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WAR DEPARTMENT

TECHNICAL MANUAL

BOMB TRAILER M5

August 22, 1942



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**BOMB TRAILER M5**

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SECTION I

GENERAL

Scope .....	Paragraph
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1. **Scope.**—*a.* This manual is published for the information and guidance of the using arms and services and ordnance maintenance personnel.

*b.* In addition to a description of the bomb trailer M5, this manual contains technical information required for the identification, use, and care of the matériel.

*c.* Disassembly, assembly, and such repairs as may be handled by using arms personnel will be undertaken only under the supervision of an officer or the chief mechanic.

d. In all cases where the nature of the repair, modification, or adjustment is beyond the scope or facilities of the unit, the responsible ordnance service should be informed in order that trained personnel with suitable tools and equipment may be provided, or proper instructions issued.

**2. Characteristics.**—The bomb trailer M5 (fig. 1) is a castered third-wheel trailer which is designed to meet low loading and ease of handling requirements. The front caster wheel unit permits turning the vehicle in its own tracks. Trailers may be connected in trains behind a prime mover for operation at fairly high speed. The front of the hitch yoke is provided with a reversible lunette which may be attached to the rear pintle of another trailer or a prime mover. The vehicle is provided with electric brakes and truck-type tires with puncture-sealing tubes.

**3. Data.**

Load capacity:

Weight of trailer empty----- 2,000 pounds.  
 Weight loaded----- 7,000 pounds.

Tires:

Front----- 6.50-10, 6-ply.  
 Rear----- 7.50-18, 8-ply.  
 Pressure----- 55 pounds.

Front wheel tread----- 10 inches.

Rear wheel tread----- 80 inches.

Size of deck----- 5 feet 8 inches by  
 11 feet 2½  
 inches.

Height of deck loaded----- 21½ inches.

Maximum speed (highways)----- 45 miles per hour.

Maximum speed (cross country)----- 20 miles per hour.

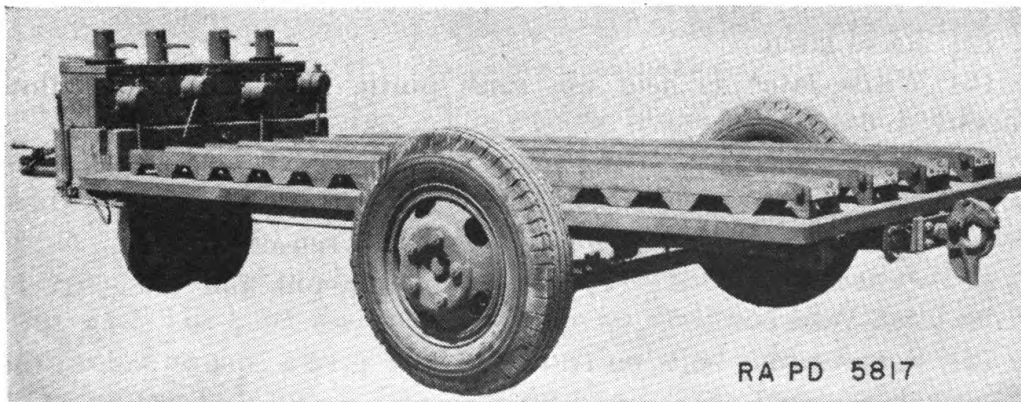


FIGURE 1.—Bomb trailer M5, rear view.

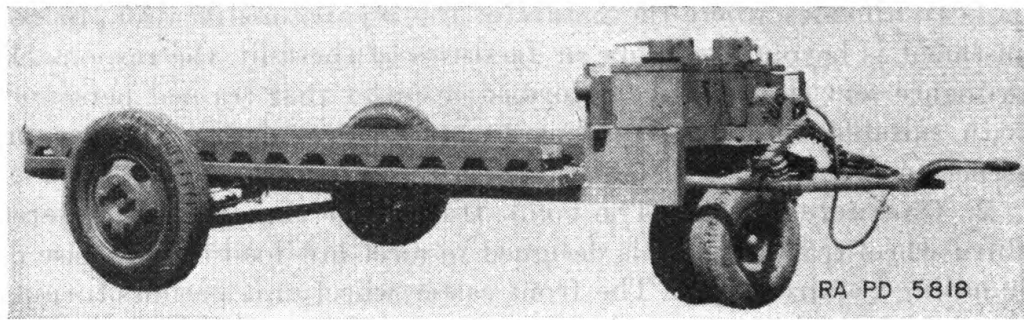


FIGURE 2. Bomb trailer M5, with caster unit turned.

SECTION II

OPERATING INSTRUCTIONS

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4. **General.**—Before operating the trailer it should be inspected as outlined in paragraph 12. The number of trailers permissible in a train is dependent upon operating conditions. Under ideal conditions as many as five trailers may be towed behind a prime mover at one time.

5. **Attaching to prime mover or other trailer.**—*a. Lunette.*—The lunette (fig. 3) is reversible to allow for a variation in the height of the pintle on the prime mover. When attaching the lunette to the pintle, the lunette should be in the position which permits the hitch yoke (fig. 4) to be as level as possible.

*b. To connect lunette to pintle.*—(1) Pull out cotter pin.

(2) Raise latch.

(3) While latch is held up, raise pintle lock enough to allow lunette to enter.

(4) Release lock by raising latch and pulling forward to lock in place.

(5) Replace cotter pin to prevent accidental release of latch.

*c. To reverse lunette.*—(1) Remove cotter pin and nut (fig. 4) from hitch yoke bolt.

(2) Remove four bolts on trailers which have a square pad on the hitch yoke.

(3) Reverse lunette and reassemble.

**6. Stabilizer assembly.**—The stabilizer (fig. 4) minimizes the tendency for the vehicle to “pitch” on rough roads. The adjusting screw may be used to increase or decrease the hitch load on the rear of the prime mover. This adjustment depends on the load conditions under which the trailer may be operating. Generally, when the vehicle ahead is lightly loaded the adjusting screw should be down, and when it is heavily loaded the adjusting screw should be up. The hitch yoke should be kept as level as possible. Under average operating conditions the hitch yoke should not vary more than  $5^{\circ}$  from a level position.

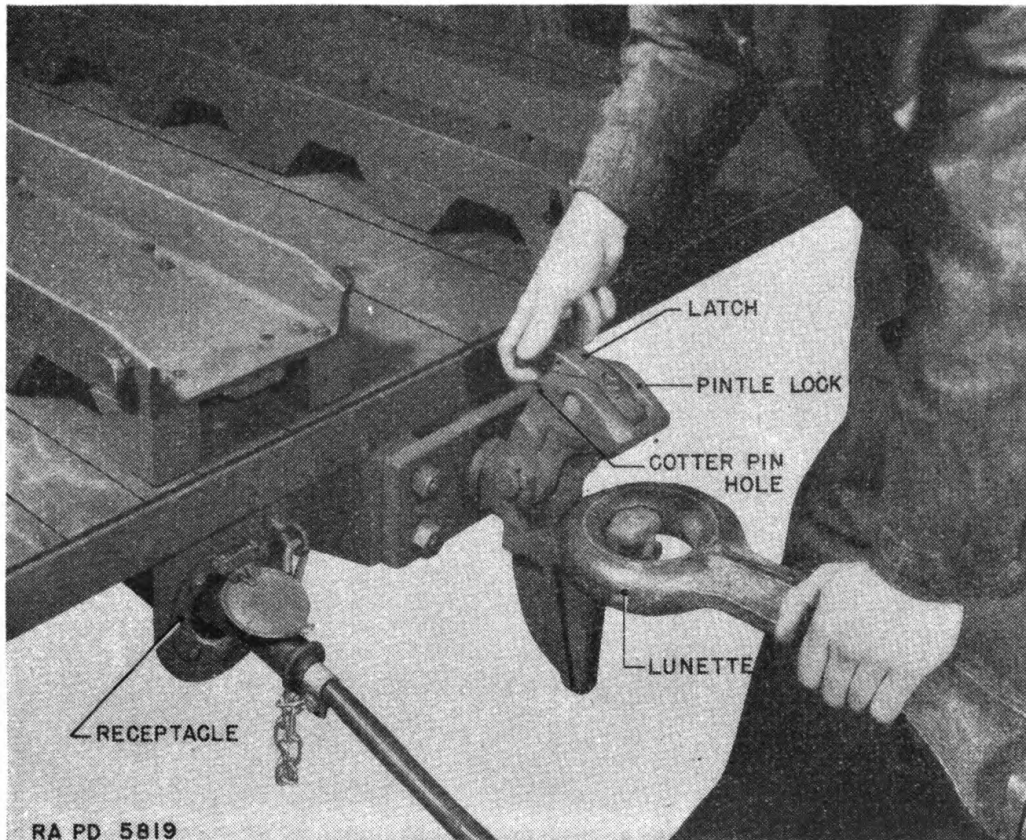


FIGURE 3.—Connecting lunette to pintle.

**7. Connecting cables.**—The electric brake system and the lighting system of the trailer are connected to the prime mover or the trailer ahead (when operating in trains) by an electric connecting cable. To connect this cable lift up the spring cover (fig. 5) on the receptacle and push the plug into the receptacle as far as it will go (fig. 8). The plug and receptacle are so designed that they can be connected only in the proper position. The plug has four contacts, two for the lighting system, one for the brake system, and one for the ground connection for both systems. The connecting cable is

provided with a chain (fig. 7) at each end, which are to be connected to the safety switch and the vehicle ahead. The clips on the end of these chains must always be properly attached before operating the vehicle.

**8. Safety switch.**—The trailer has a safety switch which applies the electric brakes automatically in case the towing connection between the trailer and the prime mover is broken. If the trailer should become unhitched from the towing vehicle the jumper cable which con-

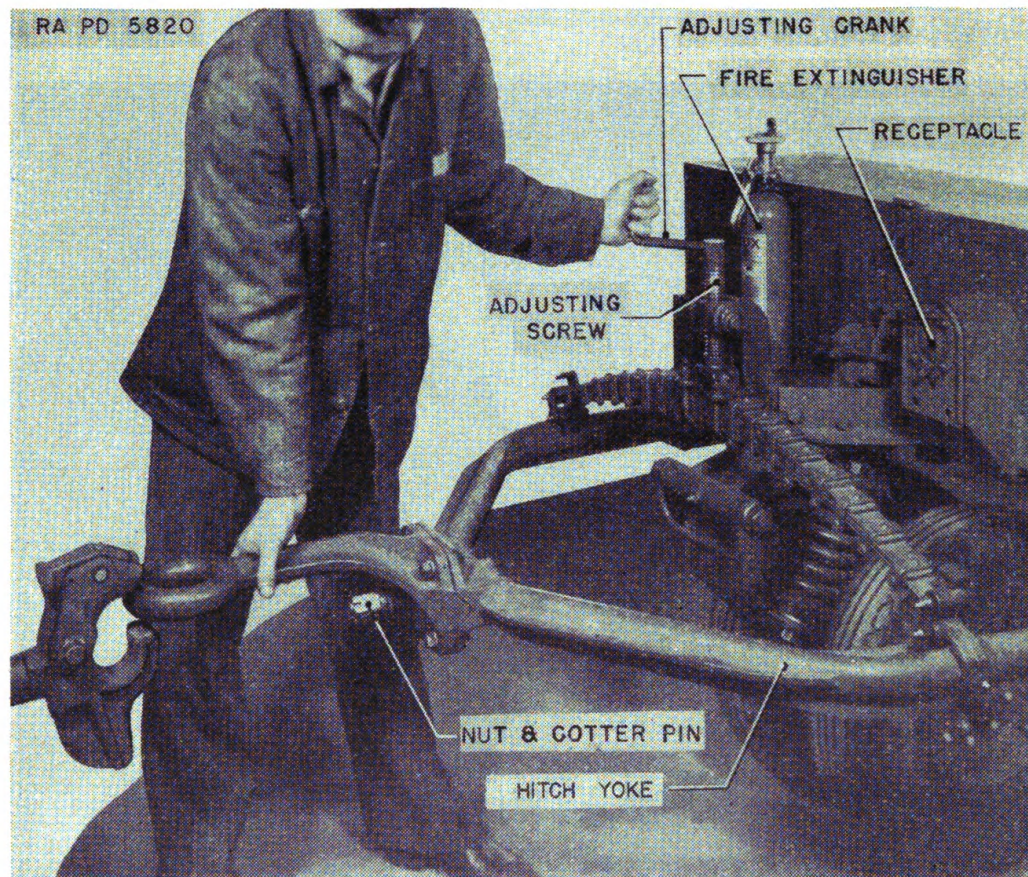


FIGURE 4.—Stabilizer mechanism.

nects to both vehicles pulls out of the socket on the rear vehicle. The safety switch lever is pulled forward by the chain and closes the switch, completing the circuit for the electric brakes. As soon as possible after a break-away, apply the hand brake and move the break-away switch lever to the "off" position, as the break-away application will hold for only about 15 minutes. An emergency battery is in the left rear compartment of the tool box. This battery operates the brakes in the case of a break-away. Space for a spare battery is provided in the front compartment.

**9. Operation of brakes.**—*a.* The brakes are controlled by the driver of the prime mover. When applying the brakes, except in emergency, the brake control should be advanced gradually. A load control on the prime mover permits the driver to regulate the braking power and prevent skidding, regardless of load and road conditions.

*b.* An electric battery is provided with the trailer to furnish current for operation of the brakes in emergencies and in case of a break-away. The electric brake should never be used in parking

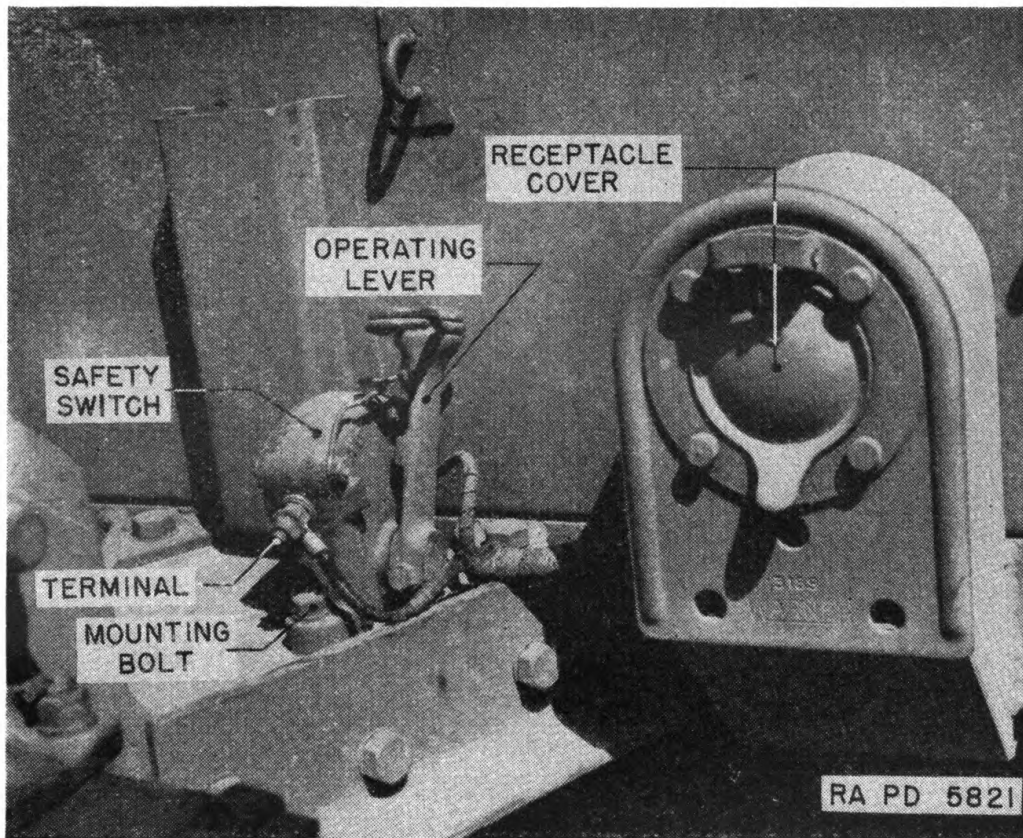


FIGURE 5.—Connector cable receptacle and safety switch.

the vehicle, except in emergencies, because of the rapid drain on the battery. The hand brake should always be used for parking.

*c.* The hand brake is on the left side of the tool box and should be used whenever the trailer or train is not being moved. The hand brake operates on the same set of brakes as the electric service brakes and should hold the trailer when on an incline. The brake is released when the lever is in the extreme forward position and applied when moved back toward the deck. To release, pull brake lever back slightly, push the button down, and allow lever to move forward. If



the brakes do not hold, an emergency adjustment may be made by removing the clevis which connects at the lower end of the brake lever; give it several turns to the right, and reconnect. Care should be taken to replace the cotter pin; bend it over the clevis pin.

**10. Loading ramp.**—A loading ramp and a supporting stand (fig. 6) are furnished with each trailer to aid in loading. The ramp

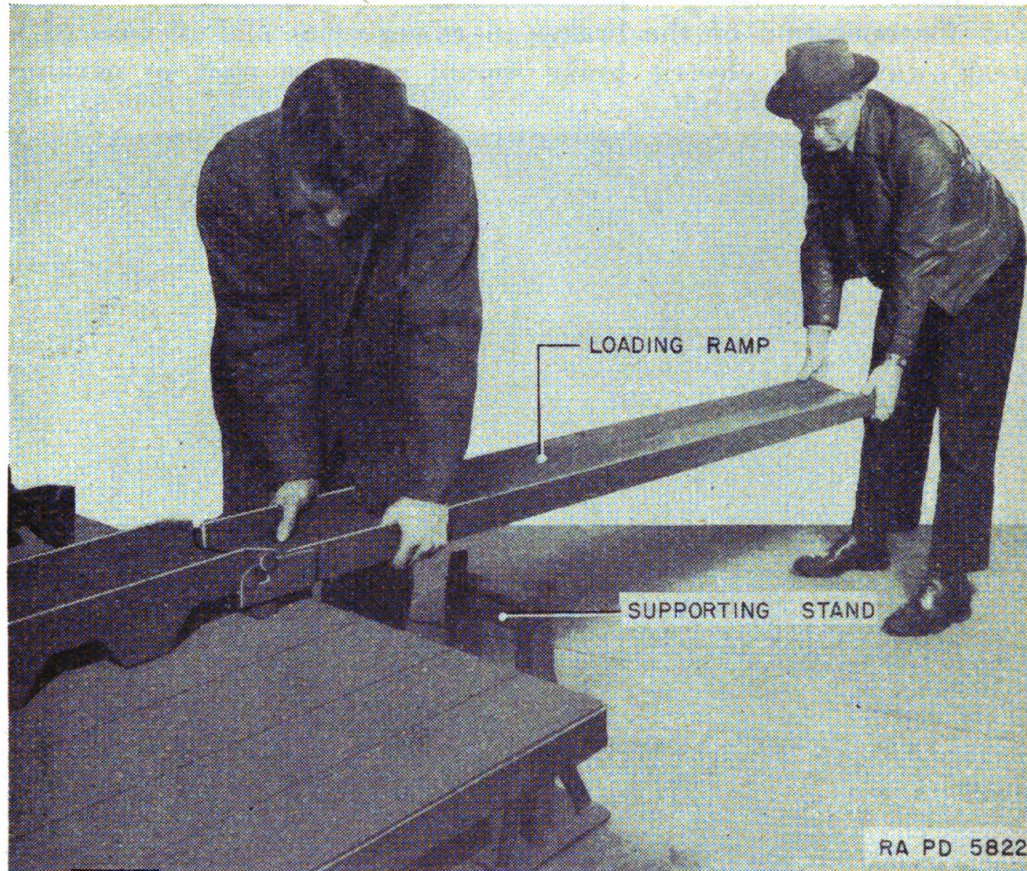


FIGURE 6.—Channel loading ramp.

is equipped with hooks for engaging the pins on the side of the deck channels. To secure the ramp to the deck channel raise lower end of ramp to level position, push ramp forward until ramp hook is lined up with pins on deck channels, then lower the other end to ground level. Place supporting stand under ramp to support center load.

SECTION III  
INSPECTION

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11. **Purpose.**—*a.* To insure mechanical efficiency it is necessary that the trailer be regularly and systematically inspected. Defects may then be discovered and corrected before they result in serious difficulties.

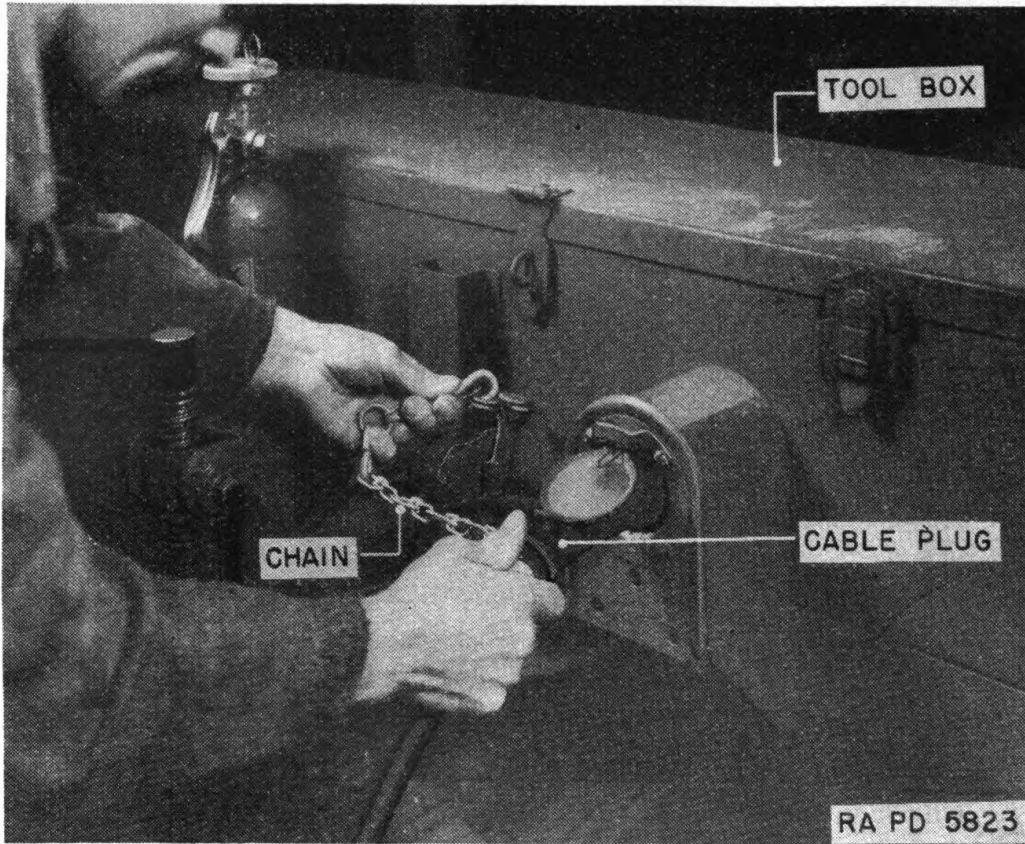


FIGURE 7.—Safety chain.

*b.* Suggestions toward changes in design prompted by chronic failure or malfunction of units, pertinent changes in inspection or maintenance methods, and changes involving safety, efficiency, and economy should be forwarded to the Chief of Ordnance, through proper channels, at the time they develop. Such action is encouraged in order that other organizations may profit thereby.

**12. Inspection after shipment.**—On receipt of a vehicle, a thorough inspection should be made as follows:

- a.* Examine tires for cuts, breaks, or other damage. Inflate to proper pressure.
- b.* Check all tools, equipment, and spare parts.
- c.* Examine all wiring for frayed, chafed, or broken insulation, and see that all connections are tight. Check lights and brakes for proper functioning.
- d.* Check frame and front yoke for straightness.

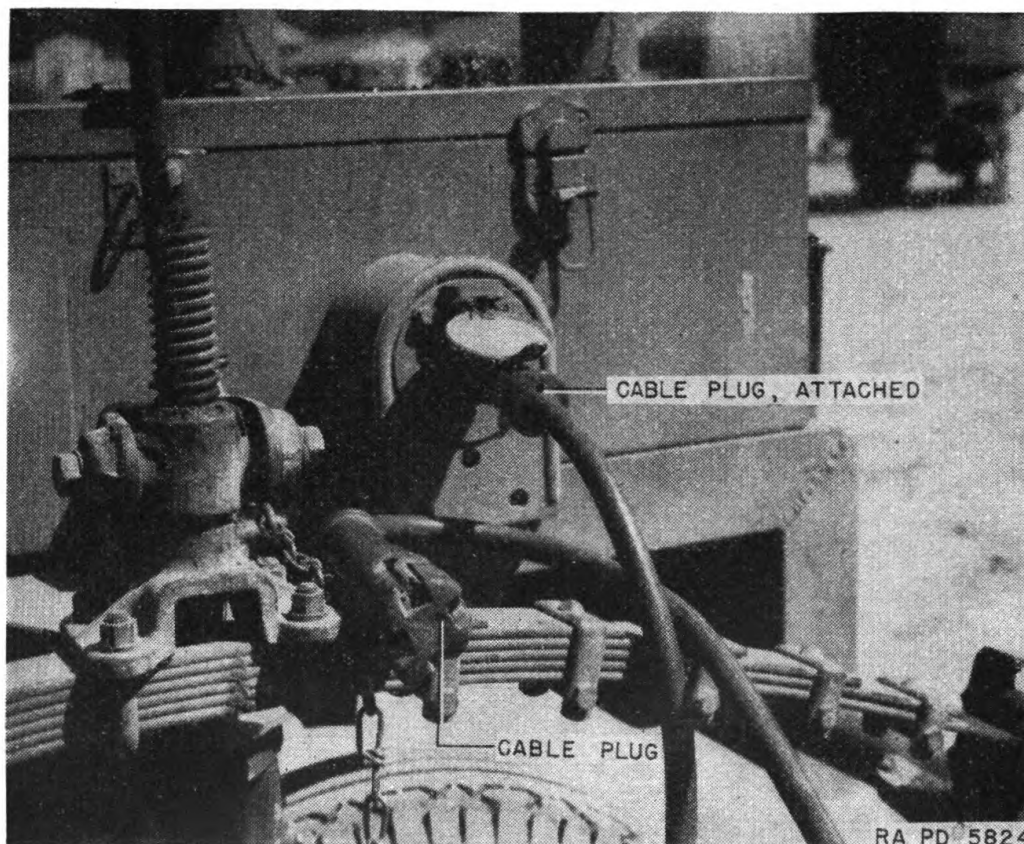


FIGURE 8.—Connector cable.

- e.* Check trueness of wheels to see that they have not bent in service.
- f.* Check entire vehicle for broken or missing parts.
- g.* Lubricate entire vehicle thoroughly.

**13. Inspection before operation.**—Before placing the trailer in operation a check should be made to see that everything is in order as follows:

- a.* Check tools and equipment. See that fire extinguisher is filled and in operating condition.
- b.* Check to see that all readily accessible bolts are tight.
- c.* Check electrical connections.

*d.* Check electric brakes for proper functioning (normal and emergency).

*e.* Check lighting system.

*f.* Check tire pressures.

*g.* Check wheel retaining studs for tightness.

**14. Inspection at halts.**—At all halts where there is sufficient time check the following:

*a.* Tire pressures.

*b.* Lights (if at night).

*c.* Hitch connection.

*d.* Load, to see that it is secure.

**15. Daily inspection.**—At the end of each day's operation, inspection should be made as follows:

*a.* Check tires for cuts, breaks, leaks, etc., and remove any gravel or pebbles which might be embedded in the treads.

*b.* Check electrical system for loose or dirty connections, frayed or broken insulation, etc.

*c.* Examine front yoke and rear pintle to see that they have not been bent, broken, or stretched.

*d.* Check entire vehicle for loose or missing parts.

**16. Monthly inspection.**—Included in the inspection to be performed each month (or oftener if subjected to severe use or unusual conditions) should be the items listed in paragraph 15, and in addition, the following:

*a.* Check all wheels for straightness and see that bearings are not loose.

*b.* Check fire extinguisher and recharge if necessary.

*c.* Check emergency brake system, replacing emergency battery if necessary.

*d.* Check hand brake, adjusting if necessary.

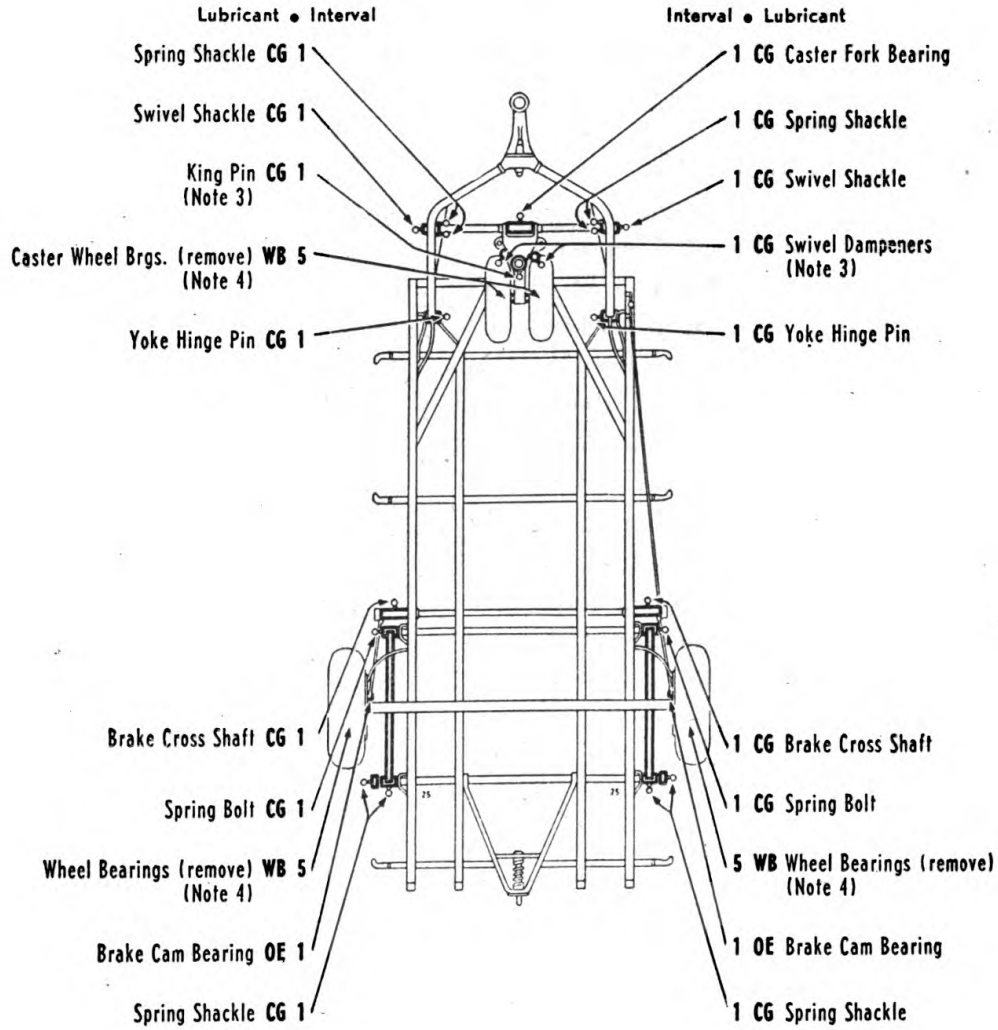
#### SECTION IV

### LUBRICATION, GENERAL CARE AND PRESERVATION

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Cleaning .....	18
Care of tires .....	19

**17. Lubrication.**—The lubrication chart (fig. 9) shows the various points to be lubricated, the periods of lubrication, and the lubricants to be used. Lubrication fittings and oilholes on the vehicle are painted red for easy identification.

MFR'S. STARTING SERIAL No.—100. Located at tool box, on right side panel.



KEY

LUBRICANTS	
OE—OIL, Engine SAE 30	WB—GREASE, General Purpose No. 2
CG—GREASE, General Purpose	
No. 1 (above +32°)	
No. 1 or No. 0 (+32° to +10°)	
No. 0 (below +10°)	

INTERVALS
1—1,000 MILES OR EVERY MONTH
5—5,000 MILES OR EVERY 5 MONTHS

CHEK-CHART NO. 25

RAPD 24035

FIGURE 9.—Lubrication chart.

## NOTES

1. *Intervals.*—Intervals indicated are for normal service. For extreme conditions of speed, heat, water, mud, snow, rough roads, dust, etc., lubricate more frequently.

2. *Fittings.*—Clean before applying lubricant. Lubricate until new grease extrudes from bearing. **Caution:** Lubricate after washing trailer.

3. *Swivel dampeners and king pin.*—Turn wheels sufficiently to left or right to reach fittings.

4. *Wheel bearings (front and rear).*—Remove wheel and clean and replace bearings. The rear bearings especially should be hand-packed with no more than the minimum amount of grease adequate for lubrication. **Caution:** No grease whatever must touch any part of the electric brake.

5. *Oilcan points.*—Lubricate parking brake clevises and pintle hook with oil, engine, SAE 30, every 1,000 miles.

6. *Points requiring no lubrication.*—Springs.

18. **Cleaning.**—*a.* Grit, dirt, and mud are the sources of greatest wear to a vehicle. If deposits of dirt and grit are allowed to accumulate, particles will soon find their way into bearing surfaces, causing unnecessary wear, and, if the condition is not remedied, will soon cause serious difficulty. When removing parts or units, in making repairs and replacements, or, if in the course of inspection, working joints or bearing surfaces are to be exposed, all dirt and grit that might find their way to the exposed surfaces must first be carefully removed. The tools must be clean, and care must always be taken to eliminate the possibilities of brushing dirt or grit into the opening with the sleeve or other part of the clothing. To cut oil-soaked dirt and grit, hardened grit, or road oil, use solvent, dry-cleaning, applied with cloths (not waste) or a brush. Detailed information on cleaning is included in TM 9-850.

*b.* Oilholes which have become clogged should be opened with a piece of wire. Wood should never be used for this purpose, as splinters are likely to break off and permanently clog the passages. Particular care should be taken to clean and decontaminate vehicles that have been caught in a gas attack. See section VI for details of this operation.

19. **Care of tires.**—*a.* Tire pressure should be maintained at 55 pounds at all times.

*b.* Tire valves should be provided with valve caps to keep out dirt and water.

*c.* Tires should be inspected frequently for cuts, breaks, and snags in tread and sidewall. Any such injury should be repaired as soon as possible. Stones and pebbles found embedded in tire treads should be removed.

*d.* When wheel rims are found to be dented or bent, the tires should be demounted and the rim straightened with a hammer. A rim which cannot be straightened properly should be replaced.

SECTION V

PAINTING

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Painting metal surfaces.....	22
Paint as camouflage.....	23
Removing paint.....	24
Painting lubricating devices.....	25

**20. General.**—*a.* Ordnance matériel is painted before issue to the using arms and one maintenance coat per year ordinarily will be ample for protection. With but few exceptions this matériel will be painted with enamel, synthetic, olive-drab, lusterless. The enamel may be applied over old coats of long oil enamel and oil paint previously issued by the Ordnance Department if the old coat is in satisfactory condition for repainting.

*b.* Paints and enamels are usually issued ready for use and are applied by brush or spray. They may be brushed on satisfactorily when used unthinned in the original package consistency or when thinned no more than 5 percent by volume with thinner. The enamel will spray satisfactorily when thinned with 15 percent by volume of thinner. (Linseed oil must not be used as a thinner since it will impart a luster not desired in this enamel.) If sprayed, it dries hard enough for repainting within ½ hour and dries hard in 16 hours.

*c.* Complete information on painting is contained in TM 9-850.

**21. Preparing for painting.**—*a.* If the base coat on the matériel is in poor condition, it is more desirable to strip the old paint from the surface than to use sanding and touch-up methods. After stripping, it will then be necessary to apply a primer coat.

*b.* Primer, ground, synthetic, should be used on wood as a base coat for synthetic enamel. It may be applied either by brushing or spraying. It will brush satisfactorily as received or after the addition of not more than 5 percent by volume of thinner. It will be dry enough to touch in 30 minutes, and will be hard in 5 to 7 hours. For spraying, it may be thinned with not more than 15 percent by volume of thinner. Lacquers must not be applied to the primer, ground, synthetic, within less than 48 hours.

*c.* Primer, synthetic, rust-inhibiting, for bare metal, should be used on metal as a base coat. Its use and application is similar to that outlined in *b* above.

*d.* The success of a painting job depends partly on the selection of a suitable paint, but also largely upon the care used in preparing the surface prior to painting. All parts to be painted should be free from rust, dirt, grease, kerosene, oil, and alkali, and must be dry.

**22. Painting metal surfaces.**—If metal parts are in need of cleaning, they should be washed in a liquid solution consisting of  $\frac{1}{2}$  pound soda ash in 8 quarts of warm water, or an equivalent solution, then rinsed in clear water and wiped thoroughly dry. Wood parts in need of cleaning should be treated in the same manner, but the alkaline solution must not be left on for more than a few minutes and the surfaces should be wiped dry as soon as they are washed clean. When equipment is in fair condition and marred only in spots, the bad places should be touched with enamel, synthetic, olive-drab, lusterless, and permitted to dry. The whole surface should then be sandpapered with paper, flint, No. 1, and a finish coat of enamel, synthetic, olive-drab, lusterless, applied and allowed to dry thoroughly before the matériel is used. If the equipment is in bad condition, all parts should be thoroughly sanded with paper, flint, No. 2, or equivalent, given a coat of primer, ground, synthetic, and permitted to dry for at least 16 hours. It should then be sandpapered with paper, flint, No. 00, wiped free from dust and dirt, and a final coat of enamel, synthetic, olive-drab, lusterless, applied and allowed to dry thoroughly before the matériel is used.

**23. Paint as camouflage.**—Camouflage is now a major consideration in painting ordnance vehicles, with rust prevention secondary. The camouflage plan at present employed utilizes three factors: color, gloss, and stenciling.

*a. Color.*—Vehicles are painted with enamel, synthetic, olive-drab, lusterless, which was chosen to blend in reasonably well with the average landscape.

*b. Gloss.*—The lusterless enamel makes a vehicle difficult to see from the air or from relatively great distances over land. A vehicle painted with ordinary glossy paint can be detected more easily and at greater distances.

*c. Stenciling.*—White stencil numbers on vehicles have been eliminated because they can be photographed from the air. A blue-drab stencil enamel is now used which cannot be so photographed. It is illegible to the eye at distances exceeding 75 feet.



*d. Preserving camouflage.*—(1) Continued friction or rubbing must be avoided, as it will smooth the surface and produce a gloss. The vehicle should not be washed more than once a week. Care should be taken to see that the washing is done entirely with a sponge or a soft rag. The surface should never be rubbed or wiped except while wet, or a gloss will develop.

(2) It is not desirable that vehicles painted with lusterless enamel be kept as clean as vehicles were kept when glossy paint was used. A small amount of dust increases the camouflage value. Grease spots should be removed with solvent, dry-cleaning. Whatever portion of the spot cannot be so removed should be allowed to remain.

(3) Continued friction of wax-treated tarpaulins on the sides of a vehicle will also produce a gloss, which should be removed with solvent, dry-cleaning.

(4) Tests indicate that repainting with olive-drab paint will be necessary once yearly; with blue-drab paint twice yearly.

**24. Removing paint.**—After repeated paintings, the paint may become so thick as to crack and scale off in places, presenting an unsightly appearance. If such is the case, remove the old paint by use of a lime-and-lye solution (see TM 9-850 for details) or remover, paint and varnish. It is important that every trace of lye or other paint remover be completely rinsed off and that the equipment be perfectly dry before repainting is attempted. It is preferable that the use of lye solutions be limited to iron or steel parts. If used on wood, the lye solution must not be allowed to remain on the surface for more than a minute before being thoroughly rinsed off and the surface wiped dry with rags. Cavities or cracks in wood should be filled with putty and the wood sandpapered before refinishing. The surfaces thus prepared should be painted according to directions in paragraph 22.

**25. Painting lubricating devices.**—Oil cups, grease fittings, oil-holes, and similar lubricating devices, as well as a circle about  $\frac{3}{4}$  inch in diameter at each point of lubrication will be painted with enamel, red, water-resisting, in order that they may be located readily.

SECTION VI

MATÉRIEL AFFECTED BY GAS

	Paragraph
Protective measures-----	26
Cleaning-----	27
Decontamination-----	28

**26. Protective measures.**—*a.* When matériel is in constant danger of gas attack, unpainted metal parts will be coated lightly with engine oil. Instruments are included among the items to be protected by oil from chemical clouds or chemical shells, but ammunition is excluded. Care will be taken that the oil does not touch leather or canvas fittings. Matériel not in use will be protected with covers as far as possible. Ammunition will be kept in sealed containers.

*b.* Ordinary fabrics offer practically no protection against mustard gas or lewisite. Rubber and oilcloth, for example, will be penetrated within a short time. The longer the period during which they are exposed, the greater the danger of wearing these articles. Rubber boots worn in an area contaminated with mustard gas may offer a grave danger to men who wear them several days after the bombardment. Impermeable clothing will resist penetration for more than an hour, but should not be worn longer than this.

**27. Cleaning.**—*a.* All unpainted metal parts of matériel that have been exposed to any gas except mustard and lewisite must be cleaned as soon as possible with solvent, dry-cleaning, or alcohol, denatured, and wiped dry. All parts should then be coated with engine oil.

*b.* Bombs which have been exposed to gas must be thoroughly cleaned before they can be used. To clean bombs use agent, decontaminating, noncorrosive, or if this is not available, strong soap and cool water. After cleaning, wipe all bombs dry with clean rags. *Do not use dry powdered agent, decontaminating* (chloride of lime) (used for decontaminating certain types of matériel on or near ammunition supplies), as flaming occurs through the use of chloride of lime on liquid mustard.

**28. Decontamination.**—For the removal of liquid chemicals (mustard, lewisite, etc.) from matériel, the following steps should be taken:

*a. Protective measures.*—(1) For all of these operations a complete suit of impermeable clothing and a service gas mask will be worn. Immediately after removal of the suit, a thorough bath with soap and water (preferably hot) must be taken. If any skin areas have come in contact with mustard, if even a very small drop of mustard gets

into the eye, or if the vapor of mustard has been inhaled, it is imperative that complete first-aid measures be given within 20 to 30 minutes after exposure. First-aid instructions are given in TM 9-850 and FM 21-40.

(2) Garments exposed to mustard will be decontaminated. If the impermeable clothing has been exposed to vapor only, it may be decontaminated by hanging in the open air, preferably in sunlight, for several days. It may also be cleaned by steaming for 2 hours. If the impermeable clothing has been contaminated with liquid mustard, steaming for 6 to 8 hours will be required. Various kinds of steaming devices can be improvised from materials available in the field.

*b. Procedure.*—(1) Commence by freeing matériel of dirt through the use of sticks, rags, etc., which must be burned or buried immediately after this operation.

(2) If the surface of the matériel is coated with grease or heavy oil, this grease or oil should be removed before decontamination is begun. Solvent, dry-cleaning, or other available solvents for oil should be used with rags attached to ends of sticks.

(3) Decontaminate the painted surfaces of the matériel with bleaching solution made by mixing one part agent, decontaminating (chloride of lime), with one part water. This solution should be swabbed over all surfaces. Wash off thoroughly with water, then dry and oil all surfaces.

(4) All unpainted metal parts exposed to mustard or lewisite must be decontaminated with agent, decontaminating, noncorrosive, mixed one part solid to fifteen parts solvent (acetylene tetrachloride). If this is not available, use warm water and soap. Bleaching solution must not be used because of its corrosive action. Instrument lenses may be cleaned only with paper, lens, tissue, using a small amount of alcohol, ethyl. Coat all metal surfaces lightly with engine oil.

(5) In the event agent, decontaminating (chloride of lime), is not available, matériel may be temporarily cleaned with large volumes of hot water. However, mustard lying in joints or in leather or canvas webbing is not removed by this procedure and will remain a constant source of danger until the matériel can be properly decontaminated. All mustard washed from matériel in this manner lies unchanged on the ground, necessitating that the contaminated area be plainly marked with warning signs before abandonment.

(6) The cleaning or decontaminating of matériel contaminated with lewisite will wash arsenic compounds into the soil, poisoning many water supplies in the locality for either men or animals.

(7) Leather or canvas webbing that has been contaminated should be scrubbed thoroughly with bleaching solution. In the event this treatment is insufficient, it may be necessary to burn or bury such matériel.

(8) Detailed information on decontamination is contained in FM 21-40, TM 9-850, and TC 38, W. D., 1941.

SECTION VII

GENERAL INFORMATION ON MAINTENANCE

Scope-----	Paragraph 29
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**29. Scope.**—*a.* The scope of maintenance and repairs by the crew and other units of the using arms is determined by the ease with which the project can be accomplished, amount of time available, nature of the terrain, weather conditions, temperatures, concealment, shelter, proximity to hostile fire, equipment available, and skill of the personnel. All of these are variable and no exact system of procedure can be prescribed.

*b.* The using arms personnel will, in general, be responsible for the following:

- (1) Cleaning and painting.
- (2) Lubrication.
- (3) Replacement of unit assemblies.
- (4) Tightening and minor adjustment operations.
- (5) Temporary repairs to wiring, etc., with materials available.

SECTION VIII

EQUIPMENT AND SPECIAL TOOLS

Equipment carried on vehicle-----	Paragraph 30
Care of equipment-----	31

**30. Equipment carried on vehicle.**—This equipment (fig. 10) includes the following:

- 1 Tool kit consisting of—
  - 1 No. 1 ball peen hammer.
  - 1 Screw driver  $\frac{3}{8}$  by 8 inches.
  - 1 6-inch combination pliers.
  - 1 10-inch auto wrench.
  - 1 Rear wheel tire wrench.
  - 1 Front wheel tire wrench.
  - 1 Tire iron.
  - 1 Alemite compressor.
  - 1 Brake coupler cable with chain.

- 1 Rack channel nut wrench.
- 1 Allen socket screw wrench.
- 1 Electric lantern with battery.
- 1 Battery for emergency application of the electric brakes.
- 1 Jumper cable.
- 1 Fire extinguisher.
- 2 Chains 12 feet long with 2 hooks.
- 3 Hooks for handling loads (5-inch handle).
- 2 Hooks for handling loads (3-foot handle).
- 4 Web straps 28 feet long (for use with channel chock blocks).
- 4 Web end straps 10 inches long.
- 16 Spacers with wing nuts (normally used with channels).

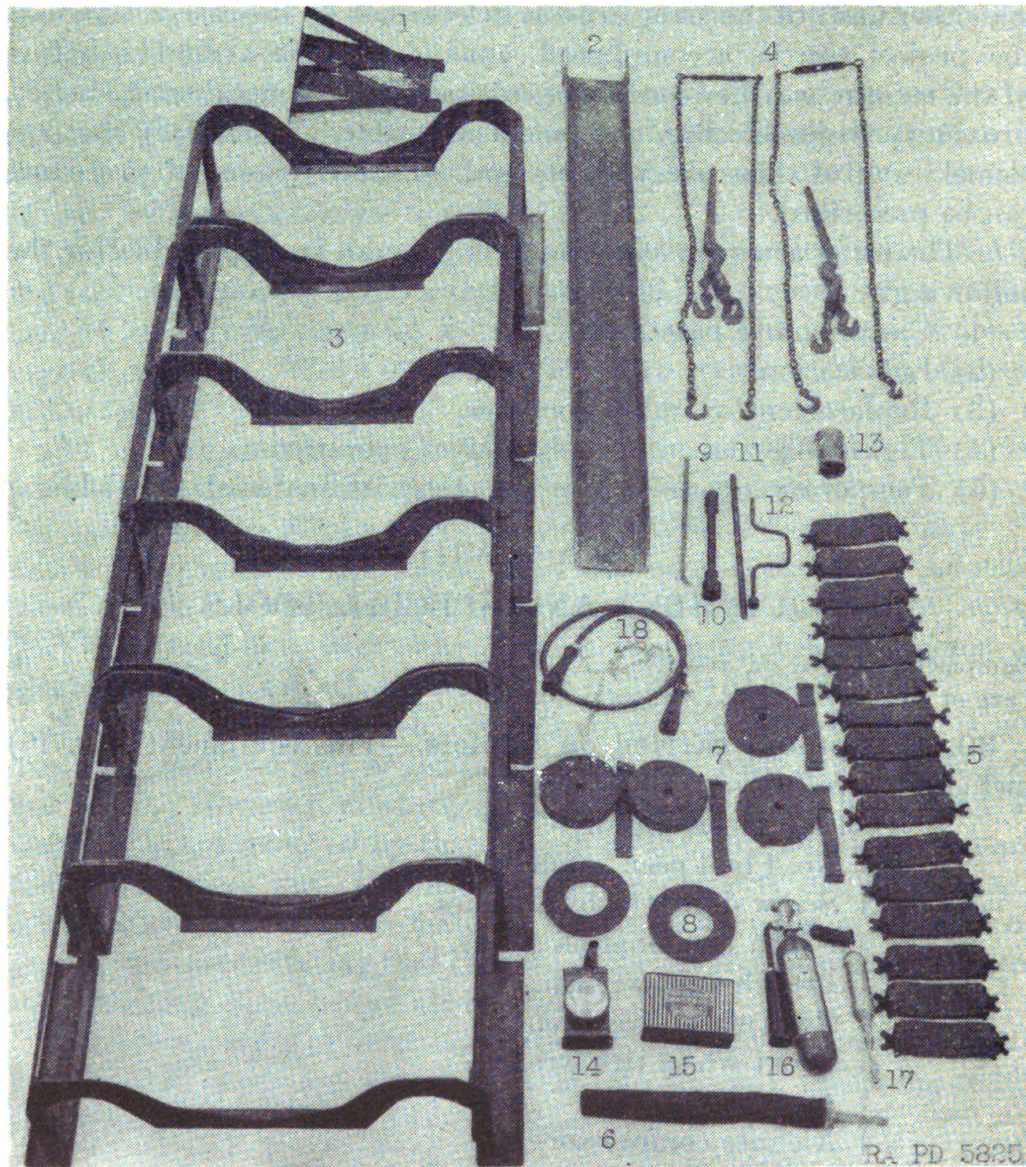


FIGURE 10.—Accessories for bomb trailer M5.

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Key to Figure 10

1. Stand, loading channel, welded construction.
2. Channel, loading, welded construction.
3. Platform, bomb handling, welded construction.
4. Binder, load.  
Chain ¼-inch straight link, 10-foot with 2 hooks and 1 turnbuckle.
5. Bracket with screw, thumb. ½—13-NC-2.
6. Flag, danger, red.
7. Strap, web, ½ by 1½ inches by 28 feet.  
Strap ½ by 1½ by 10 inches.
8. Spacer.
9. Tool, tire.
10. Wrench, wheel nut.
11. Handle, wrench.
12. Wrench, hub nut.
13. Wrench.
14. Lantern, electric.
15. Battery, dry, 6-volt.
16. Extinguisher, fire (No. 1 carbon dioxide).
17. Grease gun, Alemite, hydraulic.
18. Cable, braid coupling with chain.  
Webbing ¼ by 2½ by 8¼ inches. (Not illustrated.)  
Clip. (Not illustrated.)  
Buckle. (Not illustrated.)

**31. Care of equipment.**—An accurate record of tools and accessories should be kept in order that their location and condition may be known at all times. Items becoming lost or unserviceable should be replaced immediately. All tools and equipment should be cleaned and in proper condition for further use before being returned to their location. Frequent inspection and oiling of tools is necessary to prevent corrosion. Tools should be used only for the purposes for which they are intended.

SECTION IX

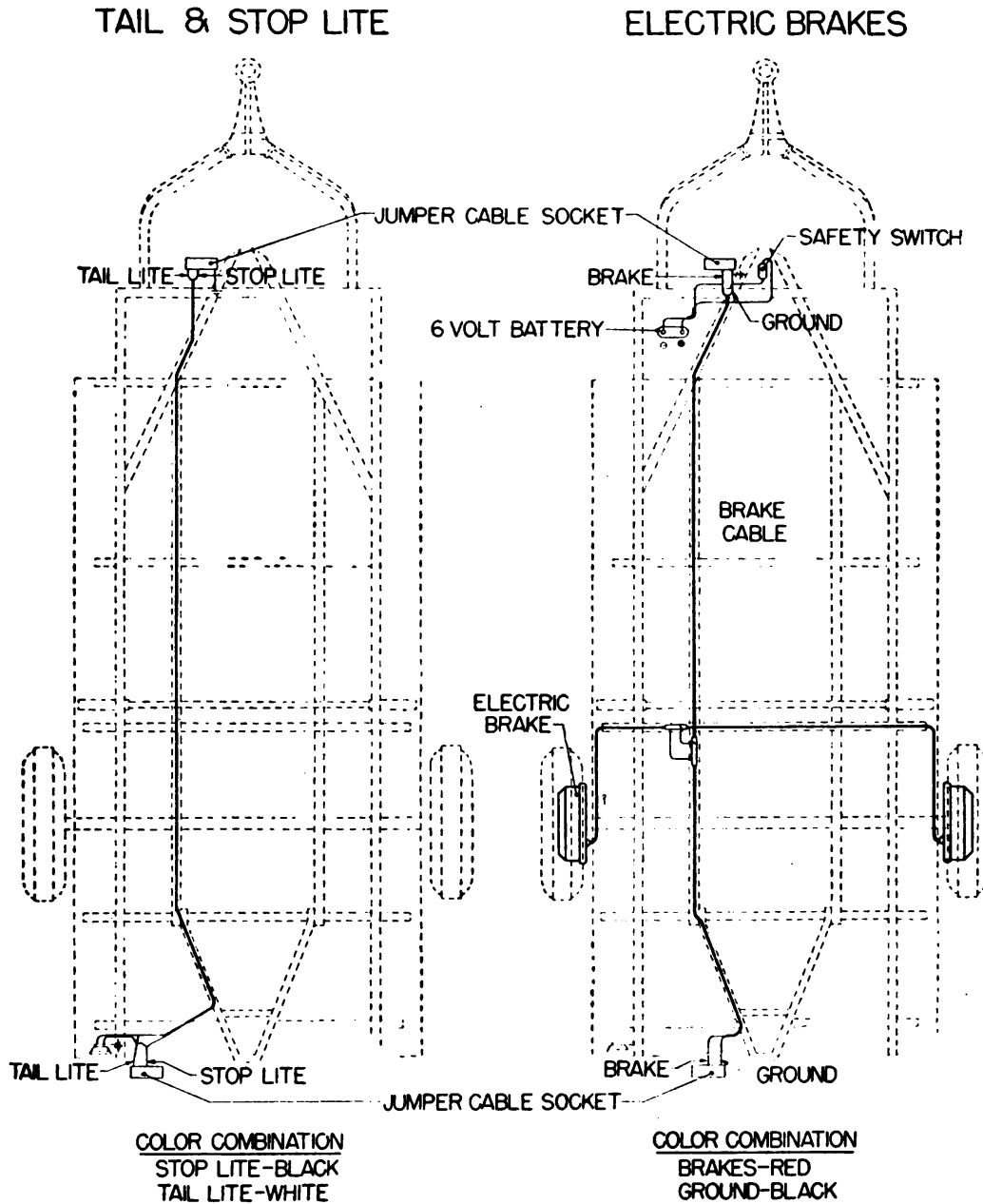
ELECTRIC LIGHTING SYSTEM

Description.....	Paragraph
Trouble shooting.....	32
Maintenance.....	33
	34

**32. Description.**—The lighting system for the bomb trailer M5 consists chiefly of a combination stop and tail light of standard automotive design, and necessary wiring. The system is shown schematically in figure 11. Current is supplied for the lighting system, as for the braking system, from the prime mover through the connector cable. All other wiring for the system is insulated and enclosed in steel wire sheathing. There is no provision for emergency operation of the lighting system by an auxiliary dry battery as in the braking system.

33. **Trouble shooting.**—*a.* If lights fail to function with the connector cable properly connected, a check should be made as follows:

- (1) Examine the electric bulbs to see if they are burned out.
- (2) Check all electrical connections to see that they are tight.
- (3) Examine all wiring for breaks or short circuits caused by chafing, etc.
- (4) Check to see that connector cable and plugs are in good order.



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FIGURE 11.—Wiring for brake and lighting systems.

(5) Check prime mover and trailer receptacles.

*b.* Flickering lights are usually caused by a loose connection or a broken or frayed wire.

**34. Maintenance.**—*a. Broken wires.*—Broken wires should be temporarily spliced and taped with electrician's tape and permanently repaired as soon as practicable.

*b. Replacements.*—(1) The taillight and stoplight assembly (fig. 12) is removed by removing two nuts from the bolts which extend through the mounting flange, and disconnecting the wiring. It is reattached by reconnecting the two wires and bolting the assembly securely to the flange.

(2) Bulbs are replaced as follows: Remove the two screws in the lamp door and lift off the door. Grasp either bulb between fingers, rotate counterclockwise about a quarter turn, and withdraw the bulb. Replace in the reverse order of removal.

*c. Connector cable.*—The connector cable may be temporarily repaired with electrician's tape in the same manner as with the other wiring for the trailer. Connector cable plugs are not replaceable in the field and must be referred to a base shop for repair.

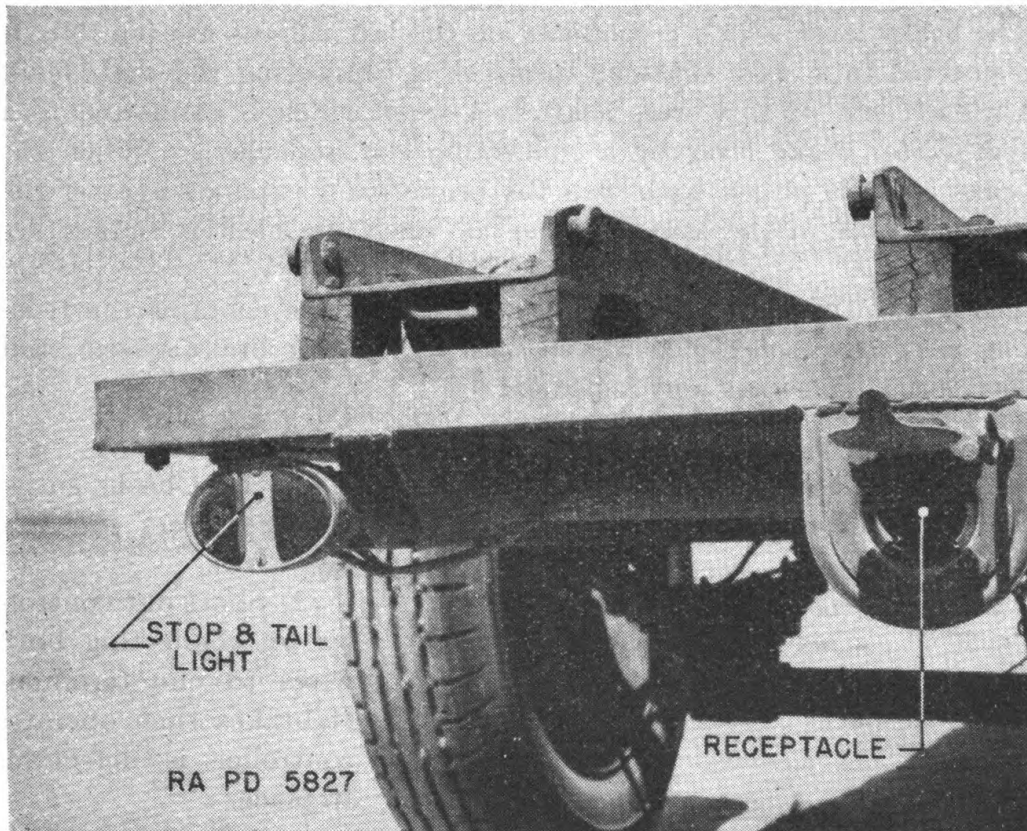


FIGURE 12.—Stop and taillight, and receptacle.



SECTION X

BRAKING SYSTEM

	Paragraph
Construction-----	35
Trouble shooting-----	36
Maintenance-----	37

**35. Construction.**—*a. Electric brake system.*—The electric brake system consists principally of the brake drum, a circular brake band, an armature, a magnet, and appropriate wiring. Electric current for operation of the brakes is supplied (except in case of a break-away) by the battery of the prime mover. The electric brake controller, which is essentially a rheostat, is mounted on the prime mover and controlled by the driver. The armature is attached to and rotates with the brake drum. The magnet, which is stationary when the brakes are inoperative, clings to the armature when current is applied and then tends to rotate with the armature (fig. 13). As the magnet moves, it engages lugs on the brake band which expands against the brake drum, bringing the vehicle to a stop.

*b. Parking brake system.*—The parking brake linkage is connected mechanically to the actuating mechanism of the electric brake system. The brake lever which is mounted on the left side of the tool box is connected to a cross shaft by means of a connecting rod and clevis. On each end of this cross shaft is a lever which is connected to a rear wheel brake lever by a connecting rod and clevis. When the brake lever is pulled backward the brake band expands against the brake drums in the same manner as when the electric brakes are applied.

**36. Trouble shooting.**—The following table contains the troubles most frequently encountered with the electric brake system, and their probable causes and remedies:

<i>Trouble</i>	<i>Cause</i>	<i>Remedy</i>
<p><i>a.</i> No brakes or intermittent brakes.</p>	<p><i>a.</i> (1) Broken wire in circuit.</p> <p>(2) Defective controller.</p>	<p><i>a.</i> (1) Check entire wiring system for broken wires.</p> <p>(2) Short out controller by connecting both wires to one terminal. If brakes then operate, controller is defective. Replace.</p>

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<i>Trouble</i>	<i>Cause</i>	<i>Remedy</i>
	(3) Poor connections.	(3) Check, clean, and tighten all electrical connections.
	(4) Broken wire on magnet.	(4) If broken wire is accessible, repair. If no current then flows through magnet, replace magnet.
	(5) Defective plug or socket.	(5) Check plug and socket for loose or dirty connections. Repair or replace.
b. Very weak brakes.	b. (1) Lining worn out.	b. (1) Replace with new lining.
	(2) Glazed magnet facing.	(2) Remove glaze with emery cloth.
	(3) Greasy lining.	(3) Replace with new lining.
	(4) Insufficient current.	(4) Clean and tighten connections. Check plug and socket. Check battery of prime mover.
	(5) Worn wheel bearings.	(5) Replace bearings.
c. Brakes grabbing.	c. (1) Loose or worn wheel bearings.	c. (1) Tighten or replace bearings.
	(2) Greasy lining.	(2) Replace with new lining.
	(3) Lining loose on rivets.	(3) Tighten rivets or replace with new rivets.
	(4) Brake bands distorted.	(4) Reshape bands.
	(5) Poor electrical connection.	(5) Check wiring for loose connections or broken wires in insulation.
	(6) Broken magnet or band springs.	(6) Replace springs.

<i>Trouble</i>	<i>Cause</i>	<i>Remedy</i>
<i>d.</i> Brakes drag.	<i>d.</i> (1) Broken spring in handbrake control. (2) Broken or weak band return springs. (3) Bands distorted. (4) Warped backing plate. (5) Broken or loose parts.	<i>d.</i> (1) Replace spring. (2) Replace springs. (3) Reshape bands. (4) Straighten or replace plate. (5) Remove broken parts. Replace with new parts. Check brake for other injuries.
<i>e.</i> Noisy brakes.	<i>e.</i> (1) Road grit or metal particles in lining. (2) Loose or worn wheel bearings. (3) Bands distorted. (4) Lining loose on rivets. (5) Grease on lining.	<i>e.</i> (1) Clean or replace lining. (2) Tighten or replace. (3) Reshape bands. (4) Tighten rivets or replace with new rivets. (5) Replace with new lining.

**37. Maintenance.**—*a. Wiring.*—All wiring should be inspected frequently. Any wiring that shows signs of wear, scuffing, or breaks should be taped with electrician's tape and the cause for wear remedied.

*b. Magnet.*—(1) Maintenance for the magnet is limited to removing glaze and repair of wiring on the outside of the magnet. Remove glaze from the magnet with a medium grade of emery cloth. Do not remove metal from pole faces of magnet. Broken wires on the outside of the magnet may be repaired with electrician's tape.

(2) A new armature may be used with an old magnet but a new magnet must not be used with an old armature.

*c. Brake band.*—For best performance the brake band must be round. • Check all bands for roundness when service work is done or the band is relined. The band should fit snugly to the special band gage (Warner tool No. 4843), with a light tension to hold it in place. If the leading end (toe end) of the band is bent away from the gage, the brake will be strong or "grabby." If the leading end is bent in toward the center, the brake will be weak. A distorted band may be rounded as follows:

(1) To round a flat spot in the band lay the band on a board or wooden top bench and strike the band where it is necessary with a ball peen hammer.

(2) To spring the band out, place it in a bench vise and close the vise. All bending should be done between rivets.

*d. Adjustment.*—(1) The brakes require no adjustment for wear during their life. The movement of the magnet during application of the brakes is sufficiently self-adjusting to wear the brakes down to the rivets. When this occurs, an automatic stop prevents the rivets from scoring the drum. However, this is all based on the proper original adjustment after the brakes have been relined.

(2) The armature will be depressed about  $\frac{5}{32}$  inch against the magnet when the drum is mounted in running position. This can be determined before the drum is placed on the axle, by using the special armature gage (Warner tool No. 4680).

(a) Place the short ends of the gage against the magnet face.

(b) Slide adjustable rod against bearing shoulder and tighten thumbscrew in gage.

(c) Slide collar against frame of gage and tighten thumbscrew in collar.

(d) Loosen thumbscrew in gage.

(e) Place inner wheel bearing in hub.

(f) At three places around the circumference of the armature wedge it away from the drum to its fullest travel.

(g) Place long ends of gage against armature face.

(h) Slide adjustable rod against wheel bearing and tighten thumbscrew in gage. The amount of movement of the adjustable rod (distance D) is the armature depression after assembly.

(3) If the depression of the armature is greater than  $\frac{5}{32}$  inch, shim the bearing out at the bearing shoulder of the axle shaft (A). If this distance is less than  $\frac{1}{8}$  inch, shim out the armature ring by using special shims (Warner shim No. 3516 is  $\frac{1}{16}$  inch thick while No. 3516A is  $\frac{1}{32}$  inch thick) between the armature ring and the drum (B). The variation from these dimensions must not exceed  $\frac{1}{64}$  inch.

*e. Break-away switch.*—If tests indicate that the break-away switch is defective, it should be replaced as follows:

(1) Disconnect the two electrical leads (fig. 5).

(2) Remove the two mounting bolts.

(3) Lift off switch.

(4) Replace in reverse order of removal.

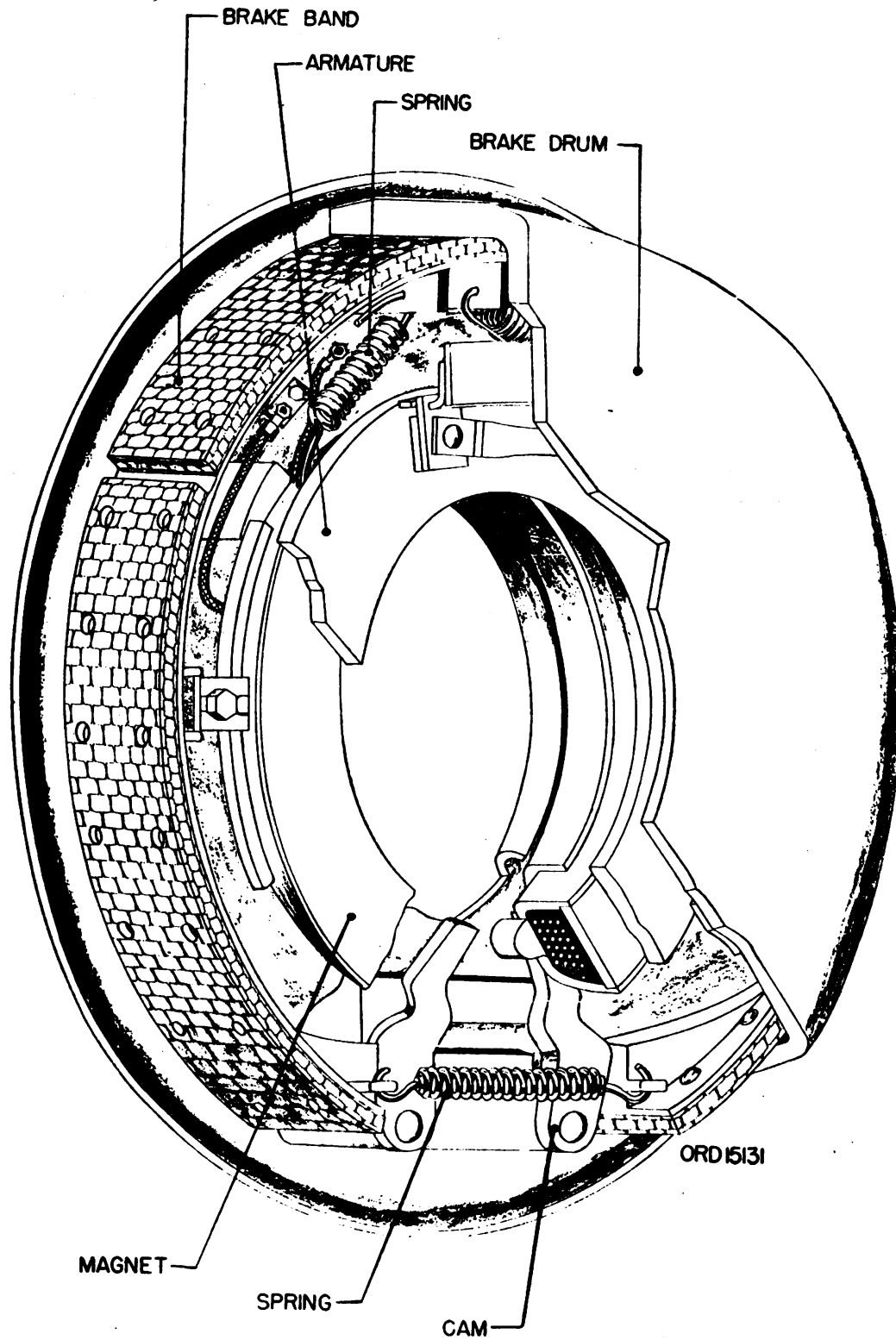
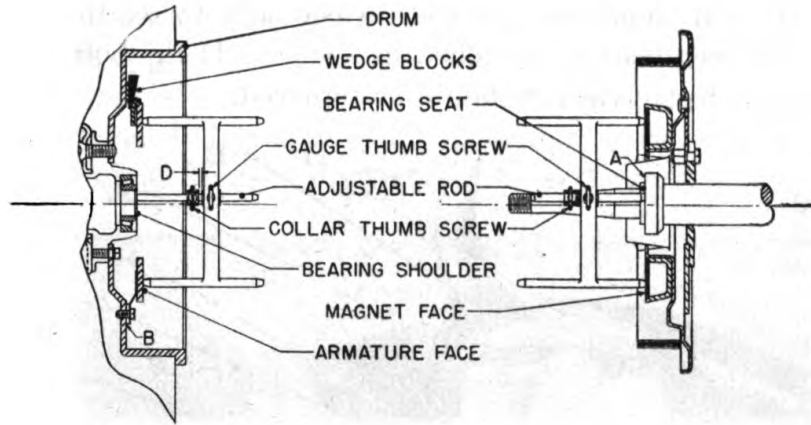


FIGURE 13. Electric brake interior.

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ARMATURE AND BEARING ASSEMBLY

BRAKE AND AXLE ASSEMBLY

RA PD 2996

FIGURE 14.—Using electric brake armature spacing gage.

SECTION XI

HITCH YOKE AND FRONT CASTER UNIT

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Hitch yoke .....	39
Front caster unit .....	40
Dismounting tires .....	41

**38. General.**—*a.* The trailer is towed by means of a hitch yoke (fig. 4). The hitch yoke is provided with a stabilizer spring arrangement which tends to prevent “pitching.” Instructions for the adjustment of the stabilizer are contained in paragraph 6.

*b.* The front caster unit is of the dual wheel type with a friction ring and shoe which may be adjusted to provide a drag or dampening effect which prevents “shimmy.” The load on the front caster unit is carried by two coil springs supported at each end by a special adapter nut and secured by a capscrew. These capscrews should be kept tight.

**39. Hitch yoke.**—*a.* To remove the hitch yoke from the trailer, proceed as follows:

(1) Support the front hitch by a stand or blocks and release the tension on the stabilizer spring by turning the stabilizer handle counterclockwise.

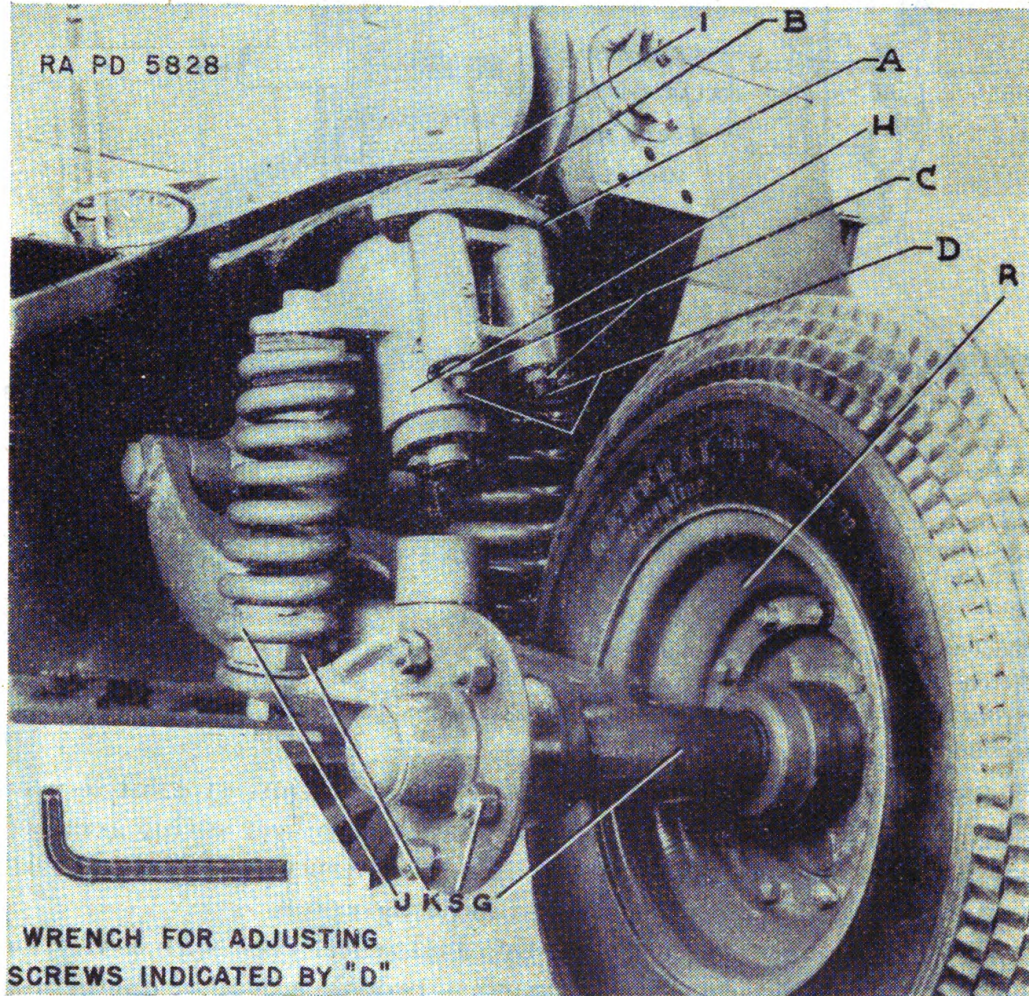
(2) Remove shackle bolts which bolt through the hitch yoke.

(3) Remove shackle bolts at rear of hitch where they bolt through frame adapter.

(4) Lift off hitch yoke.

*b.* The hitch yoke is attached in the reverse order of removal.

c. The lunette bolt should be checked occasionally to see that it is tight and has not been bent or stretched in service. If the bolt shows signs of having been stretched it should be replaced.



- A. Friction shoe.
- B. Friction ring.
- C. Lock nuts.
- D. Socket screws.
- G. Caster fork.
- H. Caster yoke.

- I. Kingpin mounting plate.
- J. Vehicle coil spring.
- K. Coil spring mounting plug.
- R. Demountable wheel.
- S. Demountable wheel nuts.

FIGURE 15.—Front caster unit with one wheel removed.

**40. Front caster unit.**—*a. Excessive tire wear.*—The tires on the front caster unit should be checked occasionally for excessive wear. Excessive tire wear indicates wheel misalignment, loose or bent wheels, or a bent axle. Any of these conditions should be reported to higher echelons for correction.

*b. Dampener adjustment.*—When a wheel “shimmy” condition exists the dampener arrangement may be adjusted by tightening the

socket bead screws (fig. 15). This adjustment should be checked at the first opportunity by higher echelon personnel.

*c. Removal of wheels.*—The caster wheel and tire assemblies may be removed by removing the five inner bolts (fig. 16). The wheel and tire may then be dismantled from the hub.

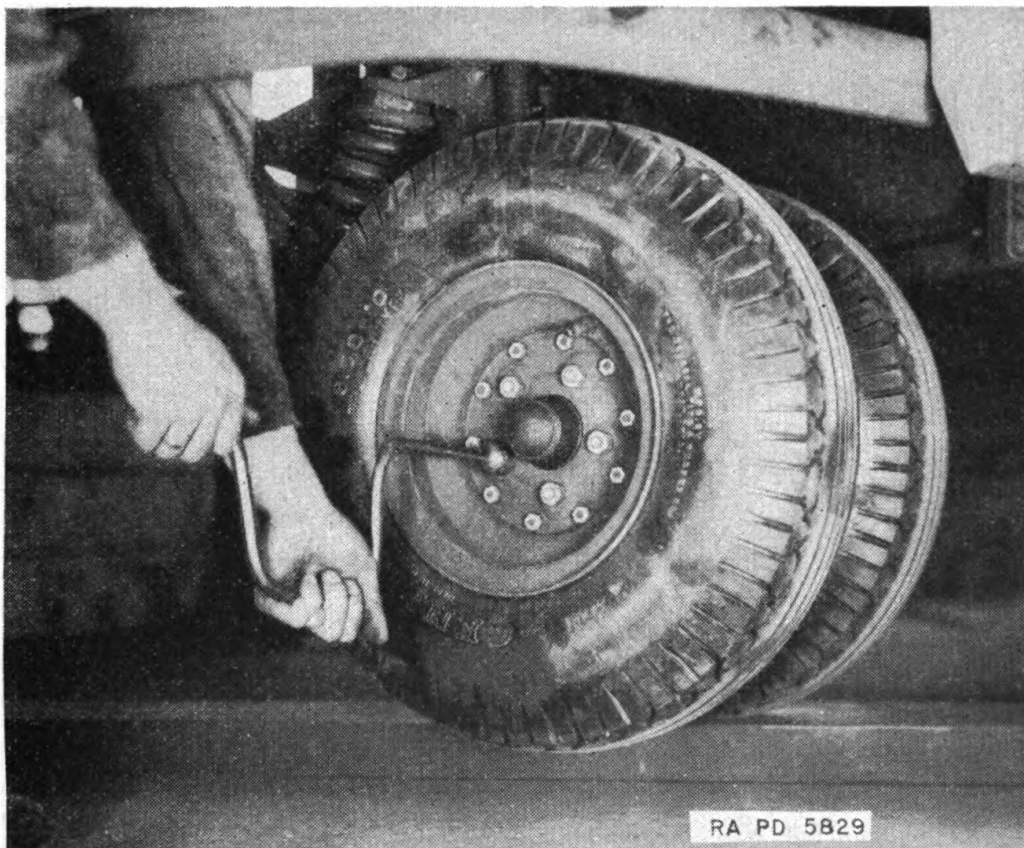


FIGURE 16.—Front wheel removal.

**41. Dismounting tires.**—*a.* To remove the tire from the wheel, first deflate the tire, then remove the 10 outer bolts (fig. 17) to disassemble the wheel disks and to allow the tire and tube to be removed.

*b.* To mount the tire, insert the tube in the tire and inflate until the tube is barely rounded out. Place the tire on one wheel disk, position the other wheel disk, and tighten the bolts. Care must be taken to keep the tube free of wrinkles and from being pinched between the disks.





FIGURE 17.—Front wheel disassembly.

## BOMB TRAILER M5

## SECTION XII

## REAR WHEELS AND TIRES

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Maintenance .....	43
Changing tires .....	44

**42. Description.**—The rear wheels for the bomb trailer M5 are conventional truck-type wheels and are demountable in the usual manner. A special large socket wrench is provided in the tool kit for



FIGURE 18.—Rear wheel removal.

demounting the wheels. The wheel nuts are marked “R” and “L” to denote a right- or left-hand thread. The tubes are of the puncture-sealing type.

**43. Maintenance.**—No maintenance is ordinarily required by the using troops. A bent or broken wheel should be replaced.

**44. Changing tires.**—*a. Demounting.*—(1) Remove the wheel assembly by removing the five nuts as shown in figure 18.

(2) Lay wheel flat on a hard surface (fig. 19).

(3) Deflate the tube and free the locking ring by prying it out with the side ring tool.

(4) The tire and tube may then be removed from the wheel. This operation will be made easier by coating the base of the tire bead with soapy water. Oil or grease must not be used.



FIGURE 19.—Demounting rear tire.

*b. Mounting tires.*—To mount the tire on the wheel, proceed as follows:

(1) Insert the tube and flap in the tire and inflate the tube until it is barely rounded out. The tube should contain very little air pressure as too much pressure will make mounting difficult. The flap should be carefully straightened in its proper position before mounting.



FIGURE 20.—Installing side ring.

(2) Place the rim on a flat surface with the gutter side up (fig. 20). Place the tire over the rim with the valve stem in line with the opening in the rim. Insert the valve and slide the tire over the rim.

(3) Place the side ring so that one-half is in the rim gutter and then draw it up tightly. It should be drawn up tightly by inserting the side ring tool into one of the crescent-shaped notches of the side ring. The ring should then be pried over into the gutter.

(4) With the tool in the above position, hammer at the point where the ring contacts the gutter and progress toward the opposite clearance slot until the ring is entirely on the rim.

(5) Inflate the tire to 55 pounds per square inch pressure.

**NOTE.**—Care must be taken in inflating the tire as an improperly installed ring may snap out and cause injury to personnel. The wheel should be positioned so that the ring is on the side of the wheel next to the ground while inflating.

### SECTION XIII

#### STORAGE AND SHIPMENT

General.....	Paragraph 45
Preparation for storage.....	46
Preparation for shipment.....	47

**45. General.**—When not in use, trailers should be stored in closed buildings or covered sheds, if available. If no covered shed or building is available they may be stored in the open and covered with tarpaulins. It is desirable that the tires rest on planks which are free from grease or oil. The place of storage should be so located that trailers will be properly protected from flood or fire.

**46. Preparation for storage.**—*a. Trailers.*—When trailers are to be stored for an appreciable length of time the procedure below should be followed:

(1) Thoroughly lubricate all points, using lubrication chart.

(2) All exposed parts which are subject to corrosion or other deterioration should then be sprayed with compound rust-preventive, thin film.

*b. Tools and accessories.*—All tools and accessories should be cleaned, sprayed with compound, rust-preventive, thin film, and placed in tool box. The fire extinguisher should be packed in the tool box with corrugated paper or other suitable protection.

*c. Tires.*—(1) *Limited storage.*—Tires should be inspected for damage and repaired. All embedded pebbles or foreign matter should be removed from the treads. Tires should be properly inflated and each tire valve provided with a valve cap.

## BOMB TRAILER M5

(2) *Dead storage.*—The axle should be blocked up so as to take the load off the tires. It is not necessary that the tires be inflated. Tires should be cleaned of grease, oil, or foreign matter and coated with protective tire paint. The following precautions should be followed when storing tires and tubes not mounted on rims:

(a) They should be stored in a cool, dark place.

(b) Still air is recommended because air currents around tires tend to increase the oxidation of surface rubber.

(c) Tires should not be stored in rooms where electrical discharges produce ozone. This condition also increases oxidation.

(d) Tires should not come in contact with oily or greasy floor surfaces.

(e) Air temperatures where tires are stored should preferably be as low as practicable. Temperatures above 90° appreciably increase rubber oxidation.

*d. Connecting cable.*—The electric connecting cable or “jumper” cable should be stored in the same manner as tires and tubes.

*e. Emergency battery.*—The emergency battery should be removed from the tool box and stored separately when putting vehicle in dead storage. During limited storage it should remain in the tool box.

**47. Preparation for shipment.**—*a.* When trailers are shipped by rail every precaution must be taken to see that they are properly loaded and securely fastened and blocked to the floor of the car.

*b.* When trailers are shipped overseas, adequate precautions must be taken against corrosion from salt water. All unpainted metal surfaces should be cleaned and sprayed with compound, rust-preventive, thin film.

*c.* Additional information on preparation for shipment may be found in Ordnance Storage and Shipment Chart No. G.

APPENDIX

LIST OF REFERENCES

1. Standard Nomenclature Lists.

- Cleaning, preserving, and lubricating materials..... SNL K-1
- Trailer, bomb M5..... SNL G-74
- Current Standard Nomenclature Lists are as tabulated here. An up-to-date list of SNL's is maintained as the "Ordnance Publications for Supply Index"..... OPSI

2. Explanatory publications.

- Cleaning, preserving, lubricating and welding materials and similar items issued by the Ordnance Department.... TM 9-850
- Chassis, body, and trailer units..... TM 10-560
- Lubrication instructions for trailer, bomb M5..... Lubrication guide
- Special instructions—Group G material, sections 1, 7, and 9..... OFSB 4-9
- Storage of motor vehicle equipment..... AR 850-18

[A. G. 062.11 (6-5-42).]

BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL.  
*Chief of Staff.*

OFFICIAL:

J. A. ULIO,  
*Major General,*  
*The Adjutant General.*

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