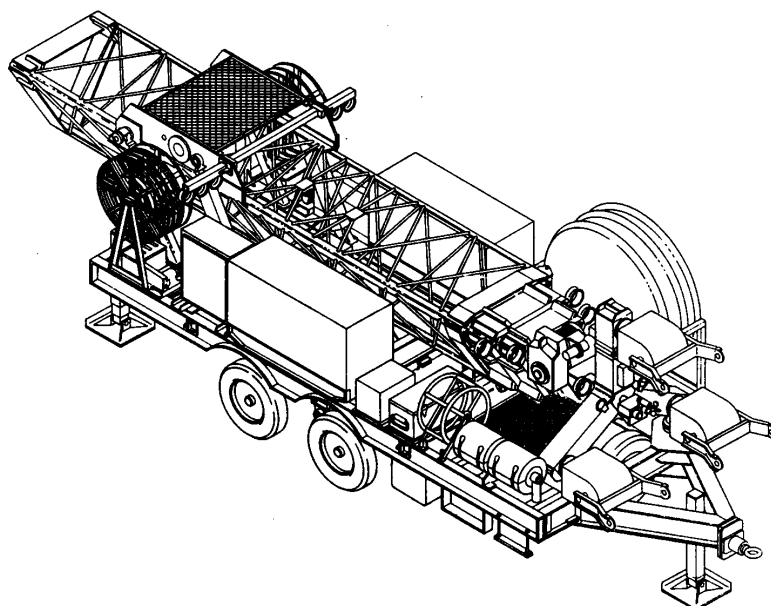


**TECHNICAL MANUAL
OPERATOR'S AND UNIT MAINTENANCE
MANUAL**



**QUICK ERECT EXPANDABLE MAST
AB-1309(V)4/TRC
(NSN 5985-01-156-0572) (EIC: HDR)**

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5

SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1

DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2

IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3

IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A DRY WOODEN POLE OR A DRY ROPE OR SOME OTHER INSULATING MATERIAL

4

SEND FOR HELP AS SOON AS POSSIBLE

5

AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING

Dangerous voltages exist in this equipment. Be very careful when working near the AC power distribution circuits.

WARNING

Before starting repairs to the electrical installation ensure power is disconnected to avoid injury or death from electrical shock.

WARNINGS

- Before making power connections, ensure that all equipment is shut down. To avoid personal injury, observe all safety precautions.
- Never make power connections alone as a safety precaution.
- Power entrance box and AB-1309 antenna trailer must be grounded prior to making power connections to preclude accidental electrocution.
- Power source (generator or commercial power) **MUST BE TURNED OFF** to ensure equipment remains shut down during power connections.
- Do not connect power cable stub SC-D-883964 to generator unless your Military Occupational Specialty (MOS) includes training on MEP-003A Generator for safety.

WARNING

Parking brakes on trailer must be engaged at all times when not being towed to prevent injury from movement of trailer.

WARNING

When raising trailer for wheel clearance ensure jacks are on firm ground and trailer cannot move to preclude injury.

* For Artificial Respiration or First Aid, refer to FM 21-11

WARNING

A crew size minimum of three is required to erect AB-1309 mast. Make sure crew members wear gloves, hard hats and eye protection at all times when working with guy cables, and ear protection when working within 35 feet (10.7 m) of Pionjar jackhammer.

WARNINGS

- To prevent personal injury, do not climb tower at any time.
- Control panel operator will at all times wear hard hat, hearing, and eye protection while under the tower.

WARNING

Tower can be safely erected or lowered only if specified wind conditions are not exceeded for each phase. The limitation is 33 mph (53.1 kmh) wind speed.

WARNINGS

- After tower has been erected, wind conditions must be monitored and the following precautions taken for unanticipated wind conditions:
- If wind speeds increase to 75 mph (120.7 kmh) (wind speed indicator), rotate all antennas to full counterclockwise azimuth and 90 degree elevation to reduce sail area for safety.
- If wind speeds exceed 100 mph (160.9 kmh) (wind speed indicator) and tower is fully erected to 117 feet (35.66 m), evacuate crew to safety.

WARNING

Do not exceed a 5000 pound (2268 kg) pull with the anchor setting and retrieval tool.

WARNING

Maximum safe towing speed of AB-1309 under ideal weather conditions shall not exceed 45 mph (72.5 kmh) on primary roads and 40 mph (64.5 kmh) on paved secondary roads.

WARNING

Provide adequate ventilation and turn off all equipment a when using cleaning solvents. Avoid prolonged breathing of fumes and vapor. Do not use solvent near heat or open flames; the products decomposed are toxic and irritating. Since cleaning solvent dissolves natural oils, avoid prolonged contact with the skin. When needed, use gloves which solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

WARNING

Remove pressure from hydraulic system by slowly loosening a line or fitting before starting hydraulic maintenance to prevent injury from pressurized fluid.

WARNING

Always fill the generator fuel tanks when engine exhaust is cool.

D

**OPERATOR'S AND UNIT MAINTENANCE MANUAL
QUICK ERECT EXPANDABLE MAST AB-1309(V)4/TRC**

(NSN 5985-01-156-0572) (EIC: HDR)

REPORTING OF ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-LC-LM-LT, Fort Monmouth, New Jersey 07703-5000. A reply will be sent to you.

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HOW TO USE THIS MANUAL

- This manual tells you how to operate and maintain Quick Erect Expandable Mast AB-1309(V)4/TRC.
- Step-by-step procedures with illustrations give you all the necessary information to install, operate, and maintain this equipment at operator and unit level. However, do not attempt any procedure before you first familiarize yourself with the entire procedure.
- The front cover index identifies frequently used information. Each item is boxed and identified by topic and page number.
- The first page containing the information you are looking for has a black box on the edge of the page.
- Bend the manual in half and follow the margin index to the page with the black edge marker.
- Topics in the table of contents which are the same as topics on the front cover are also boxed.
- If you are looking for general information, use the table of contents in the front of this manual to locate chapters and sections containing this information.
- If you are looking for specific information, use the subject index in front of each chapter or the alphabetical index located in the back of the manual to locate the paragraph and page where the topic is discussed.
- The glossary located in the back of this manual contains an explanation of technical terms and acronyms.
- Foldout illustrations are located in the back of this manual.
- **NOTE:** Contains information of special interest or of importance.
- **CAUTION:** Contains conditions, practices, or procedures that must be observed to avoid damage to the equipment.
- **WARNING:** Contains conditions, practices, or procedures that must be observed to avoid personal injury, loss of life, or long term health hazard.

CHAPTER 1
INTRODUCTION

| Subject | Page |
|---|------|
| General Information | 1-1 |
| Equipment Description | 1-5 |
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Section I. GENERAL INFORMATION

| Subject | Page |
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| Scope | 1-1 |
| Consolidated Index of Army Publications and Blank Forms..... | 1-1 |
| Maintenance Forms, Records, and Reports | 1-1 |
| Hand Receipt (-HR) Manual | 1-3 |
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| Destruction of Army Materiel to Prevent Enemy Use | 1-3 |
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1-1. SCOPE

This manual provides a description of the equipment, operation, and operator and unit maintenance instructions for Quick Erect Expandable Mast AB-1309(V)4/TRC. AB-1309(V)4/TRC is referred to in this manual as AB-1309.

1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 25-30 to determine if there are new editions, changes, or additional publications pertaining to the equipment.

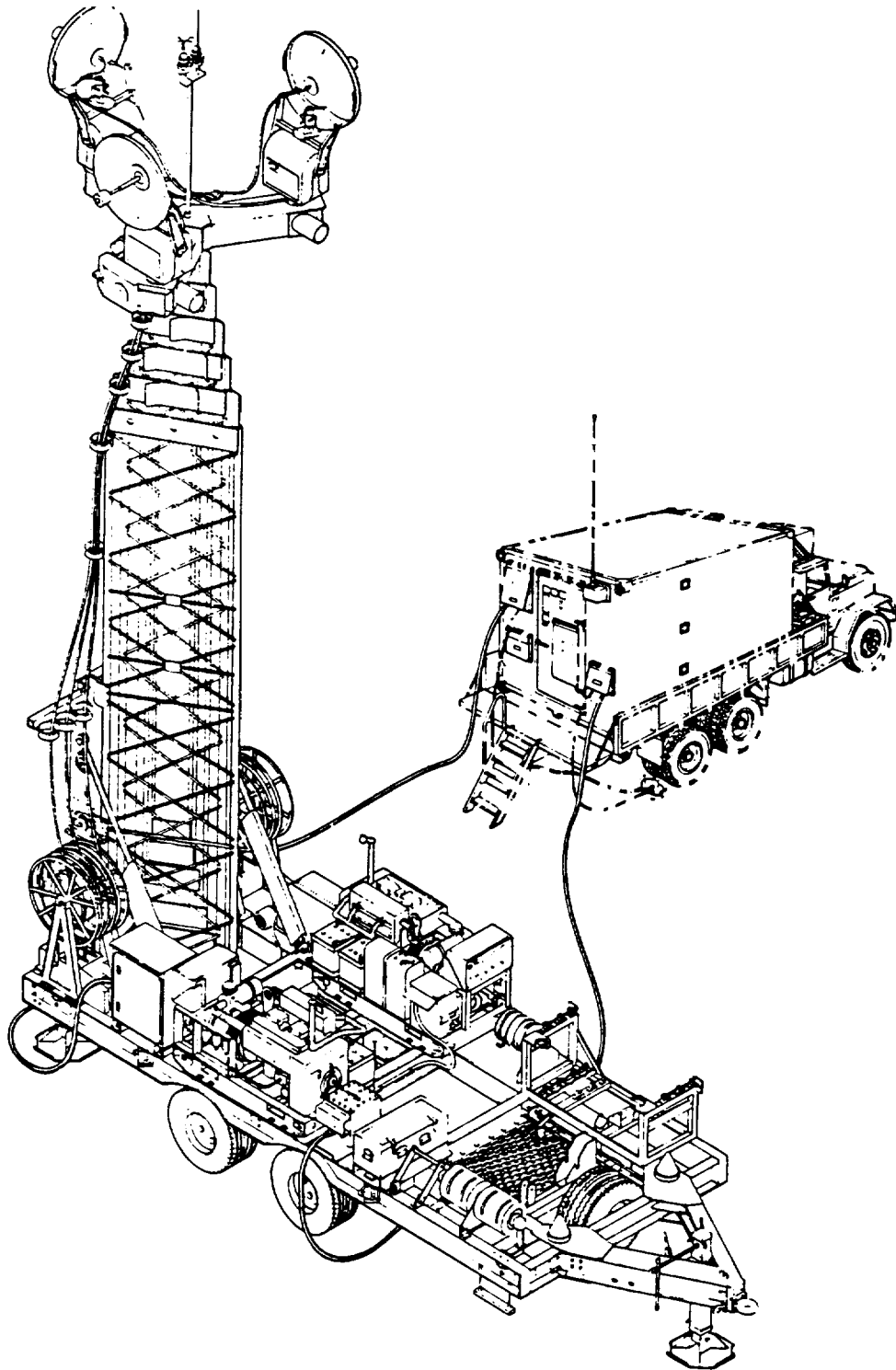
1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update.

b. Report of Item and Packaging Discrepancies

Fill out and forward SF 364 Report of Discrepancy (ROD) as prescribed in AR 735-11-2/DLAR 4150.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.



AB-1309(V)4/TRC QUICK ERECT EXPANDABLE MAST

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS - Continued**c. Transportation Discrepancy Report (TDR)**

Fill out and forward SF 361 [Transportation Discrepancy Report (TDR)] as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. HAND RECEIPT (-HR) MANUAL

This manual has a companion document with a TM number followed by -HR (which stands for Hand Receipt). The TM 11-5985-387-10-HR consists of preprinted hand receipts (DA Form 2062) that list end item related equipment (i.e., COEI, BII, and AAL) you must account for. As an aid to property accountability, additional -HR manuals may be requisitioned from the US Army Adjutant General's Publications Center, Baltimore, MD, in accordance with procedures in Chapter 3, AR 310-2, and DA PM 310-10.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIRs)

If your AB-1309 needs improvement, let us know. Send us an Equipment Improvement Recommendation (EIR). You, the user, are the only one who can tell us what you don't like about the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to Commander, U.S. Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ED-PH, Fort Monmouth, NJ 07703-5000. We'll send you a reply.

1-6. ADMINISTRATIVE STORAGE

Equipment issued to and used by Army activities shall have preventive maintenance checks and services (PMCS) performed in accordance with the PMCS charts before being placed in administrative storage. When equipment is removed from administrative storage, the PMCS should be performed to ensure operational readiness. Preparation of equipment for shipment or limited storage is covered in paragraph 4-46.

1-7. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-8. NOMENCLATURE CROSS-REFERENCE LIST

This list gives common names used in this manual for equipment nomenclature. Use nomenclature when completing report forms.

1-8. NOMENCLATURE CROSS-REFERENCE LIST - Continued

| Common Name | Nomenclature |
|---------------|---|
| AB-1309, Mast | Quick Erect Expandable Mast, AB-1309(V) 4/TRC |
| Generator | Generator MEP-003A, 10 kW, 60 Hz, 3 ph |
| Shelter | Electrical Equipment (Communications) Shelter |

1-9. LIST OF ABBREVIATIONS AND ACRONYMS**NOTE**

Refer to glossary for definitions of commonly used terms in this manual.

| | |
|-------|--|
| AZ-EL | Azimuth-Elevation |
| DGM | Digital Group Multiplexer |
| EIR | Equipment Improvement Recommendation |
| -HR | Hand Receipt |
| MTOE | Modified Table of Organization and Equipment |
| PMCS | Preventive Maintenance Checks and Services |
| TMDE | Test, Measurement, and Diagnostic Equipment |

Section II. EQUIPMENT DESCRIPTION

| <u>Subject</u> | <u>Page</u> |
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| Equipment Characteristics, Capabilities, and Features..... | 1-5 |
| Location and Description of Major Components | 1-6 |
| Equipment Data..... | 1-9 |

1-10. EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

a. Characteristics

The AB-1309 mast is a self-contained, mobile (towable) unit. It has the ability to raise antennas used with AN/GRC-103(V)4 and AN/GRC-222 radio sets. It consists of a trailer, telescoping tower, and the necessary controls and systems to raise the antennas.

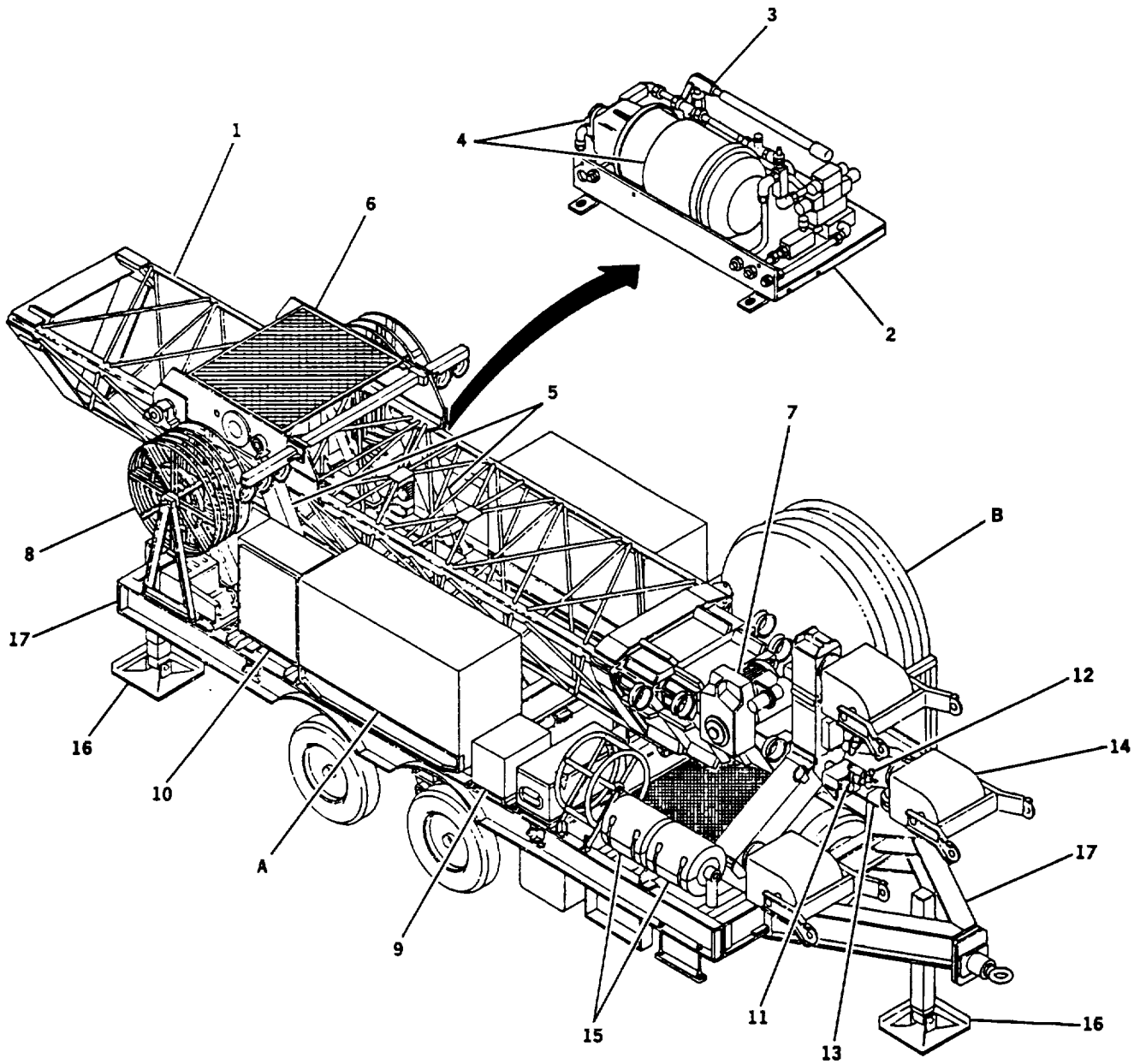
b. Capabilities and Features

NOTE

The AB-1309 mast is equipped with three reflectors and feedhorn assemblies for use with the AN/GRC222 radio set.

- (1) Ability to deploy up to three antennas on the same mast.
- (2) Operation in different areas of the world including tropical, desert, and arctic climates.
- (3) Rapid setup and teardown with twenty-four hour operation under tactical conditions.
- (4) Meets tactical transportability and mobility requirements including air, rail, and truck flatbed shipment.

1-11. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS



1-11. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

| Key | Common Name | Function |
|-----|--|---|
| 1 | Telescoping tower [117 ft (35.66m)] | Seven nested sections raise mast to operational height. |
| 2 | Hydraulic power package (shown with cover removed) | Provides hydraulic power to tilt tower. |
| 3 | Hydraulic handpump | Tower can be tilted manually with this pump. |
| 4 | Hydraulic pump/motor | Provides hydraulic pressure to cylinders to tilt tower. |
| 5 | Hydraulic cylinders | Tilt tower (up or down). |
| 6 | First stage gearmotor and winch assembly | Extends/retracts tower 1st stage. |
| 7 | Second stage gearmotor and winch assembly | Extends/retracts tower 2nd stage. |
| 8 | Cable reels | Stores cables leading up tower to antenna dishes, obstruction light, lightning rod, control circuits, etc. (Reels are motor driven when mast retracts). |
| 9 | Power distribution box | Selects generator to be used. |
| 10 | Control panel box | Houses tower control box and antenna positioner control unit. |
| 11 | Obstruction (beacon) lights | Aircraft warning. |
| 12 | Anemometer | Sends signals to wind speed indicator. |
| 13 | Lightning rod | Protects mast/personnel from lightning. |
| 14 | Antenna positioner | Positions antenna dish for azimuth and elevation. |
| 15 | Guy cable reels | Store guy cables which stabilize tower when erected. |

1-11. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS - Continued

| Key | Common Name | Function |
|-----|------------------|---|
| 16 | Trailer jacks | Levels and stabilizes trailer. |
| 17 | Trailer assembly | Allows mobility and serves as support structure when the mast is erected. |

Support Equipment (Not Part of AB-1309)

| | | |
|---|-----------------------------|--|
| A | Generator sets MEP-003A | Provides 60 Hz, 3 ph, 120/208 vac power. |
| B | Antenna reflector dishes | Dish antenna reflector assemblies, when mounted on tower, transmit and receive communications. |

1-12. EQUIPMENT DATA

| | |
|---|--|
| AB-1309 Weight: | |
| Total | 15,600 lbs (7076.2 kg) |
| Less Generators, Antenna Dishes, and Fuel | 12,400 lbs (5624.6 kg) |
| Tongue | 500 lbs (226.8 kg) |
| Tower Height: | |
| Fully extended | 117 ft (35.66 m) |
| Transportable Mode (Top positioner arm not folded) | 9 ft 8 in. (294.64 cm) |
| Trailer: | |
| Width | 8 ft (243.84 cm) |
| Length | 36 ft (10.97 m) |
| Antenna Positioning: | |
| Elevation | +90 to -18 degrees + 110 degrees |
| Capacities for Hydraulic Fluid: | |
| Mast Tilt Hydraulic Tank | 7 gal (26.5 l) |
| Trailer Hydraulic Brake System | 3 pts (1.41) |
| Capacities for Gearmotors: | |
| Reel Drive Gearmotors (Each) | 0.08 gal (0.30 l) |
| First Stage Gearmotor | 1.45 gal (5.5 l) |
| Second Stage Gearmotor | 3.03 gal (11.57 l) |
| Azimuth Gearmotor (Antenna (Each)) . . . | 8 oz (0.2365 l) |
| Elevation Gearmotor (Antenna (Each)) | 16 oz (0.4731 l) |
| Tire Pressure | 60 psi (413.9 kPa) |
| Land Performance: | |
| Towing Speed (maximum, under ideal weather conditions): | |
| Primary road | 45 mph (72.5 kmh) |
| Paved secondary road | 40 mph (64.5 kmh) |
| Turning Radius (using M923 truck) | 28 ft (8.53 m) |
| Wind Speed Restrictions: | |
| During Mast Erecting/Retraction (Max) | 33 mph (53.1 kmh) |
| During Operation (Max.) | 75 mph (120.7 kmh) |

WARNING

Evacuate crew if wind exceeds 100 mph (160.9 kmh)

Section III. TECHNICAL PRINCIPLES OF OPERATION

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| Tilt Function | 1-10 |
| Extend/Retract Tower and RF Cable Reel Drives | 1-10 |
| Emergency Release (First and Second Stages) | 1-11 |
| Beacon and De-ice Circuit | 1-11 |
| Positioner and Display Circuit | 1-11 |

1-13. TILT FUNCTION

a. 24 VDC Control System

The control system, incorporates limit switches at various functional control points to regulate the solenoid operated directional control valve in the hydraulic power package.

b. Hydraulic Power Package

Hydraulic pressure from the ac motor driven pump is regulated and controlled by the hydraulic power package before it actuates the hydraulic cylinders to tilt the tower.

c. Manual Backup System

A manual tilt procedure, incorporating a hydraulic hand pump, can be used when required.

1-14. EXTEND/RETRACT TOWER AND RF CABLE REEL DRIVES

a. 24 VDC Control System

The control system incorporates limit switches at various control points to limit overtravel and ensure safety during the erection process.

b. RF Cable Reels

The 24 vdc control system also activates the rf cable reel ac powered gearmotors when either stage is retracting.

c. Winch Gearmotors, Pulleys and Cables

Each of the two stages use a separate ac powered gearmotor to power the winch drum and extend/retract telescoping sections of the tower. The sections move up and down on sliders using cables and pulleys. Each stage also has a height gauge sensor to send signals back to the height indicator on the control box.

d. Manual Extension and Retraction of First Stage

The first stage only has a manual backup system for extending and retracting the tower. A hand crank is used to turn the gearmotor drive shaft through a ratchet clutch.

1-15. EMERGENCY RELEASE (FIRST AND SECOND STAGES)

a. **Emergency Brake Control Circuit**

A 24 vdc control circuit allows the mast to be retracted when the normal method cannot be employed.

b. **Brake Release Solenoid**

A solenoid, controlled by the dc control circuit, releases the gearmotor brake at three second intervals to gradually lower the tower.

1-16. BEACON AND DE-ICE CIRCUITS

a. **Beacon (Obstruction Light)**

The ac powered aircraft obstruction (beacon) light can be operated in a flash or continuous lit mode.

b. **De-ice Circuit**

Provides ac power to receptacles on each positioner. The antenna dish heater circuits are plugged into the receptacles.

1-17 POSITIONER AND DISPLAY CIRCUIT

a. **Antenna Dish Positioning**

This circuit provides power for antenna dish positioning, accomplished through a 115 VAC control system. A selector switch connects the circuit to one of the three positioners for positioning.

b. **Indicators and Alarm**

Indications are displayed for azimuth, elevation, and wind speed. An alarm can be set (using the wind speed indicator) to signal a wind threshold warning.

c. **True North Adjustment**

A true north adjustment setting is used to compensate for magnetic north and trailer positioning in alignment of the antenna dishes.

d. Heaters

Heaters are located near the motor assemblies inside the positioners and inside the positioner control unit. These heaters are thermostatically controlled by a switch set to close at 320F (0°C) and open at 540F (12°C).

CHAPTER 2
OPERATING INSTRUCTIONS

| <u>Subject</u> | <u>Page</u> |
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| Operator's Preventive Maintenance Checks and Services..... | 2-13 |
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| Operation Under Unusual Conditions..... | 2-110 |

Section I. DESCRIPTION AND LOCATION OF OPERATOR'S CONTROLS AND INDICATORS

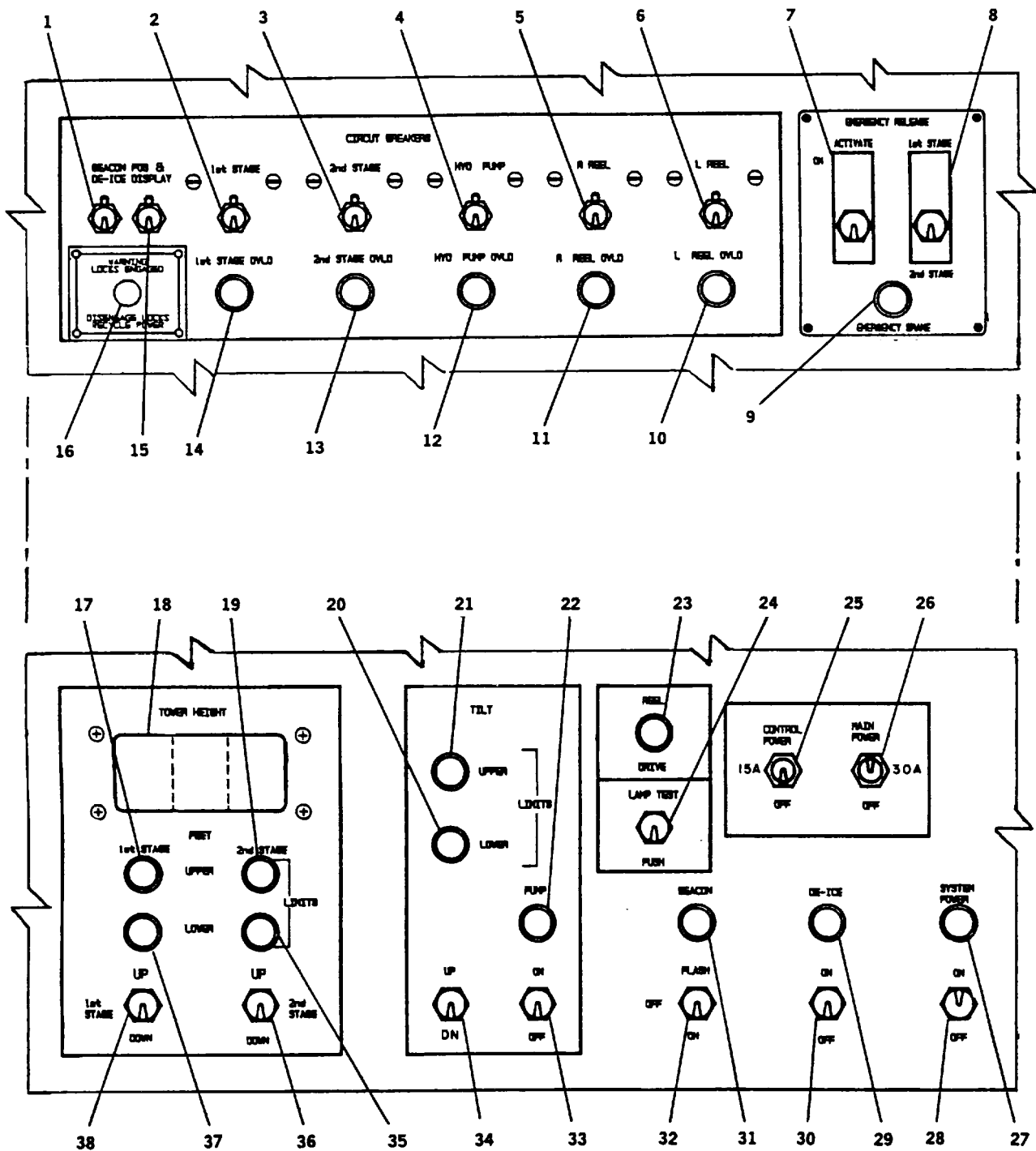
| <u>Subject</u> | <u>Page</u> |
|--------------------------------|-------------|
| Scope. | 2-1 |
| Controls and Indicators | 2-2 |

2-1. SCOPE

This section describes and shows location of operator controls and indicators for the AB-1309.

2-2. CONTROLS AND INDICATORS

a. Tower Control Box



2-2. CONTROLS AND INDICATORS - Continued

a. Tower Control Box - Continued

| Key | Name | Type | Function |
|-----|---|--|---|
| 1 | BEACON DE-ICE | Circuit breaker | Provides electrical over-load protection for beacon and de-ice circuit. |
| 2 | 1ST STAGE | Circuit breaker | Provides electrical over-load protection for 1st stage motor circuit. |
| 3 | 2ND STAGE | Circuit breaker | Provides electrical over-load protection for 2nd stage motor circuit. |
| 4 | HYD PUMP | Circuit breaker | Provides electrical over-load protection for hydraulic pump motor circuit. |
| 5 | R REEL | Circuit breaker | Provides electrical over-load protection for right reel drive motor circuit. |
| 6 | L REEL | Circuit breaker | Provides electrical over-load protection for left reel drive motor circuit. |
| 7 | EMERGENCY RELEASE ACTIVATE/ON | Switch (with safety cover) (spring-loaded) | When set to ON, activates the circuits for releasing tower stage brakes for emergency tower retraction. |
| 8 | EMERGENCY RELEASE, 1ST STAGE/2ND STAGE | Switch (with safety cover) (spring-loaded) | Used in conjunction with switch, index 7, to select tower stage (1st or 2nd) to be retracted in the emergency mode. |
| 9 | EMERGENCY BRAKE | Lamp (amber) | When on, indicates emergency brake is engaged. |
| 10 | L REEL OVLD | Lamp (amber) | When on, indicates left reel drive motor circuit has experienced an overload condition. |
| | | - | |

2-2. CONTROLS AND INDICATORS - Continued

a. Tower Control Box - Continued

| Key | Name | Type | Function |
|-----|---|-----------------------|---|
| 11 | R REEL OVLD | Lamp (amber) | When on, indicates right reel drive motor circuit has experienced an overload condition. |
| 12 | HYD PUMP OVLD | Lamp (amber) | When on, indicates hydraulic pump motor circuit has experienced overload condition. |
| 13 | 2ND STAGE OVLD | Lamp (amber) | When on, indicates tower 2nd stage motor circuit has experienced an overload condition. |
| 14 | 1ST STAGE OVLD | Lamp (amber) | When on, indicates tower 1st stage motor circuit has experienced an overload condition. |
| 15 | POS & DISPLAY | Circuit breaker | Provides electrical overload protection for position and display circuits. |
| 16 | WARNING LOCKS ENGAGED DISENGAGE LOCKS RECYCLE POWER | Lamp (red) | Lights when attempting to retract 1st stage with mechanical lockouts engaged. |
| 17 | 1ST STAGE UPPER LIMITS | Lamp (amber) | Lights when tower is being raised to indicate 1st stage is fully extended and has tripped upper limit switch. |
| 18 | TOWER HEIGHT FEET | Indicator, digital | Digital readout gives continuous indication of tower height in feet from ground level to center of load. |

2-2. CONTROLS AND INDICATORS - Continued

a. Tower Control Box - Continued

| Key | Name | Type | Function |
|-----|---------------------------|--------------------------------|---|
| 19 | 2ND STAGE UPPER LIMITS | Lamp (amber) | Lights when tower is being raised to indicate tower 2nd stage is fully extended and has tripped upper limit switch. |
| 20 | TILT LOWER LIMITS | Lamp (amber) | Light indicates tower in tilt mode has reached lower limit and actuated limit switch. |
| 21 | TILT UPPER LIMITS | Lamp (amber) | Light indicates tower in tilt mode has reached upper limit and actuated limit switch. |
| 22 | TILT PUMP | Lamp (amber) | When on, indicates hydraulic pump selected. |
| 23 | REEL DRIVE | Lamp (amber) | When on, indicates reel drive unit is operating. |
| 24 | LAMP TEST/PUSH | Spring-loaded toggle switch | When pushed (up), applies electrical power to panel lamps for test except EMERGENCY BRAKE, BEACON, and DE-ICE. |
| 25 | CONTROL POWER | Circuit breaker | When on (out of OFF position), applies electrical control power to tower control circuits. |
| 26 | MAIN POWER | Circuit breaker | When on (out of OFF position), applies electrical control power to tower control circuits. When set to OFF, disables all tower control functions. |
| 27 | SYSTEM POWER | Lamp (amber) | When on, indicates system operating electrical power is selected and the control panel can be used. |

2-2. CONTROLS AND INDICATORS - Continued

a. Tower Control Box - Continued

| Key | Name | Type | Function |
|-----|---------------------------|----------------------------------|--|
| 28 | SYSTEM POWER | Toggle switch | When set to ON, applies system power to tower control circuits. |
| 29 | DE-ICE | Lamp (amber) | When on, indicates tower de-ice system is operating. |
| 30 | DE-ICE ON/OFF | Toggle switch | When set to ON, applies electrical operating power to tower de-ice equipment. |
| 31 | BEACON | Lamp (amber) | When on, indicates tower obstruction light (beacon) is on. |
| 32 | BEACON FLASH/OFF/ON | Three position toggle switch | Controls application of electrical power to tower obstruction light (beacon) and selects tower obstruction light (beacon) operating mode. |
| 33 | TILT PUMP ON/OFF | Toggle switch | When set to ON, applies operating power to hydraulic pump. |
| 34 | TILT UP/DN | Toggle switch (spring-loaded) | Controls application of hydraulic pressure to tower tilt power cylinder. When set to UP, causes cylinder to drive tower from horizontal to vertical position; when set to DN, returns tower to horizontal. |
| 35 | 2ND STAGE LOWER LIMITS | Lamp (amber) | Lights when tower is being lowered to indicate tower 2nd stage is fully retracted and has tripped lower limit switch. |
| 36 | 2ND STAGE UP/DOWN | Toggle switch (spring-loaded) | Controls erection and retraction cycles of tower 2nd stage. |

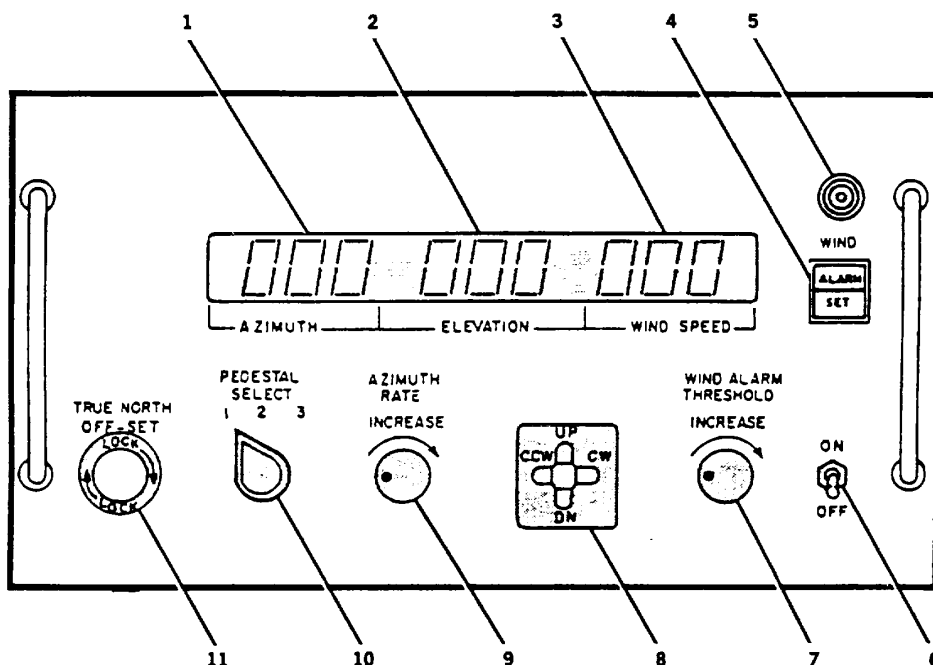
2-2. CONTROLS AND INDICATORS - Continued

a. Tower Control Box - Continued

| Key | Name | Type | Function |
|-----|---------------------------|----------------------------------|--|
| 37 | 1ST STAGE LOWER LIMITS | Lamp (amber) | Lights when tower is being lowered to indicate tower 1st stage is fully retracted and has tripped lower limit switch. |
| 38 | 1ST STAGE UP/DOWN | Toggle switch (spring-loaded) | When set to UP, energizes control circuits to extend tower 1st stage. When set to DOWN, causes tower 1st stage to retract. |

2-2. CONTROLS AND INDICATORS - Continued

b. Antenna Positioner Control Unit



Front Panel

| Key | Name | Type | Function |
|-----|------------|---------------|--|
| 1 | AZIMUTH | LED indicator | Indicates antenna azimuth (horizontal) position in degrees. Also indicates true North offset when ALARM-SET switch/indicator is pressed. |
| 2 | ELEVATION | LED indicator | Indicates antenna elevation position in degrees. |
| 3 | WIND SPEED | LED indicator | Indicates current wind speed. Also indicates wind ALARM threshold setting when ALARM-SET switch/indicator is pressed. |

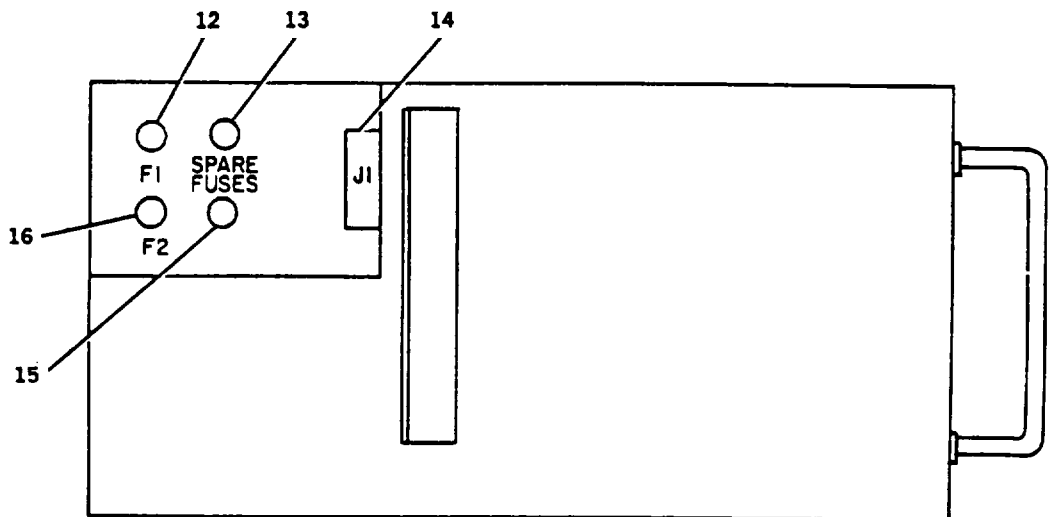
2-2. CONTROLS AND INDICATORS - Continued

b. Antenna Positioner Control Unit - Continued

| Key | Name | Type | Function |
|-----|----------------------------------|---------------------------------|--|
| 4 | ALARM-SET | Pushbutton switch/ indicator | The ALARM section lights when wind speed rises above WIND ALARM THRESHOLD setting. When pressed, SET section shows wind speed threshold setting. |
| 5 | Audible alarm | Speaker | Sounds when wind alarm threshold is exceeded. Sound ceases after a short period. It also resets after wind speed falls below threshold setting. |
| 6 | ON/OFF | Toggle switch | Turns input 115 vac, 60 Hz power ON or OFF. |
| 7 | WIND ALARM THRESHOLD | Variable potentiometer | Sets wind ALARM trip point for velocity desired for threshold. |
| 8 | UP/DOWN/ CW/CCW (Joystick) | 4-position switch | Primary control for positioning each antenna. |
| 9 | AZIMUTH RATE | Variable potentiometer | Permits speed of azimuth movement to be varied. It is variable between 0 and 2 rpm. |
| 10 | PEDESTAL SELECT | 3-position rotary switch | Selects which antenna positioners will be controlled by joystick. |
| 11 | TRUE NORTH OFF-SET | Variable potentiometer | Permits correction of trailer orientation and location of true versus magnetic North. |

2-2. CONTROLS AND INDICATORS - Continued

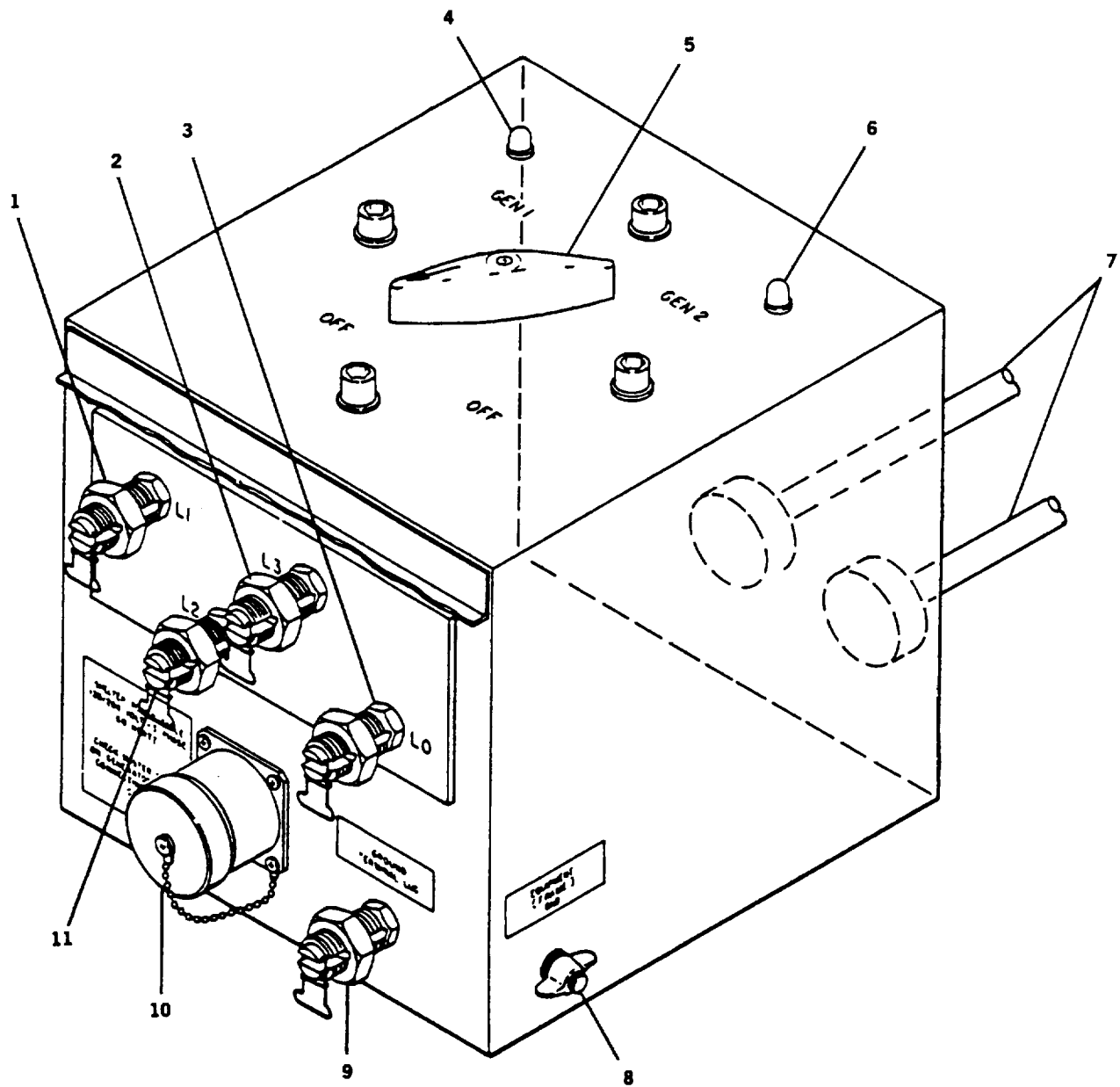
b. Antenna Positioner Control Unit - Continued



SIDE VIEW

| Key | Name | Type | Function |
|-----|------------|------------------------------|--|
| 12 | F1 | Fuse - 7 amp slow blow | Protects power supply from overload. |
| 13 | SPARE FUSE | 7 amp slow blow | |
| 14 | J1 | Multipin connector | Connects power, eleva- tion, azimuth, wind speed, and alarm cir- cuits. |
| 15 | SPARE FUSE | 6.25 amp slow blow | |
| 16 | F2 | Fuse - 6.25 amp slow blow | Protects drive motor from overload. |

2-2. CONTROLS AND INDICATORS - Continued
c. Power Distribution Box



2-2. CONTROLS AND INDICATORS - Continued
 c. Power Distribution Box - Continued

| Key | Name | Type | Function |
|-----|---|-----------------------------|---|
| 1 | L1 | Terminal lug | Connects one leg of 3-phase power cable. |
| 2 | L3 | Terminal lug | Connects one leg of 3-phase power cable. |
| 3 | L0 | Terminal lug | Connects neutral power cable. |
| 4 | GEN 1 | Indicator lamp (green) | Lights when switch is set to GEN 1 position and generator is running. |
| 5 | Selector switch | Four position rotary switch | Selects OFF, GEN 1, GEN 2, or OFF. |
| 6 | GEN 2 | Indicator lamp (green) | Lights when switch is set to GEN 2 position and generator is running. |
| 7 | Cable Assembly | 4 Conductor | Connect generators 1 and 2 to distribution box. |
| 8 | EQUIPMENT [FRAME] GND | Wing nut | Connects ground cable to earth ground stake. |
| 9 | GROUND TERMINAL LUG | Terminal lug | Connects ground wire to earth ground. |
| 10 | SHELTER POWER CABLE 120/208 VOLT-3 PHASE, 60 Hz | Multipin connector J1 | Connects generator power to shelter equipment. |
| 11 | L2 | Terminal lug | Connects one leg of 3-phase power cable. |

d. MEP-003A Generator Set
 (Refer to Technical Manual TM 5-6115-585-12)

Section II. OPERATOR'S PREVENTIVE MAINTENANCE CHECKS AND SERVICES

| | Subject | Page |
|--------------------------|---------|------|
| General..... | | 2-13 |
| Operator PMCS Table..... | | 2-13 |

2-3. GENERAL

To be sure that AB-1309 is always mission ready, you must perform scheduled preventive maintenance checks and services (PMCS) on a timely basis. Scheduled inspections allow defects to be discovered and corrected before resulting in serious damage or failure. Report any defects in accordance with instructions in DA Pam 738-750 (Maintenance Management Update) and special instructions from your commander.

2-4. OPERATOR PMCS TABLE

A PMCS table for AB-1309 appears at the end of this section. There are four categories or intervals of PMCS: B, D, A, and W. These letters head the INTERVAL columns of the PMCS table. A dot in the INTERVAL column indicates the check and/or service that should be performed by the operator at a particular time.

a. Before You Operate

Always keep in mind the CAUTIONS and WARNINGS. Perform your Before (B) PMCS to be sure that your equipment is ready to go.

b. While You Operate

Always keep in mind the CAUTIONS and WARNINGS. Perform your During (D) PMCS. This should help you spot small troubles before they become big problems.

c. After You Operate

Be sure to perform your After (A) PMCS. This should keep your equipment in top shape.

d. Weekly PMCS

Weekly PMCS is performed weekly (W) as well as Before (B) operation PMCS if:

- (1) You are the assigned operator and have not operated the AB-1309 since the last weekly PMCS.
- (2) You are operating the AB-1309 for the first time.

2-4. OPERATOR PMCS TABLE - Continued**e. Item to be Inspected and Procedure Column**

This column identifies equipment to be inspected, and procedures to do required checks and services. Carefully follow these instructions.

f. Equipment is not Ready/Available if: Column

An entry in this column will:

- (1) Identify conditions that make equipment not ready/available for readiness reporting.
- (2) Deny use of equipment until corrective maintenance has been performed.

g. Routine Checks

Routine checks are not listed as PMCS checks. You should perform routine checks as the need comes up. Some routine checks are:

- (1) Cleaning
- (2) Washing
- (3) Storing items not in use
- (4) Covering unused receptacles
- (5) Check for loose nuts, bolts, and screws

WARNING

Dangerous voltages exist in this equipment. Be very careful when working near the ac power distribution circuits and patch panel.

NOTE

If your equipment must be in operation all the time, check and service those items that can be checked and serviced without disturbing operation. Make complete checks and services when equipment can be shut down or when mission permits.

2-4. OPERATOR PMCS TABLE - Continued

B - Before operation D - During operation A - After operation W - Weekly

| ITEM NO | INTERVAL | | | | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---------|----------|---|---|---|---|---|
| | B | D | A | W | | |
| 1. | * | | * | | Tower a. Check guy cables in accordance with paragraph 3-4. | Any cable found damaged. |
| | | * | | | b. Inspect guy cables for tightness and proper tension every four hours during first 24 hours and every 8 to 12 hours thereafter. | Any cable not properly tensioned. |
| | * | | | | c. Verify tower is level. | Tower unlevel. |
| | * | | | | d. Verify signal cable reel tensioner is operating properly (signal cables not loose, nor alternatively, being pulled too tightly). | Signal cables too loose or too tight. |
| | * | | | | e. Inspect winches, steel lifting cables and pulleys for damage/wear/proper reeving. Refer to paragraph 3-4 for cable inspection. | Improper reeving, damaged cable, pulleys, or winch. |
| | * | | | | f. Inspect tower sections for damage. | Tower section(s) damaged. |
| | * | | | | g. Check tower for loose nuts and bolts. | Loose or missing hardware. |
| | * | | | | h. Check tower hydraulic fluid level. | Fluid level is low. |
| | * | | | | i. Check tower hydraulic system for leaks. | Hydraulic leaks present. |
| | * | | | | j. Verify obstruction light on tower top operates properly. | Light(s) burned out. |

2-4. OPERATOR PMCS TABLE - Continued

B - Before operation D - During operation A - After operation W - Weekly

| ITEM NO | INTERVAL | | | | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---------|----------|---|---|--|--|--|
| | B | D | A | W | | |
| 1. | | * | | | Continued | |
| | | | | | k. Check jack stands for position and security. No loose hardware. | If any jackstand is not properly positioned and secure. |
| | | * | | | l. Check coax cables for damage/security. | Damaged coax cables. |
| | | * | | | m. Check antenna positioner cables for damage/security. | Damaged positioner cables. |
| | | * | | | n. Check lightning rod and ground cable for security/proper installation. | Missing ground rod or cable. |
| | * | | | o. Check tilt limit switch box for 1/16 inch rotation (maximum). | Box rotates more than 1/16 inch. | |
| 2. | * | * | | | Tower Control Box Perform "Lamp Test" by pushing spring-loaded toggle switch labeled LAMP TEST and inspect front panel for burned out lamps. (Emergency brake, Beacon, and De-ice lamps are not part of the "Lamp Test.") Replace lamp(s) as necessary. | Lamps(s) do not light. |
| 3. | * | | | | Antenna Position Control Unit | |
| | | * | | | a. Check unit for security. b. Set power ON/OFF switch to ON and check that LEDs light. | Cannot be properly secured. Power is not applied to control unit or burned out LED. |

2-4. OPERATOR PMCS TABLE - Continued

B - Before operation D - During operation A - After operation W - Weekly

| ITEM NO | INTERVAL | | | | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---------|----------|---|---|--|---|---|
| | B | D | A | W | | |
| 3. | | * | | | Continued | |
| | | * | | | c. Verify AZIMUTH indication on display for each reflector dish is same as azimuth of distant site radio transmissions. | Improper Azimuth display. |
| 4. | | * | | | d. Check antenna position switch (joystick) and potentiometers for smooth operation. | Any switch that does not properly operate. |
| | | * | | | MEP-003A Generator Set (Refer to technical manual TM 5-6115-585-12). Battery terminals and exhaust covers installed. | Generator faulty. Protective covers are missing. |
| 5. | | * | | | Power Distribution Box | |
| | | * | | | a. Check switch knob for condition and security. | Broken or loose knob. |
| | | * | | | b. Check switch operation. Move switch to all four positions and check for smooth operation. | Switch will not move. |
| 6. | | * | | | c. Check that light for generator selected and operating is lit. Replace lamp as necessary. | Light is not on. |
| | | * | | | Tires | |
| | * | | | a. Check tire pressure [60 psi (413.7 kPa)] when tires are cool. | One tire is flat, missing or unserviceable. | |
| | * | | | b. Check tires for cuts, foreign objects or unusual tread wear. Remove any stones from between treads. | Damaged tire(s). | |

2-4. OPERATOR PMCS TABLE - Continued

B - Before operation D - During operation A - After operation W - Weekly

| ITEM NO | INTERVAL | | | | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---------|----------|---|---|---|--|---|
| | B | D | A | W | | |
| 7. | | | | * | Wheels Check wheels for damage and wheel nuts for tightness and presence. | One wheel is damaged. One or more wheel nuts missing. |
| 8. | * | | | | Drawbar Ring and Safety Chains a. Check drawbar ring for secure mounting and obvious damage. b. Check safety chains for secure mounting and obvious damage. | Ring is loose or bent. Safety chains are missing or mounting is loose. |
| 9. | * | | | | Trailer Brake System a. Test brake system by connecting trailer to towing vehicle. Connect service brake (left side) and emergency brake (right side) hose assemblies and make sure the towing vehicle service air line is turned on. Actuate the service brakes during operation. WARNING Serious burns can result from touching an overheated brake drum. | Service brakes fail to brake trailer. |

2-4. OPERATOR PMCS TABLE - Continued

B - Before operation D - During operation A - After operation W - Weekly

| ITEM NO | INTERVAL | | | | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---------|----------|---|---|---|--|--|
| | B | D | A | W | | |
| 9. | | | | | Continued b. During halts cautiously feel drums and hubs for overheated condition. Hot drum indicates dragging brake. Cool drum indicates inoperative brake. | Overheated drums or cold drums. |
| 10. | | | * | | Hand Brakes With trailer hooked to towing vehicle, set hand brakes. Move trailer slightly to see if hand brakes hold the wheels. If necessary, adjust hand brake. | Hand brakes cannot be sufficiently adjusted. |
| 11. | | | * | * | Air Tank a. Drain condensation from tank. b. Visually inspect air tank for damage and/or leaking. | Tank is leaking or damaged. |
| 12. | * | | | | Air Line Connections Inspect glad-hands for damage and leaking. Clean dirt from mounting surfaces. | Glad-hands are broken, missing or leaking. |
| 13. | * | | | | Electrical Connection and Wiring a. Visually inspect connector body for damage. | Damaged connector body. |

2-4. OPERATOR PMCS TABLE - Continued

B - Before operation D - During operation A - After operation W - Weekly

| ITEM NO | INTERVAL | | | | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---------|----------|---|---|---|--|--|
| | B | D | A | W | | |
| 13. | * | | | | Continued b. Visually inspect pins for dirt, bends, burns or damage. | Bent or damaged pins. |
| | * | | | | c. Visually inspect insulator for signs of deterioration or arcing. | Damaged insulator. |
| | * | | | | d. Visually inspect wiring harness, clips, receptacles and shells for correct assembly and good condition. | Incorrectly assembled or damaged components. |
| 14. | | | | | Lights and Reflectors NOTE An assistant is required when checking brake lights. | Lights do not work for night mission. |
| | * | | | | a. If tactical situation permits, connect the intervehicular cable to the towing vehicle. Operate the vehicle light switch through all settings and check trailer lights for proper operation. | |
| | * | | | | b. Check for damaged or missing reflectors. | |
| 15. | | | | | Leveling Jacks | Any leveling jack inoperative, loose or damaged. |
| | * | | | | a. Check for damage and secure mounting. | |

2-4. OPERATOR PMCS TABLE - Continued

B - Before operation D - During operation A - After operation W - Weekly

| ITEM NO | INTERVAL | | | | ITEM TO BE INSPECTED PROCEDURE | EQUIPMENT IS NOT READY/AVAILABLE IF: |
|---------|----------|---|---|---|---|---|
| | B | D | A | W | | |
| 15. | * | | | | Continued b. Check that leveling jacks extend and retract smoothly. | |
| 16. | | | | | Springs and Suspension | Damaged or loose suspension components. |
| | | | | * | Check springs and suspension for looseness or damage. | |
| 17. | | | | | Operation | |
| | * | | | | a. Ensure that trailer is tracking correctly with no side pull. | Poor tracking condition. |
| | * | | | | b. BE ALERT FOR ANY UNUSUAL NOISES WHILE TOWING THE TRAILER. Stop and investigate any unusual noises. | Any unusual noises. |
| 18. | * | | | | Pionjar (Refer to Pionjar manual in storage box) | Faulty pionjar. |
| 19. | | | | | Come-alongs | Damaged or missing. |
| | * | | | | Check for completeness and service ability. | |
| 20. | | | | | Accessories Items | Damaged or missing. |
| | * | | | | Check for completeness and serviceability. Refer to Appendix C for listing. | |

Section III. OPERATION UNDER USUAL CONDITIONS

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2-5. OVERVIEW

This section details operator instructions under usual conditions including site selection; preparation for use; initial turn-on, adjustments, and self test; shutdown; and preparation for movement.

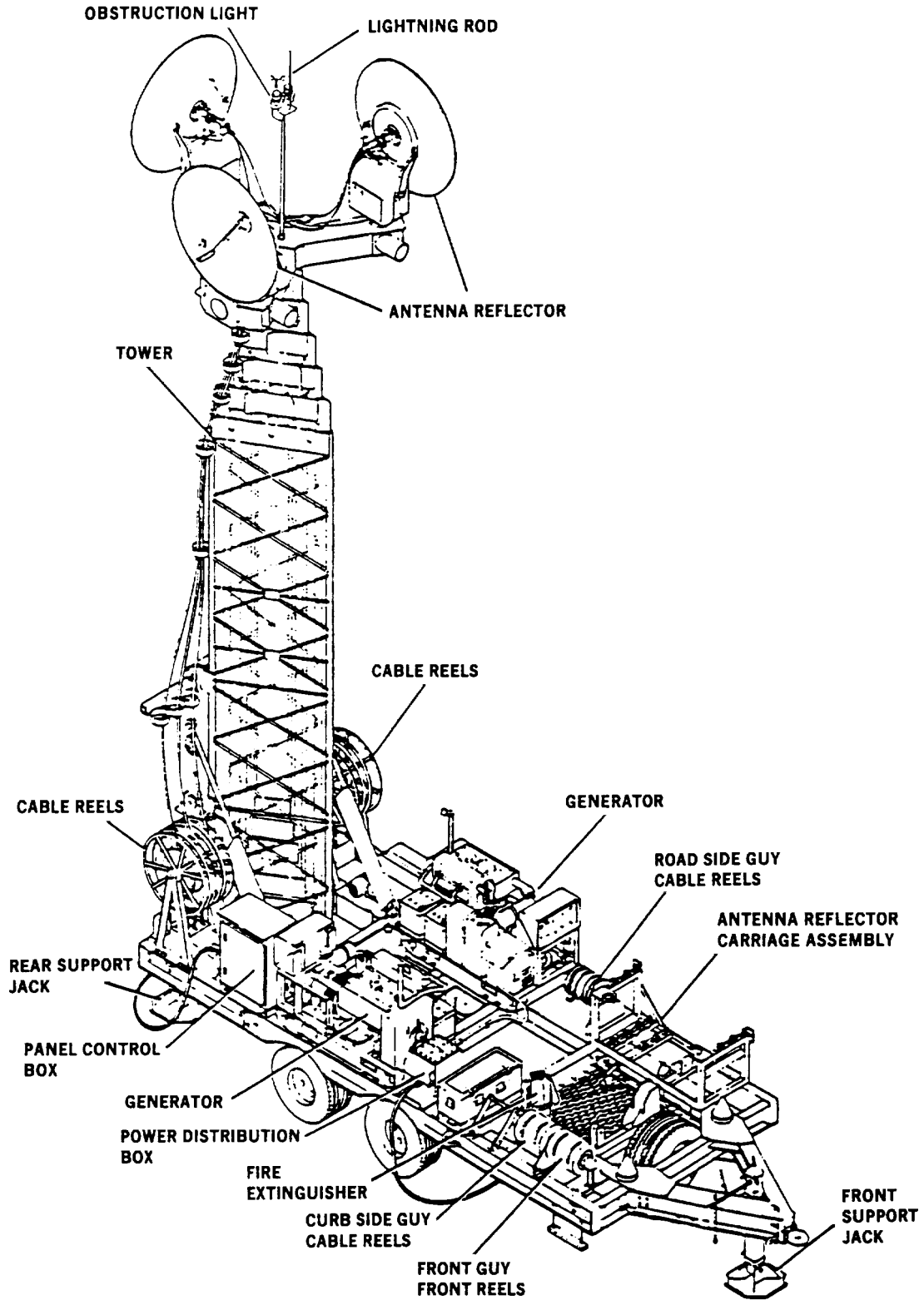
2-6. SITE REQUIREMENTS

WARNINGS

- Select site with sufficient clear area allowing personnel to work safely around tower and suitable areas for emplacing ground anchors. If necessary, guy cables may be installed through tree branches but must not contact main branches or tree trunks when tensioned to avoid injury from breakage of the cable. Tolerance of a 10-foot (3.05 m) radius, left-to-right only, is allowable from ground anchor point determined by measurement to maintain safe support of tower.
- Tower base must be placed 260 feet (79.25 m) or more from any power lines to avoid inadvertent contact causing death by electrocution.
- Make sure incline does not exceed 10 degrees (or 18 percent grade). Site modification and/or cribbing with locally obtained materials may be required to safely erect tower.
- Always use two anchors at each anchor point. During periods of increased winds, additional anchors should be installed.
- Regardless of tower height erection, all guy cables must be connected and tensioned.

NOTE

Plan direction of the shot so that radio signals have the least possibility of interference.



QUICK ERECT EXPANDABLE MAST AB-1309(V)4/TRC GENERAL ARRANGEMENT

2-6. SITE REQUIREMENTS - Continued

a. Operating Site

Operating site for AB-1309 is determined by terrain, along with system planning and security requirements.

Consideration of site size must include antenna trailer guying requirements. No obstructions can be present to interfere with correct tower guying.

Soil conditions should be considered. Extremely soft soil, sand, or solid rock should be avoided where possible. Proper leveling of trailer as well as sinking of grounding rod and holding properties of guy anchors will be affected by these conditions.

Choose site that is level, firm, dry and has good drainage. After site is prepared, the AB-1309 should be placed and leveled.

- (1) Topographic Conditions. General site area must be free of natural and man-made obstructions in transmitting and receiving direction. Tree groves, dense shrubbery, buildings, towers, cables, etc., absorb radiated power and distort radiated beam pattern. For line-of-sight (LOS) propagation, a free path is required with sufficient clearance. Although the crew may not be able to judge amount of clearance, the free path condition usually can be observed, particularly from elevated locations. Preferably, mast should be placed where terrain is most level and firmest; and inclines from plumb level no more than 10 degrees.
- (2) Interference. A site should be selected ensuring that antennas do not face toward nearby noise sources such as power lines or electric generators. The crew must select exact location, and in doing so, must observe restrictions as to deviations in altitude, distance to either side of original planned path, and distance along path. This is necessary to avoid excessive changes in assigned antenna horizon and azimuth angles. These restrictions should be considered when planning the site selection. In general, shifts along the path are not severely restricted, provided site elevation is about the same. Deviations to either side of the path should be restricted to a few hundred feet.
- (3) Petroleum, oil, and lubricant (POL) must be placed a minimum of 50 feet (15.24 m) away from both mast and communications shelter; each must be properly marked with warning indications.

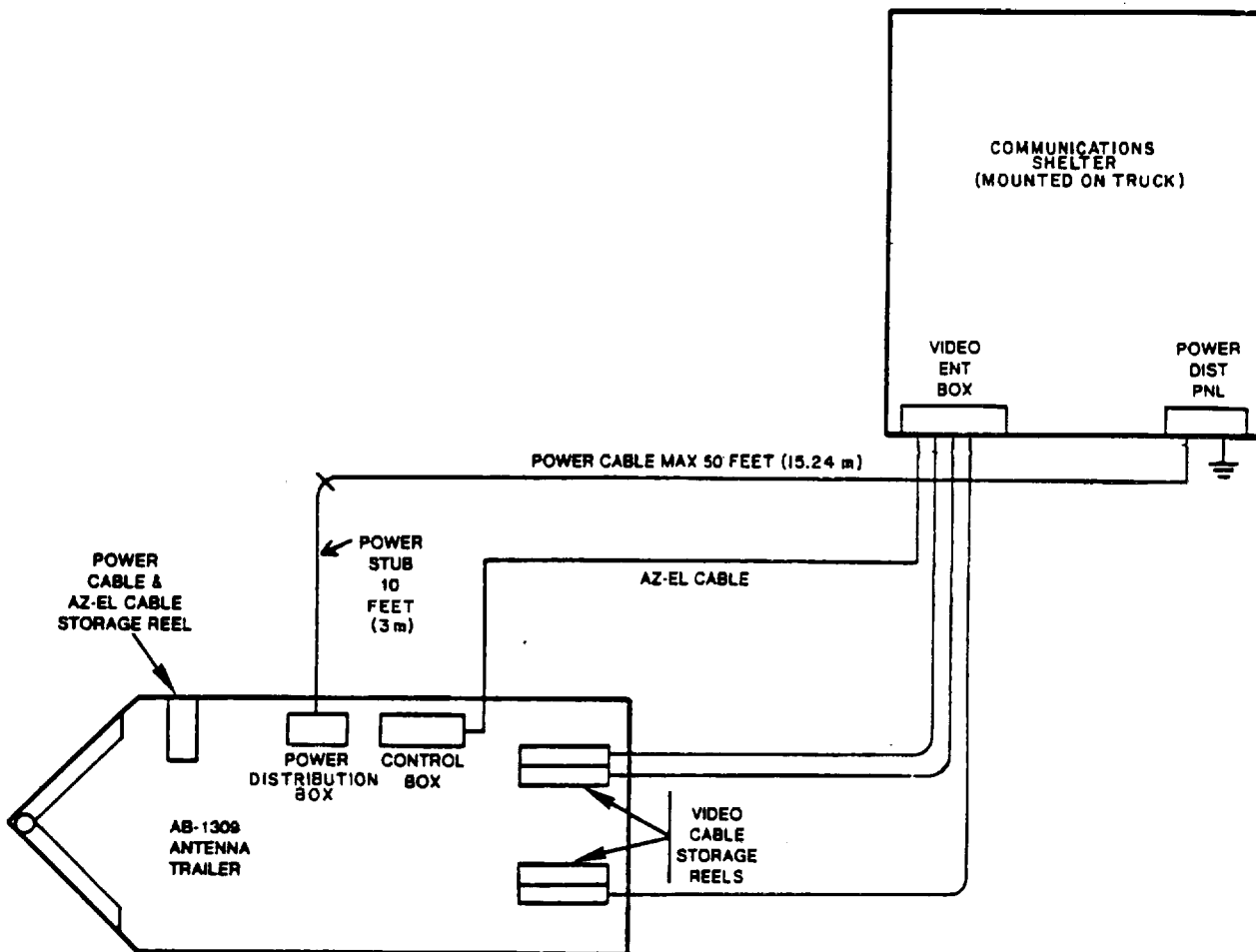
2-6. SITE REQUIREMENTS - Continued**a. Operating Site - Continued**

- (4) Fire Points: Enough fire points must be set up to ensure proper coverage of all areas, antenna/ generators, communications shelter; and POL point.
- (5) If mission permits, mark outside limits of entire site, including guy cables, with a safety ribbon.
- (6) A compass is used to measure true North location and adjust for true North offset for initial adjustments and for alignment of AB-1309 antenna reflectors. Using compass, stand 20-25 feet (6.1 7.6 m) in front of trailer, facing the tongue, and determine azimuth reading to the center of tongue. Record this reading for initial alignment and electronic adjustment procedures after electrical power is available to the antenna positioner control unit.
- (7) Ensure there is enough clear area before installing anchors. There should be a radius of at least 100 feet around the mast.

2-6. SITE REQUIREMENTS - Continued

b. Typical Site Layout

When arranging site location, position AB-1309 trailer and communications shelter a maximum of 50 feet (15.24 m) from each other. This will ensure proper cable length is maintained to interface between shelter and antenna assemblage. (See typical layout figure.)



2-6. SITE REQUIREMENTS - Continued

c. Soil Conditions

Type of soil determines quality of system ground. When equipment is grounded to a stake driven into earth, there is no guarantee that proper ground has been achieved. Soil type, moisture content, and soil temperature all affect quality of your grounding system.

- (1) Soil is classified into four general types. Each will give a different quality of electrical ground. Different types of soil and their effect on quality of ground are:

| <u>Type of Soil</u> | <u>Quality of Ground</u> |
|---|--------------------------|
| Fine soil granules with high moisture content | Very good |
| Clay, loam, shale | Good |
| Mixed (clay, loam, shale mixed with gravel or sand) | Poor |
| Gravel, sand, stone | Very poor |

- (2) Soil is usually divided into two distinct layers. The first layer [1 to 6 inches (2.54 to 15.24 cm)] is topsoil. This layer is normally dry, loosely packed, and not a good electrical conductor. The second layer is subsoil. This layer is generally tightly packed, retains moisture, and provides best electrical ground. Wet soil passes electric current better than dry soil and makes a better grounding system. A poor' grounding point can be greatly improved by adding water mixed with chemicals. Recommended chemicals, listed in order of preferred use, are:

- (a) Magnesium sulfate (epsom salts)
- (b) Copper sulfate (blue vitriol)
- (c) Calcium chloride
- (d) Sodium chloride (table salt)
- (e) Potassium nitrate (saltpeter)

- (3) Sodium chloride, being most common, is usually used. Following procedure on next page will provide maximum results.

NOTE

This procedure should be used only if an adequate ground cannot be established when checking grounding system (paragraph 2-7.f, Grounding).

2-6. SITE REQUIREMENTS - Continued

c. Soil Conditions - Continued

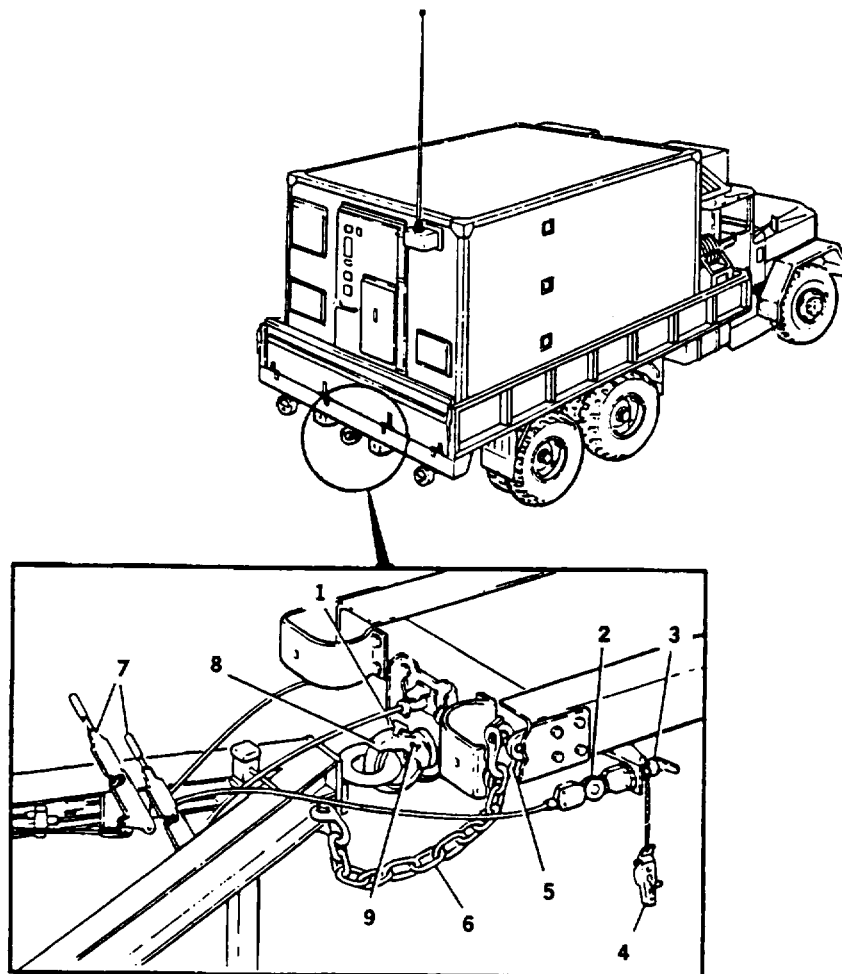
- (a) Dig hole approximately 1 foot (30.48 cm) deep and 3 feet (0.9 m) across.
- (b) Mix 5 pounds (2.27 kg) salt (Item 1, Appendix E) with 5 gallons (18.9 l) water.
- (c) Pour mixture into hole and let it seep in.
- (d) Install ground rod and connect ground strap.
- (e) Fill in hole and keep area around rod moist.

2-7. PREPARATION FOR USE

a. Unhitching AB-1309 Trailer

The following procedure should be used to unhitch the AB1309 trailer after it is transported to selected or designated site.

- (1) Park AB-1309 mast at selected site area following previous guidelines.
- (2) Turn off tow truck engine and chock rear wheels of truck and AB-1309 trailer.



2-7. PREPARATION FOR USE - Continued**a. Unhitching AB-1309 Trailer - Continued**

- (3) Apply both hand brakes (7) located at trailer tongue.

WARNING

Hand (parking) brakes on trailer must be engaged at all times when not being towed to prevent injury from movement of trailer.

WARNING

Two crew members are required to maneuver trailer jacks.

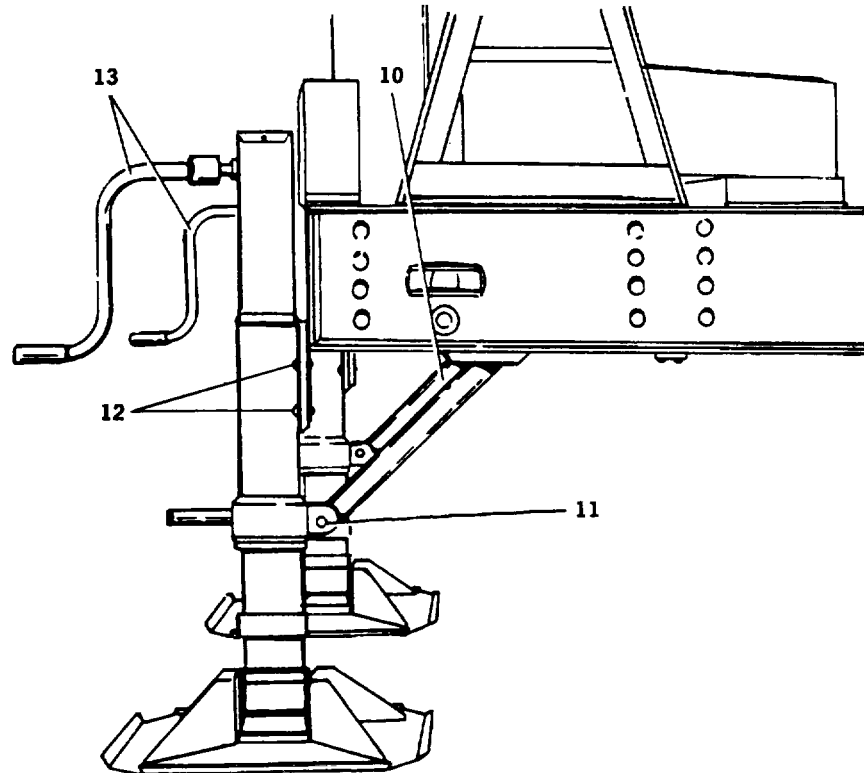
- (4) Remove three retaining pins from roadside (left) rear jack and lower to 45 degree angle. Pin in this position.

WARNING

Front jack requires two crew members to lower to vertical k,i position. (One to take weight off of retaining pin and support jack, and the other to remove the retaining pin).

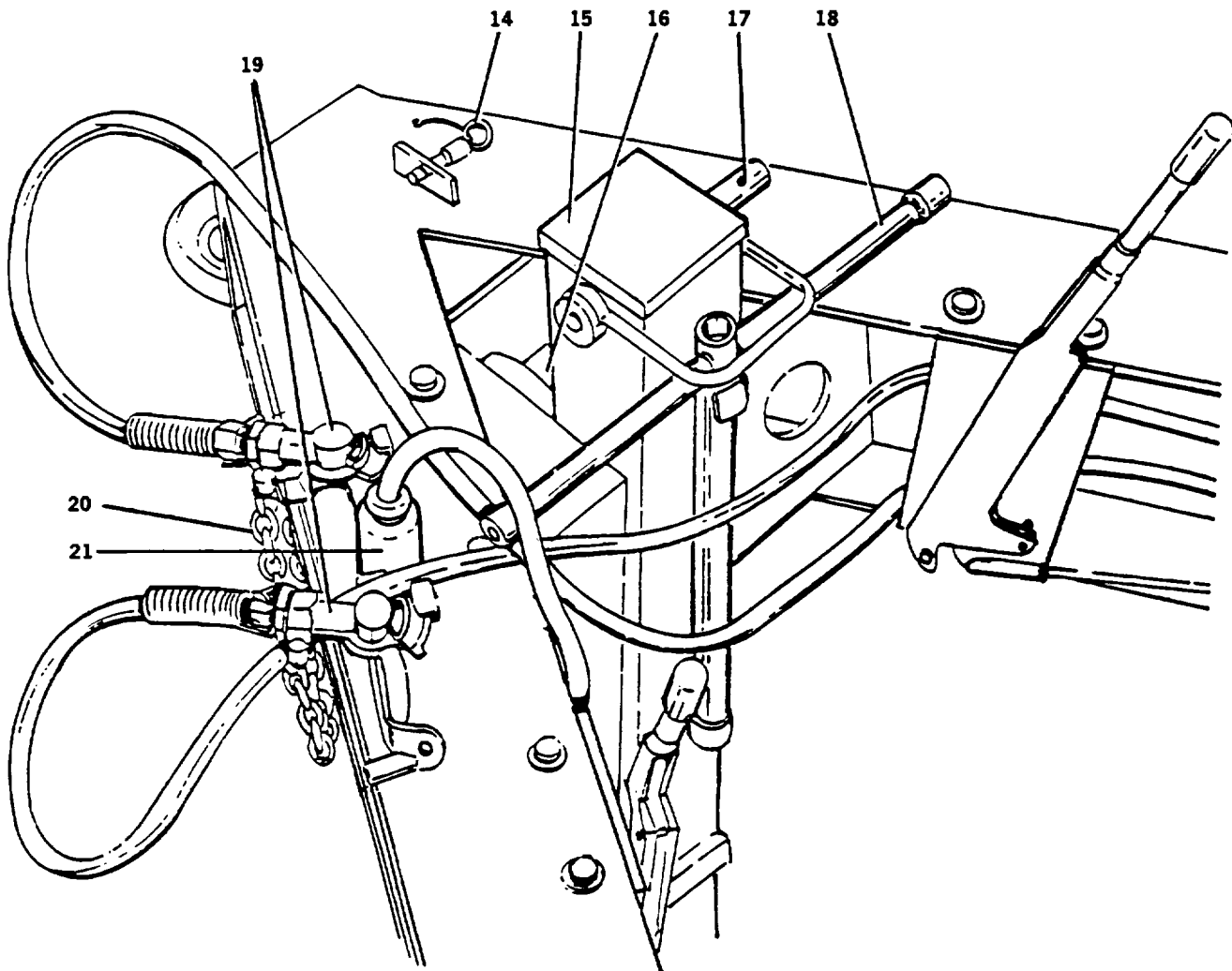
- (5) Remove retaining pin (14) from front support jack (15) and rotate jack to vertical position. Check jack is locked (16) into position (under jack pivot pin).
- (6) Connect and pin forward brace between jack and trailer tongue.
- (7) Remove crank handle (18) from clamps on front support jack.
- (8) Insert crank handle onto shaft (17) of right upper section on support jack. Align holes and insert retaining pin.
- (9) Push down air supply handles (3) to close off airbrake hose lines.
- (10) Disconnect trailer airlines from glad-hands (2) on tow truck and install protective glad-hand guards (4). Stow trailer airlines (19).

2-7. PREPARATION FOR USE - Continued

a. Unhitching AB-1309 Trailer - Continued

- (11) Disconnect both safety chains (6) from tow truck eye hooks (5) and stow them (20).
- (12) Disconnect trailer electrical cable (1) and stow it (21).
- (13) Remove cotter pin (9) and open towing pintle (8).
- (14) Rotate support jack crankhandle clockwise to lower front support jack.
- (15) Lower support jack until trailer tongue clears pintle hook.
- (16) Remove chocks from tow vehicle wheels.
- (17) Drive towing vehicle a minimum of 260 feet (79.25 m) from the AB-1309.
- (18) Replace cotter pin to lock towing pintle.

2-7. PREPARATION FOR USE - Continued

a. Unhitching AB-1309 Trailer - Continued

- (19) Remove three retaining pins (12) from each rear support jack and rotate to vertical position while lowering front jack (one crew member on front and other two at rear of trailer).
- (20) Replace three retaining pins and lock curbside (right) support jack into position. Repeat procedure for other rear jack.

2-7. PREPARATION FOR USE - Continued**a. Unhitching AB-1309 Trailer - Continued**

- (21) Remove retaining pins from rear support jack compression braces (10) on underside of trailer.
- (22) Lower compression braces into position with support jacks.
- (23) Replace retaining pins (12) to lock compression braces into place on support jacks.
- (24) Using handles (13), lower rear support jacks until they are approximately 1 inch from ground.

b. Leveling Trailer**WARNING**

Snow and ice should be removed from ground before lowering jackstand.

NOTES

- Use trailer mounted inclinometers to level trailer. If these are damaged use a 16 inch carpenter's level.
- Whenever possible, point trailer tongue uphill. AB-1309 may be positioned in any manner in relation to slope as required to take the best advantage of site characteristics. The only restriction is if the trailer tongue is pointing downhill, a slope greater than 5 degrees cannot be accommodated without site modification and/or cribbing.
- If trailer tongue is pointed up slope, and slope is between 5 and 10 degrees, trailer cannot be leveled front to rear. Mast tilt is used in conjunction with trailer jacks to get a full 10 degree compensation.

2-7. PREPARATION FOR USE - Continuedb. Leveling Trailer - Continued

(1) Trailer Tongue Pointing Up Slope

- (a) To make sure ground will support full weight of trailer, alternately lower support jacks (clockwise) until wheels clear ground.
- (b) Make sure jack supports do not sink into ground.
- (c) Once assured support jacks will support full weight of trailer, raise (counterclockwise) support jacks until wheels clear ground.
- (d) Alternately lower or raise rear and/or front jacks until trailer is level front to rear.
- (e) If trailer cannot be leveled, slope is more than 5 degrees. In this case, lower rear jacks completely and raise front jack completely. If level still cannot be achieved, dig out from under applicable support jacks and/or wheels until level can be achieved.
- (f) Raise rear jack on high side of trailer as indicated by the level until trailer is level side to side.
- (g) Check to see all three jacks are in firm contact with ground. If not, lower front jack until firm pressure is achieved.
- (h) Recheck side-to-side and front-to-rear level and adjust as needed.
- (i) When level, remove front support jack handle and stow it.

(2) Trailer Tongue Pointing Down Slope

NOTE

If slope is more than 5 degrees, leveling of trailer cannot be achieved. Move trailer to another site or point trailer tongue uphill and perform uphill procedure.

2-7. PREPARATION FOR USE - Continued**b. Leveling Trailer - Continued**

- (a) Perform procedure (1) (a) thru (d), above.
 - (b) Alternately raise rear jacks and lower front jack until trailer is level front to rear.
 - (c) If level cannot be achieved, slope is more than 5 degrees. Move trailer to another site or resite with trailer tongue pointing uphill or across slope.
 - (d) Alternately raise rear jack on high side and lower the support jack on low side to achieve side-to-side level.
 - (e) Check to see all three jacks are in firm contact with ground. If not, lower rear support jack until firm pressure is achieved.
 - (f) Recheck side-to-side and front-to-rear level and adjust as needed.
 - (g) When level, remove front support jack handle and stow it.
- (3) Trailer Tongue Pointing Across Slope.

NOTE

In performing following procedure, it may not be possible to have wheels on high side of slope come off ground.

- (a) Perform procedure (1) (a) thru (d), above.
- (b) Keep front support jack in contact with ground and raise or lower as required to level trailer front to rear.
- (c) Check to see all three jacks are in firm contact with ground. If not, raise or lower support jacks until firm pressure is achieved.
- (d) Recheck level and adjust as necessary.
- (e) Alternately raise rear jack on high side and lower rear jack on low side until side-to-side level is achieved.
- (f) Check to see all three jacks are in firm contact with ground. If not, lower rear support jacks until pressure is achieved.

2-7. PREPARATION FOR USE - Continued**b. Leveling Trailer - Continued**

- (g) Recheck side-to-side and front-to-rear level and adjust as needed.
- (h) When level, remove front support jack handle and stow it.

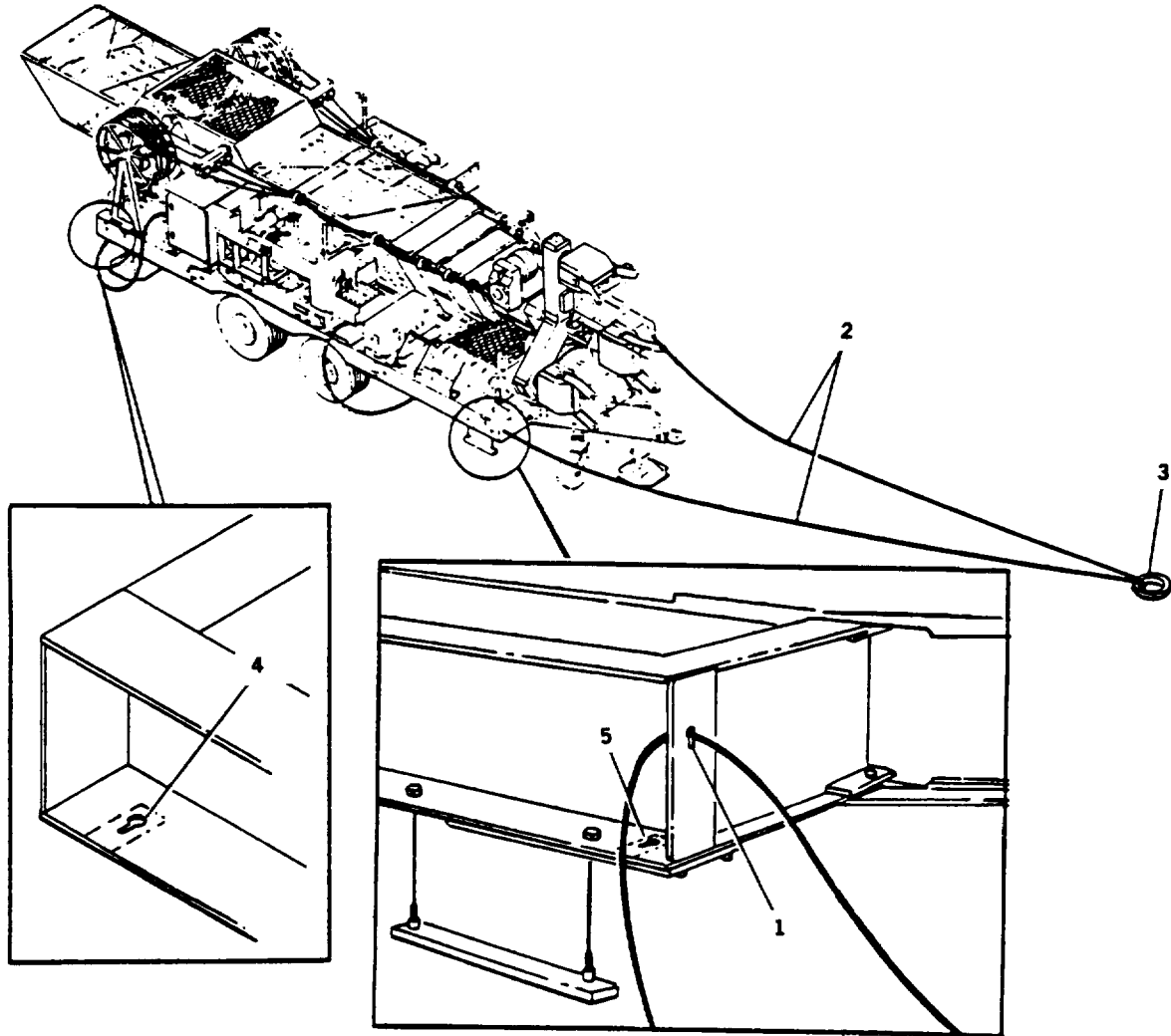
c. Removing Accessories**WARNING**

To preclude injury, never partially tilt tower for gaining access to accessory bag. With mast fully horizontal, unfasten straps that secure accessory bag to trailer. Access to these straps can be made only from underneath trailer. This is to be done only after trailer brakes are set and support jacks are lowered. After straps are unfastened, work accessory bag from under the tower.

- (1) Remove fire extinguisher from trailer and set up a fire point in an accessible location.
- (2) Remove antenna and reflectors from antenna rack assembly located at front roadside of trailer.
- (3) Remove three-piece ground rod, grounding cable, two ground lugs, three brass connecting sleeves, and protecting bolt from accessory bag located in its stowing place on trailer.
- (4) Remove petroleum, oil, and lubricant (POL) from center-mounted jerry can racks. Establish a POL point and stow these items there.

2-7. PREPARATION FOR USE - Continued

d. Layout of Anchor Points



WARNING

A crew size minimum of three is required to erect AB-1309 mast. Make sure crew members wear gloves, hard hat and eye protection at all times when working with guy cables, and ear protection when working within 35 feet (10.67 m) of Pionjar jackhammer.

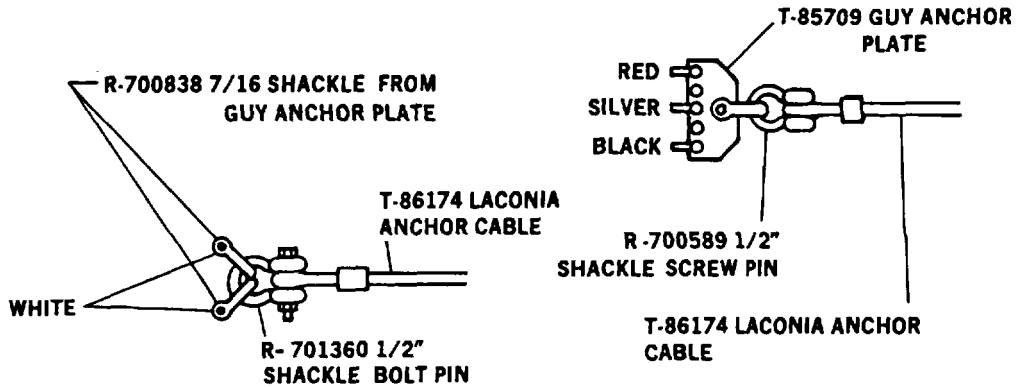
2-7. PREPARATION FOR USE - Continued**d. Layout of Anchor Points - Continued**

- (1) Locate front anchor points using following procedure:
 - (a) Remove radius cable from accessory bag located on trailer.
 - (b) Attach radius cable to each front corner of trailer using the black stops on radius cable and black slots (1) on trailer.
 - (c) Extend radius cable until both sides (2) of cable are taut.
 - (d) Use metal O-ring (3) attached to radius cable and mark location of anchors. Anchors must be located within 10-foot (3.5 m) radius of this point, **left or right only**.
 - (e) Disconnect radius cable.
- (2) Locate roadside anchor points using following procedure:
 - (a) Move to roadside of trailer. Use red slot to connect long end of radius cable to front roadside red slot (5).
 - (b) Connect short end of radius cable to rear roadside red slot (4).
 - (c) Extend radius cable until both sides are taut.
 - (d) Use metal O-ring on radius cable to mark rear roadside anchor locations. Anchors must be located within a 10-foot (3.5 m) radius of this point, left or right only.
 - (e) Disconnect radius cable from roadside red slots.
- (3) Locate curbside anchor locations using step (2) above, substituting curbside for roadside.
- (4) Disconnect radius cable, carefully roll it up, and stow it in accessory bag.

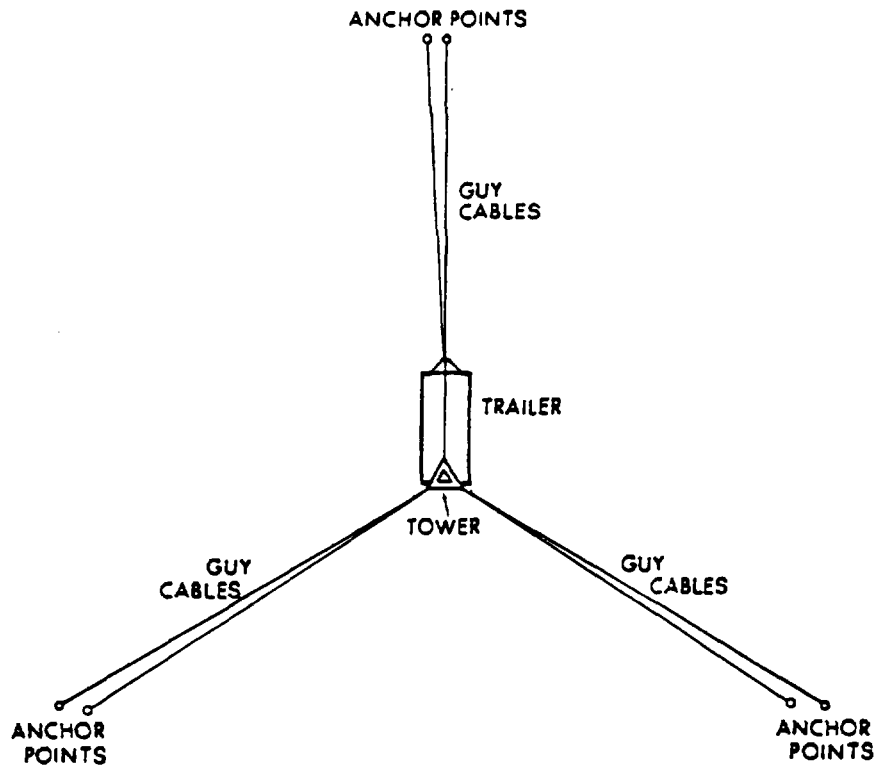
2-7. PREPARATION FOR USE - Continued

d. Layout of Anchor Points - Continued

- (5) Remove six Laconia anchors, three R-701360 one-half inch shackle "bolt" pins, and three guy plate assemblies from accessory bag. Tighten three 7/16-inch shackles on guy plates, two 7/16-inch shackles on 1/2inch shackle, and safety wire shackle pins. (See following figure.)



- (6) Place two Laconia anchors and attaching hardware at each marked anchor location.
 (7) Approximate anchor point locations are shown in the following figure:



2-7. PREPARATION FOR USE - Continued

e. Installing Anchors**NOTE**

There are three types of anchors-Laconia, Duckbill (Model 138) and screw. Use Laconia anchor procedure, 2-7.e.(1), if ground is hard. Use Duckbill (Model 138) anchor procedure, 2-7.e.(2), if ground is too hard to drive Laconia anchors. Use screw anchor procedure, 2-7.e.(3), if ground is soft.

- (1) Installing Laconia Anchors

WARNING

Hearing protection (within 35 feet (10.67 m) of Pionjar jackhammer), eye protection, hard hats and gloves are required when driving anchors.

CAUTION

Check for fuel leakage in Pionjar storage case each time Pionjar is removed or stowed. Take care to keep Pionjar as clean as possible during use. Do not lay in mud, sand or dirt.

- (a) Using two crew members, remove Pionjar and instruction manual from its case. Refer to Pionjar manual for operating instructions, etc.
- (b) Make sure gas tank on Pionjar has sufficient fuel mixture (one part of SAE 40 oil (item 2, Appendix E) to 12 parts of gasoline (item 3, Appendix E), which equates to 1 quart (0.95 l) of oil for every 3 gallons (11.36 l) of gas.

NOTE

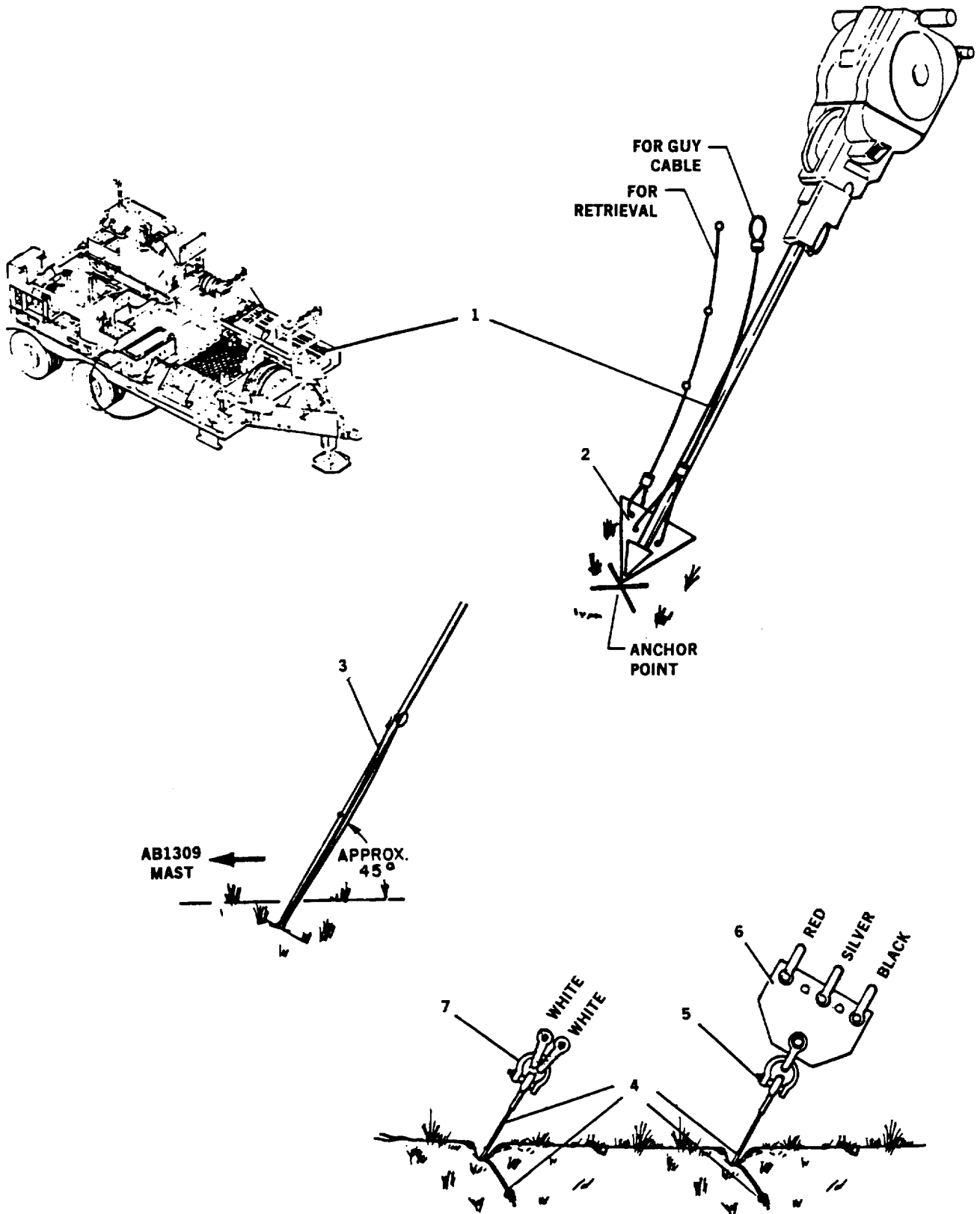
Three crew members are required at all times to operate Pionjar and drive stakes and anchors.

- (c) Start Pionjar using following procedure:

- Push switch on fuel tank cap to vent fuel tank.
- Open fuel needle by turning it fully counter-clockwise to open position.

2-7. PREPARATION FOR USE - Continued

e. Installing Anchors - Continued



2-7. PREPARATION FOR USE - Continued**e. Installing Anchors - Continued**

- Turn choke fully counterclockwise.
- Make sure throttle is fully open.
- Pull starter cable sharply until engine fires.
- Once engine fires, even if it is only one pop, open choke by turning it to the fully open (clockwise) position.
- Turn selector lever up.
- Once Pionjar is running, fuel needle is to be turned clockwise slowly until it is running at maximum speed. Allow to warmup for 3 to 5 minutes.

NOTE

All three crew members will assist in using Pionjar to drive Laconia anchors 36 inches (91.44 cm) into ground.

- (d) Remove Pionjar drive tool (1) from trailer.

WARNING

Failure to lock drive tool in place could result in personal injury.

- (e) Attach Pionjar drive tool to Pionjar and lock in place by pulling up on yoke drill.
- (f) At first selected anchor location, position anchors (2) so attached cables are on underside of anchors.

NOTE

Both anchors must be within 10 feet (3 m) radius of selected anchor location. Second anchor at each location must be within 10 feet (3 m) of first anchor, preferably, 5 feet (1.5 m) directly behind first anchor.

- (g) Attach Pionjar drive tool to anchor and drive it into ground (3) until ends of attached cables (4) are within 3 inches (7.62 cm) of ground.

2-7. PREPARATION FOR USE - Continued**e. Installing Anchors - Continued**

- (h) Use U-shaped shackle R-700589 to attach guy plate assembly (6), and shackle R-701360 (7) to olive drab anchor cable eyelets (5).
 - (i) Perform steps (f) thru (h) for other two locations.
 - (j) After driving anchors, turn off Pionjar by closing (turn clockwise) fuel needle.
 - (k) Drain fuel and remove Pionjar drive tool. Use two crew members to stow Pionjar and manual in its storage case.
 - (l) Replace Pionjar drive tool in its stowed position on trailer.
- (2) Installing Duckbill (Model 138) Anchors

WARNING

Hearing protection (within 35 feet (10.67 m) of Pionjar jackhammer), eye protection, hard hat and gloves are required when driving anchors.

CAUTION

Check for fuel leakage in Pionjar storage case each time Pionjar is removed or stowed.

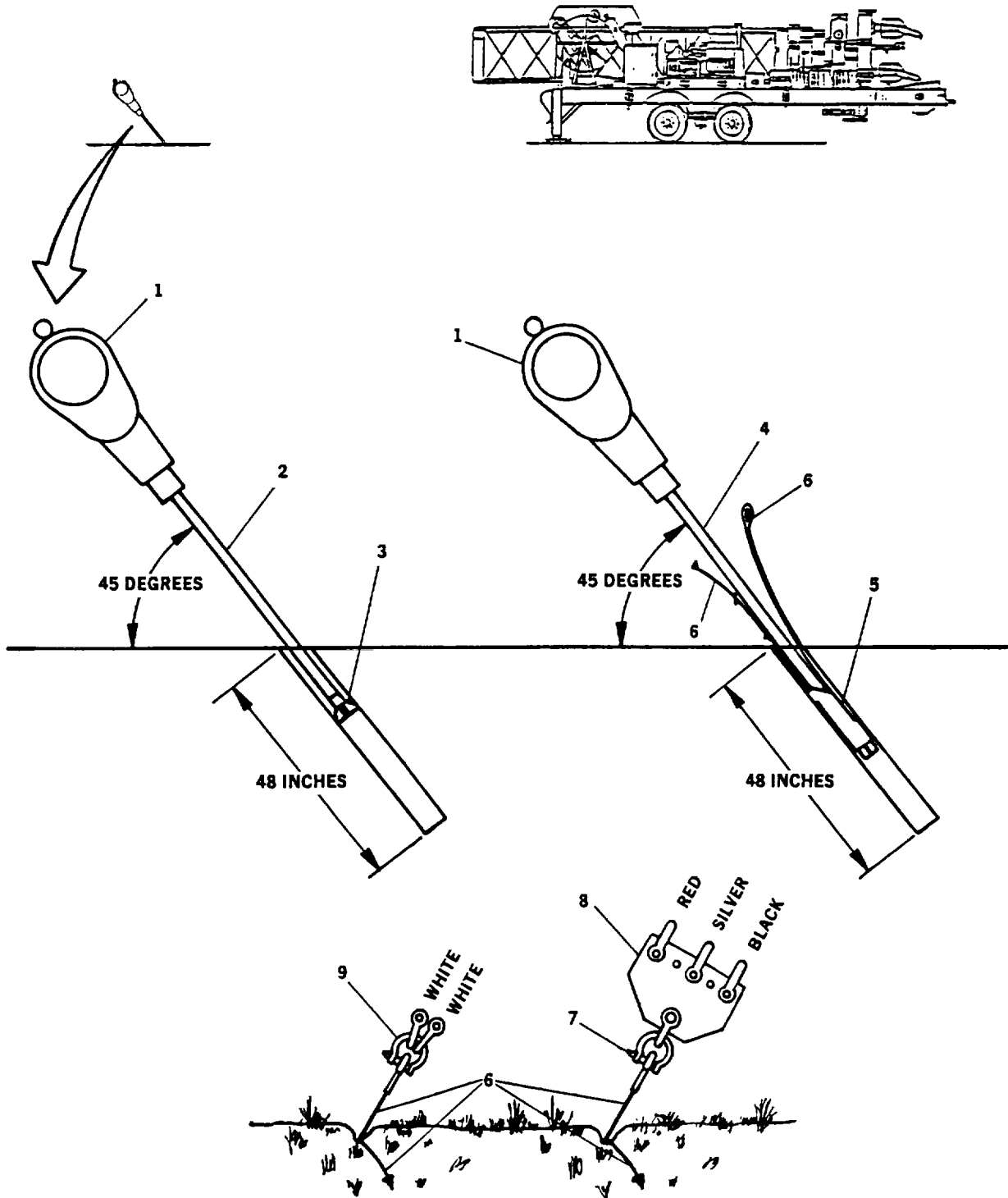
- (a) Using two crew members, remove Pionjar and instruction manual from its case. Refer to Pionjar manual for operating instruction, etc.
- (b) Make sure gas tank on Pionjar has sufficient fuel mixtures (one part of SAE 40 oil (item 2, Appendix E) to 12 parts of gasoline (item 3, Appendix E), which equates to 1 quart (0.95 l) of oil for every 3 gallons (11.36 l) of gas.

NOTE

Three crew members are required at all times to operate Pionjar and install anchors.

2-7. PREPARATION FOR USE - Continued

e. Installing Anchors - Continued



2-7. PREPARATION FOR USE - Continued**e. Installing Anchors - Continued**

(c) Start Pionjar using following procedure:

- Push switch on fuel tank cap to vent fuel tank.
- Open fuel needle by turning it fully counterclockwise to open position.
- Turn choke fully counterclockwise.
- Make sure throttle is fully open.
- Pull starter cable sharply until engine fires.
- Once engine fires, even if it is only one pop, open choke by turning it to the fully open (clockwise) position.
- Turn selector lever up.
- Once Pionjar is running, fuel needle is to be turned clockwise slowly until it is running at maximum speed. Allow to warm up for 3 to 5 minutes.

NOTE

All three crew members will assist in using Pionjar to drill holes into ground.

(d) Remove Pionjar rock drill (1), 48 inch drill rod (2) and 3 inch drill bit (3), from trailer.

WARNING

Failure to lock rock drill in place could result in personal injury.

(e) Attach Pionjar rock drill to Pionjar and lock in place by pulling up on yoke drill.

(f) At first selected anchor location, drill holes at a 45 degree angle, 48 inches (121.9 cm) deep.

2-7. PREPARATION FOR USE - Continued

e. Installing Anchors - Continued**NOTE**

Both holes must be within 10 feet (3 m) radius of selected anchor location. Second hole at each location must be within 10 feet (3 m) of first hole (preferably, 5 feet (1.5 m) directly behind first hole).

- (g) Remove drill rod (2) and drill bit (3) and attach Pionjar drive rod (4) to Pionjar.
 - (h) Attach drive rod (4) to anchor (5) and drive it into ground until ends of attached cables (6) are within 3 inches (7.62 cm) of ground.
 - (i) Use U-shaped shackle R-700589 to attach guy plate assembly (8), and shackle R-701360 (9) to olive drab anchor cable eyelets (7).
 - (j) Perform steps (f) thru (i) for other two locations.
 - (k) After driving anchors, turn off Pionjar by closing (turn clockwise) fuel needle.
 - (l) Drain fuel and remove Pionjar drive tool. Use two crew members to stow Pionjar and manual in its storage case.
 - (m) Replace Pionjar accessories in their stowed positions on trailer.
- (3) Installing Screw Anchors in Soft Soil
- (a) Remove six screw anchors (1) and screw anchor handle (2) from front roadside storage location under antenna carriage.
 - (b) At each marked anchor location, install two screw anchors using following procedure:

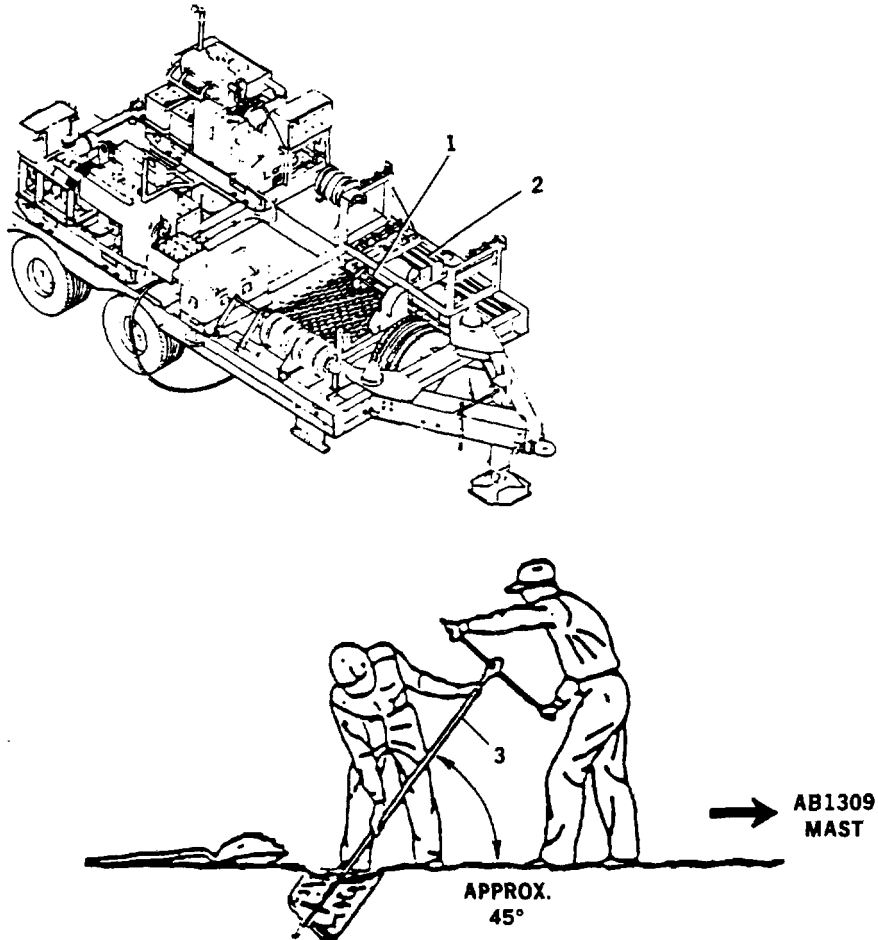
NOTE

Both screw anchors must be within 10 feet (3 m) radius of selected anchor location. Second anchor must be within 10 feet (3 m) of first anchor (preferably, 5 feet (1.5 m) directly behind first anchor).

2-7. PREPARATION FOR USE - Continued

e. Installing Anchors - Continued

- Tilt top of screw anchor toward mast approximately 45 degrees with ground (3).



NOTE

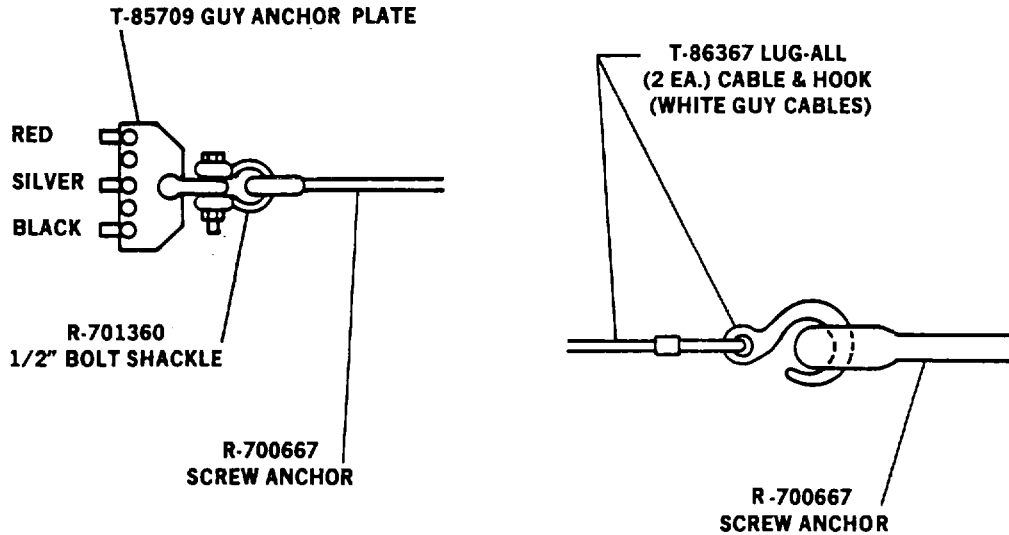
It may be necessary to dig a starting hole approximately 4 inches deep for screw anchor.

- Insert screw anchor handle through loop of anchor and turn clockwise until 4 inches (10.2 cm) of anchor remains above ground.
- Use a U-shaped shackle R-701360 to attach guy plate assembly to top of screw anchor (see following figure).

2-7. PREPARATION FOR USE - Continued

e. Installing Anchors - Continued

- Use two lug-all cable and hook assemblies for white guy cables (see following figure).



(3) Proofing Installed Anchors

WARNING

Exceeding 5000 pound (2268 kg) mark of anchor setting and retrieval tool may result in serious injury.

NOTE

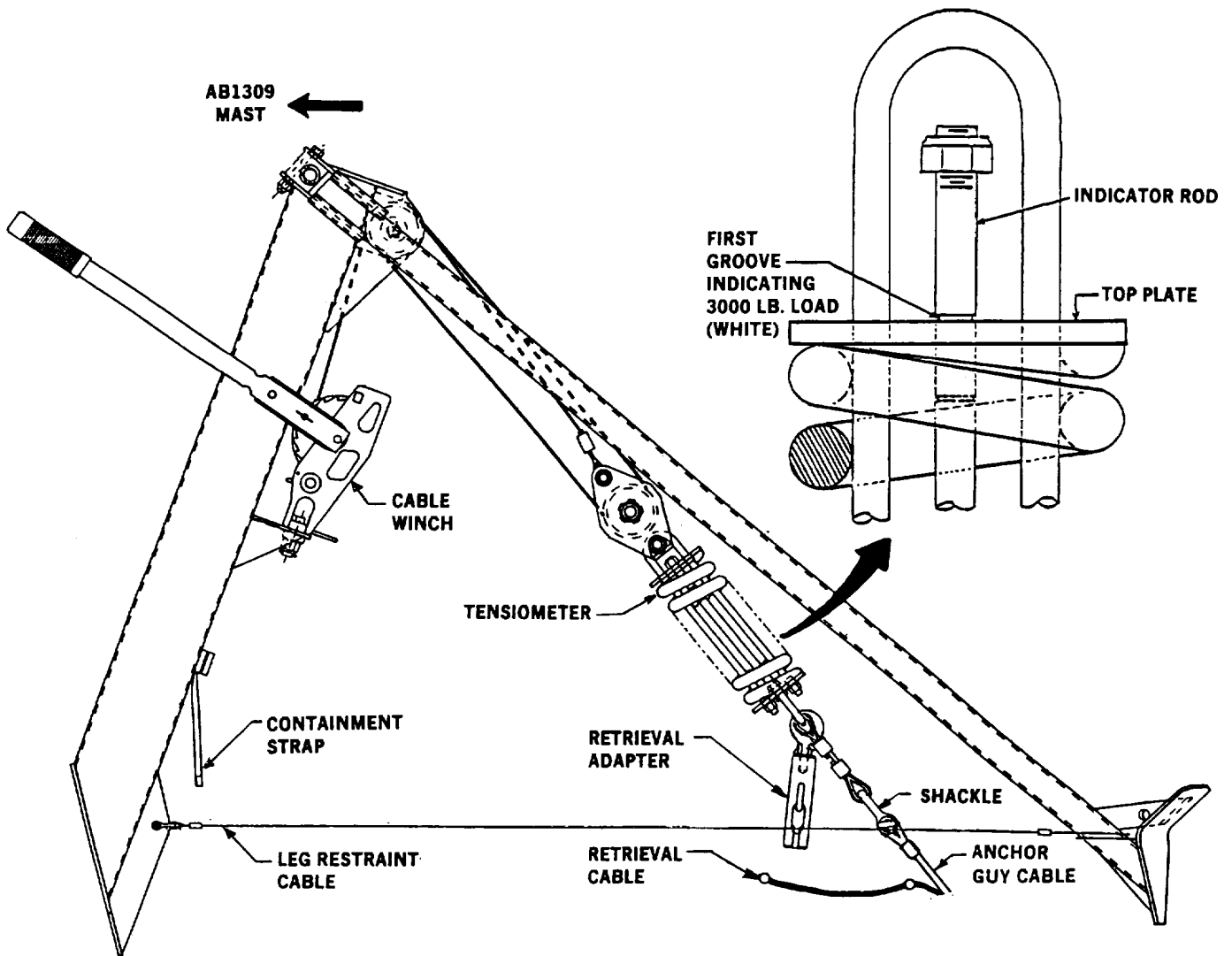
Two crew members are required to operate and remove anchor setting and retrieval tool.

After installation, anchors must be proofed to a load of 3000 pounds (1360.8 kg) before attaching guy cables and hardware.

2-7. PREPARATION FOR USE - Continued

e. Installing Anchors - Continued

- (a) Remove the anchor setting and retrieval tool from its stowage location on the AB-1309 trailer.
- (b) Unfasten the containment strap from around the anchor setting and retrieval tool.
- (c) Refer to following figure. Position the anchor tool upright over the anchor to be proofed. The legs should be spread outward as far as the leg restraint cables will permit.



2-7. PREPARATION FOR USE - Continued**e. Installing Anchors - Continued**

- (d) Disconnect the shackle from its stowed position on the left of the anchor tool.
- (e) Release the cable drum on the lever winch to allow cable to be pulled from the winch.
- (f) Using the shackle, connect the tensiometer cable to the guy cable of the anchor.

CAUTION

The anchor cable must be pulled to an approximate 45 degree angle to the ground. If necessary, reposition the anchor setting and retrieval tool, to put the anchor cable in the middle between the two front legs and 6-10 inches (15.24 - 25.4 cm) behind the leg restraint cable connecting the front legs.

- (g) Operate the lever winch, taking up cable, until the tensiometer indicates a load of 3000 pounds (1360.8 kg) (refer to figure). When the first white groove on the indicator rod appears at the surface of the top plate of the tensiometer, a 3000 pounds (1360.8 kg) load is obtained. Monitor white line to ensure anchor is set. If white line goes below, anchor is pulling out. Then the following alternative steps must be taken depending on the particular situation at the time.
 - Relocate the anchor to a slightly different location where better soil conditions may exist.
 - Install a screw type anchor and proof.
 - If adequate soil conditions cannot be found in the immediate area, the whole AB-1309 unit should be relocated to a new area.
- (h) Once the anchor has been proofed, release all of the tension in the cable and disconnect the shackle from the anchor guy cable.

2-7. PREPARATION FOR USE - Continued**e. Installing Anchors - Continued**

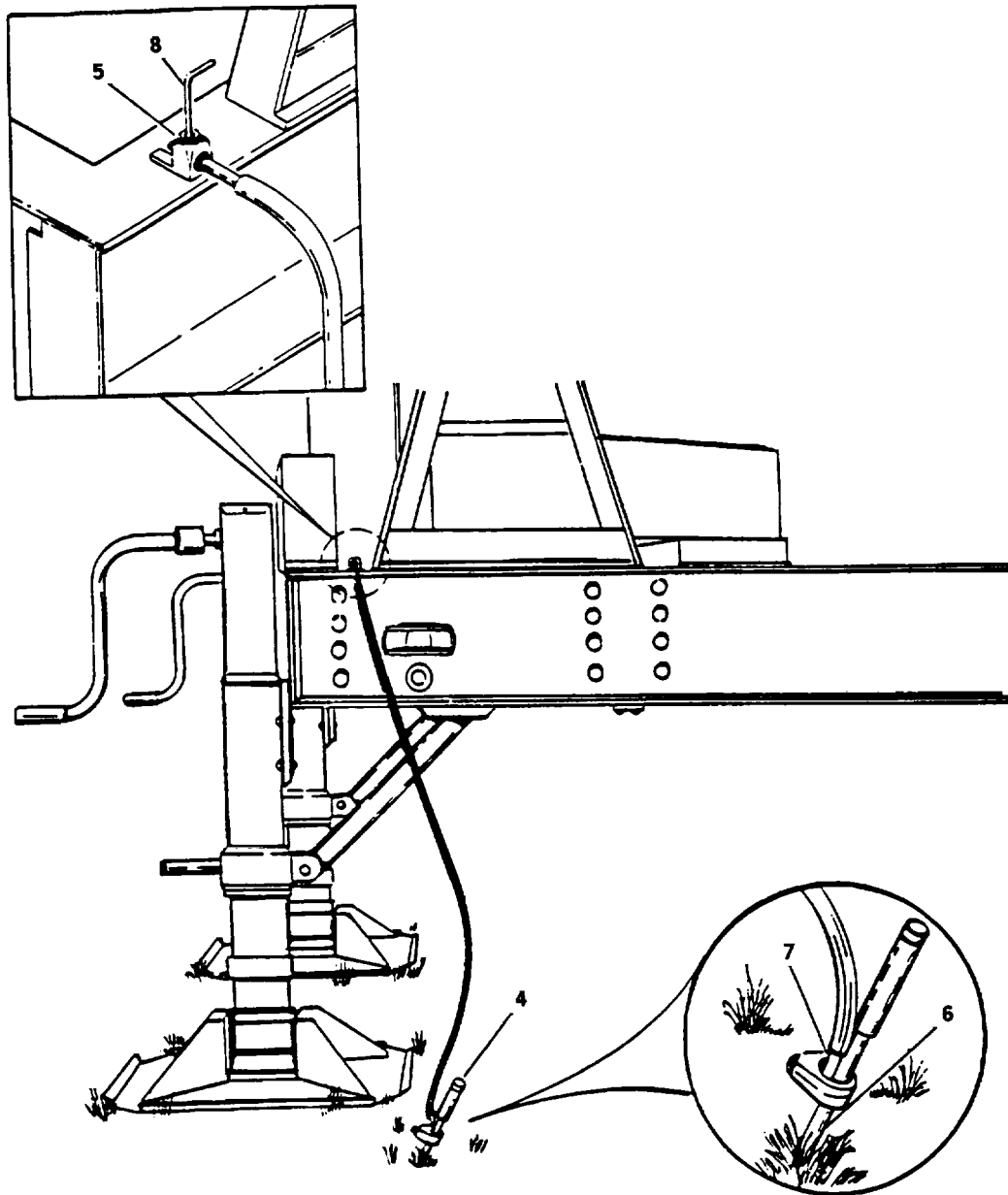
- (i) Repeat the above procedure for all remaining Laconia and/or screw type anchors.
- (j) Prepare the anchor tool for restowing. Connecting the tensiometer cable to its stowed position on the leg using the shackle. Remove the slack from the cable.
- (k) Fold the legs of the anchor tool together and secure with the containment strap.
- (1) Use two crew members to return the anchor tool to its stowage location on the AB-1309 trailer. Slide the tool into the storage compartment feet first. Close and secure the compartment door.

f. Grounding AB-1309 Trailer

- (1) Assemble the three-piece ground rod using three brass sleeves, from paragraph 2-7.c.(3).
- (2) Screw protecting bolt, from paragraph 2-7.c. (3), onto uppermost sleeve.
- (3) Position ground rod (4) approximately 1 foot (25.4 cm) away from rear curbside trailer under ground lug.
- (4) Make sure rear curbside ground lug (5) on trailer is not painted over. Scrape off paint to expose bare metal if required.
- (5) Retrieve sledgehammer from its stowed position on trailer.
- (6) Use sledgehammer to drive ground rod to within 6 inches (15.24 cm) from ground (6).
- (7) Attach one ground clamp (7) to ground rod.
- (8) Attach one end of ground cable to exposed portion of ground rod.
- (9) Use hex key (8) to attach other end of ground cable to system grounding lug located at rear curbside of trailer.

2-7. PREPARATION FOR USE - Continued

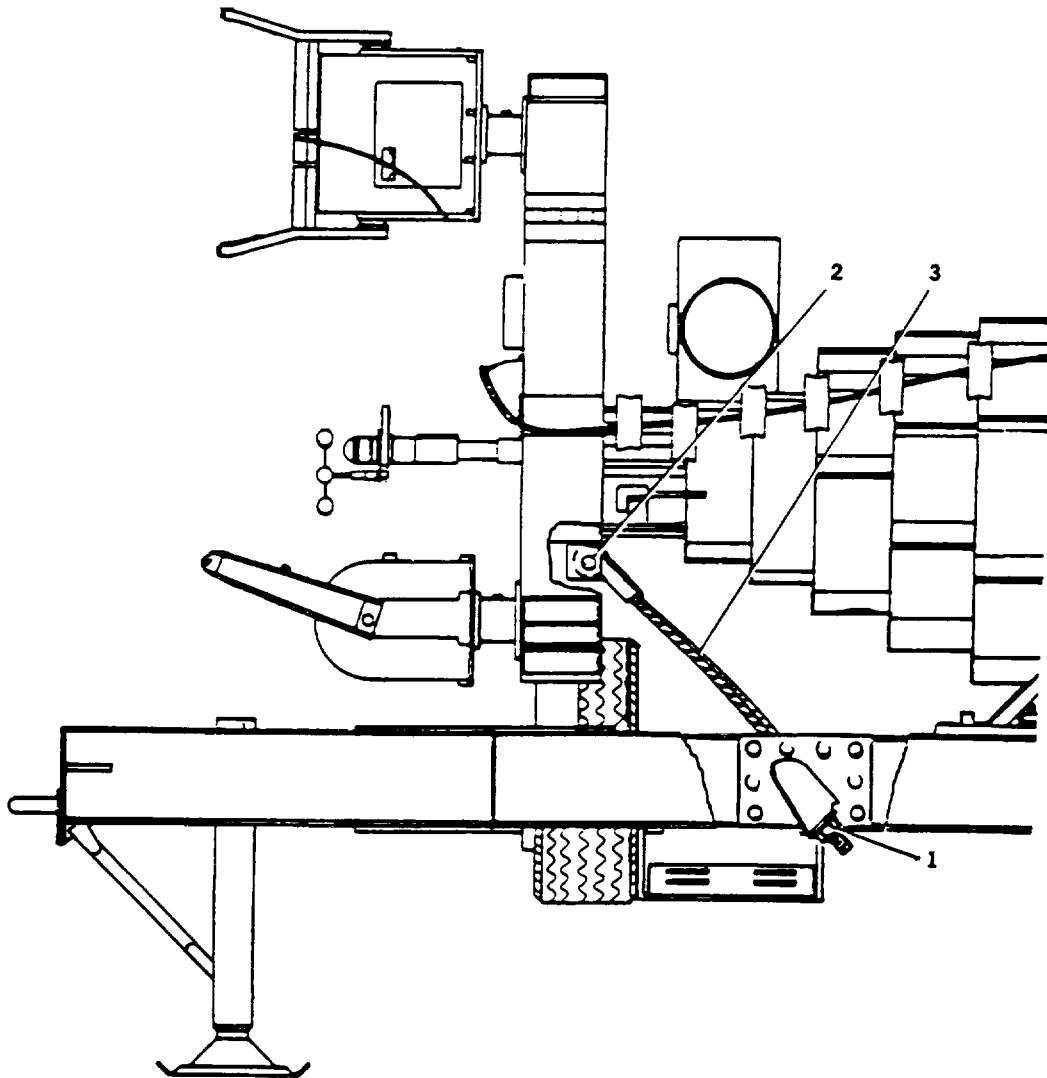
f. Grounding the AB-1309 Trailer - Continued



- (10) Attach second ground clamp (to be used later) to ground rod.
- (11) Use multimeter to test continuity between trailer frame and ground rod.

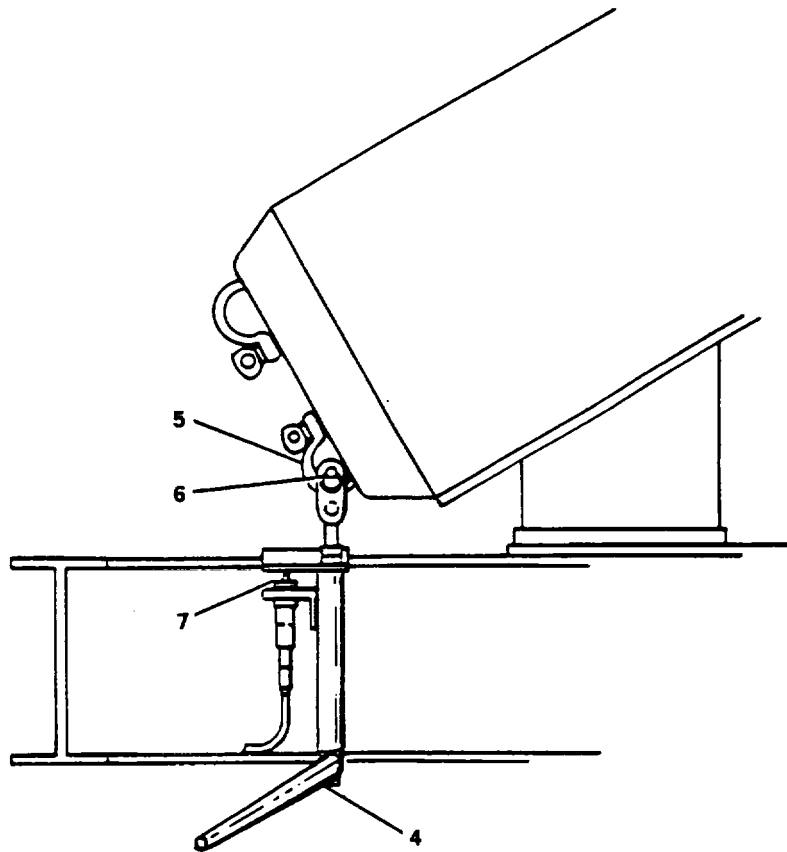
2-7. PREPARATION FOR USE - Continued

g. Releasing Front Tie-Down Interlocks



2-7. PREPARATION FOR USE - Continued**g. Releasing Front Tie-Down Interlocks - Continued**

- (1) If connected, disconnect two shipping cables from bottom center of tower section (located above spare tire) as follows:
 - (a) Loosen nuts (1) on two shipping cables.
 - (b) Remove pins (2) connecting two shipping cables to bottom center of tower.
 - (c) Remove two shipping cables (3) from tower.

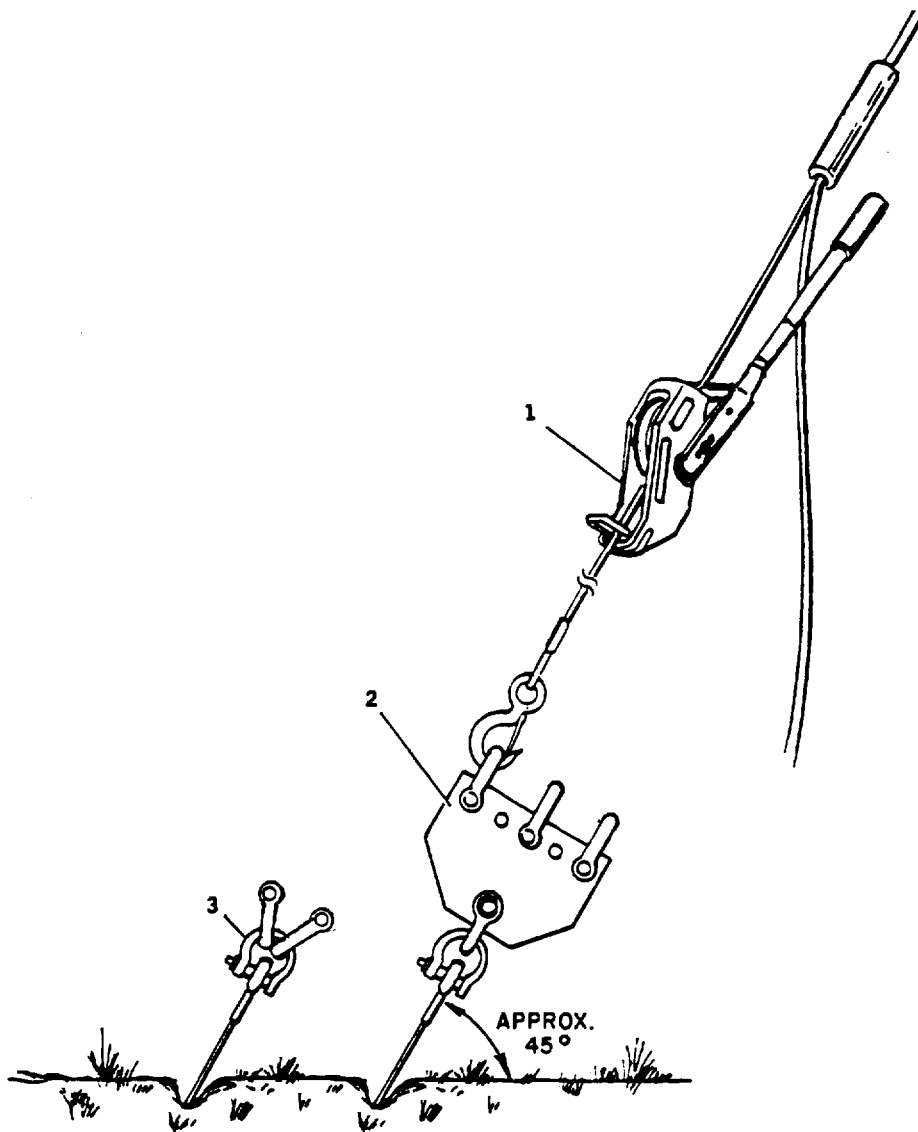


2-7. PREPARATION FOR USE - Continued**g. Releasing Front Tie-Down Interlocks - Continued**

- (2) Loosen roadside and curbside camlock handles (4) to relieve pressure on two white guy cable shackles (5) (on tower).
- (3) Disconnect pins (6) from white guy cable shackles.
- (4) Tighten roadside and curbside camlock handles and make sure microswitches (7) are engaged.

NOTE

If microswitches are not engaged, tower will not tilt.

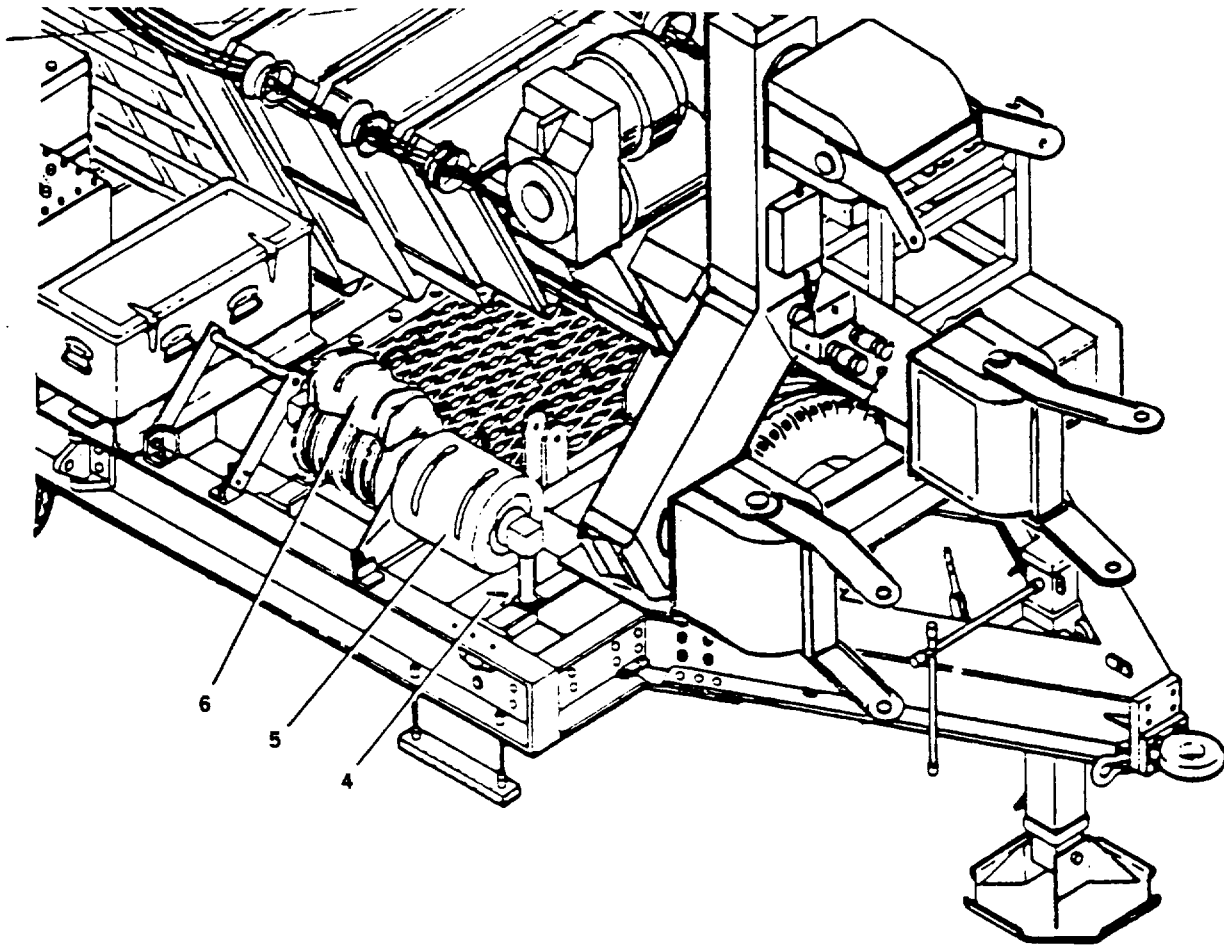
h. Layout of Guy,Cablea and Accessories

2-7. PREPARATION FOR USE - Continued**h. Layout of Guy Cables and Accessories - Continued**

- (1) Remove 15 come-alongs (1) from accessory bag and place 5 each at each anchor point.

CAUTION

Check come-alongs for proper mechanical motion. Ensure all come-along pins, nuts, and bolts are firmly seated and secured in place.



- (2) At each anchor point, attach three come-alongs to guy assembly plate (2) and two to shackle (3). Extend come-alongs to their maximum length. Make sure the three come-along hooks (attached to guy assembly plate) all point down.

2-7. PREPARATION FOR USE - Continued**h. Layout of Guy Cables and Accessories - Continued**

- (3) Remove retaining pin (4) from guy cable reel assemblies (5), (two curbside, one roadside).
- (4) Remove pins from locking bars, raise bars, and swing assemblies fully outward.
- (5) Replace pins (4) and firmly secure reel assemblies in their extended positions.
- (6) Remove vinyl covers (6) from three guy spool reels and store.

WARNING

Crew members must wear gloves, hard hats and eye protection at all times when working with guy cables.

NOTE

Steps (7) and (8) require two operators; one to pull cable out past anchor locations, and one to apply hand pressure to cable reels to prevent overtravel. As each cable comes to its end on reel, the operator applying hand pressure signals, pulling individual to stop and drop appropriate cable. Each cable in turn will be pulled out to its maximum limit and dropped. Cables must not be allowed to twist or wrap around each other.

- (7) Deploy guy cables, one at a time, to each anchor location.
- (8) Inspect guy cables as they are laid out and replace frayed cables only.

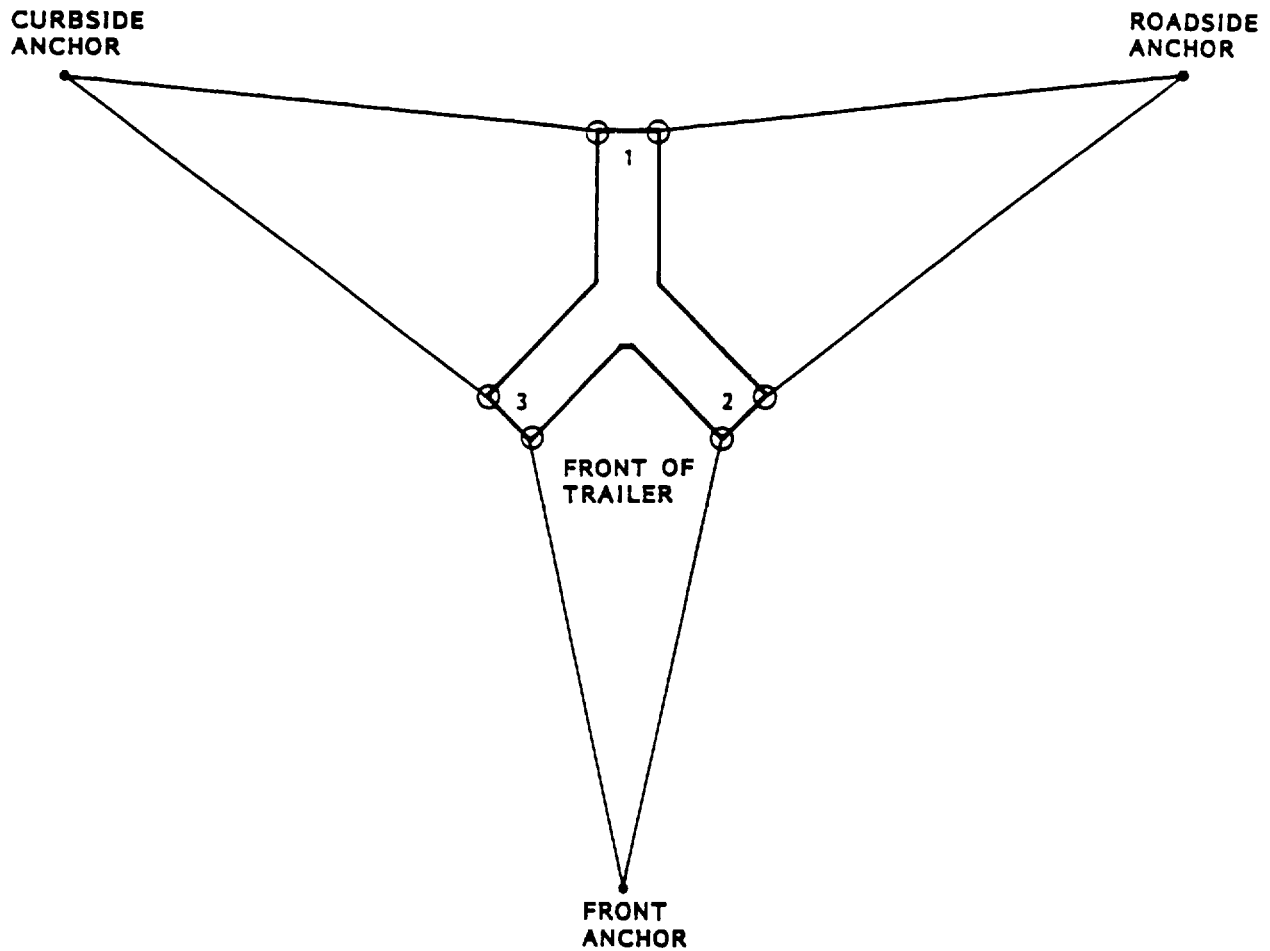
NOTE

Two white guy cables are approximately 30 feet (10.91 m) longer than other white guy cables. These two longer cables must be connected to upper antenna rotator arms.

2-7. PREPARATION FOR USE - Continued

h. Layout of Guy Cables and Accessories - Continued

- (9) When deployment of guy cables is complete and if not already done, remove 13 color-coded guy cable shackles from accessory bag and attach to antenna mast sections as follows:
 - (a) Attach three black guy cable shackles to three black tower holes.
 - (b) Attach three silver guy cable shackles to three silver tower holes.
 - (c) Attach three red guy cable shackles to three red tower holes.
 - (d) Attach four white guy cable shackles to four remaining white antenna rotator arm holes.
- (10) Attach black, silver, red, and white guy cable hooks to antenna mast shackles, attached in paragraph 2-7.h.(9), as follows:



2-7. PREPARATION FOR USE - Continued

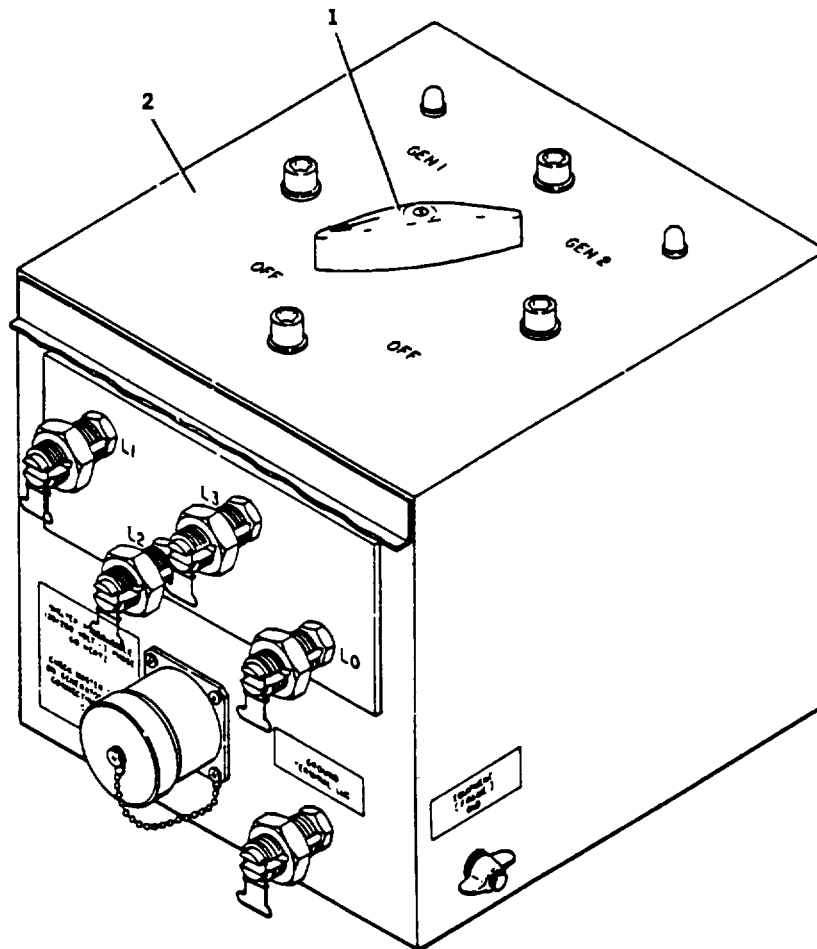
h. Layout of Guy Cables and Accessories - Continued

NOTE

Make sure open end of guy cable hooks point toward tower (when tower is elevated).

- (a) Attach three black guy cable hooks to three black tower shackles.
 - (b) Attach three silver guy cable hooks to three silver tower shackles.
 - (c) Attach three red guy cable hooks to three red tower shackles.
 - (d) Attach six white guy cable hooks to six white antenna rotator arm shackles in accordance with preceding illustration.
- (11) Swing cable reels back in place and secure with retaining pins.

2-8. OPERATION TO ERECT TOWER

a. Startup Procedures**WARNINGS**

- Selector Switch (1) on power distribution box must be set to OFF to ensure high voltage power is removed from equipment for safety.

- (1) Place selector switch (1) on power distribution box (2) to one of the OFF positions.
- (2) On generator control panel, set AMMETER-VOLTMETER TRANSFER SWITCH for 3 L3-L1 L3.
- (3) Make sure that all power switches on tower control box are in OFF position.

2-8. OPERATION TO ERECT TOWER - Continued**a. Startup Procedures - Continued**

- (4) Check hydraulic fluid level in hydraulic fluid reservoir located directly in front of rear trailer crossmember. Refill as required with proper grade oil for temperature conditions.
- (5) Check AC OUTPUT reconnection switch hydraulic ISO is in the 120/208V 3PH position.
- (6) No power connections are required for operation of AB1309. Trailer is wired prior to shipment.

CAUTION

Do not let generator idle for prolonged periods of time. To prevent damage to voltage regulators, adjust output voltage and frequency as soon as generator is started.

- (7) Start selected generator in accordance with applicable technical manual.

NOTE

If you have 120 volts on voltmeter, ensure AMMETER-VOLTMETER TRANSFER SWITCH is in 3-phase position reading 2 legs.

- (8) After generator is set and operating, place AC CIRCUIT BREAKER to ON position.
- (9) Go to curbside of trailer and place selector switch on power distribution box to generator that is running.

NOTE

One of two indicator lights (green) on power distribution box will light to indicate generator selected and operating.

- (10) After all grounding straps are connected to equipment ground terminals, use a multimeter to perform following procedure to check adequacy of your grounding system.
 - (a) Set multimeter for ac voltage.
 - (b) With system power on, place positive (red) lead to a bare metal area on trailer.

2-8. OPERATION TO ERECT TOWER - Continued**a. Startup Procedures - Continued**

- (c) Place negative (black) lead on ground rod.
- (d) An indication of 0 to 5 volts shows adequate grounding. Any indication over 5 volts indicates a poor ground.

NOTE

If grounding system checks satisfactorily, fill in all holes. If grounding is not satisfactory, refer to paragraph 2-6.c.(2), and perform procedure under Soil Condition.

b. Installing Reflector Dishes

- (1) If upper positioner platform arm has been folded for transportation, unfold as follows:

WARNING

Due to the weight of the arm with positioner, two persons are required to unfold the arm. Failure to comply could result in serious injury or death to personnel.

- (a) On front side and curbside of arm, remove clip pins from hinge pins and remove hinge pins.
 - (b) On roadside, remove clip pin from stowage pin and remove stowage pin.
 - (c) Carefully lift arm into position and insert hinge pins removed in step (a). Install clip pins in hinge pins.
 - (d) Insert stowage pin in lower portion of arm and secure with clip pin.
- (2) Attach W109 cable to tower control box at W109 and to center connection on outermost reel.

2-8. OPERATION TO ERECT TOWER - Continued**b. Installing Reflector Dishes - Continued**

- (3) Power up system (refer to paragraph 2-8.a., as applicable); test ground; and as follows; move positioner arm mounting brackets, allowing antenna reflector installation.
 - (a) Position SYSTEM POWER, MAIN POWER, and CONTROL POWER switches to ON.
 - (b) Position POS & DISPLAY circuit breaker to ON.
 - (c) Position antenna positioner control unit ON/OFF switch to ON.
 - (d) Position antenna positioner control unit PEDESTAL SELECT switch to 1, 2 or 3.
 - (e) Use antenna positioner control unit joystick to position arm as required to allow installation of dishes.
 - (f) Shut down system (reverse of above) until ready to tilt tower. (Remove W109 Cable between tower control box and center connection on outermost reel.) Perform steps (4) and (5) for AN/GRC-222 radio (AN/TRC138B or AN/TRC-175A shelters).

Perform steps (6) and (7) for the AN/GRC-103 radio (AN/TRC-173A or AN/TRC-174A shelters).

- (4) Antenna Assembly, AS-1425/GRC Installation.

NOTE

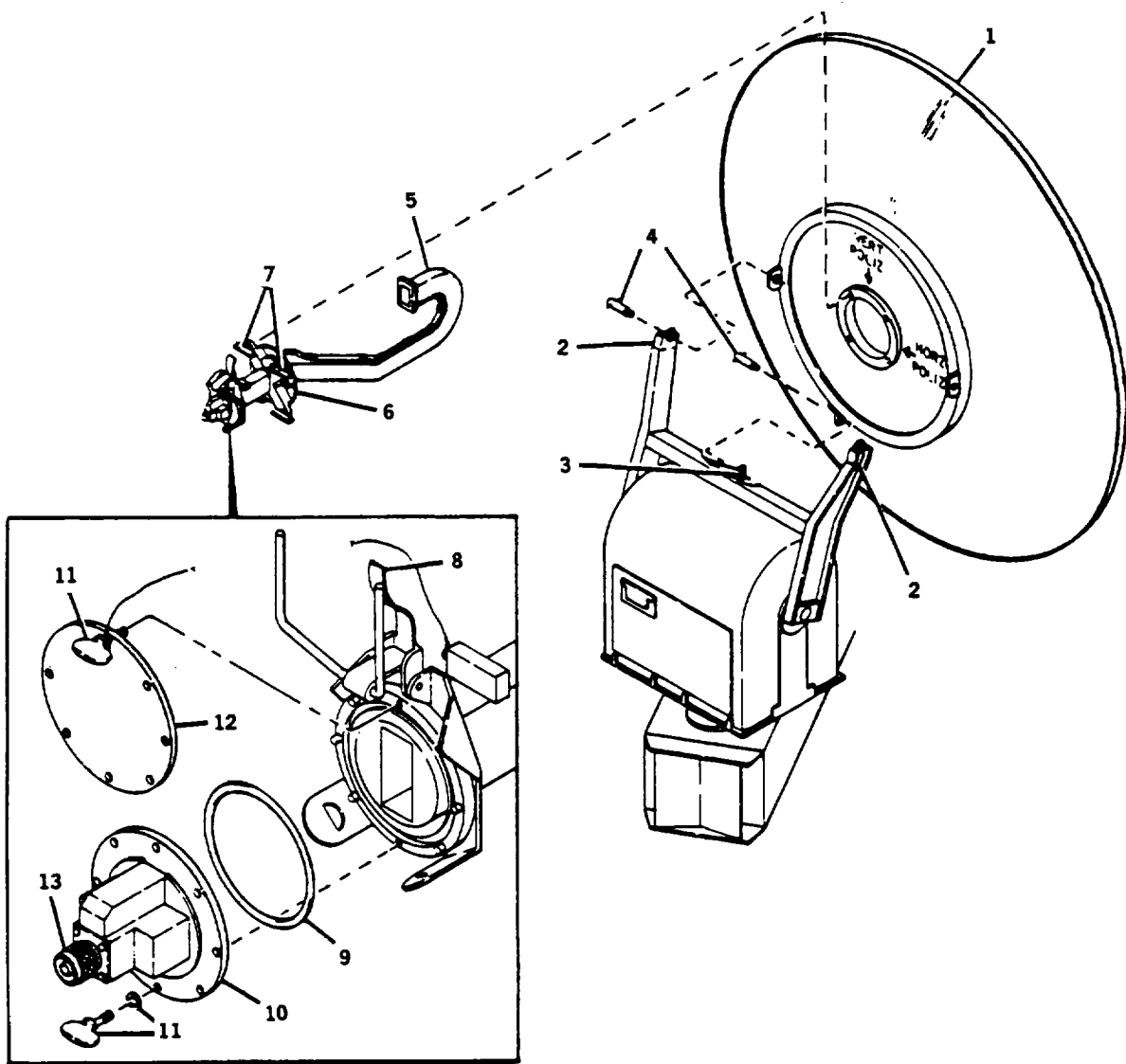
AS-1425/GRC antenna assembly consists of antenna reflector feedhorn assembly (5), coaxial-towaveguide adapter (10), and jumper cable assembly (14).

CAUTION

To prevent possible damage to antenna reflector, assistance of a second crew member is recommended when performing this procedure.

2-8. OPERATION TO ERECT TOWER - Continued

b. Installing Reflector Dishes - Continued



To mount AS-1425/GRC antenna assembly to AB-1309 antenna positioner assembly, perform following procedure:

- (a) Remove antenna reflector and all necessary mounting hardware noted above from AB-1309 storage rack.
- (b) Remove three positioner arm mounting bolts (4).
- (c) Carefully align reflector assembly (1) with positioner arm mounting brackets (2) and (3).

2-8. OPERATION TO ERECT TOWER - Continued**b. Installing Reflector Dishes - Continued**

- (d) Insert and tighten positioner arm mounting bolts (4) .
- (e) Unsnap clamp assembly (8) and remove thumbscrews (11).
- (f) Remove cover plate (12) and store for future use.
- (g) Keeping rubber O-ring gasket (9) in place, insert waveguide-to-coaxial adapter (10) in place of cover plate (12).

CAUTION

When installing waveguide-to coaxial adapter, make sure interior walls of adapter and rear of feedhorn are aligned correctly. Grave damage will result to AN/GRC-222 radio set, if waveguide walls are not aligned, due to high VOLTAGE STANDING WAVE RATIO (VSWR).

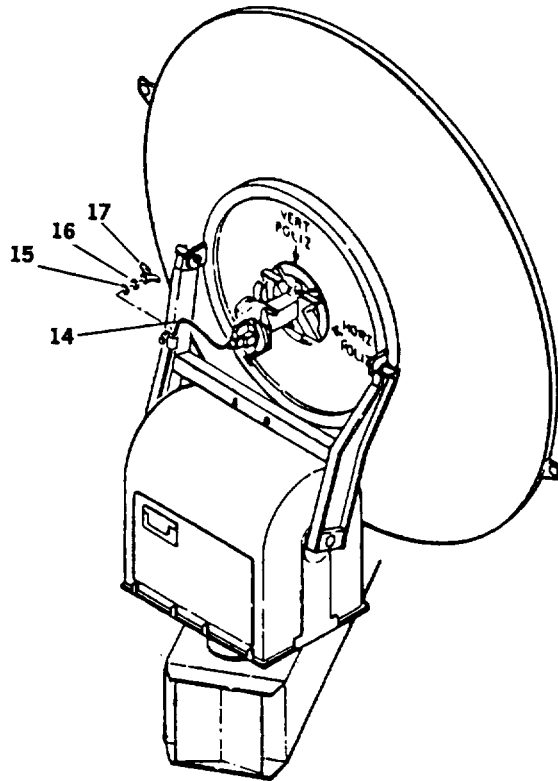
- (h) Insert and tighten two thumbscrews (11).
- (i) Place clamping bar in place and snap down.
- (j) Insert front end of antenna feedhorn (5) through rear of antenna reflector until mounting plate (6) is flush with reflector.

NOTE

Rotate antenna feedhorn assembly for horizontal or vertical polarization as established for your system by matching arrows.

- (k) Secure antenna feedhorn to reflector by tightening four mounting wing screws (7).
- (l) Remove two wing nuts (17), lock washers (16) and washers (15) from cable clamps on jumper cable (14).
- (m) Position jumper cable (14) on positioner arm and secure cable clamp assemblies with wing nuts (10), lock washers (16) and washers (15).

2-8. OPERATION TO ERECT TOWER - Continued

b. Installing Reflector Dishes - Continued

(n) Connect jumper cable (14) to connector (13) on coaxial-to-waveguide adapter (10).

(o) Connect GFE heater power cord to connector on top of feedhorn between top two connector brackets and the left hand connector on rear of positioner.

(p) Install remaining antenna assemblies by repeating above procedure.

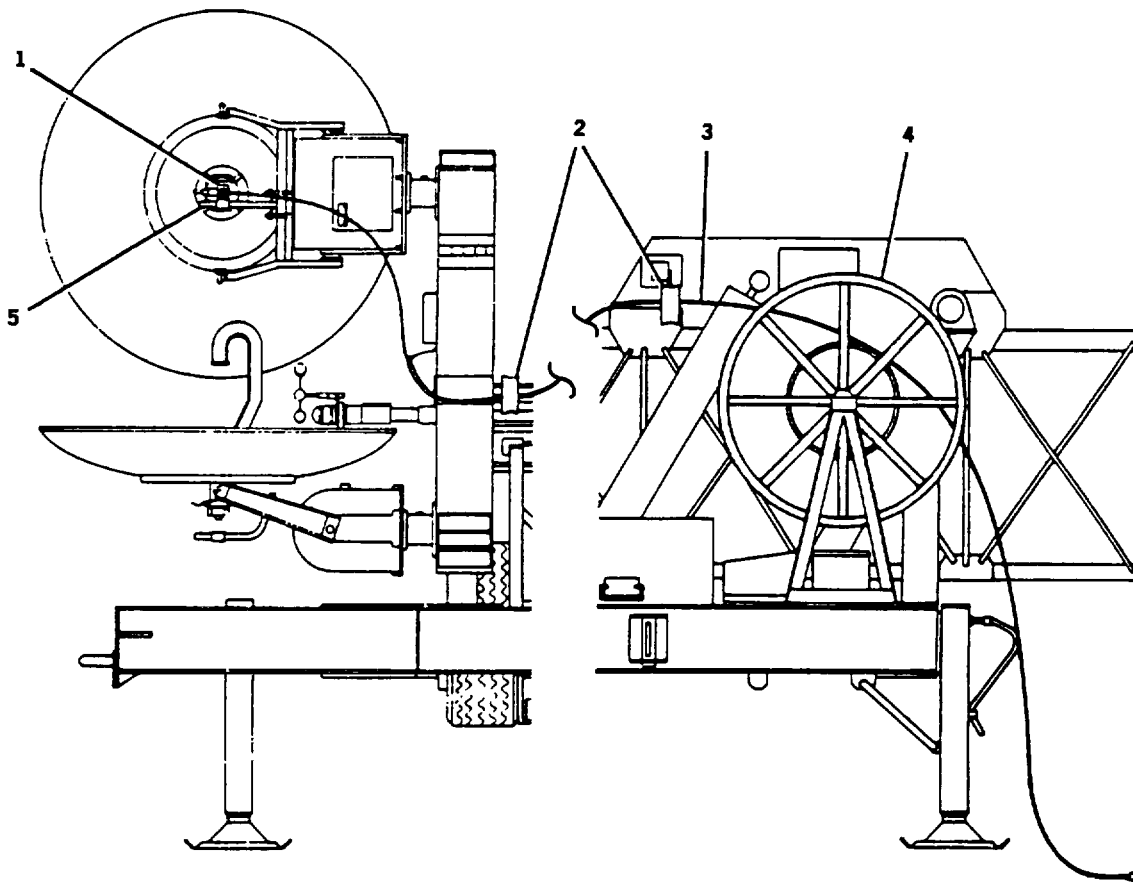
(5) RF Cabling Assembly (A3011256) Installation.

To install low loss rf cables between AB-1309 antenna mast and AN/TRC-138B or AN/TRC-175A shelter, perform following procedure.

2-8. OPERATION TO ERECT TOWER - Continued**b. Installing Reflector Dishes - Continued****NOTE**

Before installing rf cable assemblies on AB-1309 trailer cable reels, establish which reels are to be used with each antenna reflector dish. Mark reel and label ground end of rf cable being installed (i.e., reel no. 1, rf cable no. 1 to radio no. 1).

- (a) Unpack nine rf cables [54 feet (16.5 m)].
- (b) With rf cable end marked ANTENNA, string one 54foot (16.5 m) rf cable section through tower cable guides (2).



2-8. OPERATION TO ERECT TOWER - Continued

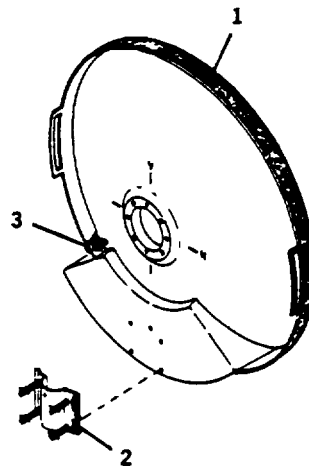
b. Installing Reflector Dishes - Continued

- (c) On L-Shaped cable relief bracket (5), loosen cable strain relief clamp (1) enough to allow rf cable to slip through.
 - (d) Push rf cable through cable strain relief clamp far enough to allow connection to antenna jumper cable.
 - (e) Connect rf cable to jumper cable.
 - (f) Wrap remaining rf cable (3) over top of antenna cable reel (4).
 - (g) Connect second and third 54-foot (16.5 m) rf cables and secure unattached cable end, using velcro strap, to inside ring of selected cable reel. Make sure cable end is properly identified. Wrap cable onto reel in same direction as step (f) above.
 - (h) Repeat steps (a) thru (g) to string other rf cable pairs to be used for SYSTEM 2 AN/GRC-222 radio set.
- (6) Antenna Assembly, AS-3047/GRC-103(V) Installation

NOTE

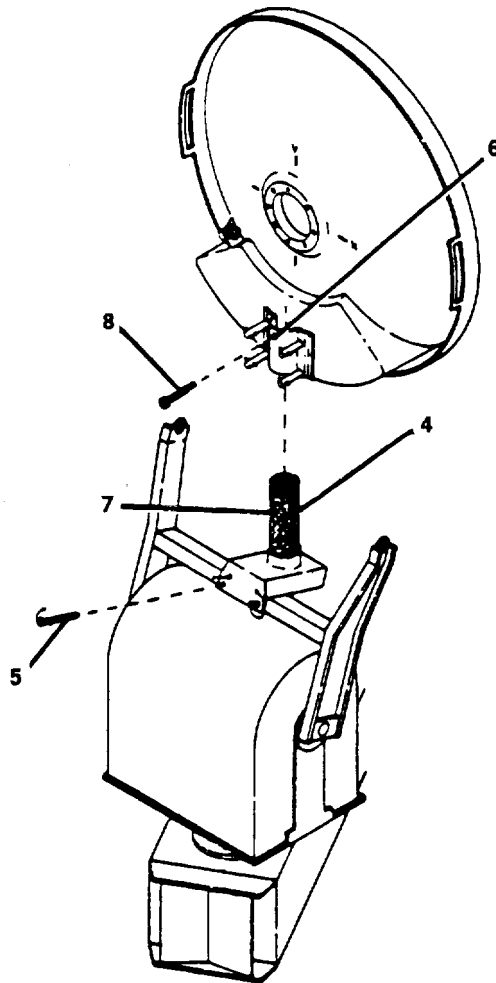
AS-3047 antenna assembly consists of AS-3414/GRC-103(V), Antenna Reflector, and AS-3415/GRC-103(V), Antenna Feed.

To mount antenna assembly AS-3047/GRC-103(V) to AB-1309 antenna positioner assembly, perform following:



2-8. OPERATION TO ERECT TOWER - Continued**b. Installing Reflector Dishes - Continued**

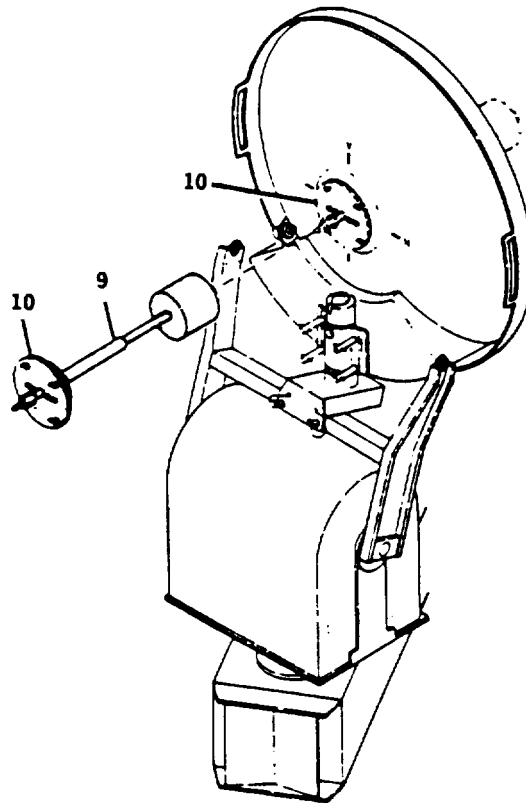
- (a) Remove antenna reflector (1) from AB-1309 storage rack.
- (b) Attach collar assembly (2) to reflector dish. Do not tighten.
- (c) Attach bulkhead adapter UG-1375/U (3) to bracket on reflector dish (1) and tighten.



- (d) Mount antenna adapter assembly (P/N T-85591) (4) to AB-1309, antenna positioner assembly and secure with hardware (5).

2-8. OPERATION TO ERECT TOWER - Continued**b. Installing Reflector Dishes - Continued**

- (e) Place antenna reflector over antenna adapter assembly (4) and align reflector mounting collar locating pin hole (6) with locating slot (7) on antenna adapter assembly.
- (f) Insert bolt (8) and tighten.
- (g) Tighten four clamping screws on reflector mounting collar.
- (h) Remove antenna horn from AB-1309 storage rack.

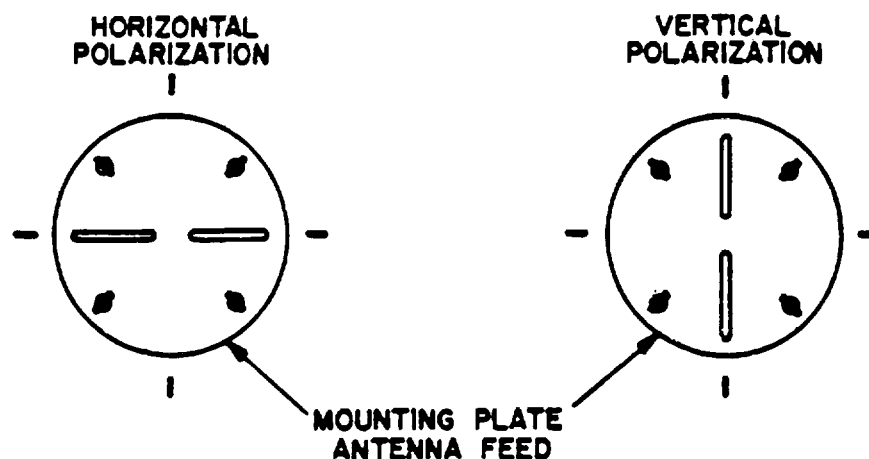


- (i) Insert front end of antenna feed (9) through rear of antenna reflector until mounting plate (10) comes in contact with antenna reflector.

2-8. OPERATION TO ERECT TOWER - Continued

b. Installing Reflector Dishes - Continued**NOTE**

Rotate antenna feed for horizontal or vertical polarization as established for your system.



- (j) Attach antenna feed to antenna reflector by locking four 1/4-turn fasteners.
 - (k) Attach 6-foot (1.83 m) coaxial cable to bulkhead adapter (3) and antenna feed (9).
 - (l) Install remaining antenna assemblies by repeating above procedure.
- (6) RF Cabling Assembly (CG-3443/U) Installation

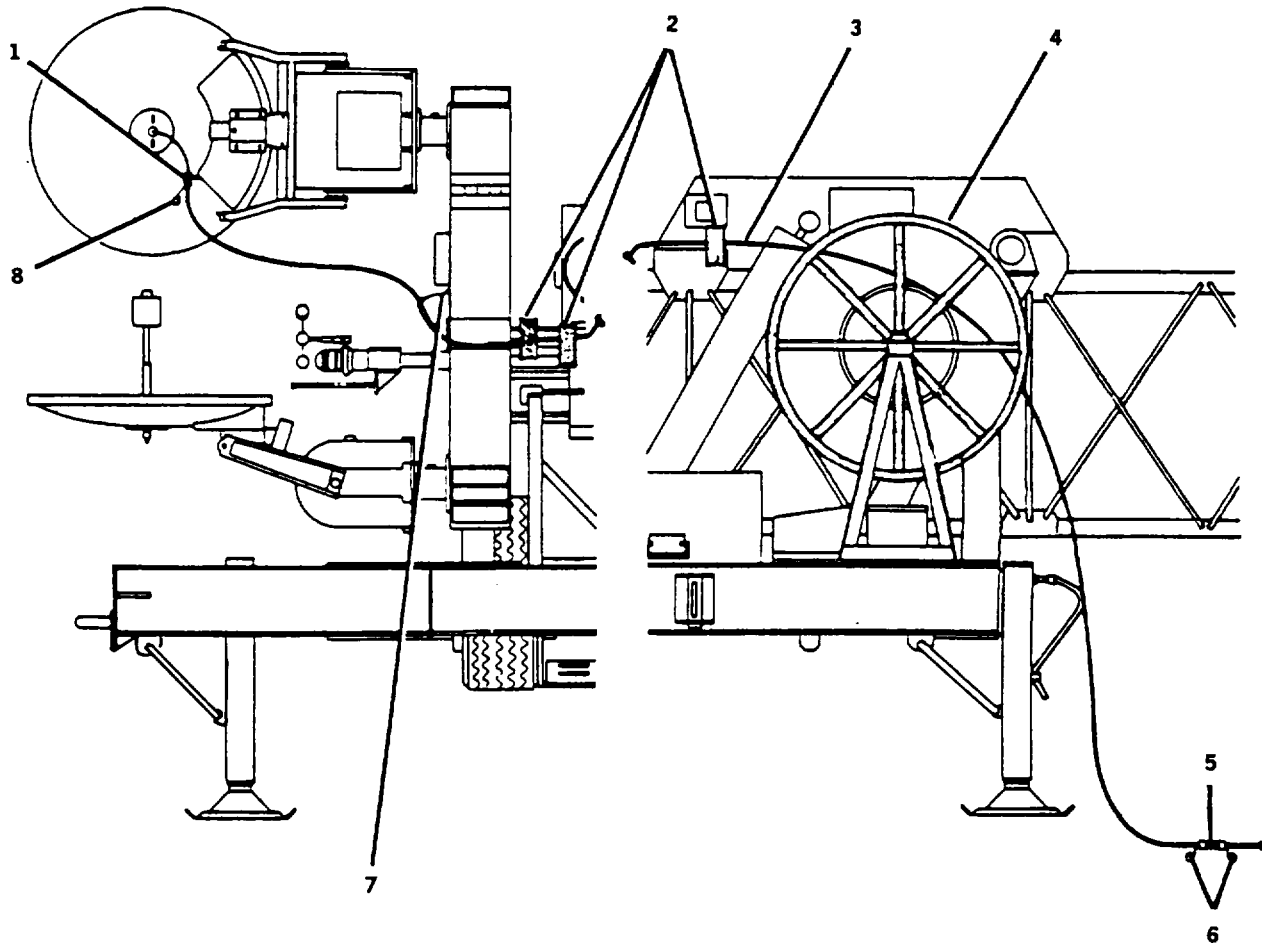
To install rf cables between AB-1309 antenna mast and the AN/TRC-173 or AN/TRC-174 shelter, perform following procedure:

- (a) Unpack nine rf cables [54 feet (16.5 m)] and six (UG-1373/U connector adapters).

NOTE

Before installing rf cable assemblies on AB-1309 trailer cable reels, establish which reels are to be used with each antenna reflector dish. Mark reel and label ground end of rf cable being installed (i.e., reel no. 1, rf cable no. 1 to radio no. 1).

2-8. OPERATION TO ERECT TOWER - Continued

b. Installing Reflector Dishes - Continued

- (b) String one 54-foot (16.5 m) rf cable through tower cable guides (2).
- (c) Remove protective cover (8) and connect rf cable to AS-3047/GRC-103(V) reflector assembly (1).
- (d) Connect cable strain relief (7).
- (e) Wrap remaining rf cable (3) over top of antenna cable reel (4).
- (f) Connect second 54-foot (16.5 m) rf cable by removing protective covers (6) from both ends of cables.
- (g) Using adapter UG-1373/U (5), connect both rf cables.
- (h) Connect third 54-foot (16.5 m) rf cable. See steps (f) and (g).

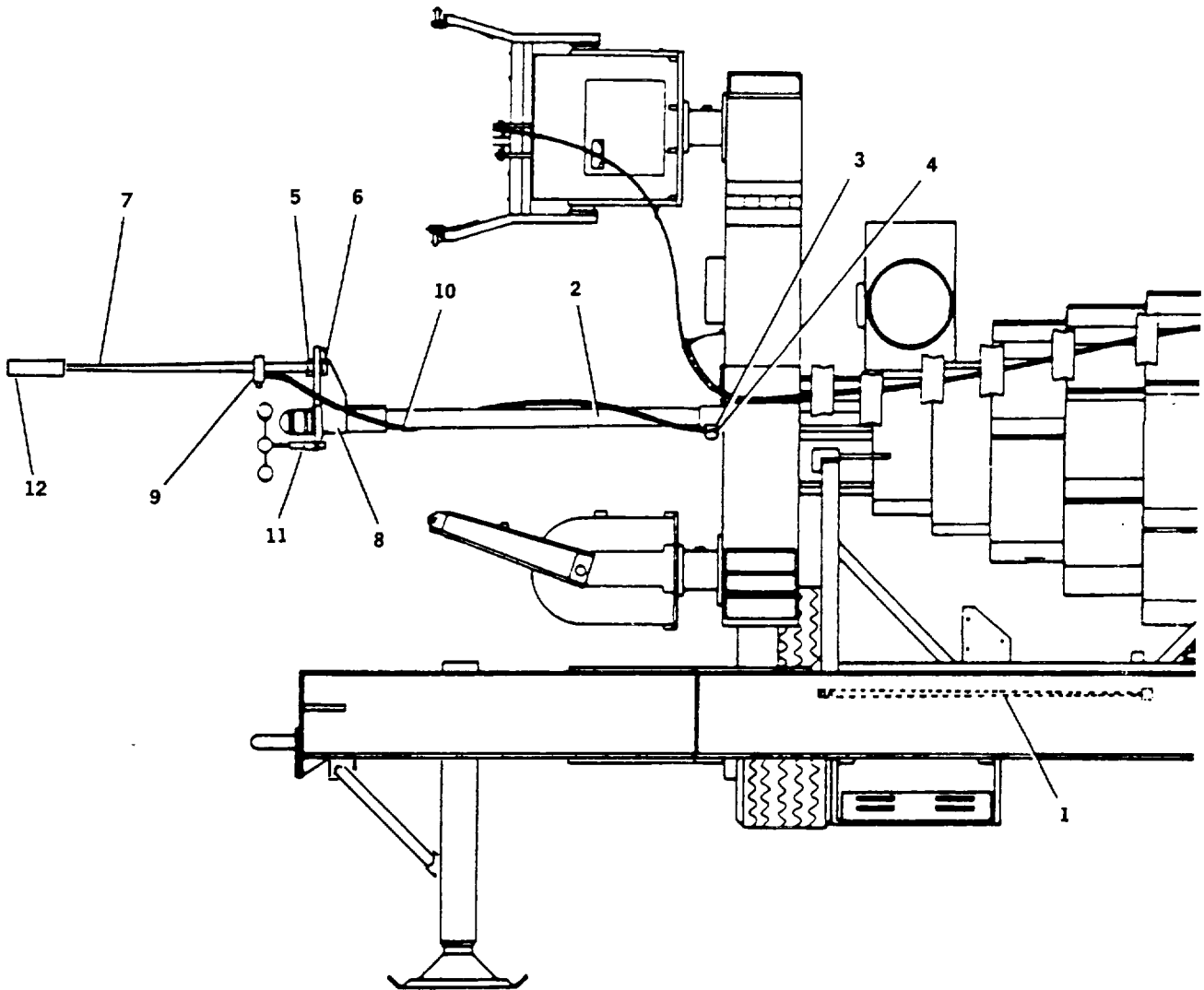
2-8. OPERATION TO ERECT TOWER - Continued

b. Installing Reflector Dishes - Continued

- (i) Secure unattached cable end, using velcro strap, to inside ring of selected cable reel. Make sure cable end is properly identified. Wrap cable onto reel in same direction as step (3) above.
- (j) Repeat steps (a) thru (i) to string other pairs of cables to be used for GRC-103-2 and GRC-103-3 radios.

(7) Connect de-icer power cord for cold weather operation (if required).

c. Installing Lightning Rod and Positioning Obstruction Light



2-8. OPERATION TO ERECT TOWER - Continued**c. Installing Lightning Rod and Positioning Obstruction Light - Continued****WARNING**

Do not remove plastic tubing from lightning rod! It must be retained and kept in place at all times mast is horizontal and lightning rod is attached.

- (1) Remove lightning rod (1) from front roadside transit position under antenna carriage assembly.
- (2) Remove a ground clamp from accessory bag.
- (3) Unlock obstruction light support rod (2) by loosening two bolts (3) and jam nuts (4) on masthead.
- (4) Extend support rod a minimum of 5 feet (1.52 m) and rotate until hole for lightning rod is located above obstruction light. Secure it in place by tightening two bolts and jam nuts on masthead.
- (5) Use two lightning rod nuts (5) and (6) to attach lightning rod (7) to obstruction light support rod (8).
- (6) Use ground clamp (9) to connect ground strap (10) to exposed bottom portion of lightning rod (7).
- (7) Make sure all antenna connections are properly made, feedhorn polarity settings are properly set, and lightning rod and obstruction light (11) are properly mounted and secured.

d. Tilting Tower To Vertical Position

- (1) On topside of tower and underneath horizontal tower, directly above and slightly behind red guy shackles, check connectors are properly connected.

WARNINGS

- To prevent personal injury, do not climb tower at any time.
- Control box operator will at all times wear hard hat, hearing, and eye protection while under the tower.

2-8. OPERATION TO ERECT TOWER - Continued**d. Tilting Tower To Vertical Position - Continued****CAUTION**

Ensure rear jack handles are in stowed position prior to tilting tower to vertical position, otherwise damage to tower may occur.

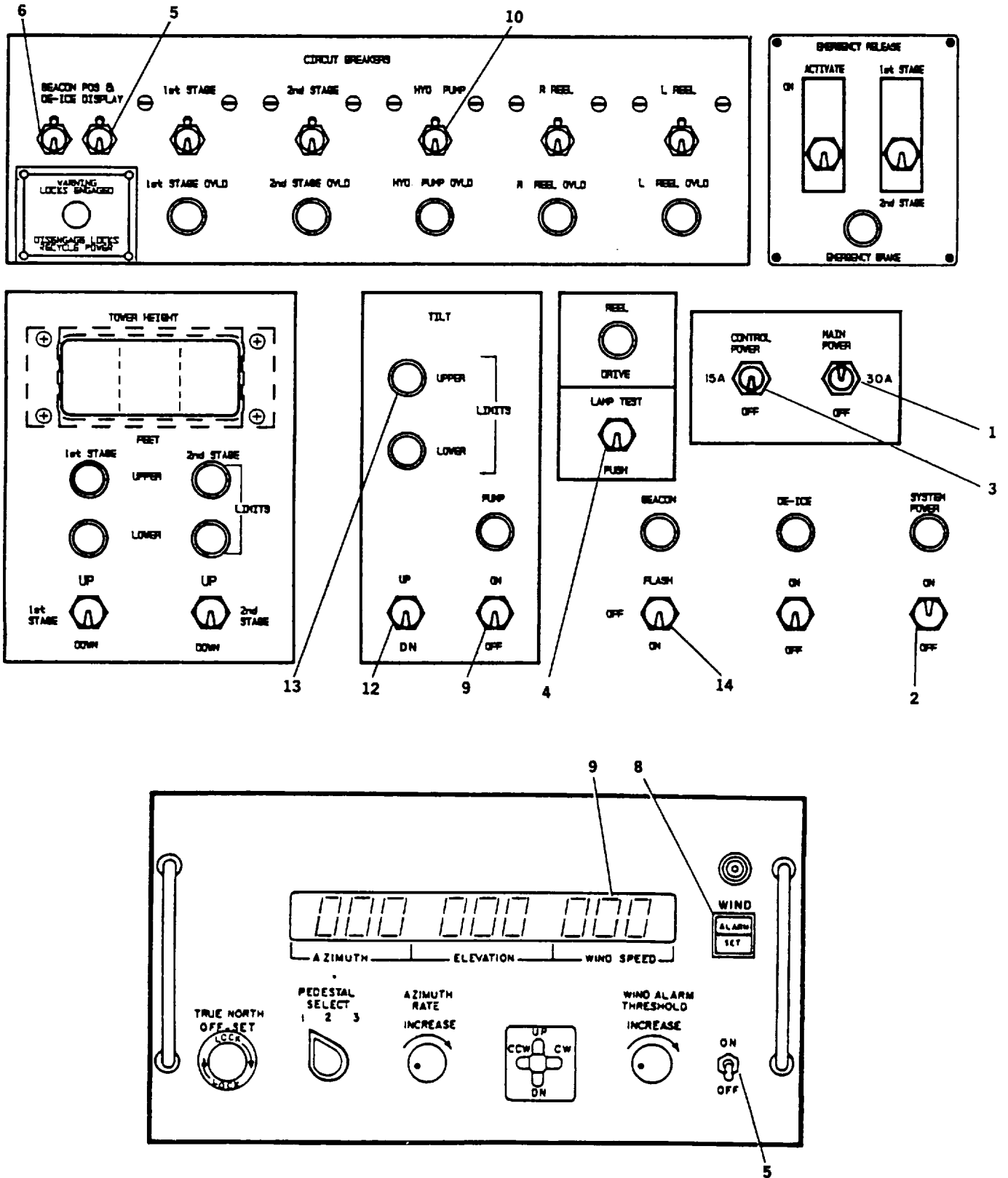
NOTE

Refer to Section IV, Paragraph 2-15, Operation Under Unusual Conditions for manually tilting tower to vertical position if equipment malfunctions.

- (2) Make visual and physical inspection of all tower sections for loose or missing bolts and tower section guides. If any bolts are loose OR any guides are missing, DO NOT proceed. Inform maintenance personnel.
- (3) Place following switches on tower control box to ON (up) position in sequence listed:
 - MAIN POWER (1)
 - SYSTEM POWER (2)
 - CONTROL POWER (3)
- (4) Push LAMP TEST switch (4). All lamps except EMERGENCY BRAKE, BEACON, and DE-ICE should light.
- (5) Replace any faulty lamps. Repeat step (4). If lamps still do not light, do not proceed. Inform maintenance personnel.
- (6) Connect antenna positioner interface cable (W109) to receptacle (J12) on lower left side of control box and to receptacle in center of outermost reel assembly, to the left of control box.
- (7) Place POS & DISPLAY (5) and BEACON DE-ICE (6) circuit breakers on control box to up position.
- (8) Place ON/OFF switch (7) in lower right corner of antenna positioner control unit to ON.
- (9) Observe WIND SET/ALARM indicator switch (8). Push switch until SET section of indicator is not lit.
- (10) Read wind speed on digital display (9).

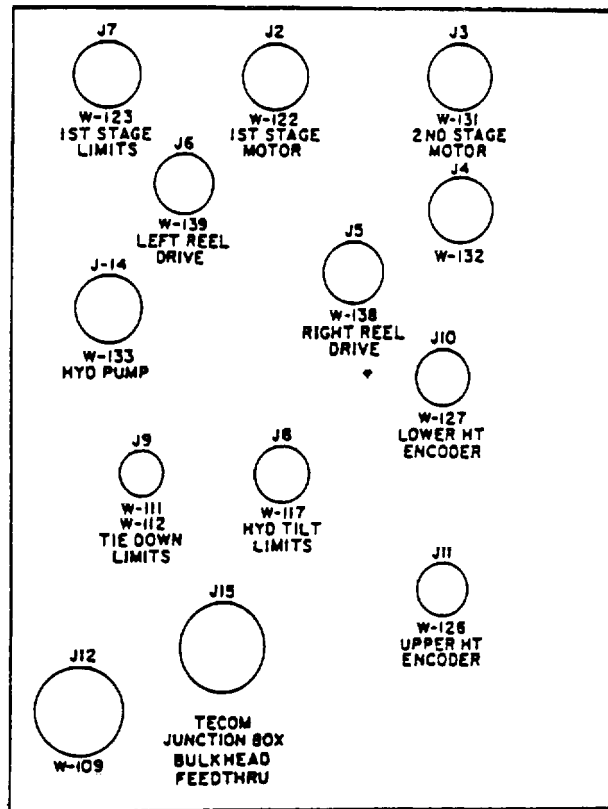
2-8. OPERATION TO ERECT TOWER - Continued

d. Tilting Tower To Vertical Position - Continued



2-8. OPERATION TO ERECT TOWER - Continued

d. Tilting Tower To Vertical Position - Continued



(11) Turn BEACON switch (14) to ON.

WARNING

Do not tilt tower if wind speed is greater than 33 mph (53.1 kmh).

NOTE

During early stage of tilting tower process, wind speed indicator reading will be accurate only if wind is blowing directly across trailer (from side to side). If wind is blowing from front to rear, reading will be significantly lower than true wind speed. In this situation, personal judgment must be used as to whether to begin tilting tower. A good rule to follow in such situations is: if treetops are bending, do not tilt tower to the vertical position.

2-8. OPERATION TO ERECT TOWER - Continued**d. Tilting Tower To Vertical Position - Continued**

- (12) Station, 30 feet (9.1 m) away from trailer, a crew member at front set of guy cables and another at roadside set of guy cables. They will control travel of cables. Crew member at tower control box will monitor curbside set of guy cables and stop periodically to check with other crew members.
- (13) Make following observations:
 - (a) Make sure guy cables at front, roadside rear, and curbside rear areas around trailer are laid out straight and are free of any obstructions.
 - (b) Individual stationed at front guy cables will monitor travel of all sets of guy cables with particular attention to unmanned curbside set.
 - (c) Until tower is fully erected, crew member operating mast control box will take instructions from crew member stationed at front set of guy cables.
- (14) Remove protector plastic tubing from end of lightning rod. Do not discard protector plastic tubing. Stow it and reuse when tower is returned to horizontal -i position.
- (15) Position HYD PUMP circuit breaker (10) to up (on).
- (16) Position TILT PUMP ON/OFF switch (11) to ON.

NOTE

Depending upon ambient temperature, it may take hydraulic pump up to 30 minutes to warm up hydraulic fluid.

- (17) Position and hold TILT UP/DN switch (12) to UP.
- (18) As tower tilts upward, monitor all guy cables. Make sure they do not become entangled or caught on anything. Observe following:
 - (a) All crew members must observe all cables for clearance.
 - (b) Tilting of tower may be stopped at any time for any reason and for visual inspection of equipment during tilting sequence.

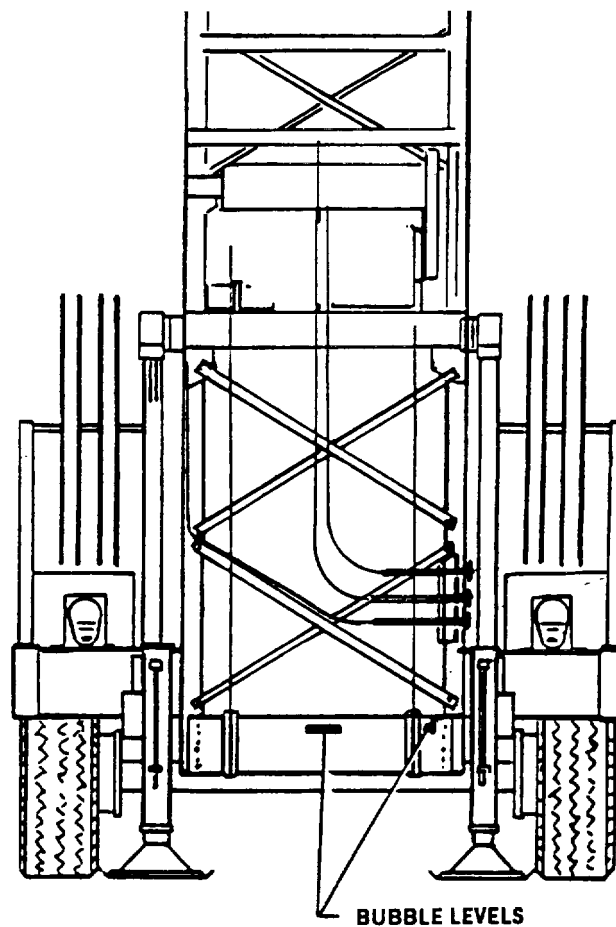
2-8. OPERATION TO ERECT TOWER - Continued**d. Tilting Tower To Vertical Position - Continued**

- (19) Release TILT UP/DOWN switch (12) to stop tilting process before base of tower makes its entry between two support jacks (approximately 75 to 80 degrees).
- (20) Walk to rear of trailer and make sure there is sufficient clearance for tower base. If there is no clearance, adjust jack stands on either curbside or roadside as required to ensure there is clearance.

NOTE

If jack stands are adjusted, check trailer remains level (refer to paragraph 2-7.b). Make sure there is no spare equipment laid under rear of trailer, rear support jack handles are secured in stored positions, and all cables are clear of rear area.

- (21) Position and hold TILT UP/DN switch (12) to UP until tower is vertical.



2-8. OPERATION TO ERECT TOWER - Continued

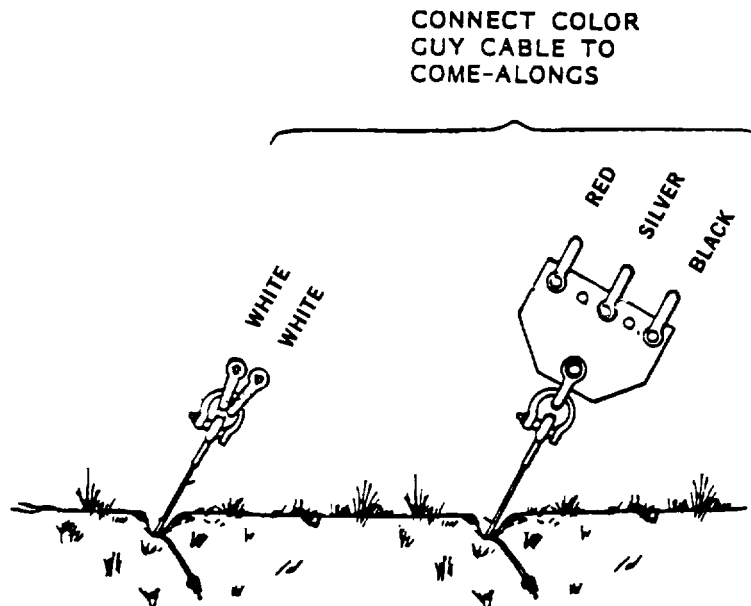
d. Tilting Tower To Vertical Position - Continued

- (22) Release TILT UP/DN switch when TILT UPPER LIMITS lamp (13) lights.
- (23) When tower is in vertical position and incline does not exceed 5 degrees, use support jack to level tower front to rear and side to side. Use bubble levels on rear of tower (see figure, page 2-79).

NOTE

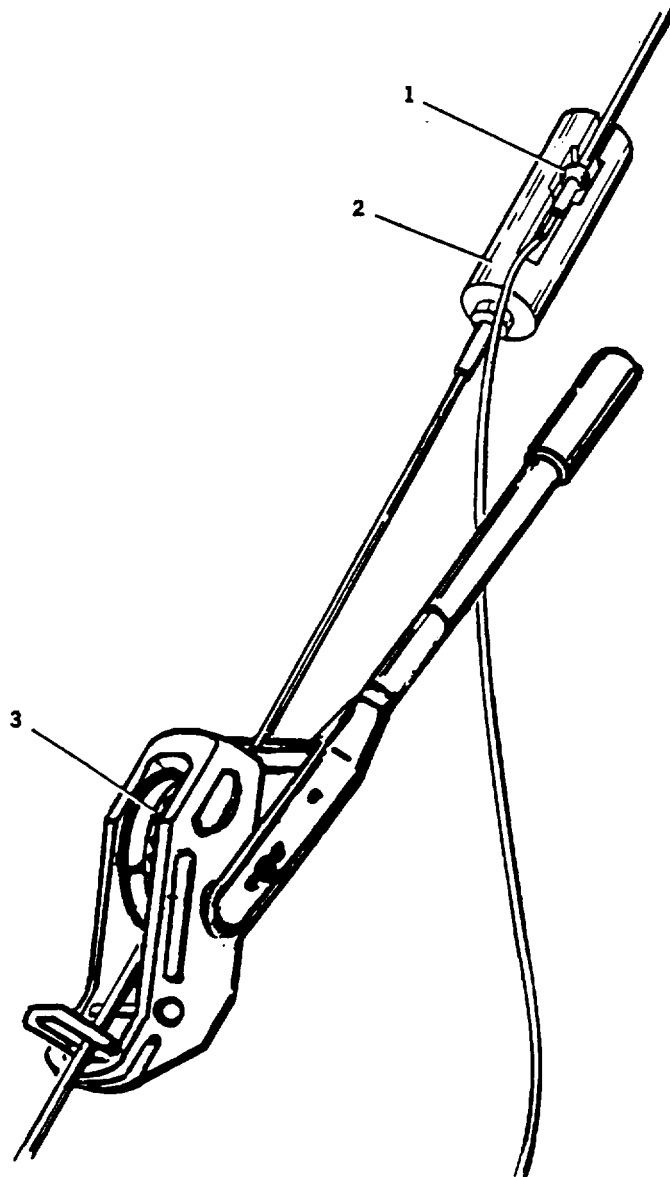
If bubble levels are damaged or missing, use carpenter's level.

- (24) If incline is between 6 and 10 degrees, use TILT UP/DN switch to level tower front to rear. Use bubble levels or carpenter's level on rear of tower.
- (25) If roadside-to-curb-side (lateral) adjustment is needed, adjust rear roadside and/or curbside support jacks until tower is level (vertical). Do not be concerned if trailer ends up off level. Tower being plumbed is most important consideration.
- (26) Position TILT PUMP ON/OFF switch (11) to OFF.
- (27) Position HYD PUMP circuit breaker (10) to down (OFF).
- (28) Perform following procedure at each anchor location:



2-8. OPERATION TO ERECT TOWER - Continued**d. Tilting Tower To Vertical Position - Continued**

- (a) Select come-along attached to bottom shackle on anchor plate (come-along cable hook must be pointing downward).
- (b) Pull no. 10 (black) guy cable taut and fasten ball (1) closest to mast into slot (2) in come-along cable connector.
- (c) Place selector lever (3) on the come-along in the UP position and take up slack in guy cable by operating the come-along ratchet.



2-8. OPERATION TO ERECT TOWER - Continued

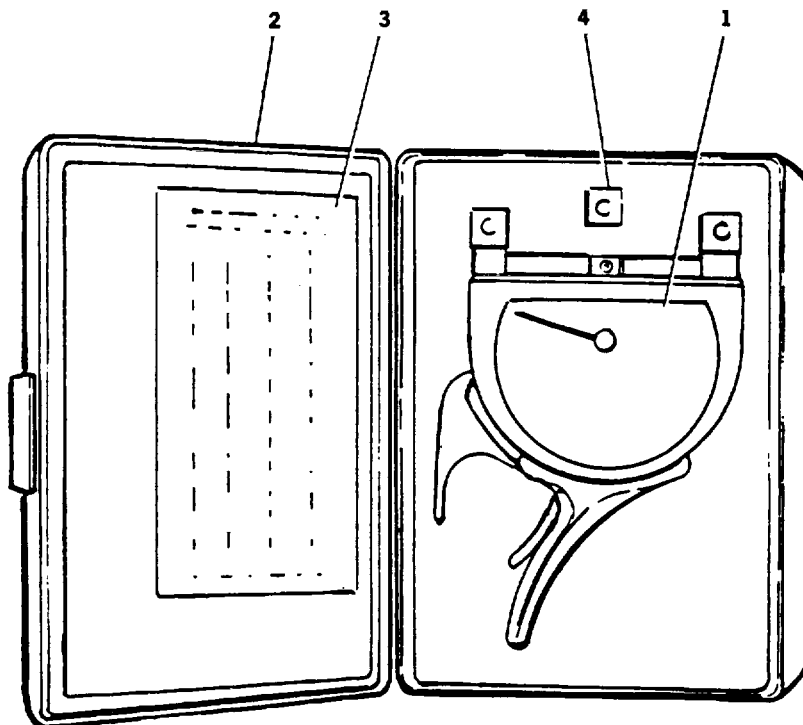
d. Tilting Tower To Vertical Position - Continued

(29) Tighten black guy cables using following procedure:

NOTE

Following procedure will require one crew member at each anchor location.

- (a) Position crew member at roadside and curbside anchor location.
- (b) Position yourself (team chief) at front anchor location.



- (c) Remove tensiometer (1) from its case (2).

NOTE

Refer to the chart (3) on inside front cover of tensiometer case as to which size cable riser (4) to use in reference to cable size. Black, silver and red cables are 1/4-inch and white cables are 5/16-inch.

2-8. OPERATION TO ERECT TOWER - Continued**d. Tilting Tower To Vertical Position - Continued**

- (d) Insert 2C cable riser into tensiometer.
- (e) Insert black guy cable between 2C cable riser and retaining slots of tensiometer approximately 18 inches (45.7 cm) above point where come-along is connected. Position it where it can be observed when standing at come-along.
- (f) Make sure tensiometer reads just above 0 at each anchor point.
- (g) Team chief at front guy cables instructs crew members at other anchor points the number of clicks to put on each come-along. The team chief checks tension until it reaches 450 to 500 pounds (204.1 to 226.8 kg). Once tension has been reached, team chief at this point goes to road and curbside guy cables to check and adjust them if necessary to reach 450 to 500 pounds (204.1 to 226.8 kg).

e. Raising First Stage**NOTE**

Refer to Section IV, Paragraph 2-16, Operation Under Unusual Conditions for manually raising first stage if equipment malfunctions.

- (1) Position crew members at front and roadside guy cables. Make sure front guy cables are clear of any obstructions.
- (2) Individual stationed at front guy cables will monitor travel of all sets of guy cables.
- (3) Until antenna tower is fully erected, crew member operating mast control box will take instruction from crew member stationed at front set of guy cables.

WARNING

Tower can be safely erected only if specified wind conditions are not exceeded for each phase of installation. The limitation for raising the first stage is 33 mph (53.1 kmh) wind speed.

- (4) Read wind speed on digital display.

2-8. OPERATION TO ERECT TOWER - Continued**e. Raising First Stage - Continued -****WARNINGS**

After tower has been erected, wind conditions must be monitored and following precautions taken for unanticipated wind conditions:

- If wind speeds increase to 75 mph (120.7 kmh), (wind speed indicator) rotate all antennas to full counterclockwise azimuth and 90 degree elevation to reduce sail area for safety.
- If wind speeds exceed 100 mph (160.9 kmh) (wind speed indicator) and tower is fully erected to 117 feet (35.66 m), evacuate crew to safety.

WARNING

If any of above restrictions are violated, loss of life, limb, and/or property may occur.

- (5) If wind speed display indicates greater than 33 mph (53.1 kmh), STOP! If wind speed display indicates 33 mph (53.1 kmh) or less, proceed to next step.

CAUTION

If antenna positioner interface cable is not disconnected from center of cable reel before proceeding, damage will occur to cable, reel, and receptacles.

- (6) Disconnect antenna positioner interface cable from outermost curbside reel assembly.

2-8. OPERATION TO ERECT TOWER - Continued

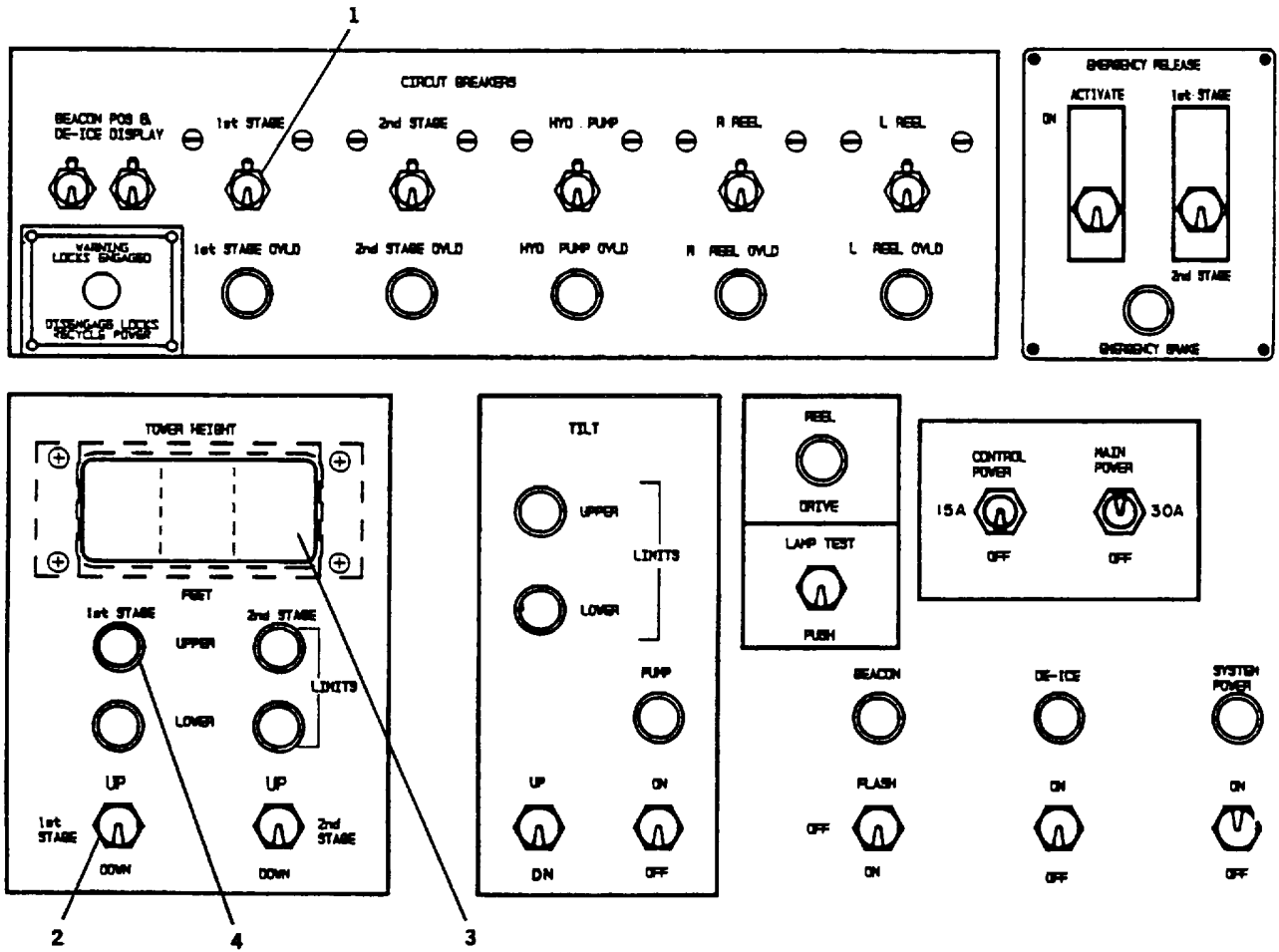
e. Raising First Stage - Continued

- (7) Place 1ST STAGE circuit breaker (1) on control box to up position.

CAUTION

Make sure antenna positioner interface cable is disconnected.

- (8) Place and hold 1ST STAGE UP/DOWN switch (2) to UP position.
- (9) Monitor TOWER HEIGHT display (3).



2-8. OPERATION TO ERECT TOWER - Continued**e. Raising First Stage - Continued**

- (10) When first stage reaches 88 feet (26.82 m), center of dish, 1ST STAGE UPPER LIMITS lamp (4) will light and first stage motor will stop automatically.

CAUTIONS

Check that elevating motors stop immediately when limit lights indicate end of travel. If power continues to be applied to actuators, take following actions immediately:

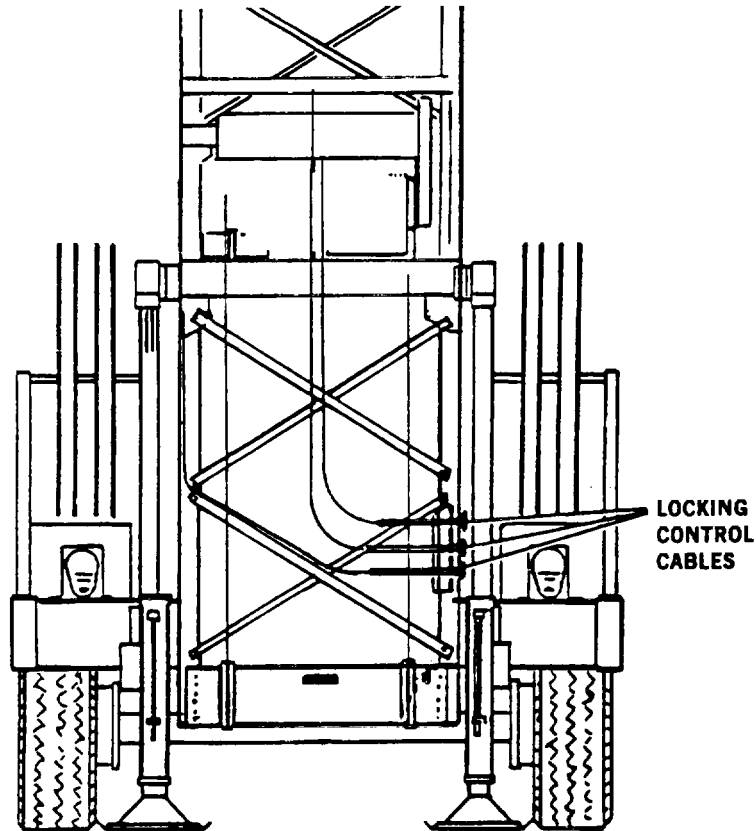
- **Place UP/DOWN switch for function being performed in center OFF position.**
- **Position following switches to OFF.**

CONTROL POWER
SYSTEM POWER
MAIN POWER

- **Notify maintenance personnel.**

- (11) Release 1ST STAGE UP/DOWN switch (2).
- (12) Place 1st stage circuit breaker to down position.
- (13) Locate three remote locking control cables at rear of trailer.
- (14) Rotate each handle either clockwise or counterclockwise and pull handles to their fullest extended positions.
- (15) Observe each safety lock under number 9 tower section swings into place.
- (16) Turn handles either clockwise or counterclockwise to lock into place.
- (17) Perform the following procedure at each anchor location:
- (a) Select the come-along attached next to the bottom shackle, refer to paragraph 2-8.d.(28) illustration, on anchor plate (come-along cable hook must be pointing downward).

2-8. OPERATION TO ERECT TOWER - Continued

e. Raising First Stare - Continued

- (b) Pull silver guy cable taut and fasten guy cable ball into slot in come-along cable connector.
 - (c) Place selector lever on come-along in up position and take up slack in silver guy cable by operating come-along ratchet.
- (18) Tighten silver guy cables using following procedure:
- (a) Position a crew member at roadside and curbside anchor locations.
 - (b) Position yourself (team chief) at front anchor location.
 - (c) Remove tensiometer from its case.
 - (d) Insert cable between 2C cable riser and retaining slots of tensiometer approximately 18 inches (45.72 cm) above point where come-along is connected. Position it where it can be observed when standing at come-along.

2-8. OPERATION TO ERECT TOWER - Continued**e. Raising First Stage - Continued**

- (e) Make sure tensiometer reads just above zero at each anchor point.
- (f) Find cable with highest tensiometer reading and make other two cables read approximately the same.
- (g) Team chief at front guy cables instructs crew members at other anchor points the number of clicks to put on each come-along. The team chief checks tension until it reaches 450 to 500 pounds (204.1 to 226.8 kg). Once tension has been reached, team chief at this point goes to road and curbside guy cables to check and adjust them if necessary to reach 450 to 500 pounds (204.1 to 226.8 kg).
- (h) Perform steps (17) and (18) (d), (e), (f) and (g) for red guy cables. (Use come-along attached to shackle next to silver guy cable come-along shackle.)
- (i) When completed, make sure between 450 and 500 pounds (204.1 and 226.8 kg) of tension exist on each guy cable already installed and tower is plumb.

NOTE

If 117-foot (35.66 m) center of dish elevation is NOT required, proceed to paragraph 2-8.f.(13) thru (17).

f. Raising Second Stage

- (1) Connect antenna positioner interface cable from control box to antenna positioner cable connector located at center of outermost curbside reel.
- (2) Unstrap connectors from innermost curbside reel and attach cable W126 to connector J11, cable W131 to connector J3, and cable W132 to connector J4 on left side of control box.
- (3) Place power switch, located at bottom right corner of antenna positioner control unit, to ON position.

2-8. OPERATION TO ERECT TOWER - Continued**f. Raising Second Stage - Continued****WARNING**

Tower can be safely erected only if specified wind conditions are not exceeded for each phase of installation. The limitation for raising the second stage is 33 mph (53.1 kmh) wind speed. If wind speed display indicates greater than 33 mph (53.1 kmh) STOP! If wind speed display indicates 33 mph (53.1 kmh) or less, proceed to next step.

- (4) Read wind speed on digital display.

WARNINGS

After tower has been erected, wind conditions must be monitored and following precautions taken for unanticipated wind conditions:

- If wind speeds increase to 75 mph (120.7 kmh), (wind speed indicator) rotate all antennas to full counterclockwise azimuth and 90 degree elevation to reduce sail area for safety.
- If wind speeds are forecasted to reach 75 mph (120.7 kmh), prepare tower ahead of time by lowering the second stage.
- If wind speeds exceed 100 mph (160.9 kmh) (wind speed indicator) and tower is fully erected to 117 feet (35.66 m), evacuate crew to safety.

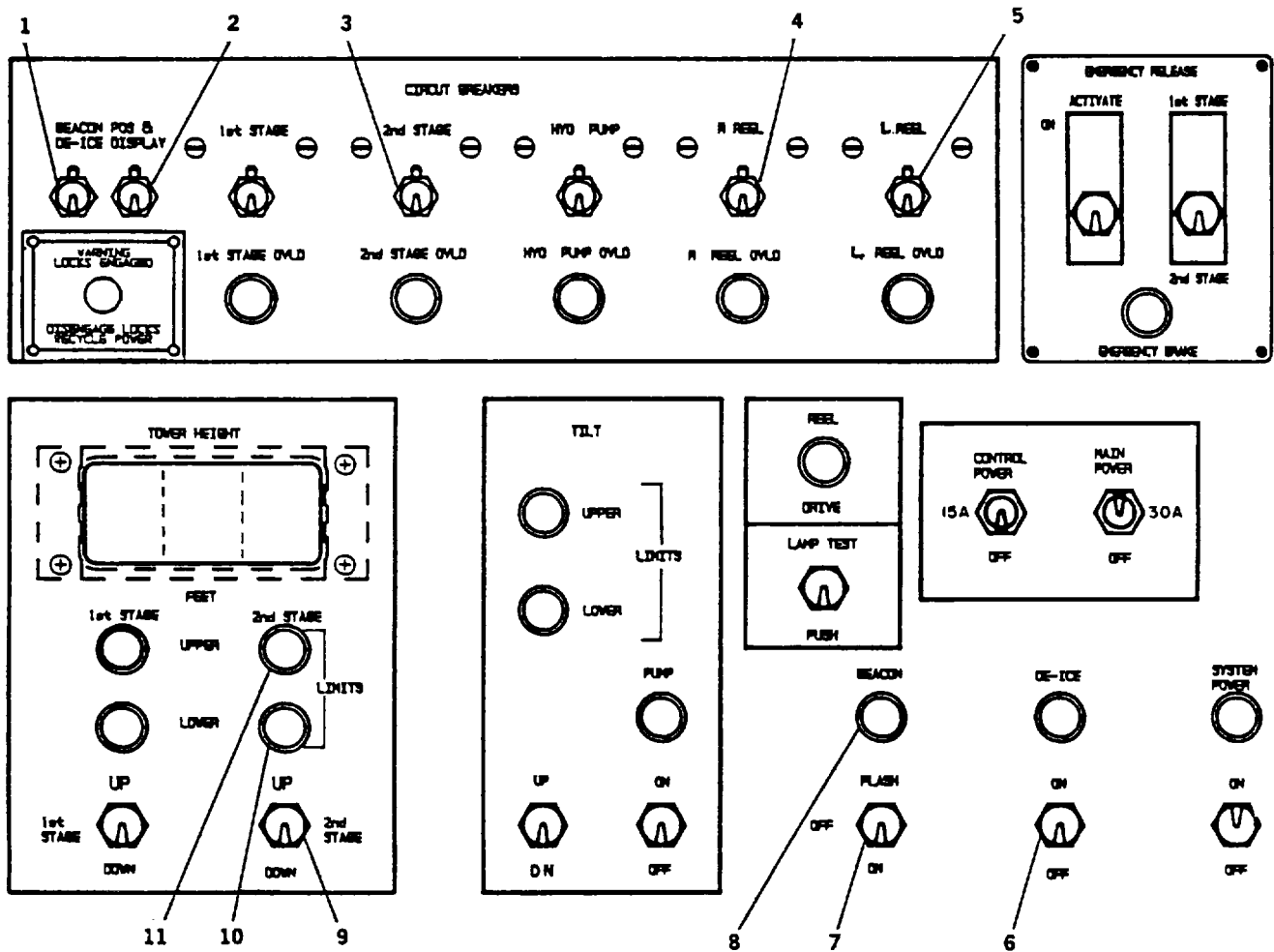
WARNING

If any of above restrictions are violated, loss of life, limb, and/or property may occur.

- (5) Disconnect antenna positioner interface cable from center of outermost curbside reel.

2-8. OPERATION TO ERECT TOWER - Continued

f. Raising Second Stage - Continued



- (6) Position crew members at front and roadside to hold onto two white guy cables. Make sure front guy cables are clear of obstructions.
- (7) Place 2ND STAGE circuit breaker (3) to up position. 2ND STAGE LOWER LIMITS lamp (10) should be lit. If not, call maintenance before proceeding.

NOTE

Make sure all crew members observe white guy cables and second stage sections for any malfunction/ obstruction or hazard as 2ND STAGE UP/DOWN switch is held in UP position.

2-8. OPERATION TO ERECT TOWER - Continued**f. Raising Second Stage - Continued****NOTE - Continued**

While second stage is being elevated, constantly monitor (watch) loose white guy cables and second stage sections. If any malfunction/obstruction or hazard occurs, immediately call for cease of operation. Release 2ND STAGE UP/DOWN switch and take corrective action. Once corrective action is accomplished, resume raising operation.

CAUTION

If antenna positioner interface cable is not disconnected from center of cable reel before proceeding, damage will occur to cable, reel, and receptacles.

- (8) Place and hold 2ND STAGE UP/DOWN switch (9) to UP position. When second stage reaches 117 feet (35.66 m), center of dish, 2ND STAGE UPPER LIMITS lamp (11) will light and second stage motor will stop automatically. If this does not occur, call maintenance before proceeding.

NOTE

If second stage fails to rise, verify 1ST STAGE upper limit light is lit. If not, loosen first stage guy cables, place 1ST STAGE circuit breaker to up position, and hold 1ST STAGE UP/DOWN switch to UP position until light is lit and release. Place 1ST STAGE circuit breaker to down position and retension guy cables. If second stage still fails to raise, verify all cable connections for second stage erection are fully seated on control box.

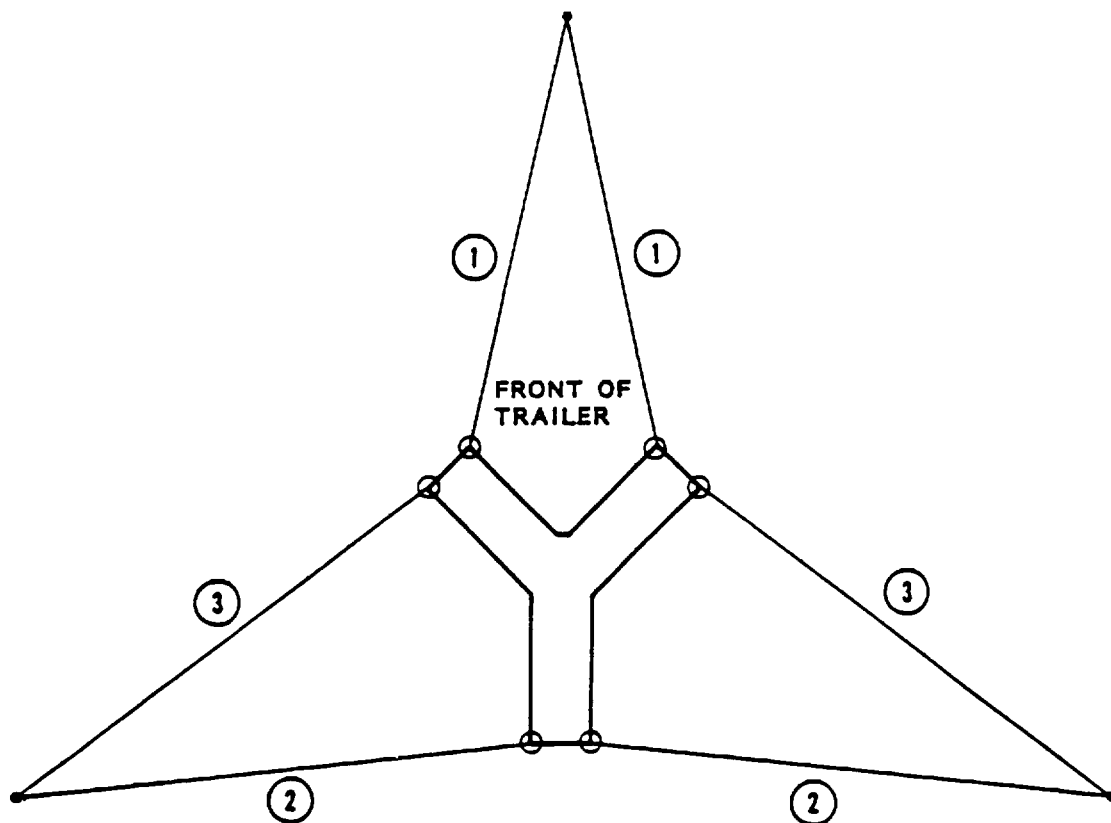
- (9) Release 2ND STAGE UP/DOWN switch (9).
- (10) Place 2ND STAGE circuit breaker (3) to down position.
- (11) Reconnect antenna positioner interface cable to curbside reel.
- (12) Place R-REEL (4) and L-REEL (5) circuit breakers to down position.

2-8. OPERATION TO ERECT TOWER - Continued**f. Raising Second Stage - Continued**

- (13) Place all circuit breakers and switches on tower control box to off position.
- (14) Move the ac circuit breakers on operating generator to OFF position.
- (15) Shut down generator.
- (16) Completely unwind lightning rod cable and antenna positioner cables from outermost curbside reel.
- (17) Connect lightning rod ground cable to spare grounding lug on ground rod, refer to paragraph 2-7.f.(9) and (10).
- (18) Perform the following procedure at each anchor location:
 - (a) Select come-along attached to second anchor at each point (come-along hook must be pointing downward).
 - (b) Pull correct white guy cable, refer to step (19)(g) illustration, taut and fasten guy cable ball into slot in come-along cable connector.
 - (c) Place selector lever on come-along in up position and take up slack in white guy cable by operating come-along cable connector.
 - (d) Repeat steps (a) thru (c) for remaining white guy cables.
- (19) Tighten white guy cables using following procedure:
 - (a) Position crew member at roadside and curbside anchor location.
 - (b) Position yourself (team chief) at front anchor location.
 - (c) Remove tensiometer from its case.
 - (d) Extract 2C cable riser from tensiometer and replace it with 3A cable riser.

2-8. OPERATION TO ERECT TOWER - Continued**f. Raising Second Stage - Continued**

- (e) At each anchor point, secure white guy cables to remaining guy cable come-alongs.
- (f) From rear of trailer, determine which white guy cables need to be tightened to straighten the second stage. Tension appropriate cables until tower is straight. Measure tension on the guy cables used to straighten mast and observe highest reading. Tension all other cables to that reading and proceed with step (g).
- (g) Refer to figure following this step. Starting at front anchor location, tighten no. 1 cables one click. Next tighten no. 2 cables one click. Next tighten no. 3 cables one click. Repeat this sequence one click at a time until between 500 and 600 pounds (226.8 and 272.2 kg) of tension has been reached for each cable.



2-8. OPERATION TO ERECT TOWER - Continued**f. Raising Second Stage - Continued****NOTE**

Change cable riser to 2C when measuring tension on black, silver, and red cables.

- (h) When completed make sure between 450 and 500 pounds (204.1 and 226.8 kg) of tension exist on black, silver, and red cables and between 500 and 600 pounds (226.8 and 272.2 kg) of tension exist on white guy cables.
- (i) When done, replace tensiometer in its case and store it in accessory bag.

g. Connecting Communications Shelter to AB-1309

- (1) Refer to applicable shelter technical manual for making shelter power connections. The following WARNINGS pertain to making shelter power connections in general.

WARNING

- **Before making power connections, ensure that all equipment is shut down. To avoid personal injury, observe all safety precautions.**
- **Never make power connections alone as a safety precaution.**
- **Power entrance box and AB-1309 trailer must be grounded prior to making power connections to preclude accidental electrocution.**
- **Power source (generator or commercial power) MUST BE TURNED OFF to ensure equipment remains shut down during power connections.**
- **Do not connect power cable stub SC-D-883964 to generator unless your Military Occupational Specialty (MOS) includes training on MEP-003A Generator for safety.**

2-8. OPERATION TO ERECT TOWER - Continued

g. Connecting Communications Shelter to AB-1309 - Continued

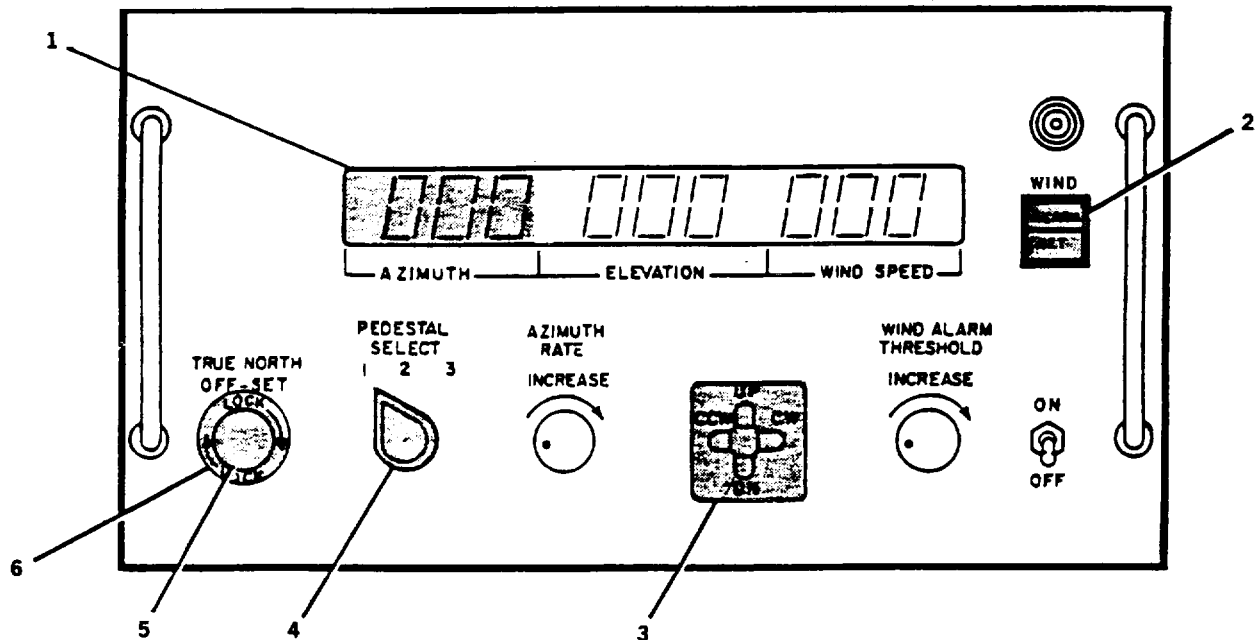
- (2) Refer to applicable shelter technical manual to move antenna positioner control box to communications shelter, and make required power and signal code connections.
- (3) Once power hook-up is connected to power distribution box, start generator in accordance with generator technical manual.
- (4) At tower control box, place following circuit breakers to on (up) position.
 - MAIN POWER
 - SYSTEM POWER
 - BEACON DE-ICE (if required)
 - POS DISPLAY
- (5) Place BEACON switch to FLASH (if required).
- (6) Place DE-ICE switch to ON (if required).

h. Antenna Positioner Control Unit

Antenna positioner control unit is used to control azimuth and elevation of AB-1309 tower reflectors. Prior to operating antenna positioner unit, perform your Before Operations (B) PMCS. Refer to paragraph 2-4, Operator PMCS Table.

i. AB-1309 Initial Antenna Alignment

To initially align antenna perform following procedures:



2-8. OPERATION TO ERECT TOWER - Continued

i. AB-1309 Initial Antenna Alignment - Continued

- (1) Using compass, stand 20 to 25 feet (6.1 to 7.6 m) in front of trailer, facing the tongue. Determine the azimuth reading to the center of the tongue.
- (2) Press ALARM/SET switch (2) to display azimuth offset on AZIMUTH display (1).
- (3) Unlock TRUE NORTH OFF-SET control (6).
- (4) Adjust TRUE NORTH OFF-SET control (5) to match magnetic north bearing recorded in step 1.
- (5) Carefully lock TRUE NORTH OFF-SET control (6) after setting has been made.
- (6) Press ALARM/SET (2) switch for normal operation.

NOTE

When TRUE NORTH OFF-SET alignment has been properly adjusted and wind velocity is known to be below alarm threshold, antennas may be adjusted for correct position.

- (7) Select positioner by setting PEDESTAL SELECT switch (4) to required position.
- (8) Use joystick (3) to adjust antenna to proper heading.
- (9) Position remaining antennas by repeating steps (7) and (8).

2-9. OPERATION TO RETRACT TOWER

a. Lowering Second Stage

NOTE

Refer to Section IV, Operation Under Unusual Conditions for emergency retraction procedures if equipment malfunctions.

- (1) Shut down generator.
- (2) Disconnect power cable, coaxial cables, messenger cable, and all other cables from towing vehicle and communication shelter. Replace dust covers to protect all receptacles/cable terminals.

2-9. OPERATION TO RETRACT TOWER - Continued**a. Lowering Second Stage - Continued**

- (3) Disconnect communication shelter ground straps from power entrance panels.
- (4) Remove ladder.
- (5) Move towing vehicle a minimum of 260 feet (79.25 m) away from base of mast.
- (6) Place selector switch on power distribution box to one of the OFF positions.
- (7) Start generator, refer to paragraph 2-8.a.(7).
- (8) Place following switches on tower control box to UP position:
 - MAIN POWER
 - CONTROL POWER
 - SYSTEM POWER
- (9) Place ON/OFF switch in lower right corner of antenna positioner control unit to ON.
- (10) Place BEACON DE-ICE (if required) and POS & DISPLAY circuit breaker to up position.

NOTE

If tower was raised to only 88 feet (26.82 m) go to step b, following.

- (11) Observe WIND SET/ALARM switch/indicator on antenna positioner control unit. If lit, push it to extinguish light. If still lit, inform maintenance personnel.
- (12) Read wind speed on digital display.

WARNING

If wind speed is in excess of 33 mph (53.1 kmh), do not loosen second stage guy wires nor proceed with retraction of second stage. If wind speed is 33 mph (53.1 kmh) or lower, proceed with retraction of second stage.

- (13) Place selector lever on attached come-alongs in down position and operate ratchet handle until white head guy cables become slack. Loosen in same order as they were tightened.

2-9. OPERATION TO RETRACT TOWER - Continued**a. Lowering Second Stage - Continued**

(14) Disconnect antenna positioner interface cable from outermost curbside reel.

CAUTION

If antenna positioner interface cable is not disconnected from center of cable reel before proceeding, damage will occur to cable, reel, and receptacles.

(15) Disconnect lightning rod ground cable from ground rod. .

(16) Attach lightning rod ground cable to outermost curbside reel with one velcro strap.

(17) Manually wind outermost curbside reel counterclockwise until slack is removed from cables.

(18) Remove all loose items on and around trailer.

(19) Make sure second stage control cables are connected to control box. If they are not, connect them before proceeding.

(20) Place following circuit breakers to up position.

- R-REEL
- L-REEL
- 2ND STAGE

NOTE

2ND STAGE UPPER LIMIT lamp should light. Refer to second stage control panel figure, item (11), under paragraph 2-8.f.

(21) Position crew members at trailer front and roadside to visually monitor cables and mast sections for complications as tower is being lowered.

(22) Place and hold 2ND STAGE UP/DOWN switch to DOWN position to retract second stage.

NOTE

When second stage is fully retracted, 2ND STAGE LOWER limit lamp (10) lights and second stage motor stops automatically.

2-9. OPERATION TO RETRACT TOWER - Continued**a. Lowering Second Stage - Continued**

- (23) When fully retracted, release 2ND STAGE UP/DOWN switch. LOWER LIMITS 2ND STAGE lamp (10) should light.
- (24) Place 2ND STAGE circuit breaker (3) to down position.
- (25) Place the following switches to down position:
- CONTROL POWER
 - MAIN POWER
 - SYSTEM POWER

b. Lowering First Stage

- (1) Connect antenna positioner interface cable to center of outermost curbside reel.

WARNING

Monitor wind speed on digital display. If the wind speed exceeds 33 mph (53.1 kmh) Do not lower the first stage. With wind speed in excess of 33 mph (53.1 kmh), Team Chief must receive permission from his/her command chain to retract first stage. If wind speed is 33 mph (53.1 kmh) or lower, proceed with lowering first stage.

- (2) Disconnect antenna positioner interface cable from outermost curbside reel.

CAUTION

If antenna positioner interface cable is not disconnected from center of cable reel before proceeding, damage will occur to cable, reel, and receptacle.

- (3) Disconnect three second stage control cables (J3, J4, J11) and attach them to innermost curbside reel.
- (4) Replace connector protection caps on control panel connectors.

CAUTION

Make sure that cable jacks are exactly centered and tight within curbside reel.

2-9. OPERATION TO RETRACT TOWER - Continued**b. Lowering First Stage - Continued**

- (5) Manually wind reels counterclockwise to take up slack.
- (6) At each anchor location, place selector lever on attached come-alongs in down position and operate ratchet handles until red and silver guy cables become slack.

NOTE

Refer to Section IV, if equipment malfunctions, for emergency retraction of mast.

- (7) At tower control box (refer to control panel figure under paragraph 2-8.e.) place following switches to up position:
 - MAIN POWER
 - CONTROL POWER
 - SYSTEM POWER
- (8) Place following circuit breakers to up position:
 - 1ST STAGE
 - R-REEL
 - L-REEL

NOTE

1ST STAGE UPPER LIMIT lamp should light.

CAUTION

Failure to disengage lockouts could result in serious damage to first stage cables.

- (9) Disengage three tower locks at rear of tower base. Push them all the way in and turn fully either clockwise or counterclockwise to lock. Visually verify that all safety locks under number 9 tower section are disengaged.

NOTE

Indicator lamp will light on control panel if attempting to lower 1st stage without disengaging mechanical tower locks. If lamp is lit, disengage locks and reset (recycle) by power (SYSTEM POWER).

2-9. OPERATION TO RETRACT TOWER - Continued**b. Lowering First Stage - Continued**

(10) Place and hold 1ST STAGE UP/DOWN switch to DOWN position to retract first stage.

NOTE

Check to see cables from curbside and roadside reels do not get caught in chain mechanism. Observe cables to make sure they do not double wrap on reels during retraction.

(11) Crew members at front and roadside take up slack in guy cables as tower is retracted.

NOTE

When first stage is fully retracted, 1ST STAGE LOWER LIMITS lamp will light and first stage motor will stop automatically.

(12) Release 1ST STAGE UP/DOWN switch.

(13) Place following circuit breakers to down position:

- 1ST STAGE
- R-REEL
- L-REEL

2-10. OPERATION TO TILT TOWER TO HORIZONTAL POSITION**NOTE**

Refer to Section IV, Operation Under Unusual Conditions for manually tilting tower to horizontal position if equipment malfunctions.

a. Preparation

(1) Connect antenna positioner interface cable to outermost curbside reel.

(2) Place POS DISPLAY circuit breaker to up position.

(3) Read wind speed on digital display.

2-10. OPERATION TO TILT TOWER TO HORIZONTAL POSITION - Continued**a. Preparation - Continued****WARNING**

If wind speed exceeds 33 mph (53.1 kmh), NJ do not tilt tower assembly. Team chief must receive permission from his/her command chain to tilt tower section. If wind speed is 33 mph (53.1 kmh) or lower, proceed.

CAUTION

Check to see front and rear jack handles are in stowed position.

- (4) Loosen and disconnect black guy cable come-alongs. Place selector lever on come-alongs in down position and operate ratchet handle until black guy cables become slack.
- (5) Press and hold quick-release button and extend come-alongs to their full lengths.
- (6) Remove white, red, silver, and black guy cables from come-alongs.

NOTE

Make sure guy cable reel assemblies are secured in their transit position.

b. Tilting Tower

- (1) Place HYD PUMP circuit breaker in up position.
- (2) Place TILT PUMP switch to ON position.

NOTE

TILT UPPER LIMIT lamp should be lit.

- (3) Place and hold TILT UP/DOWN switch to DOWN position.
- (4) Observe all guy cables, especially front guy cables for unobstructed travel.
- (5) Tilt tower until masthead and antenna arrays are approximately 2 to 3 feet (0.61 to 0.91 m) above trailer tongue. This facilitates removal of two lower reflectors and feedhorns (or radiating elements).

2-10. OPERATION TO TILT TOWER TO HORIZONTAL POSITION - Continued**b. Tilting Tower - Continued**

- (6) Remove two lower reflectors and feedhorns. Refer to paragraph 2-8.b. and perform operations in reverse order.
- (7) Use antenna rotator control (joystick) (UP/DOWN, CW/CCW) to position positioners so they will not strike the trailer when tower is tilted to its fully horizontal position.
- (8) Use TILT UP/DOWN switch to lower tower onto its support cones.
- (9) Use rotator control (joystick) to position lower positioner arms to approximately 1 inch (2.54 cm) from trailer frame.

NOTE

When tower is fully horizontal, TILT LOWER LIMITS lamp should light and directional control valve will close but pump will continue to run. (10) Disconnect antenna positioner interface cable from outermost curbside reel and control panel.

WARNING

Failure to place plastic tubing protector on lightning rod could cause serious injury to personnel.

- (11) As soon as tower is in horizontal position, replace plastic tubing protector on pointed end of lightning rod.
- (12) Remove lightning rod grounding cable from lightning rod.
- (13) Remove lightning rod.
- (14) Stow rod and ground clamp in front/roadside storage location.
- (15) Loosen two bolts and jam nuts at base of obstruction light assembly.
- (16) Move assembly into mast to its innermost position and secure it with two bolts and jam nuts.

2-10. OPERATION TO TILT TOWER TO HORIZONTAL POSITION - Continued**b. Tilting Tower - Continued - _**

- (17) Remove upper reflector and feedhorn (or radiating element) by referring to paragraph 2-8.b. and perform operations in reverse order.
- (18) Use joystick to arrange positioners so that electrical connectors face in towards center of mast.
- (19) Use joystick to position positioner arms in towards center of mast.

2-11. SHUTTING DOWN AB-1309 AND GENERATOR

Position following switches and circuit breakers down.

- HYD PUMP
- TILT PUMP ON/OFF
- ON/OFF (on antenna positioner control unit)
- SYSTEM POWER
- MAIN POWER
- CONTROL POWER

Refer to TM 5-6115-585-12 technical manual, for proper generator stopping procedure and PMCS.

2-12. REMOVING GUY CABLES AND STOWING ACCESSORIES**a. Removing Cables****WARNING**

Crew members must wear gloves, hard hats, and eye protection at all times when working with guy cables.

- (1) Remove all guy cables connected to tower and stretch them out in line with appropriate guy cable reel assembly.
- (2) Remove pins from roadside and curbside reel assemblies, remove pins from locking bars, swing reels outward, and pin in place.
- (3) Loosen roadside and curbside camlocks, remove pins, and secure shackles to tower camlocks with pins.
- (4) Retighten roadside and curbside camlock handles.
- (5) Reconnect two shipping cables if rail, air, or water shipment is anticipated. Tighten locking nuts.

2-12. REMOVING GUY CABLES AND STOWING ACCESSORIES - Continued**a. Removing Cables - Continued**

- (6) Remove guy reel handle from accessory bag, attach to reels and respool guy cables. Make sure cables are spooled tightly. When all five guy cables are respooled, secure all guy cables with straps, replace vinyl spool covers, and secure reels in transit position.
- (7) Disconnect antenna positioner interface cable and stow in accessory bag.
- (8) Remove all come-alongs from guy plates and remove guy plates from U-shaped shackle on anchor cable eyelets and stow them in accessory bag.

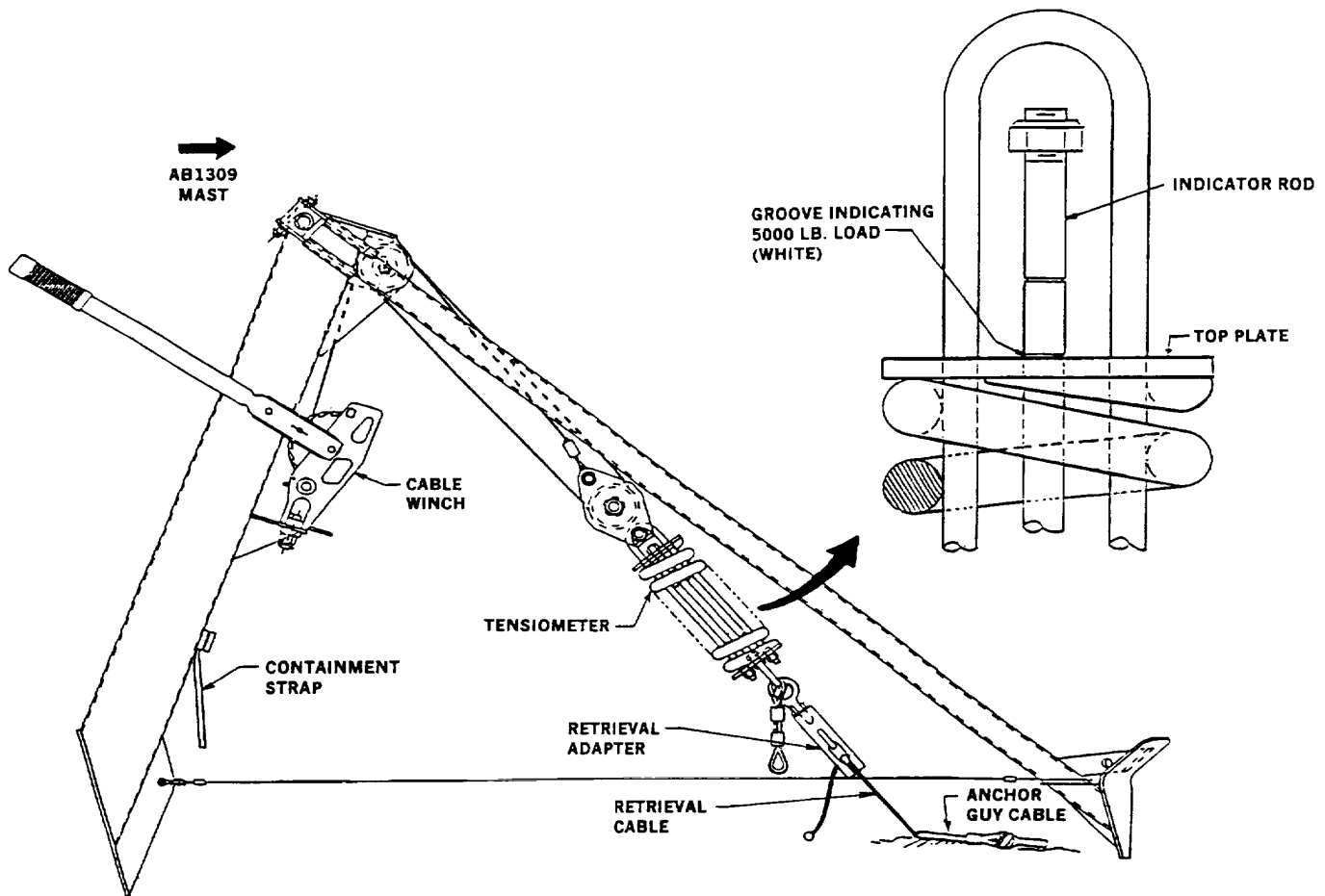
b. Removing Anchors

- (1) Using two crew members, remove the anchor setting and retrieval tool from its stowage location on the trailer.
- (2) Unfasten the containment strap from around the anchor tool.
- (3) Refer to following figure. Position the anchor tool upright over the anchor to be retrieved. The legs should be spread outward as far as the leg restraint cables will permit.
- (4) Disconnect the shackle from its stowed position on the leg of the anchor tool.
- (5) Release the cable drum on the lever winch to allow cable to be pulled from the winch.
- (6) Using the shackle, connect the tensiometer cable to the guy cable of the anchor.
- (7) Connect the retrieval adapter to the anchor retrieve cable by inserting the ball on the end of the retrieve cable into the slot in the retrieval adaptor.

CAUTION

The anchor retrieve cable must be pulled at approximately a 45 degree angle to the ground. Reposition the anchor setting and retrieval tool, if necessary, to achieve the proper angle.

2-12. REMOVING GUY CABLES AND STOWING ACCESSORIES - Continued

b. Removing Anchors - Continued**WARNING**

Do not exceed a 5000 pound (2268 kg) pull with the anchor setting and retrieval tool.

- (8) While monitoring the tensiometer indicator rod, operate the lever winch to retrieve the anchor. If the second white groove on the indicator rod appears at the surface of the top plate of the tensiometer, STOP, a 5000 (2268 Kg) pound load has been reached. Do not exceed this load. If a 5000 pound (2268 kg) load is reached, the anchor is not retrievable and is to be abandoned. If the 5000 pound (2268 kg) load is not reached and the anchor is pulling out of the ground, 2-106 continue to takeup cable until the second ball on the anchor retrieve cable is visible.

2-12. REMOVING GUY CABLES AND STOWING ACCESSORIES - Continued**b. Removing Anchors - Continued**

- (9) Relax the tension in the cable and reposition the retrieval adapter to the second ball on the retrieve cable and continue to pull the anchor from the ground. Repeat this step on the third ball of the retrieve cable and pull the anchor from the ground.
- (10) Disconnect the Laconia Anchor from the anchor tool.
- (11) Repeat the above procedure to retrieve the remaining anchors.
- (12) Connect the tensiometer cable to its stowed position on the leg using the shackle. Remove the slack from the cable.
- (13) Fold the legs of the anchor tool together and secure with the containment strap.
- (14) Using two crew members, return the anchor tool to its stowage location on the AB-1309 trailer. Slide the tool into the storage compartment feet first. Close and secure the compartment door.

c. Final Preparations

- (1) Inspect tower carefully before attempting to tow it. Ensure tower is fully secured in stowed position for transportation.
- (2) Ensure wheel lug nuts are tight and tires are properly inflated.
- (3) Replace fire extinguisher, petroleum, oil, and lubricant (POL) on trailer.
- (4) Verify all tools, (including ground rod/cable) materials, and spares are in place and in good working order.
- (5) Secure all trailer mounted equipment.

NOTE

Refer to Chapter 4, Paragraph 4-51, when preparing AB-1309 for shipment or storage.

- (6) If upper positioner platform arm has to be folded down for transportation, refer to paragraph 4-51.a.

2-13. PREPARING AB-1309 FOR TOWING**a. Jacks**

- (1) Raise all three support jacks just enough to place trailer weight on wheels.
- (2) Fully raise both rear support jacks. (Requires two crew members.
- (3) Remove three safety pins from rear support jacks.
- (4) Rotate curbside (right) support jack to horizontal position and secure it with three safety pins. (Requires two crew members.
- (5) Rotate roadside (left) support jack to 45 degree position and secure it with one safety pin. (Requires two crew members.)
- (6) Back towing vehicle into position with trailer tongue.

NOTE

If trailer tongue lunette eye and towing vehicle's towing pintle cannot be aligned for level towing, adjust the trailer tongue lunette eye up or down as necessary. Notify Unit Level Maintenance.

- (7) Adjust front support jack for proper height with respect to towing vehicle's towing pintle.

NOTE

Next step requires two crew members.

b. Hitching**CAUTION**

Ensure tailgate of towing vehicle is properly secured in closed position prior to movement, otherwise damage to positioners may occur.

- (1) Lift trailer tongue and slowly back towing vehicle to engage trailer.
- (2) Close towing pintle and block it with cotter pin.

2-13. PREPARING AB-1309 FOR TOWING - Continued**b. Hitching - Continued**

- (3) Remove and stow front support jack handle. Release support jack securing pin, raise support jack, and lock in horizontal position with safety pin.
- (4) Connect safety chains to towing vehicle.
- (5) Connect airbrake lines and emergency brake line to towing vehicle. Check airbrake system has proper pressure.
- (6) Connect trailer electrical connector/cable to towing vehicle.
- (7) Verify trailer lights operate properly.
- (8) Rotate roadside support jack to full horizontal position and secure with three safety pins.

CAUTION

Ensure positioner arms are folded in (60 degrees elevation) prior to movement, otherwise damage to positioners may occur.

- (9) Release trailer hand brakes.
- (10) Check area for any item that may have been overlooked.

WARNING

Maximum safe towing speed of AB-1309 under ideal weather and road conditions shall not exceed 45 mph (72.5 kmh) on primary roads and 40 mph (64.5 kmh) on secondary roads.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

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2-14. OPERATION IN UNUSUAL WEATHER

a. Arctic Climate

Extreme cold weather conditions cause cables, field wire, and plastic-coated components to become very brittle. Permanent damage can result from mistreatment of equipment. Follow precautions below when operating your equipment in extreme cold weather.

- (1) Avoid excessive bending of rf coaxial cables, field wire, and signal cables when making connection to assemblage.
- (2) Keep all protective caps on receptacles not being used.
- (3) Make sure all binding posts and connectors are kept free of frost, snow, and ice.
- (4) Never drag or place an open connector in snow.

2-14. OPERATION IN UNUSUAL WEATHER - Continued**b. Tropical Climate**

Extreme heat and humidity can cause moisture and fungus growth. This can cause improper operation. Follow precautions below when operating your equipment in tropical climates.

- (1) Wipe moisture and fungus growth from equipment with clean lint-free cloth.
- (2) Ventilate equipment as often as possible. Make sure protective covers are kept in place whenever equipment is operating.
- (3) Store components not in use off the ground with free air circulation around them.

c. Desert Climate

In hot, dry climates, connectors, receptacles and binding posts are subject to damage from dust and dirt. Follow precautions below when operating your equipment in desert climate.

- (1) Replace covers on electrical and equipment boxes when not in use.
- (2) Never place an open connector on ground.
- (3) Keep equipment covered as much as possible. Wind-blown sand, dirt and dust will damage equipment.
- (4) After sand or dust storm, inspect equipment for accumulation of sand or dust immediately.
- (5) Remove accumulated sand and dust. Use a vacuum cleaner, air hose [pressure not exceeding 30 psi (206.9 kPa), or a small brush.
- (6) Secure fabric covers during periods of shutdown.
- (7) If tower is deployed, with wheels off ground, spin tires/wheels to a new location periodically so that bearings remain lubricated.

2-14. OPERATION IN UNUSUAL WEATHER - Continued**d. Salt Air or Sea Spray**

Salt air or sea spray can cause serious corrosion problems. Following precautions must be followed.

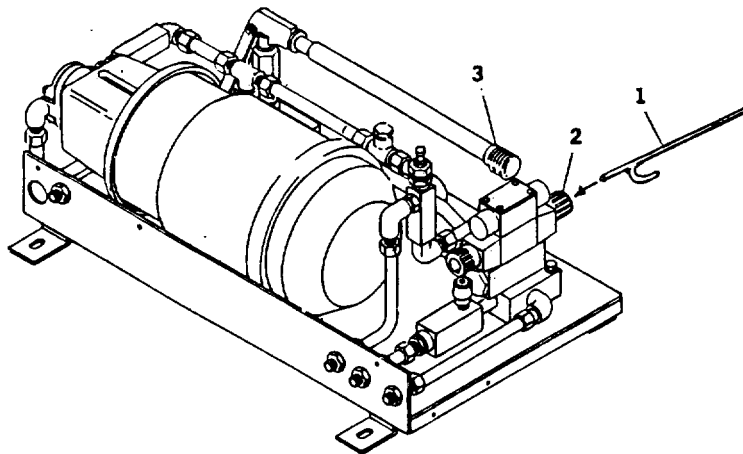
- (1) Replace covers on connectors and receptacles not in use. Close covers on equipment boxes when not in use.
- (2) Keep equipment covered as much as possible.
- (3) Clean surfaces with clean, lint-free cloth dampened with fresh water.
- (4) Frequently rinse exposed surfaces with fresh water to remove salt deposits.

2-15. MANUALLY TILTING TOWER TO VERTICAL POSITION

SPECIAL NOTE: If wind speed cannot be monitored during manual tilting process because of power failure, individual judgement must be relied on as to whether to proceed. A good rule to follow is: "If wind is bending treetops, do not tilt mast manually."

NOTE

Manual tower tilt controls are located in hydraulic power package box at rear of trailer, roadside. Use following procedure when equipment malfunctions (refer to figure).



2-15. MANUALLY TILTING TOWER TO VERTICAL POSITION - Continued**a. Preparation**

- (1) Pull two locking handles on each side of hydraulic power package cover.
- (2) Swing them outward and lift cover as high as it will go.
- (3) Remove manual up/down actuating rod (1) from retaining clips inside cover.
- (4) Place tip of actuating rod protruding outward into hole (approx 1/8 inch diameter) of up actuating cylinder in directional control valve (2).

b. Manually Tilting (Up)

- (1) Push and hold actuating rod to depress piston in up actuator (2) and hold it during tilting process.
- (2) Pump hydraulic fluid using rapid up and down strokes with pump handle (3). On each stroke, lift handle as high as it will go and push fully downward until stop is firmly contacted.

NOTE

Tilting procedure takes approximately 30 minutes to complete. For continuous operation, use two persons (i.e., one to press and hold up actuator (1) and other person to do pumping.) Rotate these individuals frequently to prevent tiring.

- (4) Stop tilting process before base of tower makes its entry between two support jacks (approximately 75 to 80 degrees).
- (5) Walk to rear of trailer and make sure there is sufficient clearance for tower base. If there is no clearance, adjust jack stands on either curbside or roadside as required to ensure there is clearance.
- (6) Tighten black guy cables per paragraph 2-8.d.(28) and (29) .

2-16. MANUALLY RAISING FIRST STAGE

SPECIAL NOTE: If wind speed cannot be monitored during manual erection/retraction process because of power failure or malfunction, individual judgement must be relied on as to whether to proceed at each stage. A good rule to follow is: "If wind is bending treetops, do not erect or retract mast manually." Use following procedure when equipment malfunctions.

NOTE

Make sure antenna positioner interface cable is disconnected and tower lockouts are in out position.

a. Preparation**NOTE**

Tower/trailer must be leveled and prepared as if performing normal procedures.

- (1) Remove manual hand crank and extension bar from accessory bag.

NOTE

Hexagonal hole into which crank will be inserted is located approximately 9 feet (2.74 m) above ground. To gain access, operator must climb onto roadside rear of trailer.

- (2) Insert hexagonal end of extension bar into hexagonal hole in shaft located in tower base, roadside.
- (3) Insert extension bar through hexagonal hole in tower.
- (4) Turn and shake bar until it can be lined up and inserted into hexagonal connector on 1st stage motor drive unit.
- (5) Insert retaining pin through extension bar and collar on hexagonal assembly on mast.
- (6) Insert hand crank over end of extension bar.
- (7) Insert retaining pin to hold it in place.

2-16. MANUALLY RAISING FIRST STAGE - Continued**b. Manually Raising****WARNING**

Extreme caution must be taken not to exceed the 88 foot (26.8 m) level. If tower is raised too far, the first stage upper limit switch will be damaged and the breakaway connector will disconnect.

- (1) With one hand, hold onto tower assembly. Lean as far to rear of trailer as possible and turn manual crank handle in clockwise direction.

CAUTION

Periodically monitor WIND SPEED display. Do not attempt to raise the first stage if it indicates greater than 33 mph (53.1 kmh).

- (2) Stop cranking when tower is just high enough for safety locks under tower section number 9 to clear.

NOTE

Approximately 50 turns of manual crank handle are required for each foot of tower elevation.

- (3) Locate three remote locking control cables at rear of trailer.
- (4) Rotate each handle either clockwise or counterclockwise and pull handles to their fullest extended positions.
- (5) Observe each safety lock under tower section number 9 swings into place.
- (6) Turn handles either clockwise or counterclockwise to lock into place.
- (7) Tighten silver and red guy cables per paragraph 28.e.(17) and (18).

NOTE

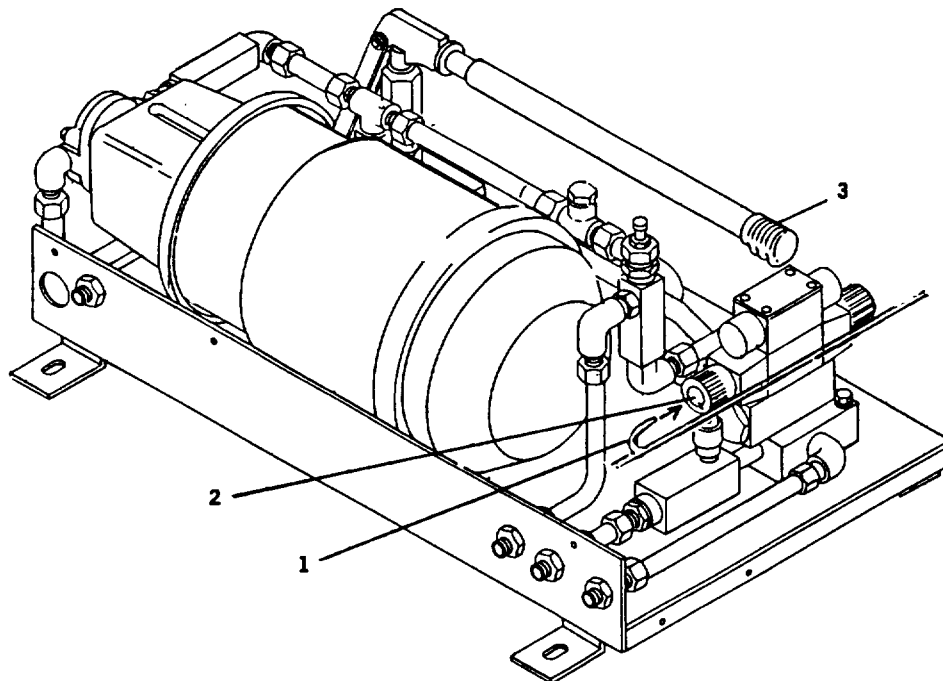
Tower second stage can not be manually erected.

2-17. MANUALLY TILTING TOWER TO HORIZONTAL POSITION**NOTE**

Use following procedure when equipment malfunctions. Procedure is similar to that found in paragraph 2-10, except for following:

a. Preparation

- (1) Pull two locking levers on each side of hydraulic power package cover located at rear of trailer, roadside.
- (2) Swing handles outward and lift cover as high as it will go.



- (3) Remove manual up/down actuating rod (1) from retaining clip inside cover.
- (4) Insert curved tip of the actuating up/down rod (1) into 1/8-inch diameter hole in back of down actuating cylinder in directional control valve (2).

b. Tilting Tower (Down)

- (1) Pull and hold actuating rod (1) while another crew member operates hand pump (3) to tilt tower. Use full length rapid strokes on hand pump handle. Rotate crew members frequently to prevent tiring.

2-17. MANUALLY TILTING TOWER TO HORIZONTAL POSITION - Continued

b. Tilting Tower - Continued

(2) Refer to usual conditions for continuation (paragraph 2-10, as applicable).

2-18. EMERGENCY RETRACTION PROCEDURES

a. Emergency Retraction of Second Stage

WARNING

- **Make sure tower is plumb and straight before implementing the emergency retraction procedures.**

NOTE

- **Emergency retraction procedure is not a faster means of retracting fully operational tower. Use normal retraction procedure when an immediate need to retract tower occurs. In event of malfunction of normal retraction mechanisms, tower may be retracted using these procedures.**
- **Switches used to activate and operate emergency retraction circuits are located on red panel marked EMERGENCY RELEASE in upper right corner of tower control box. Two emergency switches are covered by bright red switch covers, which should be lifted only when emergency retracting procedures are to be implemented. Switch on left is marked ACTIVATE. Switch on right is marked 2ND STAGE and 1ST STAGE.**
- **Both switches are spring-loaded and must be held in position during retraction process.**
- **One power generator must be running to activate the emergency retraction circuits.**

(1) Apply power to control box by positioning following switches on.

- **MAIN POWER up (on)**
- **CONTROL POWER up (on)**
- **SYSTEM POWER ON (up)**

2-18. EMERGENCY RETRACTION PROCEDURES - Continued**a. Emergency Retraction of Second Stage - Continued**

- (2) Position crew members at guy cable positions to release tension from white and red guy cables and takeup slack in cables as tower retracts.
- (3) Lift two red switch covers on emergency release panel.
- (4) Place and hold ACTIVATE switch to ON position.
- (5) Place and hold 2ND STAGE/1ST STAGE switch to 2ND STAGE position.

NOTE

As second stage retracts, tower will descend in short steps interrupted with frequent stops. Continue to hold switches until the second stage is fully retracted and 2ND STAGE LOWER LIMITS lamp comes on.

- (6) When 2ND STAGE LOWER LIMITS lamp lights, release both emergency release switches. Do not turn control panel power switches off until first stage is retracted.

b. Emergency Retraction of First Stage**NOTE**

Before activating first stage emergency retraction, push first stage locking levers all the way in and turn them either clockwise or counterclockwise to lock in place. Make sure safety locks swing outward from under tower section number 9.

- (1) Position crew members at guy cable positions to release tension from silver guy cables and takeup slack as tower retracts.
- (2) Place and hold ACTIVATE switch to ON position.
- (3) Place and hold 2ND STAGE/1ST STAGE switch to 1ST STAGE position.
- (4) Continue to hold EMERGENCY RELEASE switches until the first stage is fully retracted and 1ST STAGE LOWER LIMITS lamp lights.
- (5) Release two emergency release switches.

2-18. EMERGENCY RETRACTION PROCEDURES - Continued

b. Emergency Retraction of First Stage - Continued

(6) Place following switches to OFF position.

- MAIN POWER
- CONTROL POWER
- SYSTEM POWER

NOTE

This concludes emergency retraction procedures. From this point tower can be tilted to horizontal position.

2-19. ELECTRICAL INTERFERENCE

Following precautions must be followed during periods of operation to minimize electrical interferences caused by outside sources.

- Keep Ground Connections Clean and Secure.
- Keep Cable Connections Secure.
- Keep DGM CCA Covers in Place.
- Keep Signal and Power Cables From Crossing.

2-119/(2-120 blank)

CHAPTER 3

OPERATOR'S MAINTENANCE

| <u>Subject</u> | <u>Page</u> |
|---------------------------------------|-------------|
| Lubrication Instructions | 3-1 |
| Operator Troubleshooting | 3-1 |
| Operator Maintenance Procedures | 3-2 |

Section I. LUBRICATION INSTRUCTIONS

There are no operator lubrication requirements. Refer to Unit Level Maintenance for lubrication procedures.

Section II. OPERATOR TROUBLESHOOTING

For the purpose of this manual, operator and unit-troubleshooting are one and the same, see Chapter 4, Section IV.

Section III. OPERATOR MAINTENANCE PROCEDURES

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| Scope of Operator's Maintenance..... | 3-2 |
| Operator's Tools and Test Equipment..... | 3-2 |
| Cleaning | 3-2 |
| Inspecting Steel Cables..... | 3-2 |

3-1. SCOPE

Operator's maintenance of the AB-1309 is limited to preventive maintenance checks and services, and cleaning.

3-2. OPERATOR'S TOOLS AND TEST EQUIPMENT

There are no other tools or test equipment authorized for operator's maintenance.

3-3. CLEANING

WARNING

Provide adequate ventilation and turn off all equipment when using cleaning solvents. Avoid prolonged breathing of fumes and vapor. Do not use solvent near heat or open flames; the products decomposed are toxic and irritating. Since cleaning solvent dissolves natural oils, avoid prolonged contact with the skin. When needed, use gloves which solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

Use a dry, clean, lint-free cloth or brush to remove dust or dirt. If needed, moisten cloth or brush with cleaning solvent. After cleaning, wipe dry with clean cloth.

3-4. INSPECTING STEEL CABLES

NOTE

All steel cables will eventually deteriorate to a point where they are no longer usable.

3-4. INSPECTING STEEL CABLES - Continued**WARNING**

Steel cable shall be taken out of service when any of the following conditions exist:

- a. Six randomly distributed broken wires in one lay or three broken wires in one strand in one lay.
- b. Wear of one-third the original diameter of outside individual wires.
- c. Evidence of heat damage from any cause.
- d. More than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.
- e. Crushing Because - of loose windings on a drum, cable was pulled between laying wraps of cable and crushed when loose wraps were tightened.
- f. Birdcaging - Sudden release of a load where the lays of cable separate and light can be seen between lays.
- g. Locking, Corrosion, Pitting and Abrasion- Lack of lubrication, premature braking of wires, excessive dirt, sand, or gravel embedded in strands of cable.
- h. Reverse Bending - Caused by running steel cable over one pulley and under another one.
- i. Pinch- Caused by undersized pulley groove; breaking wire strands.

3-3/(3-4 blank)

CHAPTER 4
UNIT MAINTENANCE

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| Repair Parts, Special Tools; Test, Measurements, and Diagnostic Equipment (TMDE); and Support Equipment..... | 4-1 |
| Service Upon Receipt..... | 4-2 |
| Unit Preventive Maintenance Checks and Services (PMCS)..... | 4-3 |
| Unit Troubleshooting | 4-13 |
| Unit Maintenance | 4-28 |
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Section I. REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

| <u>Subject</u> | <u>Page</u> |
|---|-------------|
| Common Tools and Equipment..... | 4-1 |
| Special Tools, TMDE, and Support Equipment..... | 4-1 |
| Repair Parts..... | 4-1 |

4-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to Modified Table of Organization and Equipment (MTOE) applicable to your unit.

4-2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

There are no special tools, TMDE, or support equipment authorized for unit maintenance.

Maintenance tools and equipment as authorized by Maintenance Allocation Chart (refer to Appendix B, Section III).

4-3. REPAIR PARTS

Organizational level repair parts are listed and illustrated in TM 11-5985-387-24P.

Section II. SERVICE UPON RECEIPT

| <u>Subject</u> | <u>Page</u> |
|------------------------------------|-------------|
| General..... | 4-2 |
| Preparing Mast for Operation | 4-2 |
| Checking Equipment | 4-2 |

4-4. GENERAL

Masts are delivered integral with their field trailer ready for deployment (field-ready). Upon receipt of mast, prepare for operation and conduct PMCS (Section III).

a. Tower Erecting Requirements

Three persons are required for tower erecting. Only those persons belonging to the handling crew shall be allowed near the tower during erection. To avoid confusion, one person shall be designated as team chief. This person shall be the only person authorized to issue commands or instructions during tower erecting. (Refer to Chapter 2.)

b. Tower Tie-Down Provisions

Refer to Preparation for Use section in Chapter 2 for tiedown provisions.

4-5. PREPARING MAST FOR OPERATION

Refer to Chapter 2 for preparation instructions.

4-6. CHECKING EQUIPMENT

a. Damage

Inspect equipment for damage incurred during shipment. Report any damage on form SF 364 [Report of Discrepancy (ROD)].

b. Packing Slip

Check equipment against packing slip to see if shipment is complete. Report all discrepancies in accordance with instructions of DA PAM 738-750, Maintenance Management Update.

c. Modifications

Check DA PAM 25-30, Consolidated Index of Army Publications and Blank Forms, for Modification Work Orders (MWO) applicable to this equipment. Compare MWO numbers (if any) obtained from DA PAM 25-30 with that on equipment. If numbers disagree, equipment must be modified.

**Section III. UNIT PREVENTIVE MAINTENANCE
CHECKS AND SERVICES (PMCS)**

| <u>Subject</u> | <u>Page</u> |
|---|-------------|
| General..... | 4-3 |
| Unit PMCS Table and Lubrication Chart | 4-3 |

4-7. GENERAL

To be sure that AB-1309 is always mission ready, you must perform scheduled preventive maintenance checks and services (PMCS) on a timely basis. Scheduled inspections allow defects to be discovered and corrected before resulting in serious damage or failure. Report any defects in accordance with instructions in DA Pam 738-750 (Maintenance Management Update) and special instructions from your commander.

4-8. UNIT PMCS TABLE AND LUBRICATION CHART

A PMCS table for AB-1309 appears at the end of this section. There are three categories or intervals of PMCS: B, M, and S. A dot in the INTERVAL column indicates the check and/or service that should be performed by unit maintenance personnel at a particular time. A lubrication chart is provided in back of the table.

a. Item to be Inspected and Procedure Column

This column identifies equipment to be inspected and procedure to do the required checks and services. Carefully follow these instructions.

b. Routine Checks

Routine checks are not listed as PMCS checks. You should perform routine checks as the need comes up. Some routine checks are

- (1) Cleaning
- (2) Washing
- (3) Checking for frayed cables
- (4) Storing items not in use
- (5) Covering unused receptacles
- (6) Checking for loose nuts, bolts, screws, and tighten if necessary
- (7) Checking for damaged components and/or cracked welds

4-8. UNIT PMCS TABLE AND LUBRICATING CHART - Continued**b. Routine Checks - Continued**

- (8) Checking for broken or dented equipment boxes, cable reels, and braces.
- (9) Check stencils and data plates for damage/obliteration. (See Appendix F).
- (10) When you are doing any PMCS or routine checks, keep in mind the warnings.

WARNING

- **Never operate the generator or mast until it has been properly grounded. Electrical defects in the load lines or equipment can cause DEATH by electrocution when contact is made with an ungrounded system.**
- **To avoid fire do not use cleaning solvent near electrical power, heat, or open flames. To prevent asphyxiation provide adequate ventilation and avoid prolonged breathing of fumes/vapors when using cleaning solvent. Since cleaning solvent dissolves natural oils, avoid prolonged contact with skin. When needed, use gloves which the solvent cannot penetrate for protection. The solvent is a toxic poison if taken internally, consult a physician immediately.**
- **When the equipment is operated with covers removed, DO NOT TOUCH exposed connections or components to prevent injury. MAKE CERTAIN you are not grounded when making connections or adjusting components inside the equipment to prevent electrical shock.**

c. Lubrication Requirements

- (1) Keep all lubricants in closed containers and store in a clean dry place away from external heat. Keep container covers clean and allow no dust, dirt or other foreign material to mix with the lubricants. Keep all lubrication equipment clean and ready for use. For instructions on lubrication in weather below 0° F (-18° C), refer to FM 9-207. For lubrication before and after fording, refer to TM 9-238.

4-8. UNIT PMCS TABLE AND LUBRICATING CHART - Continued**c. Lubrication Requirements - Continued**

- (2) Keep all external parts not requiring lubrication free of lubricants. Before lubricating the equipment, wipe all lubrication points free of dirt and grease. Clean all lubrication points after servicing to prevent accumulation of foreign matter.
- (3) Service the lubrication points at the proper intervals as specified in the lubrication chart. The intervals specified are based on operation under normal conditions. Modification of the recommended intervals may be required under unusual operating conditions. After operating in mud, dust, sand or other unusual conditions, clean and inspect all lubrication points. The intervals may be extended during periods of low activity. If extended, adequate preservation precautions must be taken.

CAUTION

Do not use the wrong type lubricant. Do not over lubricate.

NOTE

- **Oil can points. Quarterly or when required, lubricate latches, lever assemblies and linkage with PL.**
- **Do not lubricate springs.**

4-8. UNIT PMCS TABLE AND LUBRICATING CHART - Continued

B - Before

M - Monthly

S - Semiannually

| ITEM NO. | INTERVAL | | | ITEM TO BE INSPECTED | PROCEDURE |
|----------|----------|---|---|----------------------------------|---|
| | B | M | S | | |
| 1. | • | | | Power and signal | Inspect cable layout to ensure they do not create a dangerous situation to vehicles and personnel. |
| 2. | • | | | Axe and sledgehammer | Replace handle if broken, split or does not fit head properly. |
| 3. | • | | | Drive chains | Check all drive chains for signs of wear, or damage. Replace if needed. |
| 4. | | • | | Trailer lights | Verify that all trailer lights operate properly. |
| 5. | | • | | Actuator gear box mounting bolts | Check actuator gear box mount bolts for tightness (when tower is not in extended storage. Check monthly if tower is raised and lowered frequently; otherwise, as needed.) |
| 6. | | • | | Trailer brakes | Verify that trailer brakes operate. |
| 7. | | • | | Mast/Trailer | Clean all ground terminal connections. Replace any ground cable or lead if frayed, broken, or corroded. Check to ensure all ground rods are installed properly and equipment is correctly grounded. Test in accordance with paragraph 2-8. a. (10). |

4-8. UNIT PICS TABLE AND LUBRICATING CHART - Continued

B - Before

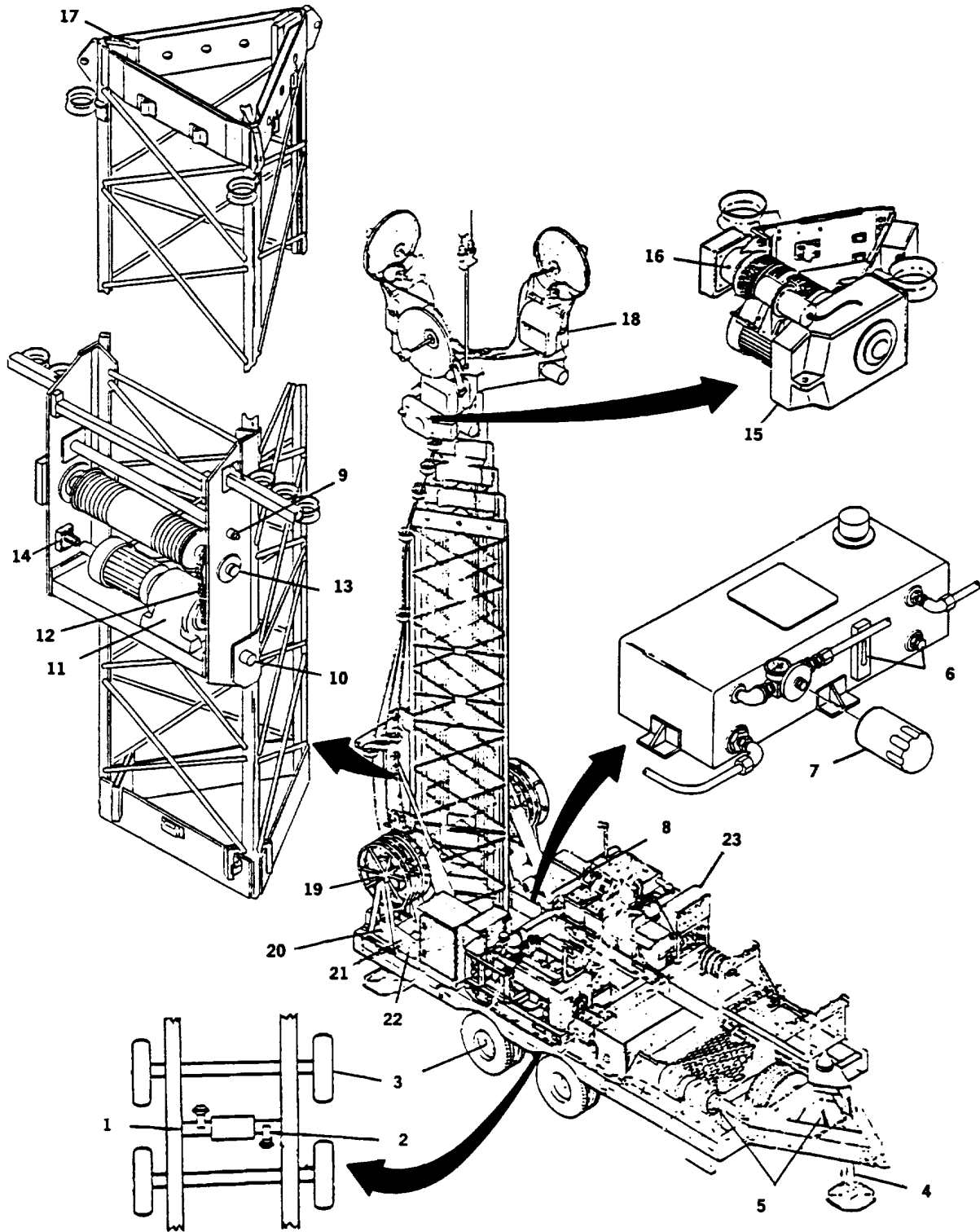
M - Monthly

S - Semiannually

| ITEM NO. | INTERVAL | | | ITEM TO BE INSPECTED | PROCEDURE |
|----------|----------|---|---|--------------------------------|---|
| | B | M | S | | |
| 8. | | • | | Power and control | <p>Inspect all cable receptacles for dirt, corrosion, broken and bent pins. Clean and repair where needed.</p> <p>Check binding post wires are firmly connected, and there is no evidence of corrosion building-up.</p> <p>Remove corrosion and clean binding post with soft bristle brush.</p> |
| 9. | | • | | AB-1309 structure | <p>Inspect positioner for paint deterioration and touch-up paint as required.</p> |
| 10. | | • | | Cabling and connectors | <p>Inspect for tightness, bent, broken or pushed back pins Repair as needed.</p> |
| 11. | | • | | Hardware | <p>Check for damaged or missing hardware. Replace as needed.</p> |
| 12. | | | • | Operational characteristics | <p>During operation, observe rotational characteristics of positioner. Note any unusual sounds such as grinding or whirring.</p> |
| 13. | | • | | Generator Sets | <p>Perform PMCS in accordance with TM 5-6115-585-12 technical manual.</p> |
| 4. | | | • | Modification Work Orders (MWO) | <p>Check to see if any MWOs are needed for AB-1309 or its components. Check equipment to see if applicable MWOs have been applied and MWO number is stamped as required. Perform modification or request modification as applicable</p> |

4-8. UNIT PMCS TABLE AND LUBRICATING CHART - Continued

LUBRICATION CRART



4-8. UNIT PMCS TABLE AND LUBRICATING CHART - Continued
LUBRICATION CHART - Continued

KEY

| LUBRICANTS | above +32°F (+0°C) | +10° to -100F (-12.2 to -23.30C) | 0° to -65°F (-17.8 to -53.90C) |
|---|--------------------------|--|--|
| PL - Lubricating Oil, General Purpose VV-L-800 (item 4, Appendix E) | PL | PL | PL |
| HB - Fluid, Brake - Silicone MIL-B-46176 (item 5, Appendix E) | HB | HB | HB |
| MPG - Multipurpose Grease MIL-G-10924 (item 6, Appendix E) | MPG | MPG | MPG |
| HF - Hydraulic Fluid MIL-H-5606 (item 7, Appendix E) | HF | HF | HF |
| MIL-L-2104 (SAE10) (item 14, Appendix E) | HF | | |
| Gear Oil (Mobil SHC or equivalent) (30 wt) GO-626 GO-629/634 (item 8, Appendix E) | GO - | GO - | GO - |
| PTFE - Dry Lithium Lubricant X20 (item 9, Appendix E) | PTFE | PTFE | PTFE |
| LTG - Low Temperature Grease MIL-G-23827A (item 10, Appendix E) | | OG | OG |

| INTERVALS |
|----------------------|
| M - Monthly |
| Q - Quarterly |
| S - Semiannual |
| A - Annual |
| A/R - As Required |

NOTE: For arctic operation refer to FM 9-207.

4-8. UNIT PMCS TABLE AND LUBRICATING CHART - Continued
LUBRICATION CHART - Continued

| ITEM NO. | ASSEMBLY/COMPONENT DESCRIPTION | LUBRICANT TYPE | INTERVAL |
|----------|---|----------------|----------|
| | <u>TRAILER</u> | | |
| 1 | Trunnion Axle (2 Fittings) | MPG | S |
| 2 | Master Cylinders (2) (Hydraulic Brakes) | HB | A |
| 3 | Wheel Bearings (4 Wheels) - repack both inner and outer bearings | MPG | A |
| 4 | Leveling Jacks (3) | | |
| | Zerk Fittings | MPG | S |
| | Screw Actuators | MPG | S |
| | Jack Braces | PL | S |
| | Jack Swivel Points | MPG | S |
| 5 | Parking Brake Moving Parts | PL | S |
| | Oil Can Points (Guy Cable Reels, Mast Lockouts, Latches, Etc.) | PL | Q |
| | | MPG | A |
| | <u>TILT SYSTEM</u> | | |
| 6 | Hydraulic Fluid (check sight gauge before operation, check fluid condition - replace if contaminated by moisture or dirt) | HF | A |
| | NOTE | | |
| | If fluid is extremely contaminated (lumpy or thick), service or replace screen if required | | |
| 7 | Hydraulic Fluid Filter (check filter gauge during operation) | | A |
| 8 | Hydraulic Cylinder Clevis (Bottom) | MPG | M |
| 9 | Hydraulic Cylinder Push Point (Top) | MPG | M |
| 10 | Tower Hinge Point (Truss Assy) | MPG | M |
| | Oil Can Points (Hand Pump, Handle Linkage, Hydraulic Box Hinge, Latches, Handles, Etc.) | PL | M |

4-8. UNIT PMCS TABLE AND LUBRICATING CHART - Continued
LUBRICATION CHART - Continued

| ITEM NO. | ASSEMBLY/COMPONENT DESCRIPTION | LUBRICANT TYPE | INTERVAL |
|----------|--|----------------|----------|
| | <u>MAST</u> | | |
| 11 | First Stage Gearmotor (change initially after 100 hrs.) [1.45 gals (5.5 1)] | GO-629/634 | A |
| 12 | Section #10 (Truss Assy) Drive Chain and Sprocket | PL | Q |
| 13 | Section #10 (Truss Assy) Winch Drum Shaft | MPG | M |
| 14 | Section #10 (Truss Assy) Ratchet Clutch | MPG | A |
| 15 | Second Stage Gearmotor (change initially after 100 hrs.) [3.03 gals (11.5 1)] | GO-629/634 | A |
| 16 | Section #6 Winch Drum Shaft | MPG | M |
| 17 | Tower Section Slides (All) (generally, after each 10 cycles of raising/ lowering) | PTFE | A/R |
| | Zerk Fittings | MPG | M |
| | Oil Can Points (Emergency Brake Release Linkage, Latches, Levers, Etc.) | PL | M |
| | <u>ANTENNA POSITIONERS (Azimuth and Elevation)</u> | | |
| 18 | Azimuth Gearmotor [8 oz (236.6 cm3)] change initially after 100 hrs.) | GO-626 | A |
| | Elevation Gearmotor [16 oz (473.1 cm3)] (change initially after 100 hrs.) | GO-626 | A |
| | Spur Gears | LTG | Q |
| | CAUTION | | |
| | Take precaution to ensure grease or oil does not get on drive belts or limit switch cams. | | |
| | Limit Switch Cam Rollers (one drop of oil) | PL | Q |
| | Bearing Seals (if dry) | PL | Q |
| | Bearings (only if unusual noises occur during movement) (bearing disassembled) | LTG | A/R |

4-8. UNIT PMCS TABLE AND LUBRICATING CHART - Continued
LUBRICATION CHART - Continued

| ITEM NO. | ASSEMBLY/COMPONENT DESCRIPTION | LUBRICANT TYPE | INTERVAL |
|----------|---|----------------|----------|
| | REELS (RF) AND DRIVE SYSTEM | | |
| 19 | Cable Reel Bearings (bearing disassembled) | MPG | A/R |
| 20 | Cable Reel Drive Shaft Pillow Blocks (4) | MPG | M |
| 21 | Chain Drives and Sprockets | PL | Q |
| 22 | Gearmotors (2) (change Initially after 100 hrs.) [0.08 gal (0.30 1)] | GO-629/634 | A |
| 23 | <u>GENERATOR</u> (Refer to Appendix A) | | |

Section IV. UNIT TROUBLESHOOTING

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| Troubleshooting | 4-13 |
| Troubleshooting Symptom Index..... | 4-14 |
| Troubleshooting..... | 4-14 |

4-9. INTRODUCTION

a. Fault Location

To maintain integrity of transmitting system and restore downed link as quickly as possible, troubleshooting should be accomplished one step at a time.

b. Troubleshooting

- (1) Troubleshooting procedures are intended to be used to isolate a fault.
- (2) It may be necessary to break transmission link during troubleshooting. Before link is broken, your command must be notified of your intentions.
- (3) In the event that troubleshooting fails to identify faulty component or corrective actions fail to restore operation, notify your command and request assistance of Direct Support maintenance personnel.

I



4-10. TROUBLESHOOTING SYMPTOM INDEX

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4-11. TROUBLESHOOTING

The following Troubleshooting table lists malfunctions, tests or inspections, and includes corrective actions for those faults for the AB-1309 Mast.

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|---|--|---|
| 1. Wrong or no output from generator. | Refer to generator technical manual (Refer to Appendix A) for all generator troubleshooting. | |
| 2. Trailer lights do not come on. | Step 1. (All systems) Check plug connection. | a. Tighten connection. b. Replace connector if defective. |
| | Step 2. (All systems) Check tow vehicle. | Repair tow vehicle. |
| | Step 3. (One system) Check for partial plug connection. | Tighten connection. |
| | Step 4. (One system) Check wiring for continuity. | Repair wiring/replace harness. |
| 3. One trailer light does not come on. | Step 1. Check for burned out bulb. | Replace bulb. |
| | Step 2. Check bulb holder for corrosion or dirt. | a. Clean bulb holder. b. Replace bulb holder. |
| | Step 3. Check continuity of wiring. | Repair/replace wiring. |
| | Step 4. Check for proper ground. | Tighten or reconnect |
| 4. Blackout light(s) do not work on tower. ground. | Step 1. (Both lights out) Inspect connector and wiring. | a. Tighten blackout light connector between tower and trailer if loose. b. Repair/replace wiring if defective. c. Tighten ground leads if loose. d. Replace bulbs if required. |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|--|--|---|
| 4. Continued | Step 2. (One light out) Inspect bulb, bulb holder, and wiring. | a. Replace bulb if burned out. b. Repair wiring if shorted. c. Tighten ground lead if loose. d. Clean bulb holder if required. |
| 5. Tower control box functions inoperable (all). | Step 1. Check generator control panel circuit breakers/controls. (Refer to Appendix A) Step 2. Check power distribution box for proper selection. Step 3. Check power distribution box rotary switch continuity (refer to paragraph 4-48). Step 4. Inspect power cables between generator- if loose. distribution box - control box (J1). Notify Direct Support maintenance if tower functions are still inoperable. | Select proper generator. If defective, notify Direct Support Maintenance. a. Tighten connections b. Replace power cables if defective. |
| 6. Tower tilt (up or down) function inoperable. | Step 1. (Hydraulic pump/motor not running) Check circuit breaker, and tilt pump switch is on. Step 2. (Hydraulic pump/motor not running) Check wiring/connections between control panel (J14) and hydraulic pump motor. | a. Switch on circuit breaker for hydraulic pump. b. Switch on hydraulic pump. a. Tighten connections. b. Repair/replace wiring. |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|--------------------|---|---|
| 6. Continued | <p>Step 3. (Pump/motor running) Check tie-downs are removed and clamp handles engage limit switches for tilt up. Check for obstructions.</p> | <p>a. Engage limit switches as required. b. Remove tiedowns, and obstructions as required.</p> |
| | <p>Step 4. (Pump/motor running) Check fluid level, filter and leaks.</p> | <p>a. Replenish fluid if level is low. b. Replace filter if flow is restricted/ dirty as indicated by gauge reading of 10 psi or more. Refer to paragraph 4-20. c. Repair leaks.</p> |
| | <p>Step 5. (Pump/motor running) Inspect hydraulic cylinders for proper operation and/or leaks.</p> | <p>If defective, notify Direct Support maintenance.</p> |
| | <p>Step 6. Check for proper operation of piping components. (Test/ inspect, relief valve, flow control valve and hand pump discharge check valve.</p> | <p>a. Replace/adjust relief valve if required. Refer to paragraph 4-18. b. Replace/adjust flow control valve if required. Refer to paragraph 4-18. c. Replace check valve if required. Refer to paragraph 4-22.</p> |
| | <p>Notify Direct Support maintenance if tower tilt function is still inoperable.</p> | |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|---|---|--|
| 7. Tower tilt function (up or down) is slow or erratic. | <p>Step 1. Check fluid level and condition.</p> <p>Step 2. Check hydraulic adjustments for proper operation.</p> <p>Step 3. Check for restriction/obstruction in hydraulic lines.</p> <p>Step 4. Check fuse (at bottom end of cylinder).</p> <p>Step 5. Inspect cylinder(s) for leaks. maintenance.</p> <p>Notify Direct Support maintenance if tower tilt function is still slow or erratic.</p> | <p>Replenish fluid and bleed air from system. Replace fluid, filter, and clean screen.</p> <p>a. Adjust flow control or replace if defective. Refer to paragraph 4-15.</p> <p>b. Adjust relief valve replace if defective. Refer to paragraph 4-18.</p> <p>a. Clear obstruction.</p> <p>b. Replace crimped lines if required.</p> <p>Replace fuse if defective.</p> <p>If defective, notify Direct Support</p> |
| 8. Tower will not tilt up when using hand pump. | <p>Step 1. Check for obstructions and that tie-downs are removed.</p> <p>Step 2. Check that switch (for activating solenoid) is held to UP or, if no electric, actuating rod is properly engaging directional control valve.</p> <p>Step 3. Inspect/replace pump/motor discharge check valve.</p> | <p>Remove tie-downs/ obstructions.</p> <p>Continue holding switch in UP position or ensure directional control valve is manually engaged by actuating rod.</p> <p>Replace check valve if required. Refer to paragraph 4-22.</p> |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|--|---|---|
| 8. Continued | Step 4. Check hand pump for proper operation (Install gauge in pressure test port and operate hand pump). | Replace hand pump if defective. Refer to paragraph 4-19. |
| 9. Tower will not tilt down when using hand pump. | <p>Step 1. Check for Clear obstruction. obstruction.</p> <p>Step 2. Check that switch (for activating solenoid) is held to DN or, if no electric, actuating rod is properly engaging directional control valve.</p> | Continue holding switch in DN position or ensure directional control valve is manually engaged by actuating rod. |
| | Step 3. Inspect/replace pump/motor discharge check valve. | Replace check valve if required. Refer to paragraph 4-22. |
| | Step 4. Check hand pump for proper operation. (Install gauge in pressure test port and operate hand pump.) | Replace hand pump if defective. Refer to paragraph 4-19. |
| 10. Tower does not extend (first or second stage). | Step 1. (Gearmotor not working) Check 1st or 2nd stage circuit breaker. | Place circuit breaker on. |
| | Step 2. (Gearmotor not working) Check upper limit switch. | If tripped, determine cause and correct. |
| | Step 3. (Motor drives but winch does not turn) Inspect drive chain (first stage) and check for obstructions or fouled cables. | <p>a. Replace drive chain if broken (first stage).</p> <p>b. Remove obstruction(s).</p> <p>c. Notify next higher level maintenance if cables are fouled or if gearmotor is defective.</p> |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|---|---|--|
| 10. Continued | Step 4. (Gearmotor not working) Test motor. | Notify next higher maintenance level if first or second stage gearmotor is defective. |
| 11. Tower slips after UP/DOWN switch is released (first or second stage). | Check that motor brake release assembly is adjusted properly. | Adjust as necessary. Refer to paragraph 4-38. |
| 12. Tower does not retract (first or second stage). | Step 1. (Gearmotor not working) Check 1st or 2nd stage circuit breaker. | Place circuit breaker on. |
| | Step 2. (Gearmotor not working) Check lower limit switch. | If tripped, determine cause and correct. |
| | Step 3. (Gearmotor not working) Inspect gearmotor. | Notify next higher level maintenance if gearmotor is defective. |
| | Step 4. (Gearmotor/winch operates but tower does not lower) Inspect for obstruction or hung up cable. | a. Remove obstruction. b. Notify next higher level maintenance if cables are fouled. |
| 13. First stage does not extend when using hand crank. | Step 1. Inspect ratchet clutch for proper operation. | Replace clutch if defective. Refer to paragraph 4-37. |
| | Step 2. Inspect tower/cables for obstruction/fouled cables. | a. Replace obstruction. b. Free up cables if accessible. c. Notify next higher level maintenance if cables are fouled. |

NOTE

Inspect cables to ensure they are not damaged.

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|--|---|--|
| <p>14. Tower emergency brake release (emergency lowering) does not operate.</p> | <p>Step 1. Inspect solenoid and actuating linkage for obstruction, damage, and proper operation.</p> <p>Step 2. Check wiring and connection between solenoid and control panel.</p> <p>Notify next higher level maintenance if emergency release system is still inoperable.</p> | <p>a. Clear obstruction if required.</p> <p>b. Adjust or repair linkage if required.</p> <p>c. Replace solenoid if defective. Refer to paragraph 4-38.</p> <p>Tighten connections if loose.</p> |
| <p>15. Cable reel drive unit inoperable (circuit breakers R-REEL and L-REEL on).</p> | <p>Step 1. (If motor is not working) Test/inspect connections and motor.</p> <p>Step 2. (If motor is working) Inspect drive chain.</p> <p>Step 3. (If motor is working) Inspect torque limiter (clutch).</p> <p>Step 4. (If motor is driving) Check for caught or tangled cable.</p> <p>Notify Direct Support maintenance if cable reel drive unit is still inoperable.</p> | <p>a. Tighten connections (J6-left reel, J5-right reel).</p> <p>b. Notify next higher level maintenance if motor is defective.</p> <p>a. Adjust if loose or thrown from sprocket. Refer to paragraph 4-23.</p> <p>b. Replace if broken.</p> <p>c. Clear obstruction if required.</p> <p>Adjust for proper tension if required. Refer to paragraph 4-23.</p> <p>Free up cable/remove obstruction.</p> |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|---|--|--|
| 16. Obstruction lights (both) do not light/flash. | <p>Step 1. Inspect for Tighten connection. loose connector (J12).</p> <p>Step 2. Check bulbs if not on.</p> <p>Step 3. Check wiring for continuity between obstruction lights and control box.</p> <p>Step 4. (Lights are on but do not flash).</p> | <p>Replace bulbs if defective.</p> <p>Repair/replace wiring.</p> <p>Notify Direct Support maintenance if beacon does not flash when switch is positioned to FLASH.</p> |
| 17. One obstruction light does not light/flash. | <p>Inspect bulb. Replace bulb.</p> | <p>Switch to (Up).</p> |
| 18. Antenna positioner control unit/indicator box inoperable (upper control panel is fully operable). | <p>Step 1. Check circuit breaker for POS & DISPLAY on control box.</p> <p>Step 2. Check positioner control unit fuse (near power plug at side of box).</p> <p>Step 3. Inspect/test connector J13 (internal) between control box and positioner control unit.</p> | <p>Replace fuse if defective.</p> <p>a. Tighten connection if loose.</p> <p>b. Replace antenna positioner control unit if power is available at connector and control unit/indicator is still not operable. Refer to paragraph 4-47.</p> |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|---|---|--|
| 19. None of the positioners will rotate or elevate. | <p>Step 1. Check circuit Switch to on (up). breaker POS & DISPLAY.</p> <p>Step 2. Inspect for loose connections (J13-internal, and J12 external).</p> <p>Step 3. Check positioner control unit fuse (near power plug at side of box).</p> <p>Step 4. Inspect wiring between control box (J12) and J-box, and positioners.</p> <p>Notify Direct Support maintenance if dishes still do not rotate.</p> | <p>Tighten connections.</p> <p>Replace fuse if defective.</p> <p>If wiring is good, replace positioner control unit.</p> |
| 20. One positioner does not rotate or elevate. | <p>Step 1. Check connectors J12 and J13 (internal) for loose or bent pins.</p> <p>Step 2. Check continuity of wiring between junction box and positioner.</p> | <p>Tighten pins if required.</p> <p>If no defect found, refer to higher level maintenance.</p> |
| 21. De-icer does not work (indicator light ON). | <p>Check continuity of wiring between control box (J12) and J-box; and plug/receptacle near top of mast. maintenance.</p> | <p>a. Plug in heater cable to receptacle or tighten connection.</p> <p>b. If no defect found, refer to higher level maintenance.</p> |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|--|---|--|
| <p>22. Wind Speed display shows no reading (wind is turning sensor).</p> | <p>Step 1. Inspect for loose connectors (J13-between antenna positioner control unit and control box; and J12-outside panel).</p> <p>Step 2. Check wiring between control box (J12) and anemometer for continuity.</p> | <p>Tighten connections (J12 and J13).</p> <p>If no defect found, refer to higher level maintenance.</p> |
| <p>23. Service brakes do not work or are weak.</p> | <p>Step 1. Inspect brake hydraulic system (fluid level, leaks).</p> <p>Step 2. Inspect air system (loose connections, filters, low pressure, glad-hands, air boosters, restricted/cripped air lines, air leak, tow vehicle)</p> | <p>a. Fill master cylinder reservoirs if needed.</p> <p>b. Bleed air from hydraulic system if required.</p> <p>c. Repair leaks as required.</p> <p>a. Tighten gladhands or any other loose connections.</p> <p>b. Fill air tank if low pressure is indicated.</p> <p>c. Clean or replace filter(s) if required. Refer to paragraph 4-31.</p> <p>d. Replace air booster(s) if defective. Refer to paragraph 4-31.</p> <p>e. Remove restriction or replace air lines if damaged or leaking.</p> <p>f. Repair tow vehicle if air supply is inadequate. (Open air shut off valve if closed.)</p> |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|--|--|--|
| 23. Continued | Step 3. Inspect brake assembly (shoes, drums, levers, cylinders). | a. Replace brake shoes if worn or coated with oil/grease. Refer to paragraph 4-28. |
| | | <p style="text-align: center;">NOTE</p> <p>If grease or oil is present on brake shoes, replace worn seals/correct problem before putting on new shoes.</p> |
| 24. One brake locks up or grabs when brakes are applied. | Step 1. Inspect for Bleed air from system. air in hydraulic brake lines. | <p>b. Repair/replace drums if required. Refer to paragraph 4-28.</p> <p>c. Replace brake cylinder(s) if required. Refer to paragraph 4-28.</p> <p>d. Replace actuating levers/hardware if required. Refer to paragraph 4-28.</p> |
| | Step 2. Check brake adjustment. | Adjust brakes if required. Refer to paragraph 4-27. |
| | Step 3. Check for moisture in air reservoir. | Drain moisture and recharge air reservoir. |
| | Step 4. Check for out-of-round, cracked, worn, or scored brake drum. | Replace brake drum if defective. Refer to paragraph 4-28. |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|---|---|---|
| 25. One brake drags or will not release. | <p>Step 1. Check brake adjustment.</p> <p>Step 2. Inspect brake assembly (springs, cylinders, levers, loose hardware).</p> <p>Step 3. Check hand brake (parking brake) is released/adjusted properly.</p> | <p>Adjust brakes if required. Refer to paragraph 4-27.</p> <p>a. Replace brake cylinder if defective. b. Replace brake return spring if defective. c. Replace/tighten hardware if damaged or loose. Refer to paragraph 4-28.</p> <p>Release hand brake or adjust if required.</p> |
| 26. Parking brakes do not hold. | <p>Step 1. Check for proper adjustment.</p> <p>Step 2. Inspect handle linkage.</p> <p>Step 3. Inspect brake assembly (lever, cable).</p> | <p>Adjust brakes. Refer to paragraph 4-27.</p> <p>Repair/adjust handle linkage.</p> <p>a. Replace/repair cable if required. b. Replace/reconnect actuating lever at brake drum if required. Refer to paragraph 4-28.</p> |
| 27. Excessive play and/or noise at wheel. (brakes are operating properly) | <p>Step 1. Check lug nuts. Tighten if loose.</p> <p>Step 2. Inspect for excess play or wheel bearing noise.</p> <p>Step 3. Inspect hub, drum, and wheel axle.</p> | <p>a. Adjust wheel bearings if needed. b. Replace wheel bearing if worn. Refer to paragraph 4-28.</p> <p>a. Repair/replace hub and drum if required. Refer to paragraph 4-28. b. Replace wheel axle if damaged or bent. Refer to paragraph 4-29.</p> |

4-11. TROUBLESHOOTING - Continued

| <u>MALFUNCTION</u> | <u>TEST OR INSPECTION</u> | <u>CORRECTIVE ACTION</u> |
|---|---|--|
| 28. Trailer sags to one side or does not track properly (suspension). | Step 1. Inspect springs/U-bolts. Step 2. Inspect axles (trunnion, wheel axles, fasteners). | a. Replace U-bolt fasteners/hardware if damaged or missing. Refer to paragraph 4-29. b. Replace springs if broken or sprung. Refer to paragraph 4-29. a. Replace trunnion axle if damaged. Refer to paragraph 4-29. b. Replace wheel axle if damaged. Refer to paragraph 4-29. c. Replace fasteners if damaged or missing. |

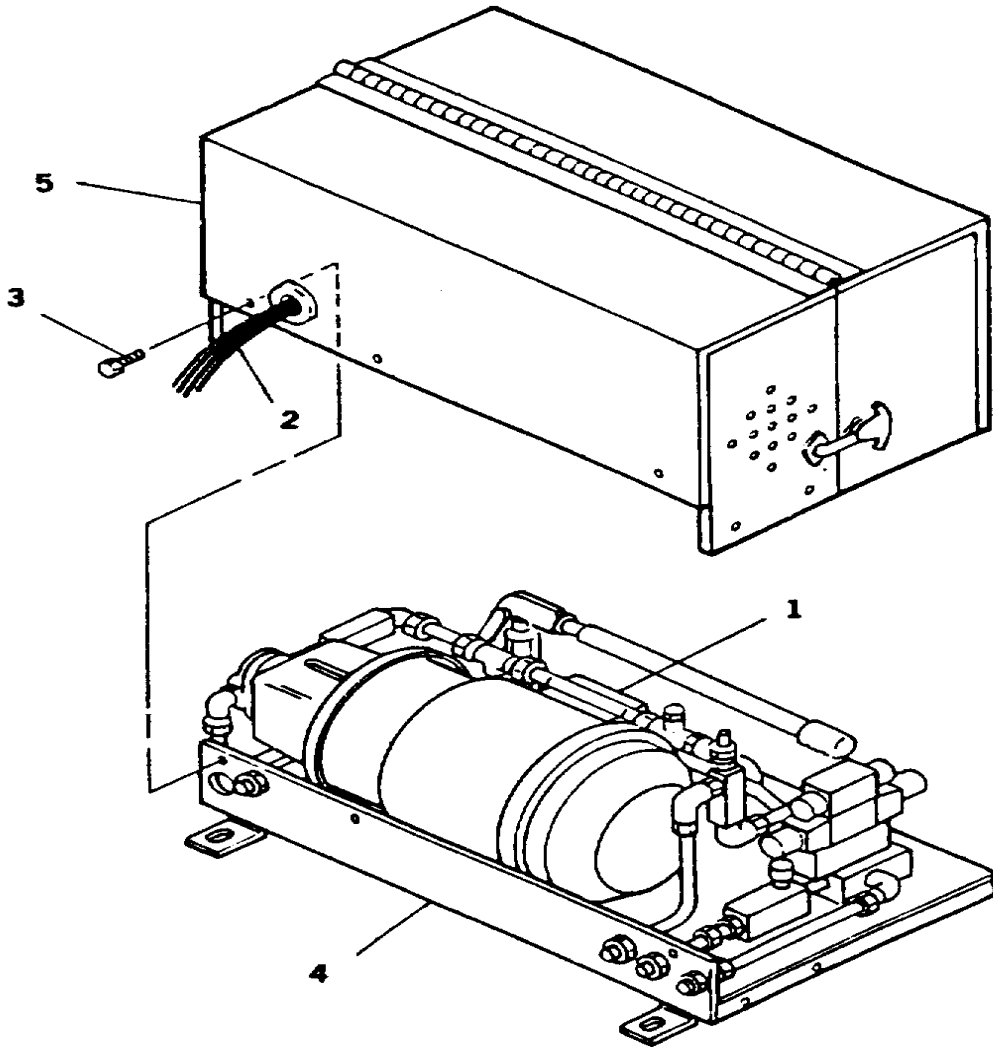
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NOTE

**This section is to be used in conjunction with the Repair Parts and Special Tools List (RPSTL).
When replacement parts are required, refer to TM 11-5985-387-24P.**

4-12. REMOVE/REPLACE HYDRAULIC COVER ASSEMBLY



| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REMOVE

WARNING

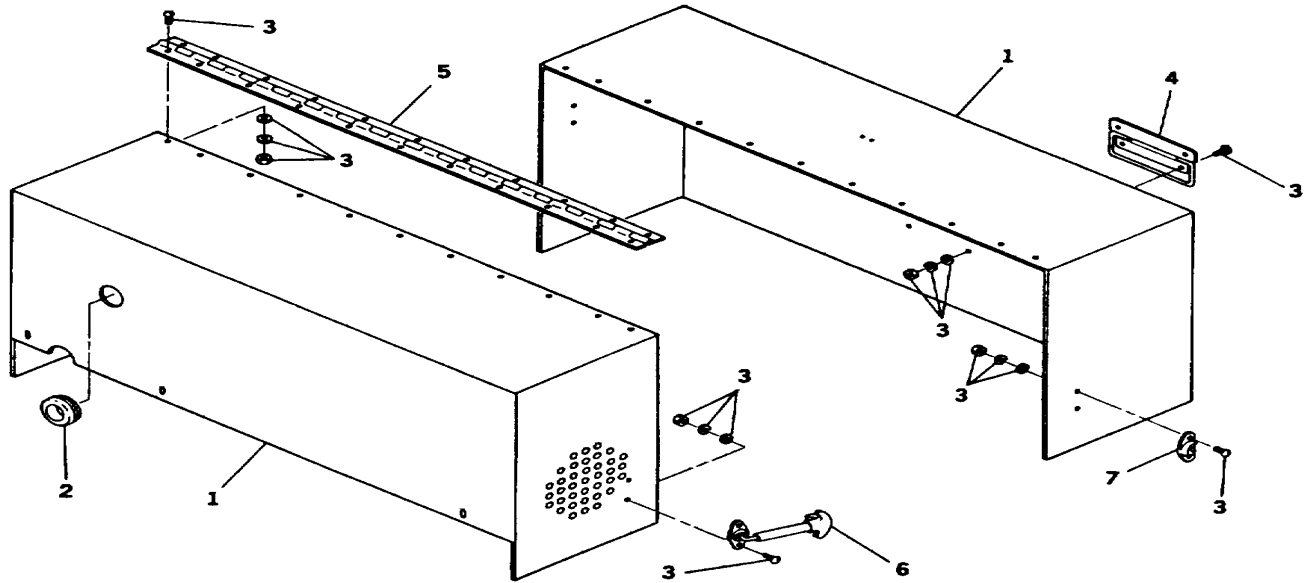
Ensure all electrical power is removed from hydraulic motor before starting.

| | | |
|---------------------------------|---------------------|---|
| 1. Motor junction box (1) | Junction box cover. | Remove two cap nuts and remove cover from junction box. Disconnect and tag wires of cable (2). Loosen stuffing tube and pull out cable. |
| 2. Hydraulic cover assembly (5) | Hex head screws (3) | Remove seven screws (3) securing cover (5) to base (4) and lift-cover from base. |

4-12. REMOVE/REPLACE HYDRAULIC COVER ASSEMBLY - Continued

| Location | Item | Action |
|---------------------------------|---------------------|--|
| REPLACE | | |
| 1. Hydraulic cover assembly (5) | Hex head screws (3) | Position cover (5) on base (4) and secure with seven screws (3). |
| 2. Motor junction box (1) | Junction box cover | Feed cable (2) through grommet on cover (5) and stuffing tube on junction box (1). Connect wires as tagged. Tighten stuffing tube on junction box (1). |

4-13. REPAIR OF HYDRAULIC COVER ASSEMBLY



| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPAIR

NOTE

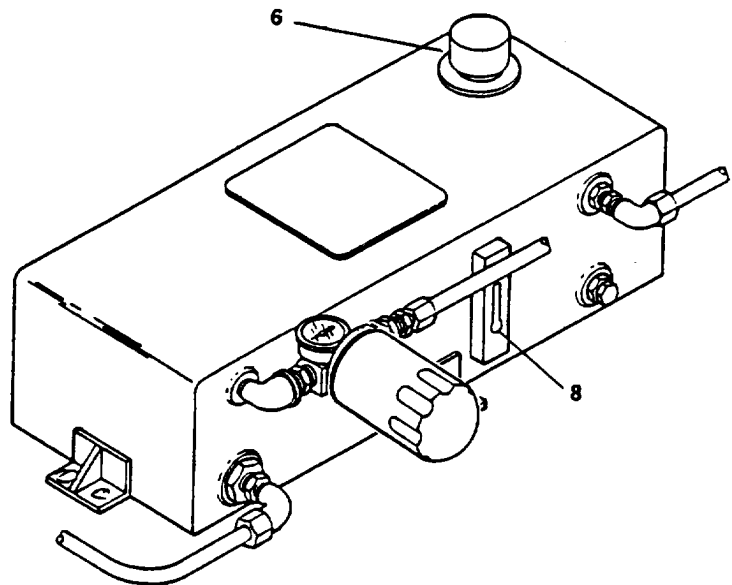
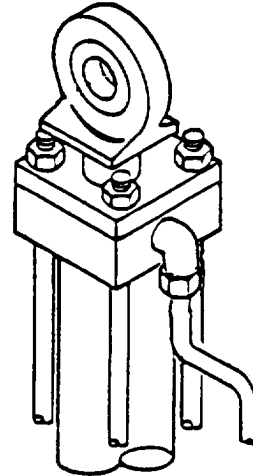
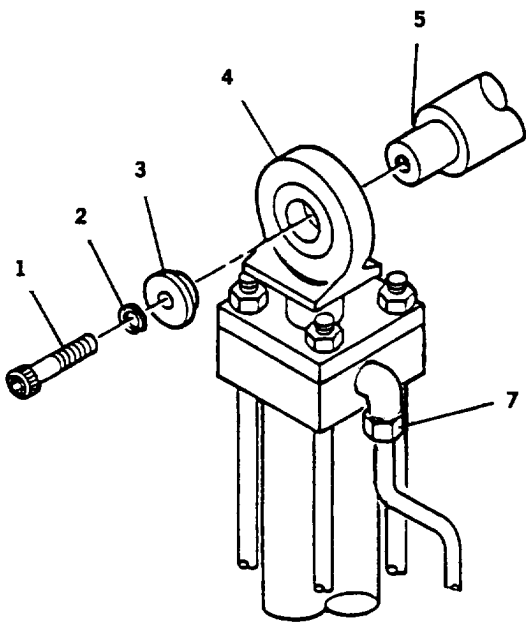
During installation always use new lock washers, do not reuse disassembled lock washers.

| | | |
|---------------------------------|---------------------|--|
| 1. Hydraulic cover assembly (1) | Grommet (2) | Remove/replace grommet. |
| 2. | Handle (4) | Remove four sets of fasteners (3) and remove/replace handle. |
| 3. | Hinge (5) | Remove twenty-two sets of fasteners (3) and remove/replace hinge. |
| 4. | Hood latch (6) | Remove two sets of fasteners (3) and remove/replace hood latch. |
| 5. | Hooking bracket (7) | Remove two sets of fasteners (3) and remove/replace hooking bracket. |

4-14. HYDRAULIC SYSTEM FILL AND BLEED PROCEDURES

WARNING

Wear eye protection, wrap rags around connection, and remove pressure from hydraulic system by slowly loosening fitting (at top of cylinder) before starting maintenance to prevent injury from pressurized fluid.



4-14. HYDRAULIC SYSTEM FILL AND BLEED PROCEDURES - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

CAUTION

Clean external areas around hydraulic connections before starting repairs. Ensure dirt/foreign matter does not enter hydraulic system during repair procedures.

NOTE

Catch excess fluid in a suitable container and dispose of properly. Do not reuse this fluid.

FILL HYDRAULIC SYSTEM

NOTE

If cylinder spherical bearing does not easily slide off of top mounting, manually pump cylinder up/down until cylinder can slide free.

| | | |
|---------------------|---------------------------------|---|
| 1. Hydraulic system | Cylinder spherical bearings (4) | Remove screw (1), lock washer (2) and ram mount (3). Slide cylinder spherical bearing (4) from top mounting (5) on truss assembly. Repeat for other cylinder. Secure hydraulic cylinders to allow full extension (using a rope or other means). |
| 2. | Hydraulic reservoir (6) | Fill system reservoir until full by observing reservoir sight gauge (8). Allow to sit for a few minutes to let fluid settle into system. |
| 3. | Cylinder hydraulic lines (7) | Loosen, but do not remove, hydraulic lines at top of cylinder bodies. |

4-14. HYDRAULIC SYSTEM FILL AND BLEED PROCEDURES - Continued

| Location | Item | Action |
|--|--|---|
| FILL HYDRAULIC SYSTEM - Continued | | |
| 4. | System power, hydraulic pump, and tilt UP/DN switches. | Power up system, turn on hydraulic pump and alternately position tilt UP/DN switch until fluid appears out of loosened cylinder lines (7). |
| 5. | Hydraulic reservoir (6) | Add new fluid to reservoir to bring level back to full. Continue jogging tilt UP/DN switch until steady stream of fluid flows from loosened cylinder lines. |
| 6. | Cylinder lines (7). | Tighten cylinder hydraulic lines on both cylinders. |

NOTE

To bleed air from hydraulic system, perform Step 2 of following procedure before reconnecting cylinders to truss assembly.

| | | |
|----|---------------------------------|--|
| 7. | Cylinder spherical bearings (4) | Slide cylinder bearings (top of cylinders) onto top mountings (5). Install ram mounts (3), new lock washers (2), and screws (1). |
| 8. | Capscrews (1) | Torque socket head capscrews (1) to 90 + 5 ft-lbs. |

NOTE

It may be necessary to adjust cylinder rod ends with hand pump to line up with top mountings.

4-14. HYDRAULIC SYSTEM FILL AND BLEED PROCEDURES - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

BLEED AIR FROM HYDRAULIC SYSTEM

NOTE

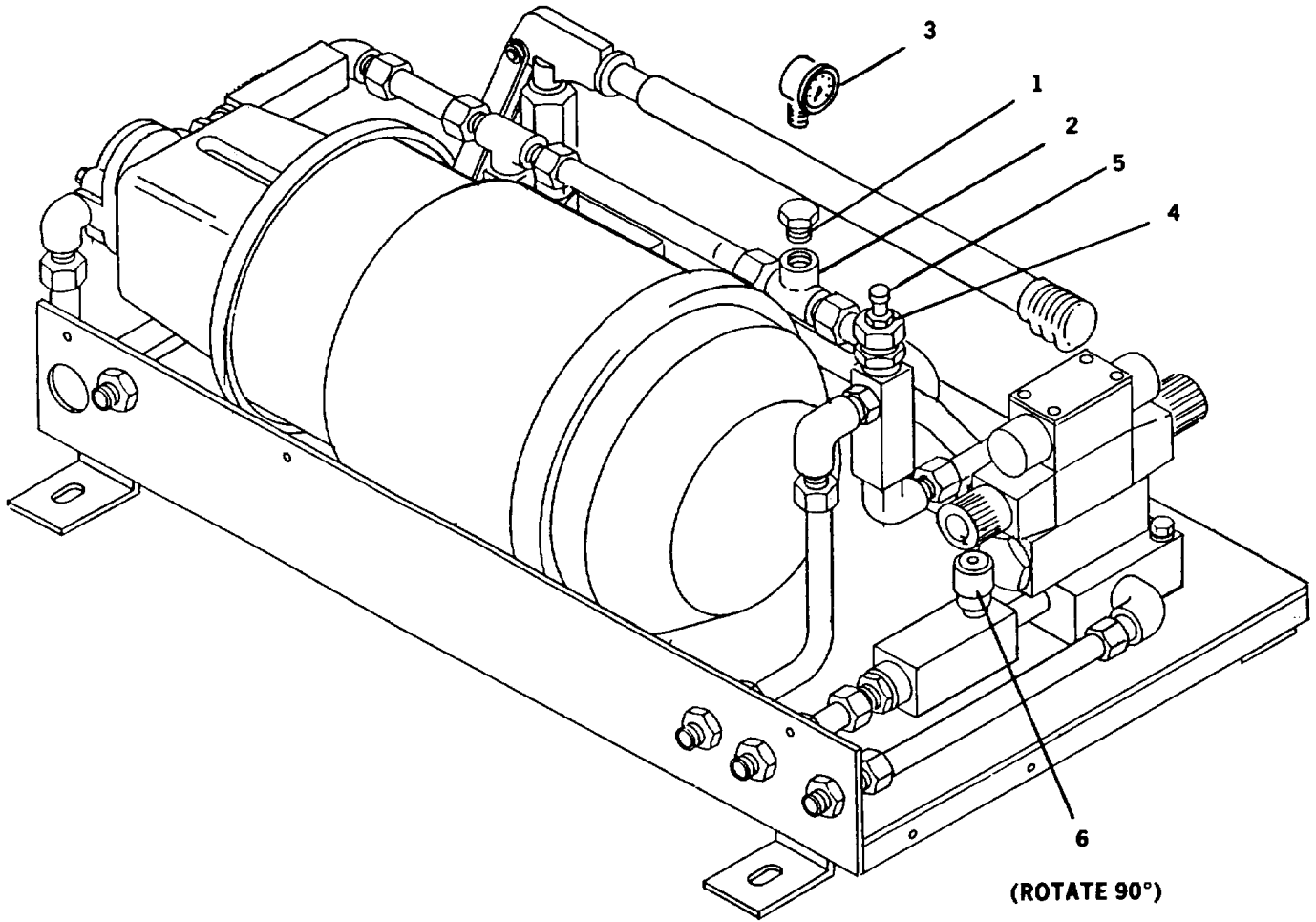
If cylinder spherical bearing does not easily slide off of top mounting, manually pump cylinder up/down until cylinder can slide free.

| | | |
|---------------------|---------------------------------|--|
| 1. Hydraulic system | Spherical bearings (4) | Remove screw (1), lock washer (2), and ram mount (3). Slide cylinder spherical bearing (4) from top mounting (5) on truss assembly. Repeat for other cylinder. |
| 2. | Power package | Secure cylinder bodies with ropes or other means and ensure cylinder rods are clear (unobstructed) to move, and operate power package, extending and retracting cylinders repeatedly until cylinder rods move in unison. |
| 3. | Cylinder spherical bearings (4) | Slide cylinder bearings (top of cylinders) onto top mountings (5). Install ram mounts (3), new lock washers (2), and screws (1). |
| 4. | Cap screws (1) | Torque socket head cap screws to 90 + 5 ft-lbs. |

NOTE

If may be necessary to use hand pump to adjust cylinder rod ends for line up with top mountings.

4-15. ADJUST HYDRAULIC SYSTEM



NOTE

Adjustments are performed with generator ON.

| Location | Item | Action |
|---|----------------------|---|
| ADJUST HYDRAULIC SYSTEM PRESSURE | | |
| 1. Hydraulic System (Power Package) | Hydraulic cover | Open hydraulic cover shown removed for clarity. |
| 2. | Plug (1) and tee (2) | With hydraulic system shut down, remove plug (1) from hydraulic pressure gauge tee (2). Install hydraulic pressure test gauge (3) in tee (2). |

4-15. ADJUST HYDRAULIC SYSTEM - Continued

| Location | Item | Action |
|---|-----------------------------|--|
| ADJUST HYDRAULIC SYSTEM PRESSURE - Continued | | |
| 3. | Pressure relief valve | Turn on hydraulic pump, loosen locknut (4) on pressure relief valve and adjust for 1800 psi (12,411 kPa). (Clockwise rotation of adjusting screw (5) increases hydraulic pressure.) Tighten adjustment lock nut (4). |
| 4. | Tower tilt system | Operate tower tilt system up and down to verify pressure remains stable under loads (refer to Chapter 2). |
| 5. | Hydraulic system | Shut down hydraulic system. |
| 6. | Plug (1) and test gauge (3) | Slowly remove test gauge (3), install plug (1) using new seal tape (item 11, Appendix E), and return test gauge. |
| 7. | Cover | Close hydraulic power package cover. |

ADJUST HYDRAULIC SYSTEM FLOW RATE

NOTE

Hydraulic system flow rate is set to control the rate at which a fully equipped tower tilts from vertical to horizontal.

| | | |
|---------------------|-----------------|--|
| 1. Hydraulic system | Tower (Tilt Up) | Refer to Chapter 2 for tilting tower up. |
|---------------------|-----------------|--|

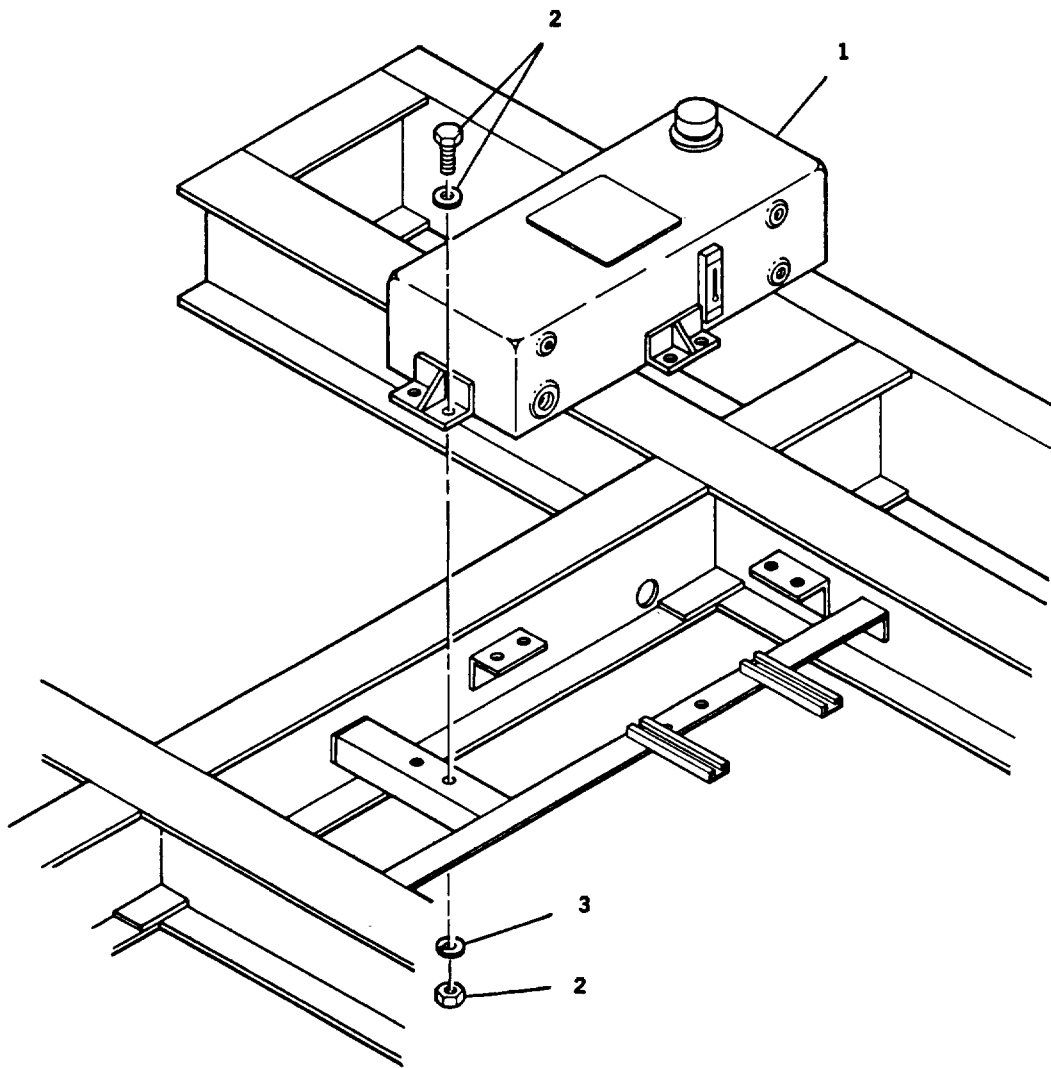
4-15. ADJUST HYDRAULIC SYSTEM - Continued

| Location | Item | Action |
|--|-------------------------------|--|
| ADJUST HYDRAULIC SYSTEM FLOW RATE - Continued | | |
| 2. | Hydraulic power package cover | Open cover to hydraulic power package (not shown for clarity). |
| 3. | Flow control valve (6) | Set tilt switch to DN and adjust flow control valve (6) (located below pressure relief valve) so mast descends at a slow, smooth rate. |
| 4. | Cover | Close power package cover. |

4-16. REMOVE/REPLACE HYDRAULIC TANK

CAUTION

Clean external areas around hydraulic connections before starting procedure. Ensure dirt/foreign matter does not enter hydraulic system, including replacement tank, during process.



4-16. REMOVE/REPLACE HYDRAULIC TANK - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REMOVE

NOTE

Drain hydraulic fluid into a suitable container and dispose of properly. Do not reuse this fluid.

| | | |
|-------------------|-----------------------|--|
| 1. Hydraulic tank | Connecting parts | Disconnect tubing, fittings, etc. from tank (1) |
| 2. | Fasteners (2) and (3) | Remove eight sets of fasteners (2) and (3) and lift out hydraulic tank (1) |

REPLACE

| | | |
|-------------------|-----------------------|--|
| 1. Hydraulic tank | Fasteners (2) and (3) | Position hydraulic tank (1) over mounting holes and secure with fasteners (2) and (3). Use new lock washers (3) during installation. |
|-------------------|-----------------------|--|

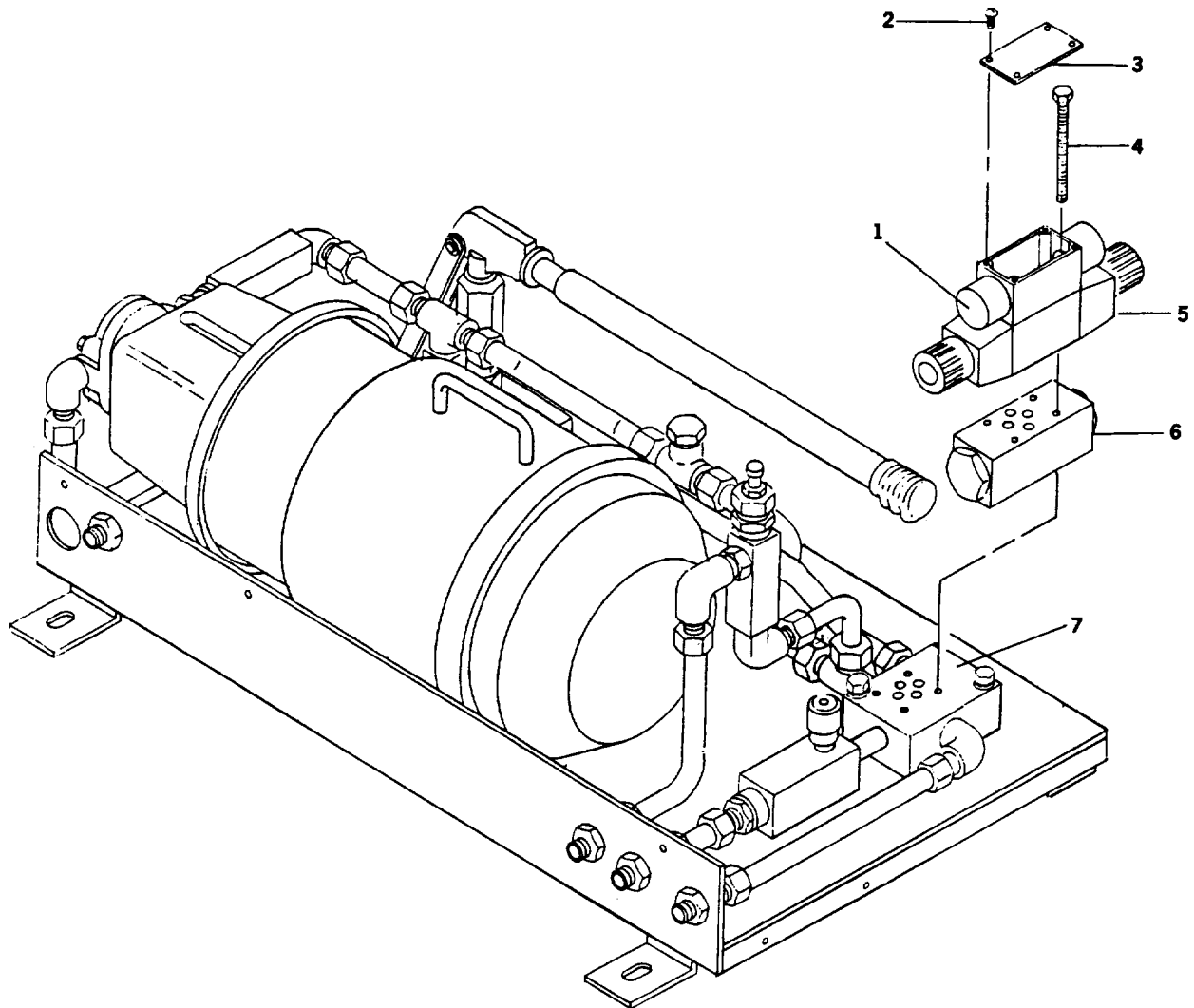
NOTE

Apply new seal tape (item 11, Appendix E) to all male threads.

| | | |
|---|------------------|--|
| 2. | Connecting parts | Reconnect tubing, fittings, etc., to tank (1). |
| 3. After installing hydraulic tank, fill and bleed air from hydraulic system in accordance with Paragraph 4-14. | | |
| 4. Adjust pressure and flow rate in accordance with paragraph 4-15. | | |

4-17. REMOVE/REPLACE HYDRAULIC POWER PACKAGE DIRECTIONAL VALVE

Equipment Condition: All systems shut down.



WARNING

Remove pressure from hydraulic system by slowly loosening piping/fittings around valve before starting removal to prevent injury from pressurized fluid.

WARNING

Ensure electrical power is not present at directional valve before starting procedure.

4-17. REMOVE/REPLACE HYDRAULIC POWER PACKAGE DIRECTIONAL VALVE
Continued

CAUTION

Clean external areas around hydraulic connections before starting work. Ensure dirt/ foreign matter does not enter hydraulic system during remove/install procedure(s).

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REMOVE

| | | |
|-------------------------|----------------------------|--|
| 1. Hydraulic power unit | Electrical connections (1) | Ensure no power is present at valve. Remove four screws (2) securing cover (3) and disconnect electrical connections (1). Tag wire for installation. |
|-------------------------|----------------------------|--|

NOTE

Catch drained hydraulic fluid in a suitable container and dispose of properly. Do not reuse this fluid.

| | | |
|----|----------------------------|---|
| 2. | Solenoid (5) and valve (6) | Remove four bolts (4) and remove directional control solenoid (5) and valve (6) from subplate (7). Inspect subplate for damage. |
|----|----------------------------|---|

REPLACE

| | | |
|-------------------------|----------------------------|---|
| 1. Hydraulic power unit | Solenoid (5) and valve (6) | Position valve (6) and solenoid (5) on subplate (7). Install four bolts (4) through solenoid (5), valve (6), and thread into subplate (7). Torque bolts (4) to 50 in-lbs. |
| 2. | Electrical connections (1) | Connect tagged wires to solenoid (5). Secure cover (3) with four screws (2). |

4-17. REMOVE/REPLACE HYDRAULIC POWER PACKAGE DIRECTIONAL VALVE**Continued**

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPLACE - Continued

3. Fill and bleed system in accordance with paragraph 4-14.
4. Check for leaks.

WARNING

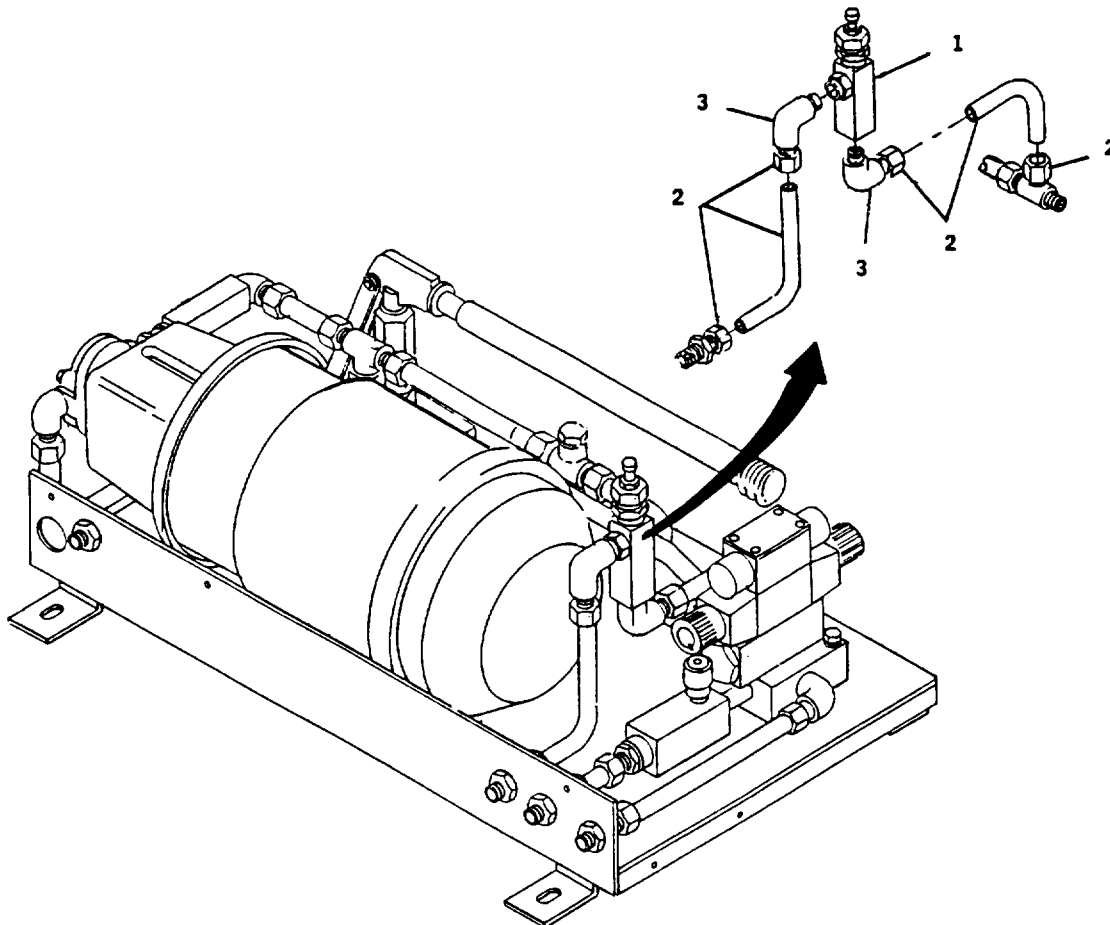
- Remove electrical power from pump motor.
- Wear eye protection, wrap rags around fitting and release pressure from hydraulic system by slowly disconnecting fitting to prevent injury from high pressure fluid.

CAUTION

Clean external areas around hydraulic connections before starting repairs. Ensure dirt/foreign matter does not enter hydraulic system during repair procedure (s).

NOTE

During installation always use new lock washers, packings/seals, new hydraulic fluid, and new seal tape (item 11, Appendix E) on male threads; don't reuse these items.



4-18. REPAIR HYDRAULIC LINES, FITTINGS, AND MINOR COMPONENTS

Continued

| Location | Item | Action |
|---|------------------------|---|
| REPAIR | | |
| NOTE | | |
| Repair Hydraulic system by removing/ replacing defective components as required (Refer to TM 11-5985-38724P). A typical piping/component repair follows. | | |
| 1. Typical piping/ component repair | Piping connections (2) | Wrap rags around fitting and slowly loosen piping connections (2) to release pressurized fluid. |
| (Pressure valve) | | |

NOTE**Catch hydraulic fluid in a suitable container and dispose of properly. Do not reuse this fluid.**

| | | |
|----|----------------------------------|--|
| 2. | Piping (2) | Remove piping (2) from elbows (3). Inspect piping for damage. |
| 3. | Elbows (3) | Remove elbows (3) from valve (1). Remove old seal tape and inspect elbows for damage. |
| 4. | Pressure valve (1) and seal tape | Loosen locknut on old valve (1) and turn adjustment screw counter-clockwise and note the number of turns until screw stops. Loosen locknut on new valve (1) and turn adjustment screw clockwise the number of turns noted for old valve. Tighten locknut. Place new seal tape (item 11, Appendix E) on all male piping threads of disassembled area. |

4-18. REPAIR HYDRAULIC LINES, FITTINGS, AND MINOR COMPONENTS

Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPAIR - Continued

- | | | |
|--|-------------------|---|
| 5. | Elbows and piping | Install elbows (3) in valve (1), and reconnect to piping (2). |
| 6. After repairing hydraulic power package, fill and bleed air from hydraulic system in accordance with Paragraph 4-14. Inspect for leaks. | | |
| 7. Adjust system pressure and flow in accordance with paragraph 4-15. | | |

4-19. REMOVE/REPLACE HYDRAULIC HAND PUMP

WARNING

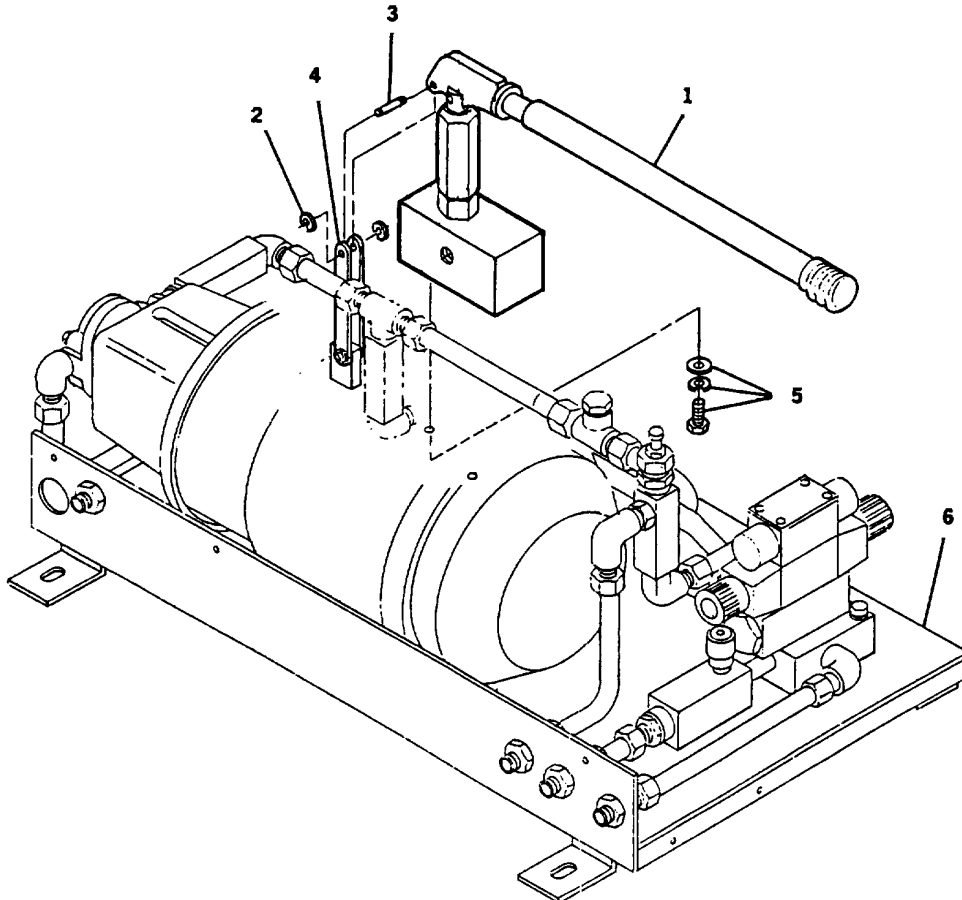
Wear eye protection, wrap rags around connection(s) and remove pressure from hydraulic system by slowly loosening piping/fittings around hand pump before starting removal to prevent injury from pressurized fluid.

CAUTION

Clean external areas around hydraulic connections before starting work. Ensure dirt/foreign matter does not enter hydraulic system during remove/install procedure(s).

NOTE

Catch hydraulic fluid in a suitable container and dispose of properly. Do not reuse this fluid.



NOTE
Other parts of hydraulic power package not shown for clarity.

4-19. REMOVE/REPLACE HYDRAULIC HAND PUMP - Continued

| Location | Item | Action |
|-----------------------|--|---|
| REMOVE | | |
| 1. Hand pump assembly | Connecting parts | Wear eye protection, wrap rags around connections and slowly loosen piping components around hand pump to release pressure. Catch fluid and disconnect tubing, fittings, etc. from hand pump (1). Remove seal tape from male threads and inspect piping components. |
| 2. | Retaining ring (2), pin (3), and leverage brackets (4) | Remove retaining ring (2) from pin (3) and slide pin from pump handle and leverage brackets (4). |
| 3. | Leverage brackets (4) | Inspect leverage brackets (4) for corrosion/damage. Fold back out of way if reusable. |
| 4. | Screws, flatwashers, and lockwashers (5) | Remove two sets of fasteners (5), securing hand pump (1) to base (6) and remove hand pump (1) from power unit. |

REPLACE

NOTE

During installation always use new lock washers and seal tape (item 11, Appendix E).

| | | |
|---------------------------|---|---|
| 1. Hand pump assembly (1) | Screws, flatwashers, and lock washers (5) | Orient hand pump (1) to match hydraulic system configuration and position over mounting holes in power unit base (6). Secure with fasteners (5) . |
|---------------------------|---|---|

4-19. REMOVE/REPLACE HYDRAULIC HAND PUMP - Continued

| Location | Item | Action |
|----------------------------|-----------------------------------|---|
| REPLACE - Continued | | |
| 2. | Leverage brackets (4) and pin (3) | Align both leverage brackets (4) with pump lever hole and slide pin (3) through brackets (4) and pump lever. |
| 3. | Retaining rings (2) | Secure pin (3) in position with retaining rings (2) on each end. |
| 4. | Connecting parts | Place new seal tape (item 11, Appendix E) on male threads of piping components and reconnect tubing, fittings, etc. to hand pump (1). |

5. Add fluid and bleed air from system in accordance with paragraph 4-14.

6. Inspect for leaks.

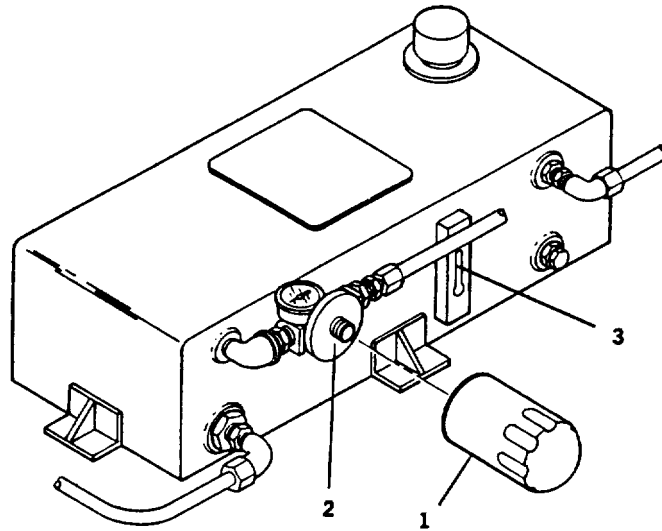
4-20. REMOVE/REPLACE HYDRAULIC FILTER

CAUTION

Clean external areas around hydraulic filter before starting procedure. Ensure dirt/foreign matter does not enter hydraulic system during process.

NOTE

Catch hydraulic fluid from filter in a suitable container and dispose of properly. Do not reuse this fluid.



| Location | Item | Action |
|---------------------|------------|---|
| REMOVE | | |
| 1. Hydraulic filter | Filter (1) | Unscrew hydraulic filter (1) from piping arrangement (2) at hydraulic tank. |
| REPLACE | | |
| 1. Hydraulic filter | Filter (1) | Coat rubber seal with clean fluid and thread new filter (1) on piping arrangement (2). Check reservoir fluid level (3). |

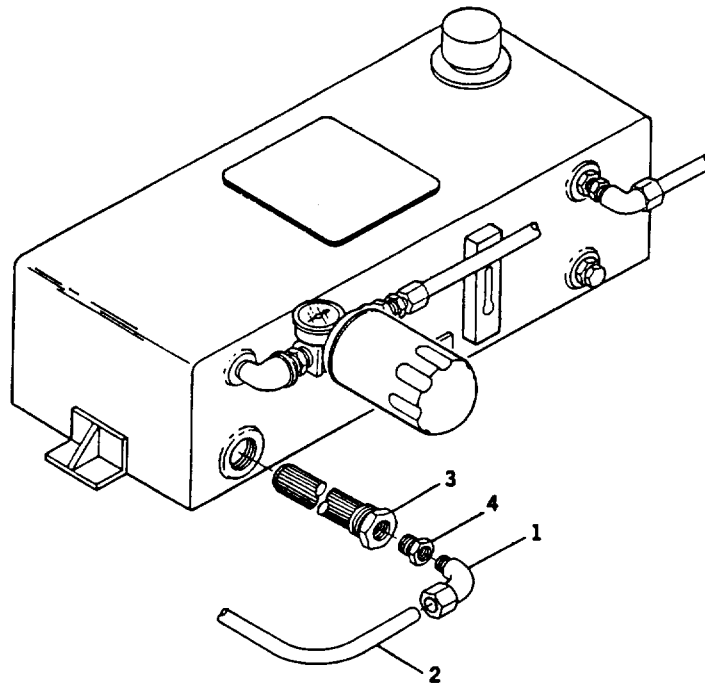
4-21. REMOVE/REPLACE HYDRAULIC STRAINER

CAUTION

Clean external areas around hydraulic strainer before starting procedure. Ensure dirt/foreign matter does not enter hydraulic system during process.

NOTE

Drain hydraulic fluid from tank into a suitable container and dispose of properly. Do not reuse this fluid.



| Location | Item | Action |
|-----------------------|--------------|---|
| REMOVE | | |
| 1. Hydraulic strainer | Elbow (1) | Loosen tubing nut and disconnect tubing (2) from elbow (1). |
| 2. | Strainer (3) | Unscrew strainer (3) from tank. |

4-21. REMOVE/REPLACE HYDRAULIC STRAINER - Continued

| Location | Item | Action |
|---------------------------|------|--|
| REMOVE - Continued | | |
| 3. | | Clean strainer (3) and if necessary, remove fitting (4) and elbow (1) from strainer (3). |

REPLACE**NOTE**

During installation always use new seal tape (item 11, Appendix E) on male threads.

| | | |
|---|--------------|--|
| 1. Hydraulic strainer | Strainer (3) | If removed, use new tape seal and install fitting (4) and elbow (1) in strainer (3). |
| 2. | | Install new tape seal (item 11, Appendix E) on strainer (3) and thread into tank. |
| 3. | Elbow (1) | Connect tubing (2) to elbow (1) and tighten nut. |
| 4. After installing strainer, fill and bleed air from hydraulic system in accordance with paragraph 4-14. | | |

WARNING

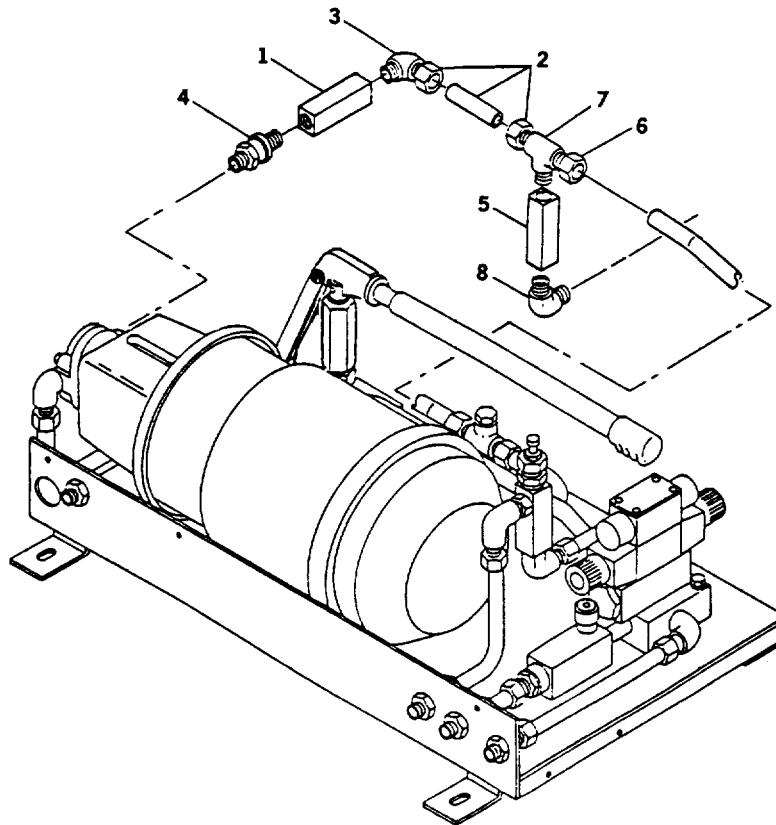
Wear eye protection, wrap rags around connection(s) and remove pressure from hydraulic system by slowly loosening piping/fittings around hand pump before starting removal to prevent injury from pressurized fluid.

CAUTION

Clean external areas around hydraulic connections before starting work. Ensure dirt/foreign matter does not enter hydraulic system during remove/install procedure(s).

NOTE

Catch hydraulic fluid in a suitable container and dispose of properly. Do not reuse this fluid.



4-22. REMOVE/REPLACE HYDRAULIC CHECK VALVES - Continued

| Location | Item | Action |
|---|------------------------------|---|
| REMOVE | | |
| 1. Pump/motor discharge check valve (1) | Piping connections (2) | Wrap rags around fittings and slowly loosen piping connections (2) to release pressurized fluid. |
| 2. | Piping (2) | Remove piping (2) from elbow (3). Inspect piping for damage. |
| 3. | Elbow (3) | Remove elbow (3) from check valve (1). Remove old seal tape and inspect elbow for damage. |
| 4. | Check valve (1) | Remove check valve (1) from fitting (4). Remove old seal tape. Inspect valve for audible clicking when valve is tipped. |
| 5. Hand pump discharge check valve (5) | Piping connections (2 and 6) | Wrap rags around fittings and slowly loosen piping connections (2 and 6) to release pressurized fluid. |
| 6. | Piping (2 and 6) | Remove piping (2 and 6) from tee (7). Inspect piping for damage. |
| 7. | Tee (7) | Remove tee (7) from check valve (5). Remove old seal tape and inspect tee for damage. |
| 8. | Check valve (5) | Remove check valve (5) from elbow (8). Remove old seal tape. Inspect check valve for audible clicking when valve is tipped. |

4-22. REMOVE/REPLACE HYDRAULIC CHECK VALVES - Continued

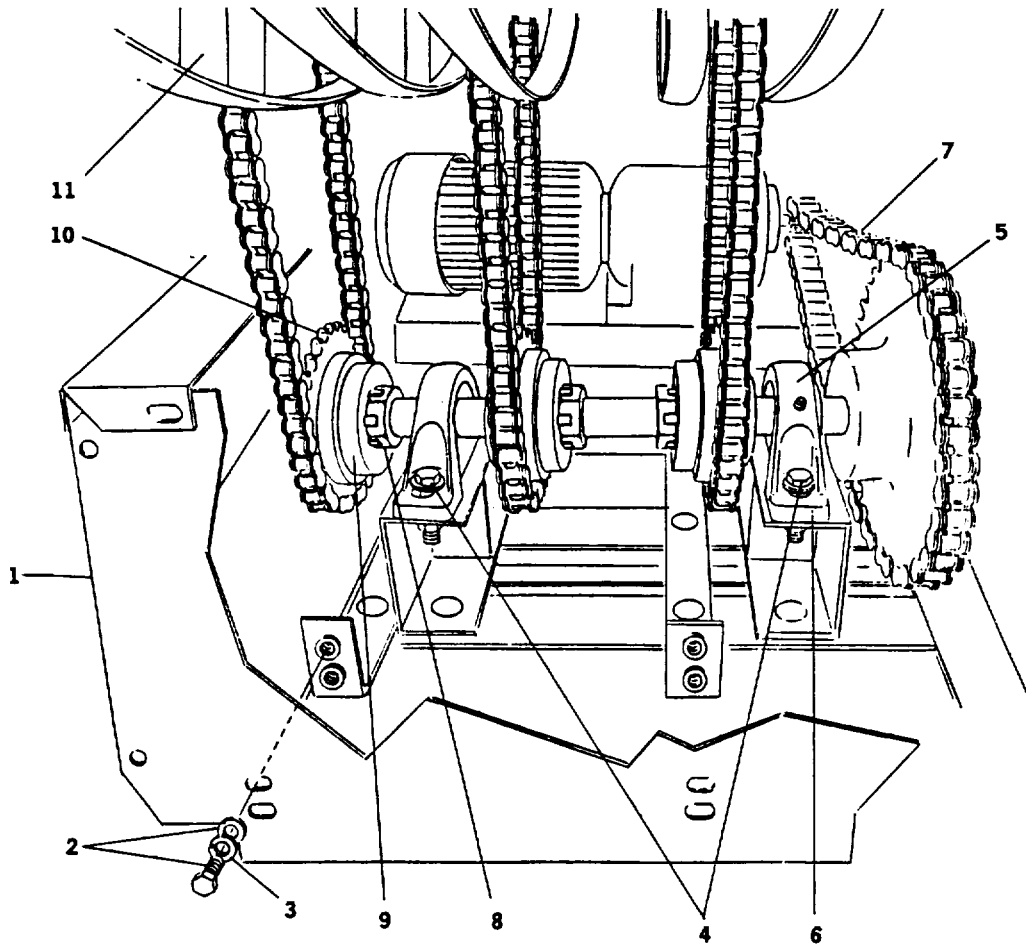
| Location | Item | Action |
|---|-----------------------|---|
| REPLACE | | |
| NOTE | | |
| Place new seal tape (item 11, Appendix E) on all threads of disassembled components. | | |
| 1. Hand pump discharge check valve (5) | Elbow (8) | Install check valve (5) on elbow (8). |
| 2. | Tee (7) | Install tee (7) on check valve (5). |
| 3. | Piping (2 and 6) | Connect piping (2 and 6) to tee (7). |
| 4. Pump/motor discharge check valve (1) | Check valve (1) | Install check valve (1) on fitting (4). |
| 5. | Elbow (3) | Install elbow (3) on check valve (1). |
| 6. Piping (2) | Connect piping (2) to | elbow (3). |
| 7. Fill and bleed air from hydraulic system in accordance with paragraph 4-14. Inspect for leaks. | | |

WARNING

Do not perform this adjustment procedure while electrical power is on. Inadvertent turn-on of reel drive motors while chains are being adjusted can cause serious personal injury.

NOTE

The reel drive chains should not be run too tight. A slack appearance when not moving is preferred. Adjustment of the individual reel drive chains is not a field adjustment; only the main drive chain is field adjustable. The following procedure applies to main reel drive chains on both sides of the trailer:



4-23. ADJUST REEL DRIVE ASSEMBLIES - Continued

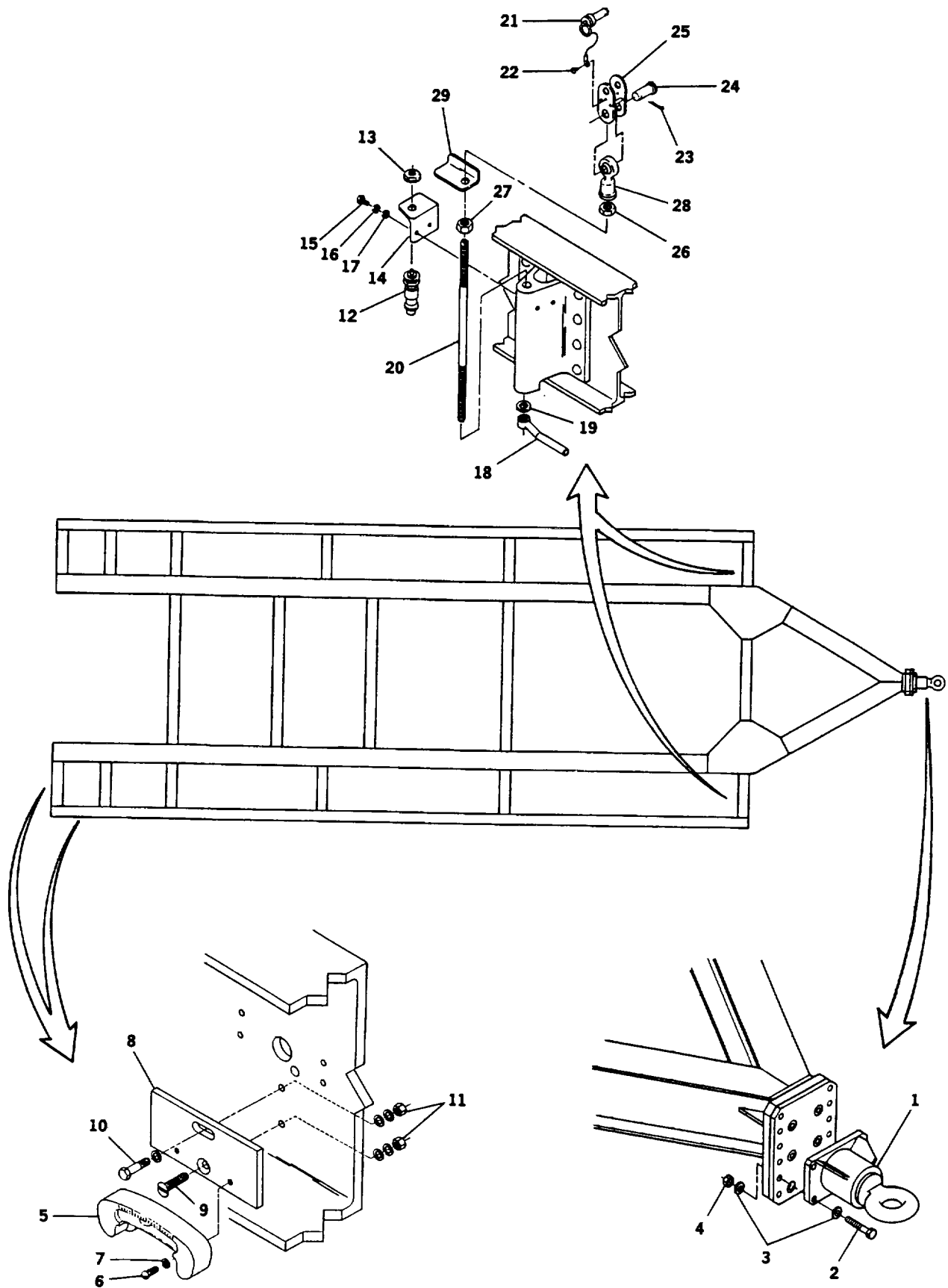
| Location | Item | Action |
|---|---------------------------|--|
| ADJUST (Reel Drive Chain) | | |
| 1. Reel drive assembly | Cover assembly (1) | Remove portion(s) of cover (1) by removing fasteners (2) and (3) in order to gain access to pillow block bolts (4). |
| 2. | Pillow blocks (5) | Loosen (do not remove) four bolts (4) securing both sprocket shaft pillow blocks (5). |
| 3. | Reel main drive chain (7) | Move sprocket shaft as necessary to adjust reel main drive chain tension. (See note above.) A non-metallic hammer may be used, tapping lightly on pillow block flanges (6). Adjust for a slight sag (approx. 3/4") in the upper run of the chain (7). |
| 4. | Pillow block bolts (4) | Torque four bolts (4) to 37 + 3 ft-lbs. |
| 5. | Cover assembly (1) | Reinstall cover assembly (1) with fasteners (2) and new lock washers (3). |
| ADJUST (Torque Limiter "Clutch") | | |
| 1. Reel sprocket | Reel sprocket (10) | Remove portion(s) of cover by removing fasteners (2) and (3) in order to gain access to reel sprocket (10). |

4-23. ADJUST REEL DRIVE ASSEMBLIES - Continued

| Location | Item | Action |
|---|--|--|
| ADJUST (Torque Limiter "Clutch") - Continued | | |
| 2. | Torque limiter (clutch) (9) (Adjust for 37 ft-lbs.) | To relax torque, lift locking tabs on washer and loosen tensioning nut (8) on torque limiter (clutch) (9). To increase torque, tighten tensioning nut (8). Measure tension by attaching a spring scale at end of spoke of cable reel (11). |
| 3. | Tensioning nut (8) | Bend locking tabs of washer over tensioning nut (8). |
| 4. | Cover assembly (1) | Reinstall cover assembly with fasteners (2) and new lock washers (3). |

4-24. REPAIR TRAILER FRAME AND BRACKET ASSEMBLY

TM 11-5985-387-12



4-24. REPAIR TRAILER FRAME AND BRACKET ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

a. Repair (General)

- Repairs to the trailer frame and bracket assembly are limited to replacement of inclinometers, cam locks, fasteners, data plates, brackets, etc.; adjustment of lunette eye and inclinometers; corrosion control and painting.

NOTE

**During installation always use new lock washers,
don't reuse disassembled lock washers.**

- Instructions for the preparation of material for painting, methods of painting, and materials to be used are contained in TM 43-0139, Painting Instructions for Field Use.

b. Adjust Lunette Eye Height

- Remove four bolts (2), washers (3) and nuts (4).
- Move lunette eye (1) up or down as necessary to obtain proper height.
- Install four bolts (2), washers (3) and nuts (4). Torque nuts to 300 ft-lbs.

c. Remove Inclinometers

| | | |
|------------------------------------|---------------------------------|--|
| 1. Right rear corner trailer frame | Screws (6) and lock washers (7) | Remove two screws (6) and two lock washers (7). |
| 2. | Inclinometer (5) | Remove inclinometer (5) from mounting plate (8). |

d. Replace Inclinometers

| | | |
|------------------------------------|---------------------------------|--|
| 1. Right rear corner trainer frame | Inclinometer (5) | Position inclinometer (5) on mounting plate (8). |
| 2. | Screws (6) and lock washers (7) | Install two screws (6) and two lock washers (7). |
| 3. | Inclinometer (5) | Adjust inclinometer (5) in accordance with paragraph 4-24.e. |

4-24. REPAIR TRAILER FRAME AND BRACKET ASSEMBLY - Continued

| Location | Item | Action |
|--|--|---|
| e. <u>Adjust Inclinometers</u> | | |
| <ol style="list-style-type: none"> 1. Lay 16" carpenter's level on trailer frame above or below inclinometer (5) being adjusted. 2. Adjust trailer jacks until carpenter's level indicates trailer plane is level. 3. Loosen nuts (11), bolt (10), and screw (9) securing mounting plate (8) to trailer frame. 4. Rotate mounting plate (8) until bubble of inclinometer (5) is centered on 0 degree mark. 5. Tighten screw (9), bolt (10) and nuts (11) securing mounting plate (8) to trailer frame. Ensure bubble of inclinometer (5) remains centered on 0 degree mark. | | |
| f. <u>Remove Cam Lock Assemblies</u> | | |
| 1. Right front or left front corner of trailer | Limit switch (12) | Disconnect electrical connector from limit switch (12). |
| 2. | Nut (13) and limit switch (12) | Remove nut (13) and limit switch (12) from limit switch bracket (14). |
| 3. | Bolts (15), lock washers (16), washers (17), and limit switch bracket (14) | Remove two bolts (15), two lock washers (16), two washers (17), and limit switch bracket (14) from cam lock mounting plate. |
| 4. | Handle (18) and washer (19) | Unscrew handle (18) and remove washer (19) from stud (20). |
| 5. | Quick release pin (21) and cam lock assembly | Remove quick release pin (21) from shackle on tower, and cam lock assembly from cam lock mounting plate. |

4-24. REPAIR TRAILER FRAME AND BRACKET ASSEMBLY - Continued

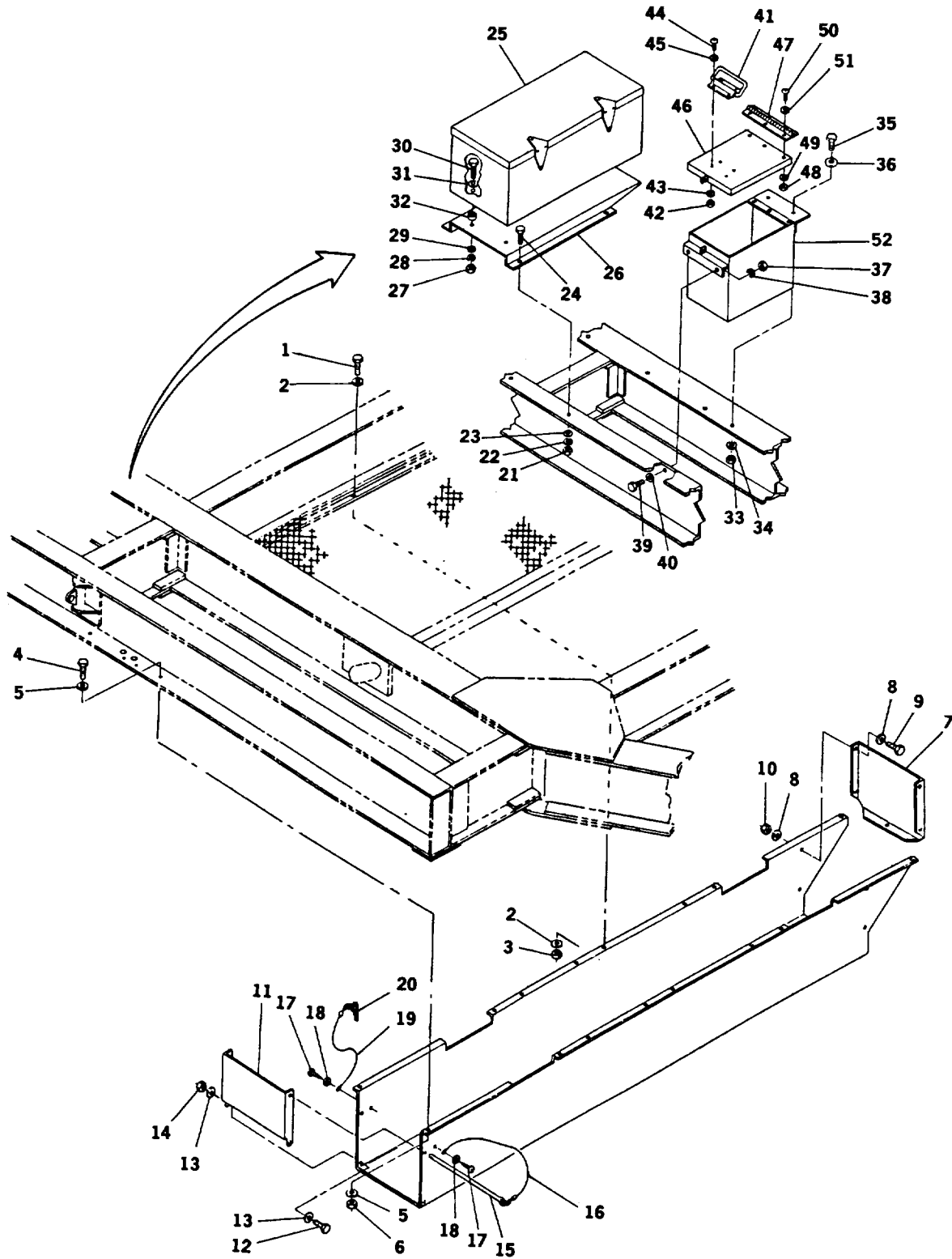
| Location | Item | Action |
|---|---|--|
| f. <u>Remove Cam Lock Assemblies - Continued</u> | | |
| 6. Cam lock assembly | Self-tapping screw (22) and quick release pin (23) | Remove self-tapping screw (22) and quick release pin (23) from cam lock rod end connector (25). |
| 7. | Cotter pin (23), clevis pin (24) and cam lock rod end connectors (25) | Remove cotter pin (23), clevis pin (24) and cam lock rod end connectors (25) from rod end (28). |
| 8. | Jam nuts (26 and 27), and rod end (28) | Loosen jam nuts (26 and 27), and unscrew rod end (28) from stud (20). |
| 9. | Jam nuts (26 and 27) and limit switch stop bracket (29) | Remove jam nuts (26 and 27) and limit switch stop bracket (29) from stud (20). |
| g. <u>Replace Cam Lock Assemblies</u> | | |
| 1. Cam lock assembly | Jam nuts (26 and 27), and limit switch stop bracket (29) | Install jam nuts (26 and 27), and limit switch stop bracket (29) on stud (20). Do not tighten jam nuts. |
| 2. | Rod end (28), and jam nuts (26 and 27) | Screw rod end (28) onto stud (20) until rod end (28) bottoms out. |
| 3. | Limit switch stop bracket (29), and jam nuts (26 and 27) | Position limit switch stop bracket (29) on stud (20), one inch down from the bottom of rod end (28) and 90 degrees to rod end opening. Tighten jam nuts (26 and 27) onto limit switch stop bracket (29). |

4-24. REPAIR TRAILER FRAME AND BRACKET ASSEMBLY - Continued

| Location | Item | Action |
|--|--|--|
| f. <u>Replace Cam Lock Assemblies - Continued</u> | | |
| 4. | Rod end connectors (25), clevis pin (24), and cotter pin (23) | Position rod end connectors (25) on each side of rod end (28) and secure in place with clevis pin (24) and new cotter pin (23). |
| 5. | Quick release pin (23) and self-tapping screw (22) | Install quick release pin (23) on rod end connector (25) with self-tapping screw (22). |
| 6. Right front or left front corner of trailer | Cam lock assembly and quick release pin (23) | Insert cam lock assembly in hole of cam lock mounting plate. Secure cam lock assembly to shackle on tower with quick release pin (23). |
| 7. | Handle (18) and washer (19) | Install washer (19) and handle (18) on stud (20). |
| 8. | Limit switch bracket (14), washers (17), lock washers (16), and bolts (15) | Install limit switch bracket (14) on cam lock mounting plate with two bolts (15), two lock washers (16), and two washers (17). |
| 9. | Limit switch (12) and nuts (13) | Install limit switch (12) in limit switch bracket (14) with nut (13). |
| 10. | Limit switch (12) | Connect electrical connector to limit switch (12). |
| 11. | Jam nuts (26 and 27), and limit switch stop bracket (29) | Adjust jam nuts (26 and 27) and limit switch stop bracket (29) as necessary to ensure alignment of limit switch stop bracket (29) limit switch (12). |

4-25. REMOVE/REPAIR/REPLACE STORAGE, PIONJAR, AND TOOL BOX ASSEMBLIES

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|



4-25. REMOVE/REPAIR/REPLACE STORAGE, PIONJAR, AND TOOL BOX ASSEMBLIES

Continued

| Location | Item | Action |
|---|--------------------------------|--|
| a. <u>Remove Storage Box Assembly</u> | | |
| NOTE | | |
| Remove anchor setting and retrieval tool assembly. | | |
| 1. Under trailer frame | Storage box | Remove bolts (1), washers (2) and locknuts (3) from frame and storage box. |
| 2. | | Support storage box and remove bolts (4), washers (5), and locknuts (6) from each end of storage box and remove storage box. |
| b. <u>Repair Storage Box Assembly</u> | | |
| 1. Storage box | End plate (7) | Remove screws (8), washers (9), locknuts (10) and end plate (7). |
| 2. | Door (11) | Remove lock pin (20) and pin (15). |
| 3. | Flexible wire rope (16 and 19) | Remove screws (17) and washers (18). |
| 4. | Door (11) | Remove screws (12), washers (13) and locknuts (14); remove door (11). |
| 5. | Door (11) | Position door (11) in storage box and secure with screws (12), washers (13) and locknuts (14). Do not overtighten, doors must be able to swing down. |

4-25. REMOVE/REPAIR/REPLACE STORAGE, PIONJAR, AND TOOL BOX ASSEMBLY

Continued

| Location | Item | Action |
|--|--|--|
| b. <u>Repair Storage Box Assembly - Continued</u> | | |
| 6. | Flexible wire rope (16 and 19) | Position on storage box and secure each with screw (17) and washer (18). |
| 7. | Door (11) | Install pin (15) and lock pin (20). |
| 8. | End plate (7) | Position end plate in storage box and secure with screws (8), washers (9) and locknuts (10). |
| c. <u>Replace Storage Box Assembly</u> | | |
| 1. Under trailer frame | Storage box | Position storage box and secure each end with bolts (4), washers (5) and locknuts (6). |
| 2. | | Install bolts (1), washers (2) and locknuts (3). Special washer goes under bolt head. |
| d. <u>Remove Pionjar Box Assembly</u> | | |
| 1. Right side trailer frame | Pionjar box assembly | Remove nuts (21), lock washers (22), washers (23), bolts (24), and Pionjar box assembly from trailer frame. |
| 2. Pionjar box assembly | Pionjar box (25) and tie down bracket (26) | Remove nuts (27), lock washers (28), washers (29 and 31), bolts (30), spacers (32), and Pionjar box (25) from tie down bracket (26). |

4-25. REMOVE/REPAIR/REPLACE STORAGE, PIONJAR, AND TOOL BOX ASSEMBLY

Continued

| Location | Item | Action |
|---|--|---|
| e. <u>Replace Pionjar Box Assembly</u> | | |
| 1. Pionjar box assembly | Pionjar box (25) and tie down bracket (26) | Install Pionjar box (25) on tie down bracket (26) with bolts (30), spacers (32), washers (31 and 29), lock washers (28), and nuts (27). |
| 2. Right side trailer frame | Pionjar box assembly | Install pionjar box assembly on trailer frame with bolts (24), lock washers (22), washers (23), and nuts (21). |
| f. <u>Remove Tool Box Assembly</u> | | |
| 1. Right side trailer frame | Tool box assembly | Remove nuts (33), lock washers (34), bolts (35), and washers (36) from frame and tool box assembly. |
| 2. | | Support tool box assembly and remove nuts (37), lock washers (38), bolts (39), washers (40), and tool box assembly from trailer frame. |
| g. <u>Repair Tool Box Assembly</u> | | |
| 1. Tool box assembly | Handle (41) | Remove nuts (42), lock washers (43), screws (44), washers (45), and handle (41) from tool box top (46). |
| 2. | Tool box top (46) and hinge (47) | Remove nuts (48), lock washers (49), screws (50), washers (51), tool box top (46), and hinge (47) from tool box (52). |

4-25. REMOVE/REPAIR/REPLACE STORAGE, PIONJAR, AND TOOL BOX ASSEMBLY

Continued

| Location | Item | Action |
|---|--|--|
| g. <u>Repair Tool Box Assembly - Continued</u> | | |
| 3. | Tool box top (46) and hinge (47) | Install tool box top (46) and hinge (47) on tool box (52) with screws (50), washers (51), lock washers (49), and nuts (48). |
| 4. | Handle (41) | Install handle (41) on tool box top (46) with screws (44), washers (45), lock washers (43) and nuts (42). |
| h. <u>Replace Tool Box Assembly</u> | | |
| 1. Right side trailer frame | Tool box assembly assembly on trailer frame | Position tool box and secure right side of tool box assembly with bolts (39), washers (40), lock washers (38), and nuts (37). |
| 2. | | Secure left side of tool box assembly to trailer frame with bolts (35), washers (36), lock washers (34), and nuts (33). |

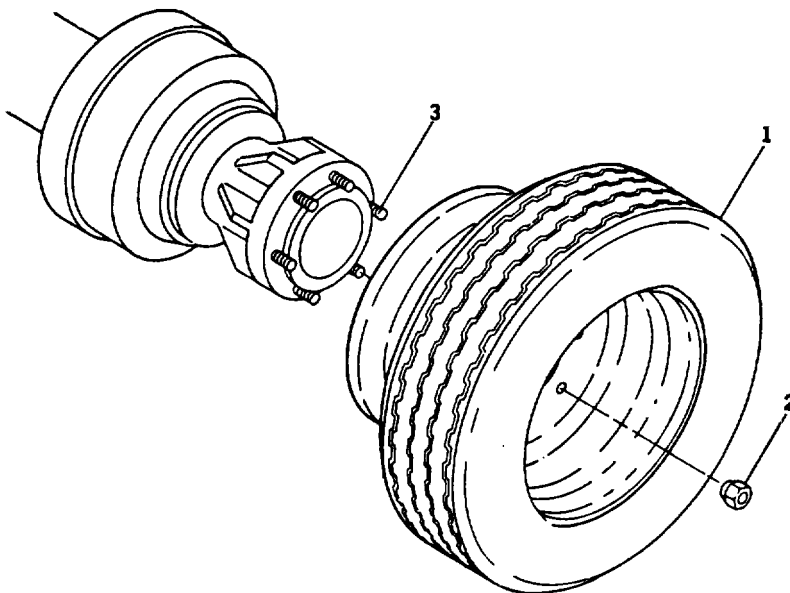
4-26. REMOVE/REPLACE TIRE/RIM ASSEMBLY

WARNING

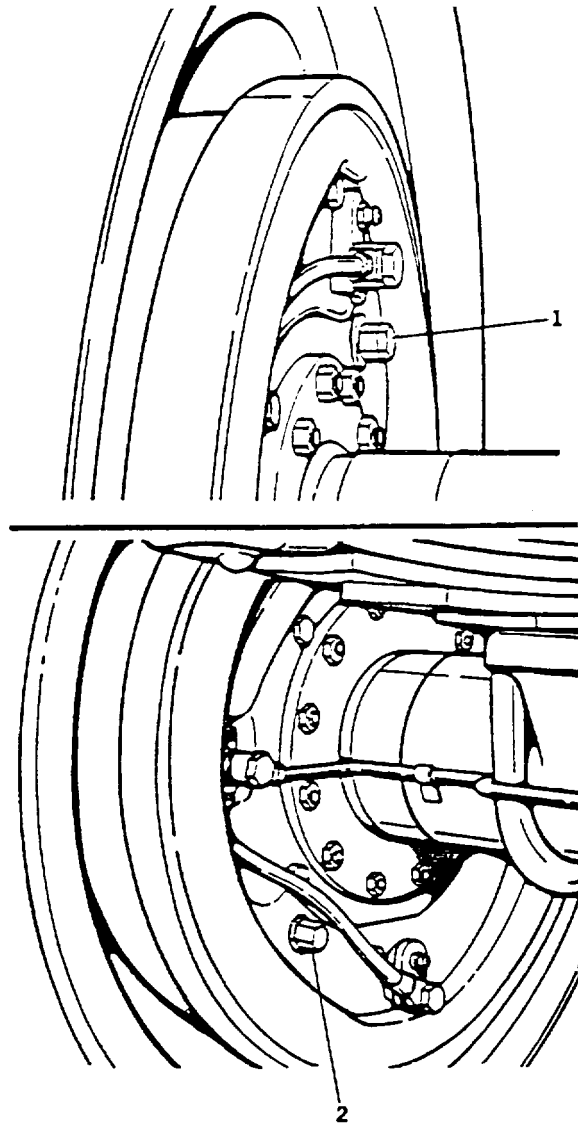
When raising trailer for wheel clearance ensure three onboard leveling jacks are on firm ground and trailer cannot move to preclude injury.

NOTE

Lugnuts are RH on right side of trailer and LH on left side.



| Location | Item | Action |
|---|---------------------------------|--|
| REMOVE | | |
| 1. Tire/rim assembly (1) and remove tire/rim (1). | Lugnuts (2) (See NOTE above) | Unscrew lugnuts (2) from studs on axle hub (3) |
| REPLACE | | |
| 1. Tire/rim assembly (1) | Lugnuts (2) (See NOTE above) | Install tire/rim (1) on axle hub (3) and screw on lugnuts (2). |
| 2. | Lugnuts (2) | Torque lugnuts (2) 400 to 450 ft-lbs. |

4-27. ADJUST AND BLEED SERVICE BRAKES - AXLE HUB AND DRUMa. Adjust Service Brakes and Parking Brakes**WARNING**

Procedure must be accomplished on a level surface with trailer either jacked up on all three onboard jacks, or hitched to tow vehicle with wheels chocked and jacking one side to prevent injury from movement.

4-27. ADJUST AND BLEED SERVICE BRAKES - AXLE HUB AND DRUM - Continued

a. Adjust Service Brakes and Parking Brakes - Continued

NOTE

Air pressure must be released to free emergency brakes. Do not adjust brakes when hot.

| Location | Item | Action |
|---|--|--|
| 1. Air tank | Drain valve | Open drain valve on bottom of tank and release air pressure. |
| 2. Brake shoe adjusting (brake backing plate) | Brake shoe adjusting studs (1) and (2) | Turn the shoe adjusting stud (1) on the upper rear face of the backing plate assembly counterclockwise until the wheel drags slightly when turned by hand. |
| 3. | | Back off shoe adjusting stud just enough to allow the wheel to rotate freely. |
| 4. | | Repeat this procedure with the shoe adjusting stud (2) on the lower rear face of the backing plate assembly, turning it in the opposite direction to tighten and loosen. |
| 5. | | Repeat procedures for other three wheels. |

NOTE

The following adjustment must be accomplished on a level surface with trailer jacked up so that wheel(s) to be adjusted clear the ground.

4-27. ADJUST AND BLEED SERVICE BRAKES - AXLE HUB AND DRUM - Continued

a. Adjust Service Brakes and Parking Brakes - Continued

| Location | Item | Action |
|-----------------------------|------------------------|--|
| 6. Parking brake adjustment | Parking brake lever(s) | Place handbrake lever(s) in fully released position. |
| 7. | Adjustment assembly | Tighten adjustment on end of handbrake lever while rotating wheel until brake begins to drag. Back off adjusting mechanism until wheel spins freely and handbrake lever can lock in the actuated position. Adjust other side of front axle the same way. |

NOTE

If more adjustment is required than can be obtained with knob on handbrake lever, locate turnbuckle under trailer frame and increase adjustment as required.

| | | |
|----|--------------------|--|
| 8. | Trailer air tank | Ensure handbrakes are engaged (locked) and fill air tank. |
| 9. | Brake system check | Lower trailer to ground, repressurize system, and check for leaks. |

4-27. ADJUST AND BLEED SERVICE BRAKES - AXLE HUB AND DRUM - Continued**b. Bleeding Service Brakes****WARNING**

Procedure must be accomplished on a level surface and trailer and tow vehicle must be chocked against movement to prevent injury.

CAUTION

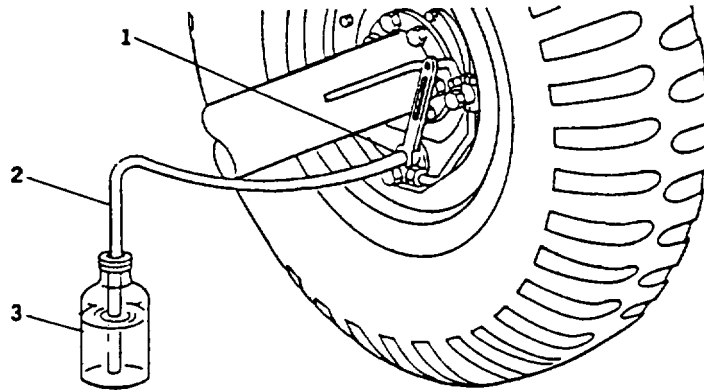
Never reuse brake fluid always replenish with new fluid. Be careful so as not to introduce contamination/ dirt into the hydraulic brake system.

NOTE

- Trailer braking system must be connected to towing vehicle system for manual bleeding operations.
- Brake pedal on towing vehicle must be depressed and released to actuate system.
- Bleeding is performed with trailer parking brakes released.
- Use drip pan to catch hydraulic fluid and dispose of properly.
- Use the manual bleeding procedure only if a pressure bleeder is not available.
- Always bleed the wheel cylinder farthest from the master cylinder first.
- Always bleed the lower cylinder first.
- Check fluid level of master cylinder frequently during manual bleeding procedure and replenish as required. Failure to keep filled will allow air to enter the hydraulic system.
- Refer to the manufacturer's instructions for proper operation and servicing of the pressure bleeder.

4-27. ADJUST AND BLEED SERVICE BRAKES - AXLE HUB AND DRUM - Continued

b. Bleeding Service Brakes - Continued



MANUAL BLEEDING

| Location | Item | Action |
|--|---------------|--|
| 1. Wheel at lower cylinder bleed fitting (1) | Bleed fitting | Clean fitting with solvent P-D-680 and cloth. |
| 2. | Tubing (2) | Push tubing onto bleed fitting. Tubing should be long enough to reach ground when connected. |
| 3. | Container (3) | Fill container half full with brake fluid and position by wheel being bled. |
| 4. | Tubing (2) | Submerge free end in brake fluid. |

NOTE

Pump brake pedal slowly while brakes are bled.

4-27. ADJUST AND BLEED SERVICE BRAKES - AXLE HUB AND DRUM - Continued

b. Bleeding Service Brakes - Continued

| Location | Item | Action |
|----------|-------------------|---|
| 5. | Bleed fitting (1) | Using wrench, open fitting three-quarter turn. Fluid and air will be forced through tube. Continue until no more air bubbles appear in fluid. |
| 6. | Bleed fitting (1) | Close fitting and remove tubing. |

NOTE

Steps 1 thru 6 should be repeated for upper wheel cylinder and both cylinders on other wheel. Repeat also for other axle.

PRESSURE BLEEDING

NOTE

The pressure bleeder should be connected to the master cylinder according to manufacturer's instructions for proper operation.

| | | |
|--------------------|-------------|--|
| 1. Master cylinder | Filler plug | Remove filler plug and install pressure feed adapter in filler plug hole and connect pressure feed filler hose to adapter. |
|--------------------|-------------|--|

4-27. ADJUST AND BLEED SERVICE BRAKES - AXLE HUB AND DRUM - Continued

b. Bleeding Service Brakes - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

PRESSURE BLEEDING - Continued

NOTE

- Filler should contain from 10 to 20 psi air pressure and sufficient fluid to maintain constant level in master cylinder assembly.
- Bleed system as in manual bleeding except that replenishing of brake fluid in the master cylinder assembly and manual operation of the towing vehicle brake pedal are not required.

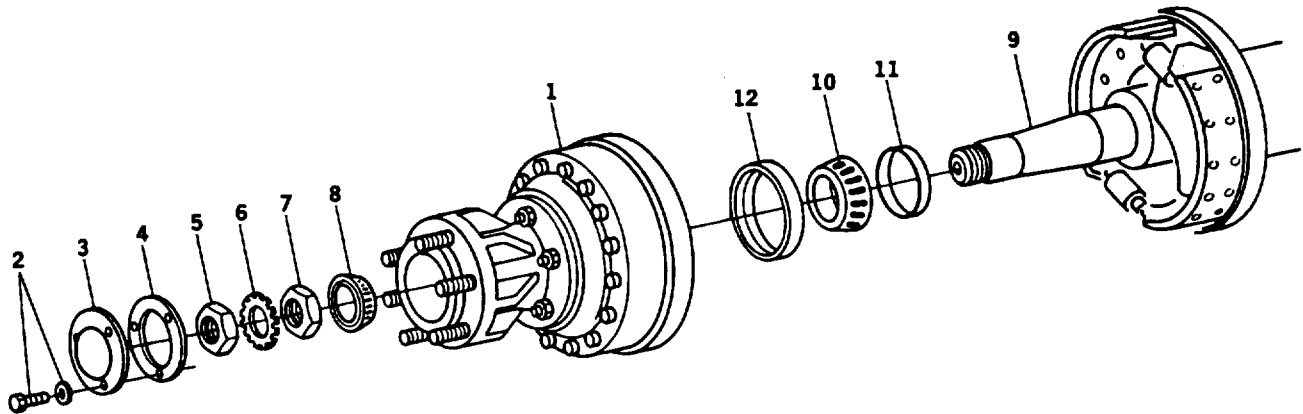
2.

Remove pressure feed hose and adapter from master cylinder and install filler plug.

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES

NOTE

This procedure is typical for any axle hub and drum on the trailer. Remove tire/rim assembly in accordance with paragraph 4-26 before starting.



| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

a. Repair Hub and Wheel Bearings

- | | | |
|----|--|--|
| 1. | Hubcap (3), gasket (4), and fasteners (2) | Remove three sets of fasteners (2), hubcap (3) and gasket (4). Remove grease from wheel bearing cavity. |
| 2. | Outer wheel bearing nut (5), and wheel bearing lock washer (6) | Locate and straighten tabs on wheel bearing lock washer (6) holding outer wheel bearing nut (5) in place. Remove outer wheel bearing nut (5) and lock washer (6). |
| 3. | Inner wheel bearing nut (7) and outer wheel bearing (8) | Remove inner wheel bearing nut (7) and outer wheel bearing (8). Clean and inspect outer wheel bearing (8). If reusable, protect from dirt and corrosion until re-installation. |

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

a. Repair Hub and Wheel Bearings - Continued

CAUTION

Hub and drum assembly (1) is two-man lift. Remove hub and drum carefully to avoid damage to inner wheel bearing (10) and seal.

| | | |
|----|------------------|--|
| 4. | Hub and drum (1) | Slide hub and drum carefully from spindle. Clean and inspect hub and drum (1). |
|----|------------------|--|

NOTE

If repairs are not needed to hub and drum (1), skip to step 9.

| |
|--|
| 5. Hub and drum (1) repair (if required) |
|--|

NOTE

Wheel studs (14) are RH for right side of trailer and LH for left side.

| | | |
|----|--|--|
| 6. | Wheel stud (14) (ribbed shoulder bolt, RH or LH) | Remove stud (14) from hub body (13) by driving out from front. Replace with same thread (RH or LH) stud (14) by inserting and pushing it into back of hub body (13). |
|----|--|--|

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|---|--|---|
| a. <u>Repair Hub and Wheel Bearings</u> - Continued | | |
| 7. | Hub body (13), nut (16) and ribbed shoulder bolt studs (17) | Remove hub body (13) by removing six nuts (16) and sliding off axle spindle and studs (17). Inspect studs (17) for damage. Remove studs (17) if required, by driving out from front of brake plate (15). Replace studs (17) by driving in from back of brake plate (15). Install hub body (13) by positioning over axle spindle and on studs (17). Secure with six nuts (16). |
| 8. | Brake drum (18), self-locking nuts and flat washers (19), brake plate (15), and ribbed bolt studs (20) | Separate brake drum (18) from brake plate (15) by removing eighteen sets of self-locking nuts and flat washers (19) and sliding off studs (20) and over/off hub (13). Inspect studs (20) for damage. If required, remove by driving out from front of brake plate. Replace stud(s) (20) by pushing in from back of brake plate (15). Secure brake drum (18) to brake plate (15) with eighteen sets of fasteners (19). |

CAUTION

If inner wheel bearing (10) can be reused, remove carefully to preclude damage. Protect from dirt and corrosion until reinstallation.

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|--|--|--|
| <p>a. <u>Repair Hub and Wheel Bearings</u> - Continued</p> | | |
| 9. | <p>Inner wheel bearing (10), spacer sleeve (11), and seal (12)</p> | <p>Remove inner wheel bearing (10), spacer (11) and seal (12) by sliding off of spindle (9). Clean and inspect bearing (10), spacer (11) and spindle (9) for damage. Inspect service brake assemblies for wear/damage. Go to paragraph b. for repair(s) if needed. (Pad minimum thickness is 3/16 inch.) Install new seal (12), spacer (11) and inner wheel bearing (10) onto spindle (9).</p> |

CAUTION

Hub and drum assembly (1) is two-man lift. Reinstall hub and drum carefully to avoid damage to inner wheel bearing (10) and seal (12).

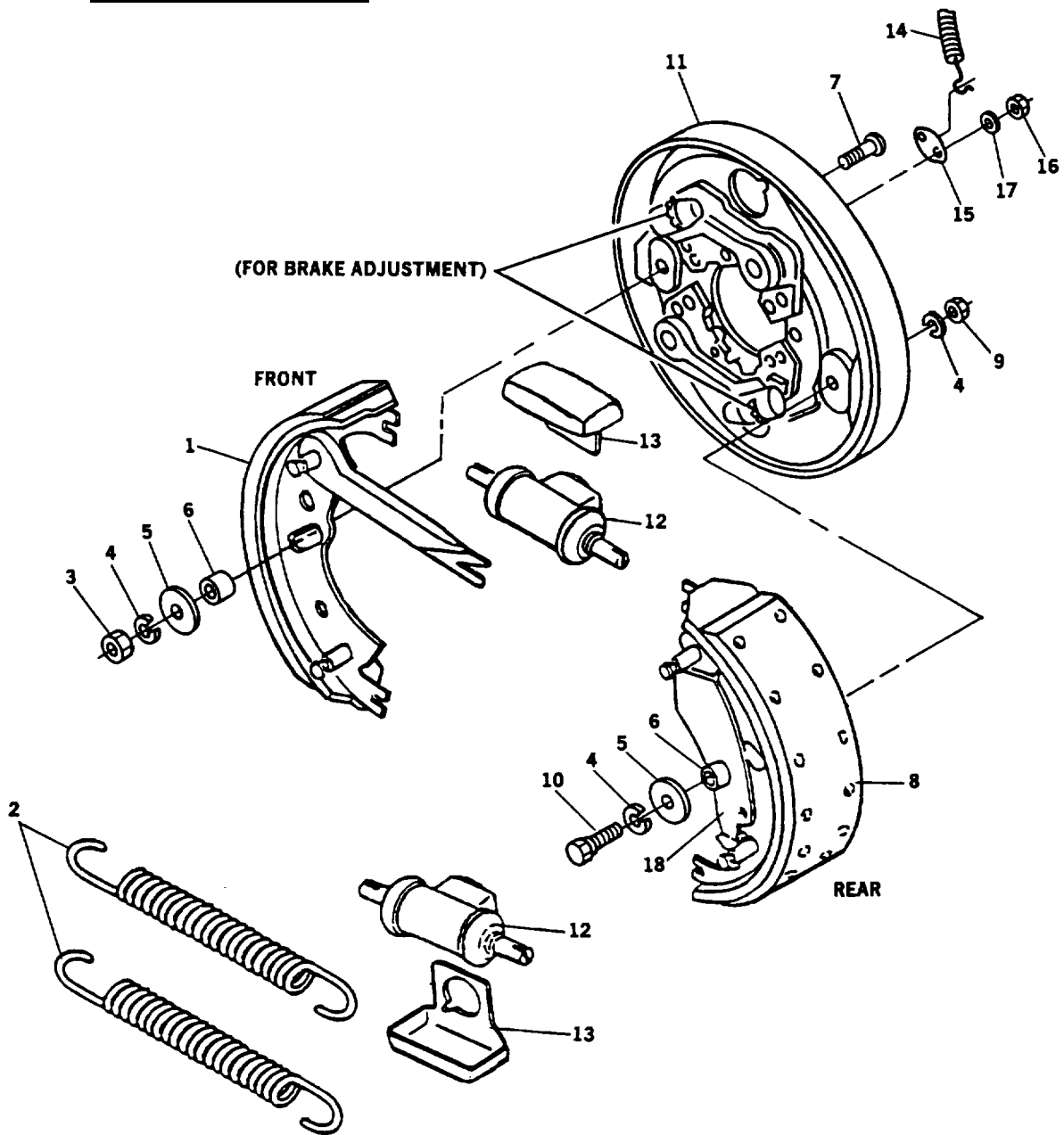
| | | |
|-----|--|--|
| 10. | Hub and drum (1) | <p>Carefully reinstall hub and drum (1) over spindle (9) and brake assembly.</p> |
| 11. | <p>Outer wheel bearing (8) and inner wheel bearing nut (7)</p> | <p>Slide outer wheel bearing (8) onto spindle (9). Thread on inner wheel bearing nut (7), torque to 40 ft-lbs then, loosen nut (7) one quarter turn.</p> |
| 12. | <p>Lock washer (6), wheel bearing outer lock nut (5)</p> | <p>Orient lock washer (6) on axle hub in order to lock wheel bearing nuts a- (5) and (7) with axle hub. Install wheel bearing outer lock nut (5) and securely tighten against lock washer (6).</p> |

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|--|---|---|
| a. <u>Repair Hub and Wheel Bearings</u> - Continued | | |
| 13. | Hubcap (3), gasket (4), and fasteners (2) | Install new gasket (4), hubcap (3), and secure with three sets of fasteners (2). |

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

b. Repair of Service Brakes



NOTE

Perform steps in paragraph 4-28.a. for removal of hub, drum, etc., to gain access to brake assembly. Inspect for wear/damage and replace parts as required. (Brake pad minimum thickness is 3/16 inch.)

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|---|--|--|
| b. <u>Repair of Service Brakes</u> - Continued | | |
| 1. Service brakes | Brake shoes (1) and (8), and brake spring (2) (Remove) | Remove brake springs (2) from brake shoes (1) and (8). Inspect springs. |
| 2. | Brake shoe (1) and fasteners | Remove nut (3), lock washer (4), flat washer (5), sleeve spacer (6), and bolt (7) from brake shoe (1) and backing plate assembly (11). |
| 3. | Brake shoe (8) and fasteners | Remove nut (9), lock washer (4), sleeve spacer (6), flat washer (5), lock washer (4), and bolt (10) from brake shoe (8) and backing plate assembly (11). |

NOTE

Front brakes have cable ramp and cable guide bracket. Rear brakes have cover. If repairs are performed on front axle brakes and/or backing plate (11) is to be removed, remove parking brake cable (14) by unhooking from lever (18) and pulling through guide (15). Guide (15) is secured to backing plate with two nuts (16) and lockwashers (17).

| | | |
|----|-------------------------|--|
| 4. | Brake shoes (1) and (8) | Maneuver brake shoes (1) and (8) away from cylinders (12). |
|----|-------------------------|--|

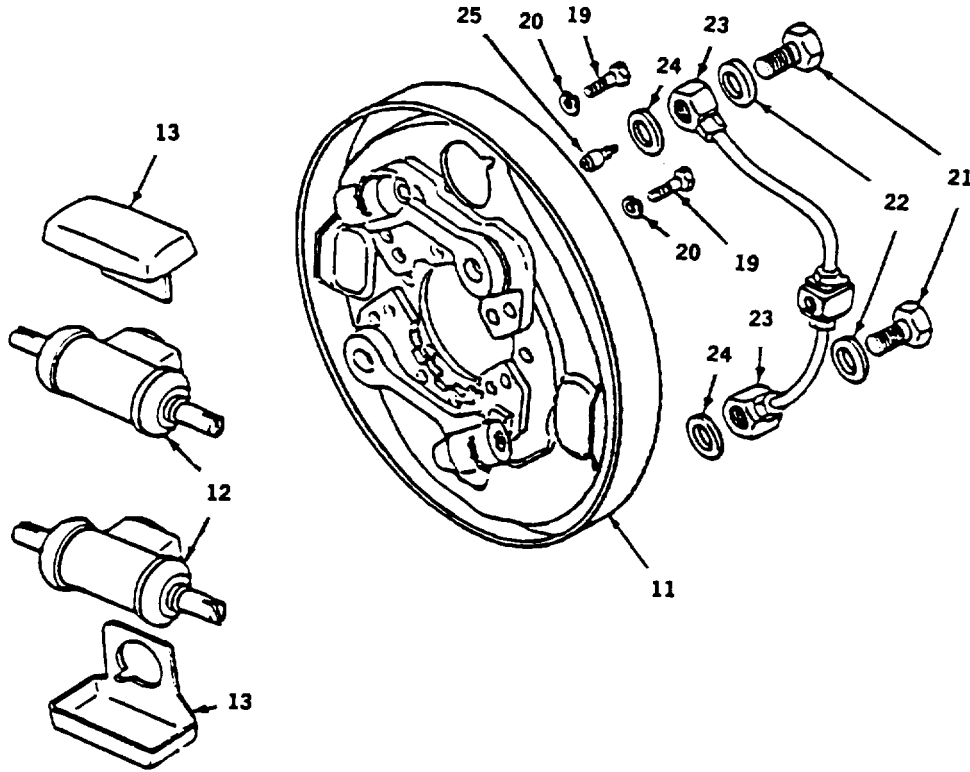
NOTE

Inspect cylinders (12) and hydraulic fittings for leaks. If they do not need to be replaced, proceed to step 8. Have suitable container available for catching hydraulic fluid drainage.

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

b. Repair of Service Brakes - Continued



5. Brake cylinders (12)
(Remove)

Remove bolts (19), lock washers (20), fluid passage bolt (21), spacer (22), tee (23), and shouldered washer (24) connected to brake cylinders (12). Remove cylinders (12) and shields (13).

NOTE

If backing plate assembly (11) is to be removed or repaired, Refer to step 12.

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

b. Repair of Service Brakes - Continued

| | | |
|----|-----------------------------------|--|
| 6. | Brake cylinders (12) (Install) | Position brake cylinders (12) and shields (13) in access hole in backing plate (11). Reconnect washers (24), tee (23), spacers (22) and fluid passage bolts (21). Secure cylinders (12) to backing plate (11) with new lock washers (20) and bolts (19). |
|----|-----------------------------------|--|

7. Bleed brakes, via valves (25), and inspect service brake hydraulic system for leaks after final assembly is complete.

NOTE

Position brake adjustments in, to provide clearance for new brake shoes during reinstallation of drum.

WARNING

Do not allow grease to contact brake linings. Linings can absorb grease and oil, causing early glazing of linings and very poor braking action. Failure to observe this precaution could cause serious injury or death to personnel.

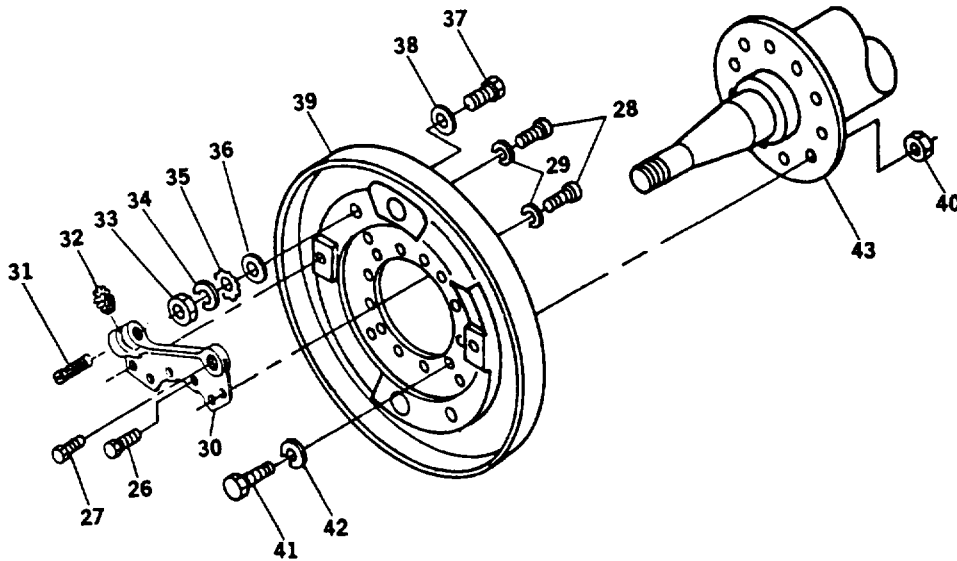
| | | |
|----|---|--|
| 8. | Brake shoes (1) and (8) (Install) | Maneuver brake shoes (1) and (8) in position with cylinders (12) and mounting holes in backing plate (11). |
| 9. | Brake shoe (8) (Rear) | Secure brake shoe (8) to backing plate (11) with bolt (10), new lock washer (4), flat washer (5), sleeve spacer (6), new lock washer (4), and nut (9). |

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|---|---------------------------|---|
| b. <u>Repair of Service Brakes</u> - Continued | | |
| 10. | Brake shoe (1) (Front) | Secure brake shoe (1) to backing plate (11) with bolt (7), sleeve spacer (6), flat washer (5), new lock washer (4) and nut (3). |
| 11. | Brake springs (2) | Reattach springs (2) to brake shoes (1) and (8). |

NOTE

It is not necessary to remove backing plate to replace brake shoes. Upon inspection, if backing plate and adjuster assembly require repairs, remove tire/rim, hub, drum, brake shoes, springs, cylinders/hydraulic connections, and parking brake actuator cable before removing brake backing plate assembly.



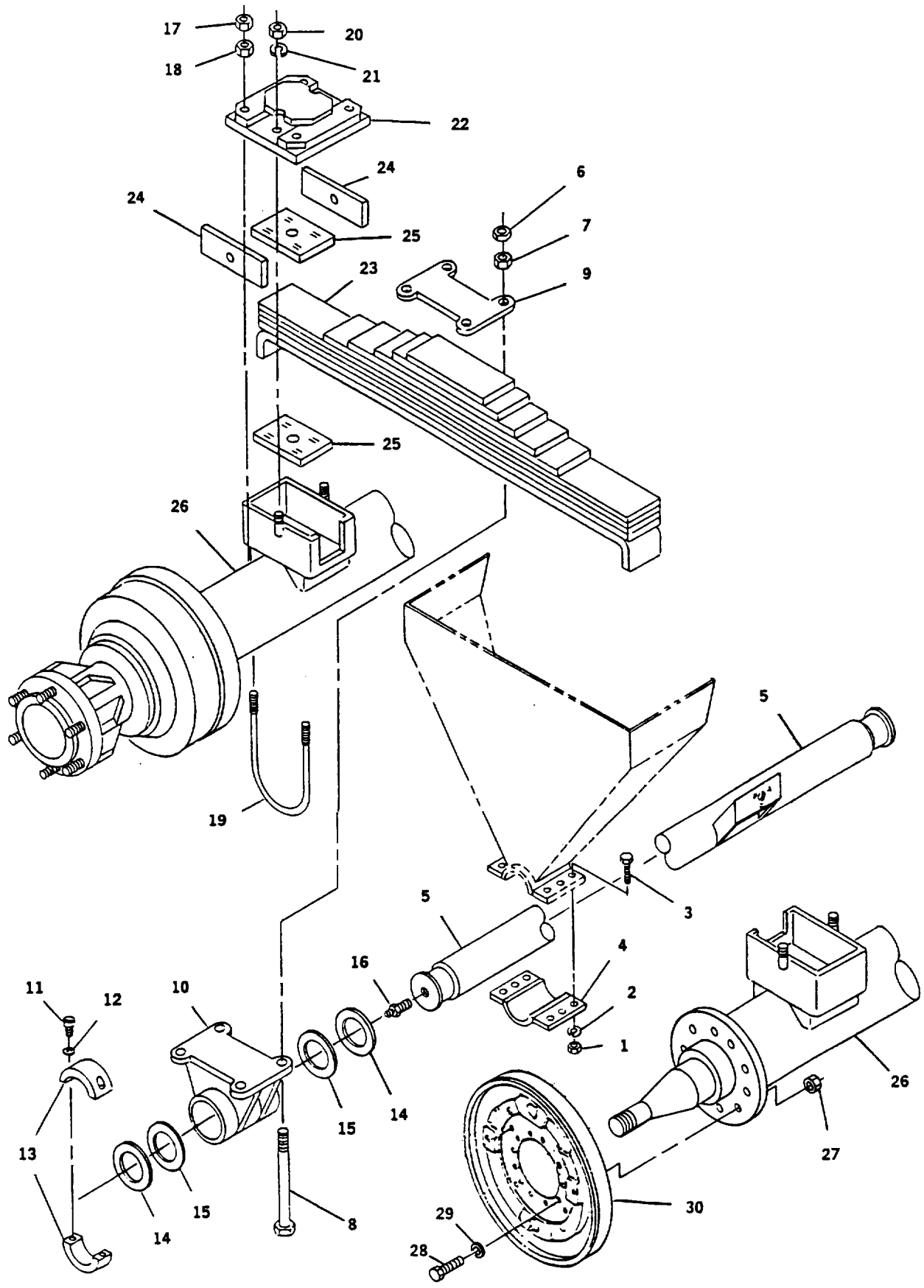
4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|---|---|--|
| b. <u>Repair of Service Brakes</u> - Continued | | |
| 12.Brake backing plate assembly (disassemble) | Anchor support and adjuster assembly (30, 31, and 32) (upper shown) | Remove four screws (26), two anchor pins (27), four screws (28), and four lock washers (29) from each anchor support and adjuster assembly. Inspect adjuster assembly for wear/damage. |
| 13. | Support (30) | Remove adjuster screw (31) and star wheel (32) from support (30). |
| 14. | Adjuster studs (37) | Remove two nuts (33), two lock washers (34), two pinions (35), two washers (36), two stud assemblies (37), and two washers (38) from backing plate (39). |
| 15. | Backing plate (39) | Remove twelve nuts (40), screws (41), and washers (42) securing backing plate (39) to axle assembly (43). |
| 16.Backing plate assembly (assemble) | Backing plate (39) | Secure backing plate (39) to axle assembly (43) with twelve screws (41), washers (42), and nuts (40). |
| 17. | Adjuster studs (37) | Position adjuster studs (37) and washers (38) in place and install washers (36), pinions (35), lock washers (34) and nuts (33). |
| 18. | Support (30) | Place star wheel (32) in position and secure with adjuster screw (31). |

4-28. REPAIR AXLE HUB, DRUM, AND SERVICE BRAKES - Continued

| Location | Item | Action |
|---|---|--|
| b. <u>Repair of Service Brakes</u> - Continued | | |
| 19. | Anchor support and adjuster assembly (30, 31, and 32) (upper and lower) | Position anchor support and adjuster assembly on brake backing plate, aligned to pinion (35). Secure with four screws (28), new lock washers (29), two anchor pins (27) and two screws (26) for each anchor support and adjuster assembly (upper and lower). |
| 20. | Reinstall brake shoes (steps 8 and 9). | |
| 21. | | |
| 22. | Perform steps in paragraph 4-28.a. for reinstallation of hub, drum, and wheel bearings. | |
| 23. | | |
| 22. | Adjust and bleed brakes after final assembly is complete (refer to paragraph 4-27). | |

4-29. REPAIR TRAILER SUSPENSION/AXLE ASSEMBLY



4-29. REPAIR TRAILER SUSPENSION/AXLE ASSEMBLY - Continued

| Location | Item | Action |
|---|---|--|
| <p>a. <u>Remove/Replace Trailer Suspension/Axle Assembly</u></p> | | |
| <p><u>WARNING</u></p> | | |
| <p>Procedure must be performed on a level surface with front and rear leveling jacks lowered, wheels choked and trailer supported by an overhead hoist to prevent movement of trailer.</p> | | |
| <p>1. Trailer assembly</p> | <p>Parking brake cables, clamps, and guides.</p> | <p>Detach from trailer where necessary to remove/replace suspension.</p> |
| <p>2. Suspension/axle assembly (removal)</p> | <p>Air lines/hydraulic lines</p> | <p>Disconnect from air brake chambers and master cylinder as required in accordance with paragraph 4-30.</p> |
| <p>3.</p> | <p>Nuts (1), lock washers (2), bolts (3) and clamps (4)</p> | <p>Remove from each side at trailer pedestals and inspect for damage.</p> |
| <p>4.</p> | <p>Suspension/axle assembly</p> | <p>Roll from beneath trailer.</p> |
| <p>5.</p> | | <p>Replace defective parts in accordance with paragraphs 4-29.b. thru 4-29.d.</p> |
| <p>6. Suspension/axle assembly (install) at front.</p> | | <p>Roll beneath trailer and position under pedestals. Ensure axle with parking brake is</p> |
| <p>7.</p> | <p>Clamps (4), bolts (3), new lock washers (2) and nuts (1)</p> | <p>Install at trailer pedestals. Torque nuts (1) to 150 ft lbs.</p> |

4-29. REPAIR TRAILER SUSPENSION/AXLE ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

a. Remove/Replace Trailer Suspension/Axle Assembly - Continued

| | | |
|---------------------------------|---|--|
| 8. | Air lines/hydraulic lines | Connect to air brake chambers and master cylinder as required in accordance with paragraph 4-30. |
| 9. Trailer assembly front axle. | Parking brake cables, clamps, and guides. | Attach to trailer frame and suspension |

b. Repair Trunnion Axle

NOTE

Repair of trunnion axle (5) is limited to replacement of defective parts and corrosion control.

| | | |
|-----------------------------|--|---|
| 1. Trailer assembly | Suspension/axle assembly | Remove in accordance with paragraph 4-29.a. |
| 2. Suspension/axle assembly | Brake master cylinders, air chambers, and lines. | Remove in accordance with paragraph 4-30. |

NOTE

Support trunnion axle (5) to aid in removal.

| | | |
|----------------------------|---|--|
| 3. Trunnion axle (removal) | Jam nuts (6), nuts (7), bolts (8) and plate (9) | Remove from each end. Remove trunnion axle(s) from suspension/axle assembly. |
| 4. | Screws (11), lock washers (12) and lock rings (13) | Remove from each end. |
| 5. | Back-up washers (14), thrust washers (15), bracket (10) and grease fitting (16) | Remove from each end. |

4-29. REPAIR TRAILER SUSPENSION/AXLE ASSEMBLY - Continued

| Location | Item | Action |
|---|---|---|
| b. <u>Repair Trunnion Axle</u> - Continued | | |
| NOTE | | |
| Clean and inspect removed parts to determine serviceability. | | |
| 6. Trunnion axle (install) | Back-up washers (14), thrust washers (15), bracket (10) and grease fitting (16) | Install on each end. |
| 7. | Lock rings (13), screws (11), and new lock washers (12) | Install on each end. |
| 8. Suspension/ axle assembly | Trunnion axle | Position under springs (23) and support in place. |
| 9. | Plate (9), bolts (8), nuts (7), and jam nuts (6) | Install on each side. Torque nuts (7) 150-175 ft lbs then tighten jam nuts (6). |
| 10. | Brake master cylinders, air chambers, and lines. | Install in accordance with paragraph 4-30. |
| 11. Trailer assembly | Suspension/axle assembly | Install in accordance with paragraph 4-29.a. |

c. Repair Sprint Assembly**NOTE**

Procedure is typical for either side spring assembly. Repair of spring assembly is limited to replacement of defective attaching parts, spring assembly or corrosion control.

| | | |
|---------------------|--------------------------|---|
| 1. Trailer assembly | Suspension/axle assembly | Remove in accordance with paragraph 4-29.a. |
|---------------------|--------------------------|---|

4-29. REPAIR TRAILER SUSPENSION/AXLE ASSEMBLY - Continued

| Location | Item | Action |
|---|---|---|
| c. <u>Repair Spring Assembly</u> - Continued | | |
| 2. Suspension/ axle assembly | Trunnion axle | Remove in accordance with paragraph 4-29.b. |
| 3. Spring assembly (removal) | Jam nuts (17), nuts (18), and U-bolts (19) | Remove from axles at spring (23) ends. |
| 4. | Nuts (20), lock washers (21), and caps (22) | Remove from axles at spring (23) ends. |
| <u>CAUTION</u> | | |
| Spring assembly is heavy. To prevent injury, two persons are required to lift. | | |
| 5. | Spacers (24) and (25), and spring (23) | Remove from axle brackets. |
| <u>NOTE</u> | | |
| Clean and inspect removed parts to determine serviceability. | | |
| 6. Spring assembly (install) | Spacers (24) and (25), and spring (23) | Position in axle brackets. |
| 7. | Caps (22), new lock washers (21), and nuts (20) | Install on axles at spring (23) ends. |
| 8. | U-bolts (19), nuts (18), and jam nuts (17) | Install on axles at spring (23) ends. Torque nuts (18) 85-105 ft. lbs then tighten jam nuts (17). |
| 9. | Trunnion axle | Install in accordance with paragraph 4-29.b. |
| 10. Trailer assembly | Suspension/axle assembly | Install in accordance with paragraph 4-29.a. |

4-29. REPAIR TRAILER SUSPENSION/AXLE ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

d. Repair Axle Assembly

NOTE

Procedure is typical for front or rear axle. Repair of axle assembly is limited to replacement of attaching parts and corrosion control.

| | | |
|-----------------------------|--|--|
| 1. Trailer assembly | Suspension/axle assembly | Remove in accordance with paragraph 4-29.a. |
| 2. Suspension/axle assembly | Trunnion axle | Remove in accordance with paragraph 4-29.b. |
| 3. | Spring assemblies | Remove in accordance with paragraph 4-29.c. |
| 4. Axle assembly (removal) | Axle assembly (26) | Support at both ends. |
| 5. | Tires and wheels | Remove in accordance with paragraph 4-26. |
| 6. | Hubs, drums, service brakes, and parking brake cables | Remove in accordance with paragraph 4-28. |
| 7. | Hydraulic brake lines | Disconnect hydraulic brake lines from axle and master cylinder. (Refer to paragraph 4-30.) |
| 8. | Nuts (27), bolts (28), washers (29), and brake backing plates (30) | Remove from both ends. |

NOTE

Clean and inspect removed parts to determine serviceability.

| | | |
|----------------------------|--|-----------------------|
| 9. Axle assembly (install) | Brake backing plates (30), washers (29), bolts (28), and nuts (27) | Install on both ends. |
|----------------------------|--|-----------------------|

4-29. REPAIR TRAILER SUSPENSION/AXLE ASSEMBLY - Continued

| Location | Item | Action |
|---|--------------------------------|--|
| d. <u>Repair Axle Assembly</u> - Continued | | |
| 10. | Hydraulic brake lines | Ensure brake lines are clean. Reconnect to axle assembly and master cylinder. (Refer to paragraph 4-30.) |
| 11. | Hubs, drums and service brakes | Install in accordance with paragraph 4-28. |
| 12. | Tires and wheels | Install in accordance with paragraph 4-26. Check wheels. |
| 13. Suspension/ axle assembly | Spring assemblies | Install in accordance with paragraph 4-29.c. |
| 14 | Trunnion axle | Install in accordance with paragraph 4-29.b. |
| 15. Trailer assembly | Suspension/axle assembly | Install in accordance with paragraph 4-29.a. |

4-30. REMOVE/REPLACE AIR BRAKE MASTER CYLINDER AND BRAKE CHAMBER ASSEMBLY

a. Remove/Replace Air Brake Master Cylinder

CAUTION

Clean area around master cylinder before starting procedure to prevent dirt from entering brake hydraulic system.

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REMOVE

NOTE

Catch brake fluid in a suitable container and dispose of properly. Do not reuse this fluid.

| | | |
|--------------------------|--|---|
| 1. Brake master cylinder | Brake master cylinder (1), hose/tube fitting (2), and gasket (3) | Disconnect hose/tube fitting (2), and remove gasket (3) from cylinder (1) |
|--------------------------|--|---|

4-30. REMOVE/REPLACE AIR BRAKE MASTER CYLINDER AND BRAKE CHAMBER ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

a. Remove/Replace Air Brake Master Cylinder - Continued

REMOVE - Continued

CAUTION

Keep dirt from entering hydraulic system.

| | | |
|----|---|--|
| 2. | Brake master cylinder (1), nuts (4), and lock washers (5) | Remove three nuts (4) and lock washers (5) from studs on air chamber (6) and remove brake master cylinder (1). |
|----|---|--|

NOTE

Clean and inspect removed parts to determine reuse.

REPLACE

| | | |
|---|--|--|
| 1. Brake master cylinder | Brake master cylinder (1), nuts (4), and lock washers (5) | Position brake master cylinder (1) on studs of air chamber (6), protruding through bracket (7). Secure with new lock washers (5) and nuts (4). |
| 2. | Brake master cylinder (1), hose/tube fitting (2), and gasket (3) | Place new gasket (3) in place and reconnect hose/tube fitting (2) to brake master cylinder (1). |
| 3. Add fluid and bleed brakes (refer to paragraph 4-27.b.). Inspect for leaks after functional check. | | |

4-30. REMOVE/REPLACE AIR BRAKE MASTER CYLINDER AND BRAKE CHAMBER ASSEMBLY - Continued

b. Remove/Replace Air Brake Chamber Assembly

| Location | Item | Action |
|-------------------------|--|---|
| REMOVE | | |
| 1. Chamber assembly (1) | Chamber assembly (1), air hose and adapter (2) | Disconnect air hose and adapter (2) from chamber assembly (1). |
| 2. | Nuts (3) and lock washers (4) | Remove three sets of nuts (3) and lock washers (4). |
| 3. | Chamber assembly (1) | Pull chamber assembly (1) from master cylinder (5) and bracket (6). |

NOTE

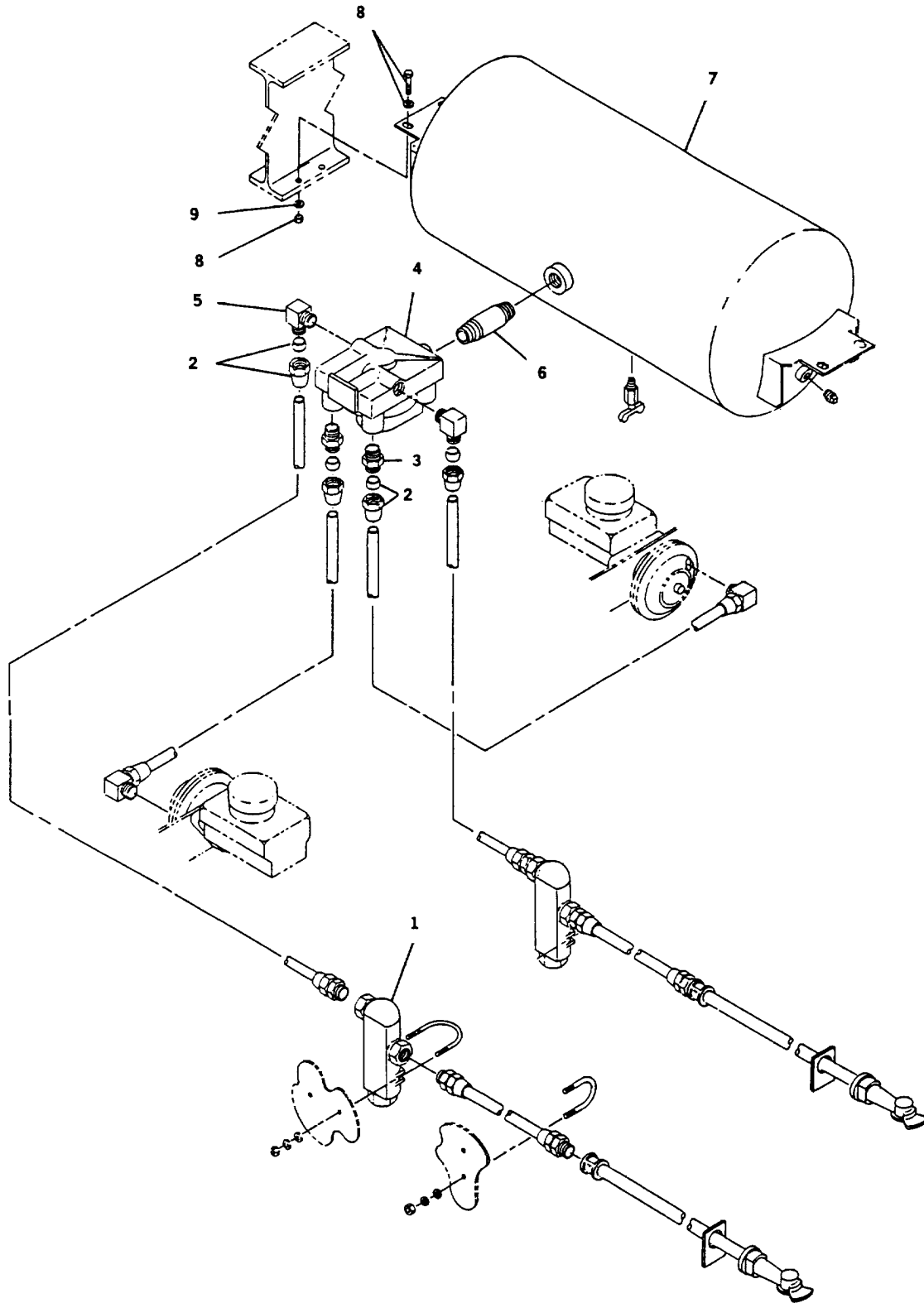
Clean and inspect removed parts to determine serviceability.

REPLACE

| | | |
|-------------------------|----------------------|---|
| 1. Chamber assembly (1) | Chamber assembly (1) | Position chamber assembly (1) through bracket (6), and align with master cylinder (5) mounting holes. |
|-------------------------|----------------------|---|

4-30. REMOVE/REPLACE AIR BRAKE MASTER CYLINDER AND BRAKE CHAMBER ASSEMBLY - Continued

| Location | Item | Action |
|---|--|---|
| <p>b. <u>Remove/Replace Air Brake Chamber Assembly</u> - Continued</p> | | |
| <p>REPLACE - Continued</p> | | |
| 2. | Nuts (3) and lock washers (4) | Secure chamber (1) to bracket (6) and master cylinder (5) with new lock washers (4) and nuts (3). |
| 3. | Chamber assembly (1), air hose and adapter (2) | Reconnect air hose and adapter (2) to chamber assembly (1). |
| 4. Recharge air tank and functional check air chamber for proper operation. | | |



4-31. REPAIR AIR BRAKES, LINES, AND FITTINGS - Continued

| Location | Item | Action |
|---|-------------------------------------|---|
| REPAIR | | |
| 1. Air brakes, lines, and fittings | Air cleaner (1) (Remove/Install) | Disconnect two hose couplings (2), adapters (3) and remove air cleaner (1). Install air cleaner (1) by reconnecting two hose couplings (2) and adapters (3). |
| 2. | Relay valve (4) (Remove) | Disconnect four hose couplings (2), two adapters (3), and two elbows (5) from relay valve (4). |
| 3. | Pipe nipple (6) | Remove relay valve (4) by threading off of pipe nipple (6). |
| <p>NOTE Clean and inspect removed parts to determine serviceability.</p> | | |
| 4. | Relay valve (4) (Install) | Thread relay valve (4) onto pipe nipple (6). Reattach two straight adapters (3) to outlet ports, and two elbow adapters (5) to inlet ports of valve (4). Reconnect four hose couplings (2) to adapters on relay valve (4). |
| 5. | Air tank (7) (Remove) | Disconnect pipe nipple (6) from air tank (7) by disconnecting hose couplings (2) from relay valve (4) and threading off nipple (6) and relay valve (4) as a unit. Remove four sets of fasteners (8) and maneuver air tank (7) out of trailer frame. |

4-31. EPAIR AIR BRAKES, LINES, AND FITTINGS - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPAIR - Continued

| | | |
|----|---------------------------|---|
| 6. | Air tank (7) (Install) | Position air tank (7) in trailer frame and secure with fasteners (8) and new lock washers (9). Thread pipe nipple (6)/ relay valve (4) onto air tank (7) and reconnect hose couplings (2) to relay valve (4). |
|----|---------------------------|---|

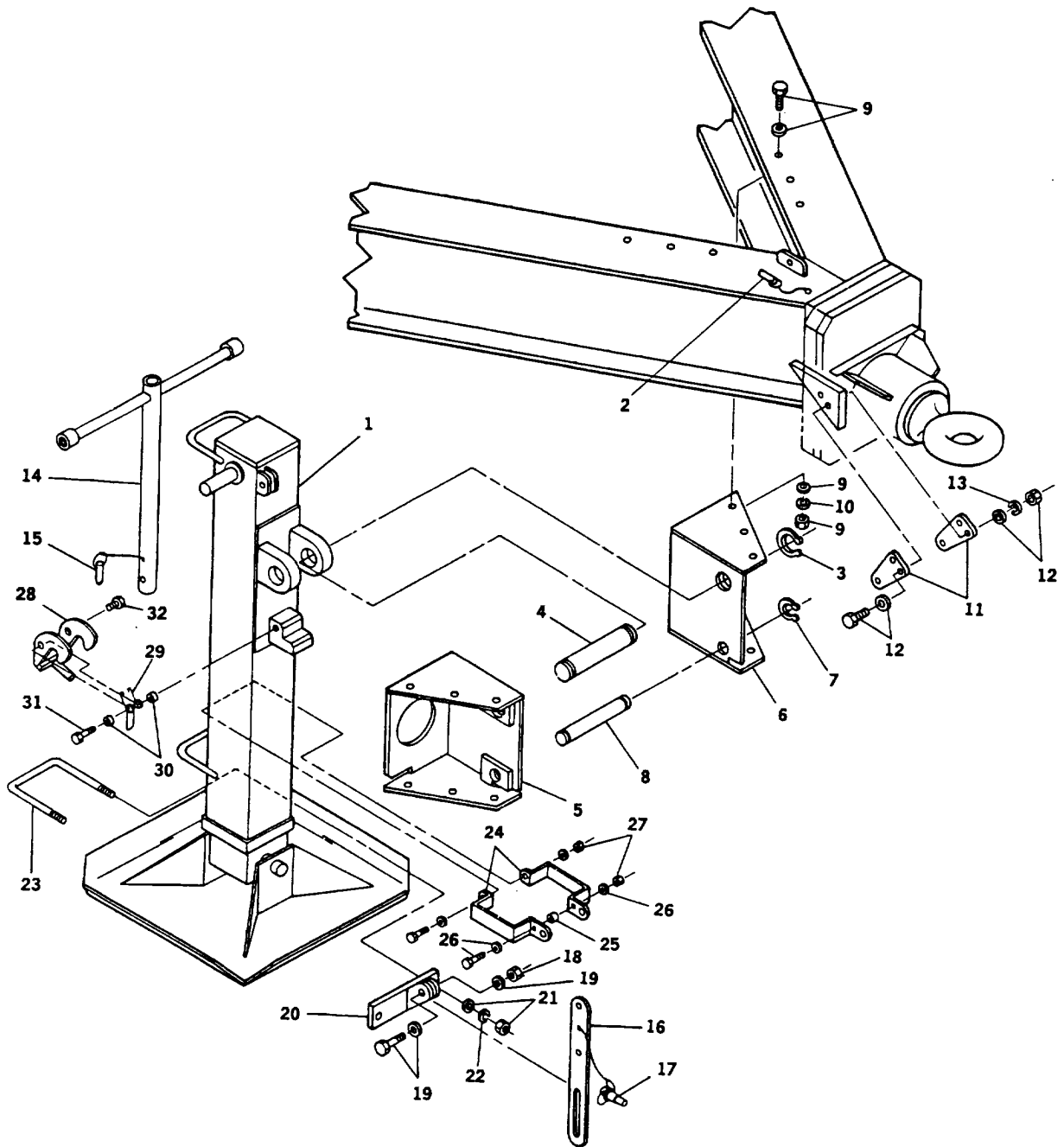
NOTE

During installation always use new lock washers, don't reuse disassembled lock washers.

| | | |
|---|----------------------|---|
| 7. | Lines/Fittings, etc. | Replace air hoses, fittings, clamps, and fasteners as required. |
| 8. Recharge air tank and check for leaks. | | |

4-32. REPAIR FRONT JACK ASSEMBLY

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4-32. REPAIR FRONT JACK ASSEMBLY - Continued

| Location | Item | Action |
|---|---------------------------------------|--|
| REPAIR | | |
| <u>WARNING</u> | | |
| Repairs to front jack assembly are performed while trailer is hitched to tow vehicle. Trailer hitch may also be supported by blocking, if wheels are chocked, or rear jacks are engaged, to ensure against movement when tow vehicle isn't hitched. | | |
| <u>NOTE</u> | | |
| Repairs to front jack assembly include corrosion control; repainting; replacing the jack, brackets, attaching hardware, and fasteners. Unlocking and maneuvering the jack requires two crew members. | | |
| 1. Front jack assembly (Remove) | Jack assembly (1) | Unlock jack assembly (1) from stowed position by pulling out double ball lock pin (2) allowing jack to swivel to vertical. |
| 2. | Jack (1) and box assemblies (5 and 6) | Remove by removing fasteners (9 and 10), retaining rings (7), and lock-in bar (8). Remove retaining rings (3) and pivot pin (4), securing jack (1) to jack box assemblies (5 and 6). Maneuver jack (1) away from trailer. |
| 3. Front jack assembly (Install) | Jack (1) and box assemblies (5 and 6) | Replace lock-in bar (8), and retaining rings (7). Aligning with holes in trailer and secure with fasteners (9), and new lock washer (10). Install pivot pin (4) through jack and box assemblies and secure with retaining rings (3). |

4-32. REPAIR FRONT JACK ASSEMBLY - Continued

| Location | Item | Action |
|---------------------------|--|---|
| REPAIR - Continued | | |
| 4. Jack assembly | Inspection/repair | Inspect jack assembly for damage. Remove/repair/install components as required. |
| 5. | Eyelet link plates (11) | Inspect eyelet link plates (11) for damage. If required, replace by removing fasteners (12) and (13); align to holes in trailer bracket and refasten with new lock washers (13) and fasteners (12). |
| 6. | Jack crank (14) and quick release pin/cable (15) | Inspect jack crank (14) and quick release pin/cable (15) for damage. |
| 7. | Tension link assembly (16) and quick release pin/cable assembly (17) | Remove tension link assembly (16) by removing lock nut (18), and fasteners (19). Inspect link (16) and pin/cable (17) for damage. |
| | | Install by aligning link (16) with bracket (20), and securing with fasteners (19) and new lock nut (18). |
| 8. | Eyelet bracket (20) | Remove eyelet bracket (20) by removing tension link assembly (16), fasteners (21) and (22), and square bend U-bolt (23). Install by realigning U-bolt (23), and bracket (20), securing with fasteners (21), and new lock washers (22). |

4-32. REPAIR FRONT JACK ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPAIR - Continued

NOTE

Check U-bolt (23)/bracket (20) for proper distance along jack body after final installation when jack is in vertical position and tension link (16) is connected to eyelet link plates (11).

| | | |
|----|------------|---|
| 9. | Clamp (24) | Remove clamp (24) (two halves) by removing fasteners (26), spacer (25), and lock nuts (27). Install by aligning clamps (24) around jack body (1). Insert spacer (25), fasteners (26), and install new lock nuts (27). |
|----|------------|---|

NOTE

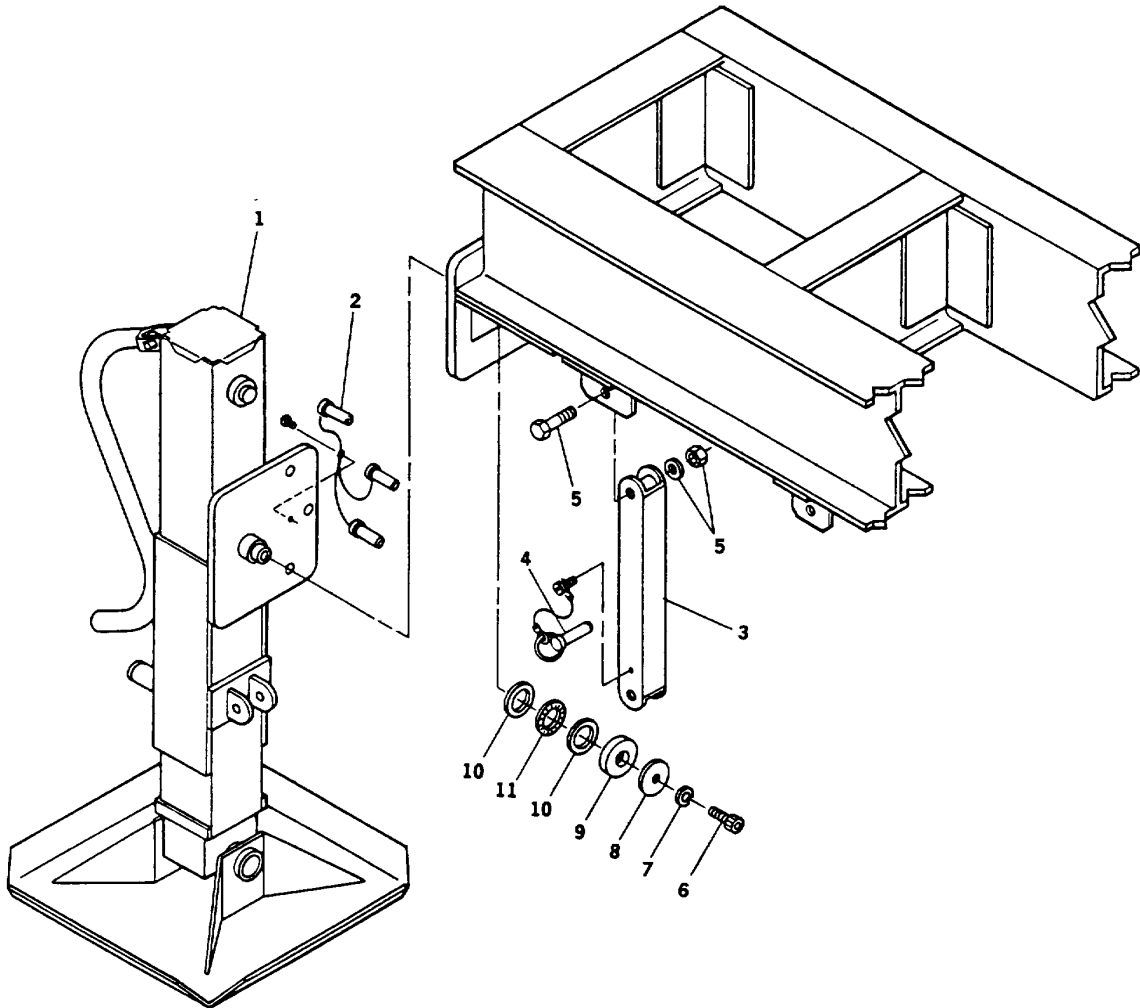
Check alignment between clamp (24) and eyelet bracket (16).

| | | |
|-----|------------------------|---|
| 10. | Jack lock-in hook (28) | Remove jack hook (28) by removing shoulder bolts (31) and (32), spring (29), sleeve spacers (30) and spring (29). Secure with shoulder bolts (31) and (32). Torque shoulder bolt (31) to 82 ft-lbs. Torque shoulder bolt (32) to 32 ft-lbs. |
|-----|------------------------|---|

4-33. REPAIR REAR JACK AND PIVOT PLATE

NOTE

Left side shown. Repairs are the same for either side. Two crew members are required when locking/unlocking and maneuvering the jacks.



4-33. REPAIR REAR JACK AND PIVOT PLATE - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPAIR

NOTE

Repairs to rear jack assemblies include corrosion control; repainting; replacing the jack assemblies, pivot plate bearings, and fasteners.

| | | |
|------------------|-------------------------------|--|
| 1. Jack assembly | Jack assembly (1) (Remove) | Pull lock pins (2) out and swivel jack (1) to vertical position. Inspect brace (3) and lock pin/cable (4) for damage. If required, remove brace (3) by removing fasteners (5). To remove jack (1), remove cap screw (6), lock washer (7), washer (8), backing cap (9), thrust washers (10) and bearing (11). Slide jack (1) from bracket on trailer. |
|------------------|-------------------------------|--|

NOTE

Clean and inspect bearing (11) for damage. If reusable, protect from dirt/corrosion until reassembly.

| | | |
|----|----------------------------|---|
| 2. | Locking pins/cables (2) | Inspect locking pins/cables (2) for damage. Replace, if required. |
|----|----------------------------|---|

NOTE

When replacing cables/pins (2), apply locking sealant (Loctite) Grade C (item 12, Appendix E), to screw securing cables/pins. Tighten screw, then unthread approximately 1/2 turn or until cables are free to swivel.

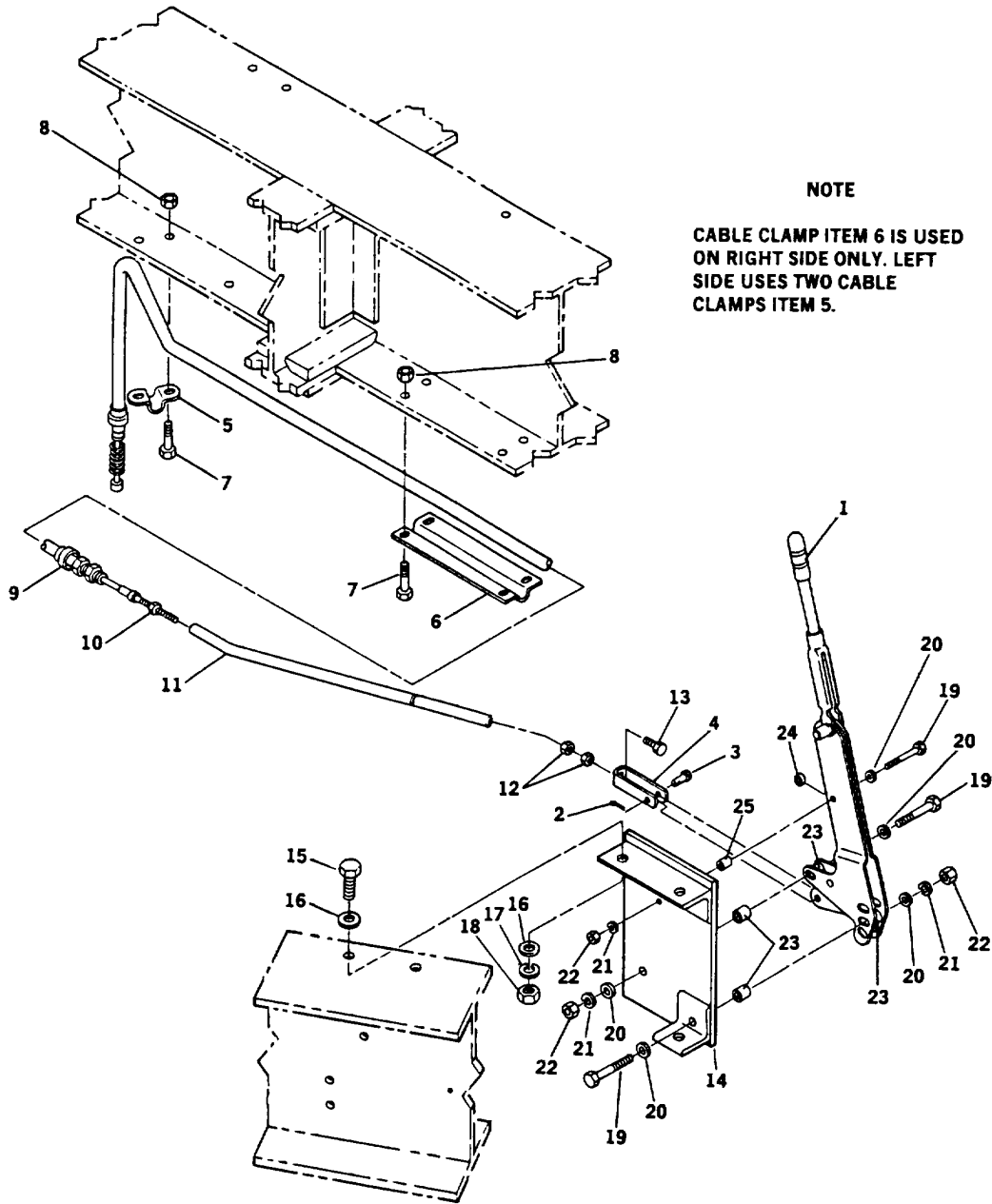
4-33. REPAIR REAR JACK AND PIVOT PLATE - Continued

| Location | Item | Action |
|--------------------------|--------------------------------|---|
| REPAIR- Continued | | |
| 3. | Jack assembly (1) (Install) | Clean mating threads of screw (6) and jack (1) with primer (for locking sealant). Slide jack (1) into trailer bracket. Position thrust washers (10), bearing (11), backing cap (9), washer (8), and new lock washer (7) on pivot hub. Apply locking sealant (Loctite) Grade AV (item 13, Appendix E), to cap screw (6) and secure jack assembly (1) to trailer. |

4-34. REMOVE/REPLACE/ADJUST HAND BRAKE ASSEMBLY

NOTE

Right side shown. Procedures are the same for either side.



4-34. REMOVE/REPLACE/ADJUST HAND BRAKE ASSEMBLY - Continued

| Location | Item | Action |
|---|------------------------|--|
| REMOVE | | |
| <u>WARNING</u> | | |
| When working on hand brake control linkage, place chocks in front of and behind both of the rear wheels to keep trailer from rolling in either direction. Failure to observe this precaution could cause serious injury or death of personnel. | | |
| 1. Hand brake | Lever (1) | Release hand brake by moving lever (1) rearward. |
| 2. | Clevis (4) | Remove cotter pin (2) and clevis pin (3), disconnecting clevis (4) from lever (1). |
| 3. | Cable clamps (5 and 6) | Remove bolts (7) and lock nuts (8). Remove cable clamps. |
| 4. Front wheel | Brake cable (9) | Refer to paragraph 4-28.b. and disconnect brake cable from brake assembly. |
| 5. Brake cable (9) | Cable rod (11) | Loosen nut (10) and unscrew cable rod (11) from brake cable (9). |
| 6. Cable rod (11) | Clevis (4) | Loosen two nuts (12). Remove bolt (13) and clevis (4) from end of cable rod (11). |

4-34. REMOVE/REPLACE/ADJUST HAND BRAKE ASSEMBLY - Continued

| Location | Item | Action |
|---------------------------|-------------------------------------|---|
| REMOVE - Continued | | |
| 7. Hand brake (14) | Mounting bracket washers (16), lock | Remove bolts (15), washers (17) and nuts (18). Remove mounting bracket (14) with lever (1) from trailer frame. |
| 8. | Lever (1) | Remove bolts (19), washers (20), lock washers (21) and nuts (22). Remove lever (1) and spacers (23, 24, and 25). |
| REPLACE | | |
| 1. Hand brake | Lever (1) | Position lever (1) on mounting bracket (14) and secure with spacers (23, 24, and 25), bolts (19), washers (20), new lock washers (21), and nuts (22). |
| 2. | Mounting bracket (14) | Position mounting bracket (14) on trailer frame and secure with bolts (15), washers (16), new lock washers (17), and nuts (18). |
| 3. Cable rod (11) | Clevis (4) | Install bolt (13) in clevis (4) and secure with one nut (12). Install other nut (12) on bolt (13) and screw bolt into cable rod (11). |

4-34. REMOVE/REPLACE/ADJUST HAND BRAKE ASSEMBLY - Continued

| Location | Item | Action |
|---------------------------------|------------------------|--|
| REPLACE - Continued | | |
| 4. Brake cable (9) | Cable rod (11) | Screw cable rod (11) onto brake cable (9). Do not tighten nut (10) or nut (12) at this time. |
| 5. Front wheel | Brake cable (9) | Refer to paragraph 4-28.b. and connect brake cable (9) to brake assembly. |
| 6. Hand brake | Cable clamps (5 and 6) | Position cable clamps (5 and 6) and secure with bolts (7) and lock nuts (8). |
| 7. | Clevis (4) | Connect clevis (4) to lever (1) using clevis pin (3) and new cotter pin (2). |
| 8. Adjust hand brake assembly., | | |

ADJUST**WARNING**

When raising trailer for wheel clearance, ensure three onboard leveling jacks are on firm ground and trailer cannot move to preclude injury.

1. Block wheels on opposite side of trailer using wheel chocks.
2. Jack up trailer using onboard leveling jacks until the wheel of brake to be adjusted is completely off the ground.
3. Drain all pressure from air reservoir.
4. Position hand brake lever in full release position (rearward). Turn hand brake lever adjusting knob counterclockwise as far as possible.

4-34. REMOVE/REPLACE/ADJUST HAND BRAKE ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

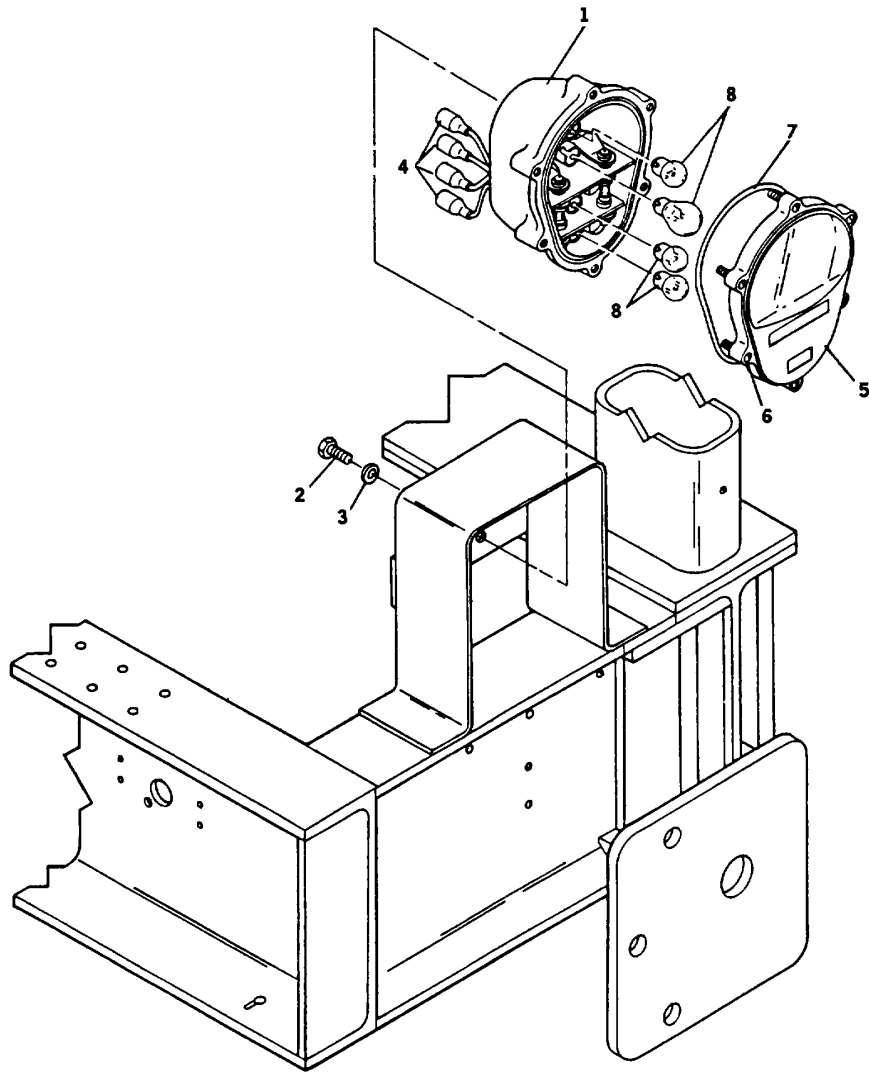
ADJUST - Continued

5. If necessary, loosen nuts (10) and (12) at each end of cable rod (11).
6. While rotating wheel, tighten cable rod (11) until brake begins to drag.
7. Back off cable rod (11) until wheel spins freely.
8. Check adjustment by applying hand brake using lever (1). If lever will not fully extend, loosen cable rod slightly.
9. Tighten nuts (10) and (12) at each end of cable rod (11).
10. Lower trailer.

4-35. REPAIR BLACKOUT CLEARANCE LIGHTS - Continued

| Location | Item | Action |
|--------------------------------|----------------------|---|
| DISASSEMBLY - Continued | | |
| 2. | Lamp (4) | Press down, turn lamp and remove from socket (5). |
| 3. | Lamp socket (5) | Unplug lamp socket lead from harness and remove socket. |
| 4. | Light base plate (7) | Remove two screws (6), lock washers (9) and nuts (10). Remove base plate (7) and gasket (8). |
| ASSEMBLY | | |
| 1. Trailer frame | Light base plate (7) | Position base plate (7) and new gasket (8) on trailer frame and secure with two screws (6), new lock washers (9) and nuts (10). |
| 2. | Lamp socket (5) | Position socket in base plate and connect lead to harness. |
| 3. | Lamp (4) | Position lamp in socket, press down and turn to lock in place. |
| 4. | Lens holder (2) | Position lens (3) and lens holder (2) on base plate and secure with two screws (1). |

4-36. REPAIR REAR STOP LIGHTS



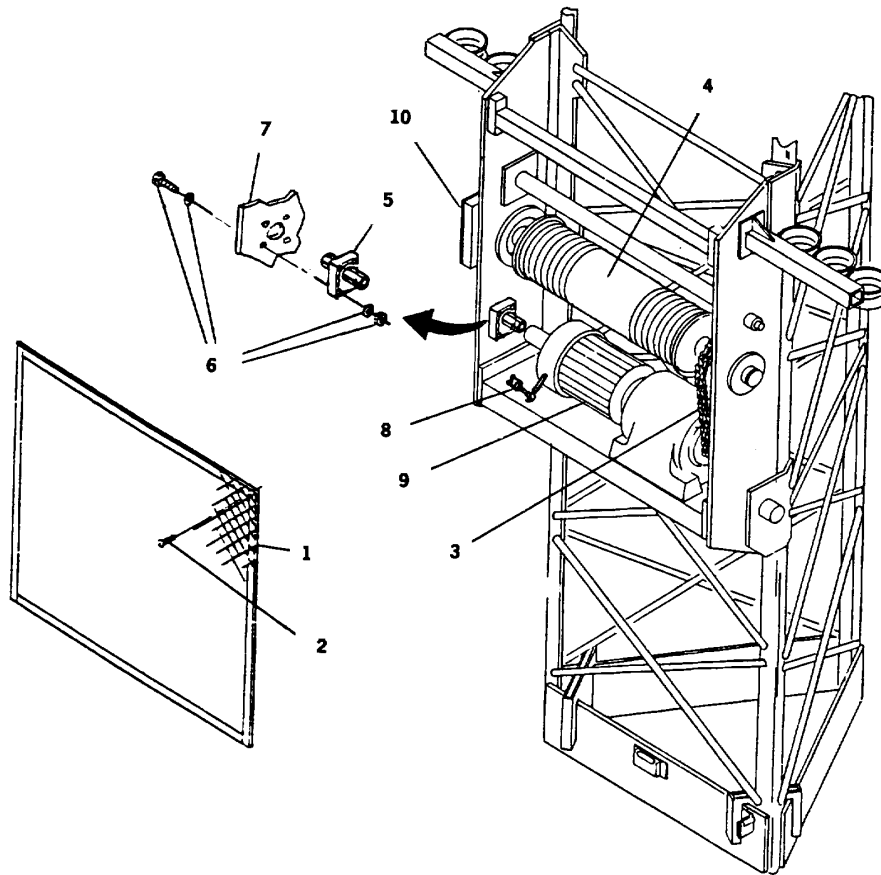
NOTE

Left rear stop light shown. Procedures same for right rear stop light.

4-36. REPAIR REAR STOP LIGHTS - Continued

| Location | Item | Action |
|-----------------------|----------------|--|
| REMOVE | | |
| 1. Rear trailer frame | Stop light (1) | Tag and disconnect four connectors (4) from harness. |
| 2. | | Remove two bolts (2) and lock washers (3). Remove stop light (1) from bracket. |
| DISASSEMBLY | | |
| 1. Stop light (1) | Lens cover (5) | Loosen six captive screws (6). Remove lens cover (5). |
| 2. | Gasket (7) | Remove gasket (7) only if worn or damaged. |
| 3. | Lamps (8) | Remove four lamps (8). |
| ASSEMBLY | | |
| 1. Stop light (1) | Lamps (8) | Install four lamps (8). |
| 2. | Gasket (7) | Install new gasket (7), if removed. |
| 3. | Lens cover (5) | Install lens cover (5) and tighten six captive screws (6). |
| REPLACE | | |
| 1. Rear trailer frame | Stop light (1) | Position stop light (1) on bracket and secure with two bolts (2) and new lock washers (3). |
| 2. | | Remove tags and connect four connectors (4) to harness. |

4-37. REPAIR TRUSS ASSEMBLY



| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPAIR

NOTE

Repairs are limited to replacing attaching parts, corrosion control, and replacing fasteners. Repairs are performed with the tower horizontal in its nested position.

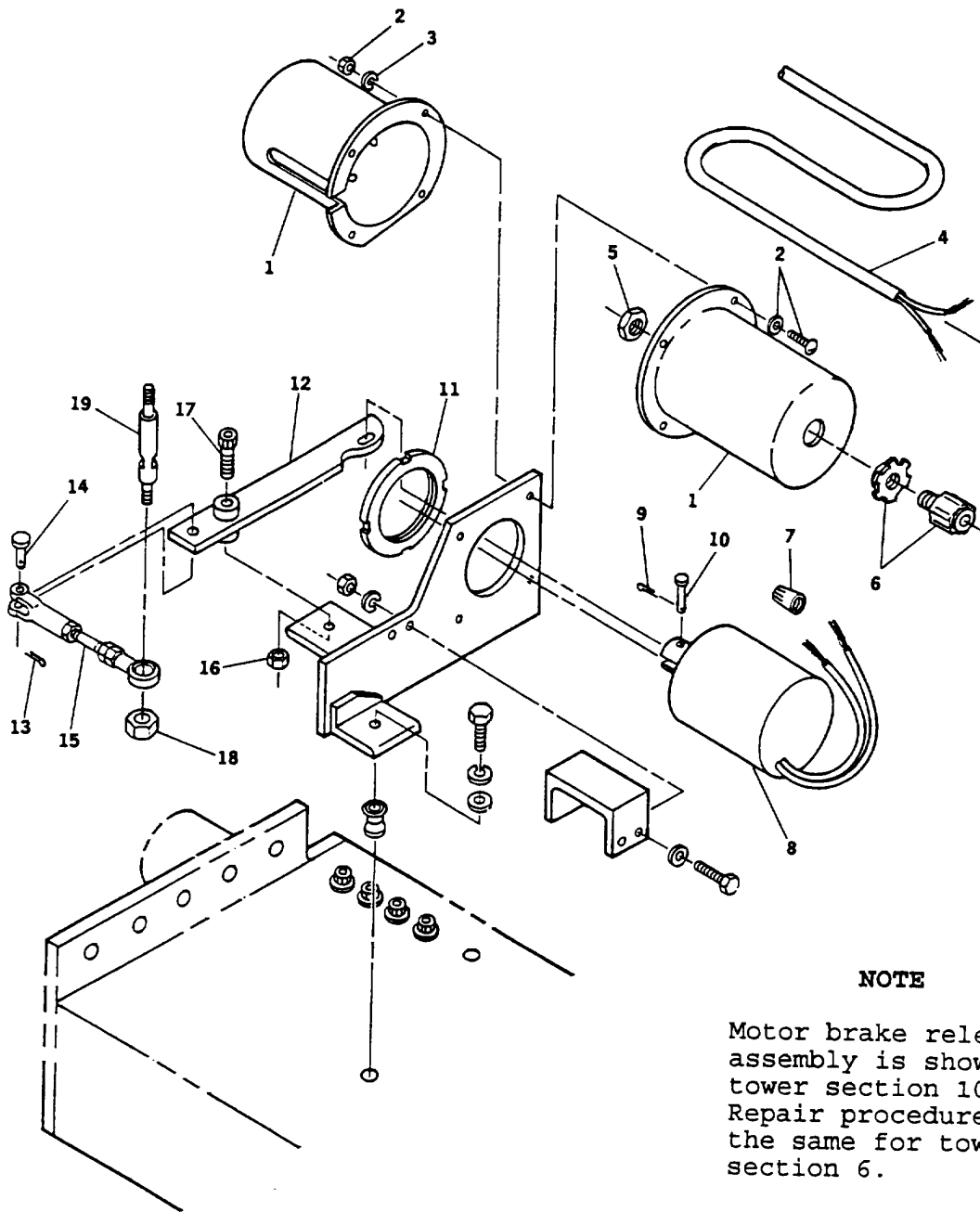
WARNING

Clear an adequate, safe work area around truss assembly. Use a secure work platform, when needed, to prevent maintenance personnel from falling.

4-37. REPAIR TRUSS ASSEMBLY - Continued

| Location | Item | Action |
|---|--------------------|---|
| REPAIR - Continued | | |
| 1. Truss assembly components (remove) | Cover (1) | Unfasten cover (1) by removing screws (2). |
| <p><u>WARNING</u> Ensure electric power is disconnected from gearmotor (9) and there is no tension on drum (4) before removing roller chain (3).</p> | | |
| 2. | Roller chain (3) | Remove roller chain by disconnecting at master link. Inspect roller chain for damage/wear. |
| 3. | Ratchet clutch (5) | Remove fasteners (6) and maneuver clutch (5) out of hole in truss brace (7). |
| 4. Truss assembly components (install) | Ratchet clutch (5) | Check to ensure correct ratchet direction and position clutch (5) in place. Secure with fasteners (6). |
| 5. | Roller chain (3) | Position roller chain (3) onto drum sprocket and gearmotor sprocket. Connect roller chain with master link. |
| 6. | Cover (1) | Position cover and secure with screws (2). |
| 7. Remove work platforms from around work area. | | |
| 8. Repairs for the following major truss components are provided in their referenced paragraphs. | | |
| <p>a. Motor brake release assembly (8) - paragraph 4-38. b. Height gage indicator (10) - paragraph 4-39.</p> | | |

4-38. REPAIR MOTOR BRAKE RELEASE ASSEMBLY



NOTE

Motor brake release assembly is shown for tower section 10. Repair procedures are the same for tower section 6.

4-38. REPAIR MOTOR BRAKE RELEASE ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPAIR

WARNING

Ensure electrical power is disconnected from the brake solenoid, and there is no tension on the cable drum before starting repairs. Clear an adequate, safe work area around truss assembly. Use a secure work platform, when needed, to prevent maintenance personnel from falling.

NOTE

Repairs are performed with tower horizontal in its nested position with truss cover (screen) removed for #10 section.

| | | |
|---|------------|---|
| 1. Motor brake release assembly (disassemble) | Covers (1) | Remove fasteners (2) and (3), securing covers (1) to mounting bracket. Disconnect wires (4) from solenoid (8) by removing wire nuts (7). Inspect stuffing tube (6) and nut (5). |
|---|------------|---|

NOTE

Tag or mark wires (4) when disconnecting from solenoid leads.

| | | |
|----|----------------|---|
| 2. | Solenoid (8) | Remove cotter pin (9), clevis pin (10), and solenoid lock nut (11) to remove solenoid (8). |
| 3. | Pivot arm (12) | Remove cotter pin (13), turnbuckle clevis pin (14), jam nut (16) and shoulder bolt (17) to remove pivot arm (12). |

4-38. REPAIR MOTOR BRAKE RELEASE ASSEMBLY - Continued

| Location | Item | Action |
|-----------------------------------|----------------------|---|
| REPAIR - Continued | | |
| 4. | Turnbuckle (15) | Remove lock nut (18) from brake lever rod (19) to remove turnbuckle (15). |
| 5. | Brake lever rod (19) | Unscrew brake lever rod (19) from gear motor. |
| 6. | Bracket, stop, etc. | Inspect mounting bracket, lever stop and hardware for damage or corrosion. repair or replace if required. |
| 7. Motor brake release (assemble) | Brake lever rod (19) | Screw brake lever rod (19) into gear motor. Tighten with wrench. |

NOTE

If replacing turnbuckle, note dimension between clevis and eyelet ends for setup on new turnbuckle.

| | | |
|----|-----------------|---|
| 8. | Turnbuckle (15) | Adjust "spread" dimension on new turnbuckle, if required. Attach to brake lever rod (19) with new lock nut (18). |
| 9. | Pivot arm (12) | Place pivot arm (12) in position and attach to bracket with shoulder bolt (17) and jam nut (16). Connect turnbuckle (15) to pivot arm with clevis pin (14) and new cotter pin (13). |

4-38. REPAIR MOTOR BRAKE RELEASE ASSEMBLY - Continued

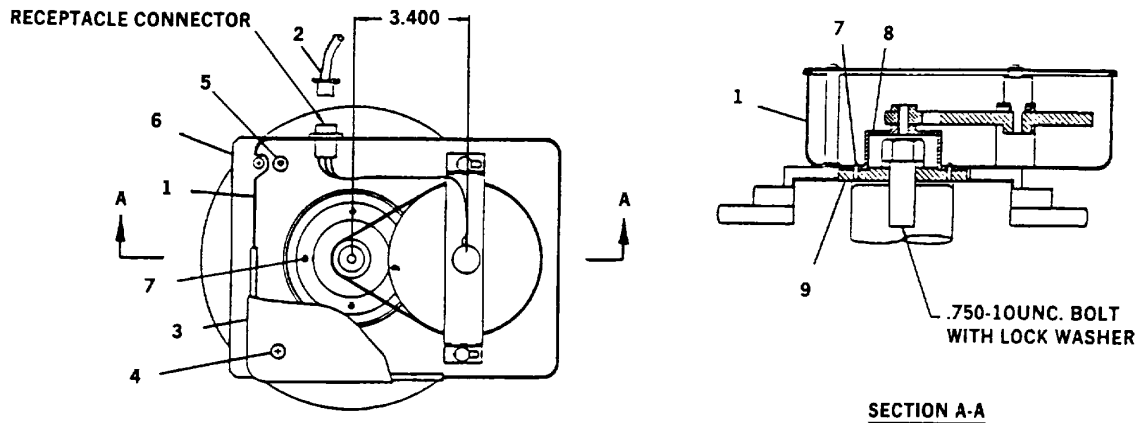
| Location | Item | Action |
|---------------------------|-----------------|---|
| REPAIR - Continued | | |
| 10. | Solenoid (8) | Position solenoid (8) through mounting bracket and align with pivot arm (12). Secure solenoid with solenoid lock nut (11). Attach pivot arm (12) to solenoid clevis with pin (10) and new cotter pin (9). |
| 11. | Wire connection | Connect electrical power wires (4) (leading from end of cover) to solenoid wires with wire nuts (7). |

CAUTION

Ensure wires are connected the same way between solenoid (8) and power wires (4), as they were disconnected.

- | | | |
|--|------------|--|
| 12. | Covers (1) | Position covers (1) over solenoid (8) and secure to bracket with fasteners (2) and new lock washers (3). |
| 13. Reconnect electrical power, raise tower and functionally check motor brake release assembly for proper operation. | | |
| 14. Adjust by removing rod end lock nut (18) and either shortening or lengthening connecting rod (15) as necessary. Allow motor brake lever to relax and position solenoid actuating arm/turnbuckle to furthestmost curbside position. Adjust turnbuckle to fit over motor brake lever and install locknut (18). | | |
| 15. Reinstall truss cover (screen) (for #10 section) and remove work platforms from around work area. | | |

4-39. REPAIR HEIGHT GAGE INDICATOR ASSEMBLY

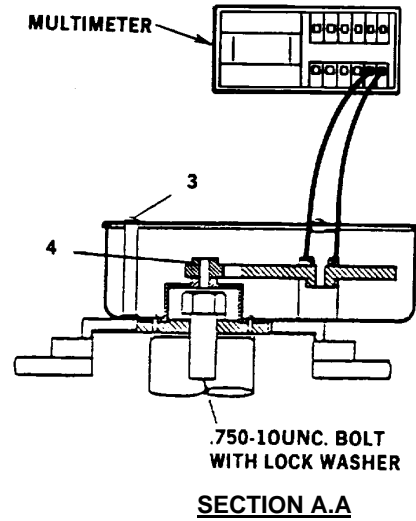
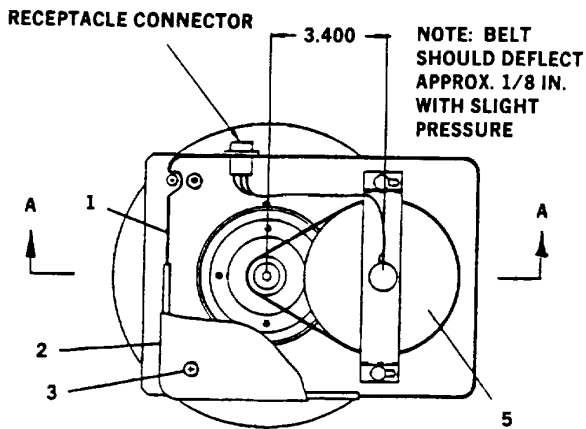


| Location | Item | Action |
|---|-----------------------------|--|
| REPAIR | | |
| NOTE | | |
| Repair of height gage indicator procedure is the same for first and second stage indicators, consisting of remove/ replace. | | |
| 1. Height gage indicator (Remove) | Housing and indicator (1) | Disconnect cable (2) from housing (1). Remove screws (4), securing cover (3) to housing (1). Remove standoff screws (5), securing housing (1) to mounting plate (6). |
| 2. | Drive sprocket assembly (8) | Remove screws (7), securing drive sprocket assembly (8) to mounting disc (9). |
| 3. Height gage indicator (Replace) | Drive sprocket assembly (8) | Position drive sprocket assembly mounting holes to disc (9) and secure with screws (7). |

4-39. REPAIR HEIGHT GAGE INDICATOR ASSEMBLY - Continued

| Location | Item | Action |
|--|---------------------------|--|
| REPAIR - Continued | | |
| 4. | Housing and indicator (1) | Position housing (1) over mounting holes and secure with standoff screws (5). Connect wire connector (2) to box (1). |
| <p>NOTE Before securing cover, adjust potentiometer in accordance with paragraph 4-40. Check belt deflection (approximately 1/8 inch) with slight pressure.</p> | | |
| 5. | Cover (3) | Secure cover (3) with screws (4). |

4-40. ADJUST HEIGHT GAGE INDICATOR ASSEMBLY



| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

ADJUSTMENT (First Stage Height Indicator)

NOTE

Adjustment is performed with tower nested in the horizontal position and system powered.

| | | |
|---------------------------|---|---|
| 1. Encoding potentiometer | Junction box cover (2) | Remove screws (3), securing cover to housing (1). |
| 2. | Potentiometer (measuring potentiometer wiper voltage) | Use digital multimeter to measure voltage at each white lead, using black lead as common. |

NOTE

Voltage at potentiometer wiper should be 0.750 ± 0.002 vdc.

| | | |
|----|--|--|
| 3. | Voltage adjustment (potentiometer wiper) | Loosen set screws (4) on drive sprocket wheel. Rotate driven sprocket wheel (5) while monitoring voltage at wiper. |
|----|--|--|

4-40. ADJUST HEIGHT GAGE INDICATOR ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

ADJUSTMENT - Continued (First Stage Height Indicator)

CAUTION

Keep sprocket wheels aligned when tightening set screw. Misalignment could cause damage to equipment or allow belt to come off. Ensure belt is not too tight or bearings will be damaged.

| | | |
|----|-------------------------------|---|
| 4. | Drive sprocket set screws (4) | When wiper voltage is correct, tighten drive sprocket wheel set screws. |
| 5. | Cover (2) | Place cover back on housing (1) and secure with screws (3). |

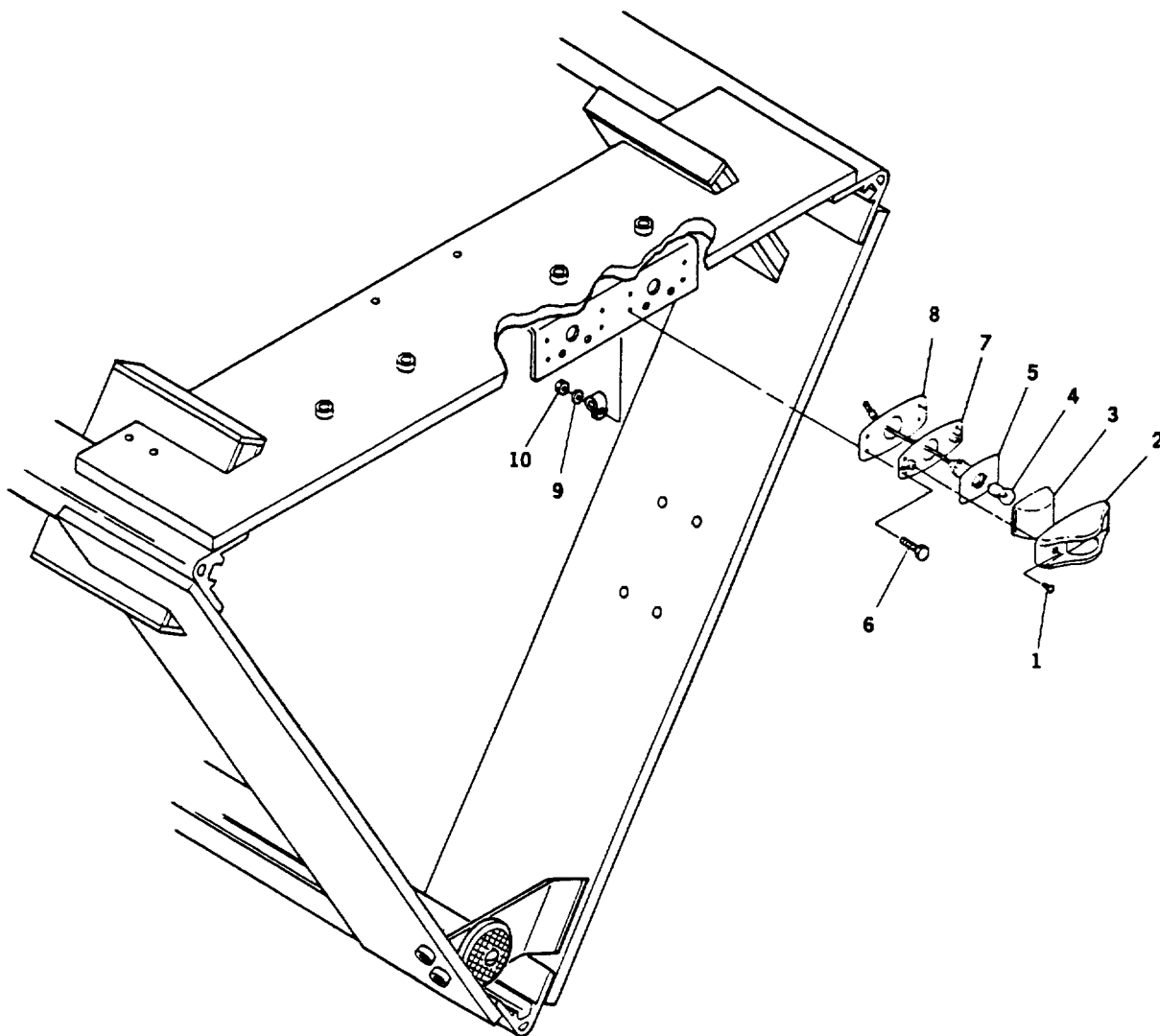
ADJUSTMENT (Second Stage Height Indicator)

NOTE

Adjustment is performed with tower nested in the horizontal position and system powered.

| | | |
|---|------------|---|
| 1. Encoding potentiometer | Cable reel | Manually pull cables off cable reel containing second stage height indicator, cable (W126) (trailer right side, inside reel). Connect small cable (W126) to control panel housing receptacle J11. |
| 2. Repeat steps 1 through 5 (first stage adjustment) for second stage height encoder. | | |
| 3. | Cable reel | Disconnect cable (W126) from J11 receptacle and rewind on cable reel. |

4-41. REPAIR BLACKOUT LIGHTS INSTALLATION



| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

DISASSEMBLY

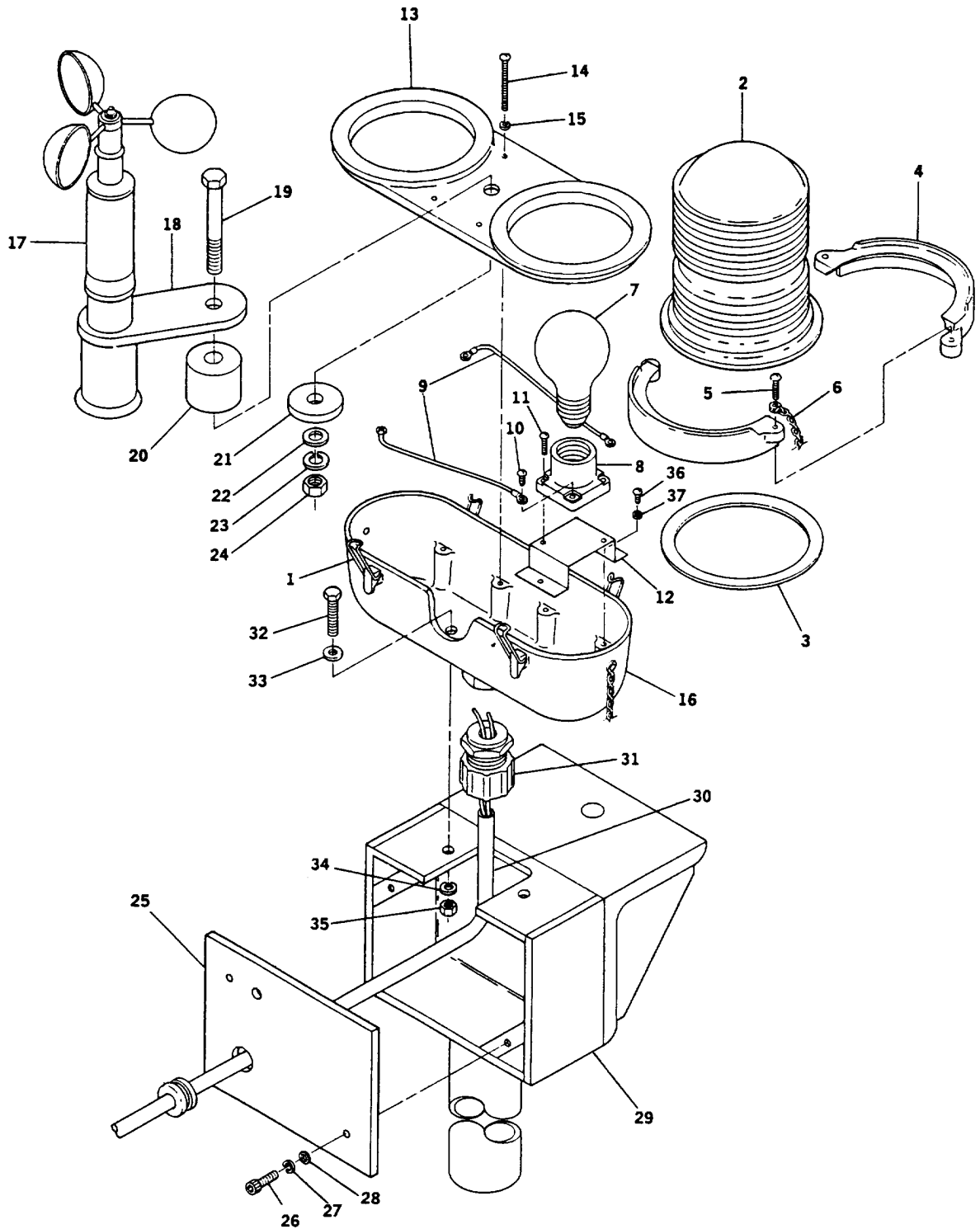
- | | | |
|---|-----------------|---|
| 1. Base of tower section No. 10 | Lens holder (2) | Remove two screws (1) securing lens holder. Remove lens holder, and lens (3). |
| 2. Lamp (4) Press down, turn lamp and remove from socket. | | |

4-41. REPAIR BLACKOUT LIGHTS INSTALLATION - Continued

| Location | Item | Action |
|---------------------------------|---|--|
| DISASSEMBLY - Continued | | |
| 3. Lamp socket (5) | Unplug lamp socket lead from harness and remove socket. | |
| 4. | Light base plate (7) | Remove four screws (6), lockwashers (9) and nuts (10) securing plate; remove base plate (7), gasket (8), and wiring clamp. |
| ASSEMBLY | | |
| 1. Base of tower section No. 10 | Light base plate (7) | Position base plate (7) and new gasket (8) on bracket and secure with four screws (6), new lockwashers (9) and nuts (10). |
| 2. | Lamp socket (5) | Position socket in base plate and connect lead to harness. |
| 3. | Lamp (4) | Position lamp in socket, press down and turn to lock in place. |
| 4. | Lens holder (2) | Position lens (3) and lens holder on base plate and secure with two screws (1). |

4-42. REPAIR OF OBSTRUCTION LIGHT

Repair consists of lens replacement, lamp replacement, lamp socket replacement, and complete light assembly replacement.



4-42. REPAIR OF OBSTRUCTION LIGHT - Continued

| Location | Item | Action |
|-----------------------------------|-------------------------|--|
| a. <u>Lens Replacement</u> | | |
| REMOVE | | |
| 1. Obstruction lights | Lens (2) | Unsnap two fasteners (1) securing collar (4) and remove lens assembly and gasket (3). |
| 2. | Gasket (3) | Inspect gasket for damage. If not damaged it may be reused. |
| 3. | Collar (4) | Remove two screws (5) securing collar halves and remove from lens (2). |
| REPLACE | | |
| 1. Obstruction light | Collar (4) | Position collar (4) halves on lens (2) and secure collar halves and chain (6) with two screws (5). |
| 2. | Lens (2) and gasket (3) | Position gasket (3) and lens (2) on light assembly and secure with two snap fasteners (1). |
| b. <u>Lamp Replacement</u> | | |
| REMOVE | | |
| 1. Obstruction light | Lens (2) | Remove lens in accordance with paragraph 4-42.a. |
| 2. | Lamp (7) | Unscrew from socket (8). |
| REPLACE | | |
| 1. | Lamp (7) | Screw lamp into socket (8). |
| 2. | Lens (2) | Clean lens as necessary and replace in accordance with paragraph 4-42.a. |

4-42. REPAIR OF OBSTRUCTION LIGHT - Continued

| Location | Item | Action |
|--|----------------------|---|
| c. <u>Lamp Socket Replacement</u> | | |
| REMOVE | | |
| 1. Obstruction light | Lens (2) | Remove lens in accordance with paragraph 4-42.a. |
| 2. | Lamp (7) | Unscrew lamp. |
| 3. | Socket (8) | Remove screws (10), tag and disconnect electrical leads (9) from socket. |
| 4. | | Remove two screws (11) and remove socket (8). |
| REPLACE | | |
| 1. Obstruction light | Socket (8) | Position socket (8) on mounting bracket (12) and secure with two screws (11). |
| 2. | | Connect electrical leads (9) to socket with screws (10). |
| 3. | Lamp (7) | Screw lamp into socket. |
| 4. | Lens (2) | Install lens in accordance with paragraph 4-42.a. |
| d. <u>Complete Light Assembly Replacement</u> | | |
| REMOVE | | |
| 1. Anemometer (17) | Electrical connector | Disconnect electrical connector from anemometer and remove anemometer from mounting bracket (18). |
| 2. Obstruction light | Lenses (2) | Remove both lenses assemblies in accordance with paragraph 4-42.a. |

4-42. REPAIR OF OBSTRUCTION LIGHT - Continued

| Location | Item | Action |
|--|----------------------------------|--|
| d. <u>Complete Light Assembly Replacement - Continued</u> | | |
| REMOVE - Continued | | |
| 3. | Lamps (7) | Unscrew both lamps. |
| 4. | Top cover (13) | Remove four screws (14) and washers (15); remove top cover. |
| 5. | Anemometer mounting bracket (18) | If necessary remove bolt (19), washer (21), washer (22), lockwashers (23) and nut (24); remove mounting bracket and spacer (20). |
| 6. | Light box cover plate (25) | Remove two screws (26), lockwashers (27) and washers (28); remove cover plate as far as cable slack will allow. |
| 7. | Power supply cable (30) leads | Remove two screws (10) and disconnect power supply leads from socket (8). |
| 8. | | Loosen stuffing tube (31), nut and pull cable (30) from stuffing tube. If necessary remove cable from grommet in cover plate (25). |
| 9. | Housing (16) | Remove two screws (32), washers (33), lockwashers (34) and nuts (35); remove housing (16). |
| 10. | Mounting brackets (12) | If necessary, remove two screws (36) and washers (37); remove each mounting bracket. |

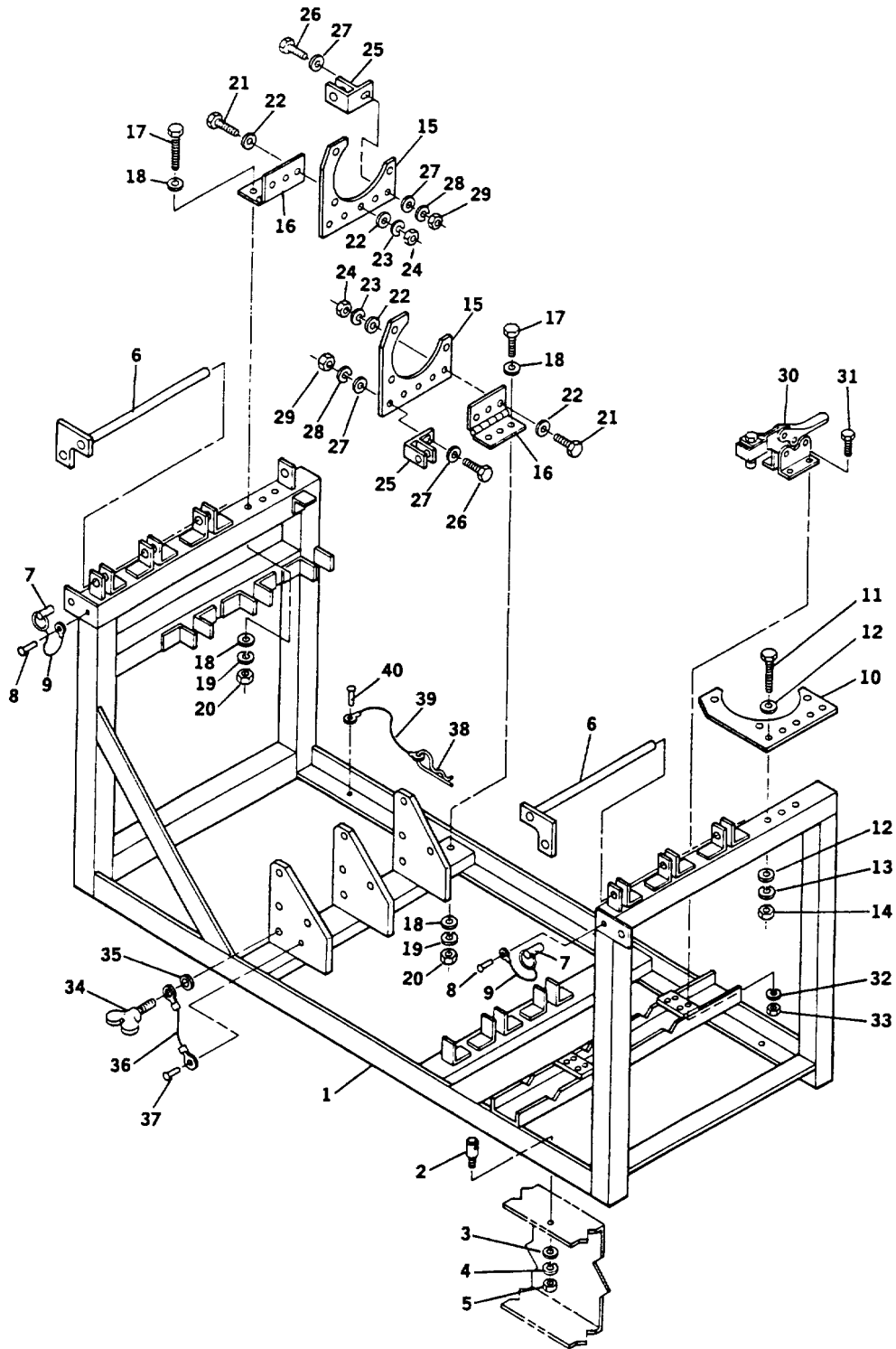
4-42. REPAIR OF OBSTRUCTION LIGHT - Continued

| Location | Item | Action |
|--|----------------------------------|---|
| d. <u>Complete Light Assembly Replacement - Continued</u> | | |
| REPLACE | | |
| 1. Obstruction light | Mounting brackets (12) | If removed, position each bracket in housing (16) and secure with two screws (36) and washers (37). |
| 2. | Housing (16) | Position housing on light box (29) and secure with two screws (32), washers (33), new lockwashers (34) and nuts (35). |
| 3. | Power supply cable (30) | If removed, pass cable through grommet in cover plate (25). |
| 4. | | Pass cable (30) through stuffing tube (31) and tighten nut. |
| 5. | | Connect cable (30) leads to appropriate socket (8) using two screws (10). |
| 6. | Light box cover plate (25) | Position cover plate on light box (29) and secure with two screws (26), new lockwashers (27) and washers (28). |
| 7. | Anemometer mounting bracket (18) | If removed, position bracket and spacer (20) on top cover (13) and secure with bolt (19), washer (21), washer (22), new lockwasher (23) and nut (24). |
| 8. | Top cover (13) | Position cover on housing (16) and secure with four screws and washers. |

4-42. REPAIR OF OBSTRUCTION LIGHT - Continued

| Location | Item | Action |
|--|-------------------------|--|
| d. <u>Complete Light Assembly Replacement - Continued</u> | | |
| REPLACE - Continued | | |
| 9. | Lamps (7) | Screw lamps into sockets. |
| 10. | Lenses (2) | Install both lenses in accordance with paragraph 4-42.a. |
| 11. Anemometer (17) | Electrical connector | Install anemometer in mounting bracket and connect electrical connector. |

4-43. REMOVE/REPAIR/REPLACE ANTENNA RACK ASSEMBLY



4-43. REMOVE/REPAIR/REPLACE ANTENNA RACK ASSEMBLY - Continued

| Location | Item | Action |
|-------------------------|-------------------------------------|--|
| REMOVE | | |
| 1. Left side of trailer | Rack assembly (1) | Remove antenna dishes. |
| 2. | | Remove four tie-down pins (2), washers (3), lock washers (4) and nuts (5). |
| DISASSEMBLY | | |
| 1. Rack assembly (1) | Two holding rods (6) | Remove quick release pins (7) and remove holding rods. |
| 2. | Four quick release pins (7) | Remove pop rivet (8) and remove cable assembly (9) from frame. Remove cable assembly from guide release pin (7). |
| 3. | Feedhorn mounting bracket (10) | Remove three bolts (11), washers (12), lock washers (13) and nuts (14). |
| 4. | Two feedhorn mounting brackets (15) | Remove bolts (17), washers (18), lock washers (19) and nuts (20). Remove brackets (15). |
| 5. | Two hinges (16) | Remove bolts (21), washers (22), lock washers (23) and nuts (24). Remove hinges (16) from feedhorn mounting brackets (15). |
| 6. | Two lock brackets (25) | Remove bolts (26), washer (27), lock washers (28) and nuts (29). Remove lock brackets (25). |

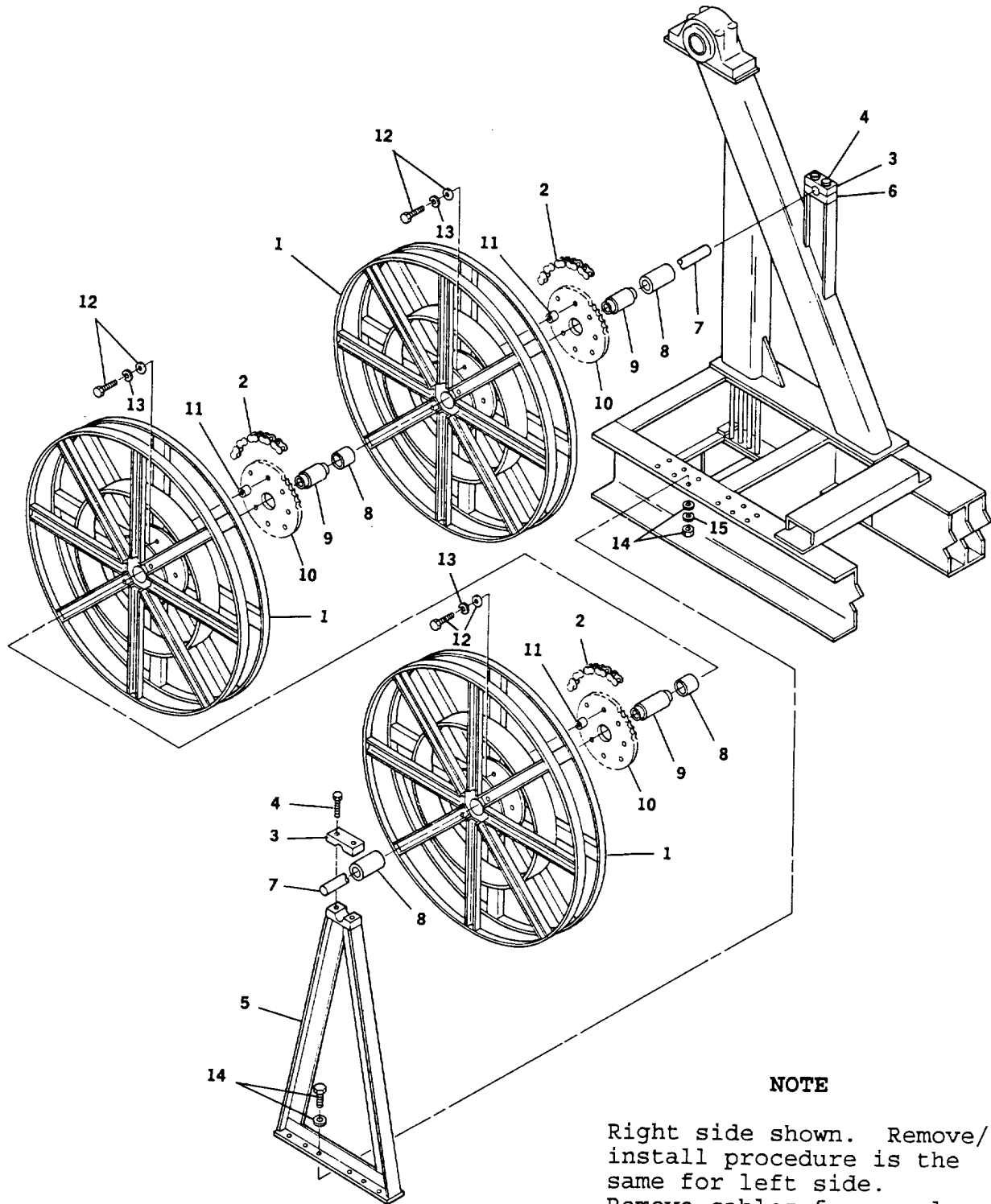
4-43. REMOVE/REPAIR/REPLACE ANTENNA RACK ASSEMBLY - Continued

| Location | Item | Action |
|--------------------------------|--------------------------|---|
| DISASSEMBLY - Continued | | |
| 7. | Three toggle clamps (30) | Remove bolts (31), lock washers (32) and nuts (33). Remove toggle clamps (30). |
| 8. | Nine thumb screws (34) | Unscrew thumb screws (34). Remove rings (35) and remove thumb screws (34) from cable assembly (34). Remove pop rivet (36). Remove cable assembly (37) and remove cable assembly (36). |
| 9. | Four clip pins (38) | Remove clip pins (38) from cable assembly (39). Remove pop rivet (40) and remove cable assembly (39). |
| ASSEMBLY | | |
| 1. Rack assembly (1) | Four clip pins (38) | Install clip pins (38) on cable assembly (39). Attach cable assembly to rack with new pop rivet (40). |
| 2. | Nine thumb screws (34) | Attach thumb screws (34) to cable assembly (36) with ring (35). Attach cable assembly to rack with new pop rivet (37). Screw thumb screw into bracket. |
| 3. | Three toggle clamps (30) | Position toggle clamps (30) and secure with bolts (31), new lock washers (32) and nuts (33). |
| 4. | Two lock brackets (25) | Position lock brackets (25) and secure with bolts (26), washers (27), lock washers (28) and nuts (29). |

4-43. REMOVE/REPAIR/REPLACE ANTENNA RACK ASSEMBLY - Continued

| Location | Item | Action |
|-----------------------------|-------------------------------------|--|
| ASSEMBLY - Continued | | |
| 5. | Two hinges (16) | Position hinges (16) on feedhorn mounting bracket (15) and secure with bolts (21), washers (22), new lock washers (23) and nuts (24). |
| 6. | Two feedhorn mounting brackets (15) | Position feedhorn mounting brackets (15) and secure other half of hinge (16) with bolts (17), washers (18), new lock washers (19) and nuts (20). |
| 7. | Four quick release pins (7) | Install quick release pins (7) on cable assembly (9). Attach cable assembly to rack using new pop rivet (8). |
| 8. | Two holding rods (6) | Install holding rods (6) and secure with quick release pins (7). |
| REPLACE | | |
| 1. Left side of trailer | Rack assembly (1) | Position rack assembly (1) and secure with four tie-down pins (2), washers (5), lock washers (4) and nuts (5). |
| 2. | | If required, install antenna dishes. |

4-44. REMOVE/REPLACE REEL ASSEMBLY



NOTE

Right side shown. Remove/
install procedure is the
same for left side.
Remove cables from reels
before starting procedure.

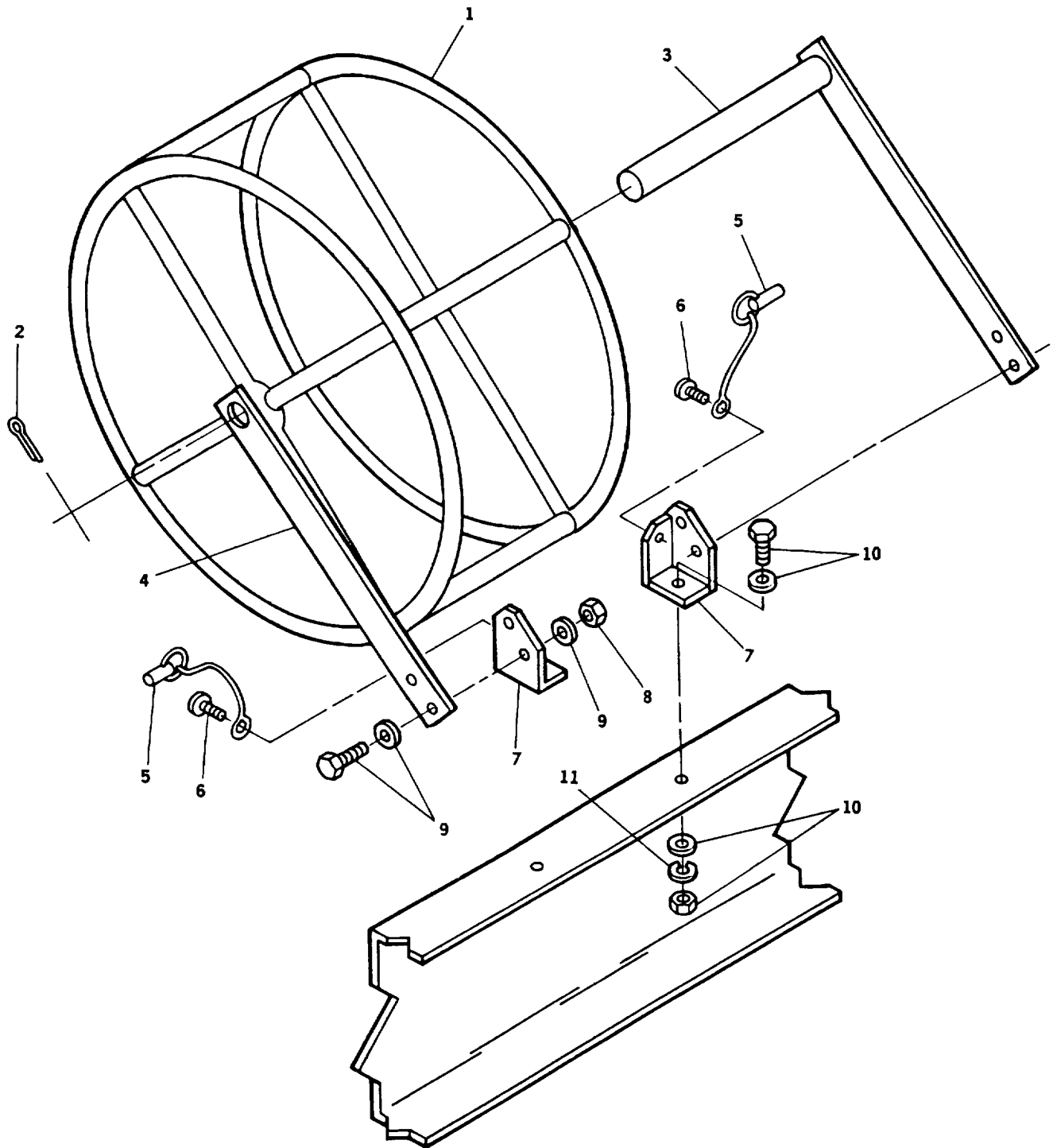
4-44. REMOVE/REPLACE REEL ASSEMBLY - Continued

| Location | Item | Action |
|------------------|----------------------------|--|
| REMOVE | | |
| 1. Reel assembly | Roller chains (2) | Remove roller chains (2) by disconnecting at master link. Inspect roller chains for wear. |
| 2. | Pillow blocks (3) | Remove screws (4) and pillow blocks (3) from both reel supports (5) and (6). Inspect pillow blocks (3) for wear. |
| 3. | Reel assembly | Lift off reel assembly and move to suitable work area. Be careful not to lose spacers (8) on ends of shaft (7). |
| 4. | Shaft (7) and spacers (8) | Slide spacers (8) and reels (1) from shaft (7). Inspect shaft (7) and spacers (8) for wear/damage. |
| 5. | Reel bearings (9) | Remove reel bearings (9) by gently tapping. Clean and inspect. If bearings are reusable, protect from dirt/corrosion. |
| 6. | Reel (1) and sprocket (10) | Inspect reels (1) and sprockets (10) for damage. If required, remove fasteners (12), (13) and sprocket spacers (11) to remove sprocket (10). |
| 7. | Reel support (5) | Inspect reel support (5) for damage. If required, remove fasteners (14) and (15) to disassemble reel support (5) from trailer. |

4-44. REMOVE/REPLACE REEL ASSEMBLY - Continued

| Location | Item | Action |
|--|--|---|
| REMOVE - Continued | | |
| 8. | Disassembled items | Check for corrosion. Clean and inspect. Replace damaged/defective items. |
| REPLACE | | |
| 1. Reel assembly | Reel support (5) by aligning with | Install reel support (5) mounting holes in trailer and secure with fasteners (14) and new lock washers (15). |
| 2. | Reel (1) and sprocket (10) | Assemble sprocket (10) to reel (1) by placing sprocket spacers (11) in position and securing with fasteners (12) and new lock washers (13). |
| 3. | Reel bearings (9) into reel (1). | Install bearings (9) |
| NOTE | | |
| Bearings are held in place by staking to a depth of 0.03 inches (19.05 mm) at eight equal spaces around outside perimeter of bearing. | | |
| 4. | Reel assembly, spacers (8) and shaft (7) | Assemble spacers (8), and reels onto shaft (7). |
| 5. | Pillow blocks (3) | Carefully lift reel assembly into place, on reel supports (5) and (6). Secure pillow blocks (3) with screws (4). |
| 6. | Roller chains (2) | Place roller chains (2) onto reel sprockets (10) and drive sprockets (below). Connect ends of roller chains (2) with master links. |

4-45. REMOVE/REPLACE RC-435 REEL ASSEMBLY



4-45. REMOVE/REPLACE RC-435 REEL ASSEMBLY - Continued

| Location | Item | Action |
|-------------------------|-----------------------------------|--|
| REMOVE | | |
| 1. RC-435 reel assembly | Reel (1) | Remove reel (1) by pulling quick release pins (5) from storage arms (4 and 3). Remove cotter pin (2) from pivot arm (3). Maneuver storage arm (4) off and away from pivot arm (3), swing reel (1) out and slide reel (1) from pivot arm (3). |
| 2. | Storage arm (4) and pivot arm (3) | Remove pivot arm (3) and storage arm (4) by removing lock nuts (8) and fasteners (9). |
| 3. | Brackets (7) | Inspect brackets (7), and quick release pins/cables (5). Remove quick release pin/cable (5) by removing self tapping screw (6). Remove bracket (7) by removing fasteners (10) and (11), securing brackets to trailer. |
| REPLACE | | |
| 1. RC-435 reel assembly | Brackets (7) | Install brackets (7) by securing to trailer with fasteners (10) and new lock washers (11). Attach quick release pin/cable (5) to bracket (7) with self tapping screw (6). |
| 2. | Storage arm (4) and pivot arm (3) | Assemble storage arm (4) and pivot arm (3) to brackets (7) with fasteners (9) and new lock nuts (8). |

4-45. REMOVE/REPLACE RC-435 REEL ASSEMBLY - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPLACE - Continued

2. Continued

NOTE

Tighten lock nuts (8) just enough so that storage arm (4) and pivot arm (3) can still rotate.

| | | |
|----|----------|--|
| 3. | Reel (1) | Install reel (1) onto pivot arm (3) and swing into place. Lock pivot arm (3) in position with quick disconnect pin (5). Position storage arm (4) onto pivot arm (3). Secure bottom of storage arm (4) with quick release pin (5) and top of arm (4) with new cotter pin (2). |
|----|----------|--|

4-46. REPAIR ELECTRICAL ASSEMBLY

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPAIR

WARNING

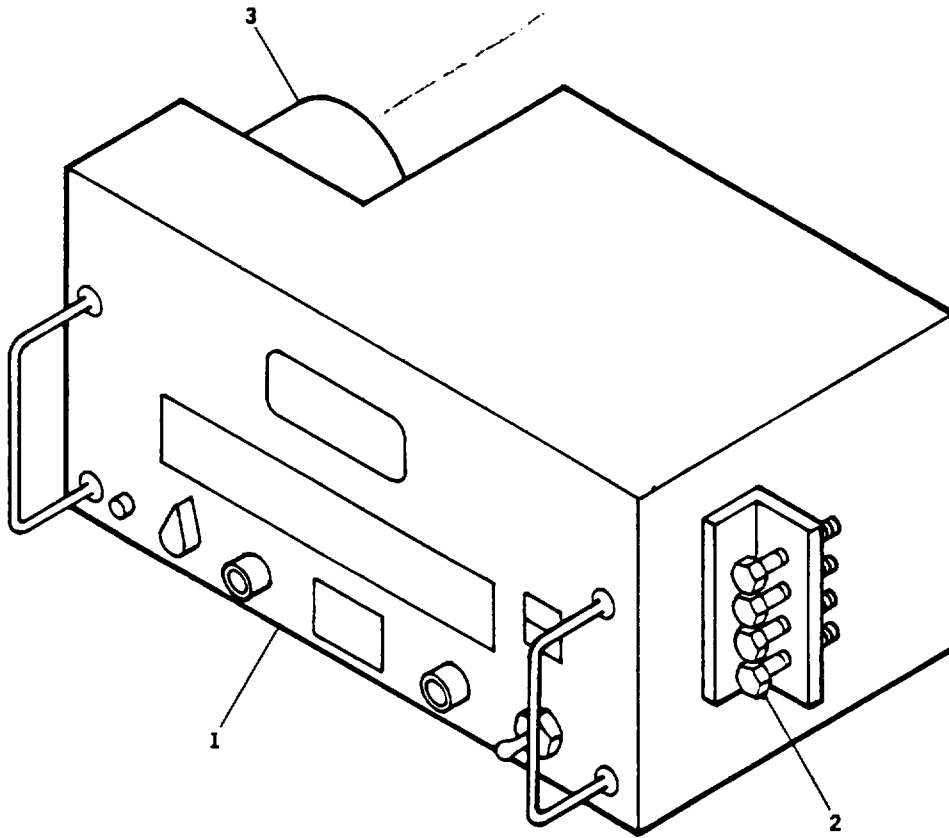
Before starting repairs to the electrical installation ensure power is disconnected to avoid injury or death from electrical shock.

NOTE

Repairs to the electrical assembly are limited to replacement of components. Refer to TM 11-5985-387-24P.

4-147

4-47. REMOVE/REPAIR/REPLACE ANTENNA POSITIONER CONTROL UNIT



WARNING

Before starting repairs, ensure power is disconnected to avoid injury or death from electrical shock.

NOTE

Repairs to the electrical assembly are limited to replacement of components. Refer to TM 11-5985-387-24P.

4-47. REMOVE/REPAIR/REPLACE ANTENNA POSITIONER CONTROL UNIT
- Continued

| Location | Item | Action |
|---|--------------------|---|
| REMOVE | | |
| 1. Control unit (1) | Captive screws (2) | Loosen eight captive screws (2). |
| 2. Connector (3) | | Disconnect connector (3) and pull control unit (1) from control box. |
| REPAIR | | |
| 1. Repair is limited to the replacement of fuses, damaged or missing switch knobs or captive mounting screws. | | |
| REPLACE | | |
| 1. Control unit (1) | Connector (3) | Position control unit (1) in control box and attach connector (3) to mating half. |
| 2. | Captive screws (2) | Tighten eight captive screws (2) after aligning with brackets in control box. |

4-48. REMOVE/REPLACE/REPAIR POWER DISTRIBUTION BOX

Equipment Conditions: Generators shutdown.

NOTE

Numbers in parenthesis refer to the illustration in paragraph 2-2.c.

| Location | Item | Action |
|---------------------------|---|--|
| REMOVE | | |
| 1. Power distribution box | Terminal post cover | Loosen two captive screws, and open cover. |
| 2. | Terminal posts LO, L1, L2, and L3 (1, 2, 3, and 11) | Tag and disconnect electrical leads. |
| 3. Generators | Electrical cable leads | Tag and disconnect cable leads from generators and slide cables out of cable clamps. |
| 4. Power distribution box | Mounting bracket | Remove four bolts, washers, lockwashers and nuts; remove box and mounting bracket. |
| REPLACE | | |
| 1. Power distribution box | Mounting bracket | Position box with mounting bracket on trailer frame and secure with four bolts, washers, new lockwashers and nuts. |
| 2. Generators | Electrical cable leads | Route electrical cables through cable clamps on trailer frame and connect cable leads to generators. |
| 3. Power distribution box | Terminal posts LO, L1, L2, and L3 (1, 2, 3, and 11) | Connect electrical leads to terminals as tagged during removal. |

4-48. REMOVE/REPLACE/REPAIR POWER DISTRIBUTION BOX - Continued

| Location | Item | Action |
|----------|------|--------|
|----------|------|--------|

REPLACE - Continued

| | |
|--------------------------------|---|
| 4. Terminal post cover screws. | Close cover and secure with two captive |
|--------------------------------|---|

INSPECTION/TEST

| | | |
|--|-----------|---|
| 1. Power distribution box 2. Switch | Terminals | Check all wiring terminals for tight connection. Using multimeter, check for continuity with switch set to GEN 1. Repeat with switch set to GEN 2. |
|--|-----------|---|

| <u>From</u> | <u>To</u> |
|-------------|-----------|
| L1 | J1-A |
| L2 | J1-B |
| L3 | J1-C |
| L0 | J1-N |

REPAIR

| | | |
|---------------------------------------|--|---|
| 1. Power distribution box 2. 3. | Rotary switch (5) knob Indicator lights (4 and 6) | Remove screw and knob from rotary switch (5). Install knob on rotary switch (5) and secure with screw. Remove lens and bulb. Inspect for damage and install bulb and lens. |
|---------------------------------------|--|---|

Section VI. PREPARATION FOR STORAGE OR SHIPMENT

| <u>Subject</u> | <u>Page</u> |
|---|-------------|
| AB-1309 Shutdown | 4-152 |
| AB-1309 Trailer Hitching | 4-152 |
| Preparing AB-1309 for Shipment or Storage | 4-153 |

4-49. AB-1309 SHUTDOWN

Refer to Chapter 2, Section III, for shutdown procedures including retracting/tilting tower, removing guy cables, anchors, and accessories.

4-50. AB-1309 TRAILER HITCHING

Refer to Chapter 2, Section III, paragraph 2-13, when hitching trailer to be towed.

4-51. PREPARING AB-1309 FOR SHIPMENT OR STORAGE**CAUTION**

When shipping by rail or flatbed, do not use AB-1309 front stabilizing jack to support weight. Use blocks/ tie-downs instead. Also, if transporting during severe weather, the AB-1309 must be properly protected to prevent damage to its various parts.

NOTE

The upper positioner arm must be folded down for air, rail and truck flatbed transport.

a. Folding Upper Positioner Arm**WARNING**

Due to the weight of the arm with positioner, two persons are required to fold the arm down. Failure to comply could result in serious injury or death to personnel.

- (1) On roadside of arm, remove the clip pin and storage pin.
- (2) On front side and curbside of arm, remove clip pins from hinge pins.
- (3) While supporting arm, remove the hinge pins and fold the arm down.
- (4) Install storage pin and secure with clip pin.
- (5) Install hinge pins in their locations and secure with clip pins.

b. Air Shipment

- (1) Ensure gear box plugs are securely tightened.
- (2) Verify all tools, materials, and spares are in place and secured.
- (3) Remove all diesel fuel from generator sets and prepare for shipment in accordance with applicable technical manual (Appendix A).

4-51. PREPARING AB-1309 FOR SHIPMENT OR STORAGE - Continued**b. Air Shipment - Continued**

- (4) Drain hydraulic fluid from hydraulic reservoir.
- (5) Close and latch trailer-mounted storage boxes.

c. Truck Flatbed Shipment**(1) Requirements****(a) Flatbed - Wood Deck**

Length - 40 feet (12.2 m) (minimum)

Width - 8 feet (2.4 m)

Height - 55 inches (139.7 cm)
(maximum - at center point)

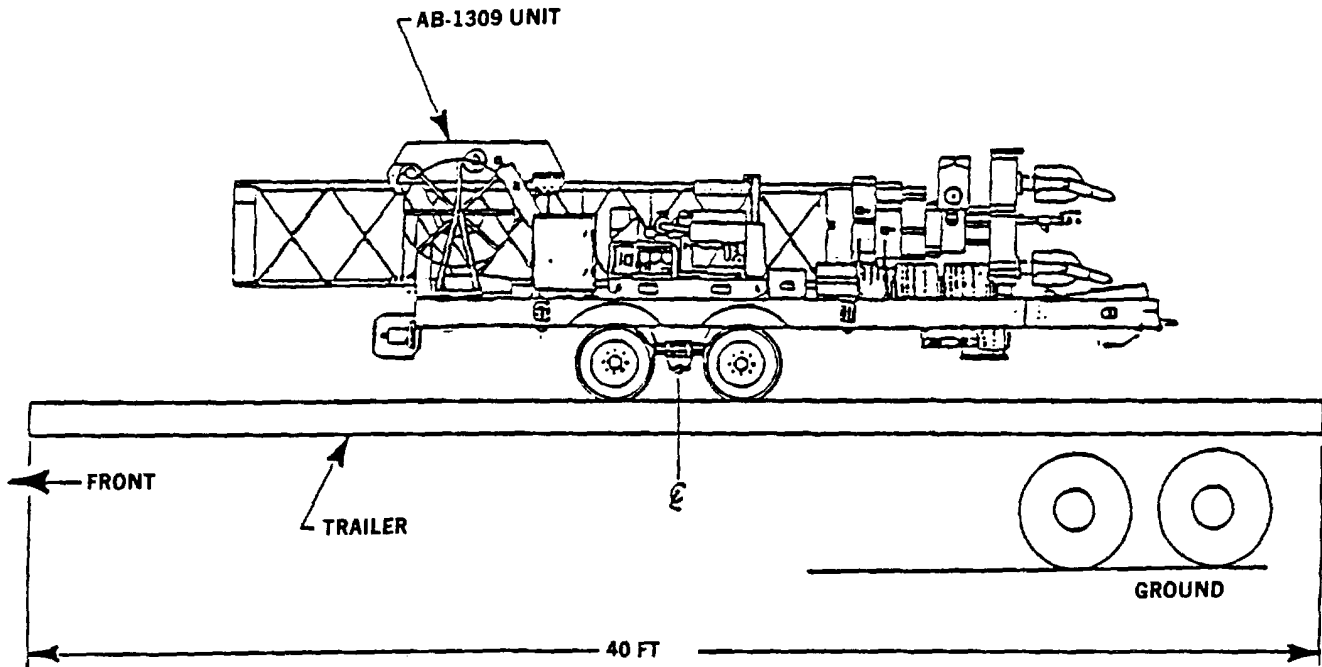
Capacity - 60,000 to 63,000 lbs
(27,216 to 28,576.8 kg)

- (b) Chains (System Seven Transport) to tie down AB-1309 (six needed)
 - Size - 3/8 inch trade size, 25 feet (7.62 m) long
 - Working load limit - 6600 lbs (2993.8 kg)
(approx.)

4-51. PREPARING AB-1309 FOR SHIPMENT OR STORAGE - Continued

b. Truck Flatbed Shipment - Continued

- (2) Using tow vehicle, back AB-1309 onto trailer and center. Apply AB-1309 hand brakes. (See Figure below.)



AB-1309 Mast System Loading

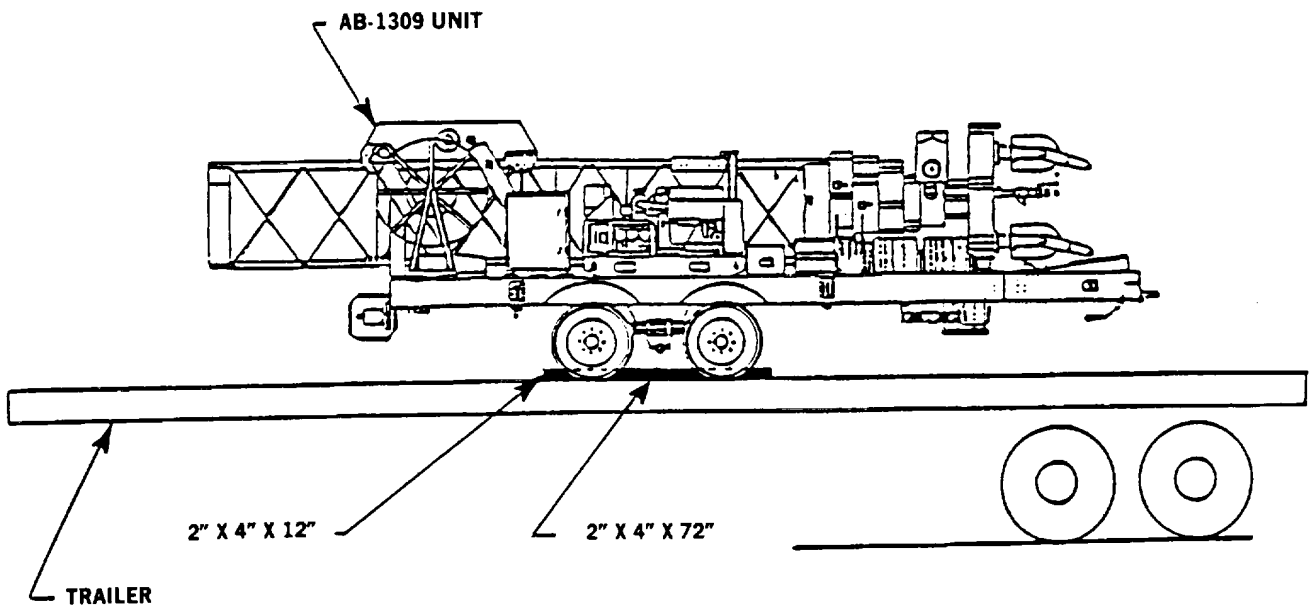
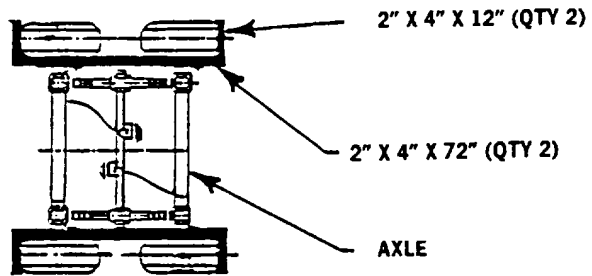
4-51. PREPARING AB-1309 FOR SHIPMENT OR STORAGE - Continued

b. Truck Flatbed Shipment - Continued

(3) Block AB-1309 trailer wheels as shown below.

NOTE

USE 16D NAILS TO CONNECT
2 X 4'S TO TRAILER BED



AB-1309 Mast System, Trailer Wheel Blocking

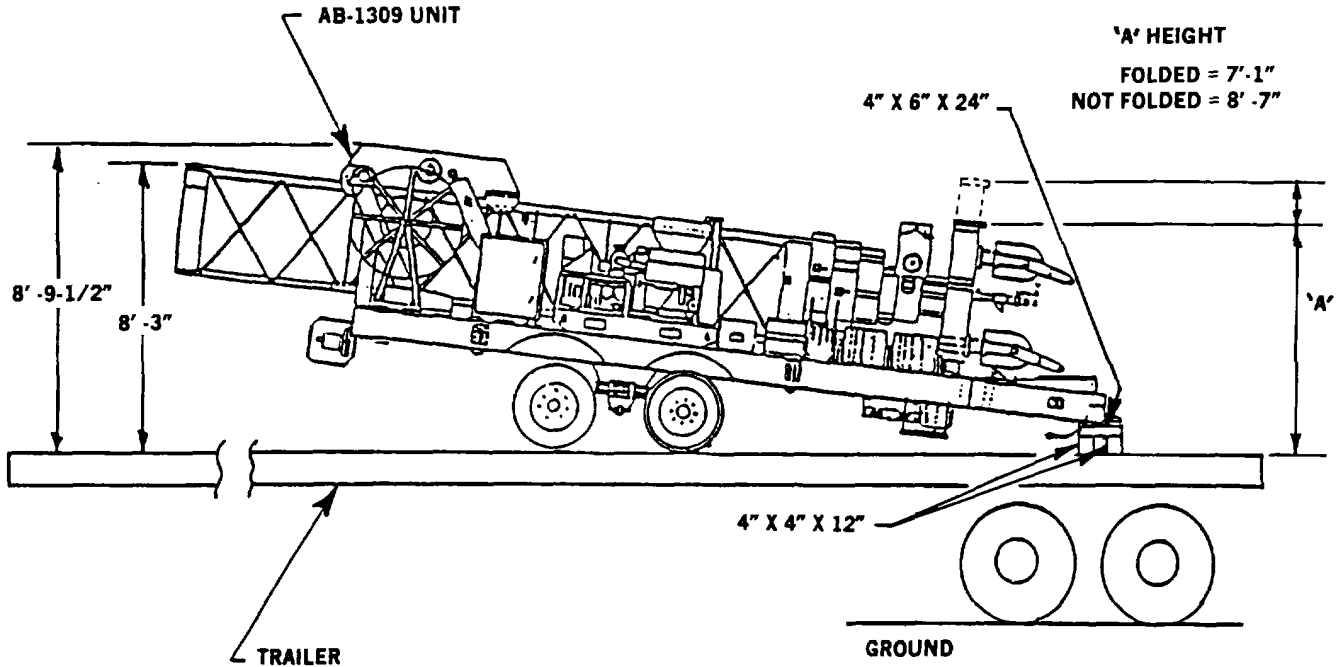
4-51. PREPARING AB-1309 FOR SHIPMENT OR STORAGE - Continued

b. Truck Flatbed Shipment - Continued

(4) Block the AB-1309 trailer lunette eye mount plate to the flatbed trailer as shown below.

CAUTION

Do not lower jacks for shipment or damage to trailer will occur. Trailer jacks were not designed to support weight during shipment.

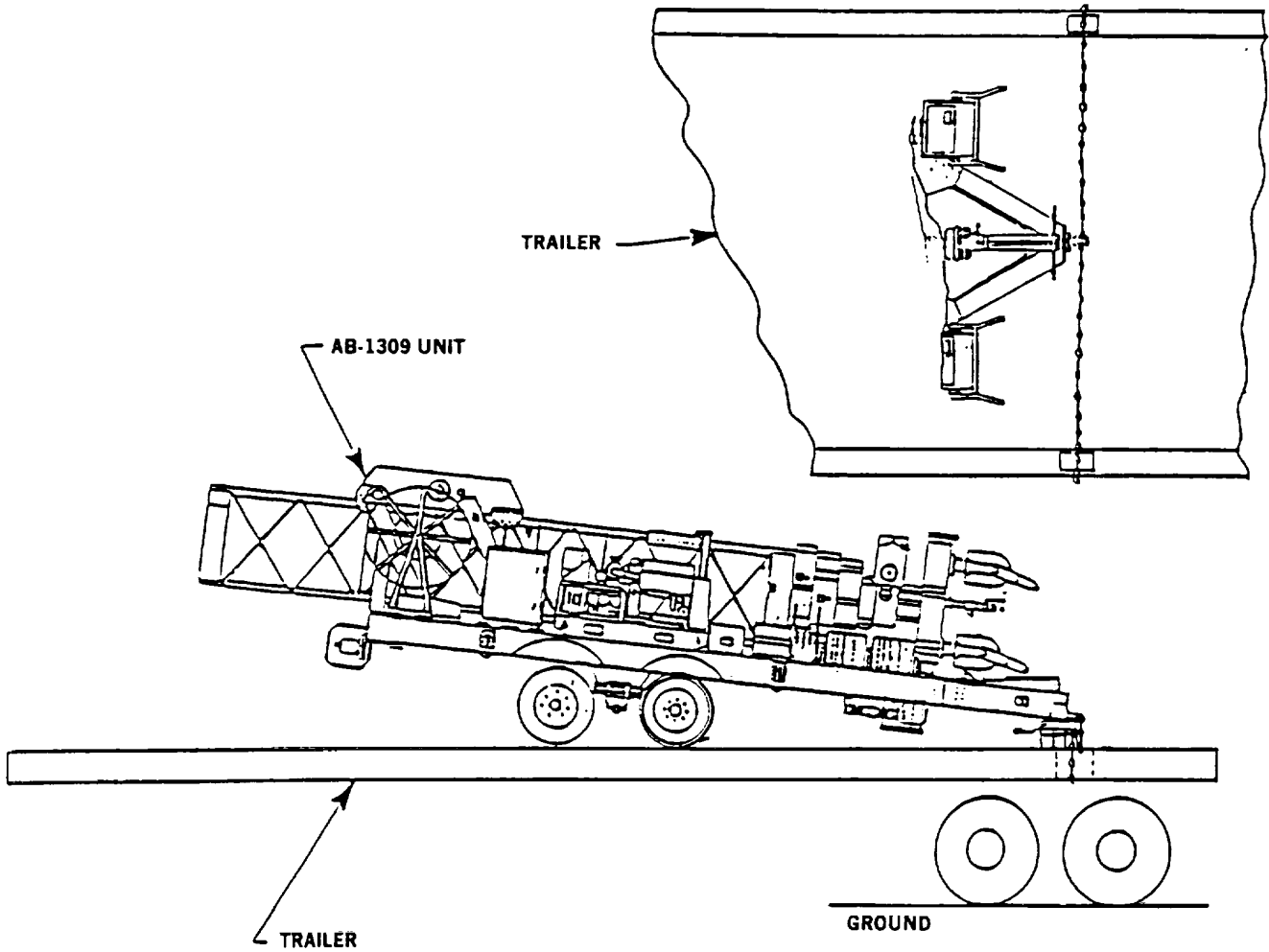


AB-1309 Mast System, Lunette Eye Plate Blocking

4-51. PREPARING AB-1309 FOR SHIPMENT OR STORAGE - Continued

b. Truck Flatbed Shipment - Continued

(5) Chain the AB-1309 trailer lunette eye mount plate to the flatbed trailer as shown below.

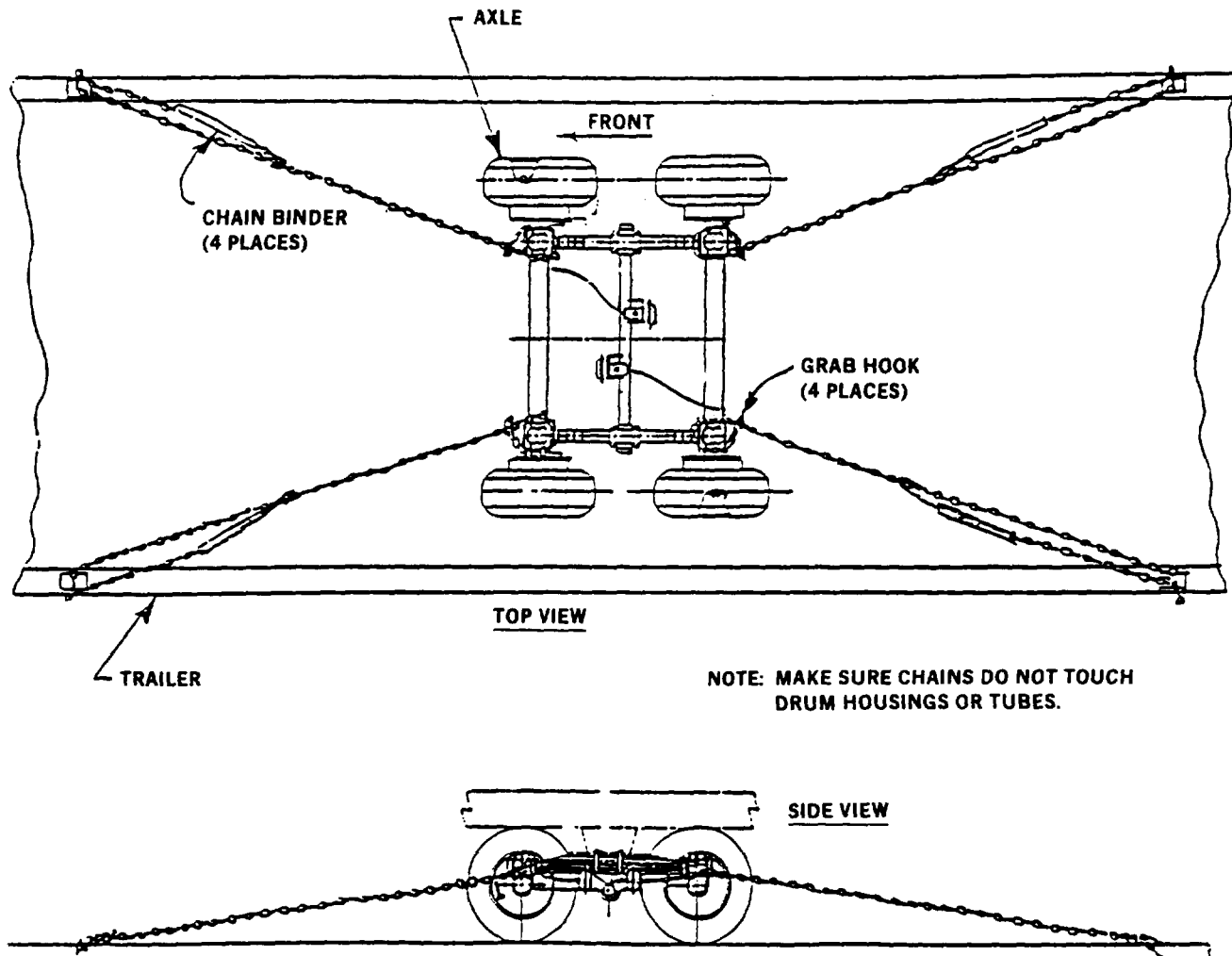


AB-1309 Mast System, Lunette Eye Plate Tie-Down

4-51. PREPARING AB-1309(V) FOR SHIPMENT OR STORAGE - Continued

b. Truck Flatbed Shipment - Continued

(6) Tie down the AB-1309 trailer suspension as shown below.



AB-1309 Mast System, Suspension Tie-Down

4-51. PREPARING AB-1309 FOR SHIPMENT OR STORAGE - Continued**b. Truck Flatbed Shipment - Continued**

- (7) Verify AB-1309 positioner (rotator) number 1 is in the up position.
- (8) Using the AB-1309 hydraulic hand pump, pump the tower to the full down position (until it can no longer be hand pumped).
- (9) Inspect AB-1309 to ensure each procedural step has been accomplished properly before shipment.

c. Storage

Storage procedures are determined by the length of time AB1309 unit is to be stored. Inspect stored unit(s) on a periodic basis in order to comply with mission readiness requirements. If AB-1309 is stored in corrosive, dusty, or humid/wet conditions, inspections and preventive maintenance schedules must be accelerated as needed.

- (1) All panel doors and lids must be closed.
- (2) All protective covers must be secure and in good shape (cylinders, reels, etc.).
- (3) Protect the stored generator sets on the AB-1309 in accordance with applicable technical manual (Appendix A).
- (4) AB-1309 trailer wheels should be off ground to prevent dry rot. (Trailer jacks may be used as long as they are resting on ground protection blocks themselves.)
- (5) Protect AB-1309 tires from ultra-violet light.

APPENDIX A REFERENCES

A-1. SCOPE

The following is a list of all Army regulations, pamphlets, forms, service bulletins, technical bulletins, and technical manuals.

A-2. PAMPHLETS

DA PAM 25-30 Consolidated Index of Army Publications and Blank Forms

DA PAM 738-750 Maintenance Management Update

A-3. FORMS

DA FORM 2404 Equipment Inspection and Maintenance Worksheet

DA FORM 2028 Recommended Changes to Publications and Blank Forms

DA FORM 2028-2 Recommended Changes to Equipment Technical Manuals

SF-361 Discrepancy in Shipment Report (DISREP)

SF-364 Report of Discrepancy (ROD)

SF-368 Quality Deficiency Report

A-4. SERVICE BULLETINS

SB 11-6 FSC Class 6135; Dry Battery Supply Data

SB 11-30 FSC Class 6135; Dry Battery Management Data

SB 11-573 Painting and Preservation Supplies Available for Field Use for Electronics Command Equipment

SB 708-41/42 Federal Supply Code for Manufacturers; United States and Canada - Name to Code and Code to Name (GSA-FSS H4-1/H4-2)

A-5. TECHNICAL BULLETINS

TB 43-0118 Field Instructions for Painting and Preserving Electronics Command Including Camouflage Pattern Painting

TB 43-0125 Installation of Communications - Electronic Equipment: Hookup of Electrical Cables to Mobile Generator Sets on Fielded Equipment to Meet Electrical Safety Standards.

TB 385-4 Safety Precautions for Maintenance of Electrical/Electronic Equipment

A-6. TECHNICAL MANUALS (TM)

| | | | |
|-------------------|---|---------|------------------|
| 11-5820-864-12-1 | Operator's and Unit Maintenance Manual for Radio Repeater Set AN/TRC-174 (NSN 5820-01-161-9420) | | |
| 11-5820-864-12-2 | | | |
| 5-6115-585-12 | Operator's and Organizational Maintenance Manual Generator Set, Diesel Engine Driven, Tactical Skid Mounted 10kW, 1 Phase-2 wire, 1 Phase-2 wire, 1 Phase-3 wire, 3 Phase-4 wire 120, 120/240 and 208 volts | | |
| | DoD Model | Class | Hertz |
| | MEP-003A | Utility | 60 |
| | MEP-112A | Utility | 400 |
| | | | NSN |
| | | | 6115-00-465-1030 |
| | | | 6115-00-465-1027 |
| 9-2610-200-24 | Organizational Care, Maintenance and Repair of Pneumatic Tires, Inner Tubes and Radial Tires | | |
| 11-5985-387-10-HR | Hand Receipt, Covering Contents of Components of End Item (COEI), Basic Issue Items (BII), and Additional Authorization List (AAL) for Quick Erect Expandable Mast, AB-1309(V) 4/TRC (NSN 5985-01-156-0572) | | |
| 11-5985-387-24P | Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for AB-1309(V)4/TRC Quick Erect Expandable Mast (NSN 5985-01-156-0572) | | |
| 11-6625-3052-14 | Operator's, Organizational, Direct Support and General Support Maintenance Manual, Multimeter, Digital AN/PSM-45 (NSN 6625-01-139-2512) | | |
| 43-0139 | Painting Instructions for Field Use | | |
| 740-90-1 | Administrative Storage of Equipment | | |
| 750-244-2 | Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronics Command) | | |
| TM 9-238 | Deep Water Fording of Ordinance Materiel | | |
| TM 9-2610-200-24 | Organizational Care, Maintenance and Repair of Pneumatic Tires, Inner Tubes and Radial Tires | | |

A-7. MISCELLANEOUS PUBLICATIONS

| | |
|-------------------|--|
| CTA 50-970 | Expendable Items (Except: Medical, Class V, Repair Parts and Heraldic Items) |
| SC 5180-01-CL-R07 | Tool Kit, Electronic Equipment TK-105/G (NSN 5180-00-610-8177) |
| SC 5180-01-CL-R13 | Tool Kit, Electronic Equipment TK-101/G (NSN 5180-00-064-5178) |

APPENDIX B
MAINTENANCE ALLOCATION CHART
Section I. INTRODUCTION

B-1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance levels for the Quick Erect Expandable Mast AB-1309.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the Quick Erect, Expandable Mast AB-1309 and its components. The application of the maintenance functions to the tower or components will be consistent with the capacities and capabilities of the designated maintenance levels.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for particular maintenance functions.

B-2. MAINTENANCE FUNCTIONS

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.t., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (include decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.

B-2. MAINTENANCE FUNCTIONS - Continued

f. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or Test, Measurement, and Diagnostic Equipment (TMDE) used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

g. Install. to install the item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair parts, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.

h. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the 3rd position of the SMR code.

i. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

j. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operation condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.

k. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II

a. Column 1, Group Number. Column 1 lists functional group code numbers, the purpose of which are to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly.

b. Column 2, Component/Assembly. Column 2 contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II - Continued

c. Column 3. Maintenance Functions. Column 3 lists the function to be performed on the items listed in column 2. (For detailed explanation of these functions, see paragraph titled "Maintenance Functions").

d. Column 4, Maintenance Levels. Column 4 specifies, by the listing of a work time figure in the appropriate subcolumn(s), the level of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance levels, appropriate work time figures will be shown for each category.

The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the Maintenance Allocation Chart. The symbol designations for the various maintenance levels are as follows:

| | |
|---------|---------------------------------------|
| C | Operator or Crew (Unit level) |
| O | Organization Maintenance (Unit level) |
| F | Direct Support Maintenance |
| H | General Support Maintenance |
| D | Depot Maintenance |

e. Column 5. Tools and Equipment. Column 5 specifies, by code, those common tools and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6. Remarks. This column shall, when applicable, contain a letter code, in alphabetical order, which shall be keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III.

a. Column 1. Reference Code. The tool and test equipment reference code correlates with a code used in the MAC, Section II, Column 5.

b. Column 2. Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III - Continued

- c. Column 3, Nomenclature. Name or identification of the tool or test equipment.
- d. Column 4, National Stock Number. The National Stock Number of the tool or test equipment.
- e. Column 5, Tool Number. the manufacturer's part number of the tool or test equipment.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV

- a. Column 1. Reference Code. The code recorded in column 6, Section II.
- b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

SECTION II. MAINTENANCE ALLOCATION CHART FOR QUICK ERECT EXPANDABLE MAST AB-1309

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQUIPMENT | (6) REMARKS |
|---------------------|-------------------------------------|---------------------------------------|-----------------------------|--------------------------|-------------------|---|---|----------------------------|----------------|
| | | | C | O | F | H | D | | |
| 00 | QUICK ERECT EXPANDABLE MAST AB-1309 | INSPECT OVERHAUL | 0.5 | | | | | 16.0 | A,B |
| 01 | TRAILER ASSY | INSPECT REPAIR | | 0.2 | 0.1 2.0 | | | 9 | A |
| 0101 | CONTROL BOX ASSEMBLY | INSPECT REPLACE REPAIR | | 0.2 | 2.0 2.0 | | | 3,10 3,10 | A,E |
| 010101 | CONTROL BOX | INSPECT REPAIR | | | 0.1 1.0 | | | 9 | A |
| 010102 | CONTROL PANEL | TEST REPLACE REPAIR | | | 2.0 2.0 1.0 | | | 1 3,10 3,10 | C |
| 010103 | HARNESS ASSY | INSPECT TEST REPLACE REPAIR | | 1.0 | 1.0 2.0 2.0 | | | 1 3,10 3,10 | E |
| 010104 | REAR PANEL ASSY | TEST REPLACE REPAIR | | | 2.0 2.0 1.0 | | | 1 3,10 3,10 | D |
| 0102 | TRAILER HYDRAULIC ASSY | INSPECT TEST ADJUST REPAIR | | 0.3 0.5 0.5 1.0 | | | | 5,9 9 | F H |
| 010201 | CYLINDER, HYDRAULIC | INSPECT REPLACE REPAIR | | 0.1 | 1.0 | | | 2,9 9 | F G |
| 010202 | HYDRAULIC POWER PACK | INSPECT REPAIR | | 0.3 1.0 | 1.0 | | | 9 | F I,J |
| 0103 | CABLE REEL DRIVE, RIGHT | INSPECT SERVICE ADJUST REPLACE REPAIR | | 0.1 0.5 0.5 | 1.0 1.0 | | | 9 16 9 | A K |
| 0104 | CABLE REEL DRIVE, LEFT | INSPECT SERVICE ADJUST REPLACE REPAIR | | 0.1 0.5 0.5 | 1.0 1.0 | | | 9 16 9 | A K |
| | | | B-5 | | | | | | |

SECTION II. MAINTENANCE ALLOCATION CHART FOR QUICK ERECT EXPANDABLE MAST AB-1309

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQUIPMENT REFERENCE CODE | (6) REMARKS |
|---------------------|------------------------------|------------------------------|-----------------------------|-------------------|-----|---|---|---|----------------|
| | | | C | O | F | H | D | | |
| 0105 | TOOL BOX ASSEMBLY | INSPECT REPAIR | | 0.1 0.5 | | | | 9 | A |
| 0106 | CAMLOCK ASSEMBLY | INSPECT REPAIR | | 0.1 0.5 | | | | 9 | A |
| 0107 | TRAILER FRAME AND SUSPENSION | INSPECT REPAIR | 0.1 | 1.0 | | | | 9,20, 22 | A |
| 010701 | TRAILER SUSPENSION | INSPECT REPAIR | | 0.1 1.0 | | | | 9,22 | A |
| 01070101 | TIRE/RIM ASSY SERVICE | INSPECT REPLACE REPAIR | 0.1 | 0.1 0.5 | 0.5 | | | 6 4,9,22 9,22 | A |
| 01070102 | TRAILER SUSPENSION AXLE | INSPECT ADJUST REPAIR | | 1.0 0.5 1.0 | | | | 9,22 9,22 9,22 | A,L M N |
| 010702 | AIR BRAKE LINES | INSPECT SERVICE REPAIR | 0.1 | 0.5 1.0 | | | | 9,22 9,22 | A O |
| 010703 | FRONT JACK ASSEMBLY | INSPECT SERVICE REPAIR | | 0.1 0.1 1.0 | | | | 7 9 | A |
| 010704 | REAR JACK ASSY (LEFT) | INSPECT SERVICE REPAIR | | 0.1 0.1 1.0 | | | | 7 9 | A |
| 010705 | REAR JACK ASSY (RIGHT) | INSPECT SERVICE REPAIR | | 0.1 0.1 1.0 | | | | 7 9 | A |
| 0108 | REEL ASSY (LEFT) | INSPECT REPLACE REPAIR | | 0.1 1.5 2.0 | | | | 9,22 9,22 | A |
| 0109 | REEL ASSY (RIGHT) | INSPECT REPLACE REPAIR | | 0.1 1.5 2.0 | | | | 9,22 9,22 | A |

SECTION II. MAINTENANCE ALLOCATION CHART FOR QUICK ERECT EXPANDABLE MAST AB-1309

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQUIPMENT REFERENCE CODE | (6) REMARKS |
|---------------------|--------------------------------|--|-----------------------------|---------------------------------|---|---|---|---|----------------|
| | | | C | O | F | H | D | | |
| 0110 | CABLE ASSY | INSPECT REPLACE REPAIR | | 0.1 0.5 | | | | 9 9 | A T |
| 0111 | JUMPER CABLE | INSPECT REPLACE REPAIR | | 0.1 0.5 | | | | 9 9 | A T |
| 0112 | ANTENNA ADAPTER | INSPECT REPLACE REPAIR | | 0.1 0.5 0.5 | | | | 10 10 | A D |
| 02 | TOWER ASSY | INSPECT SERVICE REPLACE REPAIR | | 0.1 1.0 | | | | 7 8,9 4.0 | P Q |
| 0201 | TOWER SECTION #10 | INSPECT REPLACE REPAIR | | 0.1 | | | | 2.0 2.0 | P R S |
| 020101 | TOWER SUB-ASSY | INSPECT REPLACE REPAIR | | 0.1 | | | | 1.0 1.0 | A |
| 020102 | TRUSS ASSY #10 | INSPECT ADJUST REPAIR | | 0.1 1.0 1.0 | | | | 9 9 | A U |
| 02010201 | MOTOR BRAKE RELEASE, 1ST STAGE | INSPECT TEST ADJUST REPLACE REPAIR | | 0.1 0.1 1.0 1.0 1.0 | | | | 9,18,19 9 | A 9 V |
| 020103 | LOCKOUT ASSY | INSPECT REPAIR | | 0.1 | | | | 1.0 9 | A |
| 0202 | TOWER SECTION #9 | INSPECT REPLACE REPAIR | | 0.1 | | | | 2.0 2.0 | P R S |
| 0203 | TOWER SECTION #8 | INSPECT REPLACE REPAIR | | 0.1 | | | | 2.0 2.0 | P R S |
| | | | B-7 | | | | | | |

SECTION II. MAINTENANCE ALLOCATION CHART FOR QUICK ERECT EXPANDABLE MAST AB-1309

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQUIPMENT REFERENCE CODE | (6) REMARKS |
|---------------------|--------------------------------|--|-----------------------------|---------------------------------|------------|---|---|---|-----------------------|
| | | | C | O | F | H | D | | |
| 0204 | TOWER SECTION #7 | INSPECT REPLACE REPAIR | | 0.1 | 2.0 2.0 | | | 9 9,12,14, 17 | P R S |
| 0205 | TOWER SECTION #6 | INSPECT REPLACE REPAIR | | 0.1 | 2.0 2.0 | | | 9,18,19 9,12,14, 17 | P R S |
| 020501 | TOWER SUB-ASSY | INSPECT REPLACE REPAIR | | 0.1 | 1.0 1.0 | | | 9 9,12,14 17 | A |
| 020502 | DRUM WINCH SUB-ASSY | INSPECT ADJUST REPAIR | | 0.1 1.0 1.0 | 1.0 | | | 9 9 | A U |
| 02050201 | MOTOR BRAKE RELEASE, 2ND STAGE | INSPECT TEST ADJUST REPLACE REPAIR | | 0.1 0.1 1.0 1.0 1.0 | | | | 9 9,18,19 9 | A V P R S |
| 0206 | TOWER SECTION #5 | INSPECT REPLACE REPAIR | | 0.1 | 2.0 2.0 | | | 9 9,12,14, 17 | S |
| 0207 | TOWER SECTION 04 | INSPECT REPLACE REPAIR | | 0.1 | 2.0 2.0 | | | 9 9,12,14, | P R S 17 |
| 020701 | TOWER SUB-ASSY | INSPECT REPLACE REPAIR | | 0.1 | 1.0 1.0 | | | 9 9,12,14, 17 | A |
| 020702 | ROTATOR PLATFORM ASSEMBLY | INSPECT REPLACE REPAIR | | 0.1 | 1.0 1.0 | | | 9 9 | A |
| 02070201 | OBSTRUCTION LIGHT | INSPECT REPAIR | | 0.1 0.5 | | | | 10 | A |

SECTION II. MAINTENANCE ALLOCATION CHART FOR QUICK ERECT EXPANDABLE MAST AB-1309

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQUIPMENT REFERENCE CODE | (6) REMARKS |
|---------------------|-----------------------------------|---|-----------------------------|-------------------|--|---|---|---|----------------|
| | | | C | O | F | H | D | | |
| 02070202 | ANEMOMETER | INSPECT ADJUST TEST REPLACE REPAIR | | | 0.1 0.5 0.5 0.5 1.0 | | | 9,10 1,9,10 9,10 9 | |
| 03 | ANCHOR SETTING/ RETRIEVAL TOOL | INSPECT REPLACE REPAIR | | 0.1 | 0.5 0.5 | | | 9 9 | A |
| 04 | ELECTRICAL ASSEMBLY | INSPECT REPLACE REPAIR | | 0.1 0.5 1.0 | | | | 10 10 | A D |
| 0401 | CABLE ASSY (W-110) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0402 | CABLE ASSY (W-115) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0403 | CABLE ASSY (W-114) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0404 | CABLE ASSY (W-116) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0405 | CABLE ASSY (W-117) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0406 | CABLE ASSY (W-118) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0407 | CABLE ASSY (W-119) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0408 | CABLE ASSY (W-120) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0409 | CABLE ASSY (W-121) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |

SECTION II. MAINTENANCE ALLOCATION CHART FOR QUICK ERECT EXPANDABLE MAST AB-1309

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQUIPMENT REFERENCE CODE | (6) REMARKS |
|---------------------|---------------------------|------------------------------|-----------------------------|-----|------------|---|---|---|----------------|
| | | | C | O | F | H | D | | |
| 0410 | CABLE ASSY (W-122) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0411 | CABLE ASSY (W-123) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0412 | CABLE ASSY (W-126) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0413 | CABLE ASSY (W-127) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0414 | CABLE ASSY (W-128) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0415 | CABLE ASSY (W-130) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0416 | CABLE ASSY (W-131) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0417 | CABLE ASSY (W-132) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0418 | CABLE ASSY (W-133) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0419 | CABLE ASSY (W-134) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0420 | CABLE ASSY (W-135) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0421 | CABLE ASSY (W-136) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |

SECTION II. MAINTENANCE ALLOCATION CHART FOR QUICK ERECT EXPANDABLE MAST AB-1309

| (1) GROUP NUMBER | (2) COMPONENT ASSEMBLY | (3) MAINTENANCE FUNCTION | (4) MAINTENANCE CATEGORY | | | | | (5) TOOLS AND EQUIPMENT REFERENCE CODE | (6) REMARKS |
|---------------------|---------------------------|--|-----------------------------|--------------------------|------------|---|-----|---|----------------|
| | | | C | O | F | H | D | | |
| 0422 | CABLE ASSY (W-137) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0423 | CABLE ASSY (W-138) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0424 | CABLE ASSY (W-139) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0425 | CABLE ASSY (W-111, W-112) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0426 | CABLE ASSY (W-125A) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0427 | CABLE ASSY (W-125B) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0428 | CABLE ASSY (W-129A) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0429 | CABLE ASSY (W-129B) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 0430 | CABLE ASSY (W-124) | INSPECT REPLACE REPAIR | | 0.1 | 0.3 0.5 | | | 3,10 3,10 | E T |
| 05 | ROTATOR POSITIONER | INSPECT REPLACE REPAIR | | 0.1 | 1.0 4.0 | | | 9,10,22 9,10,22, 23,24 | A |
| 06 | ROTATOR CONTROLLER | INSPECT ADJUST REPLACE REPAIR | | 0.1 1.0 1.0 0.5 | 1.0 1.0 | | 1.0 | 10 10 | A,E X |
| 07 | SWITCH BOX ASSY | INSPECT TEST REPAIR REPLACE | | 0.1 0.1 0.1 0.3 | 0.2 1.0 | | | 1 10,21 10 | W |
| | | | B-11 | | | | | | |

SECTION III. TOOLS AND TEST EQUIPMENT REQUIREMENTS

| TOOL OR TEST EQUIPMENT REF CODE | MAINTENANCE CATEGORY | NOMENCLATURE | NATIONAL/NATO STOCK NUMBER | TOOL NUMBER |
|---------------------------------|----------------------|---|----------------------------|------------------|
| 0001 | O,F | MULTIMETER, DIGITAL | 6625-00-139-2512 | AN/PSM-45 |
| 0002 | F | WRENCH, TORQ 0-170F | 5120-00-640-6364 | FF150 |
| 0003 | F | TOOL KIT, ELECTRONI | 5180-00-610-8177 | TK-105/G |
| 0004 | O | WRENCH, TORQ 0-600F | 5120-00-221-7983 | TORQUE WRENCH |
| 0005 | O | PRESS GAGE, 0-5000P | - - - | 81978-B11 |
| 0006 | O | GAGE, TIRE PRESSURE | 4910-01-038-2820 | GG-G-91 |
| 0007 | O | GUN, LUBRICATING | 4930-00-253-2478 | GUN, LUBRICATING |
| 0008 | F | HOIST, 5-TON CAPAC1 | - - - | HOIST, 5-TON |
| 0009 | O,F | TOOL KIT, GENERAL M | 5180-00-177-7033 | SC5180-90-CL-N26 |
| 0010 | O,F | TOOL KIT, ELECTRICAL | 5180-00-064-5178 | TK-101/G |
| 0011 | F | PACK, POWER | 5130-01-055-0313 | 940-26 |
| 0012 | F | GUN, HUCK (FOR 3/8) | - - - | 4801 (72139) |
| 0013 | F | GUN, HUCK (FOR 1/2) | - - - | 5901 (72139) |
| 0014 | F | NOSE, 3/8 (FOR 4801) | 5130-00-770-6122 | 99-100 |
| 0015 | F | NOSE, 1/2 (FOR 5901) | - - - | H99-657 (72139) |
| 0016 | O | SCALE, SPRING | - - - | 1756T1 (39428) |
| 0017 | F | CUTTER, MANUAL COLLAR (FOR 3/8) | - - - | 1390PQ (96508) |
| 0018 | O,F | TOOL, SWAGING | - - - | 635 (76691) |
| 0019 | O,F | DIE, SWAGING TOOL | - - - | F6 (76691) |
| 0020 | O | CARPENTER'S LEVEL | 5210-00-239-0892 | LEVEL,CARPENTER |
| 0021 | F | OHMMETER | 6625-01-102-0052 | AN/PSM-43 |
| 0022 | O,F | SHOP EQUIPMENT, AUTOMOTIVE MAIN- TENANCE AND REPAIR | 4910-00-754-0654 | SC4910-95-CL-A74 |
| 0023 | F | SOCKET, 2 INCH 8 POINT | - - - | IM764 (55719) |
| 0024 | F | ADAPTER, 3/4 TO 1 INCH DRIVE | 5120-01-356-0742 | IM72 (55719) |

SECTION IV. REMARKS

| Reference Code | Remarks |
|--|---|
| <p>NOTE An asterisk (*) denotes a maintenance task which normally is not performed by communications-electronics personnel.</p> | |
| A | Inspect for damaged and loose/missing components. |
| B | Inspect for damage and loose/missing components on a scheduled basis in accordance with PMCS. |
| C | Repair limited to failed switches, lights, and height indicator. |
| D | Repair limited to replacement of components (refer to TM 11-5985-387-24P). |
| E | Inspect for damaged wire and loose components. |
| F | Inspect for fluid leaks and damaged components. Inspect for contaminants in fluid (i.e., dirt, water, etc.) |
| G | Limited to replacement of seal kit. |
| H | * Adjust pressure and flow rates. |
| I | DS level maintains pump, motor, and directional valve, all others at Unit level. |
| J | Includes replacement of filter element. |
| K | Adjustment limited to drive chain tension. |
| L | * Inspect brake shoes for wear. |
| M | * Adjust brake shoe clearances. |
| N | * Includes repair of axle hub, drums, and brake components. |
| O | Limited to air filter only. |
| P | Inspect for corrosion, damage, loose or missing components. |
| Q | * Limited to corrosion control and replacement of tower sections and missing components. |

SECTION IV. REMARKS (Continued)

| Reference Code | Remarks |
|----------------|---|
| R | Time indicated is for removal of that tower section only. |
| S | * Limited to corrosion control and replacement of hang-on components. |
| T | Limited to replacement of end connectors and individual wires (refer to TM 11-5985-387-24P) |
| U | DS Level maintains/replaces gear motor. Unit level replaces hang-on components. |
| V | Repair limited to replacement of motor and/or gear reducer. |
| W | Organizational level repair limited to replacement of switch box knob, indicator lights, and lens. Direct support maintenance limited to replacement of rotary switch. |
| X | Organizational repair limited to replacement of damaged or missing switch knobs or mounting screws. DS level repair limited to replacement of failed switches, LED indicators, and fuses (refer to TM 11-5985-387-24P). Depot repair limited to replacement of Display Board, Processor Board, SCR Speed Control, Heater Control, and two power supplies. |

APPENDIX C**COMPONENTS OF END ITEM AND BASIC
ISSUE ITEMS LIST****Section I. INTRODUCTION****C-1. SCOPE**

This appendix lists components of end item and basic issue items for the Quick Erect Expandable Mast AB-1309. It will help you inventory items required for safe and efficient operation.

C-2. GENERAL

The Components of End Item and Basic Issue Items List are divided into the following sections:

a. Section II Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item. These items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

b. Section III Basic Issue Items (BII). These are minimum essential items required to place the AB-1309 in operation, to operate it, and to perform emergency repairs. BII must be with the AB-1309 during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

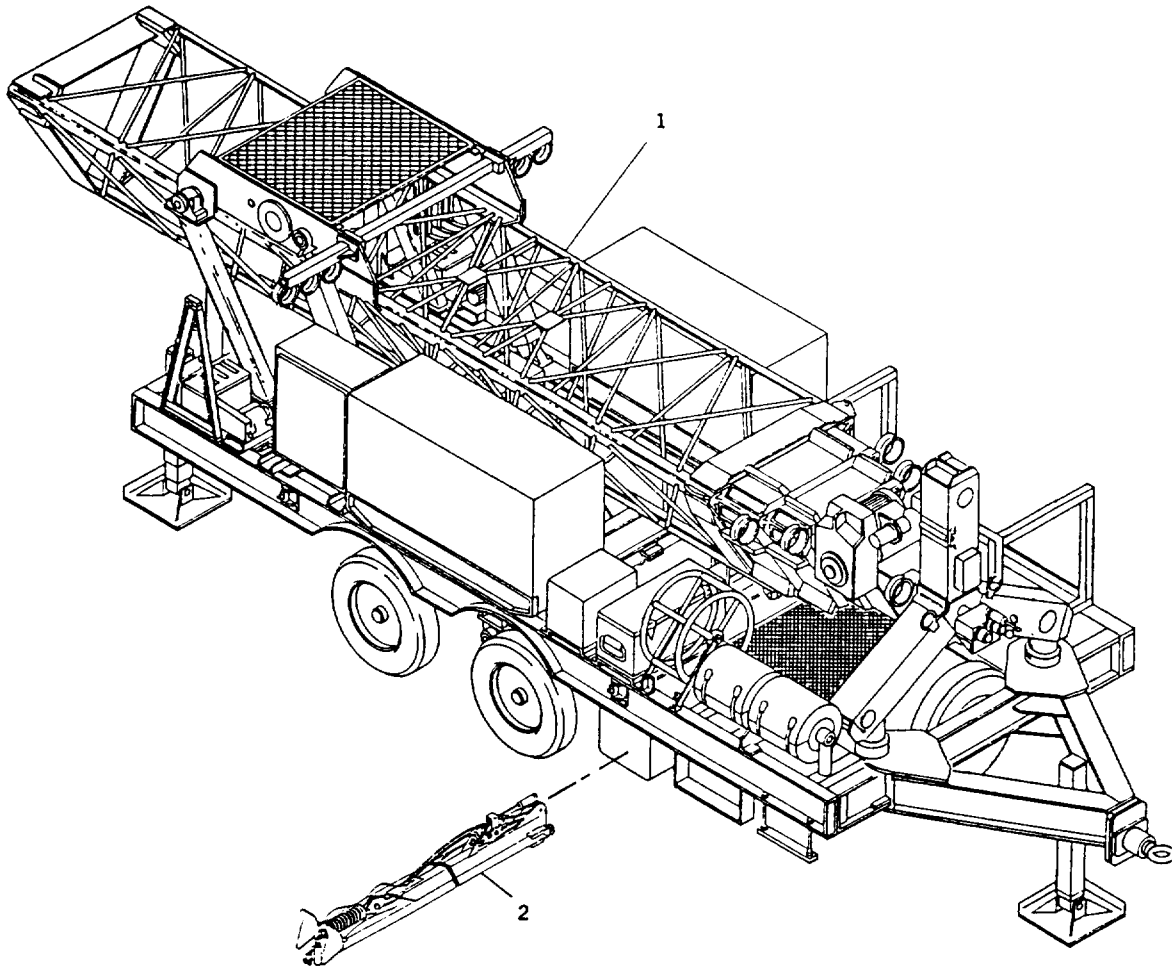
- a. Column 1 ILLUS NO. This column indicates the number on the illustration of the item.
- b. Column 2 NATIONAL STOCK NUMBER. Indicates the National Stock Number (NSN) assigned to the item and will be used for requisitioning purposes.
- c. Column 3 DESCRIPTION. Indicates the Federal item name. If needed, a brief description is given to identify the item. The last line for each item indicates the Commercial and Government Entity (CAGE) Code (in parentheses) followed by the part number. Since there are no different models of this equipment, the USABLE ON CODE column is not used.

C-3. EXPLANATION OF COLUMNS - Continued

d. Column 4 - Unit of Measure (U/M). Indicates the unit of measure used in performing the actual operational/ L-maintenance function. This measure is expressed as EA each).

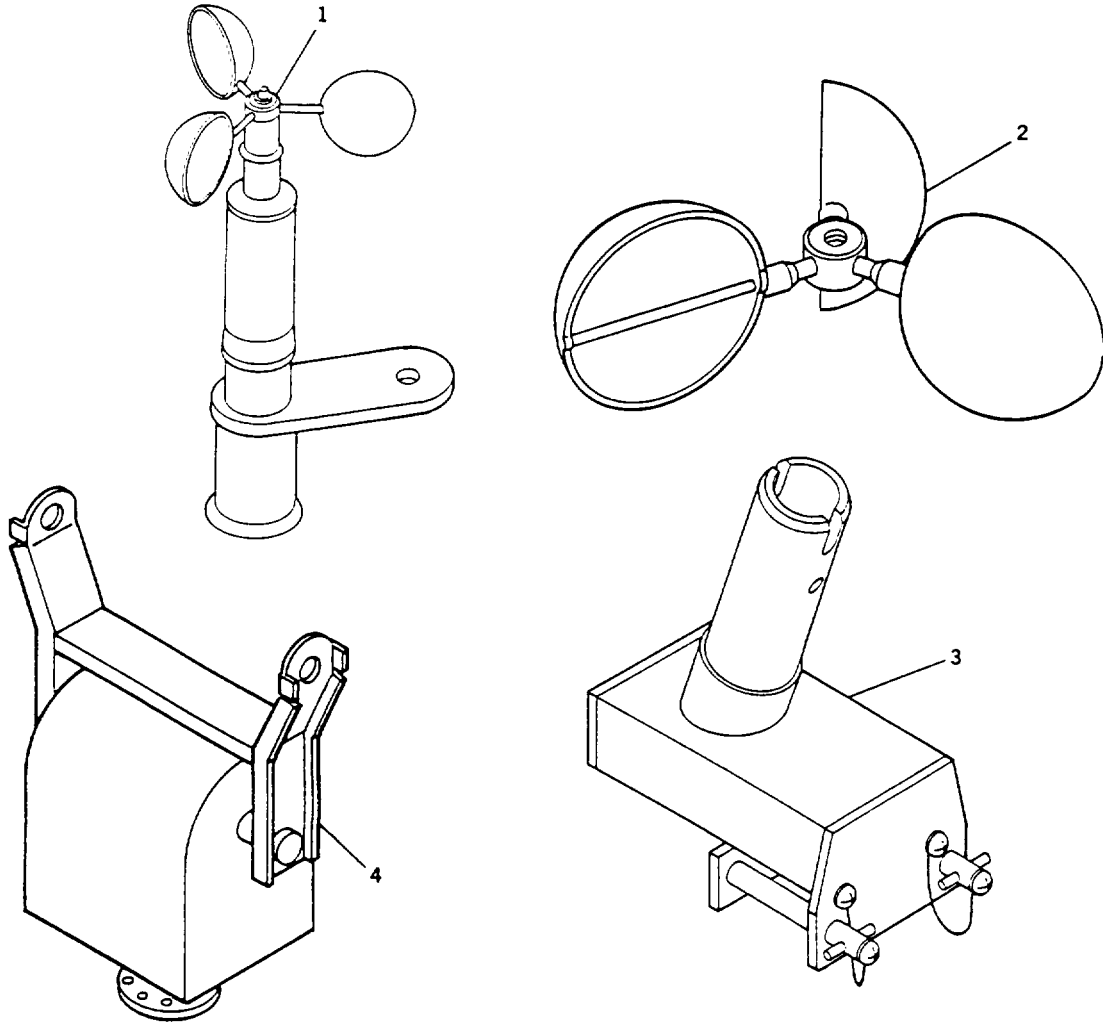
e. Column 5 - Quantity Required (Qty Reqd). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM



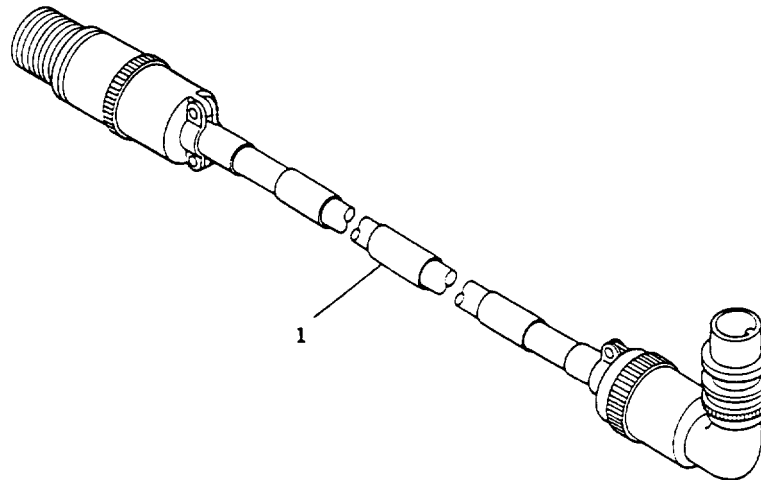
| (1) Illus. Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|-------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Trailer and Tower Assy (80063) A3142882 | | EA | 1 |
| 2 | | Anchor Setting and Retrieval Tool (80063) A3143376 | | EA | 1 |

Section II. COMPONENTS OF END ITEM - Continued



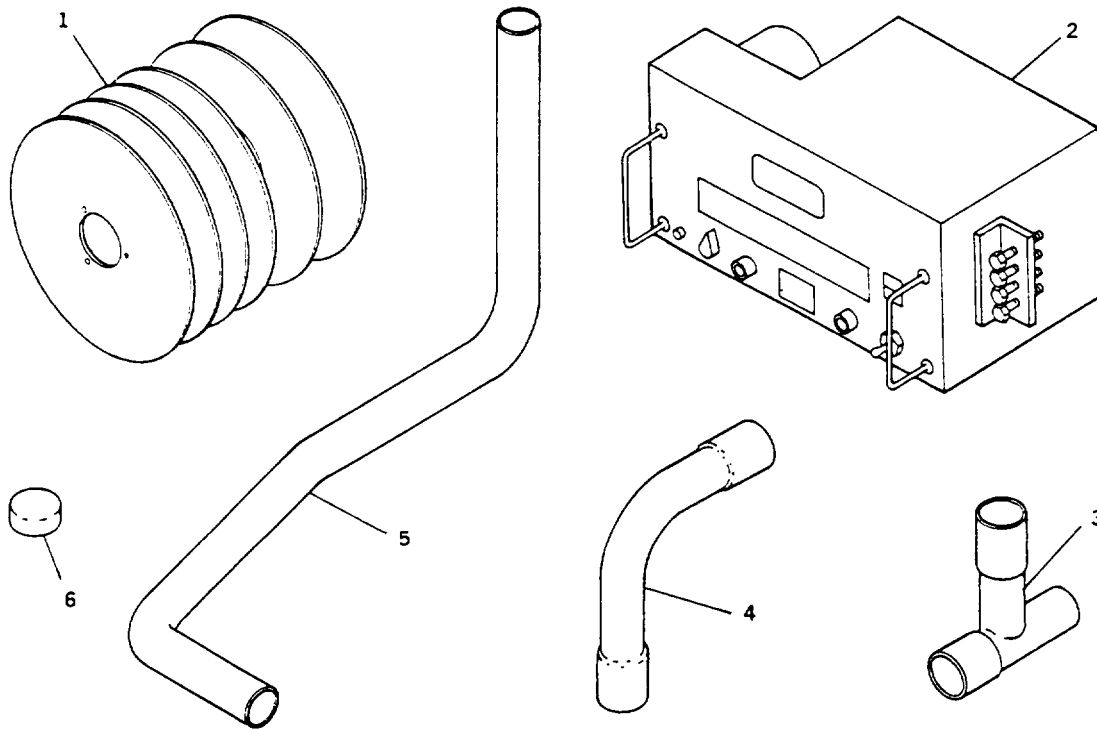
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Anemometer (80063) A3144156 | | EA | 1 |
| 2 | | Anemometer Cup Wheel (52314) 12170C | | EA | 1 |
| 3 | | Antenna Adapter Assy (80063) A3143518 | | EA | 3 |
| 4 | | Antenna Positioner (80063) A3143370 | | EA | 3 |

Section II. COMPONENTS OF END ITEM - Continued



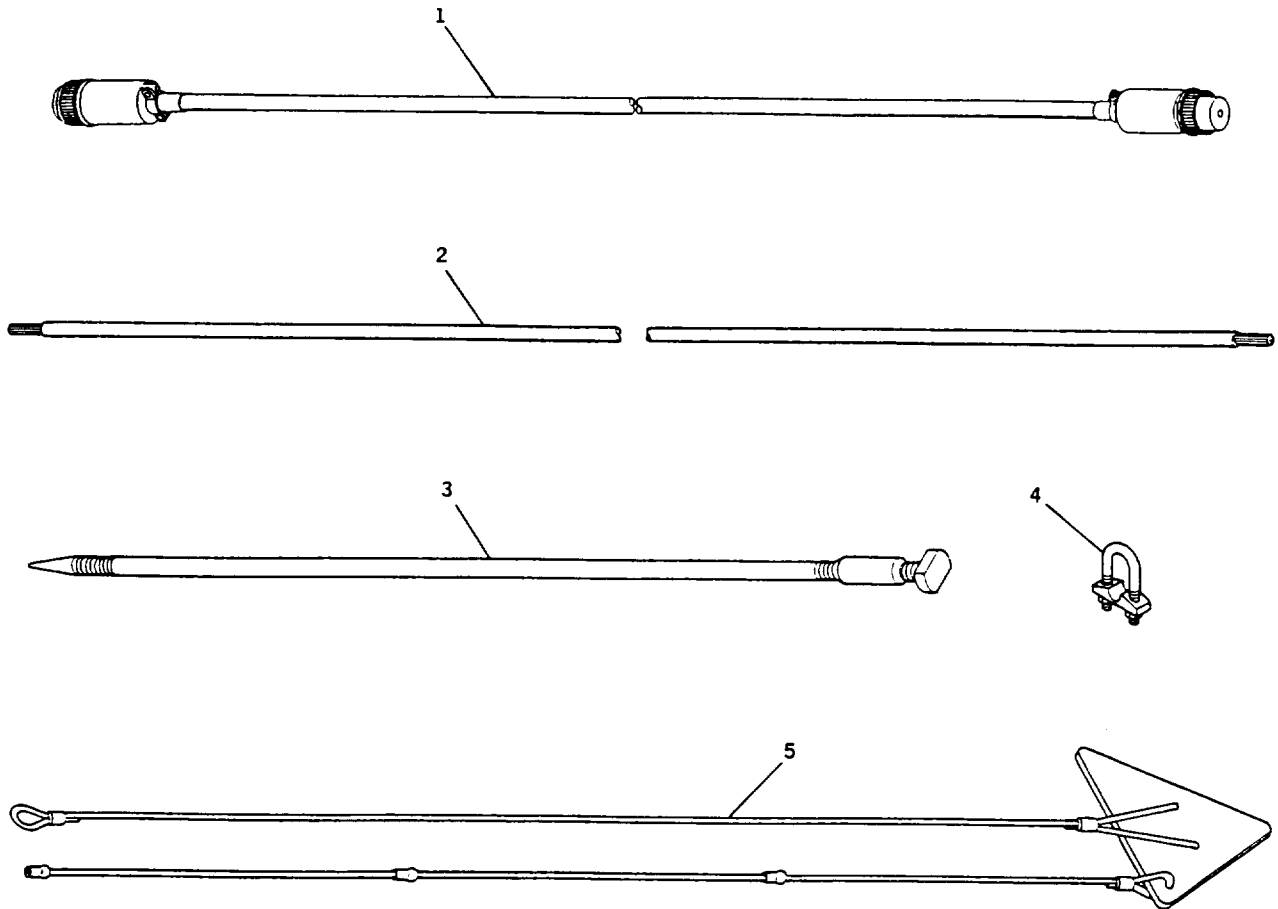
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | (4) Usable On Code | (5) Qty Reqd |
|------------------------|---------------------------------|--|--------------------------|--------------------|
| 1 | | Cable Assy W109 (80063) A3142992 | EA | 1 |
| 1A | | Cable Assy W110/W112 (80063) A3143016 | EA | 1 |
| 1B | | Cable Assy W117 (80063) A3142996 | EA | 1 |
| 1C | | Cable Assy W122 (80063) A3143001 | EA | 1 |
| 1D | | Cable Assy W126 (80063) A3143003 | EA | 1 |
| 1E | | Cable Assy W131 (80063) A3143007 | EA | 1 |
| 1F | | Cable Assy W132 (80063) A3143008 | EA | 1 |
| 1G | | Cable Assy W133 (80063) A3143009 | EA | 1 |
| 1H | | Cable Assy W137 (80063) A3143013 | EA | 1 |
| 1I | | Cable Assy W138 (80063) A3143014 | EA | 1 |
| 1J | | Cable Assy W139 (80063) A3143015 | EA | 1 |

Section II. COMPONENTS OF END ITEM - Continued



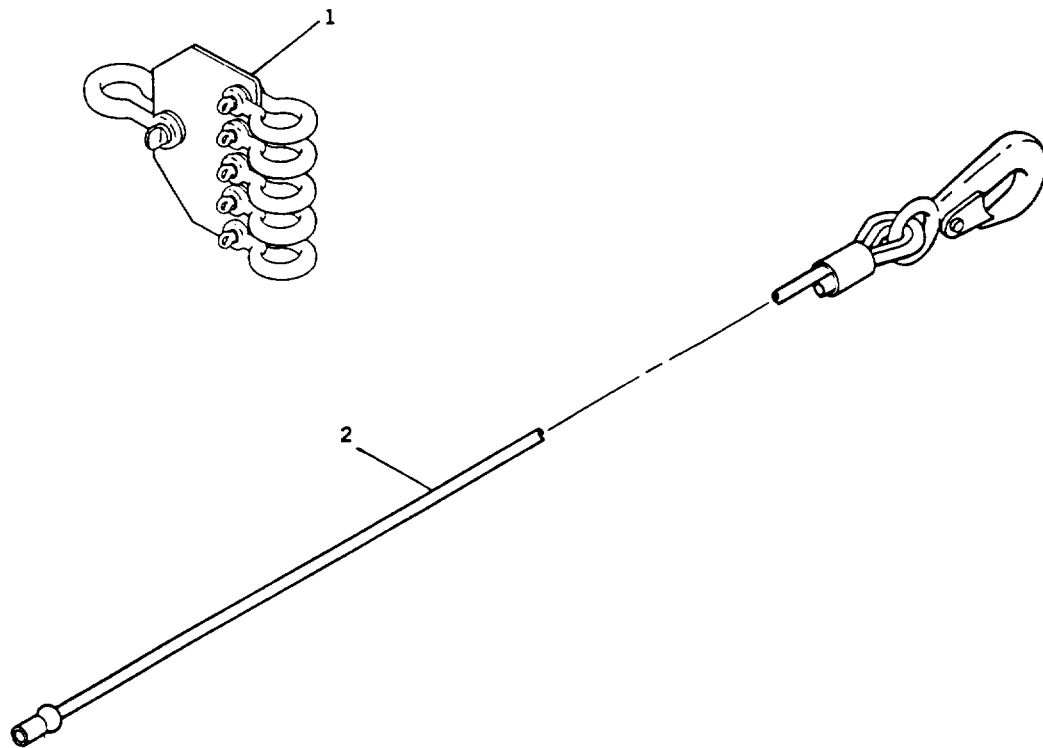
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | | Cable Reel (80063) A3143393 | | EA | 3 |
| 2 | | Controller (80063) A3155662 | | EA | 1 |
| 3 | | Exhaust Muffler Pipe, Type 3 (80063) A3143427 | | EA | 3 |
| 4 | | Exhaust Muffler Pipe, Type 2 (80063) A3143426 | | EA | 2 |
| 5 | | Exhaust Muffler Pipe, Type 1 (80063) A3143425 | | EA | 2 |
| 6 | | Exhaust Pipe Rain Cap (80063) A3155670 | | EA | 2 |

Section II. COMPONENTS OF END ITEM - Continued



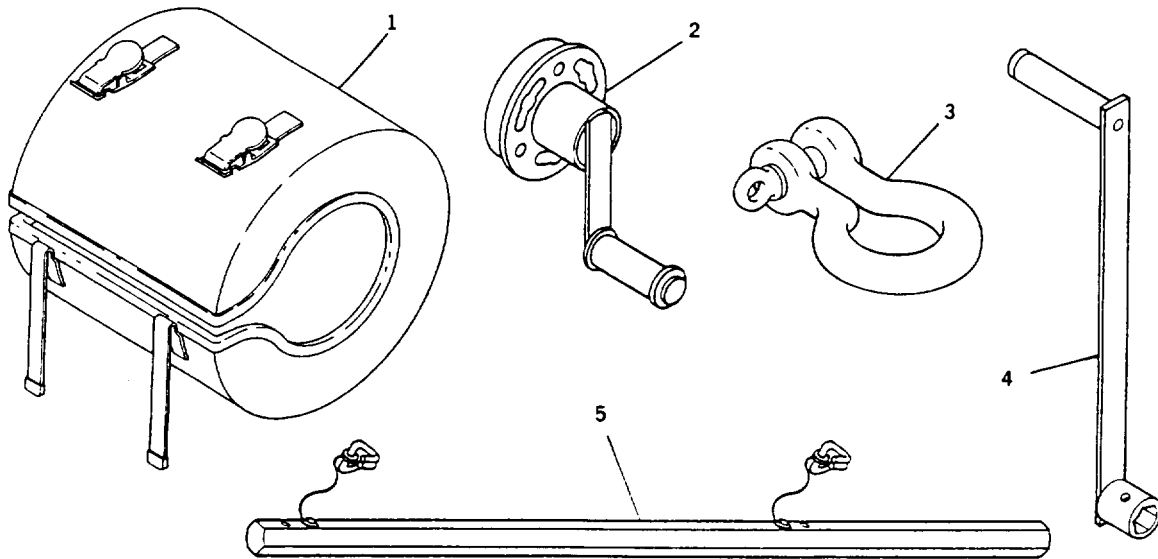
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | | Extension Cord Assy (80063) A3144045 | | EA | 3 |
| 2 | | Ground Cable, 2/0 Welding Cable, 6 ft. (80063) A3143514-1 | | EA | 1 |
| 3 | | Ground Rod Assy (80063) A3155632 | | EA | 1 |
| 4 | | Ground Rod Clamp, 3/4 in. (80063) A3155651 | | EA | 3 |
| 5 | | Guy Anchor, 8 in. Laconia (80063) A3143655 | | EA | 12 |

Section II. COMPONENTS OF END ITEM - Continued



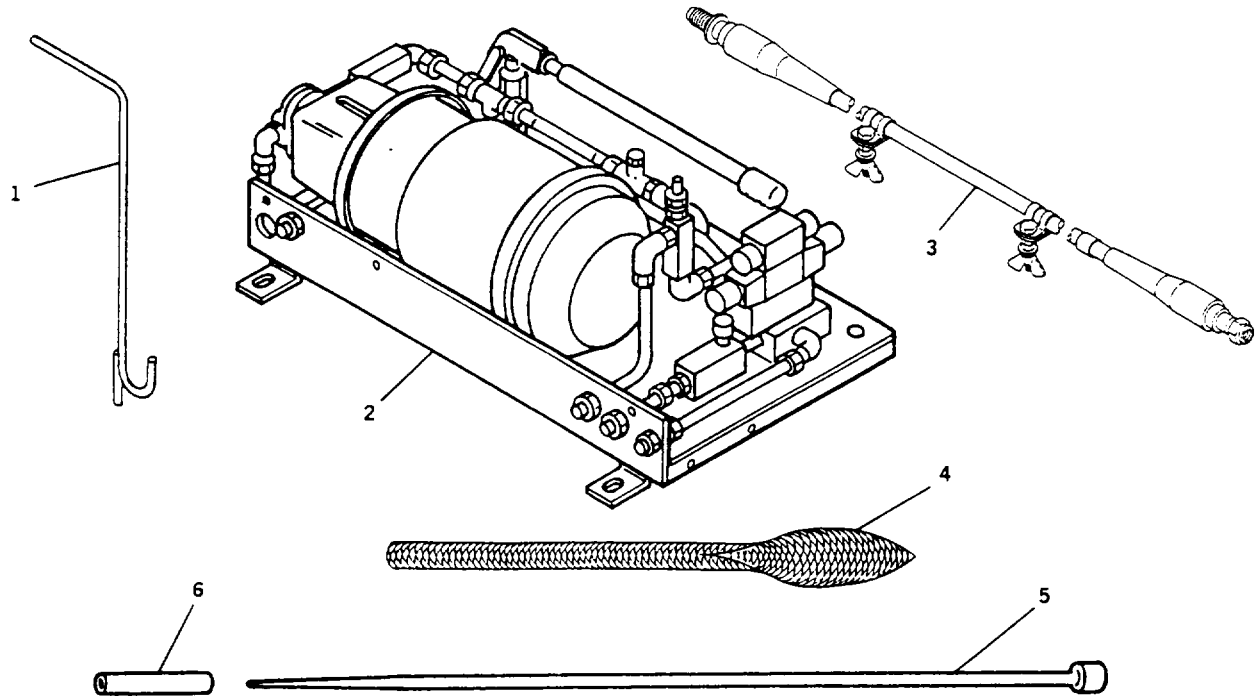
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Guy Anchor Plate Assy (80063) A3143519 | | EA | 3 |
| 2 | | Guy Cable (Black Hook) #10 (80063) A3143431 | | EA | 3 |
| 2A | | Guy Cable (Red Hook) #6 (80063) A3143433 | | EA | 3 |
| 2B | | Guy Cable (Silver Hook) #8 (80063) A3143432 | | EA | 3 |
| 2C | | Guy Cable (White Hook) #4 (80063) A3143434 | | EA | 6 |

Section II. COMPONENTS OF END ITEM - Continued



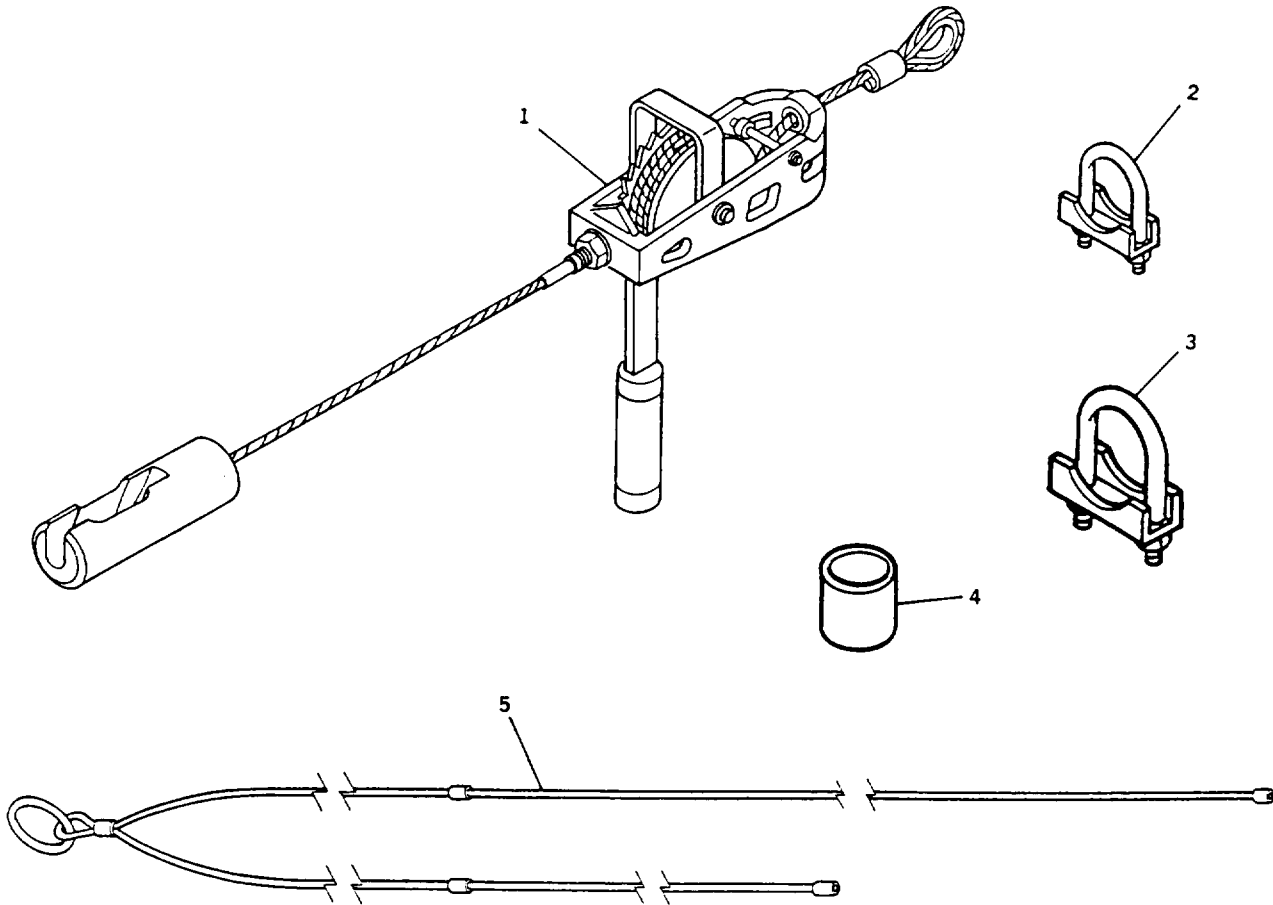
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | | Guy Cable Reel Cover (80063) A3143380 | | EA | 3 |
| 2 | | Guy Cable Reel Crank Handle (80063) A3144124 | | EA | 1 |
| 3 | | Guy Cable Shackle #4 Section (White) (80063) A3142932 | | EA | 9 |
| 3A | | Guy Cable Shackle #8 (Silver) (80063) A3142933 | | EA | 3 |
| 3B | | Guy Cable Shackle #10 (Black) (80063) A3142931 | | EA | 3 |
| 3C | | Guy Cable Shackle (Red) #6 (80063) A3142934 | | EA | 3 |
| 4 | | Hand Crank, Ratchet Handle (80063) A3143521 | | EA | 1 |
| 5 | | Hex Shaft Handle Sub- Assembly, Ratchet (Extension Bar) (80063) A3143516 | | EA | 1 |

Section II. COMPONENTS OF END ITEM - Continued



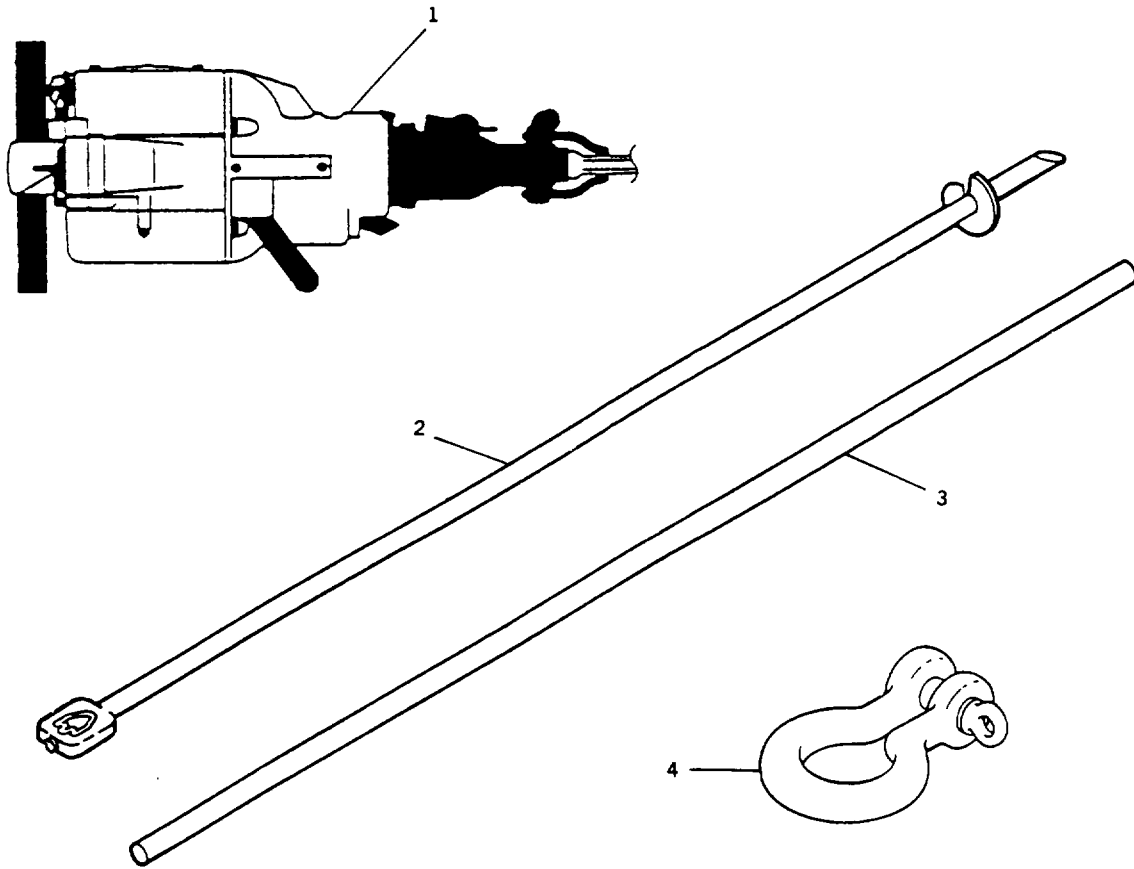
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Hydraulic Power Unit Key (80063) A3143697 | | EA | 1 |
| 2 | | Hydraulic Power Unit (80063) A3143818 | | EA | 1 |
| 3 | | Jumper Cable Assy (80063) A3143056 | | EA | 3 |
| 4 | | Kellems Grip (80063) A3155668 | | EA | 3 |
| 5 | | Lightning Rod (80063) A3155655 | | EA | 1 |
| 6 | | Lightning Rod Tip Guard (80063) A3143387 | | EA | 1 |

Section II. COMPONENTS OF END ITEM - Continued



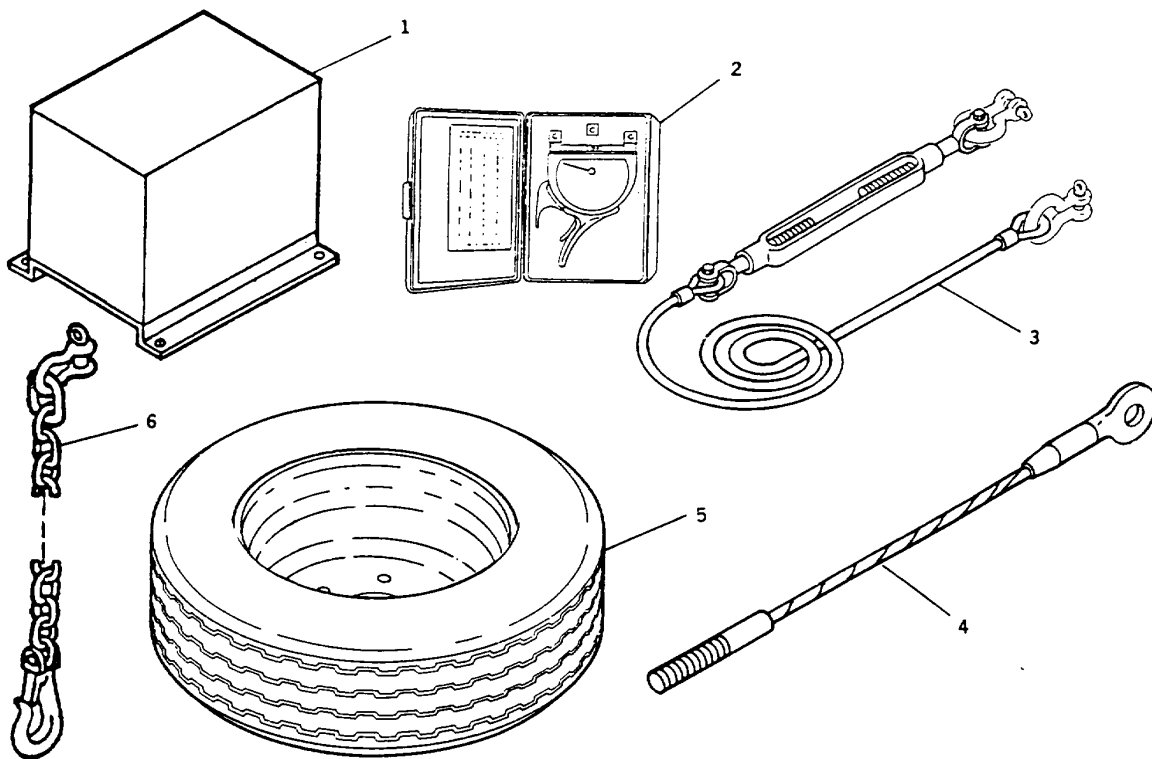
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Lug-All Assy (80063) A3143512 | | EA | 15 |
| 2 | | Muffler Clamp, 1-3/4 in. (80063) A3144147 | | EA | 4 |
| 3 | | Muffler Clamp, 2 in. (80063) A3155669 | | EA | 4 |
| 4 | | Muffler Tip (80063) A3143379 | | EA | 4 |
| 5 | | Radius Rope (80063) A3143515 | | EA | 1 |

Section II. COMPONENTS OF END ITEM - Continued



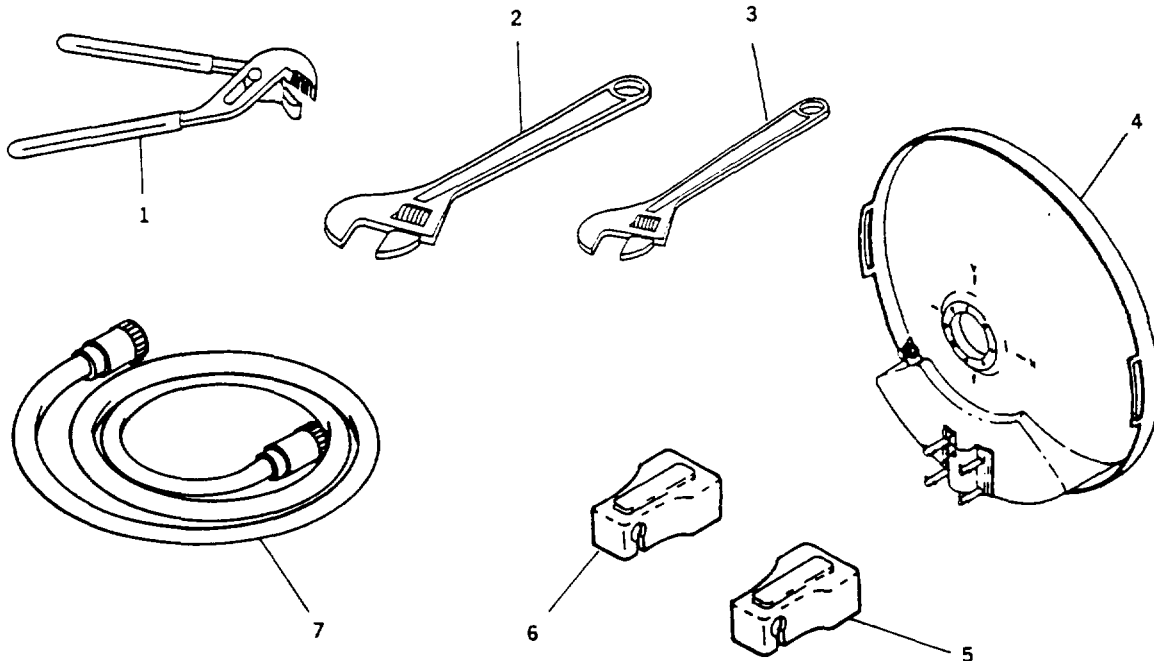
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | 3820-01-092-7465 | Rock Drill (32982) Pionjar 120 | | EA | 1 |
| 2 | | Screw Anchor (80063) A3155653 | | EA | 6 |
| 3 | | Screw Rod (80063) A3143381 | | EA | 1 |
| 4 | | Shackle w/Screwpin, 3/4 in. (Silver) (80063) A3142898-1 | | EA | 2 |
| 4A | | Shackle, Safety (81350) AN116-8 | | EA | 3 |

Section II. COMPONENTS OF END ITEM - Continued



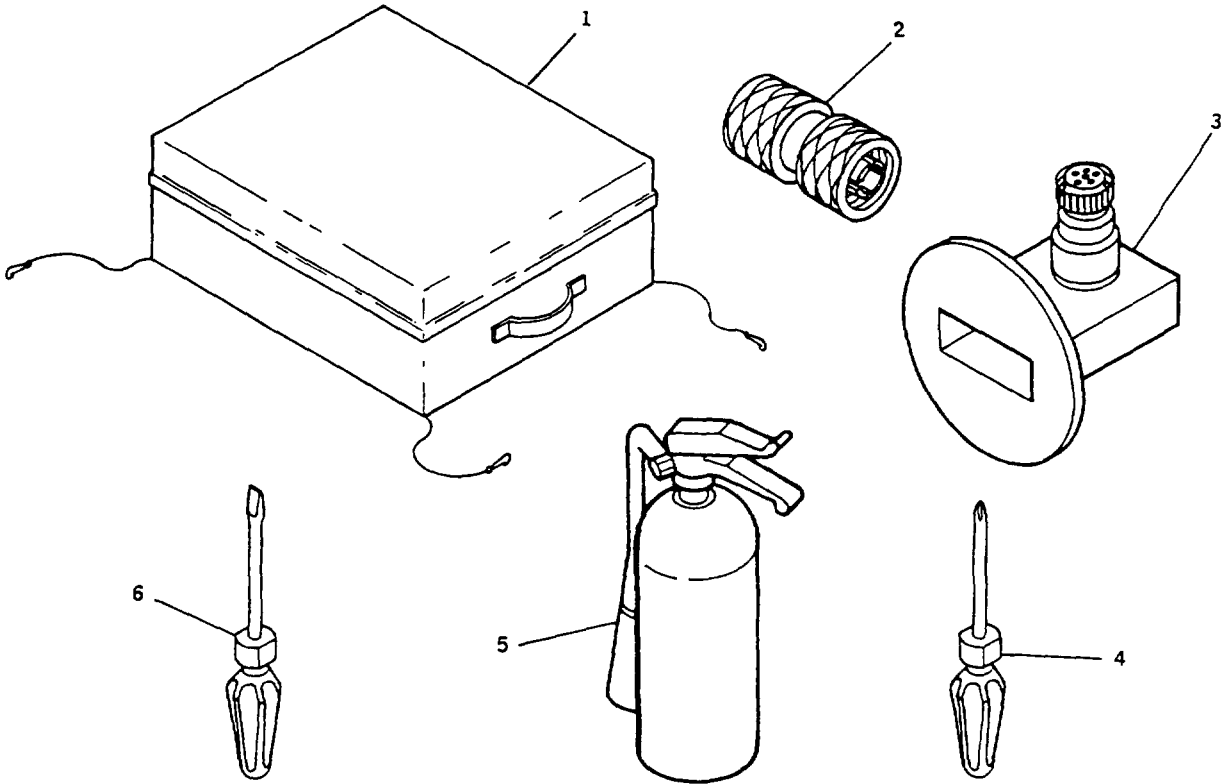
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Switch Box Assy (Power Distribution Box) (80063) A3079275 | | EA | 1 |
| 2 | | Tensiometer w/Case and Risers (80063) A3143653 | | EA | 1 |
| 3 | | Tie-Down Cable Assy, Rail (80063) A3142898 | | EA | 1 |
| 4 | | Tie-Down Cable Assy, Trailer/Tower (80063) A3143372 | | EA | 2 |
| 5 | | Tire/Rim Assy (Spare) (80063) A3143901 | | EA | 1 |
| 6 | | Trailer Safety Chain Assy (80063) A3143373 | | EA | 2 |

Section III. BASIC ISSUE ITEMS



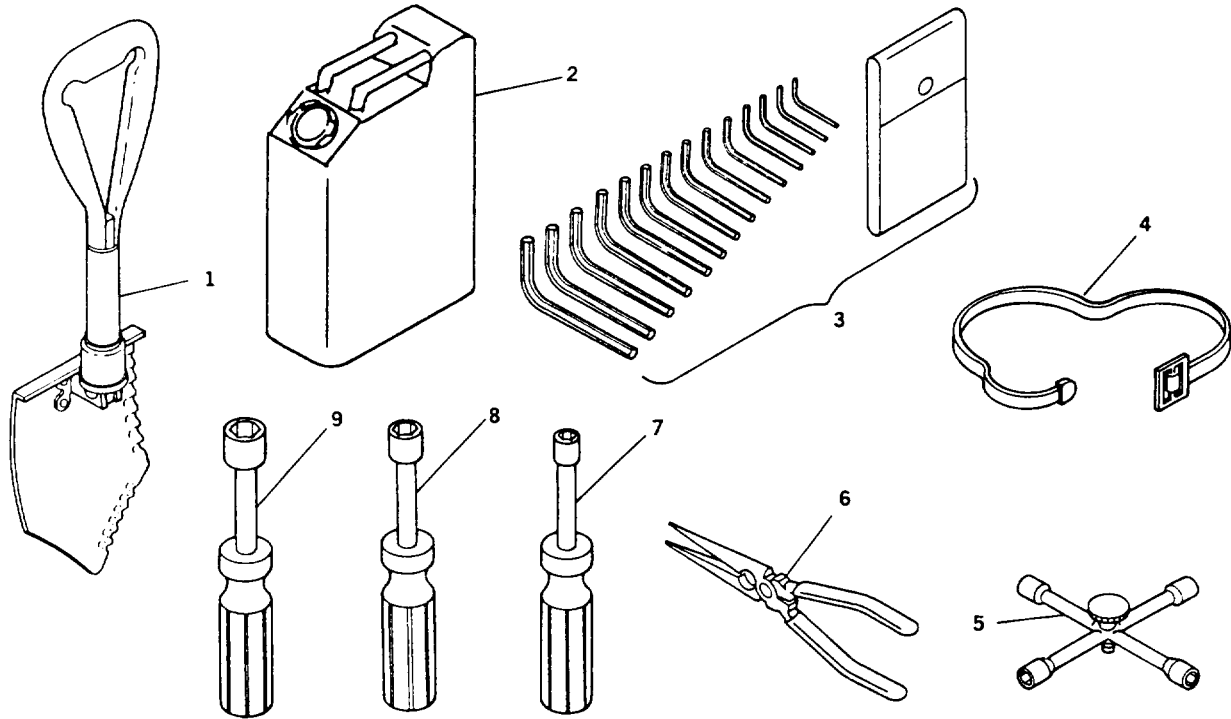
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | | Adjustable Pliers, Channel Lock 10 in. (80063) A3155646 | | EA | 1 |
| 2 | 5120-00-449-8083 | Adjustable Wrench, 10 in. (80063) A3155644 | | EA | 1 |
| 3 | 5120-00-240-5328 | Adjustable Wrench, 8 in. (80063) A3155647 | | EA | 1 |
| 4 | 5985-00-477-8334 | Antenna Reflector (80063) SM-D-561729 | | EA | 3 |
| 5 | | Battery Terminal Cover (Red) (80063) A3143429 | | EA | 4 |
| 6 | | Battery Terminal Cover (Black) (80063) A3143428 | | EA | 4 |
| 7 | 5995-01-219-9257 | Cable Assembly, CG-3860/TRC (80063) A3011256 | | EA | 9 |

Section III. BASIC ISSUE ITEMS - Continued



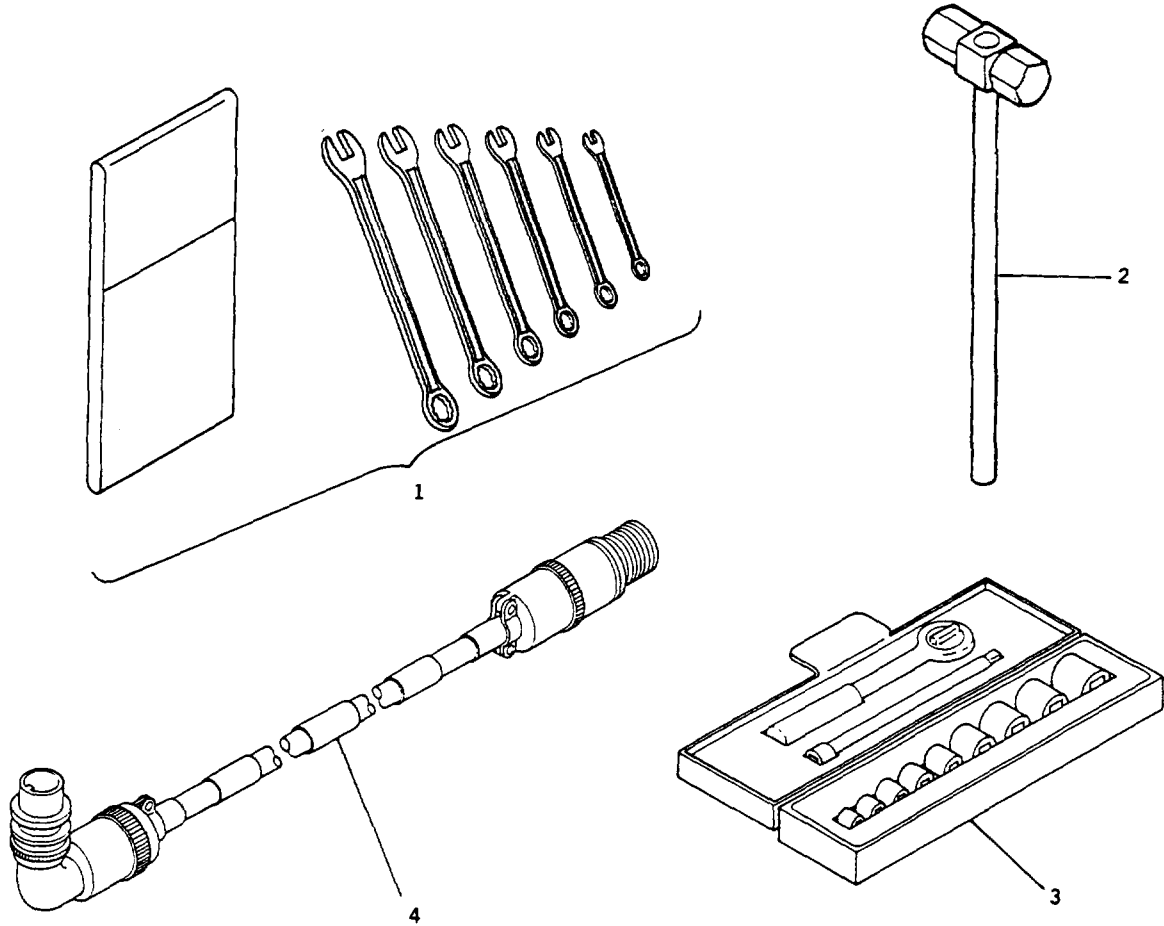
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Center Rack Tool Bag (80063) A3143520 | | EA | 1 |
| 2 | 5935-00-539-0851 | Connector Adapter (81349) M55339/05- 00057 | | EA | 3 |
| 3 | 5935-00-490-5800 | Connector Adapter (80063) SM-B-683716 | | EA | 3 |
| 4 | 5120-00-234-8913 | Cross-Tip Screwdriver, #2, 4 in. (80063) A3155639 | | EA | 1 |
| 5 | | Fire Extinguisher (80063) A3155656 | | EA | 1 |
| 6 | 5120-00-222-8852 | Flat-Tip Screwdriver, 1/4 in. x 4 in. (80063) A3155640 | | EA | 1 |

Section III. BASIC ISSUE ITEMS - Continued



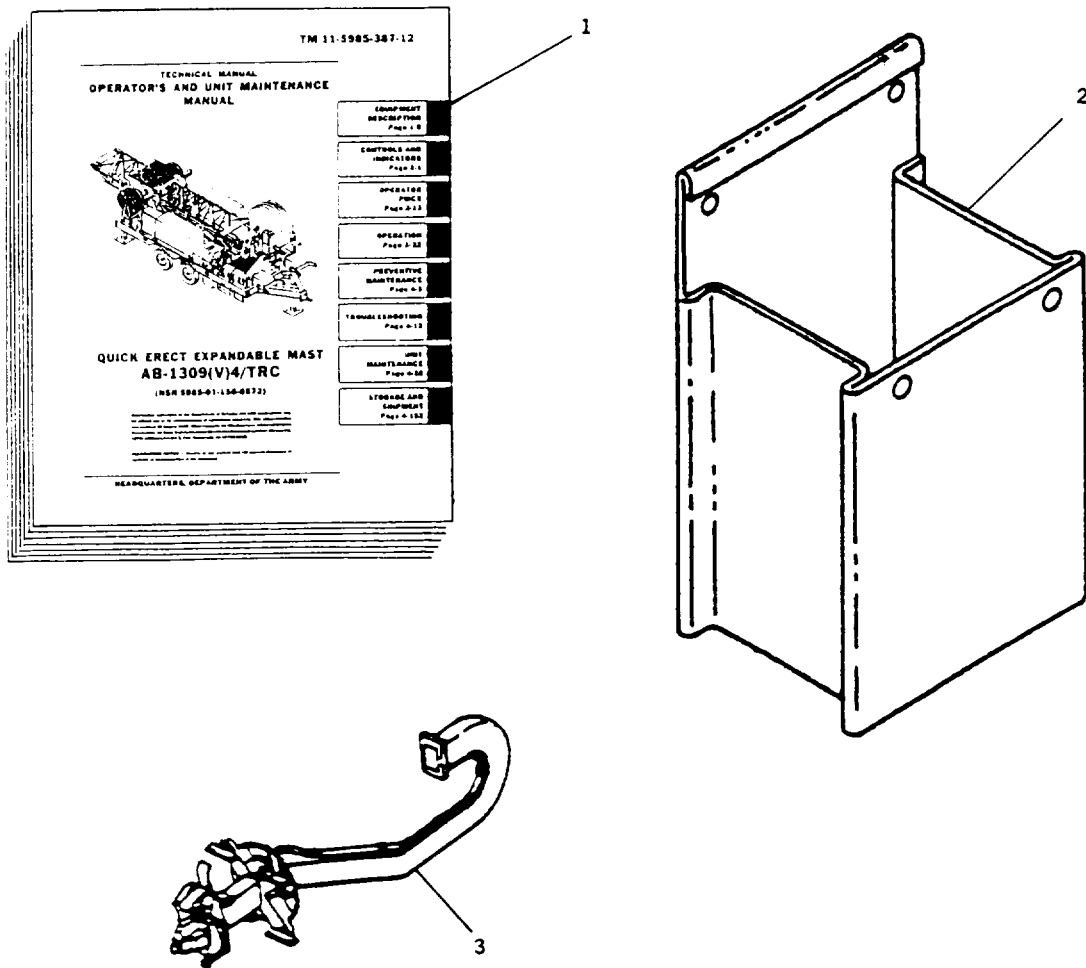
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | | Folding Shovel (80063) A3142893-1 | | EA | 1 |
| 2 | 7240-00-222-3088 | Fuel Can,5-Gallon (81902) 14196P1 | | EA | 4 |
| 3 | 5120-00-439-8988 | Hex Key Set (80063) A3155638 | | EA | 1 |
| 4 | | Jerry Can Nylon Strap (39428) 8854T173 | | EA | 4 |
| 5 | | Lug Wrench Assy (80063) A3143843 | | EA | 1 |
| 6 | 5120-00-247-5177 | Needle Nose Pliers w/Cutter, 6 in. (80063) A3155645 | | EA | 1 |
| 7 | 5120-00-222-1499 | Nut Driver, 7/16 in. (80063) A3155642 | | EA | 1 |
| 8 | 5120-00-293-0375 | Nut Driver, 1/2 in. (80063) A3155649 | | EA | 1 |
| 9 | 5120-00-294-9514 | Nut Driver, 9/16 in. (80063) A3155650 | | EA | 1 |

Section III. BASIC ISSUE ITEMS - Continued



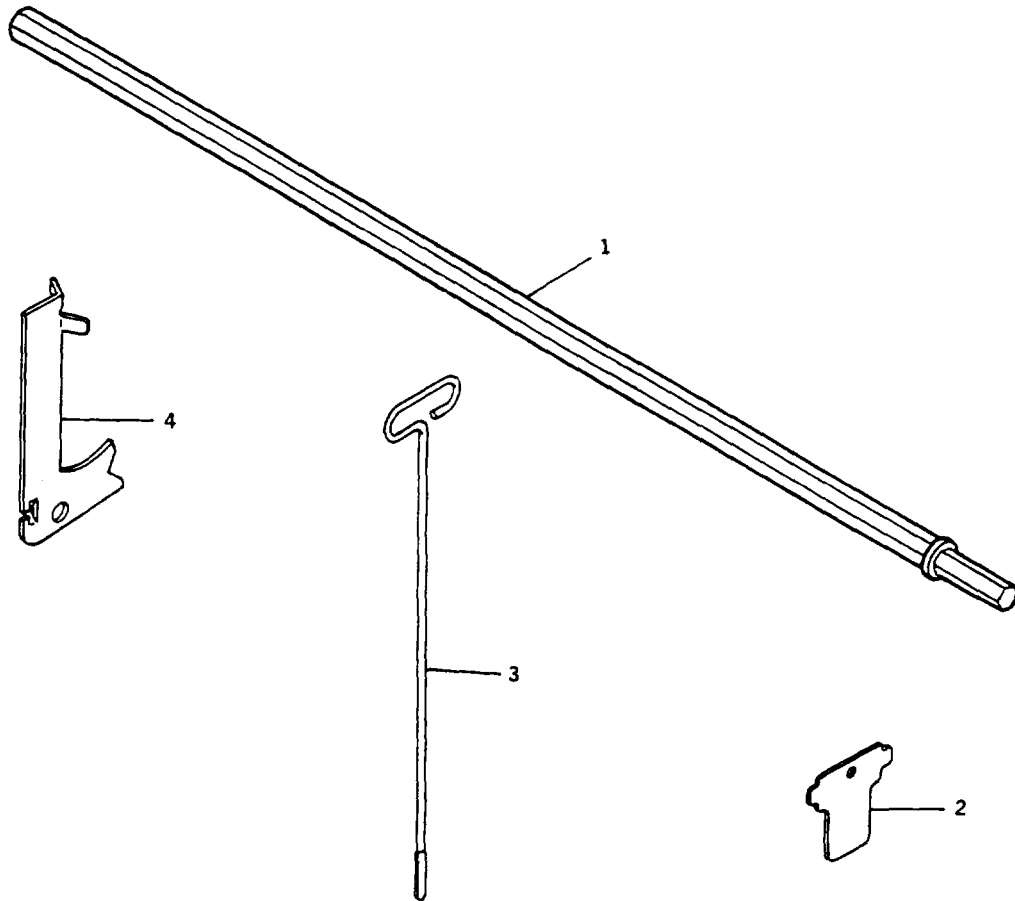
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|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | | Open/Box Wrench Set (80063) A3155643 | | EA | 1 |
| 2 | | Sledge Hammer, 8 lb (80063) A3142881-1 | | EA | 1 |
| 3 | | Socket Set, 12 Piece (80063) A3155641 | | EA | 1 |
| 4 | 5995-01-240-0580 | Special Purpose Elect- rical Cable Assy (AZ-EL) (56996) B4036644 | | EA | 1 |

Section III. BASIC ISSUE ITEMS - Continued



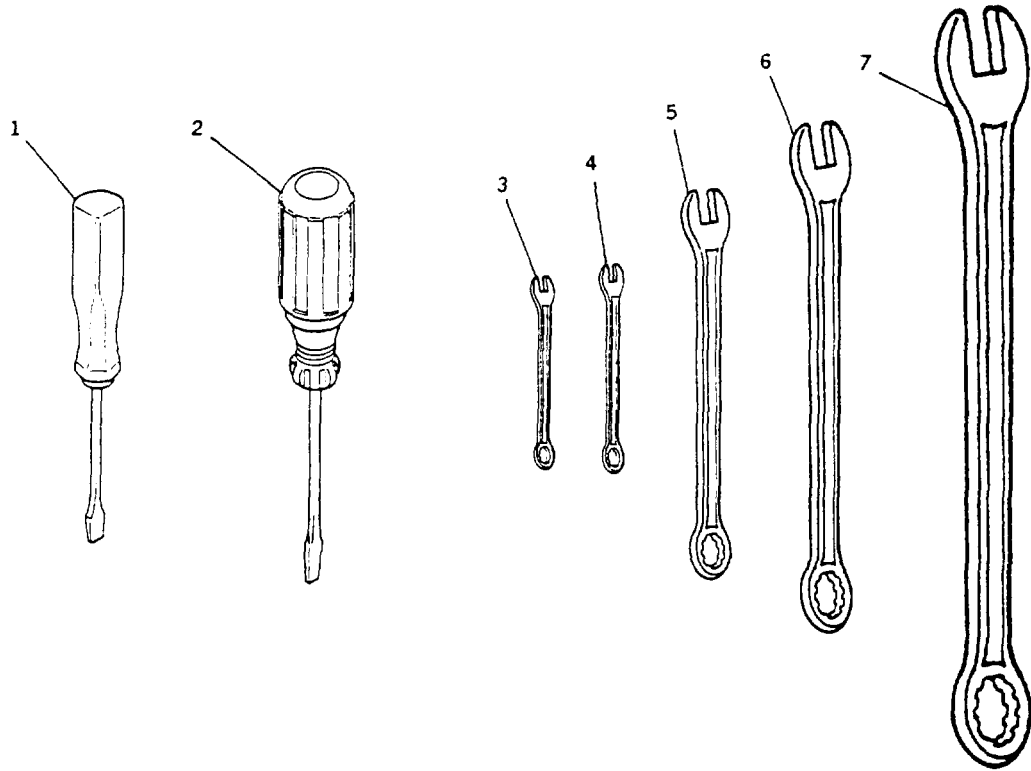
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Technical Manual TM 11-5985-387-12 | | EA | 1 |
| 2 | | Tool Bag, Green (80063) A3144122 | | EA | 1 |
| 3 | 5985-00-168-4274 | Waveguide Horn (80063) SM-E-561641 | | EA | 3 |

Section III. BASIC ISSUE ITEMS - Continued



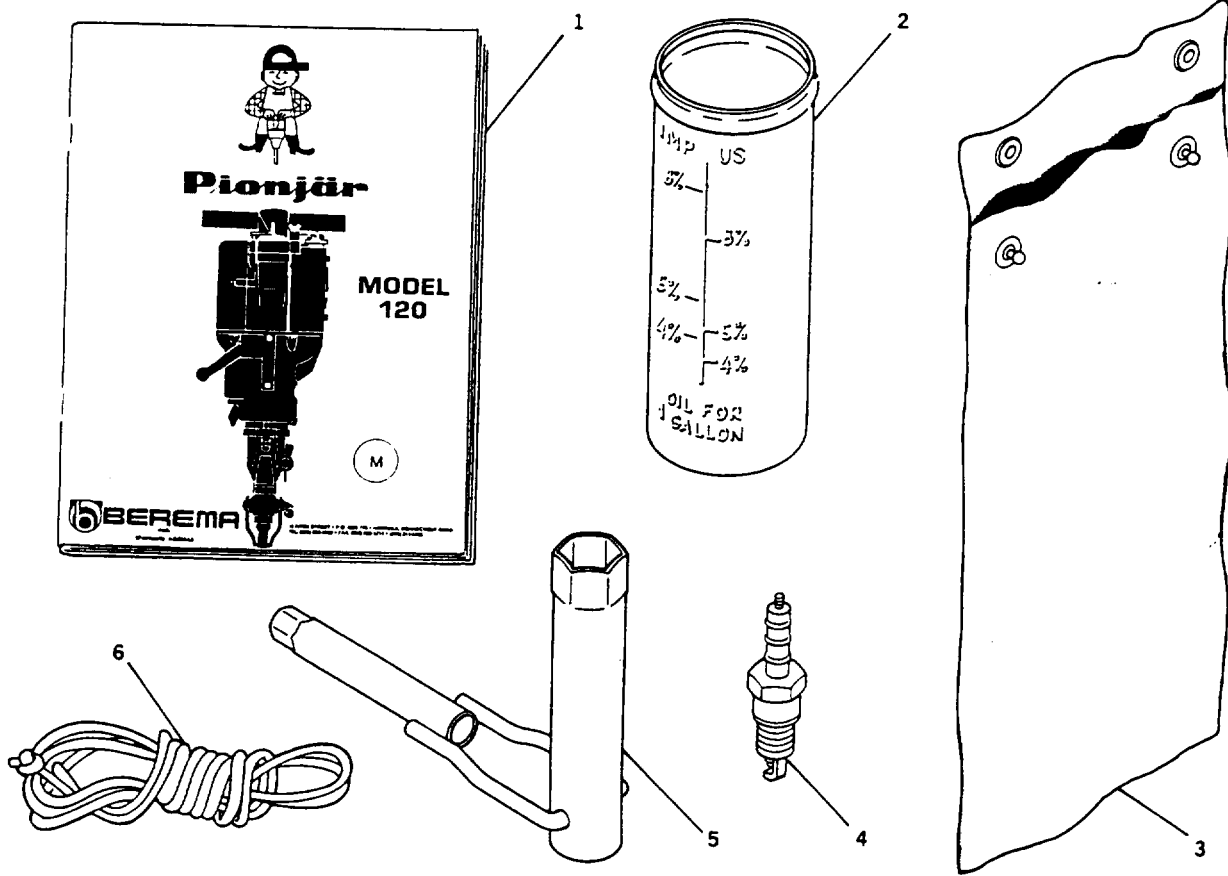
| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | | <u>Pioniar Accessories Consisting of:</u> Anchor Drive Rod (80063) A3155654 | | EA | 1 |
| 2 | | Chuck Gage, 7/8 in. (32982) 9238-2707-90 | | EA | 1 |
| 3 | | Cleaning Needle (32982) 9238-2701-00 | | EA | 1 |
| 4 | | Drill Gage (32982) 9238-2708-10 | | EA | 1 |

Section III. BASIC ISSUE ITEMS - Continued



| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|---|-------------------|------------|--------------------|
| 1 | | Flat-Tip Screwdriver 1/8 in. x 2-1/4 in. (32982) 9238-9800-01 | | EA | 1 |
| 2 | | Flat-Tip Screwdriver 1/4 in. x 3-1/8 in. (32982) 9238-2718-00 | | EA | 1 |
| 3 | | Open/Box Wrench, 7 mm (32982) 9238-9800-11 | | EA | 1 |
| 4 | | Open/Box Wrench, 8 mm (32982) 9238-9800-21 | | EA | 1 |
| 5 | | Open/Box Wrench, 10 mm (32982) 9238-9800-31 | | EA | 1 |
| 6 | | Open/Box Wrench, 13 mm (32982) 9238-9800-41 | | EA | 1 |
| 7 | | Open/Box Wrench, 21 mm (32982) 9238-9800-51 | | EA | 1 |

Section III. BASIC ISSUE ITEMS - Continued



| (1) Illus Number | (2) National Stock Number | (3) Description, (Cagec) And Part Number | Usable On Code | (4) U/M | (5) Qty Reqd |
|------------------------|---------------------------------|--|-------------------|------------|--------------------|
| 1 | | Pionjar Commercial Manual (N/A) | | EA | 1 |
| 2 | | Plastic Liquid Measure (32982) 9238-2718-40 | | EA | 1 |
| 3 | | Plastic Tool Bag (32982) 9238-2710-20 | | EA | 1 |
| 4 | | Spark Plug (Spare) (32982) 9238-2606-70 | | EA | 1 |
| 5 | | Special Wrench, 10/21 mm (32982) 9238-2714-00 | | EA | 1 |
| 6 | | Starter Rope (Spare) (32982) 9238-2405-10 | | EA | 1 |

APPENDIX D

ADDITIONAL AUTHORIZATION LIST

(NOT APPLICABLE)

D-1/D-2 Blank

APPENDIX E

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists expendable/durable supplies and materials you will need to operate and maintain the Quick Erect Expandable Mast AB-1309.

This listing is for informational purposes only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. EXPLANATION OF COLUMNS

- a. Column 1 Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material.
- b. Column 2 Level. This column identifies the lowest level of maintenance that requires the listed item.

C - Operator/Crew
O - Unit Maintenance
F - Direct Support Maintenance
H - General Support Maintenance
- c. Column 3 National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.
- d. Column 4 Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Commercial and Government Entity (CAGE) Code in parentheses followed by the part number.
- e. Column 5 Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation. If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

| (1) ITEM NUMBER | (2) LEVEL | (3) NATIONAL STOCK NUMBER | (4) DESCRIPTION | (5) U/M |
|-----------------------|--------------|------------------------------------|--|------------|
| 1 | C | | Sodium Chloride (Table Salt) | LB |
| 2 | C | | Lube Oil MIL-L-2104 SAE 40 | QT |
| 3 | C | | Gasoline | GAL |
| 4 | O | 9150-00-273-2389 | Lube Oil, General Purpose, VV-L-800 | QT |
| 5 | O | 9150-01-102-9455 | Brake Fluid, MIL-B-46176 | QT |
| 6 | O | 9150-00-190-0906 | Grease, MIL-G-10924 | LB |
| 7 | O | 9150-00-223-4134 | Hydraulic Fluid, MIL-H-5606 | GAL |
| 8 | O | 9150-01-124-3316 | Gear Oil (SAE 30), Mobil SHC GO-626, GO-629/634 | QT |
| 9 | O | 9150-01-232-6884 | Lubricant, Dry Lithium (X20) | QT |
| 10 | O | 9150-00-935-4017 | Grease, Low Temperature, MIL-G-23827A | LB |
| 11 | O | 5985-01-187-1791 | Seal Tape | ROLL |
| 12 | O | 8030-00-964-7537 | Sealant, Loctite Grade C | TUBE |
| 13 | O | 8030-01-143-5184 | Sealant, Loctite Grade AV | TUBE |
| 14 | O | 9150-00-189-6727 | Lube Oil MIL-L-2104, SAE 10 | QT |

APPENDIX F

STENCILS AND DATA PLATES

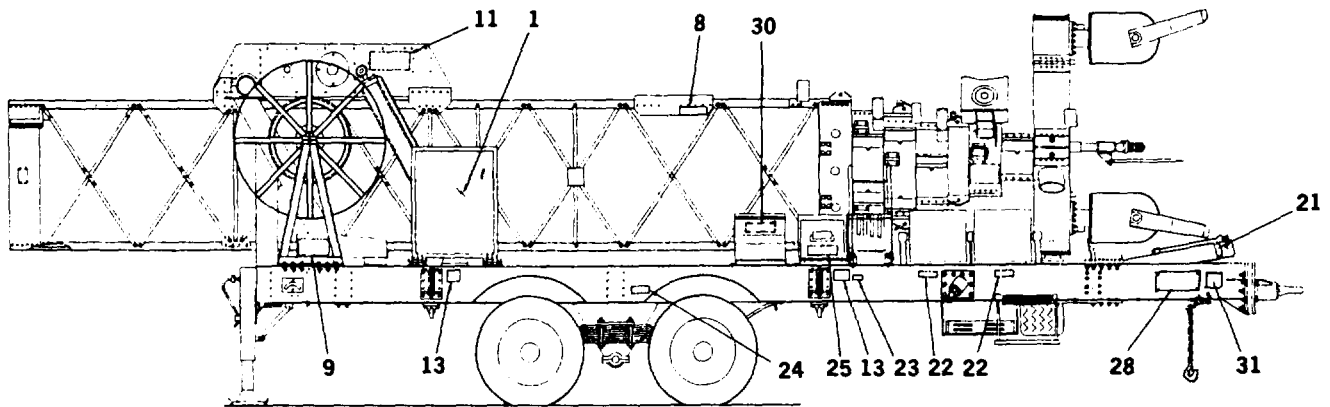
F-1. SCOPE

This appendix shows the location and content of stencils and data plates used on the AB-1309 Quick Erect Expandable Mast.

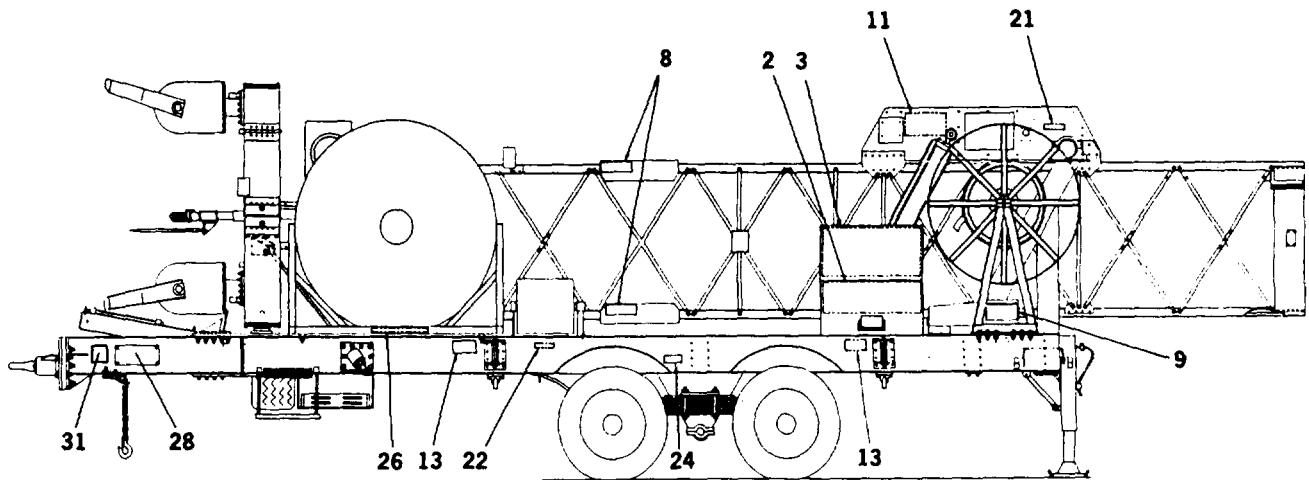
F-2. GENERAL

The illustrations below and on the next page show the location of stencils and data plates used on the AB-1309 Quick Erect Expandable Mast. The illustrations after the locator illustrations show the content of the stencils and data plates.

STENCIL AND DATE PLATE LOCATIONS

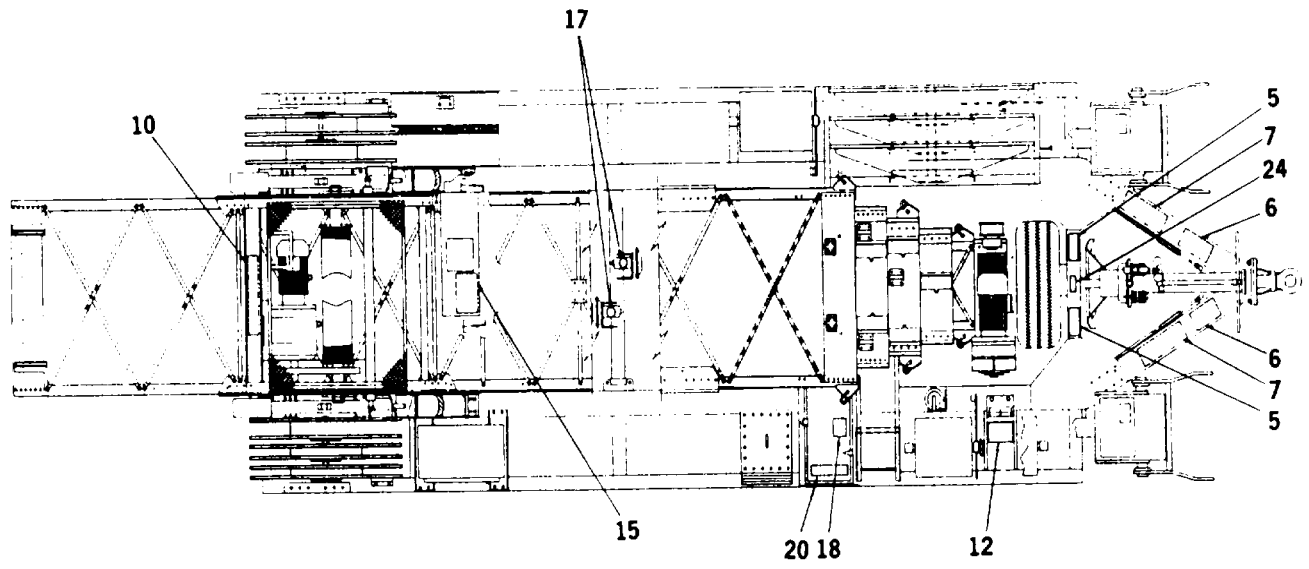


RIGHT SIDE VIEW

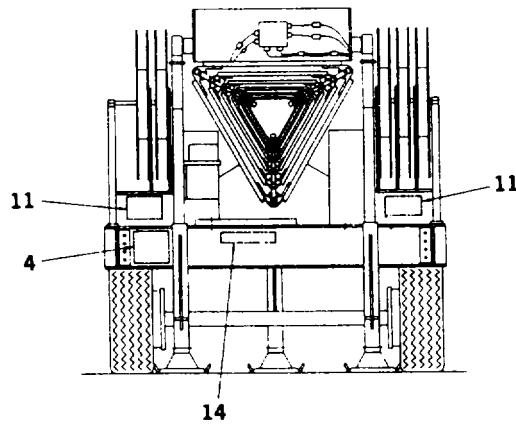


LEFT SIDE VIEW

STENCIL AND DATA PLATE LOCATIONS - Continued

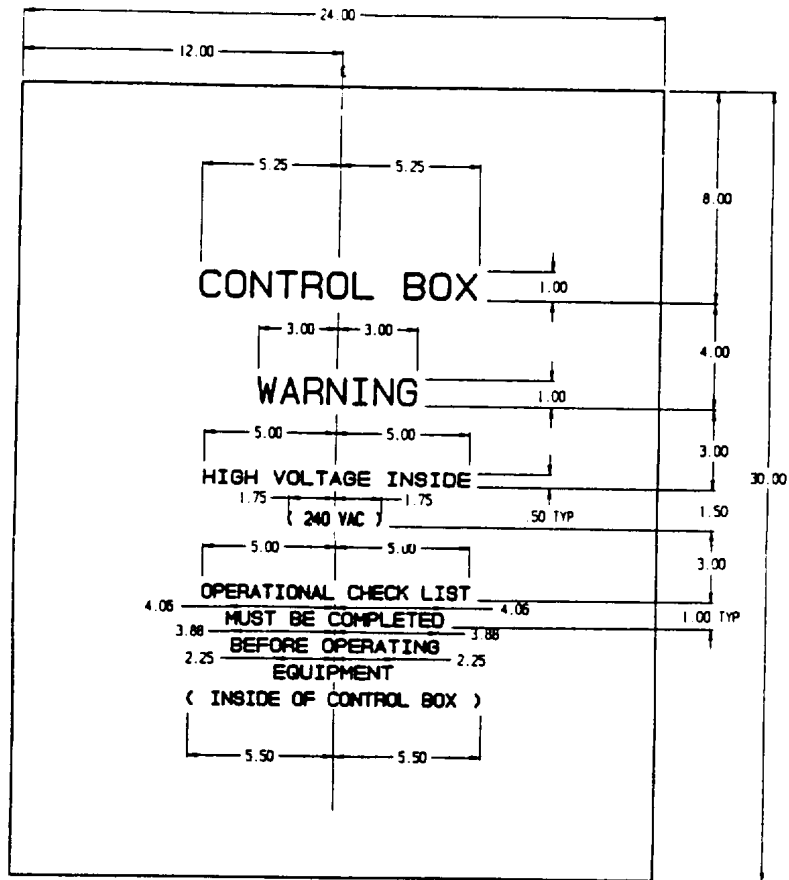


TOP VIEW

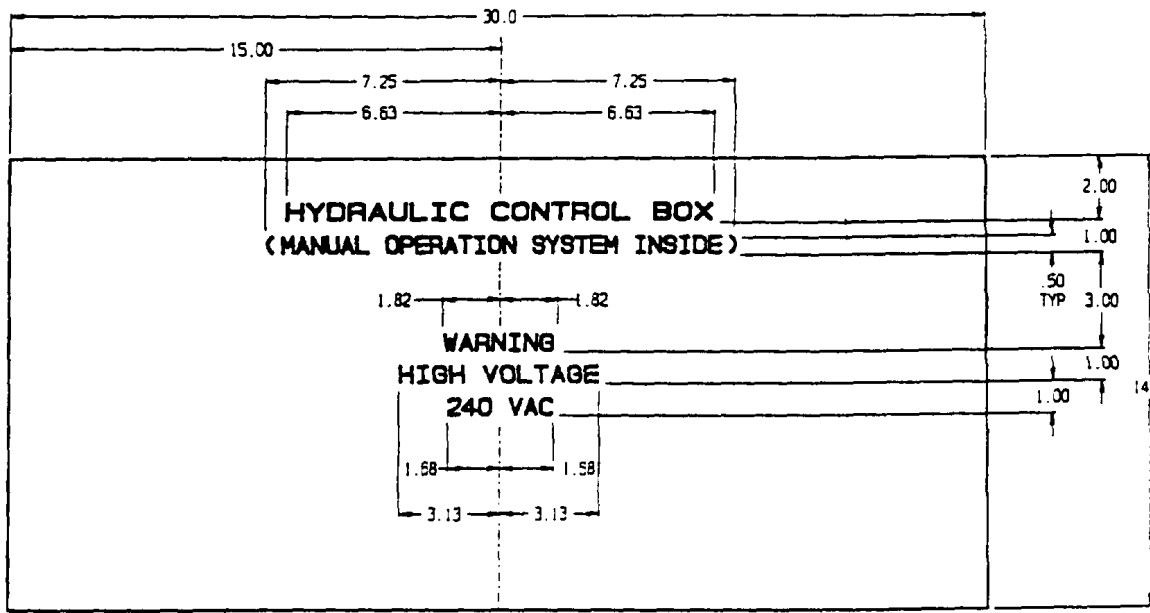


REAR VIEW

STENCILS AND DATA PLATES

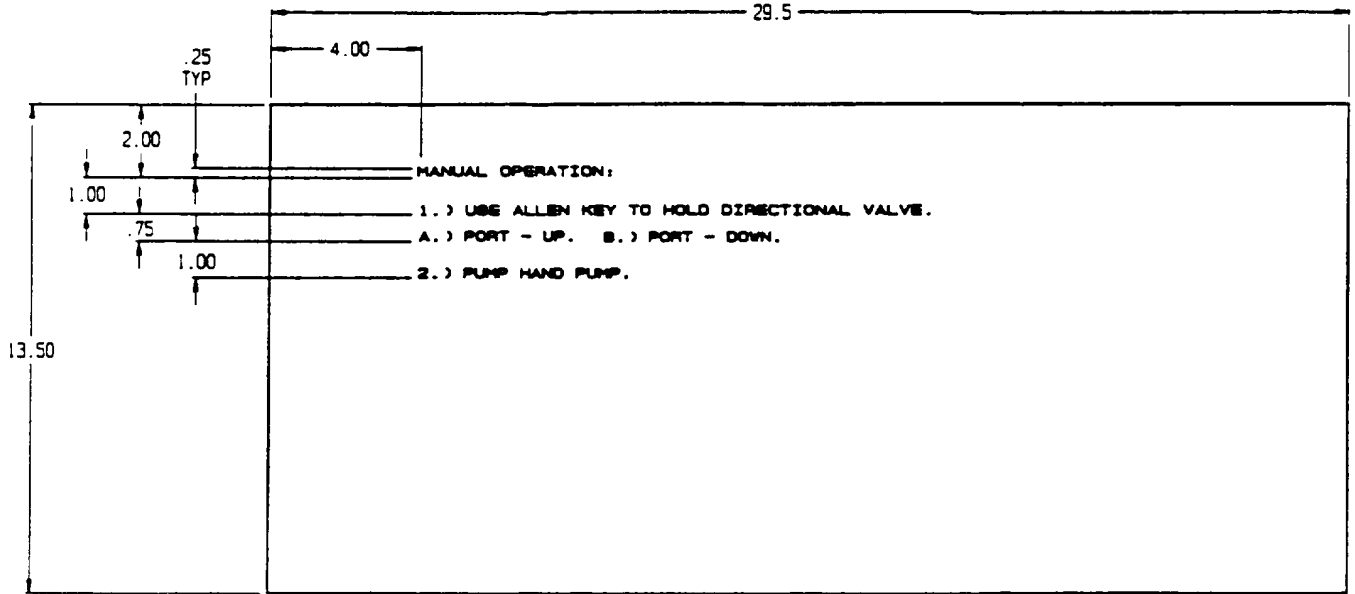


1. Control Box Stencil

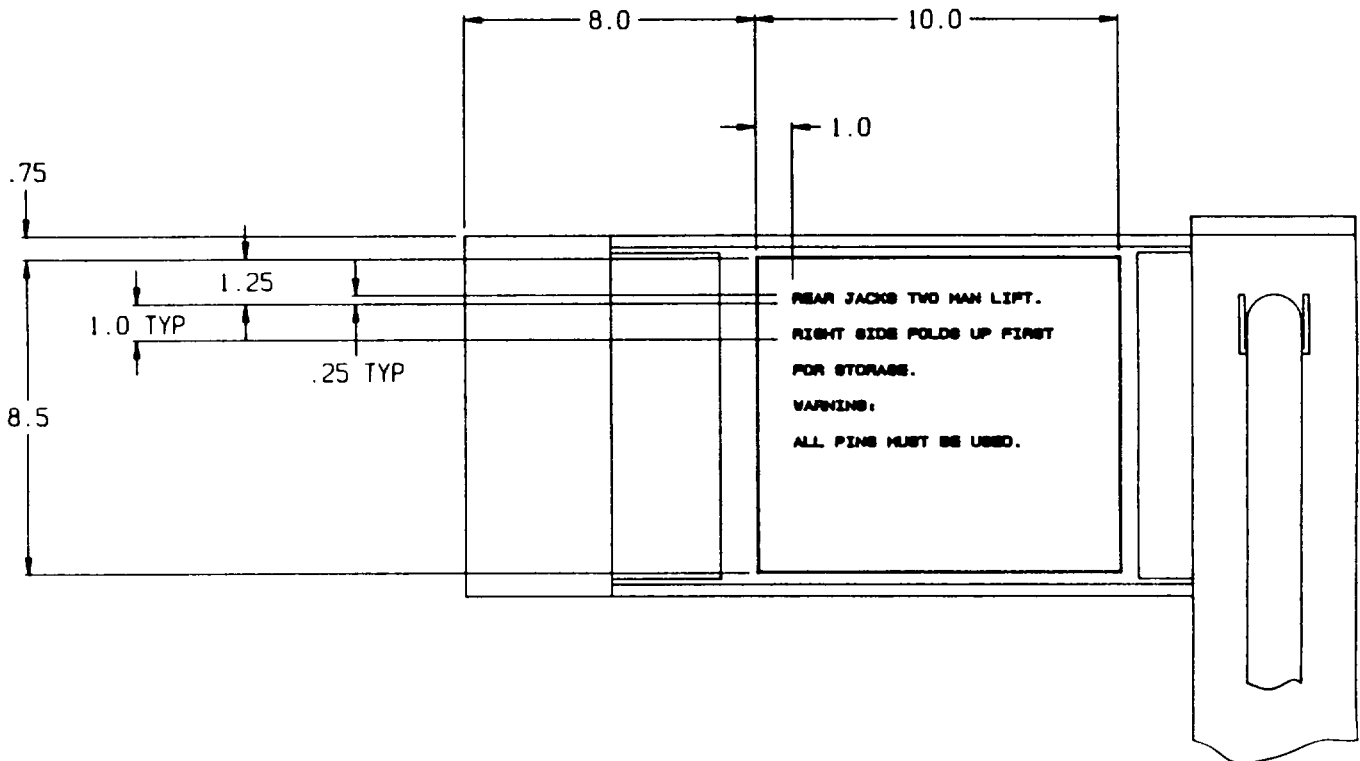


2. Hydraulic Control Box Stencil (Outside)

STENCILS AND DATA PLATES - Continued

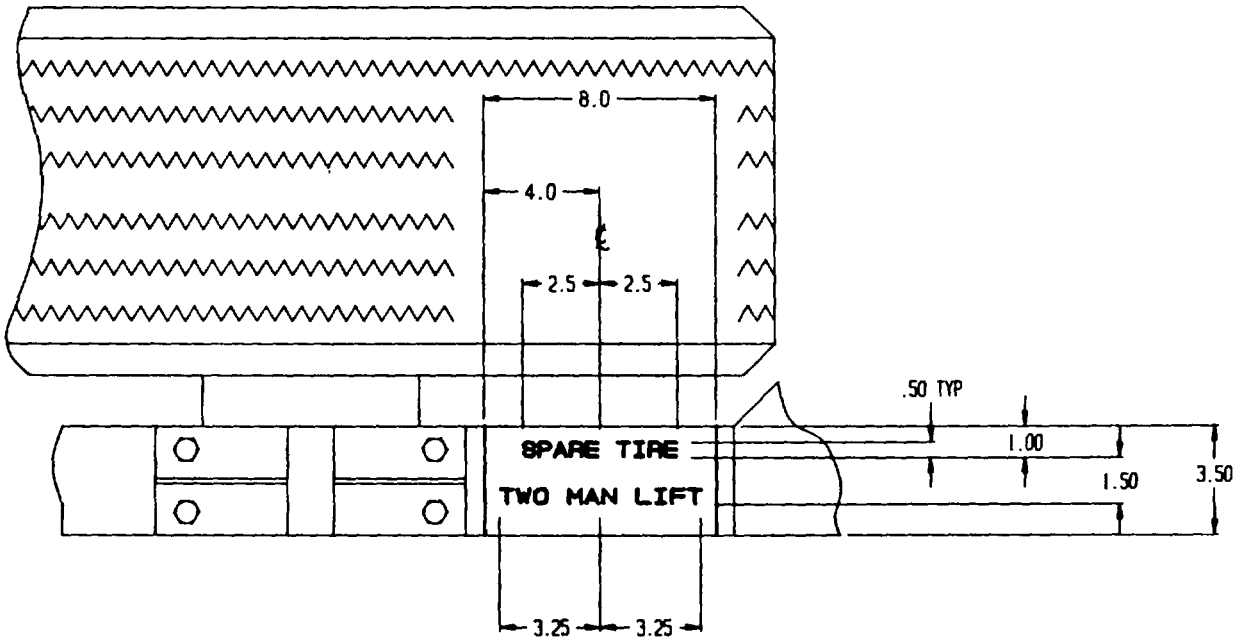


3. Hydraulic Control Box Stencil (Inside)

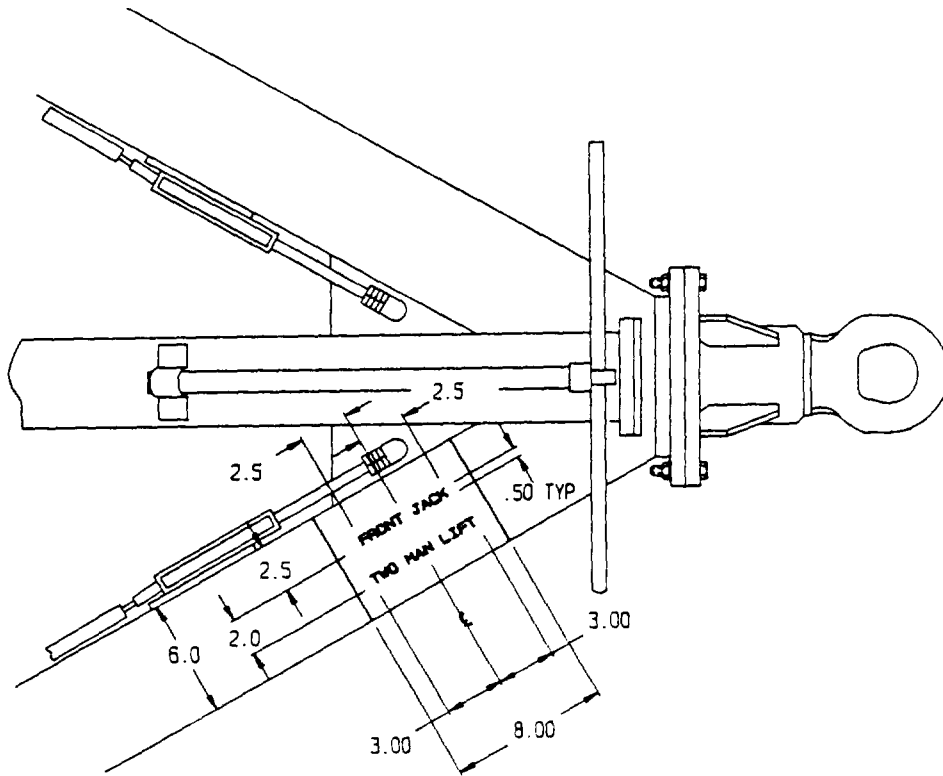


4. Rear Jacks Stencil

STENCILS AND DATA PLATES - Continued

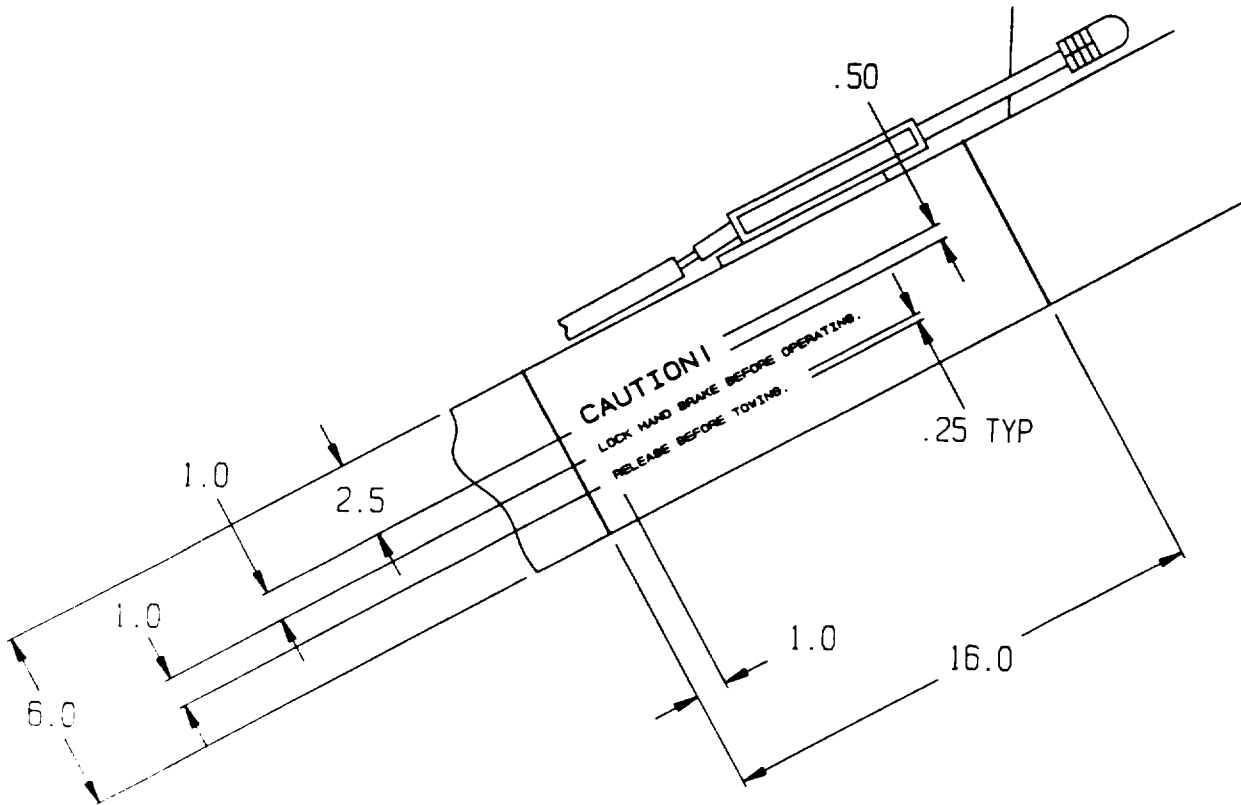


5. Spare Tire Stencil

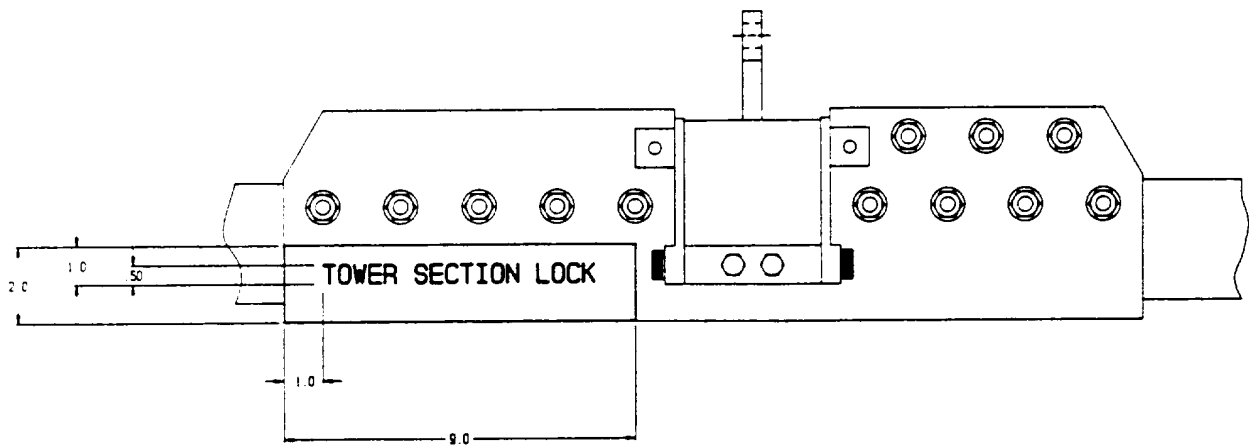


6. Front Jack Stencil

STENCILS AND DATA PLATES - Continued

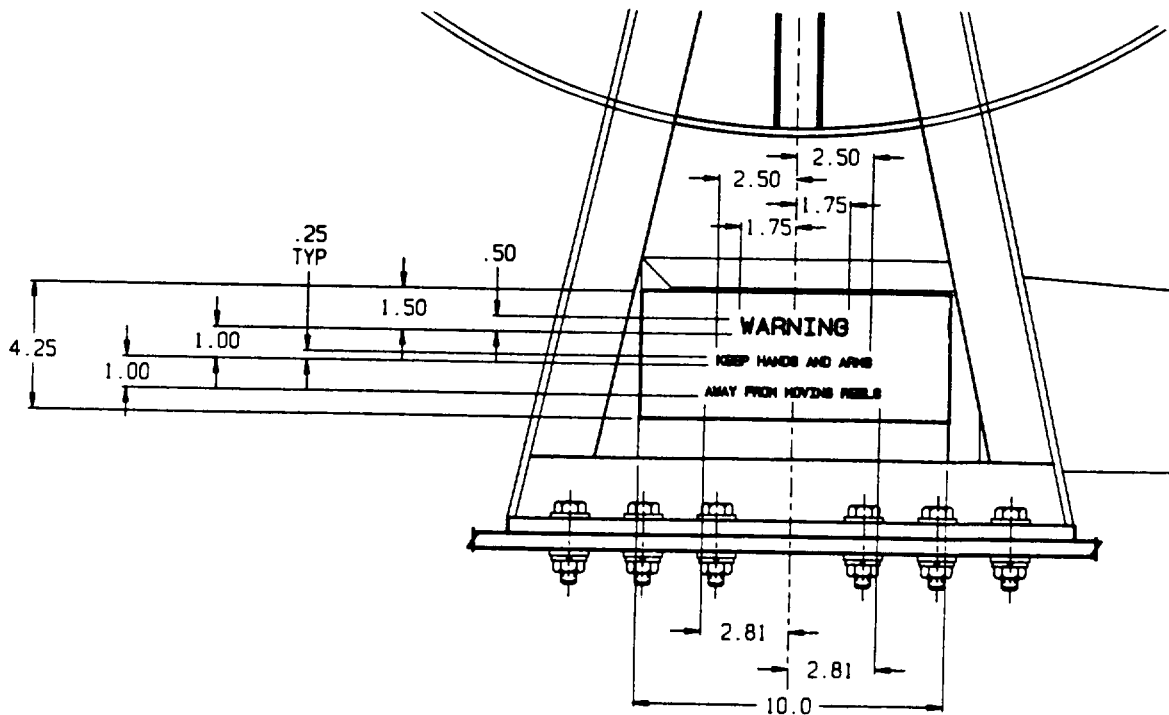


7. Hand Brake Stencil

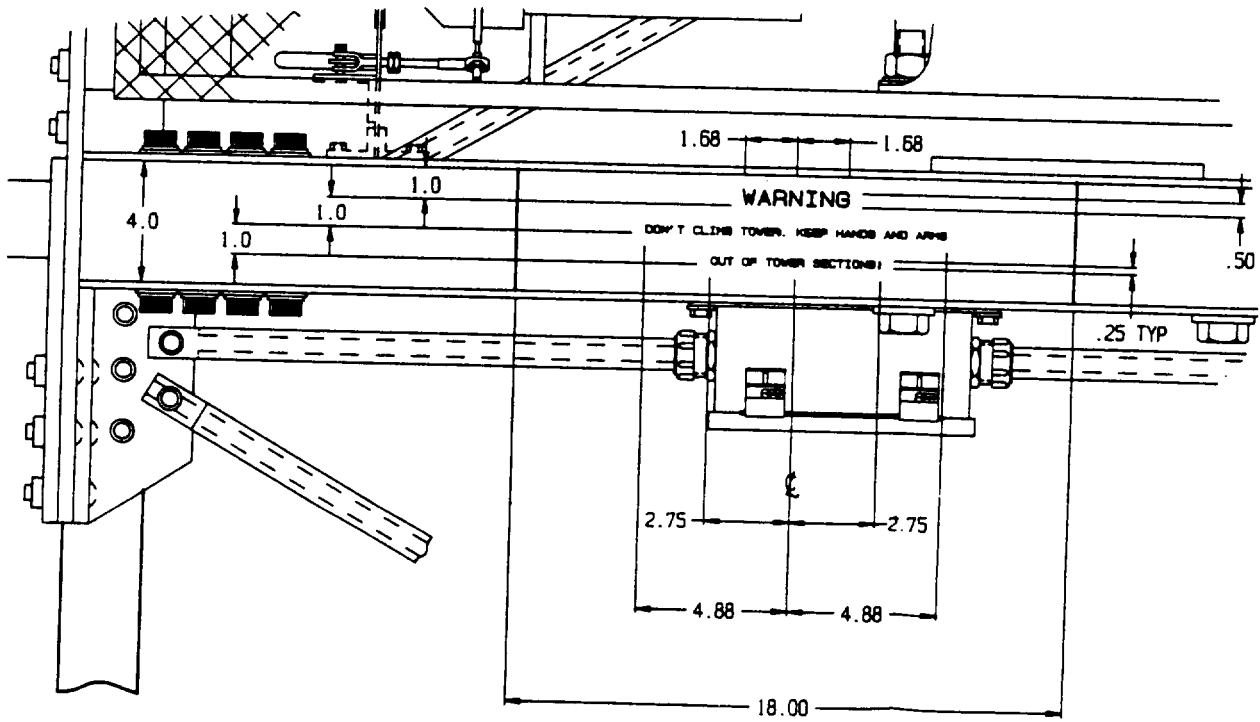


8. Tower Section Lock Stencil

STENCILS AND DATA PLATES - Continued

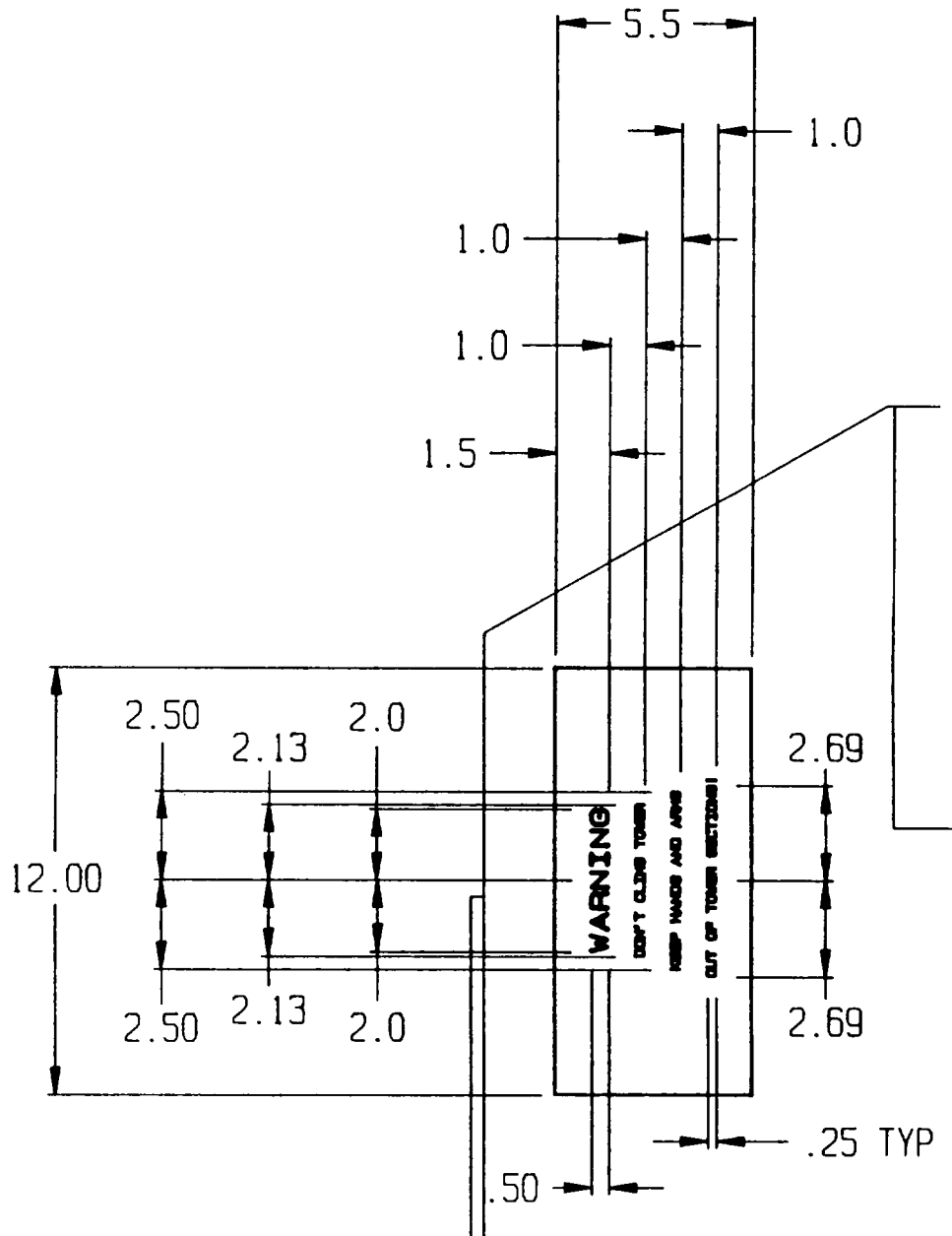


9. Reel Drive Warning Stencil



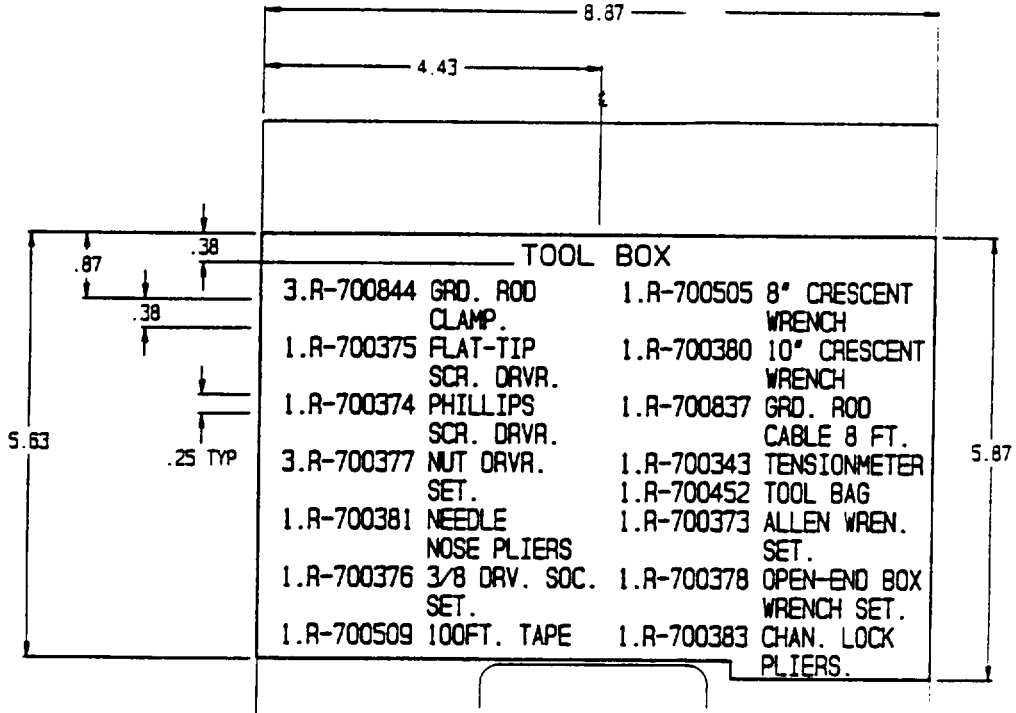
10. Tower Assembly Warning Stencil

STENCILS AND DATA PLATES - Continued

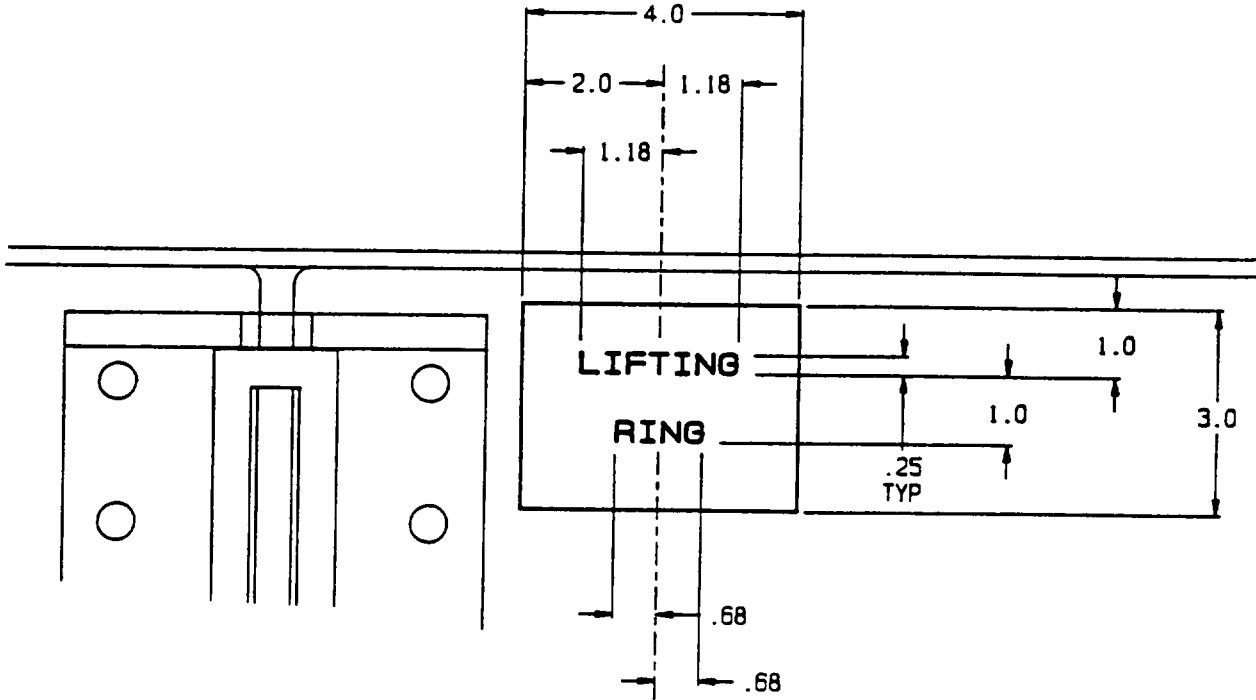


11. Truss Assembly Warning Stencil

STENCILS AND DATA PLATES - Continued

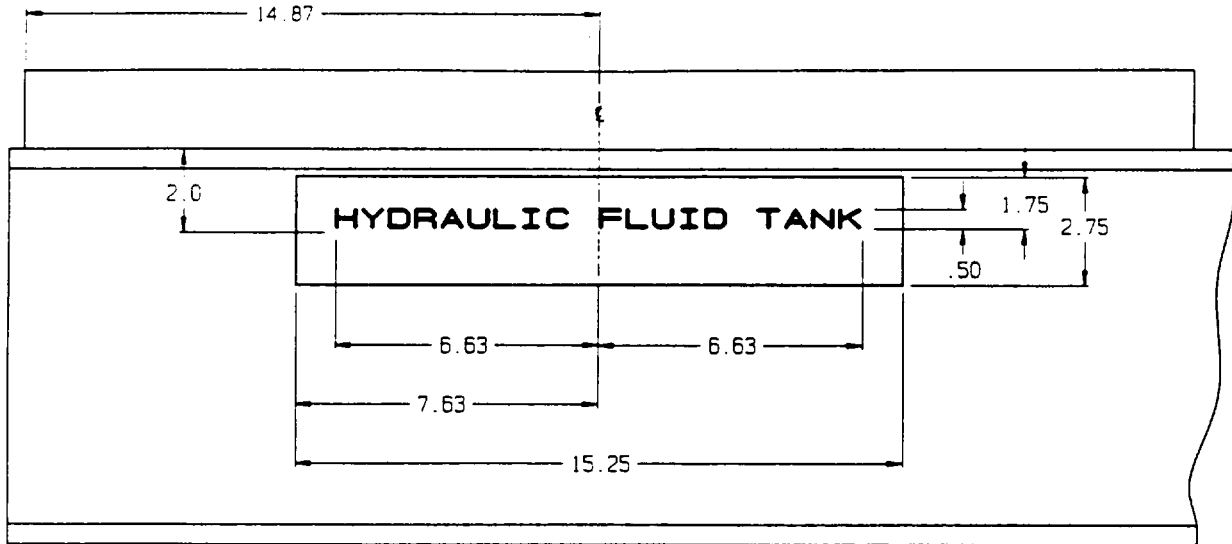


12. Tool Box Stencil

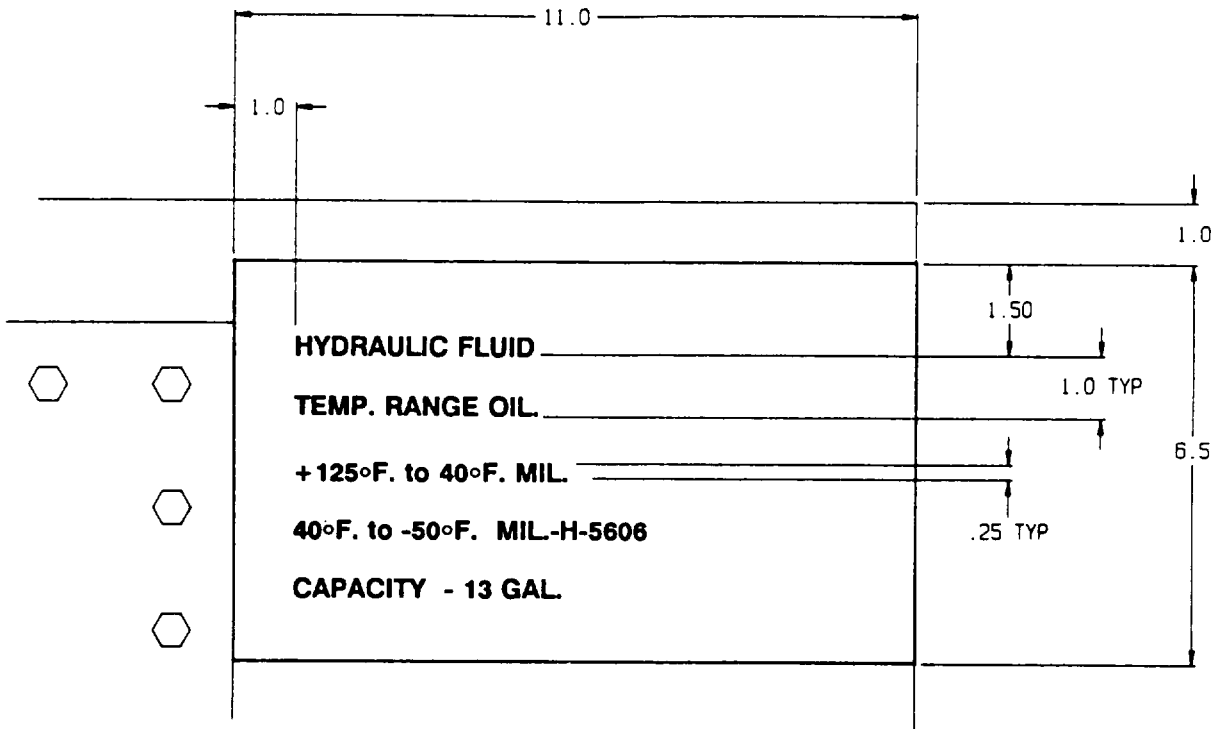


13. Lifting Ring Stencil

STENCILS AND DATA PLATES - Continued

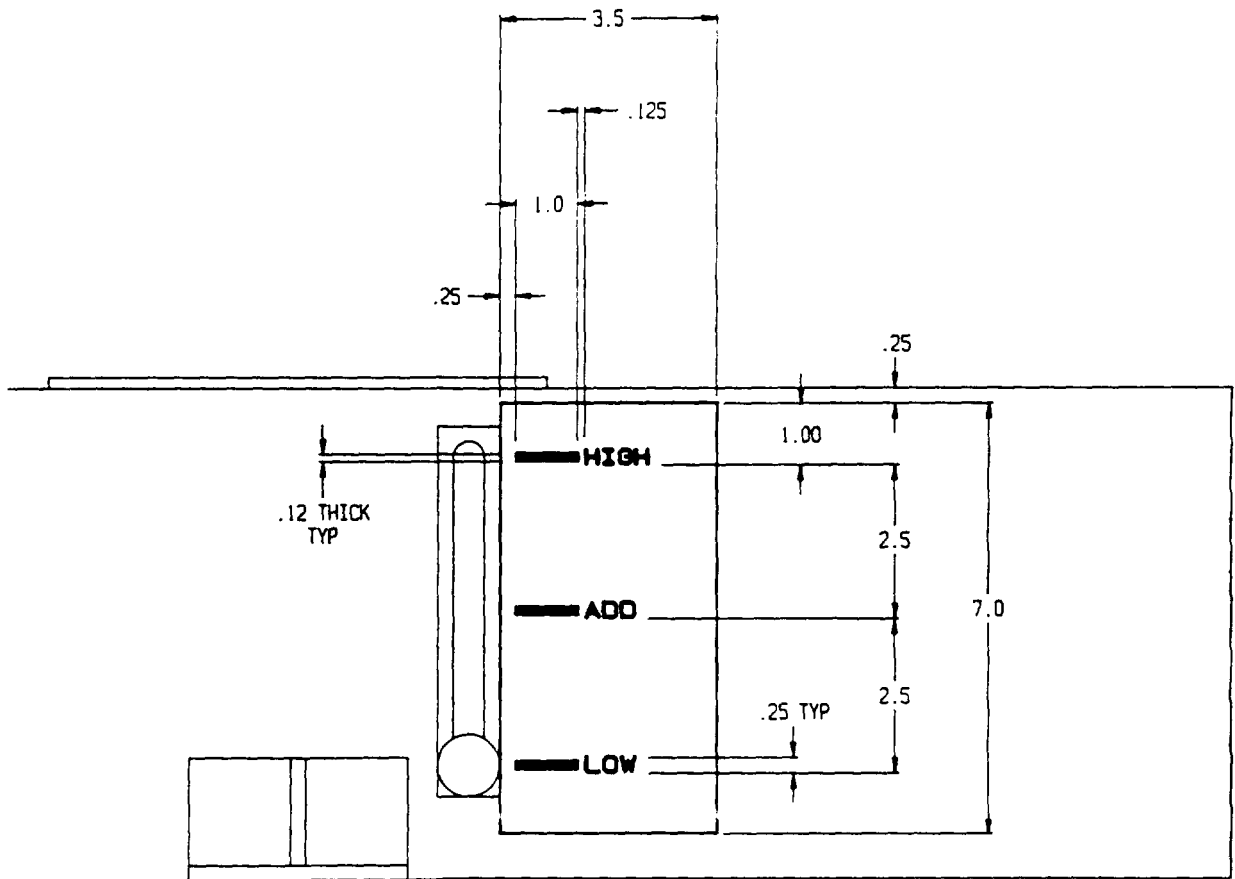


14. Hydraulic Fluid Tank Stencil



15. Hydraulic Fluid Tank Stencil (Top)

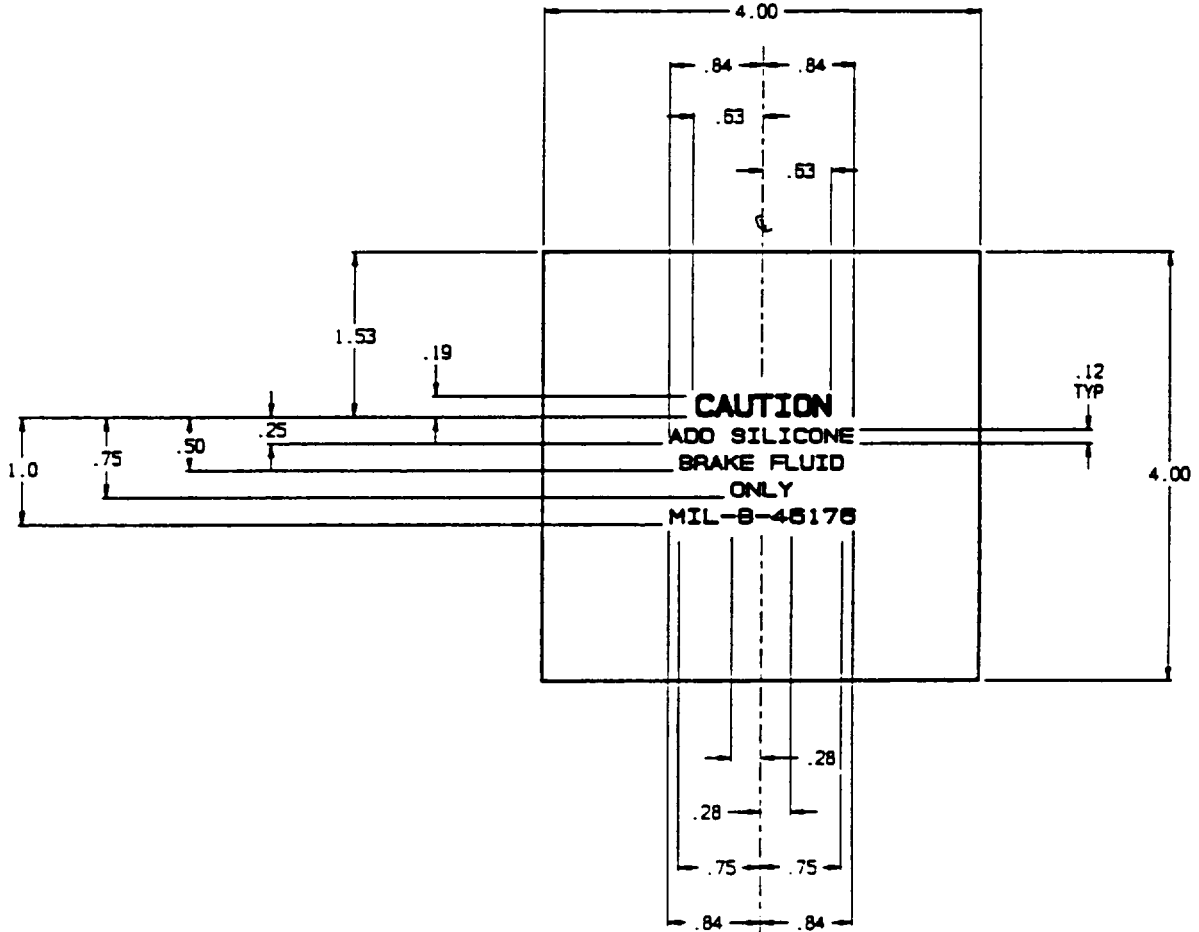
STENCILS AND DATA PLATES - Continued



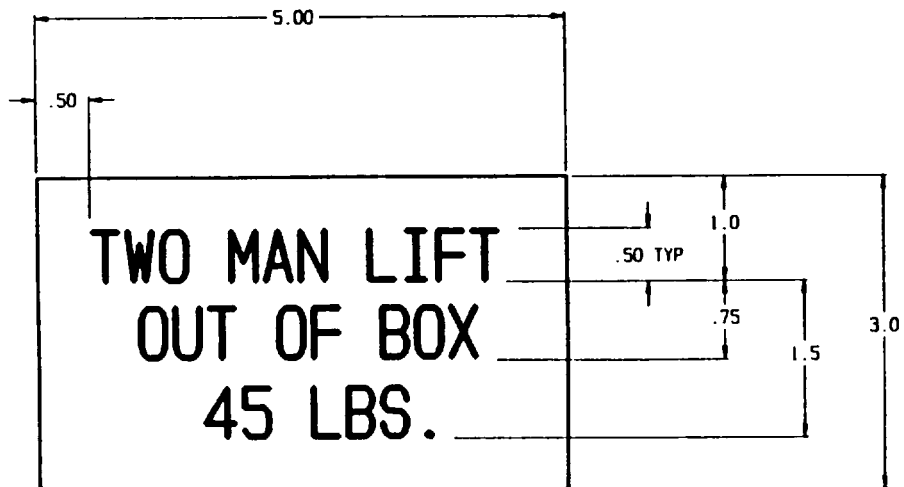
16. Hydraulic Fluid Tank Stencil (Front)

F-11

STENCILS AND DATA PLATES - Continued

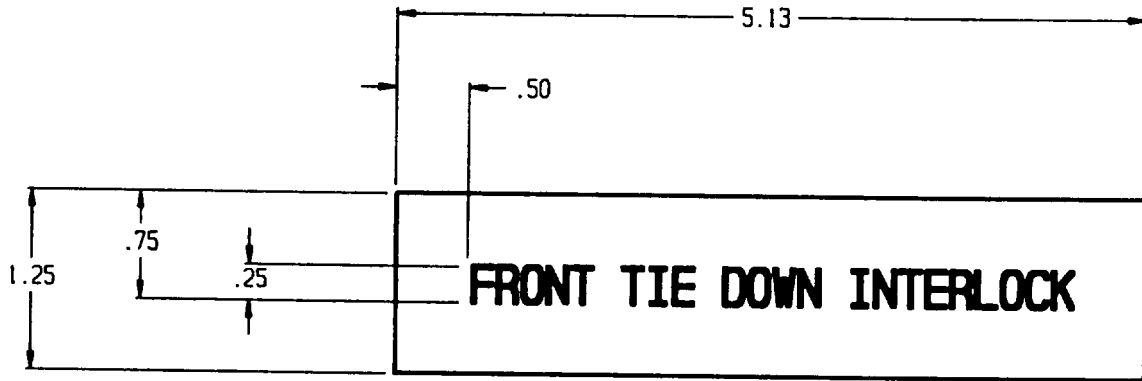


17. Brake Fluid Stencil

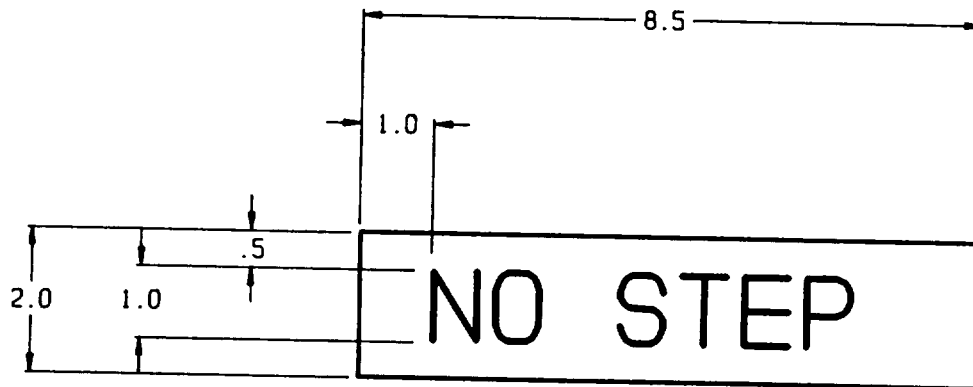


18. Pionjar Box Stencil

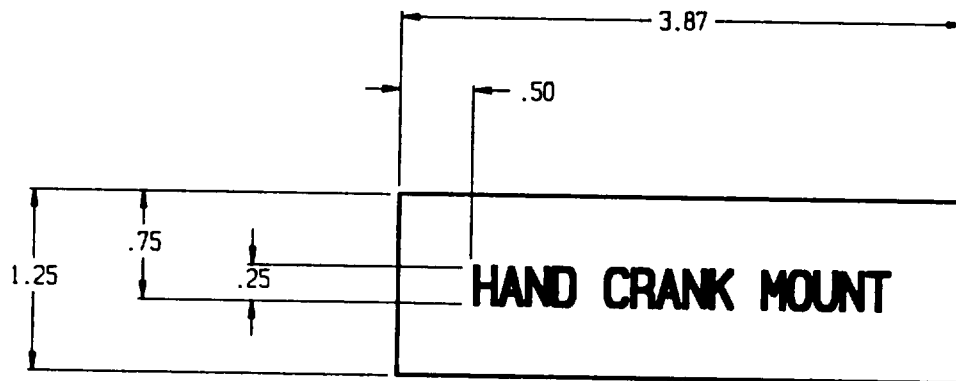
STENCILS AND DATA PLATES - Continued



19. Front Tie Down Interlock Stencil

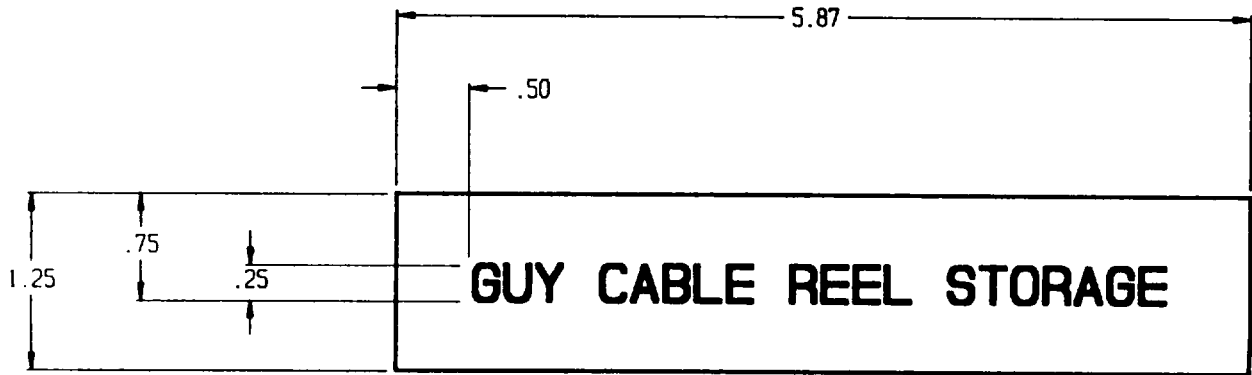


20. Pionjar Box Stencil (Top)

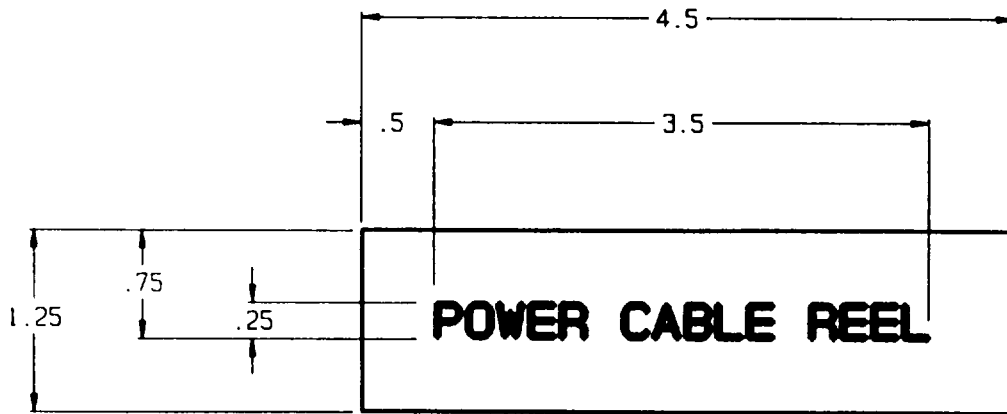


21. Hand Crank Mount Stencil

STENCILS AND DATA PLATES - Continued

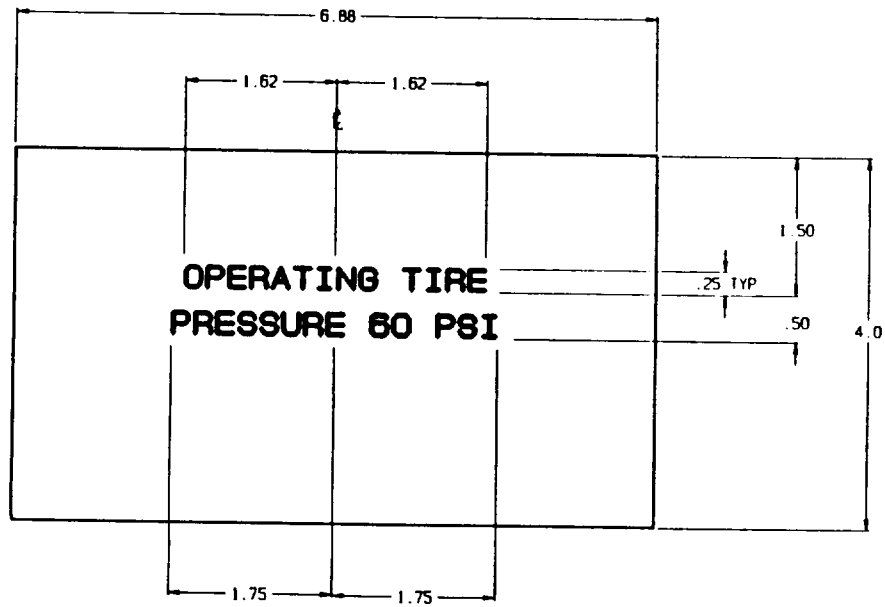


22. Guy Cable Reel Storage Stencil

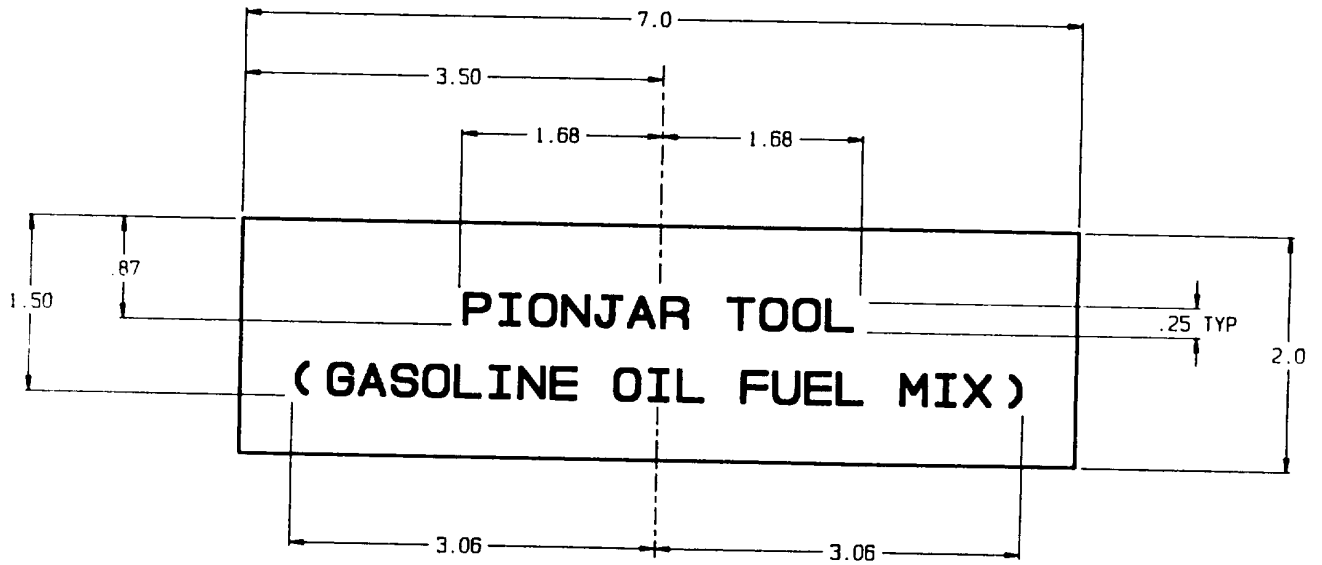


23. Power Cable Reel Stencil

STENCILS AND DATA PLATES - Continued

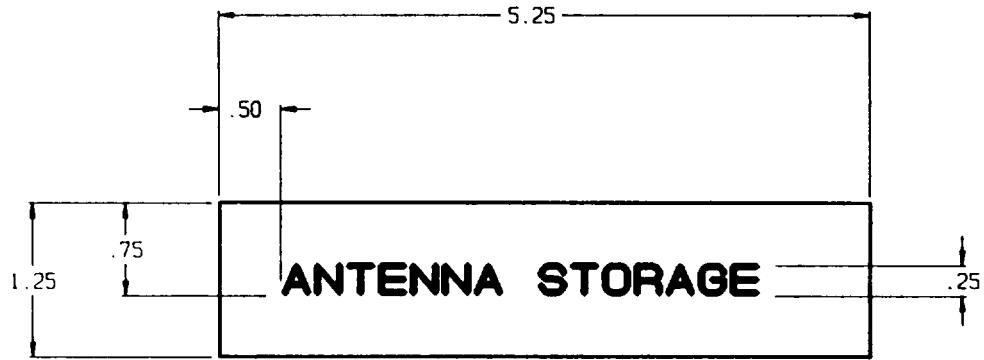


24. Tire Pressure Stencil

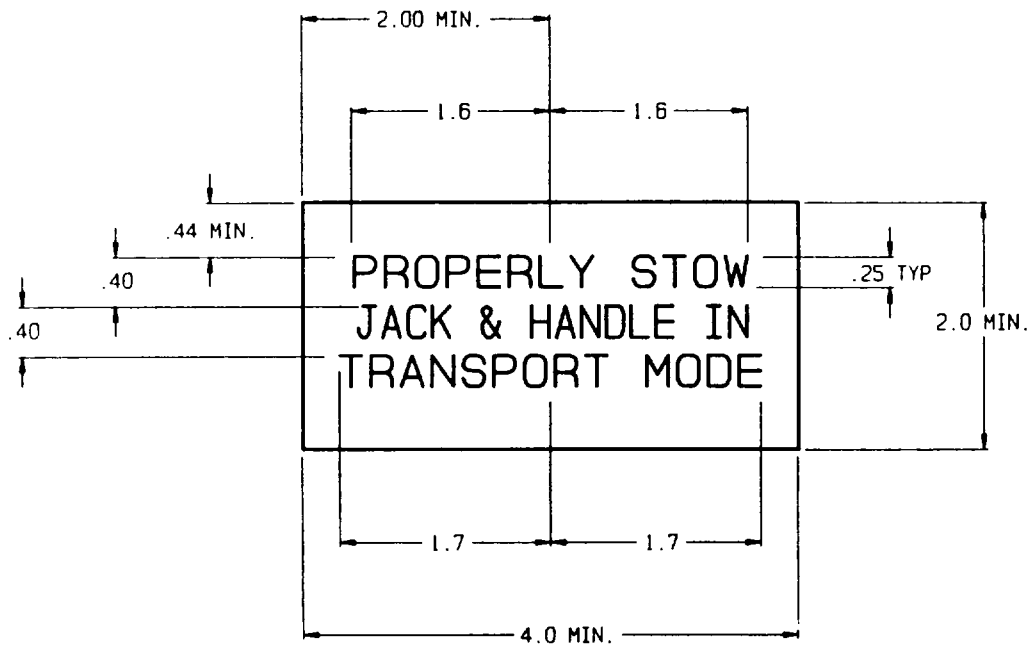


25. Pionjar Tool Stencil

STENCILS AND DATA PLATES - Continued

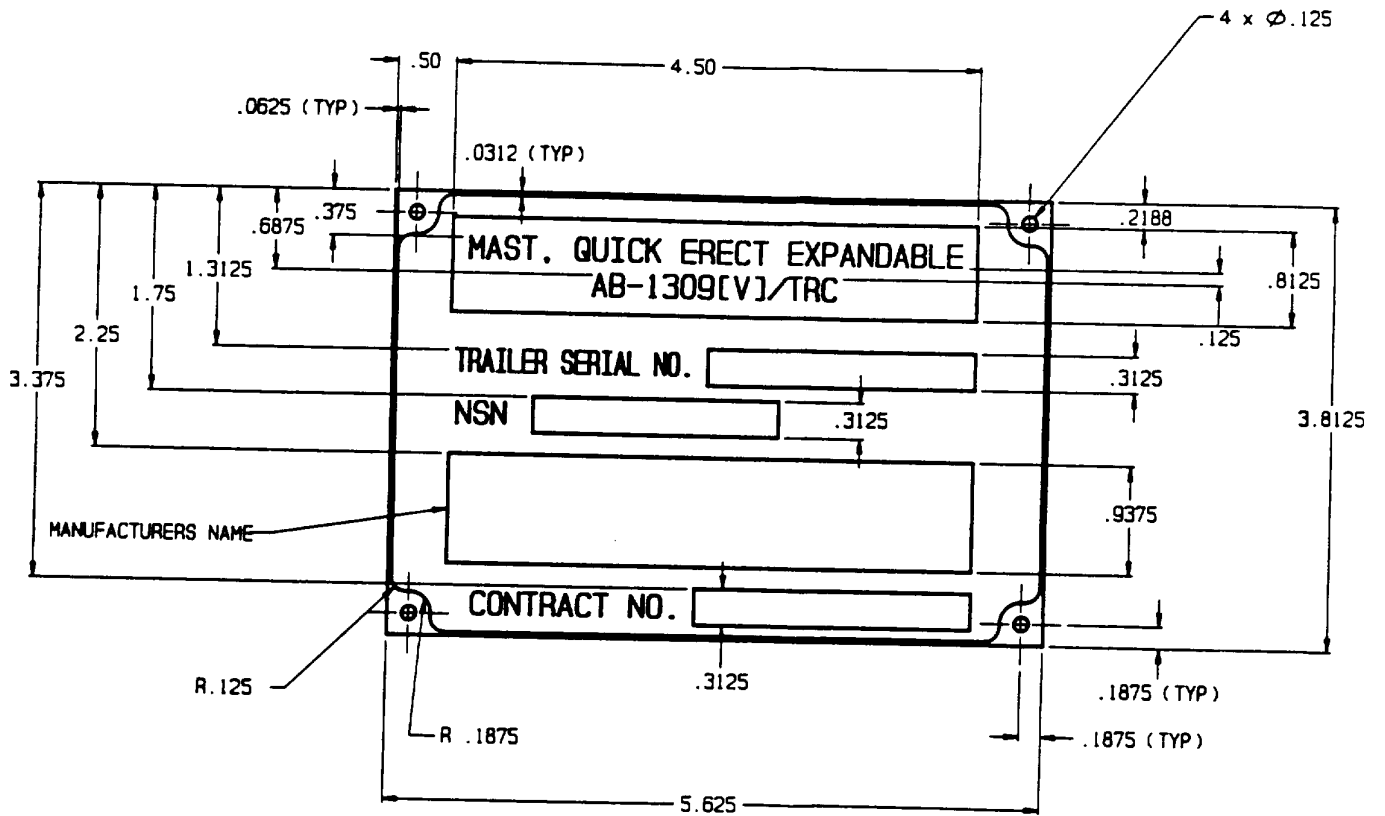


26. Antenna Storage Rack Stencil



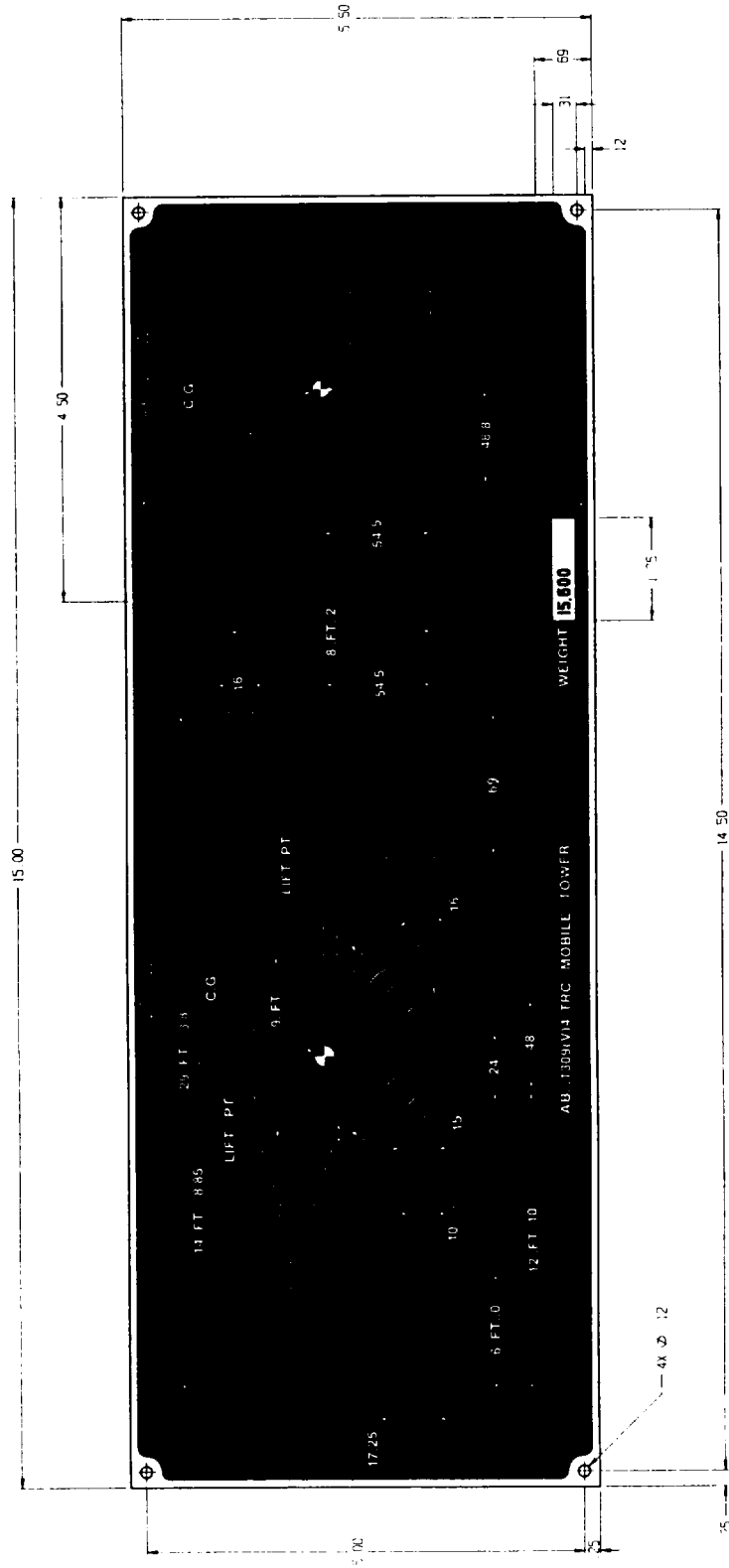
27. Jack Handle Stowage Stencil

STENCILS AND DATA PLATES - Continued



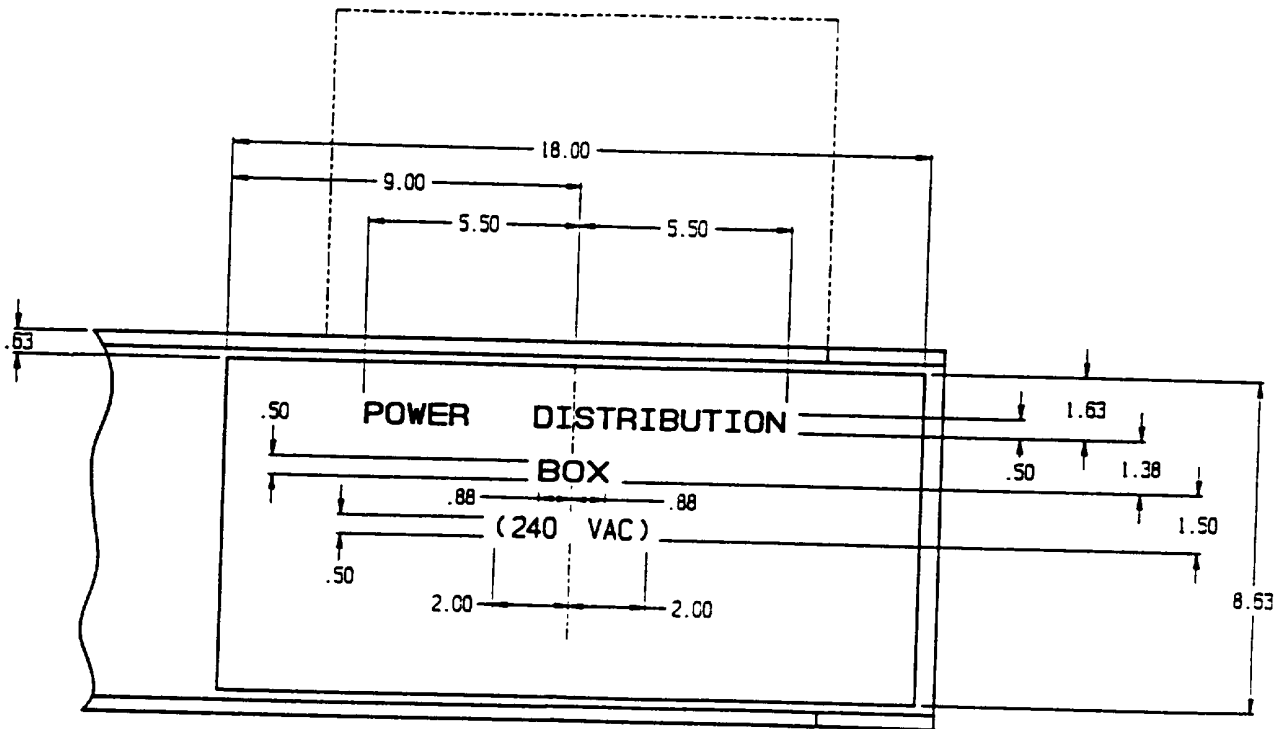
28. Trailer Name Plate

STENCILS AND DATA PLATES - Continued



29. Identification Plate (Center of Gravity)

STENCILS AND DATA PLATES - Continued



30. Power Distribution Box Stencil

STENCILS AND DATA PLATES - Continued

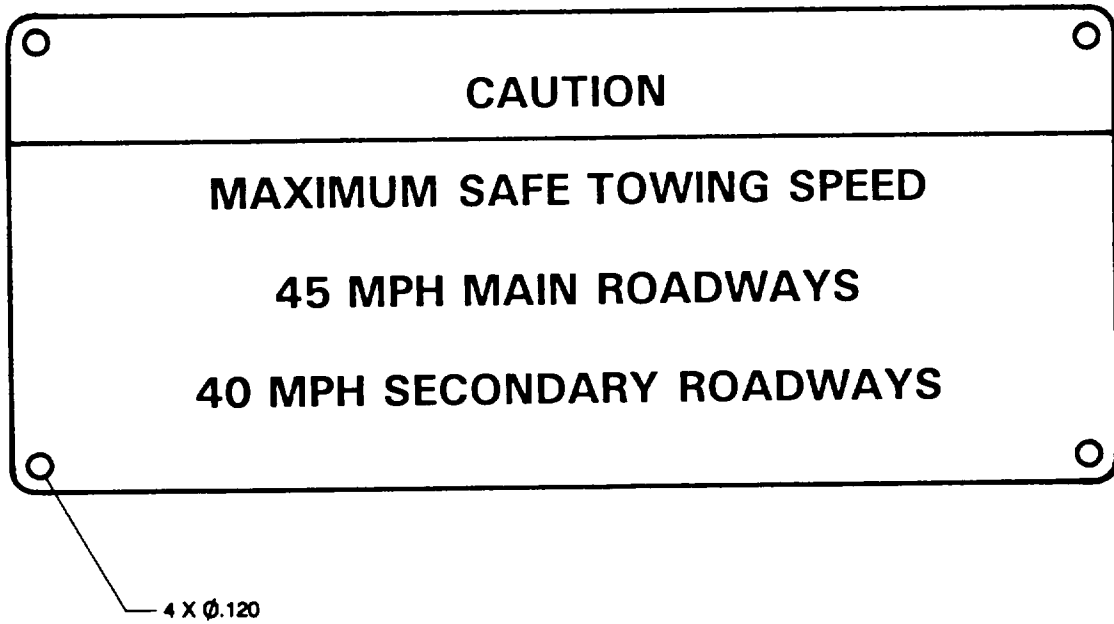


Figure 31. Towing Speed

GLOSSARY

| <u>Word</u> | <u>Meaning</u> |
|-------------|---|
| Balanced | A path in which two wires are used, each of the same amplitude with respect to ground, but of opposite polarity. |
| Energize | To activate or turn on. |
| Faults | Error or indication that something is wrong with the equipment. |
| Inhibit | To prevent an action from taking place. |
| Lay | The helical form taken by the wires in the strand and by the strands in the wire rope is characterized on the lay (or twist) of the strands or wire rope, respectively. |
| Left Lay | The wires or strands are the opposite direction as the threads on a right-hand screw. |
| Malfunction | Error or indication that something is wrong with the equipment. |
| Reeving | Cable routing from winch drums through tower sheaves to anchor points. |
| Right Lay | The wires or strands are the same direction as the threads on a right-hand screw. |
| Strand | Each group of wires helically twisted. |
| Symptom | An indication or happening. |

GLOSSARY-1/GLOSSARY-2 Blank

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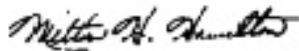
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