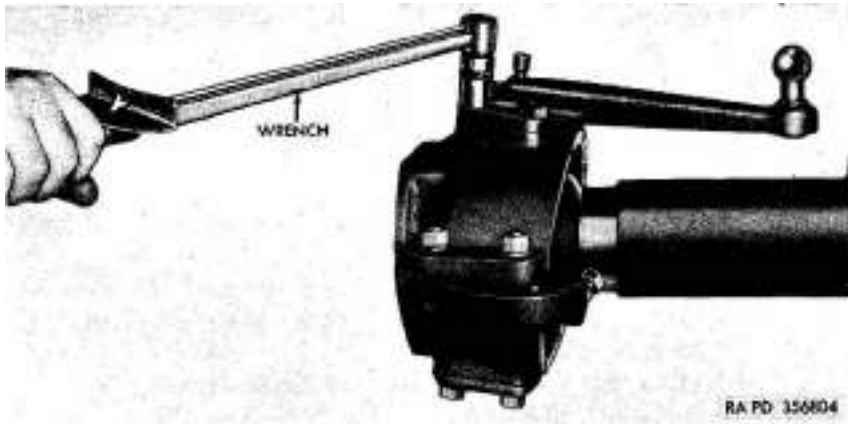


Figure 68. Checking preload of flange bearings with torque indicating wrench.

g. Adjustment of Turning Radius (fig. 69) . Check the turning radius by placing gage 41—G-449 between the flange assembly and axle housing (flange oil seal assembly removed) . Turn flange until the gage restricts further movement. If adjustment is necessary, break the weld and install a new stop screw and 7/16-14NC nut. With gage in position, adjust the stop screw so that it bears against axle housing and tighten nut. Tack weld stop screw and nut to flange assembly.

h. Assemble Parts in Flange Oil Seal Retainers and Install (fig. 57).

- (1) Saturate flange oil seals with light engine oil (OE) and install flange oil seal pressure springs and oil seals in flange oil seal retainers.
- (2) Twist retainers apart at joint ; then slip retainers, springs, and oil seals over the axle housing. Position new flange oil seal retainer gaskets on the flange assemblies (open and up) and place retainers against flange assemblies. Install a 5/16-inch lock washer and 5/16—18NC x $\frac{5}{8}$ cap screw at each side, fingertight, to hold retainers in position.
- (3) Position flange oil seal joint seals and flange oil seal joint seal retainers over joints of flange oil seal retainers. Install other lock washers and cap screws. Tighten screws.

i. Install Bushing-Type Bearings in Steering Knuckles. If inspection (par. 78c) reveals that replacement of bushing-type bearings is necessary, install new bearings with handle 41-11-1397 and drift 41—D-1535 (fig. 66).

j. Install Brake Line C-Type Clips on Front Axle Housing (fig.

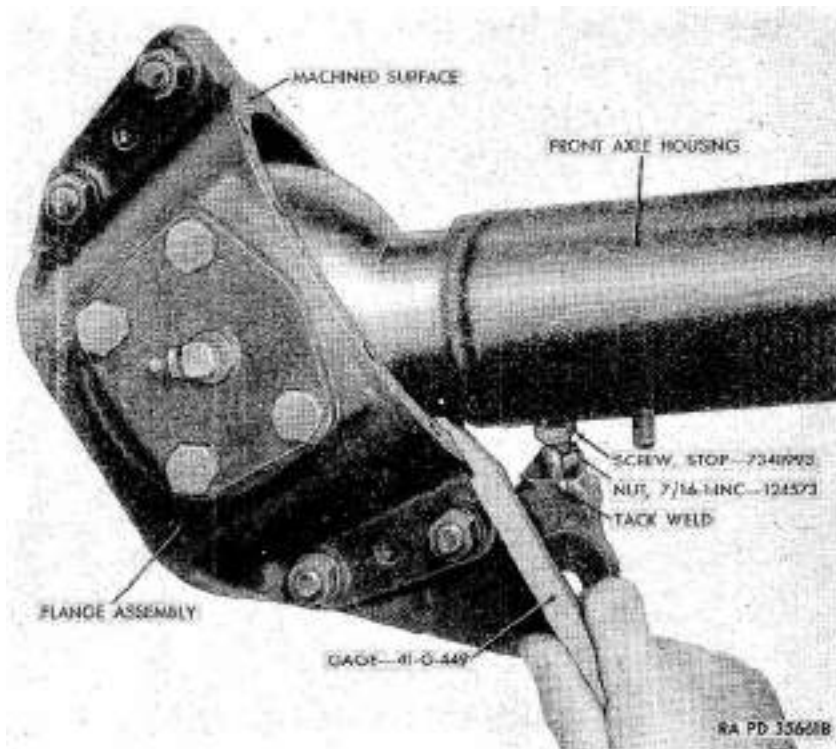


Figure 69. Checking turning radius.

48) . Apply plastic-type gasket cement on threads and install $\frac{3}{8}$ -24NF x $\frac{1}{8}$ -24NF x 1 3/16 studs in axle housing. Place brake line C-type clips, $\frac{3}{8}$ -inch lock washers, and $\frac{3}{8}$ -16NC nuts on studs. Tighten nuts.

k. *Install Brake Flexible Line on Front Axle Housing (fig. 29)* . Apply plastic-type gasket cement to threads and install $\frac{3}{8}$ -16NC x $\frac{3}{8}$ -24NF x 1 3/16 studs in axle housing. Place brake line brackets, $\frac{3}{8}$ -inch lock washers, and $\frac{3}{8}$ -16NC nuts on studs. Tighten nuts.

Section V. ASSEMBLY OF FRONT AXLE FROM SUBASSEMBLIES

80. General

Before installing the subassemblies, it is important to make certain they are free of all traces of dirt and rust-preventive compounds.

81. Differential With Carrier Assembly (Field and Depot Maintenance)

a. Install Differential With Carrier Assembly. Position new drive pinion carrier gasket on front axle housing and install differential with carrier assembly. Install 7/16-inch lock washers and drive pinion carrier stud nuts. Tighten stud nuts to 40-50 pound-feet torque.

b. Install Universal Drive Assemblies, Steering Knuckles, and Brake Support Assemblies.

- (1) Apply a small quantity of specified lubricant (refer to TM 9-840) on the various universal drive joint parts. Place male joints on universal drive inner shafts (*fig. 64*) and install inner shafts and joints in the front axle housing assembly.
- (2) Place female joints on universal drive outer shafts and insert outer shafts in steering knuckles. Engage female joints with male joints ; then position steering knuckles on steering knuckle flange assemblies (flat portion of steering knuckle to correspond with top of steering knuckle flange). Use a plastic hammer to drive steering knuckles in flanges while maintaining proper alinement with screw holes.
- (3) Position brake support assembly (Y, *fig. 54*) on steering knuckles and install $\frac{1}{4}$ -inch lock washers (X, *fig. 54*) and $\frac{1}{2}$ -13NC x 1 $\frac{1}{2}$ cap screws (W, *fig. 54*). Tighten screws to 80-85 pound-feet torque.

c. Install Tie Rod Assembly (fig. 70).

- (1) If inspection (par. 781) reveals that tie rod or tie rod end assemblies requires replacement, assemble the ends with lubricating fittings toward the rear and the offset of tie rod at right side, to provide clearance for the differential with carrier assembly. Assemble tie rod to flange assemblies with an equal amount of exposed threads at each end. The distance between the centers of the tie rod end ball studs should be 48 $\frac{1}{16}$ inches.

Note. This is an assembly dimension. The toe-in of the front wheels must be checked (TM 9-840) when the assembly is installed on a vehicle.

- (2) Place one of the tie rod end dust cover washers on each tie rod end ball stud, followed by tie rod end dust covers, other washers, and tie rod end dust cover springs. Insert ball studs up through openings in flange assemblies and install tie rod end ball stud nuts. Tighten nuts to 130-150 pound-feet torque and install new $\frac{1}{8}$ x 1% cotter pins.

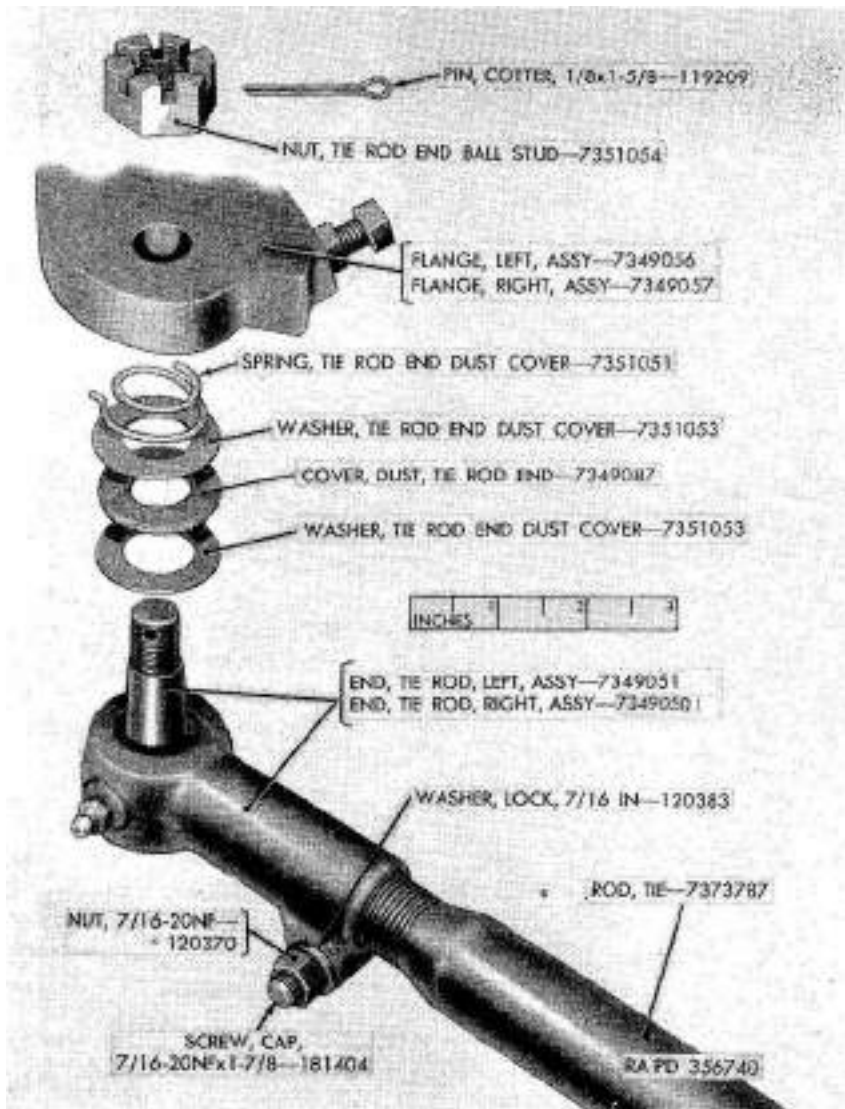


Figure 70 Tie rod end and related parts

Tighten 7/16-20NF nuts on 7/16-20NF x 1 7/8 cap screws in tie rod end assemblies.

d. Install Brake Line Assemblies and Front Axle Brake Line Tee (fig. 48).

- (1) Connect brake flexible lines at wheel cylinders.
- (2) Position flexible lines in brake line brackets (fig. 29) and install 5/8-inch lock washers and brake flexible line nuts. Tighten nuts.

- (3) Place brake lines on front axle housing and front axle brake line tee on drive pinion carrier upper stud. Close C-type clips on left line. Install 7/16-inch lock washer and 7/16-20NF nut on drive pinion carrier stud and tighten nut.

Note. Tee must be installed on upper drive pinion carrier stud with upper opening toward axle housing.

Connect brake lines to tee and flexible lines.

e. Install Vent Assembly. Screw vent assembly (fig. 48) into housing and tighten securely.

82. Hubs With Brake Drums (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 54, except where otherwise indicated.

a. Install Hubs With Brake Drums.

- (1) Position the hubs with brake drums on steering knuckles. Pack hub outer bearing cones (N) with specified lubricant, using a lubricator. Refer to TM 9-840.
- (2) Install inner bearing adjusting nut assemblies (M) (pin toward outside), and tighten nuts, with wrench 41-W-1991-17 (fig. 46), until bearings are firmly seated in cups. Then back off nut one-sixth turn.
- (3) Install bearing adjusting nut locks (L) with diagonal cutting pliers (fig. 47). If hole in lock does not index with pin on adjusting nut, remove lock and reverse its position. Holes in lock are drilled off center in relation to the steering knuckle key slot ; therefore, lock will index with pin on adjusting nut, if lock is properly positioned.
- (4) Install outer bearing adjusting nuts (K) and tighten.

b. Install Drive Flange Assemblies. Install new drive flange gaskets (J). Install drive flange assemblies (H), $\frac{3}{8}$ -inch lock washers (CC), and $\frac{3}{8}$ -24NF nuts (DD). Tighten nuts to 30 to 35 pound-feet torque.

Note. Make certain drive flanges are installed in their original position as indicated by the punch marks (fig. 45).

Install $\frac{3}{8}$ -16NC nuts (6) on ~~$\frac{1}{8}$ -16NC~~ x 1 puller set screws (F) and install screws in drive flange assemblies (H). Tighten nuts.

c. Lubricate Universal Drive Assemblies and Steering Knuckle Flange Bearings. Remove ~~$\frac{1}{8}$ -inch~~ slotted headless pipe plugs (KK and TT, fig. 62) from lower portion of outer spherical ends of axle housing and lubricate universal drive assemblies and steering knuckle flange bearings with a high pressure grease gun on the

upper $\frac{1}{8}$ NPT lubricating fitting (U and AN, fig. 62) in accordance with TM 9-840. Force lubricant through fittings until it appears at the lower plug openings. Install $\frac{1}{8}$ -inch slotted headless pipe plugs.

d. Adjust Brakes. Perform major brake adjustment in accordance with TM 9-840.

Section VI. TEST AND ADJUSTMENT

83. Axle Housing Lubricant

Install 6 pints of universal gear lubricant (GO) in axle housing and rotate drive pinion shaft sufficiently to insure distribution of lubricant over all internal parts.

84. Front Wheel Alinement (Field Maintenance)

a. General. The camber, caster, and pivot pin inclination are built into the front-axle housing assembly and alinement of housing installed on the vehicle can be determined by checking these items. Caster is affected by the condition of front springs and this must be considered whenever the caster is checked.

b. Check Camber, Caster, and Pivot Pin Inclination.

- (1) Raise front end of vehicle from floor. Check hub bearings for looseness, which will affect camber reading. Adjust hub bearings, if necessary. Refer to paragraph 82a.
- (2) Check flange bearings for looseness. Adjust, if necessary. Refer to paragraph 79f.
- (3) Check wheel and tire run-out. Replace wheel or tire if run-out exceeds three-eighths of an inch.
- (4) Check tread of tires and if badly worn, install substitute tires and wheels.
- (5) Place vehicle on a level surface and check camber, caster, and pivot pin inclination with a wheel alinement indicator (fig. 71). Refer to paragraph 342 for camber, caster, and pivot pin inclination specifications.
- (6) If the front springs are sagged to the extent that negative caster exists, it will be necessary to install rebuilt or new springs (pars. 196-198) in order to obtain accurate caster readings. If the caster varies more than 3° from the specified limit, with front springs that are in satisfactory condition, the front axle housing is twisted and must be replaced.



Figure 71. Checking front axle camber, caster, and pivot pin inclination with wheel alinement indicator.

CHAPTER 6

REAR AXLE AND DIFFERENTIAL WITH CARRIER ASSEMBLY

Section I. DESCRIPTION AND DATA

85. Description

a. Rear Axle. The rear axle is of the full-floating type. Power is transmitted from the differential to the wheels by drive shafts, which can be removed without disturbing wheels, hubs, or bearings.

b. Differential With Carrier Assembly. The differential with carrier assembly is a self-contained unit with hypoid drive gear and pinion. The drive pinion is mounted on three adjustable tapered roller bearings. The differential is a four-pinion type and is mounted on two tapered roller bearings. Both front and rear axle differential with carrier assemblies are serviced in a like manner.

c. Hubs With Brake Drums. The disassembly, inspection, and assembly of the hubs with brake drums are covered in chapter 5.

86. Data

Axle housing	-----	one piece
Axle ratio	-----	5.83 : 1
Bearings :		
Differential (2)	-----	tapered roller
Pinion bearing assembly :		
Front (1)	-----	tapered roller
Rear (1)	-----	tapered roller
Wheel :		
Inner (2)	-----	tapered roller
Outer (2)	-----	tapered roller
Differential lubricant capacity	-----	6 pt
Drive gear diameter	-----	9% in

Make ----- Chrysler Corp.
 Number of teeth :
 Drive gear ----- 35
 Drive pinion ----- 6
 Type ----- full-floating

Section II. DISASSEMBLY OF REAR AXLE INTO SUBASSEMBLIES

87. General

The rear axle is divided into four subassemblies : hubs with brake drums (refer to ch. 5), drive pinion with carrier, differential with drive gear, and axle housing with related drive and brake parts. The following procedures are based on the assumption that the rear axle assembly (fig. 72) is removed from the vehicle.

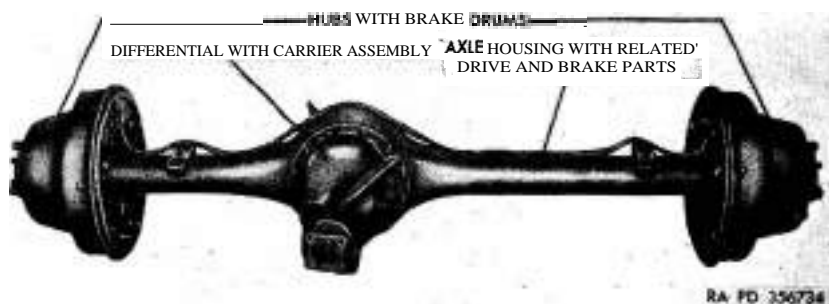


Figure 72. Rear axle.

88. Draining and Cleaning (Field and Depot Maintenance)

a. Draining. Remove drain plug from rear axle housing and drain lubricant.

b. Cleaning. Clean exterior of unit with volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

89. Hubs and Brake Drums (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 74, except where otherwise indicated.

a. Remove Drive Shafts.

- (1) Apply punch marks (fig. 73) on both drive shaft flanges and hub assemblies with a center punch and hammer. The flanges must be installed on hubs in the same position as when removed to prevent possible peeling of the studs.

- (2) Remove ~~3/8-24NF~~ hex nuts (E) and 1/2-inch lock washers (D) from drive shaft flange studs (R) (both sides).
- (3) Remove the two ~~3/8-16NC~~ x 1 puller set screws (C and G) from each drive shaft (A) and remove ~~3/4-16NC~~ hex nuts (B and F). Install screws and pull drive shafts (*fig. 73*) from hubs. Remove both drive shafts.
- (4) Remove both drive shaft flange gaskets (H and K) and hub bearing outer oil seals (J).

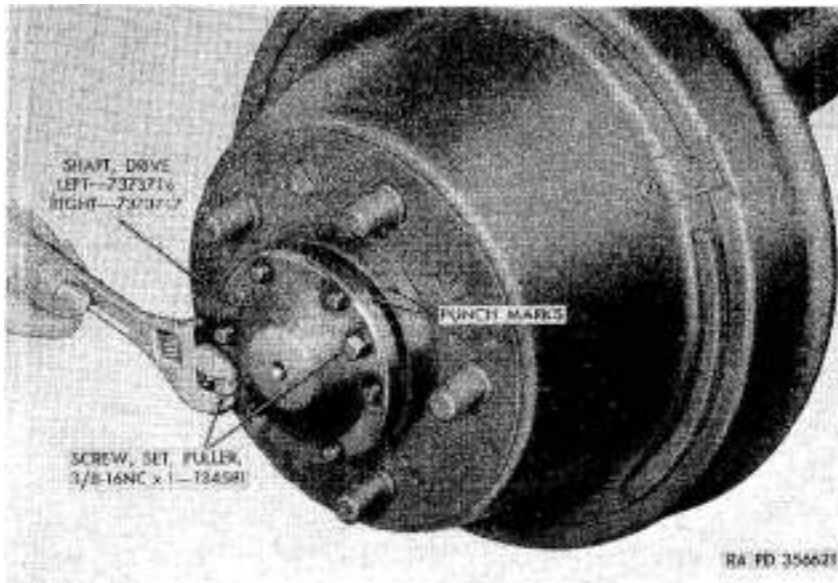


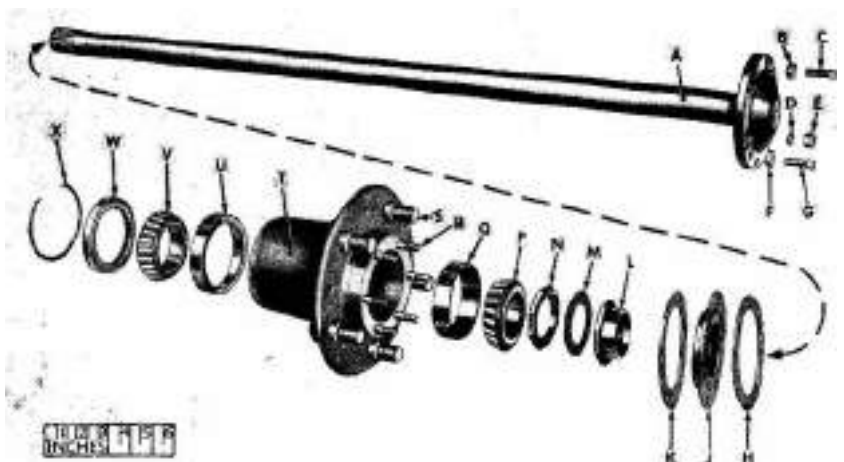
Figure 73. Removing drive shaft.

b. Remove Hubs With Brake Drums.

- (1) Remove outer bearing adjusting nuts (L) with wrench 41-W-1991-17 (*fig. 46*).
- (2) Remove bearing adjusting nut locks (M) with diagonal cutting pliers (*fig. 47*).
- (3) Remove inner bearing adjusting nut assemblies (N) with wrench 41-W-1991-17 (*fig. 46*).
- (4) Remove hub outer bearing cones (P) and hubs with brake drums.

90. Differential With Carrier Assembly (Field and Depot Maintenance)

Remove drive pinion carrier stud nuts and lock washers. Remove differential with carrier assembly and drive pinion carrier gasket from axle housing,



• NUT, HEX, 3/8-16NC-134566

C—SCREW, SET, PULLER, 3/8-16NCx1-134581
O—WASHER, LOCK, 3/8 IN-120382

E HEX, 3/8-24NF-125913

F—NUT, HEX, 3/8-16NC-134566

G—SCREW, SET, PULLER, 3/8-16NCx1-134581

GASKET, DRIVE SHAFT FLANGE-7351041

• OIL, HUB BEARING, OUTER-500125

H—GASKET, DRIVE SHAFT FLANGE-7351041

I—NUT, ADJUSTING, BEARING, OUTER—
CC-9

M—LOCK, BEARING ADJUSTING NUT-
7349223

N—NUT, ADJUSTING, BEARING, INNER,
ASSY-7348977

P—CONE, HUB OUTER BEARING-705277

O—CUP, HUB OUTER BEARING-706751

R—STUD, DRIVE SHAFT FLANGE-7351088

S—STUD, WHEEL-501826

T—HUB, W/O BEARING CUPS—CC-924883

U—CUP, HUB INNER BEARING-706873

V—CONE, HUB INNER BEARING-705472

W—SEAL, OIL, HUB BEARING-500174

X—RING, SNAP, BEARING OIL SEAL-7348984

RA PD 356795

Figure 74. Hub and drive shaft—exploded view.

91. Differential With Drive Gear (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 88, except where otherwise indicated.

a. Remove Companion Flange and Drive Pinion Bearing Oil Seal.

- (1) Place differential with carrier assembly in a suitable stand to facilitate disassembly.
- (2) Remove $1/8 \times 1 \frac{5}{8}$ cotter pin (A) from companion flange nut (B).
- (3) Hold companion flange (C) with wrench 41-W-3277-40 (fig. 75) and loosen nut.
- (4) Remove companion flange with puller (fig. 76).

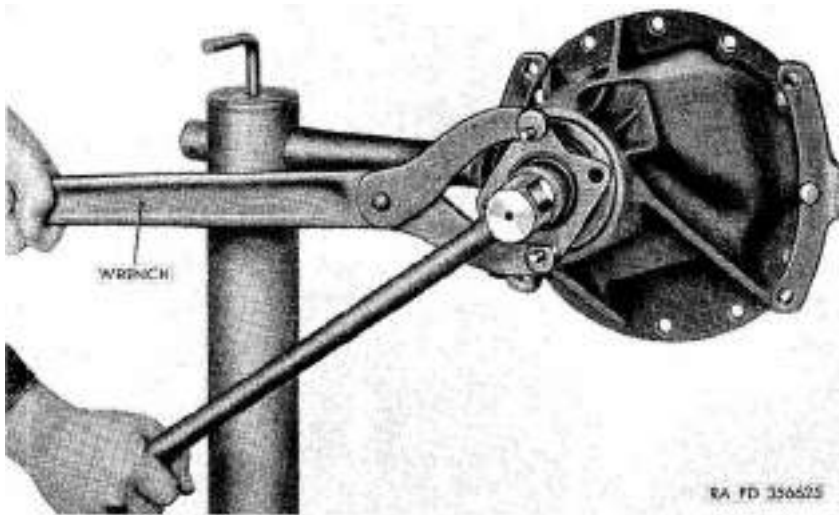


Figure 75. Holding companion flange with wrench 41-W-3277-40.

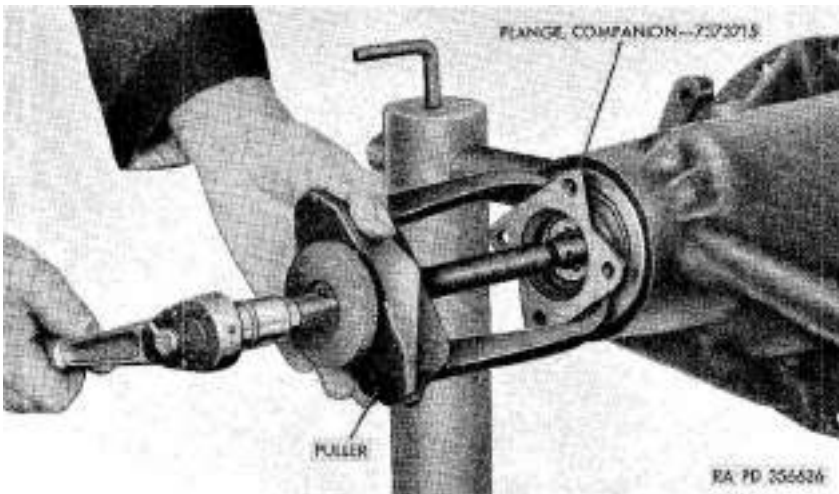


Figure 76. Removing companion flange with universal type gear puller.

- (5) Remove drive pinion bearing oil seal (D) with remover 41-R-2372-215 (fig. 77).

Note. The oil seal must be removed as the initial operation so that the drive pinion can provide a support for the oil seal remover screw.

- (6) Remove drive pinion front bearing washer (F).

b. Remove Differential With Drive Gear.

- (1) Apply locating punch marks (fig. 78) on drive pinion carrier assembly, differential bearing caps (Q and AE),

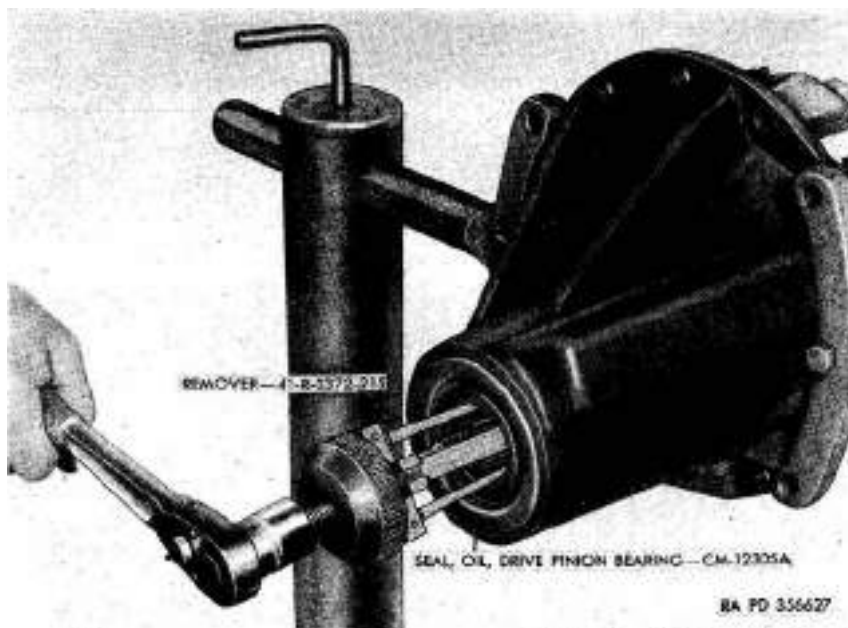


Figure 77. Removing drive pinion bearing oil seal.

and differential bearing adjusting nuts (N and AF) with a center punch and hammer. The differential bearing caps and adjusting nuts must be assembled in their original location.

- (2) Remove $\frac{5}{8}$ -18NF nuts (AB) and $\frac{5}{8}$ -inch lock washers (AD) from the differential bearing cap studs (AJ) .
- (3) Remove 5/16-18NC x $\frac{5}{8}$ lock washer screws (T and ZZ) and differential bearing adjusting nut locks (S and AC) ; then loosen differential bearing adjusting nuts (N and AF) with wrench 41-W-3724-130 (*fig. 79*). Remove adjusting nuts and differential bearing caps (Q and AE) from drive pinion carrier assembly (K) .
- (4) Remove differential with drive gear assembly and differential bearing cups (EE and QQ) from drive pinion carrier.

Section III. REBUILD OF DRIVE PINION WITH CARRIER

92. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 88, except where otherwise indicated.

- a. *General.* The drive pinion bearing cups can be inspected in

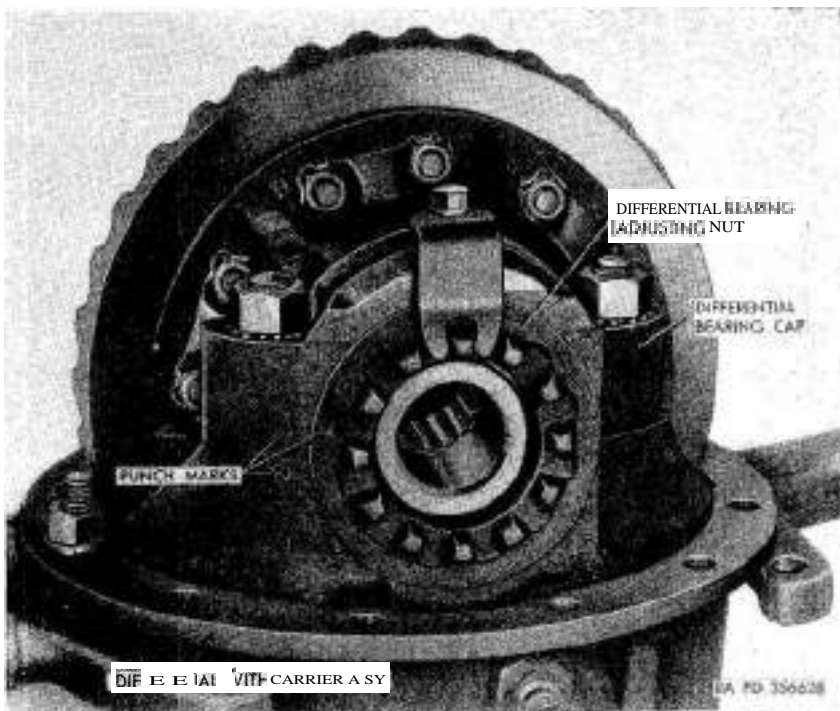


Figure 78. Locating punch marks on differential with carrier assembly.

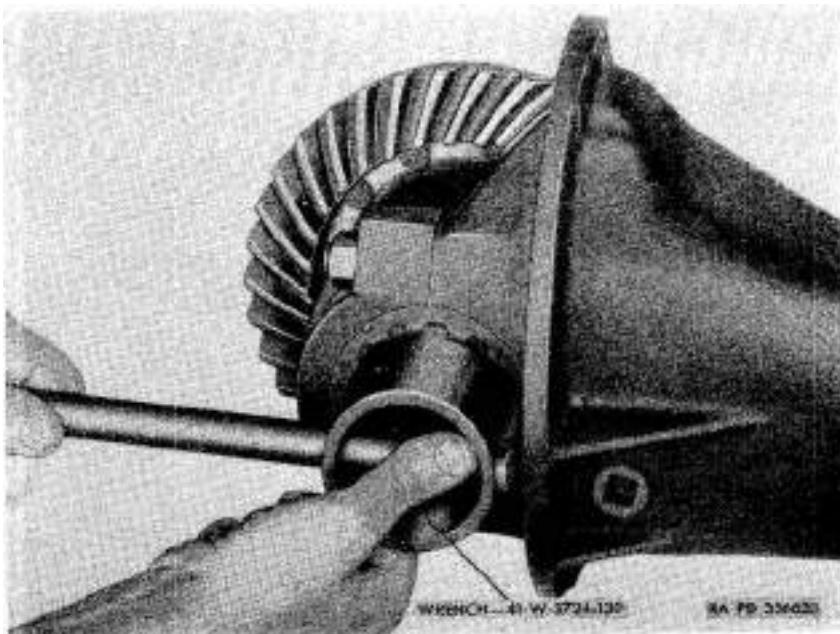


Figure 79. Turning differential bearing adjusting nut.

the drive pinion carrier and should not be removed unless inspection (par. 93) reveals replacement is necessary.

b. Remove Parts From Drive Pinion Carrier.

- (1) Remove drive gear thrust screw pad (P).
- (2) Remove drive pinion (XX) and drive pinion front and rear bearing cones (R and YY) from carrier as an assembly.
- (3) Position carrier in stand (oil seal end up) and remove 5/16-18NC x $\frac{3}{4}$ set screw (J) , which is provided as a lock for the drive pinion front bearing cup retaining nut (E).
- (4) Remove drive pinion front bearing cup retaining nut with wrench 41-W-3724-130 (*fig. 80*) and drive pinion front bearing outer cone (G).
- (5) Remove drive pinion front and rear bearing cups (H and V) from carrier with a brass drift and hammer. Openings are provided in the carrier casting for the brass drift.
- (6) Break weld at drive gear thrust screw check nut (AG) with a sharp chisel. Remove drive gear thrust screw (AH) and nut.

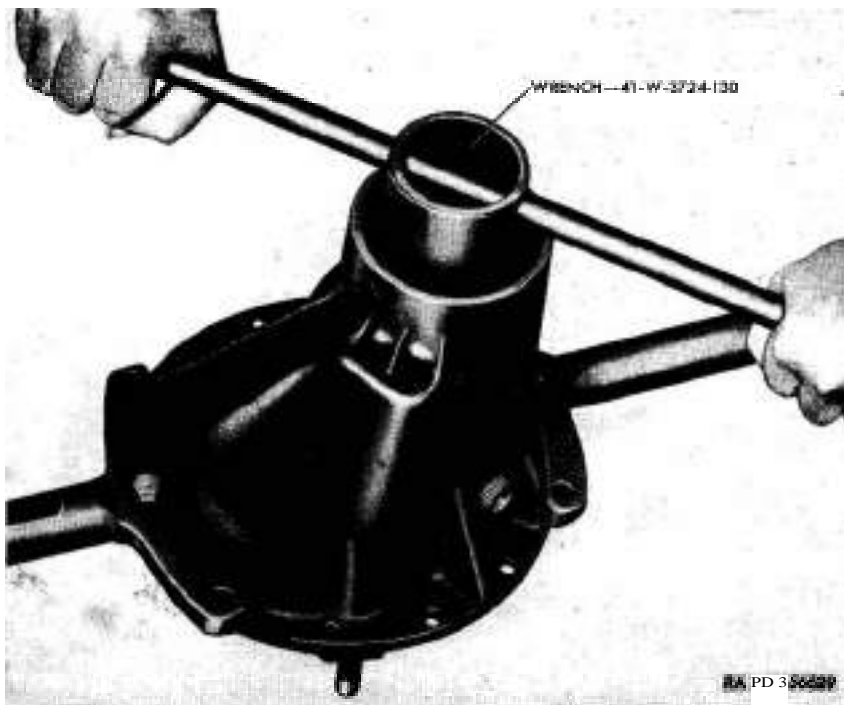


Figure 80. Removing drive pinion front bearing cup retaining nut.

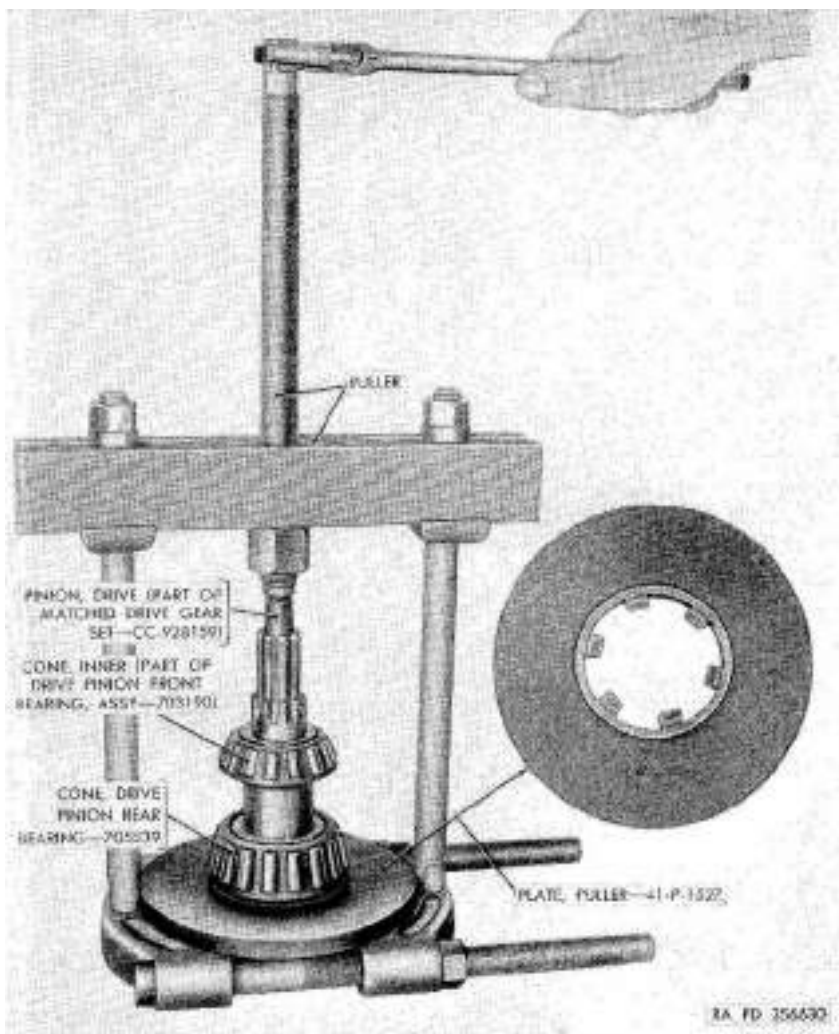


Figure 81. Removing drive pinion bearing cones with puller and puller plate 41-P-1527.

c. *Disassemble Drive Pinion.* Remove drive pinion rear bearing cone (YY) , drive pinion bearing spacer (U) , and drive pinion front bearing inner cone (R) with puller and puller plate 41—P-1527 (fig. 81).

d. *Clean Parts.* Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearing cones, with dry compressed air.

Caution: Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

93. Inspection (Depot Maintenance)

a. *Inspect Drive Pinion Carrier Assembly.* Inspect drive pinion carrier (K) for damaged bearing cup bores, cracks, damaged machined surfaces, damaged differential bearing cap studs (AJ), and damaged carrier and bearing cap threads. The studs are replaceable but if the carrier or bearing caps are found unsatisfactory, the drive pinion carrier assembly must be replaced.

b. *Inspect Companion Flange.* Inspect oil seal contact surface of companion flange (C) for scores, corrosion, and wear. Clean or replace companion flange as required. Measure diameter of companion flange at oil seal contact surface. If dimension is less than wear limit specified in paragraph 343, replace flange.

c. *Inspect Drive Gear Thrust Screw Pad.* Inspect surface of drive gear thrust screw pad (P) and if scored or worn, replace pad.

d. *Inspect Drive Pinion.* Inspect drive pinion (XX) for worn, scored, chipped, or cracked teeth. If any of these conditions are evident, install new matched drive gear set.

e. *Inspect Drive Pinion Rear Bearing Cup and Cone.* Inspect drive pinion rear bearing cup (V) and drive pinion rear bearing cone (YY) for wear, cracks, chips, or scores. If replacement is necessary, install new cup and cone (pars. 92 and 94).

f. *Inspect Drive Pinion Front Bearing Assembly.* Inspect drive pinion front bearing cup (H) and drive pinion front bearing cones (G and R) for wear, cracks, chips, or scores. If replacement is necessary, install new bearing assembly.

Note. This bearing is serviced only as an assembly, which includes the cup and two cones.

94. Assembly (Depot Maintenance)

~~Note.~~ The key letters noted in parentheses are in figure 88, except where otherwise indicated.

a. *General.* Definite preloads are specified for the drive pinion bearings to prevent the possibility of drive pinion end play. These preloads are specified in pound-inches torque and can be measured by rotating the drive pinion shaft with a torque indicating wrench and socket on the companion flange nut.

b. *Install Drive Pinion Front and Rear Bearing Cups.* If inspection of drive pinion front and rear bearing cups (H and V) (par. 93) reveals that replacement is necessary, install them in the drive pinion carrier assembly (K) with an arbor press. Make certain cups are firmly seated against counterbore shoulders.

Note. If a letter "Y" is etched on the narrow edge of the front bearing cup (fig. 83), the cup must be installed with the letter "Y" toward the front of the carrier (oil seal end).

e. Install Drive Pinion Front Bearing Cup Retaining Nut.

- (1) Place drive pinion carrier assembly in a suitable stand with oil seal end up.
- (2) Place drive pinion front bearing outer cone (G) in drive pinion front bearing cup (H).

Note. A letter "Y" is etched on the face of the outer cone (fig. 83) and this cone must be placed in the oil seal end of the drive pinion carrier.

- (3) Install drive pinion front bearing cup retaining nut (E) and tighten nut with wrench 41-W-3724-130 (fig. 80).
- (4) Install 5/16-18NC x $\frac{3}{8}$ set screw (J) in oil seal end of drive pinion carrier to prevent loosening of the retaining nut.

d. Install Drive Pinion Rear Bearing Cone. Install drive pinion rear bearing cone (YY) on drive pinion (XX) with an arbor press. Make certain the cone is firmly seated against pinion.

Caution: If the rear bearing cone is going to be installed on a new drive pinion, check the numbers etched on the smooth face of the drive gear and stamped on the gear end of the drive pinion (fig. 82). These numbers are identical on the drive gear and drive pinion of each matched drive gear set. Do not use the drive gear and pinion if numbers are different.

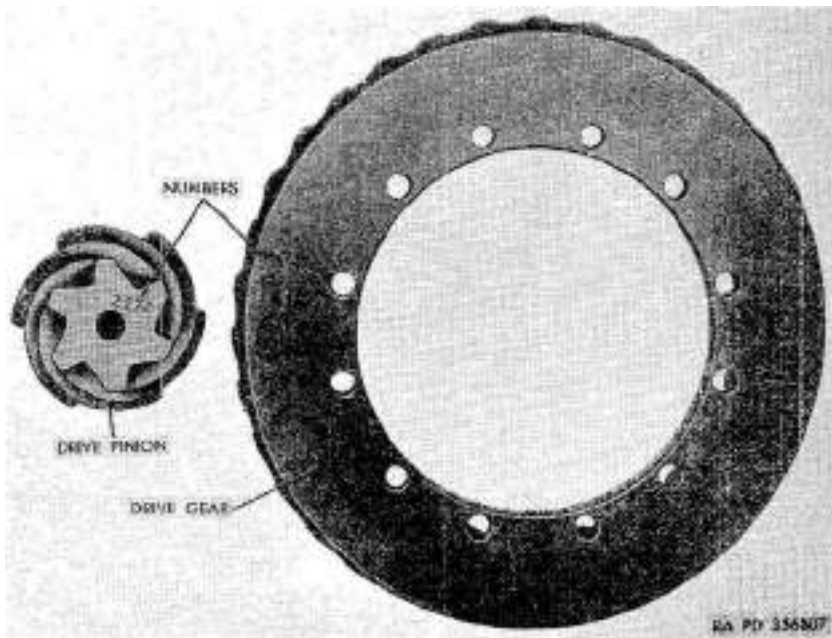


Figure 82. Location of numbers on matched drive gear set.

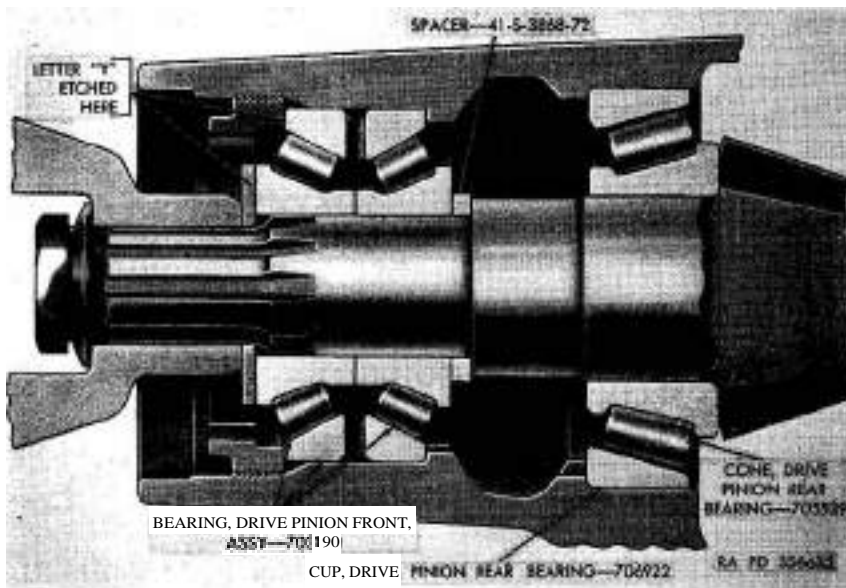


Figure 83. Location of spacer for checking drive pinion front bearing assembly.

e. Check of Drive Pinion Front Bearing Assembly.

- (1) This check applies only to a front bearing assembly that has been in service. Do not apply this check to a new bearing assembly as the correct preload is built into the bearing assembly by the manufacturer and must not be changed.

Note. Lack of preload in a front bearing assembly that has been in service is not an indication that a replacement of the bearing is necessary. If a front bearing assembly (fig. 83) that has been in service is in good condition, no perceptible end play is evident, and the bearing cup and two cones are clean and dry (no lubricant) when assembled in the carrier housing, the bearing is satisfactory.

- (2) Place spacer 41-S-3868-72 (fig. 83) and drive pinion front bearing inner cone on drive pinion.

Note. Spacer 41-S-3868-72 (fig. 83) is thicker than the service drive pinion bearing spacers and prevents drive pinion rear bearing cone rollers from contacting drive pinion rear bearing cup when the front bearing assembly is checked.

- (3) Install drive pinion and bearings in drive pinion carrier. Place drive pinion front bearing washer, companion flange, and companion flange nut on drive pinion.
- (4) Hold companion flange and tighten companion flange nut with a torque indicating wrench to 300 pound-feet torque. Rotate drive pinion several revolutions until bearings roll

- (5) Remove drive pinion from carrier. Remove front bearing inner cone and spacer 41-S-3868-72 (*fig. 83*) from drive pinion.

- (1) Install front bearing inner cone followed by original drive pinion bearing spacer (*fig. 84*) on drive pinion.

Lubricate bearings with universal gear lubricant (GO) , install drive pinion in drive pinion carrier, and place drive pinion front bearing washer, companion flange, and companion flange nut on drive pinion.

- (2) Hold companion flange and tighten nut with a torque indicating wrench to 300 pound-feet torque.
- (3) Rotate drive pinion several revolutions until the bearings roll smoothly and check the preload of the bearings (drive pinion in motion) with a torque indicating wrench (fig. 85).

Refer to paragraph 343 for correct preload specifications. Install a thinner bearing spacer if preload is insufficient and a thicker bearing spacer if preload is greater than the specified limits. A selection of eight drive pinion bearing spacers (U) is available.

- (4) If a different bearing spacer is required to obtain a correct preload of the rear bearing and front bearing outer cone, repeat operations (1), (2), and (3) above.
- (5) Remove drive pinion from carrier. Remove spacer and inner bearing cone from drive pinion. Place selected bearing spacer (*fig. 86*) on drive pinion followed by inner bearing cone. Set parts aside for final assembly.

- (1) Prepare new drive pinion bearing oil seal (D) as described in paragraph 76c. Place drive pinion front bearing washer (F) on drive pinion front bearing outer cone (G). Coat outer surface of oil seal with plastic-type gasket cement and position oil seal in drive pinion carrier

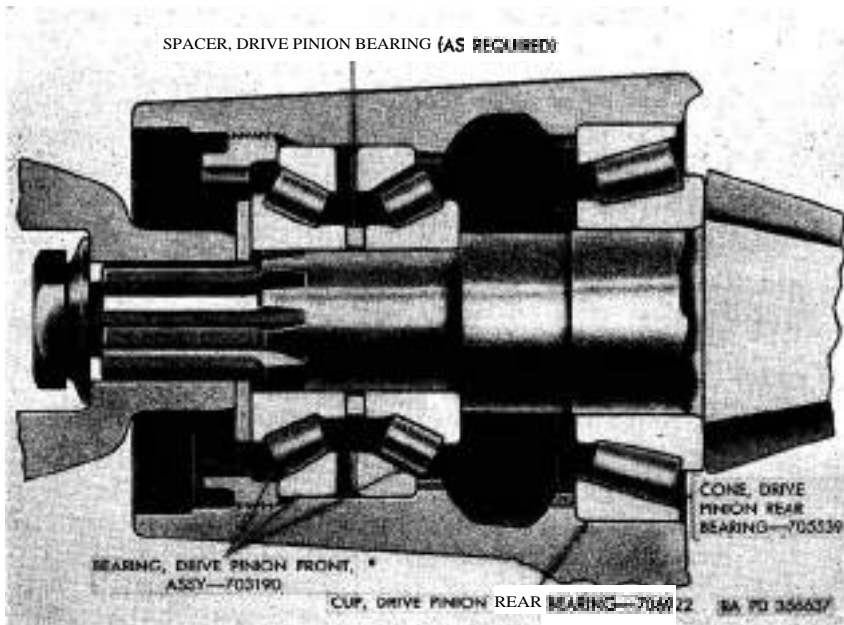


Figure 84. Location of drive pinion bearing spacer for checking preload of rear bearing and front bearing outer cone.

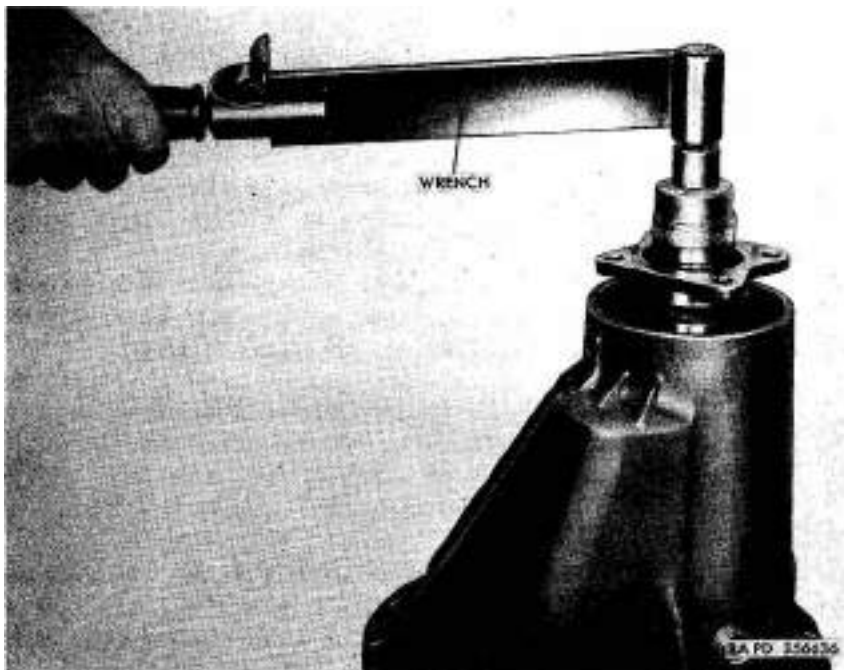


Figure 85. Checking drive pinion bearing preload with torque indicating wrench.

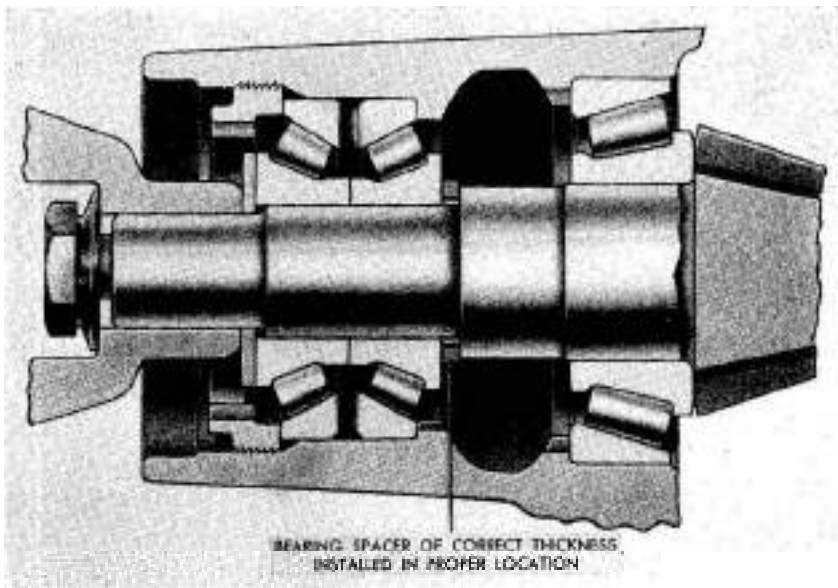


Figure 86. Location of drive pinion bearing spacers for final assembly.

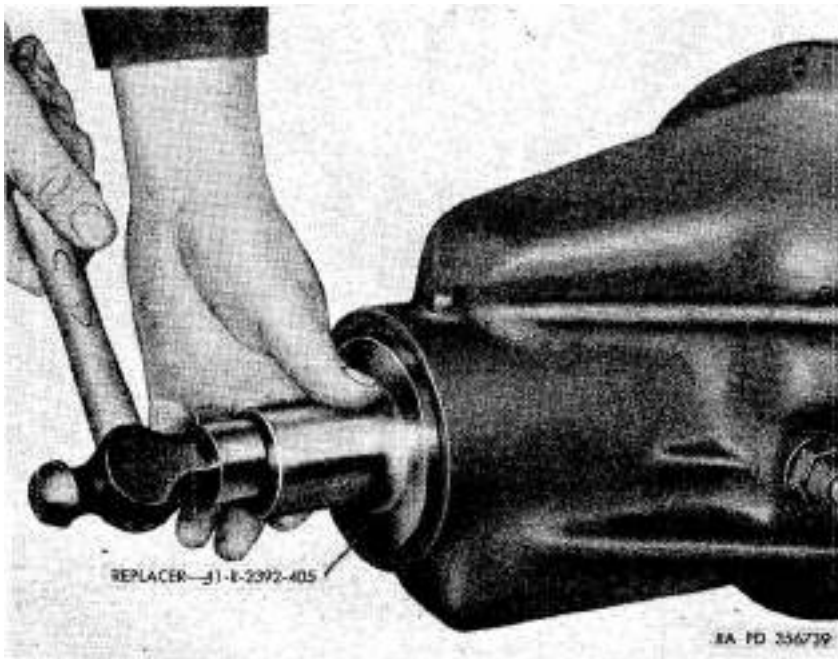


Figure 87. Installing drive pinion bearing oil seal.

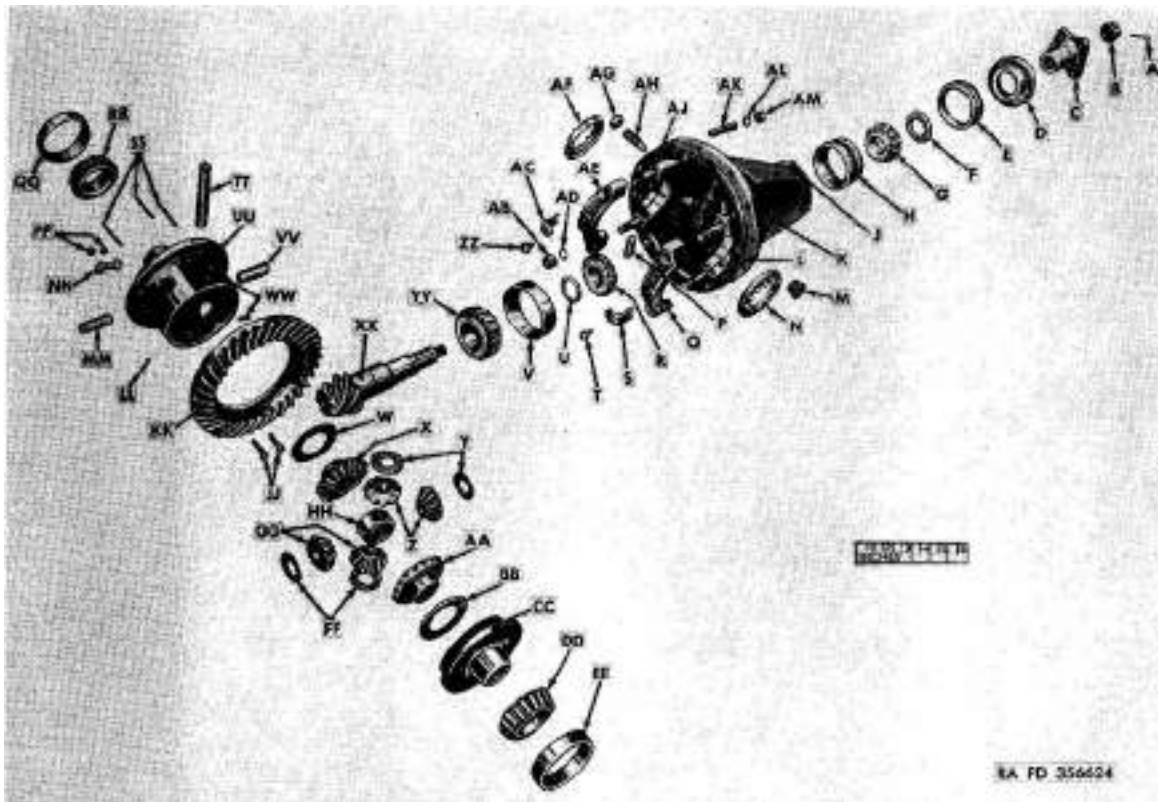


Figure 88. Differential with carrier assembly—exploded view.

A—Pin, cotter, $\frac{1}{8}$ x 1% — 119209
 B—Nut, companion flange -- CC-926228
 C—Flange, companion — 7373715
 D—Seal, oil, drive pinion bearing — CM-12305A
 E—Nut, retaining, drive pinion front bearing cup CC-587557
 F—Washer, drive pinion front bearing — 7351141
 G—Cone, outer (part of drive pinion front bearing assy — 703190)
 H—Cup (part of drive pinion front bearing assy — 703190)
 J—Screw, set, 5/16-18NC x $\frac{3}{4}$ 102883
 K—Carrier, drive pinion, assy — CC-926239
 L—Gasket, drive pinion carrier — CC-929877
 M—Plug, pipe, $\frac{1}{4}$ inch — 7374954
 N—Nut, adjusting, differential bearing — CC-926246
 P—Pad, drive gear thrust screw 7351149
 Q—Cap, differential bearing (part of drive pinion carrier assy — CC-926239)
~~R—Cone, inner (part of drive pinion front bearing assy — 703190)~~
 S—Lock, differential bearing adjusting nut — 7349071
 T—Screw, lock washer, 5/16-18NC x $\frac{5}{8}$ — 187527
 U—Spacer, drive pinion bearing
 0.1790 inch thick — 7351150
 0.1810 inch thick 7351147
 0.1830 inch thick 7351148
 0.1850 inch thick — 7351146
 0.1870 inch thick — 7351145
 0.1890 inch thick — 7351144
 0.1910 inch thick --- 7351143
 0.1930 inch thick — 7351142
 V—Cup, drive pinion rear bearing — 706922
 W—Washer, thrust, differential gear CC-922422
 X—Gear, differential — CC-922434
 Y—Washer, thrust, differential pinion — CC-855098
 Z—Pinion, differential — CC-855097
 AA—Gear, differential — CC-922434
 BB—Washer, thrust, differential gear CC-922422
 CC—Cap, differential case (part of differential case assy — 7342845)
 DD—Cone, differential bearing — 705776
 EE—Cup, differential bearing — 706880
 FF—Washer, thrust, differential pinion CC-855098
 GG—Pinion, differential — CC-855097
 HH—Block, differential pinion shaft CC-927840
 JJ—Bolt, drive gear — 7351309
 KK—Gear, drive (part of matched drive gear set CC-928159)
 LL—Pin, taper groove, $\frac{1}{4}$ x 1 $\frac{1}{8}$ — 144563
 MM—Shaft, differential pinion, short CC-927839
 NN—Lock, drive gear bolt - - 7349072
 PP—Nut, drive gear bolt -- CC-1137241
 QQ—Cup, differential bearing — 706880
~~RR—Cone, differential bearing — 705776~~
~~SS—Pin, dowel, 14 x 21 $\frac{1}{2}$ — 141211~~
 TT—Shaft, differential pinion, long CC-855099
 UU—Case, differential (part of differential case assy — 7342845)

Figure 88. Differential with carrier assembly—exploded view—Continued on following page.

VV—Shaft, differential pinion, short — CC-927831
 WW—Pin, taper groove, $\frac{1}{4}$ x 1" — 144563
 XX—Pinion, drive (part of matched drive gear set — CC-928159)
 YY—Cone, drive pinion rear bearing — 705539
 ZZ—Screw, lock washer, 5/16-18NC x $\frac{5}{8}$ — 187527
 AB—Nut, $\frac{1}{2}$ -18NF — 121358
 AC—Lock, differential bearing adjusting nut — 7349071
 AD—Washer, lock, $\frac{1}{2}$ -inch — 138502
 AE—Cap, differential bearing (part of drive pinion carrier assy — CC-926239)
 AF—Nut, adjusting, differential bearing — CC-926246
 AG—Nut, check, drive gear thrust screw — 7372624
 AH—Screw, thrust, drive gear — 7372623
 AJ—Stud, differential bearing cap — CC-928288
 AK—Stud, drive pinion carrier — CC-929855
 AL—Washer, lock, 7/16-inch — 120383
 AM—Nut, drive pinion carrier stud — 7378194

Figure 88. Differential with carrier assembly—exploded view—Continued.

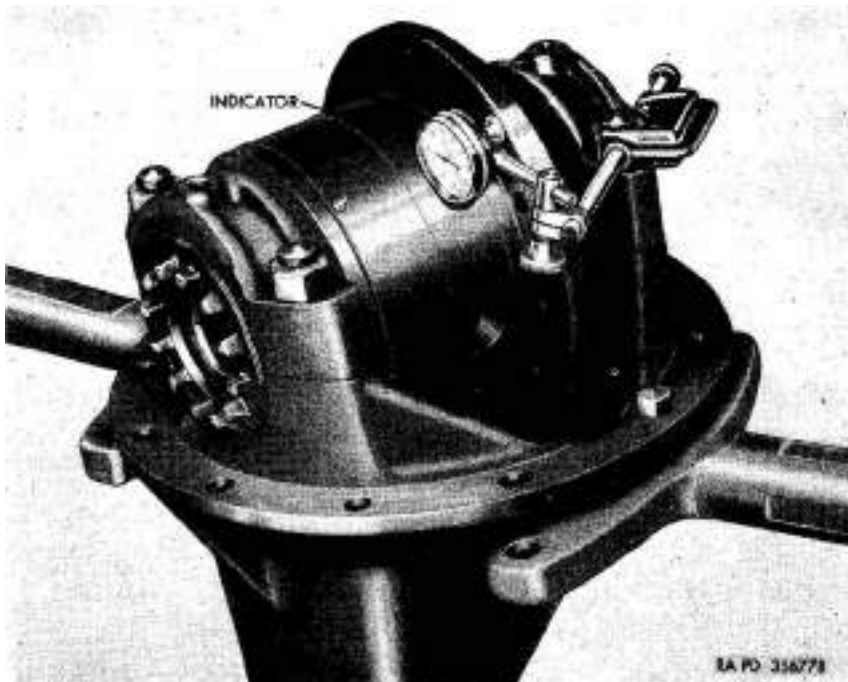


Figure 89. Checking differential case flange run-out with dial indicator.

assembly so that lip of seal is toward front bearing outer cone. Drive oil seal squarely into carrier with replacer 41—R--2392-405 (fig. 87) until seal bottoms in carrier counterbore.

- (2) Install drive pinion with bearing cones in carrier and place companion flange (C) and companion flange nut (B) on drive pinion. Tighten companion flange nut to 300 pound-feet torque (min.) and install new $\frac{1}{8} \times 1\frac{5}{8}$ cotter pin (A) .

h. Install Drive Gear Thrust Screw. Place drive gear thrust screw check nut (AG) on drive gear thrust screw (AR). Install screw in drive pinion carrier assembly, but do not tighten nut. Place drive gear thrust screw pad (P) on inner end of screw.

Section IV. REBUILD OF DIFFERENTIAL WITH DRIVE GEAR ASSEMBLY

95. Disassembly (Depot Maintenance)

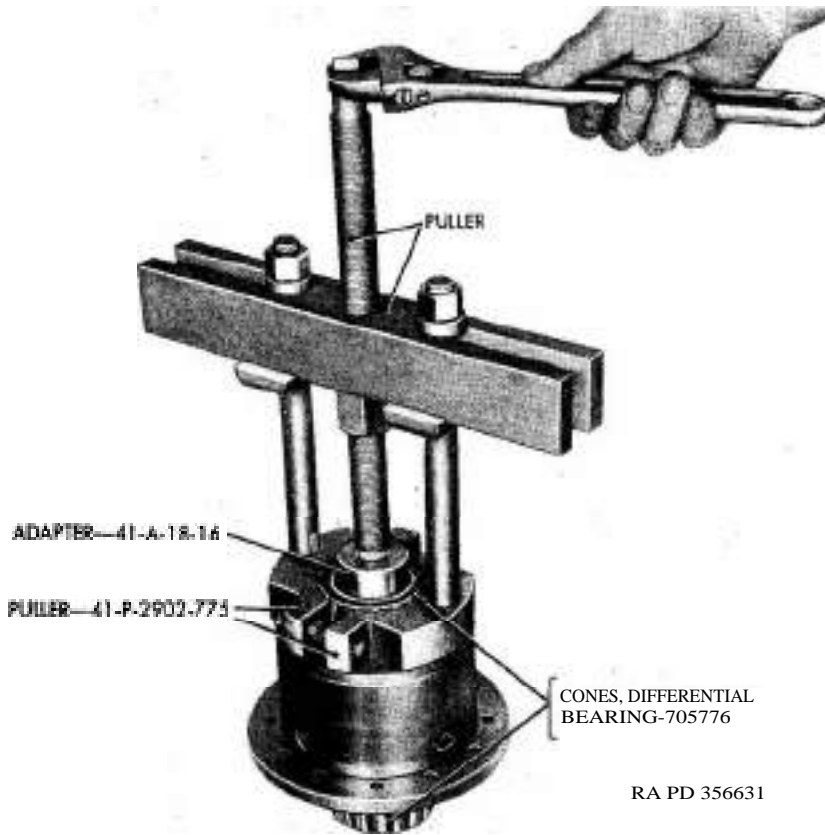
Note. The key letters noted in parentheses are in figure 88, except where otherwise indicated.

a. Remove Drive Gear From Differential Case Assembly. Remove drive gear bolt nuts (PP), drive gear bolt locks (NN), and drive gear bolts (JJ). Remove drive gear (KK) from differential case (UU).

b. Check Differential Case Flange.

Note. The differential case flange must be checked for run-out (fig. 89) with the differential case assembly mounted on the drive pinion carrier assembly to obtain an accurate check.

- (1) Assemble differential case, differential bearing cups (EE and QQ), differential bearing adjusting nuts (N and AF), and differential bearing caps (Q and AE) on carrier in accordance with locating punch marks (*fig. 78*). Install ~~$\frac{3}{8}$ -inch~~ lock washers (AD) and ~~$\frac{3}{8}$ -inch~~ nuts (AB) on differential bearing cap studs (AJ), but do not tighten nuts.
- (2) Turn bearing adjusting nuts in until differential bearings are firmly seated. Tighten nuts on bearing cap studs.
- (3) Mount a dial indicator (*fig. 89*) on the drive pinion carrier to check run-out of machined face of differential case flange. Indicator plunger must contact machined face of flange above drive gear bolt holes. Rotate differential case a complete revolution and check run-out of flange. If run-out exceeds 0.005 inch, it will be necessary to replace the differential case assembly.



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Figure 90. Removing differential bearing cones.

c. *Remove Differential Bearing Cones.* Remove the two differential bearing cones (DD and RR) from the differential case assembly with puller 41—P-2902-775, adapter 41—A-18-16, and universal puller (fig. 90).

d. *Remove Taper Groove Pins From Differential Case Assembly.* Clamp differential case flange between copper jaws of a vise and remove $\frac{1}{4} \times 1\frac{1}{2}$ taper groove pins (LL and WW) from differential case. This is accomplished as follows :

- (1) Drive the pins below surface of differential case to facilitate center punching and drilling.
- (2) Accurately center punch each taper groove pin (fig. 91) and drill pins with a No. 1 (0.228-inch) drill. Remove shell of pins from case with a punch.

e. *Remove Differential Case Cap From Differential Case Assembly.*

Note. The differential case cap (CC) is an interference fit in the differential case (UU) and requires a special procedure to facilitate disassembly.

- (1) Place a blunt drift and hammer on the bench in a convenient position.
- (2) Place wrench 41—W--3724-100 (*fig. 5*) and handle on bench in a convenient position.
- (3) Heat differential case immediately below cap with an acetylene torch flame, moving the flame around the case until the metal becomes just hot enough to cause solder to flow as it is rubbed over the heated surface of the case. This expands the case, permitting removal of the cap without damage to the differential case or cap.
- (4) When case is properly heated, loosen cap with blunt drift and hammer and quickly remove cap with wrench 41—W-3724-100 (*fig. 91*) . Immerse all parts in oil to cool for subsequent handling.

f. Remove Parts From Differential Case.

- (1) Remove differential case from vise and place it over the open jaws of vise, cap end up.
- (2) Remove differential gear (AA) and differential gear thrust washer (BB).
- (3) Drive dowel pins (SS) from differential case with a 3/16-inch drift punch and hammer (*fig. 91*).
- (4) Drive long differential pinion shaft (TT) , at plain end, from differential case with a brass drift and hammer. Remove the two differential pinions (Z and GG) and differential pinion thrust washers (Y and FF) from case.
- (5) Drive one of the short differential pinion shafts (MM) into the case and through the differential pinion shaft block (HD) until differential pinion (~~GG~~) and differential pinion thrust washer (FF) can be removed. Continue to drive the short shaft through the block, forcing the opposite differential pinion short shaft (VV) from case. Remove the other differential pinion (Z), other differential pinion thrust washer (Y), block, and shaft. Remove other short shaft from case.
- (6) Remove differential gear (X) and differential gear thrust washer (W) from case.

g. Clean Parts. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearing cones, with dry compressed air.

Caution : Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

96. Inspection (Depot Maintenance)

- a. *General.* It is not necessary to inspect the differential gear

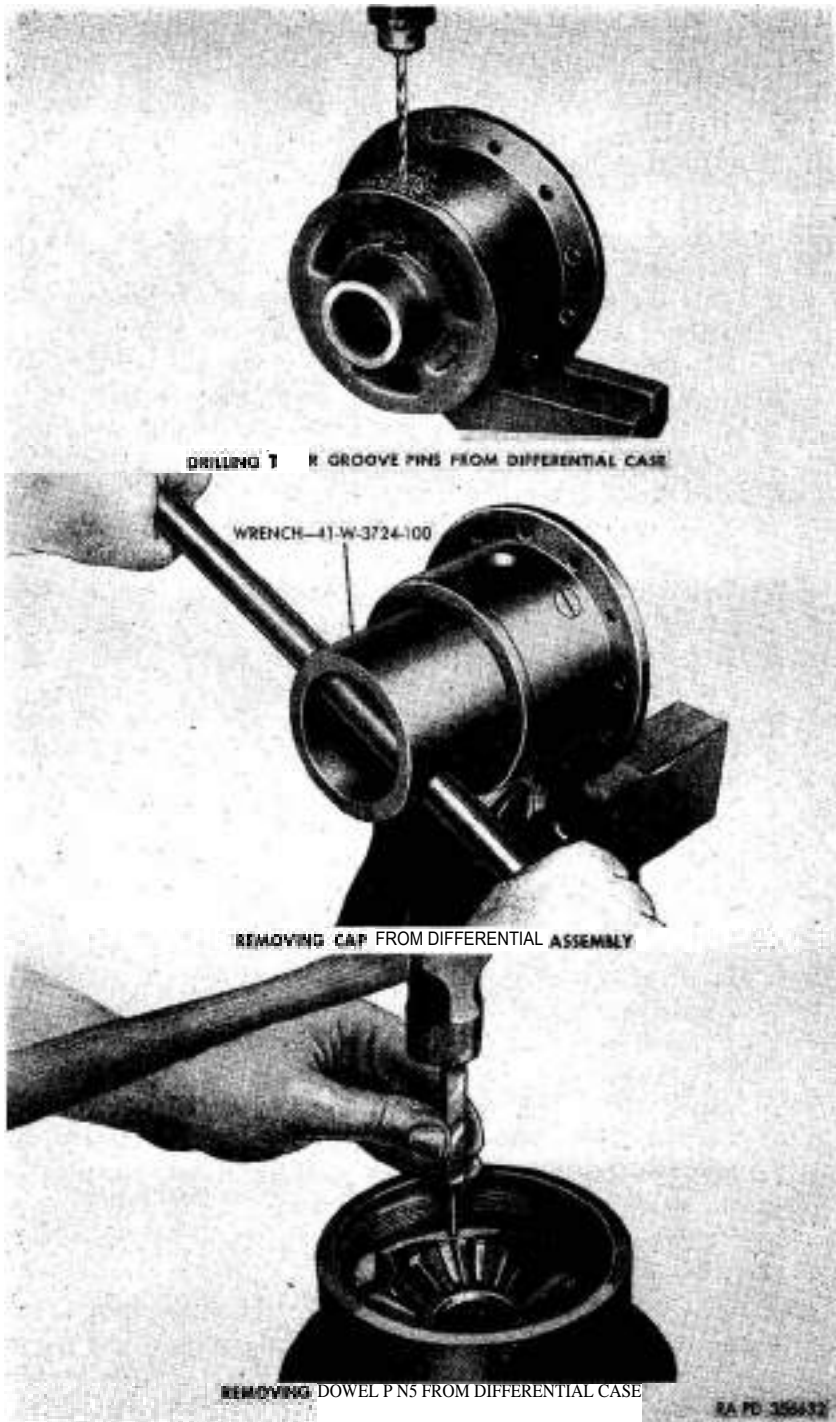


Figure 91. Disassembly of differential case.

thrust washers and differential pinion thrust washers, as these items must be replaced with new parts whenever a differential case is serviced.

b. Inspect Differential Bearing Cones and Differential Bearing Cups. Inspect differential bearing cones (DD and RR) and differential bearing cups (EE and QQ) for wear, cracks, chips, or scores. If replacement is necessary, always install new cones and cups as an assembly.

c. Inspect Gears. Inspect drive gear (KK), differential gears (X and AA), and differential pinions (Z and GG). If gear teeth are worn, scored, chipped, or cracked, replace as required. If drive gear requires replacement, install new matched drive gear set.

d. Inspect Differential Pinion Shafts. Check the differential pinion long and short shafts (MM, TT, and VV) and differential pinion shaft holes in differential case for wear. Measure shafts at point of differential pinion contact. If the measurement is less than the wear limit indicated in paragraph 343, replace shafts. Measure holes in case for wear. If the measurement is more than the limits indicated in paragraph 343, replace differential case.

e. Inspect Differential Case and Differential Case Cap. Inspect differential case (UU) and differential case cap (CC) for scored bearing surfaces, damaged threads, and cracks. If any of these conditions exist, install new differential case assembly. Inspect machined surface of case, where drive gear is mounted, for burs or damage. If burs cannot be corrected by honing, replace case.

Caution: Do not file or machine case as it will affect the accurate mounting of the drive gear.

97. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 88, except where otherwise indicated.

a. Assemble Parts in Differential Case.

- (1) Lubricate all parts with universal gear lubricant (GO) before assembly.
- (2) Install new differential gear thrust washer (W) and differential gear (X) in differential case (UU).
- (3) Place two differential pinions (Z and GG) and new differential pinion thrust washers (Y and FF) in case. Place differential pinion shaft block (HH), with large hole in line with differential pinions, on differential gear in case.

Note. Four holes are provided in the block for the differential pinion shafts. The block must be positioned so that the long differential pinion shaft is installed through the large holes. Smaller diameter holes are provided for the two short differential pinion shafts as they are a snug fit in the block.

- (4) Place long differential pinion shaft (TT) in case and aline dowel pin hole with hole in case. Drive shaft through case, thrust washers, differential pinions, and block until pin holes are in proper alinement. Drive $1/4 \times 2\frac{1}{4}$ dowel pin (SS) in differential case and through shaft with 3/16-inch drift punch and hammer. Peen metal of case over dowel pin.
- (5) Place the other two differential pinions (Z and GG) and differential pinion thrust washers (Y and FF) in case and aline them with the differential pinion shaft holes. Place ends of differential pinion short shafts (MM and VV) in case (slotted ends out) and aline the shafts with dowel pin holes in differential case. Drive shafts through case, thrust washers, and pinions into block until dowel pin holes in shafts and case are properly alined. Install other two $2\frac{1}{2}$ dowel pins (SS) with a 3/16-inch drift punch and hammer. Peen differential case metal over dowel pins.

b. Install Differential Case Cap.

- (1) Clamp the differential case flange between copper jaws of a vise.
- (2) Dip threaded portion of differential case cap (CC) in universal gear lubricant (GO) and place a new differential gear thrust washer (BB) and differential gear (AA) in cap.
- (3) Place a blunt drift and hammer on the bench in a convenient position.
- (4) Place wrench 41—W-3724-100 (*fig. 5*) and handle on the bench in a convenient position.
- (5) Heat the threaded end of the differential case (**UU**) with an acetylene torch flame (par. 95e (3)).
- (6) Screw cap in differential case with wrench 41—W-3724-100 (*fig. 91*) and finish tightening cap with blunt drift and hammer.
- (7) Drill three holes, evenly spaced, through the differential case, near the cap flange and into the closed or heavy sections of the cap with a "C" (0.242-inch) drill (*fig. 91*). Drive in three new $1/4 \times 11/8$ taper groove pins (LL and WW) $1/16$ inch below surface of case. Peen metal of case over $1/4 \times 11/8$ taper groove pins (*fig. 92*).

c. Install Drive Gear on Differential Case Assembly.

- (1) Inspect drive gear (KK) and flange of differential case for foreign particles or dirt, as the surfaces must be absolutely clean to insure proper alinement of the drive gear. Position drive gear on case and aline bolt holes.

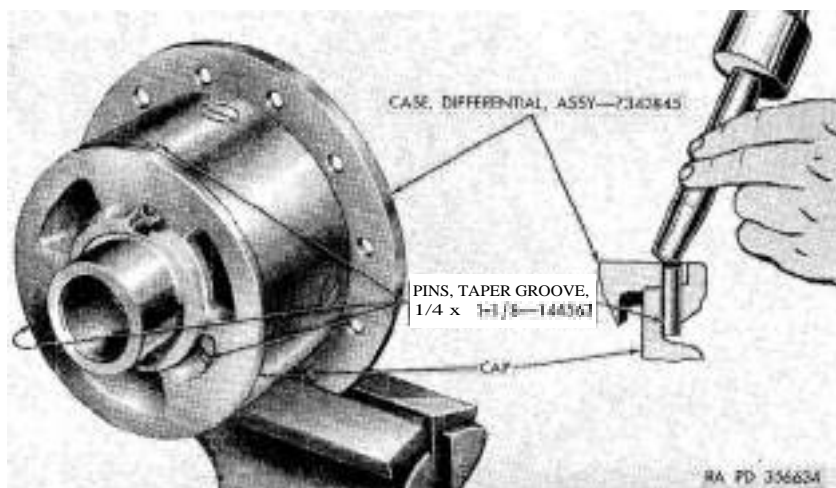


Figure 92. Peening of pins in differential case.

- (2) Install drive gear bolts (JJ), drive gear bolt locks (NN), and drive gear bolt nuts (PP).
- (3) Tighten nuts to 35 to 40 pound-feet torque.
- (4) Bend drive gear bolt locks (NN) over nuts.

d. Install Differential Bearing Cones. Install differential bearing cones (DD and RR) on differential case with an arbor press.

Note. Bearings and case must be absolutely clean to insure proper seating of cones against case shoulders.

e. Install Differential With Drive Gear in Drive Pinion Carrier Assembly.

- (1) Turn out drive gear thrust screw (All) and position drive gear thrust screw pad (P) on screw so that curvature coincides with drive gear.
- (2) Install 5/16-18NC x 5/8 lock washer screws (T and ZZ) on differential bearing caps (Q and AE) to provide a smooth checking surface for the spread gage 41-G-17-800 (fig. 5).
- (3) Lubricate differential bearing cones (DD and RR) with universal gear lubricant (GO) and place differential bearing cups (EE and QQ) on bearing cones. Place differential with drive gear assembly and bearings in drive pinion carrier (K). Make certain thrust screw pad is not disturbed on screw. Check locating punch marks (fig. 78) on drive pinion carrier bearing supports, differential bearing adjusting nuts, and differential bearing caps. Install differential bearing adjusting nuts (N and AF) and bearing caps.

Caution : Care must be exercised to make certain differential bearing adjusting nuts are properly engaged with the threads in the carrier and caps. If parting faces of bearing caps do not contact drive pinion carrier when held in place by hand, threads are not properly engaged. Serious damage will occur to the threads if differential bearing caps are forced down by the nuts on the differential bearing cap studs when bearing adjusting nuts are not properly positioned.

- (4) Install $\frac{5}{8}$ -inch lock washers (AD) and $\frac{5}{8}$ -18NF nuts (AB) on differential bearing cap studs (AJ), but do not tighten nuts.

f. Adjust Drive Gear Backlash and Preload of Differential Bearings.

Note. There must be a preload on the differential bearings when the adjustments are completed, to insure proper alinement of the drive gear when it is operating under severe conditions. This is accomplished by spreading the drive pinion carrier bearing supports beyond their normal position. A spread gage 41-G-17-800 (*fig. 5*) is provided for the checking of this particular dimension.

- (1) Turn differential bearing adjusting nuts hi with wrench 41-W-3724-130 (*fig. 79*) until differential bearings are firmly seated and some backlash exists between drive gear and pinion.
- (2) Turn differential adjusting nut (N) (tooth side of drive gear) out $1\frac{1}{2}$ turns to relieve bearings. Tighten bottom nuts on differential bearing cap studs to 100 to 120 pound-feet torque.
- (3) Set micrometer adjustment on spread gage (*fig. 93*) at "0" position ; then position arbor at opposite end so that gage will just slip over outside edges of lock washer screws in differential bearing caps. Adjust micrometer so that gage properly contacts heads of lock washer screws. Remove gage and turn the micrometer out (counterclockwise) 0.014 inch. Place gage aside, exercising care to prevent changing of the micrometer setting. Remove lock washer screws from differential bearing caps.
- (4) Install a dial indicator (*fig. 93*) on drive pinion carrier to check backlash between drive gear and pinion.
- (5) Rotate the drive gear a complete revolution and check the backlash at five different positions to determine the point of least clearance between drive gear and pinion. After the point of least clearance has been established, do not rotate drive gear until all adjustments have been completed.

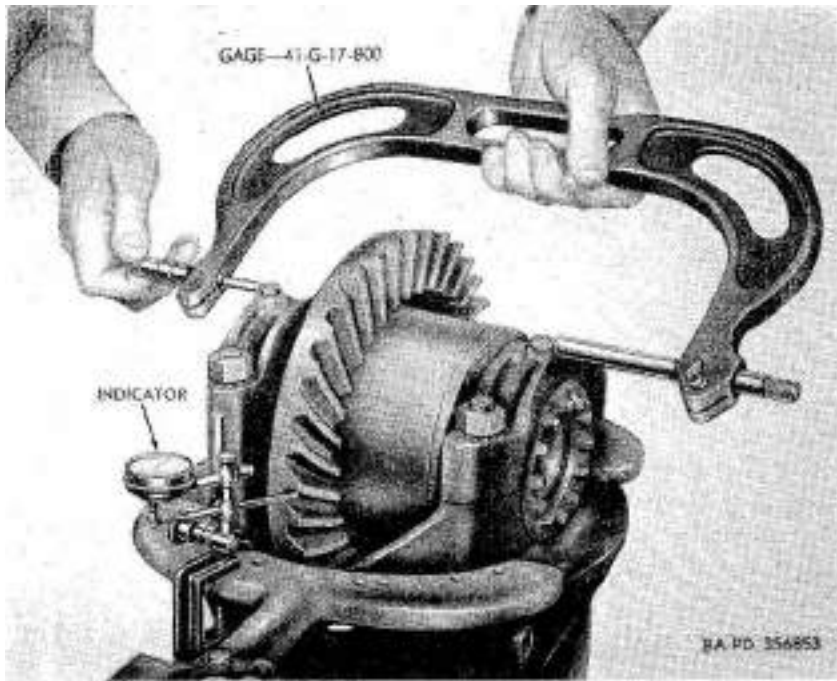


Figure 93. Proper application of spread gage and dial indicator.

- (6) Turn differential bearing adjusting nut (AF) (back face of drive gear) in until backlash between drive gear and pinion is 0.001 to 0.002 inch, with adjusting nut correctly positioned for the installation of differential bearing adjusting nut lock (S and AC) and 5/16-18NC x $\frac{3}{4}$ lock washer screws (T and ZZ). Do not install these parts until all adjustments have been completed. Tighten $\frac{3}{8}$ -18NF nut on differential bearing cap upper stud to 100 to 120 pound-feet torque with a torque indicating wrench, which may reduce the backlash 0.001 inch.

Note. The backlash between drive gear and pinion will vary when this adjustment is performed, because the bearing adjusting nut lock must be in proper alinement with the screw hole in differential bearing cap.

- (7) Turn differential bearing adjusting nut (N) (tooth side of drive gear) in, a notch at a time, until the backlash between the drive gear and drive pinion is a minimum of 0.004 inch. Tighten $\frac{3}{8}$ -18NF nuts on differential bearing cap upper stud to 100 to 120 pound-feet torque, which usually increases the backlash 0.001 to 0.002 inch. Refer to paragraph 343 for backlash specifications.
- (8) Check spread of differential bearing caps with spread

gage 41-G-17-800 (fig. 93) to determine if the spread is within the limits specified in paragraph 343.

Note. If spread is not within the specified limits, the bearing adjustments have not been properly performed and must be repeated.

Remove dial indicator.

- (9) Install differential bearing adjusting nut locks (S and AC) and 5/16-18NC x $\frac{5}{8}$ lock washer screws (T and ZZ) . Tighten screws to 15 to 20 pound-feet torque.

g. Adjustment of Drive Gear Thrust Screw. From bottom side of the differential with carrier assembly, place a long 0.006-inch feeler gage between the drive gear and drive gear thrust screw pad. Turn the drive gear thrust screw in until gage is just a snug fit between drive gear and thrust pad. Rotate drive gear an entire revolution to make certain that the minimum clearance is not less than the dimensions indicated in paragraph 343. To prevent change of adjustment, tack weld thrust screw and drive gear thrust screw check nut to drive pinion carrier.

Section V. REBUILD OF REAR AXLE HOUSING WITH RELATED DRIVE AND BRAKE PARTS

98. Disassembly (Field and Depot Maintenance)

a. Remove Left and Right Brake Line Assemblies and Rear Axle Brake Line Tee (fig. 94).

- (1) Remove nuts, lock washers, and brake line C-type clips from left and right brake line assemblies, one each side.
- (2) Disconnect brake line assemblies at wheel cylinders and rear axle brake line tee on axle housing assembly. Remove vent assembly and brake line tee from rear axle housing assembly.
- (3) Remove studs, which are provided for the brake line C-type clips, from axle housing assembly.
- (4) If the rear axle housing assembly requires replacement (par. 99), remove rear brake support to axle rivets and brake supports (fig. 95) .

b. Cleaning. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

99. Inspection (Field and Depot Maintenance)

a. Inspect Rear Axle Housing Assembly.

- (1) Inspect rear axle housing assembly for damage and broken welds. If axle housing assembly is damaged or

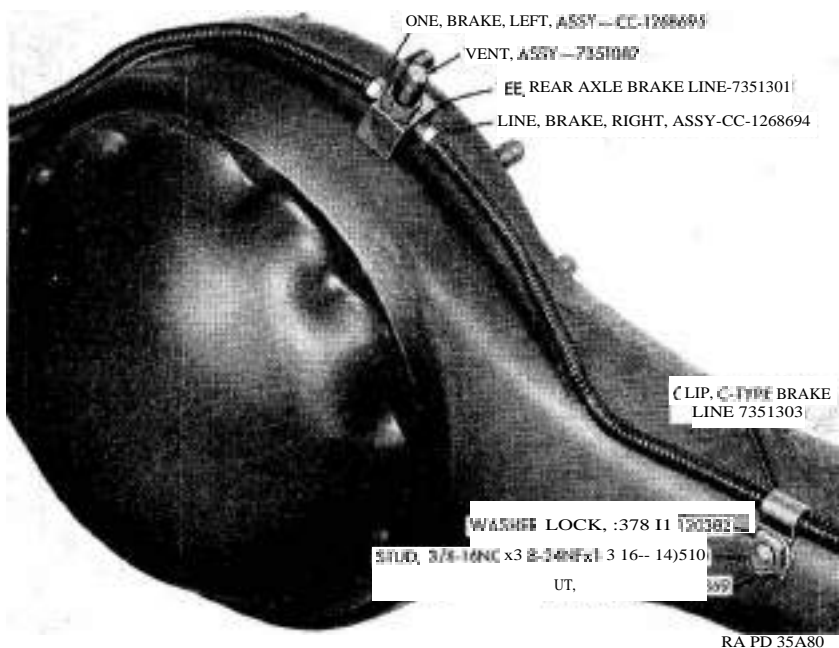


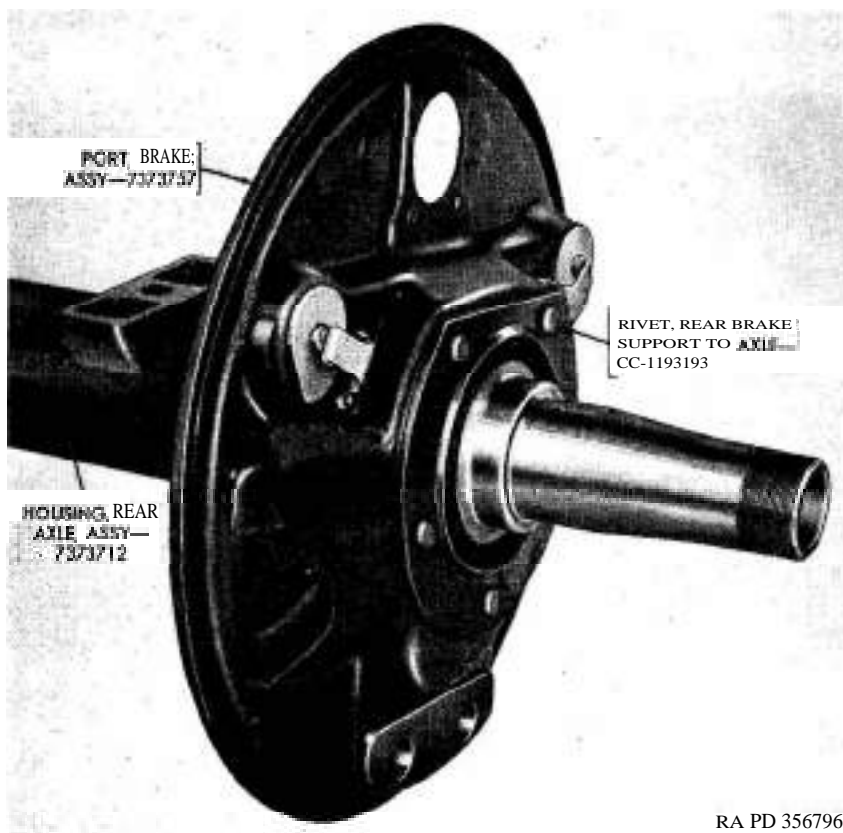
Figure 94. Rear axle brake line tee and connections.

bent, it must be replaced, as the housing assembly cannot be successfully straightened. If housing assembly is not damaged, repair any unsatisfactory welds.

- (2) Inspect drive pinion carrier studs and if any studs are worn or damaged, they must be replaced.
- (3) Inspect bearing surfaces and threads at outer ends of axle housing assembly for scores, damage, or cracks. If housing assembly is scored at bearing surfaces, or if there is any evidence of cracks, housing assembly must be replaced.
- (4) Inspect rear brake support-to-axle rivets (fig. 95) . If rivets are loose or if there is any evidence of movement between the axle housing assembly and brake supports, rivets and/or brake supports must be replaced (par. 100).

b. Inspect Vent Assembly, Brake Line Assemblies, and Rear Axle Brake Line Tee (fig. 94) .

- (1) Inspect vent assembly and make certain that check valve is functioning properly. If there is any question about condition of the vent assembly, it must be replaced.
- (2) Inspect brake-line assemblies and rear axle brake line tee for cracks or damage. If there is any evidence of cracks or damage, brake line assemblies or tee must be replaced.



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Figure 95. Rear brake support to axle rivets.

100. Assembly (Field and Depot Maintenance)

a. *Install Brake Supports (fig. 95)* . If the rear axle housing assembly, brake supports, or rear brake support-to-axle rivets require replacement, the rivets must be installed cold by hydraulic pressure.

Caution: Do not heat the rear brake support-to-axle rivets as rivets will shrink on cooling and result in early **loosening** of parts.

b. *Install Studs for Brake Line C-Type Clips (fig. 94)* . Coat $\frac{3}{8}$ -16NC x $\frac{3}{4}$ -24NF x $1 \frac{3}{16}$ studs with plastic-type gasket cement and install studs in axle housing assembly.

e. *Install Rear Axle Brake Line Tee, Vent Assembly, and Brake Line Assemblies (fig. 94)* .

- (1) Position rear axle brake line tee on axle housing assembly with opening for brake flexible line toward front and install vent assembly. Tighten vent assembly.
- (2) Position left and right brake line assemblies on axle hous-

ing assembly and connect brake line assemblies to wheel cylinders and tee. Tighten brake line nuts.

- (3) Install brake line C-type clips, $\frac{3}{8}$ -inch lock washers, and $\frac{3}{8}$ 4NF nuts on studs. Tighten nuts.

Section VI. ASSEMBLY OF REAR AXLE FROM SUBASSEMBLIES

101. General

Before installing the subassemblies, it is important to make certain they are free of all traces of corrosion, dirt, or rust-preventive compounds.

102. Differential With Carrier Assembly (Field and Depot Maintenance)

Position new drive pinion carrier gasket on rear axle housing assembly and install differential with carrier assembly. Install 7/16-inch lock washers and drive pinion carrier stud nuts on drive pinion carrier studs. Tighten nuts to 40 to 50 pound-feet torque.

103. Hubs With Brake Drum Assemblies (Field and Depot Maintenance)

a. *Install Hubs With Brake Drum Assemblies* (fig. 74).

- (1) Position hubs with brake drum assemblies on axle housing assembly. Pack the hub outer bearing cones (P) with specified lubricant (refer to TM 9-840). Install bearing cones.
- (2) Install inner bearing adjusting nut assemblies (N) (pin toward outside), and tighten nuts, with wrench 41—W-1991-17 (fig. 46), until bearings are firmly seated in cups. Back off nuts one-sixth turn.
- (3) Install bearing adjusting nut locks (M) with diagonal cutting pliers (fig. 47). If one of the holes in the locks does not index with pin on inner bearing adjusting nuts, remove locks, and reverse their position. Holes in locks are drilled off-center in relation to the axle housing slot therefore, locks will index with pin on bearing inner adjusting nuts if adjusting nuts are properly positioned.
- (4) Install outer bearing adjusting nuts (L) with extension for oil seal toward outside. Tighten nuts with wrench 41—W--1991-17 (fig. 46).

b. *Install Hub Bearing Outer Oil Seals and Drive Shafts* (fig. 74).

- (1) Prepare hub bearing outer oil seals (J) as described in paragraph 76c.
- (2) Install drive shaft flange gaskets (K) on right and left hubs. Install hub bearing outer oil seals (J) on right and left hubs with lip of leather toward outside. Install drive shaft flange gaskets (H) on right and left hubs.
- (3) Install ~~3/8-16NC~~ hex nuts (B and F) on $\frac{3}{8}$ -16NC x 1 puller set screws (C and G). Install puller set screws in axle drive shaft flanges. Make certain ends of screws do not protrude beyond gasket surface of flanges. Tighten nuts. Install drive shafts (A), $\frac{3}{8}$ -inch lock washers (D), and ~~3/8-24NF~~ hex nuts (E) on drive-shaft-flange studs (R). Tighten nuts to 30 to 35 pound-feet torque.

c. Adjust Brakes. Perform major brake adjustment. Refer to TM 9-840.

104. Axle Housing Lubricant

Install 6 pints of universal gear lubricant (GO) in axle housing and rotate drive pinion sufficiently to insure distribution of lubricant over all internal parts.

CHAPTER 7

TRANSMISSION

Section I. DESCRIPTION AND DATA

105. Description

The transmission assembly (fig. 96) has four forward speeds and one reverse. It is so designed that the reverse idler gear is in mesh only when transmission is shifted into low or reverse ; however, the reverse idler gear is under load only in reverse. The input shaft, the main shaft, and the countershaft are all mounted on antifriction ball or roller bearings. Helical gears are provided for direct, third, and second speeds with straight spur gears for first speed and reverse. Synchronizers are provided for direct and third speeds to facilitate gear shifting.

106. Data

Bearings :

Countershaft :

Front ----- ball

Rear ----- straight roller

Input shaft ----- ball

Main shaft :

Rear ----- ball

Pilot ----- straight roller

Reverse idler gear ----- bronze (bushing-type)

Gear ratios :

Direct ----- 1.00 : 1.00

First speed ----- 6.40 : 1.00

Reverse ----- 7.61 : 1.00

Second speed ----- 3.09 : 1.00

Third speed ----- 1.69 : 1.00

Lubricant capacity :

After engine T245-3955:

Without power-take-off ----- 6 pt

With power-take-off ----- 7 pt

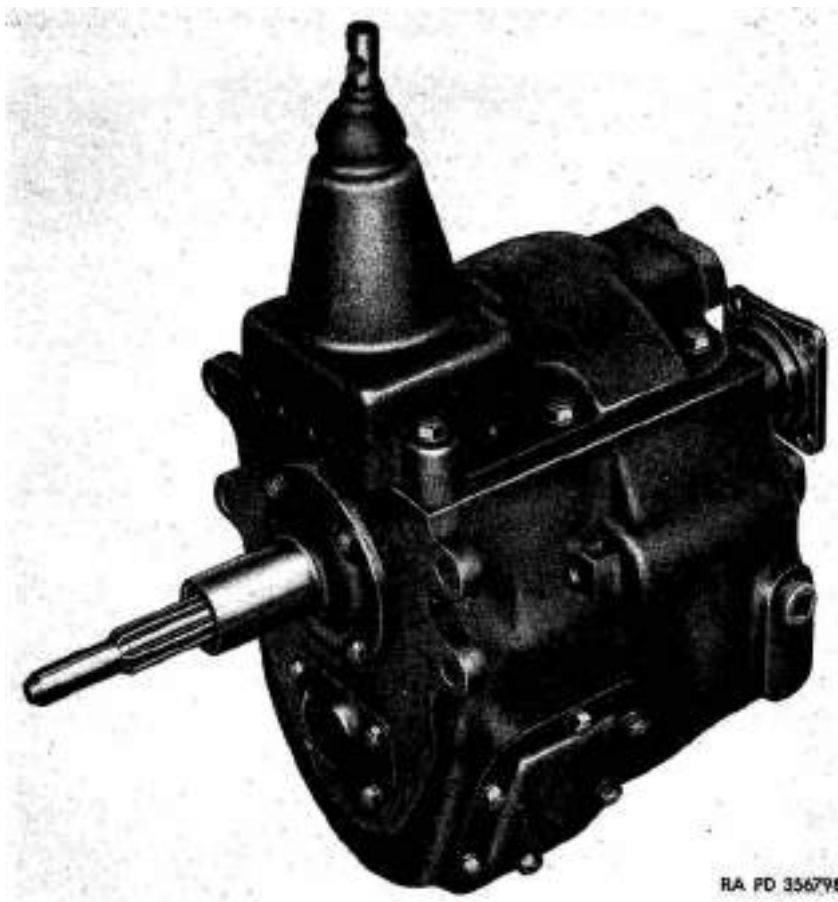


Figure 96. Transmission assembly.

Through engine T245-3955 :	
Without power-take-off -----	9 pt
With power-take-off -----	10 1/4 pt
Make -----	New process
Model -----	88950

Section II. DISASSEMBLY OF TRANSMISSION INTO SUBASSEMBLIES

107. General

The transmission assembly is divided into four subassemblies consisting of the transmission case cover assembly, input shaft assembly, main shaft assembly, and transmission case with counter-shaft and reverse idler gear. The following procedures are based on

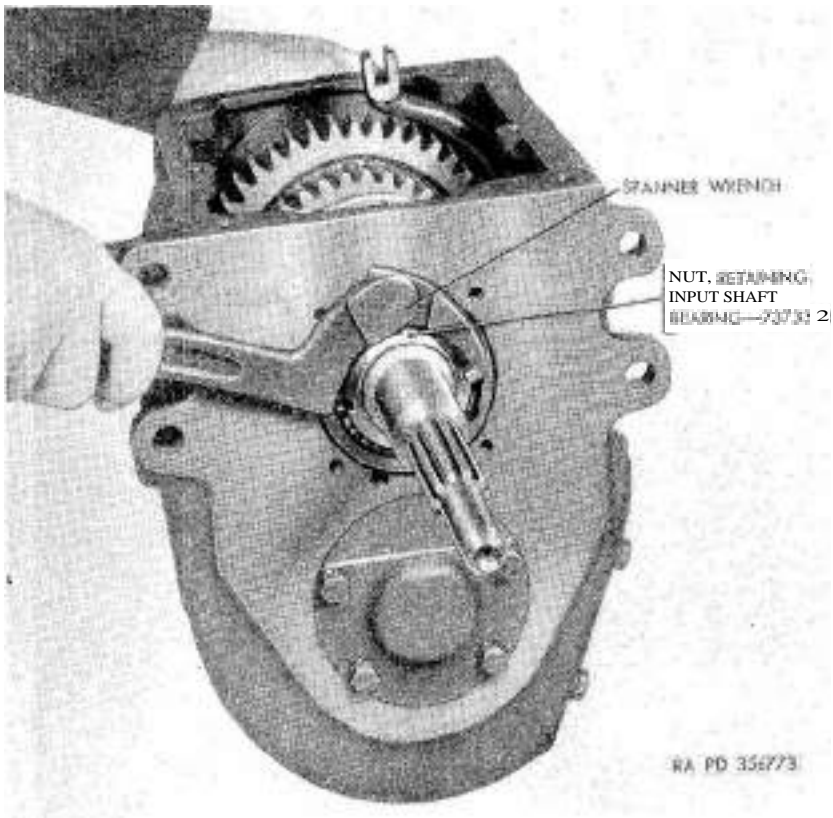


Figure 97. Removing input shaft bearing retaining nut with spanner wrench.

the assumption that the transmission assembly (fig. 96) is removed from the vehicle.

108. Draining and Cleaning (Depot Maintenance)

- a. *Draining.* Remove $\frac{3}{4}$ -inch pipe plug (AC, fig. 108) and drain lubricant.
- b. *Cleaning.* Clean exterior of transmission with volatile mineral spirits or dry-cleaning solvent.

109. Transmission Case Cover Assembly (Depot Maintenance) (fig. 108)

Remove five $\frac{3}{8}$ -16NC x $\frac{7}{8}$ cap screws (D), one $\frac{3}{8}$ -16NC x 17/8 bolt (B), and $\frac{3}{8}$ -inch lock washers (A and E). Lift the transmission case cover assembly (C) and case cover gasket (F) from transmission case (Z).

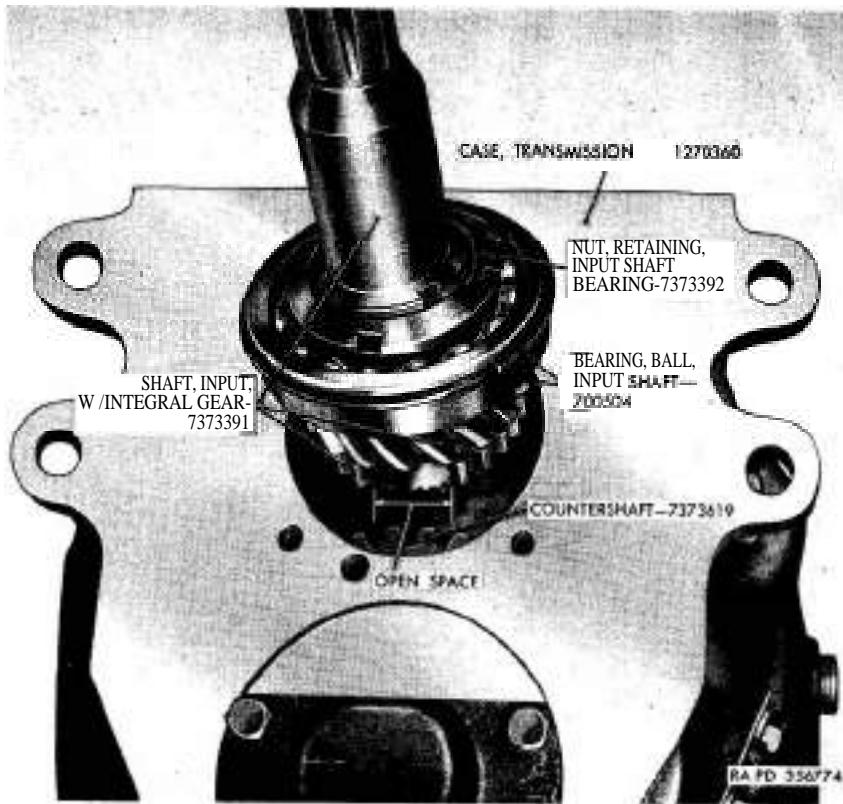


Figure 98. A linement of gear teeth for removal of input shaft.

110. Input Shaft Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 108, except where otherwise indicated.

a. Remove Input Shaft Bearing Retainer. Remove two 5/16-24NF x $\frac{3}{4}$ cap screws (AW), two input shaft bearing retainer screws (AU), and 5/16-inch lock washers (AT and AX). Remove input shaft bearing retainer (AV) and input shaft bearing retainer gaskets (AS).

b. Remove Input Shaft Bearing Retaining Nut and Loosen Companion Flange Nut.

- (1) Engage first and second speed sliding gear (V) with countershaft gear and engage synchronizer sliding clutch (J) with input shaft. This will facilitate removal of the input shaft bearing retaining nut (AY) and loosening of the companion flange nut (PP).
- (2) Remove $1\frac{1}{8}$ x $15\frac{1}{8}$ cotter pin (QQ) from companion flange nut and loosen nut.

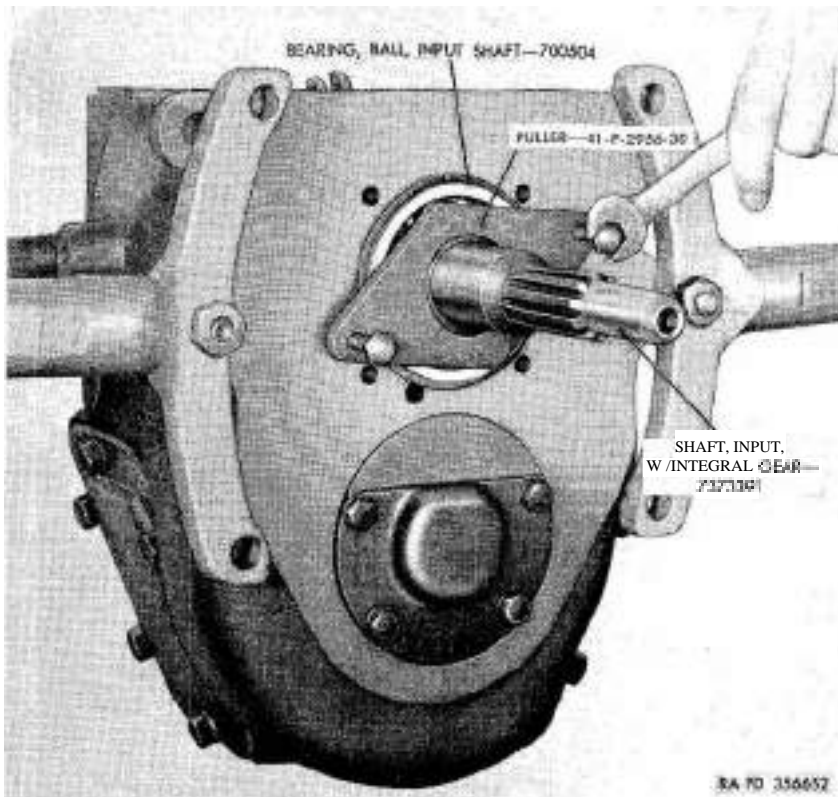


Figure 99. Removing input shaft and bearing.

- (3) Remove input shaft bearing retaining nut (AY) with a large spanner wrench (fig. 97) or a brass drift and hammer.
- (4) Place first and second speed sliding gear and synchronizer sliding clutch in neutral position.

c. Remove Input ,Shaft.

- (1) Position input shaft so that open space of clutch gear teeth will be in line with countershaft gear teeth (fig. 98). This is necessary to prevent interference between the gear teeth on the input shaft and countershaft. Install puller 41-P-2956-30 (fig. 99) on threaded portion of input shaft. Pull shaft and bearing from transmission case by tightening the two puller cap screws. Remove puller from shaft.
- (2) Remove main shaft pilot bearing (AA) from gear end of input shaft.

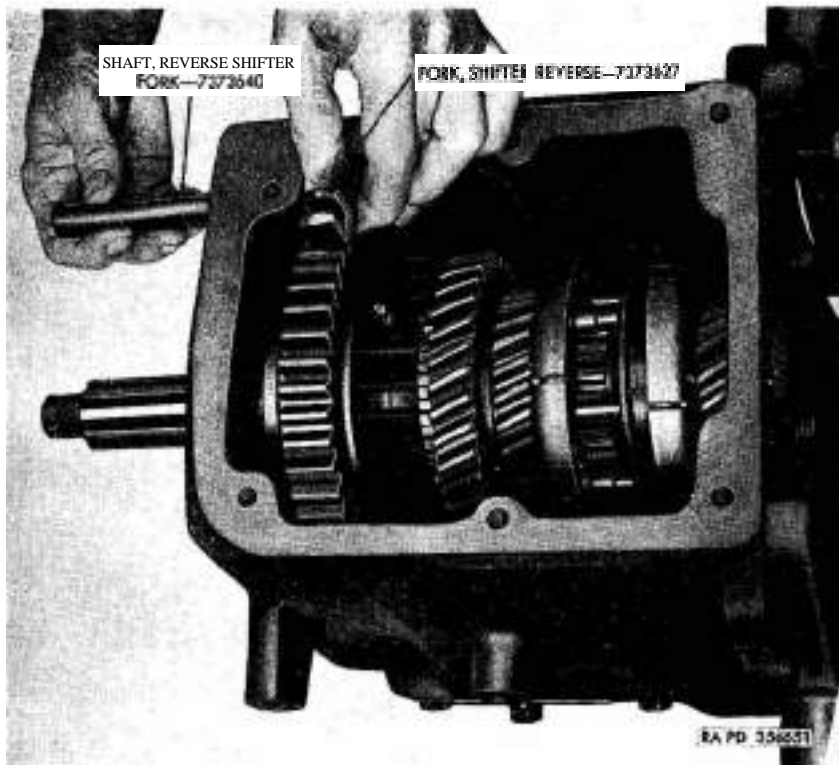


Figure 100. Removing reverse shifter fork.

111. Main Shaft Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 108, except where otherwise indicated.

a. *Remove Companion Flange.* Remove companion flange nut (PP) and companion flange plain washer (NN). Pull companion flange (MM) from main shaft (CC).

b. *Remove Main Shaft Bearing Retainer.* Remove five 5/16-18NC x 1 cap screws (KK) and 5/16-inch lock washers (JJ). Remove main shaft bearing retainer (HH) and main shaft bearing retainer gaskets (GG) from transmission case.

c. *Remove Reverse Shifter Fork* (fig. 100). Drive reverse shifter fork shaft to the rear with a bronze drift and hammer. Remove the reverse shifter fork.

d. *Remove Main Shaft Assembly.*

- (1) Drive main shaft assembly (CC) to the rear with a bronze drift and hammer until main shaft ball bearing (EE) is out of transmission case. Remove separately : synchronizer outer stop ring (G), synchronizer inner

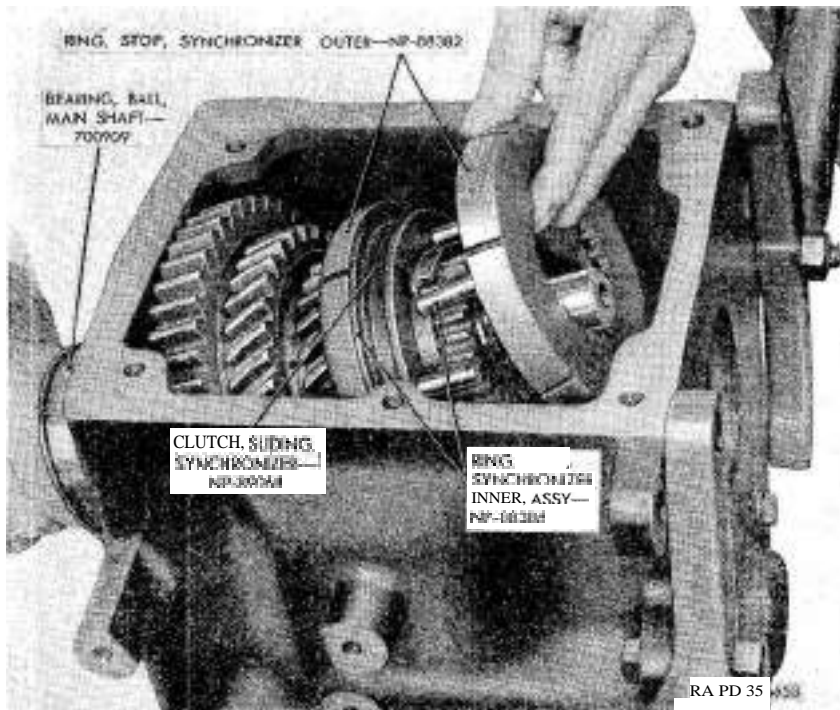


Figure 101. Removing synchronizers and synchronizer sliding clutch.

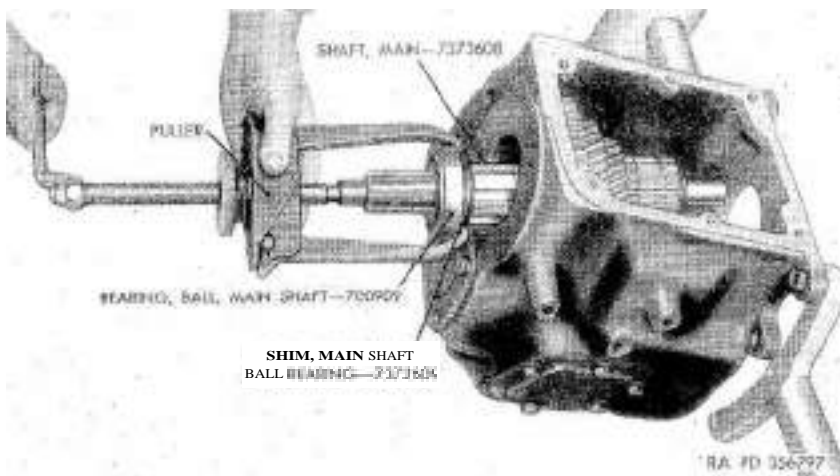


Figure 102. Removing main shaft ball bearing with puller.

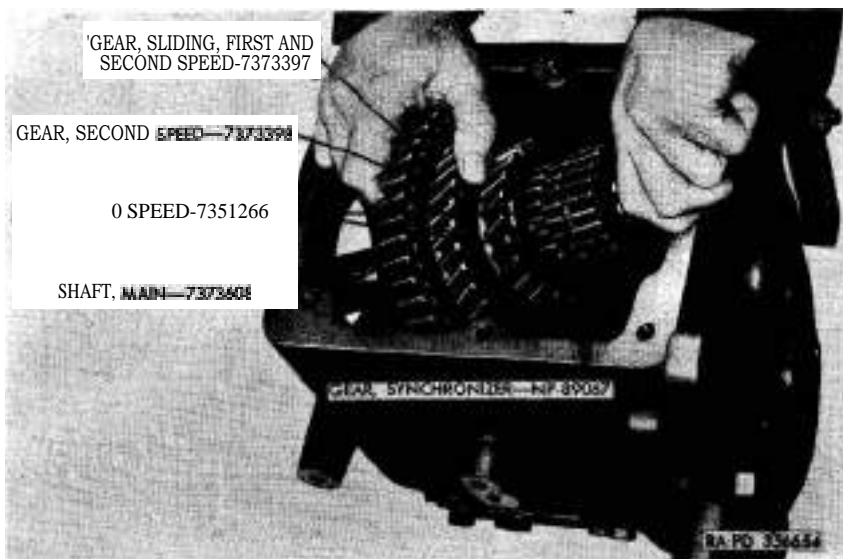


Figure 103. Removing main shaft assembly from case.

stop ring assembly (H), synchronizer sliding clutch (J), synchronizer inner stop ring assembly (K), and synchronizer outer stop ring (L) . Refer to figure 101 for removal procedures.

- (2) Pull main shaft ball bearing from main shaft (fig. 102) . Wrap ball bearing in paper to protect it from abrasives until bearing is inspected.
- (3) Hold first and second speed sliding gear against second speed gear and lift main shaft assembly from case (fig. 103).

Section III. REBUILD OF TRANSMISSION CASE, COUNTER-SHAFT, AND REVERSE IDLER GEAR

112. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 108, except where otherwise indicated.

a. Remove Reverse Idler Gear Shaft and Reverse Idler Gear Assembly.

- (1) Remove $\frac{3}{8}$ -16NC x $\frac{3}{4}$ cap screws (WW), lock $\frac{1}{4}$ -inch lock washer (XX), and reverse idler gear shaft locking plate (YY) from transmission case.
- (2) Engage screw shaft lug of puller 41—P-2956-50 (fig. 104) with slot in reverse idler gear shaft. Assemble puller hous-

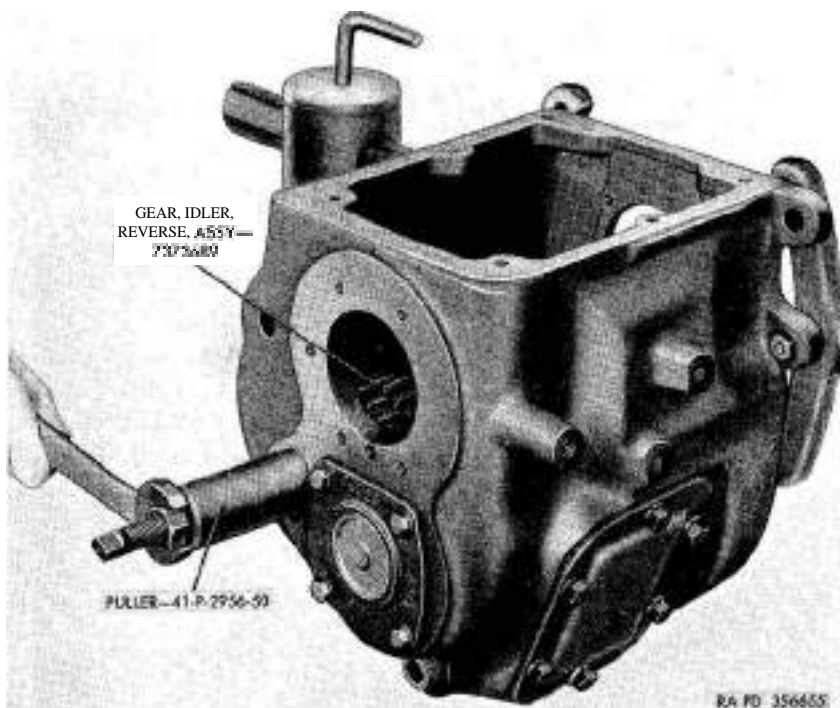


Figure 104. Removing reverse idler gear shaft.

ing on puller screw shaft and install nut. Turn nut on puller screw shaft clockwise until reverse idler gear shaft (ZZ) can be removed from transmission case.

- (3) Remove reverse idler gear assembly (X) from transmission case.

b. Remove and Disassemble Countershaft Rear Bearing Retainer.

- (1) Remove 5/16-18NC x $\frac{7}{8}$ cap screws (TT) and 5/16-inch lock washers (UU). Remove countershaft rear bearing retainer (SS) and countershaft rear bearing retainer gaskets (VV) from transmission case.

Note. Do not remove countershaft rear bearing assembly (AB) from retainer unless inspection (par. 113c) reveals replacement is necessary.

- (2) If replacement of bearing is necessary, press bearing assembly from retainer.

c. Remove Countershaft Front Bearing Retainer. Remove 5/16-18NC x $\frac{7}{8}$ cap screws (AR) and 5/16-inch lock washers (AQ). Remove countershaft front bearing retainer (AP) and countershaft front bearing retainer gaskets (AN) from transmission case.

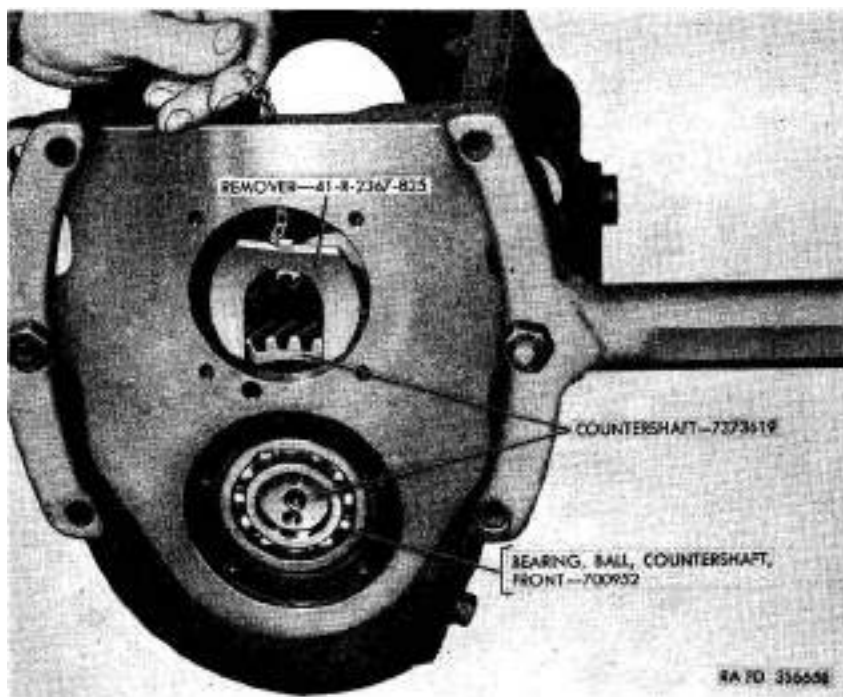


Figure 105. Removing countershaft front ball bearing.

d. Remove Countershaft Front Bearing Retainer Washer.

- (1) Remove locking wire (AK) from countershaft front bearing retainer washer screws (AM) .
- (2) Place bronze drift between countershaft large gear and transmission case to prevent countershaft from turning. Remove countershaft front bearing retainer washer screws (AM) and countershaft front bearing retainer washer (AL) . Remove bronze drift.

e. Remove Countershaft and Countershaft Front Ball Bearing.

- (1) Drive countershaft (W) with a brass drift and hammer toward rear of transmission case as far as it will go. Lift rear of countershaft and drive the shaft back until gear contacts reverse idler gear shaft support boss. Push down on rear of countershaft with all possible force by hand and drive shaft forward with a plastic hammer to force countershaft front ball bearing (AJ) out of transmission case. If bearing is a tight fit in the case and cannot be removed in the manner outlined above, drive countershaft to the rear as far as possible. Force rear end of shaft down by hand and drop remover 41—R-2367-825 (fig. 105) over the shaft between front bearing and gear.

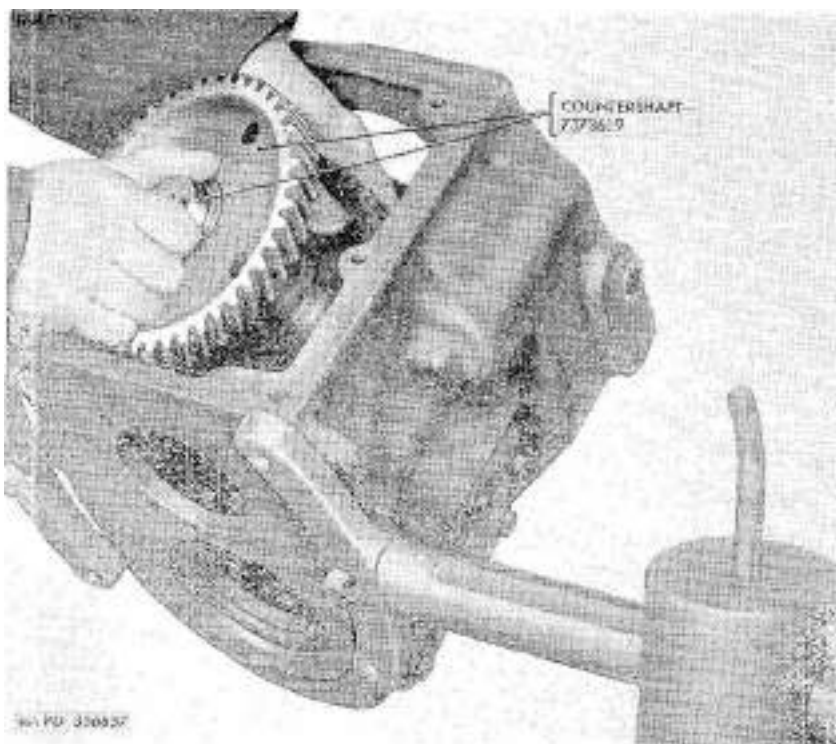


Figure 106. Removing countershaft from transmission case.

Drive countershaft forward with a plastic hammer. This will force the bearing out of the case.

- (2) If ball bearing is a tight fit on countershaft, remove bearing with a puller. Wrap ball bearing in paper to protect it from abrasives until bearing is inspected.
- (3) Lift countershaft from case (fig. 106).

f. Remove Power-Take-Off Opening Covers and Pipe Plug. Remove $\frac{3}{8}$ -16NC x $\frac{3}{4}$ cap screws (All) $\frac{3}{4}$ -inch lock washers (AG), power-take-off opening cover (AF), and power-take-off cover gaskets (AE). Remove $\frac{3}{4}$ -inch pipe plug (AD) in filler opening.

g. Cleaning. Wash all parts in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearings, with dry compressed air.

Caution Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

113. Inspection (Depot Maintenance) (fig. 108)

a. Inspect Transmission Case. Inspect transmission case (Z) for damaged gasket surfaces, damaged screw threads, or cracks. If

any of these conditions exist, replace case. Inspect the openings for the main shaft ball bearing, input shaft ball bearing, and countershaft front ball bearing. If there is evidence that any of the bearings have turned in the case, measure openings with a micrometer and replace transmission case if dimensions exceed wear limits in paragraph 344.

b. Inspect Countershaft. Inspect countershaft (W) for worn or damaged gear teeth and worn rear bearing surface. If diameter of rear bearing surface is less than wear limit indicated in paragraph 344 or if any of the gear teeth are damaged or worn, replace countershaft.

c. Inspect Countershaft Bearing.

- (1) Inspect countershaft front ball bearing (AJ) for looseness, chipped balls, worn races, or worn or damaged ball retainers. If any of these conditions exist, replace bearing.
- (2) Inspect countershaft rear bearing assembly (AB) for wear and damaged rollers or retainer. If any of these conditions exist, install new bearing assembly (pars. 112b and 114a).

d. Inspect Countershaft Bearing Retainers. Inspect countershaft front and rear bearing retainers (SS and AP) for distorted or damaged gasket surfaces and cracks. If any of these conditions exist, replace bearing retainers.

e. Inspect Reverse Idler Gear Assembly.

- (1) Inspect reverse idler gear assembly (X) for worn, chipped, or cracked gear teeth. If any of these conditions exist, replace gear assembly.
- (2) Check reverse idler gear bearing for wear. If the inside diameter exceeds wear limit indicated in paragraph 344, replace gear assembly.

Note. The bearing bore is accurately machined after assembly of bearing in gear to prevent the possibility of eccentricity; therefore, the bearing cannot be replaced in the field. The reverse idler gear and bearing is serviced only as an assembly.

f. Inspect Reverse Idler Gear Shaft. Measure diameter of reverse idler gear shaft (ZZ) with a micrometer. If the dimensions at the worn spots exceed the wear limit in paragraph 344, replace shaft.

114. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 108, except where otherwise indicated.

a. Install Countershaft and Bearings.

- (1) Place countershaft (W) in transmission case (Z) (large gear forward) and extend the countershaft (*fig. 106*) out through rear bearing opening. Start countershaft front

ball bearing (AJ) (snap ring end out) into case and on shaft. While holding the rear end of countershaft in approximate operating alignment, drive bearing with a plastic hammer, into transmission case as far as it will go. Tap shaft through bearing with a plastic hammer and install countershaft front bearing retainer washer (AL) and countershaft front bearing retainer washer screws (AM).

- (2) Place a bronze drift between the countershaft front gear and transmission case. Tighten the front bearing retainer washer screws. Install locking wire (AK) through screw heads. Remove bronze drift.
- (3) Position new countershaft front bearing retainer gasket (AN) and countershaft front bearing retainer (AP) on transmission case. Install 5/16-inch lock washers (AQ) and 5/16-18NC x $\frac{7}{8}$ cap screws (AR). Tighten screws.
- (4) If inspection (par. 113c) reveals replacement of countershaft rear bearing assembly (AB) is necessary, coat outside surface of new bearing with plastic-type gasket cement and press bearing into countershaft rear bearing retainer (SS) until the outside surfaces of bearing and retainer are flush.
- (5) Position new countershaft rear bearing retainer gasket (VV) and bearing retainer assembly on transmission case.

Note. Outside machined surface of bearing retainer must be at top.

- (6) Install 5/16-inch lock washers (UU) and 5/16-18NC x $\frac{7}{8}$ cap screws (TT) to attach bearing retainer to transmission case. Tighten screws.

b. Install Reverse Idler Gear Assembly and Reverse Idler Gear Shaft. Place reverse idler gear assembly (X) in transmission case with large gear toward rear. Insert reverse idler gear shaft (ZZ) into transmission case and align shaft so that slot for reverse idler gear shaft locking plate (YY) will be at bottom. Place locking plate in slot as shaft is installed so that shaft will not be driven in too far. Align locking plate and install $\frac{3}{8}$ -16NC x $\frac{3}{4}$ cap screw (WW) and $\frac{5}{8}$ -inch lock washer (XX). Tighten cap screw.

c. Install Power-Take-Off Opening Covers. Position power-take-off opening covers (AF) and new power-take-off cover gaskets (AE) on transmission case. Install $\frac{3}{8}$ -inch lock washers (AG) and $\frac{3}{8}$ -16NC x $\frac{3}{4}$ screws (All) ; then tighten screws.

d. Install Pipe Plugs in Transmission Case. Install $\frac{3}{4}$ -inch pipe plugs (AC and AI) in transmission case lubricant filler and drain openings.

Section IV. REBUILD OF INPUT SHAFT ASSEMBLY

115. Disassembly (Depot Maintenance)

a. Remove Input Shaft Ball Bearing (fig. 108) . If inspection (par. 116) of the input shaft ball bearing (AZ) reveals that replacement is necessary, remove bearing from shaft with an arbor press.

b. Cleaning. Wash all parts in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearings, with dry compressed air.

Caution : Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

116. Inspection (Depot Maintenance)

(fig. 108)

a. Inspect Input Shaft With Integral Gear.

- (1) Check input shaft with integral gear (BC) for worn, chipped, or cracked gear teeth. Check splines for wear and damage. If any of these conditions exist, replace shaft.
- (2) Measure diameter of bearing surface at forward end of shaft and diameter of bore in gear end of shaft. Refer to wear limits in paragraph 344 and replace input shaft if wear is excessive.

b. Inspect Input Shaft Ball Bearing. Inspect input shaft ball bearing (AZ) for looseness, chipped or corroded balls, scored or worn races, and worn or damaged ball retainers. If any of these conditions exist, replace bearings (par. 115 and 117) .

117. Assembly (Depot Maintenance)

(fig. 108)

a. Install Input Shaft Ball Bearing. If replacement of the input shaft ball bearing (AZ) is necessary (par. 116), press it on the input with integral gear shaft (BC) with an arbor press. Bearing must be installed with snap ring toward outer end of input shaft.

b. Install Input Shaft Bearing Retaining Nut. Clamp input shaft assembly between copper jaws of a vise. Install input shaft bearing retaining nut (AY) and tighten nut with a large spanner wrench or a brass drift and hammer. Shock end of spanner wrench with a hammer to make certain nut is firmly tightened.

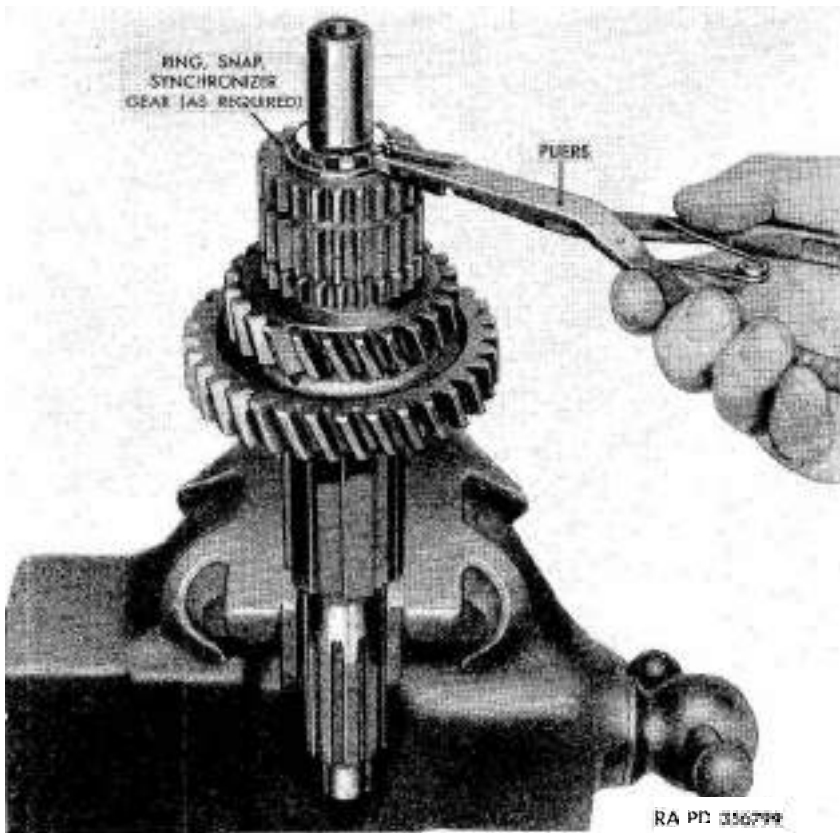


Figure 107. Removing synchronizer gear snap ring with snap ring removing pliers.

Section V. REBUILD OF MAIN SHAFT ASSEMBLY

118. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 108, except where otherwise indicated.

a. General. The main shaft assembly consists of several precision parts and must be properly inspected and assembled to insure satisfactory operation of transmission.

b. Remove Main Shaft Pilot Bearing Spacer and Synchronizer Gear Snap Ring.

- (1) Remove main shaft pilot bearing spacer (BB) from forward end of shaft.
- (2) Remove first and second speed sliding gear (V) from main shaft, clamp main shaft assembly vertically between copper jaws of a vise, and remove synchronizer gear snap ring (M) with snap ring removing pliers (fig. 107).

c. *Remove Gears, Bearings, and Locating Washers From Main Shaft.* Remove synchronizer gear (N), third speed gear (P), third speed gear bushing-type bearing (Q), third speed gear locating washer (R), second speed gear (T), second speed gear rollers (S), and second speed gear locating washer (U) from main shaft (CC).

d. *Remove Main Shaft Oil Seal From Main Shaft Bearing Retainer.* Drive main shaft oil seal (LL) from main shaft bearing retainer (HH) with a punch and hammer.

e. *Cleaning.* Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

119. Inspection (Depot Maintenance)

(fig. 108)

a. *Inspect Companion Flange.* Inspect companion flange hub for wear, scored spots, or corrosion. If any of these conditions exist, replace companion flange (MM). Inspect companion flange bolt holes and replace flange if holes are worn or elongated.

b. *Inspect Main Shaft Ball Bearing.* Check main shaft ball bearing (EE) for looseness, chipped balls, worn or rough races, or damaged or worn ball retainers. If any of these conditions exist, replace bearing. If bearing is suitable for further service, wrap it in paper as a protection against abrasives.

c. *Inspect Synchronizer Assembly.*

- (1) Inspect synchronizer outer stop rings (G and L) for scores, cracks, or wear. If any of these conditions exist, replace outer stop rings.
- (2) Inspect synchronizer inner stop ring assemblies (H and K) for scores, cracks, wear, or loose pins. If any of these conditions exist, replace inner stop rings.
- (3) Inspect synchronizer sliding clutch (J) for wear, scores, or cracks. If any of these conditions exist, replace clutch.
- (4) Inspect synchronizer gear (N) for worn teeth, scores, or cracks. If any of these conditions exist, replace gear.

d. *Inspect Gears.*

- (1) Inspect first and second speed sliding gear (V) for worn or cracked teeth, worn or damaged splines, and worn or damaged internal teeth. If any of these conditions exist, replace gear.
- (2) Inspect second speed gear (T) for worn or damaged teeth or wear at hub. If teeth are worn or damaged, replace gear. Measure width of gear at hub and diameter of hub bore with micrometers. Check dimensions against

wear limits in paragraph 344. Replace gear if it is not satisfactory for further service.

- (3) Inspect third speed gear (P) for worn or damaged teeth and wear at hub. If teeth are worn or damaged, replace gear. Measure width of gear hub and diameter of hub bore with micrometers. Check dimensions against wear limits in paragraph 344. Replace gear if it is not satisfactory for further service.

e. Inspect Second Speed Gear and Third Speed Gear Locating Washers.

- (1) Inspect second speed gear and third speed gear locating washers (R and U) for wear, scores, or cracks. If any of these conditions exist, replace washers.
- (2) Measure thickness of locating washers with a micrometer. If the dimensions are less than the wear limits in paragraph 344, replace washers.

f. Inspect Second Speed Gear Rollers. Inspect second speed gear rollers (S) for chips, cracks, or wear. If any of these conditions exist, replace rollers. Measure diameter of rollers with a micrometer. If the dimension is less than the limit in paragraph 344, replace rollers.

g. Inspect Third Speed Gear ~~Bushing-Type~~ Bearing. Inspect third speed gear bushing-type bearing (Q) for wear, scores, or cracks. If any of these conditions exist, replace bearing. Measure outside diameter and length of bearing. If dimensions are less than the wear limits in paragraph 344, replace bearing.

h. Inspect Main Shaft Pilot Bearing. Inspect main shaft pilot bearing (AA) for worn, chipped, or scored rollers or damaged cage. If any of these conditions exist, replace bearing.

i. Inspect Main Shaft.

- (1) Inspect main shaft (CC) for alinement, scored or worn bearing surfaces, and worn or damaged splines. If any of these conditions exist, replace shaft.
- (2) Measure diameter of forward end of main shaft (pilot bearing surface) with a micrometer. If dimension is less than wear limit in paragraph 344, replace shaft.
- (3) Measure diameter of shaft at surface for second speed gear rollers with a micrometer. If dimension is less than wear limit in paragraph 344, replace shaft.

j. Inspect Main Shaft Bearing Retainer. Inspect main shaft bearing retainer (HH) for cracks, distorted flange, damaged gasket surface, or damaged oil seal counterbore. If any of these conditions exist, replace retainer.

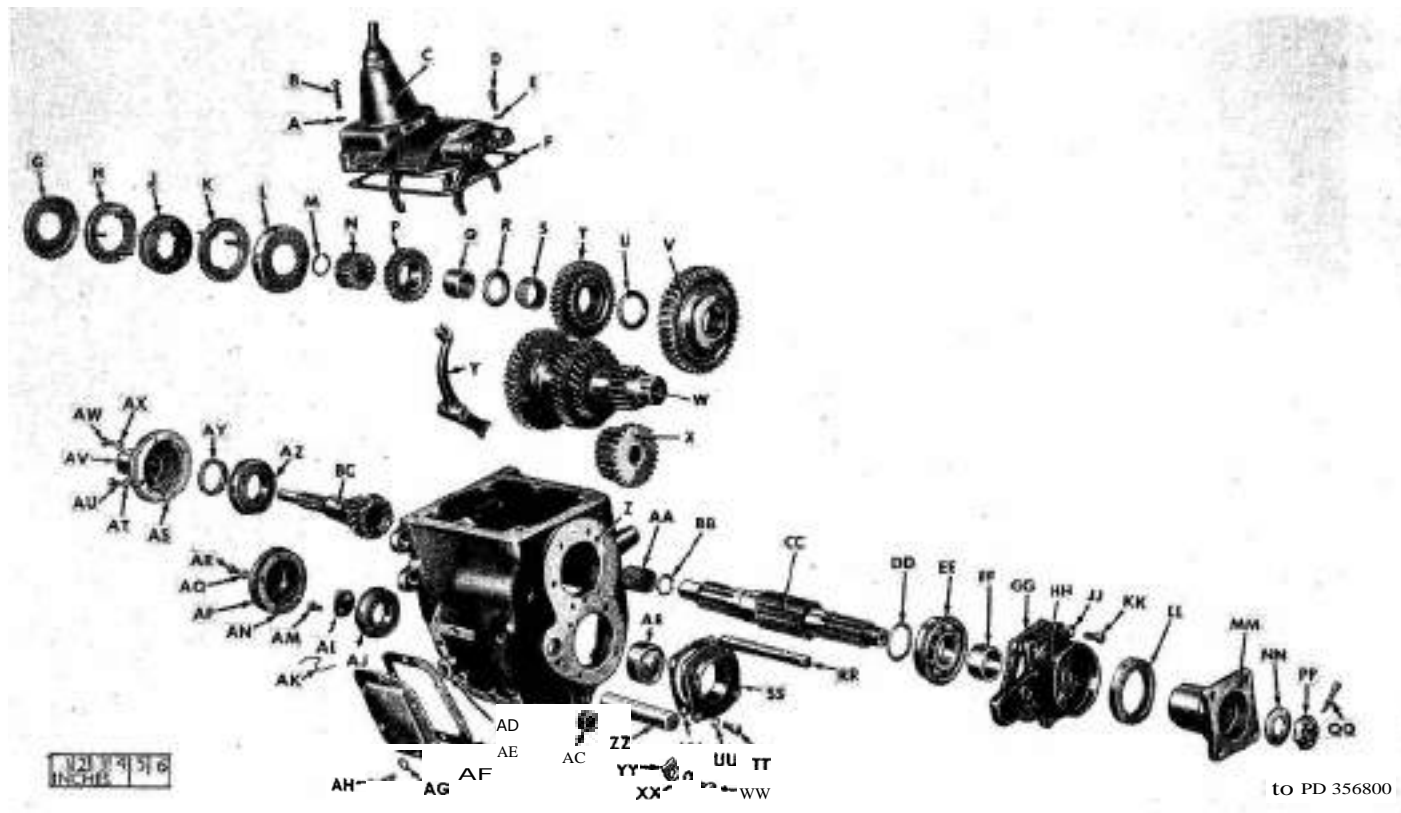


Figure 108. Transmission assembly—exploded view.

A—Washer, lock, %-inch — 120382
 B---Bolt, ~~5/16-18NC~~ x 1% — CC-122174
 C—Cover, transmission case, assy — 7374901
 D—Screw, cap, ~~5/16-18NC~~ x — 122126
~~E—Washer, lock, %-inch — 120382~~
 F—Gasket, case cover — 7373628
~~G—Ring, stop, synchronizer, outer — NP-88382~~
 H—Ring, stop, synchronizer, inner, assy — ~~NP-88381~~
 J—Clutch, sliding, synchronizer — NP-89068
 K--Ring, stop, synchronizer, inner, assy — NP-88386
 L--Ring, stop, synchronizer, outer — ~~NP-88382~~
 M—Ring, snap, synchronizer gear
 0.087 inch thick 7373603
 0.090 inch thick — 7373604
 0.093 inch thick — 7373605
 0.096 inch thick — 7373606
 N—Gear, synchronizer — ~~NP-89067~~
 P--Gear, third speed — 7351266
 Q—Bearing, bushing-type, third speed gear — 7373395
~~R—Washer, locating, third speed gear 7373614~~
 S—Roller, second speed gear 7373607
 T—Gear, second speed — 7373398
 U—Washer, locating, second speed gear -- 7373613
 V—Gear, sliding, first and second speed — 7373397
 W—Countershaft — 7373619
 X—Gear, idler, reverse, assy — 7373689
 Y—Fork, shifter, reverse — 7373627
 Z—Case, transmission — CC-1270360
 AA—Bearing, main shaft pilot 708267
 BB—Spacer, main shaft pilot bearing — 7373611
 CC—Shaft, main — 7373608
 DD—Shim, main shaft ball bearing — 7373609
 EE—Bearing, ball, main shaft 700909
~~FF—Spacer, speedometer gear — 7373610~~
 GG—Gasket, main shaft bearing retainer — 7373396
 HH—Retainer, main shaft bearing — NP-88528
~~JJ—Washer, lock, 5/16-inch — 120214~~
~~KK—Screw, cap, 5/16-18NC x 1 — 122017~~
 LL—Seal, oil, main shaft — 500134
 MM—Flange, companion — 7373704
~~NN—Washer, plain, companion flange — 7351153~~
 PP—Nut, companion flange — 7743652
~~QQ—P, cotter, 1/8 x 1% — 119209~~
 RR—Shaft, reverse shifter fork -7373640
 SS—Retainer, countershaft rear bearing — ~~NP-88256~~
 TT—Screw, cap, 5/16-18NC x — 120229
~~UU—Washer, lock, 5/16-inch — 120214~~
 VV—Gasket, countershaft rear bearing retainer — 7373618
~~WW—Screw, cap, %-16NC x % — 122119~~
~~XX—Washer, lock, %-inch -120382~~
 YY—Plate, locking, reverse idler gear shaft— 7373620

Figure 108. Transmission assembly—exploded view—Continued on following page.

ZZ—Shaft, reverse idler gear — 7373623
 AB—Bearing, countershaft, rear, assy — 708266
 AC—Plug, pipe, $\frac{3}{4}$ -inch — 7374954
 AD—Plug, pipe, $\frac{1}{2}$ -inch — 7374954
 AE—Gasket, power-take-off cover — A214787
 AF—Cover, power-take-off opening — NP-35662
 AG—Washer, lock, $\frac{3}{8}$ -inch — 120382
 AH—Screw, $\frac{1}{2}$ -18NC x $\frac{3}{4}$ — 122119
 AJ—Bearing, ball, countershaft, front — 700952
 AK—Wire, locking — ~~NP-38862~~
 AL—Washer, countershaft front bearing retainer — 7373621
 AM—Screw, countershaft front bearing retainer washer — CC-1265671
 AN—Gasket, countershaft front bearing retainer — 7373617
 AP—Retainer, countershaft front bearing — 7373616
 AQ—Washer, lock, 5/16-inch — 120214
 AR—Screw, cap, 5/16-18NC x $\frac{1}{2}$ — 120229
 AS—Gasket, input shaft bearing retainer — 7373393
 AT—Washer, lock, 5/16-inch — 138485
 AU—Screw, input shaft bearing retainer — 7032638
 AV—Retainer, input shaft bearing 7373394
 AW—Screw, cap, 5/16-24NF x $\frac{1}{4}$ — 120741
~~AX—Washer, lock, 5/16-inch — 138485~~
 AY—Nut, retaining, input shaft bearing — 7373392
 AZ—Bearing, ball, input shaft — 700504
 BC—Shaft, input, w/integral gear — 7373391

Figure 108. Transmission assembly—exploded view—Continued.

120. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 108, except where otherwise indicated.

a. Assemble Gears, Bearings, Locating Washers, and Synchronizer Assembly on Main Shaft.

- (1) Clamp main shaft (CC) vertically between copper jaws of a vise with threaded end down. Lubricate all wearing parts with universal gear lubricant (GO).
- (2) Place second speed gear locating washer (U) on main shaft. This is the thinner of the two locating washers.
- (3) Coat bore of second speed gear (T) with grease. Place gear on main shaft so that engaging teeth for first and second sliding gear are down. Insert the 46-second speed gear rollers (S) between gear and shaft.
- (4) Place third speed gear locating washer (R), with chamfered edge up, on shaft.
- (5) Install third speed gear bushing-type bearing (Q), with spline lugs at upper end, on main shaft. Slide third speed gear (P), with synchronizer sliding clutch teeth at upper end, over bushing.
- (6) Install synchronizer gear (N), with groove at upper end, on main shaft.
- (7) Install synchronizer gear snap ring (*fig.* 107) in main shaft groove. Synchronizer gear snap rings (M) are available in thicknesses of 0.087, 0.090, 0.093, and 0.096 inch. The snap ring must retain the synchronizer gear firmly in position and if any end play is evident, a thicker snap ring must be installed.

Caution: End play between the synchronizer gear and snap ring will result in damage to the third speed gear bushing-type bearing.

- (8) Install main shaft pilot bearing spacer (BB) on forward end of main shaft against splined shoulder.

b. Check End Play of Second Speed Gear and Third Speed Gear.

- (1) Change main shaft in vise to a horizontal position.
- (2) Check end play between second speed gear and forward locating washer and between third speed gear and synchronizer gear with a thickness gage (*fig.* 109). Clearance in each case must not exceed wear limits specified in paragraph 344. Excessive clearance indicates one or more used parts that will require replacement with new material. Remove main shaft from vise.

c. Install First and Second Speed Sliding Gear. Place first and

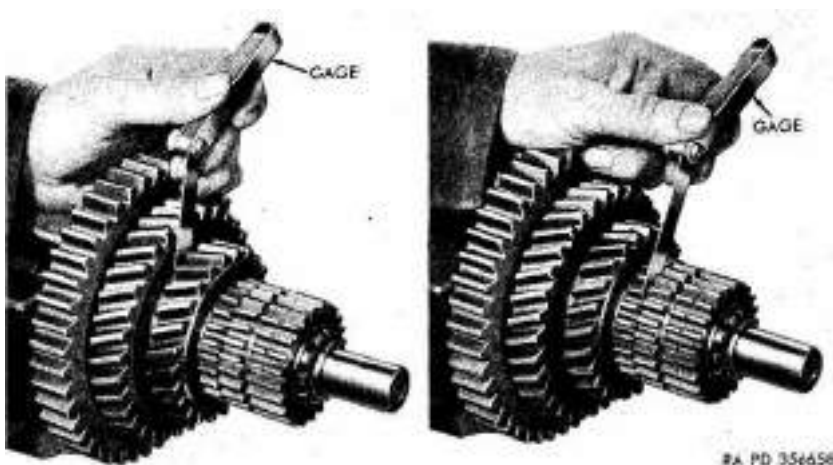


Figure 109. Checking end play of second speed and third speed gears with thickness gage.

second speed sliding gear (V) on main shaft splines with shift fork groove toward threaded end of shaft.

d. *Install Synchronizer Stop Rings and Synchronizer Sliding Clutch.* Place synchronizer outer stop ring (L) on main shaft, followed by synchronizer inner stop ring assembly (K), synchronizer sliding clutch (J), synchronizer inner stop ring assembly (H), and synchronizer outer stop ring (G).

Section VI. REBUILD OF TRANSMISSION CASE COVER ASSEMBLY

121. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 111, except where otherwise indicated.

a. *General.* Care must be exercised in disassembling the transmission case cover assembly (*fig. 110*) as the shifter shafts and shifter shaft interlock plungers will be damaged if the parts are not removed in the proper order. With the cover upside down, notice the position of the various forks and shifter shafts from the gear shift lever end.

b. *Remove Reverse Shifter Shaft.*

- (1) Remove screw locking wire (AA) and $\frac{3}{4}$ -24NF x 27/32 square head screw (BB) from reverse shifter shaft lug assembly (CC).

Caution: Two shifter shaft interlock plungers (B and G) are provided between the three shifter shafts. These plungers, in conjunction with shifter shaft inter-

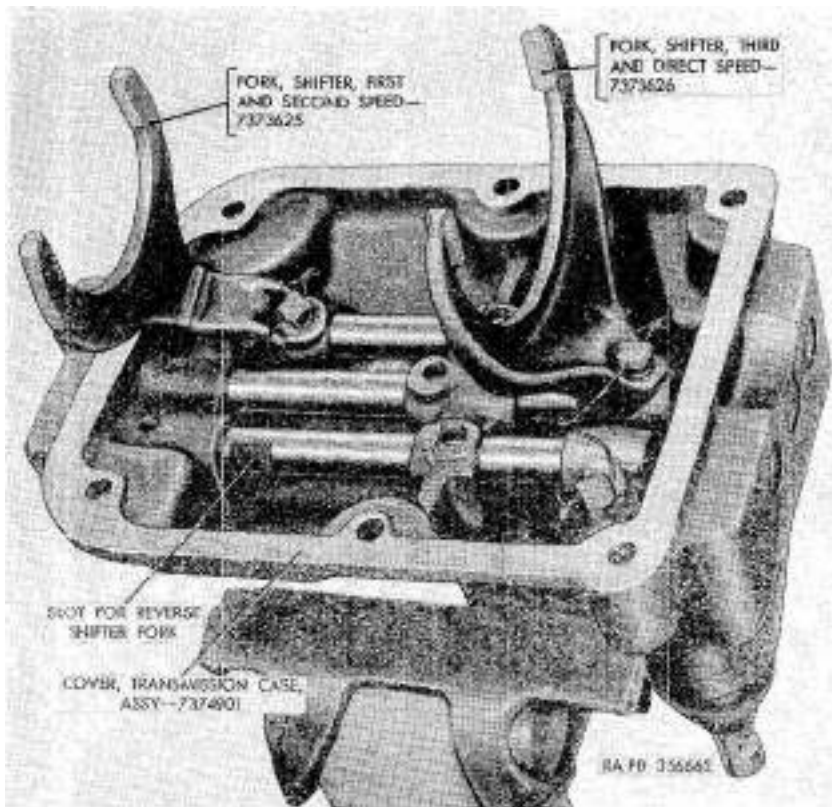


Figure 110. Transmission case cover assembly—bottom view.

lock plunger pin (F) in third and direct speed shifter shaft (D), prevent movement of more than one shifter shaft when the shift lever is moved. If resistance is evident when an attempt is made to move a shifter shaft in the process of disassembly, one of the other shifter shafts is not in a neutral position. Serious damage will occur if this precaution is not observed.

- (2) Drive reverse shifter shaft (J) (with a brass drift and hammer) from the lever end until shifter shaft expansion plug (H) is dislodged from the transmission case cover.

Caution: Before removing shifter shaft, place a finger over the hole in the center boss of transmission case cover to prevent possible injury to personnel or loss of shifter shaft poppet ball (FF) when shaft is moved, as the ball is under considerable spring force.

Push shifter shaft out of case cover and remove poppet ball, shifter shaft poppet ball spring (GG), and reverse shifter shaft lug assembly (CC) from case cover.



Figure 111. Transmission case cover assembly—exploded view.

c. *Remove Third and Direct Speed Shifter Shaft.* Remove screw locking wire (V) and $\frac{3}{4}$ -24NF x 27/32 square-head screw (U) from third and direct speed shifter fork (Z). Remove third and direct speed shifter fork (Z) from shaft before expansion plug is dislodged. Remove third and direct speed shifter shaft (D) in the same manner as reverse shifter shaft (*b* above). Remove shifter shaft interlock plunger pin (F) from shifter shaft.

d. *Remove First and Second Speed Shifter Shaft.* Remove screw locking wires (T and W) and $\frac{3}{4}$ -24NF x 27/32 square-head screws (S and X) from first and second speed shifter shaft lug (R) and first and second speed shifter fork (Y). Remove first and second speed shifter shaft (A), lug, and fork from case cover (*b* above).

e. *Remove Lower Shift Lever.*

- (1) Remove shift lever ball cap (L) from lower shift lever (N)
- (2) Lift end of shift lever compression spring (Q) from under transmission case cover lug with a large screwdriver and force the spring in a counterclockwise direction until it is free of the three case cover lugs. Remove spring, shift lever, and shift lever ball friction plate (P) from case cover. Remove shift lever guide pin (K) from case cover.
- (3) Remove case cover from vise and dislodge the two shifter shaft interlock plungers (B and G) from the passages between the shifter shaft openings in case cover.
- (4) Remove shifter shaft interlock plug (HH) from case cover.

f. *Disassemble Reverse Shifter Shaft Lug Assembly.*

Note. Do not disassemble reverse shifter lug assembly (fig. 112) unless inspection (par. 122c) reveals that replacement of parts is necessary.

- (1) Remove lug plunger snap ring from lug plunger.
- (2) Remove lug plunger and lug plunger compression spring from lug.

g. *Cleaning.* Wash all parts in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

1 22. Inspection (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 111, except where otherwise indicated.

a. *Inspect Shifter Shafts.* Inspect shifter shafts (A, D, and J) for wear, scores, or corrosion. If any of these conditions exist, replace shafts.

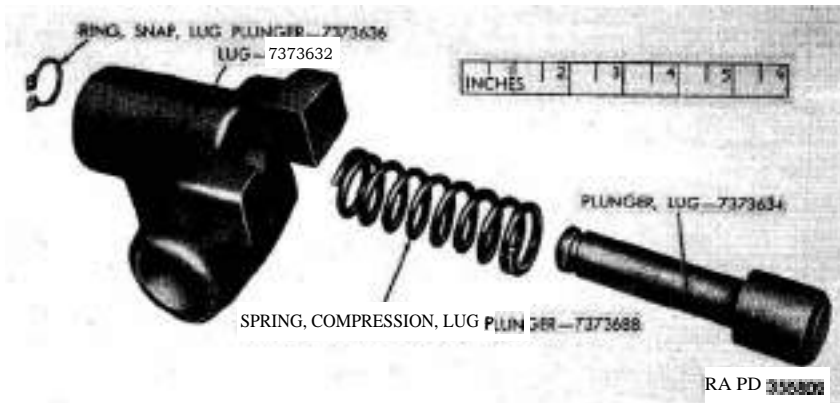


Figure 112. Reverse shifter shaft lug assembly—exploded view.

b. Inspect Shifter Forks. Inspect first and second speed shifter forks (Y) and third and direct speed shifter fork (Z) for misalignment, wear, scores, or cracks. If any of these conditions exist, replace shafts.

c. Inspect Reverse Shifter Shaft Lug Assembly.

Note. If reverse shifter lug plunger (fig. 112) operates under considerable spring tension and the reverse shifter lug snap ring is in good condition, do not disassemble lug assembly.

- (1) Inspect lug plunger for wear or damage. Replace plunger if either of these conditions exist (pars. 121f and 123b) .
- (2) Inspect lug plunger compression spring for free length, compressed length, and damage. If spring does not conform to wear limit specifications in paragraph 344 or is damaged, replace spring (pars. 121f and 123b).
- (3) Inspect lug for wear or damage. If either of these conditions exist, replace lug (pars. 121f and 123b).

d. Inspect Shifter Shaft Poppet Balls and Shifter Shaft Poppet Ball Springs. Inspect shifter shaft poppet balls (DD, EE, and FF) for wear, chipped spots, or corrosion. Replace balls if any of these conditions exist. Inspect shifter shaft poppet ball springs (GG, JJ, and KK) for free length, compressed length, and damage. If spring lengths do not conform to specifications indicated in paragraph 344 or if there is evidence of damage, replace springs.

e. Inspect Shifter Shaft Interlock Plungers and Shifter Shaft Interlock Plunger Pin. Inspect shifter shaft interlock plungers (B and G) and shifter shaft interlock plunger pin (F) for wear, distortion, or corrosion. If any of these conditions exist, replace plungers and/or pin.

l. Inspect Lower Shift Lever and Related Parts.

- (1) Inspect lower shift lever (N) for wear or damage. If either of these conditions exist, replace lever.
- (2) Inspect shift lever-compression spring (Q) for distortion or cracks. If either of these conditions exist, replace spring.
- (3) Inspect shift lever ball friction plate (P) for wear or damage. If either of these conditions exist, replace friction plate.
- (4) Inspect shift lever guide pin (K) for wear or damage. If either of these conditions exist, replace pin.
- (5) Inspect shift lever ball cap (L) for deterioration of rubber. If cap is deteriorated, install a new cap.

p. Inspect First and Second Speed Shifter Shaft Lug. Inspect first and second speed shifter shaft lug (R) for wear or damage. If either condition exists, replace lug.

P. Inspect Transmission Case Cover. Inspect transmission cover (M) for damaged machined surfaces and cracks. If either condition exists, replace cover.

(Be ~~Main chance~~)

Note. The key letters noted in parentheses are in figure 111, except here otherwise indicated.

a. Install Lower Shift Lever and Related Parts,

- 1) Place transmission case cover (M) in vise upside down to facilitate assembly of parts.
- (2) Place shift lever guide pin (K) in opening at top of transmission case cover, with square head of pin inside cover.
- (3) Insert lower shift lever (N) in cover, followed by shift lever ball friction plate (5) and shift lever compression spring (Q). Place end of a large screwdriver against top (large coil) of shift lever spring and strike handle end of screwdriver with palm of hand to force spring under cover retaining lugs (*fig. 113*). It may be necessary to strike screwdriver several times to accomplish complete engagement of spring under cover lugs.
- (4) Check friction plate and make certain it is properly aligned under spring.
- (5) Install shift lever ball cap (L).

b. Assemble Reverse Shifter Shaft Lug Assembly,

- (1) If replacement of reverse shifter shaft lug assembly (*fig. 112*) is necessary (par. 122c), place lug plunger compression spring and lug plunger in lug.
- (2) Push plunger in lug and install lug plunger snap ring.

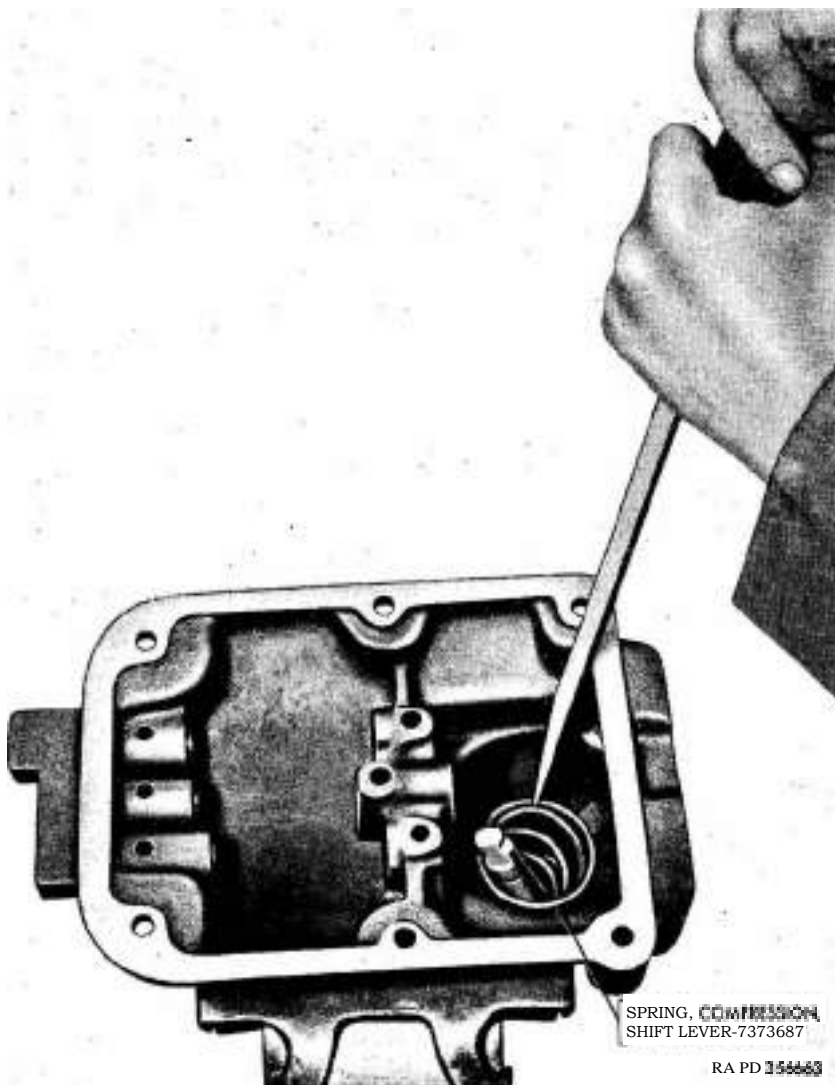
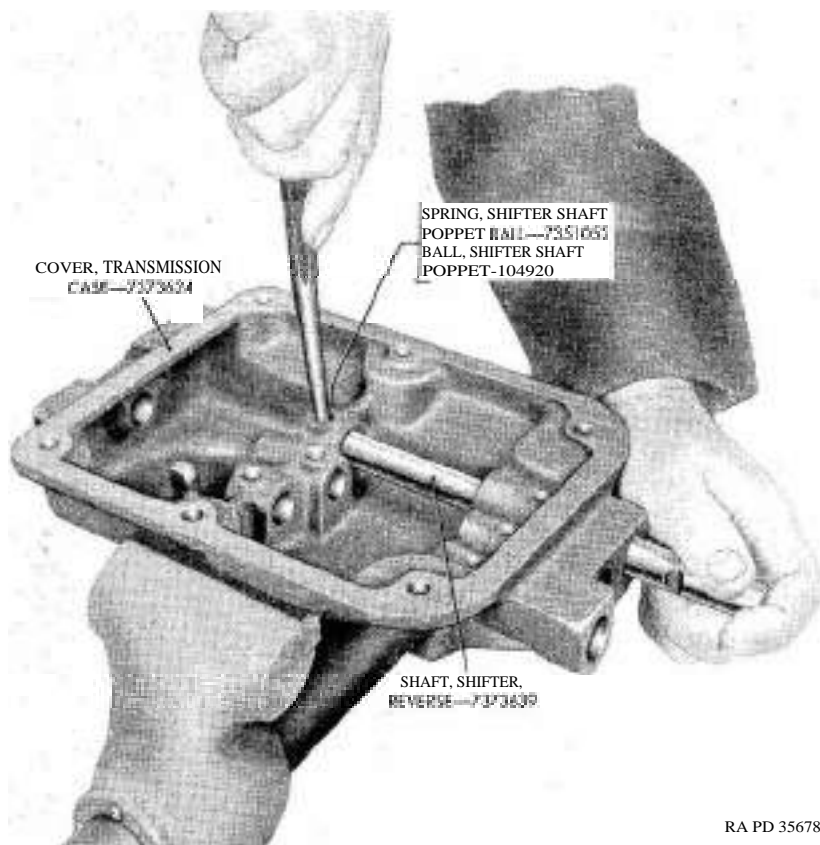


Figure 113. Installing shift lever compression spring.

c. Install Reverse Shifter Shaft.

- (1) Push reverse shifter shaft (J) in transmission case cover (two slots for reverse shifter fork opposite lever end) until shaft just enters opening in boss across center of case cover. Place shifter shaft poppet ball spring (GG) and shifter shaft poppet ball (FF) in drilled recess of cover center boss and hold ball down with a large punch (fig. 114) . Force shifter shaft in against punch and remove punch when shaft has started to cover poppet



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Figure 114. Installing shifter shaft poppet ball.

ball. Push shaft through boss. Position reverse shifter shaft lug assembly (CC) on shifter shaft and push shaft in until lug can be aligned with the screw opening in shaft.

- (2) Install $\frac{3}{8}$ -24NF x 27/32 square head screw (BB) and tighten screw. Install screw locking wire (AA) through screw and around shifter shaft.

d. Install Third and Direct Speed Shifter Shaft.

- (1) Insert shifter shaft interlock plunger (G) in locator (fig. 115). Place locator in case cover third and direct speed shifter shaft opening. Aline interlock plunger with passage in transmission case cover and push plunger into adjacent section of cover casting so that plunger will be between reverse shifter shaft and third and direct speed shifter shaft.

Note. The reverse shifter shaft must be in the neutral position so that the interlock plunger is below the surface of the third and direct speed shifter shaft opening.

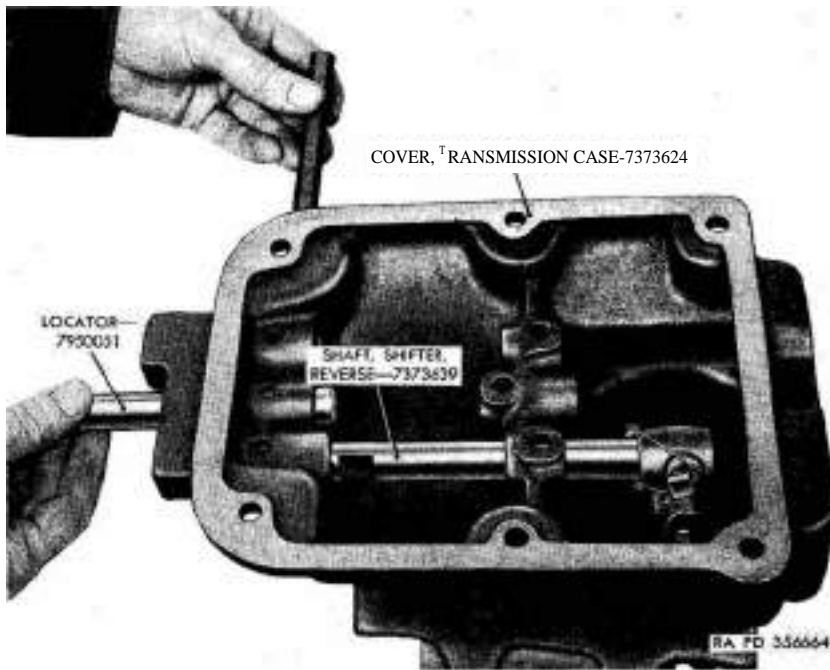


Figure 115. Installing shifter shaft interlock plunger.

- (2) Insert shifter shaft interlock plunger pin (F) in hole in third and direct speed shaft (D). Insert shifter shaft in case cover with interlock plunger pin opposite lever end. Push shaft in until it starts to enter center boss of case cover. Install shifter shaft poppet ball spring (JJ) and shifter shaft poppet ball (EE) (c above). Install third and direct speed shifter fork (Z) (bottom section offset opposite lever end) and align fork on shaft for screw. Install $\frac{3}{4}$ –24NF x 27/32 square head screw (U) and screw locking wire (V).

e. Install First and Second Speed Shifter Shaft.

- (1) Install other shifter shaft interlock plunger (B) in transmission case cover refer to *d* above.

Note. Third and direct speed shifter shaft must be in neutral position before first and second speed shifter shaft (A) can be installed.

- (2) Insert first and second speed shifter shaft in case cover (horizontal groove for poppet ball opposite lever end). Place first and second speed shifter fork (Y) on shaft (bottom of fork offset opposite lever end). Continue to push shifter shaft in until it enters center boss of case cover. Install shifter shaft poppet ball spring (KK) and

shifter shaft poppet ball (DD) (*c* above). Install first and second speed shifter shaft lug (R) on shaft and align fork and lug for screws. Install $\frac{3}{8}$ -24NF x 27/32 square-head screws (S and X) and tighten screws. Install screw locking wires (T and W).

f. Install Shifter Shaft Expansion Plugs.

- (1) Test all shifter shafts for proper operation.
- (2) Install three new shifter shaft expansion plugs (C, E, and H) in shifter shaft openings.

Note. Expansion plugs must be installed with convex surface out, and driven in place with a flat drift of approximately the same diameter as plug.

g. Install Shifter Shaft Interlock Plug in Interlock Plunger Opening. Install a new shifter shaft interlock plug (HH) in the interlock plunger opening of the transmission case cover.

Section VII. ASSEMBLY OF TRANSMISSION FROM SUBASSEMBLIES

124. General

Before installing the subassemblies, it is important to remove all traces of dirt or rust-preventive compounds.

125. Main Shaft and Input Shaft Assemblies (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 108, except where otherwise indicated.

a. General. It is necessary to partially install the main shaft and input shaft assemblies to check end play of synchronizer stop rings. The installation of these assemblies is, therefore, covered as a single operation.

b. Install Main Shaft Assembly in Transmission Case.

- (1) Hold gears and synchronizers together as a group and place main shaft assembly in transmission so that threaded end of shaft will protrude out through bearing opening of case.
- (2) If a main shaft bearing shim (DD) was on the main shaft when transmission was disassembled, place shim on shaft against splined shoulder and follow with the main shaft ball bearing (EE).
- (3) If ball bearing is a tight fit on shaft, install speedometer gear spacer (FF), companion flange (MM), companion

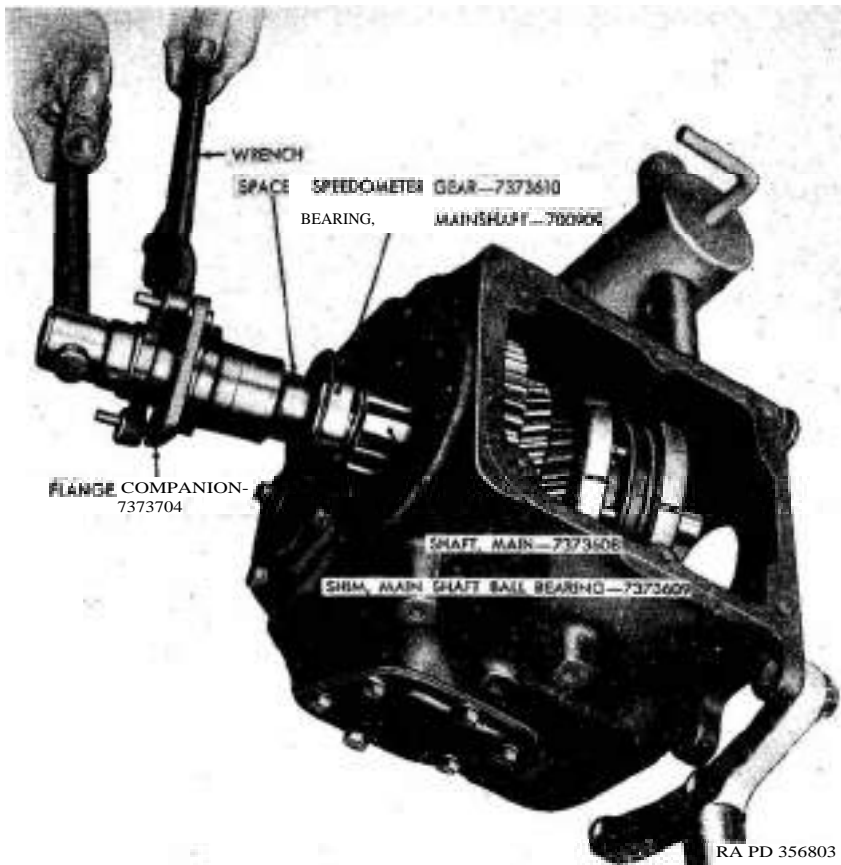


Figure 116. Installing main shaft ball bearing and holding companion flange with wrench.

flange plain washer (NN), and companion flange nut (PP). Hold companion flange and tighten companion flange nut (*fig. 116*) until ball bearing is firmly seated against shim and shaft shoulder.

Caution: Do not drive bearing on shaft with a hammer as this will damage bearing balls and races.

- (4) Position main shaft so that synchronizers are properly aligned and start ball bearing in transmission case. Force ball bearing in case by striking outer ball race with a plastic hammer until bearing snap ring is firmly seated against case.

Caution: Do not force bearing in case by striking end of shaft, as this will damage bearing balls and races.

- (5) Remove companion flange nut, plain washer, and companion flange from main shaft.

c. Install Input Shaft Assembly.

- (1) Place main shaft pilot bearing (AA) in gear end of input shaft with integral gear (BC).
- (2) Rotate input shaft so that open space in teeth for synchronizer sliding clutch will be in line with countershaft gear to provide clearance for engagement of gear teeth (fig. 98). Drive input shaft and input shaft ball bearing (AZ) into transmission case with a plastic hammer, making certain input shaft is properly engaged with synchronizer outer stop ring (G).

Caution : Do not strike end of input shaft to force ball bearing into transmission case, as this will damage bearing balls and races. Strike outer race of ball bearing to force bearing in transmission case.

d. Check End Play of Synchronizer Assembly.

Note. If end play of synchronizer assembly is checked before the input and main shaft bearing retainers (HH and AV) are installed, time can be saved.

- (1) Make certain input shaft and main shaft ball bearing snap rings are firmly seated against transmission case.
- (2) Align synchronizer inner and outer stop rings together, as an assembly, against the input-shaft gear.

Note. This operation must be carefully performed to insure an accurate check of the end play.

- (3) Measure space between synchronizer outer stop ring (L) and third speed gear (P) with two sets of thickness gages (fig. 117). Thickness gages must be placed simultaneously between the upper and lower surfaces of the synchronizer outer stop ring and third speed gear. The space must conform to the dimensions indicated in paragraph 344.
- (4) If clearance between synchronizer outer stop ring and third speed gear is not in conformance with specifications, remove input shaft (par. 110) and main shaft ball bearing (par. 111). Add or remove main shaft ball bearing shim (DD) as required. Install main shaft ball bearing, main shaft assembly, and input shaft assembly (*b* and *c* above).

e. Install Reverse Shifter Fork and Reverse Shifter Fork Shaft.

Position reverse shifter fork (Y) in groove of reverse idler gear assembly (X). Insert reverse shifter fork shaft (RR) into case, with large diameter end of shaft toward rear end of transmission case, and drive shaft in until it is firmly seated in transmission case.

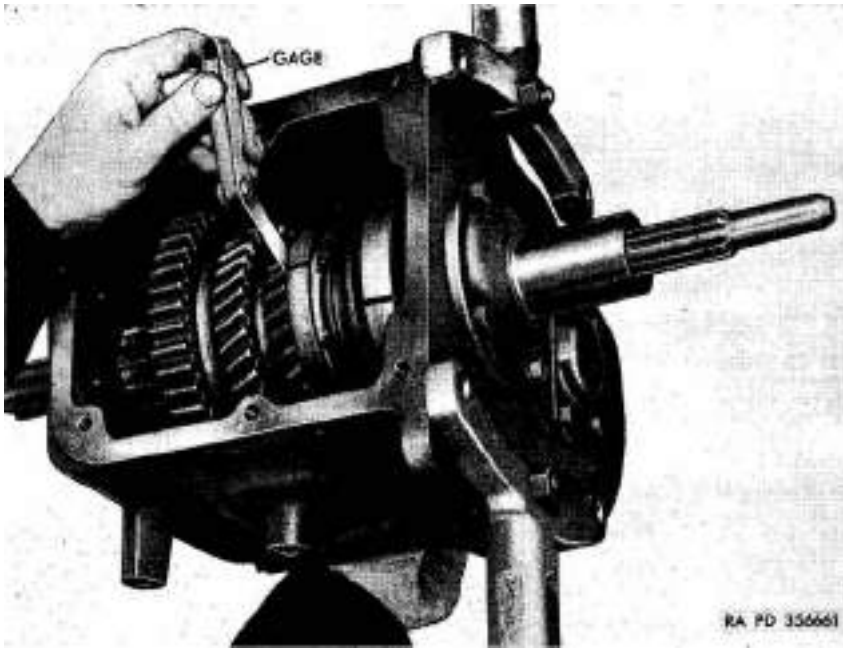


Figure 117. Checking end play of synchronizer assembly with thickness gage.

f. Install Input and Main Shaft Bearing Retainers.

- (1) Prepare main shaft oil seal (LL) by soaking in castor oil or Neatsfoot oil for about 30 minutes and work leather by rolling with a smooth round bar (fig. 55) before installing.
- (2) Coat outside surface of main shaft oil seal (LL) with plastic-type gasket cement and position seal in main shaft bearing retainer (HH) with edge of leather toward transmission case and drive seal in flush with outer edge of bearing retainer.
- (3) Position input shaft bearing retainer (AV) over shaft and against transmission case without input shaft bearing retainer gaskets (AS). Hold bearing retainer firmly against transmission case, and check clearance between retainer and case with a thickness gage (fig. 118). Gaskets have a normal thickness of 0.010 inch and total thickness of required gaskets must be 0.006 inch more or less (plus or minus 0.006 inch) than clearance between retainer and case.

Note. If clearance between retainer and case is 0.025 inch, install two gaskets.

- (4) Position gaskets and retainer on transmission case. In-

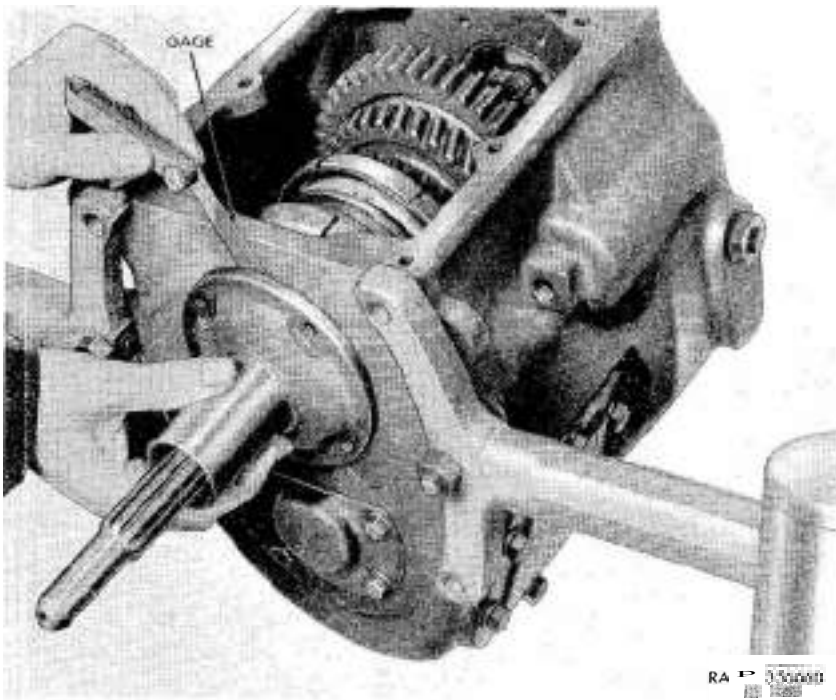


Figure 118. Checking clearance between input shaft bearing retainer and case with thickness gage.

stall two 5/16-inch lock washers (AX) and two- 5/16-24NF x cap screws (AW) at top of retainer. Install two 5/16-inch lock washers (AT) and two input shaft bearing retainer screws (AU) at bottom of retainer. Tighten screws.

- (5) Check clearance between main shaft bearing retainer (HH) and transmission case ((3) above).
- (6) Position main shaft bearing retainer gaskets (CC) and retainer on transmission case and install 5/16-inch lock washers (JJ) and 5/16-18NC x 1 cap screws (KK) . Tighten screws.

g. Install Companion Flange on Main Shaft.

- (1) Make certain speedometer gear spacer (FT) is on threaded end of main shaft.
- (2) Install companion flange (MM) followed by companion flange plain washer (NN) and companion flange nut (PP). Engage first and second speed sliding gear with countershaft gear and synchronizer sliding clutch with input shaft gear, which will lock main shaft assembly so that companion flange nut can be tightened. Tighten corn-

panion flange nut to 140 to 160 pound-feet torque with a torque indicating wrench. Install a new $1/8 \times 15/8$ cotter Pin (QQ).

h. Install Power-Take-Off on Transmission. If transmission is equipped with a power-take-off assembly, install power-take-off (par. 134b).

CHAPTER 8

POWER-TAKE-OFF

Section I. DESCRIPTION AND DATA

127. Description

The power-take-off (fig. 119), which is mounted on left side of transmission, transmits power from transmission to the winch drive shaft for operation of the winch. The power-take-off provides clockwise and counterclockwise rotation. Both are controlled by a shift lever in driver's compartment.

128. Data

Make ----- Detroit Harvester
Model ----- **DH-12530**
Type ----- single speed and reverse
Drive ----- transmission countershaft gear
Bearings :
 Drive shaft (2) ----- tapered roller
 Idler gear (2) ----- tapered roller
 Reverse gear (2) ----- straight roller
 Lubrication ----- from transmission

Section II. REBUILD OF POWER-TAKE-OFF

129. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 120, except where otherwise indicated.

a. General. The removal and installation of the power-take-off assembly on the vehicle are considered field maintenance operations and are described in section III, this chapter. The following procedures are based on the assumption that the power-take-off assembly is removed from the transmission.

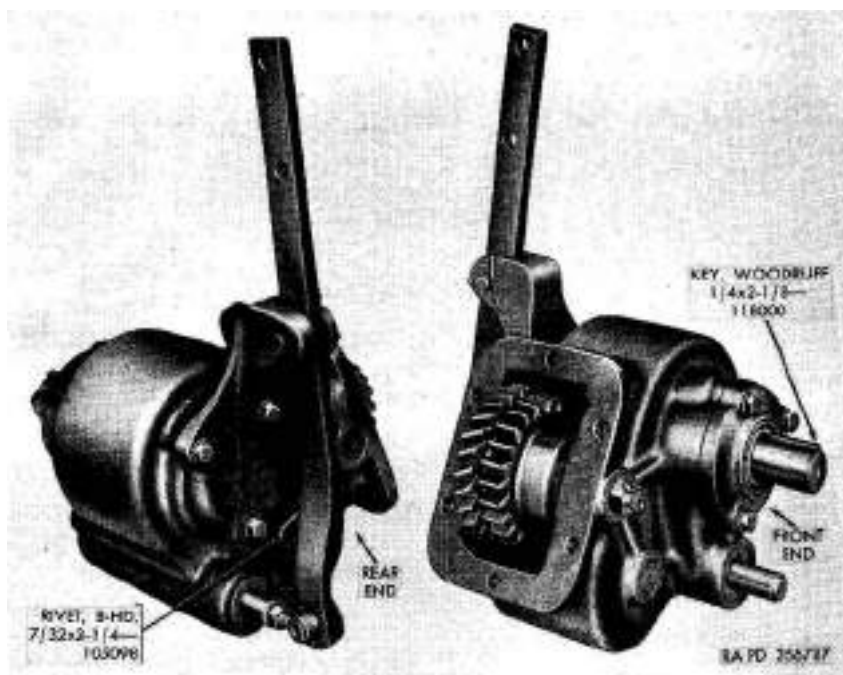


Figure 119. Power-take-off.

b. Cleaning. Clean exterior of power-take-off assembly with volatile mineral spirits or dry-cleaning solvent.

c. Remove Lower Shift Lever From Power-Take-Off.

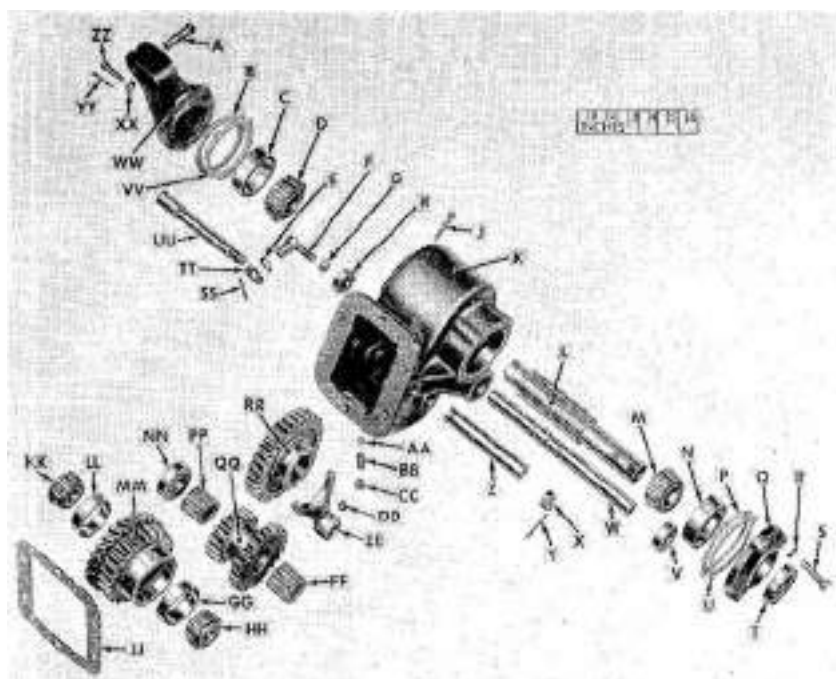
- (1) Remove cotter pin (SS) from shifter shaft eye bolt assembly (F) ; then remove plain washer (TT) and eye bolt spring washer (E) from bolt.
- (2) Remove $\frac{1}{8} \times 1\%$ cotter pin (YY) from shift lever clevis pin (A). Remove clevis pin and lower shift lever.

d. Remove Idler Gear Shaft and Idler Gear Bearing Cups and Cones.

- (1) Remove $\frac{5}{32} \times 1\frac{3}{4}$ cotter pin (Y) and $\frac{1}{2}$ -20NF slotted nut (X) from idler gear shaft (UU).
- (2) Drive idler gear shaft from housing (K) with a bronze drift and hammer (drift against threaded end of shaft).
- (3) Remove idler gear (MM) and idler gear bearing cones (HH and KK) from housing.
- (4) Remove idler gear bearing cups (GG and LL) from idler gear with a bronze drift and hammer.

Note. Bearing cups should not be removed from idler gear unless inspection (par. 130c) reveals that replacement is necessary.

e. Remove Slotted Headless Pipe Plug, Shifter Shaft Ball



- LEVER—7351267
GASKET DRIVE SHAFT PLATE
OIC THRO—7351237
DRIVE SHAFT BEARING—702744
DRIVE SHAFT BEARING—705834
E—WASHER, SPG. EYE BOLT—7351136
F—BOLT, EYE, SHIFTER SHAFT ASSY—
- G—NU
H—SEA
J—NVI
K—H
L—
M—
N—
O—
P—
Q—
R—
S—
T—
U—
V—
W—
X—
Y—
Z—
- AA—BALL SHIFTER SHAFT, 7/16 IN-104921
BB—SPRING SHIFTER SHAFT BALL-7351140
CC—FLUG. PIPE, SLOTTED, HEADLESS,
3/4 IN-113931
DD—SCREW SET, 3/8-16NC x 7/16-139413
EE—FORK, SHIFTER-7705757
FR—BEARING, ROLLER, REVERSE GEAR-
708224
GG—CUP, IDLER GEAR BEARING—707065
HH—CONE, IDLER GEAR BEARING-705369
JJ—GASKET, POWER TAKE-OFF—7351234
KK—CONE IDLER GEAR BEARING-705369
LL—GEAR BEARING—707065
MM—GEAR IDLER—7374903
NN—SPACER REVERSE GEAR—OH-12031
OO—ROLLER REVERSE GEAR—
708224
PP—GEAR REVERSE—7351234
RR—GEAR, SLIDING—7705754
SS—PIN COTTER, 1/8 x 1-5/8—119209
TT—WASHER, PLAIN, 15/32 ID, 59/64 OD
120395
VV—GASKET, DRIVE SHAFT PLATE,
(0.020 THK)—7351234
WW—PLATE DRIVE SHAFT END—OH-61
XX—WASHER, LOCK, 5/16 IN-1300 H
3/8—119209
YY—BEW. CAP, 3/16-16NC x 3/4—123302
- PA F- 356699

Figure 120. Power-take-off—exploded view.

Spring, and Shifter Shaft Ball. Remove $\frac{1}{4}$ -inch slotted headless pipe plug (CC) from housing. Remove shifter shaft ball spring (BB) and 7/16-inch shifter-shaft ball (AA) from bottom of power-take-off housing. This will facilitate removal of the reverse gear (*f* below).

f. Remove Reverse Gear Shaft, Reverse Gear, and Reverse Gear Roller Bearings.

- (1) Remove 5/16-18NC x $\frac{3}{4}$ cap screws (ZZ) and 5/16-inch washers (XX) ; then remove drive shaft end plate (WW) and drive shaft plate gaskets (B and VV) from housing. This is necessary to facilitate removal of rivet from reverse gear shaft (Z).
- (2) Cut off bent-over end of rivet (*fig. 119*) with a cold chisel and hammer. Drive rivet from housing with a punch and hammer.
- (3) Drive reverse gear shaft (Z) from housing with a bronze drift and hammer (drift at front end of shaft).
- (4) Remove reverse gear spacer (NN). Move sliding gear (RR) toward rear of housing to facilitate removal of reverse gear (QQ) . Remove reverse gear and reverse gear roller bearings (FF and PP).

g. Remove Drive Shaft and Drive Shaft Bearing Cones and Bearing Cups.

- (1) Remove $\frac{1}{4}$ x $2\frac{1}{8}$ Woodruff key (*fig. 119*) from front end of drive shaft (L). Remove burrs from area of keyway in drive shaft.
- (2) Remove 5/16-18NC x $\frac{3}{4}$ cap screws (S), 5/16-inch lock washers (R) , drive shaft oil seal retaining plate (Q), and drive shaft plate gaskets (U and P) from housing (K).
- (3) Force front drive shaft bearing cup (N) and drive shaft (L) from housing with an arbor press.
- (4) Pull front drive shaft bearing cone (M) from drive shaft with a puller (*fig. 121*).
- (5) Force drive shaft and rear drive shaft bearing cup (C) from power-take-off housing with an arbor press.

Caution: Removal must be handled in this manner to prevent brinnelling of the bearing cups. Do not use a hammer.

- (6) Press rear drive shaft bearing cone (D) from drive shaft.

h. Remove Shifter Shaft, Shifter Fork, and Sliding Gear. Remove $\frac{3}{8}$ -16NC x 7/16 set screw (DD) in shifter fork (EE) with a 3/16-inch set screw wrench. Pull shifter shaft (W) from hous-

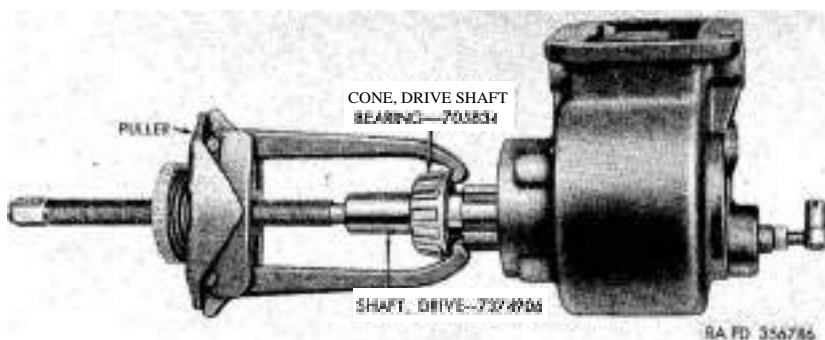


Figure 121. Removing drive shaft bearing cone with puller.

ing. Remove sliding gear (RR) and shifter fork (EE). Remove shifter shaft eye bolt assembly (F) and $\frac{3}{8}$ -24NF nut (G).

i. *Remove Shifter Shaft Oil Seals and Drive Shaft Oil Seal.*

- (1) Remove shifter shaft oil seals (H and V) from housing.
- (2) Remove drive shaft oil seal (T) from drive shaft oil seal retaining plate (Q).

j. *Clean Parts.* Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearings, with dry compressed air.

Caution: Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

130. Inspection (Depot Maintenance)

(fig. 120)

a. *Inspect Housing.* Inspect machined surfaces of housing (K) for burrs and other visual damage. If any cracks are evident or machined surfaces are damaged, replace housing.

b. *Inspect Gears.*

- (1) Inspect idler gear teeth (MM) and bearing bores for wear, scores, chips, or cracks. If any of these conditions exist, replace gear.
- (2) Inspect teeth of reverse gear (QQ) for wear, scores, chips, or cracks. If any of these conditions exist, replace gear. Measure diameter of bearing bore with a micrometer, and, if dimension exceeds wear limit in paragraph 345, replace gear.
- (3) Inspect splines and teeth of sliding gear (RR) and grooves of shifter fork (EE) for wear, scores, chips, or cracks. If any of these conditions exist, replace gear.

c. Inspect Bearings.

- (1) Inspect idler gear and drive shaft bearing cones (D, M, HH, and KK) and drive shaft bearing cups (C, N, GG, and LL) for wear, scores, chips, or cracks. If any of these conditions exist, ~~replace~~ bearing cups and cones (pars. 129d and 131c).
- (2) Inspect reverse gear roller bearings (FF and PP) for wear, scores, chipped rollers, or damaged cages. If any of these conditions exist, replace bearings.

d. Inspect Shafts.

- (1) Inspect idler gear shaft (UU) for damaged threads, burs, or other visual damage. If shaft or threads are damaged, replace shaft.
- (2) Inspect reverse gear shaft (Z) for wear and measure diameter at worn spots with a micrometer. If diameter of shaft is less than the wear limits in paragraph 345, replace shaft.
- (3) Inspect drive shaft (L) for damaged or worn splines, worn oil seal contact surface, or cracks. If any of these conditions exist, replace shaft.
- (4) Inspect shifter shaft (W) for damaged shifter shaft ball grooves or wear at oil seal contact surfaces. If shifter shaft ball grooves or oil seal contact surfaces are worn, replace shaft. If diameter of shaft is less than the wear limits in paragraph 345, replace shaft.

e. Inspect Shifter Shaft Ball and Shifter Shaft Ball Spring.

- (1) Inspect 7/16-inch shifter shaft ball (AA) for wear, chips, or cracks. If any of these conditions exist, replace ball.
- (2) Check shifter shaft ball spring (BB) with spring tester. If spring does not conform to specifications in paragraph 345, replace spring.

131. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 120, except where otherwise indicated.

a. Install ~~Shifter~~ Shaft Oil Seals in Housing. Coat outer surface of shifter shaft oil seals (H and V) with plastic-type gasket cement. Install seals in housing (K) with lips of seals facing in.

b. Install Shifter Fork, Sliding Gear, and Shifter Shaft.

- (1) Place sliding gear (RR) and shifter fork (EE) in housing (K) with groove in gear and ~~3/8-16NC~~ $\frac{3}{8}$ -16NC x 7/16 set screw (DD) in shifter fork toward front of housing.
- (2) Insert shifter shaft (W) into housing and through

shifter fork (eye bolt threads in shaft must be at rear of housing). Align shifter fork with set screw recess in shifter shaft. Tighten set screw with 3/16-inch set screw wrench. Install shifter shaft eye bolt assembly (F) and $\frac{3}{8}$ -24NF nut (G).

c. Install Drive Shaft and Drive Shaft Bearing Cones and Bearing Cups.

- (1) Press drive shaft bearing cone (D) on short machined end of drive shaft (L) with an arbor press.

Caution : Small end of bearing cone must be toward end of shaft.

- (2) Insert drive shaft through sliding gear from rear of housing. Lubricate bearing cone with universal gear lubricant (GO). Tap drive shaft bearing cup (C) into rear of housing with a plastic hammer.
- (3) Install other drive shaft bearing cone (M) on front end of drive shaft (L) with an arbor press (small end of bearing cone toward end of shaft).
- (4) Lubricate bearing cone with universal gear lubricant (GO). Drive other drive shaft bearing cup (N) into front of housing with a plastic hammer.

d. Adjust Preload of Drive Shaft Bearings.

- (1) Position drive shaft plate gaskets (B and VV) (one each of 0.010 and 0.020 inch thickness) and drive shaft end plate (WW) on rear of housing. Coat 5/16-18NC x cap screws (ZZ) with plastic-type gasket cement. Install 5/16-inch lock washers (XX) and screws. Tighten screws.
- (2) Position drive shaft plate gaskets (P and U) (one each of 0.010 and 0.020 inch thickness) and drive shaft oil seal retaining plate (Q) on front of housing. Coat 5/16-18NC x $\frac{3}{4}$ cap screws (S) with plastic-type gasket cement. Install 5/16-inch lock washers (R) and screws. Tighten screws.
- (3) Rotate drive shaft several revolutions to seat bearings.

Note. When bearings are properly adjusted, a slight drag must be apparent as drive shaft is rotated. Remove or add gaskets as required to obtain a correct adjustment of drive shaft bearings.

e. Install Drive Shaft Oil Seal. Coat exterior of drive shaft oil seal (T) with plastic-type gasket cement. Install oil seal in drive shaft oil seal retaining plate (Q) with lip of seal toward bearing.

Caution : Exercise extreme care when oil seal is installed to prevent damage to seal as it passes over drive shaft key slot.

f. Install Reverse Gear and Reverse Gear Shaft.

- (1) Lubricate reverse gear roller bearings (FF and PP) with universal gear lubricant (GO) and position bearings in gear.
- (2) Position reverse gear (QQ) and reverse gear spacer (NN) in housing with large gear toward front and spacer at rear. Insert reverse gear shaft (Z) in rear of housing (rivet groove at opposite end). Drive shaft into position until rivet groove and hole in housing are aligned.
- (3) Install 7/32 x 21,4 button-head rivet (J) and bend over protruding end to lock rivet in place (fig. 119).

g. Install Idler Gear Bearing Assemblies, Idler Gear, and Idler Gear Shaft.

- (1) If replacement of idler gear bearing cups (GG and LL) is necessary (par. 130c), remove dirt and burrs from bearing cup counterbores and press cups in idler gear (MM) with an arbor press (thin edge of cups out). Make certain cups are firmly seated against shoulder of counterbores.
- (2) Lubricate idler gear bearing cones (1111 and KK) with universal gear lubricant (GO) and place cones in idler gear. Position idler gear in power-take-off housing with large helical gear toward rear of housing. Install idler gear shaft (UU) from rear of housing and install ~~1/2-20NF~~ slotted nut (X).

h. Adjust Idler Gear Bearings. Tighten nut, one slot at a time, until a slight drag is apparent as gear is rotated. Install new 5/32 x 1 ³/₄ cotter pin (Y).

Note. These bearings must be preloaded.

i. Install Lower Shift Lever, Shifter Ball, Shifter Shaft Ball Spring, and Pipe Plug.

- (1) Position lower shift lever on shifter shaft eye bolt assembly (F) and in drive shaft end plate (WW). Insert shift lever clevis pin (A) in end plate and install new 1/8 x 15/8 cotter pin (YY).
- (2) Install eye bolt spring washer (E) on eye bolt; then install 15/32 ID, 59/64 OD plain washer (TT) and new 1/8 x 15/8 cotter pin (SS).
- (3) Install 7/16-inch shifter shaft ball (AA), shifter shaft ball spring (BB), and ~~1/4-inch~~ slotted headless pipe plug (CC) in bottom of housing. Operate shift lever to make

certain shifter shaft ball indexes with each of three grooves in shifter shaft.

Note. If it is apparent that the ball is not indexing with forward groove in shifter shaft, it will be necessary to remove shift lever and elongate, either or both, the eye bolt or clevis pin holes. If either the eye bolt hole or the clevis pin hole *is* not sufficiently elongated, movement of shifter shaft will be restricted when the lever is moved to the extreme forward position.

Section III. TEST AND ADJUSTMENT

132. General

If replacement of power-take-off is necessary on a vehicle, the transmission and power-take-off must be removed and replaced as an assembly. Refer to TM 9-840 for information pertaining to removal and installation of transmission.

133. Removal (Field and Depot Maintenance)

Remove stud nuts, lock washers, power-take-off, and power-take-off gaskets from transmission.

134. Installation (Field and Depot Maintenance)

a. *General.* The power-take-off assembly must be installed on transmission with proper backlash between power-take-off idler gear and transmission countershaft gear. This is controlled by gaskets between power-take-off housing and transmission. Thickness of the power-take-off gasket is 0.005 inch.

b. *Install Power-Take-Off Assembly on Transmission.*

- (1) Position six new power-take-off gaskets (JJ, *fig.* 120) and power-take-off assembly on transmission. Install $\frac{1}{2}$ -inch lock washers and $\frac{1}{2}$ -24NF nuts on studs in transmission case, but do not tighten nuts.
- (2) Remove power-take-off opening cover from right side of transmission. This is necessary in order to check backlash between power-take-off idler gear and transmission countershaft gear.
- (3) Install a dial indicator (*fig.* 122) on right side of transmission to contact countershaft gear. Insert a screwdriver through right side of transmission to prevent power-take-off idler gear from moving. When idler gear is locked with screwdriver, movement of transmission

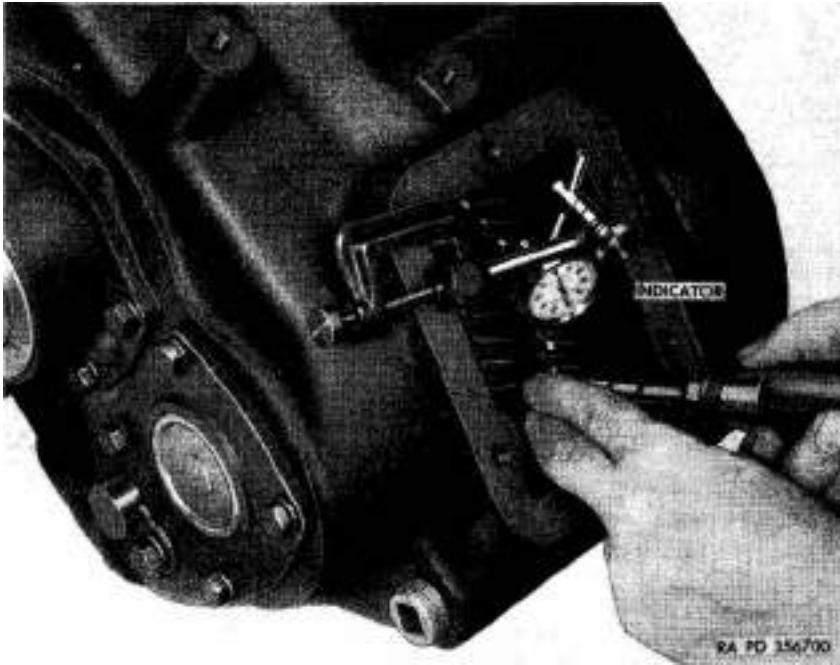


Figure 122. Checking power-take-off gear backlash with indicator.

countershaft gear will indicate backlash on the dial indicator.

Note. If this check is performed with transmission in vehicle, the clutch pedal must be held in the depressed position until check is completed so that transmission gears will be free to rotate.

- (4) Tighten nuts on studs and simultaneously check backlash between gears. If backlash drops to less than 0.001 inch do not continue to tighten nuts as additional gaskets must be installed.

Caution : If stud nuts are tightened with insufficient gaskets between power-take-off assembly and transmission and no backlash exists between gears, serious damage will occur to power-take-off assembly or transmission.

Repeat operations above and add or remove gaskets so that backlash, with stud nuts tightened, will conform to specifications in paragraph 345.

- (5) Remove dial indicator, and replace power-take-off opening cover gasket, cover, $\frac{3}{8}$ -inch lock washers, and $\frac{3}{8}$ 16NC x $\frac{3}{4}$ cap screws. Tighten screws.

135. Eye Bolt Adjustment (Field Maintenance)

a. *General.* When a power-take-off assembly is replaced or a cab is changed, the shifter shaft eye bolt assembly (F, fig. 120) may require adjustment to insure clearance between shift lever and opening in transmission floor front cover when shift lever is in the extreme forward and rear positions.

b. *Adjust Shifter Shaft Eye Bolt (fig. 120).*

- (1) Loosen $\frac{3}{8}$ 24NF nut (G) on shifter shaft eye bolt assembly (F). Remove $1\frac{1}{8}$ x $1\frac{5}{8}$ cotter pin (SS), 15/32 ID, 59/64 OD plain washer (TT), and eye bolt spring washer (E) from shifter shaft eye bolt assembly.
- (2) Remove $\frac{1}{8}$ x $1\frac{5}{8}$ cotter pin (YY) from lower shift lever clevis pin (A). Remove clevis pin from drive shaft end plate (WW). Raise lower shift lever and disconnect lever from eye bolt.
- (3) Turn eye bolt in or out as required, to obtain a proper adjustment.
- (4) Connect lever to eye bolt. Install spring washer, plain washer, and new $1\frac{1}{8}$ x $1\frac{5}{8}$ cotter pin.
- (5) Install clevis pin through end plate and shift lever. Install new $1\frac{1}{8}$ x $1\frac{5}{8}$ cotter pin. Align eye bolt and tighten nut.

CHAPTER 9

TRANSFER

Section I. DESCRIPTION AND DATA

136. Description

The transfer assembly (fig. 123) , as the name implies, provides for the transfer of engine torque from the transmission to the front and rear driving axles. The assembly consists of a single-piece case, two helical gear trains in constant mesh, and sliding clutch gears for control of the two speed ranges and front axle drive. All gears and shafts are mounted on ball, straight roller, or tapered roller bearings.

137. Data

Make ----- New Process
Model ----- 88845
Type ----- two-speed, helical gear
Gear ratios :
 Low ----- 1.96 : 1.00
 High ----- 1.00 : 1.00
Drive ----- propeller shaft from transmission
Bearings :
 Input shaft ----- ball and straight roller
 Front axle output shaft ----- ball and straight roller
 Rear axle output shaft (2) ----- tapered roller
 Brake output shaft (2) ----- tapered roller
 Idler gear (2) ----- tapered roller

Section II. DISASSEMBLY OF TRANSFER INTO SUBASSEMBLIES

138. General

The transfer assembly is divided into three subassemblies : brake output shaft bearing retainer assembly (*fig. 123*), rear axle output

shaft bearing retainer assembly (fig. 123), and the transfer case which consists of the idler gear, input shaft, front axle output shaft (fig. 123), and shifter parts. The following procedures are based on the assumption that the transfer assembly (fig. 123) is removed from the vehicle. Information pertaining to the servicing of the hand brake assembly, which is mounted on the rear of the transfer, is contained in chapter 11.

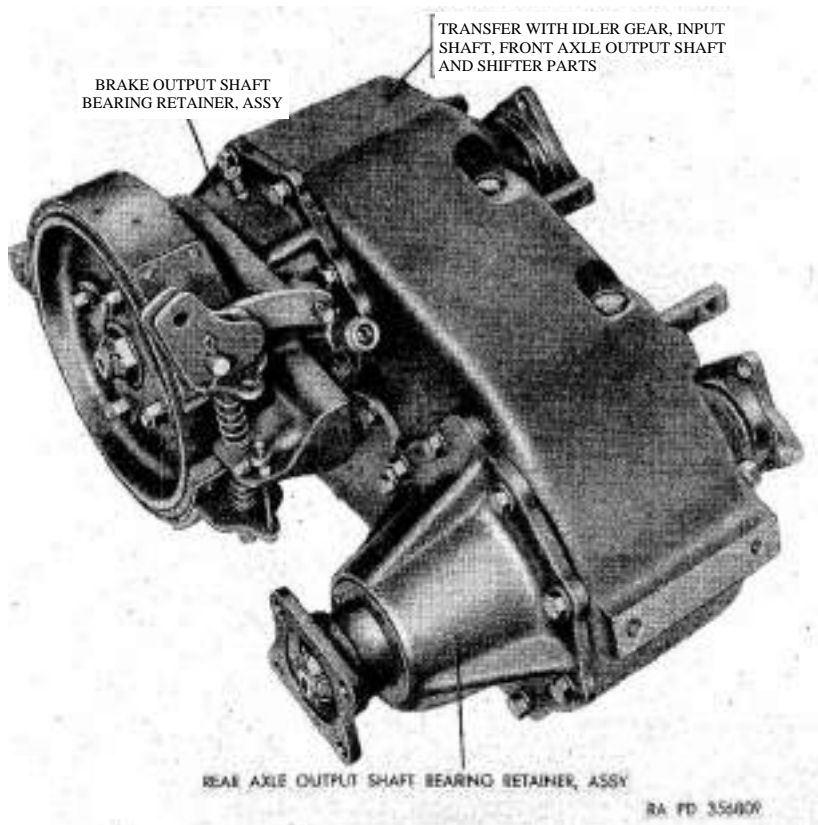


Figure 123. Transfer assembly.

139. Draining and Cleaning (Field and Depot Maintenance)

- a. *Draining.* Remove $\frac{3}{4}$ -inch pipe plug (U, fig. 135) from bottom of transfer case and drain lubricant.
- b. *Cleaning.* Clean exterior of transfer assembly with volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

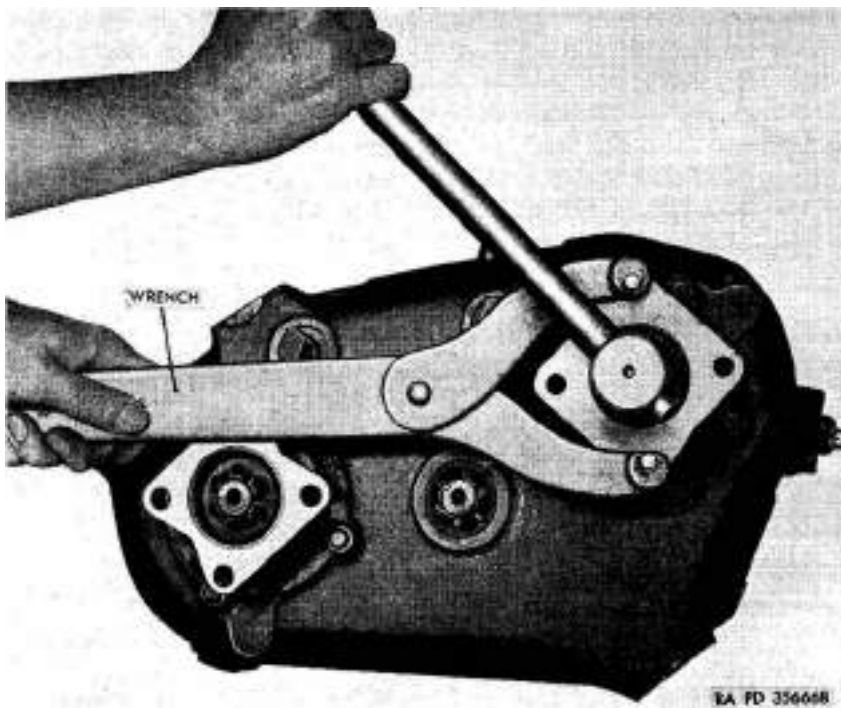


Figure 124. Holding companion flange with wrench—41-W-1277-10.

140. Brake Output Shaft Bearing Retainer Assembly (Field and Depot Maintenance)

a. *Loosen Companion Flange.* Remove $\frac{1}{8} \times 1 \frac{5}{8}$ cotter pin (DD, fig. 128) from 7/16-16NC slotted nut (EE, fig. 128) . Apply hand brake and loosen nut.

b. *Remove Brake Output Shaft Bearing Retainer Assembly.* Remove cap screws, nuts from studs, and lock washers, which hold brake output shaft bearing retainer assembly to transfer case. Remove retainer assembly and gasket from transfer case.

141. Rear Axle Output Shaft Bearing Retainer Assembly (Field and Depot Maintenance)

a. *General.* To facilitate disassembly of the rear axle output shaft bearing retainer assembly, it is necessary to remove the companion flange and companion flange oil seal before the bearing retainer assembly is removed from transfer case. This is necessary in order to provide a support for the screw in remover 41—R-2372-215 (fig. 125).

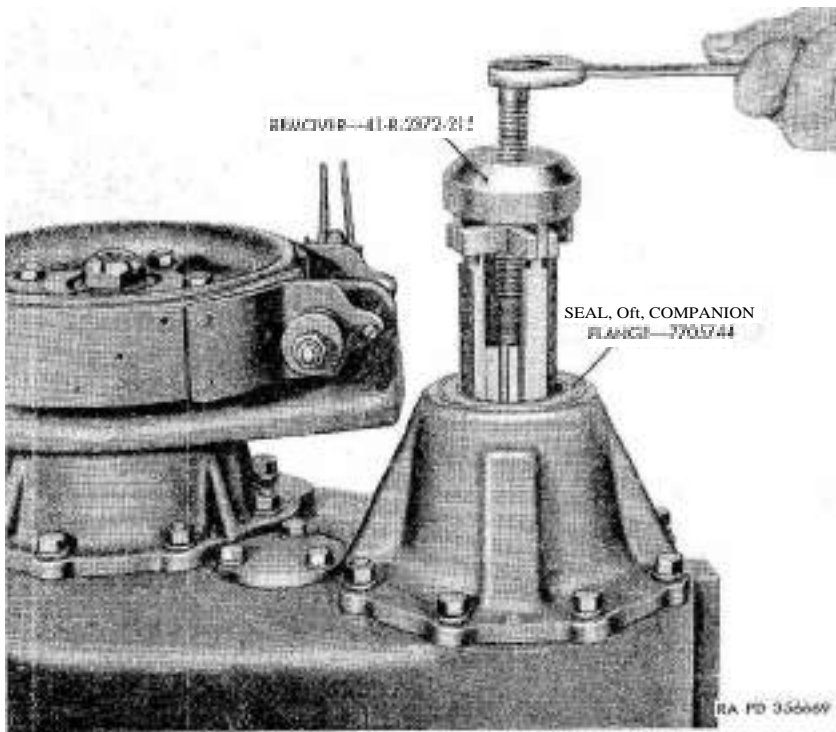


Figure 125. Removing companion flange oil seal.

b. Remove Rear Axle Output Shaft Bearing Retainer Assembly.

Note. The key letters noted in parentheses are in figure 132, except where otherwise indicated.

- (1) Remove $\frac{1}{8}$ x 1% cotter pin (C) from $\frac{7}{8}$ -16NC slotted nut (D).
- (2) Hold companion flange with a wrench 41—W-3277-40 (fig. 124) and loosen slotted nut. Remove nut and 29/32 ID, 1 $\frac{3}{4}$ OD plain washer (E).
- (3) Remove companion flange (F) from shaft. If companion flange is a tight fit on shaft, remove flange with a puller (fig. 76).
- (4) Remove companion flange oil seal (G) with remover 41—R-2372-215 (fig. 125).
- (5) Remove screws, nuts from studs, and lock washers, which hold rear axle output shaft bearing retainer assembly to transfer case. Remove retainer assembly and gasket from transfer case.

Section III. REBUILD OF BRAKE OUTPUT SHAFT BEARING RETAINER ASSEMBLY

142. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 128, except where otherwise indicated.

a. General.

- (1) In addition to the brake output shaft bearing retainer assembly with bearing cups, the assembly is also available complete with all related parts.
- (2) The bearing cups can be inspected in the bearing retainer and must not be removed unless inspection (par. 143a) reveals replacement is necessary.

b. Remove Brake Band With Lining Assembly.

- (1) Remove 3/32 x 3/4 cotter pin (M) from brake spacer link stud (J). Disconnect brake spacer link (L) from brake spacer link stud.
- (2) Remove 7/16-14NC nuts (BB and CC), 1 1/2 ID, 1 1/4 OD plain washer (AA), and, on brakes so equipped, brake operating compression spring (Z) from brake adjusting bolt (P).
- (3) Remove brake adjusting bolt (P), brake cam levers (N and Q), brake spacer link (L), and brake cam lever clevis pin (S) from brake band.
- (4) Remove 5/32 x 1 cotter pin (R) and disassemble cam levers and spacer link from clevis pin.
- (5) Remove 1/2-20NC nut (T), 1/4-inch lock washer (U), and 1/2-20NC nut (V) from brake adjusting screw (Y). Remove brake adjusting bolt compression springs (K and W).
- (6) Remove anchor clip screw locking wire (PP) and brake band anchor clip screw (NN).
- (7) Remove brake band with lining assembly (X) and anchor clip compression spring (MM) from brake support (TT).
- (8) Remove 3/4-24NF nut (G), 3/4-inch external-teeth lock washer (H), and brake spacer link stud (J) from brake support (TT).

c. Remove Brake Drum and Brake Support.

- (1) Remove speedometer drive pinion retaining nut (A) and speedometer drive pinion (C) from bearing retainer (AB). Remove speedometer drive pinion oil seal (B) from retaining nut.

- (2) Remove ~~7/8-16NC~~ slotted nut (EE), 29/32 ID, 1 3/8 OD plain washer (FF), and companion flange (JJ) with brake drum (KK).
- (3) Remove ~~3/8-24NF~~ nuts (GG), ~~3/8-inch~~ lock washers (HH), and brake drum bolts (LL) . This will separate the brake drum (KK) from the companion flange (JJ).
- (4) Remove ~~3/8-24NF~~ nuts (RR) and ~~3/8-inch~~ lock washers (SS) from ~~3/8-16NC~~ x ~~3/8-24NF~~ x 1 7/16 studs (XX) in bearing retainer (AB). Remove brake support (TT) and brake support gasket (UU).
- (5) Remove companion flange oil seal (QQ) from brake support.

d. Disassemble Bearing Retainer Assembly.

- (1) Remove output shaft with integral gear (AL), rear bearing cone (VV), bearing shims (AC, AD, AE, and AF), speedometer drive gear spacer (AG), and speedometer drive gear (AH) from bearing ~~retainer~~.
- (2) If inspection (par. 143a) of the front and rear bearing cups (WW and AJ) reveals that replacement is necessary, remove them with a bronze drift and hammer (*fig. 126*). Openings are provided in the bearing retainer casting for the bronze drift.
- (3) Remove vent assembly (D) from bearing retainer.

e. Remove Front Bearing Cone From Output Shaft. Remove front bearing cone (AK) from shaft with a puller (*fig. 127*).

f. Remove Output Shaft Rollers From Output Shaft.

- (1) Remove output shaft rollers snap ring (AN).
- (2) Remove output shaft rollers (AM) from counterbore of output shaft.

g. Clean Parts. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearings, with dry compressed air.

Caution: Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

143. Inspection (Depot Maintenance)

a. Inspect Front and Rear Bearing Cups, Front and Rear ~~Bearing~~ Cones, and Output Shaft Rollers.

- (1) Inspect front and rear bearing cups (WW and AJ) and front and rear bearing cones (VV and AK) for wear, corrosion, scores, chips, or cracks. If any of these conditions exist, the bearing cups and cones must be replaced (pars. 142d and 144b) .



Figure 126. Removing bearing cups from bearing retainer.

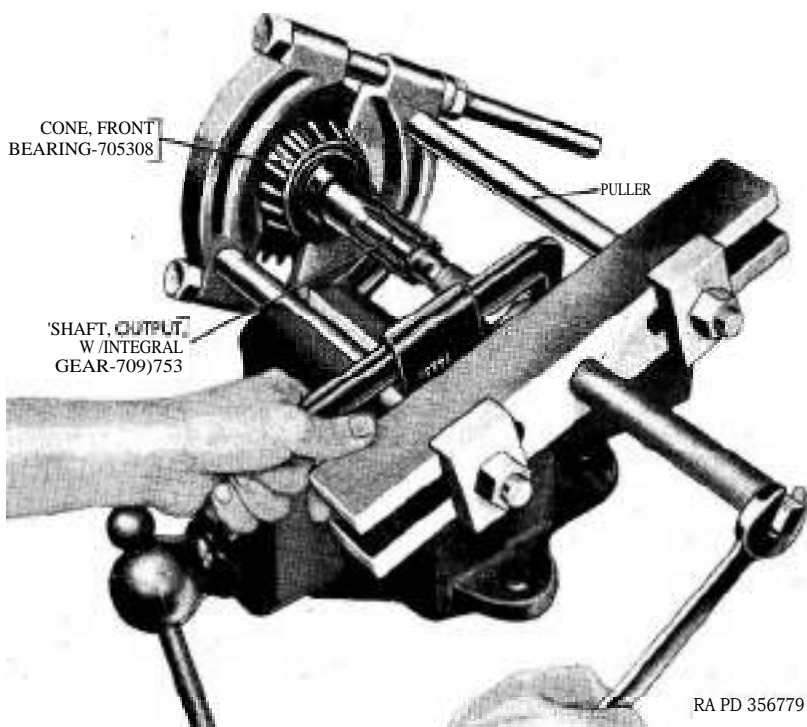


Figure 127. Removing front bearing cone from output shaft with puller.

- (2) Inspect output shaft rollers (AM) for wear, corrosion, or chipped spots. If diameter of rollers is less than the dimension in paragraph 346 or there is evidence of corrosion or chipped spots, replace rollers.

b. Inspect Bearing Retainer.

- (1) Inspect bearing retainer (AB) for damaged machined surfaces, cracks, or loose bearing cups. Replace retainer if any of these conditions exist.
- (2) Inspect $\frac{3}{4}$ -16NC x $\frac{1}{2}$ -24NF x 1 7/16 studs (XX) , screw holes, and threads for speedometer drive pinion retaining nut for wear and damage. Repair or replace parts as required.

c. Inspect Output Shaft.

- (1) Inspect output shaft with integral gear (AL) for worn, scored, cracked, or damaged teeth. If any of these conditions exist, replace shaft.
- (2) Inspect splines and threads on output shaft for wear and damage. If either of these conditions exist, replace shaft.
- (3) Measure diameter of bore in gear end of output shaft with a micrometer, replace shaft if dimension exceeds wear limit in paragraph 346.

d. Inspect Speedometer Drive Gear, Speedometer Drive Gear Spacer, and Bearing Shims.

- (1) Inspect speedometer drive gear (AH) for worn or damaged teeth. If either of these conditions exist, replace gear.
- (2) Inspect speedometer drive gear spacer (AG) for damage. Replace spacer if it is not in good condition.
- (3) Inspect bearing shims (AC, AD, AE, and AF) for mutilation. Replace them if they are not in good condition.

e. Inspect Brake Support. Inspect brake support (TT) for cracks or damaged machined surfaces. If either of these conditions exist, replace support.

f. Inspect Brake Drum. Inspect brake drum (KK) for wear, scores, cracks, elongated bolt holes, or damaged machined surfaces. If there is evidence of wear or damage, replace brake drum.

Note. Information pertaining to the inspection of the brake band assembly and related parts is contained in chapter 11.

g. Inspect Companion Flange.

- (1) Inspect oil seal contact surface on hub of companion flange (JJ) and machined surface of flange and splines for wear, damage, cracks, or corrosion. If any of these conditions exist or diameter of companion flange hub is

A—Nut, retaining, speedometer drive pinion — 7373731
 B—Seal, oil, speedometer drive pinion — CC-652840
 C—Pinion, speedometer drive — 7373732
 D—Vent, assy — A196397
 E—Washer, lock, $\frac{3}{8}$ -inch — 120382
 F—Nut, $\frac{3}{8}$ -24NF — 120369
 G—Nut, $\frac{3}{8}$ -24NF — 120369
 H—Washer, lock, external-teeth, $\frac{3}{8}$ s-inch — 138617
 J—Stud, brake spacer link — NP-36159
 K—Spring, compression, brake adjusting bolt — A284008
 L—Link, brake spacer — CC-921861
 M—Pin, cotter, 3/32 x $\frac{3}{4}$ — 103373
 N—Lever, brake cam — 7351253
 P—Bolt, brake adjusting — 7705713
 Q—Lever, brake cam — 7351253
 R—Pin, cotter, 5/32 x 1 — 103396
 S—Pin, clevis, brake cam lever — 7351262
 T—Nut, $\frac{1}{4}$ -20NC — 120375
 U—Washer, lock, $\frac{1}{4}$ -inch — 120380
 V—Nut, $\frac{1}{4}$ -20NC — 120375
 W—Spring, compression, brake adjusting bolt — A284008
 X—Band, brake, w/lining, assy — 7349062
 Y—Screw, brake adjusting — CC-566990
 Z—Spring, compression, brake operating — B245692
 AA—Washer, plain, $\frac{1}{2}$ II, 1% OD — 120389
 BB—Nut, 7/16-14NC -- 124834
 CC—Nut, 7/16-14NC — 124834
 DD—Pin, cotter, $\frac{1}{8}$ x 11/2 — 119209
 EE—Nut, slotted, $\frac{1}{4}$ -16NC — 7743652
 FF—Washer, plain, 29/32 II, 1% OD — 7412534
 GG—Nut, $\frac{3}{8}$ -24NF — 1.25913
 HH—Washer, lock, $\frac{3}{8}$ -inch — 138489
 JJ—Flange, companion — 7351116
 KK—Drum, brake — 7349142
 LL—Bolt, brake drum — 7351254
 MM—Spring, compression, anchor clip -- 7351256
 NN—Screw, brake band anchor clip 7351258
 PP—Wire, locking, anchor clip screw — 7375412
 QQ—Seal, oil, companion flange — 7705744
 RR—Nut, $\frac{3}{8}$ -24NF — 120369
 SS—Washer, lock, $\frac{3}{8}$ -inch — 120382
 TT—Support, brake — NP-38599
 UU—Gasket, brake support — 7373725
 VV—Cone, rear bearing — 705268
 WW—Cup, rear bearing — 706746
 XX—Stud, $\frac{3}{8}$ -16NC x $\frac{3}{8}$ -24NF x 1 7/16 — 113247
 YY—Screw, $\frac{3}{8}$ -16NC x 1 $\frac{1}{4}$ — 122138
 ZZ—Washer, lock, $\frac{3}{8}$ -inch — 120382
 AB—Retainer, bearing — CC-927859
 AC—Shim, bearing (0.004 inch thk) — 7342496
 AD—Shim, bearing (0.005 inch thk) — NP-A85842
 AE—Shim, bearing (0.0125 inch thk) — 7342494
 AF—Shim, bearing (0.015 inch thk) — 7373724
 AG—Spacer, speedometer drive gear — 7342499
 AH—Gear, speedometer drive -- CC-561651
 AJ—Cup, front bearing — 706763
 AK—Cone, front bearing — 705308
 AL—Shaft, output, w/integral gear — 7091753
 AM—Rollers, output shaft — NP-35946
 AN—Ring, snap, output shaft rollers — NP-38578

Figure 128. Brake output shaft bearing retainer assembly and
 hand brake--exploded view—Continued.

less than wear limit in paragraph 346, repair or replace companion flange.

- (2) Inspect bolt holes in companion flange for wear. If bolt holes are worn or elongated, replace companion flange.

144. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 128, ~~except~~ where otherwise indicated.

a. General. A preload is specified for the bearings that support the output shaft, and adjustment of the bearings must conform to the preload specifications in paragraph 346. The preload is specified in pound-inch as torque and can be measured, after all of the parts are properly assembled, by rotating the output shaft with a torque indicating wrench and socket on the companion-flange nut.

b. Install Front and Rear Bearing Cups in Bearing Retainer.

- (1) If inspection (par. 143a) reveals that replacement of the front and rear bearing cups (WW and AJ) is necessary, clean the counterbores in the bearing retainer and remove any burrs that may exist.
- (2) Install bearing cups in bearing retainer (AB) with an arbor press. Make certain bearing cups are firmly seated against the shoulders in the counterbores.

c. Install Brake Support on Bearing Retainer.

- (1) Tighten ~~3/4-16NC~~ x % studs (XX) in bearing retainer.
- (2) Place new brake support gasket (~~UU~~) and the brake support (TT) on bearing retainer so that cut out in gasket and oil drain openings in bearing retainer and brake support are alined. Install ~~3/8-inch~~ lock washers (SS) and ~~3/4-24NF~~ nuts (RR) on ~~3/4-16NC~~ x % studs (XX) . Tighten nuts.

d. Install Output Shaft Rollers.

- (1) Lubricate the 15 output shaft rollers (AM) with universal gear lubricant (GO) and position them in the output shaft counterbore.
- (2) Install output shaft roller snap ring (AN) in output shaft counterbore.

e. Install Front Bearing Cone on Output Shaft. Install front bearing cone (AK) on output shaft with integral gear (AL) with an arbor press. Make certain bearing cone is firmly seated against gear.

f. Install Output Shaft in Bearing Retainer.

- (1) Position speedometer drive gear (AH) , speedometer drive gear spacer (AG), and bearing shims (AC, AD, AE,

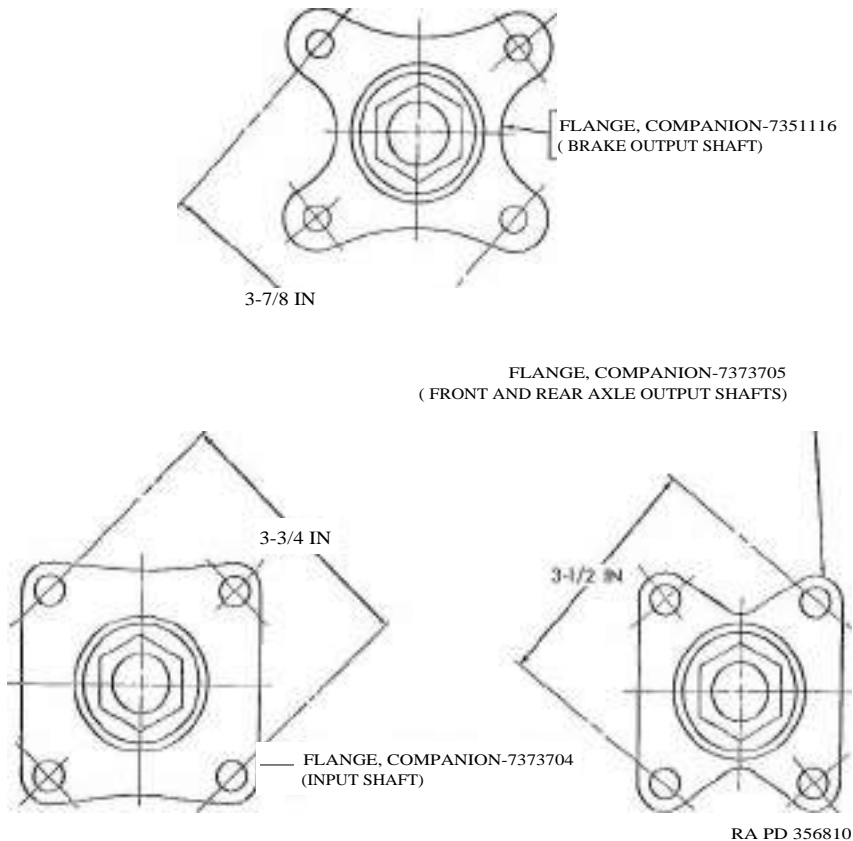


Figure 129. Companion flange dimensions.

and AF) on output shaft. If new shims are required, start with 0.0365-inch shim pack, consisting of one each 0.004, 0.005, 0.0125, and 0.015 inch thick shims and check adjustment of bearings. Refer to *g* below.

- (2) Lubricate bearings with universal gear lubricant (GO) and install output shaft with integral gear (AL) in bearing retainer (AB) . Install rear bearing cone (VV), companion flange (JJ), 29/32 ID, $1\frac{1}{4}$ OD, plain washer (FF), and 7/16-16NC slotted nut (EE).

Note. The transfer assembly is equipped with three different companion flanges and it is important that each flange be installed in its proper location. The correct flange for each location can be determined by measuring the distance between bolt holes (fig. 129).

- (3) Clamp companion flange between copper jaws of a vise and tighten slotted nut with torque indicating wrench and socket (fig. 130).

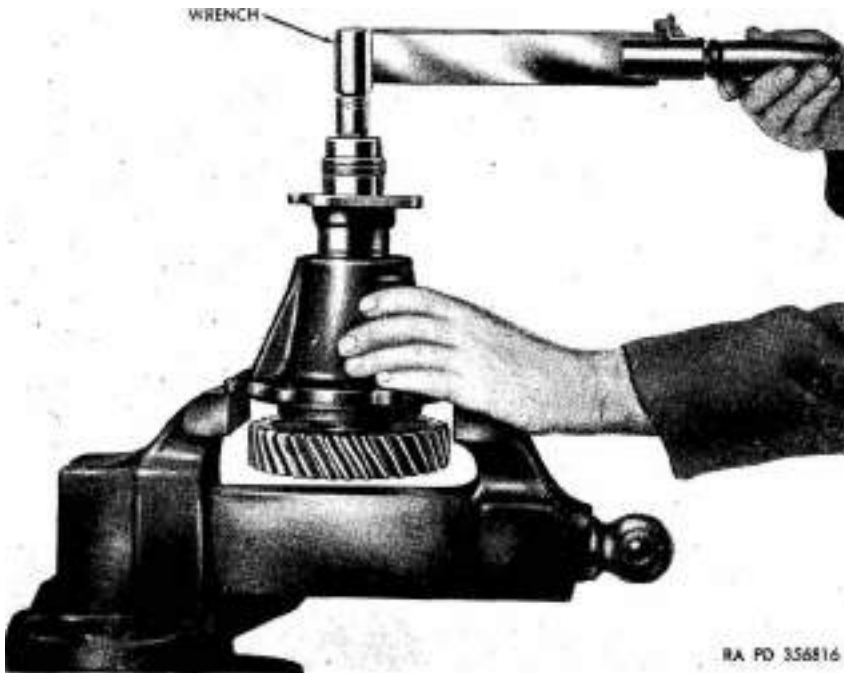


Figure 130. Checking preload of bearings on output shaft with torque indicating wrench.

g. Adjust Preload of Bearings.

- (1) Place bearing retainer assembly on a suitable stand or the open jaws of a vise in a vertical position so that the output shaft will be free to rotate. Rotate shaft with a torque indicating wrench (*fig. 130*) until bearings roll smoothly and check preload of bearings with wrench in motion.
- (2) If preload of bearings is not within 15 to 30 pound-feet torque (*par. 346*), add or remove shims, as required, to obtain correct preload.
- (3) Remove slotted nut, plain washer, and companion flange.

h. Install Companion Flange Oil Seal, Brake Drum, and Companion Flange.

- (1) Prepare new companion flange oil seal (QQ) by soaking in castor oil or Neatsfoot oil for about 30 minutes and work leather by rolling with a smooth round bar (*fig. 55*) before installing.
- (2) Coat outer surface of oil seal with plastic-type gasket cement and position oil seal in brake support with lip of leather toward bearings. Install oil seal with a companion flange and plastic hammer (*fig. 131*).



Figure 131. Installing companion flange oil seal.

- (3) Place companion flange (JJ) in shallow side of brake drum (KK) so that hub of companion flange will protrude through brake drum. Insert brake drum bolts (LL) from opposite side of brake drum and install $\frac{3}{8}$ -inch lock washers (HH) and $\frac{3}{4}$ -24NF nuts. Tighten nuts.
- (4) Install hand brake drum (KK) ; companion flange (JJ) ; 29/32 ID, $\frac{13}{16}$ OD plain washer (FF) ; and 7/8-16NC slotted nut (EE).

i. Install Brake Band With Lining Assembly.

- (1) Place anchor clip compression spring (MM) in brake support (TT) and position brake band with lining assembly (X) on brake support. Install brake band anchor clip screw (NN), but do not tighten.
- (2) Position brake adjusting bolt compression springs (K and W) on both sides of brake support between band ends. Assemble brake cam levers (N and Q), brake cam lever clevis pin (S) , and brake spacer link (L) on brake adjusting bolt (P) with open end of adjusting bolt toward clevis pin hole end of cam levers. Install brake adjusting bolt (P). Install brake operating compression

spring (Z), on brakes so equipped; $\frac{1}{2}$ ID, 1 1/4 OD plain washer (AA) ; and 7/16-14NC nuts (BB and CC) on threaded end of adjusting bolt.

- (3) Install brake spacer link stud (J) in brake support (TT) ; then install ~~3/8-inch~~ external teeth lock washer (H) and ~~3/8-24NF~~ nut (G). Position brake spacer link (L) on brake spacer link stud (J) in brake support and install new 3/32 x 3/4 cotter pin (M).
- (4) Install brake adjusting screw (Y) through lower end of brake band and brake support; then install ~~1/4-20NC~~ nuts (T and V) and ~~1/4-inch~~ lock washer (U).
- (5) Refer to TM 9-840 for adjustment of hand brake band.

j. Install Speedometer Drive Pinion and Vent Assembly; Tighten Slotted Nut.

- (1) Position speedometer drive pinion (C) in bearing retainer. Make certain pilot at lower end of pinion engages in hole of retainer boss.
- (2) Place speedometer drive pinion oil seal (B) in speedometer drive pinion retaining nut (A) and install retaining nut in bearing retainer assembly. Tighten retaining nut.
- (3) Apply hand brake band and tighten ~~7/8-16NC~~ slotted nut (EE) to 140 to 160 pound-feet torque with a torque indicating wrench and socket. Install new $\frac{1}{8}$ x 1 $\frac{5}{8}$ cotter pin (DD).
- (4) Install vent assembly (D) in top of bearing retainer assembly.

Section IV. REBUILD OF REAR AXLE OUTPUT SHAFT BEARING RETAINER ASSEMBLY

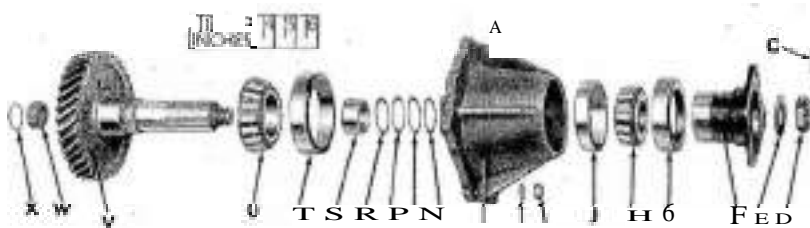
145. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 132, except where otherwise indicated.

a. General.

- (1) In addition to the bearing retainer including cups, the rear axle output shaft bearing retainer assembly is also available complete with all related parts.
- (2) The bearing cups can be inspected in the output shaft bearing retainer and should not be removed unless inspection (par. 146b) reveals replacement is necessary.

b. Remove Output Shaft From Bearing Retainer. Remove output shaft with integral gear (V), front and rear bearing cones



A--WASHER LOCK, 3/8 IN-120382
 B--SCREW 3/8-16NC x 1-1/8-122138
 C-PIN, COTTER, 1/8 x 1-5/8-119704
 D--NUT, SLOTTED, 7/8-16NC
 E-WASHER, PLAIN, 29/32 ID, 1-3/4 OD
 F-FLANGE COMPANION--7373705
 G--SEAL OIL COMPANION FLANGE-7705744
 H--CONE, BEARING, REAR-706746
 J--CUP BEARING, REAR-706746
 K-NUT, 3/8-24NF-120369
 M--RETAINER BEARING--NP-36537
 N--SHIM, BEARING (0.004 thk)--7342496
 P-SHIM, BEARING (0.005 thk)--NP-463343
 Q--SHIM BEARING (0.0125 thk)--7343193
 R--SHIM, BEARING (0.015 thk)--7373724
 S--SPACER SHAFT-7342501
 T--CUP BEARING, FRONT--706746
 U--CONE, BEARING, FRONT--706746
 V-SHAFT, OUTPUT, W/INTEGRAL GEAR--706746
 W--ROLLERS, OUTPUT SHAFT--NP-36542
 X-RING, SNAP, OUTPUT SHAFT ROLLER--NP-36572

RA PD 356790

Figure 132. Rear axle output shaft bearing retainer assembly—exploded view.

(H and U), shaft spacer (S), and bearing shims (N, P, Q, and R) from bearing retainer (M).

c. *Remove Front Bearing Cone From Output Shaft.* Remove front bearing cone from output shaft with a puller (fig. 127).

d. *Remove Front and Rear Bearing Cups From Bearing Retainer.* If inspection (par. 146b) of the front and rear bearing cups (J and T) reveals that replacement is necessary, remove them with a bronze drift and hammer (fig. 126). Openings are provided in the bearing retainer casting for the bronze drift.

e. *Remove Output Shaft Rollers From Output Shaft.*

- (1) Remove output shaft roller snap ring (X) from output shaft with integral gear (V).
- (2) Remove output shaft rollers (W) from counterbore of output shaft.

f. Clean Parts. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearings, with dry compressed air.

Caution: Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance.

146. Inspection (Depot Maintenance)

(fig. 132)

a. Inspect Bearing Retainer. Inspect bearing retainer (M) for cracks, damaged machined surfaces, or scored bearing cup counterbores. If any of these conditions exist, replace retainer.

h. Inspect Front and Rear Bearing Cups, Front and Rear Bearing Cones, Output Shaft Rollers, Shaft Spacer, and Bearing Shims.

- (1) Inspect front and rear bearing cups (J and T) and front and rear bearing cones (H and U) for cracks, chipped spots, pitting, corrosion, or wear. If any of these conditions exist, replace bearing cups and cones (pars. 145d and 147b).
- (2) Inspect output shaft rollers (W) for wear, corrosion, or chipped spots. If any of these conditions exist or the diameter of rollers is less than the dimension in paragraph 346, replace rollers.
- (3) Inspect shaft spacer (S) for cracks and damage. If either of these conditions exist, replace spacer.
- (4) Inspect bearing shims (N, P, Q, and R) for mutilation and if damaged, replace shims.

c. Inspect Output Shaft.

- (1) Inspect output shaft with integral gear (V) for worn, chipped, or cracked gear teeth ; worn splines ; or damaged threads. If any of these conditions exist, replace output shaft.
- (2) Measure diameter of bore in gear end of output shaft with a micrometer and replace shaft if dimension exceeds wear limit in paragraph 346.

d. Inspect Companion Flange.

- (1) Inspect oil seal contact surface on hub of companion flange (F) and machined surface of flange and splines for wear, damage, cracks, or corrosion. If any of these conditions exist, or diameter of companion flange hub is less than wear limit in paragraph 346, replace companion flange.
- (2) Inspect bolt holes in companion flange for wear. If bolt holes are worn or elongated, replace companion flange.

147. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 132, except where otherwise indicated.

a. General. A preload is specified for the bearings that support the output shaft and adjustment of the bearings must conform to the preload specification in paragraph 346. The preload is specified in pound-inches torque and can be measured, after all of the parts are properly assembled, by rotating the output shaft with a torque indicating wrench and socket on the 7/8-16NC slotted nut (D).

b. Install Front and Rear Bearing Cups in Bearing Retainer.

- (1) If inspection (par. 146b) reveals that replacement of front and rear bearing cups (J and T) is necessary, clean the counterbores in the bearing retainer and remove any burs that may exist.
- (2) Install bearing cups in bearing retainer (M) with an arbor press. Make certain bearing cups are firmly seated against the shoulders in the counterbores.

c. Install Output Shaft Rollers.

- (1) Lubricate the 15 output shaft rollers (W) with universal gear lubricant (GO) and position them in the output shaft counterbore.
- (2) Install output shaft roller snap ring (X) in output shaft counterbore.

d. Install Front Bearing Cone on Output Shaft. Install front bearing cone (U) on output shaft with an arbor press. Make certain the bearing cone is firmly seated against gear.

e. Install Output Shaft in Bearing Retainer.

- (1) Lubricate bearing cones with universal gear lubricant (GO).
- (2) Position shaft spacer (S) and bearing shims (N, P, Q, and R) on output shaft with integral gear (V). If new bearing shims are required, start with a 0.0365-inch shim pack, consisting of one each 0.004-, 0.005-, 0.0125- and 0.015-inch thick shims and check adjustment of bearing. Refer to *f* below.
- (3) Install output shaft with integral gear (V) in bearing retainer (M). Install rear bearing cone (H), companion flange (F), 29/32 ID, 1% OD, plain washer (E), and ~~7/8-16NC~~ slotted nut (D). Refer to figure 129 for dimensions of correct companion flange.
- (4) Clamp companion flange between copper jaws of a vise and tighten slotted nut to 140 to 160 pound-feet torque with a torque indicating wrench and socket.

f. Adjust Preload of Bearings.

- (1) Place bearing retainer assembly on a suitable stand or the open jaws of a vise in a vertical position so that the output shaft will be free to rotate. Rotate shaft with a torque indicating wrench (*fig. 130*) until bearings roll smoothly and check preload of bearings with wrench in motion.
- (2) If preload of bearing is not within the limits specified in paragraph 346, add or remove shims, as required, to obtain correct preload. When correct preload is obtained, remove slotted nut, plain washer, and companion flange.

g. Install Companion Flange Oil Seal and Companion Flange.

- (1) Prepare new companion flange oil seal (G) by soaking in castor oil or Neatsfoot oil for about 30 minutes and work leather by rolling with a smooth round bar (*fig. 55*) before installing.
- (2) Coat outer surface of oil seal with plastic-type gasket cement and position oil seal in bearing retainer with lip of leather toward bearings. Install oil seal with a companion flange and plastic hammer (*fig. 131*).
- (3) Install companion flange (F) ; 29/32 ID, 13/4 OD, plain washer (E) ; and 7/8-16NC slotted nut (D). Clamp companion flange between copper jaws of a vise and tighten slotted nut to 140 to 160 pound-feet torque with a torque indicating wrench and socket. Install new 1/8 x 1% cotter pin (C).

Section V. REBUILD OF TRANSFER WITH IDLER GEAR, INPUT SHAFT, FRONT AXLE OUTPUT SHAFT, AND SHIFTER PARTS

148. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 135, except where otherwise indicated.

a. General. The bearing cups can be inspected in the idler gear and must not be removed unless inspection (par. 149a) reveals replacement is necessary.

b. Remove Shifter Fork, Two Speed Clutch Gear, and Two Speed Clutch Gear Shifter Shaft.

- (1) Remove locking wire (GG) from shifter fork screw (FF) and remove screw.
- (2) Remove poppet ball screw (SS) , poppet ball screw gasket (AP), poppet ball spring (AQ), and poppet ball (AR).
- (3) Remove two-speed clutch gear shifter shaft (ZZ), shifter fork (BF), and two-speed clutch gear (BE).

e. Remove Front Axle Clutch Gear, Shifter Fork, and Front Axle Clutch Gear Shifter Shaft.

- (1) Remove locking wire (Z) from shifter fork screw (Y) and remove screw.
- (2) Remove poppet ball screw (N), poppet ball screw gasket (P), poppet ball spring (Q), and poppet ball (R).
- (3) Remove front axle clutch gear shifter shaft (YY), shifter fork (X), and front axle clutch gear (AA).

d. Remove Shifter Shaft Oil Seals. Remove shifter shaft oil seals (WW and XX) from transfer case with a small pry bar.

e. Remove Companion Flange and Front Axle Output Shaft.

- (1) Remove $\frac{1}{8}$ x 1% cotter pin (A) from $\frac{7}{8}$ -16NC slotted nut (B). Hold companion flange with a wrench (fig. 124) and remove nut.
- (2) Remove 29/32 ID, 1 $\frac{3}{4}$ %, OD, plain washer (C) and companion flange (D) from front axle output shaft (W) .
- (3) Remove front axle output shaft (W) and front axle output shaft thrust washer (V) from case.

f. Remove Companion Flange, Input Shaft, Input Shaft Gear, and Input Shaft Gear Rollers.

- (1) Remove $\frac{1}{8}$ x 1% cotter pin (AB) from ~~$\frac{7}{8}$ -16NC~~ slotted nut (AC). Hold companion flange with a wrench (fig. 124) and remove nut.
- (2) Remove 29/32 II), 13%,, OD, plain washer (AD) and companion flange (AE) from input shaft (BD). Exercise care to prevent shaft from slipping out of input shaft gear (AW).
- (3) Grasp input shaft and gear (fig. 133) and remove them from transfer case. Keep shaft, gear, and input shaft gear rollers (AX and AZ) together to avoid loss of rollers.
- (4) Perform the following disassembly procedure over a container to avoid the loss of rollers. Remove input shaft gear outer thrust washer (AV), gear, rollers, input shaft gear roller spacer (AY), and input shaft gear inner thrust washer (BC) from input shaft.

g. Remove Bearing Retainers and Ball Bearing Assemblies.

- (1) Remove 7/16-20NC nuts (F and AG), 7/16-inch lock washers (G and AH), bearing retainers (H and AJ), and bearing retainer gaskets (J, K, AK, and AL) from transfer case.
- (2) Drive companion flange oil seals (E and AF) from bearing retainers. Discard oil seals.
- (3) Remove ball bearing assemblies (M and AN) from case

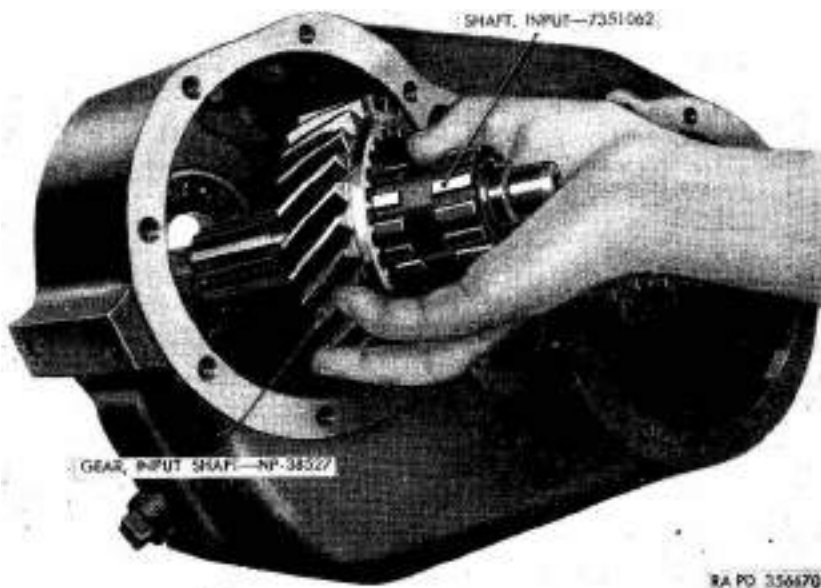


Figure 133. Removing input shaft and input shaft gear.

with a bronze drift and hammer. To protect bearings from dirt, wrap them in clean paper until they are inspected.

h. Remove Idler Gear Shaft, Idler Gear Bearings, and Idler Gear.

- (1) Remove $\frac{1}{8}$ x 1% cotter pin (TT), $\frac{7}{8}$ -16NC slotted nut (VV), and 29/32 ID, 13/4 OD, plain washer (UU) from idler gear shaft (BH).
- (2) Remove 5/16-18NC x % screws (BB), 5/16-inch lock washers (CC), idler gear shaft cover (DD), and idler gear shaft cover gasket (EE).
- (3) Screw arbor-41-A-338 (*fig. 134*) on threaded end of idler gear shaft. Make certain arbor is firmly seated against shaft shoulder. Drive idler gear shaft from case with a plastic hammer. Remove idler gear and bearings from case.
- (4) Remove idler gear bearing cones (BG and RR), bearing shims (JJ, KK, LL, and MM), and idler gear bearing spacer (NN) from idler gear (PP).
- (5) Drive idler gear bearing cups (HH and QQ) from idler gear with a bronze drift and hammer.

Note. Do not remove bearing cups unless inspection (par. 149a) reveals that replacement is necessary.

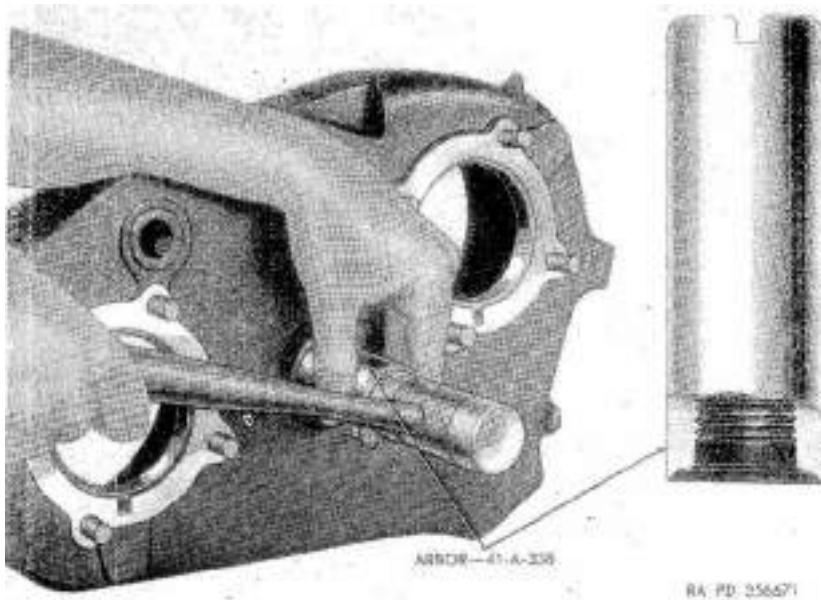


Figure 134. Removing idler gear shaft from transfer case.

i. *Remove Pipe Plug From Filler Opening.* Remove $\frac{3}{4}$ -inch pipe plug (AT) from filler opening in transfer case.

j. *Clean Parts.* Clean parts in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except bearings, with dry compressed air.

Caution: Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

1 49. Inspection (Depot Maintenance)

(fig. 135)

a. *Inspect Idler Gear.* Inspect idler gear (PP) for worn, chipped, or cracked gear teeth or loose bearing cups. If any of these conditions exist, replace cups or gears (pars. 148b and 150c).

b. *Inspect Shifter Forks.* Inspect shifter forks (X and BF) for misalignment, scored machined surfaces, or cracks. If any of these conditions exist, replace forks.

c. *Inspect Two-Speed Clutch Gear Shifter Shaft and Front Axle Clutch Gear Shifter Shaft.* Inspect two-speed clutch gear shifter shaft (ZZ) and front axle clutch gear shifter shaft (YY) for scores, corrosion, or wear. If any of these conditions exist or diameter of shafts is less than wear limit in paragraph 346, replace shafts.

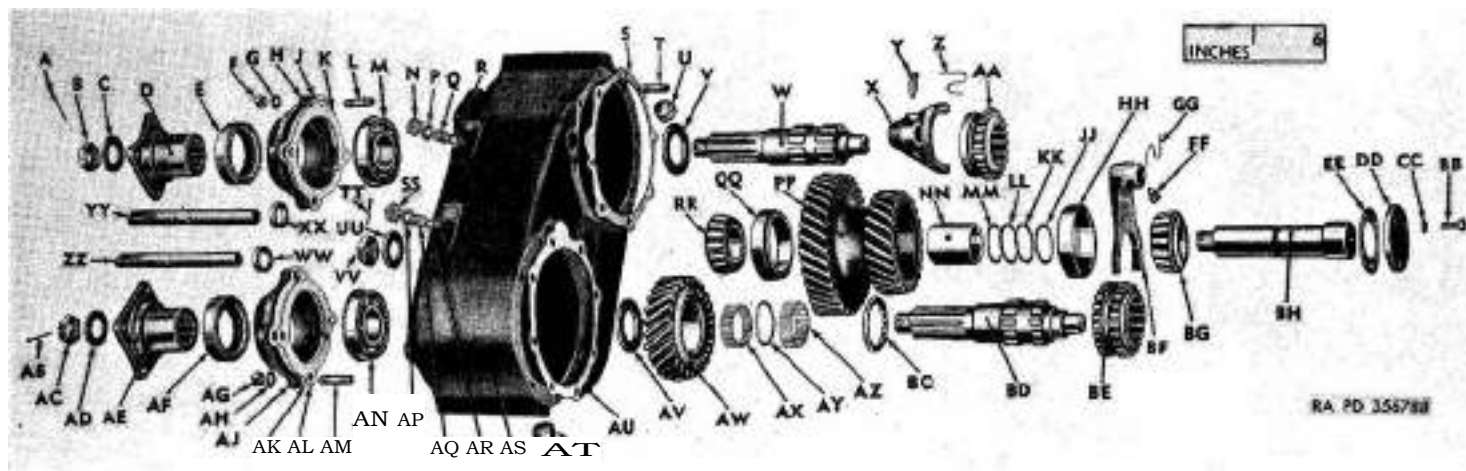


Figure 135. Transfer with idler gear, input shaft, front axle output shaft, and shifter parts—exploded view.

A—Pin, cotter, $\frac{1}{8}$ x 1 % — 119209
 B—Nut, slotted, ~~$\frac{3}{4}$ -16NC~~ — 7743652
 C—Washer, plain, 29/32 ID, 1 $\frac{3}{4}$ OD 7351153
 D—Flange, companion — 7373705
 E—Seal, oil, companion flange — 7705744
 F—Nut, ~~$\frac{7}{16}$ -20NF~~ — 120370
~~G—Washer, lock, 7/16-inch — 120383~~
 H—Retainer, bearing — NP-38552
 J—Gasket, bearing retainer (0.009-inch thk) — CC-927395
 K—Gasket, bearing retainer (0.013-inch thk) — NP-38556
 L—Stud, bearing retainer — NP-37378
~~M—Bearing, ball, assy - 700792~~
 N—Screw, poppet ball — 7351129
 P—Gasket, poppet ball screw — 7373727
 Q—Spring, poppet ball — 7351126
~~R—Ball, poppet, 5/16-inch — 104919~~
 S—Gasket, bearing retainer — NP-38587
 T—Stud, ~~$\frac{3}{4}$ -16NC x $\frac{3}{4}$ -24NF~~ x 1 $\frac{7}{16}$ — 113247
 U—Plug, pipe, ~~$\frac{1}{2}$ -inch~~ — 7374954
 V—Washer, thrust, front axle output shaft — NP-38567
 W—Shaft, output, front axle 7351134
 X—Fork, shifter — 7091754
 Y—Screw, shifter fork — NP-38386
 Z—Wire, locking — 7375412
 AA—Gear, clutch, front axle — ~~NP-38529~~
 BB—Screw, 5/16-18NC x $\frac{3}{4}$ — 122007
 CC—Washer, lock, 5/16-inch — 120214
 DD—Cover, idler gear shaft — 7342649
~~EE—Gasket, idler gear shaft cover — NP-38581~~
~~FF—Screw, shifter fork — NP-38386~~
 GG—Wire, locking — 7375412
 HH—Cup, idler gear bearing — 706746
~~JJ—Shim, bearing (0.004 inch thk) 7342496~~
 KK—Shim, bearing (0.005 inch thk) NP-A85342
 LL—Shim, bearing (0.0125 inch thk) 7342494
 MM—Shim, bearing (0.015 inch thk) 7373724
~~NN—Spacer, idler gear bearing 7342500~~
 PP—Gear, idler — ~~NP-378~~
 QQ—Cup, idler gear bearing — 706746
 RR—Cone, idler gear bearing — 705268
 SS—Screw, poppet ball — 7351129
 TT—Pin, cotter, $\frac{1}{8}$ x — 119209
~~UU—Washer, plain, 29/32 ID, 1 $\frac{3}{4}$ OD — 7351153~~
 VV—Nut, slotted, ~~$\frac{3}{4}$ -16NC~~ — 7743652
 WW—Seal, oil, shifter shaft — 500011
 XX—Seal, oil, shifter shaft-500011
 YY—Shaft, shifter, front axle clutch gear — 7342859
 ZZ—Shaft, shifter, two-speed clutch gear 7342858
~~AB—Pin, cotter, $\frac{1}{8}$ x 1% — 119209~~
 AC—Nut, slotted, ~~$\frac{3}{4}$ -16NC~~ — 7743652
 AD—Washer, plain, 29/32 ID, 1 $\frac{3}{4}$ OD — 7351153
 AE—Flange, companion — 7373704

Figure 135-Continued on following page.

AF—~~Seal~~, oil companion flange — 7705744
 AG—Nut, 7/16-20NF — 120370
 AH—Washer, lock, 7/16-inch — 120383
 AJ—~~Retainer~~, bearing — NP-38552
 AK—Gasket, bearing retainer (0.009 inch thk) — ~~CC-927391~~
 AL—Gasket, bearing retainer (0.013 inch thk) — NP-38556
 AM—Stud, bearing retainer — ~~NP-37078~~
 AN—Bearing, ball, asst' — 700792
 AP—Gasket, poppet ball screw — 7373727
 AQ—~~Spring~~, poppet ball — 7351126
 AR—Ball, poppet, 5/16-inch — 104919
 AS—Case, transfer — NP-38631
 AT—Plug, pipe, 1/4-inch — 7374954
 AU—Gasket, bearing retainer -- NP-38587
 AV—Washer, thrust, input shaft gear, outer — ~~NP-38667~~
 AW—~~Gear~~, input shaft — ~~NP-38627~~
 AX—Roller, input shaft gear — 7342864
 AY—Spacer, input shaft gear roller — 7342723
 AZ—Roller, input shaft gear 7342864
 BC—Washer, thrust, input shaft gear, inner — NP-38609
 BD—Shaft, input — 7351062
 BE—Gear, two-speed clutch — NP-38532
 BF—Fork, shifter — 7091754
 BG—Cone, idler gear bearing — 705268
 BH—~~Shaft~~, idler gear — 7342505

Figure 135.—Continued.

d. Inspect Poppet Ball Screws, Poppet Ball Springs, and Poppet Balls.

- (1) Inspect poppet ball screws (N and SS) for cracks or damaged threads. If either of these conditions exist, replace screws.
- (2) Check poppet ball springs (Q and AQ) for free length, compressed length, and damage. If spring lengths do not conform to specifications in paragraph 346 or if there is evidence of damage, replace springs.
- (3) Inspect 5/16-inch poppet balls (R and AR) for worn spots, cracks, or corrosion. If any of these conditions exist, replace poppet balls.

e. Inspect Two-Speed Clutch Gear. Inspect two-speed clutch gear (BE) for worn, chipped, or cracked teeth and worn or damaged splines. If any of these conditions exist, replace gear.

f. Inspect Front Axle Clutch Gear. Inspect front axle clutch gear (AA) for worn, chipped, or cracked teeth and worn or damaged splines. If any of these conditions exist, replace gear.

g. Inspect Front Axle Output Shaft.

- (1) Inspect bearing surface of front axle output shaft (W) for wear or damage. If either of these conditions exist, replace shaft.
- (2) Inspect threads on shaft for wear or damage. If either of these conditions exist, replace shaft.
- (3) Inspect shaft splines for wear, chipped spots, or cracks. If any of these conditions exist, replace shaft.
- (4) Measure ground end of shaft with a micrometer and if diameter is less than wear limit in paragraph 346, replace output shaft.

h. Inspect Input Shaft Gear.

- (1) Inspect teeth of input shaft gear (AW) for wear, chipped spots, or cracks. If any of these conditions exist, replace gear.
- (2) Inspect bearing bore of gear for wear and measure diameter with a micrometer. If diameter of bore exceeds wear limit in paragraph 346, replace gear.
- (3) Inspect thrust washer surfaces of gear. If surfaces are scored, replace gear.

i. Inspect Input Shaft Gear Rollers and Input Shaft Gear Roller Spacer.

- (1) Inspect input shaft gear rollers (AX and AZ) for wear and measure their diameter with a micrometer. If diam-

eter of roller is less than dimension in paragraph 346, replace rollers.

- (2) Inspect input shaft gear roller spacer (AY) for ~~mis-alignment~~, wear, or cracks. If any of these conditions exist, replace spacer.

j. *Inspect Input Shaft Gear Thrust Washers and Front Axle Output Shaft Thrust Washer.* Inspect input shaft gear outer and inner thrust washers (AV and BC) and front axle output shaft thrust washer (V) for scores, wear, or cracks. If any of these conditions exist or thickness of washers is less than wear limits in paragraph 346, replace thrust washers.

k. *Inspect Input Shaft.*

- (1) Inspect input shaft (BD) threads for damage or wear. If either of these conditions exist, replace shaft.
- (2) Inspect bearing surface for input shaft gear and measure diameter of shaft with a micrometer. If dimension is less than wear limit in paragraph 346, replace shaft.
- (3) Inspect surface for output shaft rollers and measure diameter of shaft with a micrometer. If dimension is less than wear limit in paragraph 346, replace shaft.
- (4) Inspect shaft splines for wear, chipped spots, or cracks. If any of these conditions exist, replace shaft.

l. *Inspect Ball Bearing Assemblies.* Inspect bearing races, balls, and cages for wear, chipped spots, cracks, or corrosion. If any of these conditions exist, replace ball bearing assemblies (M and AN) .

m. *Inspect Bearing Retainers.* Inspect oil seal counterbores and machined surfaces of bearing retainers (H and AJ) for scores, damage, or cracks. If any of these conditions exist, replace retainers.

n. *Inspect Transfer Case.*

- (1) Inspect transfer case (AS) for cracks and replace if there is any evidence of breakage.
- (2) Inspect machined surfaces and bearing bores of case for damage or scores. If either of these conditions exist, replace case.
- (3) Inspect screw holes and studs in case for worn or damaged threads. If threads or screw holes are worn or damaged and cannot be corrected by tapping, replace case. If stud threads are worn or damaged, replace bearing retainer studs (L and AM) and $\frac{3}{8}$ -16NC x 3/\$-24NF x 1 7/16 stud (T).

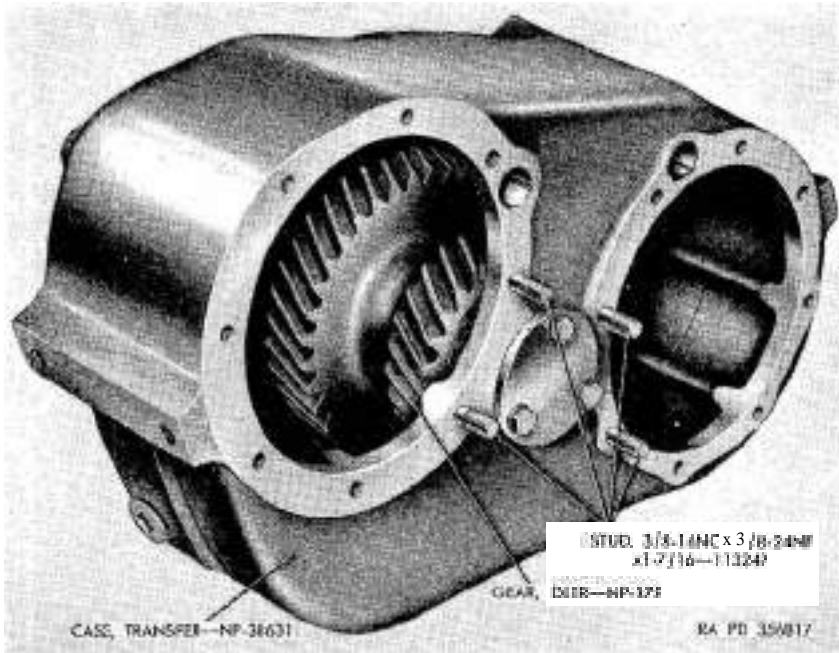


Figure 136. Proper location of bearing retainer studs.

150. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 135, except where otherwise indicated.

a. *Tighten Bearing Retainer Studs in Transfer Case.* Tighten bearing retainer studs (L and AM) in transfer case.

b. *Tighten Studs for Rear Axle Output Shaft Bearing Retainer and Brake Output Shaft Bearing Retainer.* Tighten the four $\frac{3}{8}$ -16NC x $\frac{3}{4}$ -24NF x 1 7/16 studs (T) in transfer case.

Caution: These studs are installed adjacent to the idler gear (fig. 136) to prevent interference that will occur if long cap screws are employed.

c. *Install Idler Gear Bearing Cups.* If replacement of idler gear bearing cups (HH and QQ) is necessary (par. 149a), install them in idler gear with an arbor press. Make certain bearing cups are firmly seated against the counterbore shoulders.

d. *Adjust Idler Gear Bearing.*

- (1) Place large end of idler gear shaft (BH) vertically between copper jaws of a vise.
- (2) Lubricate idler gear bearing cones (BG and RR) with universal gear lubricant (GO). Place one bearing cone (BG) on idler gear shaft against shoulder and follow

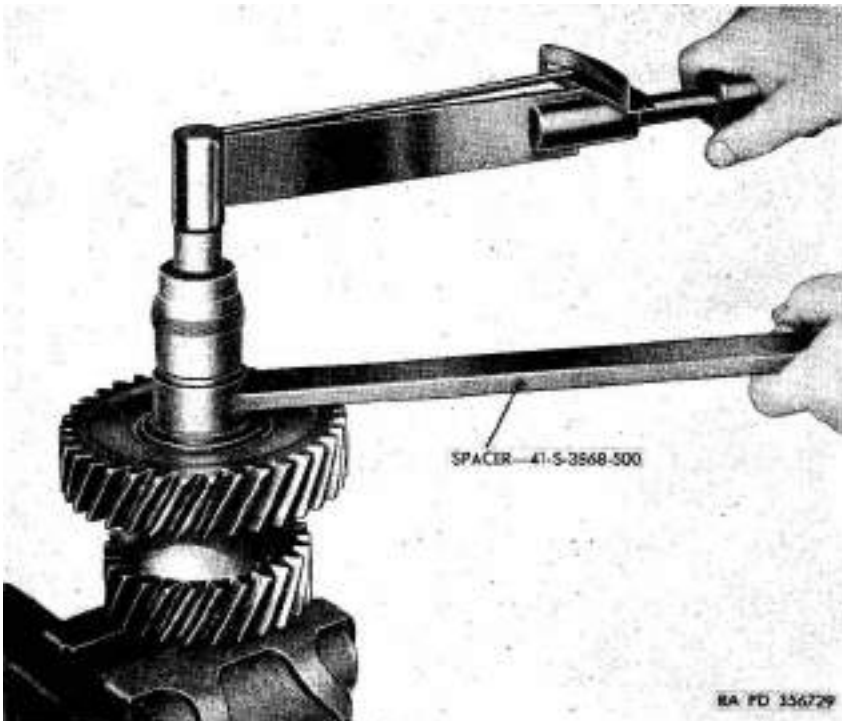


Figure 137. Location of spacer on idler gear shaft.

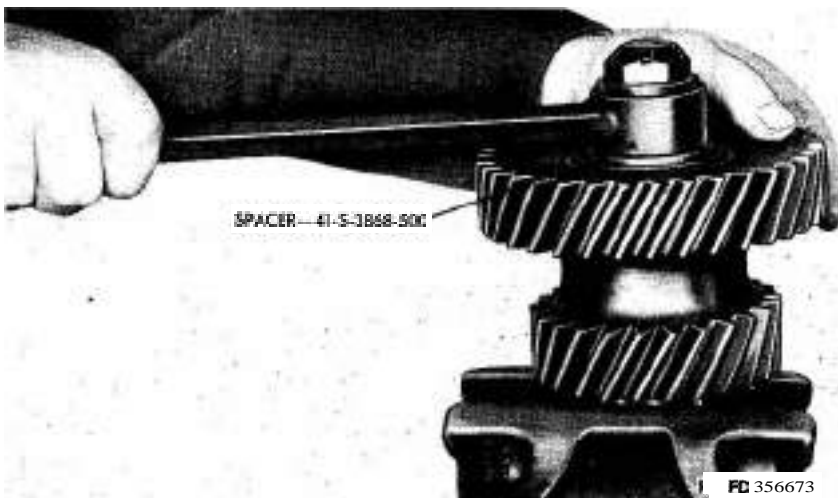


Figure 138. Checking adjustment of idler gear bearings.

with idler gear bearing spacer (NN) and bearing shims (JJ, KK, LL, and MM). If new shims are required, start with a 0.0365-inch shim pack, consisting of one each of 0.004-, 0.005-, 0.0125-, and 0.015-inch thick shims.

- (3) Place idler gear (PP) on shaft (small gear down), and install other bearing cone (RR), spacer 41-S-3868-500 (*fig. 137*), 29/32 ID, 1 $\frac{3}{4}$ OD, plain washer (UU), and $\frac{7}{8}$ -16NC slotted nut (V V) .
- (4) Hold spacer 41-S-3868-500 (*fig. 137*) and tighten nut to 140 to 160 pound-feet torque with a torque indicating wrench and socket.
- (5) Rotate idler gear (*fig. 138*) until bearings roll smoothly. Correct adjustment of bearings is free-rolling, no end play. To accomplish a correct adjustment of the idler gear bearings, remove bearing shims, repeating operations (2), (3), and (4) above until a slight drag is evident when the gear is revolved. Add a thin shim so that bearings will roll freely.
- (6) Remove nut, washer, and spacer 41-S-3868-500 (*fig. 137*) from idler gear shaft. Remove parts from vise and disassemble them.

e. Install Idler Gear, Idler Gear Shaft, and Related Parts in Transfer Case.

- (1) Place one of the idler gear bearing cones (RR) in large gear end of idler gear (PP) and position gear on bench with small gear end up and follow with arbor 41-A-338 (*fig. 134*) (threaded end up), idler gear bearing spacer (NN), selected bearing shims (JJ, KK, LL, and MM), and other idler gear bearing cone (BG).
- (2) Place idler gear assembly (with arbor 41-A-338) in transfer case with small gear toward rear of case.
- (3) Insert idler gear shaft (BH) through opening at rear of transfer case and screw threaded end of shaft in arbor 41-A-338 (*fig. 134*). Make certain shaft is firmly seated in arbor.

Warning: Arbor 41-A-338 must be used when idler gear shaft is installed to prevent damage to bearing shims.

- (4) Drive idler gear shaft into case with a bronze drift and hammer, and remove arbor. Install 29/32 ID, 1 $\frac{3}{4}$ OD, plain washer (UU) and $\frac{7}{8}$ -16NC slotted nut (VV) on shaft. Tighten nut to 140 to 160 pound-feet torque with a torque indicating wrench and socket. Install new $\frac{1}{8}$ x $1\frac{5}{8}$ cotter pin (TT).

- (5) Install idler gear shaft cover gasket (EE), idler gear shaft cover (DD), 5/16-inch lock washers (CC) , and 5/16-18NC x 3 1/4 screws (BB). Tighten screws.

f. Install Ball Bearing Assemblies, Bearing Retainer Gaskets, Bearing Retainers, and Companion Flange Oil Seals.

- (1) Lubricate ball bearing assemblies (M and AN) with universal gear lubricant (GO) and install bearings in transfer case with a plastic hammer, until bearing snap rings are firmly seated against case.
- (2) Hold bearing retainers (H and AJ) firmly against case by hand, without gaskets or nuts, and measure clearance between machined surface of retainer and case with thickness gage (fig. 139). Select a combination of bearing retainer gaskets (J, K, AK, and AL) that are 0.006 inch more or less (plus or minus 0.006 inch) than clearance between retainer and case.

Note. Gaskets are available in 0.009- and 0.013-inch thickness.

- (3) Prepare companion flange oil seals (E and AF) by soaking in castor oil or Neatsfoot oil for about 30 minutes and work leather by rolling with a smooth round bar (fig. 55) before installing.
- (4) Coat outer surface of oil seals with plastic-type gasket cement and position seals in bearing retainers with lip of leather toward bearing. Install oil seals in retainers with a companion flange and plastic hammer (fig. 131).
- (5) Install selected bearing retainer gaskets (J, K, AK, and AL), bearing retainers (H and AJ), 7/16-inch lock washers (G and AH), and 7/16-20NF nuts (F and AG). Tighten nuts.

g. Assemble Input Shaft Gear Rollers, Input Shaft, and Input Shaft Gear.

- (1) Place input shaft gear (AW) on a clean surface, plain side up, and position sleeve 41-S-3776-40 (fig. 140), tapered end up, in gear.
- (2) Fill space between gear and sleeve 41-S-3776-40 (fig. 140) with general purpose grease (GAA). Install 35 input shaft gear rollers (AX), input shaft gear roller spacer (AY), and the other 35 input shaft gear rollers (AZ). A total of 70 rollers are required.
- (3) Position input shaft gear inner thrust washer (BC) on input shaft (BD) and insert shaft in sleeve 41-S-3776-40 (fig. 140). Hold rollers from coming out of gear and push input shaft into position. This will remove sleeve from rollers. Remove sleeve from shaft. Place input shaft

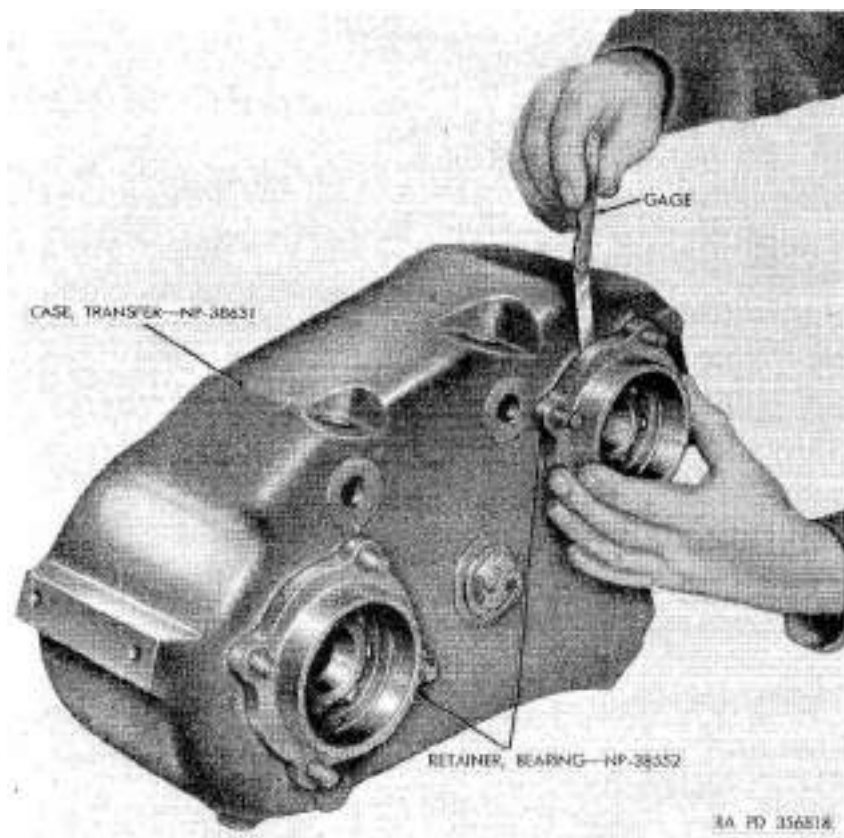


Figure 189. Checking clearance between bearing retainers and transfer case with thickness gage.

gear outer thrust washer (AV) over outer end of input shaft and position it against gear to prevent loss of rollers.

h. Install Input Shaft Assembly in Transfer Case.

Note. Care must be exercised when the input shaft and input shaft gear are installed in the transfer case as an assembly. Loss of the input shaft gear rollers will occur if the gear is not held firmly in contact with the input shaft gear inner thrust washer (BC) when the assembly is installed.

Hold the gear in place on the input shaft (fig. 133) and insert input shaft through upper ball bearing (inside of transfer case) Install companion flange (AE), 29/32 ID, 1% OD, plain washer (AD), and $\frac{7}{8}$ -16NC slotted nut (AC). Refer to figure 129 for dimensions of correct companion flange. Tighten nut to 140 to 160 pound-feet torque with a torque indicating wrench and socket. Install new $\frac{1}{8}$ x $1\frac{1}{8}$ cotter pin (AB).

i. Install Front Axle Output Shaft and Companion Flange.

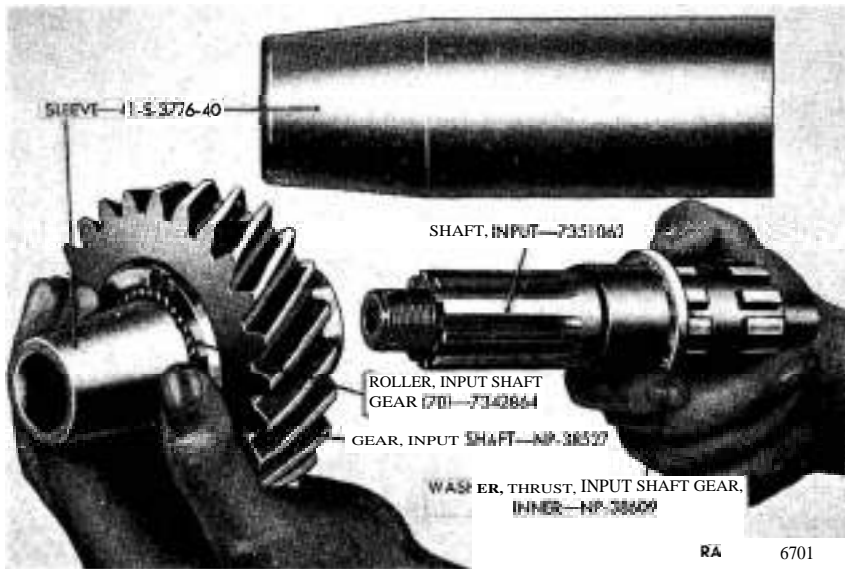


Figure 140. Installing input shaft gear and rollers.

- (1) Place front axle output shaft thrust washer (V) on threaded end of front axle output shaft (W) and install shaft in transfer case.
- (2) Install companion flange (D), 29/32 ID, 1 3/4 OD, plain washer (C), and 7/8-16NC slotted nut (B). Refer to figure 129 for dimensions of correct companion flange. Tighten nut to 140 to 160 pound-feet torque with a torque indicating wrench and socket. Install new 1/8 x 15/8 cotter pin (A).

j. *Install Shifter Shaft Oil Seals.* Coat outer surface of shifter shaft oil seals (XX and WW) with plastic-type gasket cement and drive seals in transfer case (lip of seal toward inside) until seals bottom in case counterbores.

k. *Install 2-Speed Clutch Gear Shifter Shaft (Short Shaft), 2-Speed Clutch Gear, and Shifter Fork.*

- (1) Insert 2-speed clutch gear shifter shaft (ZZ) through upper oil seal, plain end toward case.
- (2) Position shifter fork (BF) on 2-speed clutch gear (BE) so that recess in clutch gear will be toward drive gear and screw hole in fork will be down when parts are installed. Place 2-speed clutch gear and shifter fork in case and position clutch gear on input shaft. Push shifter shaft through shifter fork.
- (3) Install shifter fork screw (FF) in shifter fork and align

screw with hole in shifter shaft. Tighten screw and install locking wire (GG) through screw head and around shifter shaft.

1. Install Frost Axle Clutch Gear Shifter Shaft (Long Shaft), Front Axle Clutch Gear, and Shifter Fork.

- (1) Insert front axle clutch gear shifter shaft (YY) through lower oil seal, plain end toward case.
- (2) Install shifter fork screw (Y) in shifter fork (X) . Position shifter fork on front axle-clutch gear (AA) so that shifter fork screw will be toward end of case and teeth of clutch gear will be toward rear of case. Place clutch gear on front axle output shaft (W).
- (3) Push shifter shaft through shifter fork, and align shifter fork screw with hole in shaft. Tighten screw and install locking wire (Z) through hole in screw and around shifter shaft.

m. Install 5/16-inch Poppet Balls, Poppet Ball Springs, Poppet Ball Screw Gaskets, and Poppet Ball Screws. Install 5/16-inch poppet balls (R and AR) , poppet ball springs (Q and AQ), poppet ball screw gaskets (P and AP), and poppet ball screws (N and SS) in transfer case. Tighten screws.

Section VI. ASSEMBLY OF TRANSFER FROM SUBASSEMBLIES

151. General

Before installing the subassemblies, it is important to make certain they are free from all traces of dirt, corrosion, or rust preventive compounds.

152. Brake Output Shaft Bearing Retainer Assembly (Field and Depot Maintenance)

Place new bearing retainer gasket (AU, *fig. 135*) on brake output shaft bearing retainer and position retainer in transfer case so that pad on retainer flange covers shifter shaft opening. Position $\frac{3}{4}$ -inch lock washers on $\frac{3}{4}$ -16NC x $\frac{3}{4}$ -24NF x 1 7/16 studs and cap screws. Install $\frac{3}{4}$ -24NF nuts and $\frac{3}{4}$ -16NC x 11/8 cap screws. Tighten nuts and screws.

153. Rear Axle Output Shaft Bearing Retainer Assembly (Field and Depot Maintenance)

Place new bearing retainer gasket (S, *fig. 135*) on rear axle output shaft bearing retainer and position retainer in transfer

case so that pad on retainer flange covers shifter shaft opening. Position $\frac{3}{8}$ -inch lock washers on ~~$\frac{3}{8}$ -16NC~~ x ~~$\frac{3}{8}$ -24NF~~ x $1\frac{7}{16}$ studs and cap screws. Install ~~$\frac{3}{8}$ -24NF~~ nuts and ~~$\frac{3}{8}$ -16NC~~ x $1\frac{1}{2}$ cap screws. Tighten nuts and screws.

154. Transfer Lubricant (Depot Maintenance)

Install 5 pints of universal gear lubricant (GO) in transfer and rotate companion flanges sufficiently to insure distribution of lubricant over all internal parts.

CHAPTER 10

PROPELLER SHAFTS AND UNIVERSAL JOINTS

Section I. DESCRIPTION AND DATA

155. Description

Three tubular propeller shafts (fig. 141) , equipped with sliding splined yokes and roller bearing universal joints at each end, transmit power from the transmission to the transfer and from the transfer to the two driving axles. The various parts, except tubes, are interchangeable on the propeller shafts to front and rear axles. Complete interchangeability is provided on the roller bearing assemblies, bearing oil seals, bearing oil seal retainers, and bearing retainers for all of the universal joints, but the journals and yokes on the transmission-to-transfer propeller shaft are of greater width than those provided for the other two propeller shafts.

156. Data

Make ----- Universal Products Co

Model :

Transmission-to-transfer propeller shaft assembly ____ 5360

Front axle propeller shaft assembly ----- 5160

Rear axle propeller shaft assembly ----- 5160

Propeller shaft tube diameter ----- 2 1/2 in

Propeller shaft tube length (*fig. 142*) :

Transmission-to-transfer ----- 77 7/8 in

Front axle ----- 88 1/4 in

Rear axle, models M37 and M42 ----- 28 1/2 in

Rear axle, models M43 and V41 ----- 42 1/2 in

Splined yoke length (*fig. 142*) :

Transmission-to-transfer ----- 51 1/4 in

Front axle ----- 9 7/16 in

Rear axle ----- 9 7/16 in

Universal joint (type) ----- journal and roller

Universal joint bearings ----- cageless roller

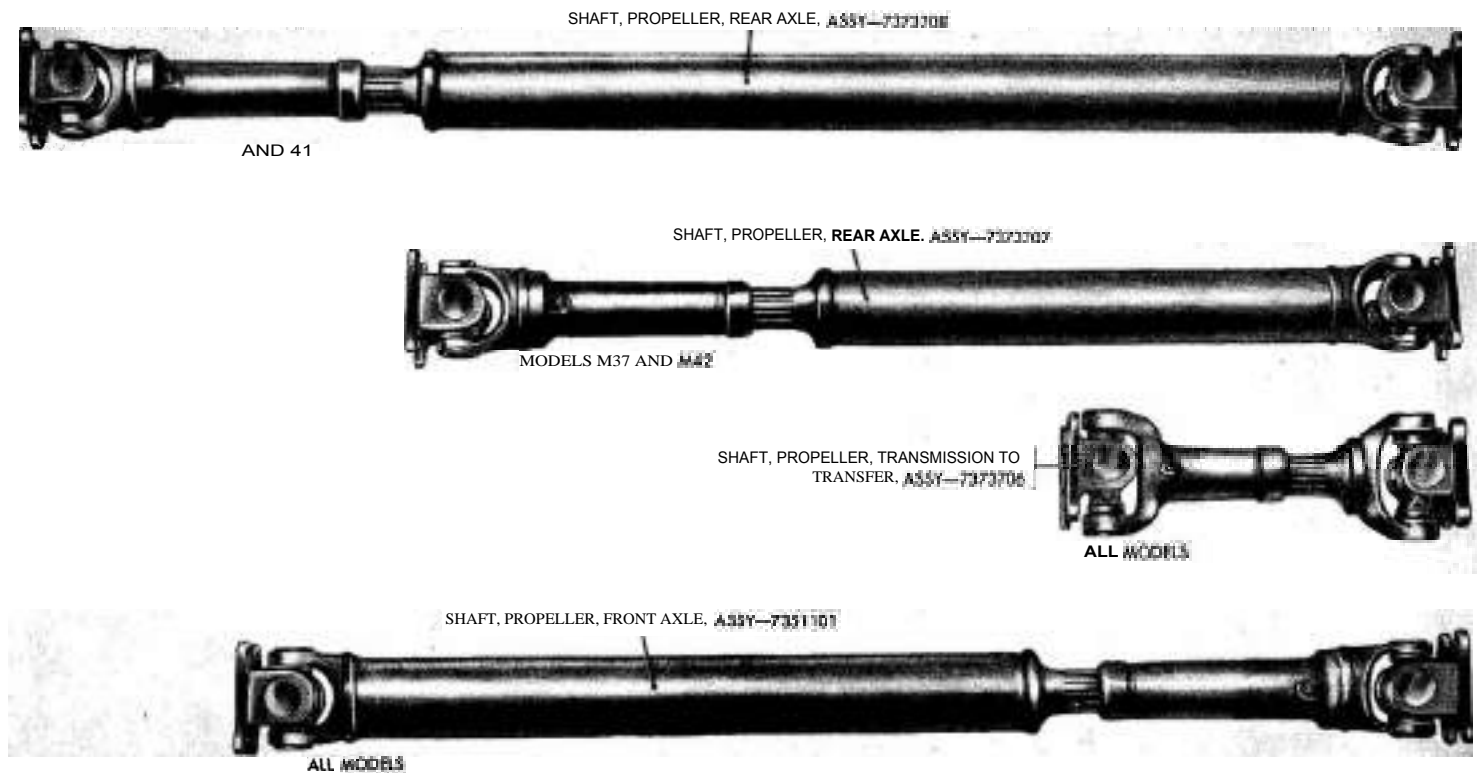


Figure 141. Propeller shaft assemblies.

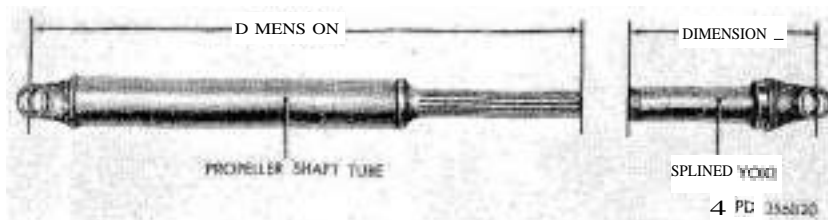


Figure 142. Propeller shaft tube and splined yoke dimensions.

Section II. REBUILD OF PROPELLER SHAFTS AND UNIVERSAL JOINTS

157. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 146, except where otherwise indicated.

a. Remove Splined Yoke from Propeller Shaft and Disassemble Oil-Seal Parts.

- (1) Remove splined yoke from propeller shaft tube (L) .
- (2) Remove splined yoke oil seal cap (M), splined yoke oil seal washer (N), splined yoke oil seal (P) , and splined yoke oil seal washer (Q).

b. Disassemble Universal Joint.

- (1) Remove $\frac{1}{4}$ -NPT straight lubricating fittings (K) and $67\frac{1}{2}$ -degree $\frac{1}{8}$ -NPT lubricating fitting (S) from splined yoke (R) and journal (J).
- (2) Remove bearing retainers (A, E, W, and X) with a punch and hammer (*fig. 143*) .
- (3) To remove the roller bearing assemblies, proceed as follows :

Note. The roller bearing assemblies (B, F, V, and Y) are a press fit in the propeller shaft tube yoke, flange yokes (BE), and splined yokes (R). The proper removal procedure must be followed to prevent damage of parts.

- (a) Position a $1\frac{1}{4}$ -inch heavy-duty socket over roller bearing assembly (F) and a $\frac{1}{2}$ -inch socket over roller bearing assembly (Y). Force roller bearing assembly (F) from the flange yoke (BB) with a vise (*fig. 144*) or an arbor press. Watch the position of journal (J) as bearing assembly is forced from the yoke because the opposite bearing oil seal retainers (H and AA) will be damaged if they contact the splined yoke or propeller shaft tube yoke ends.
- (b) Change position of the sockets so $1\frac{1}{2}$ -inch socket is

against the journal assembly end and 1 ¼-inch socket is over roller bearing assembly (Y). Remove roller bearing assembly ((a) above).

(4) Remove the two other roller bearing assemblies (B and V). Refer to (3) above. Remove journal (J) from splined yoke or tube yoke. Remove flange yoke (BB).

(5) Remove bearing oil seals (C, G, U, and Z) and bearing oil seal retainers (D, H, T, and AA) from journal (J) .

Note. Do not remove retainers unless new replacement parts are available as they must be a snug fit on the journal.

(6) Disassemble other universal joints requiring attention. Refer to (1) through (5) above.

(7) To disassemble roller bearing assembly, remove bearing roller retainer and bearing rollers from roller bearing bushing. The bearing roller retainer can be separated from the bushing with a sharp-blade instrument.

Note. From a reclamation standpoint, the roller bearing assemblies (B, F, V, and Y) can be disassembled (fig. 145).

c. *Clean Parts.* Wash all parts in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

158. Inspection (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 146, except where otherwise indicated.

a. *Inspect Journals.* Inspect journals (J) for wear, corrosion, scores, cracks, or other visual damage. If wear is evident, measure journal pins with a micrometer. If the journal is not in good condition or the diameter of the journal pins is less than the wear limit in paragraph 347, replace journal.

b. *Inspect Roller Bearing Bushings* (fig. 145). Inspect roller bearing bushings for wear, corrosion, scores, or cracks. If wear is evident, measure diameter of inside and outside ground surfaces. If the outside dimension is less or the inside dimension more than the wear limits specified in paragraph 347, replace bushings.

Note. Repair kits consisting of the journal, roller bearing assemblies, bearing oil seals, bearing oil seal retainers, and bearing retainers are listed in the applicable ORD 7 and 8 and these parts should be installed, if available, when there is evidence of wear in the roller bearing bushings and bearing rollers.

c. *Inspect Bearing Rollers* (fig. 145) . Measure diameter of bearing rollers with a micrometer and if dimension is less than the limit specified in paragraph 347, replace rollers.

d. *Inspect Bearing Oil Seal and Bearing Oil Seal Retainers.*

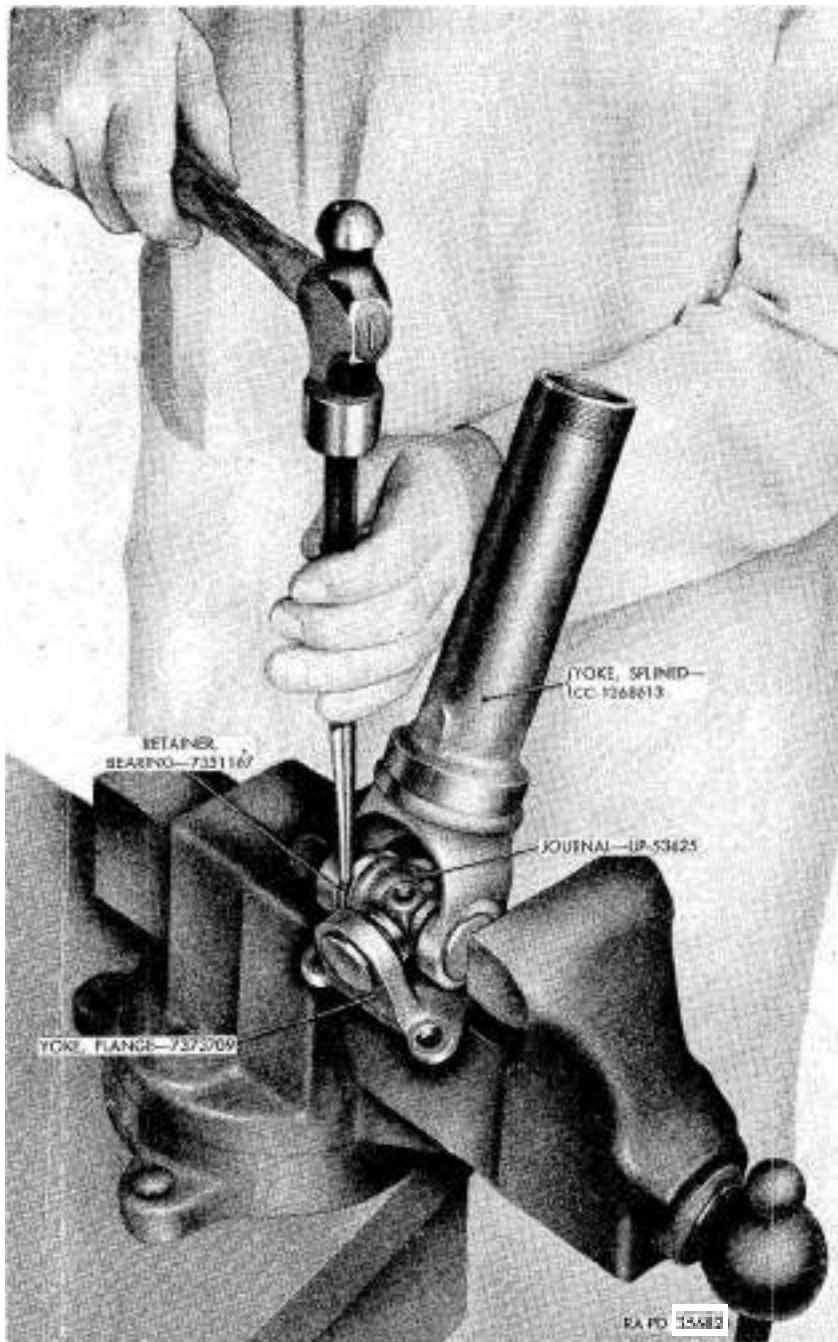


Figure 143. Removing bearing retainer.

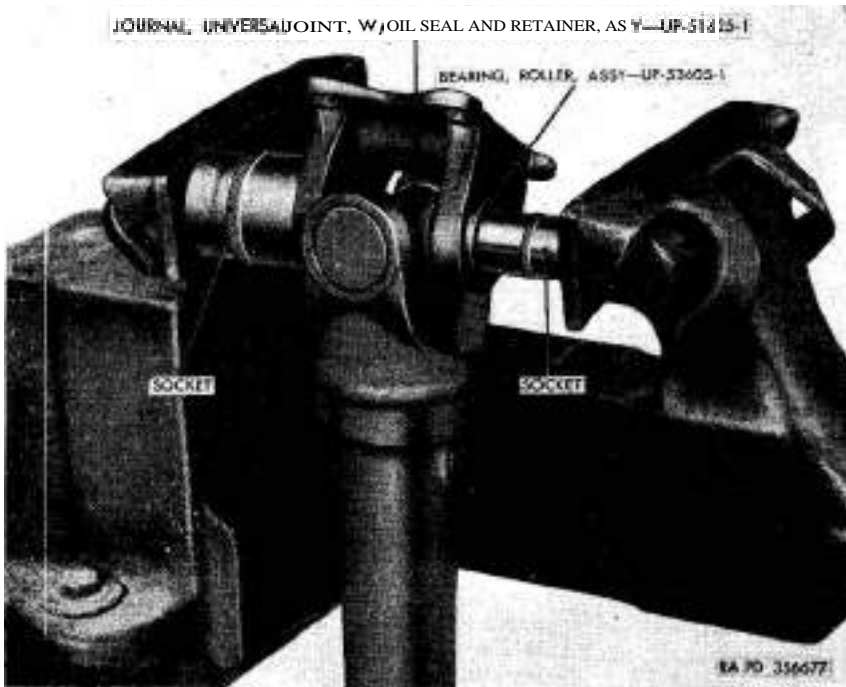


Figure 144. Removing roller bearing assembly from universal joint.

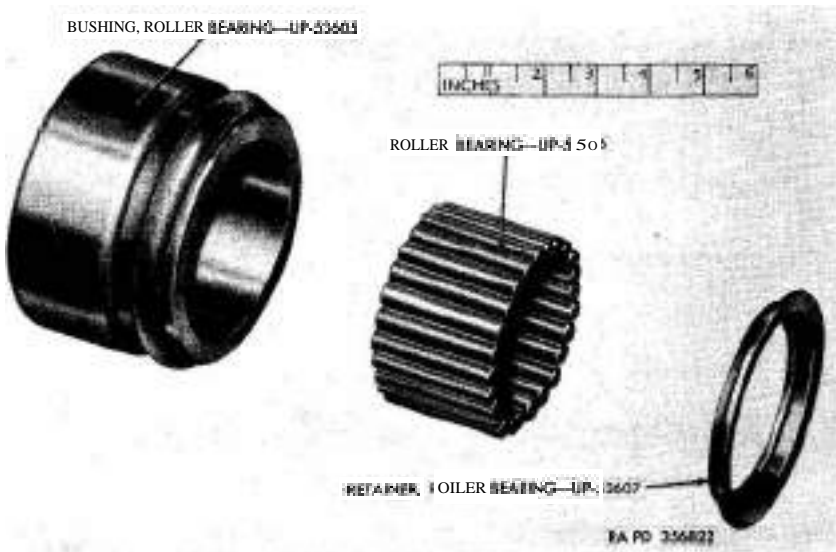


Figure 145. Roller bearing assembly—exploded view.

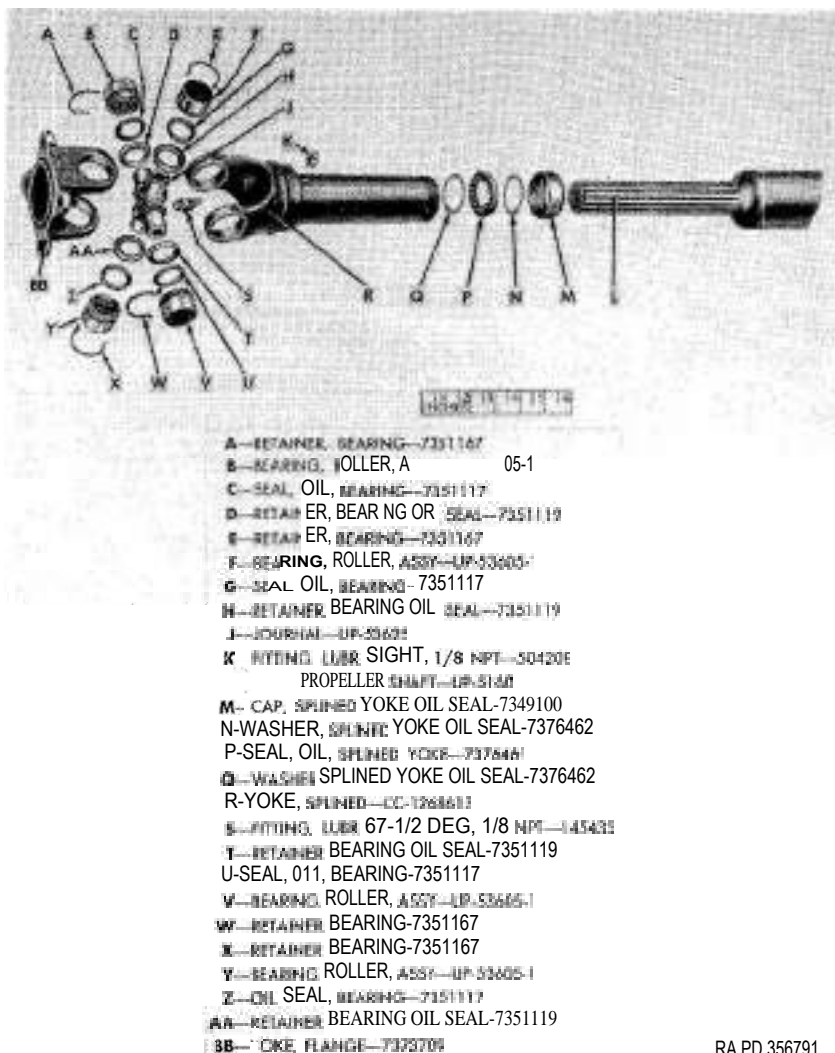


Figure 146. Universal joint and propeller shaft assembly—exploded view.

If new parts are available, the bearing oil seals (C, G, U, and Z), including the bearing oil seal retainers (D, H, T, and AA), must be replaced whenever the universal joints are disassembled for any reason. The retainers will be satisfactory for further service if they have not been removed from journals and are in good condition.

e. Inspect Splined Yokes and Flange Yokes. Inspect splined yokes (R) and flange yokes (BB) for wear, corrosion, scores, cracks, or other visual damage. Measure bearing bores in splined yokes and flange yokes. If the inside diameter is greater than the

wear limit specified in paragraph 347 or if the parts are not in otherwise good condition, replace as required. Inspect splines in splined yokes for wear and if noticeable wear is evident, replace yoke.

f. Inspect Splined Yoke Oil Seal, Splined Yoke Oil Seal Cap, and Splined Yoke Oil Seal Washers. Inspect splined yoke oil seal cap (M) and splined yoke oil seal washers (N and Q) for wear or damage and replace as required. A new splined yoke oil seal (P) must be installed when repairs are performed on the propeller shaft.

g. Inspect Propeller Shaft Tube.

- (1) Inspect propeller shaft tube (L) for dents and damage. The propeller shaft tube must be replaced if there is any evidence of dents or damage as such defects will result in misalignment and failure of tube.
- (2) Inspect propeller shaft tube splines for wear and if wear is evident, replace tube.
- (3) If propeller shaft tubes are free of dents and damage, the alignment of the tubes may be considered satisfactory. Alignment of the propeller shaft tubes can be checked with a dial indicator if the tubes are mounted in a lathe equipped with an adjustable chuck. Support splined end of tube on center in tail stock of lathe and yoke end of tube in adjustable chuck. Remove paint from middle of tube with a piece of abrasive cloth to eliminate any uneven surfaces which might affect the reading of the dial indicator. If run-out at center of tube exceeds the dimension specified in paragraph 347, replace tubes as required.
- (4) Measure the bearing bore in yoke end of the propeller shaft tubes and if inside diameter is greater than the wear limit specified in paragraph 347, replace tubes.

159. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 146, except where otherwise indicated.

a. General. If there is any question about the assembly of the propeller shaft tubes and splined yokes, the length of the parts must be checked to make certain they agree with the dimensions in paragraph 156.

b. Assemble Bearing Rollers in Roller Bearing Bushings (fig. 145). If the roller bearing assemblies were disassembled, apply general purpose grease (GAA) in the roller bearing bushings and insert 25 bearing rollers in each bushing. Install bearing roller retainer (cup side in) and make certain retainer is firmly seated.

e. Install Bearing Oil Seal Retainers and Bearing Oil Seals on Journals.

- (1) Install bearing oil seal retainers (D, H, T, and AA) on journals (J). Make certain the retainers are properly seated on journal shoulders.
- (2) Soak bearing oil seals (C, G, U, and Z) in light engine oil for approximately 30 minutes before installation. Install oil seals on journals.

d. Assemble Universal Joints.

- (1) Place journal in flange yoke (BB) so lubricating fitting opening in journal will be toward the engaging splined yoke or propeller shaft tube yoke. (This does not apply to journals for the transmission-to-transfer propeller shaft assembly because the lubricating fitting openings are located in a different position.)
- (2) Position two of the roller bearing assemblies (B and V) in the splined yoke (R) or propeller shaft tube yoke and force them into position between jaws of a vise or with an arbor press. Considerable pressure will be necessary to compress oil seals so that the bearing retainers (A and W) can be installed.

Note. New bearing retainers (A, E, W, and X) must be installed whenever universal joint repairs are performed.

Install bearing retainers with a punch and hammer and make certain they are fully seated on roller bearing assemblies, but do not distort them.

- (3) Engage journal (J) in openings of flange yoke (BB) and install roller bearing assemblies (F and Y). Install bearing retainers (E and X). Refer to (2) above.
- (4) Install $\frac{1}{8}$ NPT, 67 $\frac{1}{2}$ " lubricating fitting (S) in journal and make certain it is properly positioned for the grease gun connection.

e. Assemble Splined Yoke Oil Seal Washers and Splined Yoke Oil Seal Cap on Propeller Shaft Tubes.

- (1) Install splined yoke oil seal cap (M) on propeller shaft tube splines, followed by splined yoke oil seal washer (N), splined yoke oil seal (P), and the other splined yoke oil-seal washer (Q). Engage splined yoke (R) with splined end of propeller shaft tube (L) and screw splined yoke oil seal cap (M) on threaded end of splined yoke. Tighten cap until oil seal is firmly compressed.
- (2) Install $\frac{1}{8}$ NPT, straight lubricating fitting (K) in splined yoke.

f. Lubricate Universal Joints and Splined Yokes. Lubricate universal joints and splined yokes with general purpose grease (GAA). If the grease does not appear at all of bearing-oil seals, pressure must be applied, with a vise or arbor press, to the roller bearing assemblies from which grease is escaping. This will cause the grease to flow through the other bearings as additional grease is forced through the journal by a grease gun.

CHAPTER 11

BRAKE SYSTEM

Section I. DESCRIPTION AND DATA

160. Description

a. *Hand Brake Assembly* (fig. 147). The hand brake assembly consists of an external-contracting steel band equipped with compressed woven lining, which operates on a cast iron drum at rear of transfer assembly. Control of hand brake assembly is provided by a lever in driver's compartment. The brake band is adjustable to compensate for lining and drum wear.

b. *Service Brake Assemblies* (fig. 147). Internal-expanding hydraulic service brake assemblies are provided on all four wheels. They consist of steel brake shoes that are equipped with tapered, woven, and molded linings, which operate against cast iron brake drums attached to the hubs and wheels. Control of the brake assemblies is accomplished by a brake pedal in the driver's compartment. The pedal is attached to the master cylinder, which forces fluid to the wheel cylinders for actuation of the brake shoes when brakes are applied.

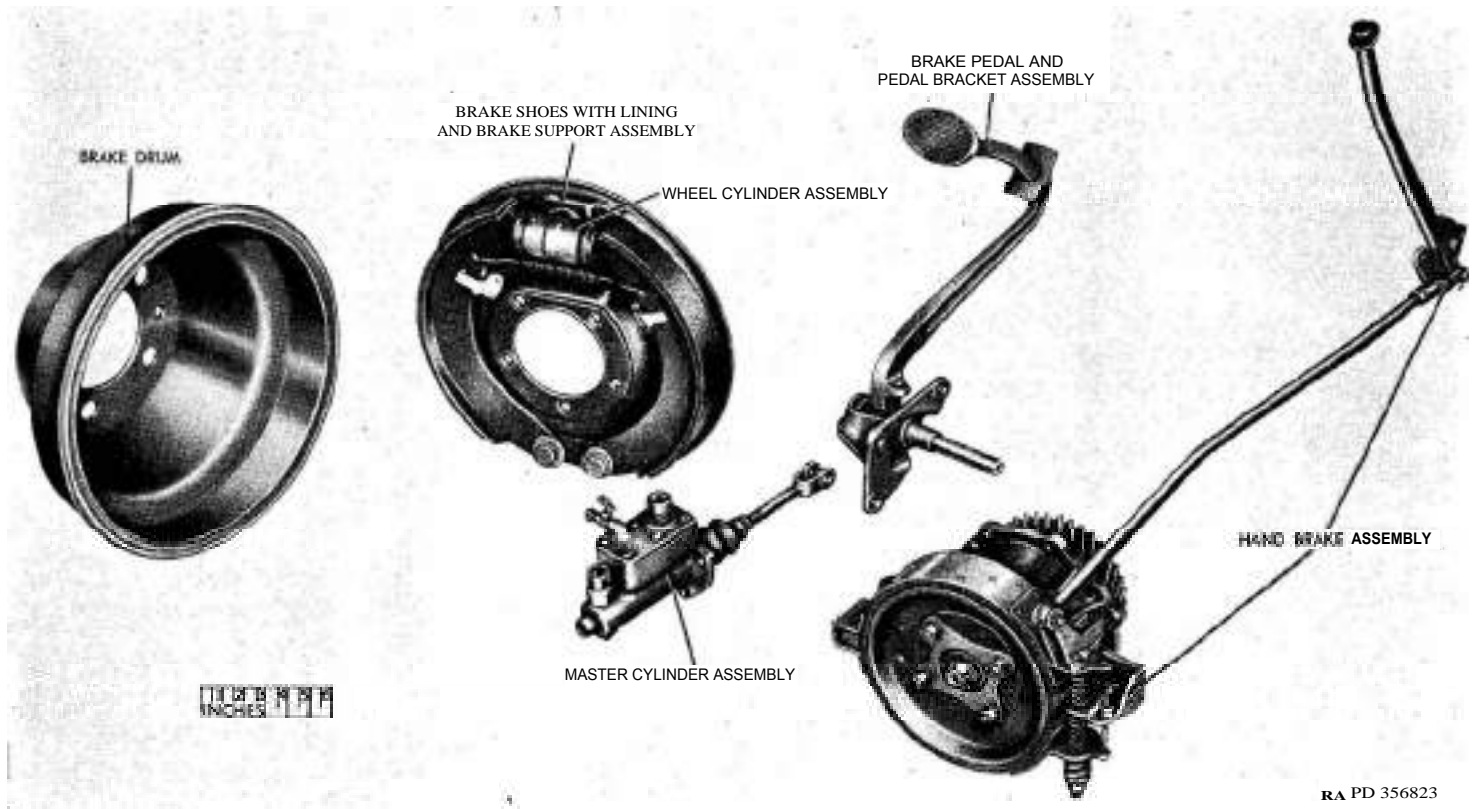
161. Data

a. *Hand Brake Assembly.*

Type	external-contracting band
Location	rear of transfer assembly
Drum diameter	7 13/16 in.
Lining material	woven asbestos
Method of attachment to band	rivets
Width of lining	2 in.
Length of lining	24 in.
Thickness of lining	1/4 in.

b. *Service Brake Assemblies.*

Type	hydraulic-internal expanding
Drum diameter	14 1/8 in.



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Figure 147. Brake system major components.

Lining material	----- tapered, woven, and molded
Method of attachment to shoes	----- cement bonded
Width of lining	----- 13/4 in.
Length of lining, per shoe	----- 15 in.
Thickness of lining at center	----- 1/4 in.
Master cylinder bore	----- 11/4 in.
Wheel cylinder bore :	
Front wheel, front shoe	----- _ 11/4 in.
Front wheel, rear shoe	----- 13/8 in.
Rear wheel, front shoe	----- 11/4 in.
Rear wheel, rear shoe	----- 13/8 in.

Section II. DISASSEMBLY OF BRAKE SYSTEM INTO SUBASSEMBLIES

162. General

The brake system (fig. 147) is divided into five subassemblies : hand brake assembly ; brake shoes with lining and brake support assemblies, including brake drums ; wheel cylinders, master cylinder; and brake pedal and pedal bracket assembly. The following procedures are based on the assumption that the master cylinder is removed from the vehicle. It is also assumed that the transfer assembly and axles, to which the hand and service brake assemblies are attached, are also removed from the vehicle.

163. Brake Pedal and Pedal Bracket (Field Maintenance)

a. Remove Clutch and Brake Pedal Covers from Cab. Remove 11 lock washer screws; then remove clutch and brake pedal covers from cab (E, fig. 21).

b. Remove Brake Pedal and Pedal Bracket from Frame.

- (1) Remove cotter pin (J, fig. 34) from clevis pin and disconnect master cylinder-to-pedal rod from brake pedal.
- (2) Remove brake pedal pull back spring (D, fig. 34) and spring extension from pedal.
- (3) Remove cotter pin and clevis pin from clutch pedal shaft lever. This will release the pull back spring, clip, and clutch operating rod from the lever (fig. 35).
- (4) Remove nut, lock washer, and cap screw from clutch pedal shaft lever ; then remove lever from pedal shaft (B, fig. 35).
- (5) Remove three nuts, lock washers, and cap screws (H, fig. 34) ; then remove pedals and pedal bracket assembly from vehicle.

Section III. REBUILD OF HAND BRAKE ASSEMBLY

164. Disassembly (Field and Depot Maintenance)

a. *General.* Refer to TM 9-840 for information pertaining to the replacement of hand brake lever.

b. *Remove Parts from Hand Brake Lever* (fig. 148).

- (1) Remove 3/32 x 3/4 cotter pin (K) from clevis pin (F) ; then remove clevis pin from lever-to-brake rod yoke (G) and hand brake lever assembly (D). This will release the rod and yoke from lever. Remove lever-to-brake rod yoke (G) and 7/16-20NF nut (H) from lever-to-brake rod (J).
- (2) Remove 3/4-24NF stamped-jam nut (N) and 1/2-24NF jam nut (P) from lever bolt (E). Remove lever bolt from hand brake lever assembly (D). This will release the hand brake lever sector (L).
- (3) Push lever pawl rod assembly (M) up through lever to expose lever pawl rod button (B) and button knurled pin (A). When knurled pin is visible above lever, drive pin from button with a small drift. Remove button and lever pawl rod compression spring (C) from lever pawl assembly rod (M).

c. *Cleaning.* Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

165. Inspection (Field and Depot Maintenance)

a. *Inspect Hand Brake Lever and Related Parts* (fig. 148).

- (1) Inspect hand brake lever assembly (D) for damage, cracks, distortion, or worn bolt holes or clevis pin holes. If any of these conditions exist, hand brake lever must be replaced.
- (2) Inspect lever pawl rod compression spring (C) for damage or breakage. If there is evidence of damage or breakage, replace spring.
- (3) Inspect lever pawl rod button (B), button knurled pin (A), lever bolt (E), and clevis pin (F) for wear or damage. If either of these conditions are evident, the parts affected must be replaced.
- (4) Inspect lever pawl rod assembly (M) for cracks, distortion, or worn pawl. If any of these conditions exist, lever pawl rod assembly must be replaced.
- (5) Inspect hand brake lever sector (L) for worn sector teeth, bolt holes, or clevis pin holes ; cracks ; or distortion. If any of these conditions exist, sector must be replaced.

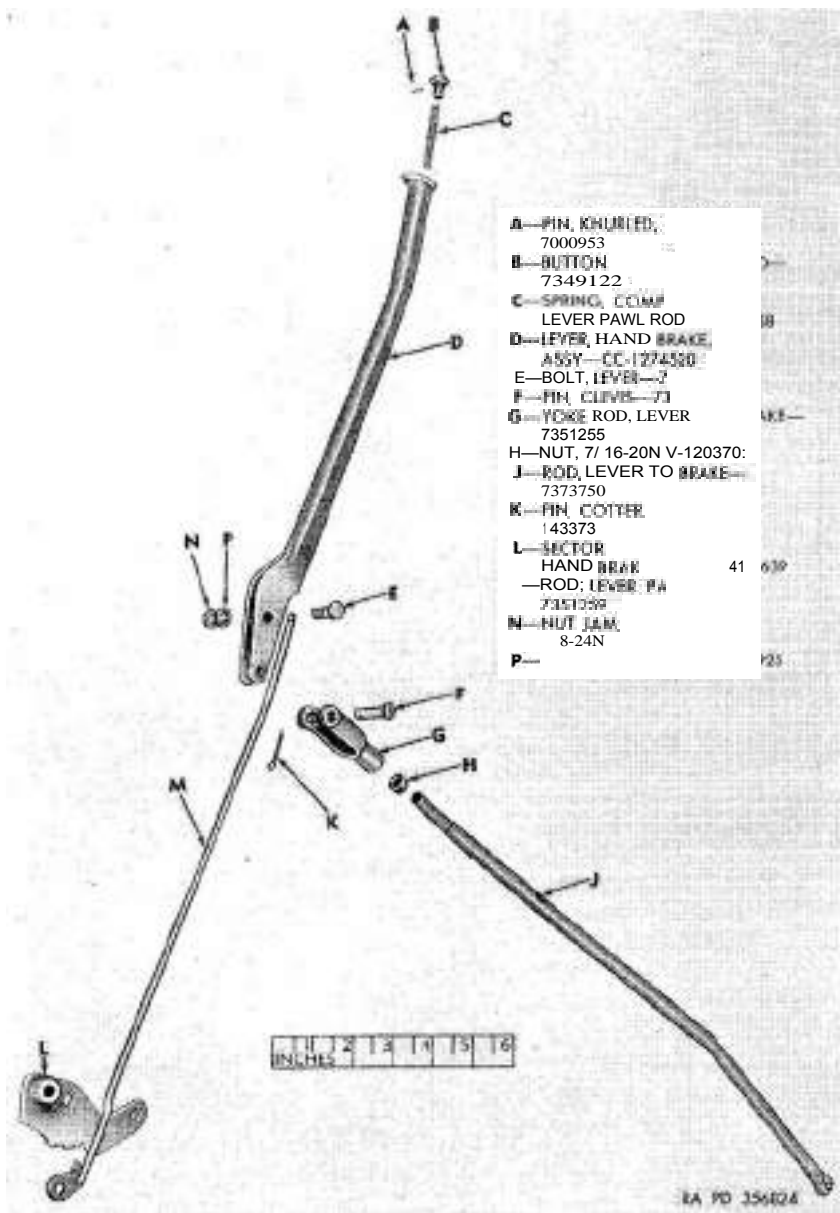


Figure 148. Hand brake lever and rod—exploded view.

b. Inspect Lever-to-Brake Rod, Lever-to-Brake Rod Yoke, and Nut (fig. 148).

- (1) Inspect lever-to-brake rod (J) for wear, cracks, or damaged threads. If any of these conditions exist, rod must be replaced.
- (2) Inspect lever-to-brake rod yoke (G) and ~~7/16-20NF~~ nut (H) for worn threads, damaged threads, cracks, or worn clevis pin holes. If any of these conditions exist, yoke or nut must be replaced.

c. Inspect Brake Band and Related Parts (fig. 128).

- (1) Inspect brake band with lining assembly (X) for wear, loose rivets, or cracks. If lining is worn, it must be replaced. If any of the bracket rivets are loose, they must be replaced or tightened. If any cracks or other visual damage is apparent, replace brake band.
- (2) Inspect brake adjusting bolt compression springs (K and W) and anchor clip compression spring (MM) for damage or breakage. If there is evidence of damage or breakage, springs must be replaced.
- (3) Inspect brake operating compression spring (Z), on brakes so equipped, for damage or breakage. If there is evidence of damage or breakage, replace spring.
- (4) Inspect brake adjusting bolt (P) for worn or damaged threads. If threads on adjusting bolt are not satisfactory, replace bolt.
- (5) Inspect brake cam levers (N and Q) and brake spacer link (L) for cracks or worn clevis pin holes. If either of these conditions exist, unsatisfactory parts must be replaced.
- (6) Inspect brake adjusting screw (Y) for worn or damaged threads. If either of these conditions exist, replace screw.
- (7) Inspect brake band anchor clip screw (NN) for cracks and worn or damaged threads. If any of these conditions exist, replace screw.

d. Inspect Brake Drum (fig. 128). Inspect brake drum (~~KK~~) for cracks, worn bolt holes, or scored or worn braking surface. If braking surface of drum is scored, drum can be machined, providing the material to be removed does not exceed wear limits indicated in paragraph 348. If there is any evidence of cracks or worn bolt holes, brake drum must be replaced.

166. Assembly (Field and Depot Maintenance)

a. General. Information pertaining to the installation of the hand brake band and related parts on the transfer assembly is

covered in paragraph 144i. Refer to TM 9-840 for adjustment of hand brake assembly.

b. Assemble Hand Brake Lever (fig. 148).

- (1) Insert lever pawl rod assembly (M) in hand brake lever assembly (D). Position lever pawl rod compression spring (C) and lever pawl rod button (B) on upper end of pawl rod. Aline hole in button with hole in pawl rod and install button knurled pin (A).
- (2) Position hand brake lever sector (L) in hand brake lever assembly (D) so that spacer on sector will be on offset side of lever. Install lever bolt (E) and $\frac{3}{8}$ -24NF jam nut (P). Tighten jam nut until sector is just a free fit in lever. Install $\frac{3}{8}$ -24NF stamped jam nut (N) (flange side out) and tighten nut securely against $\frac{3}{8}$ -24NF jam nut (P).

c. Assemble ~~Lever-to-Brake~~ Rod and Lever-to-Brake Rod Yoke and Attach Rod to Hand Brake Lever (fig. 148). Assemble 7/16-20NF nut (H) and lever-to-brake rod yoke (G) on lever-to-brake rod (J). Aline pawl with holes in hand brake lever assembly (D) and attach rod to lever with clevis pin (F). Install new 3/32 x $\frac{3}{4}$ cotter pin (K) in clevis pin.

d. Reline Brake Band (fig. 128).

- (1) Before attaching new brake lining, make certain surface of brake band (X) is clean and metal is smooth and level around lining rivet holes.
- (2) Position 24 inches of $\frac{1}{4}$ x 2-inch woven asbestos brake lining and install eighteen 3/16 x 13/32 brass-tubular countersunk head rivets.

Note. A tight smooth fit of brake lining on band can be accomplished if lining is raised (or bumped-up) from band one-half inch at anchor clip before the four end rivets are installed.

Countersink brake lining to a depth of five thirty-seconds of an inch with a brake lining machine and install the four end rivets.

- (3) Drive lining down smooth against the brake band at anchor clip, with a hammer.
- (4) Install remaining 14 rivets.
- (5) Grind lining around rivet holes to eliminate high spots.

Section IV. REBUILD OF BRAKE SHOES WITH LINING AND BRAKE SUPPORT ASSEMBLIES INCLUDING BRAKE DRUMS

167. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 151, except where otherwise indicated.

a. General.

- (1) Information pertaining to the removal of the hub with brake drum assemblies is covered in paragraphs 72 and 89.
- (2) Removal of brake drums from the hubs is covered in paragraph 74.
- (3) Do not remove brake shoe guide springs from brake supports unless inspection (par. 168) reveals that replacement is necessary, as these parts are attached by rivets.
- (4) Do not remove brake shoe cams from the brake shoe cam adjusters unless inspection (par. 168) reveals that replacement of adjusters, brake shoe compression springs, or cams is necessary, as adjusters are riveted to cams.

b. Remove Brake Shoe Assemblies from Brake Support Assemblies.

- (1) Remove brake shoe return spring (W) with pliers (fig. 149).

Note. A tough rubber pad must be used between pliers (fig. 149) and brake lining to prevent damage to lining. A suitable piece of rubber can be cut from a discarded tire.

- (2) Remove ~~5/8-18NF~~ nuts (M) and ~~3/4-inch~~ lock washers (N) from anchor bolts (U). Remove anchor bolts complete with anchor bolt "C" washers (T and V), anchor bolt oil washer retainers (S), and anchor bolt oil washers (R).

Note. The anchor bolts must be removed whenever brake shoes are relined so that all traces of corrosion can be removed to insure free movement of bolts when adjustments are performed.

Remove brake shoe assemblies from brake support assemblies.

c. Remove Wheel Cylinder Assembly from Brake Support. Remove 5/16-18NC x 5/8 cap screws (C), 5/16-inch lock washers (H), and wheel cylinder assembly (A) from brake support.

d. Remove Brake Shoe Guide Spring. If inspection (par. 168) reveals that replacement of brake shoe guide spring (X) is necessary, cut the two 3/16 x 5/8 button-head rivets (Y) and remove guide spring.

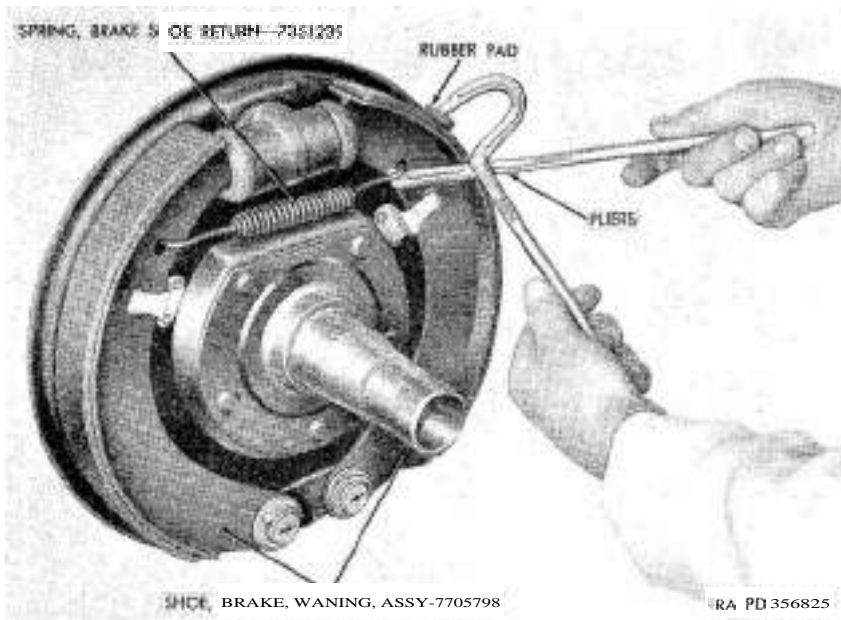


Figure 149. Removing brake shoe return spring with brake spring pliers.

e. *Remove Brake Shoe Cam Adjuster and Brake Shoe Cam.* If inspection (par. 168) reveals that replacement of the brake shoe cam adjuster (K) and brake shoe cam (Z) is necessary, grind riveted end from adjuster. This will release the brake shoe cam, brake shoe cam compression spring (J), and $\frac{1}{4}$ -inch plain washer (L).

f. *Remove Cement-Bonded-Type Brake Lining from Brake Shoes.* If inspection (par. 168) reveals that replacement of original cement-bonded-type brake lining is necessary, remove brake lining from brake shoes with a hammer and chisel (fig. 150). When lining is removed with a hammer and chisel, care must be exercised to prevent damage to brake shoes. The cement that remains after brake lining is removed can be dressed from brake shoes with a belt-type grinder.

Note. When cement is removed by grinding, care must be exercised to prevent the removal of excessive metal from shoes.

168. Inspection and Repair (Field and Depot Maintenance)

a. Inspection.

Note. The key letters noted in parentheses are in figure 151.

- (1) Inspect brake drums for cracks, scores, or worn braking surface. If brake drums are scored or worn and cannot be

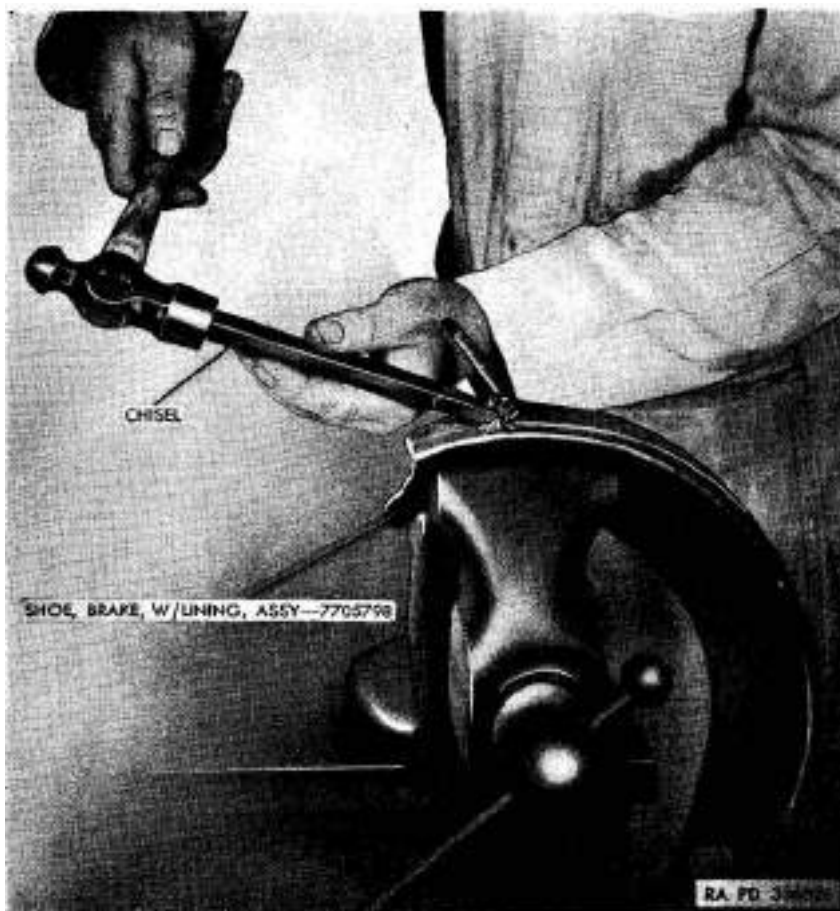


Figure 150. Removing cement-bonded-type brake lining with chisel.

repaired in accordance with *b* below, the installation of new brake drums will be necessary. If brake drums are cracked, replace brake drums as required.

- (2) Inspect brake support with pin assemblies (P) for damage or cracks. If either of these conditions exist, brake supports must be replaced. Inspect brake shoe guide springs (X) for distortion, cracks, or loose rivets. If any of these conditions exist, install new guide springs (pars. 167 and 169). Inspect brake shoe cam adjusters (K), brake shoe cams (Z), and brake shoe cam compression springs (J) for damage or breakage. If any of these parts are not in satisfactory condition, they must be replaced (pars. 167 and 169).
- (3) Inspect brake shoe with lining assemblies (Q) for wear,

distortion, or damage. If brake lining is worn to less than $\frac{1}{8}$ -inch thickness, it must be replaced (pars. 167 and 169). If brake shoes are damaged or badly distorted, they must be replaced.

- (4) Inspect anchor bolts (U), ~~$\frac{5}{8}$ -inch~~ lock washers (N) , and ~~$\frac{5}{8}$ -inch~~ nuts (M) for wear or damaged threads. If either of these conditions exist, replace required parts.
- (5) Inspect anchor bolt "C" washers (T and V) for damage and if there is evidence that they have been previously removed, install new "C". washers. Inspect anchor bolt oil washer retainers (S) for damage. If there is evidence of damage, retainers must be replaced. Inspect anchor bolt oil washers (R) for wear. Whenever repairs are performed on brake shoes, anchor bolt oil washers must be replaced.
- (6) Inspect brake shoe return springs (W) for free and extended lengths. If lengths of brake shoe return springs do not conform to the wear limits in paragraph 348, replace springs. Inspect springs for damage or cracks. If either of these conditions exist, replace springs.

b. Repair. If braking surface of brake drums is scored or worn, it can be satisfactorily repaired by removing the worn braking surface with a brake drum lathe. If it is necessary to increase inside diameter of the brake drums beyond wear limits indicated in paragraph 348, install new brake drums.

Note. When brake drums are machined on a brake drum lathe, they must be attached to the hubs with three ~~$\frac{1}{2}$ -inch~~ x flat-head machine screws and three wheel stud nuts to insure proper alinement.

169. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 151, except where otherwise indicated.

a. General.

- (1) Facilities are not available at ordnance repair units for the cement bonding of brake lining to brake shoes, therefore, drilled and countersunk replacement brake linings (standard and 0.030-inch oversize) , with rivets, are available as repair packages. The service brake shoes after truck serial number 80024000 are drilled for rivet-on lining, but only cement bonded lining is installed on new trucks.
- (2) Brake shoes complete with cement bonded brake lining (standard and 0.030-inch oversize lining) are available for replacement through established supply channels. The

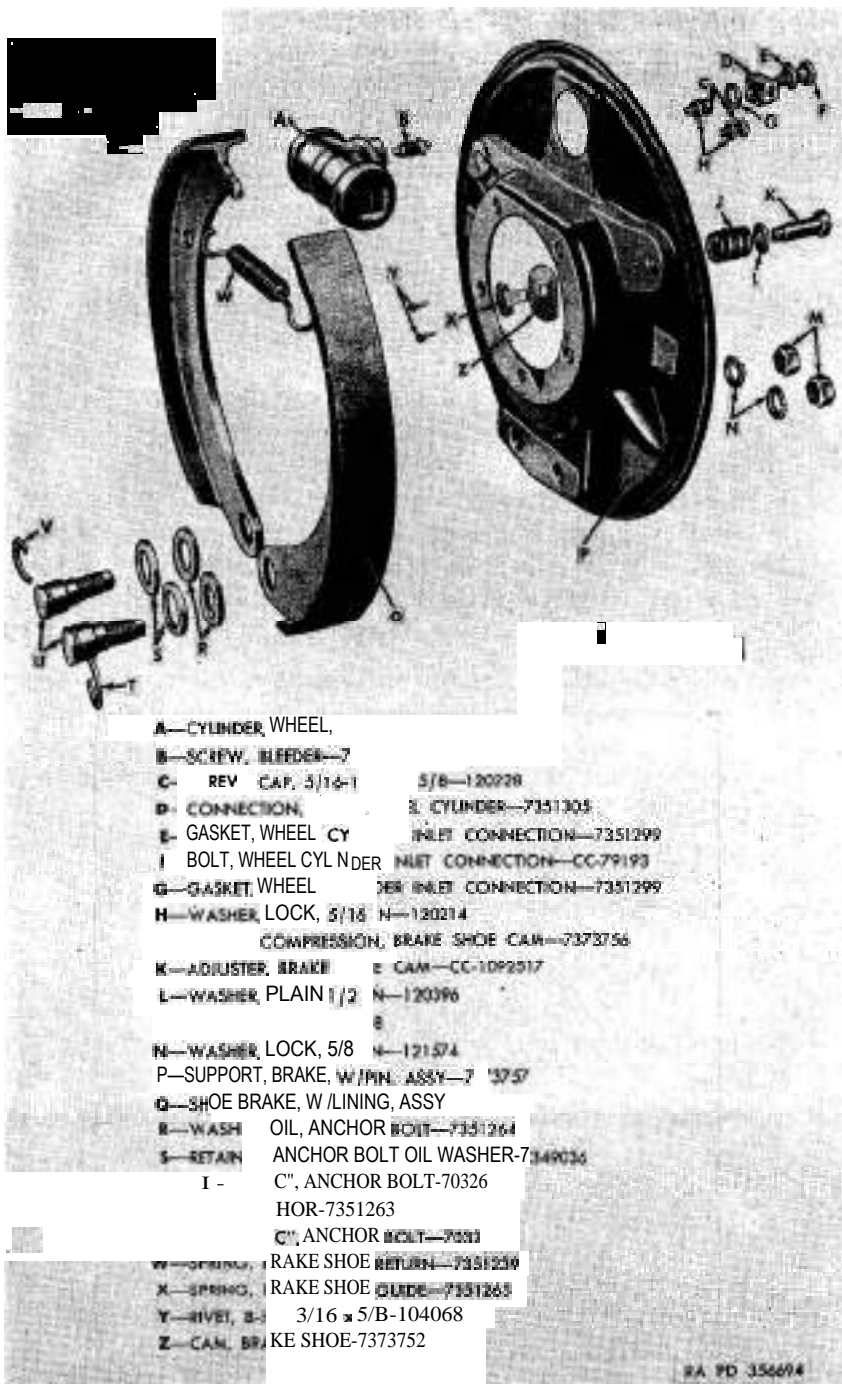


Figure 151. Brake support and brake shoes—exploded view.

shoes with 0.030-inch oversize lining are provided for brake drums that have been machined more than 0.030-inch oversize.

b. *Install Brake Lining on Brake Shoes.*

- (1) Hold brake lining in position on shoes with a brake lining applier. Install 3/16 x 13/32 brass countersunk tubular rivets at each end and secure them to brake shoes with a brake lining machine. Remove brake lining applier.

Note. If lining is used that is not drilled, rivet holes must be countersunk to a depth of five thirty seconds of an inch. If it is necessary to drill the brake shoes, a No. 10 drill is required and the service brake lining can be employed as a template.

- (2) Install other rivets and secure them in place as described in (1) above.

c. *Install Brake Shoe Cam Adjuster and Brake Shoe Cam.* If inspection (par. 168) reveals that replacement of the brake shoe cam adjuster (K) and brake shoe cam (Z) is necessary, assemble the ~~1/2~~-inch plain washer (L) and brake shoe cam compression spring (J) on cam adjuster and insert the small end of cam adjuster through hole in brake support. Place brake shoe cam (Z) on cam adjuster and cold rivet end of cam adjuster over cam.

Note. The riveting or swaging of small end of cam adjuster must be performed in an arbor press.

d. *Install Brake Shoe Guide Spring.* If inspection (par. 168) reveals that replacement of the brake shoe guide spring (X) is necessary, position guide spring on brake support and install two new 3/16 x 5/8 button head rivets (Y) with the heads on outside of brake support. Swage ends of rivets in an arbor press to insure a secure attachment of guide spring to brake support.

e. *Install Wheel Cylinders.*

Note. The location of the wheel cylinders is indicated by the letters "L" and "R" cast into the wheel cylinder body designating left and right and must be installed accordingly. This identification is provided because large bore of wheel cylinder must always be toward rear of vehicle.

Position wheel cylinder assembly (A) on brake support with pin assembly (P). Install two 5/16-18NC x 5/8 cap screws (C) and 5/16-inch lock washers (H) to attach wheel cylinder to brake support.

f. *Install Brake Shoe with Lining Assemblies on Brake Support Assemblies.*

- (1) Position brake shoe with lining assemblies (Q) on brake support with pin assemblies (P).
- (2) Place anchor bolt "C" washers (T and V) on each anchor bolt (U), followed by anchor bolt oil washer retainers

(S) and anchor bolt oil washers (R). Saturate washers with engine oil. Insert anchor bolts through brake shoes and brake support. Install 5/8-inch lock washers (N) and 5/4-18NF nuts (M) on anchor bolts.

- (3) Make certain upper ends of brake shoes are properly engaged in slots in boots at each end of wheel cylinder.
- (4) Engage brake shoe return spring (W) in hole at upper end of one of the brake shoes and finish installation in other brake shoe with brake spring pliers (fig. 149).

g. Adjust Shoe Prior to Installation of Brake Drums.

- (1) Turn anchor bolts so the arrows point toward each other as indicated on figure 152, but do not tighten nuts.
- (2) Turn brake shoe cam adjusters in direction indicated on figure 152 until the brake shoes drop to lowest point. This will position them for maximum clearance between lining and drum.

h. Install Brake Drums on Hubs and Hub with Brake Drum Assemblies on Axles.

- (1) Refer to paragraph 76d for information pertaining to installation of brake drums on hub assemblies.
- (2) Refer to paragraphs 82 and 103 for information pertaining to the installation of hubs with brake drums assembly.

i. Adjustment of Brake Shoes. Refer to TM 9-840 for adjustment of brake shoes.

Section V. REBUILD OF WHEEL CYLINDER

1 70. Disassembly (Field and Depot Maintenance)

a. Remove Boots from Wheel Cylinders (fig. 154). Remove boots from both ends of the wheel cylinder.

b. Remove Bleeder Screw and All Internal Parts from Wheel Cylinder (fig. 154).

- (1) Remove front piston, rear piston, rear piston cup, front piston cup, and piston cup compression spring from wheel cylinder.
- (2) Remove bleeder screw from wheel cylinder.

c. Cleaning. Wash all parts thoroughly in alcohol.

Note. Do not clean parts in volatile mineral spirits or dry-cleaning solvent as the solvent is detrimental to the rubber parts.

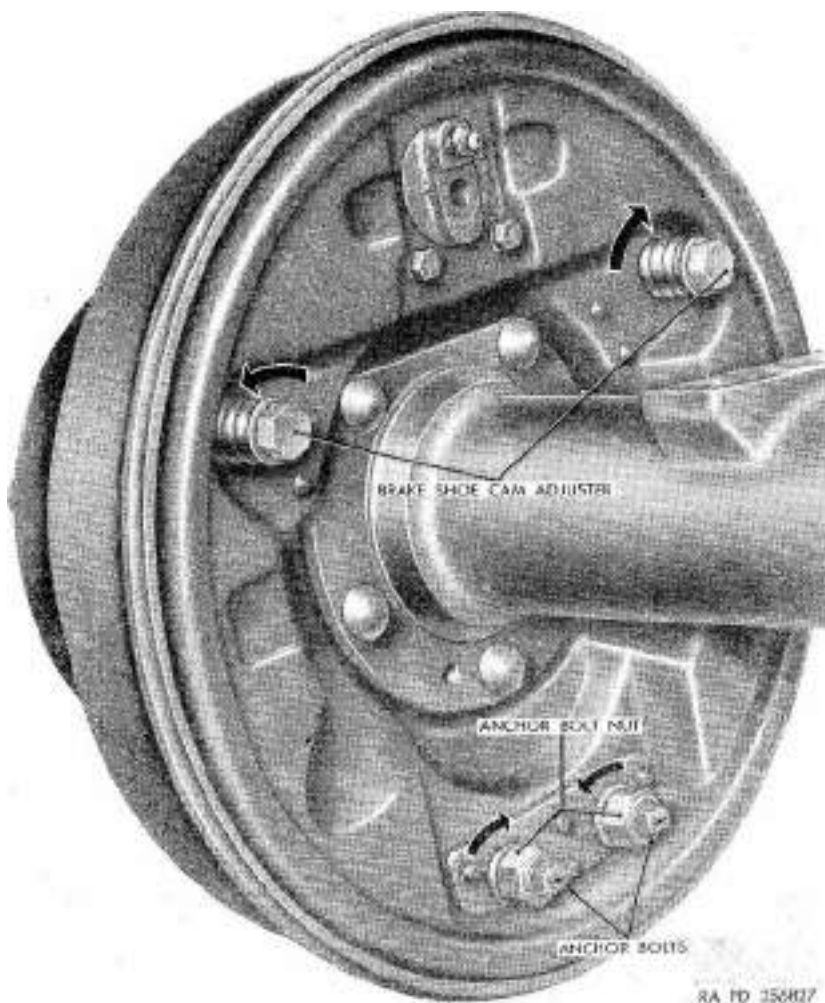


Figure 152 Service brake adjustment points.

171. Inspection and Repair (Field and Depot Maintenance)

a. Inspect Wheel Cylinder and Related Parts (fig. 154).

(1) Inspect wheel cylinder for wear, corrosion, or cracks.

(a) Measure diameter of wheel cylinder bores with an inside micrometer. If dimension exceeds limit specified in paragraph 348, check clearance between each bore and a new front or rear piston (*(b)* below).

(b) If wear is evident in the bore of wheel cylinder, check clearance between wheel cylinder and a new piston with a thickness gage (fig. 153). Place thickness gage



Figure 153. Checking clearance between wheel cylinder and piston with thickness gage.

in wheel cylinder and insert new piston to determine size of thickness gage that can be pulled from wheel cylinder with a slight drag. If clearance exceeds the wear limits indicated in paragraph 348, wheel cylinder must be replaced.

- (c) If bore of wheel cylinder is corroded, but clearance between cylinder and new piston is less than the wear limits specified in paragraph 348, cylinder can be repaired as described in *b* below.
- (2) Inspect front and rear pistons for scores or wear. If pistons are worn, check the diameter with a micrometer. If measurement is less than the wear limits in paragraph 348, pistons must be replaced.

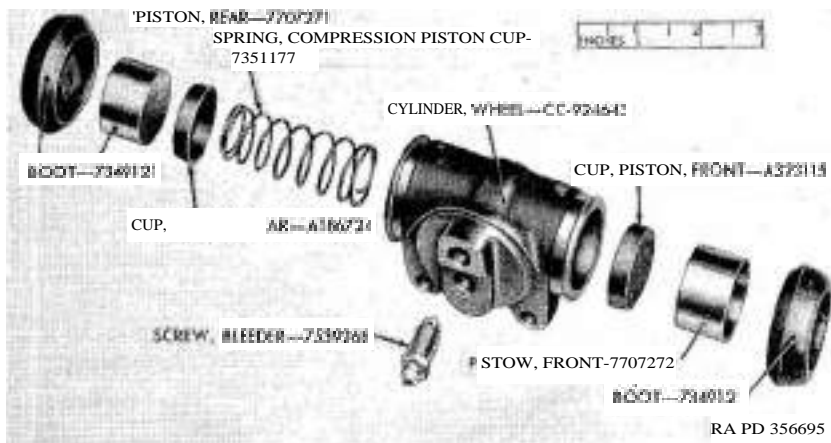


Figure 154. Wheel cylinder—exploded view.

- (3) If wheel cylinder is cracked, install new wheel cylinder.
- (4) Inspect piston cup compression spring for free length and compressed length. If length of piston cup spring does not conform to the wear limits in paragraph 348, a new spring must be installed.
- (5) The boots at each end of wheel cylinder must be replaced whenever repairs are required to insure proper protection of internal parts.
- (6) Inspect threads and seat of bleeder screw. If either of these are not in good condition, bleeder screw must be replaced.

b. Repair.

- (1) Hone corroded spots from wheel cylinder.

Note. Corrosion in wheel cylinder can be removed with a hone, providing amount of material removed does not increase the clearance between wheel cylinder and piston beyond the wear limits indicated in paragraph 348. Only standard pistons are available as service replacement parts. This limits the amount of material that can be removed from bores of wheel cylinder.

Wash wheel cylinder free of abrasives. Refer to paragraph 170c.

- (2) Check clearance between new piston and reconditioned wheel cylinder (a (1) (b) above) . If clearance between new piston and reconditioned wheel cylinder exceeds wear limits indicated in paragraph 348, wheel cylinder must be replaced.

172. Assembly (Field and Depot Maintenance)

a. General. Absolute cleanliness must be exercised in the assembly of wheel cylinder parts. To insure proper protection of wheel cylinder bores and pistons, coat parts with hydraulic brake fluid (HB) before installation.

b. Install Parts in Wheel Cylinder (fig. 154).

- (1) Place piston cup compression spring in wheel cylinder with large end toward large bore of wheel cylinder.
- (2) Install front piston cup and rear piston cup (flat side out).
- (3) Install front piston and rear piston (flat side in).

Note. With wheel cylinder in its operating position, pistons must be installed so that the two bosses for the brake shoes are vertical.

- (4) Install a boot at each end of wheel cylinder. Make certain slot in boot is vertical to insure a tight fit on end of brake shoe.

c. Install Bleeder Screw (fig. 154). Install bleeder screw in upper threaded hole of wheel cylinder.

d. Seal Wheel Cylinders for Storage. Seal openings of wheel cylinders with tape to prevent the entrance of dirt while parts are in service stock awaiting issue.

Section VI. REBUILD OF MASTER CYLINDER

173. Disassembly (Field and Depot Maintenance)

(fig. 155)

a. Remove Master Cylinder-to-Pedal Rod, Push Rod Assembly, and Boot.

- (1) Remove large boot strap (F). Remove master cylinder-to-pedal rod (A), push rod assembly (C), and boot (E), as an assembly, from master cylinder.
- (2) Remove small boot strap (D) ; then remove boot (E) from push rod assembly (C). Remove master cylinder-to-pedal rod (A) from push rod assembly (C). Remove $\frac{1}{2}$ -20^{UNF} nut (B).

b. Remove Cover and External Parts from Master Cylinder.

- (1) Remove $\frac{1}{4}$ -inch cover plug (T), master cylinder-to-air cleaner tube shut-off cock (Z), and 90-degree, 3/16-inch tube, $\frac{1}{8}$ NPT, elbow (AA) from cover (S). Remove $\frac{1}{4}$ -20NC x $\frac{5}{8}$ cap screws (U) and cover screw gaskets

(V). This will release cover and cover gasket (R) from master cylinder.

- (2) Remove $\frac{1}{4}$ -inch pipe plug (W) or stop light switch from master cylinder.
- (3) Remove outlet connector (X) from master cylinder.
- (4) Remove $\frac{1}{4}$ -inch pipe plug (Y) from bottom of master cylinder.

c. *Remove Internal Parts from Master Cylinder.* Remove piston stop locking ring (G) from large end of master cylinder, which will release piston stop (H), secondary cup (J) with piston (K), piston shim (L), piston cup (M), piston return spring with retainer assembly (N), and valve assembly (P). Remove secondary cup (J) from piston (K).

d. *Cleaning.* Wash all parts thoroughly in alcohol.

Note. Do not clean parts in volatile mineral spirits or dry-cleaning solvent as the solvent is detrimental to rubber parts.

174. Inspection and Repair (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 155, except where otherwise indicated.

a. *Inspection (fig. 155).*

- (1) Inspect master cylinder (Q) for wear, corrosion, or cracks.
 - (a) Measure diameter of master cylinder bore with an inside micrometer, and if dimension exceeds limit specified in paragraph 348, check clearance between each bore and a new piston, as described in (b) below.
 - (b) If wear is evident in bore of master cylinder, check clearance between master cylinder and a new piston with thickness gage in a manner similar to that used for wheel cylinder (*fig. 153*). Place thickness gage in master cylinder and insert new piston to determine size of thickness gage that can be pulled from cylinder with a slight drag. If clearance exceeds wear limit indicated in paragraph 348, master cylinder must be replaced.
- (2) If bore of master cylinder is corroded, but clearance between cylinder and new piston is less than the wear limits specified in paragraph 348, cylinder can be repaired as described in *b* below.
- (3) If master cylinder is cracked, install a new master cylinder.
- (4) Inspect cover (S) for cracks, damaged machined sur-

face, or stripped or worn threads. If any of these conditions exist, cover must be replaced.

- (5) Inspect 1/2-inch cover plug (T), ~~1/8-inch~~ pipe plug (W), outlet connector (X), pipe plug (Y), master cylinder-to-air cleaner tube shut-off cock (Z), and 90° 3/16-inch tube ~~1/8 NPT~~ elbow (AA) for damaged threads, cracks, or other visual damage. If any of the parts are unsatisfactory, replace as required.
- (6) Inspect master cylinder-to-pedal rod (A), ~~1/2-20NF~~ nut (B), and push rod assembly (C) for damaged threads, distortion, or worn clevis pin holes. If any of these conditions exist, replace parts as required.
- (7) Inspect small boot strap (D) and large boot strap (F) for damage or distortion. If either of these defects are apparent, replace parts as required.
- (8) Boot must be replaced whenever repairs are performed on master cylinder.
- (9) Inspect piston stop locking ring (G) and piston stop (H) for distortion, corrosion, or damage. If corrosion on piston stop is not excessive, it can be removed; however, locking ring must be replaced if it is distorted.
- (10) Discard secondary cup (J) and piston cup (M).

Note. A kit containing the secondary cup (J) and piston cup (M) is available for service replacement and these parts must be replaced whenever repairs are required on the master cylinder.

- (11) Inspect piston (K) for wear by measuring the diameter of the flanged ends with a micrometer. If dimensions are less than the wear limits indicated in paragraph 348, replace piston.
- (12) Inspect piston shim (L) for distortion. If shim is not in good condition, it must be replaced.
- (13) Inspect free and compressed length of piston return spring with retainer assembly (N). If the dimensions are less than the wear limits in paragraph 348, spring must be replaced.
- (14) Inspect valve assembly (P) for damaged contacting surfaces. The contacting surfaces of valve and rubber seat must be absolutely free of scratches. If there is any question about their condition, install a new valve assembly.

b. Repair. If there is evidence of corrosion in the master cylinder (Q), hone master cylinder bore until surface is smooth and free of corrosion. Clean master cylinder thoroughly with alcohol and check clearance between piston (K) and master cylinder as described in a above. If clearance exceeds wear limits in paragraph 348 with a new piston, master cylinder must be replaced.

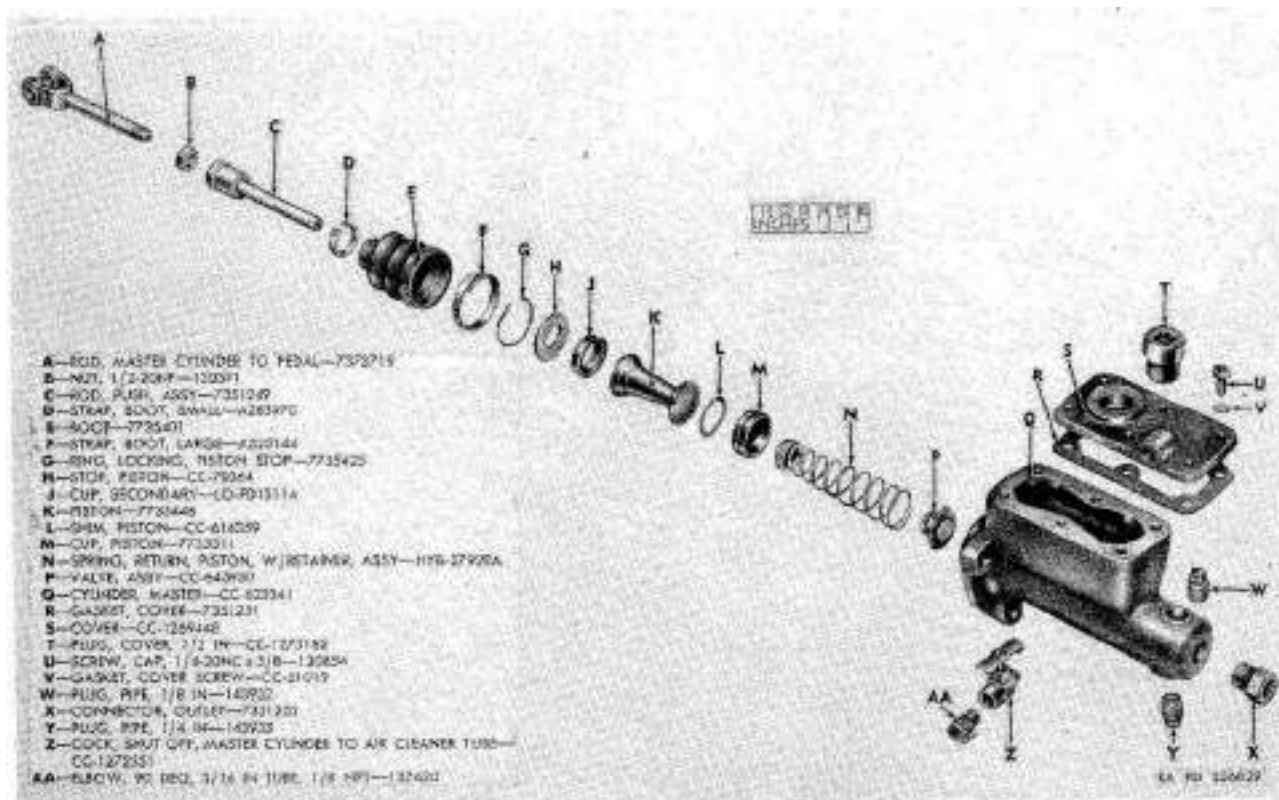


Figure 155. Master cylinder—exploded view.

175. Assembly (Field and Depot Maintenance)

a. General. Care must be exercised in handling master cylinder parts at time of assembly to prevent the possibility of leakage because of dirt particles between cups and master cylinder bore.

Note. All parts must be washed in alcohol and dipped in hydraulic brake fluid (HB) before assembly. A clean piece of paper must be placed on the bench during the process of assembly.

b. Install External Parts on Master Cylinder.

- (1) Position new cover gasket (R) and cover (S) on master cylinder (Q), with filler opening in cover towards large open end of master cylinder. Install $\frac{1}{4}$ -20NC x $\frac{3}{8}$ cap screws (U) and new cover screw gaskets (V). Tighten screws.
- (2) Install 1/2-inch cover plug (T), 1/8-inch pipe plug (W) or stop light switch, whichever was removed, 1/4-inch pipe plug (Y), outlet connector (X), master cylinder-to-air cleaner tube shut-off cock (Z), 90° 3/16-inch tube $\frac{1}{8}$ NPT elbow (AA) . Tighten all parts.

c. Install Internal Parts in Master Cylinder.

- (1) Wash master cylinder bore free of all dirt particles with hydraulic brake fluid (HB).
- (2) Attach valve assembly (P) to piston return spring with retainer assembly (N). Place spring and valve in master cylinder (valve end first).
- (3) Insert piston cup (M) (flat side out) in master cylinder, followed by piston shim (L).
- (4) Assemble secondary cup (P) on piston (K). Insert piston and cup in master cylinder (perforated end of piston towards shim), followed by piston stop (H). Install piston stop locking ring (G).
- (5) Install new boot (E) on master cylinder and attach boot to master cylinder with large boot strap (F).
- (6) Install $\frac{1}{2}$ -20NF nut (B) on master cylinder-to-pedal rod (A) and screw pedal rod into push rod assembly (C). Tighten nut.
- (7) Install push rod and pedal rod assembly in boot and attach boot to push rod with small boot strap (D).

d. Prepare Master Cylinder for Storage. If completed master cylinder is going to be placed in service stock for issue, cover all openings with adhesive tape to prevent the entrance of dirt.

Section VII. REBUILD OF BRAKE PEDAL AND PEDAL BRACKET ASSEMBLY

1 76. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 158, except where otherwise indicated.

a. General.

- (1) The rebuild of the brake pedal and pedal bracket assembly is considered a field maintenance operation.
- (2) Do not remove bushing-type bearings from brake pedal or pedal bracket assembly unless inspection (par. 177) reveals that replacement is necessary.

b. Remove Brake Pedal from Pedal Bracket Assembly.

- (1) Remove $3/16 \times 3/4$, Woodruff key (K) from pedal shaft (J).
- (2) File any distorted metal from shaft that may be evident around Woodruff key opening. Remove shaft from pedal bracket (F). This will release brake pedal (A) and pedal shaft spacer (H). Remove brake pedal draft pad (M).

c. Remove Brake Pedal Bushing-Type Bearing from Brake Pedal.

- (1) Remove 45° $1/4-28\text{NF}$ lubricating fitting (B) from brake pedal.
- (2) If inspection (par. 177) reveals that replacement of brake pedal bushing-type bearing (L) is necessary, remove bearing from brake pedal (A) with a bushing remover and replacer (fig. 156).

Note. To prevent possible damage to brake pedal, a suitable metal block spacer (fig. 156) must be placed between pedal and vise jaw.

d. Remove Pedal Bracket Bushing-Type Bearings from Pedal Bracket Assembly.

- (1) Remove 45° $1/4-28\text{NF}$ lubricating fittings (C and D) from pedal bracket assembly.
- (2) If inspection (par. 177) reveals that replacement of pedal bracket bushing-type bearings (E and G) is necessary, place pedal bracket assembly over open jaws of a vise and drive bearings from bracket assembly with a bushing remover and replacer (fig. 157).

e. Cleaning. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

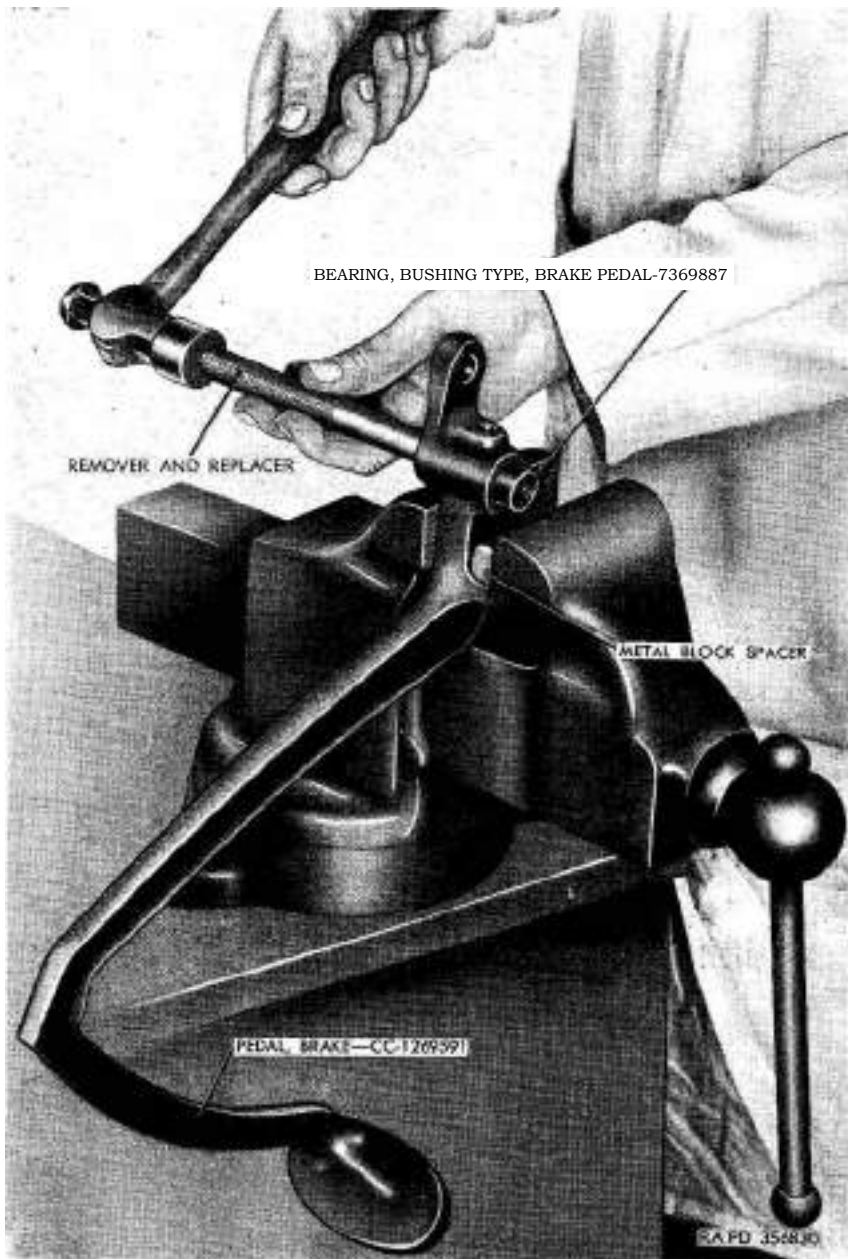


Figure 156. Removing brake pedal bushing-type bearing from brake pedal with a bushing remover and replacer.

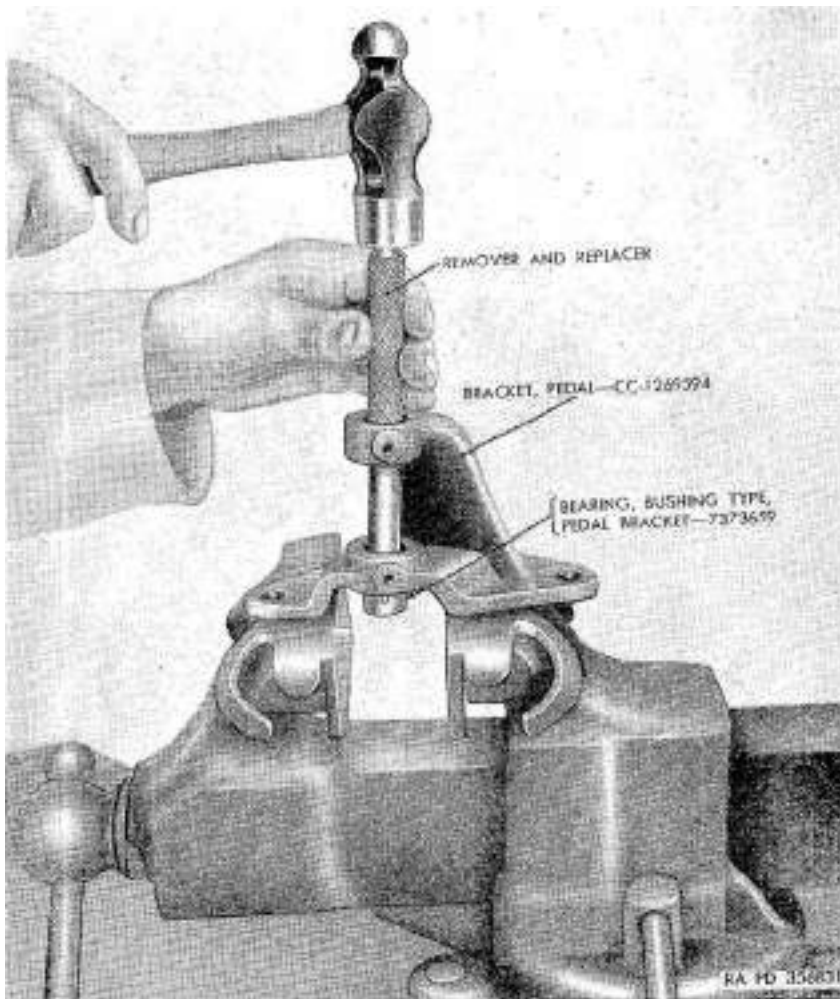


Figure 157. Removing pedal bracket bushing-type bearing from pedal bracket with a bushing remover and replacer.

177. Inspection (Field and Depot Maintenance)

(fig. 158)

a. Inspect Brake Pedal and Brake-Pedal-Draft Pad.

- (1) Inspect brake pedal bushing-type bearing (L) for wear. If inside diameter exceeds the wear limits indicated in paragraph 348, it will be necessary to replace bearing (pars. 176 and 178).
- (2) Inspect brake pedal (A) for cracks, damage, or worn lubricating fitting threads. If any of these conditions exist, replace brake pedal.

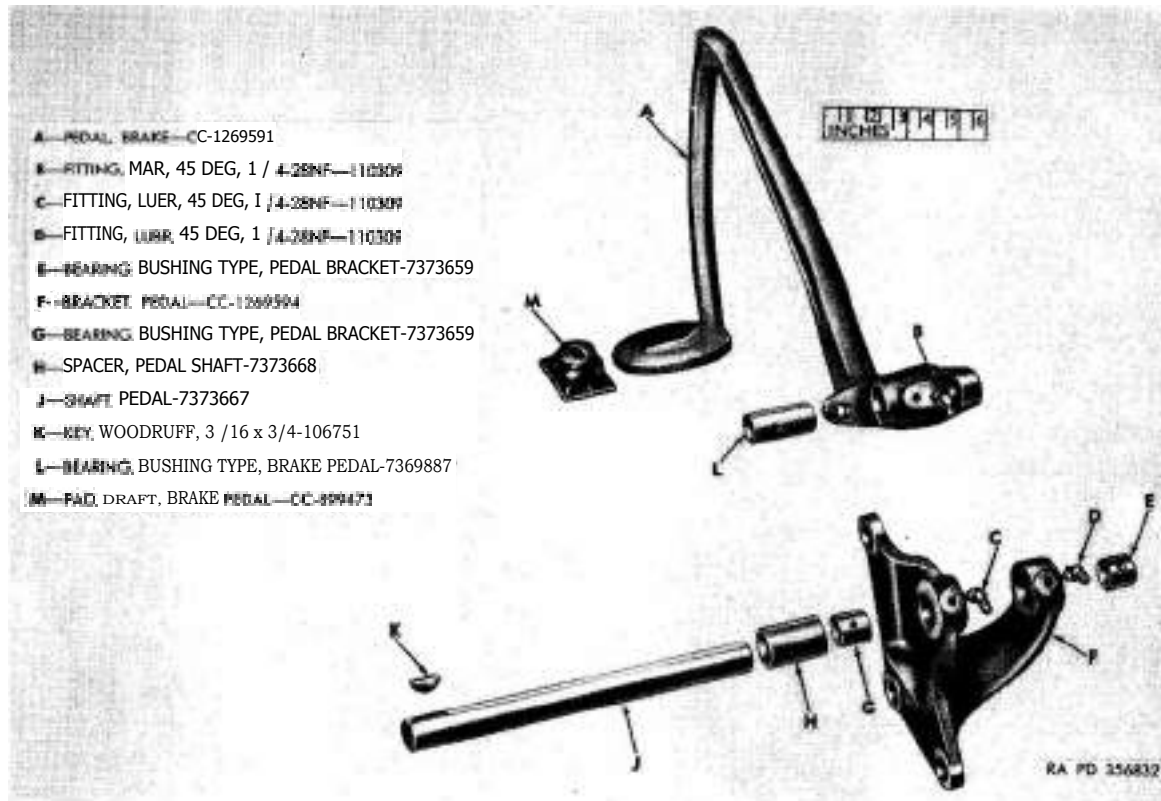


Figure 158. Brake pedal and pedal bracket—exploded view.

- (3) Inspect brake pedal draft pad (M) for deterioration. If pad is not in good condition, replace pad.
- (4) Inspect 45° $\frac{1}{4}$ -28NF lubricating fitting (B) for damage or worn threads. If either of these conditions exist, replace lubricating fitting.

b. Inspect Pedal Bracket and Pedal Bracket Bushing-Type Bearings.

- (1) Inspect pedal bracket bushing-type bearings (E and G) in pedal bracket (F) . If inside diameter of bearings exceeds the wear limits indicated in paragraph 348, it will be necessary to replace bearings (pars. 176 and 178).
- (2) Inspect pedal bracket (F) for cracks, scored bearing openings, or damaged lubricating fitting threads. If any of these conditions exist, replace bracket.
- (3) Inspect 45° $\frac{1}{4}$ -28NF lubricating fittings (C and D) for damage or worn threads. If either of these conditions exist, replace lubricating fittings.

c. Inspect Pedal Shaft, Pedal Shaft Spacer, and Woodruff Key.

- (1) Inspect pedal shaft (J) for wear and measure diameter at the worn spot with a micrometer. If diameter is less than the wear limits in paragraph 348, it will be necessary to replace shaft.
- (2) Inspect pedal shaft spacer (H) for damage. If the spacer is not in good condition, install new spacer.
- (2) Inspect $\frac{3}{16} \times \frac{3}{4}$ Woodruff key (K) for wear or damage. If either of these conditions exist, replace key.

178. Assembly (Field and Depot Maintenance)

(fig. 158)

a. Install Brake Pedal Bushing-Type Bearing in Brake Pedal.

- (1) If inspection (par. 177) reveals that replacement of the brake pedal bushing-type bearing (L) is necessary, press bearing in brake pedal. Be careful to aline hole in bearing with lubricating fitting hole in brake pedal. The bearing can be installed in pedal with a remover and replacer or by an arbor press.
- (2) Ream bearing, if necessary, until pedal shaft (J) is a free fit with minimum clearance between shaft and bearing.
- (3) Install a $\frac{1}{4}$ -28NF 45-degree lubricating fitting (B) in brake pedal.
- (4) Install brake pedal draft pad (M) on brake pedal. Draft pad must be installed from pad end of brake pedal, flat side towards pedal when installed.

b. Install Pedal Bracket Bushing-Type Bearings in Pedal Bracket.

- (1) If inspection (par. 177) reveals that replacement of the pedal bracket bushing-type bearings (E and G) is necessary, install pedal bracket bushing-type bearings in pedal bracket (F), exercising care to aline holes in bearings with lubricating fitting holes in bracket. The installation of bearings can be accomplished with a remover and replacer or by an arbor press.
- (2) Ream bearings until pedal shaft (J) is a free fit in bearings with minimum clearance between shaft and bearings.
- (3) Install ~~1/4-28NF~~ 45-degree lubricating fittings (C and D) in pedal bracket assembly.

c. Assemble Brake Pedal to Pedal Bracket Assembly.

- (1) Position brake pedal (A) in pedal bracket (F) so that lubricating fittings on bracket and pedal are facing in same direction.
- (2) Insert pedal shaft (J) through bushing-type bearings in bracket assembly and pedal.
- (3) Position pedal shaft spacer (H) on pedal shaft and install a 3/16 x 3/4 Woodruff key (K) in keyway at end of shaft that protrudes through frame.

Section VIII. ASSEMBLY OF BRAKE SYSTEM FROM SUBASSEMBLIES

179. General

The installation of the brake pedal and pedal bracket assembly is a field maintenance operation.

180. Brake Pedal and Pedal Bracket Assembly (Field Maintenance)

a. Install Brake Pedal and Pedal Bracket Assembly on Frame.

- (1) Install clutch pedal and 3/16 x 3/4 Woodruff key in shaft; then install clutch pedal adjusting collar on outer end of shaft. Aline screw hole in collar with groove in shaft. Place %-inch lock washer on screw and install %-16NC x 1 1/2 cap screw in adjusting collar. Tighten cap screw.
- (2) Install pedals with bracket assembly on frame left side rail with three ~~1/2-20NF~~ x 1 1/2 cap screws (H, fig. 34) and ~~1/2-20NF~~ nuts. Tighten nuts.
- (3) Install 3/16 x 3/4 Woodruff key in shaft. Install clutch

pedal shaft lever on pedal shaft. Align screw hole in lever with groove in shaft. Install ~~1/8-16NC~~ $\frac{1}{8}$ -16NC x $1\frac{1}{2}$ cap screw in lever followed by ~~3/8-inch~~ $\frac{3}{8}$ -inch lock washer and ~~3/8-16NC~~ $\frac{3}{8}$ -16NC nut (B, *fig. 35*) . Tighten nut. Position clutch operating rod on lever and install $21/64$ x $1\frac{3}{8}$ clevis pin through yoke on clutch operating rod and clutch pedal shaft lever. Place clip attached to pull-back spring on clevis pin and install new $3/32$ x $3/4$ cotter pin.

- (4) Install $1\frac{1}{2}$ x $13/8$ clevis pin in yoke on master-cylinder-to-pedal rod and brake pedal (*fig. 34*) . Install new $1/8$ x $7/8$ cotter pin in clevis pin.
- (5) Attach brake pedal pull back spring to pedal and attach spring to spring extension (*fig. 34*) .

b. Install Clutch and Brake Pedal Covers in Cab. Position clutch and brake pedal covers in cab and attach covers to cab with eleven ~~7/16-20NF~~ $7/16$ -20NF x $7/8$ lock washer screws (E, *fig. 21*).

c. Adjust Brake Pedal Free Play. Refer to TM 9-840 for information pertaining to adjustment of brake pedal free play.

CHAPTER 12

STEERING SYSTEM

Section I. DESCRIPTION AND DATA

181. Description

a. Steering Gear Assembly (fig. 159). The steering gear is a worm and sector type, assembled in a cast iron housing, which supports the column shaft with worm and pitman arm shaft with integral sector. Tapered, adjustable roller bearings support the worm. Pitman arm operates in bushing-type bearings. Adjustments are provided for controlling the backlash between worm and sector. Adjustment of the roller bearings is accomplished by the use of shims.

b. Steering Idler Arm, Bracket, and Shaft Assembly (fig. 159). Proper steering geometry is accomplished by the use of two drag link assemblies, which require a steering idler arm to complete the connection between steering gear and front axle. The idler arm is equipped with a bushing-type bearing and operates on a steel shaft supported in a bracket, which is attached to the frame left side rail.

c. Drag Link Assemblies (fig. 159). The drag links are tubular assemblies with adjustable ends. One drag link provides a connection between pitman arm on the steering gear and the steering idler arm ; the other drag link connects idler arm to the steering arm on front axle.

182. Data

a. Steering Gear Assembly.

Make and model	-----	Gemmer B-60
Type	-----	worm and sector
Ratio	-----	23.2: 1
Worm bearings	-----	tapered roller
Pitman arm shaft bearings	-----	bushing-type
Column jacket bearing	-----	ball

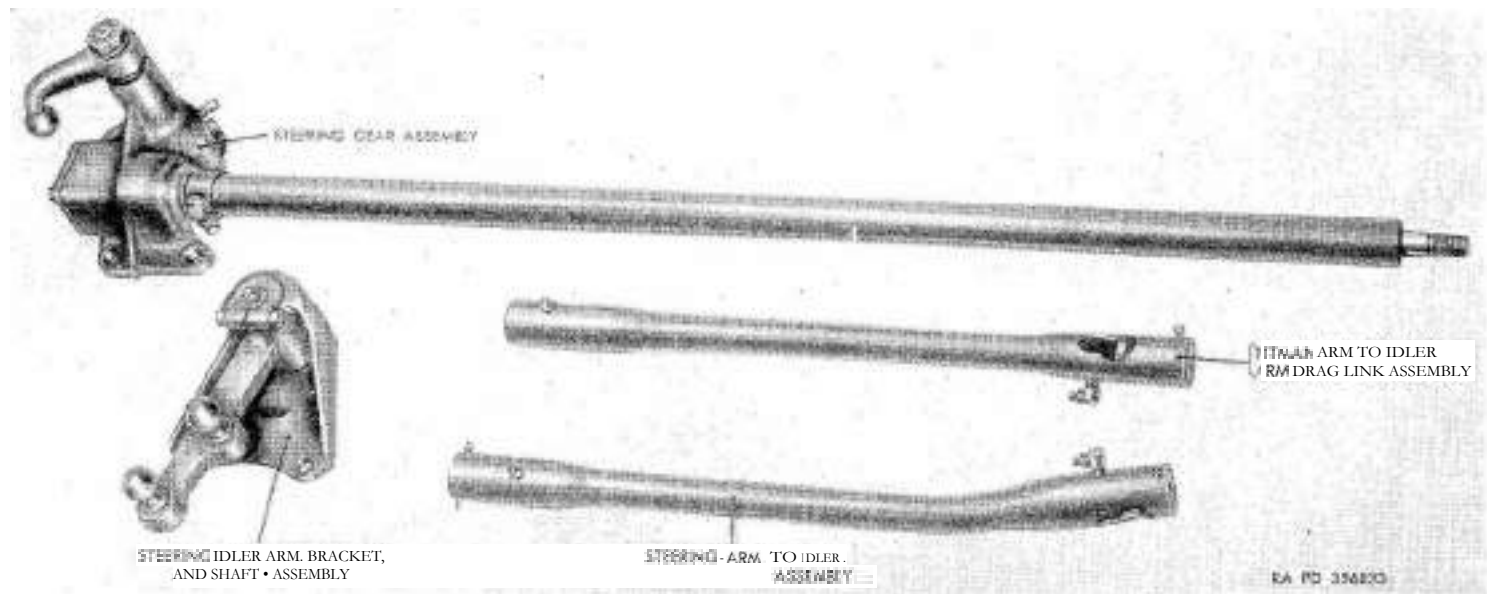


FIGURE 159 Steering system assemblies

b. Steering Idler Arm, Bracket, and Shaft Assembly.

Steering idler arm ----- drop-forged steel
Steering idler arm bracket ----- malleable casting
Steering idler arm shaft ----- hardened and ground steel

c. Drag Links.

Type ----- tubular
Number of drag links ----- 2
Type of adjustment ----- threaded plug

Section II. REBUILD OF STEERING GEAR ASSEMBLY

183. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 163, except where otherwise indicated.

a. General. The information in this section is based on the assumption that the steering gear assembly (fig. 159) is removed from the vehicle.

b. Remove Column Jacket with Bearing Assembly and Column Jacket Parts from Steering Gear.

- (1) Remove nut, lock washer, and cap screw, which retains the column jacket clamp at bottom of column jacket (fig. 164) . Remove column jacket with bearing assembly and clamp from steering gear.
- (2) Remove column jacket bearing upper spacer (V), column jacket bearing compression spring (U) , and column jacket bearing spring retainer (T) from column shaft with worm assembly (DD).
- (3) Remove column jacket bearing spring retainer snap ring (S) from column shaft assembly with snap-ring pliers.
- (4) Remove column jacket oil seal spring washer (R), column jacket oil seal compression spring (Q), column jacket oil seal washer (P) , and column jacket oil seal (N) from column shaft assembly. Discard column jacket oil seal as it must be replaced at assembly.

c. Remove Column Jacket Seal. If inspection (par. 184i) reveals that replacement of column jacket seal (fig. 164) is necessary, remove seal from upper end of column jacket.

Note. Do not remove ball bearing assembly from upper end of the column jacket as this part is serviced only with the jacket assembly.

d. Remove Pitman Arm from Pitman Arm Shaft. Remove pitman arm nut (W) and pitman arm lock washer (X) from pitman arm shaft (H). Install puller (fig. 160) and pull pitman arm (Y) from shaft.

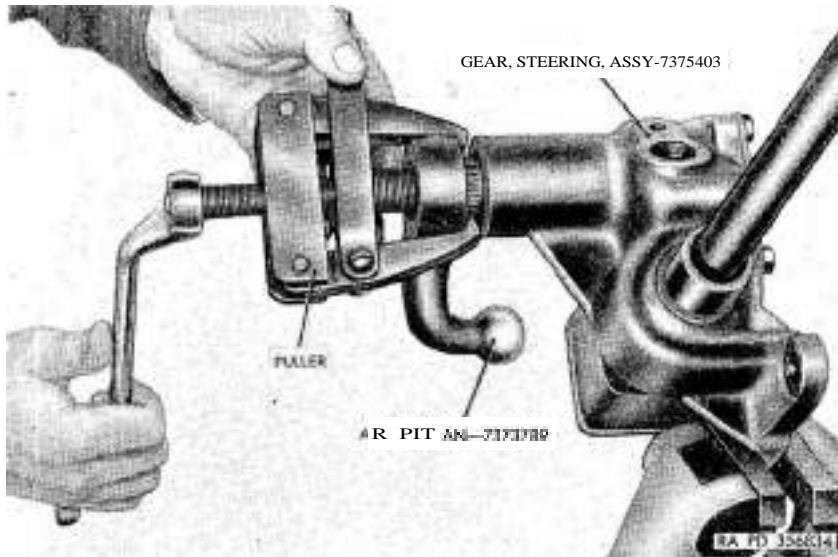


Figure 160. Removing pitman arm with puller.

e. Remove Parts from Steering Gear Housing.

- (1) Remove vent assembly (L) from steering-gear housing.
- (2) Remove $\frac{3}{4}$ -inch pipe plug (M) from filler opening in steering gear housing.
- (3) Remove pitman arm shaft adjusting screw nut (B) and pitman arm shaft adjusting screw lock plate (C) from pitman arm shaft adjusting screw (G).
- (4) Remove housing cover screws (A). Push pitman arm shaft (H), housing cover (D), pitman arm shaft adjusting screw (G), and housing cover gasket (E) from steering gear housing (K) as an assembly. Disengage pitman arm shaft adjusting screw and housing cover from pitman arm shaft.
- (5) Remove pitman arm shaft adjusting screw (G) and pitman arm shaft adjusting screw thrust washer (F) from housing cover (D).
- (6) Remove housing lower cover screws (PP). This will release housing lower cover assembly and housing lower cover shims (GG, HH, and JJ) on trucks built after serial number 80030117. On trucks built through serial number 80030117, removal of housing lower cover screws will release the housing lower cover seal plate (NN), housing lower cover seal plate gasket (MM), housing lower cover (KK), and housing lower cover shims (GG, HH, and JJ).

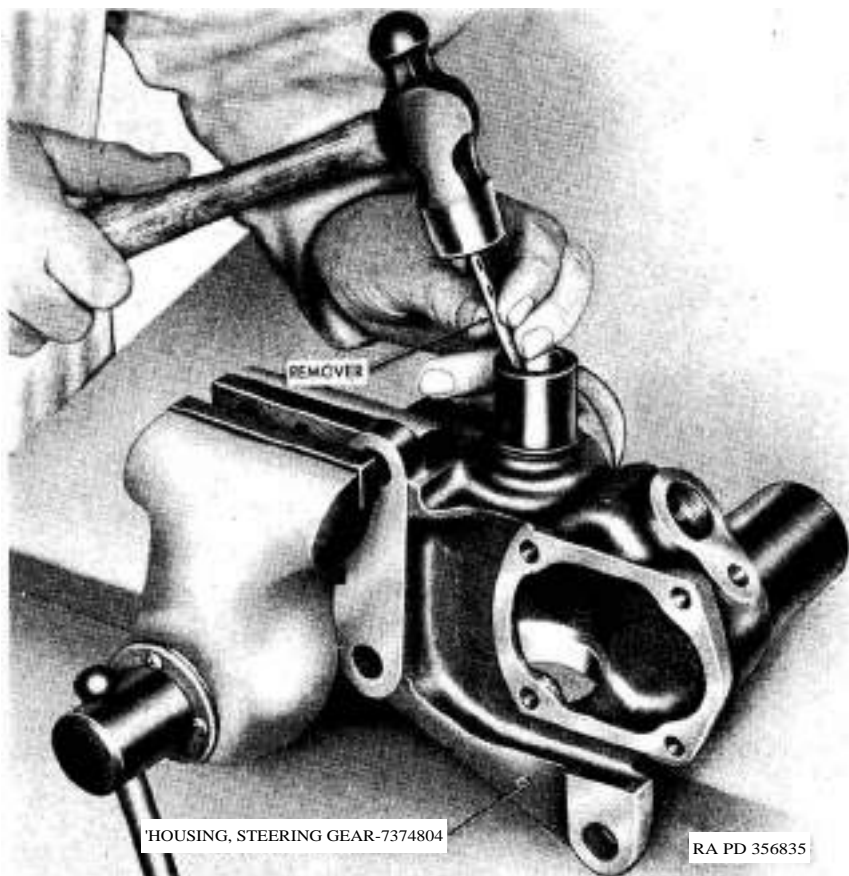


Figure 161. Removing worm upper bearing cup from steering gear housing with an improvised remover.

- (7) Remove worm lower bearing cup (FF) and roller bearing with cage assembly (EE) from steering gear housing.
- (8) Remove column shaft with worm assembly (DD) and roller bearing with cage assembly (CC) from steering gear housing.
- (9) Remove pitman arm shaft seal (Z) from steering gear housing.

f. *Remove Worm Upper Bearing Cup from Steering Gear Housing.* If inspection (par. 184c) reveals that replacement of worm upper bearing cup (BB) is necessary, drive bearing cup from housing with an improvised remover (fig. 161), which can be manufactured locally (fig. 6). Refer to paragraph 11 for information pertaining to the bearing-cup remover.

g. *Remove Housing Bushing-Type Bearings from Steering Gear Housing.* If inspection (par. 184a) reveals that replacement

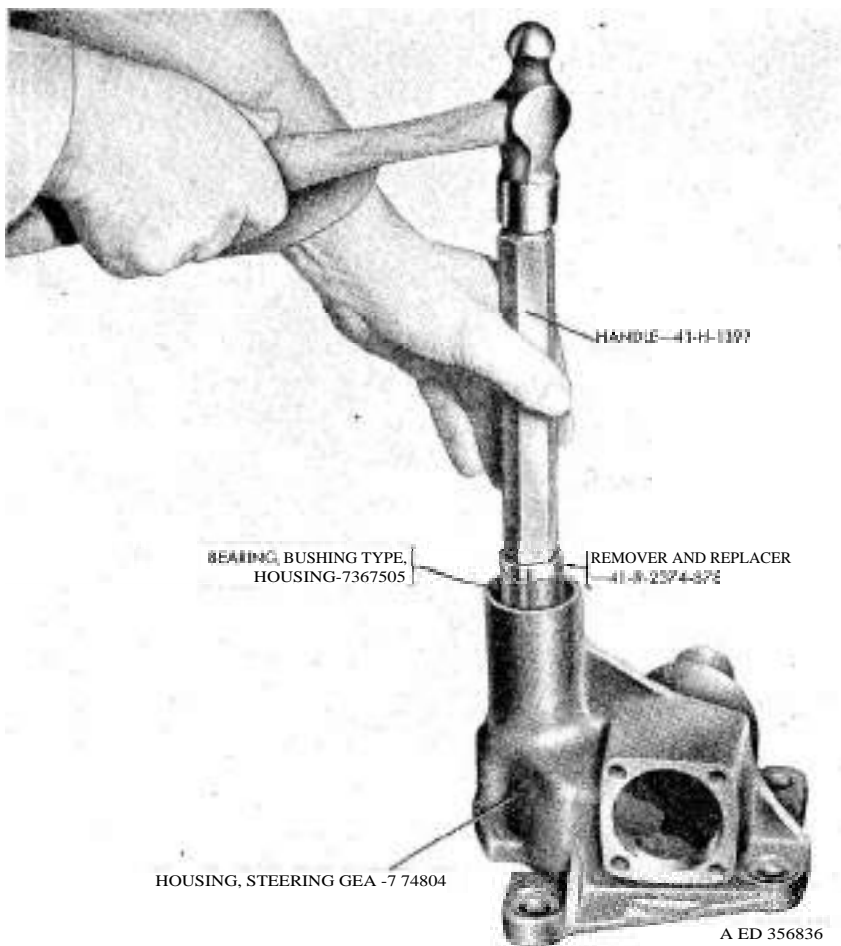


Figure 162. Removing and installing housing bushing-type bearing.

of housing bushing-type bearings (J and AA) is necessary, drive bearings from steering gear housing (K) with remover and replacer 41—R-2374-878 and handle 41—H-1397 (fig. 162).

h. Cleaning. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry parts, except roller bearings, with dry compressed air.

Caution: Roller bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

134. Inspection (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 163, except where otherwise indicated.

a. Inspect Steering Gear Housing. Inspect steering gear housing (K) for cracks, damaged machined surfaces, damaged cap screw threads, damaged vent assembly threads, or damaged filler plug threads. If any of these conditions exist, housing must be replaced.

Note. If housing bushing-type bearings (J and AA) are in good condition and inside diameter of bearings does not exceed the wear limit in paragraph 349, bearings will be satisfactory for further service.

b. Inspect Column Shaft with Worm Assembly. Inspect column shaft with worm assembly (DD) for cracks, damaged threads, damaged serrations, worn spots on worm, worn roller bearing cones on worm, or worm seal contacting surface at lower end of shaft. If any of these conditions exist or diameter of lower end of shaft is less than the wear limit in paragraph 349, it will be necessary to install a new shaft assembly.

c. Inspect Worm Upper and Lower Bearing Cups and Roller Bearing with Cage Assemblies.

- (1) Inspect worm upper and lower bearing cups (BB and FF) for cracks, corrosion, or wear. Also inspect fit of worm upper bearing cup (BB) in steering gear housing as this cup must be a tight fit. If there is any evidence of cracks, corrosion, wear, scores, or looseness of worm upper bearing cup, bearing cups must be replaced (pars. 183 and 185). If worm upper bearing cup is loose in housing, it will be necessary to replace housing and cup.
- (2) Inspect roller bearing with cage assemblies (CC and EE) for worn, cracked, scored, or corroded rollers. Also inspect cages for wear or damage. If any of these conditions exist, it will be necessary to replace the roller bearing assemblies.

d. Inspect Pitman Arm Shaft. Inspect pitman arm shaft (H) for worn sector teeth, worn shaft, damaged splines, damaged threads, cracks, scores, or corrosion. If any of these conditions exist or if diameter of shaft is less than the wear limit in paragraph 349, replace shaft.

e. Inspect Pitman Arm. Inspect pitman arm (Y) for cracks, distortion, damaged splines, or worn ball. Measure diameter of ball with a micrometer and if measurement is less than the wear limit in paragraph 349, replace arm. If splines are damaged or if there is any evidence of cracking or distortion, replace arm.

f. Inspect Housing Cover, Housing Lower Cover, and Related Parts.

- (1) Inspect housing cover (D) for damaged threads, distortion, or cracks. If any of these conditions exist, replace cover.

- (2) Inspect housing lower cover (KK) and housing lower cover oil seal (LL) for cracks, damaged machined surfaces, distortion, or worn or damaged sealing element. If any of these conditions exist, replace cover and seal.

Note. The housing lower cover oil seal (LL) is spun into housing lower cover and cannot be replaced. If the seal requires replacement, cover and seal assembly must be discarded. Housing lower cover (KK) and housing lower cover oil seal (LL) are available as replacement parts.

- (3) Inspect housing lower cover seal plate (NN) for cracks, distortion, or damaged threaded bushing. If any of these conditions exist, replace seal plate.

g. Inspect Pitman Arm Shaft Adjusting Screw, Pitman Arm Shaft Adjusting Screw Thrust Washer, Pitman Arm Shaft Adjusting Screw Lock Plate, and Pitman Arm Shaft Adjusting Screw Nut.

- (1) Inspect pitman arm shaft adjusting screw (G) for damage or worn threads. If either of these conditions exist, replace screw.
- (2) Inspect pitman arm shaft adjusting screw thrust washer (F) for wear or distortion. Measure thickness of thrust washer with a micrometer. If dimension is less than the wear limit indicated in paragraph 349, replace thrust washer. Replace thrust washer if it is distorted.
- (3) Inspect pitman arm shaft adjusting screw lock plate (C) and pitman arm shaft adjusting screw nut (B) for damage, wear, or worn threads. If any of these conditions exist, replace lock plate and/or nut.

h. Inspect Vent Assembly and Pipe Plug.

- (1) Inspect vent assembly (L) for damaged threads, damaged cap, or clogging of the opening with dirt. If vent is clogged, clean it with volatile mineral spirits or dry-cleaning solvent and dry with compressed air. If threads or cap are damaged, replace vent assembly.
- (2) Inspect $\frac{3}{4}$ -inch pipe plug (M) for damaged or worn threads. If either of these conditions exist, replace plug.

i. Inspect Column Jacket with Bearing Assembly and Column Jacket Parts.

- (1) Inspect column jacket with bearing assembly (fig. 164) for damage or cracks. If either of these conditions exist, replace jacket assembly. Inspect ball bearing assembly at upper end of jacket and if it is not in good condition, replace jacket assembly. Inspect column jacket seal at upper end of jacket and replace if worn or damaged (pars. 183 and 185).

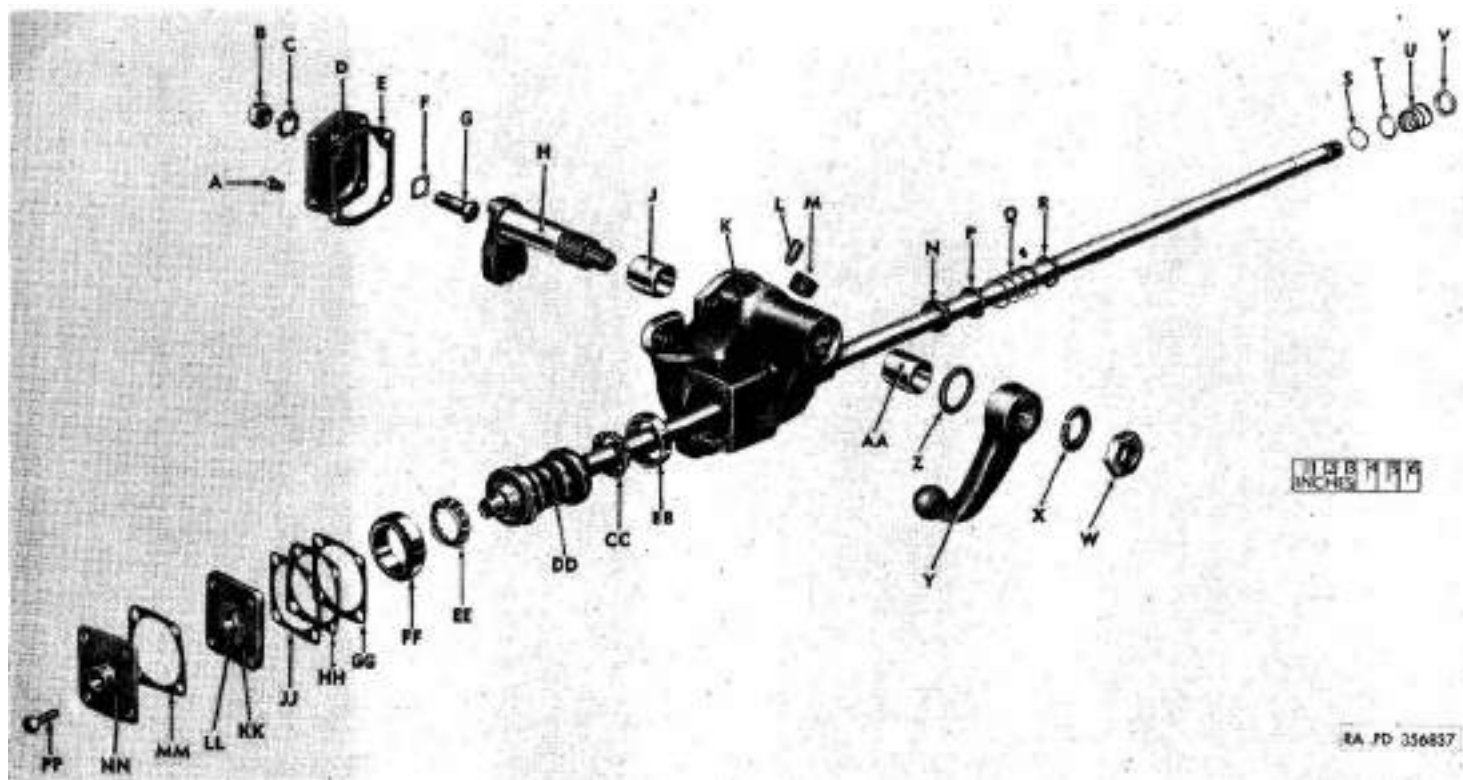


Figure 163. Steering gear assembly—exploded view.

A—Screw, housing cover — GEM-1200
 B—Nut, pitman arm shaft adjusting screw — 7373794
 C—Plate, lock, pitman arm shaft adjusting screw 7373796
 D—Cover, housing — 7374772
 E—Gasket, housing cover 7373790
 F—Washer, thrust, pitman arm shaft adjusting screw — 7705743
 G—Screw, pitman arm shaft adjusting — 7374770
 H—Shaft, pitman arm — 7705741
 J—~~Bearing~~, bushing-type, housing — 7367805
 K—Housing, steering gear — 7374804
 L—Vent, assy— ~~NP-38803~~
 M—Plug, pipe, $\frac{5}{16}$ -inch — 7374954
 N—Seal, oil, column jacket — 7373799
 P—Washer, column jacket oil seal — 7351092
 Q—~~Spring~~, compression, column jacket oil seal — 7351094
 R—~~Washer~~, column jacket oil seal spring — 7351093
 S—Ring, snap, column jacket bearing spring retainer — CC-1270135
 T—~~Retainer~~, column jacket bearing spring ~~GEM-N010~~
 U—Spring, compression, column jacket bearing GEM-33221
 V—Spacer, upper, column jacket bearing — 7374802
 W—Nut, pitman arm — GEM-1630
 X—Washer, lock, pitman arm CC-52855
 Y—Arm, pitman — 7373789
 Z—Seal, pitman arm shaft — 7375410
 AA—~~Bearing~~, bushing-type, housing — 7367805
 BB—~~Cup~~, worm upper bearing — 707075
 CC—~~Bearing~~, roller, w/cage, assy — 705011
 DD—Shaft, column, w/worm, ~~assy~~ — 7705742
 EE—~~Bearing~~, roller, w/cage, ~~assy~~ — 705011
 FF—~~Cup~~, worm lower bearing — 706624
 GG—Shim, housing lower cover (0.003-inch thk) — GEM-33924
 HH—~~Shim~~, housing lower cover (0.006-inch thk) CC-620180
 JJ—Shim, housing lower cover (0.011-inch thk) CC-620181
 KK—Cover, housing lower 7374775
 LL—Seal, oil, housing lower cover -- 7373798 *
 MM—Gasket, housing lower cover seal plate ~~CC-620181~~
 NN—Plate, housing lower cover seal CC-1274856 *
 PP—Screw, housing lower cover — 7372665

After truck serial number 80030117, housing lower cover assembly 1501214 is used. Assembly includes cover, oil seal, and bushing for nut on horn button cable tube.

Figure 171—Continued

- (2) Inspect column jacket bearing upper spacer (V) for wear or distortion. If either of these conditions exist, replace spacer.
- (3) Check column jacket bearing compression spring (U) for damage or breakage. If either of these conditions exist, replace spring.
- (4) Inspect column jacket bearing spring retainer (T) and column jacket bearing spring retainer snap ring (S) for wear or distortion. If either of these conditions exist, replace parts as required.
- (5) Inspect column jacket oil seal spring washer (R), column jacket oil seal washer (P) , and column jacket oil seal (N) for distortion, wear, or damage. If any of these conditions exist, replace parts as required.

Note. Whenever steering gear is disassembled for repairs, a new column jacket oil seal (N) must be installed.

- (6) Check column jacket oil seal compression spring (Q) for damage or breakage. If there is evidence of damage or breakage, replace spring.

j. Inspect Pitman Arm Shaft Seal. Inspect pitman arm shaft seal (Z) for wear. If there is any evidence of wear, seal must be replaced.

185. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 163, except where otherwise indicated.

a. General. All parts must be free of corrosion and dirt before assembly. Satisfactory steering gear adjustment cannot be accomplished unless parts are free of corrosion and dirt.

b. Install Worm Upper Bearing Cup. If inspection (par. 184c) reveals that it is necessary to replace worm upper bearing cup (BB), install bearing cup in steering gear housing (K) . This operation can be performed with an arbor press or a bronze drift and hammer. Make certain cup is firmly bottomed in steering gear housing counterbore.

c. Install Housing Bushing-Type Bearings in Steering Gear Housing.

- (1) If inspection (par. 184a) reveals that it is necessary to replace housing bushing-type bearings (J and AA) , install new bearings in steering gear housing with remover and replacer 41-R-2374-878 and handle 41-H-1397 (fig. 162) .
- (2) If necessary, ream bushing-type bearings until Pitman arm shaft is just a free fit without play.

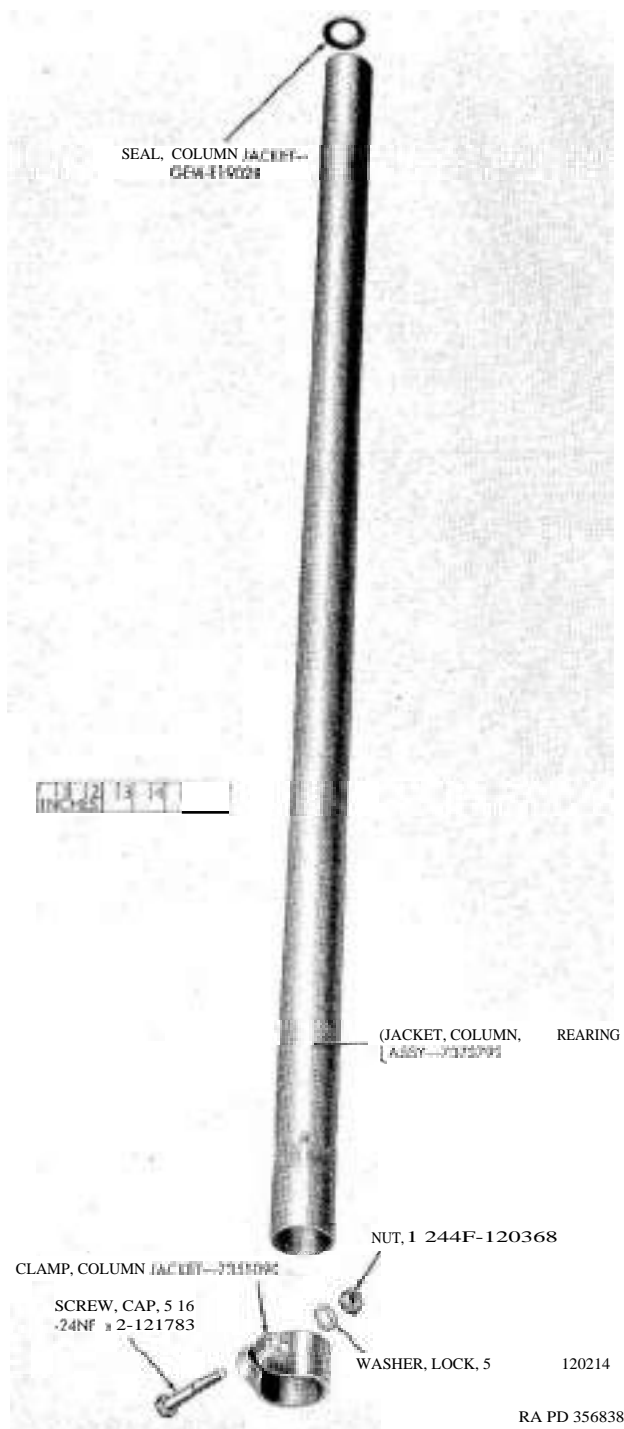


Figure 164. Column jacket and related parts.

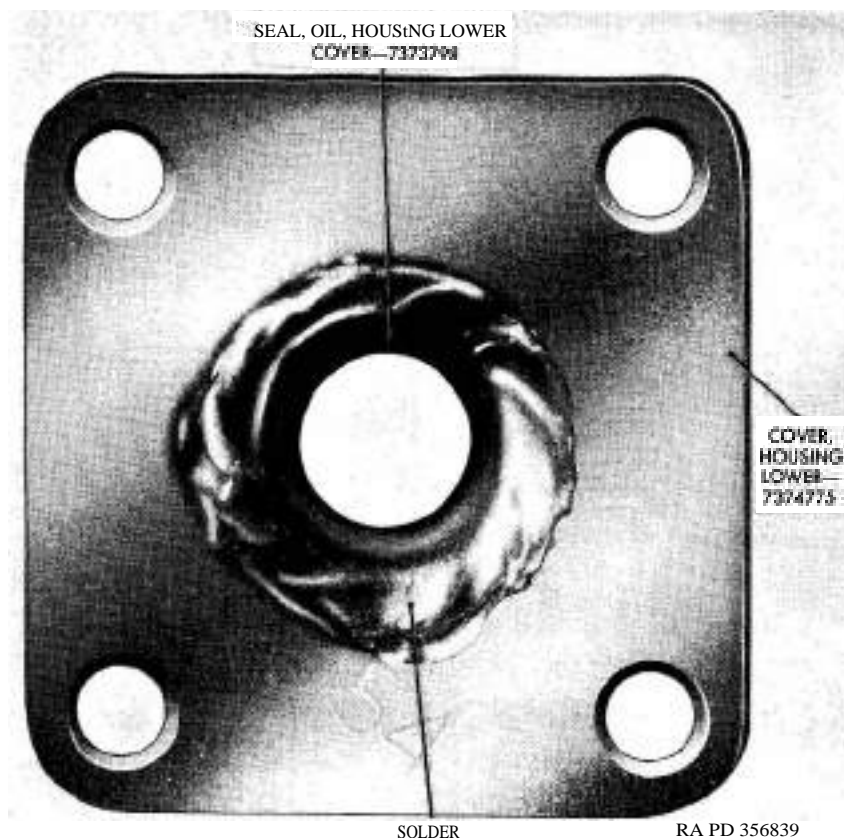


Figure 165. Housing lower cover and housing cover oil seal.

d. Install Column Shaft with Worm Assembly in Steering Gear Housing.

- (1) Place a roller bearing with cage assembly (CC and EE) on each end of worm. Lubricate bearings with universal gear lubricant (GO) .
- (2) Position column shaft with worm assembly (DD) in steering gear housing and install worm lower bearing cup (FF).
- (3) Position one 0.011-inch thick housing lower cover shim (JJ), two 0.006-inch thick housing lower cover shims (MI), and one 0.003-inch thick housing-lower-cover shim (GG) on steering-gear housing.

e. Install Housing Lower Cover Oil Seal.

- (1) If replacement of the housing lower cover oil seal (LL) is necessary (par. 184f), a new oil seal and housing lower

cover must be installed. The original oil seal is spun into the cover and cannot be replaced.

- (2) If a new oil seal is installed in a new housing lower cover, solder must be applied over the seal retainer and housing lower cover (fig. 165) to prevent lubricant leakage. Care must be exercised when applying solder because excessive heat will damage seal.

f. Install Housing Lower Cover Assembly. Position housing lower cover assembly (KK) against shims on steering gear housing and install housing lower cover screws (PP) . Tighten screws.

Note. The housing lower cover screws are special items as they are machined with a circular ridge under the head to provide a lubricanttight seal against lower cover. Do not use lock washers or substitute ordinary cap screws.

g. Check Preload of Worm Bearings.

Note. Definite preloads are specified for the worm roller bearings. These ~~preloads~~ are specified in pound-inches torque and can be measured by rotating column shaft with a torque indicating wrench and socket on the steering wheel nut.

Check preload of worm bearings by rotating column shaft with a torque indicating wrench (*fig. 166*) . Add, change, or remove housing lower cover shims until bearing preload conforms to the specifications in paragraph 349. Read torque indicating wrench while wrench is in motion to obtain accurate results.

h. Install Housing Lower Cover Seal Plate and Housing Lower Cover Seal Plate Gasket.

Note. On trucks built through serial No. 80030117, a housing lower cover seal plate gasket (MM) and housing lower cover seal plate (NN) is used in addition to the housing lower cover (KK). After truck serial No. 80030117, all parts are incorporated into a single housing lower cover which includes oil seal and threaded bushing for horn button cable tube. This later-type cover is interchangeable with the parts on early-type steering gears.

On early-type steering gears, remove housing lower cover screws (PP) and install a housing lower cover seal plate gasket (MM) and housing lower cover seal plate (NN) . Install housing lower cover screws (PP) and tighten screws.

i. Install Pitman Arm Shaft, Housing Cover, Pitman Arm Shaft Adjusting Screw, and Related Parts.

- (1) Place pitman arm shaft adjusting screw thrust washer (F) on pitman arm shaft adjusting screw (G) and install screw in housing cover (D) .
- (2) Place housing cover gasket (E) against cover and engage adjusting screw and thrust washer in slot in pitman arm shaft: (H). Lubricate shaft with universal gear lubricant (GO) and install shaft and cover as an assembly in

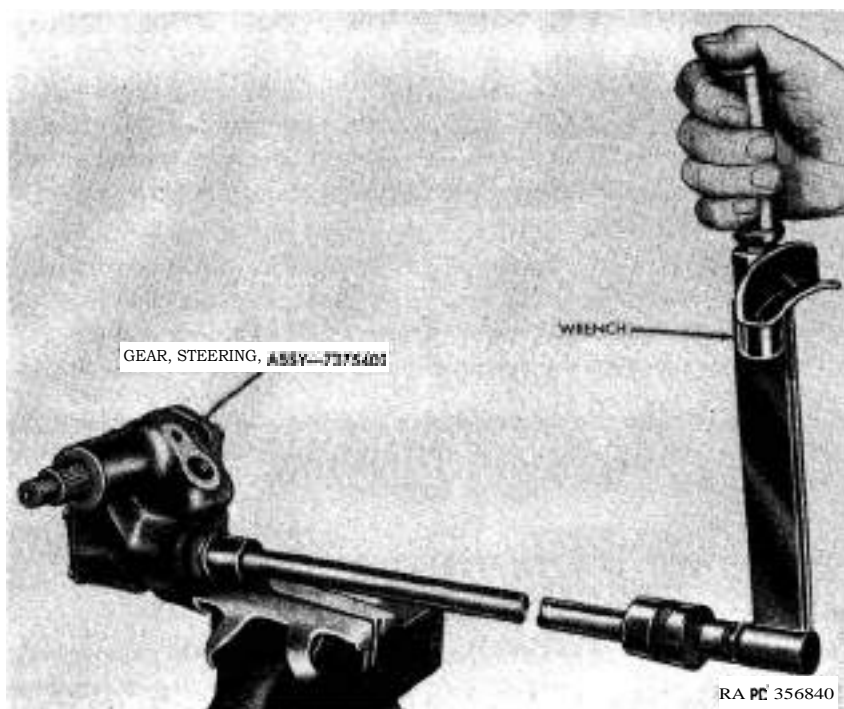


Figure 166. Checking preload of worm roller bearings with torque indicating wrench.

steering gear housing (K). Install housing cover screws (A).

Note. The housing cover screws are special items. They are equipped with a machined ridge, located on the under side of the head, which provides a lubricanttight seal between screw and cover. Do not use lock washers with these screws or substitute standard cap screws.

Tighten screws.

j. Adjust Backlash Between Worm and Sector of Pitman Arm Shaft.

Note. The threads on the worm are designed so that steering gear can be adjusted to operate without backlash in the straightahead position, which is known as the high spot. Because of this design, worm must be in proper position when backlash adjustments are performed.

- (1) Turn column shaft as far as it will go in both directions and count total number of turns. When shaft is in the extreme position in one direction, turn shaft back one-half the total number of turns. When shaft is in this position, high spot on worm is in contact with sector on pitman arm shaft.

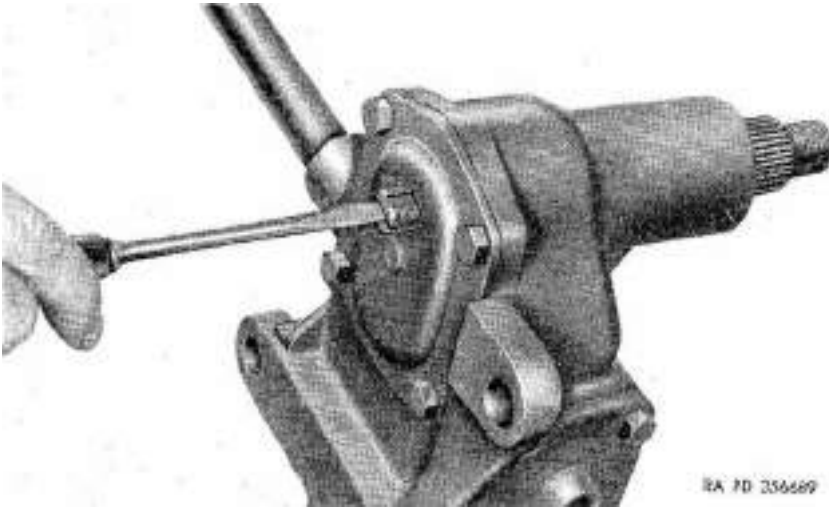


Figure 167. Adjusting backlash between worm and pitman arm shaft sector.

- (2) Turn pitman arm shaft adjusting screw (G) out to increase backlash and in to decrease backlash (fig. 167) . With worm positioned so that high spot is in contact with sector of pitman arm shaft, turn adjusting screw in until a drag is apparent as sector is moved across the high spot. Check drag with a pound-inches torque indicating wrench (fig. 166) and turn adjusting screw until drag conforms to the specifications in paragraph 349. Install pitman arm shaft adjusting screw lock plate (C) and make certain it indexes with button on housing cover. Install pitman arm shaft adjusting screw nut (B) and tighten.

k. Install Pitman Arm Shaft Seal and Pitman Arm.

- (1) Install pitman arm shaft seal (Z) in steering gear housing (counterbore side out).
- (2) Install pitman arm (Y) on pitman arm shaft with ball toward steering gear housing. Locating marks on pitman arm and pitman arm shaft (fig. 168) must be in alignment. Install pitman arm lock washer (X) and pitman arm nut (W). Tighten nut to specifications indicated in paragraph 354 with a torque indicating wrench.

L. Install Vent Assembly and Pipe Plug.

- (1) Install vent assembly (L) in steering gear housing.
- (2) Install $\frac{3}{4}$ -inch pipe plug (M) in filler hole of steering gear housing.

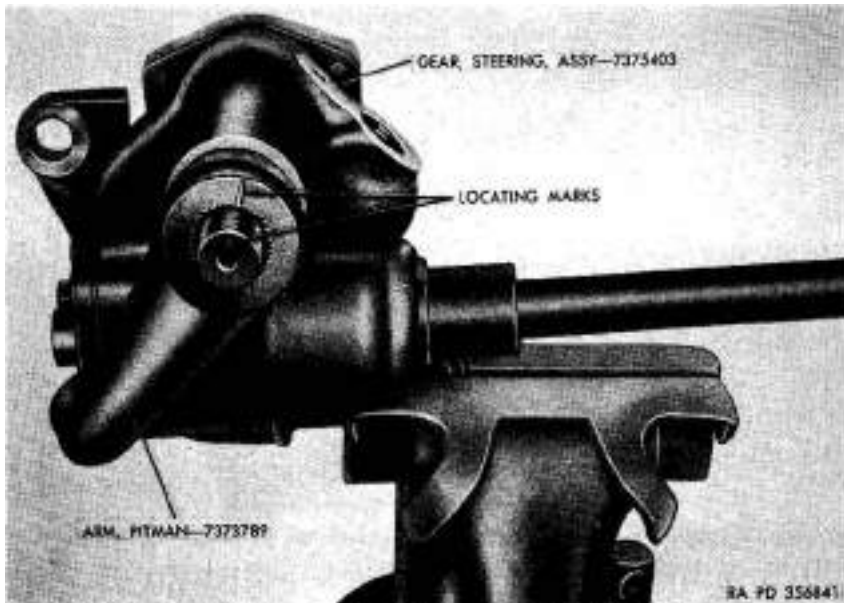


Figure 168. Correct location of pitman arm on pitman arm shaft.

m. Install Column Jacket Parts and Column Jacket Assembly.

- (1) Soak new column jacket oil seal (*fig. 169*) in universal gear lubricant (GO) . Install seal on column shaft against steering gear housing. Install column jacket oil seal washer with cupped surface toward seal, followed by column jacket oil seal compression spring and column jacket oil seal spring washer.
- (2) Install column jacket bearing spring retainer snap ring in groove at upper end of column shaft. Install column jacket bearing spring retainer on column shaft, followed by column jacket bearing compression spring and column jacket bearing upper spacer. Make certain flanged end of spacer is down.
- (3) Lubricate ball bearing at top of column jacket with universal gear lubricant (GO) . Install column jacket seal (*fig. 164*) in upper end of column jacket (counterbore side out) . Place column jacket clamp on lower end of column jacket (*fig. 164*) . Install column jacket with bearing assembly on steering gear. Install 5/16-24NF x 2 cap screw through column jacket clamp ; then install 5/16-inch lock washer and 5/16-24NF nut. Locate end of column jacket approximately one-eighth of an inch from shoulder on steering gear housing. Tighten nut on cap screw in column jacket clamp.

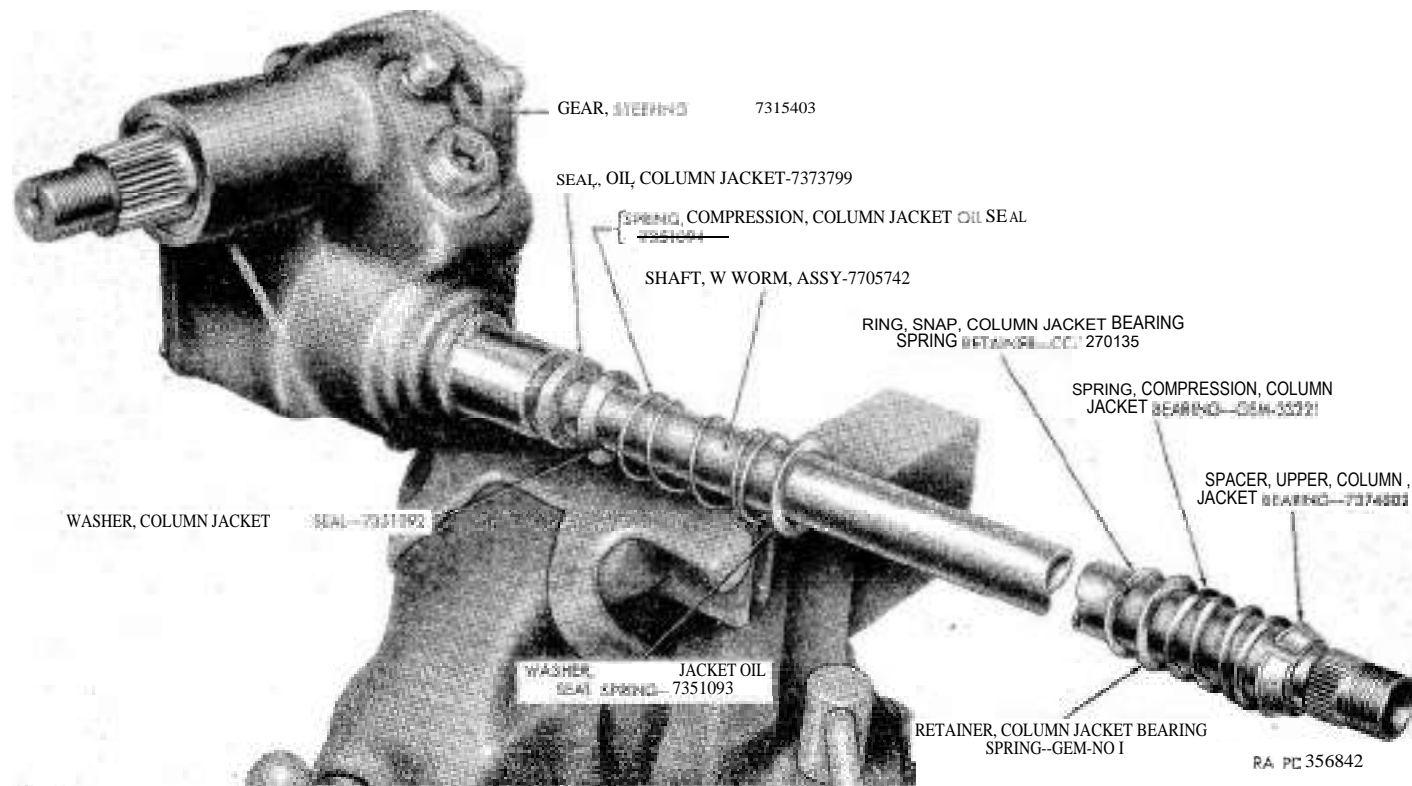


Figure 169. Proper location of column jacket parts.

186. Lubrication (Field and Depot Maintenance)

Install 12 ounces of universal gear lubricant (GO) in steering gear housing and rotate column shaft until all internal parts are thoroughly lubricated. If steering gear is going to be placed in storage, drain lubricant from housing.

Section III. REBUILD OF STEERING IDLER ARM ASSEMBLY, BRACKET, AND SHAFT ASSEMBLY

187. Disassembly (Field and Depot Maintenance)

a. *General.* The information in this section is based on the assumption that the steering idler arm assembly, bracket, and shaft assembly are removed from the truck.

b. *Remove Lubricating Fitting, Steering Idler Arm Assembly, and Steering Idler Arm Shaft from Steering Idler Arm Bracket (fig. 171) .*

- (1) Remove lubricating fitting from steering idler arm shaft.
- (2) Remove nut and lock washer from screw which clamps the steering idler arm bracket around steering idler arm shaft. Remove screw from bracket.
- (3) Drive steering idler arm shaft from bracket with a bronze drift and hammer, which will disengage the steering idler arm assembly from bracket. Shaft can also be removed with adapter 41-A-18-241 (L, fig. 5) and a slide-hammer-type puller.

c. *Remove Steering Idler Arm Bushing-Type Bearing from Steering Idler Arm Assembly.*

Note. Do not remove steering idler arm bushing-type bearing from steering idler arm assembly unless inspection (par. 188a) reveals that replacement is necessary.

If replacement of bearing is necessary, place idler arm assembly in a vise (fig. 170) and drive bearing from arm with a remover and **replacer**.

d. *Clean Parts.* Wash all parts in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

188. Inspection (Field and Depot Maintenance)

a. *Inspect Steering Idler Arm Assembly (fig. 171) .*

- (1) Measure inside diameter of steering idler arm bushing-type bearing with an inside micrometer. If dimension exceeds wear limit indicated in paragraph 349, replace bearing (pars. 187 and 189).

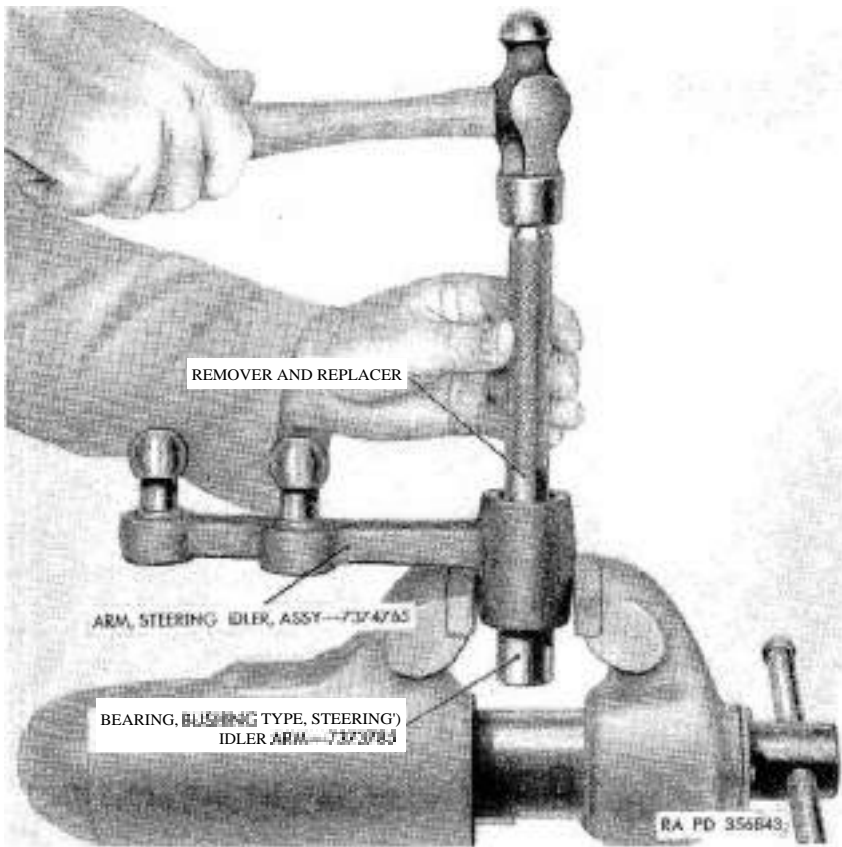


Figure 170. Removing steering idler arm bushing-type bearing with a bushing re-mover and replacer.

- (2) Measure diameter of balls on steering idler arm with a micrometer. If dimension is less than the wear limit in paragraph 349, replace idler arm assembly.
- (3) Inspect idler arm for cracks and damage. If either condition exists, replace idler arm.

b. Inspect Steering Idler Arm Bracket (fig. 171) .

- (1) Measure steering idler arm shaft openings in steering idler arm bracket with an inside micrometer. If diameter of openings exceeds the wear limits in paragraph 349, replace bracket.
- (2) Inspect bracket for cracks or damage. If either condition exists, replace bracket.

c. Inspect Steering Idler Arm Shaft, Screw, Nut, and Lubricating Fitting (fig. 171) .

- (1) Measure diameter of steering idler arm shaft with a



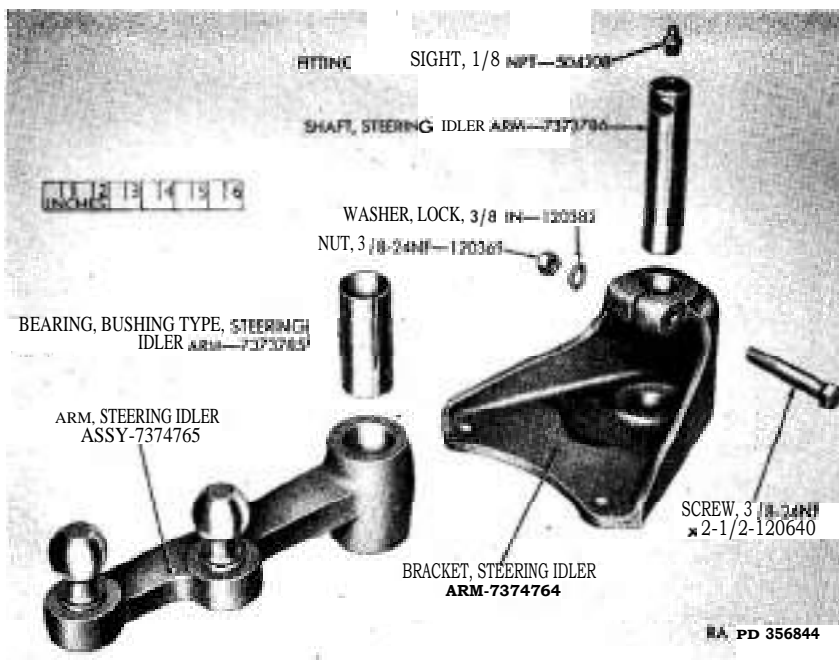


Figure 171. Steering idler arm assembly and steering idler arm bracket with related parts.

micrometer. If measurement of the surface in contact with bushing-type bearing is less than the wear limit in paragraph 349, replace shaft.

- (2) Inspect screw and nut, which clamp the bracket around steering idler arm shaft, and lubricating fitting for damaged threads. If threads are damaged, replace parts.

189. Assembly (Field and Depot Maintenance)

a. *Install Steering Idler Arm Bushing-Type Bearing in Steering Idler Arm.* If inspection (par. 188a) reveals that replacement of steering idler arm bushing-type bearing is necessary, install a new bearing with a remover and replacer and hammer (fig. 170). Ream bearing if necessary, so that steering idler arm shaft is a free fit in bearing, without play.

b. *Assemble Parts in Steering Idler Arm Bracket (fig. 171).*

- (1) Lubricate steering idler arm bushing-type bearing with general purpose lubricant (GO) and position steering idler arm assembly in bracket. Install steering idler arm shaft in bracket and through bearing in idler arm. Make certain that groove in shaft is in proper alignment with screw hole.

- (2) Install ~~3/8-24NF~~ x 2 1/2 screw in bracket and make certain it engages with the groove in steering idler arm shaft. Install 1/2-inch lock washer and ~~3/8-24NF~~ nut. Tighten nut.
- (3) Install ~~1/2NPT~~, straight, lubricating fitting in shaft.
- (4) Lubricate steering idler arm bushing-type bearing and steering idler arm shaft with general purpose grease (GAA).

Section IV. REBUILD OF DRAG LINK ASSEMBLIES

190. Disassembly (Field and Depot Maintenance)

a. *General.* The information in this section is based on the assumption that the drag link assemblies are removed from the truck.

b. *Remove Parts from Drag Links* (fig. 172).

- (1) Remove 5/32 x 23/4 cotter pins (M, Q, V, and Z) and drag link plugs (H and U) from pitman arm-to-idler arm drag link tube (D) and steering arm to idler arm drag link tube (N) . Remove drag link ball seats (A, E, J, and R), drag link bumpers (C, G, L, and T), and drag link compression springs (B, F, K, and S) .
- (2) Remove lubricating fittings (P, W, and X) and lubricating fitting elbows (Y) from drag links.

c. *Clean Parts.* Wash all parts in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

191. Inspection (Field and Depot Maintenance)

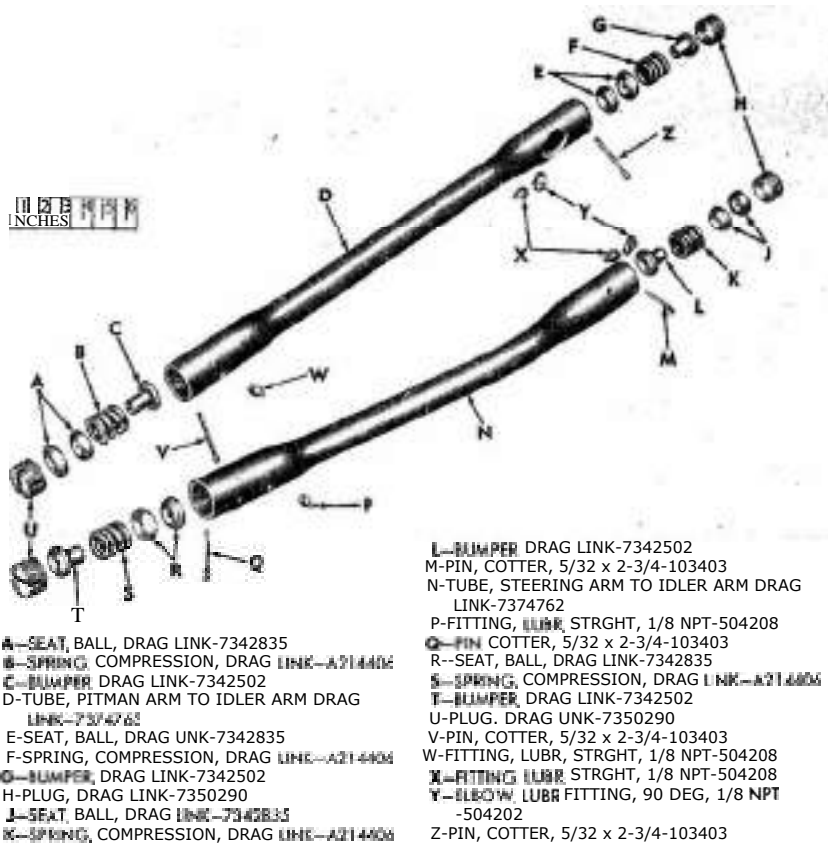
(fig. 172)

a. *Inspect Pitman-Arm-to-Idler-Arm Drag Link Tube and Steering-Arm-to-Idler-Arm Drag Link Tube.* Inspect pitman arm to idler arm and steering arm-to-idler arm drag link tubes (D and N) for cracks, damaged plug threads, damaged lubricating fitting threads, or distortion. If any of these conditions exist, replace tubes.

b. *Inspect Drag Link Plugs.* Inspect drag link plugs (H and U) for cracks or worn or damaged threads. If any of these conditions exist, replace plugs.

c. *Inspect Drag Link Ball Seats.* Inspect drag link ball seats (A, E, J, and R) for wear or cracks. If either of these conditions exist, replace seats.

d. *Inspect Drag Link Compression Springs.* Inspect drag link



RA PD 356845

Figure 172. Drag link assemblies—exploded view.

compression springs (B, F, K, and S) for cracks or breakage. If any of these conditions exist, replace springs.

e. Inspect Drag Link Bumpers. Inspect drag link bumpers (C, G, L, and T) for cracks or breakage. If either of these conditions exist, replace bumpers.

192. Assembly (Field and Depot Maintenance)

(fig. 172)

a. General. To insure proper steering, the internal parts of the drag links must be installed as indicated in figure 172.

b. Assembly of Parts in Pitman-Arm-to-Idler-Arm Drag Link Tube.

- (1) Assemble parts in pitman arm-to-idler arm drag link tube (D), beginning at pitman arm end. Pitman arm end

may be identified by greater distance of ball opening from end of tube. Install two drag link ball seats (E), followed by drag link compression spring (F), drag link bumper (G), and drag link plug (H). Install new 5/32 x 2 3/4 cotter pin (Z). Tape opening to protect internal parts.

- (2) install 1/8 NPT 90-degree lubricating fitting elbow (Y) in drag link at pitman arm end and install 1/8 NPT, straight, lubricating fitting (X) in elbow.
- (3) Position drag link bumper (C) (flanged end in) in idler arm end of drag link tube (D), followed by drag link compression spring (B), drag link ball seats (A), and drag link plug (U). Tighten plug and install new 5/32 x 2 3/4 cotter pin (V) . Tape opening to protect internal parts. Install 1/8 NPT, straight, lubricating fitting (W) in idler arm end of drag link.

c. Install Parts in Steering-Arm-to-Idler-Arm Drag Link Tube.

- (1) Begin assembly at steering arm end of steering-arm-to-idler-arm-drag-link tube (N). Steering arm end may be identified by shorter distance of ball opening from end of tube. Position drag link bumper (L) (flanged end in) in drag link, followed by drag link compression spring (K), drag link ball seats (J), and drag link plug (H). Tighten plug and install a new 5/32 x 2 3/4 cotter pin (M) . Tape opening to protect internal parts.
- (2) Install 1/8 NPT 90° lubricating fitting elbow (Y) in steering arm end of drag link. Install 1/8 NPT straight lubricating fitting (X) in elbow.
- (3) Position drag link ball seats (R) in idler arm end of drag link, followed by drag link compression spring (S), drag link bumper (T) and drag link plug (U) . Tighten plug and install a new 5/32 x 2 3/4 cotter pin (Q). Tape opening to protect internal parts.
- (4) Install 1/8 NPT straight lubricating fitting (P) in idler arm end of drag link.

193 Lubrication

If the drag link assemblies are placed in storage, inject a sufficient amount of general purpose grease (GAA) through the lubricating fittings to prevent corrosion of the internal parts.

CHAPTER 13

SPRINGS AND SHOCK ABSORBERS

Section I. DESCRIPTION AND DATA

194. Description

a. Springs (fig. 173) . The springs are semielliptic, consisting of a number of leaves held together by a center bolt and spring leaf clips. Attachment of the springs to the axle housings is accomplished with U bolt-type clips. Hardened steel bolts, operating in bronze bushing-type bearings, which are pressed into the eyes of the top spring leaf, attach the springs to the frame brackets and shackles. Ample capacity to absorb the braking and driving strains is provided by the additional wrap of the second spring leaf around the front end of each spring.

b. Shock Absorbers (fig. 173) . Hydraulic, telescopic, cylindrical-type, triple-acting shock absorbers are provided at the front and rear axles. The shock absorbers are attached to the axles and frame brackets by rubber bushing-type bearings.

195. Data

a. Front Spring.

Number of leaves :

Truck models M37, M42, and M43	----- 7
Truck model V41	----- 8

Length (spring flat) :

Eye-to-eye center	----- 46 in. ($\frac{1}{8}$ in.)
Front eye to center bolt	----- 24 in. ($\pm 1/16$ in.)
Rear eye to center bolt	----- 22 in. ($\pm 1/16$ in.)

Width of spring leaves	----- 2 in.
Spring leaf clips	----- 4
Bushing-type bearing	----- bronze

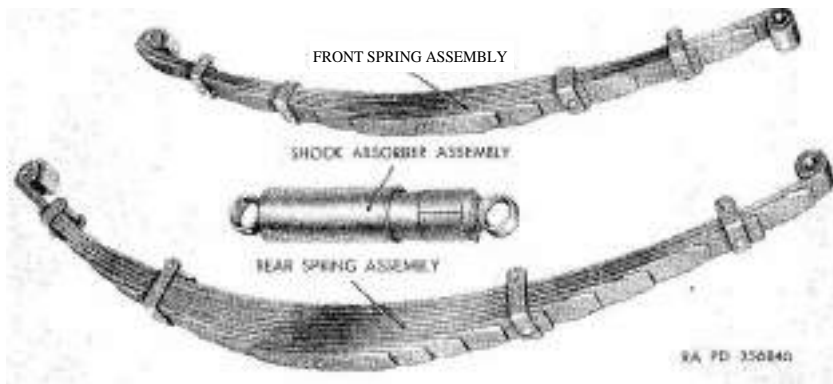


Figure 173. Spring and shock absorber assemblies.

Thickness of spring leaves :

Leaf Nos. 1 and 2 (all truck models)	-----	0.323 in.
Leaf Nos. 3 and 4 (all truck models)		0.291 in.
Leaf Nos. 5, 6, and 7 (all truck models)	__	0.262 in.
Leaf No. 8 (truck model V41)	-----	0.262 in.

b. Rear Spring.

Number of leaves :

Truck models M37 and M42	__	11
Truck models M43 and V41		13

Length :

Eye-to-eye center (spring flat)	56 in. ($\pm 1\frac{1}{8}$ in.)
Spring eye to center bolt	----- 28 in. ($\pm 1/16$ in.)

Width of spring leaves ----- 2 in.

Spring leaf clips ----- 4

Bushing-type bearings ----- bronze

Thickness of spring leaves :

Leaf No. 1 (all truck models)	-----	0.323 in.
Leaf Nos. 2, 3, 4, 5, and 6 (truck models M37 and M42)	-----	0.291 in.
Leaf No. 7 (truck models M43 and V41)	-----	0.291 in.
Leaf Nos. 7, 8, 9, 10, and 11 (truck models M37 and M42)	-----	0.262 in.
Leaf Nos. 8, 9, 10, 11, 12, and 13 (truck models M43 and V41)	-----	0.262 in.

a. Shock Absorbers.

Make	-----	Delco, Gabriel, or Monroe
Type	-----	3-stage control, hydraulic
Size	-----	2 in.

Section II. REBUILD OF FRONT SPRING ASSEMBLIES

196. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 175, except where otherwise indicated.

a. General.

- (1) The following procedures are based on the assumption that the front spring assemblies (*fig. 173*) are removed from the vehicle. Refer to TM 9-840 for information pertaining to the removal and installation of front springs.
- (2) The inspection of the spring bolts and spring shackles is covered in paragraph 197c and *d.* Refer to TM 9-840 for information relative to the removal, installation, and adjustment of the spring bolts and spring shackles.

b. Remove Spring Center Bolt, Spring Leaf Clip Bolts, and Related Parts.

Caution: Place spring assembly between the jaws of a vise to prevent possible injury to personnel when nut (C) is removed from spring center bolt (R).

- (1) If ends of spring center bolt (R) and spring leaf clip bolts (G and Z) are peened over the nuts, remove necessary metal by grinding.
- (2) Remove heavy jam nuts (L and W) from spring leaf clip bolts (G and Z) ; then discard nuts. Drive bolts from spring leaf upper clips (H and Y). This will release spring leaf clip spacers (B and D). Discard bolts.
- (3) Open spring leaf lower clips (M and U) with a chisel and hammer. Clips must be opened a sufficient amount to provide clearance for the release of upper leaves.
- (4) Remove nut (C) from spring center bolt (R) and discard nut. Drive bolt from spring and discard bolt.
- (5) Release spring assembly from vise and separate leaves.

c. Remove Bushing-Type Bearings from No. 1 Spring Leaf.

Note. Do not remove bushing-type bearings (A and E) from No. 1 spring leaf (F) unless inspection (par. 197a) reveals replacement of bearings is necessary.

Place spring leaf in a vise and remove bushing-type bearings with a remover and replacer (*fig. 174*).

d. Remove Spring Leaf Upper and Lower Clips. If inspection (par. 197b) reveals that replacement of the spring leaf upper and lower clips (H, M, U, and Y) is necessary, remove heads from

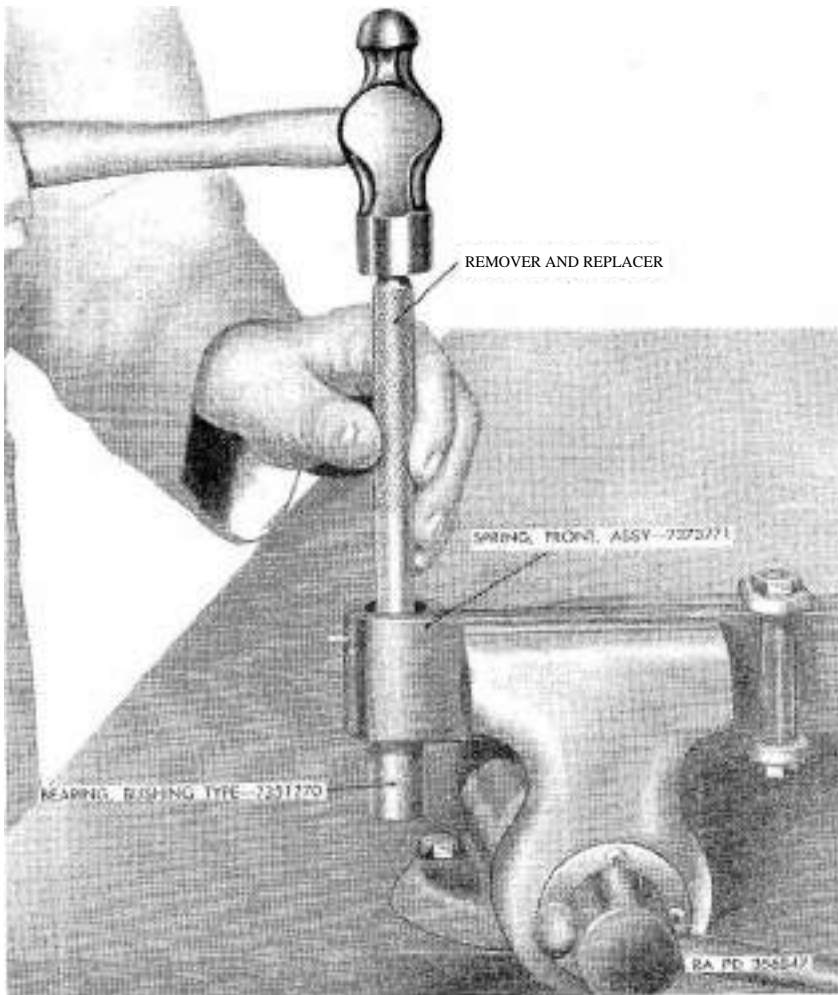


Figure 174. Removing hushing-type hearing from spring with a bushing 'remover and replacer.

steel button-head rivets (K, T, and X) by grinding. Drive rivets from spring leaves with a punch and hammer. This will release clips from spring leaves.

e. Cleaning. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent and dry with compressed air. Clean all scale or corrosion from spring leaves with a power-driven wire brush.

197. Inspection (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 175.

a. Inspect Spring Leaves.

- (1) Inspect spring leaves for wear or cracks.

Note. It is important to inspect spring leaves for wear that may be caused by the ends of the lower leaves. This type of wear usually results in breakage of the upper leaf.

Replace leaves that are cracked or worn.

- (2) Measure inside diameter of bushing-type bearings (A and E) in No. 1 spring leaf (F) with an inside micrometer. If dimension exceeds wear limit in paragraph 350, replace bearings (pars. 196c and 198a).

b. Inspect Spring Leaf Upper and Lower Clips and Related Parts.

- (1) Inspect spring leaf upper clips (H and Y) for cracks, loose rivets, or worn bolt holes. If clips are cracked or bolt holes are worn, replace clips (pars. 196d and 198b). If rivets are loose, they can be tightened in an arbor press.
- (2) Inspect spring leaf lower clips (M and U) for cracks or loose rivets.

Note. The spring leaf lower clip is a bent-over-type clip that must be opened whenever a change of spring leaves is necessary, therefore, this item must be carefully inspected for cracks.

If there is any evidence of cracks, replace clips (pars. 196d and 198b). If rivets are loose, they can be tightened in an arbor press.

- (3) Inspect spring leaf clip spacers (B and D) for distortion. If spacers are distorted, they must be replaced.

c. Inspect Spring Inner and Outer Shackles. Inspect spring inner and outer shackles for wear, worn bolt holes, or cracks. Measure inside diameter of bolt holes with an inside micrometer. If there is any evidence of cracks or damage, or diameter of bolt holes exceeds the wear limit specified in paragraph 350, replace shackles.

d. Inspect Spring Bolts and Spring Shackle Lower Bolts. Inspect spring bolts and spring shackle lower bolts for wear, cracks, or damaged threads. Measure diameter of bolts with a micrometer. If dimension is less than the wear limit indicated in paragraph 350, replace bolts as required. If there is any evidence of cracks or damaged threads, replace spring bolts.

198. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 1'75, except where otherwise indicated.

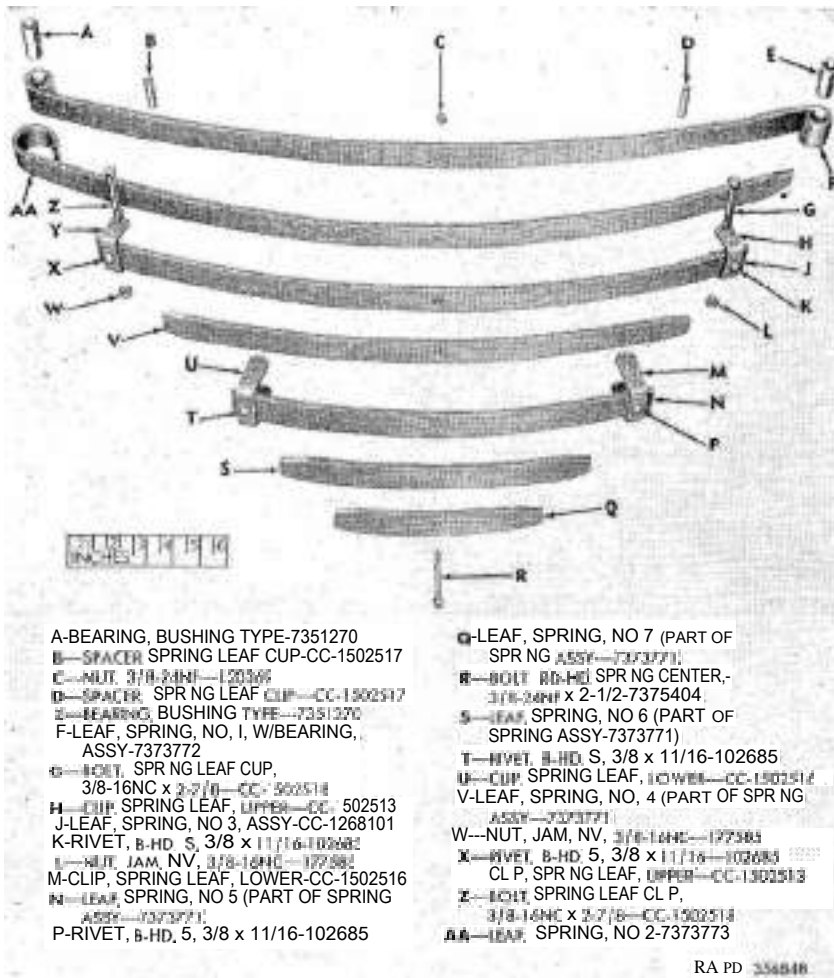


Figure 175. Front spring assembly—truck models M37, M42, and M43—exploded view.

a. Install Bushing-Type Bearing in No. 1 Spring Leaf.

- (1) If inspection (par. 197a) reveals that replacement of the bushing-type bearings (A and E) is necessary, place No. 1 spring leaf (F) in a vise and install new bearings with a remover and replacer (*fig. 174*).
- (2) Ream bearings so that spring bolts are a free fit in bearings, with minimum clearance.

b. Install New Spring Leaf Upper or Lower Clips.

- (1) If inspection (par. 197b) reveals that replacement of the spring leaf of upper or lower clips (I-I, M, U, and Y) is necessary, position spring-leaf clips on spring leaves and

insert new $\frac{3}{8} \times 11/16$ steel button-head rivets (K, P, T, and X) (rivet heads on clip side).

Note. The spring leaf upper clips are attached to No. 3 spring leaf on all trucks. On truck models M37, M42, and M43, the spring leaf lower clips are attached to No. 5 spring leaf. On truck model V41, the spring leaf lower clips are attached to No. 6 spring leaf.

- (2) Set rivets into countersunk space around rivet holes in spring leaves with an arbor press.

Note. End of rivets must not protrude above top surface of spring leaf. If necessary, grind end of rivet level with spring leaf surface.

c. Assemble Spring Leaves (Truck Models M37, M42, and M43).

- (1) Apply a thin coating of general purpose grease (GAA) on spring leaves.
- (2) Position No. 2 spring leaf (AA) on No. 1 spring leaf with bearing assembly (F) so that wrapped end of No. 2 spring leaf is around top eye of No. 1 spring leaf.
- (3) Place No. 3 spring leaf assembly (J), which includes spring leaf upper clips, on No. 2 spring leaf, followed by No. 4 spring leaf (V) ; No. 5 spring leaf (N), which includes spring leaf lower clips; No. 6 spring leaf (S) ; and No. 7 spring leaf (Q).

Note. The center bolt hole in the front spring leaves is offset and the long dimension from the center bolt hole to the end of the leaf must be toward the front.

- (4) Insert a long thin punch through center bolt holes in spring leaves and place the assembly in a vise. Align center bolt holes as vise is tightened. Remove punch and install new $\frac{3}{8}$ -24NF x $2\frac{1}{2}$ round-head-spring-center bolt (R) (head down). Install new $\frac{3}{4}$ -24NF nut (C) on center bolt. Tighten nut and peen end of bolt over nut.
- (5) Wipe surplus grease from edges of spring leaves.
- (6) Position spring leaf clip spacers (B and D) between open ends of spring leaf upper clips (H and Y). Insert new $\frac{3}{8}$ -16NC x $2\frac{7}{8}$ spring leaf clip bolts (G and Z) through clips and spacers. Install new $\frac{3}{8}$ -16NC heavy jam nuts (L and W) on bolts and tighten nuts. Peen end of bolts over nuts.
- (7) Remove spring assembly from vise.

d. Shape Spring Leaf Lower Clips Over Top of Spring. Clamp spring assembly at each spring leaf lower clip (M and U) between the jaws of a vise and firmly tighten jaws. Bend ends of clips over top of spring assembly with a heavy hammer. Remove spring

assembly from vise. Support each lower clip between the open jaws of a vise to clear rivet and finish shaping of clip around spring assembly.

e. Assemble Spring Leaves (Truck Model V41).

- (1) Position No. 2 spring leaf on No. 1 spring leaf as described in *c* (1) and (2) above. Place No. 3 spring leaf, which includes spring leaf upper clips, on No. 2 spring leaf, followed by No. 4 spring leaf ; No. 5 spring leaf ; No. 6 spring leaf, which includes spring leaf lower clips ; No. 7 spring leaf ; and No. 8 spring leaf.

Note. The center bolt hole in the ~~front~~ spring leaves is offset and the long dimension from the center bolt hole to the end of the leaf must be toward the front.

- (2) Finish installation of all parts as described in *c* (4) through (7) above.

Section III. REBUILD OF REAR SPRING ASSEMBLIES

199. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 176, except where otherwise indicated.

a. General.

- (1) The following procedures are based on the assumption that the rear spring assemblies (fig. 173) are removed from the vehicle. Refer to TM 9-840 for information pertaining to the removal and installation of rear springs.
- (2) Inspection of the spring bolts and spring shackles is covered in paragraph 200c and *d*. Refer to TM 9-840 for information pertaining to the removal, installation, and adjustment of spring bolts and spring shackles.

b. Remove Spring Center Bolt, Spring Leaf Clip Bolts, and Related Parts.

Caution: Place spring assembly between jaws of a vise to prevent possible injury to personnel when nut (C) is removed from the spring center bolt (V).

- (1) If ends of spring center round head bolt (V) and spring leaf clip bolts (G, N, CC, and JJ) are peened over the nuts, remove necessary metal by grinding.
- (2) Remove bearing jam nuts (M, T, Y, and EE) from spring leaf clip bolts (C, N, CC, and JJ), and discard nuts. Drive bolts from spring leaf upper and lower clips (H, Q, BB, and GG). This will release spring leaf clip spacers (B and D). Discard bolts.

- (3) Remove nut (C) from spring center round head bolt (V) and drive bolt from spring. Discard bolt and nut.
- (4) Release spring assembly from vise and separate leaves.

c. Remove Bushing-Type Bearings from No. 1 Spring Leaf.

Note. Do not remove bushing-type bearings (A and E) from spring leaf (F), unless inspection (par. 200a) reveals replacement of bearings is necessary.

Place spring leaf in a vise and remove bushing-type bearings with a remover and replacer (*fig. 174*).

d. Remove Spring Leaf Upper and Lower Clips. If inspection (par. 200b) reveals that replacement of spring leaf upper and lower clips (H, **Q**, **BB**, and GG) is necessary, remove heads from rivets (K, R, Z, and FF) by grinding. Drive rivets from spring leaves with a punch and hammer. This will release clips from spring leaves.

e. Cleaning. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent and dry with compressed air. Clean all scale or corrosion from spring leaves with a power-driven wire brush.

200. Inspection (Field and Depot Maintenance)

a. Inspect Spring Leaves.

- (1) Inspect spring leaves for wear or cracks.

Note. It is important to inspect spring leaves for wear that may be caused by the ends of the lower leaves. This type of wear usually results in breakage of the upper leaf.

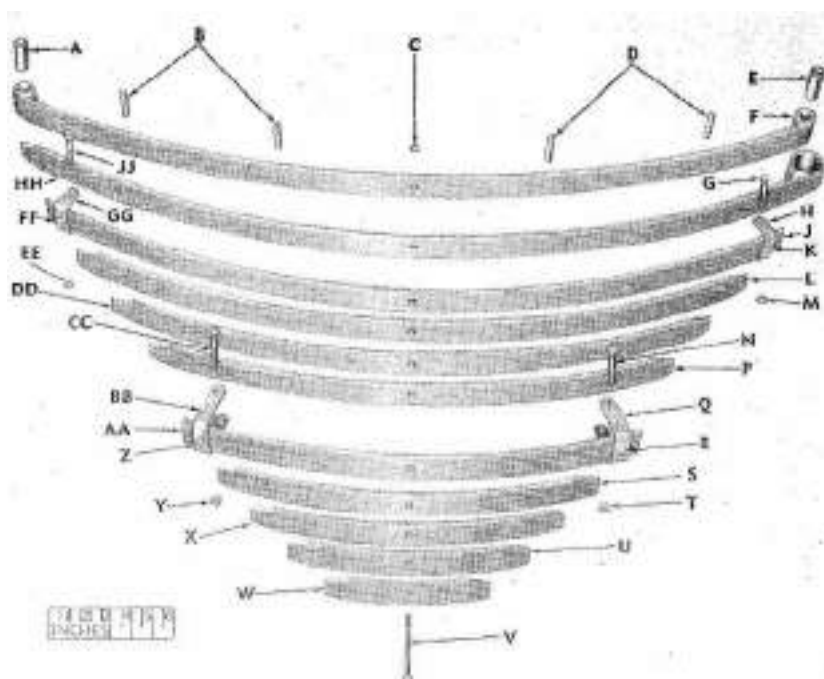
Replace leaves that are cracked or worn.

- (2) Measure inside diameter of bushing-type bearings (A and E) in spring leaf with bearing assembly No. 1 (F) with an inside micrometer. If dimension exceeds wear limit specified in paragraph 350, replace bearings (pars. 199c and 201a).

b. Inspect Spring Leaf Upper and Lower Clips and Related Parts.

- (1) Inspect spring leaf upper and lower clips (H, **Q**, **BB**, and GG) for cracks, loose rivets, or worn bolt holes. If clips are cracked or the bolt holes are worn, replace clips (pars. 199d and 201b). If rivets are loose, they can be tightened in an arbor press.
- (2) Inspect spring leaf clip spacers (B and D) for distortion. If spacers are distorted, they must be replaced.

c. Inspect Spring Shackles. Inspect spring shackles for wear, loose bearing, cracks, or worn bolt holes. If any of these condi-



A--BUSHING, TYPE--2351221
 a--SPACER, SPRING LEAF CLIP--CC-1502517
 C--NUT, 3/8-16NC--177583
 D--SPACER, SPRING LEAF CLIP--CC-1502517
 E--BEARING, BUSHING TYPE--7337362
 F--LEAF SPRING, NO 1, W/BEARING, ASSY-7373762
 G--BOLT SPR NG LEAF CL P, 3/8-16NC x 2-7/8--CC-1502517
 H--CLIP SPRING LEAF, UPPER--CC-1502517
 J--LEAF SPRING, NO 3, ASSY--CC-1268105
 K--RIVET, B-HD, S, 3/8 x 11/16-102685
 L--LEAF SPRING, NO 4 (PART OF SPRING ASSY--7373761)
 M--NUT, JAM, NV, 3/8-16NC--177583
 N--BOLT SPRING LEAF CLIP, 3/8-16NC x 2-7/8--CC-1502517
 P--LEAF SPRING, NO 6 (PART OF SPRING ASSY--7373761)
 Q--CLIP, SPRING LEAF, LOWER--CC-1502514
 R--RIVET, B-HD, S, 3/8 x 11/16-102685
 S--LEAF SPRING, NO 8 (PART OF SPRING ASSY--7373761)
 T--NUT, JAM, NV, 3/8-16NC--177583

U--LEAF, SPRING, NO 10 (PART OF SPRING ASSY--7373761)
 V--BOLT B-HD SPRING CENTER, 3/8-24NC x 3-5/8-7351213
 W--LEAF SPRING, NO 11 (PART OF SPRING ASSY--7373761)
 X--LEAF SPRING, NO (PART OF SPRING ASSY--7373761)
 Y--NUT, JAM, HV, 3/8-16NC--177583
 Z--RIVET, B-HD, S, 3/8 x 11/16-102685
 AA--LEAF, SPRING, NO 7, ASSY (PART OF SPRING ASSY--7373761)
 BB--CLIP SPRING LEAF, UPPER--CC-1502514
 CC--BOLT, SPRING LEAF CLIP, 3/8-16NC x 2-7/8--CC-1502517
 DD--LEAF SPRING, NO 5 (PART OF SPR NG ASSY--7373761)
 EE--NUT, JAM, NV, 3/8-16NC--177583
 FE--RIVET, B-HD, S, 3/8 x 11/16-102685
 GG--CLIP, SPRING LEAF, UPPER--CC-1502517
 HH--LEAF, SPRING, NO 2-7373763
 JJ--BOLT SPRING LEAF CLIP, 3/8-16NC x 2-7/8--CC-1502517

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FIGURE 176. Rear spring assembly—truck models M37 and M42—exploded

tions exist, replace shackles. Measure inside diameter of outer bolt holes and bushing-type bearing with an inside micrometer. If the dimensions are greater than the wear limits specified in paragraph 350, replace shackles.

d. Inspect Spring Bolts. Inspect spring bolts for wear, cracks, or damaged threads. Measure diameter of bolts with a micrometer.

If dimension is less than the wear limits specified in paragraph 350, replace bolts as required. If there is any evidence of cracks or damaged threads, replace spring bolts.

201. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 176, except where otherwise indicated.

a. Install Bushing-Type Bearing in No. 1 Spring Leaf.

- (1) If inspection (par. 200a) reveals that replacement of the bushing-type bearings (A and E) is necessary, place No. 1 spring leaf with bearing assembly (F) in a vise and install new bearings with a remover and replacer (*fig. 174*).
- (2) Ream bearings so that spring bolts are a free fit in bearings, with minimum clearance.

b. Install New Spring Leaf Upper or Lower Clips.

- (1) If inspection (par. 200b) reveals that replacement of the spring leaf upper or lower clips (H, Q, BB, and GG) is necessary, position clips on spring leaves and insert new $\frac{3}{8}$ x 11/16 steel button-head rivets (K, R, Z, and FF) with rivet heads on clip side.

Note. The spring leaf upper clips are attached to No. 3 spring leaf on all trucks. On truck models M37 and M42, the spring leaf lower clips are on No. 7 spring leaf. On truck models M43 and V41, the spring leaf lower clip is on No. 8 spring leaf.

- (2) Set rivets into countersunk space around rivet holes in spring leaves with an arbor press.

Note. End of rivets must not protrude above top surface of spring leaf. If necessary, grind end of rivets level with spring leaf surface.

c. Assemble Spring Leaves (Truck Models M37 and M42).

- (1) Apply a thin coating of general purpose grease (GAA) on spring leaves.
- (2) Position No. 2 spring leaf (HH) on No. 1 spring leaf with bearing assembly (F) so that wrapped end of No. 2 spring leaf is around eye of No. 1 spring leaf.
- (3) Place No. 3 spring leaf assembly (J), which includes spring leaf upper clips, on No. 2 spring leaf, followed by No. 4 spring leaf (L) ; No. 5 spring leaf (DD) ; No. 6 spring leaf (P) ; No. 7 spring leaf assembly (AA), which includes spring leaf lower clips ; No. 8 spring leaf (S) ; No. 9 spring leaf (X) ; No. 10 spring leaf (U) ; and No. 11 spring leaf (W).

- (4) Insert a long thin punch through center bolt holes in spring leaves and place assembly in a vise. Align center bolt holes as vise is tightened. Remove punch and install new $\frac{3}{8}$ -24NF x $3\frac{1}{8}$ round head spring center bolt (V) head down. Install new $\frac{3}{8}$ -24NF nut (C) on center bolt and tighten nut. Peen end of bolt over nut.
 - (5) Wipe surplus grease from edges of spring leaves.
 - (6) Position spring leaf clip spacers (B and D) between open ends of spring leaf upper and lower clips (H, Q, BB, and GG). Insert new $\frac{3}{8}$ -16NC x $27/8$ spring leaf clip bolts (G, N, CC, and JJ) through clips and spacers. Install new $\frac{3}{4}$ -16NC heavy jam nuts (M, T, Y, and EE) on bolts and tighten nuts. Peen end of bolts over nuts.
 - (7) Remove spring assembly from vise.
- d. *Assemble Spring Leaves (Truck Models M43 and V41)*
- (1) The spring leaves for the rear spring assemblies on truck models M43 and V41 are assembled in the same manner as outlined in c above, but the spring leaf lower clips are on No. 8 spring leaf assembly and there are a total of 13 spring leaves.
 - (2) Finish installation of all parts as described in c above.

Section IV. REBUILD OF SHOCK ABSORBERS

202. Disassembly (Field and Depot Maintenance)

The following procedures are based on the assumption that the shock absorber assemblies (*fig. 173*) are removed from the vehicle. The shock absorbers cannot be disassembled for servicing, therefore, no rebuild information is required.

203. Inspection (Field and Depot Maintenance)

a. *Inspect Shock Absorbers for Broken Welds.* Inspect shock absorbers for damaged or broken welds around eyes at each end. If either condition exists, shock absorbers must be replaced.

b. *Inspect Shock Absorbers for Fluid Leakage.* Inspect shock absorbers for fluid leakage. This will be apparent by fluid that is leaking past the shock absorber piston rod and seal. If fluid leakage is evident, shock absorbers must be replaced.

c. *Check Functioning of Shock Absorbers.* Clamp lower eye of shock absorbers in a vise with short absorber upright. When shock absorbers are in the upright position, the lettering on the dust shield is at top of absorber. Operate shock absorbers a few full

strokes to remove air from pressure cylinder. Valves that are functioning properly seat instantly and resistance to any movement of the shock absorber must be felt without any lost motion in either direction. If lost motion or any lack of resistance is evident in either direction, shock absorbers must be replaced.

d. Check Alinement of Shock Absorber Piston Rod. Clamp shock absorber in a vise in an upright position (dust shield or large section up). Rotate dust shield. If dust shield does not rotate freely, binding of internal parts is indicated or the shock absorber piston rod is bent. If dust shield does not rotate freely, shock absorber must be replaced.

CHAPTER 14

FRAME AND PINTLE ASSEMBLY

Section I. DESCRIPTION AND DATA

204. Description

a. Frame Assembly (fig. 177). The frame assembly consists of two double-drop, high carbon steel side rails and six cross members. Five of the cross members are riveted to the frame side rails. The transfer rear cross member is bolted to the side rail gussets to facilitate replacement of the transfer assembly. The frame front cross member and rear spring front bracket cross member are box-type assemblies for added rigidity. The radiator support bracket, spring brackets, engine front support brackets, and body hold-down brackets are also riveted to the frame side rails or cross members.

b. Pintle Assembly. The pintle assembly is mounted on the rear cross member of the frame and contains a latching mechanism, which prevents accidental disengagement of the pintle hook. The pintle hook is mounted on a shaft operating in the bracket, which is attached to the rear cross member, and permits the hook to swivel.

205. Data

a. Frame.

Type ----- double drop

Number of cross members ----- 6

Thickness of side rails :

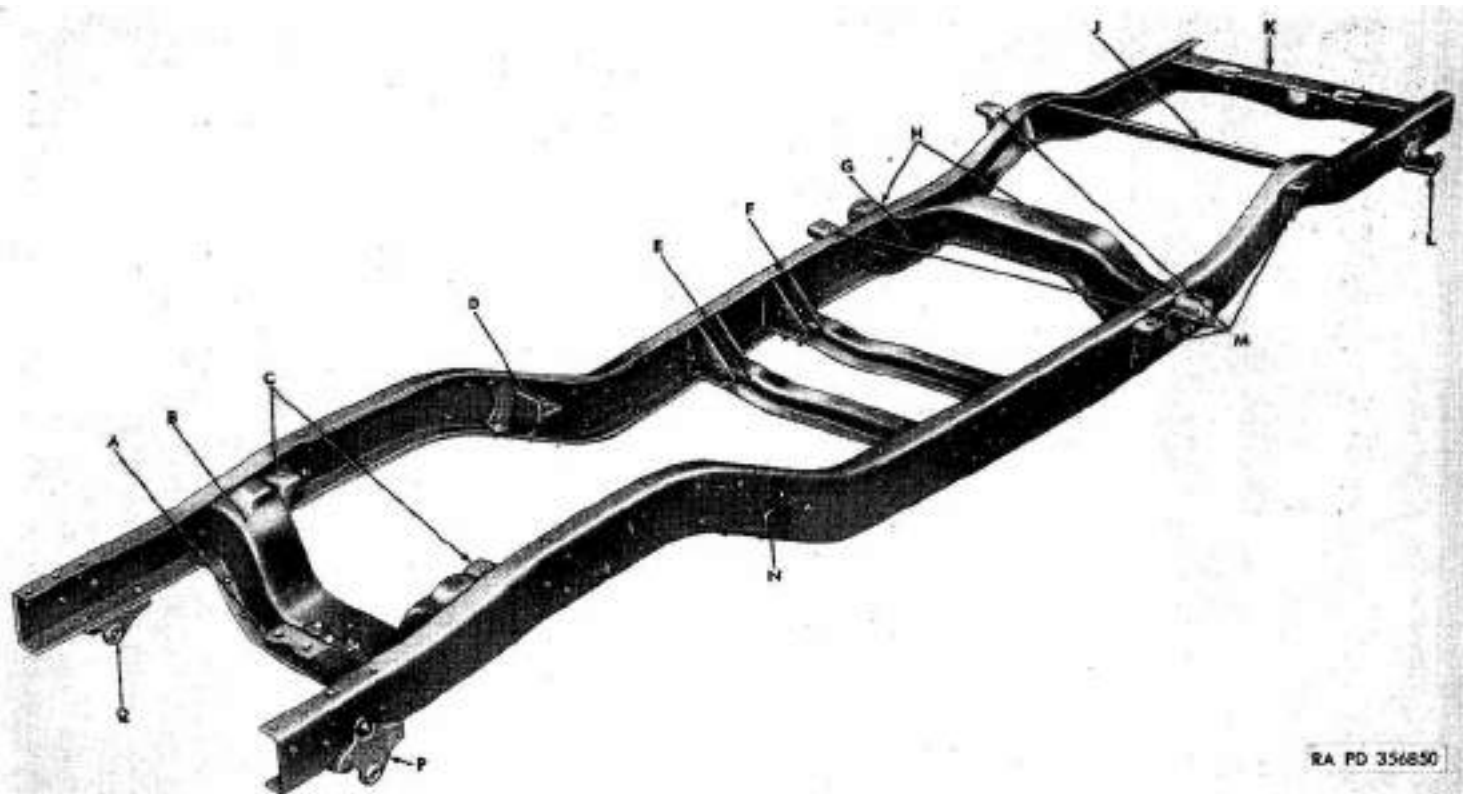
Truck models M37 and M42 ----- 7/32 in.

Truck models M43 and V41 ----- 15/64 in.

Width side rail flange :

Truck models M37 and M42 ----- 2 1/16 in.

Truck models M43 and V41 ----- 2 5/64 in.



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Figure 177. Frame assembly.

- A—Bracket, radiator support-CC-1268112
¹ Rivet, button-head, $\frac{1}{2}$ x 1 $\frac{1}{2}$ (upper)-104131
¹ Rivet, button-head, $\frac{3}{8}$ x 1 $\frac{1}{2}$ (lower)-104117
- B—Cross member, front-CC-1268111
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{2}$ -110436
- C—Bracket, engine front support-CC-1268308
¹ Rivet, button-head, $\frac{3}{8}$ x 1 $\frac{1}{2}$ -110952
- D—Bracket, front spring, rear, right, assy-7705749
¹ Rivet, button-head, $\frac{3}{8}$ x 1 $\frac{1}{2}$ -104133
- ~~E—Cross~~ member, transfer front-CC-1268283
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{2}$ -110435
- F—Cross member, transfer rear-CC-1268284
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{4}$ (gusset) -110435
- ~~G—Cross~~ member, rear spring front bracket-CC-1268235
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{2}$ (side) -110438
¹ Rivet, button-head, $\frac{3}{8}$ x 1 $\frac{1}{4}$ (bottom)-104115
- H—Bracket, rear spring-7705752
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{2}$ (side)-110438
¹ Rivet, button-head, $\frac{5}{16}$ x 1 $\frac{1}{8}$ (center)-104100
- J—Cross member, fuel tank support-CC-1269321
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{2}$ -110436
- K—Cross member, rear-CC-1268287
¹ Rivet, button-head, $\frac{3}{8}$ x 1 $\frac{1}{2}$ s (rear, upper and lower)-104114
¹ Rivet, flat-head, $\frac{3}{8}$ x 1 $\frac{1}{8}$ (front upper)-104282
- L—Bracket, rear spring-7705752
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{2}$ (front) -110436
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{2}$ (rear)-110438
¹ Rivet, button-head, $\frac{5}{16}$ x 1 $\frac{1}{8}$ (center)-104100
- M—Bracket, body hold-down-7705724
¹ Rivet, button-head, $\frac{7}{16}$ x 1 $\frac{1}{2}$ -110436
- N—Bearing, bushing-type-7705747
- ~~P—Bracket~~, front spring, front, left-7705750
¹ Rivet, button-head, $\frac{1}{2}$ x 1 $\frac{1}{2}$ -104132
- Q—Bracket, front spring, front, right-7705751
¹ Rivet, button-head, $\frac{1}{2}$ x 1 $\frac{1}{2}$ -104132

Rivets for attaching frame parts.

Figure 177—Continued.

Maximum depth of frame side rails :

Truck models M37 and M42 ----- ~~6 1/4~~ in.

Truck models M43 and V41 ----- 6 17/32 in.

Length of frame side rail inside front reinforcement - - 47 5/64 in.

Thickness of frame side rail inside front reinforcement___7/64 in.

Length of frame side rail outside reinforcement, truck 59 3/16 in.
models M43 and V41.

Thickness of frame side rail outside reinforcement, 1/4 in.
truck models M43 and V41.

b. Pintle Assembly.

Type ----- swivel

Location ----- frame rear cross member

Section II. REBUILD OF FRAME ASSEMBLY

206. Disassembly (Depot Maintenance)

a. General. The following procedures are based on the assumption that the frame assembly is removed from the vehicle.

b. Remove Cross Member.

- (1) If inspection (par. 207a) reveals that it is necessary to remove one of the cross members from the frame-side rails, remove rivet heads with a rivet buster and hammer.

Caution : Do not remove rivet heads with a chisel and hammer as damage to the frame side rail or enlargement of the rivet hole will occur.

- (2) Remove rivets from frame side rail and cross member with a punch and hammer. Remove cross member from frame side rails.

c. Remove Front or Rear-Spring Bracket from Frame Side Rails.

- (1) If inspection (par. 207a) reveals that it is necessary to remove one of the front or rear-spring brackets from frame side rail, remove rivet heads with a rivet buster and hammer.
- (2) Remove rivets from frame side rail and front or rear spring bracket with a punch and hammer. Remove bracket from frame side rail.

d. Remove Bushing-Type Bearings from Front Spring Rear Brackets (fig. 177) . If inspection (par. 207a) reveals that replacement of the bushing-type bearings (N) is necessary, remove

bearings from front spring right rear bracket assemblies (D) with a remover and replacer.

e. Cleaning. Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry parts with compressed air. Clean all corrosion or scale from frame assembly with a power-driven wire brush.

207. Inspection and Repair (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 177, except where otherwise indicated.

a. Inspect Frame Assembly.

- (1) Inspect frame side rails for cracks, breakage, or damage. If the frame side rails are cracked, broken, or damaged, they can be repaired as described in *b* below.
- (2) If inspection of the frame side rails indicates any evidence of misalignment, measure distance between points indicated by diagonal lines A and B, C and D, and E and F (fig. 178). If distance between points indicated by any pair of diagonal lines varies more than one-quarter inch, the frame is not in proper alignment.

Note. Extreme care must be exercised when checking diagonal dimensions as the measurements must be taken from exactly the same point on each side of frame.

- (3) If misalignment is indicated by the diagonal measurements, check the various important frame dimensions (fig. 179) , to determine exact location of any unsatisfactory condition that may exist.
- (4) Inspect front cross member (B) for cracks or loose rivets. The cracks can be repaired as explained in *b* below. Replace loose rivets.
- (5) Inspect radiator support bracket (A) and engine front support brackets (C) for cracks or loose rivets. Minor cracks may be repaired by welding. If rivets are loose, replace the front cross member assembly (pars. 206b and 208b) , which includes the radiator support bracket and engine front support brackets.

Note. The front cross member (B) is a box-type assembly, which prevents replacement of the rivets for the radiator support bracket and engine front support brackets.

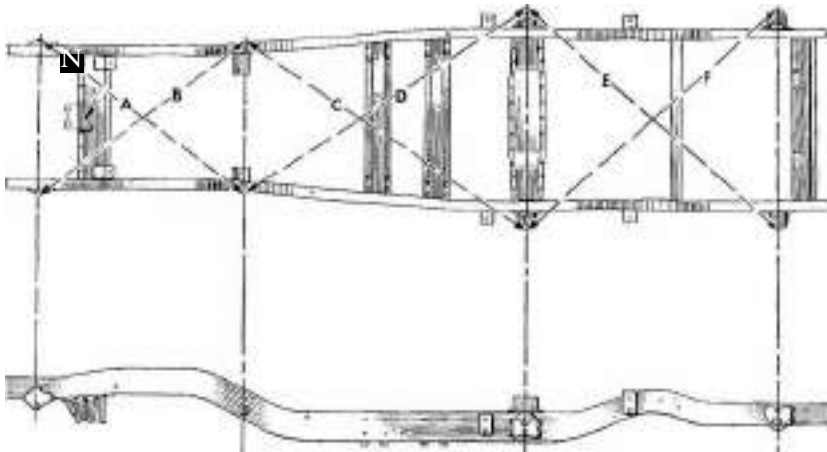
- (6) Inspect spring brackets (H, L, P, and Q) for cracks, worn spring bolt holes, or loose rivets. Measure diameter of spring bolt holes with an inside micrometer. If the brackets are cracked or diameter of spring bolt holes exceeds the wear limit specified in paragraph 351, re-

place brackets (par. 206c and 208c) . If rivets are loose, replace rivets.

- (7) Inspect bushing-type bearings (N) and front spring right rear bracket assemblies (D) for wear, cracks, or loose rivets. Measure inside diameter of bearings with a micrometer. If inside diameter of bearings exceeds wear limit in paragraph 351, replace bearings (pars. 206d and 208d) . If brackets are cracked, replace brackets (pars. 206c and 208c). Replace loose rivets.
- (8) Inspect transfer front and rear cross members (E and F) for cracks or damage. If cross members are cracked, they can be repaired by welding. Damage of the cross members can be repaired, if metal is not distorted. If metal is distorted, replace cross members (pars. 206a and 208b) . Inspect rivets, which attach transfer cross member gussets to frame, for looseness. If rivets are loose, install new rivets.
- (9) Inspect rear spring front bracket cross member (G) for cracks, distortion, or loose rivets. Cracks can be repaired by welding, but if cross member is distorted, it must be replaced (pars. 206c and 208c) . If rivets are loose, install new rivets.
- (10) Inspect body hold-down brackets (M) for cracks or loose rivets. If brackets are cracked, they can be repaired by welding. Replace all loose rivets with new rivets.
- (11) Inspect fuel tank support cross member (J) for cracks or loose rivets. If cross member is cracked, it can be repaired by welding. Replace loose rivets with new rivets.
- (12) Inspect rear cross member (K) for cracks or loose rivets. If cross member is cracked, it can be repaired by welding. Replace loose rivets with new rivets.

b. Repair.

- (1) When frame is originally manufactured, no heat is employed in the shaping and forming of the side rails, therefore, all straightening operations must be performed cold whenever practical. When heat is employed, maintain the temperature of the area to be straightened at a cherry red throughout the operation. As an oxyacetylene torch is generally used for heating, employ a neutral flame and play it over the entire area to be heated until the metal has reached a uniform cherry red. Never heat metal beyond a cherry red as it will result in serious weakening of the steel. Frequently check the temperature of the heated metal with a dry pine stick as metal that is



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Figure 178. Frame diagonal measurements.

cherry red will cause stick to glow and char but not ignite. Protect heated area of the frame from drafts to prevent sudden cooling of the metal.

- (2) When a major welding operation has been performed, apply a reinforcement to strengthen the repaired section. The thickness of the reinforcement material must at least equal the thickness of the frame section. A channel reinforcement provides a satisfactory repair. When installing the channel reinforcement, weld only the edges of the channel to the frame flanges, leaving the ends free to avoid stresses brought about by the straightening and welding.

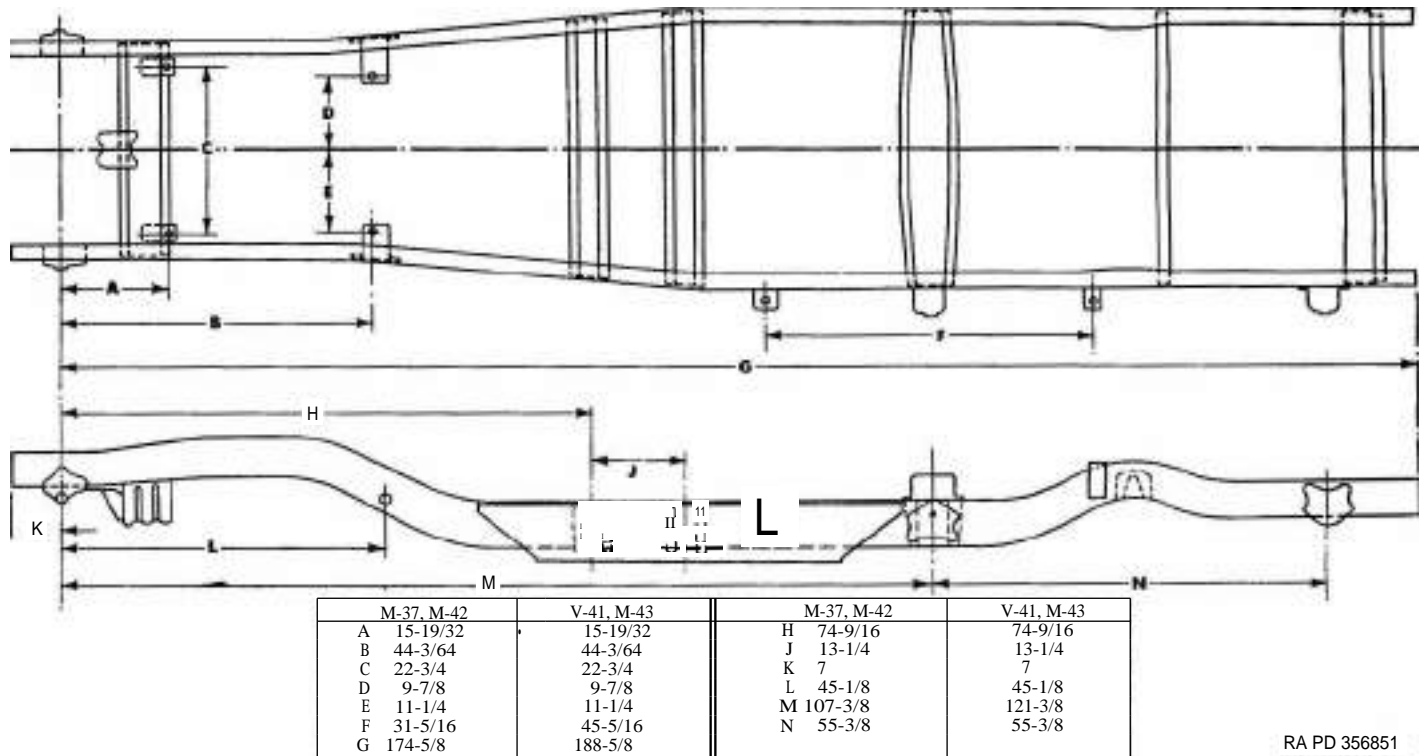
208. Assembly (Depot Maintenance)

a. General. Inasmuch as most of the parts on the frame are attached by rivets, this means of attachment must be used in event of replacement.

Note. Rivets must be installed cold. Do not apply heat as rivet will shrink and result in premature looseness.

b. Install Gross Member.

- (1) If inspection (par. 207a) reveals that replacement of a cross member is necessary, make certain the frame side rail metal around rivet holes is smooth and level.
- (2) Position cross member between frame side rails and install two bolts, lock washers, and nuts on each side, to correctly position cross member. Use a punch to aline



RA PD 356851

Figure 179. Frame dimensions.

holes in frame side rails and cross member as nuts are tightened. Install rivets of the same dimensions as indicated in figure 177.

Note. To insure a satisfactory job of cold riveting, rivet must extend from hole 1.75 times its diameter. As an example: If rivet is one-half inch in diameter, rivet must extend seven-eighths of an inch. If a cone-point rivet is used, add one-sixteenth to length specified in figure 177.

- (3) Set rivets cold with a hydraulic riveter, using a button-head adapter.

Note. Do not install oversize rivets if holes are worn as a more satisfactory repair can be accomplished with rivets specified in figure 177.

c. Install Front or Rear Spring Brackets. If inspection (par. 207a) reveals that replacement of any of the front or rear spring brackets is necessary, perform installation as outlined in *b* above.

d. Install Bushing-Type Bearings in Front Spring Rear Brackets (fig. 177).

- (1) If inspection (par. 207a) reveals that replacement of the bushing-type bearings (N) is necessary, install new bearings in front spring rear brackets (D) with a remover and replacer.
- (2) Ream bearings until spring bolts are a free fit, with minimum clearance.

Section III. REBUILD OF PINTLE ASSEMBLY

209. Disassembly (Field and Depot Maintenance)

(fig. 180)

a. General. The following procedures are based on the assumption that pintle assembly is removed from vehicle. Refer to TM 9-840 for information pertaining to the removal and installation of the pintle assembly.

b. Remove Parts from Pintle Hook.

- (1) Remove lubricating fittings (M and T) from latch pin (K), lock pin (N), and flange adapter (D).
- (2) Remove snap ring (L) from latch pin (K) with a small screw driver. Discard snap ring.
- (3) Remove latch pin (K). This will release latch (P) from pintle hook (R).
- (4) Remove snap ring (L) from lock pin (N) with a small screw driver. Discard snap ring.
- (5) Remove lock pin (N). This will release lock (H) and latch spring (J) from latch (P).

- (6) Remove snap rings (S) from latch pin (K) and lock pin (N) . Discard snap rings.
- (7) Remove nuts (F) , lock washers (G), and cap screws (Q). This will separate pintle hook (R) from pintle adapter (E).

c. *Remove Pintle Adapter from Adapter Flange.* Remove cotter pin (A), slotted nut (B), and adapter plain washer (C) from shaft of pintle adapter. Separate pintle adapter (E) from adapter flange (D).

d. *Cleaning.* Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent. Dry parts with compressed air. Thoroughly clean lubricant passages in latch pin (K) and lock pin (N). Remove all evidence of corrosion from shaft of pintle adapter (E) and bore of adapter flange (D).

210. Inspection (Field and Depot Maintenance)

(fig. 180)

a. *Inspect Adapter Flange.* Inspect adapter flange (D) for cracks or worn bearing surfaces. Measure diameter of bore in adapter flange with an inside micrometer. If there is any evidence of cracks or diameter of bore exceeds wear limit specified in paragraph 351, replace adapter.

b. *Inspect Pintle Adapter, Adapter Plain Washer, and Slotted Nut.*

- (1) Inspect shaft of pintle adapter for wear, worn or damaged threads, or cracks. Measure diameter of shaft with a micrometer. If threads are worn or damaged, cracks are evident, or diameter of shaft is less than wear limit specified in paragraph 351, replace pintle adapter.
- (2) Inspect adapter plain washer (C) for cracks. If washer is cracked, install a new washer.
- (3) Inspect slotted nut (B) for worn or damaged threads. If either of these conditions exist, replace nut.

c. *Inspect Pintle Hook.* Inspect pintle hook (R) for cracks. If there is any evidence of cracks, replace pintle hook.

d. *Inspect Latch.* Inspect latch (P) for cracks. If there is any evidence of cracks, replace latch.

e. *Inspect Lock, Latch Spring, Latch Pin, and Lock Pin.*

- (1) Inspect lock (H) for cracks. If there is any evidence of cracks, replace lock.
- (2) Inspect latch spring (J) for cracks. Check compressed and free length of spring. If free and compressed lengths

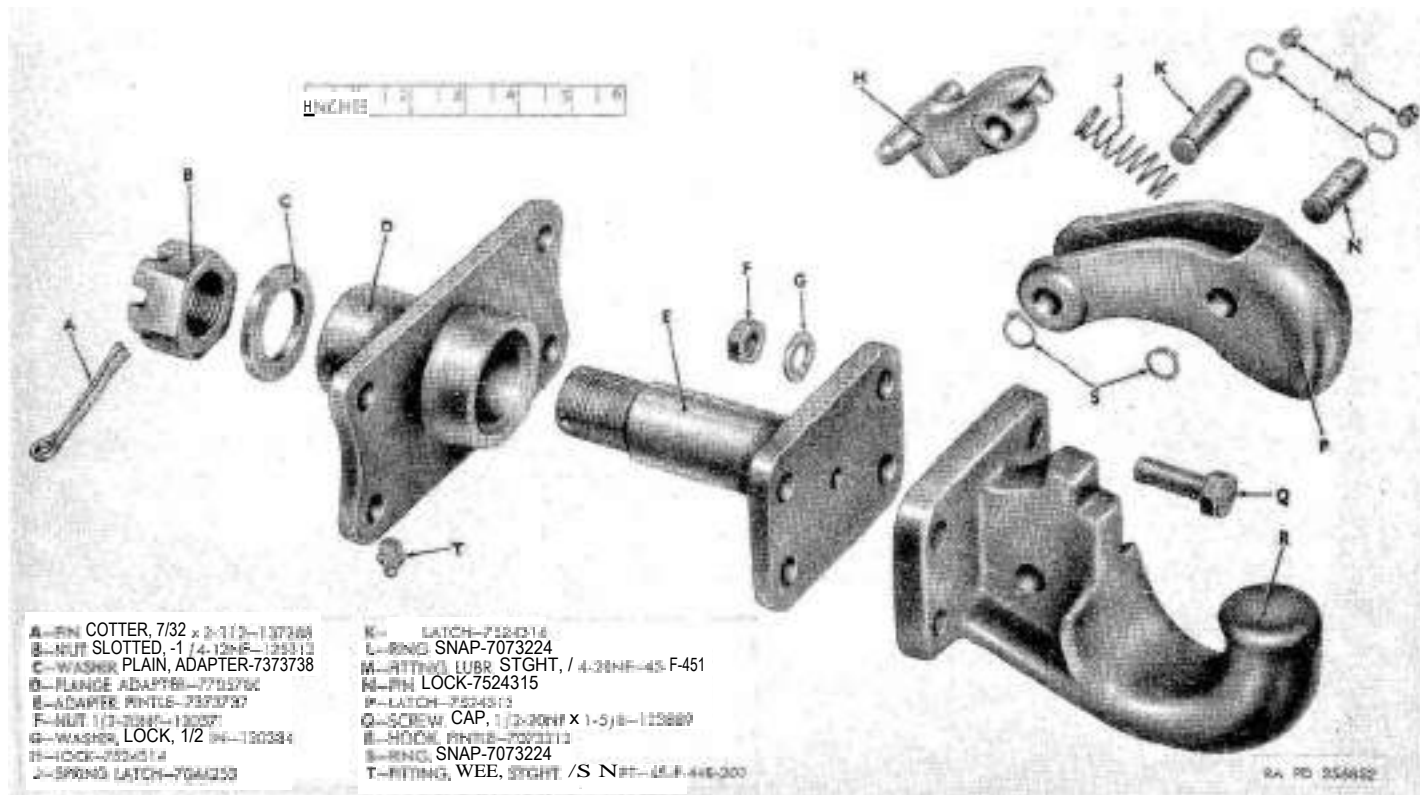


Figure 180. Pin/E assembly—exploded view.

of spring do not conform to wear limits in paragraph 351 or if there is any evidence of cracks, replace spring.

- (3) Measure diameter of latch pin (K) and lock pin (N) with a micrometer. If diameter of pins is less than wear limits specified in paragraph 351, replace pins.

f. Inspect Lubricating Fittings. Inspect lubricating fittings (M and T) for damaged threads, clogging, or damaged ball seats. If there is any evidence of damaged threads or ball seats, lubricating fittings must be replaced. If fittings are clogged, remove obstruction.

g. Inspect Cap Screws and Nuts. Inspect cap screws (Q) and nuts (F) for worn or damaged threads. If either of these conditions exist, replace cap screws and nuts.

211. Assembly (Field and Depot Maintenance)

(fig. 180)

a. Assemble Parts on Pintle Hook.

- (1) Install new snap rings (L) on latch pin (K) and lock pin (N) .

Note. New snap rings must be installed whenever pintle hook is disassembled for any reason. Exercise care in the installation of the snap rings to prevent distortion.

- (2) Insert latch spring (J) in closed end of latch (P) . Position lock (H) in latch (P) so that tapered boss engages with latch spring and pin holes in lock and latch are aligned for lock pin. Install lock pin (N) .
- (3) Install new snap ring (S) on lock pin (N) .
- (4) Position latch (P) on pintle hook (R) and insert latch pin (K) through holes in latch and pintle hook.

Note. Latch pin (K) and lock pin (N) must be installed so that ¹/₄-28NF straight lubricating fittings (M) are on the same side.

Install new snap ring (S) in latch pin (K).

- (5) Install ~~¹/₄-28NF~~ straight lubricating fittings (M) in latch pin (K) and lock pin (N).

b. Attach Pintle Hook to Pintle Adapter.

- (1) Install ¹/₆NPT straight lubricating fitting (T) in flange adapter (D) .
- (2) Attach pintle hook to pintle adapter with four ~~¹/₂-20NF~~ x 1% cap screws (Q), ¹/₂-inch lock washers (G), and ~~¹/₂-20NF~~ nuts (F).
- (3) Insert shaft of pintle adapter (E) in short hub end of flange adapter (D). Install plain adapter washer (C),

~~11/4-12NF~~ slotted nut (B), and new 7/32 x 2 1/2 cotter pin (A).

Note. The adjustment of the shaft on pintle adapter (E) in adapter flange (D) cannot be performed until adapter flange is installed on a vehicle.

- (4) Information pertaining to adjustment of pintle adapter in the flange adapter is outlined in TM 9-840.

212. Lubrication (Field and Depot Maintenance)

Lubricate shaft on pintle adapter, latch pin, and lock pin through lubricating fittings (M and T, fig. 180) with general purpose grease (GA A). Rotate pintle hook several revolutions to insure complete lubrication of the pintle adapter shaft and adapter flange.

CHAPTER 15

CAB

Section I. DESCRIPTION AND DATA

213. Description

The cab is an open-type, all steel assembly, equipped with doors and folding-type windshield. Protection from the weather is provided by a canvas cover supported on the windshield support frame, a steel bow, and side rails. Adjustable glass assemblies are provided in the doors and windshield support frame. The driver's seat is an adjustable bucket-type assembly and a storage compartment for truck tools is accessible by tilting the seat forward. Adjustments are not provided for the passenger seat, but the cushion is removable for servicing of the batteries.

214. Data

Type	-----	open, welded steel construction
Number of passengers	-----	
Type of windshield	-----	folding, with adjustable glass
Ventilator location	-----	cowl upper panel
Type of mounting	-----	insulators and coil springs

Section II. DISASSEMBLY OF CAB INTO SUBASSEMBLIES

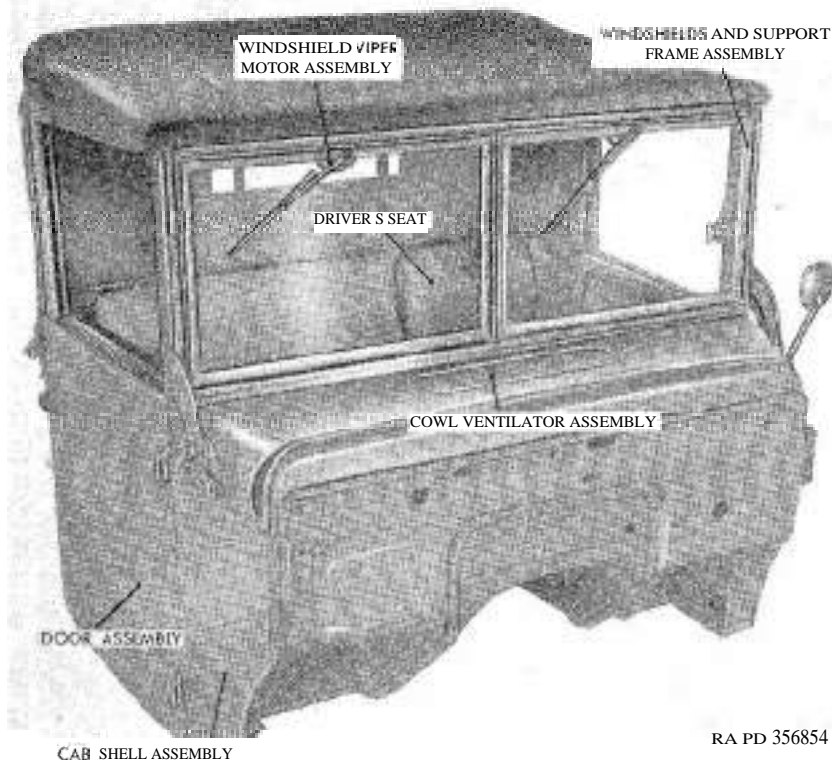
215. General

The cab assembly (*fig. 181*) is divided into six subassemblies: door assembly, driver's seat, windshields and support frame assembly, windshield wiper motor assembly, cowl ventilator assembly, and cab shell assembly.

216. Door Assembly (Field and Depot Maintenance)

a. Remove Pin From Door Check Arm. Remove riveted end of pin with a portable grinder or file and drive pin from door check arm with a punch and hammer.

b. Remove Door Assembly From Cab. Drive hinge pins from hinges with a short punch and hammer.



RA PD 356854

Figure 181. Cab assembly.

217. Driver's Seat (Field and Depot Maintenance)

Remove four cap screws and lock washers ; then remove driver's seat from seat riser.

218. Windshields and Support Frame Assembly (Field and Depot Maintenance)

a. Remove Cab Top Cover Assembly and Disconnect Right and Left Top Side Rails From Windshield Frame. Refer to paragraph 42a for information pertaining to the removal of the cab top cover assembly and the disconnecting of the right and left top side rails from windshield support frame.

b. Remove Windshields and Support Frame Assembly From Cab.

- (1) Disconnect windshield wiper hinge tube from rubber hose on windshield wiper left pillar-to-manifold tube (under cowl) .
- (2) Remove tapping screw and windshield wiper hinge tube

- clip from windshield wiper hinge tube. Disconnect windshield wiper hinge tube from windshield wiper left pillar hose and remove tube from support frame pivot screw.
- (3) Remove nuts, lock washers, and support frame pivot screws, which attach support frame to cowl.
 - (4) Unlatch support frame clamp handles from instrument panel brackets. Remove windshields and support frame assembly from cab.

219. Windshield Wiper Motor Assemblies (Field and Depot Maintenance)

a. Remove Wiper Blades and Wiper Arms.

- (1) Disengage wiper blades from wiper arms.
- (2) Remove wiper arm nuts and wiper arms.

b. Remove Windshield Wiper Motor Assemblies and Wiper-to-Tube Hoses.

- (1) Pull wiper-to-tube hoses from windshield wiper motor assemblies and wiper header tube assembly.
- (2) Remove nuts and lock washers from studs, which attach wiper motors to windshields. Remove wiper motors from windshields.

220. Cowl Ventilator Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 182, except where otherwise indicated.

a. Remove Cowl Ventilator Lid Assembly, Cowl Ventilator Weatherstrip, and Drain Tube.

- (1) Disconnect ground cable from batteries (*fig. 9*) to prevent the possibility of a short circuit when the various cowl ventilator parts are removed.
- (2) Turn four attaching screws counterclockwise and disconnect instrument cluster from instrument panel to permit access to the various cowl ventilator parts.
- (3) Remove four lock washer screws (D), which attach the ventilator lid assembly (A) to the hinge arms at each side.
- (4) Remove two nuts (N), lock washers (B), and cap screws (C), which attach the link with brace assembly (K) to the lid assembly. Lift lid assembly from cowl opening.

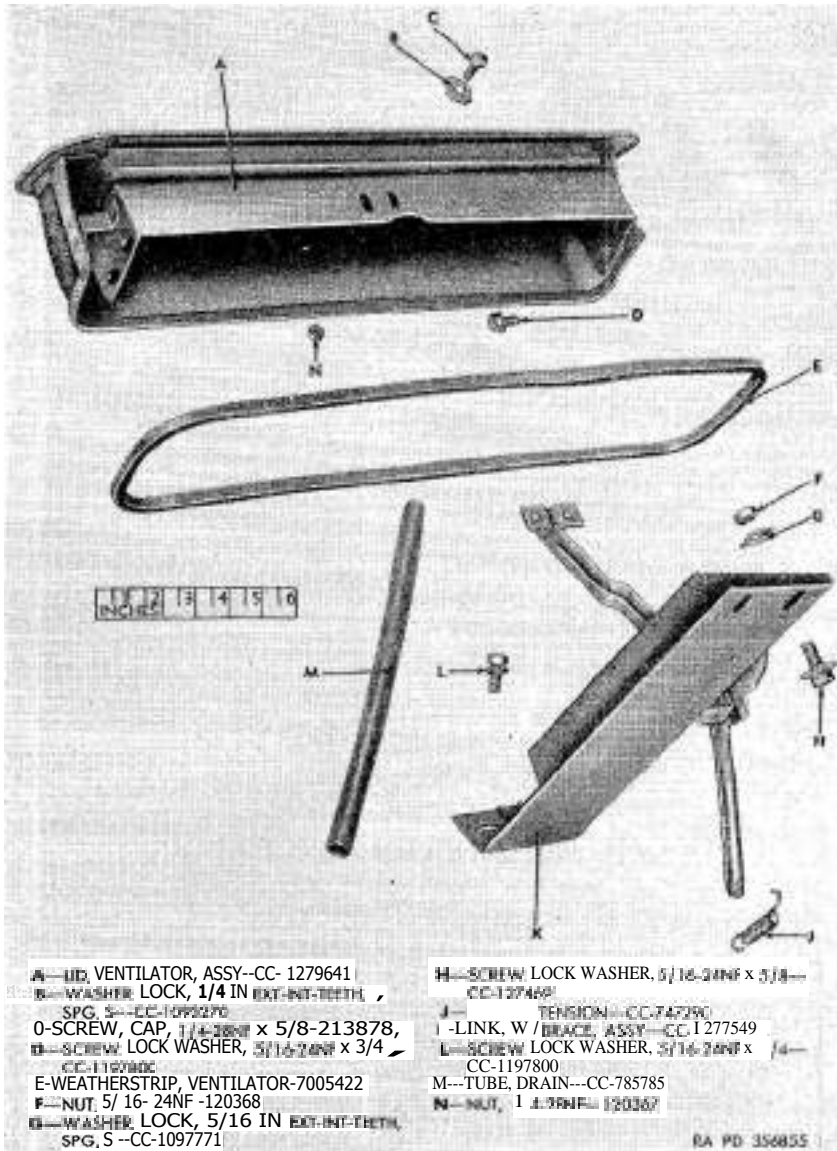


Figure 182. Cowl ventilator assembly with related parts.

b. Remove Link With Brace Assembly.

- (1) Disconnect cable connectors from circuit breakers, which are attached to brace assembly.
- (2) Open clip and release cable harness from brace assembly.
- (3) Remove two lock washer screws (L) , which attach the brace assembly to cowl.
- (4) Remove two nuts (F), lock washers (G), and lock washer

screws (II), which attach the brace assembly to instrument panel. Remove link with brace assembly (K) from cab.

Section III. REBUILD OF DOOR ASSEMBLIES

221. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 184, except where otherwise indicated.

a. General. The door locks, dovetails, window regulators, window glass, and weatherstrips can be inspected without removing these parts from the door. Do not remove any of these parts until they are inspected.

b. Remove Inspection Cover.

- (1) Remove six inspection cover lock washer screws (K) . This will release inspection cover (M) from door.
- (2) Remove inspection cover liners (L) from cover.

Note. Do not remove inspection cover liners unless inspection reveals that replacement is necessary (par. 222a).

c. Remove Door Glass Assembly.

- (1) Lower door glass and remove the two lower channel stop lock washer screws and glass framing lower channel stops (*fig.* 183).
- (2) Remove lower channel-to-regulator retainers (RR and SS) . Disengage left regulator assembly (PP) from glass framing lower channel assembly. Raise glass assembly by hand and lift from opening at top of door.
- (3) Remove four nuts, lock washers, and glass lower stop lock washer screws (HH). This will release the glass lower stops (GG) from door.
- (4) Remove door glass panel weatherstrip assemblies (B) from top opening of door by disengaging the snap-on-type fasteners.

d. Remove Regulator Assembly.

- (1) Remove regulator handle pin (CC) with a small punch when the regulator handle escutcheon assembly (F) is pushed in toward the door as far as it will go. Remove regulator handle assembly (D) and escutcheon assembly.
- (2) Remove four regulator lock washer screws (G) and two regulator arm pivot bracket lock washer screws (FF) from door inside panel. Remove regulator arm pivot bracket plain washers (EE) from door inside panel.

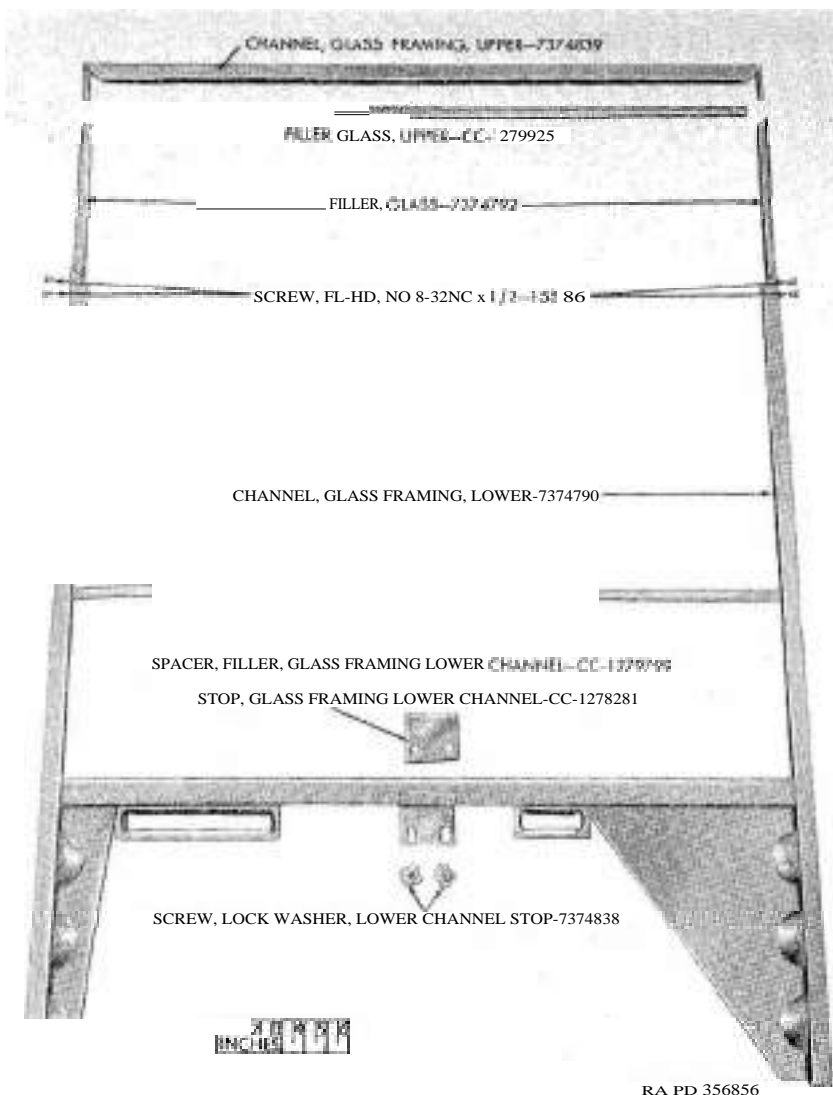


Figure 183. Doer glass framing channels and related parts.

- (3) Lower left regulator assembly (PP) and remove through inspection cover opening in door.
- (4) Remove regulator arm pivot bracket (NN) from regulator assembly.

e. Remove Lock With Remote Control Assembly.

- (1) Remove oval-head screws (V and W) ; then remove outside lock handle assembly (U) from door.
- (2) Remove remote control handle pin (AA) with a small

punch. This can be accomplished when the remote control handle escutcheon assembly (Z) is pushed toward the door as far as it will go. Remove remote control handle (BB) and escutcheon assembly.

- (3) Remove three lock lock washer screws (X) and three remote control lock washer screws (DD) from door panel. Lower lock with remote control assembly (LL) and remove through inspection cover opening in door.

f. Remove Glass Run Channel Assemblies, Glass Runs, and Door Check Arm Assembly.

- (1) Remove door check arm assembly (J) from door by lightly striking the outer end of the arm and removing the assembly through the inspection cover opening.
- (2) Remove channel run lock washer screws (E, R, and Y) from front and rear of door. This will release the front glass run channel (H) and rear glass run channel (N). Remove channels through the inspection cover opening.
- (3) Remove four split rivets (P). This will release glass runs (MM) from glass run channels. Pull runs from channels.

Note. Do not remove glass runs unless inspection reveals replacement is necessary (par. 222f).

g. Remove Female Dovetail Blocks and Female Dovetail Springs From Door. Release female dovetail blocks (S) and female dovetail springs (T) from door with a screwdriver.

h. Remove Door Weatherseals and Upper Hinge Pillar Weather-Seals From Door.

Note. Do not remove door weatherseals (Q) or upper hinge pillar weatherseals (C) from door unless inspection reveals that replacement is necessary (par. 222h).

- (1) Remove tapping screws (KK) and door weatherseal clips (JJ) from bottom of door.
- (2) Pull weatherseals (Q) from door.
- (3) Pull upper hinge pillar weatherseal (C) from door.

i. Remove Glass From Glass Framing Lower Channel (fig. 189).

Note. Do not remove glass from glass framing lower channel unless inspection reveals that replacement is necessary (par. 222i).

- (1) Remove two flat-head screws at each side of top of glass framing lower channel. This will release the glass framing upper channel. Remove glass framing upper channel.
- (2) Remove glass by shocking upper ends of glass framing lower channel on a wooden or fiber block with lower channel upside down.

Note. Care must be exercised during removal of glass to prevent damage to glass framing lower channel.

- (3) Remove and discard glass upper filler and glass filler.

j. *Remove Glass Framing Lower Channel Filler Spacer* (fig. 183). Remove glass framing lower channel filler spacer from glass framing lower channel. Discard spacer.

k. *Cleaning*. Remove all traces of cement, corrosion, weather-seal, or glass filler from the various parts.

222. Inspection (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 184, except where otherwise indicated.

a. *Inspect Inspection Cover and Inspection-Cover Liners.*

- (1) Inspect inspection cover (M) for distortion or corrosion. If cover is damaged or corrosion has destroyed portions of the metal, replace cover.
- (2) Inspect inspection cover liners (L) for unsatisfactory adhesion to cover or damage. If liners are damaged or improperly located, replace liners.

b. *Inspect Regulator Assembly and Lower Channel-to-Regulator Retainers.*

- (1) Inspect left regulator assembly (PP) for improper operation, loose rivets, damaged spring, damaged or worn threads, worn gear teeth, damaged regulator arm pivot bracket (NN) , or broken spot welds. If any of these conditions exist, replace regulator assembly.
- (2) Inspect lower channel-to-regulator retainers (RR and SS) for cracks or distortion. If there is any evidence of breakage, distortion, or if the retainers do not engage properly with pins on regulator arms, replace retainers.

c. *Inspect Door Glass Panel Weatherstrip Assemblies.* Inspect door glass panel weatherstrip assemblies (B) for wear, loose fasteners, or damaged retainers. If any of these conditions exist, replace weatherstrips.

d. *Inspect Window Regulator Handle, Remote Control Handle, Outside Lock Handle, and Escutcheons.*

- (1) Inspect regulator handle assembly (D) , remote control handle (BB) , and outside lock handle assembly (U) for cracks or damage. If either of these conditions exist, replace handles.
- (2) Inspect regulator handle escutcheon assembly (F) and remote control handle escutcheon assembly (Z) for wear, damage, or weak springs. If any of these conditions exist, replace escutcheon assemblies.

e. Inspect Lock With Remote Control Assembly.

- (1) Inspect lock with remote control assembly (LL) for worn latch, broken spring, loose rivets, or worn operating parts. If any of these conditions exist, replace lock with remote control assembly.
- (2) Inspect lock with remote control assembly (LL) for cracks or damaged threads. If either of these conditions exist, replace lock with remote control assembly.

f. Inspect Glass Run Channels and Door Check Arm Assembly.

- (1) Inspect front and rear glass run channels (H and N) for worn glass runs, cracked channels, or damaged threads. If the glass runs are worn, install new runs and rivets (par. 223b) . If channels are cracked or any of the threads for the attaching screws are damaged, replace channels as required.
- (2) Inspect door check arm assembly for deteriorated door check arm bumper (QQ), damaged spring, or cracked arm (J) . If bumper is deteriorated, it can be replaced (par. 223b) . If the arm is cracked or breakage of the springs is evident, replace door check arm assembly.

g. Inspect Female Dovetail Blocks and Female Dovetail Springs.

- (1) Inspect female dovetail blocks (S) for wear or cracks. If either of these conditions exist, replace blocks.
- (2) Inspect female dovetail springs (T) for distortion or breakage. If either of these conditions exist, replace springs.

h. Inspect Door Weatherseals and Upper Hinge Pillar Weatherseals. Inspect door weatherseals (Q) and upper hinge pillar weatherseals (C) for deterioration or looseness. If weatherseals are deteriorated, install new seals. If weatherseals are loose at any point, cement them to door as required.

i. Inspect Glass, Glass Framing Upper Channel, and Glass Framing Lower Channel (fig. 183) .

- (1) Inspect glass for cracks or discoloration. If glass is cracked or there is evidence of discoloration, replace glass.
- (2) Inspect glass filler and if there is evidence of water leakage, replace filler.
- (3) Inspect glass framing upper channel and glass framing lower channel for damage, corrosion, broken welds, or distortion. If any of these conditions exist, replace channels as required.

or glass tramming lower channel (fig. 183).

- (2) Make certain glass is clean and position glass filler around sides and bottom of glass.
- (3) Apply a liberal coating of liquid soap on glass filler and position glass in glass framing lower channel. Force glass into position until it contacts filler spacer at bottom of channel. If glass is a tight fit, it may be necessary to tap it in place with a rubber mallet.
- (4) Install glass upper filler across top edge of glass.
- (5) Position glass framing upper channel over glass and make certain it is properly engaged in the glass framing lower channel. Aline screw holes and install four No. 8-32NC x $\frac{1}{2}$ flat-head screws. Tighten screws.

b. Install Glass Run Channels and Door Check Arm Assembly in Door.

- (1) If inspection (par. 222f) reveals that replacement of the glass runs (MM) is necessary, position new glass runs in glass run channels and fasten in place with 9/64 x 7/16 oval-head brass split rivets (P).
- (2) Insert glass run front channel (H) (straight brackets) and glass run rear channel (N) (offset brackets) through inspection cover opening in door. Aline channels with screw holes and install four channel run lock washer screws (E, R, and Y). Tighten screws.
- (3) If inspection (par. 222f) reveals that it is necessary to replace the door check arm bumper (QQ), install new bumper on door check arm. Insert door check arm assembly (J) from inside of door with rivet holes in end of arm toward door outside panel.

Caution: Door check arm assembly must be properly positioned in door or breakage of the arm spring catch in door is certain to result.

c. Install Door Glass Panel Weatherstrip Assemblies in Top Opening of Door. Install door glass panel weatherstrip assemblies (B) in top opening of door, with metal retainer down. Engage snap-on-type fasteners in holes provided in door shell.

d. Install Lock With Remote Control Assembly.

- (1) Insert lock with remote control assembly (LL) up

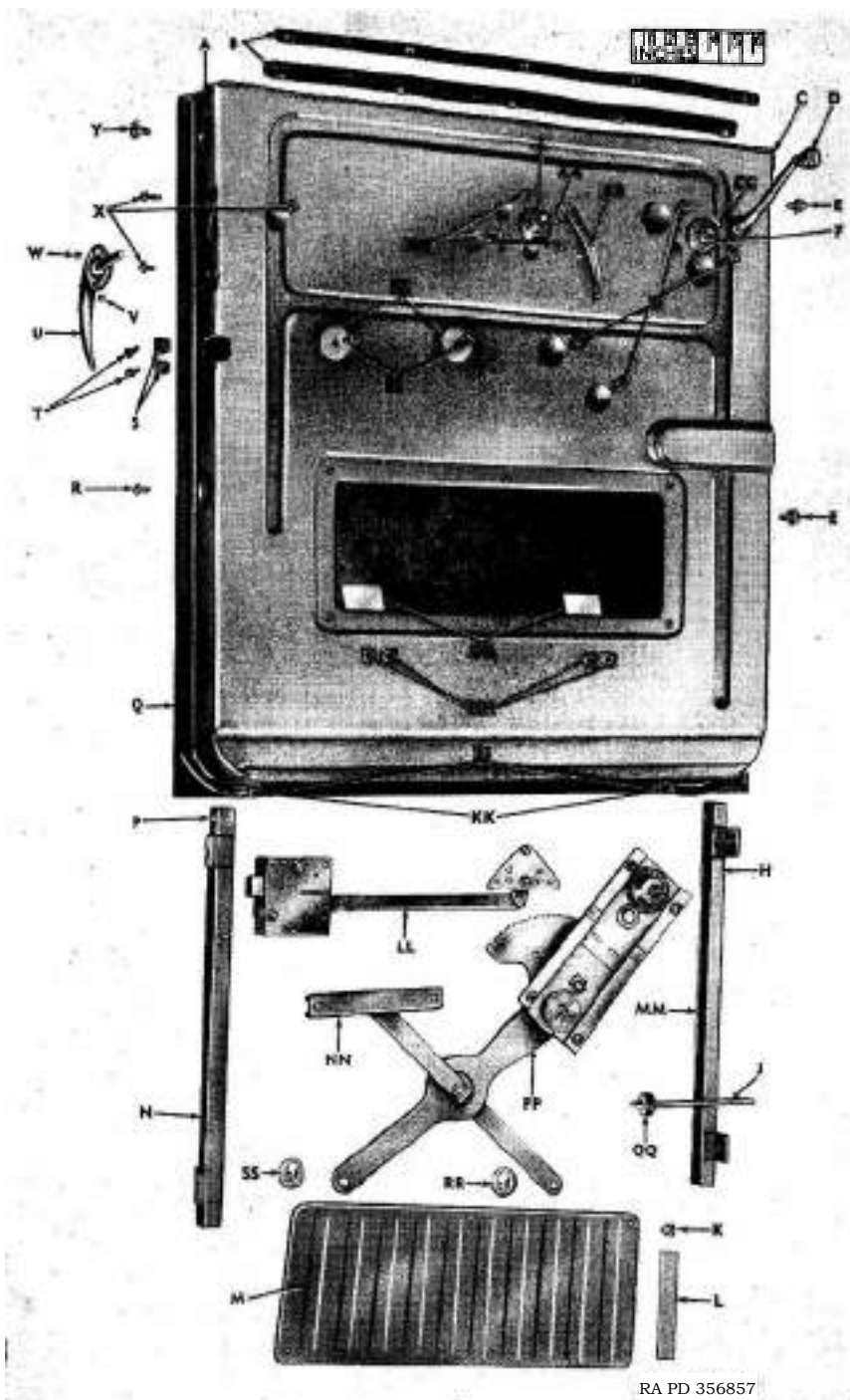


Figure 184. Door shell, door lock, window regulator, and related parts,

A—Shell, left door — CC-1278077
~~B—Weatherstrip~~, door glass panel, assy — 7374795
~~C—Weatherseal~~, upper hinge pillar — CC-1279117
 D—Handle, regulator, assy — 7374797
 E—Screw, lock washer, channel run — 7374835
~~F—Escutcheon~~, regulator handle, assy — 7374785
~~G—Screw~~, lock washer, regulator — 7374796
 H—Channel, front, glass run 7374830
 J—Arm, door check, assy -- 7346912
 K—Screw, lock washer, inspection cover — CC-1197018
 L—Liner, inspection cover -- CC-358197
 M—Cover, inspection — CC-1277741
 N—Channel, rear, glass run — 7375408
 P—Rivet, split, oval-head, brass, 9/64 x 7/16 — 113194
~~Q—Weatherseal~~, door—CC-1277641
~~R—Screw~~, lock washer, channel run 7374835
 S—Block, female dovetail -- CC-1197435
 T—Spring, female dovetail — CC-1197436
 U—Handle, lock, outside, assy — 7373744
 V—Screw, oval-head, No. 10-24NF x $\frac{5}{8}$ 134289
 W—Screw, oval-head, No. ~~10-24NF~~ x — ~~134289~~
 X—Screw, lock washer, locic — 7374777
 Y—Screw, lock washer, channel run — 7374835
 Z—Escutcheon, remote control handle, assy — 7374785
 AA—Pin, remote control handle — 7348978
 BB—Handle, remote control — 7373745
 CC—Pin, regulator handle — 7348978
 DD—Screw, lock washer, remote control — 7374777
 EE—Washer, plain, regulator arm pivot bracket — 7346905
 FF—Screw, lock washer, regulator arm pivot bracket — 7374835
 GG—Stop, glass lower — CC-1277636
 HH—Screw, lock washer, glass lower stop 7374835
 JJ—Clip, door weatherseal — 7346902
 KK—Screw, tapping, No. 10 x $\frac{1}{2}$ inch — 125591
 LL—Lock, w/remote control, assy — 7374788
 MM—Run, glass — 7374793
~~NN—Bracket~~, regulator arm pivot — 7374836
 PP—Regulator, left, assy — 7374784
 QQ—Bumper, door check arm — CC-1197179
 RR—Retainer, lower channel to regulator — 7346914
 SS—Retainer, lower channel to regulator — 7346914

Figure 184—Continued.

through inspection cover opening in door and position latch and remote control handle shaft in openings in door.

- (2) Aline screw holes and install three lock lock washer screws (X) and three remote control lock washer screws (DD). Tighten screws.

e. Install Lock Outside Handle Assembly, Remote Control Handle Escutcheon Assembly, and Remote Control Handle.

- (1) Insert shaft of outside lock handle assembly (U) with handle in a horizontal position (pointing toward front of door), through door and into lock. Attach handle to door with two No. 10-24NF x $\frac{3}{8}$ oval-head screws (V and W). Tighten screws.
- (2) Position remote control handle escutcheon assembly (Z) on door and place remote control handle (BB) on remote control handle shaft in a horizontal position (pointing toward rear of door). Force escutcheon assembly in toward door as far as it will go and install remote control handle pin (AA) so that it will be covered when escutcheon is released.

f. Install Female Dovetail Springs and Female Dovetail Blocks in Door. Position female dovetail springs (T) in female dovetail blocks (S) . Install blocks in door with springs toward outside panel.

g. Install Regulator Assembly in Door.

- (1) Install regulator arm pivot bracket (NN) with flat portion of bracket toward regulator, on arm of left regulator assembly (PP) .
- (2) Insert left regulator assembly (PP), with regulator arm pivot bracket (NN), up through inspection cover opening in door as an assembly. Position regulator handle shaft through opening in door. Aline regulator with screw holes in door and install four regulator lock-washer screws (G).
- (3) Temporarily install regulator handle assembly (D) and operate regulator to aline regulator arm pivot bracket (NN) with screw openings in door. Position regulator arm pivot bracket plain washers (EE) over screw holes. Install two regulator arm pivot bracket lock washer screws (FF). Tighten screws. Remove regulator handle.

Note. The position of the inside regulator arm pivot bracket lock washer screw (FF) controls the alinement of the door glass in the cab opening. Final adjustment can only be accomplished when door assembly is installed on truck.

Refer to TM 9-840 for adjustment procedure.

- (4) Position regulator handle escutcheon assembly (F) on door and install regulator handle assembly. Push escutcheon in as far as it will go and install regulator handle pin (CC) so that it will be covered when escutcheon is released.

h. Install Glass Lower Stops on Door. Position glass lower stops (GG) on door inside panel. Insert four glass lower stop lock washer screws (HH) (heads outside) through door panel and stops ; then install 5/16-inch internal external teeth lock washers and 5/16—24NF nuts. Do not tighten nuts until door glass assembly is installed.

i. Install Door Glass Assembly.

- (1) Lower glass assembly, with large gusset plate (bottom end of lower glass framing channel) toward hinge side of door, through upper opening of door until it contacts glass lower stops (GG) .

Caution : Glass assembly must be correctly installed to insure proper operation of the regulator.

- (2) Engage arms on regulator assembly (PP) with openings in glass framing lower channel. Install lower channel-to-regulator retainers (RR and SS).
- (3) Position glass framing lower channel stop (*fig. 183*) with offset at top. Weld nuts toward door outside panel in line with screw holes in lower channel. Install lower channel stop lock washer screws. Tighten screws.

Nets. The glass framing lower channel stop controls the total upward travel of the glass assembly and final adjustment can only be accomplished when door assembly is installed on truck.

Refer to TM 9-840 for adjustment procedure.

j. Adjust Glass Lower Stops. Lower door glass so that glass framing upper channel (*fig. 183*) is flush with top of door. Position glass lower stops (GG) against glass framing lower channel. Tighten nuts on glass lower stop lock washer screws (HH) .

is. Install Inspection Cover.

- (1) If inspection (par. 222a) reveals that replacement of the inspection cover liners (L) is necessary, apply a coating of synthetic rubber cement (52—C-1556) to the inspection cover and liners. Allow cement to dry for 10 minutes. Apply liners on cover between screw holes.
- (2) Install inspection cover (M) and six inspection cover lock washer screws (K). Tighten screws.

l. Install Door Weatherstrips and Upper Hinge Pillar Weatherstrips. If inspection (par. 222a) reveals that replacement of the

door weatherseals (Q) and/or upper hinge pillar weatherseals (C) is necessary, apply a coating of synthetic rubber cement (52-C-1556) on the weatherseals and door. Allow cement to dry for 10 minutes. Install upper hinge pillar weatherseal (C) and door weatherseal (Q) on door and exercise care to prevent stretching of weatherseals. Firmly press weatherseals in position to insure proper adhesion to door. Install door weatherseal clips (JJ) and No. 10 x 1½ tapping screws (KK) at bottom of door.

Section IV. REBUILD OF DRIVER'S SEAT

224. Disassembly (Field and Depot Maintenance)

a. General. The inspection of the driver's seat assembly can be accomplished without removing seat from truck. Do not remove the seat cushion assembly, seat back cushion assembly, or seat regulator assemblies until parts are inspected (par. 225).

b. Remove Seat Cushion Assembly (fig. 186). Remove two cap screws (Q) and lock washers (R) ; then remove seat cushion assembly (A).

c. Remove Seat Cushion Cover Assembly, Seat Cushion Pad, and Seat Cushion Pad Support From Seat Cushion Spring Assembly (fig. 185).

- (1) If inspection (par. 225a) reveals that either the seat cushion cover assembly, seat cushion pad, or seat cushion spring assembly requires replacement, untie the rope, which fastens the cushion cover assembly to the spring assembly, and remove cover. Remove cushion pad.
- (2) Remove cushion pad support fasteners, which attach seat cushion pad support to the spring assembly, and remove support.

d. Remove Seat Back Cushion Assembly (fig. 186). Remove cap screws (C) and lock washers (B) ; then remove seat-back cushion assembly (D) .

e. Remove Seat Back Cushion Cover Assembly, Seat Back Cushion Pad, and Seat Back Cushion Pad Support From Seat Back Cushion Spring Assembly (fig. 185).

- (1) Untie rope, which attaches the seat back cushion cover assembly to the spring assembly, and remove cover. Remove seat back cushion pad.
- (2) Remove cushion pad support fasteners, which attach seat cushion pad support to the spring assembly and remove support.

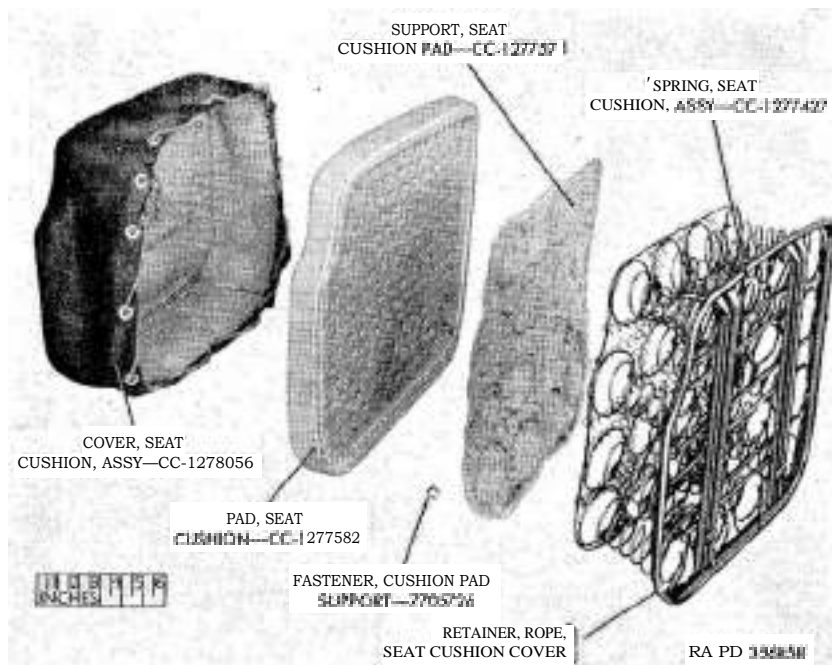


Figure 185. Seat cushion assembly-exploded view.

f. Remove Seat Regulator Assemblies (fig. 186).

- (1) Remove six nuts (F) and six lock washers (G) ; then remove right and left seat regulator assemblies (L and M) from seat board (S).
- (2) Remove regulator control rod (K), which connects the two seat regulator controls.

g. Remove Seat Board From Seat Back Panel (fig. 186). Remove nine nuts (J) and lock washers (H). Remove seat board (S) from seat back panel assembly (E). Remove nine round-head carriage bolts (T) from seat board.

225. Inspection (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 186, except where otherwise indicated.

a. Inspect Seat Cushion Assembly.

- (1) Inspect seat cushion assembly (A) for worn or torn cover (*fig. 185*). If either of these conditions exist, replace cover (pars. 224c and 226c).
- (2) Inspect seat cushion pad (*fig. 185*) for deterioration or other visible damage. Replace pad if not in good condition (pars. 224c and 226c).

- (3) Inspect seat cushion pad support (*fig. 185*) for damage and wear. If either of these conditions exist, replace support (pars. 224c and 226c) .
- (4) Inspect seat cushion spring assembly (*fig. 185*) for sagged, broken, or misplaced springs or broken spot welds. If any of these conditions exist, replace cushion spring assembly (pars. 224c and 226c) .

b. *Inspect Seat Back Cushion Assembly.*

- (1) Inspect seat back cushion assembly (D) for worn or torn cover. If either of these conditions exist, replace cover (pars. 224e and 226d).
- (2) Inspect seat back cushion pad for deterioration or other visible damage. Replace pad if not in good condition (pars. 224e and 226d).
- (3) Inspect seat back cushion pad support for damage and wear. If either of these conditions exist, replace support (pars. 224e and 226d).
- (4) Inspect seat back cushion spring assembly for sagged, broken, or misplaced springs or broken spot welds. If any of these conditions exist, replace spring assembly (pars. 224e and 226d).

c. *Inspect Seat Regulator Assemblies.*

- (1) Inspect left and right seat regulator assemblies (L and M) for broken springs, loose rivets, damaged threads, broken welds, cracks, or distortion. If any of these conditions exist, replace right or left seat regulator assemblies.
- (2) Inspect regulator control rod (K) for cracks or distortion. If either of these conditions exist, replace control rod.

d. *Inspect Seat Board.* Inspect seat board (S) for cracks, warpage, or other visible damage. Replace seat board if any of these conditions exist.

e. *Inspect Seat Back Panel Assembly.* Inspect seat back panel assembly (E) for distortion, cracks, damaged threads or unsatisfactory spot welds. If any of these conditions exist, replace seat back panel assembly.

226. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 186, except where otherwise indicated.

a. *Install Seat Board in Seat Back Panel Assembly.* Position seat board (S) in seat back panel assembly (E) , with countersunk recesses for bolt heads at top. Install nine 5/16-18NC x 1 1/2 round-



A-CUSHION, SEAT, ASSY-7705727
 8-WASHER, LOCK, EXT-INT-DISHED, 5/16 IN -
 7705727

C-SCREW, CAP, 5/16-24NPT x 5/8-123473
 8-CUSHION, SEAT BACK, ASSY-7346928

E-PANEL, SEAT BACK, ASSY-CC-1277405

F-NUT, 5/16-24NPT-120368

G-WASHER, LOCK, EXT-INT-DISHED, 5/16 IN-
 7705727

H-WASHER, LOCK, 5/16 IN-120214

J-NUT, 5/16-18NPT-120374

K-ROD, CONTROL, REGULATOR-
 CC-1277394

L-REGULATOR ASSY, RIGHT-7705728

M-REGULATOR ASSY, LEFT-7705729

N-SCREW, CAP, 3/8-24NPT x 3/4-123520

P-WASHER, LOCK, 3/8 IN-120382

Q-SCREW, CAP, 5/16-24NPT x 1-1/4-123774

R-WASHER, LOCK, EX (INT-DISHED), 5/16 IN-
 7705727

S-BOARD, SEAT-CC-1277301

T-BOLE, CARRIAGE, RCHD, 5/16-18NPT x
 1-1/2-120371

RA PD 356859

Figure 186 Driver's seat assembly

head carriage bolts (T) through seat board and seat back panel. Install 5/16-inch lock washers (H) and 5/16-18NC nuts (J) on bolts. Tighten nuts.

b. Install Seat Regulator Assemblies.

- (1) Position right seat regulator assembly (L), with hinge toward front, on seat board. Install three 5/16-inch external internal dished lock washers (G) and 5/16-24NF nuts (F) . Tighten nuts.
- (2) Install regulator control rod (K) on right regulator assembly.
- (3) Attach left regulator assembly (M), with hinge toward front, to regulator control rod (K). Position left regulator assembly on seat board. Install three 5/16-inch external internal dished lock washers (G) and 5/16-24NF nuts (F). Tighten nuts.

c. Install Seat Cushion Support, Seat Cushion Pad and Seat Cushion Pad Cover Assembly on Seat Cushion Spring Assembly (fig. 185).

- (1) Place seat cushion pad support on seat cushion spring assembly and attach support to outside frame of spring assembly with cushion pad support fasteners. The fasteners can be inserted through the support and crimped around spring assembly frame with pliers.
- (2) Place seat cushion pad on seat cushion spring assembly.
- (3) Place seat cushion cover assembly over pad and spring assembly and fasten cover to bottom of spring assembly with rope. Place rope under seat cushion cover rope retainers (*fig. 185*), which are a part of the spring assembly. Tighten rope so that cover is a snug fit over the pad and spring assembly and tie rope.

d. Install Seat Back Cushion Pad Support, Seat Back Cushion Pad, and Seat Back Cushion Cover Assembly on Seat Back Cushion Spring Assembly (fig. 185) .

- (1) Place seat back cushion pad support on seat back cushion spring assembly and attach pad to outside frame of spring assembly with cushion pad support fasteners. Fasteners can be inserted through support pad and crimped around the spring assembly frame with pliers. Place seat back cushion pad on spring assembly.
- (2) Place seat back cushion cover assembly over pad and spring assembly. Loop rope around seat back cushion cover rope retainers, which are a part of the spring assembly. Tighten rope until cover is a snug fit on spring assembly and tie rope,

e. Install Seat Back Cushion Assembly.

- (1) Engage seat back cushion assembly (D) with the two support clips at top of seat back panel assembly (E) .
- (2) Install two 5/16-24NF x $\frac{5}{8}$ cap screws (C) and ~~5/16-inch~~ external internal dished lock washers (B) to attach seat back cushion assembly (D) to seat back panel assembly (E) at bottom. Tighten cap screws.

f. Install Cushion Assembly. Position seat cushion assembly (A) on seat board (S) . Install two 5/16-inch external internal dished lock washers (R) and 5/16-24NF x 1% cap screws (Q) . Tighten screws.

Section V. REBUILD OF WINDSHIELDS AND SUPPORT FRAME ASSEMBLY

227. Disassembly (Field and Depot Maintenance)

a. Remove Windshield Assemblies From Support Frame Assembly (fig. 187).

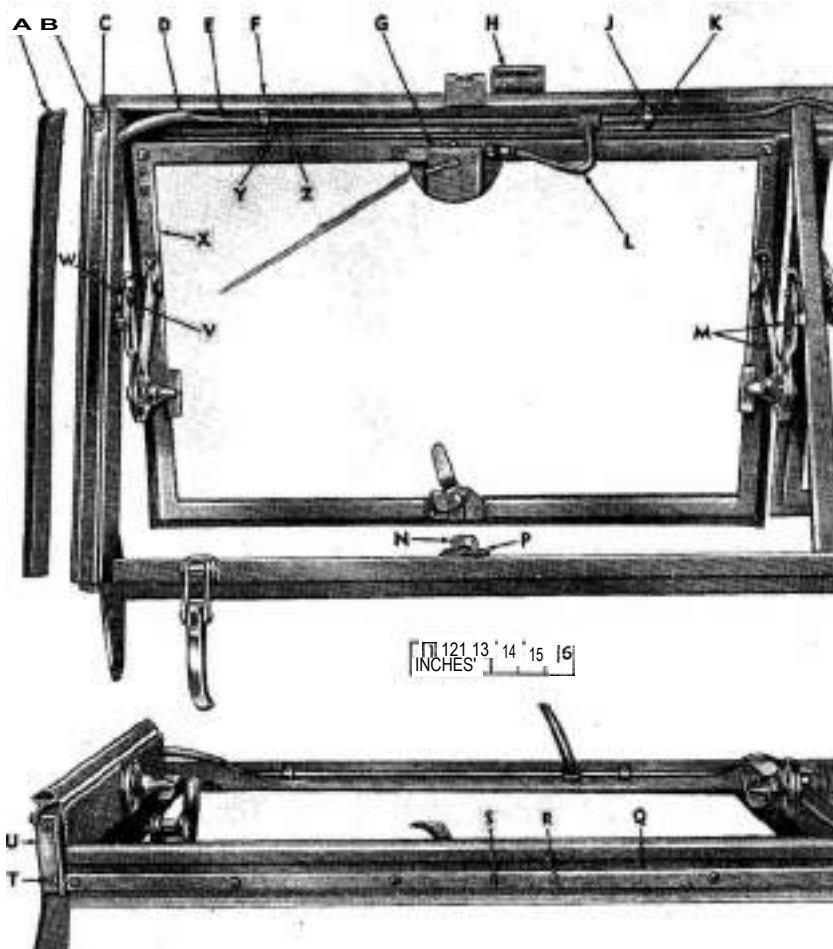
- (1) Place windshields and support frame assembly on a bench upside down. Open windshield assemblies (X) and remove lock washer screws (V), which attach the ~~adjust-~~
~~ing~~ arm with screw assemblies (M) to the support frame assembly (F), from adjusting arm. Disengage adjusting arm with screw assemblies (M) from support frame and remove adjusting arm spring washers (W) .
- (2) Remove 14 ~~fillister-head~~ screws (Y) and lock washers (Z), which attach the hinges to the support frame. Remove windshield assemblies.

b. Remove Windshield Glass From Frame Lower Unit Assembly.

Note. The key letters noted in parentheses are in figure 188, except where otherwise indicated.

Note. Do not remove windshield glass unless there is evidence of water leakage or glass is broken.

- (1) Remove two lock washer screws ; then remove adjusting arm with screw assemblies (M, fig. 187) from windshield. Remove adjusting arm spring washers (Q and T) .
- (2) Remove four pan-head machine screws (K, M, V, and X) and lock washers (L, N, U, and W) from frame lower unit assembly (P).
- (3) Remove two low crown blind nuts (E and BR) and lock washers (F and AA) from pan-head machine screws (G and Y) . Remove machine screws from frame upper cross-piece.



A-WEATHERSTRIP, DOOR GLASS, LEFT FRONT
 -7005425
 B-SCREW, TAPPING, PAN-HD, NO 10 x 1/2-
 161895
 C-RETAINER, DOOR GLASS WEATHERSTRIP-
 7005420
 D-HOSE, WIPER, LEFT PILLAR-CC-1271728
 E-TUBE, WIPER HEADER, ASSY-CC-1271724
 F-FRAME SUPPORT ASSY-7005416
 G-MOTOR WINDSHIELD WIPER, ASSY-
 500844
 H-BRACKET, TOP BOW STRAP-CC-1278252
 I-SCREW, TAPPING, PAN-HD, NO 8 x 1/2 IN
 -161860
 K-CLIP, WIPER HEADER TUBE-7005431
 L-HOSE, WIPER TO TUBE-CC-628868
 M-ARM, ADJUSTING, W /SCREW, ASSY-
 737327
 N-BRACKET, SUPPORT FRAME LOCKING-
 CC-1277735
 P-SCREW, LOCK.WASHER, 10-32NF x 3/8-
 CC-1279978

Q-RETAINER, SUPPORT FRAME CENTER
 WEATHERSTRIP-7005419
 R-SCREW, TAPPING, NO 10-32NF x 1/2-
 446556
 S-WEATHERSTRIP, SUPPORT FRAME LOWER
 CENTER-7005424
 T-SCREW, TAPPING, NO 10-32NF x 1/2-
 446556
 U-WEATHERSTRIP, SUPPORT FRAME LOWER
 SIDE-7374751
 V-SCREW, LOCK WASHER, 1/4-28NF x 1/2-
 7374756r
 W-WASHER, SPRING, ADJUSTING ARM-
 7743621
 X-WINDSHIELD, ASSY-7005417
 Y-SCREW, FIL-HD, NO 0-32NF x 3/8-
 CC-1279978
 Z-WASHER, LOCK, EXT-TEETH, NO 10-
 138479

RA PD 356860

Figure 187. Windshields and support frame assembly.

- (4) Remove frame upper crosspiece (D), with hinge (B) , from windshield. Remove crosspiece plugs (H and Z) from crosspiece assembly.
- (5) Hold windshield upside-down and shock open ends of frame lower unit assembly (P) alternately on the edge of a wooden or fiber block to remove glass.

Note. Exercise care when removing glass to prevent damage to the open ends of the frame lower unit assembly.

- (6) Remove any glass filler (J) that may remain in the frame upper crosspiece or frame lower unit assembly. Discard filler.

c. Remove Weatherstrip From Frame Lower Unit Assembly (fig. 188).

Note. Do not remove frame lower unit weatherstrip (R) from frame lower unit assembly unless inspection (par. 228d) reveals that replacement is necessary.

Pull weatherstrip (R) from frame lower unit. Discard weatherstrip.

d. Remove Hinge From Frame Upper Crosspiece Assembly (fig. 188).

Note. Do not separate hinge (B) from frame upper crosspiece assembly (D) unless inspection (par. 228a) reveals that replacement of either part is necessary.

Open one crimped end of hinge and separate frame upper crosspiece assembly from hinge.

e. Remove Hinge-to-Frame Weatherseals and Hinge End Weatherseals (fig. 188).

Note. Do not remove hinge-to-frame ~~weatherseals~~ (A) or hinge end ~~weatherseals~~ (C and CC) unless inspection (par. 228c1) reveals replacement is necessary.

If weatherseals require replacement, remove them from hinge. Discard weatherseals.

f. Remove Frame Locking Handle Assembly (fig. 188).

Note. Do not remove frame locking handle assembly (S) unless inspection (par. 228a) reveals replacement is necessary.

Remove blind nuts, lock washers, and screws. This will release locking handle assembly and frame locking handle bumper from windshield. Discard bumper.

g. Remove Parts From Support Frame Assembly (fig. 187).

- (1) Remove four pan-head tapping screws (J) and wiper header tube clips (K). Remove wiper header tube assembly (E) and left pillar wiper hose (D). Separate tube from hose.

- (2) Remove tapping screws (T) and support frame lower side weatherstrips (U) from each side of support frame assembly.
- (3) Remove tapping screws (R), support frame center weatherstrip retainer (Q), and support frame lower center weatherstrip (S) from frame.
- (4) Remove left front door glass weatherstrip (A) from door glass weatherstrip retainer (C) .

Note. Do not remove door glass weatherstrip unless inspection (par. 228d) reveals that replacement is necessary.

- (5) Remove pan-head tapping screws (B) and door glass weatherstrip retainer (C) from frame.
- (6) Remove lock washer screws (P) and support frame locking bracket (N) from each side of support frame.

Note. Do not remove the support frame locking bracket unless inspection (par. 228g) reveals that replacement is necessary.

- (7) Remove screws and top bow strap brackets (H) from support frame.

h. Cleaning (fig. 187). Remove all traces of corrosion from the various parts. Clean cement from door glass weatherstrip retainers (C).

228. Inspection (Field and Depot Maintenance)

a. Inspect Windshield Assembly (fig. 188).

- (1) Inspect frame upper crosspiece (D) for evidence of corrosion, damage, or cracks. Corrosion can be cleaned from crosspiece if metal is not damaged. If corrosion is extensive or there is evidence of damage or cracks, replace crosspiece. Inspect crosspiece plugs (H and Z) for damaged threads, cracks, or distortion. If any of these conditions exist, replace plugs.
- (2) Inspect frame lower unit assembly (P) for evidence of corrosion, distortion, cracks or loose rivets. If any of these conditions exist, replace frame lower unit assembly.
- (3) Inspect frame locking handle assembly (S) for corrosion, loose rivet, or cracks. If rivet is loose, replace handle. If there is evidence of corrosion, which affects operation of the handle, it can be corrected by the use of rust remover. If there is any evidence of cracks or distortion, replace handle assembly.
- (4) Inspect hinge (B) for distortion, corrosion, or broken locking ends. If the metal is not damaged, corrosion can be removed with rust remover. If the hinge is distorted

or either of the locking ends are broken, replace hinge (pars. 227d and 229c).

b. Inspect Wiper Header Tube Assembly, Wiper Hoses, Wiper Arms, and Wiper Blades (fig. 187).

- (1) Inspect wiper header tube assembly (E) for kinks, loose tee, or cracks. If any of these conditions exist, replace tube assembly.
- (2) Inspect left pillar wiper hose (D) and wiper-to-tube hose (L) for deterioration. Replace hose if not in satisfactory condition.
- (3) Inspect wiper arms for weak spring, loose rivet, worn serrations, or distortion. If any of these conditions exist, replace wiper arms.
- (4) Inspect wiper blades for worn or deteriorated rubber wiping element. Replace wiper blades if they are not in satisfactory condition.

c. Inspect Adjusting Arm Assemblies (fig. 187) .

- (1) Inspect adjusting arm with screw assemblies (M) for distortion, cracks, or worn locking indentations. If arms are distorted, straighten or replace as required. If there is any evidence of cracks or worn indentations, replace arm assemblies.
- (2) Inspect large spring washers and clamp screws for breakage or damaged threads. If either of these conditions exist, replace adjusting arm assemblies as individual parts are not serviced because the end of the clamp screws are riveted to prevent accidental disengagement.

d. Inspect Front Door Glass Weatherstrips, Support Frame Lower Center Weatherstrip and Support Frame Lower Side Weatherstrip (fig. 187).

- (1) Inspect left front door glass weatherstrips (A), support frame lower center weatherstrip (S), and support frame lower side weatherstrip (U) for deterioration or other visual damage. If any of the weatherstrips are unsatisfactory, replace as required.
- (2) Inspect door glass weatherstrip retainers (C), support frame center weatherstrip retainer (Q), and tapping screws (B, R, and T) for corrosion damage, distortion, or worn threads. If any of these conditions exist, replace parts as required.

e. Inspect Top Bow Strap Brackets (fig. 187) . Inspect top bow strap brackets (H) for corrosion, damage, distortion, or breakage. If any of these conditions exist, replace brackets.



f. Inspect Support Frame Assembly (fig. 187) . Inspect support frame assembly (F) for corrosion, damage, broken welds, loose rivets, damaged threads, distortion, or other visual damage. Broken welds and loose rivets can be repaired, but it will be necessary to replace the support frame assembly if the metal is damaged by corrosion or the assembly is distorted.

g. Inspect Support Frame Locking Brackets (fig. 187) . Inspect support frame locking brackets (N) for corrosion, damage, or cracks. If any of these conditions exist, replace brackets.

2i9. Assembly (Field and Depot Maintenance)

a. Install Windshield Glass.

Note. The key letters noted in parentheses are in figure 188, except where otherwise indicated.

- (1) Install glass filler (*J*) evenly around edge of windshield glass with joint at top.
- (2) Apply a liberal quantity of liquid soap around the inside of the glass channel in the frame lower unit assembly (*P*) to facilitate installation of glass. Slide glass into frame lower unit assembly until glass is firmly seated in lower portion of unit.
- (3) Support frame lower unit assembly (*P*) in an upright position (open end up). Insert crosspiece plugs (*H* and *Z*), with screw holes exposed, in each end of frame upper crosspiece (*D*) . Place frame upper crosspiece (*D*), with lip for hinge, on opposite side of adjusting arm brackets and position crosspiece, with crosspiece plugs (*H* and *Z*) inserted in upper ends of frame lower unit assembly, on glass. Force frame upper crosspiece assembly in position and align screw holes with a small punch. Install four No. 8-32NC x 7/16 pan-head machine screws (*K*, *M*, *V*, and *X*) and No. 8 lock washers (*L*, *N*, *U*, and *W*). Tighten screws. Install two No. 10-32NF x 7/8 pan-head machine screws (*G* and *Y*) with heads opposite bracket side of windshield. Install two No. 10 lock washers (*F* and *AA*) and No. 10-32NF low crown blind nuts (*E* and *BB*) Tighten nuts.

b. Install Frame Lower Unit Weatherstrip.

- (1) Apply a liberal quantity of liquid soap around the edge of the frame lower unit weatherstrip (*R*) and channel in frame lower unit assembly (*P*) to facilitate installation.

- (2) Position weatherstrip on frame lower unit assembly with groove and tapered side to the outside of windshield. Starting at bottom, insert the grooved side of weatherstrip in frame lower unit channel and work opposite side of weatherstrip in channel with the end of a hack saw blade.

Note. Do not stretch or cut off the ends of the weatherstrip as the size is correct for the frame lower unit channel.

If length of weatherstrip appears too long, slide weatherstrip in channel until it is firmly engaged in channel.

c. Install Hinge. If inspection (par. 228a) reveals that replacement of hinge (B) is necessary, slide new hinge on frame upper crosspiece (D), and bend in ends of hinge to lock hinge in place.

d. Install Hinge-to-Frame Weatherseal and Hinge End Weatherseal.

- (1) If inspection (par. 228d) reveals that replacement of hinge-to-frame weatherseal (A) is necessary, coat upper surface of hinge (B) and hinge-to-frame weatherseal (A) with synthetic rubber cement (52—C-1556). Allow cement to dry for 10 minutes. Position weatherseal in groove at top of hinge.
- (2) If inspection (par. 228d) reveals that replacement of the hinge end weatherseals (C and CC) is necessary, install new weatherseals in hinge (tapered end toward center of windshield) .

e. Install Adjusting Arm Assemblies and Frame Locking Handle Assembly.

- (1) Position adjusting arm spring washers (Q and T) on brackets of frame lower unit assembly. Place long arm of adjusting arm with screw assemblies (M, *fig.* 187) on brackets and install two $\frac{1}{4}$ -28NF x $\frac{1}{2}$ lock washer screws. Tighten screws.
- (2) Position new frame locking handle rubber bumper in hole provided in locking handle bracket. Place frame locking handle assembly (S) on bracket side of frame lower unit assembly (P) and install two No. 10-32NF x $\frac{7}{8}$ pan-head machine screws (head on frame side), No. 10 lock washers, and No. 10-32NF low crown blind nuts. Tighten nuts.

f. Install Parts on Support Frame Assembly.

Note. The key letters noted in parentheses are in figure 187.

- (1) Position top bow strap brackets (H) on support frame

assembly (F) with strap slots toward inside ; then install $\frac{3}{8}$ -24NF x $\frac{1}{4}$ lock washer screws. Tighten screws.

- (2) If inspection (par. 228g) reveals that replacement of support frame locking bracket (N) is necessary, position bracket on support frame ; then install two No. 10-32NF x $\frac{3}{8}$ lock washer screws (P). Tighten screws.
- (3) Position support frame lower center weatherstrip (S) with narrow side of weatherstrip against support frame (groove at front). Position support frame center weatherstrip retainer (Q) on weatherstrip ; then install eleven No. 10-32NC x $\frac{1}{2}$ tapping screws (R). Tighten screws.
- (4) Place support frame lower side weatherstrips (U) at each end of support frame ; then install four No. 10-32NC x $\frac{1}{2}$ tapping screws (T). Tighten screws.
- (5) Position door glass weatherstrip retainer (C) on each side of frame support assembly (F).

Note. Position each weatherstrip retainer with large flange in. Install four No. 10 x $\frac{1}{2}$ pan-head tapping screws (B) in each retainer. Tighten screws. Coat channels of each weatherstrip retainer and left front door glass weatherstrips (A) with synthetic rubber cement (52-C-1556) . Allow cement to dry for 10 minutes and install weatherstrips in retainers with large lip of weatherstrips in, tapered end up. The installation of the weatherstrips can be facilitated with the aid of a small screw driver.

g. Install Windshield Assemblies. Position windshield assemblies (X, fig. 187) in frame support assembly (F, fig. 187) ; then install seven No. 10 external-teeth lock washers (DD) and No. 10-32NF x $\frac{3}{4}$ fillister-head screws (EE) in each hinge. Tighten screws.

h. Attach Adjusting Arm Assemblies. Place adjusting arm spring washers (W, fig. 187) on adjusting arm brackets, which are attached to the support frame assembly. Position adjusting arms on brackets and install four $\frac{1}{4}$ -28NF x $\frac{1}{2}$ lock washer screws (V, fig. 187). Tighten screws.

i. Install Wiper Header Tube Assembly, Left Pillar Wiper Hose, and Wiper-to-Tube Hoses. Install left pillar wiper hose (D, fig. 187) on wiper header tube assembly (E, fig. 187).

Note. Left pillar wiper hose must be installed on end nearest header tube tee.

Insert wiper hose in left pillar of support frame at top and guide hose through outside opening at bottom. Position wiper header tube assembly in support frame and install four wiper header tube clips (K, fig. 187) and four No. 8 x $\frac{1}{2}$ pan-head tapping screws (J, fig. 187). Tighten screws.

Section VI. REBUILD OF WINDSHIELD WIPER MOTOR ASSEMBLIES

230. Disassembly (Depot Maintenance)

a. General. Special tools and repair parts are required for the servicing of the windshield wiper motor assemblies. The wiper motor assemblies must not be disassembled unless windshield wiper repair kit 14--K-280, which contains all necessary tools and gages, and repair kit 7735526, which contains necessary replacement parts, are available.

b. Remove Parts From Windshield Wiper Motor Assembly.

Note. The key letters noted in parentheses are in figure 192, except where otherwise indicated.

- (1) Remove two plate and bushing flat-head screws (P). This will release plate and bushing (M) from windshield wiper motor assembly. Remove plate and bushing (M), felt washers (Q), and spacing washer (R). Remove two studs (N) from plate and bushing (M).
- (2) Remove handle set screw (BB) from handle (CC). Remove handle from shaft.
- (3) Remove two valve cover ~~fillister-head~~ lock washer screws (DD). This will release valve cover (EE) from housing (GG).
- (4) Remove cover flat-head screws (C), cover long screws (B), and cover short screws (D). Move top end of kicker (L) from lug on cover assembly (A). Lift cover assembly (A) and gaskets (T and HH) from housing. Discard gaskets. Remove two shut-off valve cover screws (F). This will release shut-off valve cover (E), shut-off valve plate spring (G), shut-off valve retainer plate (H), retainer plate paper pad (J), and shut-off valve (K). Remove control knob (NN) from shut-off valve.
- (5) Disengage escapement spring (X) from tripper (Y) with remover and installer (fig. 189) from kit 14-K-280.
- (6) Remove tripper (Y), valves (W and Z), and felt washers (V and AA). Discard valves and felt washers.
- (7) Remove paddle plate assembly (KK) and paddle shaft (FF). Drive rivet (LL) from paddle plates. This will disengage paddle plate assembly from paddle shaft. Remove metal washers (S and MM). Discard paddle.
- (8) Remove kicker (L) and escapement spring (X). Remove escapement spring from kicker. Discard spring.
- (9) Remove valve bushings (U and JJ) from housing (GG) with a punch and hammer (*fig. 190*). Discard bushings.

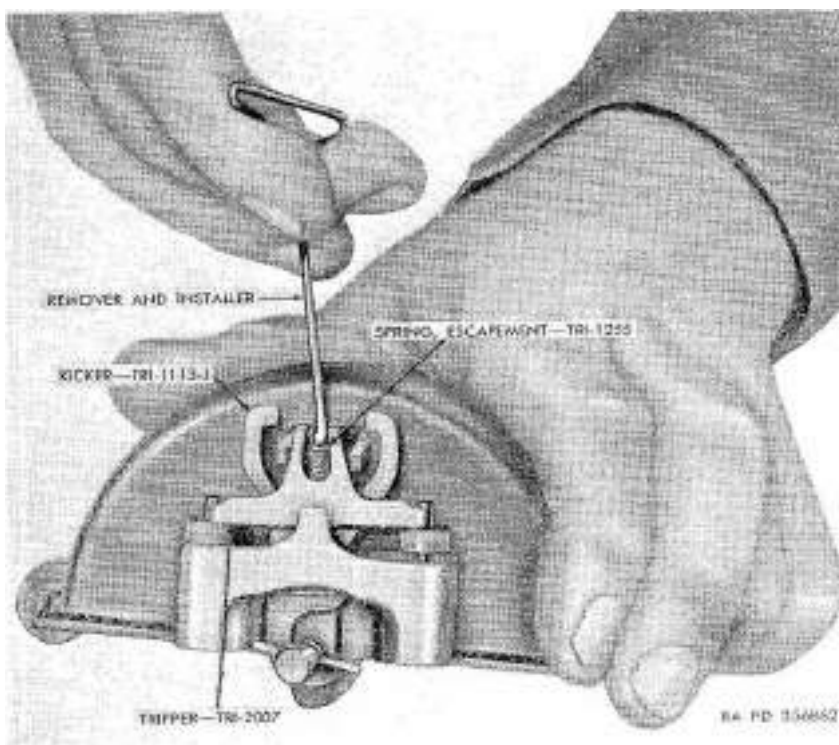


Figure 189. Removing and installing escapement spring with remover installer from kit —41-K-280.

c. *Cleaning.* Wash all parts thoroughly in volatile mineral spirits or dry-cleaning solvent and dry with compressed air. Blow out all passages and ports with compressed air.

231 Inspection (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 192, except where otherwise indicated,

a. *limped Housing.*

- (1) Inspect housing (GG) with "go—no go" gage (fig. 191) from kit 41-K-280. If upper "no go" portion of gage (top land) can be inserted in housing, windshield wiper motor assembly must be replaced,
- (2) inspect threads in housing for wear or damage, gasket surface for imperfections, or cracks in housing. if any of these conditions exist, wiper motor assembly must be replaced.

b. *Inspect Cover Assembly.*

- (1) Inspect threads in cover assembly (A)) and gasket sur-

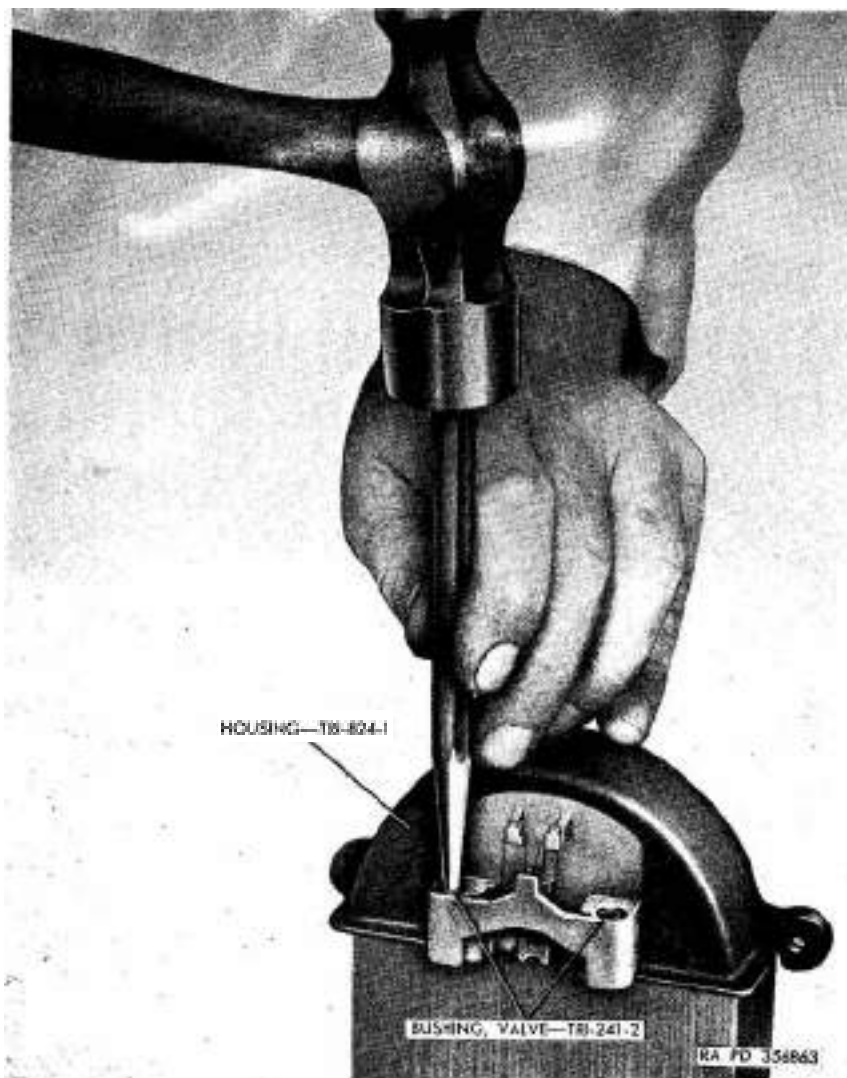


Figure 190. Removing valve bushings.

faces for wear or damage. If either of these conditions exist, replace wiper motor assembly.

- (2) Inspect shut-off valve (K) for wear or breakage, retainer plate paper pad (J), shut-off valve retainer plate (H) and shut-off valve plate spring (G) for wear or other visual damage. If any of these parts are not in satisfactory condition, replace as required.

c. *Inspect Kicker and Tripper.* Inspect kicker (L) and tripper

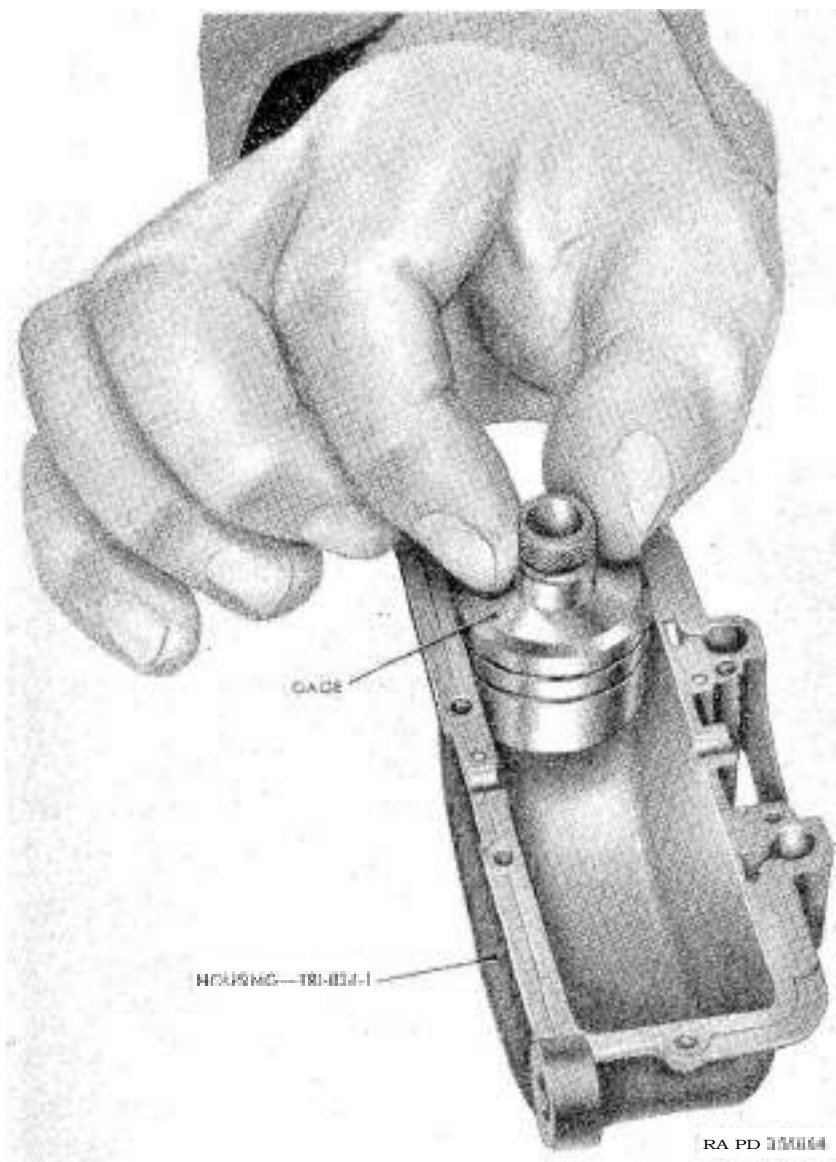


Figure 191. Checking housing with "go—no go" gage from kit — 41—K-280.

(Y) for cracks or distortion. If either of these conditions exist and satisfactory repairs cannot be performed, replace as required.

d. Inspect Paddle Shaft, Handle, and Handle Set Screw.

- (1) Inspect paddle shaft (FF) for damaged threads, damaged serrations, distortion, or other visual damage. If shaft is not in good condition, replace shaft.

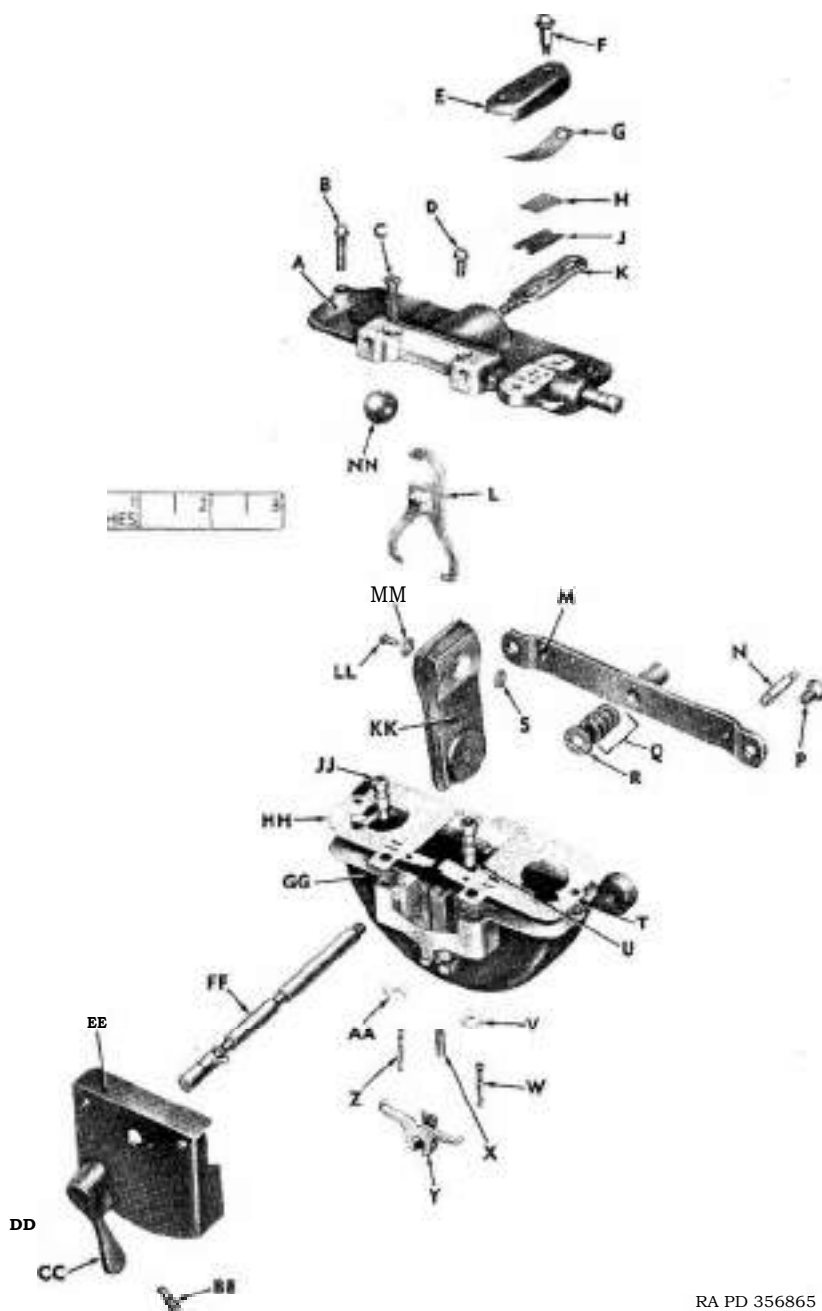


Figure 192. Windshield wiper motor assembly—exploded view.

A—Cover, assy — TRI-75457-4
 B—Screw, long, cover — TRI-1900-1
 C—Screw, flat-hd, cover — TRI-1854-20
 D—Screw, short, cover — TRI-1900
 E—Cover, shut-off valve — TRI-75457 (part of cover assy)
 F—Screw, shut-off valve cover — TRI-483 (part of cover assy)
 G—Spring plate, shut-off valve — TRI-497 (part of cover assy)
 H—Plate, retainer, shut-off valve — TRI-493 (part of cover assy)
 J—Pad, paper, retainer plate — TRI-614 (part of cover assy)
 K—Valve, shut-off — TRI-75233-1 (part of cover assy)
 L—Kicker TRI-1113-J
 M—Plate and bushing TRI-80384-41
 N—Stud, 10-32NF (3/16) x 10-32NF (9/32) x 1 1/16 — CC-927972
 P—Screw, flat-head, plate and bushing — TRI-1727-12
 Q—Washer, felt — TRI-75896
 R—Washer, spacing — TRI-2050-1
 S—Washer, metal — TRI-76120 (part of kit-7735526)
 T—Gasket—TRI-711 (part of kit-7735526)
 U—Bushing, valve — TRI-241-2 (part of kit-7735526)
 V—Washer, felt — TRI-2376 (part of kit-7735526)
 W—Valve TRI-2202 (part of kit-7735526)
 X—Spring, escapement — TRI-1258 (part of kit-7735526)
 Y—Tripper — TRI-2007
 Z—Valve TRI-2202 (part of kit-7735526)
 AA—Washer, felt — TRI-2376 (part of kit-7735526)
 BB—Screw, set, handle — TRI-F-105-2
 CC—Handle TRI-F-105-1
 DD—Screw, lock washer, fillister-hd, valve cover — TRI-1852-0
 EE—Cover, valve — TRI-350-9
 FF—Shaft, paddle — TRI-S-75120-20
 GG—Housing — TRI-824-1
 HH—Gasket TRI-711 (part of kit-7735526)
 JJ—Bushing, valve TRI-241-2 (part of kit-7735526)
 KK—Plate, paddle assy — TRI-58 (part of kit-7735526)
 LL—Rivet — TRI-1876-12-R (part of kit-7735526)
 MM—Washer, metal — TRI-76120 (part of kit-7735526)
 NN—Knob, control — TRI-76224

Figure 109—Continued

- (2) Inspect handle (CC) and handle set screw (BB) for cracks or damaged threads. If handle is cracked or threads are damaged, replace handle.

e. Inspect Valve Cover, Control Knob, and All Screws.

- (1) Inspect valve cover (EE) for distortion or cracks. If either of these conditions exist, replace valve cover.
- (2) Inspect threads of control knob (NN) and all screws for wear or damage. If threads are worn or damaged, replace as required.

f. Inspect Plate and Bushing.

- (1) Inspect plate and bushing (M) for loose bushing, damaged threads, distortion, or cracks. If any of these conditions exist, replace plate and bushing.
- (2) Inspect studs (N) for worn threads, damaged threads, or misalignment. If any of these conditions exist, replace studs.

232. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 192, except where otherwise indicated.

a. General. When a windshield wiper motor assembly is disassembled for rebuild, the entire contents of the repair kit 7735526 must be installed. These parts are indicated in the nomenclature list for figure 192.

b. Install Paddle Plate Assembly on Paddle Shaft.

- (1) Swing new paddle plate assembly (KK) open and pack interior with Trico wiper lubricant and close paddle plates.
- (2) Hold paddle plate assembly (KK) with parking lift pad (*fig.* 193) up and insert paddle shaft (FF) through paddle plate assembly with short end of shaft at left. Place metal washer (MM) on rivet (LL) and insert rivet through paddle plate and paddle shaft. Install other metal washer (S) and set rivet with punch and riveting block (*fig.* 193) from kit 14-K-280.

c. Form Edges of Paddle Plate Assembly. Form sides and bottom edges of paddle plate toward center of paddle with a smooth punch and slide paddle into forming tray (*fig.* 194) from tool kit 41-K-280 as far as it will go. Allow paddle to remain in tray for 10 minutes.

Note. This operation must be carefully performed to insure a proper seal between the paddle plate assembly and housing.

Form top edges of paddle with a smooth punch (*fig.* 195) to insure a seal at the cover.

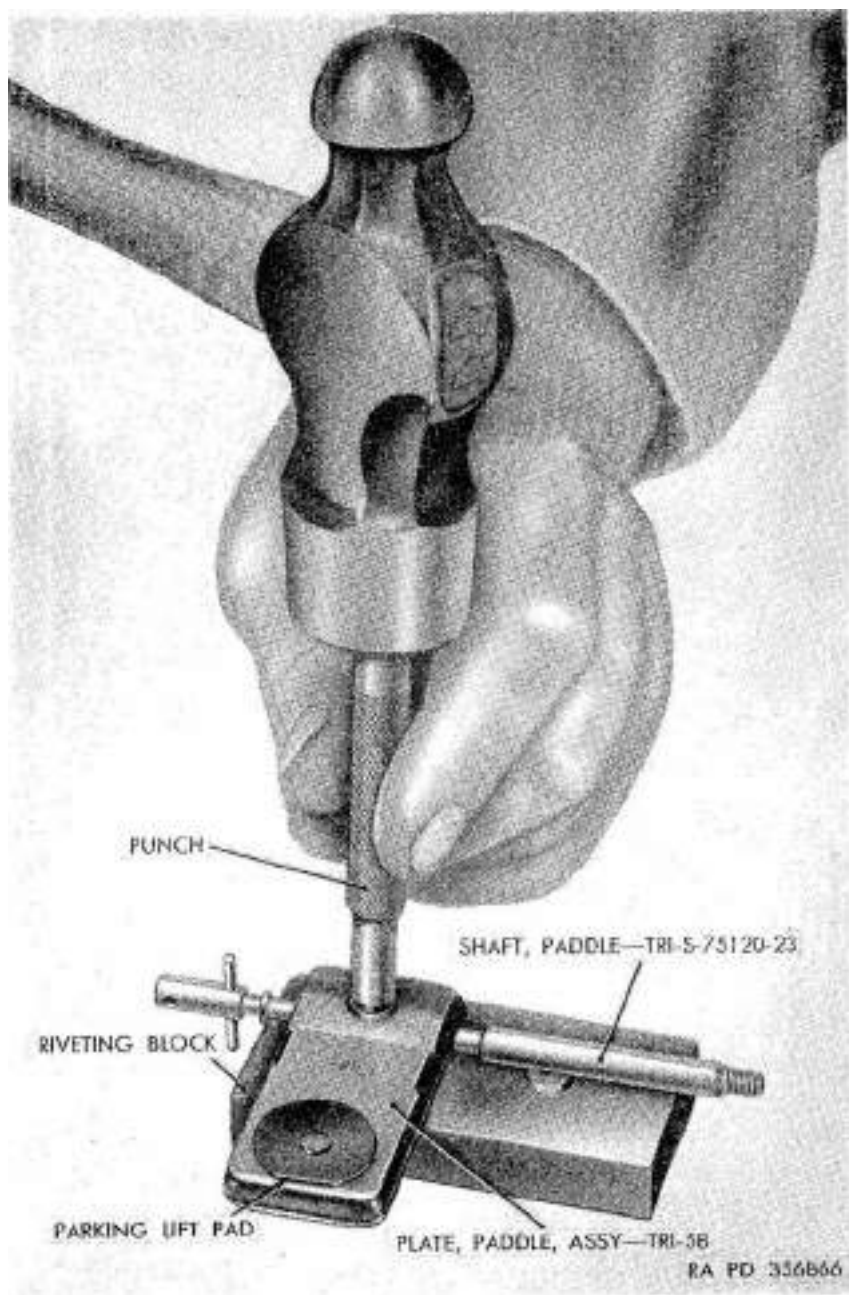


Figure 193. Setting rivet with punch and riveting block from *Tri-S-K-250*.

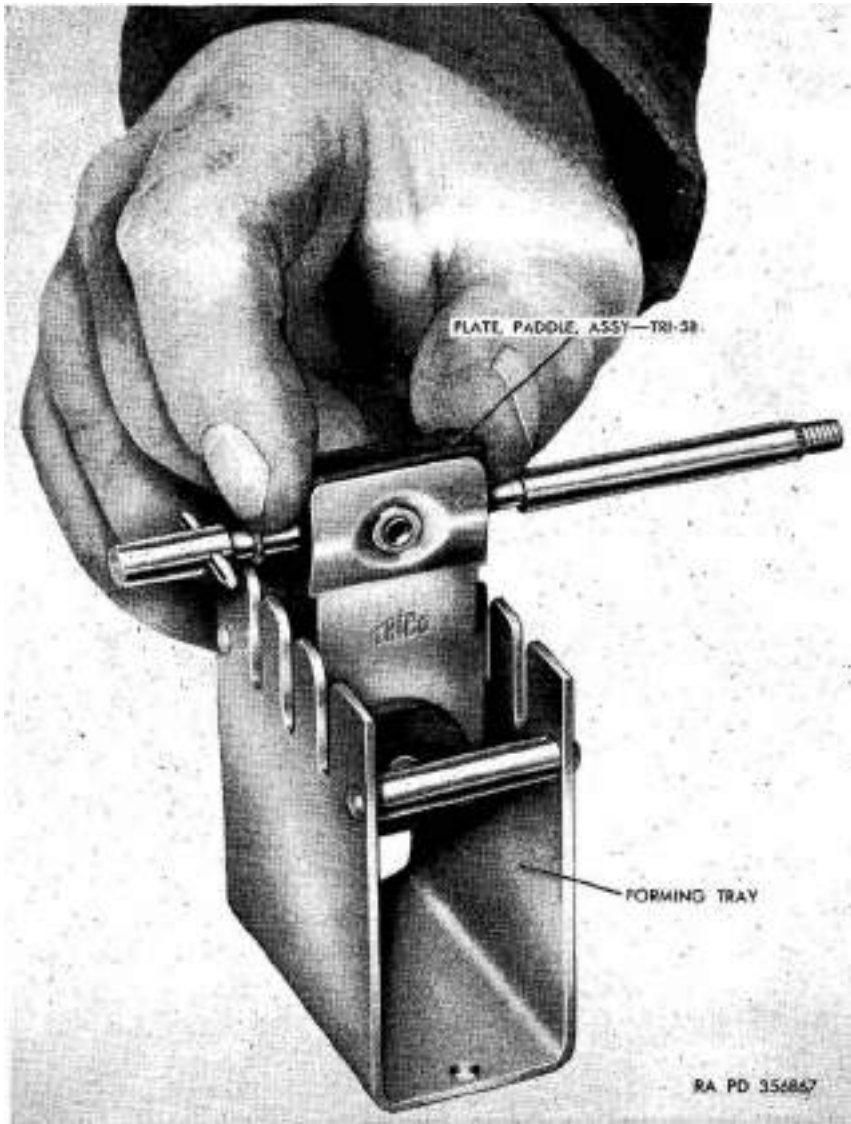


Figure 194. Forming paddle plate edges with forming tray from
41—K-280.

d. *Install Valve Bushings in Housing.* Position valve bushings (U and JJ) in top of housing (GG) and carefully set bushings in housing with installer (fig. 196) from kit 41—K-280.

Note. Exercise care to prevent damage to the machined gasket surface of housing when bushings are installed.

e. *Install Paddle Plate Assembly, Paddle Shaft, and Kicker.*
(1) Attach escapement spring (X) to kicker (L) and close

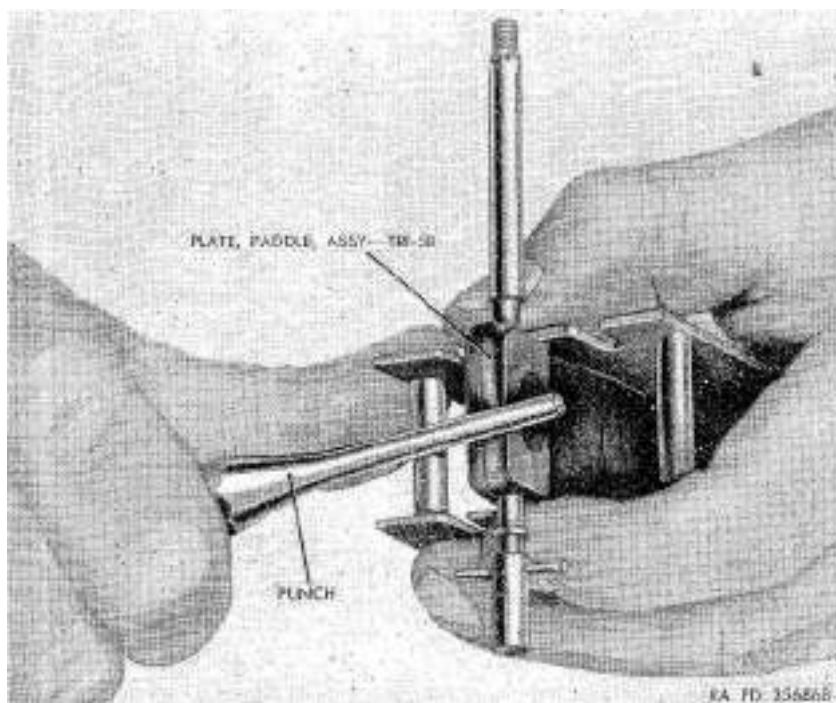


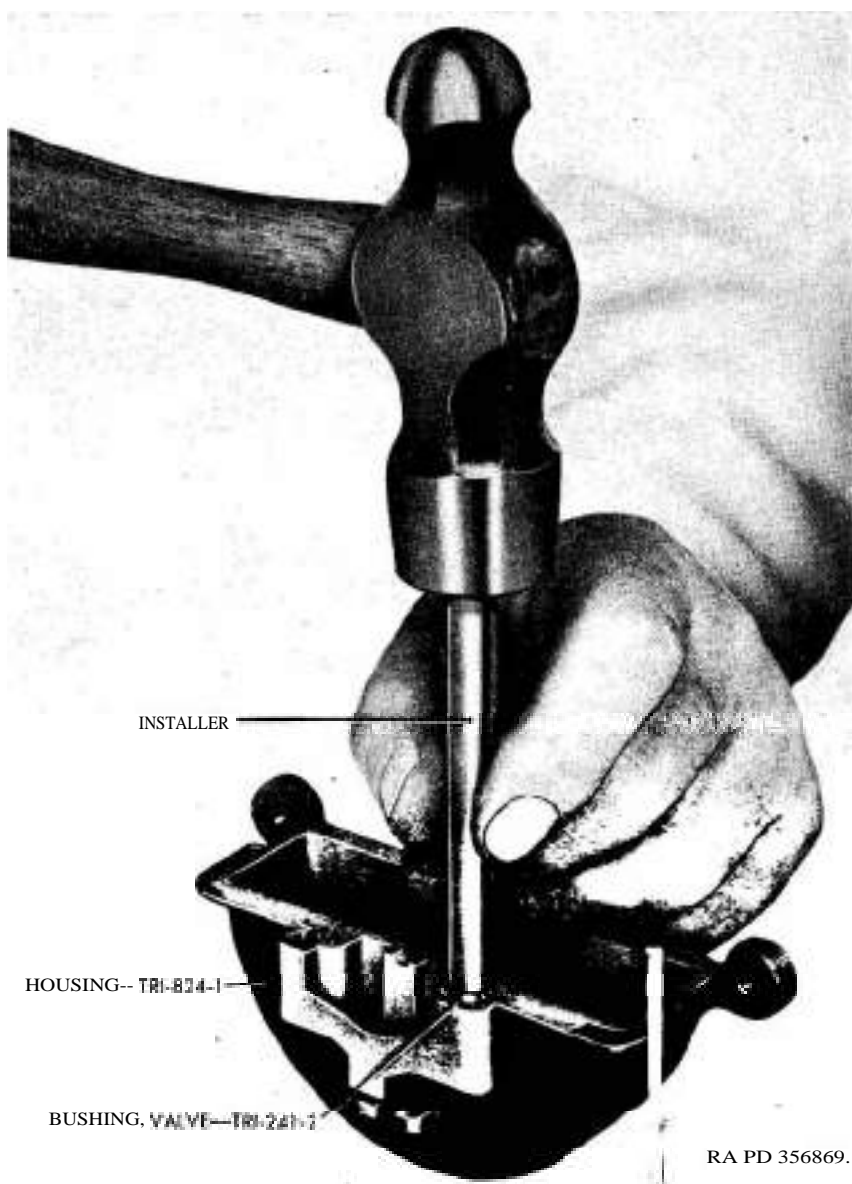
Figure 195. Forming paddle plate edges with smooth punch.

end of spring with pliers to prevent disengagement of spring from kicker when other parts are installed.

- (2) Insert kicker (L), with escapement spring attached, in opening provided in housing at valve side (flat side of kicker toward housing).
- (3) Spread **Trico-Wiper** lubricant lightly on inside walls of housing. Insert paddle plate assembly (KK) and paddle shaft (FF) by holding fingers at edge of housing and forcing paddle straight down between fingers as shown in figure 197 to prevent damaging of paddle seal. Place hooked end of kicker (L) over paddle shaft (FF) as shaft is being positioned.

Install Valves, Felt Washers, and Tripper.

- (1) Place new felt washers (V and AA) on valves (W and Z). Insert valves in housing from under side, notched end down, and notches toward center of housing.
- (2) Position tripper (Y) on housing and engage tripper with notches in valves (W and Z).
- (3) Hook remover and installer from kit 41—K-280 over lower end of escapement spring (X) and attach spring to tripper (fig. 189).



RA PD 356869.

Figure 196. Installing valve bushings with installer

80-11-K-280.

g. Install Shut-Off-Valve Cover on Corer Assembly.

- (1) Place shut-off valve (K) on cover assembly (A), followed by retainer plate paper pad J, shut-off valve retainer plate (H), and shut-off valve pressure spring (G) with open end toward threaded end of shut-off valve. Place shut-off valve cover (E) over valve parts, open end

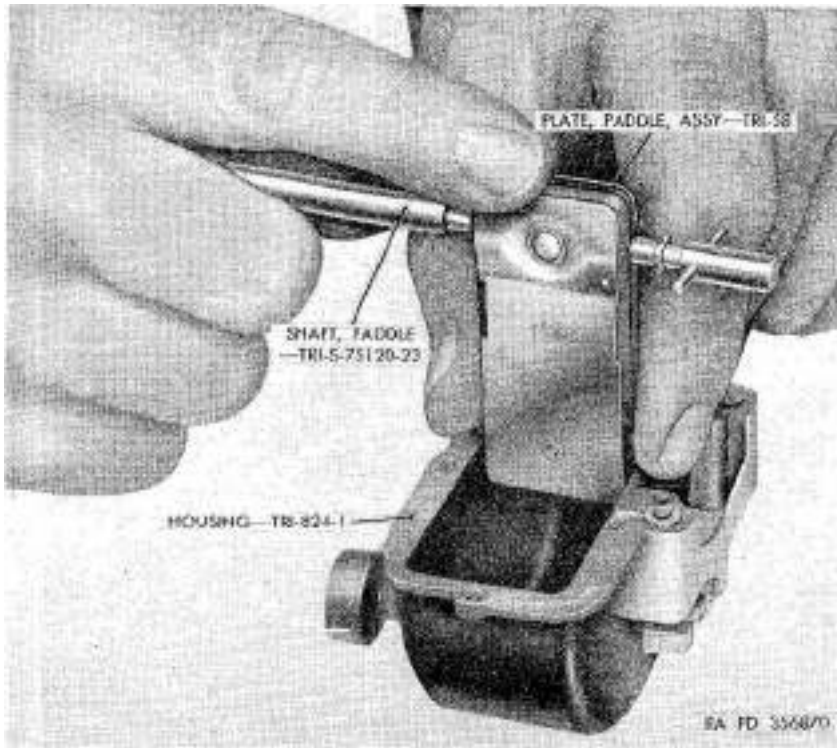


Figure 197. Inserting paddle plate and shaft assembly.

toward threaded portion of shut-off valve. Install and tighten two shut-off valve cover screws (F).

(2) Install control knob (NN).

h. Install Gaskets, Cover Assembly, and Screws.

- (1) Position gaskets (T and HH) on top of housing. Place cover assembly (A) on housing and install cover long screws (B), cover flat-head screws (C), and cover short screws (D). Tighten screws.
- (2) Lift kicker (L) and engage hooked end with boss located on cover.

i. Install Valve Cover, Handle, and Plate and Bushing.

- (1) Position valve cover (EE) on housing and install two valve cover fillister-head lock washer screws (DD).
- (2) Place handle (CC) on end of paddle shaft (FF) and align handle set screw hole with hole in shaft. Install handle set screw (BB), and tighten screw.
- (3) Place spacing washer (R) on paddle shaft, followed by four felt washers (Q). Apply Trico wiper lubricant on

felt washers and position plate and bushing (M) on housing. Install plate and bushing flat-head screws (P). Tighten screws.

- (4) Install two ~~10-32NF~~ (3/16) x ~~10-32NF~~ (9/16) x 1 1/16 studs (N) in plate and bushing (M) .

Note. Install short threaded end of stud in plate and bushing. Tighten studs.

Section VII. REBUILD OF COWL VENTILATOR ASSEMBLY

233. Disassembly (Field and Depot Maintenance)

a. General. The cowl ventilator assembly is generally serviced as five items : the lid assembly, cowl ventilator weatherstrip, drain tube, link with brace assembly, and tension spring. The cowl ventilator screen assembly, cowl ventilator handle assembly, and cowl ventilator ratchet pawl can also be replaced, but these parts are attached with rivets.

b. Remove Circuit Breakers and Clip From Ventilator Brace Assembly (fig. 198).

- (1) Remove tapping screws. This will release the circuit breakers from ventilator brace assembly.
- (2) Remove tapping screw. This will release rubber coated open clip from brace assembly.

c. Remove Cowl Ventilator Screen Assembly From Ventilator Lid Assembly (fig. 199) . Remove tapping screw and two rivets. This will release the cowl ventilator screen assembly from the ventilator lid assembly.

d. Remove Ventilator Handle Assembly and Ventilator Handle Ratchet Pawl From Ventilator Brace Assembly (fig. 200) .

- (1) Remove tension spring.
- (2) Grind ends from rivets and drift rivets from brace assembly. This will release the ventilator handle assembly and ventilator handle ratchet pawl. If it is necessary to replace the handle assembly, remove rivet, which connects ventilator handle link to the handle. This can be accomplished with a punch and hammer.
- (3) Support ventilator handle link and drive rivet from ventilator handle link brackets and link with a punch and hammer.

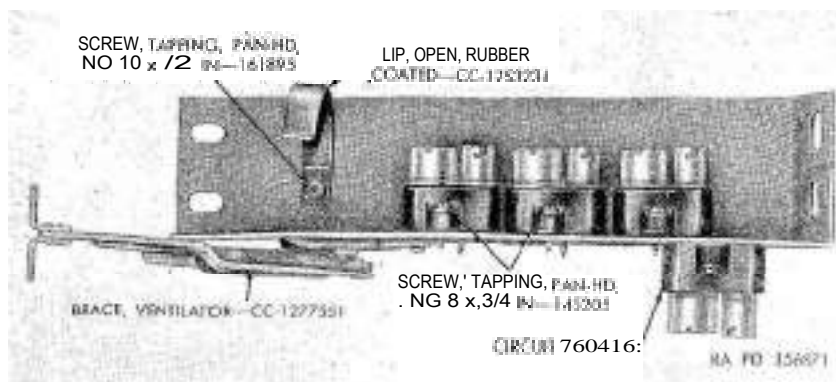


Figure 198. Link with brace assembly, circuit breakers, and clip.

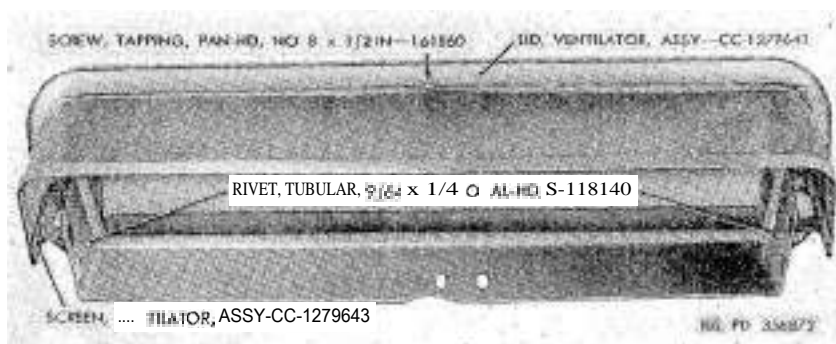


Figure 199. Ventilator lid assembly.

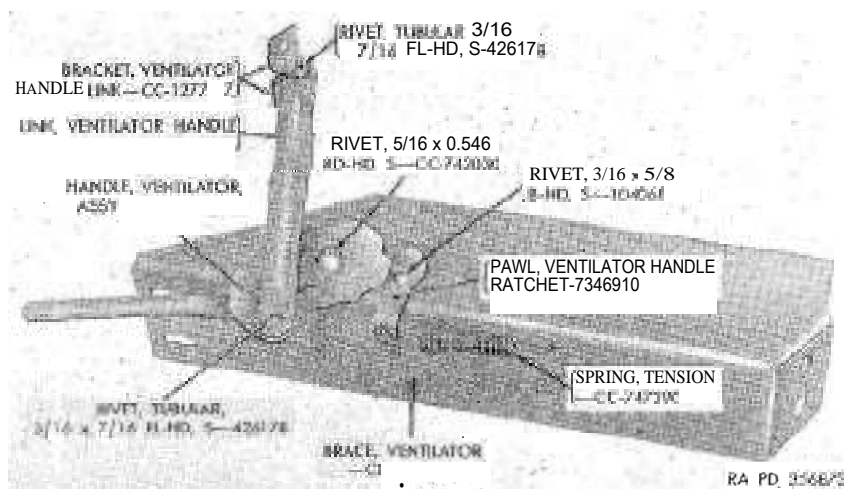


Figure 200. Link with brace assembly.

234. Inspection (Field and Depot Maintenance)

a. Inspect Ventilator Lid Assembly.

- (1) Inspect ventilator lid assembly (A, fig. 182) for **corrosion**, distortion, cracks, or broken welds. If any of these conditions exist, replace lid assembly.
- (2) Inspect ventilator screen assembly (*fig. 199*) for corrosion, holes, distortion, or broken brackets. If any of these conditions exist, replace screen assembly.

b. Inspect Ventilator Weatherstrip and Drain Tube (fig. 182).

- (1) Inspect ventilator weatherstrip (E) for deterioration, unsatisfactory sealing, or other visual damage. If ventilator weatherstrip is detached from cowl trough at any point, it can be resealed. If weatherstrip is deteriorated or damaged, it must be replaced.
- (2) Inspect drain tube (M) for deterioration. Replace tube if it is not in good condition.

c. Inspect Link With Brace Assembly.

- (1) Inspect link with brace assembly (K, *fig. 182*) for corrosion, distortion, or cracks. If any of these conditions exist, replace link with brace assembly.
- (2) Inspect ventilator handle link and ventilator handle link brackets for corrosion, distortion, or cracks. If replacement is necessary, repairs can be accomplished by installing a new link with brace assembly, ventilator handle link (*fig. 200*), or ventilator handle link brackets (*fig. 200*).

d. Inspect Ventilator Handle Assembly and Ventilator Handle Ratchet Pawl (fig. 200).

- (1) Inspect ventilator handle assembly for broken welds, corrosion, damage, worn or loose rivet. If the weld between handle and ratchet is broken, satisfactory repairs can be accomplished by rewelding handle to ratchet. Replace rivet if it is loose or worn. If parts are damaged by corrosion, replace link with brace assembly or install a new ventilator handle assembly.
- (2) Inspect ventilator handle ratchet pawl for wear, loose or worn rivet, or corrosion damage. If rivet is loose or worn, install new rivet. If pawl is damaged by corrosion, repairs can be accomplished by installing a new link with brace assembly or a new ventilator handle ratchet pawl.

e. Inspect Tension Spring (fig. 182). Inspect tension spring (J) for cracks or loss of tension. If there is evidence of cracks or space between the spring coils, replace spring.

f. Inspect Cowl Ventilator Hinge Assemblies. Inspect cowl ventilator hinge assemblies at each end of ventilator opening for damaged threads, loose nuts, worn or loose rivets, cracks, or corrosion. If any of these conditions exist, replace hinge assemblies, which are attached to the cowl.

g. Inspect Ventilator Drain Trough in Cowl. Inspect ventilator drain trough for holes, distortion, or corrosion. Repair any evidence of holes, distortion, or corrosion by straightening and soldering as required.

235. Assembly (Field and Depot Maintenance)

a. Install Ventilator Screen Assembly (fig. 199).

- (1) Position ventilator screen assembly on ventilator lid assembly. Install No. 8 x $\frac{1}{3}$ pan-head tapping screw, but do not tighten.
- (2) Install one $\frac{9}{64}$ x $\frac{1}{4}$ oval-head steel tubular rivet through each screen-bracket and lid deflector. Set rivets with a rivet punch. Tighten screw.

b. Assemble Parts on Ventilator Brace (fig. 200).

- (1) Position ventilator handle link brackets on short offset end of ventilator handle link and insert a $\frac{3}{16}$ x $\frac{7}{16}$ flat-head steel tubular rivet. Set rivet with a rivet punch.
- (2) Insert a $\frac{3}{16}$ x $\frac{7}{16}$ flat-head steel tubular rivet through ventilator handle assembly from handle side. Position No. 10 plain washer over rivet followed by ventilator handle link, embossed side of link away from handle to prevent interference. Set rivet with a rivet punch.
- (3) Place ventilator handle assembly on brace with link and handle toward tapered end of brace. Insert a $\frac{5}{16}$ x 0.546 round-head steel rivet with head on handle side. Set rivet and exercise care to prevent binding of handle.
- (4) Place ventilator handle ratchet pawl on brace so that pawl indexes with ratchet on handle. Insert a $\frac{3}{16}$ x $\frac{5}{8}$ button-head steel rivet with head on pawl side. Set rivet and exercise care to prevent binding of pawl.
- (5) Install ventilator tension spring to pawl and brace.
- (6) Position one of the circuit breakers on handle side of brace assembly (*fig. 198*). Install two No. 8 x $\frac{3}{4}$ pan-head tapping screws and tighten.
- (7) Position other circuit breakers on inside surface of brace assembly (*fig. 198*). Install two No. 8 x $\frac{5}{8}$ pan-head tapping screws in each circuit breaker and tighten.
- (8) Position rubber coated open clip on brace assembly (*fig.*

198) . Install a No. 10 x ½ pan-head tapping screw and tighten.

c. Install Ventilator Weatherstrip in Cowl Trough; Then Drain Tube. Coat flat lower edge of ventilator weatherstrip and trough in cowl with synthetic rubber cement (52—C-1556). Allow cement to dry for 10 minutes and install weatherstrip in trough around ventilator opening in cowl.

Note. Weatherstrip must be installed so that lip at inner edge is up. Install drain tube on cowl vent drain pipe and insert tube through opening in dash panel.

Section VIII. REBUILD OF CAB SHELL

236. Disassembly (Field and Depot Maintenance)

a. General. The cab shell is a steel, welded, composite assembly and repairs are generally necessitated by corrosion or collision damage. Since the repairs involve welding and metal finishing, specific instructions are not included in this chapter.

b. Remove Cowl Hood Lacing. If inspection (par. 237a) reveals that replacement of the cowl hood lacing is necessary, pull the worn lacing from cowl and unscrew drive studs with pliers.

Note. Do not pry drive studs from cowl with a screw driver as it will enlarge the holes in the sheet metal and prevent a satisfactory attachment of new lacing.

c. Remove Door Lower Weatherseal Retainer, Door Lower Weatherseal, Door Hinge Pillar Weatherseal, and Door Lock Pillar Weatherseal.

- (1) Remove five tapping screws, door lower weatherseal retainer, and door lower weatherseal.
- (2) Remove door hinge pillar weatherseal and door lock pillar weatherseal.

d. Remove Passenger Seat Cushion Assembly and Passenger Seat Back Cushion Assembly. Remove passenger seat cushion assembly from cab. Remove lock washer screws, which attach passenger seat back cushion assembly to cab shell. Raise cushion to release it from the two upper clips and remove cushion from cab.

e. Remove Passenger Seat Cushion Cover Assembly and Passenger Seat Cushion Pad From Passenger Seat Cushion Board. Untie rope, which attaches the passenger seat cushion cover assembly to the clips on passenger seat cushion board. Remove cover and passenger seat cushion pad from board.

f. Remove Passenger Seat Back Cushion Cover Assembly and Passenger Seat Back Cushion Pad From Passenger Seat Back Cushion Spring Assembly (fig. 185).

- (1) Untie rope, which attaches the passenger seat back cushion cover assembly to the passenger seat back cushion spring assembly, and remove cover. Remove seat back cushion pad.
- (2) Remove passenger seat back cushion pad support fasteners, which attach the support to the spring assembly, and remove support.

Remove Battery Tray Assembly and Battery Box Assembly.

- (1) Remove battery tray drain hose from battery tray drain tube, which is located under the cab underbody.
- (2) Remove batteries (par. 38a).
- (3) Remove four washer face screws, battery cable grommet retainer, and battery cable rubber grommets from cab underbody and battery box assembly. These grommets seal the openings around the cables. Remove four cap screws and lock washers. This will release the battery tray assembly and battery box assembly from the cab underbody. Remove battery box and tray from cab. Remove five battery box seal grommets if inspection (par. 237d) reveals that replacement is necessary.

h. Remove Miscellaneous Parts From Cab. Information pertaining to the removal of instruments, clutch and brake pedal covers, and front floor transmission cover is contained in TM 9-840.

Inspection (Field and Depot Maintenance)

a. Inspect Cowl Hood Lacing and Drive Studs. If cowl hood lacing is worn or damaged, it must be replaced. If any of the drive studs are loose and cannot be tightened, new drive studs must be installed in a different location.

b. Inspect Door Lower Weatherseal Retainer, Door Lower Weatherseal, Door Hinge Pillar Weatherseal, and Door Lock Pillar Weatherseal.

- (1) Inspect door lower weatherseal retainer for corrosion, or cracks. If any of these conditions exist, replace retainer.
- (2) Inspect door lower weatherseal for deterioration or cracking. If either of these conditions exist, replace weatherseal.
- (3) Inspect door hinge pillar weatherseal and lock pillar

weatherseal for deterioration or looseness. If weatherseals are deteriorated, they must be replaced. If weatherseals are loose, they can be attached with synthetic rubber cement.

c. Inspect Passenger Seat Cushion Assembly and Passenger Seat Back Cushion Assembly.

- (1) Inspect passenger seat cushion cover assembly and passenger seat back cushion cover assembly for wear, deterioration, or damage. If any of these conditions exist, replace cushion covers as required.
- (2) Inspect passenger seat cushion pad and passenger seat back cushion pad for deterioration or damage. If either of these conditions exist, replace pads.
- (3) Inspect passenger seat back cushion pad support for damage and wear. Replace support if not in good condition.
- (4) Inspect passenger seat back cushion spring assembly for sagging springs, cracks, or broken welds. If any of these conditions exist, replace cushion spring assembly.
- (5) Inspect passenger seat cushion cover rope clips on bottom of passenger seat cushion board for missing clips and loose screws.

Note. There is a total of 18 clips spaced around the seat cushion board.

Tighten the No. 10 x $\frac{1}{2}$ cross-recess wood screws or replace missing clips and screws.

- (6) Inspect passenger seat cushion board for cracks and deterioration. If either of these conditions exist, replace board.

d. Inspect Battery Box Assembly, Battery Tray Assembly, and Miscellaneous Parts.

- (1) Inspect cab underbody and determine if nuts, which are a part of the floor, are in satisfactory condition. If threads are worn or stripped, nuts must be replaced.
- (2) Inspect battery tray assembly for corrosion, cracks, or loose drain tube. If drain tube is loose, it can be soldered in place. If there is evidence of cracks or tray is damaged by corrosion, a new tray must be installed.
- (3) Inspect battery box assembly for corrosion or other visual damage. If battery box is not in good condition, it must be replaced.
- (4) Inspect battery hold-down cover for distortion or corrosion. Replace cover if there is evidence of distortion or corrosion.

- (5) Inspect battery tray drain hose for deterioration. Replace hose if it is deteriorated.
- (6) Inspect battery box seal rubber grommets for deterioration. Replace grommets if necessary.
- (7) Inspect battery cable rubber grommets and battery cable grommet retainers for deterioration or corrosion. If either of these conditions exist, replace parts as required.
- (8) Inspect battery cover for corrosion or unsatisfactory welds. Replace cover if there is evidence of extensive corrosion. Perform necessary welding if any of the spot welds are broken.

238. Assembly (Field and Depot Maintenance)

a. *Install Cowl Hood Lacing.* Place cowl hood lacing on cowl with large section of lacing toward windshield. Punch holes in lacing with a small drift corresponding with the drive stud holes in cowl. Install new No. 6 round flat-head steel ~~7/8-inch~~ drive studs with a punch and hammer.

Note. A punch must be used to install the drive studs as damage to the cowl hood lacing will occur if hammer contacts lacing.

If any of the drive studs are not a tight fit, it will be necessary to drill a new ~~1/8-inch~~ hole in the cowl and relocate the drive stud.

b. *Install Door Lower Weatherseal, Door Lower Weatherseal Retainer, Door Hinge Pillar Weatherseal, and Door Lock Pillar Weatherseal.*

- (1) Position door lower weatherseal, with rolled edge of seal up, on lower section of the cab door opening. Place door lower weatherseal retainer against weatherseal. Install and tighten five No. 8 x $\frac{1}{2}$ gimlet point pan head tapping screws.
- (2) If inspection (par. 237b) reveals that replacement of the door hinge pillar weatherseal and door lock pillar weatherseals is necessary, coat new weatherseals and metal surface with synthetic rubber cement (52-C-1556). Allow cement to dry for 10 minutes and install weatherstrips (large lip down) on door hinge pillar and door lock pillar in line with door lower weatherseal.

c. *Install Passenger Seat Cushion Cover Assembly and Passenger Seat Cushion Pad on Passenger Seat Cushion Board.*

- (1) Place passenger seat cushion pad on passenger seat cushion board. Make certain pad is positioned to conform with contour of board. Tack pad to edge of board.

- (2) Place passenger seat cushion cover assembly over pad and board, and fasten cover to bottom of board with rope that is a part of the cover assembly. Position rope around passenger seat cushion cover rope clips and tighten rope until cover is a snug fit over pad. Tie rope.

d. Install Passenger Seat Back Cushion Pad Support, Passenger Seat Back Cushion Pad, and Passenger Seat Back Cushion Cover Assembly on Passenger Seat Back Cushion Spring Assembly (fig. 185).

- (1) Place passenger seat back cushion pad support on passenger seat back cushion spring assembly and attach support to outside frame of spring assembly with cushion pad-support fasteners. Fasteners can be inserted through support pad and crimped around the spring assembly frame with pliers. Place passenger seat back cushion pad on spring assembly.
- (2) Place passenger seat back cushion cover assembly over pad and spring assembly. Loop rope in cushion cover around rope retainers, which are a part of the spring assembly. Tighten rope until cover is a snug fit and tie rope.

e. Install Battery Box Assembly and Battery Tray Assembly.

- (1) Place five battery box seal grommets in cab underbody in holes adjacent to the nuts for screws, which attach battery box and tray assembly to underbody. Position battery box assembly on cab underbody with hinge brackets at rear. Place battery tray assembly in battery box with drain tube toward center of truck in hole provided in battery box and underbody. Install four $\frac{3}{8}$ -inch external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screws. Tighten cap screws.
- (2) Position cables in battery box and cab underbody. Install battery cable rubber grommets, battery cable grommet retainers, and four $\frac{1}{4}$ -20NC x $\frac{3}{8}$ washer face screws in battery box and cab underbody. Tighten screws.
- (3) Install batteries, battery hold down cover, cables, and battery box cover (par. 66a).

Caution: Do not connect ground cable until cowl ventilator assembly is installed.

f. Install Passenger Seat Cushion Assembly and Passenger Seat Back Cushion Assembly. Install passenger seat back cushion assembly in cab and make certain cushion assembly is properly engaged with upper clips on cab shell. Attach lower brackets of

seat back cushion to cab shell with two 5/16-24NF x $\frac{3}{4}$ lock washer screws. Install passenger seat cushion assembly.

g. Install Battery Tray Drain Hose. Install battery tray drain hose on tube, which extends from tray through cab underbody.

Section IX. ASSEMBLY OF CAB FROM SUBASSEMBLIES

239. Door Assemblies (Field and Depot Maintenance)

a. Install Door Assemblies.

- (1) Clean all traces of corrosion from door hinge pins and coat pins and hinges with general purpose grease (GAA) .
- (2) Position door assemblies in cab and install hinge pins.

b. Connect Door Check Arms to Bracket on Cab. Engage door check arms with brackets on cab hinge pillars and install $1\frac{1}{4}$ x 7/16 flat-head hollow point steel pins. Rivet end of pins.

c. Door Alinement and Glass Alinement. Refer to TM 9-840 for information pertaining to alinement of the doors and glass assemblies.

240. Driver's Seat (Field and Depot Maintenance)

Position driver's seat on seat riser and attach hinges on regulator assemblies to seat riser with four $\frac{3}{8}$ -inch lock washers and ~~$\frac{3}{8}$ -24NF~~ x $\frac{3}{4}$, cap screws. Tighten cap screws.

241. Windshields and Support Frame Assembly (Field and Depot Maintenance)

a. Install Windshields and Support Frame Assembly.

- (1) Position windshields and support frame assembly on cowl and install support frame pivot screws, which attach the support frame to cowl. Install 9/16-inch lock washers and ~~9/16-18NF~~ nuts. Tighten nuts.

Note. The drilled screw must be installed at the left side for the windshield wiper hinge tube.

- (2) Latch support frame clamp handles to instrument panel brackets.
- (3) Insert windshield wiper hinge tube through support pivot screw on left side and attach tube to hose on windshield wiper left pillar frame-to-manifold tube. Connect windshield wiper hinge tube to windshield wiper left pillar hose.
- (4) Install windshield wiper hinge tube clip and No. 8 x ~~$\frac{1}{2}$ -inch~~ pan-head gimlet point tapping screw. Tighten screw.

b. Install Cab Top Cover Assembly and Connect Right and Left Top Side Rails to Windshield Support Frame. Refer to paragraph 67 for information pertaining to the installation of the right and left top side rails and cab top cover assembly.

242. Windshield Wiper Motor Assembly (Field and Depot Maintenance)

a. Install Windshield Wiper Motor Assemblies on Windshields.

- (1) Position windshield wiper motor assemblies in windshield upper frame crosspiece and install two No. 10 lock washers and No. 10-32NF nuts on each wiper motor. Tighten nuts.
- (2) Connect wiper-to-tube hose on both windshield wiper motor assemblies.

b. Install Wiper Arms and Wiper Blades.

- (1) Position wiper arms and wiper blades on wiper motor shafts. Install and tighten wiper arm nuts.
- (2) Check operation of wiper motors and make certain wiper arms and wiper blades are properly located.

243. Cowl Ventilator Assembly (Field and Depot Maintenance)

a. Install Link With Brace Assembly (fig. 182) . Position link with brace assembly (K) between instrument panel and cab dash panel. Install 5/16-24NF x $\frac{5}{8}$ lock-washer screws (H) (head down) at instrument panel end, followed by 5/16-inch external internal teeth spring steel lock washers (G) and ~~5/16-24NF~~ nuts (F), but do not tighten nuts. Install 5/16-24NF x $\frac{3}{4}$ lock washer screws (L) at dash panel end. Tighten screws and nuts.

b. Connect Cables to Circuit Breakers and Clip on Brace.

- (1) Connect cables to large and small connectors on circuit breakers.
- (2) Place cable harness in clip on brace and reform clip to retain harness.

c. Install Ventilator Lid Assembly (fig. 182).

- (1) Position ventilator lid assembly (A) in cowl opening and attach hinge arms at each side with four 5/16-24NF x $\frac{3}{4}$ lock washer screws (D) (heads inside), but do not tighten screws.
- (2) Attach ventilator handle link to ventilator lid assembly with 1/4-inch ~~external-internal-teeth~~ spring steel lock

washers (B), two $\frac{1}{4}$ -28NF x % cap screws (C), and $\frac{1}{4}$ -24NF nuts (N). Do not tighten nuts.

- (3) Elongated holes are provided in the ventilator lid assembly to facilitate adjustment of the lid in the cowl opening and the lid should be positioned to insure proper contact with the ventilator weatherstrip. When ventilator lid is properly positioned, tighten cap screws and nuts.

d. Install Instrument Cluster and Connect Battery Cable.

- (1) Position instrument cluster in instrument panel and turn four attaching screws clockwise.
- (2) Connect ground cable to batteries.

CHAPTER 16

BODY

Section I. DESCRIPTION AND DATA

244. Description

a. Ambulance Body. The ambulance body is a closed-type, steel assembly, and is equipped with a plywood floor. The assembly consists of the driver's compartment and litter compartment, which are separated by a partition and sliding door. The litter compartment is equipped with litters for transporting four patients, a personnel heater, surgical lamp, ventilating system, and provision for blackout. The rear entrance to the litter compartment is facilitated by double hinged rear doors and folding step. The seating arrangement and controls in the driver's compartment are similar to the cab. The spare wheel and tire assembly is mounted on a carrier, which is attached to the body left hinge and lock pillars. Removal and installation of the body is described in paragraphs 43 and 63.

b. Cargo Body. The cargo body is an open top, steel assembly. It incorporates seats for troops, which can be raised and lowered whenever necessary, and a hinged tail gate. Protection from weather is provided by a paulin and end curtains, which are supported by wooden top bows. These are mounted in supports in the body side panels. The spare wheel and tire assembly is mounted on a bracket attached to the front panel. Removal and installation of the body is described in paragraphs 41 and 62.

c. Command Body. The command body is the same as the cargo body except that it contains a map table, lighting, and provision for complete blackout within the body.

d. Telephone Maintenance Body. The telephone maintenance body is a steel assembly, and is equipped with side compartments, ladder rack, pole rack, and a wire spool. A paulin is provided to protect the center compartment of the body from the weather. A compartment is provided at front of body for spare wheel and tire assembly and is accessible from the right side. Removal and

installation of the body is described in paragraphs 41 and 63. Rebuild information on the telephone maintenance body is not included in this chapter as repairs will usually be required because of corrosion or collision damage.

245. Data

a. Ambulance Body.

Type	-----	closed, welded, steel construction
Compartment door	-----	sliding
Rear doors	-----	hinged with windows
Rear step	-----	folding
Litter capacity	-----	4
Ventilation	-----	forced air
Personnel heater	-----	gasoline-forced air
Type of mounting	-----	insulators and hold-down bolts

b. Cargo and Command Body.

Type	-----	open, sectional, steel construction
Tailgate	-----	hinged
Number of troop seats	-----	2
Roof covering	-----	paulin
Type of mounting	-----	insulators and hold-down bolts

c. Telephone Maintenance Body.

Type	-----	semioopen, welded, steel construction
Compartment doors	-----	hinged, reinforced steel
Center compartment cover	-----	paulin
Type of mounting	-----	insulators and hold-down bolts

Section DISASSEMBLY OF AMBULANCE BODY INTO SUBASSEMBLIES

246. General

The ambulance body is divided into 10 subassemblies : partition door assembly, front door assemblies, windshields and support frame assembly, windshield wiper motor assemblies, ventilating blower assemblies, driver's and attendant's seat assemblies, rear door assemblies, folding step assembly, cowl ventilator assembly, and ambulance body shell.

247. Partition Door Assembly (Field mid Depot Maintenance)

Remove nuts and lock washers from bolts at partition door upper run retainer. Remove upper run retainer, bolts and plain washers. Remove partition door assembly from body.

248. Front Door Assemblies (Field and Depot Maintenance)

Refer to paragraph 216 for information pertaining to the removal of the front door assemblies.

249. Windshields and Support Frame Assembly (Field and Depot Maintenance)

a. General. To accomplish removal of the windshields and support frame assembly, the spot light assembly, the partition door upper retainer, and roof inside front panels must be removed to provide access to the seven screws, which attach the body roof to the support frame assembly.

b. Remove Spot Light Assembly. Remove handle, switch housing, adjusting nut, collet bracket assembly, and spot light. Refer to paragraph 334 for information pertaining to the removal of these parts.

c. Remove Partition Door Upper Run Retainer and Partition Door Assembly. The removal of the partition door upper run retainer and partition door assembly is described in paragraph 247.

d. Remove Roof Inside Front Panel Assemblies.

- (1) Remove roof inside front center panel screws and lock washers, including the spot light extension cable clip and screw. Remove roof inside front center panel assembly (*fig. 201*).
- (2) Remove lock washer screws, which attach the right and left ventilating blower inspection covers to body panels. Remove covers.
- (3) Remove lock washer screws, which attach the roof inside front left panel assembly to body (*fig. 201*). Remove panel assembly.
- (4) Remove screws and spot light extension cable clip from roof inside front right panel assembly. Disconnect spot light extension cable by separating the two connector shells. Remove grommet, bushing, and shell from cable, which extends through right panel.
- (5) Remove lock washer screws, which attach the roof inside front right panel assembly to body. Remove panel assembly and withdraw spot light extension cable from panel assembly.

e. Remove Windshields and Support Frame Assembly (*fig. 203*).

- (1) Remove seven lock washer screws, which attach the roof to the windshields and support frame assembly (*fig. 202*).

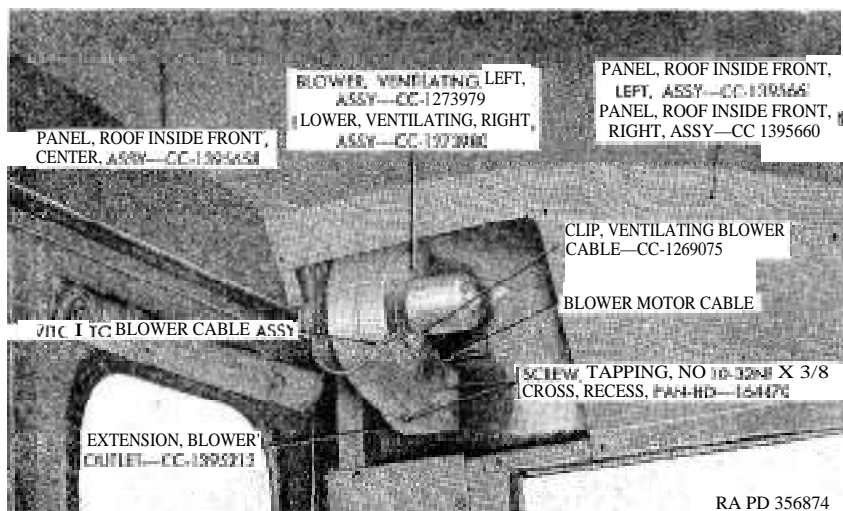


Figure 201. Ventilating blower assembly installed.

- (2) Remove tapping screw and windshield wiper hinge tube clip. Disconnect windshield wiper hinge tube from hose under cowl at left side. Pull windshield wiper hinge tube from left support frame-to-cowl screw.
- (3) Remove nuts, lock washers, and screws, which attach the rear view mirror assembly (left side) and the cowl liquid container strap bracket to cowl (right side). Remove rear view mirror assembly and strap bracket.
- (4) Remove two nuts, lock washers, and support frame-to-cowl lock washer screws (each side).
- (5) Remove windshields and support frame assembly from truck. Remove support frame lower center weatherstrip from cowl.

250. Windshield Wiper Motor Assemblies (Field and Depot Maintenance)

Refer to paragraph 219 for information pertaining to the removal of the windshield wiper motor assemblies.

251. Ventilating Blower Assemblies (Field and Depot Maintenance)

a. *Remove Right and Left Exhaust Ducts From Litter Compartment (fig. 210).* Remove screws from right and left exhaust ducts (S). Remove ducts from litter compartment.

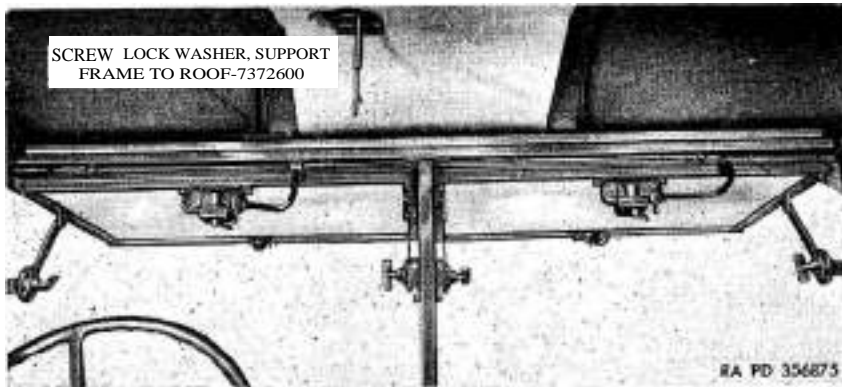


Figure 202. Roof to windshield and support frame assembly attaching screws.

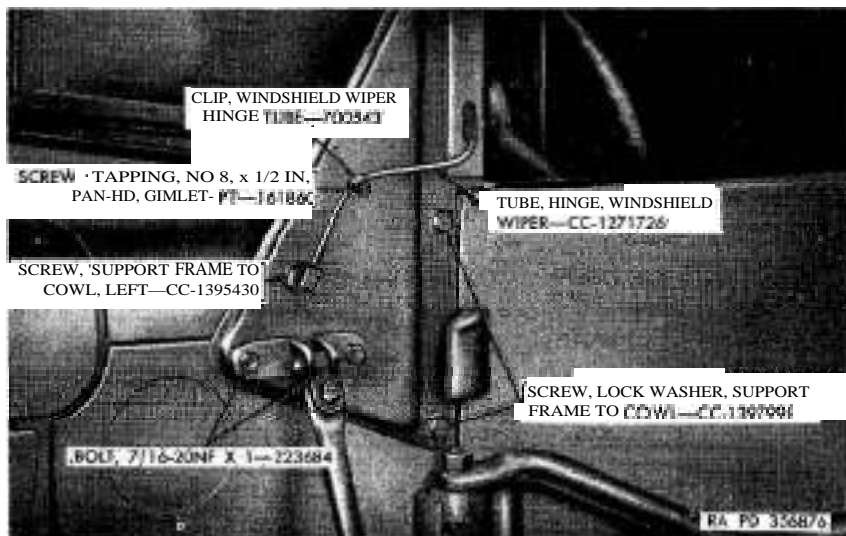


Figure 203. Windshields and support frame assembly to cowl parts.

b. Remove Air Control Blower Valves, Blower Inspection Covers, and Blower Outlet Louvers (fig. 210).

- (1) Remove four screws, which attach each air control blower valve (R) to body partition ; then remove valves.
- (2) Remove four fillister head machine screws (T). This will release each blower outlet louver (U), blower outlet screen (V), and blower outlet gasket (W) from body panel. Remove louvers, screens, and gaskets.

c. Remove Blower Outlet Extensions (fig. 201). Loosen two

screws (lower and front) on each side. Pull extensions through openings in body panels.

d. Remove Right and Left Ventilating Blower Assemblies (fig. 201).

- (1) Remove blower motor cable from ventilating blower cable clip. Disengage switch-to-blower cable assembly from blower motor cable by separating the connector shells.
- (2) Remove nuts and lock washers from studs in blower housing assemblies (litter compartment side).
- (3) Remove right and left ventilating blower assemblies, blower housing gaskets, blower housing spacers, and plain washers (if truck is so equipped) from body.

252. Driver's and Attendant's Seat Assemblies (Field and Depot Maintenance)

Refer to paragraph 217 for information pertaining to the removal of the driver's and attendant's seat assemblies.

253. Rear Door Assemblies (Field and Depot Maintenance)

a. Disconnect Check Arms (fig. 204). Remove cotter pins (T) and check arm plain washers (S). Remove check arms (Q) from brackets on body.

b. Remove Rear Door Assemblies (fig. 204).

- (1) Remove hinge screw hole rubber plugs (R) from body hinge pillars.
- (2) Remove hinge lock washer screws (Y) (four each hinge) from hinges and body-hinge pillar. Remove door assemblies from vehicle.

254. ~~Folding~~ Step Assembly (field and Dew Maintenance)

a. Remove Rear Door Scuff Plate From Body.

- (1) Remove lower striker lock washer screws (fig. 205) and door lower lock strikers.
- (2) Remove nuts and lock washers from scuff plate front screws. Remove screws.
- (3) Remove scuff plate tapping rear screws. Remove rear door scuff plate from body.

b. Remove Folding Step Assembly (figs. 205 and 206). Remove step hinge lock washer screws. Remove folding step assembly and step hinge spacers. Pull cross sill hinge weatherseals from sill and discard weatherseals.

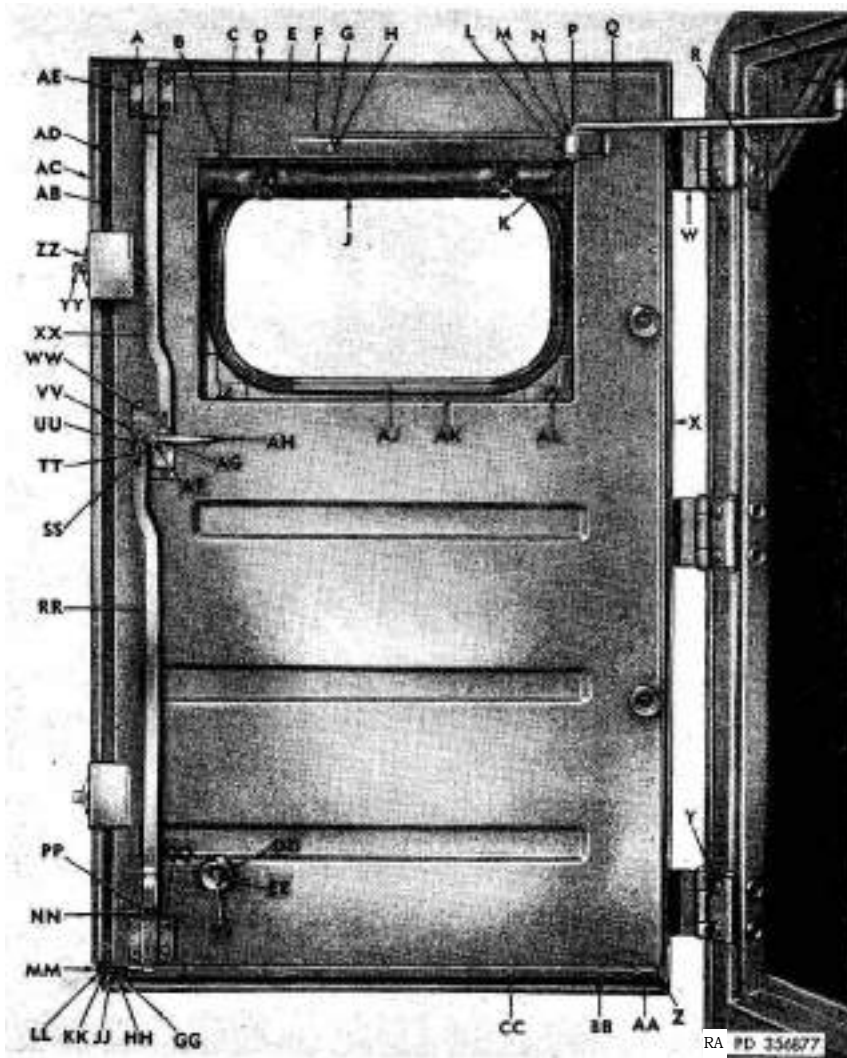


Figure 204. Rear door assembly and related parts.

A—Screw, lock washer, lock, ~~assy—CC-1279641~~
 B—Screw, tapping, No. 8 x 1/2-161860
 C—Washer, plain, No. 8-446143
 D—Weatherseal, upper—CC-1395637
 E—Door, left rear—CC-1395257
 Door, right rear—CC-1395256
 F—Guide, check arm, ~~assy—CC-1395302~~
 G—Screw, cap, 5/16-24NF x % -123473
 H—Washer, lock, ~~5/16-inch—120214~~
 J—Curtain, blackout, assy—CC-1395339
 K—Pin, cotter, 1/8 x 1-103385
 L—Washer, plain, check arm—CC-1094370
 M—Spacer, check arm-7350304
 N—Washer, plain, check arm—CC-1094370
 P—Pin, cotter, 1/8 x 1—103385
 Q—Arm, check-7376113
 R—Plug, rubber, hinge screw hole—CC-1395805
 S—Washer, plain, check arm—CC-1094370
 T—Pin, cotter, 1/2 x 1-103385
 U—Hinge, door to body—CC-1395294
 V—Pin, hinge—CC-1395296
 W—Hinge, door—CC-1395295
 X—Weatherseal, hinge pillar—CC-1395318
 Y—Screw, lock washer, hinge—CC-1397998
 Z—Weatherseal, hinge pillar, lower—CC-1395319
 AA—Weatherseal, lower—CC-1395322
 BB—Retainer, lower weatherseal—CC-1395328
 CC—Screw, tapping, No. 10 x 1/2-161895
 DD—Bumper, rubber-7350265
 ER—Washer, plain, 13/32 ID, 13/16 OD-103341
 FF—Screw, 5/16- 24NF x 7A-223651
 GG—Screw, tapping, No. 8 x 1/2-161860
 HH—Washer, plain, No. 8-446143
 JJ—Weatherseal, lock pillar, lower—CC-1395321
 KK—Retainer, lock pillar lower weatherseal—CC-1395326
 LL—Washer, plain, No. 8-446143
 MM—Screw, tapping, No. 8 x 1/2-161860
 NN—Washer, lock, external-teeth, 14-inch-138165
 PP—Screw, mach, round-hd, ~~1/2-20NF~~ x 1A-120628
 QQ—Spacer, lock, lower—CC-1395641
 RR—Link, lock remote control, lower left—CC-1398976
 Link, lock remote control, lower right—CC-1398975
 SS—Pin, cotter, 3/32 x 3/4-103373
 TT—Washer, plain, 11/32 ID, 11/16 OD-120393
 UU—Washer, spring, remote control—CC-1398977
 VV—Control, lock remote, left, ~~assy—CC-1398973~~
 Control, lock remote, right, assy—CC-1398972
 WW—Screw, lock washer, lock remote control—CC-1279646
 XX—Link, lock remote control, upper—CC-1398974
 YY—Dovetail, male-7350348
 ZZ—Screw, lock washer, ~~dovetail—CC-446580~~
 AB—Screw, tapping, No. 10 x 1/4—~~161895~~
 AC—Weatherseal, lock pillar—CC-1395320
 AD—Retainer, lock pillar ~~weatherseal—CC-1395324~~
 AE—Lock, assy—CC-1398971
 AF—Screw, lock washer, lock remote control inside ~~handle—CC-191881~~
 AG—Washer, plain, 7/32 ID, 1/2 OD-118676
 AH—Handle, lock remote control, inside—CC-1395563
 AJ—Insert, glass ~~weatherseal—CC-1395317~~
 AK—Weatherseal, glass—CC-1395316
 AL—Stud, blackout curtain fastener—CC-931444

Figure 204—Continued.

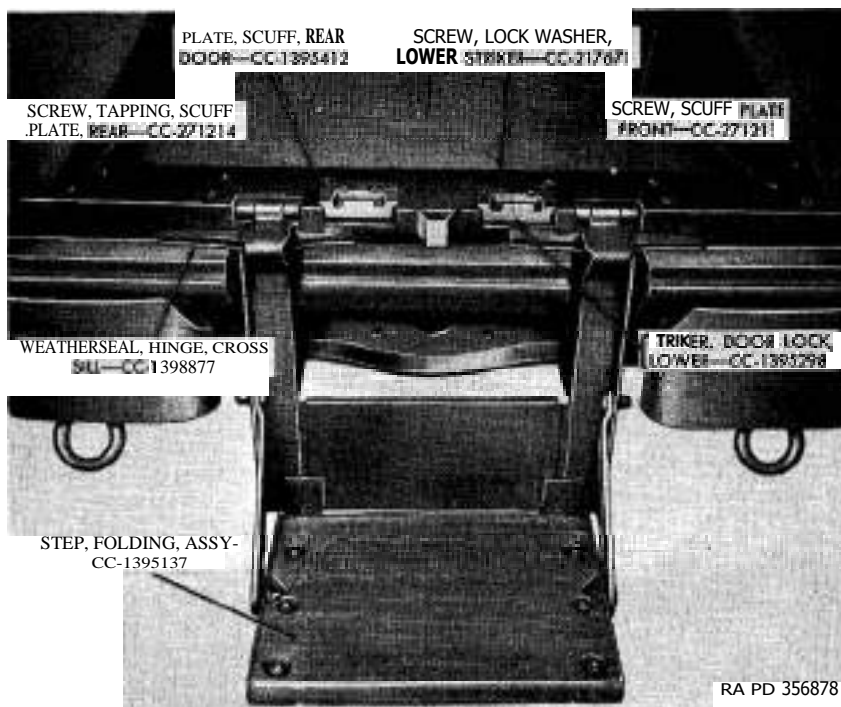


Figure 205. Folding step assembly—installed.

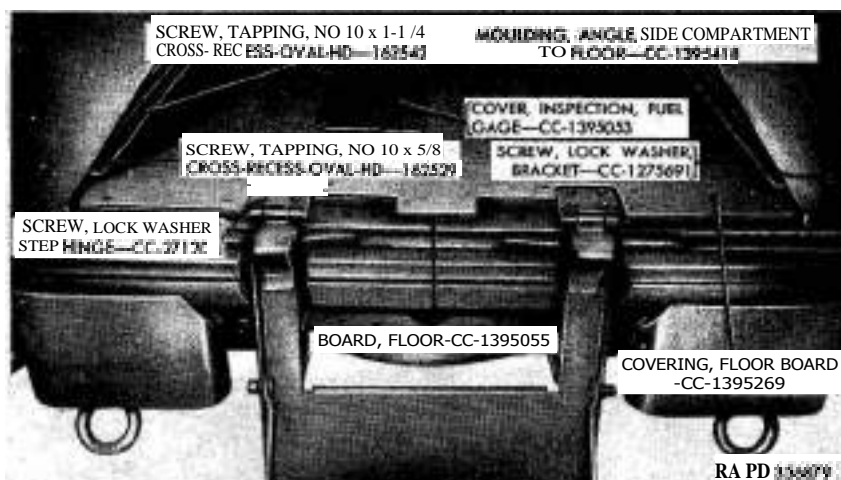


Figure 206. Folding step hinges and floor board with related parts.

255. Cowl Ventilator Assembly (Field and Depot Maintenance)

Refer to paragraph 220 for information pertaining to the removal of the cowl ventilator assembly.

Section III. REBUILD OF PARTITION DOOR ASSEMBLY

256. Disassembly (Field and Depot Maintenance)

(fig. 207)

a. Remove Blackout Curtain and Related Parts.

- (1) Remove three pan-head tapping screws (A) and plain washers (B). This will release blackout curtain (C) from door.
- (2) Remove nuts (H) and lock washers (G) from blackout curtain fastener studs (FF). Remove studs from door.

b. Remove Door Glass.

Note. Do not remove door glass or glass weatherseal unless inspection (par. 257b) reveals that replacement is necessary.

- (1) Pry one end of glass weatherseal insert (F) from glass weatherseal (EE) and pull insert from weatherseal.
- (2) Force door glass from weatherseal and remove glass. Remove weatherseal from door.

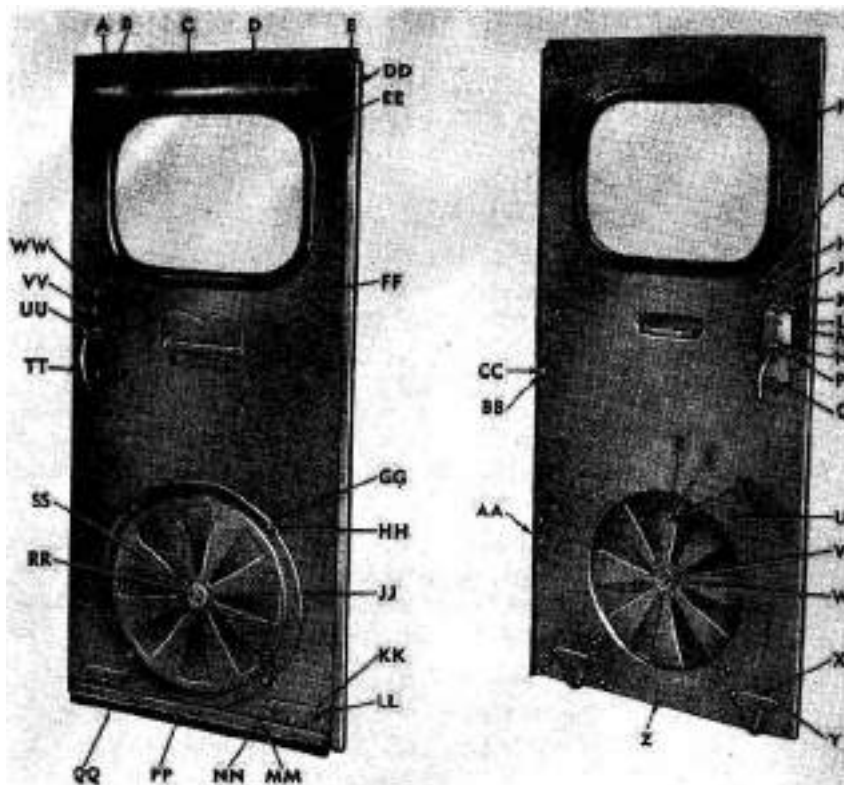
c. Remove Lock Assembly and Related Parts.

- (1) Remove locking cylinder retainer set screw from opening in lock spacer (L). Remove locking cylinder assembly (VV) from door. Remove machine screw (P), lock washer (N), and lock inside handle (Q).
- (2) Remove nuts (K), lock washers (J), and carriage bolts (WW) from lock assembly and door. Remove lock assembly (M) and lock spacer (L) from door.
- (3) Remove nuts, lock washers, and oval-head machine screws (UU) ; then remove outside lock handle assembly (TT) from door.

d. Remove Door Side Weatherseal and ~~Door~~ Lower Weatherseal.

Note. Do not remove door side weatherseals or door lower weatherseals unless inspection (par. 257d) reveals that replacement is necessary.

- (1) Remove nuts (BB), lock washers (CC), and round-head machine screws (E) ; then remove door side weatherseal retainer (DD) and door side weatherseal (AA) from door. Separate retainer and weatherseal. Discard ~~weath-~~
~~er~~seal.
- (2) Remove nuts (NN), lock washers (MM), and carriage bolts (Z) ; then remove door lower weatherseal retainer (PP) and door lower weatherseal (QQ) from door. Separate retainer from weatherseal. Discard weatherseal.



A—SCREW, TAPPING, PAN-HD,
NO 8 x 7/8-161869
B—WASHER, PLAIN, NO 10-120214
C—CURTAIN, BLACKOUT-7350275
D—DOOR—CC-1395517
E—SCREW, MACH, RD-HD,
NO 10-32NF x 7/8-132919
F—INSERT, GLASS WEATHERSEAL—
CC-1395533
G—WASHER, LOCK, NO 10-120217
H—NUT, NO 10-32NF-120614
J—WASHER, LOCK, 5/16 IN-120214
K—NUT, 5/16-18NC-120374
L—SPACER, LOCK—CC-1395521
M—LOCK, ASSY—CC-1395507
N—WASHER, LOCK, NO 10-120217
P—SCREW, MACH, PAN-HD,
NO 10-24NC x 5/8-191681
Q—HANDLE, INSIDE LOCK—CC-1395543
R—KNOB, VENTILATOR—CC-1395544
S—STUD, VENTILATOR KNOB—CC-1395543
T—WASHER, LOCK, 5/16 IN-120214
U—BOLT, CARRIAGE, RD-HD,
5/16-18NC x 1-126358
V—WASHER, LOCK, 1/2 IN-120384
W—NUT, 1/2-20NF-120071
X—ROLLER, ASSY—CC-1395546
Y—BOLT, CARRIAGE, RD-HD,
5/16-18NC x 1-126358
Z—BOLT, CARRIAGE, RD-HD,
1/4-20NC x 7/8-120071

AA—WEATHERSEAL, DOOR SIDE—CC-1395549
BB—NUT, NO 10-32NF-120614
CC—WASHER, LOCK, NO 10-120217
DD—RETAINER, DOOR SIDE WEATHERSEAL—
CC-1395533
EE—WEATHERSEAL, GLASS—CC-1395520
FF—STUD, BLACKOUT CURTAIN FASTENER—
CC-1395636
GG—WASHER, LOCK, 5/16 IN-120214
HH—NUT, 5/16-18NC-120367
JJ—VENTILATOR ASSY—CC-1395538
KK—WASHER, LOCK, 5/16 IN-120214
LL—NUT, 5/16-18NC-120376
MM—WASHER, LOCK, 1/4 IN-120380
NN—NUT, 1/4-20NC-120373
PP—RETAINER, DOOR LOWER WEATHERSEAL—
CC-1395550
QQ—WEATHERSEAL, DOOR LOWER—
CC-1395544
RR—BOLT, TILAT, 1/2-20NF x 7/8—
213964
SS—WASHER, PLAIN, VENTILATOR BOLT—
CC-443521
TT—HANDLE, OUTSIDE LOCK, ASSY—
CC-1395528
UU—SCREW, MACH, OVAL-HD,
NO 10-32NF x 1-157179
VV—CYLINDER, LOCKING, ASSY-7350275
WW—BOLT, CARRIAGE, RD-HD,
5/16NC x 1 3/4-120231

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Figure 207. Partition door assembly.

e. Remove Ventilator Assembly From Door.

- (1) Remove four nuts (HH), lock washers (GG), and carriage bolts (U) ; then remove ventilator assembly (JJ) from door.
- (2) Remove nut (W) , lock washer (V), ventilator bolt plain washers (SS), and ventilator bolt (RR). Remove ventilator knob (R) and lock washer (T) from ventilator knob stud (S). This will result in separation of inner and outer halves of ventilator assembly (JJ) and ventilator spacer. Remove other knob from stud.

f. Remove Roller Assemblies From Partition Door. Remove nuts (LL), lock washers (KK), and carriage bolts (Y) ; then remove the two roller assemblies (X) from door.

g. Remove Door Pillar Weatherseal and Door Bumper.

Note. Do not remove door pillar weatherseal unless inspection (par. 257g) reveals that replacement is necessary.

- (1) Pull door pillar weatherseal from partition door right pillar and discard weatherseal.
- (2) Remove two tapping screws and plain washers ; then remove door bumper from partition door left pillar.

h. Remove Door Upper Run From Door Upper Run Retainer.

Note. Do not remove door upper run from door upper run retainer unless inspection (par. 257h) reveals that replacement is necessary.

Drive door upper run studs from door upper run retainer and door upper run with a punch and hammer. This will separate run from retainer. Discard run and studs.

i. Cleaning. Remove all traces of corrosion or dirt from door shell and metal parts.

257. Inspection (Field and Depot Maintenance)

(fig. 207)

a. Inspect Blackout Curtain and Related Parts.

- (1) Inspect blackout curtain (C) for holes, damage, or deterioration. If any of these conditions exist, replace curtain.
- (2) Inspect blackout curtain fastener studs (FF) for corrosion or wear. If either of these conditions exist, replace fastener studs.

b. Inspect Door Glass, Glass Weatherseal Insert, and Glass Weatherseal.

- (1) Inspect door glass for cracks or discoloration. If either of these conditions exist, replace glass (pars. 250 and 258g).

- (2) Inspect glass weatherseal insert (F) for deterioration or other visual damage. Replace insert (pars. 256b and 258g) if not in good condition.
- (3) Inspect glass weatherseal (EE) for deterioration or other visual damage. Replace weatherseal (pars. 256b and 258g) if not in good condition.

c. Inspect Lock Assembly and Related Parts.

- (1) Inspect lock assembly (M) for worn or broken parts or corrosion. If any of these conditions exist, replace lock assembly.
- (2) Inspect lock spacer (L) for cracks or other visual damage. Replace if necessary.
- (3) Inspect lock inside handle (Q) for wear or cracks. If either of these conditions exist, replace handle.
- (4) Inspect lock outside handle assembly (TT) for corrosion, cracks, or worn parts. If any of these conditions exist, replace handle assembly.

d. Inspect Door Side Weatherseal, Door Side Weatherseal Retainer, Door Lower Weatherseal, and Door Lower Weatherseal Retainer.

- (1) Inspect door side weatherseal (AA) and door lower weatherseal (QQ) for cracks, inadequate contact, or deterioration. If any of these conditions exist, replace weatherseal (pars. 256d and 258e).
- (2) Inspect door side weatherseal retainer (DD) and door lower weatherseal retainer (PP) for corrosion or distortion. If either of these conditions exist, replace retainer (pars. 256d and 258e).

e. Inspect Ventilator Assembly.

- (1) Inspect ventilator assembly (JJ) inner and outer halves for misalignment or corrosion. If either of these conditions exist, replace ventilator assembly.
- (2) Inspect ventilator bolt (RR), ventilator bolt plain washers (SS), lock washer (V), nut (W), and spacer for worn or damaged threads or corrosion. Replace bolts, washers, and spacer if they are not in satisfactory condition.
- (3) Inspect ventilator knob (R) and ventilator knob stud (S) for damaged or worn threads or corrosion. If any of these conditions exist, replace parts as required.

f. Inspect Roller Assemblies. Inspect roller assemblies (X) for worn or damaged bearings, worn rollers, or damaged brackets. If any of these conditions exist, replace roller assemblies.

g. Inspect Door Pillar Weatherseal and Door Bumper.

- (1) Inspect door pillar weatherseal, which is attached to the partition door right pillar, for deterioration or looseness. If weatherseal is deteriorated, it must be replaced (pars. 256g and ~~258j~~). If weatherseal is loose at any point, it can be attached to the pillar post with synthetic rubber cement (52-C-1556).
- (2) Inspect door bumper, which is located on the partition door left pillar, for deterioration or other visual damage. If bumper is not in good condition, install new bumper.

h. Inspect Door Upper Run and Door Upper Run Retainer.

- (1) Inspect door upper run for deterioration, wear, or other visual damage. If upper run is not in good condition, it must be replaced (pars. 256h and 2580).
- (2) Inspect door upper run retainer for corrosion or distortion. If either of these conditions exist, replace retainer (pars. 256 h and 2580).

i. Inspect Door. Inspect door (D) for corrosion, distortion, or other visual damage. Replace door if any of these conditions exist.

258. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 207, except where otherwise indicated.

a. Install Roller Assemblies on Door.

- (1) Apply a small quantity of general purpose grease (GAA) on the roller assembly ball bearings.
- (2) Position roller assemblies (X) on door and install six 5/16-18NC x 1 round-head carriage bolts (Y) (heads on opposite side of curtain screw holes). Install 5/16-inch lock washers (KK) and 5/16-18NC nuts (LL). Tighten nuts.

b. Install Ventilator Parts and Ventilator Assembly on Door.

- (1) Position ventilator inner half in ventilator outer half (flanged section).
- (2) Place ventilator bolt plain washer (SS) on the ~~1/2-20NF~~ x ⁷/₈ ventilator bolt (RR) followed by ventilator spacer. Insert bolt through center of ventilator (head on flanged half of ventilator), and install other ventilator bolt plain washer, ~~1/2-inch~~ lock washer (V), and ~~1/2-20NF~~ nut (W). Tighten nut.

c. Install Ventilator Knob Stud, Lock Washers, and Ventilator Knobs.

- (1) Position knob hole of ventilator inner half in notch opening of ventilator outer half.

- (2) Assemble ventilator knob (R) on ventilator knob stud (S) and install 5/16-inch lock washer (T). Insert stud through ventilator inner half and install other ventilator knob on stud. Tighten knob.

d. Install Ventilator Assembly.

- (1) Install four 5/16-18NC x 1 round-head carriage bolts (U) in door for ventilator assembly (heads on same side as bolts for roller assemblies).
- (2) Position ventilator assembly (JJ) on door (knob at top) and install four 5/16-inch lock washers (GG) and 5/16-18NC nuts (HH). Tighten nuts.

e. Install Door Lower Weatherseal, Door Lower Weatherseal Retainer, Door Side Weatherseal, and Door Side Weatherseal Retainer.

- (1) Install five ~~1/4-20NC~~ x 7/8 round-head carriage bolts (Z) through door for door lower weatherseal (heads on opposite side of ventilator). Position door lower weatherseal (QQ) on bolts, followed by door lower weatherseal retainer (PP) (flanged edges out). Install five ~~1/4-inch~~ lock washers (MM) and ~~1/4-20NC~~ nuts (NN). Tighten nuts.
- (2) Position door side weatherseal (AA) on ventilator side of door followed by door side weatherseal retainer (DD) so that flange covers edge of door and weatherseal. Install five No. 10-32NF x 7/8 round-head machine screws (E) through retainer, weatherseal, and door. Install five No. 10 lock washers (CC) and No. 10-32NF nuts (BB). Tighten nuts.

f. Install Lock Assembly and Related Parts.

- (1) Position lock outside handle assembly (TT) on ventilator side of door (handle down). Install two No. ~~10-32NF~~ x 1 oval-head machine screws (UU) through handle escutcheon and door. Install two No. 10 lock washers and No. 10-32NF nuts. Tighten nuts.
- (2) Install two 5/16NC x 1 3/4 round-head carriage bolts (WW) through door for lock assembly (heads on ventilator side of door). Position lock spacer (L) over bolts so that locking cylinder support sleeve flange fits into recess in door. Insert locking cylinder assembly (VV) in door, but do not tighten locking cylinder retainer set screw. Place lock assembly (M) on spacer and guide locking cylinder shaft through opening in lock assembly with a piece of wire. Install two 5/16-inch lock washers (J) and two 5/16-18NC nuts (K). Tighten nuts. Posi-

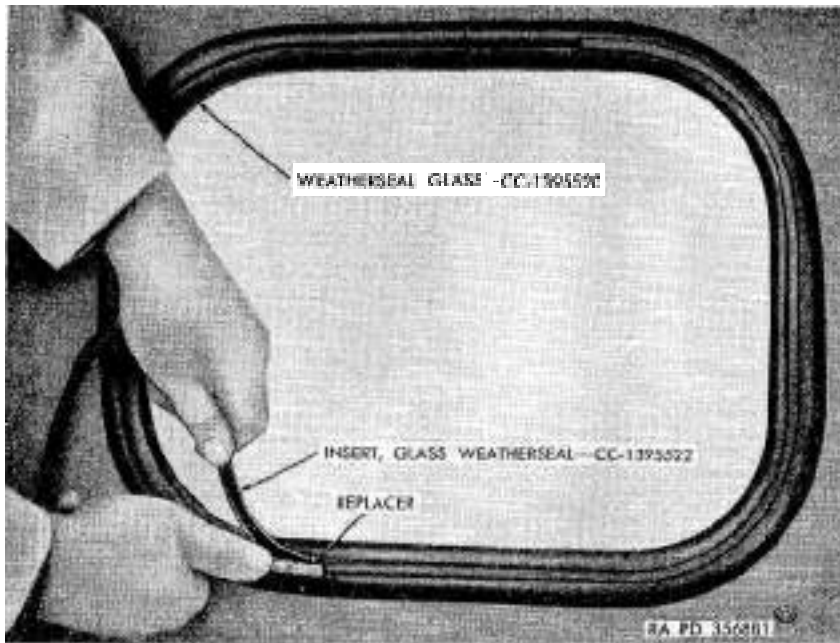


Figure 208. Installing glass weatherseal insert with an improvised weatherseal insert replacer.

tion locking cylinder assembly (VV) in door (key slot down) as far as it will go. Tighten locking cylinder retainer set screw, which is accessible through an opening in the lock spacer (L).

- (3) Install lock inside handle (Q) (handle down). Install No. 10 lock washer (N) and No. 10-24NC x % pan-head machine screw (P). Tighten screw.

g. Install Glass Weatherseal, Door Glass, and Glass Weatherseal Insert.

- (1) Position glass weatherseal (EE) around opening in door with joint at top and weatherseal insert opening on lock side of door.
- (2) Position door glass in weatherseal.
- (3) Apply a liberal coating of liquid soap over entire surface of glass weatherseal insert (F). Position end of weatherseal insert 3 inches either side of weatherseal joint and install insert with an improvised weatherseal insert replacer (*fig. 208*). A satisfactory replacer can be fabricated locally (*fig. 8*).

Caution : Exercise extreme care to prevent stretching of the glass weatherseal insert during installation. If

stretching occurs during installation, push insert backward in glass weatherseal with a screw driver. This will increase force of weatherseal against glass.

h. Install Blackout Curtain and Related Parts.

- (1) Install blackout curtain fastener studs (FF) through door with fastener on ventilator side. Install No. 10 lock washers (G) and ~~No. 10-32NF~~ nuts (H) on blackout curtain fastener studs. Tighten nuts.
- (2) Position blackout curtain (C) on ventilator side of door and install three No. 8 plain washers (B) and No. 8 x 5/8 pan-head tapping screws (A). Tighten screws.

i. Install Door Upper Run In Door Upper Run Retainer. Position door upper run in door upper run retainer. Fasten run to retainer with three door upper run studs.

j. Install Door Bumper and Door Pillar Weatherseal.

- (1) Position door bumper on partition door left pillar and install two No. 8 plain washers and No. 8 x ³/₈ pan-head tapping screws. Tighten screws.
- (2) Apply a coating of synthetic rubber cement (52-C4556) on flat side of new door pillar weatherseal and in channel on partition door right pillar. Allow cement to dry for 10 minutes and install new weatherseal (lip forward).

Section IV. REBUILD OF FRONT DOOR ASSEMBLIES

259. Disassembly (Field and Depot Maintenance)

a. General. The front door assemblies are identical with the door assemblies on the cab. The same rebuild information also applies to the ambulance front door assemblies.

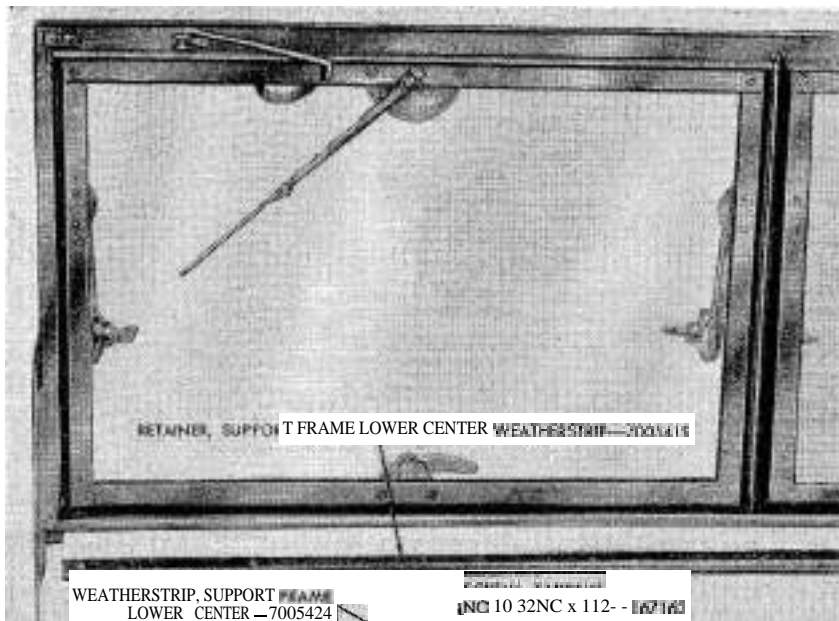
b. Remove Parts From Door Assemblies. Refer to paragraph 221 for information pertaining to the disassembly of the front door assemblies.

260. Inspection (Field and Depot Maintenance)

Refer to paragraph 222 for information pertaining to the inspection of the front door assemblies.

261. Assembly (Field and Depot Maintenance)

Refer to paragraph 223 for information pertaining to the assembly of the front door assemblies.



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Figure 209. Support frame lower center weatherstrip and retainer.

Section V. REBUILD OF WINDSHIELDS AND SUPPORT FRAME ASSEMBLY

262. Disassembly (Field and Depot Maintenance)

a. General. The removal of the windshield assemblies, windshield glass, and support frame related parts is described in paragraph 227. The only items covered in this section are those peculiar to the ambulance body.

b. Remove Support Frame Lower Center Weatherstrip Retainer (fig. 209) . Remove nine tapping screws. This will release the support frame lower center weatherstrip retainer from support frame assembly.

c. Cleaning. Remove all traces of sealing compound from top of support frame assembly.

263. Inspection (Field and Depot Maintenance)

a. General. Only the items peculiar to the ambulance body are covered in this paragraph. Refer to paragraph 228 for complete information pertaining to the inspection of the windshields and support frame assembly.

b. Inspect Support Frame Lower Center Weatherstrip Retainer and Weatherstrip Retainer Screw Holes in Support Frame Assembly.

- (1) Inspect support frame lower center weatherstrip retainer (fig. 209) for corrosion, distortion, or cracks. If any of these conditions exist, replace retainer.
- (2) Check screw holes in lower portion of support frame assembly with a No. 10-32NC tapping screw to determine if the holes are in good condition. If the screw is not a satisfactory fit, it will be necessary to install an over-size tapping screw in the holes that are enlarged.
- (3) Check screw holes at top of support frame assembly with a $\frac{3}{8}$ -24NF cap screw. If any of the threads are worn or damaged, repair with a $\frac{3}{8}$ -24NF tap. If the threads cannot be restored with a tap, it will be necessary to install a 7/16-20NF x $\frac{7}{8}$ lock washer screw.

264. Assembly (Field and Depot Maintenance)

Refer to paragraph 229 for information pertaining to the assembly of the windshields and support frame assembly.

Section VI. REBUILD OF WINDSHIELD WIPER MOTOR ASSEMBLIES

265. Disassembly (Depot Maintenance)

a. General. The windshield wiper motor assemblies are identical on the ambulance body and cab, and the same rebuild information applies.

b. Remove Parts From Windshield Wiper Motor Assemblies. Refer to paragraph 230 for information pertaining to the disassembly of the windshield wiper motor assemblies.

266. Inspection (Depot Maintenance)

Refer to paragraph 231 for information pertaining to the inspection of the windshield wiper motor assembly parts.

267. Assembly (Depot Maintenance)

Refer to paragraph 232 for information pertaining to the assembly of the windshield wiper motor assemblies.

Section VII. REBUILD OF VENTILATING BLOWER ASSEMBLIES

26B. Disassembly (Field and Depot Maintenance)

a. Remove Right and Left Blower Motors and Parts From Right and Left Blower Housing Assemblies (fig. 210).

- (1) Remove plain washers (N) from studs in blower housing assembly, if so equipped.
- (2) Remove blower housing spacer (M), blower housing spacer plate (L), and blower housing gasket (K) from blower housing assembly (J).
- (3) Remove five pan-head tapping screws (A). This will release cable clip, ground wire, and left and right blower motor assembly (B) from blower housing assembly (J). Remove blower motor assembly (B) and motor retainer (D) from blower housing assembly (J).
- (4) Loosen set screw in blower wheel hub with a 5/32-inch set screw wrench. Remove blower wheel (H) from blower motor shaft.
- (5) Remove nuts (G), lock washers (F), plain washers (Y), and motor mounting grommets (E) from screws in blower motor ; then remove motor retainer (D) and motor gasket (C) from blower motor.

b. Cleaning. Wash all parts except blower motor and gaskets in volatile mineral spirits or dry-cleaning solvent. Dry with compressed air. Wipe dirt from blower motor with a rag dipped in dry-cleaning solvent or volatile mineral spirits.

269. Inspection (Field and Depot Maintenance)

(fig. 210)

a. Inspect Right and Left Blower Motor Assemblies.

- (1) Inspect blower motor assembly (B) for corrosion. If metal is not damaged by corrosion to the extent that the protection of the internal parts is endangered, remove corrosion and repaint as required.
- (2) Check end play of motor shaft and if end play is not within the limits indicated in paragraph 352, replace motor assembly.
- (3) Check current draw and revolutions per minute of motor shaft. If current draw and performance of motor is not within the specifications indicated in paragraph 352, replace motor assembly.

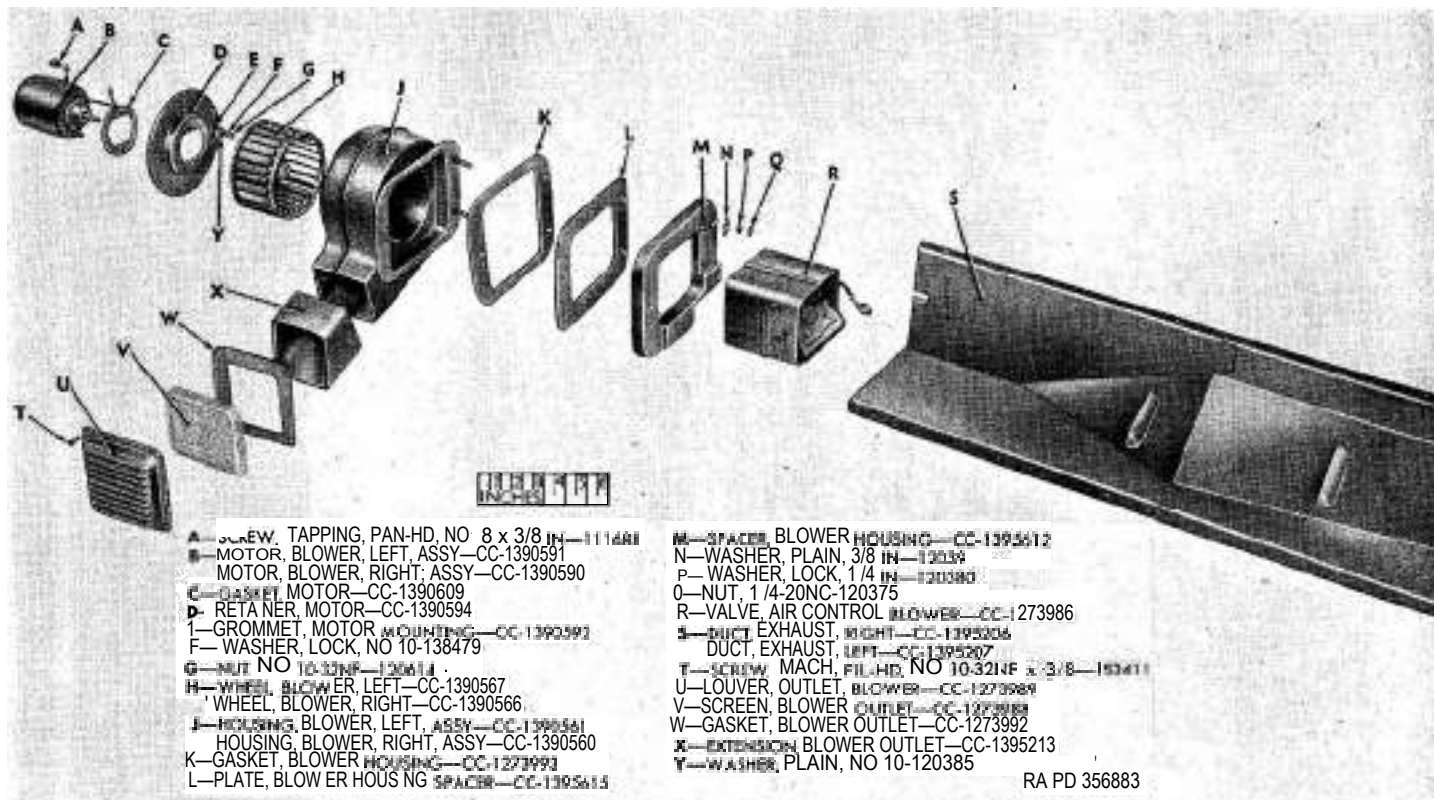


Figure 210. Ventilating blower assembly—exploded view.

b. Inspect Motor Gaskets, Motor Retainers, and Right and Left Blower Wheels.

- (1) Inspect motor gasket (C) for deterioration or breakage. If either of these conditions exist, replace gasket.
- (2) Inspect motor retainer (D) for corrosion, cracks, or distortion. If corrosion has not damaged metal, remove corrosion and paint retainer. If retainer is distorted or cracked, install new retainer.
- (3) Inspect blower wheel (H) for bent blades, damaged set screw threads, or other visual damage. If blower wheel is not in satisfactory condition, it must be replaced.

c. Inspect Right and Left Blower Housing Assemblies, Blower Housing Gaskets, Blower Housing Spacer Plates, and Blower Housing Spacers.

- (1) Inspect blower housing assembly (J) for corrosion, distortion, cracks, or damaged threads on attaching bolts. If any of these conditions exist, replace housing assembly.
- (2) Inspect blower housing gasket (K) for deterioration. If gasket is not in good condition, it must be replaced.
- (3) Inspect blower housing spacer plate (L) for corrosion or distortion. If either of these conditions exist, replace plate.
- (4) Inspect blower housing spacer (M) for deterioration or cracks. If either of these conditions exist, replace spacer.

d. Inspect Blower Air Control Valve, Blower Outlet Extension, Blower Outlet Gasket, Blower Outlet Screen, and Blower Outlet Louver.

- (1) Inspect air control blower valve (R) for corrosion, distortion, worn or deteriorated valve plate, broken shaft tension spring or spot welds. Tension spring can be replaced, but if any other unsatisfactory conditions exist, valve must be replaced.
- (2) Inspect blower outlet extension (X) for corrosion, distortion, or cracks. If any of these conditions exist, replace extension.
- (3) Inspect blower outlet gasket (W) for deterioration. If gasket is not in satisfactory condition, it must be replaced.
- (4) Inspect blower outlet screen (V) for deterioration or breakage. If either of these conditions exist, screen must be replaced.
- (5) Inspect blower outlet louver (U) for bent or broken plates or corrosion. If louver is distorted or damaged, replace louver.

e. Inspect Right and Left Exhaust Ducts. Inspect exhaust ducts (S) for corrosion, distortion, broken spot welds, or other visual damage. If ducts are not in satisfactory condition, they must be replaced.

270. Assembly (Field and Depot Maintenance)

(fig. 210)

a. General. The right and left blower motor assemblies revolve in opposite directions. Viewing the shaft end, the shaft revolves clockwise on the left motor and counterclockwise on the right motor.

b. Install Motor Gaskets and Motor Retainers On Blower Motor Assemblies.

- (1) Place motor gasket (C) on shaft end of blower motor assembly (B). Position motor retainer (D) on shaft end of motor assembly (flange toward motor assembly).
- (2) Place motor mounting grommets (E) on motor screws, followed by No. 10 plain washer (Y), No. 10 lock washer (F), and No. ~~10-32NF~~ nut (G) . Tighten nut.

c. Install Right and Left Blower Wheels.

Note. Right and left blower wheels are required and the position of the blower wheel blades must be checked before installation. The blower wheel blades must slant in the direction of motor rotation. Refer to a above.

Aline flat portion of motor shaft with set screw hole in blower wheel hub. Position blower wheel (H) on shaft (open end of wheel out) and locate hub end of wheel flush with bottom of chamfer on end of motor shaft. Install ~~1/4-20NC~~ $\frac{1}{4}$ -20NC x $\frac{3}{8}$ hex-socket cup-point set screw ; tighten with a 5/32-inch set screw wrench.

d. Install Blower Motor Assemblies In Blower Housing Assemblies.

- (1) Position blower motor assembly in blower housing assembly (J) with motor cable up on right assembly and down on left assembly.
- (2) Position cable clip at bottom and install five No. 8 x 3/8 inch pan-head tapping screws (A). Attach motor ground wire to motor retainer under one of the screws. Tighten screws.

e. Install Blower Housing Gaskets, Blower Housing Spacer Plates, and Blower Housing Spacers. Place blower housing gasket (K) on blower housing assembly, followed by blower housing spacer plate (L) and blower housing spacer (M), with flat side toward blower housing assembly.

Section VIII. DRIVER'S AND ATTENDANT'S SEAT ASSEMBLIES

271. Disassembly (Field and Depot Maintenance)

a. General. The driver's and attendant's seat assemblies are similar to driver's seat in the cab, and the same rebuild information applies.

b. Remove Parts From Driver's and Attendant's Seat Assemblies. Refer to paragraph 224 for information pertaining to the disassembly of driver's and attendant's seat assemblies.

272. Inspection (Field and Depot Maintenance)

Refer to paragraph 225 for information pertaining to the inspection of driver's and attendant's seat assemblies.

273. Assembly (Field and Depot Maintenance)

Refer to paragraph 226 for information pertaining to the assembly of driver's and attendant's seat assemblies.

Section IX. REBUILD OF REAR DOOR ASSEMBLIES

274. Disassembly (Field and Depot Maintenance)

(fig. 204)

a. General. The right and left rear door assemblies are disassembled in a like manner. The disassembly of the left door assembly is described in this paragraph. The parts peculiar to the right door assembly are—lock remote control lock cylinder, lock remote control outside handle, and female dovetail assembly.

b. Remove Check Arm and Check Arm Guide Assembly From Rear Door Assemblies.

- (1) Remove cap screws (G) and lock washers (H) ; then remove check arm guide assembly (F) from door.
- (2) Remove cotter pin (K), check arm plain washer (L), and check arm spacer (M) from check arm (Q). Remove check arm (Q) from check arm guide assembly (F). Remove check arm plain washer (N) and cotter pin (P) from check arm. Discard cotter pins.

c. Remove Blackout Curtain Assembly and Blackout Curtain Fastener Studs.

- (1) Remove three tapping screws (B) and plain washers (C) ; then remove blackout curtain assembly (J) from door.

- (2) Remove blackout curtain fastener studs (AL) from door.

d. Remove Rubber Bumpers From Door. Remove screws (FF), plain washers (EE) and rubber bumpers (DD) from door.

e. Remove Lock Remote Control, Lock Assemblies, Lock Remote Control Links, and Lock Remote Control Inside Handle From Doors.

- (1) Remove lock remote control inside handle lock washer screw (AF), plain washer (AG), and lock remote control inside handle (AH).
- (2) Remove cotter pins (SS), plain washers (TT), machine screws (PP), and lock washers (NN). This will release the lock remote control lower link (RR) and lock remote control upper link (XX). Remove remote control links and remote control spring washers (UU).
- (3) Remove lock assembly lock washer screws (A) ; then remove lock assemblies (AE) and lower lock spacers (QQ) from door.

f. Remove Right and Left Lock Remote Control Assembly.

Note. The right rear door assembly is equipped with a lock remote control outside handle and lock remote control lock cylinder. These parts should not be removed unless inspection (par. 275e) reveals that replacement is necessary.

- (1) Remove lock remote control lock washer screws (WW) and remove lock remote control assembly (VV) from door.
- (2) Loosen headless set screw, which retains the lock remote control lock cylinder in right door, with a magnetized screw driver through a hole provided in the edge of the door.

Caution: Loosen screw only enough to release lock remote control lock cylinder as extreme care must be exercised to prevent screw from dropping down inside of door.

Remove lock cylinder from door.

- (3) Remove two machine screws. This will release lock remote control outside handle from right door assembly. Remove handle.

g. Remove Door Hinges and Male Dovetails.

Note. The right rear door assembly is equipped with female dovetail assemblies. They should not be removed unless inspection (par. 275f) reveals that replacement is necessary.

- (1) Remove four hinge lock washer screws (Y) from each door hinge (W) ; then remove hinges from door.

- (2) Remove hinge pins (V) and remove door-to-body hinge (U) from door hinge (W).
- (3) Remove four dovetail lock washer screws (ZZ) and male dovetails (YY) from left door.
- (4) Remove female dovetail assemblies, which consist of blocks and coil springs, from right door with a small screw driver.

h. Remove Glass Weatherseal Insert, Door Glass, and Glass Weatherseal.

Note. Do not remove glass, glass weatherseal insert (AJ), or glass weatherseal (AK) from door unless inspection (par. 275g) reveals that replacement of the glass or ~~weatherseal~~ is necessary.

- (1) Lift one end of glass weatherseal insert (AJ) from glass weatherseal (AK) and pull insert from weatherseal.
- (2) Remove glass from insert side of weatherseal. Remove weatherseal from door.

i. Remove Upper ~~Weatherseal~~, Hinge Pillar Weatherseal, Hinge Pillar Lower Weatherseal, Lower Weatherseal Retainer, Lower Weatherseal, Lock Pillar Lower Weatherseal Retainer, Lock Pillar Lower Weatherseal, and Lock Pillar Weatherseal Retainer, and Lock Pillar Weatherseal.

Note. Do not remove any of the weatherseals from doors unless inspection (par. 275h) reveals that replacement is necessary.

- (1) Pull upper weatherseal (D) from door and discard weatherseal.
- (2) Pull hinge pillar weatherseal (X) from ~~door~~ and discard weatherseal.
- (3) Pull hinge pillar lower weatherseal (Z) from door and discard weatherseal.
- (4) Remove five tapping screws (CC) ; then remove lower weatherseal retainer (BB) and lower weatherseal (AA) from door and discard weatherseal.
- (5) Remove two tapping screws (GG and MM), plain washers (~~HH~~ and LL), and lock pillar lower weatherseal retainer (KK) ; then remove lock pillar lower weatherseal (JJ) from door. Discard ~~weatherseal~~.
- (6) Remove nine tapping screws (AB) ; then remove lock pillar weatherseal retainer (AD) and lock pillar weatherseal (AC) as an assembly from door.
- (7) Pull weatherseal from retainer and discard ~~weatherseal~~.

Cleaning. Remove all traces of cement and weatherseals from door and retainers. Remove corrosion from all metal parts. Clean dirt or grease from metal parts with volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

275. Inspection (Field and Depot Maintenance)

(fig. 204)

a. *Inspect Check Arm, Check Arm Guide Assembly, and Related Parts.*

- (1) Inspect check arm (Q) for corrosion, distortion, or cracks. If there is evidence of corrosion, clean corrosion from arm and perform necessary painting. Arm can be straightened if it is distorted. Replace arm if cracked.
- (2) Inspect check arm guide assembly (F) for broken spring, distortion, corrosion, or cracks. Remove corrosion and paint check arm guide. If spring is broken or there is evidence of distortion or cracks, replace check arm guide assembly.
- (3) Inspect check arm spacer (M) for corrosion or other visual damage. Corrosion can be removed. If there is evidence of other visual damage, replace spacer.

b. *Inspect Blackout Curtain Assembly and Blackout Curtain Fastener Studs.*

- (1) Inspect blackout curtain assembly (J) for deterioration or other visual damage. If blackout curtain is not in good condition, it must be replaced.
- (2) Inspect blackout curtain fastener studs (AL) for worn threads or other visual damage. If threads are worn or there is evidence of other visual damage, replace studs.

c. *Inspect Rubber Bumpers.* Inspect rubber bumpers (DD) for deterioration or other visual damage. If bumpers are not in good condition, they must be replaced.

d. *Inspect Lock Assemblies, Lock Remote Control Links, and Lock Remote Control Inside Handle.*

- (1) Inspect lock assemblies (AE) for worn latches, corrosion, broken spot welds, or binding. If latches are worn or there is evidence of any other visual damage, the lock assemblies must be replaced. Corrosion can be removed if lock is in good condition otherwise.
- (2) Inspect lock remote control lower links (RR) and lock remote control upper links (XX) for distortion, corrosion, or cracks. Replace links if they are not in good condition.
- (3) Inspect lock remote control inside handle (All) for wear or cracks. If either of these conditions exist, replace handle.

e. *Inspect Right and Left Lock Remote Control Assemblies,*

Right Rear Door Lock Remote Control Outside Handle, and Lock Remote Control Lock Cylinder.

- (1) Inspect lock remote control assembly (VV) for wear, corrosion, broken spot welds, cracks, or binding. If binding cannot be corrected by removal of corrosion or if any of the other conditions exist, replace lock remote control assembly (pars. 274f and 276d).
- (2) Inspect link pins on lock remote control assemblies for wear or looseness. If either of these conditions exist, replace control assemblies.
- (3) Inspect right rear door lock remote control outside handle for cracks, corrosion, or distorted escutcheon. If any of these conditions exist, replace handle.
- (4) Inspect lock remote control lock cylinder on right rear door for corrosion, binding, twisted or broken shaft, or other visual damage. If any of these conditions exist, replace cylinder.

f. Inspect Door Hinges, Door-to-Body Hinges, Hinge Pins, Male and Female Dovetails.

- (1) Inspect door-to-body hinges (U) and door hinges (W) for wear, corrosion, breakage, or distortion. Corrosion can be corrected by cleaning and painting. If there is evidence of other visual damage, replace hinges.
- (2) Inspect hinge pins (V) for wear, corrosion, or ~~distortion~~. If hinge pins are not in good condition, install new pins.
- (3) Inspect male dovetails (YY) for wear. Dovetails must be replaced if they are worn.
- (4) Inspect female dovetail blocks and springs for worn blocks or broken springs. If either of these conditions exist, replace parts as required (pars. 274g and 276b).

g. Inspect Door Glass, Glass Weatherseal Insert, and Glass Weatherseal.

- (1) Inspect door glass for cracks or discoloration. If either of these conditions exist, replace door glass (pars. 274h and 276a).
- (2) Inspect glass weatherseal insert (AJ) for deterioration or cracks. If either of these conditions exist, replace glass weatherseal (AK) and glass weatherseal insert (AJ) (pars. 274h and 276a).
- (3) Inspect glass weatherseal (AK) for deterioration, cracks, or evidence of water leakage. If any of these conditions exist, replace weatherseal and glass weatherseal insert (pars. ~~274h~~ and 276a) .

h, Inspect Upper Weatherseal, Hinge Pillar ~~Weatherseal~~, Hinge

Pillar Lower Weatherseal, Lower Weatherseal, Lower Weatherseal Retainer, Lock Pillar Lower Weatherseal, and Lock Pillar Weatherseal.

- (1) Inspect upper weatherseal (D), hinge pillar weatherseal (X), hinge pillar lower weatherseal (Z), lower weatherseal (AA), lock pillar lower weatherseal (JJ), and lock pillar weatherseal (AC) for deterioration or looseness. If either of these conditions exist, replace weatherseals as required (pars. 274i and 276h).
- (2) Inspect lower weatherseal retainer (BB), lock pillar lower weatherseal retainer (KK), and lock pillar weatherseal retainer (AD) for corrosion, cracks, or distortion. If any of these conditions exist, replace retainers as required.

i. Inspect Right and Left Doors. Inspect rear door (E) for corrosion, damaged panels, distortion, broken welds, or damaged threads. If corrosion has not damaged the panels, remove corrosion and paint door as required. If any of the other conditions exist, replace door.

276. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 204, except where otherwise indicated.

a. Install Glass Weatherseal, Door Glass, and Glass Weatherseal Insert.

- (1) Position glass weatherseal (AK) around opening in door with joint at top and weatherseal insert opening on curtain side of door.
- (2) Position door glass in weatherseal.
- (3) Apply a liberal coating of liquid soap over entire surface of glass weatherseal insert (AJ). Position end of weatherseal insert 3 inches either side of weatherseal joint and install insert with an improvised weatherseal insert replacer (*fig. 208*). A satisfactory improvised replacer can be fabricated locally (*fig. 8*).

Caution: Exercise extreme care to prevent stretching of the glass weatherseal insert during installation. If stretching occurs during installation, push insert backwards in glass weatherseal with a screw driver. This will increase force of weatherseal against glass.

b. Install Door Hinges, Male Dovetails, and Female Dovetail Assemblies.

- (1) Position door hinges (W) on door and install four hinge

lock washer screws (Y) in each hinge ; do not tighten screws.

- (2) Position male dovetails (YY) on left door (tapered portion toward hinge side of door). Install dovetail lock washer screws (ZZ) and tighten screws.
- (3) Position female dovetail springs in female dovetail blocks and install assemblies in right door with spring toward outside panel.

c. Install Lock Remote Control Outside Handle and Lock Remote Control Lock Cylinder in Right Door.

- (1) Position lock remote control outside handle on right door with handle pointing toward hinges. Install two No. ~~10-24NC~~ $\times \frac{1}{2}$ oval-head machine screws. Tighten screws.
- (2) Position lock remote control lock cylinder in door (key opening down). Tighten lock remote control lock cylinder set screw, with a small screwdriver, through opening provided in edge of door.

Note. Check operation of lock cylinder when set screw is tightened to prevent possibility of binding.

d. Install Right and Left Lock Remote Control Assemblies and Lock Assemblies.

- (1) Position lock remote control assembly (VV) on door. Install and tighten lock remote control lock washer screws (WW).
- (2) Position lock assemblies (AE) on top and bottom of door, with lower lock spacer (QQ) between lower lock and door. Install and tighten lock assembly lock washer screws (A).

e. Install Lock Remote Control Links and Lock Remote Control Inside Handle.

- (1) Place remote control spring washer (UU) on inside pin of lock remote control assembly (VV).
- (2) Position lock remote control upper link (XX) on inside pin of lock remote control assembly (VV). Install 11/32 ID \times 11/16 OD plain washer (TT) and new 3/32 \times 3/4 cotter pin (SS). Position link in bracket of upper lock assembly (AE) and install 1/4-inch external-teeth lock washer (NN) and ~~1/4-20NC~~ $\times \frac{1}{2}$ round-head machine screw (PP). Tighten screw.
- (3) Position remote control spring washer (UU) on outside pin of lock remote control assembly (VV). Position lock remote control lower link (RR) on outside pin of

lock remote control assembly (VV). Place 11/32 ID x 11/16 OD, plain washer (TT) on pin and install new 3/32 x 3/4 cotter pin (SS).

- (4) Insert lower end of link in bracket of lower lock assembly. Install a ~~1/4-inch~~ external-teeth lock washer (NN) and ~~1/4-20NC~~ x ¹/₄, round-head machine screw (PP).
- (5) Position lock remote control inside handle (AH) on lock remote control assembly (VV), with handle pointing toward hinge side of door. Install 7/32 ID x ¹/₂ OD plain washer (AG), and lock remote control inside handle lock washer screw (AF). Tighten screw.

f. Install Rubber Bumpers, Blackout Curtain Assembly, and Blackout Curtain Fastener Studs.

- (1) Place 13/32 ID x 13/16 OD, plain washers (EE) on 5/16-24NF x ⁷/₈ screws (FF). Install rubber bumpers (DD) on door at three locations. Tighten screws.
- (2) Position blackout curtain assembly (J) on door (finished side out) and attach curtain to door with three No. 8 plain washers (C) and No. 8 x 1/2 tapping screws (B). Tighten screws. Install two blackout curtain fastener studs (AL) in door.

g. Install Check Arm Guide Assembly, Check Arm, and Related Parts on Door.

- (1) Position check arm guide assembly (F) on door with spring at hinge side of door and slot at top. Install two 5/16-inch lock washers (H) and 5/16-24NF x 5/8 screws (G). Tighten screws.
- (2) Install new ¹/₈ x 1 cotter pin (P) and check arm plain washer (N). Place end of check arm (Q) in slot of check arm guide assembly (F). Install check arm spacer (M), check arm plain washer (L), and new ¹/₈ x 1 cotter pin (K). Bend ends of cotter pins.

h. Install Upper Weatherseal, Hinge Pillar Weatherseal, Hinge Pillar Lower Weatherseal, Lower Weatherseal, Lower Weatherseal Retainer, Lock Pillar Weatherseal, Lock Pillar Weatherseal Retainer, Lock Pillar Lower Weatherseal, and Lock Pillar Lower Weatherseal Retainer.

- (1) If inspection (par. 275h) reveals that replacement of the upper weatherseal (D) is necessary, apply a coating of synthetic rubber cement on new weatherseal and door. Allow cement to dry for 10 minutes. Install ~~weatherseal~~ on door with lip at top.

- (2) If inspection (par. 275h) reveals that replacement of the hinge pillar weatherseal (X) is necessary, apply a coating of synthetic rubber cement (52-C-1556) on new weatherseal and door. Allow cement to dry for 10 minutes. Install new weatherseal so that it fits squarely against door.
- (3) If inspection (par. 275h) reveals that replacement of the hinge pillar lower weatherseal (Z) is necessary, apply a coating of synthetic rubber cement on new weatherseal and door. Allow cement to dry for 10 minutes. Install new weatherseal on door, with lip down and away from door.
- (4) If inspection (par. 275h) reveals that replacement of the lower weatherseal (AA) is necessary, place new weatherseal on door (flat edge toward door). Position lower weatherseal retainer (BB) on lower weatherseal, with flange of retainer covering upper edge of weatherseal. Install five No. 10 x $\frac{1}{2}$ tapping screws (CC) to attach retainer and weatherseal to door. Tighten screws.
- (5) If inspection (par. 275h) reveals that replacement of the lock pillar lower weatherseal (JJ) is necessary, position new seal on bottom corner of door, closed end of weatherseal at flange of door. Place lock pillar lower weatherseal retainer (KK) at closed end of weatherseal and attach weatherseal and retainer to door with No. 8 plain washer (LL) and No. 8 x $\frac{1}{2}$ tapping screw (MM). Tighten screw. Place No. 8 plain washer (MI) on No. 8 x $\frac{1}{2}$ tapping screw (GG) and install screw at opposite end of lock pillar lower weatherseal. Tighten screw.
- (6) If inspection (par. 275h) reveals that replacement of the lock pillar weatherseal (AC), or lock pillar weatherseal retainer (AD) is necessary, apply a coating of synthetic rubber cement (52-C-1556) on new weatherseal and groove of retainer. Allow cement to dry for 10 minutes. Install square side of weatherseal in retainer with lip of weatherseal at screw side of retainer. Firmly press weatherseal in retainer to insure proper adhesion. Position retainer on door. Install and tighten nine No. 10 x $\frac{7}{8}$ tapping screws (AB).

i. Install Door-to-Body Hinges and Hinge Pins on Door Hinges. Position door-to-body hinges (U) on doors with offset towards inside of door. Install hinge pins (V), with heads toward top of door.

Section X. REBUILD OF FOLDING STEP ASSEMBLY

277. Disassembly (Field and Depot Maintenance)

(fig. 211)

a. Remove Parts From Folding Step Assembly.

- (1) Remove nuts (R) and lock washers (S) from step bolts (X). Drift step bolts from step board (Q) and step frame (P). Remove board.
- (2) Remove cotter pins (K and AA), slotted nuts (L and Z), lock washers (J and BB), plain washers (H and CC), and remove step link screws (C and D). Remove step link screw spring washers (B and E) and right and left step links (M and DD) from upper portion of step frame.
- (3) Remove cotter pins (T), slotted nuts (U), lock washers (V), plain washers (W), and step link screws (N and Y); then remove links from lower portion of step frame.

b. Cleaning. Wash all parts except step board (Q) in volatile mineral spirits or dry-cleaning solvent and dry with compressed air. Clean step board with a wire brush or soap and water.

278. Inspection (Field and Depot Maintenance)

(fig. 211)

a. Inspect Step Board. Inspect step board (Q) for deterioration, cracking or warpage. If any of these conditions exist, replace step board.

b. Inspect Step Frame. Inspect step frame (P) for broken welds, cracks, distortion, corrosion, or seized hinge pins. If any of these conditions exist, replace step frame.

c. Inspect Right Step Link, Left Step Link, and Related Parts.

- (1) Inspect right step link (M) and left step link (DD) for corrosion, cracks, or distortion. If any of these conditions exist, replace links.
- (2) Inspect step link screws (C, D, N, and Y) for worn or damaged threads or distortion. If any of these conditions exist, replace screws as required.
- (3) Inspect step link screw spring washers (B and E) for cracks. If washers are not in good condition, they must be replaced.

d. Inspect Step Hinge Spacers. Inspect step hinge spacers (F and EE) for cracks. If any cracks are evident, spacers must be replaced.

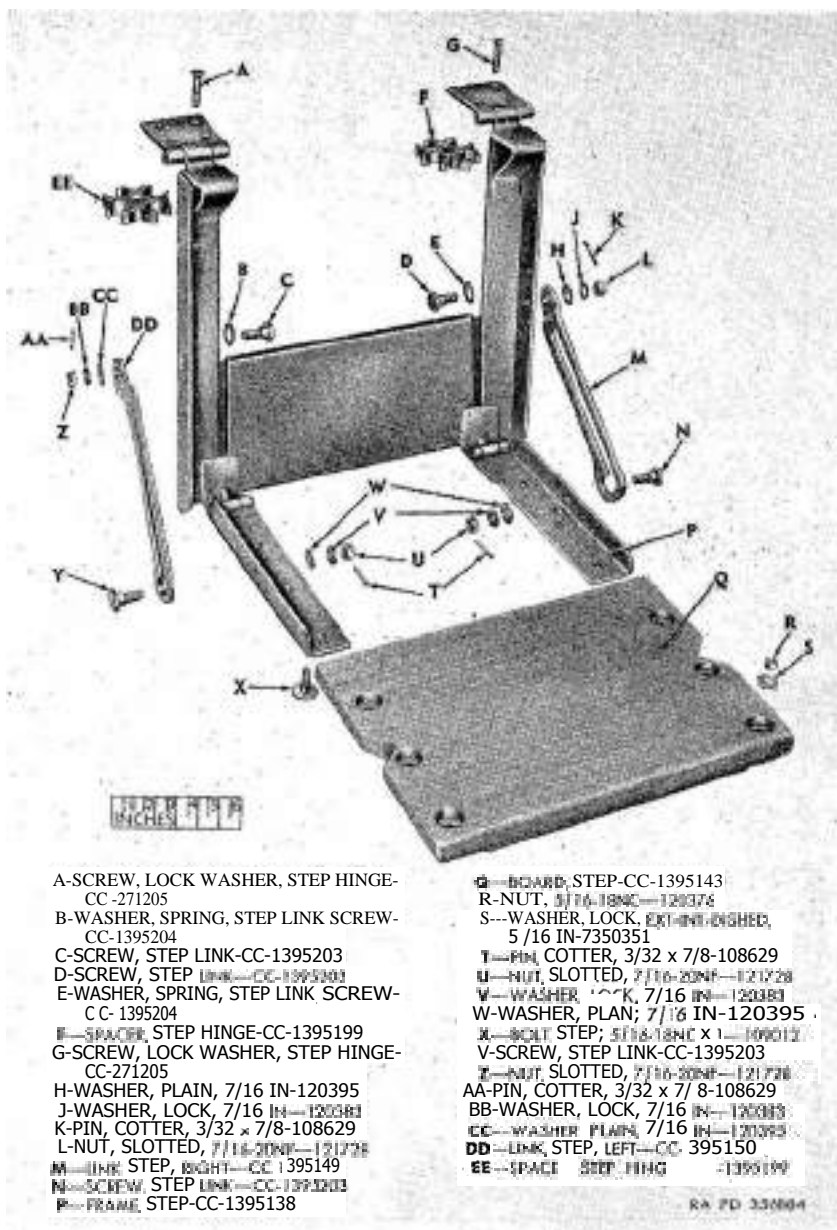


Figure 211. Folding step assembly—exploded view.

279. Assembly (Field and Depot Maintenance)

(fig. 211)

a. install Right Step Link, Left Step Link, and Related Parts.

(1) Hold right step link (M) and left step link (DD) with

upper ends of links inside of step frame channel, and lower end outside of step frame channels (flat edge of links up and upper offset ends toward channel flange). Install step link screws (N and Y) through links and lower portion frame channels, followed by 7/16-inch plain washers (W) , 7/16-inch lock washers (V) , and 7/16—20NF slotted nuts (U). Tighten nuts and install new 3/32 x 7/8 cotter pins (T) . Bend over ends of cotter pins.

- (2) Insert step link screw spring washers (B and E) between right step link (M) and left step link (DD) and flange of step frame (P) . Insert step link screws (C and D) through step links, spring washers and frame flanges. Install 7/16-inch plain washers (H and CC) , followed by 7/16-inch lock washers (J and BB) and ~~7/16—20NF~~ slotted nuts (L and Z). Tighten nuts and install new 3/32 x 7/8 cotter pins (K and AA). Turn over ends of cotter pins.

b. Install Step Board. Position step board (Q) in step frame (P) (counter-bored holes up) . Insert six 5/16-18NC x 1 step bolts (X) through step frame and board from bottom. Install 5/16-inch external internal dished lock washers (S) and 5/16—18NC nuts (R). Tighten nuts.

Section XI. REBUILD OF COWL VENTILATOR ASSEMBLY

280. Disassembly (Field and Depot Maintenance)

a. General. The cowl ventilator assemblies on the ambulance body and cab are identical, and the same rebuild information applies.

b. Remove Parts From Cowl Ventilator Brace and Cowl Ventilator Lid. Refer to paragraph 233 for information pertaining to removal of parts from cowl ventilator brace and cowl ventilator lid.

281. Inspection (Field and Depot Maintenance)

Refer to paragraph 234 for information pertaining to the inspection of the cowl ventilator assembly.

282. Assembly (Field and Depot Maintenance)

Refer to paragraph 235 for information pertaining to the assembly of parts on the cowl ventilator brace and cowl ventilator lid.

Section XII. REBUILD OF AMBULANCE BODY SHELL

283. Disassembly (Field and Depot Maintenance)

a. General. The patients' seat back cushion assemblies, litter rack guide brackets, litter rack assemblies, litter rack rear support assemblies, floor board covering, and floor board can be removed from the body shell. The body shell proper is a welded assembly and repairs will only be required in event of corrosion or collision damage. The correction of corrosion or collision damage is not covered in this section.

b. Remove Patients' Seat Back Cushion Assemblies (fig. 212).

- (1) Remove six hinge-to-panel lock washer screws. This will release the hinges from the body inside panel. Release patients'-seat-back-latch catch and remove patients' seat back cushion assembly.
- (2) Release fasteners; then remove patients' seat back cushion cover and patients' seat back cushion pad.
- (3) Remove latch catch lock washer screws. This will release the patients' seat back latch catch from the patients' seat back cushion board.
- (4) Remove hinge-to-board lock washer screws; then remove patients' seat back hinge assemblies from board.
- (5) Remove screws and lock washers; then remove the three patients' seat back bumpers from each board.
- (6) Do not remove patients' seat back cushion cover fastener sockets from patients' seat back cushion board unless inspection (par. 284a) reveals replacement is necessary. If replacement is necessary, remove sockets.

c. Remove Litter Rack Rear Guide Brackets (fig. 212). Remove four litter rack rear guide lock washer screws ; then remove litter rear guide brackets and litter rack rear guide bracket fillers from inside body panels.

d. Remove Right and Left Litter Rack Assemblies (fig. 213).

- (1) Pull out litter rack lift handle assemblies and place rear of litter rack assembly in raised position (front end down). Remove patients' seat cushion assemblies from litter rack assembly.
- (2) Remove screws, nuts, and lock washers, which attach the rear side compartment lid to side compartment. Remove lid.
- (3) Remove nuts, lock washers, and screws from rear side compartment panel. Remove panel. Remove litter rack rear support cross shaft bracket lock washer screws from litter rack rear support cross shaft brackets.

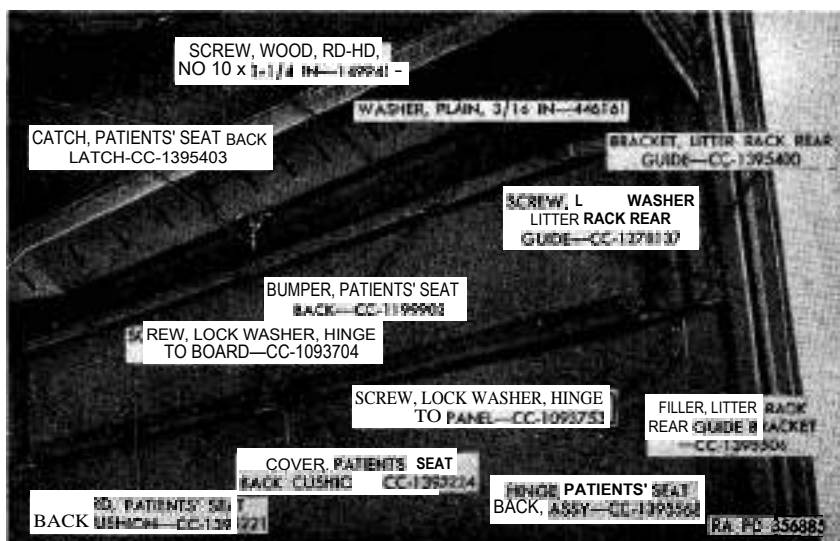


Figure 212. Patients' seat back cushion assembly and litter rack rear guide bracket.

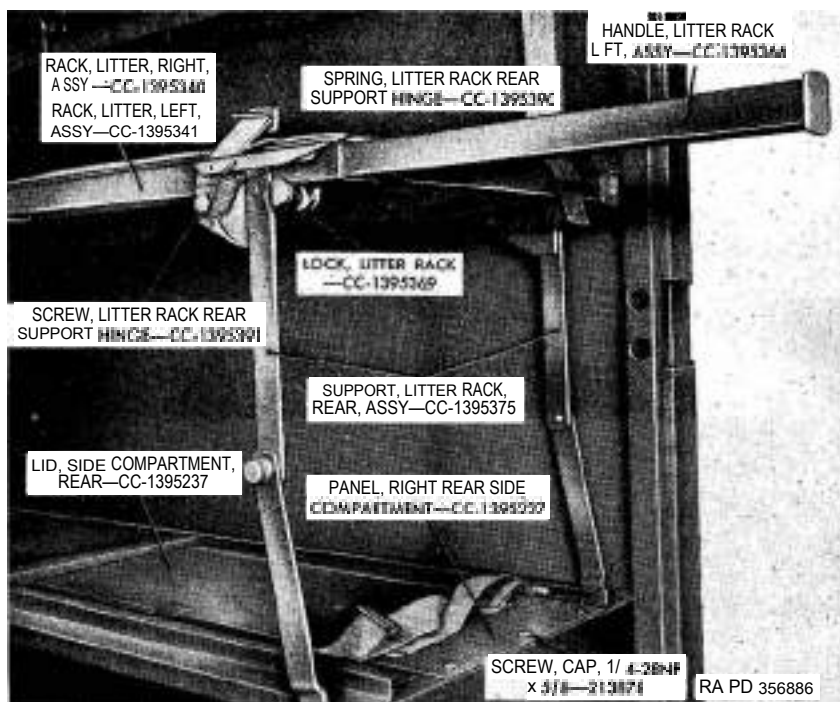


Figure 213. Litter rack and litter rack rear support.

- (4) Remove litter rack rear support hinge springs.

Note. Litter rack must be tilted toward center of body to provide room for removal of outside spring.

The removal of the springs can be facilitated by the use of brake return spring pliers.

- (5) Remove nuts, lock washers, and litter rack rear support hinge screws. This will release litter rack assembly from litter rack rear support assembly. Remove litter rack assembly from vehicle.

e. Remove Litter Rack Rear Support Assembly From Body.

- (1) Lower outside arm of litter rack rear support assembly into side compartment opening. Refer to A of figure 214.
- (2) Lift inside end of litter rack support and move outside arm into side compartment opening. Refer to B of figure 214.
- (3) Raise outside arm of litter rack support up and over side compartment inside panel and remove support from body. Refer to C of figure 214.

f. Remove Litter Rack Lock and Related Parts From Litter Racks (fig. 215).

- (1) Turn litter rack locks and remove litter rack lift handle assemblies from litter rack.
- (2) Remove cotter pin and pull litter rack lock from bracket on litter rack. Remove litter rack lock lever, litter rack lock lever spacers, and litter rack lock spring from each side of litter rack.

g. Remove Patients' Seat Cushion Board and Patients' Seat Cushion Pad From Patients' Seat Cushion Cover. Release fasteners from patients' seat cushion cover ; then remove patients' seat cushion board and patients' seat cushion pad from cover.

h. Remove Floor Board Covering (fig. 206).

- (1) Remove rear door scuff plate and door lock lower strikers. Refer to paragraph 254.
- (2) Remove tapping screws; then remove side compartment-to-floor angle mouldings.
- (3) Remove four screws; then remove fuel gage inspection cover from floor.
- (4) Remove floor board covering from floor board. Discard covering.

i. Remove Floor Board (fig. 206).

- (1) Remove bracket lock washer screws from side compartment rear panel and compartment side panel. This will

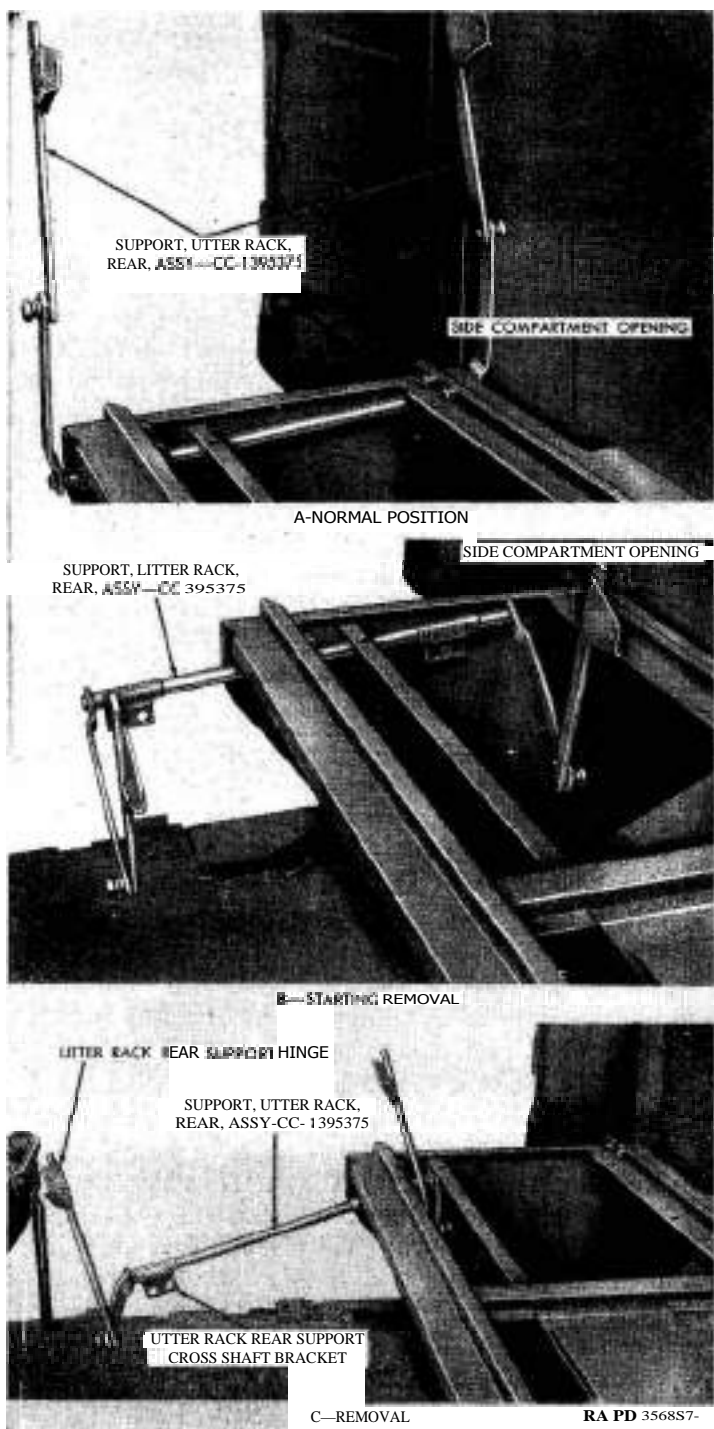


Figure 214. Removing litter rack rear support assembly.

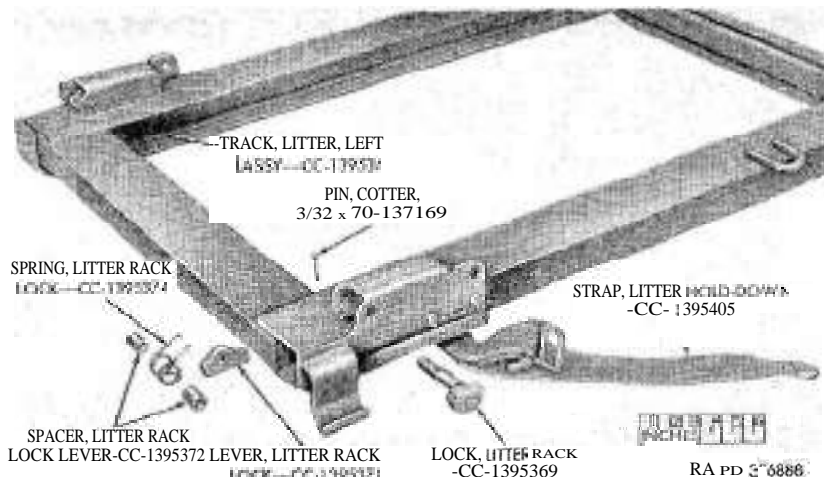


Figure 215. Litter rack lock and related parts.

release the side panel to rear panel bracket assembly.
Remove brackets.

- (2) Remove fuel tank. Refer to paragraph 51b.
- (3) Remove 16 nuts, lock washers, and machine screws, which attach floor board to body cross sills. Slide floor board from body through rear door opening.

Cleaning.

- (1) If a new floor board covering is installed on the original floor board, clean all traces of cement from floor board with a floor sander.
- (2) Remove grease and dirt from metal parts with volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

284. Inspection (Field and Depot Maintenance)

a. Inspect Patients' Seat Back Cushion Assembly (fig. 212).

- (1) Inspect patients' seat back cushion cover for wear or other visual damage. If either of these conditions exist, replace cover.
- (2) Inspect patients' seat back cushion cover fastener sockets for damage. If any of the sockets are damaged, replace as required (pars. 283b and 285j).
- (3) Inspect patients' seat back cushion pad for deterioration or other visual damage. Replace pad if not in good condition.
- (4) Inspect patients' seat back cushion board for cracks,

warping, or other visual damage. Replace board if not in good condition.

- (5) Inspect patients' seat back hinge assemblies for corrosion or distortion. Replace hinges if either of these conditions exist.
- (6) Inspect patients' seat back bumpers for deterioration. If bumpers are not **in** good condition, replace as required.
- (7) Inspect patients' seat back latch catch for corrosion or weak or broken spring. If any of these conditions exist, replace catch.

b. Inspect Patients' Seat Cushion Assembly.

- (1) Inspect patients' seat cushion cover for wear or other visual damage. If not in good condition, replace cover.
- (2) Inspect patients' seat cushion pad for deterioration or other visual damage. Replace pad **if** not in good condition.
- (3) Inspect patients' seat cushion board for cracks, warpage, or other visual damage. Replace board if not in good condition.

c. Inspect Litter Rack Assemblies.

- (1) Inspect litter rack assembly (fig. 215) for broken welds, corrosion, or distortion. Broken welds can be repaired by welding. If litter racks are distorted or damaged by corrosion, replace as required.
- (2) Inspect litter rack lift handle assemblies (*fig.* 213), for cracks, broken welds, distortion, or corrosion. Broken welds can be corrected by welding. If handles are distorted or damaged by corrosion, replace handles.
- (3) Inspect litter hold down straps (*fig.* 215) for wear or deterioration. Replace straps if either of these conditions exist.
- (4) Inspect litter rack locks (*fig.* 215) for bent or broken shafts. If either of these conditions exist, replace locks.
- (5) Inspect litter rack lock levers (fig. 215) for cracks or wear. If either of these conditions exist, replace levers as required.
- (6) Inspect litter rack lock springs (*fig.* 215) for cracks or distortion. Replace springs if either of these conditions exist.
- (7) Inspect litter rack lock lever spacers (*fig.* 215) for damage. If spacers are damaged, replace as required.

d. Inspect Litter Rack Rear Support Assemblies and Litter Rack Rear Support Hinge Springs.

- (1) Inspect litter rack rear support assembly (*fig.* 214) for

broken welds, worn hinge pins, damaged support hinges, or distortion. Repair broken welds by welding. If any of the other conditions exist, replace rear support assembly.

- (2) Inspect litter rack rear support hinge springs (fig. 213) for cracks or distortion. If either of these conditions exist, replace spring.

e. Inspect Litter Rack Rear Guide Bracket and Related Parts (fig. 212).

- (1) Inspect litter rack rear guide bracket for cracks or distortion. Straighten bracket if distorted. Replace bracket if cracked.
- (2) Inspect litter rack rear guide bracket filler for deterioration. Replace filler if it is not in good condition.

f. Inspect Floor Board, Side Compartment-to-Floor Angle Mouldings, and Fuel Gage Inspection Cover (fig. 206).

- (1) Inspect floor board for deterioration, warpage, or cracks. If any of these conditions exist, replace floor board.
- (2) Inspect side compartment-to-floor angle mouldings for distortion, cracks, or corrosion. If any of these conditions exist, replace mouldings.
- (3) Inspect fuel gage inspection cover for distortion or corrosion. If either of these conditions exist, replace cover.

g. Inspect Side Panel-to-Rear-Panel Bracket Assemblies. Inspect side panel-to-rear-panel bracket assemblies for distortion, corrosion, or stripped or broken weld nuts. If there is evidence of distortion or corrosion, replace brackets. If any of the weld nuts are stripped or broken, remove damaged weld nuts and use a cap screw, lock washer, and nut.

285. Assembly (Field and Depot Maintenance)

a. Install Floor Board, Floor Board Covering, and Related Parts (fig. 206).

- (1) Slide floor board through rear opening of body and align screw holes in board and body cross sills (metal side of floor down). Install sixteen 5/16-24NF x 1 1/8 cross-recess flat-head machine screws, 5/16-inch lock washers, and 5/16-24NF nuts. Tighten nuts.
- (2) Apply a liberal coating of floor board covering cement on floor board. Position new floor board covering on floor board and align screw holes.
- (3) Position side compartment to floor angle mouldings on each side and install a No. 10 x 5/8 cross-recess oval-

head tapping screw at each end. Install No. 10 x 11/4 cross-recess oval-head tapping screws in other holes. Tighten screws.

- (4) Apply a coating of sealing compound (51—C-1616) on under side edge of fuel gage inspection cover. Place cover over floor opening and install four No. 10 x 11/4 cross-recess oval-head tapping screws. Tighten screws.
- (5) Install rear door scuff plate and door lock lower strikers. Refer to paragraph 290 for information pertaining to the installation of these parts.

b. Install Side Panel-to-Rear-Panel Bracket Assemblies. Position side panel-to-rear-panel bracket assemblies in opening between the two panels. Install and tighten bracket lock washer screws (*fig. 206*).

c. Install Parts on Litter Racks (fig. 215).

- (1) Insert litter hold down straps through slots in litter brackets at each end and install retaining pins or loops.
- (2) Place litter rack upside down. Insert litter rack lock lever spacers in litter rack lock spring and position spacers and spring in litter rack bracket with ends of spring up and forward. Position litter rack lock lever between spring coils and in slot in litter rack (straight edge out). Aline lock lever, spring, and spacers. Install litter rack lock with curved side of lock toward end of litter. Install a new 3/32 x 7/8 cotter pin.
- (3) Install litter rack lift handle assemblies (*fig. 213*) with slots on lock side so that they will engage with the litter rack lock lever (*fig. 215*).

d. Position Litter Rack Rear Support Assemblies in Body Side Compartments. Insert outside arm of litter rack rear support assemblies up through opening in side compartment with litter rack rear support cross shaft brackets toward front of body. Refer to C of figure 214. Lift outer end of litter rack support and position support so that outside arms will be in side compartment. Refer to B of figure 214. Insert outside arm up through side compartment opening. Refer to A of figure 214.

e. Install Right and Left Litter Rack Assemblies (fig. 213).

- (1) Place litter rack assembly in body (front end down).
- (2) Position litter rack on litter rack rear support assembly and install litter-rack-rear-support-hinge screws (heads outside) followed by ~~3/8-inch~~ lock washers and ~~3/8-24NF~~ nuts. Tighten nuts.
- (3) Install litter rack rear support hinge springs. This operation can be facilitated with brake spring pliers.

- (4) Align holes in litter rack rear support cross shaft brackets and side compartment rear panel brackets. Install litter rack rear support lock washer screws. Tighten screws.
- (5) Insert patients' seat cushion pad in patients' seat cushion cover, followed by patients' seat cushion board (fastener side of cover). Close cover by snapping fasteners over fastener sockets.
- (6) Install patients' seat cushion assemblies in litter rack (fastener side down).

f. Install Right and Left Rear Side Compartment Panels and Rear Side Compartment Lids.

- (1) Position right and left rear side compartment panels (fig. 213) on side compartment with rolled edge toward front of body. Install five $\frac{1}{4}$ -28NF x $\frac{5}{8}$ cap screws (fig. 213), $\frac{1}{4}$ -inch lock washers, and $\frac{1}{4}$ -28NF nuts. Tighten nuts.
- (2) Place rear side compartment lid over rear opening of side compartment. Install three $\frac{1}{4}$ -28NF x $\frac{5}{8}$ flat-head cross-recess machine screws through each lid hinge and side compartment, followed by $\frac{1}{4}$ -inch lock washers and $\frac{1}{4}$ -28NF nuts. Tighten nuts.

g. Install Litter Rack Rear Guide Brackets and Related Parts (fig. 212). Position litter rack rear guide bracket filler on body panel (holes up and tapered end out), followed by litter rack rear guide brackets (offset end down), and install litter rack rear guide lock washer screws. Place litter rack in raised position and push guide brackets down in contact with litter rack. Tighten screws.

In Install Parts On Patients' Seat Back Cushion Board (fig. 212).

- (1) Position the three patients' seat back bumpers on cleats of patients' seat back cushion board (recessed holes out). Install 3/16-inch plain washers and No. 10 x 1 1/4 round-head wood screws. Tighten screws.
- (2) Place patients' seat back latch catch on center of board with open end of bracket toward edge of board. Install latch catch lock washer screws. Tighten screws.

i. Install Patients' Seat Back Hinge Assemblies (fig. 212). Position patients' seat back hinge assemblies on patients' seat back cushion board (offset plate of hinge toward top of board). Install hinge-to-board lock washer screws and tighten screws.

j. Install Patients' Seat Back Cushion Cover Fastener Sockets, Patients' Seat Back Cushion Pad, and Patients' Seat Back Cushion Cover (fig. 212).

- (1) If inspection (par. 284a) reveals that replacement of patients' seat back cushion cover fastener sockets is necessary, install new sockets as required.
- (2) Place patients' seat back cushion pad on board and install patients' seat back cushion cover. Fasten cover to board.

k. Install Patients' Seat Back Cushion Assemblies In Body (fig. 212). Position patients' seat back cushion assemblies on body inside panels. Install and tighten six hinge to panel lock washer screws.

Section XIII. ASSEMBLY OF AMBULANCE BODY FROM SUBASSEMBLIES

286. Windshields and Support Frame Assembly (Field and Depot Maintenance)

a. Install Windshields and Support Frame Assembly.

- (1) Apply a liberal coating of sealing compound (51-C-1616) across top of support frame assembly.
- (2) Position support frame lower center weatherstrip (fig. 209) across top of cowl (groove out and lip down).
- (3) Position windshields and support frame assembly in body opening. Install but do not tighten, seven support frame-to-roof lock washer screws (fig. 202).
- (4) Aline support frame lower center weatherstrip (fig. 209) and position support frame lower center weatherstrip retainer on support frame. Install nine No. 10-32NC x 1/2 tapping screws. Tighten screws.
- (5) Install right and left support frame-to-cowl screws (fig. 203) (hollow screw left side). Install 9/16-inch lock washers and ~~9/16-18NF~~ nuts, but do not tighten nuts. Install support frame-to-cowl lock washer screws each side, but do not tighten screws.
- (6) Position rear view mirror assembly on left side and install two ~~7/16-20NF~~ x 1 bolts (fig. 203), 7/16-inch lock washers, and ~~7/16-20NF~~ nuts. Do not tighten nuts.
- (7) Position cowl liquid container strap bracket on cowl (right side). Install two ~~7/16-20NF~~ x 1 bolts, 7/16-inch lock washers, and ~~7/16-20NF~~ nuts. Do not tighten nuts.
- (8) Tighten all screws and nuts.
- (9) Insert windshield wiper hinge tube in windshield wiper left pillar tube hose; then insert tube through left support frame-to-cowl screw (fig. 203). Install windshield

wiper hinge tube clip and No. 8 x $\frac{1}{2}$ -inch pan-head gimlet-point tapping screw. Tighten screw. Attach wind-shield wiper hinge tube to hose under cowl.

b. Install Roof Inside Front Panels Assemblies.

- (1) Insert spot light extension cable through grommet in roof inside front right panel assembly. Position panel in right side and install four No. 10-32NF x $\frac{3}{4}$ pan-head cross-recess lock washer screws. Tighten screws.
- (2) Position roof inside front left panel assembly in body and install four No. 10-32NF x $\frac{3}{4}$ pan-head cross-recess lock washer screws. Tighten screws.
- (3) Position roof inside front center panel assembly in body and install thirteen No. 10-32NF x $\frac{3}{4}$ pan-head cross-recess lock washer screws. Tighten screws.
- (4) Position three spot light extension cable clips over spot light extension cable and attach to roof inside front right and center panel assemblies with No. 8-32NF x $1\frac{1}{2}$ round-head cross-recess machine screws.
- (5) Install connector shell, bushing, and grommet on spot light extension cable. Install connector on cable.

c. Install Spot Light Assembly. Refer to paragraph 339 for information pertaining to the installation of the spot light. Connect spot light extension cable to spot light.

287 Ventilating Blower Assemblies (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 210, except where otherwise indicated.

a. Install Ventilating Blower Assemblies in Body. Insert blower housing bolts through holes in body partition panel and hold ventilating blower assembly against partition panel. Temporarily install blower outlet extension (fig. 201) on blower housing assembly and check alinement of extension in body outside panel opening. If outlet extension is not properly alined in body opening, it will be necessary to add $\frac{3}{8}$ -inch plain washers (N) between blower housing spacer (M) and partition. When blower assembly is properly positioned, install $\frac{1}{4}$ -inch lock washers (P) and $1\frac{1}{4}$ -20NC nuts (Q) on blower housing bolts. Tighten nuts.

b. Install Blower Outlet Extensions, Blower Outlet Gaskets, Blower Outlet Screens, and Blower Outlet Louvers.

- (1) Install blower outlet extension (fig. 201) on blower housing assembly through opening in body outside panel. Install No. 10-32NF x $\frac{3}{8}$ cross-recess pan-head tapping

screws, which retain the blower outlet extension on blower housing assembly. Tighten screws.

- (2) Place blower outlet gasket (W), blower outlet screen (V), and blower outlet louver (15) on body outside panel. Install four No. 10-32NF x 3/8 ~~fillister-head~~ machine screws (T) in each louver. Tighten screws.
- (3) Connect switch-to-blower cable assembly to blower motor cable (*fig. 201*) . Insert cable connector assembly in ventilating blower cable clip on blower housing assembly.

c. Install Blower Inspection Covers and Air Control Blower Valves.

- (1) Position blower inspection covers on right and left openings in roof inside front panels (plate with large cutout on left side). Install one ~~1/4-28NF~~ x 1 pan-head lock washer screw in upper rear corner of each inspection plate. Install four ~~1/4-28NF~~ x 5/8 pan-head lock washer screws in other holes of each inspection plate and tighten screws.
- (2) Position air control blower valves (R) in openings at upper front corners of partition panel (litter compartment side) and install four No. 10 x ~~1/2-inch~~ pan-head gimlet-point tapping screws in each valve. Tighten screws.

d. Install Right and Left Exhaust Ducts in Litter Compartment. Position right and left exhaust ducts (S) in upper corners of litter compartment. Install seventeen No. 10-32NF x 3/8 pan-head lock washer screws (each duct). Tighten screws.

288. Partition Door Assembly (Field and Depot Maintenance)

a. Install Partition Door Assembly. Position partition door assembly in body (curtain toward windshield).

b. Install Partition Door Upper Run Retainer. Place partition door upper run retainer over top of door and against partition. Install four 5/16-18NC x 2 carriage bolts (heads toward windshield), 5/16-inch lock washers, and 5/16-18NC nuts. Tighten nuts.

289. Rear Door Assemblies (Field and Depot Maintenance)

a. Install Rear Door Assemblies (fig. 204). Position rear door assemblies in line with body hinge pillars and insert hinge assemblies through body openings. Install four hinge lock washer screws (Y) in each hinge. Aline doors in body opening and tighten

all hinge screws. Refer to TM 9-840 for information pertaining to alinement of rear doors.

b. Install Hinge Screw Hole Rubber Plugs (fig. 204). Insert hinge screw hole rubber plugs (R) into hinge-pillar post.

c. Attach Check Arms to Body Brackets (fig. 204). Insert check arms (Q) up through body brackets. Install check arm plain washers (S) and new $1/8 \times 1$ cotter pins (T) ; bend ends of cotter pins.

290. Folding Step Assembly (Field and Depot Maintenance)

a. Install Folding Step Assembly (fig. 211).

- (1) Position step hinge spacers (F and EE) on rear cross sill and aline with screw holes for the folding step hinges.
- (2) Position hinges of folding step assembly on spacers and install eight step hinge lock washer screws (A and G). Tighten screws.

b. Install Cross Sill Hinge Weatherseals, Rear Door Scuff Plate, and Door Lock Lower Strikers (fig. 205).

- (1) Coat flat surface of new cross sill hinge weatherseals and cross sill with synthetic rubber cement (52—C-1556). Allow cement to dry for 10 minutes and install new weatherseals (lip down).
- (2) Place rear door scuff plate over end of floor and install four scuff plate tapping rear screws and six scuff plate front screws. Install 5/16-inch lock washers and 5/16—24NF nuts on scuff plate front screws. Tighten nuts.
- (3) Position door lock lower strikers on openings in rear door scuff plate. Install and tighten four lower striker lock washer screws.

291. Front Door Assemblies (Field and Depot Maintenance)

Refer to paragraph 239 for information pertaining to the installation of the front door assemblies.

292. Windshield Wiper Motor Assemblies (Field and Depot Maintenance)

Refer to paragraph 242 for information pertaining to the installation of the windshield wiper motor assemblies.



Figure 216. Cargo and command body assembly.

293. Driver's and Attendant's Seat Assemblies (Field and Depot Maintenance)

Refer to paragraph 240 for information pertaining to the installation of the driver's and attendant's seat assemblies.

294. Cowl Ventilator Assembly (Field and Depot Maintenance)

Refer to paragraph 243 for information pertaining to the installation of the cowl ventilator assembly.

Section XIV. REBUILD OF CARGO AND COMMAND BODY

295. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 216, except where otherwise indicated.

a. Remove Roof Bow Assemblies. Refer to TM 9-840 for information pertaining to the removal of the roof bow assemblies (A).

b. Remove Cargo and Command Body. Refer to paragraph 41a for information pertaining to the removal of the cargo and command body.

c. Remove Front Rack Assembly and Seat Back Assemblies.

- (1) Remove the two cap screws and lock washers, which attach front rack stake (Q) to front panel (P) and remove front rack assembly (T) from body.
- (2) Remove three nuts, lock washers, and cap screws from right and left side panels (N and S) ; then remove right and left seat back (with supports) assemblies (E and U).
- (3) If replacement of the safety strap eye bolt (B) is necessary, remove nut, lock washer, and eye bolt from lower board of each seat back (with support) assembly (E and U).
- (4) If replacement of the seat back board seat retainers (C) is necessary, remove nut, cap screw, and plain washer ; then remove retainer from lower board of each seat back assembly.

d. Remove Right and Left Seat Assemblies. Remove four nuts, lock washers, and cap screws from support brackets of right and left seat assemblies (F and V) ; then remove seat assemblies from side panels.

e. Remove Auxiliary Seat Assembly. Remove four lock washer screws. This will release auxiliary seat assembly from front panel. Remove seat from panel.

f. Remove Spare Wheel Bracket. Remove two cap screws and internal-external-teeth lock washers from lower flange of spare wheel bracket (R). Remove two cap screws, lock washers, and nuts holding bracket to front panel ; then remove bracket.

g. Remove Front Panel. Remove lock washer screws, at each side, machine screws, lock washers, and nuts at front end of floor. Remove front panel (P) from body.

It. Remove Tail Gate Assembly.

- (1) Remove two lock washer screws. This will release tail gate hinge support from rear floor cross sill (fig. 217).
- (2) Remove four lock washer screws. This will release the

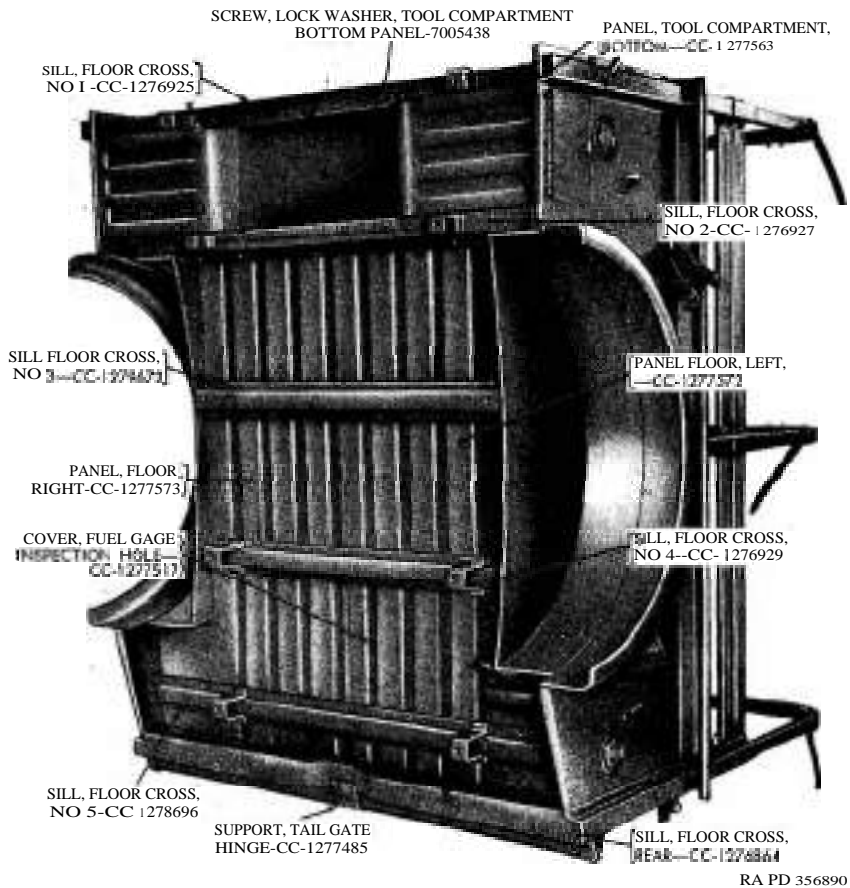


Figure 217. Cargo underbody and related parts.

tail gate outer hinges (G) and tail gate assembly from rear floor cross sill. Remove tail gate assembly and hinges.

i. Remove Right and Left Side Panels, Tool Compartment Door, and Related Parts.

- (1) Remove eight machine screws, nuts, and lock washers ; then remove fuel filler housing from inside of left side panel. Remove two cap screws, nuts, and lock washers ; then remove fuel filler tube assembly from wheel housing.
- (2) Remove nuts, lock washers, and screws, which attach the inside flange of the left side panel, wheel housing, and tool compartment door lock catch to floor left panel. Remove cap screws, lock washers, and nuts, which attach side panel tool compartment door (M) to left side panel (N) . Remove door.

- (3) Remove jam nuts. Remove side panel tool compartment door lock handle (L) from tool compartment door.
 - (4) Remove nuts, lock washers, and cap screws. This will release tool compartment door lock from door. Remove lock.
 - (5) Remove two lock washer screws from rear floor cross sill. This will release side panel corner bracket from sill. Remove left side panel (N). Remove lock washer screw at rear of side panel. Remove side panel corner bracket from side panel.
 - (6) The right side panel (S) is removed in the same manner as left side panel ((1) through (5) above), except for the removal of the fuel filler housing and fuel filler tube assembly.
- j. *Remove Rear Fenders.* Remove fender lock washer screws ; then remove rear fenders (J) and rear fender welts (K) from side panels.
- k. *Remove Tool Compartment Bottom Panel.* Remove tool compartment bottom panel lock washer screws; then remove tool compartment bottom panel (fig. 217) from floor cross sills.
- l. *Remove Right and Left Floor Panels and Fuel Gage Inspection Hole Cover.*
- (1) Remove screws and fuel gage inspection hole cover (fig. 217) from left floor panel.
 - (2) Remove nuts, lock washers, screws, and right and left floor panels from floor cross sills.
- m. *Cleaning.* Clean all metal parts in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

2%. Inspection (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 216, except where otherwise indicated.

a. *Inspect Roof Bow Assemblies, Right and Left Seat Back (with Supports) Assemblies, and Front Rack Assembly.*

- (1) Inspect roof bow assemblies (A) for cracks or deteriorated wood and corroded or distorted roof bow metal corners. If any of these conditions exist, replace roof bow assemblies (A) as required. Inspect roof ridge pole (W) and brackets for cracks, deterioration, or corrosion. If any of these conditions exist, replace roof ridge pole or brackets as required.
- (2) Inspect right and left seat back (with supports) assemblies (E and U) for cracked or deteriorated boards. If either of these conditions exist, replace boards.

- (3) Inspect seat back supports for distortion or corrosion. If either of these conditions exist, replace supports as required.
- (4) Inspect front rack assembly (T) for cracked, warped, or deteriorated boards. If any of these conditions exist, replace boards as required. Inspect front rack stake (Q) for distortion, cracks, or corrosion. If any of these conditions exist, replace stake. Inspect front rack brackets and related parts for corrosion or distortion. If either of these conditions exist, replace parts as required.

b. Inspect Right and Left Seat Assemblies and Auxiliary Seat Assembly. Inspect boards on right and left seat assemblies (F and V) and auxiliary seat assembly, for cracks, warpage, or deterioration. If any of these conditions exist, replace boards as required. Inspect brackets and supports for distortion or corrosion. If either of these conditions exist, replace brackets as required.

c. Inspect Right and Left Side Panels and Front Panel. Inspect left side panel (N), right side panel (S), and front panel (P) for collision damage or corrosion. Collision damage can be corrected by sheet metal repairs, but the panels must be replaced if corrosion is extensive.


d. Inspect Right and Left Floor Panels and Fuel Gage Inspection Hole Cover.

- (1) Inspect right and left floor panels for corrosion or distortion. If corrosion has damaged the floor panels to the extent that sheet metal repairs cannot be performed, replace panels. Replace floor panels if they are distorted.
- (2) Inspect fuel gage inspection hole cover (*fig. 217*) for distortion or corrosion. Replace cover if either of these conditions exist.

e. Inspect Tail Gate Assembly. Inspect tail gate assembly (D) for collision damage, distortion, or corrosion. If any of these conditions exist, replace tail gate assembly. Inspect tail gate outer hinges (G) and supports for wear, corrosion, or distortion. If any of these conditions exist, replace hinges or tail gate assembly.

f. Inspect Rear Fenders and Rear Fender Welts. Refer to paragraph 310 for information pertaining to the inspection of the rear fenders (J) and rear fender welts (K).

g. Inspect Side Panel Tool Compartment Door and Related Parts.

- (1) Inspect side panel tool compartment door (M) for distortion or corrosion. Replace door if either of these conditions exist.
- (2) Inspect side panel tool compartment door lock for .

tortion, broken parts, or corrosion. If any of these conditions exist, replace lock.

- (3) Inspect side panel tool compartment door lock handle (L) for cracks or other visual damage. Replace handle if it is not in satisfactory condition.

h. Inspect Tool Compartment Bottom Panel. Inspect tool compartment bottom panel (fig. 217) for corrosion, loose welds, or distortion. If any of these conditions exist, replace panel.

i. Inspect Floor Cross Sills. Inspect floor cross sills (fig. 217) for corrosion, distortion, cracks, broken welds, or bent brackets. Repair or replace cross sills as required.

297. Assembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 216, except where otherwise indicated.

a. Install Right and Left Floor Panels on Floor Cross Sills (fig. 217).

- (1) Position No. 1 floor cross sill with the holes for the tool compartment bottom panel toward rear.

Note. The lower flange of No. 1 floor cross sill and No. 2 floor cross sill are drilled for the tool compartment bottom panel. The No. 1 floor cross sill can be identified by the greater distance between the brackets.

- (2) Position the floor rear cross sill with drilled flange up and toward front.
- (3) Position left floor panel on cross sills (cutout for wheel housing and fuel filler housing toward outside).
- (4) Install two 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screws through the two inside holes of the floor panel at the rear cross sill. Install 5/16-inch lock washers and 5/16-24NF nuts. Do not tighten nuts. Install one 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screw in inside hole of floor panel through rear flange of No. 1 floor cross sill. Install 5/16-inch lock washer and 5/16-24NF nut, but do not tighten nut.
- (5) Position right floor panel on floor cross sills (wheel house cutaway outside).
- (6) Install two 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screws through inside holes at rear floor cross sill, followed by 5/16-inch lock washers and 5/16-24NF nuts. Do not tighten nuts. Install one 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screw through hole in floor

panel and rear flange of No. 1 floor cross sill. Install 5/16-inch lock washer and ~~5/16-24NF~~ nut, but do not tighten nut.

- (7) Position No. 2 floor cross sill on floor panels (holes for tool compartment bottom panel forward).
- (8) Install three 5/16-24NF x $\frac{1}{8}$ pan-head cross-recess machine screws through three holes in floor panel and forward flange of No. 2 floor cross sill. Install 5/16-inch lock washers and 5/16-24NF nuts, but do not tighten nuts. Install two 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screws through two inside holes of floor panels and rear flange of No. 2 floor cross sill. Install 5/16-inch lock washers and 5/16-24NF nuts, but do not tighten nuts.
- 9) ~~Position~~ No. 3 floor cross sill on floor panels.

Note. This is the short cross sill without brackets.

- (10) Install one 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screw through floor panels and front flange of No. 3 floor cross sill, followed by 5/16-inch lock washer and 5/16-24NF nut. Install two 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screws through floor panels and center of cross sill rear flange, followed by 5/16-inch lock washer and 5/16-24NF nuts. Do not tighten nuts.
- (11) Position No. 4 floor cross sill on floor panels.

Note. This is the short cross sill with brackets.

- (12) Install one 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screw through floor panels and No. 4 floor cross sill front flange, followed by 5/16-inch lock washers and 5/16-24NF nuts. Do not tighten nuts. Install two 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screws through floor panels and center holes in rear flange of cross sill, followed by 5/16-inch lock washers and 5/16-24NF nuts. Do not tighten nuts.
- (13) Position No. 5 floor cross sill on floor panels.
- (14) Install three 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screws through floor panels and front flange of No. 5 floor cross sill, followed by 5/16-inch lock washers and 5/16-24NF nuts. Do not tighten nuts. Install four 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screws through floor panels and rear flange of cross sill, followed by ~~5/16-inch~~ lock washers and 5/16-24NF nuts. Do not tighten nuts.
- (15) Tighten all nuts.

b. Install Tool Compartment Bottom Panel on Floor Cross Sills

(fig. 217). Apply a liberal coating of sealing compound (51-C-1616) to upper surface of the front and rear flanges on tool compartment bottom panel. Position tool compartment bottom panel on No. 1 and No. 2 floor cross sills. Install 24 tool compartment bottom panel lock washer screws. Tighten screws.

c. *Install Front Panel.* Apply a liberal coating of sealing compound (51-C-1616) on top surface of front panel lower flange. Position front panel (P) with lower flange below No. 1 floor cross sill-upper flange and install the four center 5/16-24NF x 7/8 pan-head cross-recess machine screws, followed by 5/16-inch lock washers and 5/16-24NF nuts. Tighten nuts.

d. *Install Right and Left Side Panels.*

- (1) Apply a coating of synthetic rubber cement (52-C-1556) on inside of right and left side panels (N and S) at sides of each tool compartment opening. Allow cement to dry for 10 minutes and install four side panel-to-tool-compartment panel pads.
- (2) Insert side panel rear supports in rear lower corners of side panels (flat side toward rear of side panels). Install a 7/16-inch internal-external-teeth lock washer and a ~~7/16-20NF~~ x 1 1/8 cap screw through rear of side panels and in upper threaded hole of support, but do not tighten screws.
- (3) Apply a liberal coating of sealing compound (51-C-1616) on lower surface of side panel flanges. Guide side panel rear supports in rear floor cross sill and position side panels on floor panels. Install eleven 5/16-24NF x 7/8 pan-head cross-recess machine screws through left-side panel and floor panel, followed by 5/16-inch lock washers and ~~5/16-24NF~~ nuts. Tighten nuts. Install thirteen 5/16-24NF x 7/8 pan-head cross-recess machine screws through right side panel and floor panel, followed by 5/16-inch lock washers and 5/16-24NF nuts. Tighten nuts.
- (4) Install four ~~3/8-inch~~ internal-external-teeth lock washers and ~~3/8-24NF~~ x 3/4, fluted taper point cap screws on each side to attach side panel to front panel. Tighten screws.
- (5) Install two ~~3/8-inch~~ internal-external-teeth lock washers and ~~3/8-24NF~~ x 3/4, fluted taper point cap screws through holes in lower-front side of side panels to attach side panels to rear floor-cross sill. Tighten cap screws,
- (6) Install two 7/16-inch internal-external-teeth lock washers and ~~7/16-20NF~~ x 1 1/8 cap screws, each side, through rear floor cross sill and into side panel rear support but do not tighten screws until tail gate assembly is installed (k below)

e. Install Fuel Filler Tube Assembly and Fuel Filler Housing.

- (1) Position fuel filler tube assembly on rear of left wheel housing and install two 5/16-24NF x $\frac{3}{4}$ cap screws, **5/16** tube side). Tighten nuts.
- (2) Coat inside surface of flanges on fuel filler housing with sealing compound (51-C-1616) and position housing on left side panel. Install eight 5/16-24NF x $\frac{7}{8}$ pan-head cross-recess machine screws, 5/16-inch lock washers, and **5/16-24NF** nuts (heads outside on three screws through side panels and heads on filler housing side on other screws). Tighten nuts.

*f. Install Tool Compartment Door Lock Catches, Tool ~~Com-~~
~~partment~~ Door Locks, and Tool Compartment Doors.*

- (1) Remove nuts and lock washers from second machine screw at front of side panels and install tool compartment door lock catches, followed by external-teeth lock washer and 5/16-24NF nut, but do not tighten nut. Install a 5/16-24NF x $\frac{7}{3}$ pan-head cross-recess screw, each side, through other hole in catch, followed by an external-teeth lock washer and 5/16-24NF nut. Do not tighten nut.
- (2) Position tool compartment door locks on inside of tool compartment doors (latch opposite hinge) and install two **~~1/4-28NF~~** x $\frac{1}{2}$ cap screws (heads out), $\frac{1}{4}$ -inch lock washers, and **~~1/4-28NF~~** nuts. Tighten nuts.
- (3) Insert side panel tool compartment door lock handle (L) through lock so that handle will be in a horizontal position when latch is in the locked position. Install 5/16-18NC jam nut and tighten nut. Install other 5/16-18NC jam nut and tighten nut.
- (4) Position side panel tool compartment doors (M) on side panels and install three 5/16-24NF x $\frac{5}{8}$ cap screws through door hinge and side panel (heads out), followed by 5/16-inch lock washers and 5/16-24NF nuts. Tighten nuts.
- (5) Position tool compartment door lock catches so that doors are firmly closed. Tighten nuts, which attach door lock catch to floor panels.

g. Install Rear Fenders. Refer to paragraph 311a for information pertaining to the installation of rear fenders.

h. Install Spare Wheel Bracket. Position spare wheel bracket at right side of front panel and install two **~~3/8-24NF~~** x $2\frac{1}{4}$ cap screws through bracket and front panel, followed by **~~1/8-inch~~** lock

washers and $\frac{3}{8}$ -24NF nuts. Do not tighten nuts. Install two $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screws at lower flange of spare wheel bracket. Tighten cap screws and upper nuts.

i. Install Right and Left Seat Back (with Supports) Assemblies, Safety Strap Eye Bolt, Seat Back Board Seat Retainer, and Front Rack Assembly.

- (1) Position right and left seat back (with supports) assemblies (E and U) in right and left side panels (N and S). Aline holes in seat back supports with holes in side panels and install three $\frac{5}{16}$ -24NF x $2\frac{3}{4}$ cap screws (each side), followed by $\frac{5}{16}$ -inch lock washers and $\frac{5}{16}$ -24NF nuts. Tighten nuts.
- (2) Insert safety strap eye bolts (B) in upper rear hole in seat back lower board and seat back support, followed by $\frac{3}{8}$ -inch lock washer and $\frac{3}{8}$ -16NC nut (each side). Tighten nuts.
- (3) Place a $\frac{5}{16}$ -inch plain washer on two $\frac{5}{16}$ -24NF x 1 cap screws, followed by the right and left seat back board seat retainers (C) and other $\frac{5}{16}$ -inch plain washers. Insert cap screws through lower rear hole in seat back lower board and seat back supports (seat retainer offset toward center of body and top edge of offset pointing down and toward rear of body). Install $\frac{5}{16}$ -24NF nuts and tighten nuts so that retainers can be moved freely without end play. Peen end of cap screws over nuts to retain proper adjustment and prevent loss of parts.
- (4) Install front rack assembly (T) so that front rack stake (Q) is inside of front panel and end connectors are engaged with brackets on seat back support assemblies. Install two $\frac{3}{8}$ -inch lock washers and $\frac{3}{8}$ -24NF x $7\frac{7}{8}$ cap screws to attach front rack stake to front panel. Tighten cap screws.

Install Auxiliary Seat and Right and Left Seat Assemblies.

- (1) Position auxiliary seat assembly on front panel and attach each hinge to front panel with two $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ fluted taper point cap screws. Tighten cap screws.
- (2) Position right and left seat assemblies (F and V) on side panels and install two $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screws through each hinge bracket and side panel (heads outside), followed by $\frac{3}{8}$ -inch lock washers and $\frac{3}{8}$ -24NF nuts. Tighten nuts.

k. Install Tail Gate Assembly, Tail Gate Outer Hinges, and Tail Gate Hinge Support.

- (1) Position one of the tail gate outer hinges (G) on body-side panel and attach hinge to body with 7/16-inch internal-external-teeth lock washers and ~~7/16-20NF~~ x 1 cap screws. Tighten cap screws. Tighten three side panel rear support cap screws.
- (2) Coat hinge ends of tail gate assembly with general purpose grease (GAA) and insert tail gate assembly in tail gate outer hinge, which is attached to body. Position other tail gate outer hinge on tail gate assembly and install two 7/16-inch internal-external-teeth lock washers and ~~7/16-20NF~~ x 1 cap screws. Tighten cap screws. Tighten three side panel rear support cap screws.
- (3) Close tail gate assembly and position tail gate hinge support (fig. 217) at center of rear floor cross sill and install two $\frac{1}{8}$ -inch internal-external-teeth lock washers and ~~$\frac{3}{8}$ -24NF~~ x $\frac{3}{4}$ fluted taper point cap screws. Tighten cap screws.

l. Install Roof Bow Assemblies. Refer to TM 9-840 for information pertaining to the installation of the roof bow assemblies (A).

m. Install Cargo and Command Body. Refer to paragraph 62 for information pertaining to the installation of the cargo and command body.

CHAPTER 17

HOOD, FENDERS, AND GUARDS

Section I. DESCRIPTION AND DATA

298. Description

a. Hood Assembly (fig. 218). The hood assembly (F) is a one piece alligator-type attached to the cowl and opens from the front. Spring loaded locks, which hold hood in closed position, are provided at the front end. A hood safety catch assembly (AA) was added at the front end, starting with truck serial number 80017625.

b. Front Fender Assemblies (fig. 218). The front fender assemblies (J and V) are heavy-gage steel stampings with rolled edges for increased rigidity. The fenders are mounted independently of the body on front and rear brackets.

c. Rear Fenders (fig. 216). Rear fenders (J) are provided on the cargo, command, and telephone maintenance bodies. These fenders are also heavy-gage steel stampings with a rolled outer edge.

d. Radiator Guard and Headlight Guards (fig. 218). The radiator guard (U) and headlight guards (M and W) are provided to protect the lights and radiator against brush damage. The guards are constructed of heavy-gage steel straps and bars.

299. Data

a. Hood Assembly.

Type	-----	alligator, hinged at rear
Number of reinforcements	-----	3
Number of hood locks	-----	2

b. Front Fenders.

Type	-----	one-piece steel stamping
Number of supports	-----	2

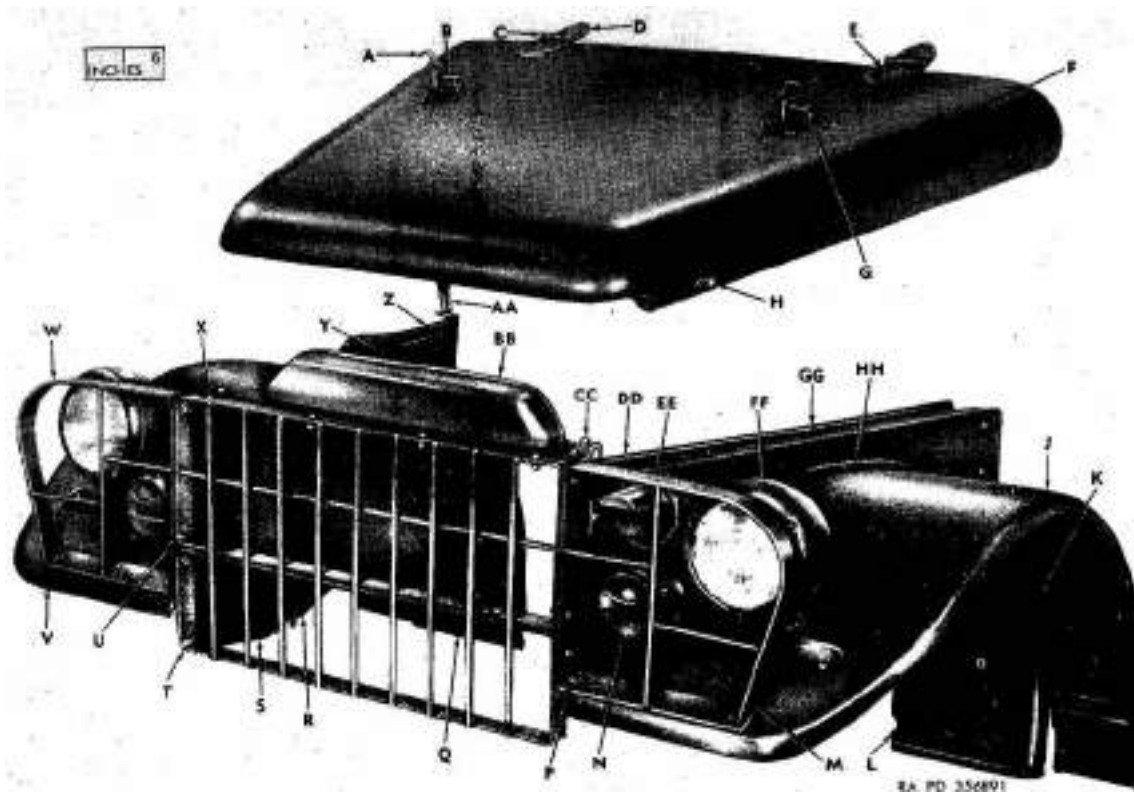


Figure 218. Hood, front, fenders, guards, and related parts.

A—Catch, hood windshield, ~~assy—7005413~~
 B--Bumper, hood windshield support ~~bracket—CC-1199902~~
 C—Pin, hinge-7373388
 D—Hinge, hood, male half-7372603
~~E—Hinge, hood, female half-7372602~~
~~F—Hood, assy-7372601~~
 G—Bracket, hood windshield support—CC-1278322
 H—Catch, hood panel lock-7005413
~~J—Fender, left front, assy-7707256~~
 K—Screw, lock washer, fender rear splash ~~shield—7371288~~
~~L—Shield, splash, left fender, rear—CC-1278733~~
 M—Guard, headlight, left-7374731
 N—Light, marker-7762614
 P--Screw, cap, $\frac{1}{8}$ -24NF x $\frac{1}{4}$ —~~120758~~
 Q—Shield, splash, right fender, rear—CC-1278732
 H—Shield, splash, right fender, assy-7707263
 Shield, splash, left fender, ~~assy—CC-1277091~~
 S—Support, side, radiator guard, right-7374729
 T—Extension, radiator guard-7374733
 U—Guard, radiator-7374739
 V—Fender, right front, assy—C-1278310
 W—Guard, headlight, right-7374732
 X—Screw, cap, $\frac{1}{8}$ -24NF x $\frac{1}{4}$ —~~120758~~
 Y—Panel, right fender to hood, ~~assy—CC-1278099~~
~~Z—Bracket, fender liquid container, assy—CC-1276767~~
 AA—Catch, hood safety, assy—CC-1396208
 BB—Baffle, radiator upper-7413236
 CC—Screw, cap, $\frac{1}{8}$ -24NF x $\frac{1}{4}$ —~~120758~~
 DD—Support, side, radiator guard, left-7374730
~~EE—Light, blackout head, assy-7760505~~
 FF—Light, service head, assy-7760504
~~GG—Panel, left fender to hood, assy—CC-1278106~~
~~HH—Filler, rubber, fender to hood panel-7374947~~

Figure 218—Continued.

<i>c. Rear Fenders.</i>	
Type -----	one-piece steel stamping
Method of attachment -----	screw to body
<i>d. Radiator Guard and Headlight Guards.</i>	
Type -----	welded steel
Number of sections (w/o winch) -----	4
(w/winch) -----	3

Section II. REBUILD OF HOOD ASSEMBLY

300. Disassembly (Field and Depot Maintenance)

a. Remove Hood Assembly from Vehicle. Refer to TM 9-840 for information pertaining to the removal of the hood assembly.

b. Remove Parts from Hood Assembly (fig. 218).

- (1) Remove hinge pins (C). This will separate the male half hood hinges (D) from female half hood hinges (E). Remove nuts, lock washers, cap screws, and female half hood hinges from hood.
- (2) If inspection (par. 301b) reveals that replacement of the hood bumpers is necessary, remove bumpers from underside of hood front reinforcement. Discard bumpers.
- (3) If inspection (par. 301c) reveals that replacement of the hood panel lock catches (H) is necessary, grind or file heads from rivets, drive rivets from hood, and remove catches. Discard catches.
- (4) If truck is equipped with a hood safety catch assembly (AA), remove cap screws and lock washers. This will release safety catch from hood front reinforcement.
- (5) If inspection (par. 301e) reveals that it is necessary to replace the hood windshield catch assemblies (A), hood windshield support brackets (G), or hood windshield support bracket bumpers (B) on cargo, command, or telephone maintenance trucks, proceed as follows :
 - (a) Remove nuts, lock washers, and screws ; then remove windshield catch assemblies.
 - (b) Remove nuts, lock washers, and screws ; then remove hood windshield support brackets complete with bumpers. Remove nuts, lock washer, screws, and plain washers ; then remove bumpers from support brackets.

c. Cleaning. Remove all dirt and corrosion from metal parts with a wire brush.

301. Inspection (Field and Depot Maintenance)

a. Inspect Male and Female Halves of Hood Hinges and Hinge Pins (fig. 218).

- (1) Inspect male half hood hinges (D) and female half hood hinges (E) for corrosion, distortion, or cracks. If corrosion has not damaged the metal, satisfactory repairs can be accomplished by removal of corrosion. Replace hinges if they are distorted or cracked.
- (2) Inspect hinge pins (C) for distortion, corrosion, or wear. If hinge pins are corroded, remove corrosion and check pins in hinges. If pins are not a snug fit, replace pins or hinges as required.

b. Inspect Hood Bumpers. Inspect hood bumpers for deterioration or other visual damage. Replace bumpers (pars. 300b and 302c) if they are not in good condition.

c. Inspect Hood Panel Lock Catches and Hood Safety Catch Assembly (fig. 218).

- (1) Inspect hood panel lock catch (H) for corrosion, wear, or cracks. If any of these conditions exist, replace catch (pars. 300b and 302b).
- (2) Inspect hood safety catch assembly (AA) for corrosion, distortion, binding, or broken or weak spring. If any of these conditions exist, replace hood safety catch assembly (pars. 300b and 302d).

d. Inspect Hood Assembly (fig. 218). Inspect hood assembly (F) for corrosion, distortion, bent reinforcements, or broken welds. Remove corrosion if metal is not damaged and paint parts. Repair broken welds by welding. Replace hood assembly if satisfactory repairs cannot be performed.

e. Inspect Hood Windshield Support Brackets, Hood Windshield Support Bracket Bumpers, and Hood Windshield Catch Assemblies (Cargo, Command, and Telephone Maintenance Trucks) (fig. 218).

- (1) Inspect hood windshield support brackets (G) for corrosion, distortion, or cracks. If any of these conditions exist, replace brackets (pars. 300b and 302a).
- (2) Inspect hood windshield support bracket bumpers (B) for deterioration or other visual damage. Replace bumpers (pars. 300b and 302a) if they are not in good condition.
- (3) Inspect each hood windshield catch assembly (A) for corrosion, cracks, distortion, or weak or broken spring. Replace catch assembly (pars. 300b and 302a) if any of these conditions exist.

302. Assembly (Field and Depot Maintenance)

a. Install Hood Windshield Support Bracket Bumpers, Hood Windshield Support Brackets, and Hood Windshield Catch Assemblies (Cargo, Command, and Telephone Maintenance Trucks) (fig. 218).

- (1) If inspection (par. 301e) reveals that it is necessary to replace hood windshield support bracket bumpers (B), position new bumpers on hood windshield support brackets (G). Place a 3/16-inch plain washer on two No. 8-32NC x 3/8 round-head machine screws (each side) and insert screws through bumper and bracket. Install No. 8 lock washers and No. 8-32NC nuts. Tighten nuts.
- (2) If inspection (par. 301e) reveals that it is necessary to replace hood windshield support brackets (G), position new support brackets, complete with bumpers, on hood (long side of brackets toward outside of hood). Install two 1/4-28NF x 5/8 cross-recess pan-head machine screws (each side) through bracket and hood, followed by 1/4-inch lock washers and 1/4-28NF nuts. Tighten nuts.
- (3) If inspection (par. 301e) reveals that it is necessary to replace hood windshield catch assembly (A), position new catch assembly on hood (open end of brackets toward front of hood). Install two 1/4-28NF x 5/8 cross recess pan-head machine screws (each side), 1/4-inch lock washers, and 1/4-28NF nuts. Tighten nuts.

b. Install Hood Panel Lock Catches (fig. 218). If inspection (par. 301c) reveals that it is necessary to replace the hood panel lock catch (H), position new catch on hood (each side) open end up, and install two 3/16 x 3/8 round-head steel rivets (heads outside). Set rivets.

c. Install Hood Bumpers. If inspection (par. 301b) reveals that it is necessary to replace hood bumpers, coat new bumpers with liquid soap and force them into the openings of the hood front reinforcement with a 1/8-inch flat-end rod, inserted in bumper opening.

d. Install Hood Safety Catch Assembly (fig. 218). If inspection (par. 301c) reveals that it is necessary to replace hood safety catch assembly (AA), position catch assembly on hood front reinforcement (hook toward front) and install two 3/8-inch internal-external-teeth lock washers and 3/8-24NF x 7/8 cap screws. Tighten screws.

e. Install Hood Hinges and Hinge Pins (fig. 218).

- (1) Position female half hood hinge (E) (each side) on hood. Install three hood hinge lock washer screws through

hinge and hood panel, followed by $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF nuts. Tighten nuts.

- (2) Coat each hinge pin (C) with general purpose grease (GAA). Aline each male half hood hinge (D) with female half hood hinge and install hinge pin.

f. Install Hood Assembly on Truck. Refer to TM 9-840 for information pertaining to the installation and adjustment of the hood assembly.

Section III. REBUILD OF RIGHT AND LEFT FRONT FENDER ASSEMBLIES, RIGHT AND LEFT FENDER SPLASH SHIELD ASSEMBLIES, AND RIGHT AND LEFT FENDER-TO-HOOD PANEL ASSEMBLIES

303. Disassembly (Field and Depot Maintenance)

a. Remove Right and Left Fender-to-Hood Panel Assemblies and Radiator Tie Rods and Hood Support Assemblies.

- (1) Disconnect battery ground terminal at battery.
- (2) Remove four lock washers and cap screws (each side) from right and left fender-to-hood panel assemblies (Y and GG, *fig. 218*) ; then remove panel assemblies.
- (3) Remove lock washer cap screw at front of each radiator tie rod and loosen nuts at rear. Remove radiator tie rod complete with hood support assembly.

b. Remove Right and Left Front Fender Assemblies and Right and Left Fender Splash Shield Assemblies.

- (1) Open rubber coated open clips on right and left fender splash shield assemblies, left front fender assembly, and radiator guard right and left side supports to release cables. Remove screws and lock washers, which attach ground cables to fender splash shields ; then remove cable connectors from clips. Separate cable front connectors.
- (2) Remove three lock washer and cap screws (CC and DD, *fig. 220*) to release right and left front fender assemblies (J and V, *fig. 218*) from fender rear supports.
- (3) Remove three cap screws, lock washers, and nuts (each side) to separate right and left headlight guards (M and W, *fig. 218*) from radiator guard right and left side supports (S and DD, *fig. 218*).
- (4) Remove two lock washer screws (each side), which attach the front fender to the radiator guard side support (underside of fender).

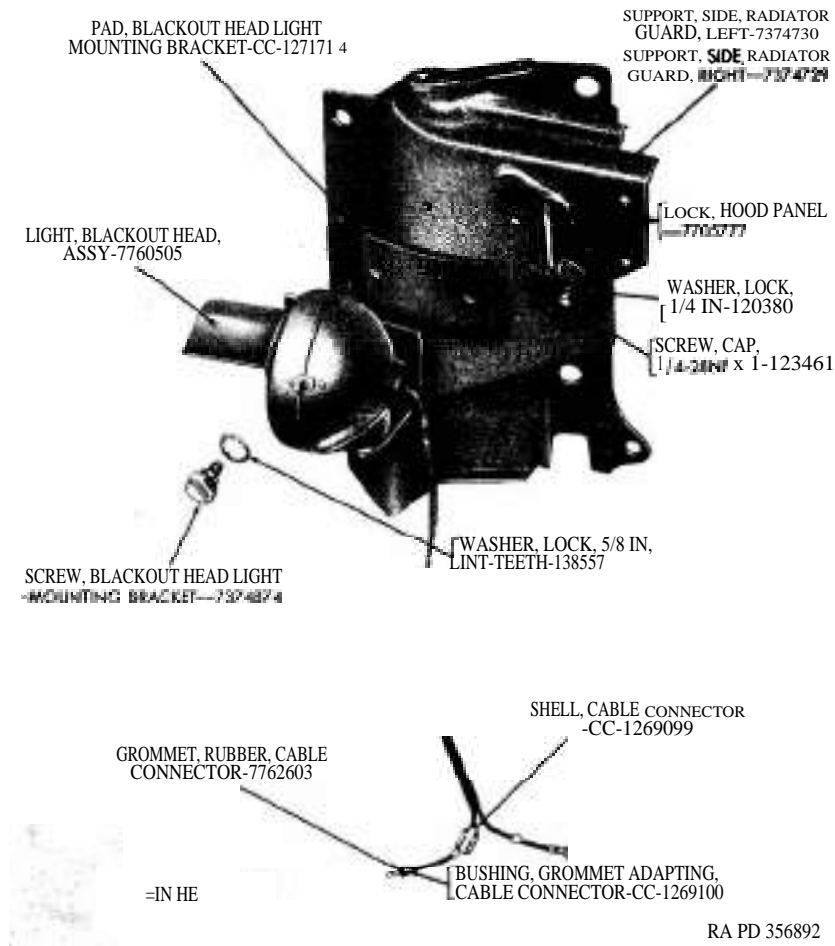


Figure 219. Radiator guard left side support, blackout headlight assembly, and hood panel lock.

- (5) Remove cable connector rubber grommet (fig. 219), cable connector grommet adapting bushing (fig. 219), and cable connector shell (fig. 219) from blackout headlight cable. Remove cable split grommet (G, fig. 220) from fender and withdraw blackout headlight cable.
- (6) Remove six cap screws and lock washers each side to separate right and left fender splash shield assemblies from right and left front fender assemblies.
- (7) Remove three nuts and lock washers each side ; then remove right and left cable covers (KK, fig. 220) from underside of fenders. Remove service headlight cables

and marker light cables from engine compartment through opening at front of fender splash shields.

- (8) Remove two cap screws (X, *fig. 220*) and lock washers (Y, *fig. 220*) (each side) ; this will release each front fender front support (W, *fig. 220*) from radiator support.
- (9) Remove right and left front fender assemblies.
- (10) Remove one cap screw and lock washer (each side), which attach lower front corner of fender splash shield to radiator guard side support. Remove right and left splash shields.

c. Remove Parts from. Right and Left Front Fender Assemblies.

Note. The key letters noted in parentheses are in figure 220, except where otherwise indicated.

- (1) Remove two nuts (V), lock washers (U), cap screws (M), and lock washers (N). This will release each headlight guard (K) from front fender assembly (C).
- (2) Remove two remaining nuts (HH) and lock washers (JJ) from cap screws, which attach each service headlight assembly (H) to fender. Lift service headlight assembly from fender and remove cable split grommet (G). Sufficient space is provided in the fender opening for removal of the service headlight cable complete with connector shells if connector shells are withdrawn one at a time. Remove service headlight assembly.
- (3) Remove remaining nut (LL), lock washer (MM), and cap screw (J). This will release each marker light assembly (R) from fender. Sufficient space is provided in the fender opening for removal of the marker light cable complete with connector shells if connector shells are withdrawn one at a time. Remove marker light assemblies.
- (4) Remove three nuts (Z), lock washers (AA), cap screws (S), and plain washers (T) (each side), which attach the front fender to the front fender front support (W).
- (5) Remove three fender rear splash shield lock washer screws (FF) (each fender) ; then remove fender rear splash shield (EE).
- (6) If inspection (par. 304b) reveals replacement of the splash shield-to-fender rubber filler (GG) and rear splash shield-to-bracket antisqueak (BB) is necessary, remove and discard filler and antisqueak, each side.
- (7) If inspection (par. 304a) reveals replacement of the

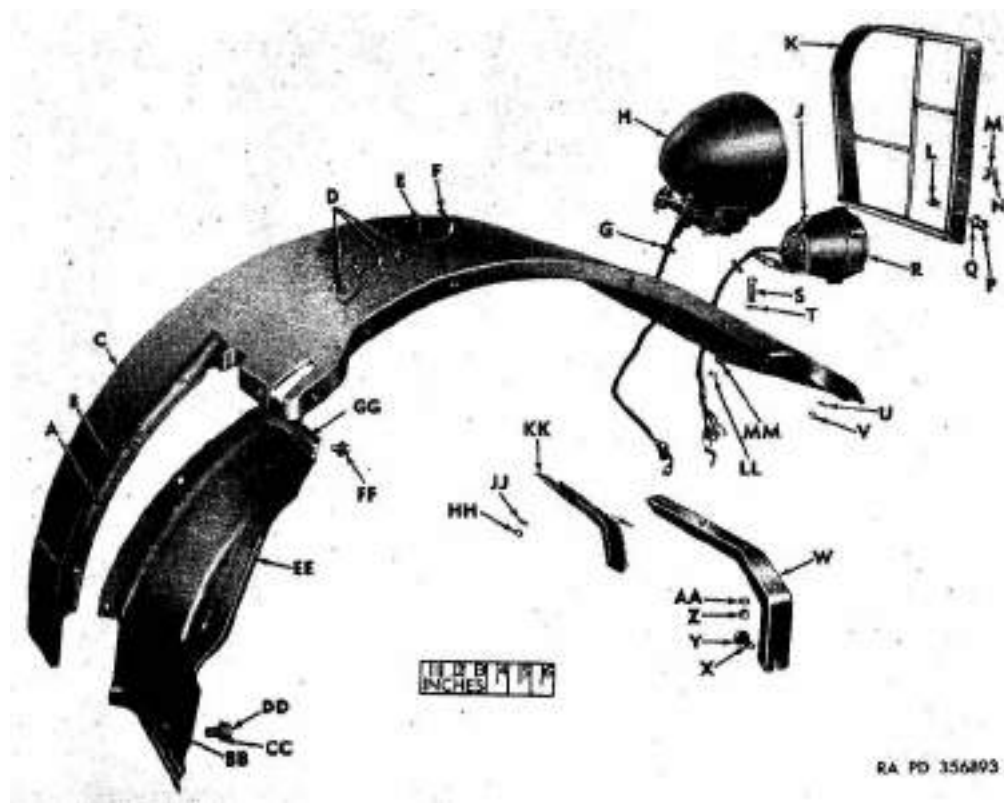


Figure 220. Front fender and related parts.

A—Rivet, split, 9/64 x 7/16, oval-head, br-113194
 B—Filler, left fender to cowl—CC-127802
 Filler, right fender to cowl-1278024
 C—Fender, left front, assy—CC-1278311
 Fender, right front, assy—CC-1278310
 D—Clip, open, rubber coated (small)—CC-1253234
 E—Screw, tapping, $\frac{1}{4}$ -20NC x $\frac{1}{2}$, tapered-pt—166041
 F—Clip, open, rubber coated (large)-7346792
 G—Grommet, split, cable-120879
 H—Light, service head, assy-7760504
 J—Screw, cap, $\frac{1}{4}$ -24NF x $\frac{1}{2}$ —120758
 K—Guard, left, headlight-7374731
 Guard, right, headlight-7374732
 L—Screw, cap, $\frac{1}{4}$ -24NF x 1 1/2-123534
 M—Screw, cap, $\frac{3}{8}$ -24NF x $\frac{1}{2}$ —120758
 N—Washer, lock, $\frac{3}{8}$ -inch, internal-external-teeth-178551
 P—Nut, $\frac{3}{8}$ -24NF—120369
 Q—Washer, lock, $\frac{1}{2}$ -inch, internal-external-teeth-178551
 R—Light, marker, assy-7762614
 S—Screw, cap, 7/16-20NF x 1-123567
 T—Washer, plain, 7/16-inch-120395
 U—Washer, lock, $\frac{1}{2}$ -inch, internal-external-teeth-178551
 V—Nut, $\frac{3}{8}$ -24NF—120369
 W—Support, front, left front fender—CC-1277016
 Support, front, right front fender-7707268
 X—Screw, cap, $\frac{1}{4}$ -20NF x 1 1/2-214192
 Y—Washer, lock, $\frac{1}{2}$ -inch, internal-external-teeth—178591
 Z—Nut, 7/16-20NF—120370
 AA—Washer, lock, 7/16-inch-120383
 BB—Antisqueak, rear splash shield to bracket—CC-313073
 CC—Washer, lock, $\frac{1}{2}$ -inch, internal-external-teeth-178591
 DD—Screw, cap, $\frac{1}{4}$ -20NF x 1-213967
 EE—Shield, splash, left fender, rear—CC-1278733
 Shield, splash, right fender, rear—CC-1278732
 FF—Screw, lock washer, fender rear splash shield-7351288
 GG—Filler, rubber, splash shield to fender-7374947
 HH—Nut, 5/16-24NF—120368
 JJ—Washer, lock, 5/16-inch, internal-external-teeth—178582
 KK—Cover, left cable—CC-1273351
 Cover, right cable—CC-1273352
 LL—Nut, $\frac{3}{8}$ -24NF—120369
 MM—Washer, lock, $\frac{1}{2}$ -inch, internal-external-teeth—178551

Figure 220—Continued.

fender-to-cowl filler (B) is necessary, remove split rivets (A). This will release filler from fender, each side. Discard fillers.

- (8) Remove two tapping screws (E) and large and small rubber coated open clips (D and F) from left front fender.
- (9) Remove six nuts, lock washers, and cap screws, and remove fender liquid container bracket assembly (Z, fig. 218) from right front fender assembly (V, fig. 218).

d. Remove Parts from Right and Left Fender Splash Shield Assemblies (fig. 221). Remove six tapping screws and rubber coated open clips from right and left fender splash shield assemblies. Remove tapping screws, tension tube open clip assemblies, and clip mounting plate assemblies from splash shield assemblies.

e. Remove Fender-to-Hood Panel Rubber Filler from Right and Left Fender-to-Hood Panel Assemblies. If inspection (par. 304a) reveals that replacement of the fender-to-hood panel rubber filler (HH, fig. 218) is necessary, remove split rivets and rubber filler. Discard filler.

f. Cleaning. Remove dirt and corrosion from all metal parts with a wire brush.

304. Inspection (Field and Depot Maintenance)

a. Inspect Right and Left Fender-to-Hood Panel Assemblies and Radiator Tie Rods and Hood Support Assemblies (fig. 218).

- (1) Inspect right and left fender-to-hood panel assemblies (Y and GG) for corrosion, distortion, or cracks. Cracks can be repaired by welding. If panels are damaged because of corrosion or distortion, they must be replaced.
- (2) Inspect each fender-to-hood panel rubber filler (HH) for deterioration. Fillers must be replaced (pars. 303e and 305c) if not in good condition.
- (3) Inspect each radiator tie rod for damaged threads or cracks. Cracks can be repaired by welding but the tie rod must be replaced if the threads are worn or damaged.
- (4) Inspect each hood support assembly for deteriorated hood support bumper, corrosion, broken welds, distorted bracket, or cracks. Replace hood support bumper if it is deteriorated. Replace hood support assembly if there is evidence of cracks, broken welds, distortion, or corrosion.

b. Inspect Right and Left Front Fender Assemblies and Right and Left Fender Rear Splash Shields.

Note. The key letters noted in parentheses are in figure 220, except where otherwise indicated.

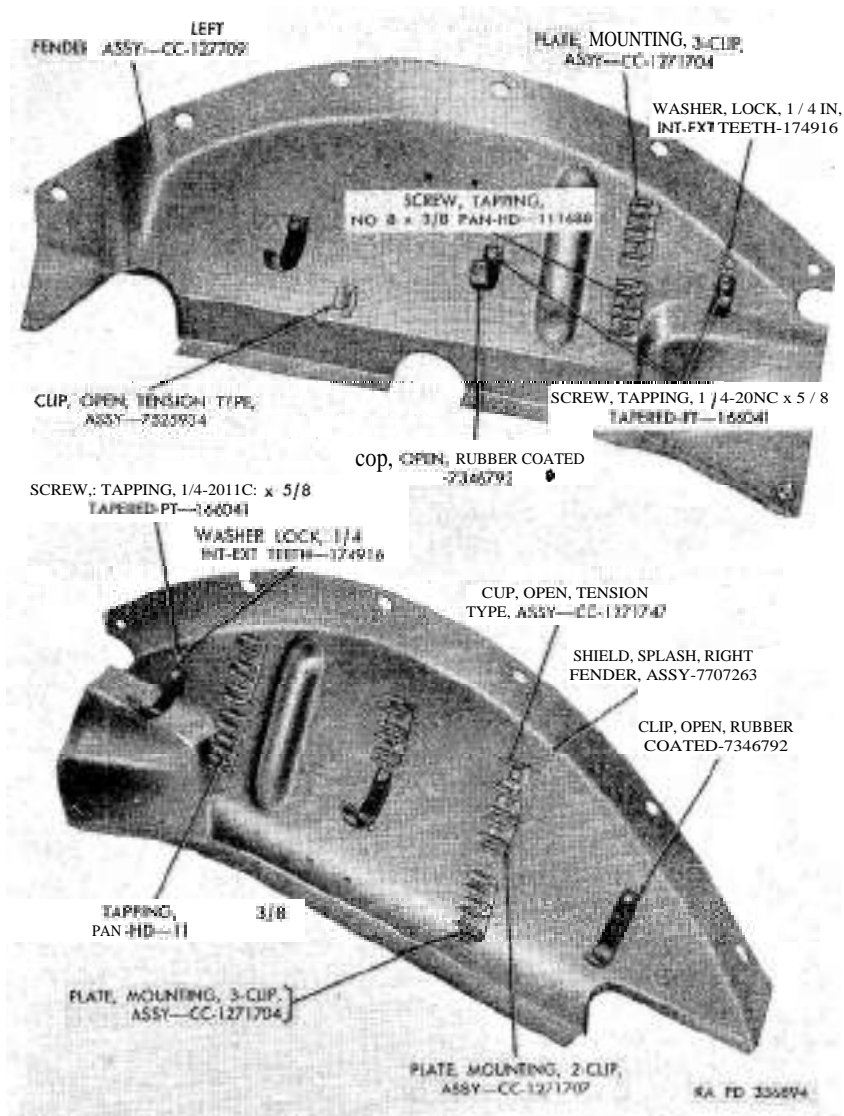


Figure 221. Right and left fender splash shield assemblies.

- (1) Inspect right and left front fender assemblies (J and V, fig. 218) for corrosion, distortion, cracks, broken outside beads, damaged threads, or broken welds. Cracks and broken welds can be repaired by welding and proper metal finishing. Distortion can be corrected if the damage is not extensive, but fenders must be replaced if they are damaged by corrosion.
- (2) Inspect each fender rear splash shield (EE) for cor-

rosion, cracks, or distortion. Cracks can be repaired by welding, but splash shields must be replaced if they are distorted or damaged by corrosion.

- (3) Inspect each splash shield-to-fender rubber filler (GG), each fender-to-cowl filler (B), and rear splash shield-to-bracket antisqueak (BB) for deterioration. Fillers and antisqueak must be replaced (pars. 303c and 305a) if not in good condition.
- (4) Inspect each front fender front support (W) for broken welds, cracks, distortion, or corrosion. Cracks and broken welds can be repaired by welding, but supports must be replaced if they are distorted or damaged by corrosion.
- (5) Inspect each cable cover (KK) for corrosion, cracks, or distortion. ~~Cracks~~ can be repaired by welding but covers must be replaced if they are distorted or damaged by corrosion.
- (6) Inspect each front fender rear support for cracks, corrosion, or distortion. Cracks can be repaired by welding but supports must be replaced if they are distorted or damaged by corrosion.

c. Inspect Right and Left Fender Splash Shield Assemblies and Related Parts (fig. 221).

- (1) Inspect right and left fender splash shield assemblies for cracks, corrosion, or distortion. Cracks can be repaired by welding but splash shields must be replaced if they are distorted or damaged by corrosion.
- (2) Inspect rubber coated open clips for cracks or deterioration. Replace clips if either of these conditions exist.
- (3) Inspect tension-type open clip assemblies for cracks or distortion. Clips must be replaced if they are not in good condition.
- (4) Inspect clip mounting plate assemblies for cracks, distortion, or loose rivets. Replace clip mounting plates if any of these conditions exist.

d. Inspect Fender Liquid Container Bracket Assembly (fig. 218) . Inspect fender liquid container bracket assembly (Z) for corrosion, cracks, broken welds, or distortion. Cracks or broken welds can be repaired by welding. Replace bracket assembly if any of the other conditions exist.

305. Assembly (Field and Depot Maintenance)

a. Assemble Parts on Right and Left Front Fenders (fig. 220).

- (1) If inspection (par. 304a) reveals that it is necessary to

replace fender-to-cowl filler (B), position new fender-to-cowl filler on rear portion of each front fender. Install six 9/64 x 7/16 oval-head brass split rivets (A) in each filler and front fender. Bend over ends of rivets.

- (2) If inspection (par. 304b) reveals that it is necessary to replace splash shield-to-fender rubber filler (GG) or rear splash shield-to-bracket antisqueak (BB), apply a coating of synthetic rubber cement (52-C-1556) on the rear surface across the top and around the lower opening of fender rear splash shield (EE). Also apply a coating of rubber cement on the new filler and new anti-squeak. Allow cement to dry for 10 minutes and install new filler and new antisqueak on each splash shield.
- (3) Position fender rear splash shield (EE) on each fender and install three fender rear splash shield lock washer screws (FF) in each splash shield. Tighten screws.
- (4) Position rubber coated open clips (D and F) on top of left front fender with large clip (F) toward front. Install two ~~1/4-20NC~~ x ~~5/8~~ tapered point tapping screws (E). Tighten screws.
- (5) Position front fender front support (W) (gusset plate reinforcement forward) on each fender and install three 7/16-inch plain washers (T), ~~7/16-20NF~~ x 1 cap screws (S) (heads up), 7/16-inch lock washers (AA), and ~~7/16-20NF~~ nuts (Z). Tighten nuts.
- (6) Insert cable of service headlight assembly (H) through opening in each fender and install cable split grommet (G). Position headlight assembly on each fender and install two 5/16-inch internal external teeth lock washers (JJ) and 5/16-24NF nuts (~~HH~~) on the two front cap screws (each side). Tighten nuts.
- (7) Insert cable of each marker light assembly (R) through opening in each fender. Position each marker light assembly on each fender and install one ~~5/8~~-inch internal-external-teeth lock washer and one ~~3/4-24NF~~ x ~~7/8~~ cap screw (J) through inside hole of marker light mounting bracket and fender (each side), followed by ~~3/8~~-inch internal-external-teeth lock washer (MM) and ~~3/4-24NF~~ nut (LL). Tighten nuts.

b. Install Parts on Right and Left Fender Splash Shield Assemblies (fig. 221).

- (1) Position three rubber coated open clips on right and left fender splash shield assemblies and install ~~1/4-20NC~~ x tapered point tapping screws. Tighten screws.
- (2) Position four 3-clip mounting ~~plate~~ assemblies on right

fender splash shield assembly and two 3-clip assemblies on left fender splash shield assembly. Attach mounting plate assemblies to splash shields with No. 8 x $\frac{3}{8}$ pan-head tapping screws. Tighten screws.

- (3) Position one 2-clip mounting plate assembly on right splash shield assembly and install two No. 8 x $\frac{3}{8}$ pan-head tapping screws. Tighten screws.
- (4) Position one tension-type open clip assembly (large) on right splash shield assembly and install a $\frac{1}{4}$ -20NC x $\frac{5}{8}$ tapered-point tapping screw. Tighten screw.
- (5) Position one tension-type open clip assembly (small) on left splash shield assembly and install two No. 8 x $\frac{3}{8}$ pan-head tapping screws. Tighten screws.

c. *Install Fender-to-Hood Panel Rubber Filler on Right and Left Fender-to-Hood Panel Assemblies* (fig. 218). If inspection (par. 304a) reveals that it is necessary to replace fender-to-hood panel rubber filler (HH), position new fender-to-hood panel rubber filler on right and left fender-to-hood panel assemblies (Y and GG). Install seven $\frac{9}{64}$ x $\frac{7}{16}$ oval-head brass split rivets to attach each filler to panels. Bend over ends of rivets.

d. *Install Right and Left Front Fender Assemblies and Right and Left Fender Splash Shield Assemblies.*

- (1) Position right and left fender splash shield assemblies (fig. 221) on truck. Install one $\frac{9}{16}$ -inch internal-external-teeth lock washer and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screw (each side) to attach lower forward corner of splash shields to radiator guard right and left side supports, but do not tighten screws.
- (2) Position right and left front fender assemblies (J and V, fig. 218) on truck.
- (3) Install three $\frac{1}{2}$ -inch internal-external-teeth lock washers (CC, fig. 220) and $\frac{1}{2}$ -20NF x 1 cap screws (DD, fig. 220) through fender rear support and fender (each side), to attach fenders at rear, but do not tighten screws.
- (4) Install two $\frac{1}{2}$ -inch internal-external-teeth lock washers (Y, fig. 220) and $\frac{1}{2}$ -20NF x $1\frac{1}{2}$ cap screws (X, fig. 220) through front fender front support (each side), but do not tighten screws.
- (5) Insert cable for blackout headlight assembly through marker light cable opening in left fender. Insert cables for service headlight, marker lights, and blackout headlight through opening at forward end of splash shields. Install cable split grommet (G, fig. 220) in fender opening for marker light and blackout headlight cables.

- (6) Install three $\frac{3}{8}$ -24NF x $1\frac{1}{8}$ cap screws (L, fig. 220) through each headlight guard and radiator guard on trucks without winch, followed by $\frac{3}{8}$ -inch internal-external-teeth lock washers (Q, fig. 220) and $\frac{3}{8}$ -24NF nuts (P, fig. 220). Do not tighten nuts.

Note. On trucks with winch, install one $\frac{3}{8}$ -24NF x 1 cap screw through lower hole in headlight guard.

- (7) Install six $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screws (each side), to attach right and left fender splash shield assemblies to fender assemblies. Do not tighten screws.
- (8) Install two $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screws (each side), to attach front fender to radiator guard side support (underside of fenders). Tighten screws.
- (9) Position cable cover (KK, fig. 220) on underside of both front fenders, utilizing the two rear service headlight screws and marker light outer screw (each side). Install 5/16-inch internal-external-teeth lock washers (JJ, fig. 220) and 5/16-24NF nuts (HH, fig. 220) on service headlight screws. Tighten nuts. Install $\frac{3}{8}$ -24NF x $7/8$ cap screw (J, fig. 220) through marker light mounting bracket, fender and cable cover (each side), followed by $\frac{3}{8}$ -inch internal-external-teeth lock washers (MM, fig. 220) and $\frac{3}{8}$ -24NF nuts (LL, fig. 220). Tighten nuts.

e. Install Connector Parts on Blackout Headlight Cable. Install cable connector shell (fig. 219), cable connector grommet adapting bushing, and cable connector rubber grommet on blackout headlight cable.

f. Connect All Cables.

- (1) Position ground cables (No. 91) to right and left fender splash shield assemblies and install a $\frac{1}{4}$ -inch internal-external-teeth lock washer and $\frac{1}{4}$ -20NC x $\frac{5}{8}$ tapered point tapping screw (fig. 221) (each side). Tighten screws.
- (2) Connect all cables (numbers on identifying tags must correspond on each pair of cables). Insert cables in rubber coated open clips and bend clips over cables. Insert connector shells in tension-type open clip assemblies.

g. Install Radiator Tie Rod and Hood Support Assemblies.

Note. Radiator tie rod for right side has an offset for the air cleaner.

Position right and left radiator tie rods and hood support assemblies on cowl brackets ($\frac{3}{4}$ -inch plain washer and $\frac{3}{4}$ -20NF nut, each side of bracket). Install a $\frac{1}{2}$ -inch internal-external-teeth lock

washer and $\frac{1}{2}$ -20NF x 1 cap screw at front (each side) through end of tie rod radiator guard side supports, and into radiator support.

h. Instal; Right and Left Fender-to-Hood Panel Assemblies and A line Fender Assemblies.

- (1) Raise front end of each fender assembly as high as possible by hand and tighten cap screw, which attaches radiator tie rod to radiator support.
- (2) Position right and left fender-to-hood panel assemblies on truck and adjust radiator tie rod at rear to obtain proper alinement of screw holes. Tighten nuts at rear of tie rods. Place hood panel assemblies in position and install four $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screws, each side, but do not tighten cap screws.
- (3) Raise or lower front or rear of front fenders, as required, to obtain uniform clearance between fender-to-hood panel assemblies and hood. Tighten all fender support screws, fender splash shield screws, headlight guard screws, and fender-to-hood panel screws (each side).

i. Install Fender Liquid Container Bracket Assembly. Position fender liquid container bracket assembly (Z, fig. 218) on right front fender assembly. Install six $\frac{3}{8}$ -24NF x 1 cap screws, $\frac{3}{8}$ -inch internal-external-teeth lock washers, and $\frac{3}{8}$ -24NF nuts. Tighten nuts.

j. Focus Service Headlight Assemblies. Refer to TM 9-840 for information pertaining to the focusing of service headlight assemblies.

Section IV. HEADLIGHT GUARDS, RADIATOR GUARD, AND RADIATOR GUARD SIDE SUPPORTS

306. Disassembly (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 218, except where otherwise indicated.

a. Remove Right and Left Headlight Guards. Remove five nuts, lock washers, and cap screws on trucks without winch (four on trucks with winch). This will release right and left headlight guards (M and W) from truck.

b. Remove Radiator Guard, Radiator Guard Extension, and Radiator Upper Baffle.

- (1) Remove four cap screws (CC) and lock washers, which attach radiator upper baffle (BB) to radiator guard side

supports and remove baffle and radiator guard (U) as an assembly.

- (2) Remove four nuts, lock washers, and cap screws (X) ; then separate baffle from radiator guard.
- (3) On trucks without winch, remove two nuts, lock washers, and cap screws ; then separate radiator guard extension (T) from radiator guard.

c. Remove Blackout Headlight Assembly from Radiator Guard Left Side Support (fig. 219). Remove two blackout headlight mounting bracket screws and lock washers. This will release blackout headlight assembly and blackout headlight mounting bracket pad from radiator guard left side support.

Note. Place blackout headlight on fender in a protected position.

d. Remove Radiator Guard Right and Left Side Supports from Truck.

- (1) Remove four cap screws and lock washers (each side) and remove right and left fender-to-hood panel assemblies (Y and GG)
- (2) Remove cap screws and lock washers at front end of radiator tie rods. Loosen nuts at rear of radiator tie rods and remove rods complete with hood support assemblies.
- (3) Remove two lock washer screws (each side) (underside of front fenders), which attach fenders to radiator guard right and left side supports. Remove cap screw and lock washer (each side), which attaches lower rear corner of radiator guard side supports to front end of right and left fender splash shield assemblies.
- (4) Remove two cap screws (X, *fig. 220*) and lock washers (Y, *fig. 220*) from front fender front support-to-radiator support (each side).
- (5) Remove cables from rubber coated open clips on radiator guard side supports. Lift side supports from truck.
- (6) Remove tapping screws; then remove rubber coated open clips from side supports.
- (7) Remove cap screws and lock washers, which attach hood panel locks to side supports. Remove locks.

e. Cleaning. Remove all dirt and corrosion from metal parts with a wire brush.

307. Inspection (Field and Depot Maintenance)

a. Inspect Right and Left Headlight Guards (fig. 218). Inspect right and left headlight guards (M and W) for broken welds,

distortion, or corrosion. Broken welds can be repaired by welding and distortion can be corrected by straightening if damage is not extensive. Replace guards, if corrosion has damaged metal.

b. Inspect Radiator Guard (fig. 218). Inspect radiator guard (U) for broken welds, distortion, or corrosion. Broken welds can be repaired by welding. Distortion can be corrected by straightening if damage is not extensive. Replace guard if corrosion has damaged metal.

c. Inspect Radiator Guard Extension (Trucks Without Winch) (fig. 218). Inspect radiator guard extension (T) for broken welds, distortion, or corrosion. Broken welds can be repaired by welding. Distortion can be corrected by straightening if damage is not extensive. Replace radiator guard extension if corrosion has damaged metal.

d. Inspect Radiator Upper Baffle (fig. 218). Inspect radiator upper baffle (BB) for cracks, corrosion, or distortion. If any of these conditions exist, replace baffle.

e. Inspect Radiator Guard Right and Left Side Supports (fig. 219).

- (1) Inspect each radiator guard side support for broken welds. Broken welds can be corrected by welding.
- (2) Inspect each side support for damaged threads. If the threads are worn or damaged in any of the weld nuts, nuts can be removed and the various parts attached by the use of cap screws, lock washers, and nuts.
- (3) Inspect each side support for cracks. Cracks can be repaired by welding and the necessary metal finishing.
- (4) Inspect each side support for distortion or corrosion. If either of these conditions exist, replace side supports.

f. Inspect Hood Panel Locks (fig. 219). Inspect each hood panel lock for broken or weak spring, cracks, wear, or distortion. If any of these conditions exist, replace locks.

308. Assembly (Field and Depot Maintenance)

a. Install Hood Panel Locks and Rubber Coated Open Clips on Radiator Guard Right and Left Side Supports (fig. 219).

- (1) Position rubber coated open clip on rear lower surface of each radiator guard side support and install a 1/4—20NC x 3/8 tapered-point tapping screw. Position clip so that it extends down and tighten screw.
- (2) Position hood panel lock on each side support and install two 1/4-inch lock washers and 1/4-28NF x 1 cap screws. Tighten cap screws.

b. Install Radiator Guard Right and Left Side Supports.

- 1) Position each radiator guard side support on truck (lower rear portion of side support outside of right and left fender splash shield assemblies).
- (2) Install a $\frac{3}{8}$ -inch internal-external-teeth lock washer and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screw (each side) to attach lower rear portion of side support to fender splash shield assemblies, but do not tighten screws.
- (3) Install two $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{3}{4}$ cap screws (each side) through underside of fender to attach fender to side support, but do not tighten screws.
- (4) Install two 1/2-inch internal-external-teeth lock washers (Y, fig. 220) and $\frac{1}{2}$ -20NF x $1\frac{1}{2}$ cap screws (X, fig. 220) (each side) to attach front fender front support to radiator support, but do not tighten screws.

Note. To insure proper alinement between the hood and various parts, do not tighten any of the screws until the headlight guards and radiator guard are installed.

c. Install Blackout Headlight Assembly on Radiator Guard Left Side Support (fig. 219). Position blackout headlight mounting bracket pad and blackout headlight assembly on radiator guard left side support and install two $\frac{5}{8}$ -inch internal-teeth lock washers and blackout headlight mounting bracket screws. Tighten screws.

d. Install Radiator Upper Baffle, Radiator Guard, and Radiator Guard Extension (fig. 218).

- (1) Position radiator upper baffle (BB) on radiator guard right and left side supports. Install four $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{7}{8}$ cap screws (CC). Do not tighten cap screws.
- (2) Position radiator guard (U) on radiator upper baffle and install four $\frac{3}{8}$ -24NF x $\frac{7}{8}$ cap screws (X) through radiator guard and upper baffle followed by $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF nuts. Tighten nuts.
- (3) On trucks without winch, position radiator guard extension (T) between side supports and under radiator guard. Install two $\frac{3}{8}$ -24NF x $1\frac{1}{2}$ cap screws, $\frac{3}{8}$ -inch internal-external-teeth lock washers, and $\frac{3}{8}$ -24NF nuts. Tighten nuts.
- (4) Position right and left headlight guards (M and W) on front fenders and install two $\frac{3}{8}$ -inch internal-external-teeth lock washers and $\frac{3}{8}$ -24NF x $\frac{7}{8}$ cap screws (P) (each side) through guard and front fender, followed by

~~3/8-inch~~ lock washers and ~~3/8-24NF~~ nuts. Do not tighten nuts.

- (5) Install three ~~3/8-24NF~~ x 11/8 cap screws through headlight guards, radiator guard, and radiator guard extension, followed by ~~3/8-inch~~ internal-external-teeth lock washers and ~~3/8-24NF~~ nuts. Do not tighten nuts.

Note. On trucks with winch, install a % -24NF x 1 cap screw (each side) through lower hole in vertical bar in headlight guards, followed by a ~~1/2-inch~~ internal-external-teeth lock washer and % -24NF nut. Do not tighten nuts.

e. Install Radiator Tie Rod and Hood Support Assemblies and Right and Left Fender-to-Hood Panel Assemblies.

- (1) Position radiator tie rod and hood support assemblies on radiator support and cowl bracket (~~1/2-inch~~ plain washer and ~~3/8-24NF~~ nut each side of cowl bracket). Install a 1/2-inch internal-external-teeth lock washer and ~~1/2-20NF~~ x 1 cap screw at front end through tie rod and into radiator support.
- (2) Position right and left fender-to-hood panel assemblies on fenders. Check alinement of front and rear cap screw holes. Adjust radiator tie rods, as required, to obtain proper alinement of cap screw holes. Tighten nuts at rear of radiator tie rods.
- (3) Place right and left fender-to-hood panels on truck and install four ~~3/8-inch~~ internal-external-teeth lock washers and ~~3/8-24NF~~ x 3/4 cap screws (each side), but do not tighten cap screws.

f. Align Right and Left Front Fender Assemblies.

- (1) Refer to paragraph 305h for information pertaining to the alining of the right and left front fender assemblies.
- (2) Tighten all screws and nuts.

Section V. REBUILD OF REAR FENDERS

309. Disassembly (Field and Depot Maintenance)

a. Remove Right and Left Rear Fenders (fig. 216).

- (1) Remove eight fender lock washer screws (**H**) (cargo and command bodies) ; then remove each rear fender (**J**) and rear fender welt (**K**) from body.
- (2) Remove twenty sheet metal tapping screws, six machine screws, lock washers, and nuts (each side) (telephone maintenance body). Remove rear fenders and rear fender welts from body.

b. Cleaning. Remove dirt and corrosion from fenders and body sheet metal with a wire brush.

310. Inspection (Field and Depot Maintenance)

a. Inspect Right and Left Rear Fenders (fig. 216). Inspect each rear fender (J) for cracks, corrosion, distortion, or damaged outer bead. If the rear fenders are cracked they can be repaired by welding. If the fenders are distorted, corroded, or the outer beads are broken, replace fenders.

b. Inspect Rear Fender Welts (fig. 216). Inspect rear fender welts (K) for deterioration or other visual damage. Replace fender welts if not in good condition.

311. Assembly (Field and Depot Maintenance)

a. Install Right and Left Rear Fenders (Cargo and Command Bodies) (fig. 216) . Place rear fender welt (K) on each rear fender (J) and position fenders on body. Install eight fender lock washer screws (H) (each side), but do not tighten screws. Aline welt so that it is even with both ends of fender and bead is snug against body panel. Tighten screws.

b. Install Rear Fenders and Rear Fender Welts (Telephone Maintenance Body). Place rear fender welt on each rear fender and position fender on body. Install twenty 1/4-inch external-teeth lock washers, twenty No. 14 x 1/2 round-head gimlet-point sheet-metal thread tapping screws, six No. 10-24NC x 1 round-head machine screws, six No. 10 lock washers, and six No. 10-24NC nuts (each side). Do not tighten screws or nuts. Aline welt so that it is even with both ends of fender and bead is snug against body panel. Tighten screws and nuts.

CHAPTER 18

WINCH AND DRIVE SHAFT

Section I. DESCRIPTION AND DATA

312. Description

a. Winch Assembly (fig. 222) . The winch assembly is a worm drive assembly and is mounted at the front end of the frame side rails. It is operated by power transmitted through the transmission to the power-take-off and drive shaft.

b. Drive Shaft Assembly (fig. 222). The drive shaft assembly is a solid steel shaft and is equipped with two universal joints and a sliding yoke.

313. Data

a. Winch Assembly.

Make	-----	Braden
Model	-----	LU-4
Capacity	-----	7,500 lb.
Gear ratio	-----	29 :1
Lubricant capacity	-----	2 qt.
Cable size	-----	7/16 in. x 150 ft.

b. Drive Shaft Assembly.

Make	-----	Blood Brothers
Model	-----	4080
Diameter of shaft	-----	1 1/4 in.
Type of joint	-----	journal and bearing
Type of bearing	-----	steel bushing

Section II. DISASSEMBLY OF WINCH AND DRIVE SHAFT INTO SUBASSEMBLIES

314. General

The winch and drive shaft assemblies (fig. 222) are divided into four subassemblies : clutch housing assembly, cable drum assembly,

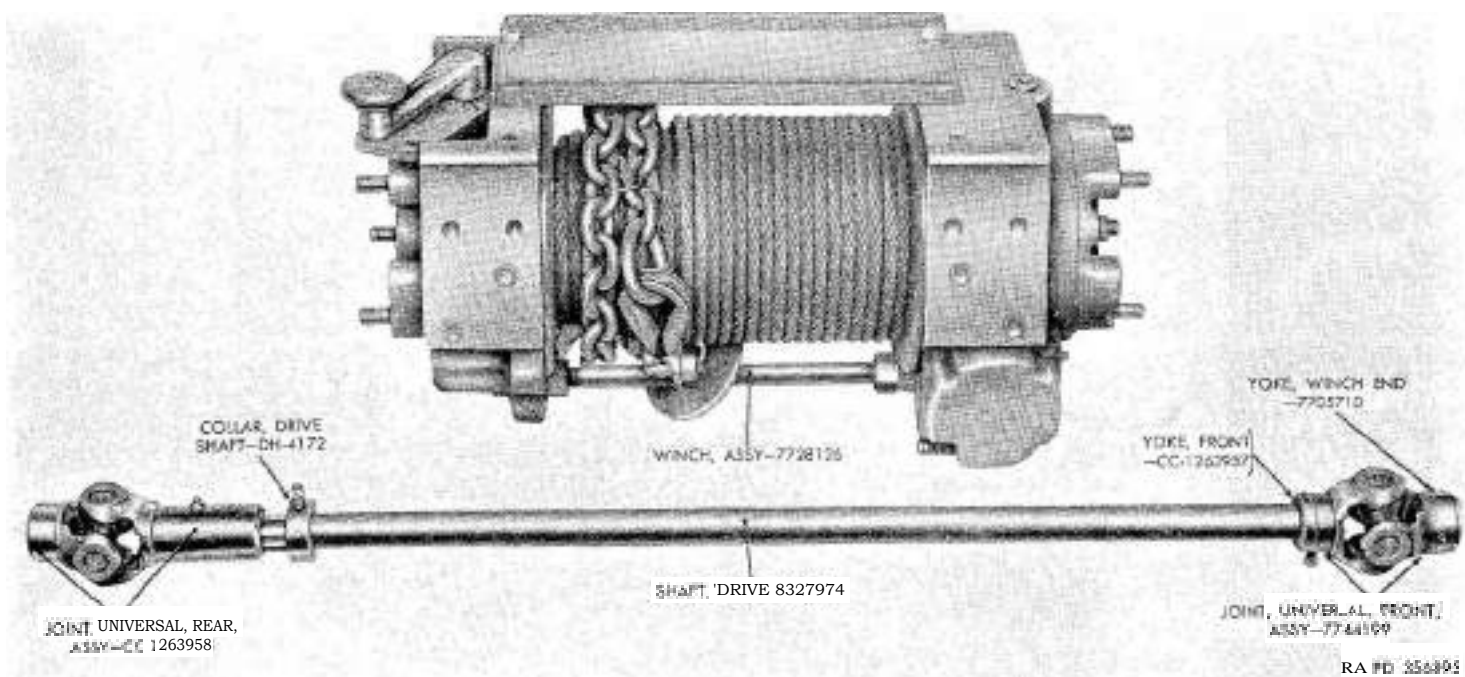


Figure 222. Winch and drive shaft assemblies.

worm housing assembly with cable drum shaft, and drive shaft assembly. The following procedures are based on the assumption that the winch and drive shaft assemblies are removed from the truck.

315. Draining and Cleaning (Depot Maintenance)

a. Draining. Remove pipe plugs (LL and YY, *fig. 226*) from clutch housing assembly and worm housing assembly. Drain lubricant.

b. Cleaning. Clean exterior of winch assembly, drive shaft assembly, and cable assembly with volatile mineral spirits or dry-cleaning solvent and dry with compressed air.

316. Clutch Housing Assembly (Depot Maintenance)

a. Remove Cable Assembly from Cable Drum Assembly (*fig. 226*). Raise clutch shifter handle knob (AK) and engage clutch shifter handle (AJ) in outside hole of clutch indexing plate (AR) . Unwind cable assembly from cable drum assembly. Remove set screw from drum with a 5/32-inch set screw wrench ; then remove cable assembly from drum assembly.

b. Remove Clutch Housing Assembly (*fig. 226*).

- (1) Remove four cap screws (BF) and lock washers (BE) ; then remove spacer plate (BD) from winch.
- (2) Remove nut (AD) from winch spacer bar (RR) at clutch housing assembly end.
- (3) Pry clutch housing assembly from cable drum assembly by inserting two large screwdrivers between housing and drum.

c. Remove Winch Spacer Bar (*fig. 226*). Loosen nut (QQ) and unscrew winch-spacer bar (RR) from worm housing assembly (F).

317. Cable Drum Assembly (Depot Maintenance)

(*fig. 226*)

Remove sliding clutch keys (UU) from cable drum shaft (J) with a punch and hammer. Remove cable drum retainer ring (AY) and cable drum assembly (BC) from cable drum shaft.

Section HI. REBUILD OF CLUTCH HOUSING ASSEMBLY

318. Disassembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 226, except where otherwise indicated.

a. General. The clutch housing bushing-type bearing is a press fit in the aluminum clutch housing assembly. It is serviced only with the housing assembly. The clutch housing assembly must be replaced if the bearing is worn (par. 319a) or damaged.

b. Remove Parts from Clutch Housing Assembly.

- (1) Remove $\frac{1}{4}$ -inch pipe plug from level opening and $\frac{3}{4}$ -inch pipe plug (AE) from filler opening in clutch housing.
- (2) Remove clutch housing grease seal (AT) from clutch housing with puller (*fig.* 223). Discard grease seal.
- (3) Remove two machine screws (VV), lock washers (WW), and cable drum drag brake assembly (XX) from clutch housing.
- (4) Remove sliding clutch (AX) and cable drum retainer ring (AU) from clutch housing.
- (5) Move clutch shifter handle (AJ) off clutch indexing plate (AR) and strike shaft end of handle with a plastic hammer to remove clutch housing expansion plug (AB) and clutch housing expansion plug spacer (ZZ) from bottom of clutch housing. Discard plug. Remove clutch shifter shaft snap ring (AC) from lower end of clutch shifter shaft (AP).
- (6) Remove set screw (AW) from clutch shifter fork (AV) with a 3/16-inch set screw wrench.
- (7) Remove clutch shifter shaft (AP), clutch shifter handle (AJ), and plain washer (AG) from clutch housing. Remove clutch shifter fork (AV) from clutch housing.
- (8) Remove two machine screws (AQ) ; then remove clutch indexing plate (AR) from clutch housing.
- (9) Remove clutch shifter shaft grease seal (AF) from clutch housing. Discard seal.

c. Remove Clutch Shifter Handle from Clutch Shifter Shaft.

Remove set screw (AH) with a 1/8-inch set screw wrench and press clutch shifter handle (AJ) from clutch shifter shaft (AP). Remove Woodruff key (AM) from shifter shaft.

d. Remove Parts from Clutch Shifter Handle.

Note. Do not remove parts from clutch shifter handle (AJ) unless inspection (par. 319g) reveals that replacement is necessary.

Clamp exposed end of clutch shifter handle knob shaft (AN) between jaws of a vise and remove riveted portion of shaft (knob

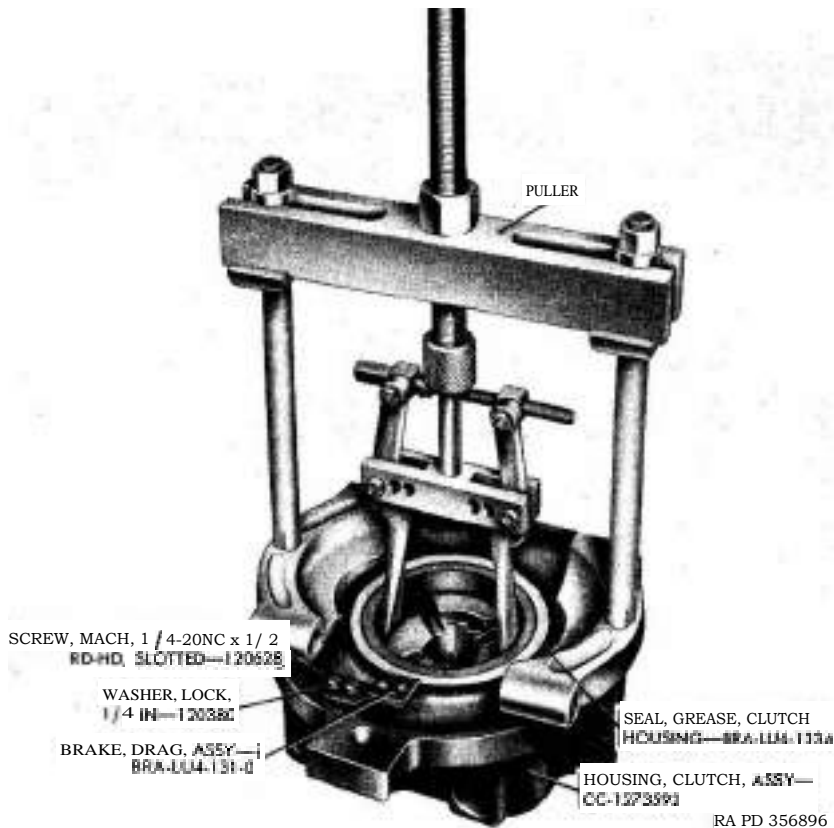


Figure 223. Removing clutch housing grease seal with puller.

end) with a drill. Remove clutch shifter handle knob (AK) from shifter handle knob shaft. Lift clutch shifter handle (AJ) and clutch shifter handle knob spring (AL) from handle knob shaft. Remove shaft from vise and discard shaft.

e. Cleaning. Wash all parts except cable drum drag brake assembly, in volatile mineral spirits or dry-cleaning solvent. Dry with compressed air.

319. Inspection (Depot Maintenance)

(fig. 226)

a. Inspect Clutch Housing Assembly.

- (1) Inspect clutch housing assembly (AS) for cracks or damaged threads. Replace housing if either of these conditions exist.

- (2) Inspect machine surfaces at counterbores (clutch shifter shaft grease seal (AF) and clutch housing grease seal (AT)) for scores or other visual damage. Replace housing assembly if condition of either counterbore is questionable.
- (3) Measure inside diameter of clutch housing bushing-type bearing with an inside micrometer. If the diameter is greater than the wear limit specified in paragraph 353, replace clutch housing assembly.

b. Inspect Sliding Clutch. Inspect sliding clutch (AX) for worn jaws, worn fork groove, or cracks. If any of these conditions exist, replace sliding clutch.

c. Inspect Clutch Shifter Fork and Clutch Shifter Shaft.

- (1) Inspect clutch shifter fork (AV) for cracks, damaged threads, or other visual damage. Replace fork if any of these conditions exist.
- (2) Inspect clutch shifter shaft (AP) for corrosion, distortion, or other visual damage. Replace shaft [†] if any of these conditions exist.

d. Inspect Cable Drum Drag Brake Assembly. Inspect cable drum drag brake assembly (XX) for worn lining, loose rivets, cracks, or distortion. If any of these conditions exist, replace cable drum drag brake assembly.

e. Inspect Clutch Indexing Plate. Inspect clutch indexing plate (AR) for cracks or elongated holes. If either of these conditions exist, replace plate.

f. Inspect Cable Drum Retainer Rings. Inspect cable drum retainer rings (AU and AY) for wear or cracks. If rings are cracked or thickness of the rings is less than the wear limits specified in paragraph 353, replace rings.

g. Inspect Clutch Shifter Handle and Related Parts.

- (1) Inspect clutch shifter handle (AJ) for cracks or other visual damage. Handle must be replaced if it is not in good condition (pars. 318d and 320a).
- (2) Inspect clutch shifter handle knob (AK) for cracks or other visual damage. Replace knob if it is not in good condition (pars. 318d and 320a).
- (3) Inspect clutch shifter handle knob spring (AL) for cracks or distortion. If either of these conditions exist, replace spring (pars. 318d and 320a).

h. Inspect Sliding Clutch Keys. Inspect sliding clutch keys (UU) for wear, scores, or other visual damage. Replace keys if they are not in good condition.

320. Assembly (Depot Maintenance)

Note. The key letters noted in parentheses are in figure 226, except where otherwise indicated.

a. Install Parts on Clutch Shifter Handle. If inspection (par. 319g) reveals that replacement of clutch shifter handle parts is necessary, place clutch shifter handle knob spring (AL) on new clutch shifter handle knob shaft (AN) and insert knob shaft and spring through opening in outer end of clutch shifter handle (AJ). Place lower portion of knob shaft on a metal surface and force the clutch shifter handle knob (AK) on upper end of knob shaft and peen end of shaft into counterbore in knob.

b. Install Clutch Shifter Handle on Clutch Shifter Shaft.

- (1) Install a $1\frac{1}{8} \times \frac{5}{16}$ Woodruff key (AM) in clutch shifter shaft (AP).
- (2) Align keyway in clutch shifter handle (AJ) with Woodruff key on clutch shifter shaft and press handle on shaft until end of shaft is flush with top of handle. Install and tighten a ~~$\frac{1}{4}$ -20NC~~ $\times \frac{3}{8}$ set screw (AH) in handle with a $\frac{1}{8}$ -inch set screw wrench.

c. Install Parts in Clutch Housing Assembly.

- (1) Coat outer surface of new clutch shifter shaft grease seal (AF) with plastic-type gasket cement and install seal in counterbore at top of clutch housing assembly (lip of seal toward inside of housing).
- (2) Position clutch indexing plate (AR) on clutch housing assembly (AS). Install and tighten two ~~$\frac{3}{8}$ -16NC~~ $\times 1\frac{1}{4}$ slotted-flat-head machine screws (AQ).
- (3) Place ~~$\frac{3}{4}$ -inch~~ plain washer (AG) over clutch shifter shaft grease seal (AF) and insert clutch shifter shaft (AP) through washer and seal. Place clutch shifter fork (AV) in clutch housing assembly and slide shaft through shifter fork and clutch housing assembly. Align set screw holes in fork and shaft and install a $\frac{3}{8}$ -16NC $\times \frac{3}{8}$ set screw (AW) in shifter fork with a $\frac{3}{16}$ -inch set screw wrench. Tighten screw.
- (4) Install clutch shifter shaft snap ring (AC) in groove on lower end of clutch shifter shaft (AP). Insert clutch housing expansion plug spacer (ZZ) in counterbore at bottom of clutch housing assembly and install new clutch housing expansion plug (AB) in housing assembly.

Note. Install clutch housing expansion plug (AB) with a flat drift of approximately the same diameter as the plug (convex surface of plug out).

- (5) Position cable drum drag brake assembly (XX) on

clutch housing assembly (*fig. 223*). Install two 1/4-inch lock washers (WW) and ~~1/4-20NC~~ $\frac{1}{4}$ x $\frac{1}{2}$ slotted-round head machine screws (VV) ; then tighten screws.

- (6) Install 3/4-inch pipe plugs (YY and AE) in drain and filler openings in clutch housing assembly but tighten only drain plug. Install ~~1/8-inch~~ pipe plug in level opening of clutch housing assembly but do not tighten plug.
- (7) Place cable drum retainer ring (AU) on clutch housing bushing type bearing in clutch housing assembly. Engage sliding clutch (AX) with clutch shifter fork (AV) (jaws exposed).
- (8) Prepare new clutch housing grease seal (AT) by soaking in castor oil or Neatsfoot oil for about 30 minutes and work leather by rolling with a smooth, round bar. Coat outer surface of grease seal with plastic-type gasket cement and install grease seal in clutch housing assembly (lip of seal in).

Section IV. REBUILD OF CABLE DRUM ASSEMBLY

321. Disassembly (Depot Maintenance)

a. Remove Cable Drum Grease Seal. Remove cable drum grease seal from cable drum assembly with puller (*fig. 224*). Discard grease seal.

b. Remove Cable Drum Bushing-Type Bearings and Cable Drum Bearing Pins.

Note. Do not remove cable drum bushing-type bearings (PP and AZ, *fig. 220*) unless inspection (*par. 322a*) reveals that replacement is necessary.

- (1) Remove cable drum bushing-type hearings (PP and AZ, *fig. 226*) with puller (*fig. 225*).
- (2) Remove cable drum bearing pins (TT and BJ, *fig. 226*) from cable drum assembly (BC). Discard pins.

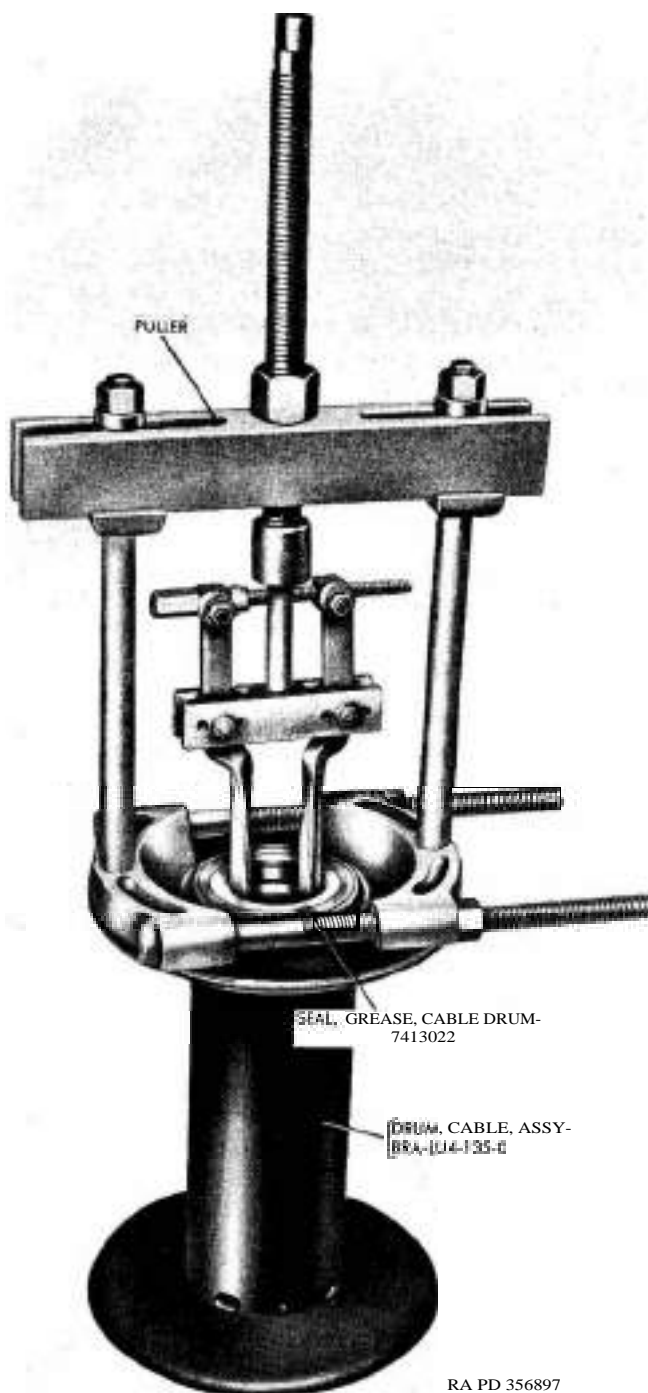
c. Cleaning.

- (1) Clean all parts in volatile mineral spirits or dry-cleaning solvent and dry with compressed air.
- (2) Clean cable assembly in a degreaser.

322. Inspection (Depot Maintenance)

a. Inspect Cable Drum Assembly (fig. 226).

- (1) Inspect cable drum assembly (BC) for broken welds, distortion, or corrosion. Broken welds can be repaired by welding. Replace drum assembly if it is distorted or corroded.



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Figure 224. Removing cable drum grease seal with puller.

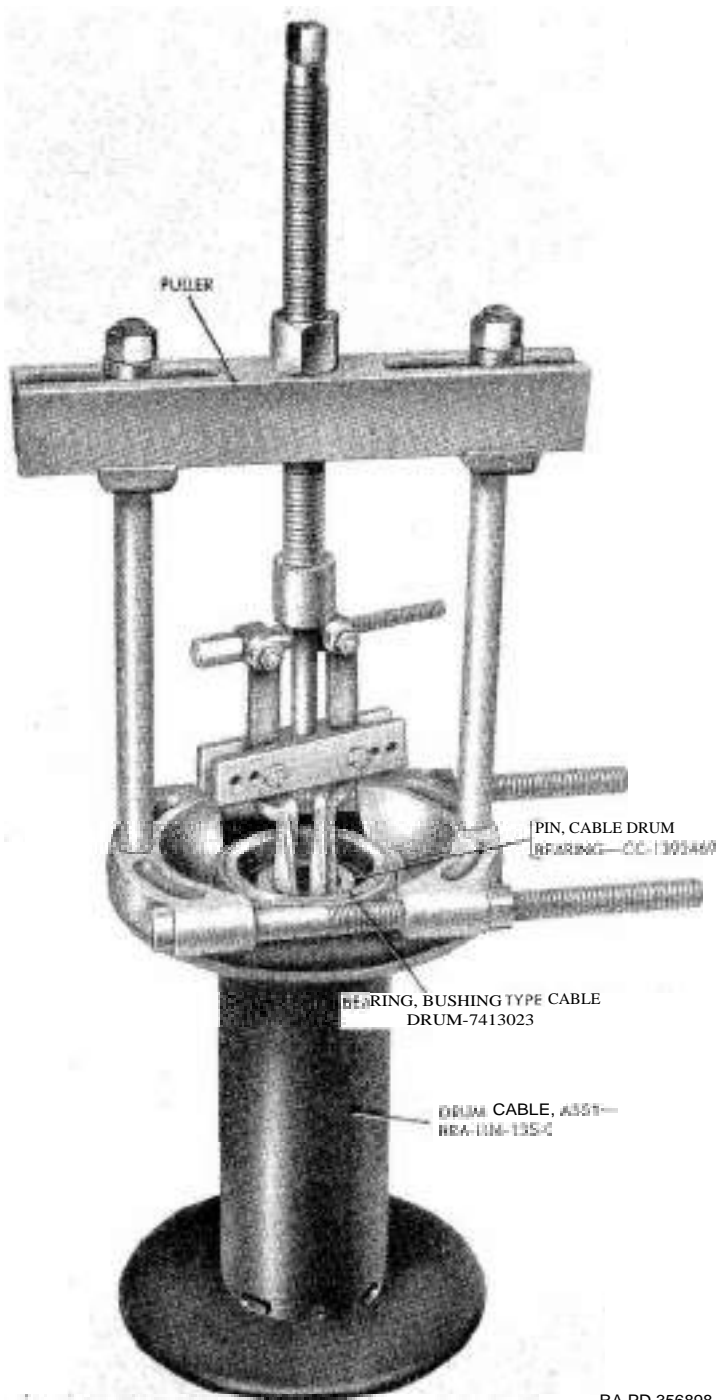


Figure 225. Removing cable drum bushing-type bearings with puller.

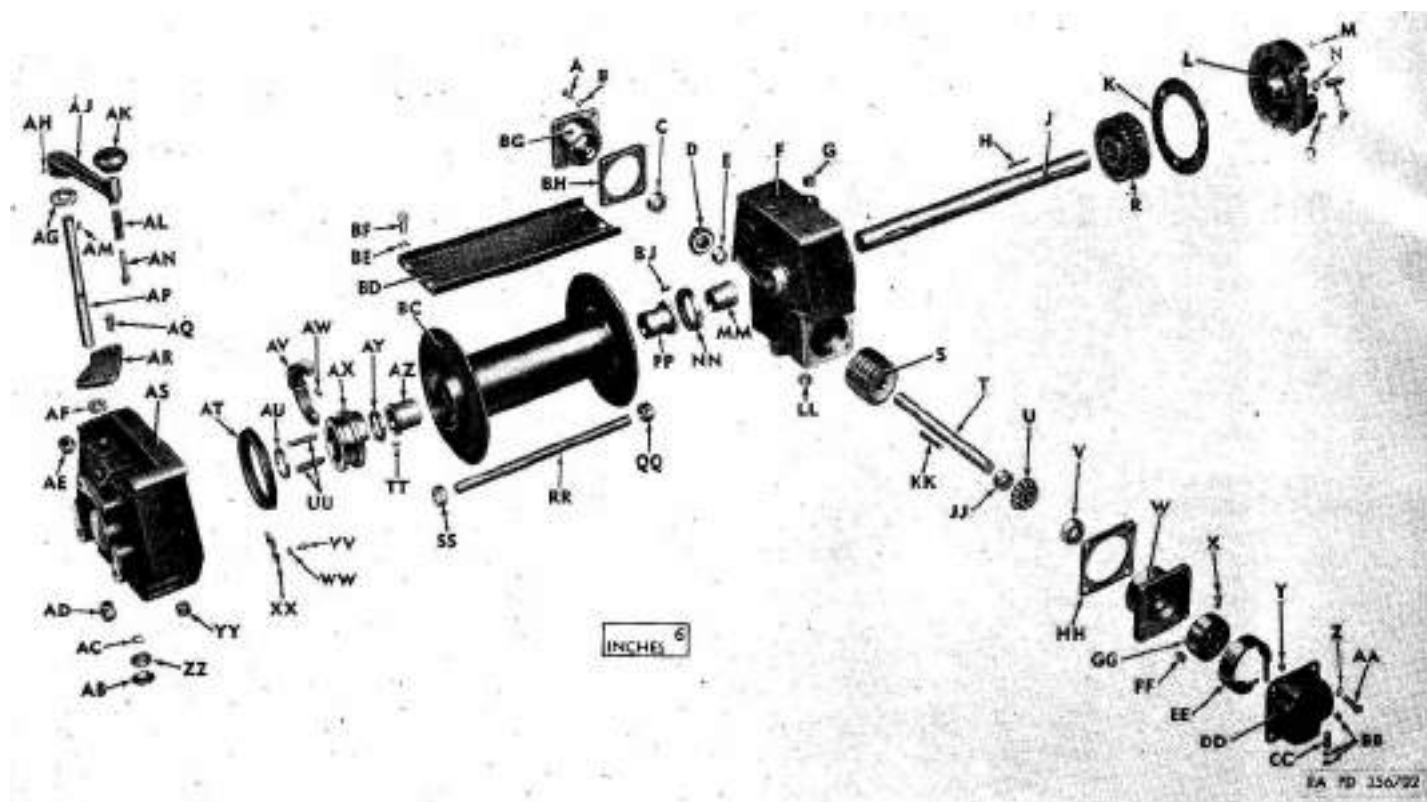


Figure 226. Winch assembly—exploded view.

A—Screw, cap, ~~3/4-16NC~~ x 1 1/4—122146
 B—Washer, lock, ~~3/4-inch~~—120382
~~C—Seal, grease, worm shaft, assy-7374957~~
 D—Cone, bearing, worm shaft-705436
 E—Spacer, worm shaft bearing-7702756
 F—Housing, worm, ~~assy—CC-1273594~~
 G—Plug, pipe, ~~3/4-inch—7374954~~
 H—Key, worm gear-7412419
 J—Shaft, cable drum-7374959
 K—Gasket, worm housing cover-7413024
 L—Cover, worm housing, ~~assy—CC-1273594~~
 M—Vent, ~~assy—CC-1273594~~
 N—Washer, lock, 1/2-inch-120384
 P—Screw, cap, ~~1/2-18NC~~ x 1 1/2-122433
 Q—Plug, pipe, ~~3/4-inch—143982~~
 R—Gear, worm-7412418
 S—Worm--7412468
 T—Shaft, worm-7378242
 U—Cone, bearing, worm ~~shaft—705436~~
 V—Seal, grease, worm shaft, assy-7374957
 W—Retainer, bearing, worm housing, assy—CC-1501149
 X—Screw, set, 1/4-20NC x %-102570
 Y—Nut, jam, ~~1/4-28NF—120613~~
 Z—Washer, lock, %-inch-120382
 AA—Screw, cap, %-16NC x 1 1/4-122145
 BB—Nut, jam, ~~1/4-28NF—120613~~
 CC—Spring, safety brake-7412462
~~DD—Housing, safety brake—7374951~~
 BE—Band, safety brake, assy-7351201
 FF—Key, Woodruff, 1/4 x 1-113782
~~GG—Drum, safety brake-7412415~~
 HH—Gasket, worm housing bearing ~~retainer—A240623~~
 JJ—Spacer, worm shaft bearing-7702756
 KK—Key, worm-7351199
 LL—Plug, pipe, ~~3/4-inch—7374954~~
 MM—Bearing, bushing-type, worm housing-7412403
~~NN—Seal, grease, cable drum--7413022~~
 PP—Bearing, bushing-type, cable drum-7413023
 QQ—Nut, ~~3/4-10NC—124595~~
~~RR—Bar, winch spacer—BRA-LU4-184B~~
 SS—Nut, ~~3/4-10NC—124595~~
 TT—Pin, cable drum bearing—CC-1392469
 UU—Key, clutch, sliding-7351200
 VV—Screw, machine, 1/4-20NC x 1/2 round-head, slotted-120628
 WW—Washer, lock, ~~1/4-inch—120382~~
 XX—B rake, cable drum drag, assy-8328017
 YY—Plug, pipe, ~~3/4-inch—7374954~~
 ZZ—Spacer, clutch housing expansion ~~plug—BRA-LU4-143W~~
 AB—Plug, clutch housing expansion—CC-179380
 AC—Ring, snap, clutch shifter shaft-73'74955
 AD—Nut, ~~3/4-long—124595~~
 AE—Plug, pipe, 3/4-inch-7374954

Figure 226—Continued on following page.

AF—Seal, grease, clutch shifter shaft-7374956
 AG—Washer, plain, $\frac{3}{4}$ -inch-131017
 AH—Screw, set, $\frac{1}{4}$ -20NC x 3/8-102570
 AJ—Handle, clutch shifter—BRA-LU4-143B
 AK—Knob, clutch shifter handle-7412420
 AL—Spring, clutch shifter handle knob-7412464
 AM—Key, Woodruff, $\frac{1}{4}$ x $\frac{1}{2}$ -103905
 AN—Shaft, clutch shifter handle knob-7412454
 AP—Shaft, clutch shifter-7374958
 AQ—Screw, machine, $\frac{3}{4}$ -16NC x flat-head, slotted-133906
 AR—Plate, clutch indexing—BRA-LU4-193C
 AS—Housing, clutch, assy—CC-1273592
 AT—Seal, grease, clutch housing-7413025
 AU—Ring, cable drum retainer-7412456
 AV—Fork, clutch shifter-7374953
 AW—Screw, set, $\frac{1}{2}$ -16NC x $\frac{1}{2}$ -139412
 AX—Clutch, sliding-7374952
 AY—Ring, cable drum retainer—BRA-MV139
 AZ—Bearing, bushing-type, cable drum-7413023
 BC—Drum, cable, assy—BRA-LU4-135-0
 BD—Plate, spacer—BRA-LU4-184A
 BE—Washer, lock, $\frac{1}{4}$ -inch-120384
 BF—Screw, cap, $\frac{1}{2}$ -13NC x $1\frac{1}{4}$ -120426
 BG—Retainer, bearing, worm housing, assy—CC-1501149
 BH—Gasket, worm housing bearing retainer-5249623
 BJ—Pin, cable drum bearing—CC-1392469

Figure 226—Continued.

- (2) Inspect sliding clutch jaws on end of cable drum assembly for wear and replace drum assembly if there is any evidence of wear.
- (3) Inspect outside surface of cable drum extension at clutch housing grease seal end for scores, wear, or other visual damage. If surface is not in good condition, replace cable drum assembly.
- (4) Measure inside diameter of cable drum bushing-type bearings (PP and AZ) with an inside micrometer. Replace bearings if dimension is greater than wear limit specified in paragraph 353. Inspect flanged surface of bearings for wear. Replace bearings if wear is evident (pars. 321b and 323a).
- (5) Inspect cable drum grease seal counterbore (worm housing end) for evidence of mutilation or scoring. If either of these conditions exist, replace cable drum assembly.
- (6) Inspect cable set screw threads in cable drum for wear or damage. If threads are worn or damaged, it will be necessary to drill and tap drum for a new, larger set screw.

b. Inspect Cable Assembly. Inspect cable assembly for broken strands, damaged locking clamps, distorted eye, damaged chain, or damaged hook. If any of these conditions exist, replace cable assembly.

c. Inspect Spacer Plate and Winch Spacer Bar (fig. 226).

- (1) Inspect spacer plate (BD) for distortion, corrosion, or cracks. If any of these conditions exist, replace spacer plate.
- (2) Inspect winch spacer bar (RR) for worn or damaged threads, cracks, or distortion. If any of these conditions exist, replace bar.

323. Assembly (Depot Maintenance)

a. Install Cable Drum Bushing-Type Bearings and Cable Drum Bearing Pins (fig. 226).

- (1) If inspection (par. 322a) reveals that replacement of cable drum bushing-type bearings (PP and AZ) is necessary, install bearings in cable drum assembly with an arbor press. Ream bearings, if necessary, so that cable drum shaft is a slip fit in bearings.
- (2) Drill a new $\frac{1}{8}$ -inch hole through flange of bearings and into cable drum assembly for cable drum bearing pins (TT and BJ). Depth of hole must be exactly three-eighths of an inch to insure full pin engagement with bearing

flange. Drive new cable drum bearing pins in holes so that they are just flush with flange surface of bearings.

b. Install Cable Drum Grease Seal in Cable Drum Assembly (fig. 226). Prepare new cable drum grease seal (NN) by soaking in castor oil or Neatsfoot oil for about 30 minutes and work leather by rolling with a smooth, round bar. Coat outer surface of grease seal retainer with plastic-type gasket cement and install grease seal (lip toward inside of drum assembly) with replacer 41—R-2392-405 (fig. 5).

c. Install Cable Set Screw in Cable Drum Assembly. Install 5/16-18NC x $\frac{5}{8}$ hex-socket cup-point cable set screw in cable drum assembly, but do not tighten until cable is installed.

Section V. REBUILD OF WORM HOUSING ASSEMBLY WITH CABLE DRUM SHAFT

324. Disassembly (Depot Maintenance)

(fig. 226)

a. Remove Worm Shaft and Related Parts.

- (1) Remove three jam nuts (BB) from safety brake band assembly ; then remove safety brake spring (CC).
- (2) Remove three cap screws (AA) and lock washers (Z) from safety brake housing (DD).

Note. A fourth cap screw is located between the safety brake band adjusting stud and flange of safety brake housing. It must be loosened with an end wrench because screw and housing must be removed as an assembly.

Remove safety brake housing.

- (3) Remove four cap screws (A) and lock washers (B) ; then remove worm housing bearing retainer assembly (BG) and worm housing bearing retainer gaskets (BH) from worm housing.
- (4) Remove worm shaft assembly by turning the worm shaft counterclockwise as shaft is withdrawn from worm housing assembly.

b. Remove Parts from Worm Shaft.

Note. Do not remove worm shaft bearing cones (D and U) or worm (S) from worm shaft (T) unless inspection (par. 325d) reveals replacement is necessary.

- (1) Remove set screw (X) from safety brake drum (GG) and pull drum from worm shaft (T). Remove Woodruff key (FF) from worm shaft.

- (2) Remove worm housing bearing retainer assembly (W) and worm housing bearing retainer gaskets (HH).
- (3) Remove worm shaft bearing cones (D and U) from worm shaft (T) with an arbor press. Remove worm shaft bearing spacers (E and JJ), worm (S), and worm key (KK) from worm shaft.
- (4) Remove worm shaft grease seal assemblies (C and V) from worm housing bearing retainer assemblies (W and BG).

Note. Do not remove the bearing cups from the worm housing bearing retainers as the retainers and bearing cups must be serviced as an assembly.

c. Remove Safety Brake Band Assembly from Safety Brake Housing. Remove safety brake band assembly (EE) from safety brake housing (DD). Remove jam nut (Y) from band assembly.

d. Remove Worm Housing Cover Assembly and Cable Drum Shaft from Worm Housing Assembly.

- (1) Remove three cap screws (P) and lock washers (N) ; then remove worm housing cover assembly (L) from worm housing assembly (F). Remove worm housing cover gasket (K).

Note. Do not remove bushing-type bearing from worm housing cover assembly (L) as the worm housing cover and bearing must be serviced as an assembly.

- (2) Remove cable drum shaft (J) and worm gear (R) as an assembly from worm housing assembly.

e. Remove Worm Gear from Cable Drum Shaft.

Note. Do not remove worm gear (R) from cable drum shaft (J) unless inspection (par. 325c) reveals that replacement of either part *is* necessary.

- (1) Remove worm *gear* (R) from cable drum shaft (J) with an arbor press.
- (2) Remove two worm gear keys (H) from cable drum shaft.

f. Remove Worm Housing Bushing-Type Bearing, Pipe Plugs, and Vent Assembly.

- (1) Do not remove worm housing bushing-type bearing (MM) from worm housing assembly (F) unless inspection (par. 325a) reveals replacement is necessary. If replacement is necessary, remove bearing with an arbor press.
- (2) Remove pipe plugs (G and Q) from filler and lubricant level openings in worm housing assembly.
- (3) Remove vent assembly (M) from worm housing cover assembly (L).

g. Cleaning. Wash all parts in volatile mineral spirits or dry-cleaning solvent. Dry the parts, except roller bearings, with dry compressed air.

Caution: Bearings must not be dried or spun with compressed air. Refer to TM 37-265 for care and maintenance of bearings.

325. Inspection (Depot Maintenance)

(fig. 226)

a. Inspect Worm Housing Assembly and Worm Housing Cover Assembly.

- (1) Inspect worm housing assembly (F) for cracks, damaged or worn threads, scored bearing bore, or damaged machined surfaces. If any of these conditions exist, replace worm housing assembly.
- (2) Measure inside diameter of worm housing bushing-type bearing (MM) with an inside micrometer. If dimension is greater than the wear limit specified in paragraph 353, replace bearing (pars. 324f and 326a).
- (3) Inspect worm housing cover assembly (L) for cracks, damaged threads, or damaged machine surfaces. If any of these conditions exist, replace worm housing cover assembly.
- (4) Measure inside diameter of bushing-type bearing in worm housing cover assembly with an inside micrometer. If dimension is greater than wear limit specified in paragraph 353, replace worm housing cover assembly.

b. Inspect Vent Assembly. Inspect vent assembly (M) for clogged opening, weak or broken spring, or other visual damage. Remove obstructions from vent opening or replace vent if it is not in good condition.

c. Inspect Cable Drum Shaft and Worm Gear.

- (1) Inspect cable drum shaft (J) for scores, worn keyways, or other visual damage. Replace shaft if it is not in good condition. Measure diameter of shaft at points of wear with an outside micrometer. If diameter of shaft is less than the wear limit specified in paragraph 353, replace shaft (pars. 324e and 326g).
- (2) Inspect worm gear (R) for worn teeth or other visual damage. Replace worm gear if it is not in good condition (pars. 324e and 326g).

d. Inspect Worm Shaft Bearing Cones, Worm, Worm Shaft, Worm Shaft Bearing Spacers, and Worm Key.

- (1) Inspect worm shaft bearing cones (D and U) for scores, corrosion, wear, or chipping. If the bearing cones are not

in good condition, replace bearing cones (pars. 324b and 326b) and worm housing bearing retainer assemblies (W and BG).

- (2) Inspect worm (S) for wear, pits, scores, chips, or other visual damage. Replace worm (pars. 324b and 326b) if it is not in good condition.
- (3) Inspect worm shaft (T) for corrosion or damaged keyways. Replace shaft if either of these conditions exist.
- (4) Measure diameter of worm shaft at points of wear with an outside micrometer. If dimension is less than the wear limit specified in paragraph 353, replace worm shaft.
- (5) Inspect worm shaft bearing spacers (E and J3) for distortion or other visual damage. Replace spacers if they are not in good condition.
- (6) Inspect worm key (KK) for wear or scores. If either of these conditions exist, replace key.

e. Inspect Worm Housing Bearing Retainer Assemblies.

- (1) Inspect worm housing bearing retainer assemblies (W and BG) for cracks or damaged machine surfaces. If either of these conditions exist, replace worm housing bearing retainer assemblies.
- (2) Inspect bearing cups in worm housing bearing retainer assemblies for scores, pitting, wear, cracks, or other visual damage. If bearing cups are not in good condition, replace worm housing bearing retainer assemblies and worm shaft bearing cones (D and U) (pars. 324b and 326b).

f. Inspect Safety Brake Drum, Safety Brake Band Assembly, Safety Brake Spring, and Safety Brake Housing.

- (1) Inspect safety-brake drum (GG) for scores, cracks, or other visual damage. Replace drum if any of these conditions exist. Measure diameter of drum with an outside micrometer and if the dimension is less than the wear limit specified in paragraph 353, replace drum.
- (2) Inspect safety brake band assembly (EE) for worn lining, loose rivets, cracked band, broken welds, or damaged threads. If lining is worn or band is not in good condition, install a new safety brake band assembly.
- (3) Inspect safety brake spring (CC) for cracks, distortion, or other visual damage. Replace spring if not in good condition.
- (4) Inspect safety brake housing (DD) for cracks or other visual damage. Replace housing if it is not in good condition.

326. Assembly (Depot Maintenance)

a. Install Worm Housing Bushing-Type Bearing in Worm Housing Assembly (fig. 226). If inspection (par. 325a) reveals that the worm housing bushing-type bearing (MM) requires replacement, install a new bearing in worm housing assembly (F) with an arbor press. Ream bearing if necessary, so that cable drum shaft is a slip fit in bearing.

b. Install Parts on Worm Shaft.

Note. The key letters noted in parentheses are in figure 227, except where otherwise indicated.

- (1) If worm or worm shaft bearing cones were removed (par. 324b), install worm key (KK, fig. 226) in worm shaft (L). Install worm shaft bearing spacer (N) on shaft so that slot engages with worm key. Start worm shaft bearing cone (M) on shaft (small end toward end of shaft). Press cone on shaft with an arbor press until it just contacts the worm shaft bearing spacer.
- (2) Place worm (**P**) on worm shaft followed by worm shaft bearing spacer (Q) and engage slot in spacer with worm key. Start worm shaft bearing cone (R) on shaft (small end toward end of shaft) and press bearing on shaft with an arbor press until it just contacts spacer. Change set-up of shaft in arbor press and support the assembly on face of lower bearing cone.

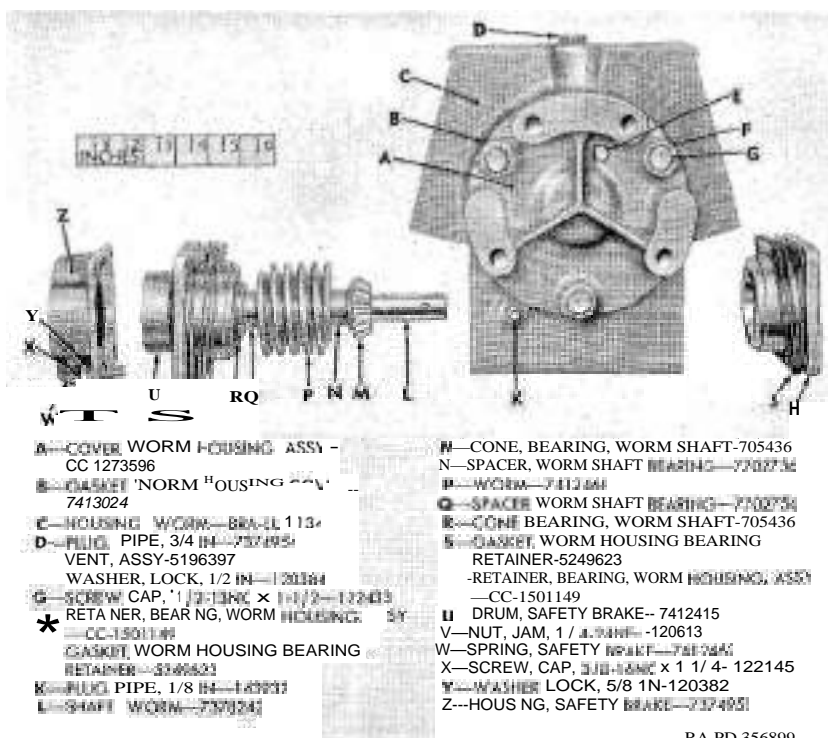
Caution: Make certain bearing cone is supported on a sleeve that is smaller in diameter than the opening of the bearing cage as damage to the cage will destroy bearing.

Apply pressure with an arbor press on other bearing cone to firmly lock spacers and worm on shaft. Remove shaft from arbor press.

c. Adjust Worm Shaft Bearings.

Note. The key letters noted in parentheses are in figure 227, except where otherwise indicated.

- (1) Lubricate worm shaft bearing cones (M and R) with universal gear lubricant (GO). Place worm shaft assembly in worm housing.
- (2) Position four worm housing bearing retainer gaskets (J and S) on each worm housing bearing retainer assembly (H and T). Position worm housing bearing retainer assemblies and gaskets on worm housing assembly, and align shaft in bearing cups. Install four $\frac{3}{8}$ -inch lock washers (B and Z, fig. 226) and $\frac{3}{8}$ -16NC x $1\frac{1}{2}$ cap



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Figure 227. Worm, worm housing, and related parts.

screws (A and AA, fig. 226) in each retainer. Tighten screws.

- (3) Insert a punch in hole at drive end of worm shaft and oscillate shaft back and forth to seat bearing cone rollers. Remove or install worm housing bearing retainer gaskets until bearings have a slight drag when shaft is oscillated.

Note. Variation must not exceed one gasket on either bearing retainer.

Remove bearing retainers, gaskets, and worm shaft assembly from worm housing.

Note. Tie gaskets to each bearing retainer to insure a proper bearing adjustment when parts are assembled.

d. *Install Worm- Shaft Grease Seal Assemblies in Worm Housing Bearing Retainer Assemblies (fig. 226).* Prepare new worm shaft grease seal assemblies (C and V) by soaking in castor oil or Neatsfoot oil for about 30 minutes and work leather by rolling with a smooth, round bar. Coat outer surface of grease seals with plastic-type gasket cement and install seals in worm housing bearing retainer assemblies (W and BG) (lip of narrow seal out).

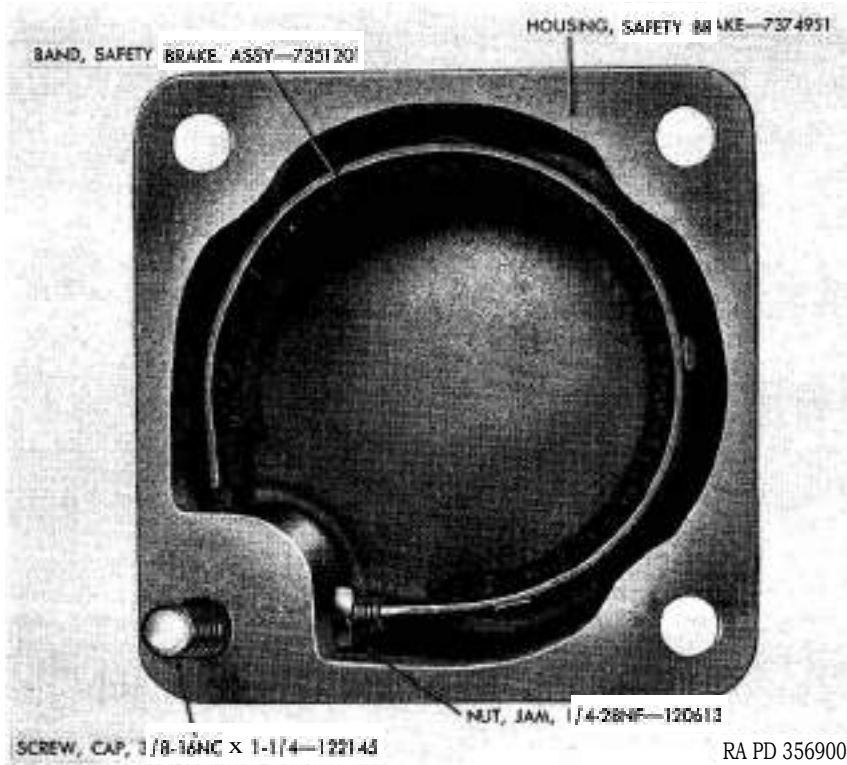


Figure 228. Safety brake band assembly in housing.

e. Install Worm Housing Bearing Retainer Assembly and Safety Brake Drum on Worm Shaft.

Note. The key letters noted in parentheses are in figure 227, except where otherwise indicated.

Position worm housing bearing retainer assembly (T) and worm housing bearing retainer gaskets (S) on worm shaft. Install $1\frac{1}{4}$ x 1 Woodruff key (FF, fig. 226) in worm shaft and press safety brake drum (U) on shaft so that face of drum hub is flush with end of shaft (set screw hole out). Install $\frac{1}{4}$ -20NC x $\frac{3}{8}$ set screw (X, fig. 226) in safety brake drum and tighten set screw.

f. Install Safety Brake Band Assembly in Safety Brake Housing (fig. 228).

- (1) Install a $\frac{3}{8}$ -inch lock washer and $\frac{3}{8}$ -16NC x $1\frac{1}{4}$ cap screw in safety brake housing adjacent to holes that are drilled for the threaded ends of the safety brake band assembly, as this screw cannot be installed after the safety brake band assembly is in the housing.
- (2) Install $\frac{1}{4}$ -28NF jam nut on short threaded end of safety

brake band assembly. Position safety brake band assembly in safety brake housing as illustrated in figure 228 (short threaded end of safety brake band assembly at bottom). Install ~~1/4-28NF~~ jam nut on outside end of short threaded end of safety brake band assembly. Position jam nuts so that threaded end of safety brake band assembly will be approximately flush with outside nut, when nut is tightened.

- (3) Install safety brake spring (W, *fig. 227*) on threaded end of safety brake band assembly, followed by one ~~1/4-24NF~~ jam nut (V, *fig. 227*). Nut must be just flush with threaded end of band.
- (4) Position safety brake housing (Z, *fig. 227*) on safety brake drum.

g. Install Worm Gear on Cable Drum Shaft (fig. 226).

- (1) If worm gear (R) was removed (par. 324e), install two worm gear keys (H) in cable drum shaft (J).
- (2) Install worm gear on cable drum shaft with an arbor press. Press gear on shaft until measurement from gear hub to end of shaft is 1.562 inches.

Caution: This dimension is important as the proper positioning of the worm gear establishes the correct end play for the cable drum.

h. Install Worm Gear, Cable Drum Shaft, Worm Housing Cover Assembly, and Related Parts in Worm Housing Assembly (fig. 226).

- (1) Lubricate worm housing bushing-type bearing (MM) with universal gear lubricant (GO) and install cable drum shaft and worm gear in worm housing assembly as an assembly.
- (2) Position a new worm housing cover gasket (K) on worm housing cover assembly (L) and position cover assembly on worm housing with vent opening at top. Install three ~~1/4-inch~~ lock washers (N) and ~~1/2-19NC~~ x 1 1/2 cap screws (P). Tighten cap screws. Check end play of cable drum shaft. Install additional worm housing cover gaskets, if necessary, until a small amount of end play is evident.
- (3) Install vent assembly (M) in worm housing cover.
- (4) Install ~~3/4-inch~~ pipe plugs (G and LL) in ~~filler~~ and drain openings of worm housing assembly. Tighten plug only in drain opening.

i. Install Worm Shaft Assembly and Worm Housing Bearing Retainer Assemblies in Worm Housing Assembly (fig. 227).

- (1) Insert worm shaft assembly into worm housing assem-

bly (from lubricant level opening end of housing) , engage worm with worm gear, and turn cable drum shaft until worm housing bearing retainer assembly (T) is fully seated in worm housing assembly. Install worm housing bearing retainer gaskets (J) and worm housing bearing retainer assembly (H) on worm housing.

- (2) Position safety brake housing (Z) on safety brake drum (U) (safety brake spring (W) down) and start $\frac{3}{8}$ -16NC x 1 1/4 cap screw (X) and $\frac{3}{8}$ -inch lock washer (Y) in worm housing. Install other seven $\frac{3}{8}$ -inch lock washers and $\frac{3}{8}$ -16NC x 1 1/4 cap screws in the two worm housing bearing retainer assemblies. Tighten cap screws.

j. Adjust Safety Brake Band Assembly (fig. 227).

- (1) Insert a long punch through this hole in drive end of worm shaft (L) so that shaft can be oscillated as brake adjustment is performed.
- (2) Oscillate worm shaft and tighten $\frac{1}{4}$ -24NF jam nut (V) until a noticeable drag is apparent in one direction. Holding jam nut, install and tighten other $\frac{1}{4}$ -24NF jam nut (V) to lock adjustment.

Section VI. REBUILD OF DRIVE SHAFT ASSEMBLY

327. Disassembly (Field and Depot Maintenance)

a. Remove Drive Shaft Front and Rear Universal Joint Assemblies and Drive Shaft Collar (fig. 222).

- (1) Remove locking wire and set screw from drive shaft front universal joint assembly. Drive front universal joint assembly from drive shaft with a plastic hammer. Remove Woodruff key from drive shaft.
- (2) Remove drive shaft rear universal joint assembly from splined end of drive shaft. Remove set screw and remove drive shaft collar from drive shaft (on trucks so equipped).

b. Remove Parts from Front and Rear Universal Joint Assemblies.

Note. The key letters noted in parentheses are in figure 229, except where otherwise indicated.

- (1) Remove lubricating fittings from rear splined yoke (C), universal joint journals (V), and winch end yoke (fig. 222).

- (2) Remove universal joint bearing snap rings (G, H, T, and Z).

Note. The universal joint bushing-type bearings (F, J, S, and Y) are a press fit in the yokes and the proper removal procedure must be followed to prevent damage of parts.

- (3) To remove the bearings, proceed as follows:
 - (a) Position a 1-inch socket over universal joint bushing-type bearing (Y) and a 7/16-inch socket on bearing (F). Force bearing (Y) from yokes with a vise (fig. 144) or an arbor press.
 - (b) Change the position of the sockets, so that the 7/16-inch socket is against the end of the universal joint journal (V) and the 1-inch socket is over the bearing (F). Remove bearing as described in (a) above.
- (4) Remove other bearings as outlined in (3) above. Remove journal from yokes.
- (5) Remove universal joint bearing seals (E, K, R, and X). Discard seals.
- (6) Remove universal joint bearing seal retainers (D, L, Q, and W).

c. *Cleaning.* Wash all parts in volatile mineral spirits or dry

328. Inspection (Field and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 229, except where otherwise indicated.

a. *Inspect Universal Joint Journals.* Inspect universal joint journals (V) for wear, corrosion, scores, cracks, or other visual damage. If wear is evident, measure journal pins with a micrometer. If the journals are not in good condition or the diameter of the journal pins is less than the wear limit specified in paragraph 353, replace journals.

b. *Inspect Universal Joint Bushing-Type Bearings.* Inspect universal joint bushing-type bearings (F, J, S, and Y) for wear, corrosion, scores, or cracks. If wear is evident, measure inside diameter of bearings with an inside micrometer. If inside dimension is greater than the wear limit specified in paragraph 353, or there is evidence of corrosion, scores or cracks, replace bearings.

c. *Inspect Universal Joint Bearing Seal Retainers.* Inspect universal joint bearing seal retainers (D, L, Q, and W) for distortion or corrosion damage. Replace retainers if they are not in good condition.

d. *Inspect Power-Take-Off Yoke, Winch End Yoke, Front Yoke, and Rear Splined Yoke.*

- (1) Inspect power-take-off yoke (N), winch end yoke (fig.

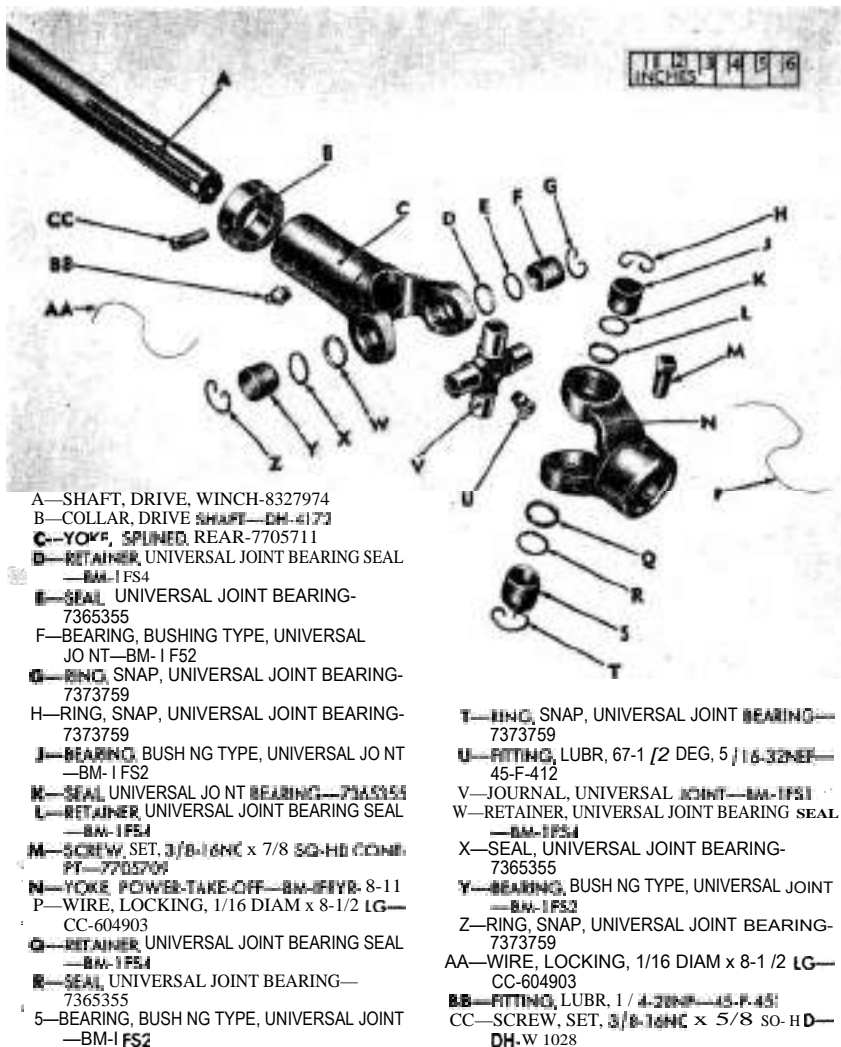


Figure 229. Drive shaft universal joint—exploded view.

222), and front yoke (fig. 222) for corrosion, cracks, or other visual damage. Replace yokes if they are not in good condition.

- (2) Inspect rear splined yoke (C) for wear, corrosion, scores, cracks, or other visual damage. Inspect splines for wear and if yoke is not in good condition, install new yoke.

e. Inspect Universal Joint Bearing Snap Rings. Inspect universal joint bearing snap rings (G, H, T, and Z) for distortion or other visual damage. Snap rings must be replaced if they are not in good condition.

f. Inspect Lubricating Fittings. Inspect lubricating fittings (U and BB) and fitting from winch end yoke (*fig. 222*) for worn threads or other visual damage. If lubricating fittings are not in good condition, they must be replaced.

g. Inspect Drive Shaft. Inspect winch drive shaft (A) for ~~misalignment~~, worn splines, or damaged keyway. The shaft must be replaced if any of these conditions exist.

h. Inspect Drive Shaft Collar. Inspect drive shaft collar (B) (on trucks so equipped) for corrosion or worn threads. If either of these conditions exist, replace collar (on trucks so equipped).

329. Assembly (Held and Depot Maintenance)

Note. The key letters noted in parentheses are in figure 229, except where otherwise indicated.

a. General. Early production trucks were equipped with a drive shaft collar (B) which was later discontinued. It is not necessary to install the drive shaft collar on drive shafts not so equipped.

b. Install Universal Joint Bearing Seal Retainers and Universal Joint Bearing Seals on Universal Joint Journals.

- (1) Install universal joint bearing seal retainers (D, L, Q, and W) on each universal joint journal (V).
- (2) Soak new universal joint bearing seals (E, K, R, and X) in light engine oil (OE) for approximately 30 minutes before installation. Install seals on journals.

c. Assemble Front and Rear Universal Joint Assemblies.

- (1) Place universal joint journals (V) in power-take-off yoke (N) and winch end yoke (*fig. 222*) so that the lubricating fitting openings in journals are toward yoke.
- (2) Apply a coating of general purpose grease (GAA) to inside of universal joint bushing-type bearings (F, J, S, and Y) and position two of the universal joint bushing-type bearings (J and S) in the yokes and force them in position between jaws of a vise or with an arbor press. Press bearings into yokes until the snap ring groove is fully exposed and install universal joint bearing snap rings (H and T).
- (3) Engage universal joint journal (V) in openings of rear splined yoke (C) and front yoke (*fig. 222*). Install other universal joint bearings (F and Y), and universal joint bearing snap rings (G and Z).
- (4) Install $\frac{3}{8}$ -~~16~~NC x $\frac{7}{8}$ square-head cone-point set screw (M) in power-take-off yoke (N) and insert 1/16-inch diameter x ~~8 1/2-inch~~ long locking wire (P) in set screw. Place wire around yoke to prevent loss of parts.

- (5) Install 671 $\frac{1}{2}$ ° 5/16-32NEF lubricating fitting (U) in each universal joint journal (V). Install ~~1/4-28NF~~ lubricating fitting (BB) in rear splined yoke (C). Install ~~1/4-28NF~~ lubricating fitting in winch end yoke.

d. Install Front and Rear Universal Joint Assemblies and Drive Shaft Collar on Drive Shaft (fig. 222).

- (1) Install 1 $\frac{1}{4}$ x 21 $\frac{1}{8}$ Woodruff key in front end of drive shaft. Install front universal joint assembly on front end of drive shaft and align set screw hole in yoke with indentation on shaft. Install $\frac{3}{8}$ -16NC x $\frac{7}{8}$ square-head cone-point set screw in yoke and tighten screw. Install 1/16 diameter x 8 $\frac{1}{2}$ long locking wire through set screw head and around yoke.
- (2) Install drive shaft collar (B) on splined end of drive shaft (on drive shafts so equipped). Install rear universal joint assembly on splined end of drive shaft so that universal joint bearings on the front yoke and splined yoke are in line.
- (3) Install a $\frac{3}{8}$ -16NC x $\frac{5}{8}$ square-head set screw (CC) in drive shaft collar and tighten screw. Install 1/16 diameter x 8 $\frac{1}{2}$ long locking wire through head of set screw, but do not lock wire in place. Wire rear universal joint assembly to drive shaft collar to prevent loss of parts.

Note. Adjustment of collar cannot be accomplished until drive shaft assembly is installed on a truck. Refer to TM 9-840 for adjustment procedure.

e. Lubricate Universal Joints and Rear Splined Yoke. Lubricate universal joints and rear splined yoke with general purpose grease (GAA).

Section VII. ASSEMBLY OF WINCH ASSEMBLY FROM SUBASSEMBLIES

330. Cable Drum Assembly (Depot Maintenance)

a. Install Cable Drum Assembly (fig. 226). Lubricate cable drum bushing-type bearings (PP and AZ) with general purpose grease (GAA). Install cable drum assembly (BC) on cable drum shaft (**J**) (grease seal toward worm housing).

b. Install Cable Drum Retainer Ring and Sliding Clutch Keys (fig. 226). Position cable drum retainer ring (AY) on cable drum shaft. Install two sliding clutch keys (UU) in keyways of cable drum shaft.

331. Clutch Housing Assembly (Depot Maintenance)

a. *Install Clutch Housing Assembly* (fig. 226).

- (1) Install two $\frac{3}{4}$ -10NC nuts (QQ and SS) on winch spacer bar (RR) and turn nuts to the bottom of threads. Install short threaded end of winch spacer bar in worm housing assembly (F).
- (2) Turn worm shaft (T), with a punch, at drive end until sliding clutch keys (UU) are straight up and down in relation to the worm housing assembly. Place clutch housing assembly on bench, open end up, and align cable drum retainer ring (AU) and sliding clutch (AX) with bearing in clutch housing assembly (AS) to facilitate installation of cable drum shaft (J).
- (3) Install worm housing assembly (F) complete with cable drum assembly on clutch housing assembly. Exercise care to align keys on cable drum shaft with sliding clutch keyways. This must also apply to the cable drum shaft, cable drum retainer ring, and bushing-type bearing in clutch housing assembly.

b. *Install Spacer Plate and Nut on Spacer Bar* (fig. 226).

- (1) Position spacer plate (BD) on worm housing assembly (F) and clutch housing assembly (AS). Install four 1/2-inch lock washers (BE) and ~~$\frac{1}{2}$ -13NC~~ $\frac{1}{2}$ -11NC x 11% cap screws (BF). Tighten cap screws.
- (2) Turn winch spacer bar (RR) into worm housing assembly (F) as far as it will go and tighten nut (QQ). Turn nut (SS), at opposite end, fingertight against clutch housing assembly (AS). Install and tighten ~~$\frac{3}{4}$ -10NC~~ $\frac{3}{4}$ -10NC nut (AD) on bar.

c. *Lubrication.* Remove ~~$\frac{1}{8}$ -inch~~ $\frac{1}{8}$ -inch pipe plugs from lubricant level openings in worm housing assembly (F) and clutch housing assembly (AS). Remove $\frac{3}{4}$ -inch pipe plugs (G and AE) from filler openings in worm housing and clutch housing. Fill housings with universal gear lubricant (GO) until lubricant just runs out of level openings. Install plugs.

d. *Install Cable Assembly on Cable Drum.* Insert end of cable in opening provided in cable drum and tighten 5/16-18NC x $\frac{5}{8}$ hex-socket cup-point cable set screw.

Note. Position winch as installed on truck and turn worm shaft until cable opening in cable drum is at top. Install cable from front of winch around bottom of cable drum.

Tighten set screw with a 5/32-inch set screw wrench to retain cable. Power drive winch and wind cable on cable drum. Wind cable until cable and chain are firmly in position with cable hook over winch spacer bar as shown in figure 222.

CHAPTER 19

ELECTRICAL

Section I. DESCRIPTION AND DATA

332. Description

a. Spot Light Assembly (Ambulance M43). The spot light assembly (fig. 230) is a high candle power unit incorporating a self-contained switch and mechanism, which permits the driver to direct the light beam in any desired direction. The spot light assembly is mounted in the roof and the control handle and switch are in the driver's compartment.

h. Spot Light Assembly (Telephone Maintenance Truck V41). The spot light assembly is of the same general construction as described in a above ; however, it is mounted on a bracket attached to the left front fender and cowl. The control handle and switch are accessible to the driver.

333. Data

Make	-----	Guide
Model	-----	2070
Type of lamp	-----	sealed beam unit
Lens	-----	crystal glass
Type of control	-----	rack and pinion

Section II. REMOVAL OF SPOT LIGHT ASSEMBLY

334. Remove Spot Light Assembly (Ambulance M43) (Field and Depot Maintenance)

a. Disconnect Switch Cable from Extension Cable. Separate connector shells and connector. This will disconnect extension cable from switch cable.

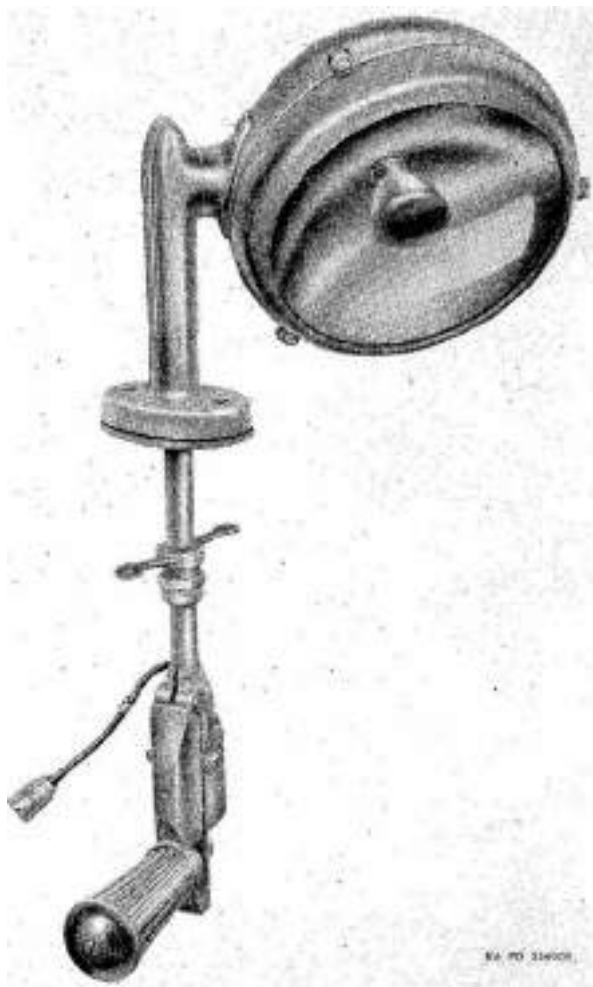


Figure 230 Spot light assembly (ambulance M43).

b. Remove Handle Assembly from Spot Light (fig. 231) . Remove handle mounting screw ; then remove handle, handle pinion bearing, and spring washer from spot light assembly. Remove handle pinion from switch housing assembly.

c. Remove Switch Housing Base and Switch Housing Assembly.

- (1) Remove two machine screws (*fig. 232*) ; then remove switch housing base from switch housing assembly.
- (2) Remove socket-head cap screw (*fig. 232*) from switch housing assembly with a *5/32-inch* set screw wrench.
- (3) Separate connector shells (*fig. 233*) and connector. This will release arm and tube cable from switch cable (short).
- (4) Pull switch housing assembly from arm and tube assem-



Figure 231. Spot light handle and related parts.

bly. Exercise caution in removal of switch housing, as arm and tube cable must be guided through slot at upper end of switch housing, as housing is removed.

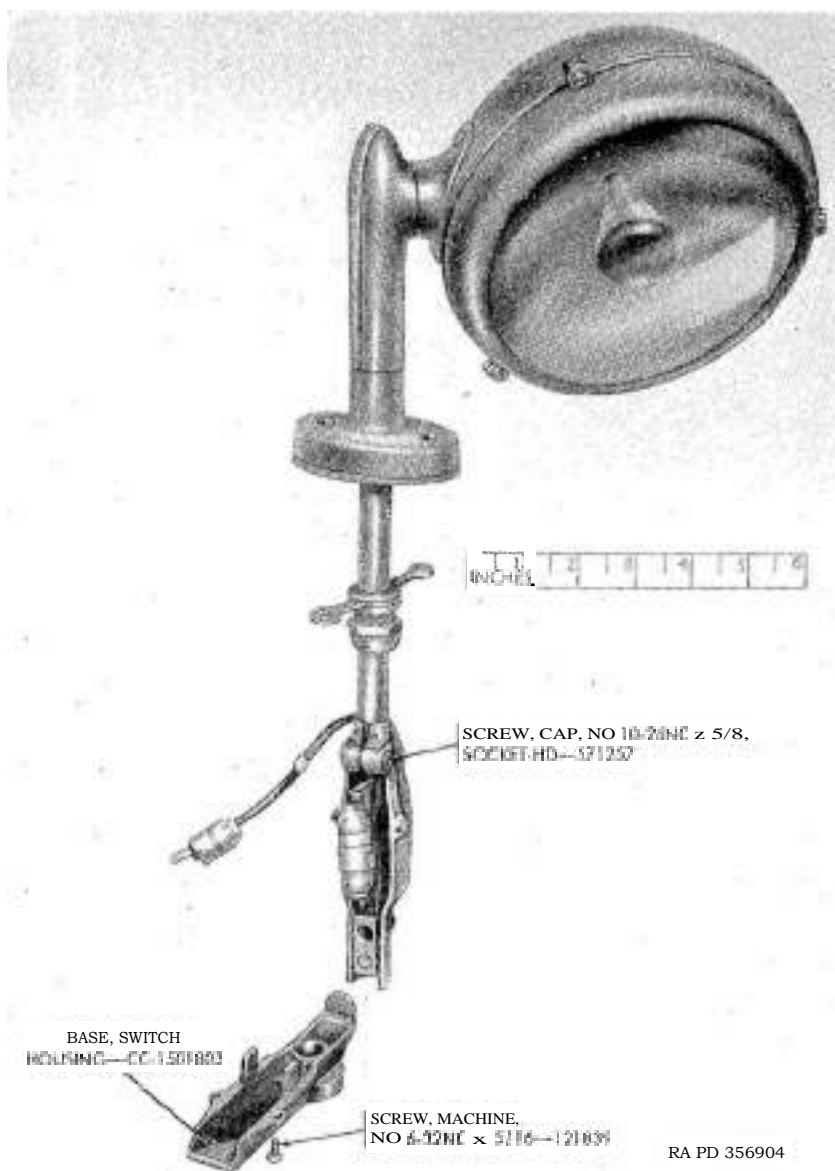


Figure 232. Switch housing base-removed.

- (5) Remove connector grommet, connector bushing, and connector shell (fig. 234) from arm and tube cable.

d. Remove Adjusting Nut, Collet Bracket, and Screws from Outside Mounting Bracket (fig. 234).

- (1) Remove adjusting nut from collet bracket.
- (2) Remove two lock washers and screws. This will release

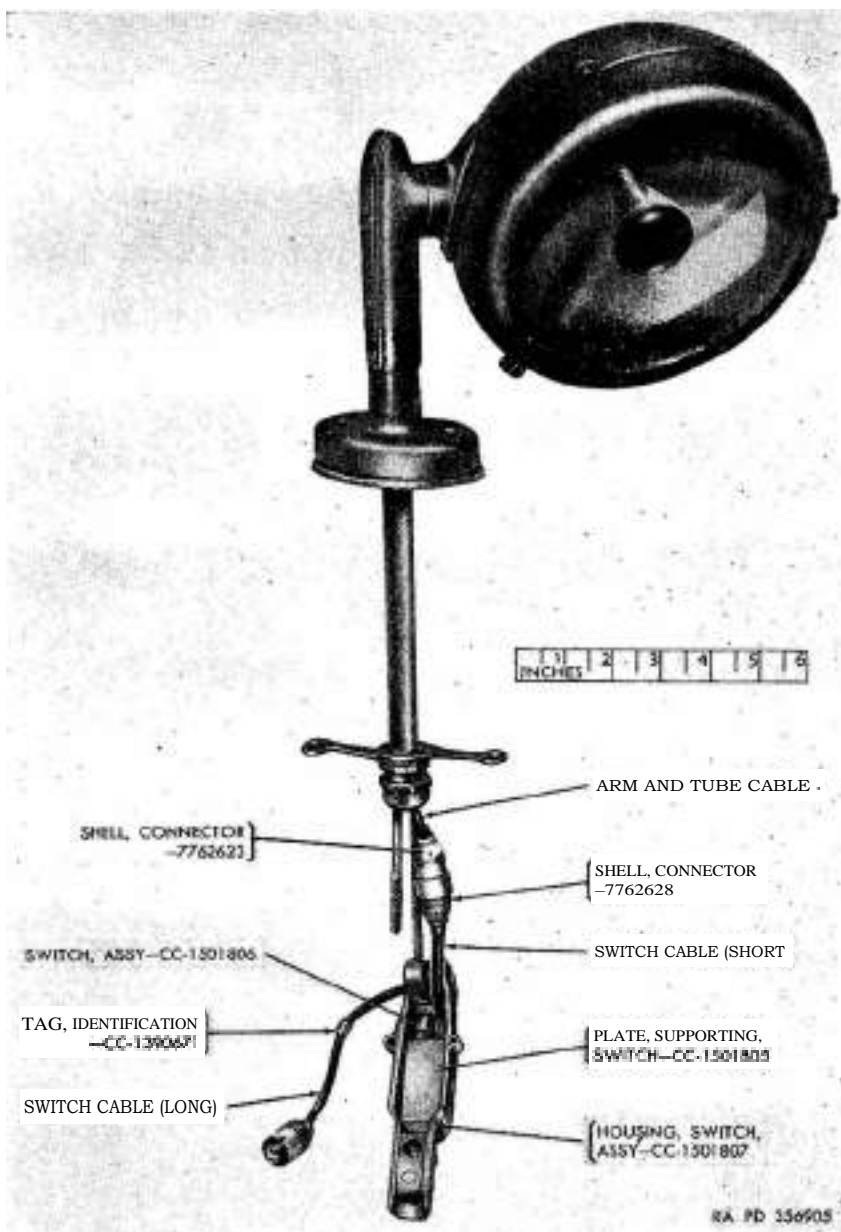


Figure 233. Switch and switch housing assemblies removed.

collet bracket from roof inside front center panel. Remove collet bracket from spot light.

- (3) Remove two machine screws from outside mounting bracket ; then remove spot light assembly from roof.

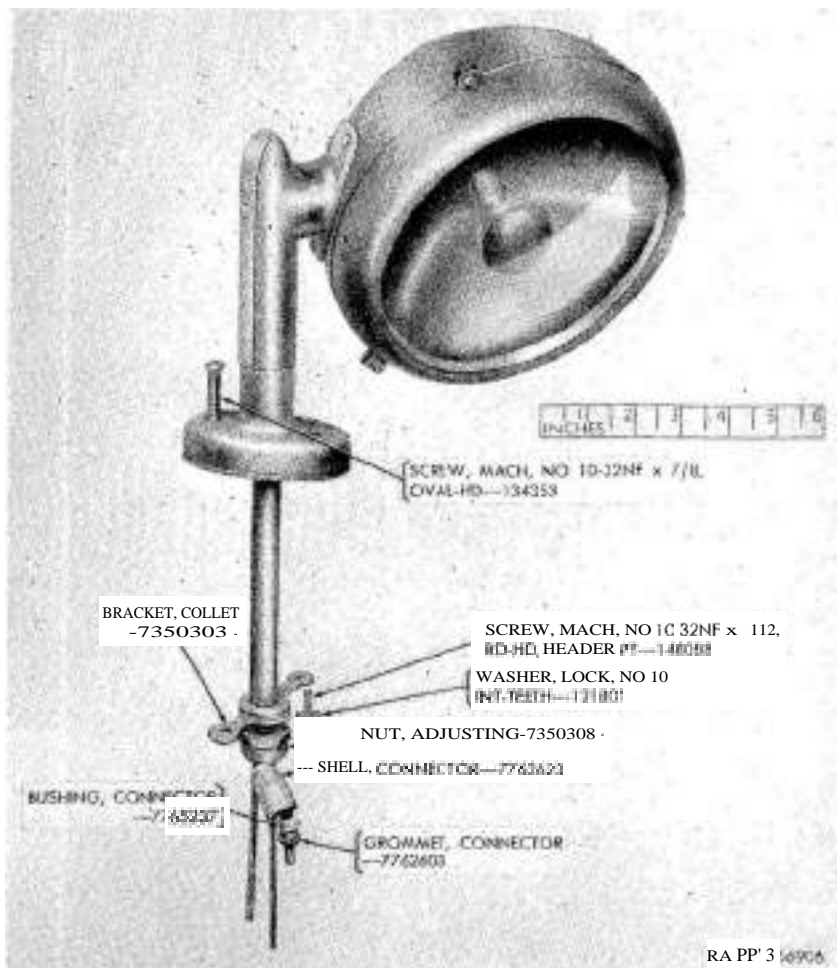


Figure 234. Bracket, collet, adjusting nut, and connector parts.

335. Remove Spot Light Assembly (Telephone Maintenance Truck V41) (Field and Depot Maintenance)

a. *General.* On the telephone maintenance truck V41, two different length extension cables and switch cables (long) have been used. The connector shells on the two cables are under the cowl on early production trucks and outside at the top of spot light mounting tube on late production trucks.

b. *Disconnect Switch Cable from Extension Cable.*

- (1) On the early production trucks, separate connector shells and connector. This will disconnect extension cable from switch cable. Remove switch cable rubber grommet from cowl side panel and withdraw switch cable. Remove two

tapping screws and cable clips from spot light mounting tube assembly.

- (2) On late production trucks, remove two tapping screws. This will release cable clip and connector shell clamp from spot light mounting tube assembly. Separate connector shells and connector at top of spot light mounting tube assembly. This will disconnect extension cable from switch cable.

c. Remove Handle Assembly, Switch-Housing Base, Switch Housing Assembly, and Switch Assembly. Refer to paragraph 334b through *d* for information pertaining to the removal of the handle assembly, switch housing base, switch housing assembly, and switch assembly.

d. Remove Spot Light Assembly from Spot Light Mounting Tube Assembly. Loosen wing nut and remove adjusting clamp from spot light support. Remove spot light assembly from spot light mounting tube assembly.

Section III. REBUILD OF SPOT LIGHT ASSEMBLY

336. Disassembly (Field and Depot Maintenance)

a. Remove Door and Lamp Unit Assembly from Spot Light Assembly (fig. 235).

- (1) Loosen three machine screws and separate door and lamp unit assembly as an assembly from body.
- (2) Remove connector shells from clip in body. Separate connector shells and connector.
- (3) Remove nut, lock washer, and ground terminal screw. This will separate lamp unit ground cable from body.
- (4) Remove lamp unit retaining springs and separate lamp unit assembly from door.

b. Remove Mounting Bracket Gasket, Retaining Spring, and Outside Mounting Bracket (Ambulance M43) (fig. 236). Remove mounting bracket gasket, retaining spring, and outside mounting bracket from arm and tube assembly.

c. Remove Arm and Tube Assembly from Body (fig. 236).

- (1) Remove machine screw and pinion retainer spring washer.
- (2) Push arm pinion from body and arm and tube assembly. This will separate body (fig. 235) from arm and tube assembly. Withdraw the two arm racks from arm and tube assembly. Remove pinion sleeve.
- (3) Remove arm and tube cable from arm and tube assembly.

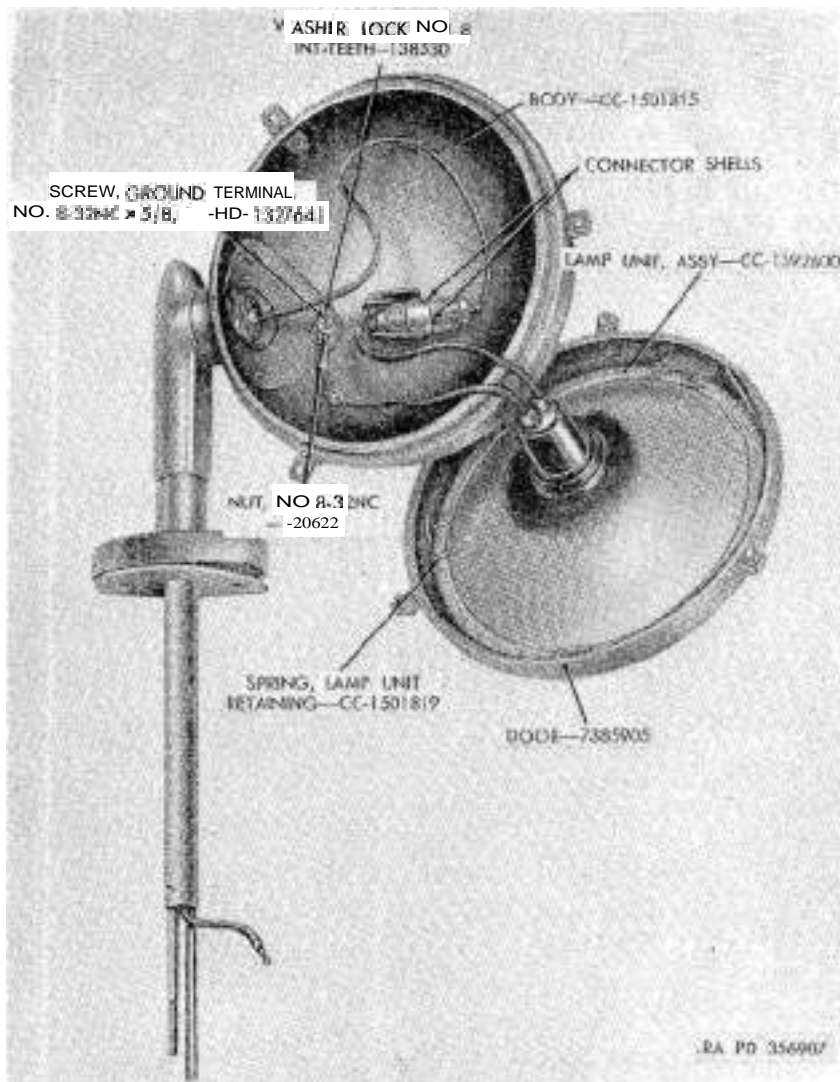
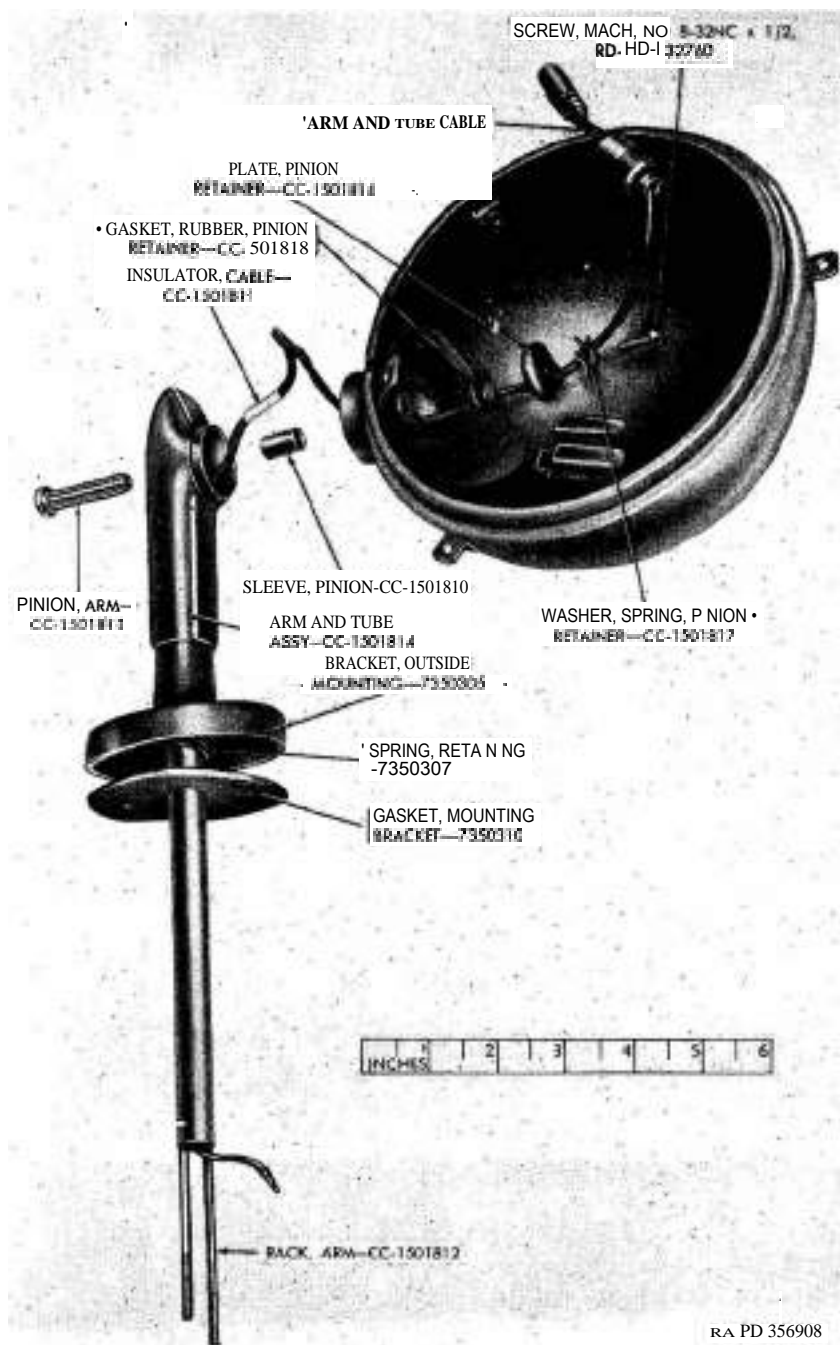


Figure 235. Body, lamp unit assembly, and door.

d. Remove Arm and Tube Cable and Related Parts from Body (fig. 236).

Note. Do not remove arm and tube cable or related parts from body unless inspection (par. 337f) reveals that replacement of cable or related parts is necessary.

Remove male terminal from one end of arm and tube cable ; then remove body, cable tube, pinion retainer plate, and pinion retainer rubber gasket from cable.



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Figure 236. Arm and tube assembly—removed.

e. Remove Switch Assembly from Switch Housing Assembly.

- (1) Remove machine screw and cable clamp from switch housing assembly. Remove connector grommet, connector bushing, and connector shell from switch cable (long).
- (2) Remove identification tag from switch cable (long).
- (3) Remove clips from switch cable (early production telephone maintenance trucks V41).
- (4) Remove switch supporting plate and switch assembly from switch housing.

f. Cleaning. Wash metal parts in volatile mineral spirits or dry-cleaning solvent and dry with compressed air. Wipe dirt from other parts with a cloth.

337. Inspection (Field and Depot Maintenance)

a. Inspect Handle, Aim Pinion, Handle Pinion, Handle Pinion Bearing, and Spring Washer (fig. 231).

- (1) Inspect handle for cracks or other visual damage. Handle must be replaced if it is not in good condition. Inspect handle mounting screw for distortion or damaged threads. Replace screw if either of these conditions exist.
- (2) Inspect arm pinion (*fig. 236*) and handle pinion for worn teeth, distortion, or damaged threads. Replace pinions if any of these conditions exist.
- (3) Inspect handle pinion bearing, for cracks, worn splines, or other visual damage. Replace bearing if any unsatisfactory conditions exist.
- (4) Inspect spring washer for cracks or other visual damage. Replace washer if it is not in good condition.

b. Inspect Switch Housing Base, Switch Housing Assembly, and Switch Assembly.

- (1) Inspect switch housing base (*fig. 232*) for cracks or other visual damage. Replace housing base if it is not in good condition.
- (2) Inspect switch housing assembly (*fig. 233*) for cracks, broken or seized switch lever, cracked or distorted contact plate, or damaged threads. Replace switch housing if any of these conditions exist.
- (3) Check switch assembly (*fig. 233*) for current flow to determine if contacts are in good condition. If current flow is not satisfactory, replace switch assembly. Inspect switch cables, cable tube, and cable spring for deterioration or other visual damage. If these parts are not in good condition replace switch assembly.

- (4) Inspect switch supporting plate (fig. 233) for distortion. Replace plate if it is not in good condition.

c. Inspect Collet Bracket, Adjusting Nut, Mounting Bracket Gasket, Retaining Spring, and Outside Mounting Bracket.

- (1) Inspect collet bracket (fig. 234) for distortion, cracks, or damaged threads. Replace collet bracket if any of these conditions exist.
- (2) Inspect adjusting nut (fig. 234) for distortion or damaged threads. Replace nut if any of these conditions exist.
- (3) Inspect mounting bracket gasket (fig. 236) for deterioration or other visual damage. Replace gasket if it is not in good condition.
- (4) Inspect retaining spring (fig. 236) for cracks or distortion. Replace spring if either of these conditions exist.
- (5) Inspect outside mounting bracket (fig. 236) for broken stop, cracks, or other visual damage. Replace bracket if it is not in good condition.

d. Inspect Spot Light Mounting Tube Assembly, Switch Cable Rubber Grommet, and Adjusting Clamp (Telephone Maintenance Truck V41).

- (1) Inspect spot light mounting tube assembly for broken welds, cracks, corrosion, damaged threads, distortion, or other visual defects. Replace spot light mounting tube assembly if it is not in good condition.
- (2) Inspect adjusting clamp for distortion, corrosion, or other visual damage. Replace clamp if it is not in good condition.
- (3) Inspect switch cable rubber grommet (early production trucks) for deterioration or other visual damage. Replace grommet if it is not in good condition.

e. Inspect Door, Lamp Unit Assembly, Lamp Unit Retaining Springs, and body (fig. 235) .

- (1) Inspect door for worn or damaged screws, cracks, corrosion, distortion, or other visual damage. Replace door if any unsatisfactory conditions exist.
- (2) Connect lamp unit assembly to a source of current and determine if filament is in good condition. Replace lamp unit assembly if not satisfactory. Inspect lamp unit assembly for evidence of moisture on reflector. Replace lamp unit assembly if there is evidence of moisture on reflector.
- (3) Inspect lamp unit retaining springs for breakage or distortion. Replace springs if not in good condition.

- (4) Inspect body for loose rivets, cracks, distortion, corrosion, or other visual defects. Replace body if not in good condition.

f. Inspect Arm and Tube Assembly, Arm Racks, Arm and Tube Cable, and Related Parts (fig. 236).

- (1) Inspect arm and tube assembly for cracks, distortion, corrosion, or other visual defects. Replace arm and tube assembly if not in good condition.
- (2) Inspect arm racks for worn teeth, distortion, or cracks. Replace racks if any of these conditions exist.
- (3) Inspect arm and tube cable and cable insulator for deteriorated insulation or other visual damage. Replace cable and/or insulator if not in good condition (pars. 336d and 338a).
- (4) Inspect pinion retainer rubber gasket for deterioration. Replace gasket if there is any evidence of deterioration (pars. 336d and 338a).
- (5) Inspect pinion retainer plate for cracks, corrosion, or distortion. Replace retainer plate if any of these conditions exist (pars. 336d and 338a).
- (6) Inspect pinion retainer spring washer for cracks. Replace washer if it is not in good condition.

338. Assembly (Field and Depot Maintenance)

a. *Install Arm and Tube Cable (fig. 236) and Related Parts in Body.*

- (1) If arm and tube cable or related parts were removed (par. 336d), install cable and related parts in body ((2, (3), and (4) below).
- (2) Insert arm and tube cable in body.
- (3) Install cable insulator so that it will be located at right angle bend where cable enters tube from body. Install connector male terminal on one end of cable.
- (4) Install pinion retainer rubber gasket on cable through outside hole of gasket, followed by pinion retainer plate (through outside hole of plate and flanged edge toward body bracket). Install other connector male terminal on end of cable.

b. *Install Arm and Tube Assembly (fig. 236), Arm Racks, Arm Pinion, Pinion Sleeve, and Body.*

- (1) Insert arm and tube cable in arm and tube assembly through lower hole in arm upper opening.

Note. Allow approximately 6 1/2 inches of cable inside of body and 6 inches between body and arm so that approximately 3 inches of cable will extend from bottom of tube.

- (2) Position cable insulator on cable so that it will cover cable where it extends through upper end of arm and tube assembly.
- (3) Insert the two arm racks in the arm and tube assembly with arm and tube cable between racks. Hold arm and tube assembly in left hand and push one rack up into arm and tube assembly as far as it will go. Position other rack so that teeth at upper end just cover opening for pinion. Insert arm pinion in arm and tube assembly and place pinion sleeve over pinion. Wrap cable three times around sleeve (counterclockwise) and position body on pinion with opening of body pointing directly away from arm and tube assembly. Install pinion retainer spring washer and No. 8-32NC x $\frac{1}{2}$ round-head machine screw in end of pinion and tighten screw.

c. Install Connector Parts on Arm and Tube Cable, Lamp Unit Assembly, Lamp Unit Retaining Springs, and Door (fig. 235).

- (1) Install connector shell, connector bushing, and connector grommet on upper end of arm and tube cable.
- (2) If a new lamp unit assembly is installed, install a No. 91 identification tag on lamp unit ground cable and a No. 87 identification tag on other cable. Also install a connector shell, connector bushing, and connector grommet on other cable.
- (3) Position lamp unit in door and install four lamp unit retaining springs equally spaced.
- (4) Install No. 8-32NC x $\frac{5}{8}$ round-head ground terminal screw through hole in body assembly (head outside). Place terminal of lamp ground cable on screw followed by a No. 8 internal-teeth lock washer and No. 8-32NC nut. Position cable at right angles to connector shell clip and tighten nut.
- (5) Install connector on arm and tube cable and insert lamp unit cable. Connect connector shells and insert connector shells in clip attached to body assembly.
- (6) Position door on body so that drain hole in door corresponds with drain opening in body. Tighten attaching screws.

d. Install Outside Mounting Bracket, Retaining Spring, and Mounting Bracket Gasket (Ambulance ^M43) (fig. 236). Position outside mounting bracket on arm and tube assembly (flange down), followed by retaining spring (hook down) and engage hook of spring in hole in tube assembly. Install mounting bracket gasket on tube assembly.

e. Assemble Switch Assembly in Switch Housing Assembly (fig. 233).

- (1) Insert switch cable (long) through hole in switch housing assembly (from inside). Make certain coil spring around cable extends through hole. Install identification tag on cable.
- (2) Position cable clamp on switch housing assembly and install a No. 6 lock washer and No. 6-32NC x $\frac{1}{4}$ round-head machine screw. Tighten screw.
- (3) Install female connector shells, connector bushings, and connector grommets on switch cables. Install cable connectors on switch cables.
- (4) Install switch supporting plate on switch assembly.

Section IV. INSTALLATION OF SPOT LIGHT ASSEMBLY

339. Install Spot Light Assembly (M43 Ambulance) (Field and Depot Maintenance)

a. Install Spot Light Assembly on Roof.

- (1) Position spot light assembly on roof and install two No. 10-32NF x $\frac{7}{8}$ oval-head machine screws (*fig. 234*). Tighten screws.
- (2) Position collet bracket over lower end of tube and attach bracket to roof inside front center panel with two No. 10 internal-teeth lock washers and No. 10-32NF x $\frac{1}{2}$ round-head header-point machine screws. Tighten screws.
- (3) Install adjusting nut on collet bracket, but do not tighten nut.

b. Install Switch Housing Assembly, Switch Assembly, and Switch Housing Base.

- (1) Connect connector shells on switch cable (short) and arm and tube cable. Position switch housing assembly on end of tube and work arm and tube cable through slot at end of switch housing assembly (*fig. 233*). Align screw hole at upper end of switch housing assembly with cut-out in end of tube. Insert a No. ~~10-24NC~~ x socket-head cap screw (*fig. 232*) through slotted end of switch housing assembly. Tighten screw.
- (2) Install handle pinion (*fig. 231*) through switch housing assembly and engage teeth of pinion with teeth on arm racks.
- (3) Snap cable connectors in switch housing base and posi-

tion base on switch housing assembly. Install two No. 6-32NC x 5/16 machine screws. Tighten screws.

c. *Install Spring Washer, Handle Pinion Bearing, Handle, and Handle Mounting Screw (fig. 231)*. Place spring washer in counter-bore of switch housing base followed by handle pinion bearing (slots outside), handle, and handle mounting screw. Engage handle mounting screw in threads of handle pinion and tighten screw.

d. *Connect Extension Cable and Switch Cable (Long)*. Engage connector and connector shells to attach extension cable to switch cable (long). Place connector shells in clip on roof panel.

e. *Adjust Adjusting Nut (fig. 234)*. Tighten adjusting nut until a slight drag is evident when handle is oscillated.

340. Install Spot Light Assembly (Telephone Maintenance Truck V41) (Field and Depot Maintenance)

a. *Install Spot Light Assembly on Spot Light Mounting Tube Assembly*. Insert arm and tube assembly through spot light mounting tube assembly (lamp forward). Install adjusting clamp over slotted end of mounting tube assembly. Tighten wing nut until mounting tube assembly is snug against arm and tube assembly.

b. *Install Switch Housing Assembly, Handle, and All Related Parts*. Refer to paragraph 339b and c for information pertaining to the installation of the switch housing assembly, handle, and all related parts.

c. *Install Cable Clips and Switch Cable Rubber Grommet on Switch Cable (Early Production Trucks)*. Align two cable clips with threaded holes in spot light mounting tube assembly. Provide a loop at top of switch cable and install two No. 8 x 3/8 pan-head tapping screws to attach clips to mounting tube assembly.

Note. On late production trucks, a cable connector clamp is required in place of the cable clip, as the extension cable and switch cable are connected at this point by connector shells.

d. *Connect Extension Cable to Switch Cable.*

- (1) On early production trucks, insert switch cable through hole in cowl side panel and install switch cable rubber grommet in cowl side panel. Connect switch cable to extension cable under cowl.
- (2) On late production trucks, connect the switch cable to extension cable at upper end of the spot light mounting tube assembly. Engage connector and connector shells. Install connector shell clamp and two No. 8 x 3/8 pan-head tapping screws. Tighten screws.

CHAPTER 20

REPAIR AND REBUILD STANDARDS

341. General

The repair and rebuild standards included herein give the minimum, maximum, and key clearances of new or rebuilt parts. They also give wear limits which indicate that point to which a part or parts *may* be worn before replacement, in order to receive maximum service with minimum replacement. Normally, all parts which have not been worn beyond the dimensions shown in the "Wear limits" column or damaged from corrosion will be approved for service. An asterisk (*) in the "Wear limits" column indicates that the part or parts should be replaced when worn beyond the limits given in the "Sizes and fits of new parts" column. All dimensions are in inches unless otherwise specified.

342. Front Axle

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
237	A	78c	Inside diameter of steering knuckle bushing-type bearing.	1.519 to 1.521	1.525
54	AA	79d	A-10 mxstor Otr erino	2 R12 to 2.515	2 ROR

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
68		79f	Preload of steering knuckle flange bearing.	25 torque to 30 lb-it	(*)
71		84b	Wheel alinement:		
			Pivot pin inclination (deg.)	$7\frac{1}{2}$ to $8\frac{1}{2}$ -----	(5)
			Camber (deg.)	$1\frac{1}{4}$ to $1\frac{3}{4}$ -----	(*)
			Caster (deg.)—no load	0 to 1 -----	(**)

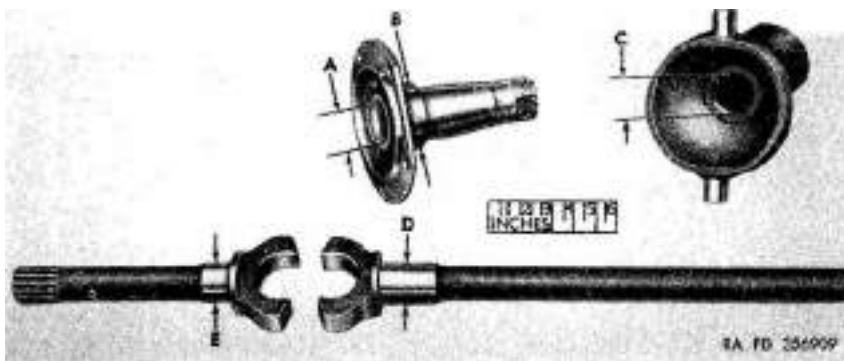


Figure 237. Front axle parts.

343. Axle Differential Carrier

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
238	A-D	96d	Inside diameter of differential pinion shaft holes in differential case.	0.802 to 0.803 ---	(5)
238	C	96d	Outside diameter of differential pinion shafts (Pinion contact surface).	0.8025 to 0.803 --	0.801
238	B	93b	Outside diameter of companion flange at oil seal contact surface.	1.873 to 1.878 ---	1.869
85		94	Preload of drive pinion rear bearing and front bearing outer cone (drive pinion bearing oil seal removed).	35 torque to 70 lb-in	(*)
93		97f	Backlash between drive gear and pinion.	0.005 to 0.010 ---	(*)
93		97f	Spread of differential bearing-caps.	0.012 to 0.014 ---	(*)
		97g	Clearance between drive gear and drive gear thrust screw pad (360-deg. rotation).	0.006 to 0.008 ---	(*)

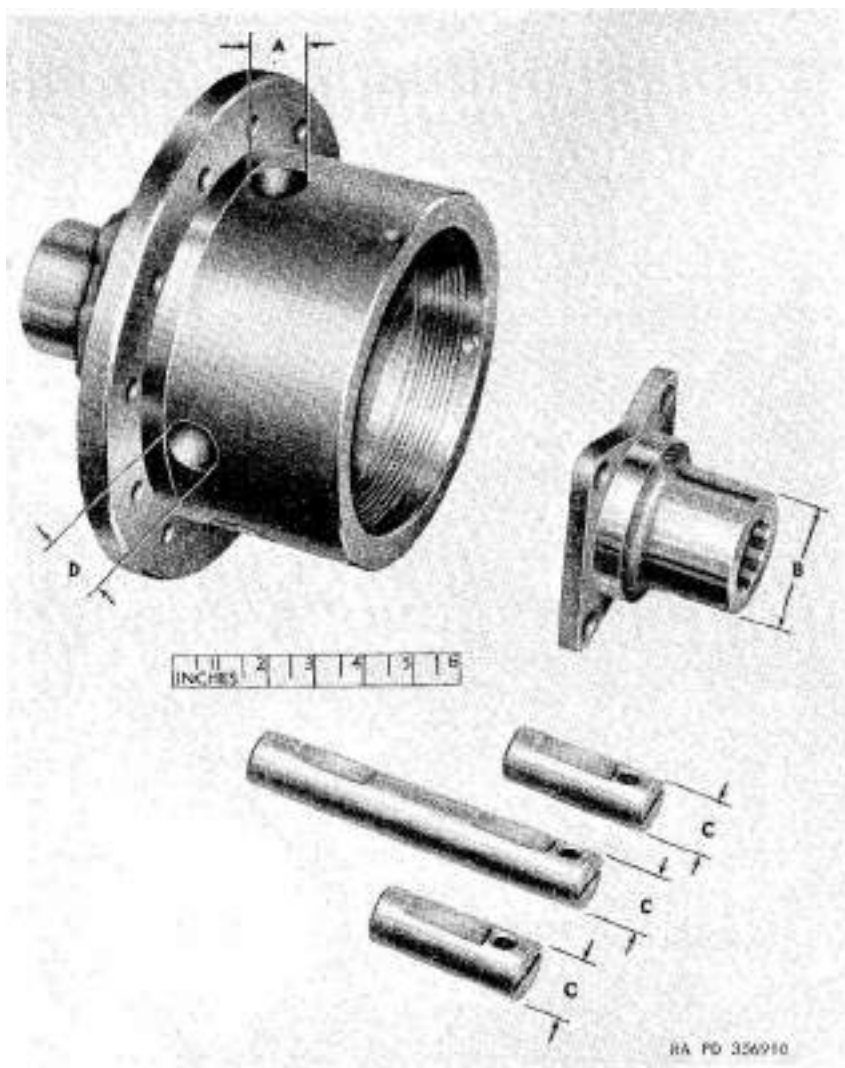
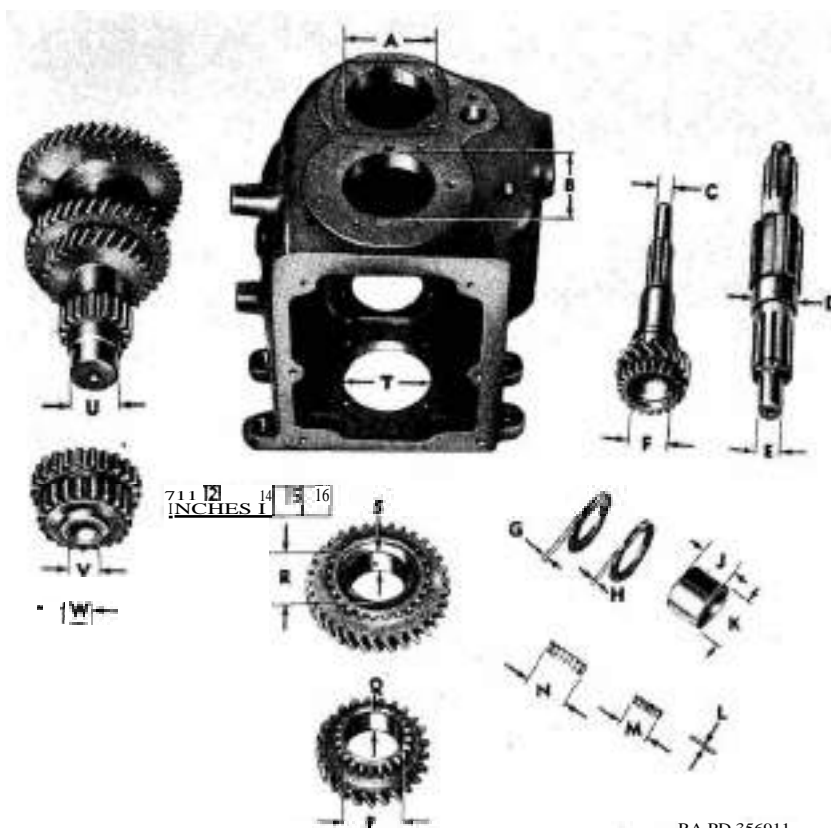


Figure 238. Axle differential carrier parts.

344. Transmission

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
239	T	113a	Inside diameter of case main shaft ball bearing opening.	3.3466 to 3.347L__	3.348
239	B	113a	Inside diameter of case input shaft ball bearing opening.	3.1497 to 3.1502__	3.151
239	A	113a	Inside diameter of case counter-shaft front ball bearing opening.	3.1497 to 3.1502__	3.151
239 108	U W	1136	Outside diameter of counter-shaft rear bearing contact surface.	1.7495 to 1.750__	1.748
239 108	V X	113e	Inside diameter of reverse idler gear bearing.	0.9895 to 0.9905__	0.992
239 108	W ZZ	113f	Outside diameter of reverse idler gear shaft.	0.9872 to 0.9897__	0.9855
239 108	F BC	116a	Inside diameter of input shaft bearing bore.	1.312 to 1.313 - - -	1.315
239 108	C BC	116a	Outside diameter of input shaft.	0.7470 to 0.748 - -	0.745
239 108	S T	119d	Width of second speed gear at hub.	1.012 to 1.015 - -	1.009
239 108	R T	119d	Inside diameter of second speed gear hub bore.	1.9590 to 1.9595 -	1.9605
239 108	Q	119d	Width of third speed gear at hub.	1.251 to 1.254 - - -	1.248
239 108	P P	119d	Inside diameter of third speed gear hub bore.	1.8006 to 1.801_ _	1.802
239 108	G U	119e	Thickness of second speed gear locating washer.	0.155 to 0.157 - - -	0.1535
239 108	H R	119e	Thickness of third speed gear locating washer.	0.176 to 0.178 - - -	0.1745
239 108	L S	119f	Outside diameter of second speed gear roller.	0.1248 to 0.125 - - -	(*)

<i>No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
239 108	K Q	119g	Outside diameter of third speed gear bushing-type bearing.	1.7975 to 1.7985 ---	1.796
239 108	J Q	119g	Length of third speed gear bushing-type bearing.	1.257 to 1.260 ---	(5)
239 108	E CC	119i	Outside diameter of forward end of main shaft (pilot bearing surface).	0.936 to 0.9365 --	0.934
239 108	D CC	119i	Outside diameter of main shaft second speed gear roller contact surface.	1.708 to 1.7085 --	1.707
109		1205	End play between second speed gear and forward locating washer.	0.003 to 0.008 ---	0.011
109		1205	End play between third speed gear and synchronizer gear.	0.003 to 0.008 ---	0.011
239	N	122c	Free length of reverse shifter shaft lug plunger compression spring.	$1\frac{9}{16}$ -----	(*)
			Length under compression of 25 to 35 pounds.	1 -----	(5)
239 111	Di GG-JJ- KK	122d	Free length of shifter shaft poppet ball spring.	$\frac{5}{16}$ -----	(*)
			Length under compression of 22 to 26 pounds.	$2\frac{1}{32}$ ----	
117		125d	End play of synchronizer assembly.	0.040 to 0.100 ---	(5)



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Figure 239. Transmission parts.

345. Power-Take-Off

Fig. No.	Ref. letter	Par. ref.	Point of measurement	Sizes and fits of new parts	Wear limits
240 120	A. QQ	130b	Inside diameter of reverse gear bore.	1.375 to 1.376 - - -	1.378
240 120	C Z	130d	Outside diameter of reverse gear shaft.	0.8745 to 0.875 - -	0.8735
240 120	B W	130d	Outside diameter of shifter shaft.	0.738 to 0.739 - - -	0.736
240 120	D BB	130e	Free length of shifter shaft ball spring. Length under compression of 20 to 26 pounds.	$\frac{5}{16}$ ----- $\frac{9}{16}$ -----	(*)
122		134b	Backlash between transmission countershaft gear and power-take-off idler gear.	0.003 to 0.008 - - -	(*)

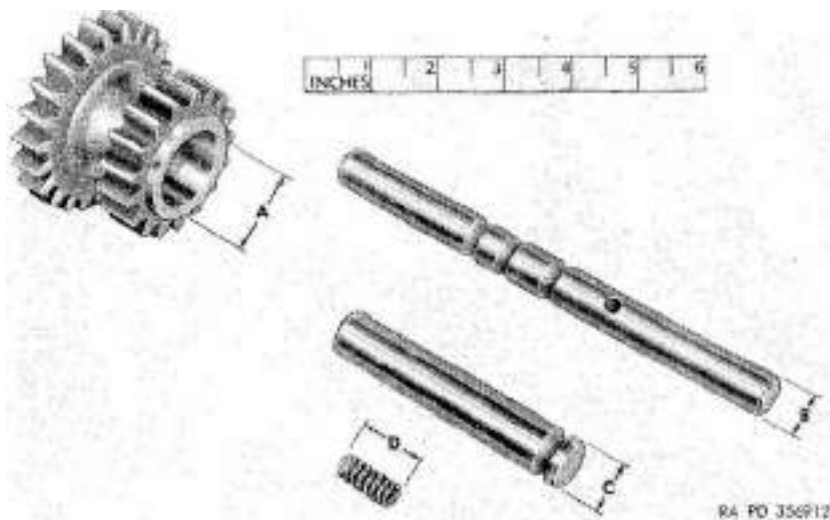


Figure 240. Power-take-off parts.

346. Transfer

Fig. No.	Ref. letter	Par. ref.	Point of measurement	Sizes and fits of new parts	Wear limits
241 128	K AM	143a	Outside diameter of (brake) output shaft rollers.	0.218 to 0.2182__	(*)
241 128	A AL	143c	Inside diameter of bore in gear end of (brake) output shaft.	1.2686 to 1.2691__	1.271
241 128	G JJ	143g	Outside diameter of (brake) companion flange hub at oil seal contact surface.	2.125 to 2.130 - -	2.12
130		144a 144g	Preload of (brake) output shaft bearings.	15 torque to 30 lb-in	(*)
241 132	K W	146b	Outside diameter of (rear axle) output shaft rollers.	0.218 to 0.2182 - -	(*)
241 132	E V	146c	Inside diameter of bore in gear end of (rear axle) output shaft.	1.2686 to 1.2691__	1.271
241 132	R F	146d	Outside diameter of (rear axle) companion flange hub as oil seal contact surface.	2.125 to 2.130	2.121
		147a 147f	Preload of (rear axle) output-shaft bearings.	15 torque to 30 lb-in.	(*)

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
241 135	L-M YY-ZZ	149c	Outside diameter of two speed clutch gear shifter shaft and front axle clutch gear shifter shaft.	0.7465 to 0.747_____	0.7445
241 135	N Q-AQ	149d	Free length of shifter shaft poppet ball springs. Length under compression of 22 to 26 pounds.	$\frac{1}{16}$ eis (*) $\frac{5}{16}$ (*)	
241 135	B W	149g	Outside diameter of front axle output shaft bearing contact surface.	0.8313 to 0.8318 - - -	0.830
241 135	C AW	149h	Inside diameter of input shaft gear bore.	1.9331 to 1.9336 - - -	1.9346
241 135	H AX-AZ	149i	Outside diameter of input shaft gear rollers.	0.158 to 0.1582 - - - - -	(*)
241 135	J-P-Q V-W-X BC	149j	Thickness of input shaft gear thrust washers and front axle output shaft thrust washers.	0.154 to 0.156 - - -	0.151
241 135	F BD	149k	Outside diameter of input shaft at gear roller contact surface.	1.6161 to 1.6164_ _ _	1.6152
241 135	D BD	149k	Outside diameter of input shaft at output shaft roller contact surface.	0.8313 to 0.8318_ - -	0.830

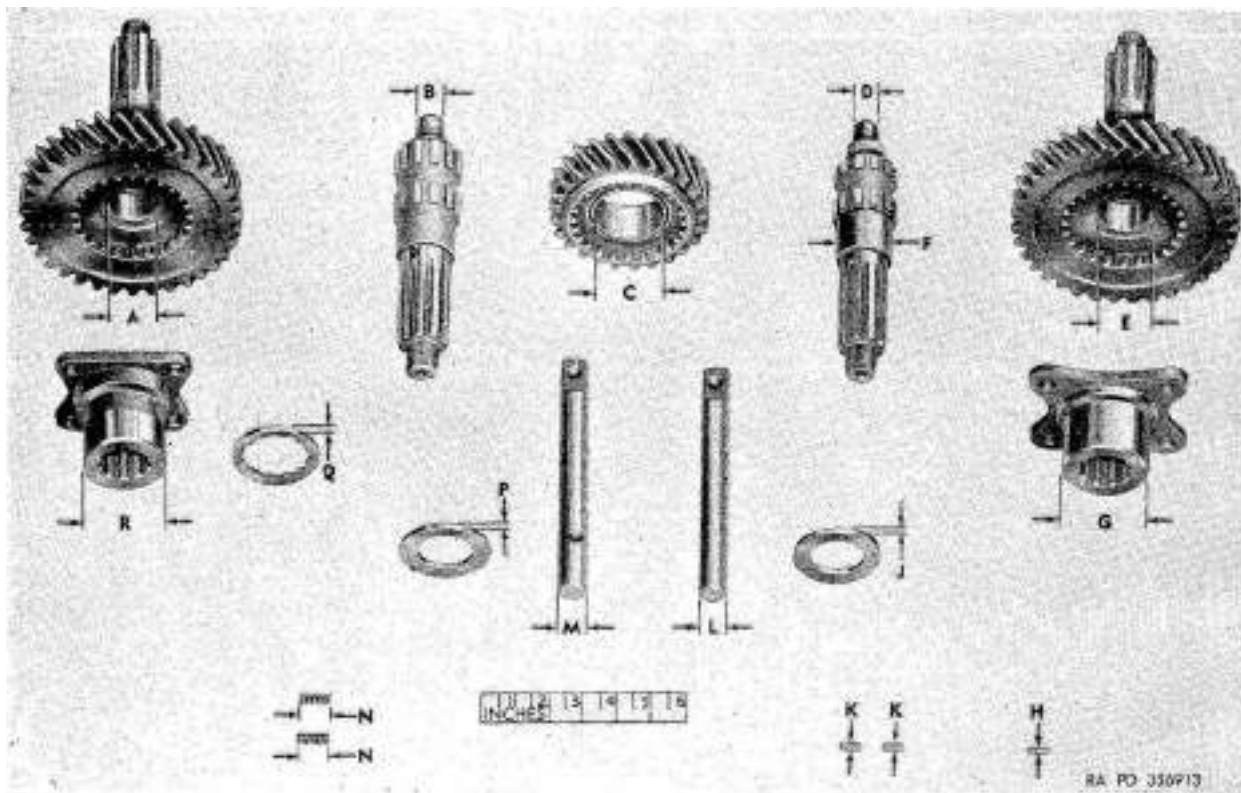


Figure 241. Transfer parts.

347. Universal Joints and Propeller Shaft

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
242 146	L J	158a	Outside diameter of journal pins.	0.7095 to 0.710_ _ _	0.708
242	B	158b	Outside diameter of roller bearing bushing.	1.231 to 1.2315_ _ _	(*)
242 145	C	158b	Inside diameter of roller bearing bushing.	0.913 to 0.914 _ _ _	0.9155
242 145	D	158c	Outside diameter of bearing rollers.	0.1009 to 0.1012_ _ _	(*)
242 146	A R-BB	158e 158g	Inside diameter of bearing bores in yokes.	1.2305 to 1.231_ _ _	(*)
242	F	158g	Run-out of propeller shaft _ _ _	0.010 to 0.015 _ _ _	0.020

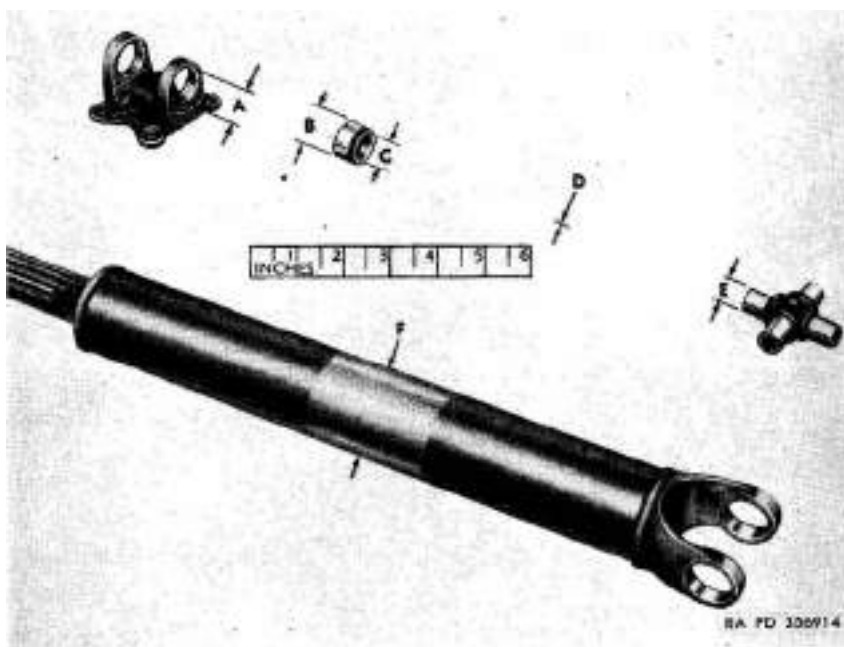


Figure 242. Universal joint and propeller shaft parts.

348. Brakes

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
243 128	B KK	165d	Outside diameter of hand brake drum.	7.803 to 7.823 -	7.780
243 151	E W	168a	Free length of brake shoe return spring.	7 - - - - -	(*)
			Length when subjected to pull of 70 to 82 pounds.	7N - - - - -	(*)
243	A	108b	Inside diameter of (wheel) brake drum.	14.155 to 14.165_ _ _	14.220
		171a	Inside diameter of wheel cylinder bore:		
243	K		Front and rear wheel front cylinders.	1.250 to 1.253 - -	(*)
243	J		Front and rear wheel rear cylinders.	1.375 to 1.378 - -	(5)
		171a	Outside diameter of pistons (wheel cylinder):		
243	L		Front and rear wheel front pistons.	1.2475 to 1.2490_ _ _	(5)
243	G		Front and rear wheel rear pistons.	1.3725 to 1.3740_ _ _	(5)
243 153	K-L	171a	Piston (wheel cylinder) to bore fit (all pistons must be select fit at assembly to give clearance of).	0.001 to 0.004 - -	(5)
243	II	171a	Free length of piston cup compression spring (wheel cylinder).	2% - - - - -	(*)
			Length under compression of 4 1/4 to 4% pounds.	1 5/8 - - - - -	
243 155	M Q	174a	Inside diameter of master cylinder bore.	1.249 to 1.253 - -	(*)
243 155	F K	174a	Outside diameter of piston (master cylinder).	1.247 to 1.2485_ _ _	(*)
243 155	N N	174a	Length of piston return spring (master cylinder) under compression of 8N to 9 1/4 pounds.	2N - -	(5)
243	M-F	174a	Piston (master cylinder) to bore fit (all pistons must be select fit to give clearance of).	0.001 to 0.0045_ _ _	(5)

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Size and fits of new parts</i>	<i>Wear limits</i>
243 158	C L	177a	Inside diameter of brake pedal bushing-type bearing.	0.753 to 0.755 - - -	0.759
243 158	P-Q E-G	177b	Inside diameter of pedal bracket bushing-type bearings.	0.753 to 0.755 - - -	0.759
243 158	D J	177c	Outside diameter of pedal shaft. 0.748 to 0.750 - - -	0.745	



Figure 242. Brake parts.

349. Steering

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
244 163	J J-AA	184a	Inside diameter of steering gear housing bushing-type bearings.	1.250 to 1.251 - - -	1.253
244 163	A DI)	184b	Outside diameter of steering column shaft at seal contacting surface.	0.683 to 0.687 - - -	0.680
244 163	C II	184d	Outside diameter of pitman arm shaft.	1.2485 to 1.2495_	1.247
244 163	F Y	184e	Outside diameter of pitman arm ball.	1.230 to 1.250 - - -	1.215
244 163	H F	184g	Thickness of pitman arm shaft adjusting screw thrust washer.	0.082 to 0.083_ - - -	0.079
166		185g	Preload of steering column shaft and worm assy bearings sector shaft removed.	12 torque to 24 lb-in.	(*)
166		185j	Preload of gear mesh between worm high spot and pitman arm sector.	24 torque to 36 lb-in.	(*)
244 171	C	188a	Inside diameter of steering idler arm bushing-type bearing.	0.999 to 1.001 - - -	1.003
244 171	D	188a	Outside diameter of steering idler arm balls.	1.2137 to 1.2237_ -	1.207
244 171	E	188b	Inside diameter of steering idler arm bracket bore.	0.999 to 1.001_ - -	1.002
244 171	B	188c	Outside diameter of steering idler arm shaft.	0.981 to 0.986 - - -	0.978

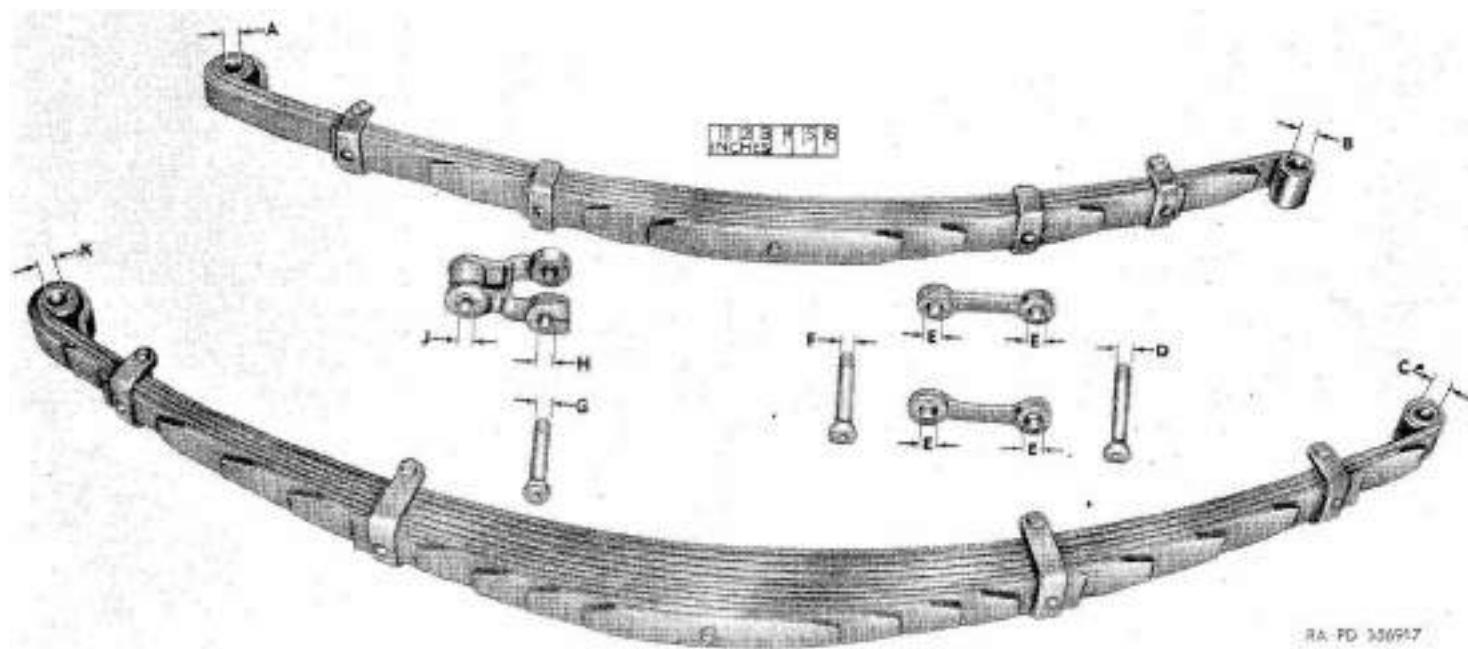


Figure 245. Spring parts.

350. Springs

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>f</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Tfear limits</i>
245 175	A-B A-E	197a	Inside diameter of front spring bushing-type bearings.	0.735 to 0.740 - - - -	0.750
245	E	197c	Inside diameter of inner and outer front spring rear shackle bolt holes.	0.749 to 0.7505 _ _ _ _	0.752
245	D-F-G	197d 200d	Outside diameter of spring bolts and shackle lower spring bolts.	0.745 to 0.747 - - - -	0.741
245 176	C-K A-E	200a	Inside diameter of rear spring bushing-type bearings.	0.735 to 0.740 - - - -	0.750
245	H	200c	Inside diameter of rear out- side shackle bolt hole.	0.751 to 0.753 - - - -	0.755
245	J	200c	Inside diameter of rear shackle bushing-type bearing.	0.7495 to 0.7515 _ _ _ _	0.761

351. Frame and Pintle

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
177	H-L- P-Q	207a	Inside diameter of spring bracket bolt holes.	0.7490 to 0.7505 _ _ _ _	0.752
177	N	207a	Inside diameter of front spring rear bracket bearing.	0.7495 to 0.7515 _ _ _ _	0.761
246 180	A D	210a	Inside diameter of pintle adap- ter flange bore.	1.505 to 1.510 - - - -	1.515
246 180	B E	210b	Outside diameter of pintle adapter shaft.	1.490 to 1.495 - - - -	1.485
246 180	C J	210e	Free length of pintle hook latch spring. Length under compression of 7 pounds.	1 % - - - - - 1 5/16 - - - - -	(*)
246 180	D K	210e	Outside diameter of pintle latch pin.	0.495 to 0.497 - - - -	(*)
246 180	E N	210e	Outside diameter of pintle lock pin.	0.495 to 0.497 - - - -	(*)

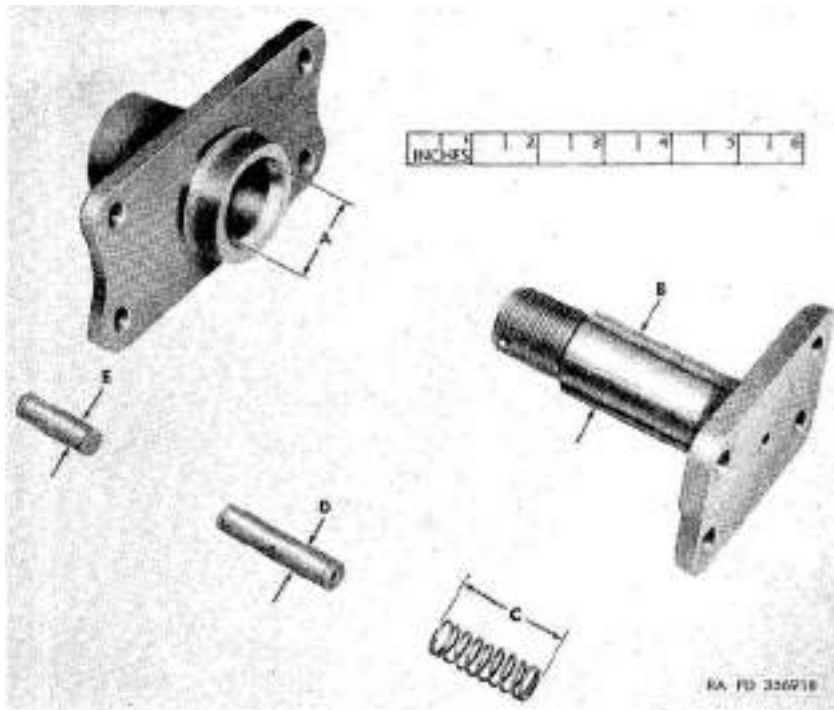


Figure 246. Pintle parts.

352. Body—Ventilating Blower

Fig. No.	lief. letter	Par. ref.	Point of measurement	Sizes and fits of new parts	Wear limits
210	B	269	Blower motor shaft end	0.008 to 0.015	0.030
		269	Current draw is 2 amperes at 27.5 volts, motor turning 2,700 rpm and outlet opening restricted to 2.5 inches.	-----	(*)

353. Winch and Drive Shaft

Fig. No.	Ref. letter	Par. ref.	Point of measurement	Sizes and fits of new parts	Wear limits
247 226	A MM	325a	Inside diameter of worm housing bushing-type bearing.	1.749 to 1.751	1.756
247 226	B AS	319a	Inside diameter of clutch housing bushing-type bearing.	1.749 to 1.751	1.756
247 226	C PP-AZ	322a	Inside diameter of cable drum bushing-type bearings.	1.7550 to 1.7565	1.761

33

<i>fig. No.</i>	<i>Ref. letter</i>	<i>Par. ref.</i>	<i>Point of measurement</i>	<i>Sizes and fits of new parts</i>	<i>Wear limits</i>
247 226	D L	325a	Inside diameter of worm housing cover bushing-type bearing.	1.749 to 1.751 - - -	1.756
247 229	E V	328a	Outside diameter of journal pins.	0.650 to 0.652 - - -	0.6485
247 229	F J-S-Y	328b	Inside diameter of universal joint bushing-type bearings.	0.656 to 0.658 - - -	0.660
247 226	G J	325c	Outside diameter of cable drum shaft.	1.747 to 1.750 - - -	1.745
247 226	H-J AU-AY	319f	Thickness of cable drum retaining rings.	0.250 - -	0.235
247 226	K GG	325f	Outside diameter of safety brake drum.	3.000	2.970
247 226	L T	325d	Outside diameter of worm shaft.	1.0005 to 1.0015_ -	(*)



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Figure 247. Winch and drive shaft parts.

354. Torque Wrench Specifications

<i>Fig. No.</i>	<i>Ref. letter</i>	<i>Name of part</i>	<i>Torque (lb.-ft.)</i>
<i>a. Front Axle.</i>			
62	S-AL	Steering arm and upper flange bearing cap screws - - -	60-80
62	AA-CC	Lower flange bearing cap screws - - - - -	60-80
02	BE	Flange assembly cap screws - - - - -	80-85
88	AM	Drive pinion carrier-to-axle-housing stud nuts	40-45
54	W	Brake support cap screws - - - - -	80-85
70		Tie rod end ball stud nut - - - - -	130-150
45		Axle drive flange stud nuts - - - - -	30-35
<i>b. Rear Axle.</i>			
88	B	Companion flange nut - - -	300
88	PP	Drive gear bolt nuts - - - - -	35-40
88	AB	Differential bearing cap stud nuts - - - - -	100-120
88	T	Differential bearing adjusting-nut screws - -	15-20
88	AM	Drive pinion carrier-to-axle-housing stud nuts - - - -	40-50
74	B	Drive shaft flange stud nuts - - - - -	30-35
<i>c. Transmission.</i>			
108	PP	Main shaft companion flange nut - - - - -	140-160
<i>d. Transfer.</i>			
128	JJ	Brake output shaft companion flange nut - - - - -	140-160
132	F	Rear axle output shaft companion flange nut - - - - -	140-160
135	VV	Idler gear shaft nut - - - - -	140-160
135	AC	Input shaft companion flange nut - - - - -	140-160
135	B	Front axle output shaft companion-flange nut - - - - -	140-160
<i>e. Steering.</i>			
163	W	Pitman arm nut - - - - -	140-150

APPENDIX

REFERENCES

1. Publication Indexes

Special Regulations in the 310-20-series, SR 110-1-1, ORD 1, FM 21-8, and SB 9-1 should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to materiel covered in this manual.

2. Supply Manuals

a. Repair and Rebuild.

~~Antifriction~~ Bearings and Related Items ____ ORD 5 SNL H-12
Cleaners, Preservatives, Lubricants, Recoil ____ ORD 3 SNL K-1
Fluids, Special Oils, and Related Maintenance
Materials.
Electrical Fittings - - - - - ORD 5 SNL 11-4
Items of Soldering, Metallizing, Brazing, and ____ ORD 3 SNL K-2
Welding Materials : Gases and Related Items.
Lubricating Equipment, Accessories and ____ ORD (*) SNL K-3
Related Dispensers.
Lubrication Fittings, Oil Filters, and Oil ____ ORD 5 SNL H-16
Filter Elements.
Major Items and Major Combinations of ____ ORD 3 SNL G-1
Group G.
Miscellaneous Hardware - - - - - ORD 5 SNL 11-2
Oil Seals - - - - - ORD 5 SNL 11-13
Pipe and Hose Fittings - - - - - ORD 5 SNL H-6
Shop Set, Headquarters and Service ____ ~~ORD~~ 6 SNL J-9, Section 2
Company, Maintenance Automotive
or Armament.
Shop Set, Maintenance (Field) ____ ORD 6 SNL J-8, Section 13
Automotive.
Shop Set, Power Train Rebuild ____ ORD 6 SNL J-9, Section 1
Company (Automotive), Depot Maintenance.

See ORD 1 for published manuals of the ordnance section of the Department of the Army Supply Manual.

Shop Set, Tire Rebuild Company, ORD 6 SNL J-9, Section 10
 Depot Maintenance.

Shop Set, Engine and Power Train ORD 6 SNL J-9, Section 8
 Rebuild Company (Armament), Depot
 Maintenance.

Standard Hardware - - - - - ORD 5 SNL H-1

Tool Set, Canvas and Leather ORD 6 SNL J-10, Section 15
 Repairman.

Tool Sets, Field and Depot Main- ORD 6 SNL J-16, Section 15
 tenance for Truck, ~~3/4-Ton~~ 4 x 4
 (Dodge) (SNL's G-502 and
 G-741) ; Truck, 1 1/2-Ton 6 x 6
 (Dodge) (SNL G-507).

Tool Set, General Mechanics - - - - - ORD 6 SNL J-10, Section 4

Tool Set, Glass Cutting and Installing __ORD 6 SNL J-9, Section 6

Tool Set, Maintenance (Field), ORD 6 SNL J-8, Section 7
 Motor Vehicle Assembly Company.

Tool Set, Metal Body Repairman ORD 6 SNL J-10, Section 7
 (MOS 040 or 201).

b. Vehicle.

Truck, ~~3/4-Ton~~, 4 x 4, Ambulance, M43 ; ORD (*) SNL G-741
 Cargo, M37 ; Command M42 ; Telephone
 Maintenance, V41.

3. Forms

The following forms pertain to this materiel :

WD AGO Form 9-1, Materiel Inspection Tag

DA Form 9-3, Processing Record for Shipment and Storage of
 Vehicles and Boxed Engines (Tag)

DA Form 9-4, Vehicular Storage and Servicing Record (Card)

DA Form 9-68, Spot Check Inspection Report for Wheeled and
 Half-Track Vehicles

WD AGO Form 9-71, Locator and Inventory Control Card

WD AGO Form 9-72, Ordnance Stock Record Card

DA Form 9-76, Request for Work Order

DA Form 9-77, Job Order Register

WD AGO Form 9-78, Job Order

DA Form 9-79, Parts Requisition

DA Form 9-80, Job Order File

WD Form 9-81, Exchange Part or Unit Identification Tag

DA Form 446, Issue Slip

See ORD 1 for published manuals of the ordnance section of the Department of the Army Supply Manual.

DA Form 447, Turn-In Slip
 DA Form 460, Preventive Maintenance Roster
 DA AGO Form 461, Preventive Maintenance Service and Inspection for Wheeled and Half-Track Vehicles
 DA Form 461-5, Limited Technical Inspection
 DA Form 468, Unsatisfactory Equipment Report
 DA Form 478, MWO and Major Unit Assembly Replacement Records and Organizational Equipment File
 DA Form 811, Work Request and Job Order
 DA Form 811-1, Work Request and Hand Receipt
 WD AGO Form 865, Work Order
 WD AGO Form 866, Consolidation of Parts
 WD AGO Form 867, Status of Modification Work Order
 DD Form 6, Report of Damaged or Improper Shipment
 DD Form 317, Preventive Maintenance Service Due (Sticker)

4. Other Publications

The following explanatory publications contain information pertinent to this materiel and associated equipment :

a. General.

Cooling Systems : Vehicles and Powered Ground Equipment.	TM 9-2858
Inspection of Ordnance Materiel in the Hands of Troops.	TM 9-1100
Military Vehicles - - - - -	TM 9-2800
Precautions in Handling Gasoline - - - - -	AR 850-20
Principles of Automotive Vehicles - - - - -	TM 9-2700
Safety: Prevention of Motor Vehicle Accidents ____	SR 385-155-1
Safety: Reports of Accident Experience - - - - -	SR 385-10-40
Storage Batteries : Lead-Acid Type - - - - -	TM 9-2857
Supplies and Equipment: Motor Vehicles - - - - -	AR 700-105
Supplies and Equipment : Unsatisfactory Equipment Report.	SR 700-45-5

b. Operation.

Truck, 3/4-Ton, 4 x 4, Ambulance M43; Cargo M37 ; Command M42 ; Telephone Maintenance V41.	TM 9-840
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c. Repair and Rebuild.

Abrasive, Cleaning, Preserving, Sealing, Adhesive, and Related Materials Issued for Ordnance Materiel.	TM 9-850
Disposal of Supplies and Equipment : Uneconomically Repairable Ordnance Vehicles.	SR 755-105-5

Hand, Measuring, and Power Tools - - - - -	TM 10-590
Instruction Guide: Care and Maintenance of Ball and Roller Bearings.	TM 37-265
Lubrication - - - - -	TM 9-2835
Maintenance and Care of Hand Tools - - - - -	TM 9-867
Maintenance and Care of Pneumatic Tires and Rubber Treads.	TM 31-200
Maintenance of Supplies and Equipment: Maintenance Responsibilities and Shop Operation.	AR 750-5
Modification of Ordnance Materiel - - - - -	SB 9-38
Ordnance Field Maintenance - - - - -	FM 9-10
Electrical Equipment (Auto-Lite) - - - - -	TM 9-1825B
Electrical Equipment (Bendix-Scintilla) - - -	TM 9-1825E
Engine (Dodge Model T-245) and Clutch (Borg and Beck Model 11828).	TM 9-1840A
Propeller Shafts and Universal Joints (Universal Products Company, Inc.).	TM 9-1839D
Fuel Pumps - - - - -	TM 9-1828A
Hydraulic Brakes (Wagner-Lockheed) - - -	TM 9-1827C
Power Brake Systems (Bendix-Westinghouse) - -	TM 9-1827A
Speedometer, Tachometers, and Recorders - - -	TM 9-1829A
Vacuum Brake System (Bendix BIB) - - - - -	TM 9-1827B
Vehicular Maintenance Equipment, Grinding, Boring, Valve Reseating Machines, and Lathes.	TM 9-1834A
Painting Instructions for Field Use - - - - -	TM 9-2851
Uneconomically Repairable Ordnance Vehicles -	SR 755-105-5
Preventive Maintenance of Electric Motors and Generators.	TM 55-405
Wheeled and Half-Track Vehicles, Trailers, and Towed Artillery : Lubrication of Wheel Bearings.	TB 9-2835-12

d. Shipment and Stand-By or Long-Term Storage.

Army Shipping Document - - - - -	TM 38-705
Catalog of Approved Packaging Instructions for Major Items and Spare Parts for Ordnance General Supplies.	PS 1000'
Instruction Guide: Ordnance Packaging and Shipping (Posts, Camps, and Stations).	TM 9-2854
Marking and Packaging of Supplies and Equipment: Marking of Oversea Supply.	SR 746-30-5
Military Standard—Marking of Shipments - - - - -	MIL-STD-129'
Ordnance Storage and Shipment Chart—Group G	TB 9-OSSC-G

Copies may be obtained from Raritan Arsenal Publications Division, Metuchen, New Jersey.

² Copies may be obtained from Aberdeen Proving Ground, Aberdeen, Maryland.

Preparation of Motor Vehicles and Related Unboxed SB 9-4
Materiel for Shipment and Storage.
Preservation, Packaging, and Packing of Military TM 38-230
Supplies and Equipment.
Protection of Ordnance General Supplies in Open TB ORD 379
Storage.
Shipment of Supplies and Equipment : Report of SR 745-45-5
Damaged or Improper Shipment.
Standards for Oversea Shipment and Domestic TB ORD 385
Issue of Ordnance Material Other than Ammunition
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