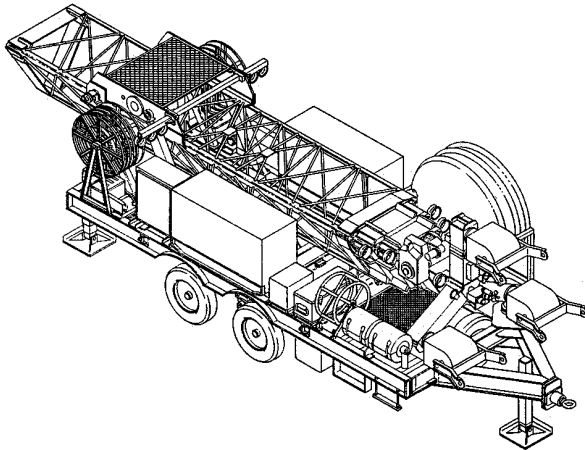

**TECHNICAL MANUAL
DIRECT SUPPORT AND GENERAL SUPPORT
MAINTENANCE MANUAL**

**EQUIPMENT
DESCRIPTION
AND DATA
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**DIRECT SUPPORT
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**QUICK ERECT EXPANDABLE MAST
AB- 1309(V)4/TRC**

(NSN 5985-1-156-0572) (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

WARNINGS

- Never operate the generator or tower 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.
- 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 electrical connections or adjusting components near electrical power.
- Never climb on the tower. Use cribbing/ platform(s) that have been safety approved to perform maintenance tasks.
- Turn off all equipment power before using degreaser/solvent to avoid fire. Provide adequate ventilation while using cleaning solvents. Avoid prolonged breathing of fumes and vapor to avoid asphyxiation. Do not use solvent near heat or open flames; the products decomposed are toxic and irritating. Since solvents dissolve natural oils, avoid prolonged contact with skin. When needed, use protective gloves that the solvent cannot penetrate. If taken internally, consult a physician immediately.
- Compressed air used for cleaning purposes shall not exceed 30 psi (206.9 kPa). Use only with effective chip guarding and personal protective equipment (goggles/ shield, gloves, etc.).

WARNING

Ensure electrical power is removed from control box to prevent injury or death from electrical shock before starting maintenance procedures.

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

WARNING

All switches/circuit breakers must be in off position before starting or stopping generators.

WARNING

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

WARNING

Steel cables shall be taken out of service when damage exceeds allowable limits.

WARNING

Lift steel cables are constructed of stainless steel. Gloves must be worn when handling.

WARNING

Use extreme caution when operating Huck machine/tool. Hydraulic Huck tool produces approximately 6000 psi (41,370 kPa) for compressing collar onto truck bolt. Fingers and hands must be kept clear of bolt, collar and front of Huck tool when operating to prevent serious injury.

WARNING

AB-1309 requires 208 vac 3 phase power to the control box for operation. Improper voltage or phasing can cause damage or injury.

DIRECT SUPPORT AND GENERAL SUPPORT
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 07703-5007. A reply will be sent to you.

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CHAPTER 1

INTRODUCTION

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Section I. GENERAL INFORMATION

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1-1. SCOPE

This manual describes the Quick Erect Expandable Mast AB-1309(V)4/TRC and provides troubleshooting and maintenance instructions for the equipment. The 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

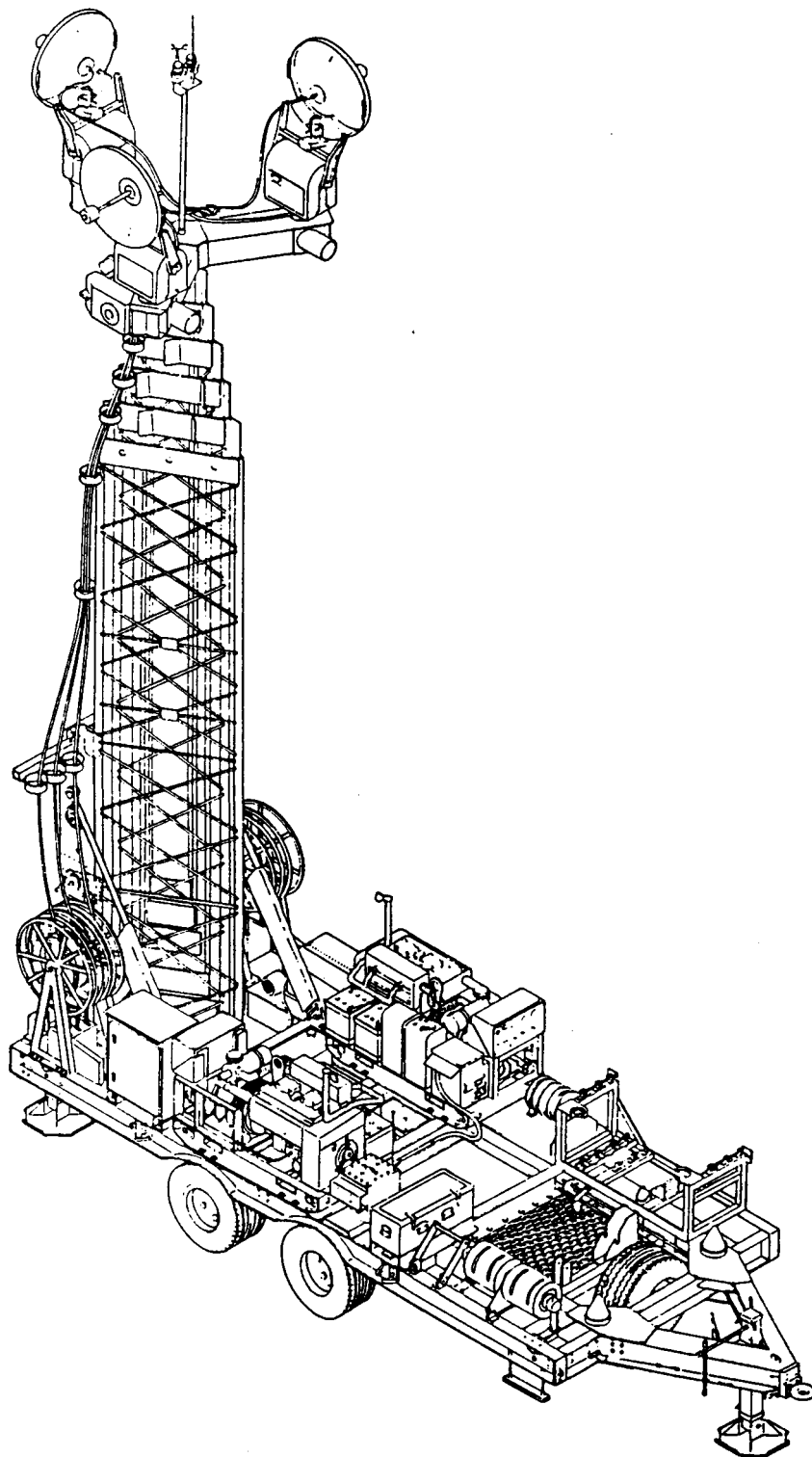
a. Reports of Maintenance and Unsatisfactory Equipment

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.

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

TM 11-5985-387-34

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 12, AR 25-30.

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-LC-ED-CFO, Fort Monmouth, NJ 07703-5007. 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 TM 11-5985387-12.

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.

TM 11-5985-387-34

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

1-10. CALIBRATION/ADJUSTMENTS

- a. Refer to Operator and Unit Maintenance Technical Manual (TM 11-5985-387-12) for calibrating/adjusting the following:
 - (1) Height Gauge Indicator
 - (2) Service Brakes and Parking Brakes (Trailer)
 - (3) Hydraulic System (Tilting mast)
 - (4) Cable Reel Drive Chains
- b. Refer to TM 5-6115-585-12 for calibrating/adjusting the generator sets.
- c. Refer to paragraph 2-57 for positioner adjustments.
- d. Calibrate tensiometer (NSN 6635-00-530-1130) in accordance with TB43-180.

Section II. EQUIPMENT DESCRIPTION AND DATA

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Equipment Characteristics, Capabilities, and Features.....	1-5
Location and Description of Major Components	1-6
Equipment Data.	1-9

1-11. 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, two generators, and the necessary controls and systems to raise the antennas. In addition, the generator sets provide power to the communications shelter.

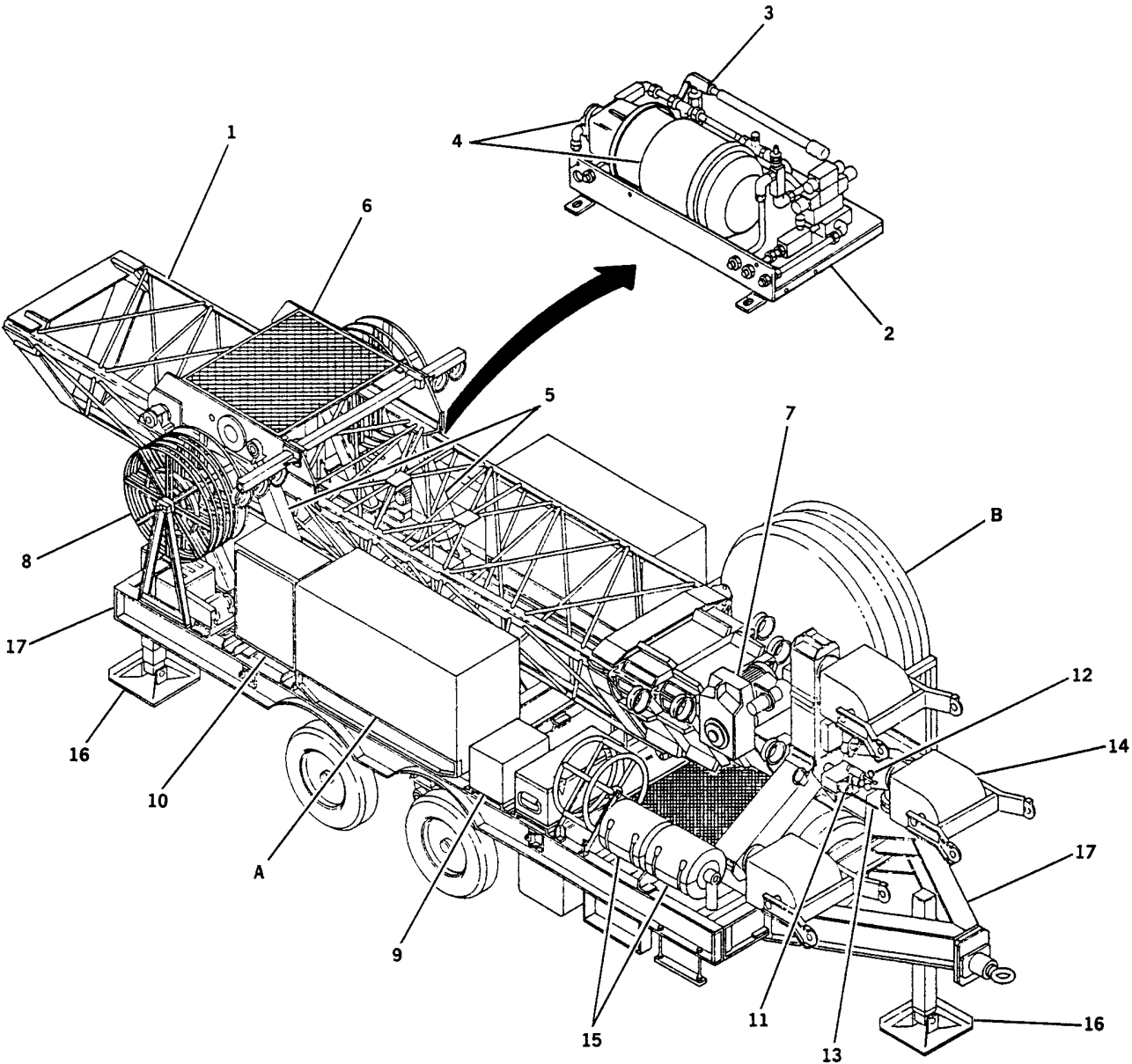
b. Capabilities and Features

NOTE

The AB-1309 mast is equipped with three reflectors and feedhorn assemblies for use with the AN/GRC-222 radio set.

- (1) Ability to deploy up to three antennas on the same mast.
- (2) Contains space to mount two generator sets (not part of the AB-1309).
- (3) Operation in different areas of the world including tropical, desert, and arctic climates.
- (4) Rapid setup and teardown with twenty-four hour operation under tactical conditions.
- (5) Meets tactical transportability and mobility requirements including air, rail, and truck flatbed shipment.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS



1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS Continued

Key	Common Name	Function
1	Telescoping tower [117 ft (35.66m)	Seven nested sections (4 thru 10) raise mast to operational height. The AB-1309 does not use sections numbered 1 thru 3.
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.

1-12. 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 structure when the mast is

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.

1-13. 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.8 ft (294.64 cm)
Trailer:	
Width	8 ft (243.84)
Length.....	36 ft (10.97 m)
Antenna Positioning:	
Elevation	+90 to -18 degrees
Azimuth	+ 110 degrees
Capacities for Hydraulic Fluid:	
Mast Tilt Hydraulic Tank	7 gal (26.51)
Trailer Hydraulic Brake System.....	3 pts. (1.4 l)
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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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

1-14. 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.

1-15. 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.

1-16. 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.

1-17. BEACON AND DE-ICE CIRCUITS

a. **Beacon (Aircraft Warning)**

The ac powered aircraft obstruction (beacon) warning 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.

1-18 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 32°F (0°C) and open at 54°F (12°C).

CHAPTER 2

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

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Section I. REPAIR PARTS, SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

2-1. (Refer to Technical Manual TM 11-5985-387-24P)

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-2. (Refer to Technical Manual TM 11-5985-387-12)

Section III. TROUBLESHOOTING

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General Troubleshooting Procedures	2-1
Troubleshooting	2-2

2-3. INTRODUCTION

a. Fault Location.

Troubleshooting should be accomplished one step at a time to restore downed link as quickly as possible.

b. General Troubleshooting Procedures.

- (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) If the mobile tower cannot be used to support activated antennas for an extended period of time, notify your command about this situation.

2-4. TROUBLESHOOTING

The following table lists possible malfunctions, what to test or inspect for, and corrective actions. An index of malfunctions/item numbers is provided to assist in locating troubleshooting information.

TROUBLESHOOTING INDEX

1. No power from control box. (Generator and power distribution box are operating correctly.)
2. All lights (24V) are out during "Lamp Test" on control box. (System power, main power, and control power are ON.)
3. One indicator light does not work on control box (function works).
4. Both beacon and de-ice indicator lights (AC) are out (functions work).
5. Emergency brake indicator lamp does not light (function works).
6. No reading or obvious incorrect reading on height indicator.
7. Panel circuit breaker (any) keeps tripping or does not activate circuit.
8. Tower tilt (UP or DOWN) function inoperable (hydraulic pump/motor not running).
9. Tower tilt (UP or DOWN) function inoperable (hydraulic pump/motor running).
10. Tower tilt slow or erratic (UP or DOWN).
11. Tower first stage will not extend (UP) or retract (DOWN).
12. Tower second stage will not extend (UP) or retract (DOWN).
13. Tower first or second stage is slow or erratic to extend (UP) or retract (DOWN).
14. Second stage motor runs in down direction when first stage UP/DOWN switch is positioned to DOWN.
15. First or second stage gear motor does not stop automatically when reaching maximum up or down travel.
16. Emergency release system inoperable (first or second stage).
17. Neither cable reel motor runs.
18. Only one cable reel motor runs.
19. Both obstruction (beacon) lights do not light. (De-ice indicator lights when switched ON; if not, go to malfunction number 22.)
20. One obstruction (beacon) light does not light.
21. Obstruction (beacon) lights go on but do not flash.
22. Both obstruction (beacon) lights and de-ice functions are inoperable (AC). Tower antenna de-ice does not work (all dishes). (Beacon lights work.)
24. Tower antenna de-ice does not work (one dish).
25. Antenna positioner control unit is inoperable.
26. Antenna positioner does not work.

2-4. TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<p>1. No power from control box. (Generator and power distribution box are operating correctly.)</p>	<p>Step 1. Check J1 receptacle, connector, and wiring harness for continuity and inspect for damage.</p>	<p>a. Repair or replace connector or receptacle if defective. b. Repair or replace wiring harness if required.</p>
	<p>Step 2. Test CONTROL POWER circuit breaker (E2CB04) (rated 5 amp ac). (Test continuity across terminals when closed.)</p>	<p>Replace circuit breaker if defective.</p>
	<p>Step 3. Test MAIN POWER circuit breaker (E2CB07) (rated 10 amp DC). (Test continuity across terminals when closed).</p>	<p>Replace circuit breaker if defective.</p>
	<p>Step 4. Test SYSTEM POWER switch (E2SW09). (Check across terminals when closed.)</p>	<p>Replace switch if defective.</p>
	<p>Step 5. Test/inspect interlock switch (E1SW10). (Check continuity across terminals with switch closed.)</p>	<p>a. Replace interlock switch if defective. b. Adjust/realign switch if required.</p>
	<p>Step 6. Test main contactor (E5CT01). (Check for open or shorted coil and check continuity across terminals when closed.)</p>	<p>Replace main contactor if defective.</p>
	<p>Step 7. Test power supply on rear panel. (Verify correct ac voltage at input terminal and check output dc voltage from power supply.)</p>	<p>If input AC voltage is correct (115±10.0 vac) and output voltage (24±2.0 vdc) is incorrect, replace defective power supply assembly.</p>

2-4. TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
2. All lights (24V) are out during "Lamp Test" on control box. (SYSTEM POWER, MAIN POWER, and CONTROL POWER ON.)	<p>Step 1. Test LAMP TEST switch. (Check across terminals when closed.)</p> <p>Step 2. Test power supply (rear panel). (Check power supply for correct AC voltage at input terminal and and output DC voltage.)</p> <p>Step 3. Check wiring for continuity (DC circuits).</p>	<p>Replace if defective.</p> <p>If input voltage (115±10.0 vac) is correct and output voltage (24±2.0 vdc) is incorrect, replace defective power supply.</p> <p>a. Tighten connections on harness and terminal blocks. b. Repair or replace wiring harness if defective.</p>
3. One indicator light does not work on control box (function works).	<p>Step 1. Check for defective bulb or bulb holder.</p> <p>Step 2. Check continuity of wiring.</p>	<p>Clean or replace bulb or bulb holder.</p> <p>Repair or replace wiring harness if defective.</p>
4. Both BEACON and DE-ICE indicator lights (AC) are out (functions work).	<p>Step 1. Check continuity Repair or replace wiring of wiring (ac circuit).</p>	<p>Repair or replace wiring if defective</p>
5. EMERGENCY BRAKE indicator lamp does not light (function works).	<p>Step 2. Check for defective bulbs or bulb</p> <p>Step 1. Check for defective bulb or bulb holder.</p>	<p>Clean or replace bulb or bulb holder(s).</p> <p>Clean or replace bulbs holders.</p>
6. No reading or obvious incorrect reading on height indicator.	<p>Step 2. Check continuity of wiring</p> <p>Step 1. Check that height gauge sensors are aligned and sending proper signals. Ensure timing belt is snug on timing gear sprockets..</p>	<p>Repair or replace wiring if defective</p> <p>a. Align/adjust potentiometers. b. Replace height gauge sensor(s) if defective. c. Adjust tension on belt.</p>

2-4. TROUBLESHOOTINGContinued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
6. (Continued)	Step 2. Check continuity of wiring/proper grounding.	<ul style="list-style-type: none"> a. Tightening connections in circuit. b. Repair or replace wiring harness if defective. c. Tighten grounding connections (shielded wires).
7. Panel circuit breaker (any) keeps tripping or does not activate circuit.	Step 3. Test height indicator readout box. (Check inputs for proper voltage from sensors/ etc.)	If input signals are correct/present and indicator gauge does not respond, replace defective indicator.
	Step 1. Test circuit breaker continuity across "closed" terminals and rating of circuit breaker.	Replace circuit breaker if defective.
8. Tower tilt (up or down) function inoperable.	Step 2. Check for short circuit (wiring).	Repair or replace wiring.
	Step 1. Check HYD PUMP circuit breaker (E2CB08) continuity while ON and continuity of wiring in pump motor circuit.	<ul style="list-style-type: none"> a. Replace circuit breaker if defective. b. Repair or replace wiring if defective
	Step 2. Check for continuity across Replace PUMP switch. in ON position.	Replace PUMP switch if defective.
	Step 3. Check pump motor contactor (MS03) for. continuity across terminals when closed.	Replace contactor if defective.
	Step 4. Test motor input If input voltage is lead for proper voltage	If input voltage is 115±10.0 vac, replace motor.

2-4. TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<p>9. Tower tilt(up or down) function in-operable (motor running).</p>	<p>Step 1. Test output pressure/flow rate of hydraulic pump. (Use hydraulic pressure test.)</p> <p>Step 2. Check directional control valve/ solenoid for proper operation. Use manual override to check valve operation. Check solenoids for open or short circuits.</p> <p>Step 3. Test left and right tie-down limit switches, tilt-up limit switch, mast first stage lower limit, switch mast first stage lower limit, switch (Check for continuity across terminals when limit switch is closed.)</p> <p>Step 4. Test TILT UP-DOWN switch.(Check continuity across terminals with switch closed.)</p> <p>Step 5. Test 30 second time delay. (24±2.0 vdc at terminal 5 for tilt to horizontal.)</p> <p>Step 6. Test K3 relay (tilt to vertical), K4 relay (first stage lower limit switch). (Check for open or shorted coil and check for continuity across closed contacts.)</p>	<p>a. Replace coupling between pump and motor if defective. b. Replace pump if defective.</p> <p>Replace directional control valve if defective.</p> <p>a. Replace limit switch if defective. b. Adjust limit switch if required.</p> <p>Replace switch if defective.</p> <p>Replace 30 second time delay if defective (paragraph 2-17).</p> <p>Replace relay if defective (paragraph 2-9).</p>

2-4. TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<p>10. Tower tilt slow or erratic (up or down). 11. Tower first stage will not extend (up) or retract (down).</p>	<p>Step 1. Test directional control valve for proper operation. Use manual override to check valve operation. Check solenoids for open or short circuits.</p>	<p>Replace valve if defective.</p>
	<p>Step 2. Check hydraulic a. cylinders/pivot point.</p>	<p>a. Repair or replace cylinder(s). b. Replace tower section number 10 if pivot point shaft is bent or damaged.</p>
	<p>Step 1. (Gearmotor not running) test circuit breaker (E2CB01) on control panel and check continuity of wiring (harness).</p>	<p>a. Replace circuit breaker if defective. b. Repair or replace wiring (harness) if defective.</p>
	<p>Step 2. (Gearmotor not running) test 1ST STAGE UP-DOWN switch (E2SW06) for each position. (Check continuity across terminals.)</p>	<p>Replace switch if defective</p>
	<p>Step 3. (Gearmotor not running) Test/adjust 5 degree limit switch, first stage lower limit switch, and first stage upper limit switch. (Check for continuity across terminals when closed.)</p>	<p>a. Adjust limit switch if required (paragraph 2-31). b. Replace limit switch if defective (paragraph 2-31).</p>
	<p>Step 4. (Gearmotor not running) Test first stage up contactor (MS01A) if tower does not extend, and down contactor (MS01B) if tower does not retract.</p>	<p>Replace contactor if defective.</p>

2-4. TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
11. (Continued)	(Check for open or shorted coil and check for continuity across terminals when closed.)	
	Step 5. (Gearmotor not running) Test relays K1 and K2. (Check for continuity across terminals when closed.)	Replace relay if defective (paragraph 2-9).
	Step 6. (Gearmotor not a. running) Test motor, check gear reducer, inspect chain/sprockets for damage and inspect/ test brakes.	<ul style="list-style-type: none"> a. Repair gearmotor by a. replacing motor, or gear reducer if defective. Test motor by checking voltage (115±10.0 vac) at input terminals. If OK, replace motor. b. Replace gearmotor if defective. c. Replace chain/ sprockets if damaged. d. Replace/repair brake system if emergency brake is defective.
	Step 7. (Gearmotor attempts to run) Inspect cables/re3eeving for hangups and winch drum bearings.	<ul style="list-style-type: none"> a. Free up cables if required. b. Replace cables if required. c. Replace winch drum if defective. c.
	Step 8. (Gearmotor attempts to run) Inspect tower sections, slide blocks, and pulleys for damage/wear/obstruction.	<ul style="list-style-type: none"> a. Replace tower section(s) if bent or damaged. b. Replace slide blocks if defective. Replace pulleys if damaged or worn. d. Remove obstructions.

2-4. TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
11. (Continued)	Step 9. (Motor running) Inspect for broken coupling, sprocket free wheeling, defective gear reducer, or broken cables.	<ul style="list-style-type: none"> a. Replace coupling if required. b. Secure sprocker on shaft with new key or replace sprocker if damage.
12. Tower second stage will not extend (up) or retract (down).	<p>Step 1. (Gearmont not running) Test circuit breaker (E2CB02) on control panel and check continuity of wiring (harness). (Check across terminals while closed.)</p> <p>Step 2. (Gearmotor not running) Test 2ND STAGE UP-DOWN switch (E2SW07) for each position.</p> <p>Step 3. (Gearmotor not running) When extending second stage (UP), test/adjust 5 degree limit switch, first stage upper limit switch, and second stage upper limit switch. When retracting second stage (down), test/adjust second stage lower limit switch. (Check for continuity across terminals with limit switch closed.)</p> <p>Step 4. (Gearmotor not running) When extending second stage (up), test contactor MS02A. When retracting second stage (down) test contactor MS02B. (Check for open or shorted coil and check for continuity across terminals when contactor is closed.)</p>	<ul style="list-style-type: none"> c. Replace gear reducer if defective. d. Rereeve new cables if brokern. a. Replace circuit breaker if defective. b. Repair or replace wiring (harness) if defective. <p>Replace switch if defective.</p>

2-4. TROUBLESHOOTING-Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
12. (Continued)	<p>Step 5. (Gearmotor not running) Test K1 relay. (Check for open or shorted coil and check continuity across terminals when closed.)</p>	<p>Replace relay if defective (paragraph 2-9).</p>
	<p>Step 6. (Gearmotor not running) Test motor, check gear reducer, inspect winch drum, and inspect/test brakes. Test motor by verifying b. voltage (115±10.0 vac) at input terminals. c.</p>	<p>a. Repair gearmotor by replacing motor or gear reducer if defective. If OK, replace motor. b. Replace gearmotor if defective. c. Replace winch drum if required. d. Replace/repair brake system.</p>
	<p>Step 7. (Gearmotor attempts to run) Inspect cables/reeving for hang-ups.</p>	
	<p>Step 8. (Gearmotor attempts to run) Inspect tower sections, slide blocks, and pulleys for damage/obstruction.</p>	<p>a. Free up cables if required. b. Replace cables if required. a. Replace tower section(s) if bent or damaged. b. Replace slide blocks if defective. c. Replace pulleys if damaged or worn. d. Remove obstructions.</p>
	<p>Step 9. (Motor running) a. Inspect for defective gear reducer, free wheeling drum winch, or broken cables.</p>	<p>a. Replace Gearmotor or gear reducer if defective. b. Secure drum winch to drive shaft with new key if required. c. Rereeve new cables.</p>

2-4. TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<p>13. Tower first or second stage is slow or erratic to extend (up) or retract (down).</p>	<p>Step 1. Inspect for fouled cables, hung up cables, or broken cables.</p>	<p>a. Rereeve or clear hung up cable(s). b. Replace cable if defective.</p>
	<p>Step 2. Inspect cable pulleys.</p>	<p>a. Clear obstruction around pulley. b. Replace pulley if defective.</p>
	<p>Step 3. Inspect slide blocks for security and damage.</p>	<p>a. Tighten slide blocks if loose. b. Replace slide blocks if defective.</p>
	<p>Step 4. Inspect winch drum bearings.</p>	<p>Replace bearings if defective.</p>
	<p>Step 5. Inspect tower section(s) for obstruction and/or bent or damaged parts.</p>	<p>a. Remove any obstruction(s). b. Replace tower section(s) if damaged.</p>
	<p>Step 6. Inspect gearmotor for proper operation.</p>	<p>Replace gearmotor or repair if defective.</p>
	<p>Step 7. Inspect lockouts Adjust or replace lockouts if required. (first stage).</p>	<p>Adjust or replace lockouts if required.</p>
	<p>Step 8. Inspect drive chain/sprocket (first stage). Replace drive chain if damaged.</p>	<p>a. Replace drive chain if damaged. b. Replace sprocket if damaged.</p>
<p>14. Second stage motor runs in down direction when 1ST STAGE UP/DOWN switch is positioned to DOWN.</p>	<p>Step 1. Test/inspect second stage lower limit switch. (Check continuity across terminals when switch is closed.)</p>	<p>a. Replace switch if defective. b. Adjust switch if required.</p>
	<p>Step 2. Test K1 relay. (Check for open or shorted coil and check continuity across terminals when closed.)</p>	<p>Replace relay if defective (paragraph 2-9).</p>

2-4. TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<p>15. First or second stage gearmotor does not stop automatically when reaching maximum up or down travel.</p>	<p style="text-align: center;">NOTE</p> <p>During extension or retraction of first or second stage, the respective motor should stop running when the stage reaches its maximum travel regardless if UPDOWN control switch is still activated. This is accomplished by respective limit switches.</p> <p>Test/adjust upper or lower limit switch for first or second stage experiencing malfunction. (Check for continuity across terminals when switch is closed.)</p>	<p>a. Replace limit switch if defective. b. Adjust limit switch if required.</p>
<p>16. Emergency release system inoperable (first or second stage).</p>	<p>Step 1. Test EMERGENCY RELEASE ACTIVATE switch (E2SW15). (Check continuity across terminals when switch is closed.)</p> <p>Step 2. Test EMERGENCY RELEASE 1ST/2ND STAGE selector switch (E2SW14). (Check continuity across terminals with switch positioned in each direction.)</p> <p>Step 3. Check wiring and connectors for continuity.</p>	<p>Replace switch if defective.</p> <p>Replace switch if defective.</p> <p>a. Repair or replace wiring if required. b. Replace/tighten connectors if required</p>

2-4. TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
<p>16. (Continued) 17. Neither cable reel motor runs. 18. Only one cable reel motor runs.</p>	<p>Step 4. Test emergency brake control circuit component (E6CKTF1). (Test brake control circuit component input leads for 24 + 2.0 vdc.)</p>	<p>If voltage is correct, replace defective brake control circuit component.</p>
	<p>Step 1. Test reel drive contactor (CT02). (Check for open or shorted coil and check continuity across terminals when closed.)</p>	<p>Replace contactor if defective.</p>
	<p>Step 2. Test reel drive circuit breakers (both drives). (Check for continuity across terminals when breakers are closed.)</p>	<p>Replace circuit breakers if defective.</p>
	<p>Step 3. Check continuity of wiring in reel drive circuit. (Refer to FO 4.)</p>	<p>Repair or replace wiring if required.</p>
	<p>Step 4. Test K1 relay. (Check for open or shorted coil and check continuity across terminals when closed.)</p>	<p>Replace relay if defective (paragraph 2-9).</p>
	<p>Step 1. Test reel circuit breaker (E2CB08-right or E2CB09-left) (Check continuity across terminals with breaker closed.)</p>	<p>Replace circuit breaker if defective.</p>
	<p>Step 2. Inspect shaft, pillow blocks, sprockets and torque limiters for alignment, damage, or proper adjustment.</p>	<p>Replace, repair or adjust as required.</p>
	<p>Step 3. Test motor input If voltage is correct, lead for 115 + 10.0 replace motor. vac.</p>	<p>If voltage is correct, replace motor</p>

2-4. TROUBLESHOOTING - Continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
19. Both obstruction (beacon) lights do not light. (DE-ICE indicator lights when switched ON; if not, go to malfunction number 22.)	<p>Step 1. Test switch (E2SW08). (Check continuity across terminals with switch ON.)</p> <p>Step 2. Check ac wiring circuit for continuity.</p> <p>Step 3. Inspect bulbs and bulb holders.</p>	<p>Replace switch if defective.</p> <p>Repair or replace wiring if required.</p> <p>a. Replace bulbs if required. Refer to TM 11-5985-387-12.</p> <p>b. Clean or replace bulb holders if required.</p>
20. One obstruction (beacon) light does not light.	Inspect bulb and bulb holder.	<p>a. Replace bulb. Refer to TM 11-5985387-12.</p> <p>b. Clean or replace bulb holder if required.</p>
21. Obstruction (beacon) lights go on but do not flash.	<p>Step 1. Test switch (E2SW08). (Check continuity across terminals with switch in FLASH position.)</p> <p>Step 2. Test flasher (MTO1). (Check for 65 + 5.0 vac at input terminal.)</p>	<p>Replace switch if defective.</p> <p>If voltage is correct, replace flasher.</p>
22. Both obstruction (beacon) lights and deice functions are inoperable (AC).	<p>Step 1. Test circuit breaker (E2CB05) rated at 10 amp do. (Check continuity across terminals with circuit breaker closed.)</p> <p>Step 2. Test connectors and wiring for continuity.</p>	<p>Replace circuit breaker if defective.</p> <p>Repair or replace wiring or connectors if defective</p>

2-4. TROUBLESHOOTING - continued

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION
23. Tower antenna de-ice does not work (all dishes) (Beacon lights work.)	Step 1. Test switch (E2SW11) (Check continuity across terminals with switch ON.) Step 2. Check continuity of wiring/connections.	Replace switch if defective. Repair or replace wiring/connections if defective.
24. Tower antenna de-ice does not work (one dish).	Step 1. Test heater element. (Check for 115 + 10.0 vac at input terminal.) Step 2. Check continuity of wiring/connections. Step 3. Test receptacle.	If voltage is correct, replace defective heat element. Repair or replace wiring/connections if defective. Replace receptacle if defective.
25. Antenna positioner control unit is inoperable .	Step 1. Test circuit breaker (E2CB06) rated at 10 amp dc. (Check continuity across terminals with circuit breaker closed.) Step 2. Test continuity of wiring/connections.	Replace circuit breaker if defective. Repair or replace wiring/connections if required.
26. Antenna positioner does not work (elevation or azimuth).	Step 1. Test motor input lead for 115 + 10.0 vac. Step 2. Inspect drive system (belt, gear reducer, etc.) for proper movement. Step 3. Check for proper Adjust positioner adjustments. system.	If voltage is correct and gear reducer is operating properly, replace motor. Repair/replace drive components as required. Adjust positioner adjustments. system

Section IV. MAINTENANCE PROCEDURES

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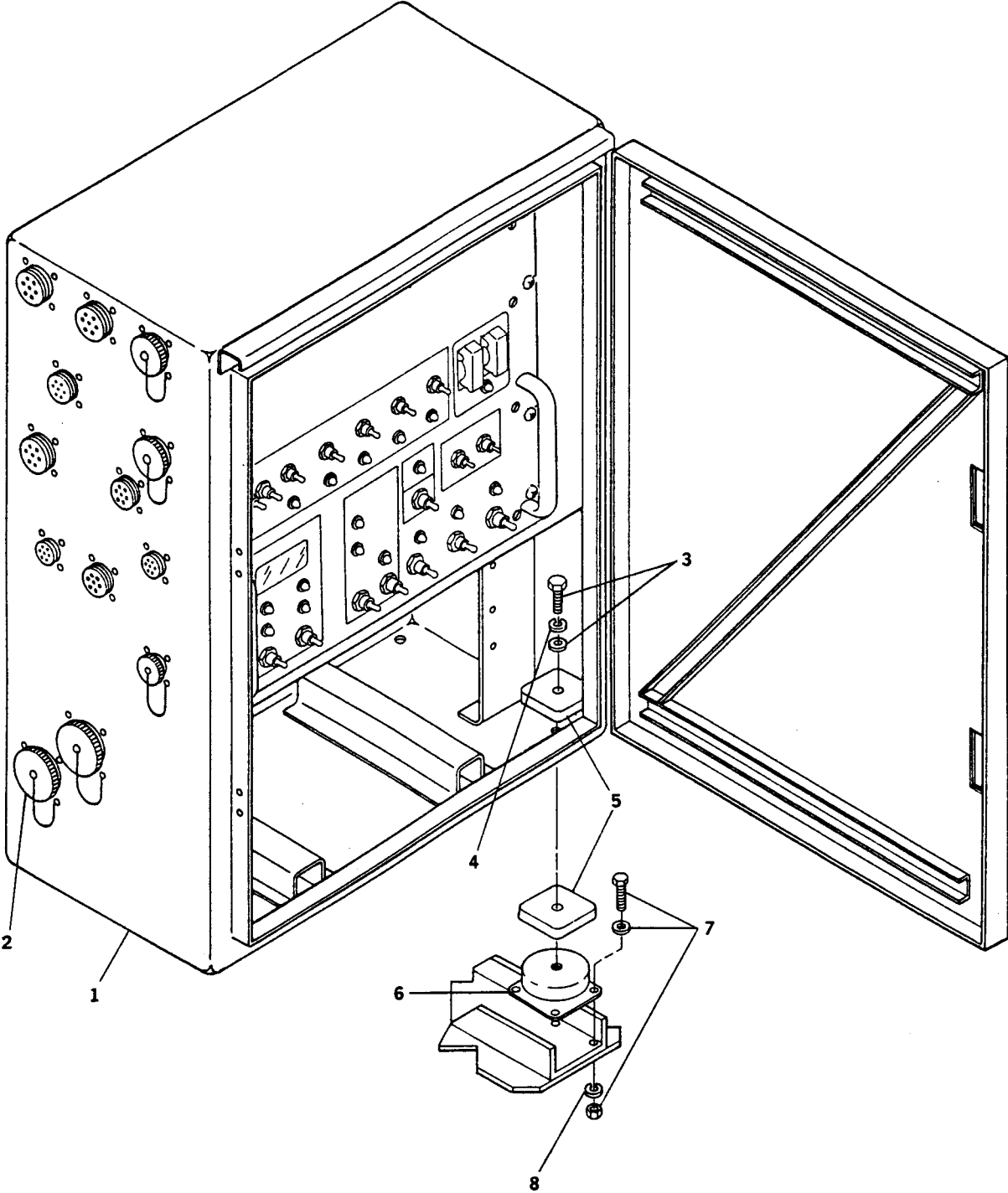
2-5. MAINTENANCE PROCEDURES OVERVIEW

This section provides general guidelines for Direct Support maintenance requirements as assigned by the Maintenance Allocation Chart for the AB -1309. For Repair Parts and Special Tools List (RPSTL) refer to TM 11-5985-387-24P. When you are performing any maintenance on the mobile tower, keep in mind the following warnings.

WARNINGS

- Never operate the generator or tower 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.
- 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 electrical connections or adjusting components near electrical power.
- Never climb on the tower. Use cribbing/ platform(s) that have been safety approved to perform maintenance tasks.
- Turn off all equipment power before using degreaser/solvent to avoid fire. Provide adequate ventilation while using cleaning solvents. Avoid prolonged breathing of fumes and vapor to avoid asphyxiation. Do not use solvent near heat or open flames; the products decomposed are toxic and irritating. Since solvents dissolve natural oils, avoid prolonged contact with skin. When needed, use protective gloves that the solvent cannot penetrate. If taken internally, consult a physician immediately.

2-6. REMOVE/REPLACE TOWER CONTROL BOX ASSEMBLY



2-6. REMOVE/REPLACE TOWER CONTROL BOX ASSEMBLY - Continued

WARNING

Ensure electrical power is removed from control box to prevent injury or death from electrical shock before starting procedure.

WARNING

Tower Control box weighs 150 pounds. Ensure lifting device is capable of supporting this weight.

Location	Item	Action
REMOVE		
1. Tower Control Box	External connectors	Disconnect/remove connectors from outside of box (1).
2.	Protective caps (2)	Place protection caps (2) over receptacles.
3.	Antenna positioner control unit	
4.	Mounting fasteners (3) and (4)	Remove antenna positioner control unit control unit from bottom of control panel box (1) (refer to TM 11-5985 387-12).

NOTE

If fasteners (3) turn but do not come out, remove and replace the cupmount shock absorbers (6).

5.	Spacers (5) and cupmount shock absorbers (6)	Inspect spacers (5) and cupmount shock absorbers (6). Replace if required by removing fasteners (7) and (8).
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2-6. REMOVE/REPLACE TOWER CONTROL BOX ASSEMBLY - Continued

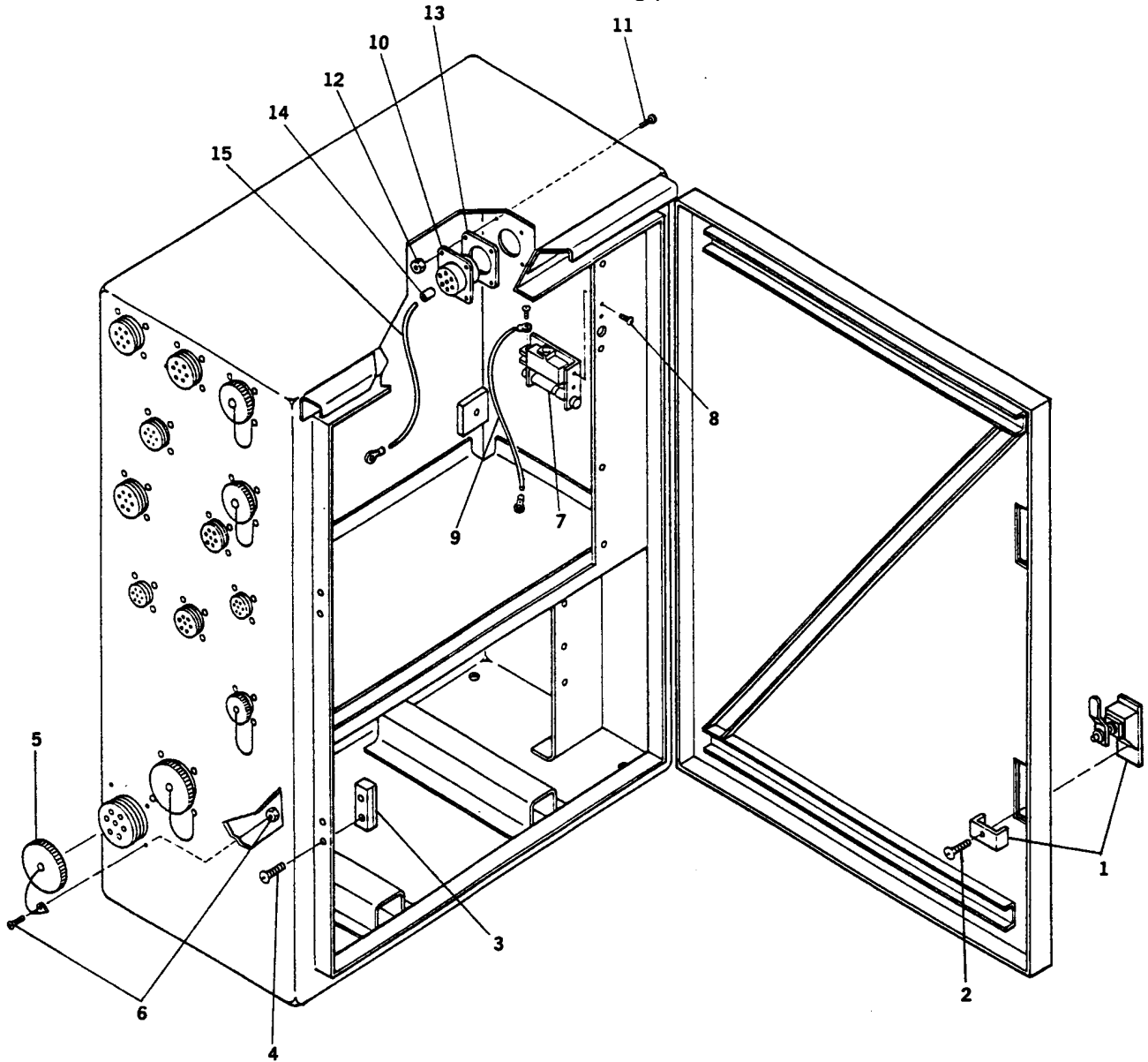
Location	Item	Action
1. Tower control box	Spacers (5) and cupmount shock absorbers (6)	Ensure front and rear spacers (5) are in the correct position and aligned over cupmount shock absorbers (6).
	<p style="text-align: center;">NOTE</p> Offset hole in spacers must be positioned next to control box side, facing the rear of trailer.	
2.	Tower control box (1)	Position control box over mounts and secure with fasteners (3) and new lockwashers (4).
3.	Antenna positioner control unit	Install antenna positioner control unit in bottom of control panel box (1) (refer to TM 11-5985-387-12). Ensure plug connector is secure.
4.	External connectors	Install external connectors to control box exterior.
5.	Controls/indicators	Verify controls and indicators are functioning properly.

2-7. REPAIR TOWER CONTROL BOX ASSEMBLY

Equipment Conditions: Front panel and rear panel removed, if necessary, to gain access to certain parts. (Refer to paragraphs 2-8, and or 2-16.)

WARNING

Ensure electrical power is removed from control box to prevent injury or death from electrical shock before starting procedure.



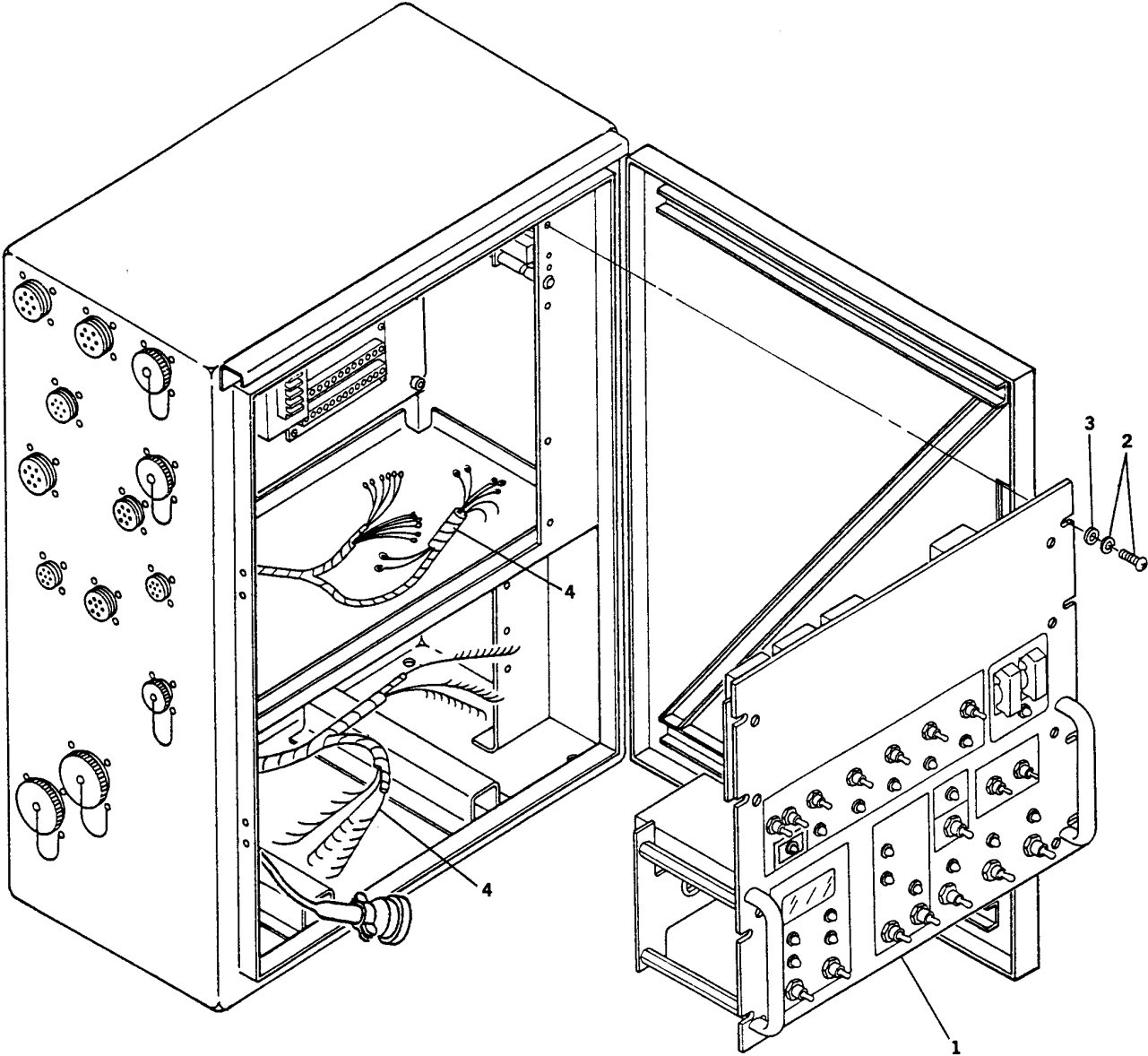
2-7. REPAIR TOWER CONTROL BOX ASSEMBLY - Continued

Location	Item	Action
REPAIR 1. Tower Control Box Assembly	Latch assembly (1)	Replace latch assembly by removing screw (2).
2.	Latch block (3)	Replace latch block (3) by removing screws (4).
3.	Receptacle caps (5)	Replace protective cap (5) by removing fasteners (6).
4.	Interlock switch (7)	Replace interlock switch (7) by removing two screws (8), disconnecting wire (9) from back of switch, and disconnecting wiring harness from switch. Inspect wiring/terminals.
5.	Receptacle (10)	Replace receptacle (10) by removing screws (11), lock nuts (12), gasket (13), and wiring (15). Inspect gasket (13), wiring (15), and identification sleeves (14). Use new lock nuts (12) during installation.
6.	Control box	Inspect box for corrosion or damage.

2-8. REMOVE/REPLACE TOWER CONTROL PANEL (FRONT)

WARNING

Ensure electrical power is removed from control box to prevent injury or death from electrical shock before starting procedure.

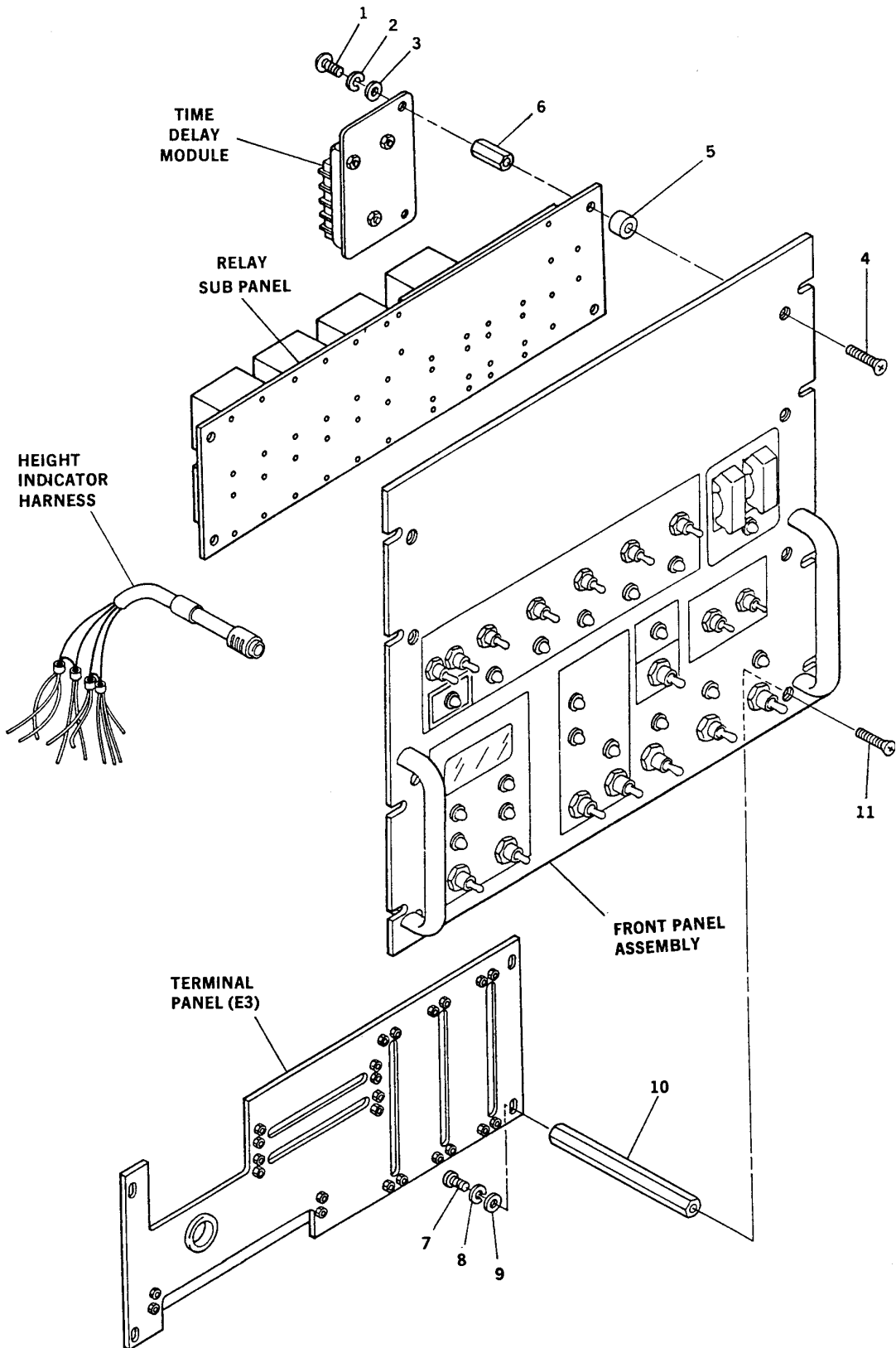


2-8. REMOVE/REPLACE TOWER CONTROL PANEL (FRONT) - Continued

Location	Item	Action
REMOVE		
1. Tower control panel (front)	Panel assembly (1)	Remove fasteners (2) panel (front) and (3) securing panel (1) to box.
2.	Panel assembly (1) and harness (4)	Move panel (1) away from and harness (4) box to gain access to connectors/terminals on back of panel (1). Disconnect wiring and harness (4) from back side of panel (1). Ensure wires are tagged (identified) for installation.
REPLACE		
1. Tower control panel (front)	Panel assembly (1) and harness (4)	Connect wiring harness (4) to back of panel (1).
2.	Panel assembly (1)	Position panel (1) over mounting holes in box and secure with fasteners (2) and new lockwashers (3).
3.	Controls/indicators	Apply power, verify controls/indicators are functioning properly. Refer to TM 11-5985-387-12.

TM 11-5985-387-34

2-9 REPAIR TOWER CONTROL PANEL (FRONT)



2-9. REPAIR TOWER CONTROL PANEL (FRONT) - Continued

WARNING

Ensure electrical power is removed from control box to prevent injury or death from electrical shock before starting procedure.

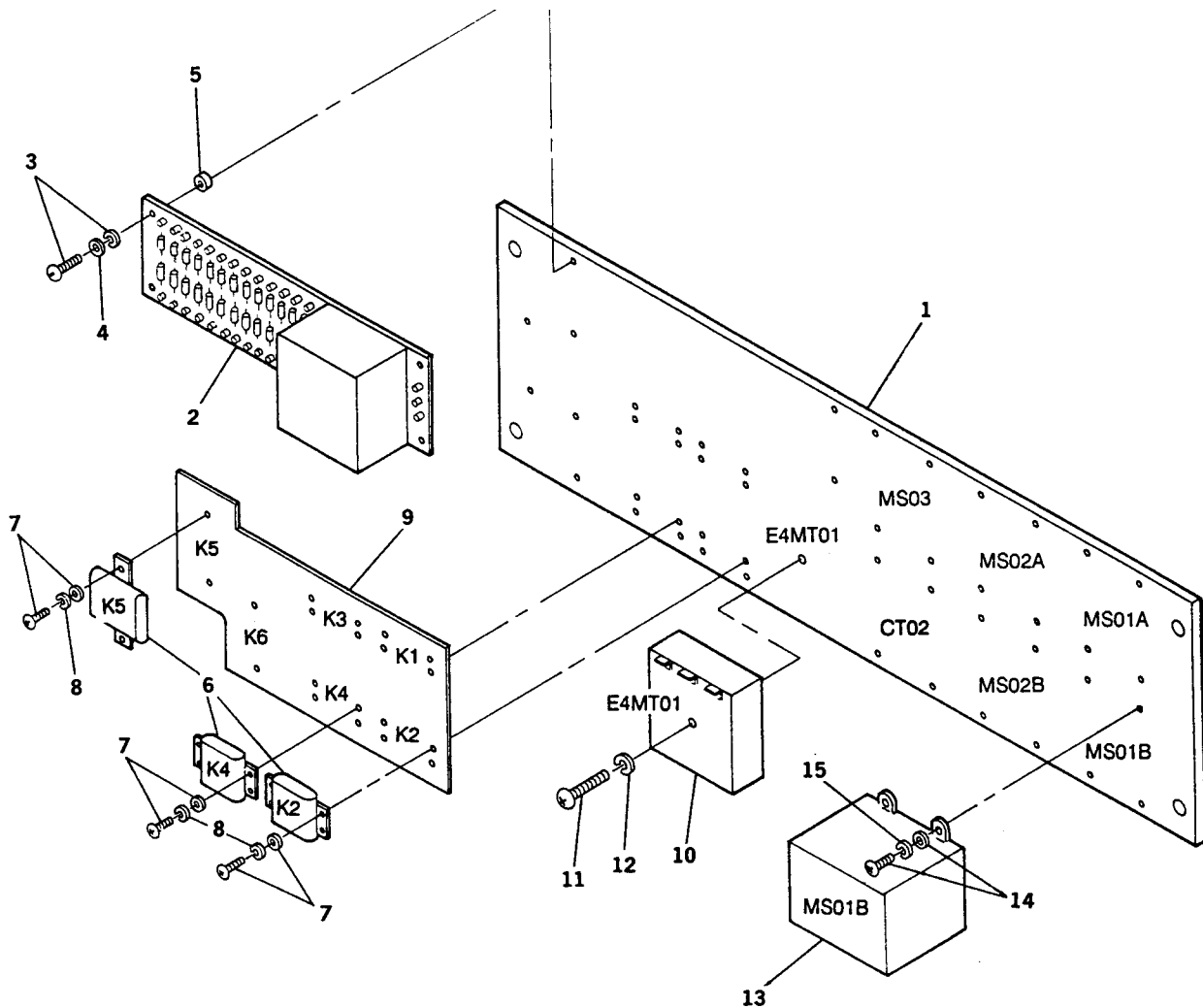
NOTE

Certain components are replaceable without removing the panel, or completely disassembling the panel, such as indicator bulbs and switches. Ensure wires are marked (tagged) for installation before disconnecting.

Location	Item	Action
REPAIR (Major Subassemblies)		
1. Tower control panel (front)	Control panel	Remove control panel in accordance with instructions in paragraph 2-8.
2.	Time delay module(tower lockout)	Replace time delay by disconnecting attached wiring, removing fasteners (1), (2), and (3).
3.	Relay sub panel	Replace relay panel by disconnecting attached wiring, removing fasteners (4) and spacers (5) and (6).
4.	Height indicator harness	Replace height indicating harness by disconnecting from height readout indicator and wire terminals.
5.	Terminal panel E3	Replace terminal panel E3 by disconnecting wiring and removing fasteners (7), (8), and (9) from spacer (10).

2-9. REPAIR TOWER CONTROL PANEL (FRONT) - Continued

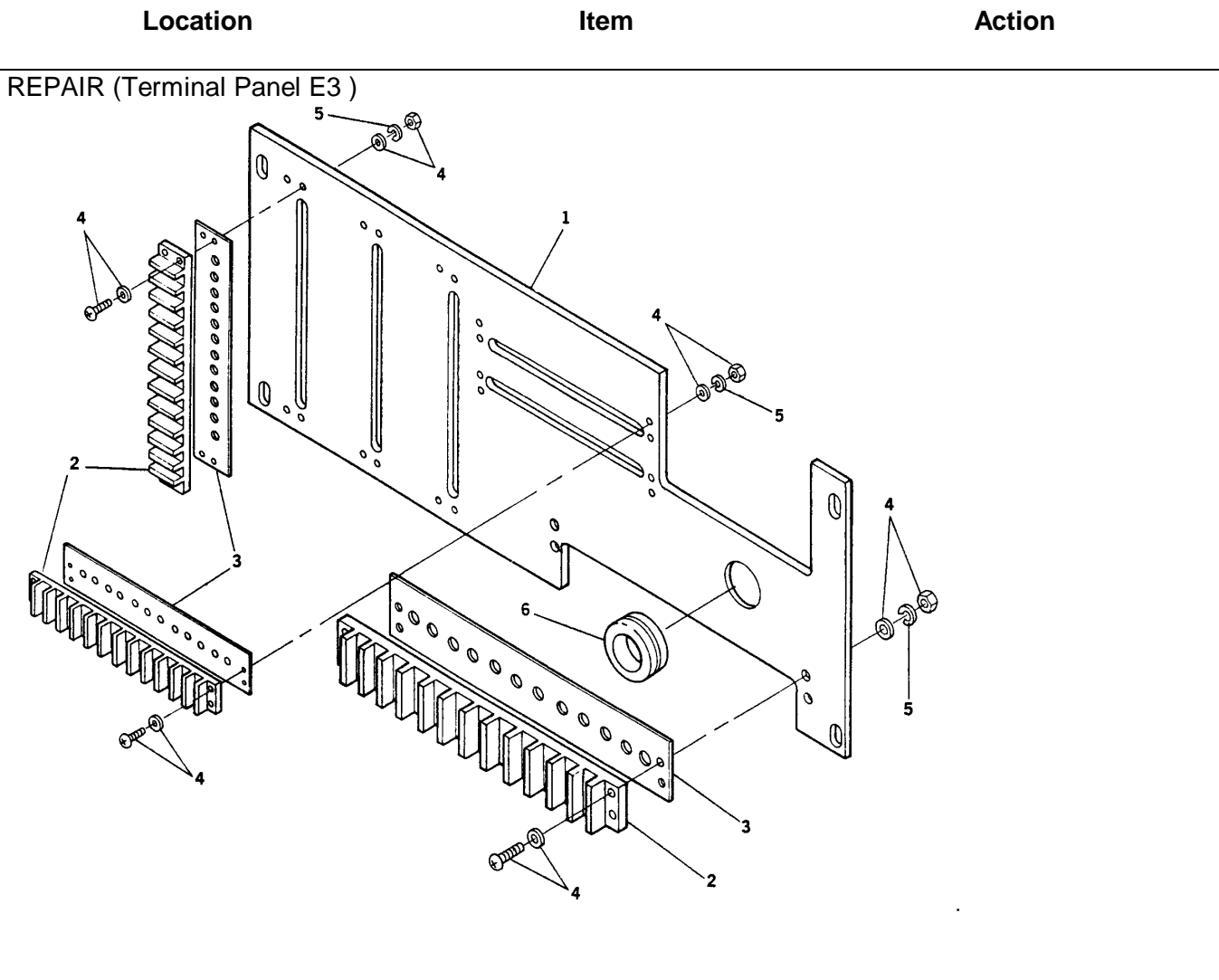
Location	Item	Action
REPAIR (Major Subassemblies) - Continued		
6.	Front panel assembly	Replace front panel by disconnecting wiring and removing fasteners (11) and spacers (10).
REPAIR (Relay Sub Panel)		



2-9. REPAIR TOWER CONTROL PANEL (FRONT) - Continued

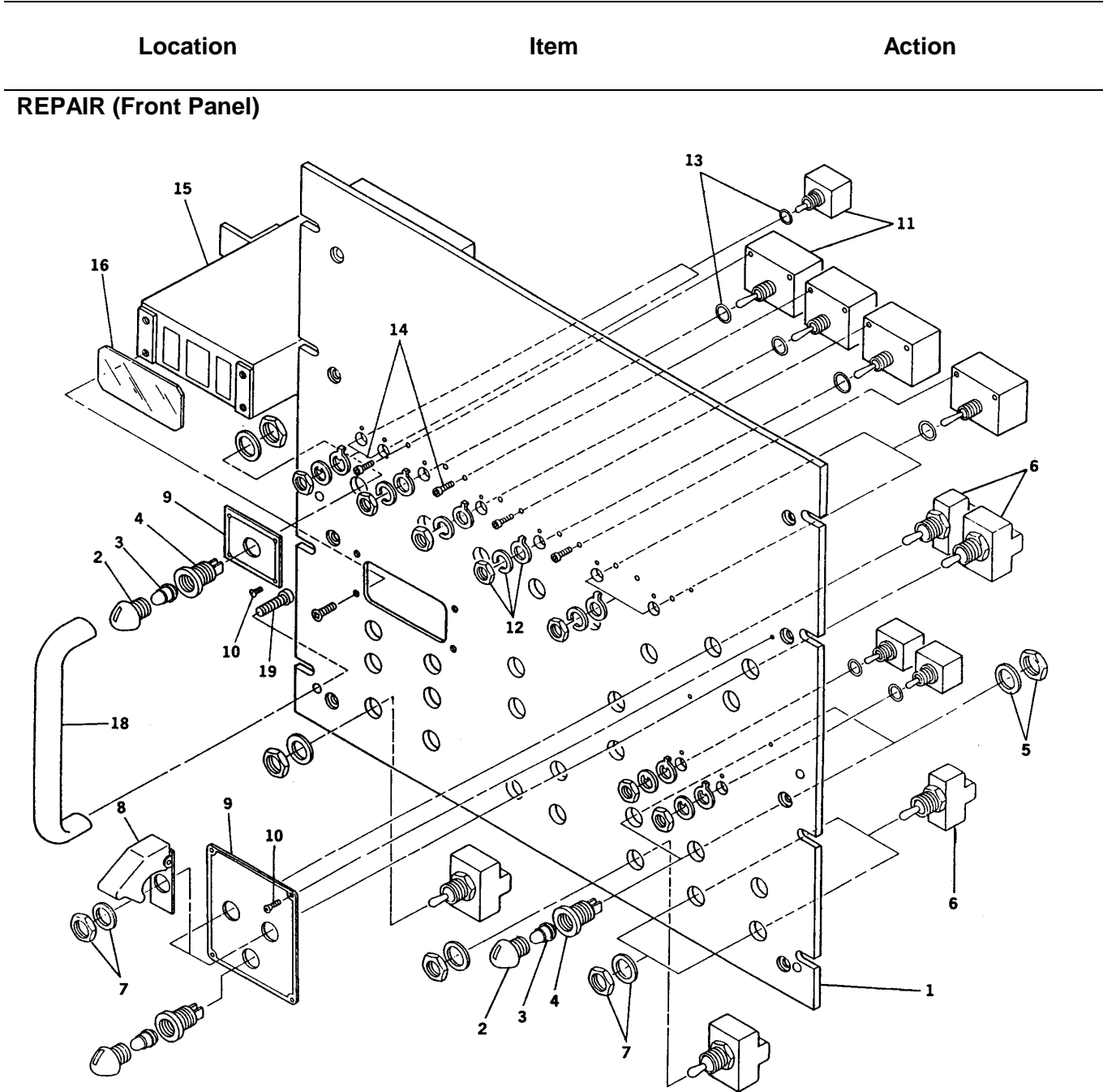
Location	Item	Action
REPAIR (Relay Sub Panel) - Continued		
1. Relay sub panel	Wiring	Tag and disconnect wiring from area needing repair.
2.	Circuit board assembly (2)	Replace circuit board (2) on relay sub panel (1) by removing fasteners (3), (4), and spacers (5). Use new lockwashers (4) during installation.
3	Relays (6) (Typical)	Replace relay (6) on insulator (9) by removing fasteners (7) and (8). Use new lockwashers (8) during installation.
<p>NOTE To replace insulator (9), remove all relays (6).</p>		
4.	Flasher (10)	Replace flasher (10) on relay sub panel (1) by removing fasteners (11) and (12). Use new lockwasher (12) during installation.
5.	Power relays (13) (Typical)	Replace power relay (13) on relay sub panel (1) by removing fasteners (14) and (15). Use new lockwashers (15) during installation.

2-9. REPAIR TOWER CONTROL PANEL (FRONT) - Continued



Location	Item	Action
1. Terminal Panel E3	Wiring	Tag and disconnect wiring from area needing repair.
2. 3.	Terminal boards (2) Replace terminal board and marker strips (3)	Replace terminal board (2) and/or marker strip (3) on panel (1) by removing fasteners (4) and (5). Use new lock-washers (5) during installation.
	Grommet (6)	Inspect for damage/wear

2-9. REPAIR TOWER CONTROL PANEL (FRONT)-Continued



2-9. REPAIR TOWER CONTROL PANEL (FRONT)-Continued

Location	Item	Action
REPAIR (Front Panel) -Continued		
		Subassembly panels
1. Front panel		
Remove time delay, relay sub panel, and terminal panel E3 required		
2.	Wiring	Tag and remove wiring from component(s) requiring replacement
3.	Bulbs (3) (Typical)	Replace bulb (3) by removing lens cover (2) and removing bulb. Inspect lamp socket (4). If damaged replace by removing fasteners (5).
4.	Toggle switches (6) (Typical)	Replace toggle switch (6) (Typical) on panel (1) by removing fasteners (7).
NOTE		
Always use new fasteners when provided with the replacement component.		
5.	Switch guards (8) (Typical)	Inspect switch guard. If damaged, replace by removing toggle switch (6).
6.		
7.	Plates (9) (Typical)	Inspect plate (9). If damaged, replace by removing switches (6) or lamps and screws (10).
	Circuit breakers (11) (Typical)	Replace circuit breaker (11) on panel (1) by removing fasteners (12).

NOTE

Some circuit breakers are secured to panel (1) with screws (14), in addition to fasteners (12).

2-9. REPAIR TOWER CONTROL PANEL (FRONT)-Continued

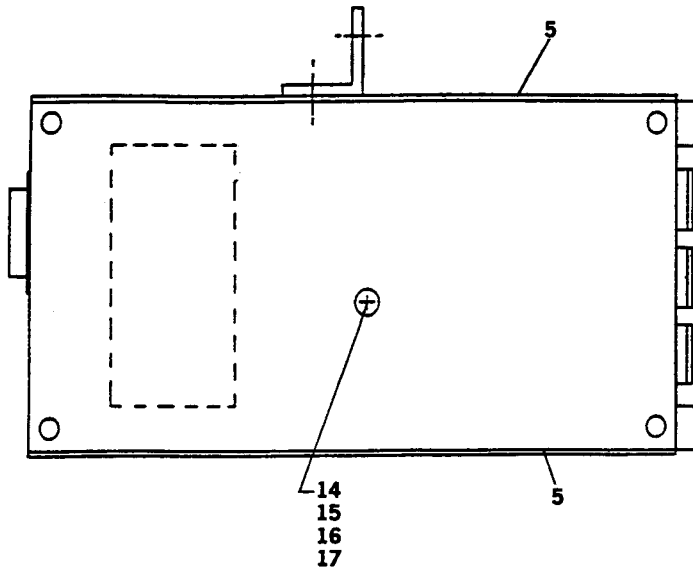
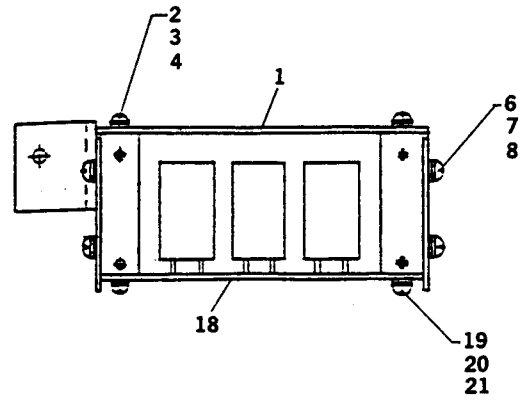
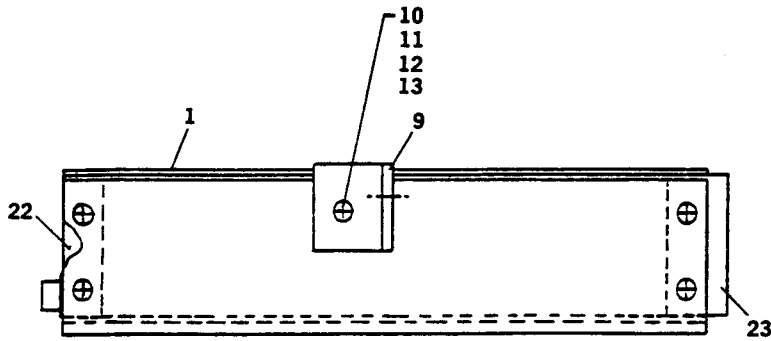
Location	Item	Action
REPAIR (Front Panel) -Continued		
NOTE		
Always use new fasteners (12) and gaskets (13) when provided with replacement component.		
8.	Height indicator readout box (15) and display window (16)	Replace height indicator box (15) by removing screws (17) and disconnecting harness connector. Inspect display window (16) for clarity and damage.
NOTE		
Adjust height indicating system in accordance with TM 11-5985-387-12 and paragraph 2-12.		
9.	Oval handles	Replace handles (18) by removing screws (19).

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2-10. REMOVE/REPLACE HEIGHT INDICATOR

Remove and replace height indicator in accordance with paragraph 2 -9.

2-11. REPAIR HEIGHT INDICATOR



2-11. REPAIR HEIGHT INDICATOR-Continued

Location	Item	Action
DISASSEMBLY		
1. Height indicator	Cover plate (1)	Remove screws (2), washers (3) and lockwashers (4). Remove cover plate.
2.	Side plates (5)	Remove screws (6), washers (7) and lockwashers (8). Remove each side plate.
3.	Support bracket (9)	Remove screw (10), washers (11), lockwasher (12) and nut (13). Remove support bracket
4.	Spacer (14)	Remove screws (15), washers (16) and lockwashers (17).
5.	Circuit board (18)	Remove screws (19), washers (20), lockwashers (21) and circuit board (19) from standoffs (22 and 23).
ASSEMBLY		
1. Height indicator	Circuit board (18)	Position standoffs (22 and 23) on circuit board and secure with screws (19), washers (20) and new lockwashers (21).
2	Spacer (14)	Install spacer (14) and secure with screws (15), washers (16) and new lockwashers (17).
3.	Support bracket (9)	Install support bracket on side panel and secure with screw (10), washers (11), new lockwasher (12) and nut (13).

2-11. REPAIR HEIGHT INDICATOR-Continued

Location	Item	Action
ASSEMBLY - Continued		
4.	Side plates (5)	Install side plates on standoffs (22 and 23) and secure with screws (16), washers (7) and new lockwashers (8).
5.	Cover plate (1)	Install cover plate (1) and secure with screws (2), washers (3) and lockwashers (4).

2-12. ADJUST HEIGHT GAGE INDICATOR ASSEMBLY

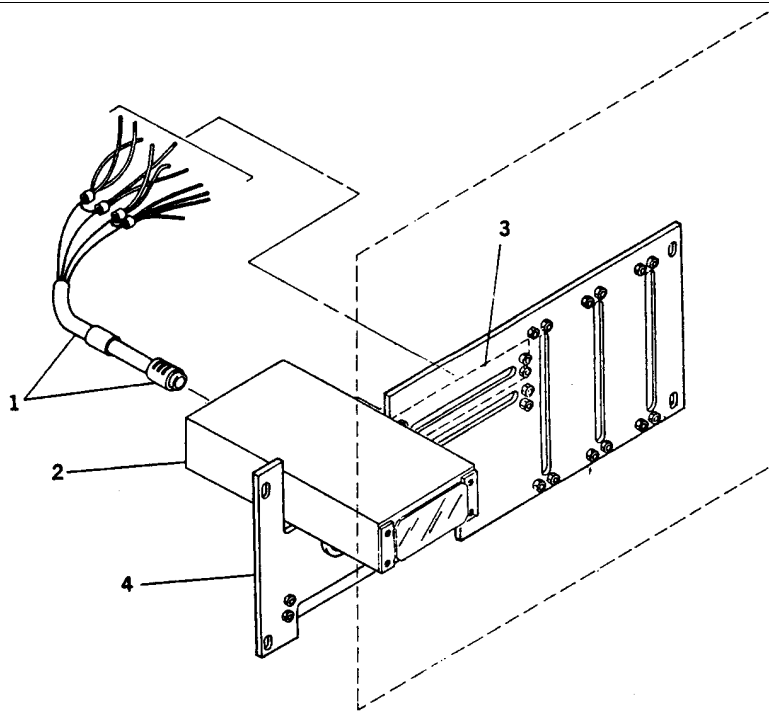
Location	Item	Action
<u>WARNING</u>		
High voltages exist in other parts of control panel. Use extreme caution when making adjustments. Wear rubber soled shoes and do not ground yourself while making adjustments.		
ADJUSTMENT (Balancing of First Stage Indicating Circuit Inside Control Box)		
1. First stage	Tower (tilt)	Refer to TM 11-5985-387 circuit12, tilt tower to vertical.
2.	Cable W126	Disconnect second stage height encoder cable W126 from control panel (J11).
3.	Height indicating control box	Remove eight screws and control box tilt tower control panel open. Remove cover on height indicating system box (inside control box housing).
4.	R14 (adjuster)	Inside height indicating box, adjust R14 for a height indication of 29 feet.
5.	Tower (erect first stage)	Refer to TM 11-5985-387-12, erect tower first stage.
6.	R5 (adjuster)	Inside height indicating box, adjust R5 for a height indication of 88 feet.
ADJUSTMENT (Balancing of Second Stage Indicating Circuit Inside Control Box)		
1.	Second stage circuit	[Perform steps 1 through 6 (first stage circuit circuit) before starting second stage circuit.]

2-12. ADJUST HEIGHT GAGE INDICATOR ASSEMBLY-Continued

Location	Item	Action
ADJUSTMENT-Continued (Balancing of Second Stage Indicating Circuit Inside Control Box)		
2.	Cable W126	Connect second stage height encoder cable W126 to control panel (J11).
NOTE		
Height indication will change when connecting W126.		
3.	R5 (adjuster)	Adjust R5 as necessary for a reading of 89 feet.
4.	Tower (erect second stage)	Refer to TM 11-5985-38712, erect tower second stage.
5.	R10 (adjuster)	Inside height indicating box, adjust R10 for a height indication of 117 feet.
6.	Covers	Install cover on height indicator box and secure tower control panel inside box.

2-13. REMOVE/REPLACE HEIGHT INDICATOR HARNESS

Location	Item	Action
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REMOVE

1. Harness assembly (height indicator)	Connector	Disconnect connector (1) from back of height indicator readout box (2).
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2.	Terminal block/ harness wiring	Tag and disconnect wiring from terminal block TB6 (3) on terminal panel E3 (4).
----	--------------------------------	---

REPLACE

1. Harness assembly (height indicator)	Terminal block/ harness wiring	Install harness wiring on terminal block TB6 (3) terminal panel E3 (4). Ensure connections are secure.
--	--------------------------------	--

2.	Connector	Connect harness (1) to back of height indicator readout box (2).
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3. Functionally check for proper operation. (Adjust height indicating system in accordance with TM 11-5985-387-12 and paragraph 2-12.) Ensure harness is properly installed to protect from electrical interference (shielding).

2-14. REMOVE/REPLACE CONTROL BOX HARNESS

WARNING

Ensure electrical power is removed from control box to prevent injury or death from electrical shock before starting procedure.

Location	Item	Action
REMOVE		
1. Control box harness	Antenna positioner	Pull out antenna control unit positioner control unit plug/front and disconnect plug control panel (refer to TM 11-5985-387-12). Disassemble panel box to extent to gain access to harness. (Refer to paragraph 2-8.)
2.	Terminals/connections	Tag and disconnect wiring terminals from remaining connections in panel box
3.	Receptacles	Remove receptacles from panel box by removing four screws and nuts for each receptacle. Inspect gaskets.
1. Control box harness	Receptacles	Install each receptacle harness by placing gasket between receptacle and box, aligning with mounting holes, and securing with four sets of screws and nuts.
2.	Terminals/connections	Install wiring terminals in panel box (except on front panel).
3.	Front control panel	Connect remaining wiring terminals between harness and front panel. Install front panel in control box (refer to paragraph 2-8).

2-14. REMOVE/REPLACE CONTROL BOX HARNESS - Continued

Location	Item	Action
REPLACE - Continued	Antenna positioner control unit	Connect antenna positioner control unit plug and install antenna positioner control unit in control panel box (refer to TM 11-5985-38712).
4.		
5.		Functionally check for proper operation. Ensure harness is correctly installed to protect from electrical interference (shielding).

2-15. REPAIR OF HARNESS ASSEMBLIES (TYPICAL)

WARNING

Ensure electrical power is removed from control box to prevent injury or death from electrical shock before starting procedure.

NOTES

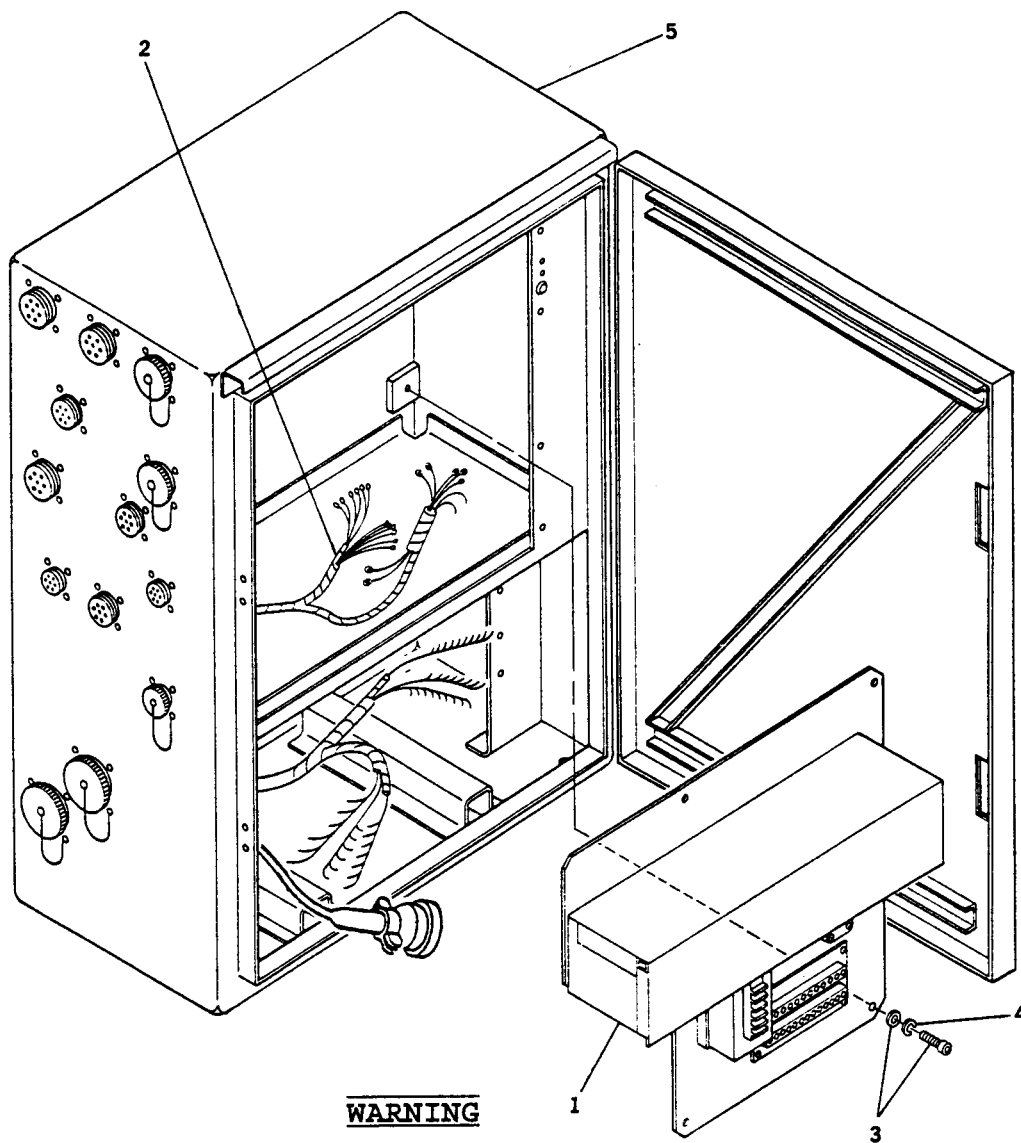
1. Refer to TM 11-5985-387-24P for individual repair parts and sizes concerning the particular harness under repair.
2. When repairing shielded components, ensure proper installation to protect from interference.
3. Soldering shall conform to MIL-STD-454, requirement 5. Refer to Figure FO-5, Sheet 5, for tinning requirements.
4. Insulate solder connections in accordance with MIL-I-23053, Class 1.
5. Identify new components in accordance with MIL-STD-130.
6. Workmanship shall be in accordance with MIL-STD-454, Requirements 9 and 69.
7. Cable ties should be at intervals of approximately 3 inches.

Location	Item	Action
1. Harness assembly	Connectors/Replace	Replace by moving at solder points. Slide shrink tubing and necessary connector parts over wires before soldering.
2.	Terminals lugs	Replace terminal lugs by crimping new lugs onto wire. (Refer to TM 11 5985-387-24P for sizes.)

2-15. REPAIR OF HARNESS ASSEMBLIES (TYPICAL) - Continued

Location	Item	Action
3.	Metal shell (over connector)	Replace metal shell over connector in accordance with MIL-C-85049/48.
4.	Wiring, including shielded wires	Replace wiring as required. Ensure shielding qualities are maintained throughout repair process. Tin as required in accordance with Figure FO-5, Sheet 5.

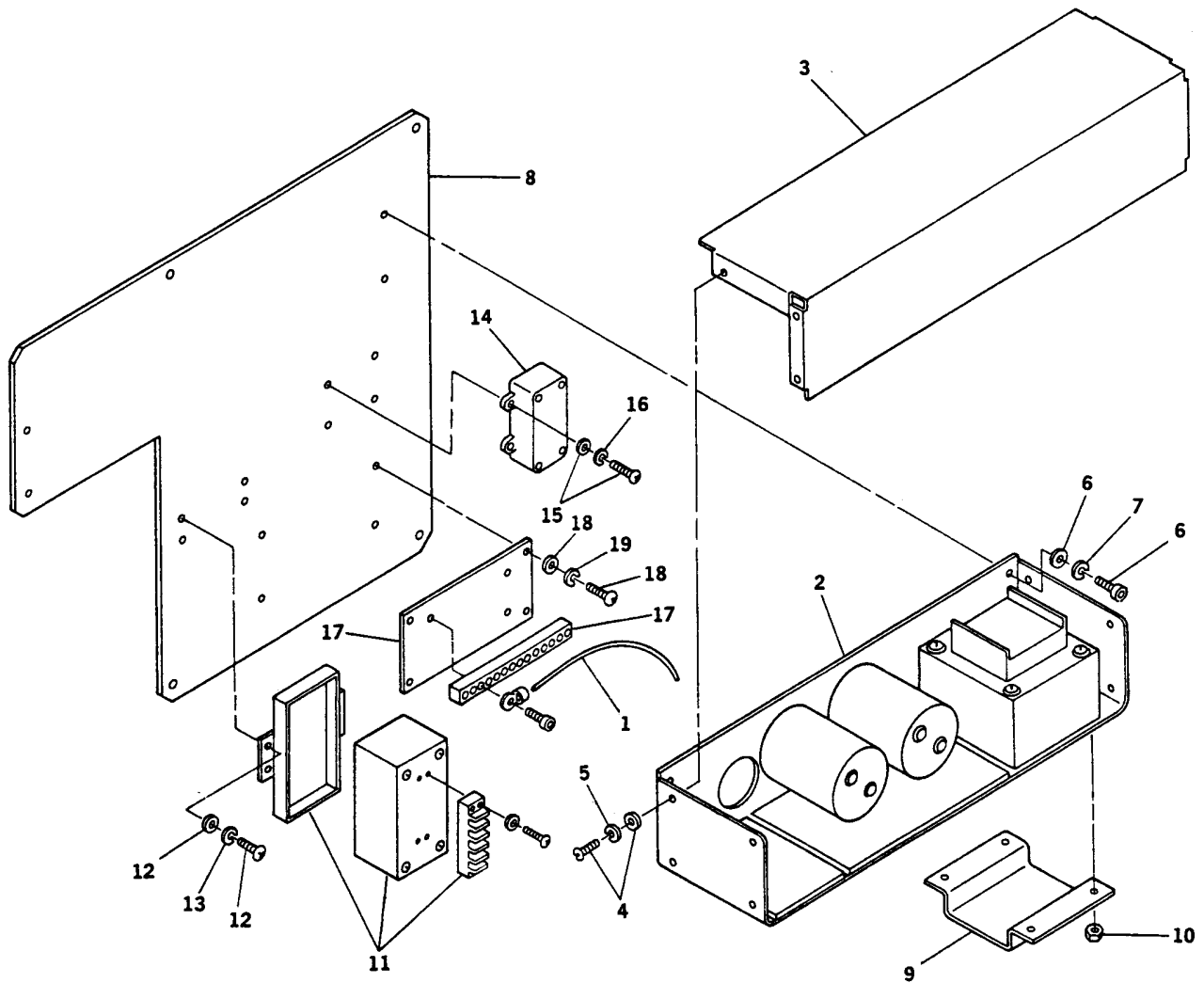
2-16. REMOVE/REPLACE REAR PANEL ASSEMBLY



2-16. REMOVE/REPLACE REAR PANEL ASSEMBLY - Continued

Location	Item	Action
REMOVE		
1. Rear panel assembly	Panel box (5) (preparation)	Remove front panel in accordance with paragraph 2-8.
2.	Wiring harness (2)	Tag and disconnect wiring harness from rear panel (1) .
3.	Rear panel (1)	Remove rear panel from control box (5) by removing four sets of fasteners (3) and (4).
REPLACE		
1. Rear panel assembly	Rear panel (1)	Align rear panel to mounting holes and secure with four sets of fasteners (3) and new lockwashers (4).
2.	Wiring harness (2)	Connect wiring harness to rear panel (1).
3.	Panel box (5).	Complete assembly of panel box (5) by installing front panel in accordance with paragraph 2-8.
4. Functionally check for proper operation. Ensure harness is correctly installed to protect from electrical interference (shielding).		

2-17. REPAIR REAR PANEL ASSEMBLY



WARNING

Ensure electrical power is removed from control box to prevent injury or death from electrical shock before starting procedure.

NOTE

Certain components are replaceable with out removing or completely disassembling the panel.

2-17. REPAIR REAR PANEL ASSEMBLY - Continued

Location	Item	Action
REPAIR		
1. Rear panel assembly	Wiring (1)	Tag and disconnect wiring from component(s) needing replacement.
2.	Power supply Assembly (2)	Replace power supply (2) by removing fasteners (4), (5) securing cover (3); and fasteners (6), (7) securing power supply to rear panel (8). Inspect transformer cover (9). Replace if necessary by removing nuts (10). Use new lockwashers (5) and (7) during installation.
3.	30 second time delay (11)	Replace 30 second time delay (11) by removing fasteners (12) and (13). Use new lockwashers (13) during installation.
4.	Relay contactor (14)	Replace relay contactor by removing fasteners (15) and (16). Use new lockwashers (16) during installation.
5.	Bus assembly (17)	Inspect bus assembly (17) for damage. If necessary, replace by removing fasteners (18) and (19). Use new lockwashers (19) during installation.
6. Functionally check control box after repairs.		

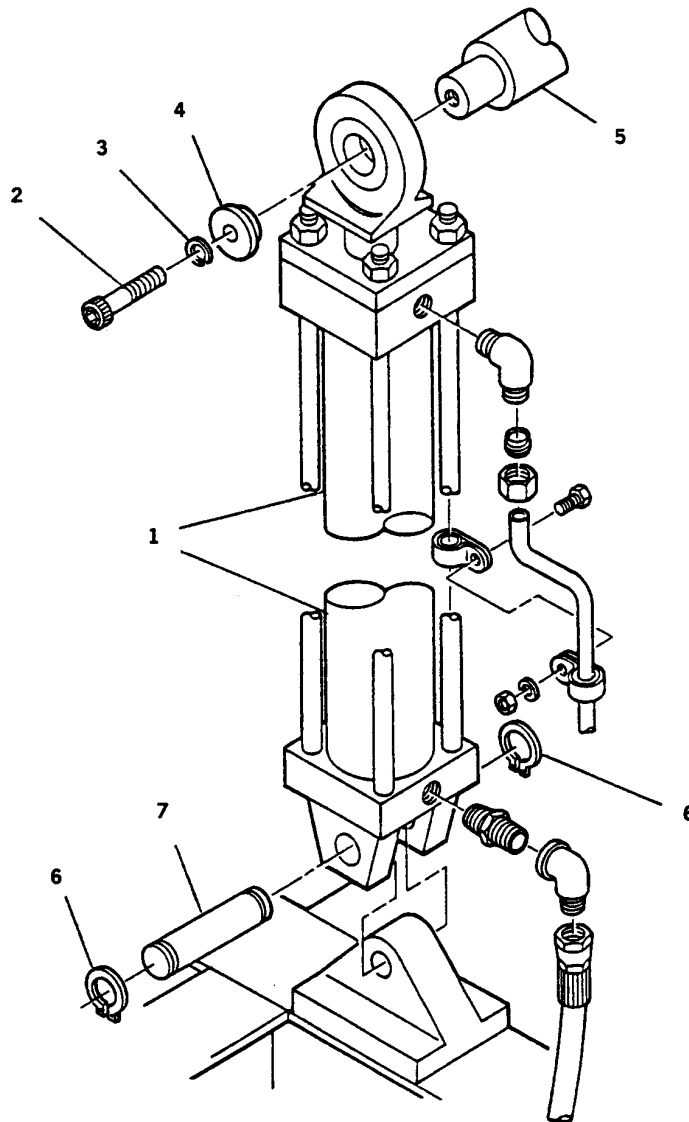
2-18. REMOVE/REPLACE HYDRAULIC CYLINDER

WARNING

Wear eye protection and wrap rags around fittings to prevent pressurized fluid from splashing while slowly disconnecting hydraulic lines.

CAUTION

Clean external areas around hydraulic connections before starting procedure. Ensure dirt/foreign matter does not enter hydraulic system during remove/replace procedure.



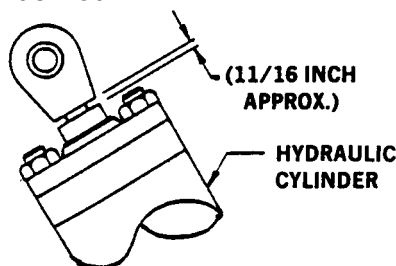
2-18. REMOVE/REPLACE HYDRAULIC CYLINDER - Continued

Location	Item	Action
REMOVE		
NOTE		
Catch hydraulic fluid in a suitable container and dispose of properly. Do not reuse this fluid		
1. Hydraulic cylinder	Connecting parts Top mounting (spherical bearing)	Slowly disconnect tubing, fittings, etc. from cylinder (1) and catch fluid in a suitable container.
2.	Bottom mounting (clevis)	Remove screw (2) and lockwasher (3). Slide ram mount end cap (4) from end of top mounting (5)
3.		Remove retaining ring (6) from slot in cylinder clevis pin (7). Drive out clevis pin (7) using a drift and maneuver cylinder assembly (1) away from top and bottom mounting points. Inspect all disassembled parts for damage or wear.

REPLACE

NOTE

Prior to installation, check that cylinder is adjusted so that approximately 11/16 inch clearance is provided between bottom of clevis and top of cylinder rod

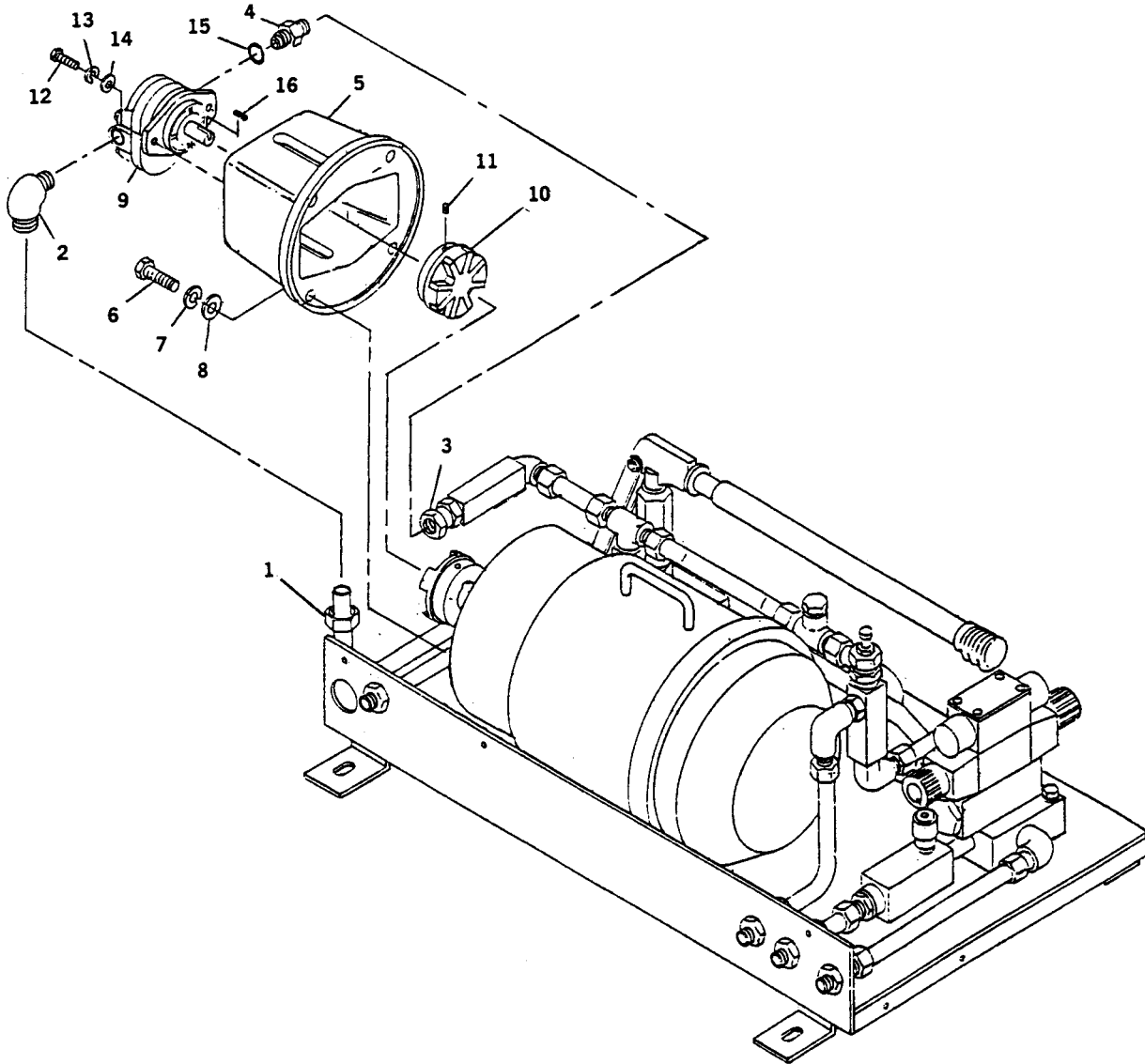


2-18. REMOVE/REPLACE HYDRAULIC CYLINDER - Continued

Location	Item	Action
REPLACE - Continued		
1. Hydraulic	Top mounting (spherical bearing)	Position hydraulic cylinder (1) onto end of top mounting (5) and slide ram mount end cap (4) onto end of top mounting (5). Secure loosely, with new lockwasher (3) and socket head cap screw(2)
2.	Capscrews (2)	
3.	Bottom mounting (clevis)	
4.	Connecting parts	Torque socket head cap screw (2) (after filling, bleeding and adjusting pressures) to 90 + 5 ft-lbs. Position bottom of hydraulic cylinder (1) onto bottom mounting bracket and secure by tapping in clevis pin (7) and installing retaining ring (6). Reconnect tubing, fittings, etc., to cylinder (1). (Hand tighten piping connection at top of cylinder body.)
5.	After connections are made, fill and bleed air from hydraulic system in accordance with TM 11-5985-387-12.	
6.	Tighten piping after filling and bleeding air from system.	
7.	Torque socket head cap screw (2) to 90 + 5 ft-lbs	
8.	Adjust pressure and flow rate in accordance with TM 11-5985-387-12.	

2-19. REMOVE/REPLACE HYDRAULIC POWER PACKAGE GEAR PUMP

Equipment Conditions: All systems shut down. Hydraulic cover assembly removed. (Refer to TM 11-5985-R7-1 2).



WARNING

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

CAUTION

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

2-19. REMOVE/REPLACE HYDRAULIC POWER PACKAGE GEAR PUMP - Continued

Location	Item	Action
NOTE		
Catch excess fluid in a suitable container and dispose of properly. Do not reuse this fluid.		
REMOVAL		
1. Hydraulic pump hydraulic	Pump hydraulic connections	Disconnect tube (1) from connections elbow (2) on inlet of pump and adapter (3) from connector (4) on outlet
2.	Pump/motor adapter (5)	Remove four bolts (6), lockwashers (7) and washers (8) securing to motor. Remove adapter (5) with pump (9) and coupling half (10). Discard lock washers (7).
NOTE		
Before removing coupling half (10), mark locations on shaft so during replacement the coupling is properly installed.		
3.	Coupling (10)	Loosen set screw (11) from coupling half (10) and remove coupling from pump (9) keyed shaft. Remove key (16) from shaft and inspect for damage.
4.	Pump (9)	Remove two bolts (12), lockwashers (13) and washers (14); remove pump from adapter. Discard lockwashers (13).
5.	Inlet and outlet connections	If necessary, remove elbow (2), connector (4) and preformed packing (15). Discard preformed packing (15).

2-19. REMOVE/REPLACE HYDRAULIC POWER PACKAGE GEAR PUMP - Continued

Location	Item	Action
REPLACEMENT		
1. Pump	Inlet and outlet connections	If removed, install elbow (2) in inlet port and new preformed packing (15) and connector (4) in outlet port.
NOTE		
Preformed packing (15) is installed over the threaded end of connector (4) and then installed in pump outlet.		
2. Hydraulic pump/motor	Pump (9)	Position pump on adapter pump/motor (5) and secure with two bolts (12), new lock washers (13), and washers (14).
NOTE		
Note location of coupling half (10) mark made on pump shaft during removal and install coupling half at this location on existing or new pump.		
3.	Pump/motor adapter (5)	Install key (16) and coupling half (10) on pump (9) shaft and secure with set screw (11).
4.	Adapter (5)	Position pump/motor adapter (5) on motor, mating coupling halves, and secure with four bolts (6), new lock washers (7) and washers (8).
5.	Pump hydraulic connections	Apply seal tape to disassembled male fittings. Connect tube (1) to elbow (2) and adapter (3) to connector (4).

2-19. REMOVE/REPLACE HYDRAULIC POWER PACKAGE GEAR PUMP - Continued

Location

Item

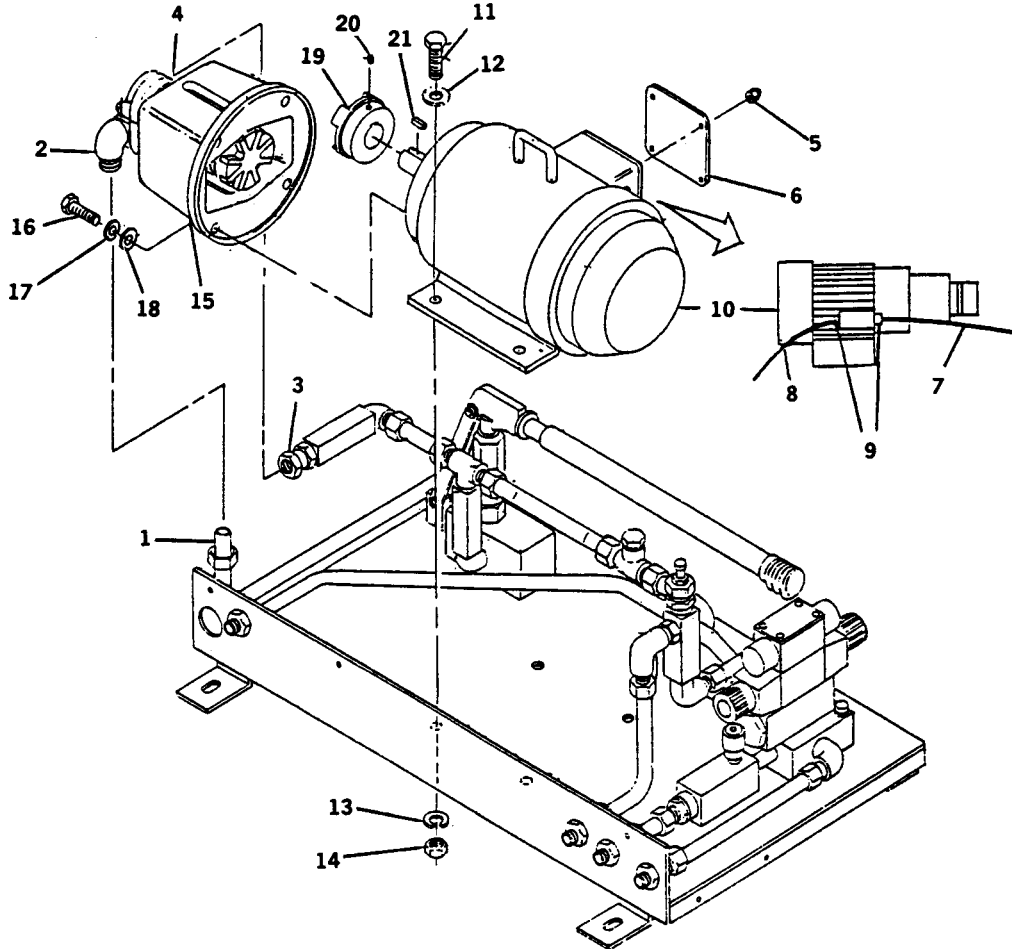
Action

REPLACEMENT - Continued

6. Fill (Item 10, Appendix B) and bleed air from hydraulic system. Refer to TM 11-5985-387-12.
7. Check for leaks.
8. Check and if necessary, adjust pressure and flow rate. Refer to TM 11-5985-387-12.

2-20. REMOVE/REPLACE HYDRAULIC POWER PACKAGE ELECTRIC MOTOR

Equipment Conditions: All systems shut down. Hydraulic cover assembly removed (Refer to TM 11-5985387-12).



WARNING

Ensure electrical power is not present at motor connections before starting procedure.

WARNING

Electric motor weighs 80 pounds. Ensure lifting device is capable of supporting this weight.

CAUTION

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

2-20. REMOVE/REPLACE HYDRAULIC POWER PACKAGE ELECTRIC MOTOR - Continued

NOTE

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

Location	Item	Action
REMOVAL	Pump hydraulic connections	Disconnect tube (1) from elbow (2) on inlet of pump and adapter (3) from connector (4) on outlet of pump.
1. Hydraulic pump/motor	Electrical box cover (6)	Remove nuts (5) securing cover (6) to motor (10) connection box and remove cover.
	Electrical wires	Tag and disconnect wires in motor connection box.
	Cables (7) and (8)	Remove cables (7 and 8) from strain relief connectors (9) and tape cable ends to protect wires.
NOTE		
Motor/pump weighs approximately 80 pounds (36.3 kg).		
5.	Motor (10)	Remove four bolts (11), washers (12), lockwashers (13) and nuts (14); using a lifting device remove motor/pump from mounting plate. Discard lockwashers (13).
6.	Pump/motor adapter (15)	Remove four bolts (16), lockwashers (17) and washers (18). Remove adapter (15) with pump and coupling half. Discard lockwashers (17).

2-20. REMOVE/REPLACE HYDRAULIC POWER PACKAGE ELECTRIC MOTOR - Continued

Location	Item	Action
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REMOVAL - Continued

NOTE

Before removing coupling half (19), mark location on motor shaft so during replacement the coupling is properly installed.

Coupling half (19)	If necessary, loosen setscrew (20) and remove coupling half (19) and key (21) from motor shaft.
--------------------	---

REPLACEMENT

NOTE

Note location of coupling half (19) mark made on motor shaft during removal and install coupling half at this location on existing or new motor.

1. Hydraulic pump/motor	Coupling half (19)	If removed, install key (21) and coupling half (19) on motor (10) shaft and secure with setscrew (20).
	Pump/motor adapter (15)	Position adapter (15) on adapter (15) motor (10), mating coupling halves, and secure with four bolts (16), new lockwashers (17) and washers (18).

NOTE

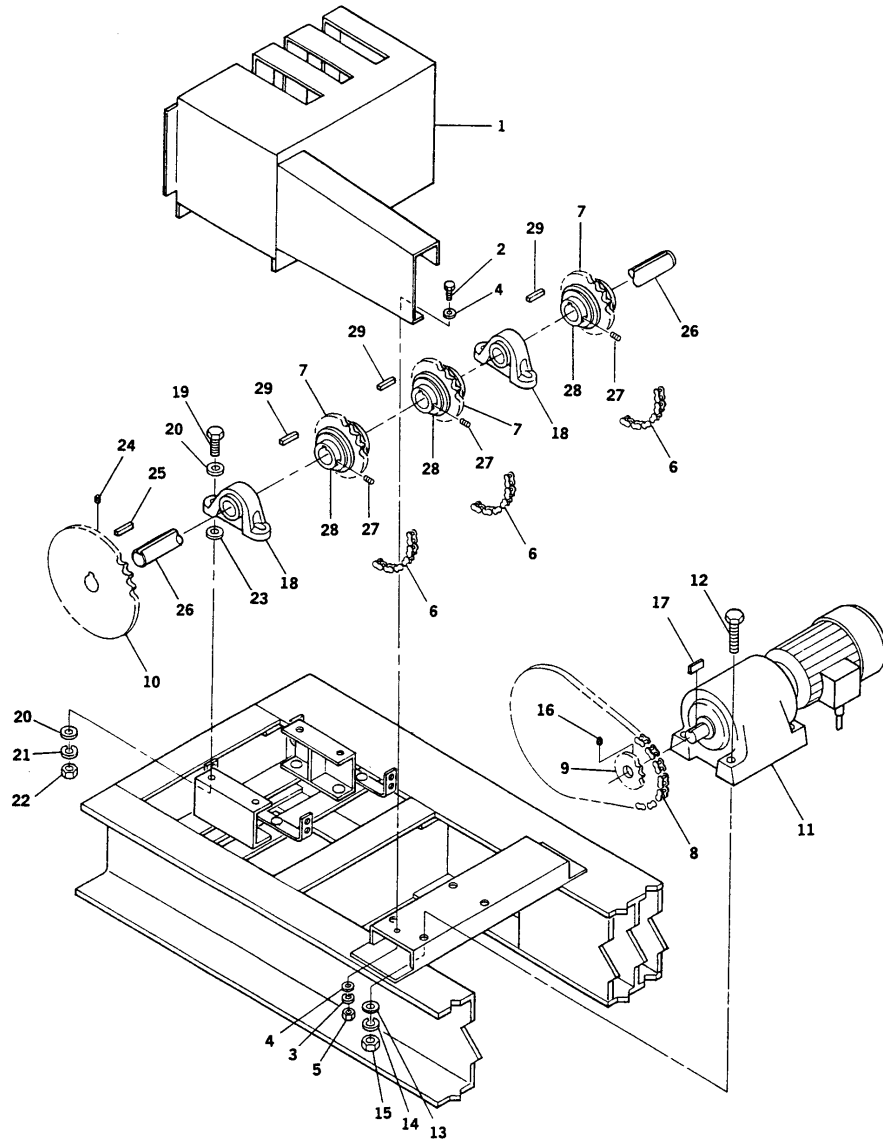
The motor/pump weighs approximately 80 pounds (36.3 kg).

2-20. REMOVE/REPLACE HYDRAULIC POWER PACKAGE ELECTRIC MOTOR
- Continued

Location	Item	Action
REPLACEMENT - Continued		
3.	Motor (10)	Using lifting device, position motor/pump on mounting plate and secure with four bolts (11), washers (12), new lock-washers (13) and nuts(14).
4.	Cables (7) and (8)	Remove protective tape from cables (7 and 8);route cables through strain relief connectors (9) and tighten.
5.	Electrical wires	Connect electrical wires as tagged during removal.
6.	Electric box cover (6)	Position cover (6) on motor connection box and secure with nuts (5).
7.	Pump hydraulic connections	Apply new seal tape to connections disassembled male fittings. Connect tube (1) to elbow (2) andadapter (3) to connector (4).
8. Fill (Item 10, Appendix B) and bleed air Refer to TM 11-5985-387-12.		
9. Check for leaks.		
10. Check and if necessary, adjust pressure and flow rate. Refer to TM 11-5985-387-12.		

2-21. REMOVE/REPLACE REEL DRIVE ASSEMBLY

Removal and replacement procedures are same for both road and curbsides. Curbside is shown.
Equipment Condition: All systems shut down.



2-21. REMOVE/REPLACE REEL DRIVE ASSEMBLY - Continued

Location	Item	Action
REMOVAL	Cover assembly (1)	Remove 24 capscrews (2), 24 lockwashers (3), washers (4) and one nut (5); remove cover assembly. Discard lockwashers (3).
1. Curb rear side of trailer	Roller chains (6)	
	Roller chain (8)	
2.	Gear motor (11)	Disconnect chains at master link and remove from reel and drive (7) sprockets.
3.	Sprocket (9)	
4.	Bearing pillow blocks (18)	Disconnect chain at master link and remove from sprockets (9 and 10).
5.		Open junction box on gearmotor and disconnect cable leads. Loosen stuffing tube nut and pull cable from junction box. Remove four bolts(12), washers (13), lockwashers (14) and nuts(15); remove gearmotor. Discard lockwashers (14).
6.		If necessary, loosen setscrew (16) and remove sprocket (9) and key (17) from gearmotor shaft.
		Remove four capscrews (19), eight washers (20), four lockwashers (21) and four nuts (22); remove pillow blocks with drive shaft and sprockets. Discard lockwashers (21).

NOTE

There may be washers (23) between bearing pillow blocks (18) and pillow block spacer. Note quantity and location.

2-21. REMOVE/REPLACE REEL DRIVE ASSEMBLY - Continued

Location	Item	Action
REMOVAL - Continued		
NOTE		
Mark or measure location of all components on drive shaft (26) for replacement.		
7.	Sprocket (10)	Loosen setscrew (24) and remove sprocket (10) and key (25) from shaft (26).
8.	Sprocket (7) and torque limiter (28)	
9.		On other end of drive shaft (26), loosen setscrew (27) and remove sprocket (7), torque limiter (28) and key (29).
10.	Bearing pillow blocks (18)	
11.		
	Remaining sprockets (s) (7) and torque limiter (s) (28)	Loosen setscrew through inner race of bearing and remove bearing pillow blocks (18) from drive shaft (26)
	Disassembled items	For remaining components on drive shaft (26), loosen setscrew (27) and remove sprocket (7), torque limiter (28) and key (29). If necessary disassemble torque limiter and sprocket.
		Check for corrosion. Clean and inspect. Replace damaged/defective items.

REPLACE

NOTE

When installing setscrews, apply locking sealant, MIL-S-22473, Grade C (Item 6, Appendix B) to threads

2-21. REMOVE/REPLACE REEL DRIVE ASSEMBLY - Continued

Location	Item	Action
REPLACE - Continued		
1. Curb rear side of trailer	Inner sprocket(s) (7) and torque torque limiters and limiter(s) (28)	If disassembled, assemble sprockets. Position torque limiters (29), sprockets (7), and key (29) on drive shaft (26) in location as noted during removal and secure with setscrews (27).
2.	Bearing pillow blocks (18)	Position bearing pillow blocks (18) on shaft (26) in locations as noted during removal so that shaft collar of bearings will face sprocket (10). Tighten setscrews through inner bearing.
3.	Sprocket (10)	Position sprocket(10) and key (25) on shaft(26) and secure with setscrew (24).
4.	Remaining sprocker (7) and torque limiter (28)	Position torque limiters (7) and torque (28), sprockets (7), and limiter (28) key (29) on drive shaft (26) in location as noted during removal and secure with setscrews (27).

NOTE

If there were washers (23) between bearing pillow block (18) and pillow block spacer, install them in locations as noted during removal.

5.	Bearing pillow blocks (18)	Position pillow blocks (18) and washers (23) on spacers and secure with four capcrews (19), eight washers (20), four new lockwashers (21) and four nuts (22). Do not tighten at this time.
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2-21. REMOVE/REPLACE REEL DRIVE ASSEMBLY - Continued

Location	Item	Action
REPLACE - Continued	Sprocket (9) Gearmotor (11)	If removed, install sprocket (9) and key (17) on gearmotor shaft and secure with setscrew (16).
7.		Position gearmotor on mounting and secure with four bolts (12), washers (13), new lockwashers (14) and nuts (15). Push cable through stuffing tube on motor junction box and connect wires. Install junction box cover.
8.	Roller chain (8)	Position chain on sprockets (9 and 10) and connect using master link.
9.	Roller chains (6)	Position chains on reel and drive (7) sprockets and connect using master link.
NOTE		
The drive sprockets (7) should be aligned so that drive chains are vertical and do not rub cable reels. Loosen setscrews and move sprockets as necessary.		
NOTE		
The reel drive chains should not be run too tight. A slack appearance when not moving is preferred.		
10.	Roller chains (6)	Check chain tension and add or remove washers (23) between either side of pillow blocks (18) and spacers.

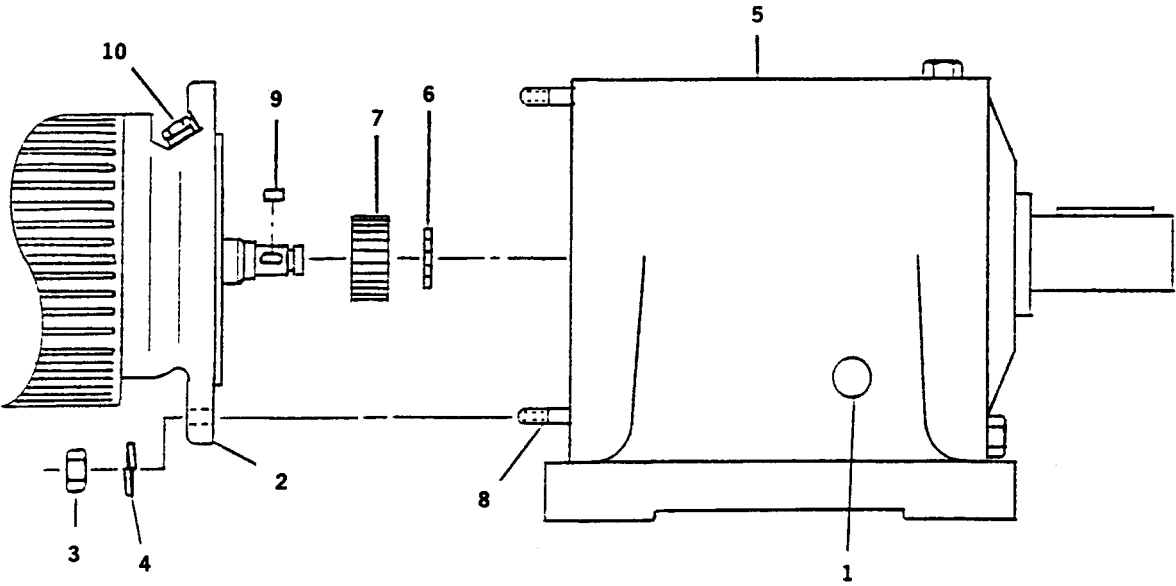
2-21. REMOVE/REPLACE REEL DRIVE ASSEMBLY - Continued

Location	Item	Action
REPLACE - Continued		
11.	Roller chain (8)	Move sprocket shaft as necessary to adjust chain (8) tension. A nonmetallic hammer may be used, tapping lightly on pillow block (18) flanges. Adjust for a slight sag in upper run of the chain (8).
12.	Pillow block bolts (19)	Torque bolts to 37 + 3 ft-lbs.
13.	Torque limiters (28)	Refer to TM 11-5985-387-12 and adjust torque limiters.
14.	Cover assembly (1)	Position cover assembly and secure with 24 cap screws (2), 24 new lock-washers (3), washers (4) and one nut (5).

2-22. REPAIR OF CABLE REEL DRIVE GEARMOTOR

Repair of the gearmotor is limited to separating the motor and gearbox for replacement of faulty unit.

Equipment Condition: Gearmotor removed from cable reel drive assembly. Refer to paragraph 2-21.



2-22. REPAIR OF CABLE REEL DRIVE GEARMOTOR - Continued

Location	Item	Action
DISASSEMBLY		
1. Gearmotor	Drain plug (1)	Remove the lower one of the four drain plugs (1) and drain oil from gearbox into a suitable container. Dispose of properly.
2.	Motor (2)	Remove four nuts (3) and lockwashers (4) securing motor (2) to gearbox (5). Discard lockwashers (4).
3.	Motor/gearbox	Separate motor (2) from gearbox (5).
4.	Drive gear (7)	If new motor is to be installed, remove snap ring (6) and remove gear(7) from motor shaft key (9). Discard snap ring (6). Inspect key.
5.	Gearbox (5)	If new gearbox is to be installed, remove four mounting studs (8) from gearbox.
ASSEMBLY		
1. Gearmotor	Gearbox (5)	If removed, install four mounting studs (8) in gearbox.
2.	Drive gear (7)	If removed, install key (9) and gear (7) on motor shaft and secure with new snap ring (6).
3.	Motor/gearbox	Install motor (2) on gearbox mounting studs (8) meshing gears and secure with four new lockwashers (4) and nuts (3).

2-22. REPAIR OF CABLE REEL DRIVE GEARMOTOR - Continued

Location	Item	Action
<hr/>		
ASSEMBLY - Continued		
4.	Gearbox (5)	Ensure all drain plugs (1) are installed and service gearbox through fill plug (10). Refer to TM 11-5985-387-12.

TM 11-5985-387-34

2-23. REPAIR TIRE/RIM ASSEMBLY

For repair of tire/rim assembly, refer to TM 9-2610-200-24.

TM 11-5985-387-34

2-24. REMOVE/REPLACE STIFFENER AND SUPPORT ASSEMBLIES

Removal and replacement procedures are same for both right and left sides. Right side shown.

Equipment Condition: Tower assembly, rear leveling jacks and cable reels removed.

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2-24. REMOVE/REPLACE STIFFENER AND SUPPORT ASSEMBLIES - Continued

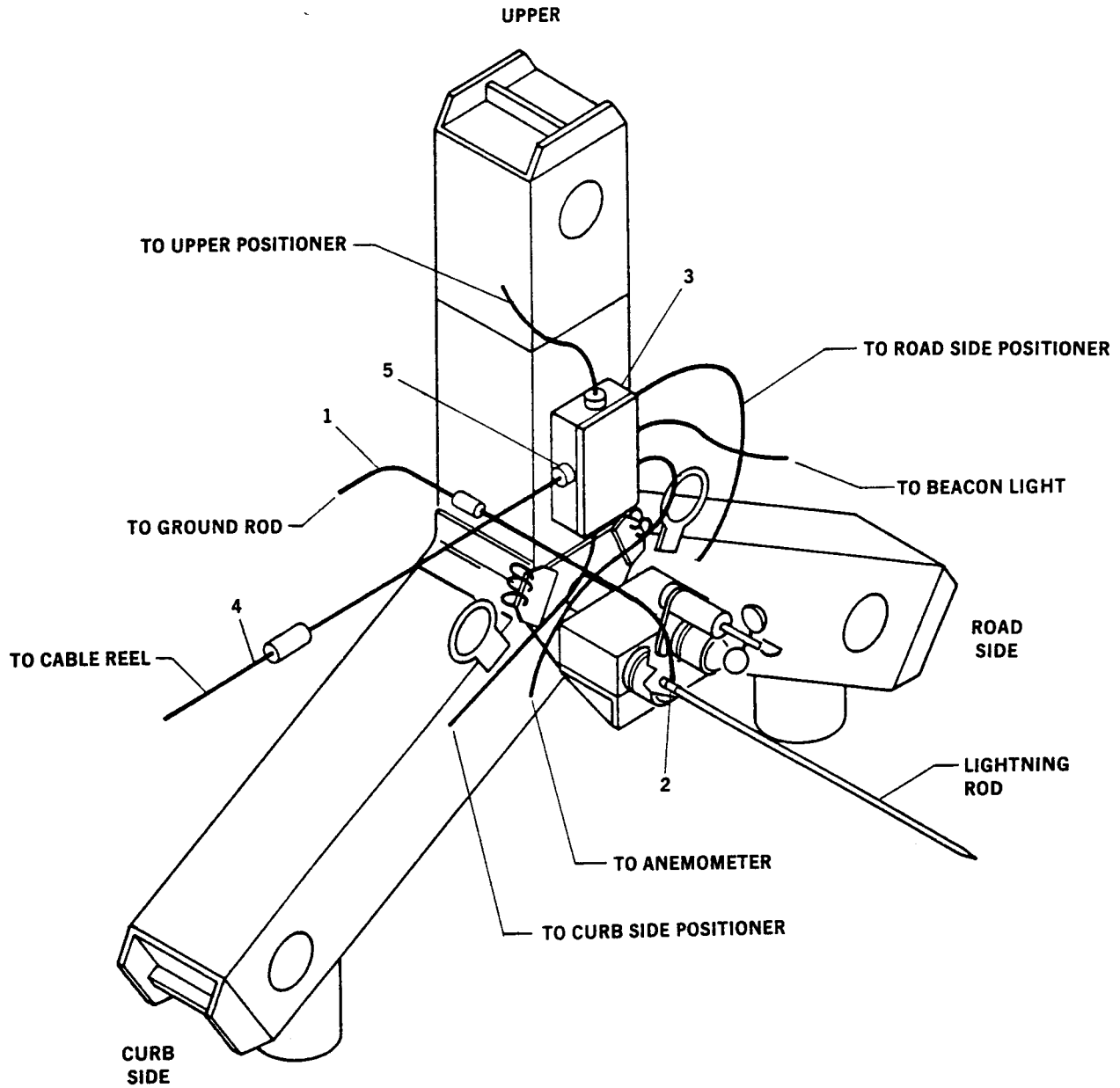
Location	Item	Action
REMOVAL		
1. Trailer Frame	Tilt guide (1)	Remove nuts (2), lockwashers (3), washers (4), tilt guide (1) and lockwasher (3) under tilt guide.
2.	Rear jack backing plate assembly (5)	Remove nuts (6 and 8), lockwashers (7 and 9) and rear jack backing plate assembly (5).
3.	Tower hinge weld assembly (10)	Remove remaining nuts (11) and lockwashers (12). Remove tower hinge weld assembly (10).
4.	Tie bolts (13)	If necessary, remove tie bolts (13), remaining washers (4), lockwashers (3) and nuts (2).
REPLACEMENT		
1. Trailer Frame	Tie bolts (13)	If removed, install nuts (2), new lockwashers (3) and nuts (4) on tie bolts (13). Install tie bolts (13) and tighten nuts (2).
2.	Tower hinge weld assembly (10)	Position tower hinge weld assembly (10) on tie bolts (13) and frame. Secure with new lockwashers (12) and nuts (11)
3.	Rear jack backing plate assembly (5)	Position rear jack backing plate assembly (5) and secure with new lockwashers (7 and 9) and nuts (6 and 8).

2-24. REMOVE/REPLACE STIFFENER AND SUPPORT ASSEMBLIES - Continued

Location	Item	Action
REPLACEMENT - Continued		
4.	Tilt guide (1)	Position tilt guide (1) with new lockwashers (3) under tilt guide. Secure with washers (4), new lockwashers (3) and nuts (2).
5.	Tower hinge weld assembly (10)	Ensure tower hinge weld assembly (10) is level and torque all nuts to 90 ft-lbs.

2-25. REMOVE/REPLACE LIGHTNING ROD GROUND CABLE AND CABLE W-110

Equipment Condition: Trailer and tower in shutdown/stowed condition.



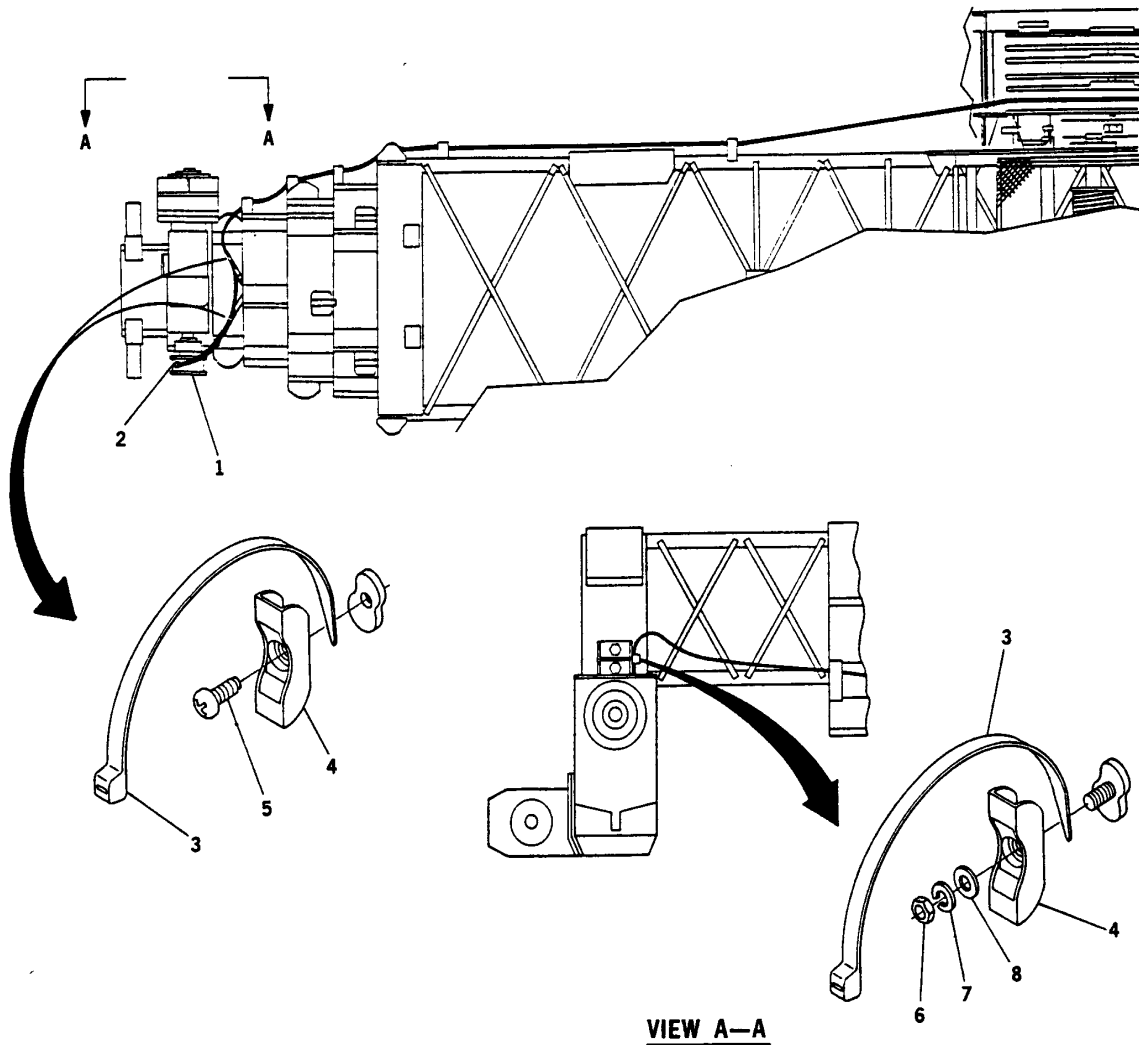
Location	Item	Action
REMOVAL		
1. Positioner platform	Ground cable (1)	Loosen cable clamp (2) and remove cable, tighten clamp
2. Positioner platform junction box (3)	Cable W-110 (4)	Disconnect connector (5) from J6 on box.

2-25. REMOVE/REPLACE LIGHTNING ROD GROUND CABLE AND CABLE W-110 - Continued

Location	Item	Action
REMOVAL - Continued		
NOTE		
Cable W-110 (4) and ground cable (1) are tiwrapped together and may be removed separately or together		
3. Tower curbside cable guides	Cable W-110 (4) and ground cable (1)	Remove from guides and wind onto cable reel or remove all cable from reel
REPLACEMENT		
1. Cable W-110 and ground cable	Tie wraps	If cables (4) and (1).have been separated, use a tie wrap every three feet till within six feet of positioner platform end.
2. Tower curbside cable guides and outermost curb side cable reel.	Cable w-110 (4) and ground cable (1)	Route cables to top of cable reel and route to positioner platform thru cable guides.
3. Positioner platform junction box	Cable W0110 (4)	Connect connector (5) to J6 on box (3).
4. Positioner platform	Ground cable (1)	Positioner cable under cable clamp.
5. Outermost curb-side cable reel	Cable W-110 (4) and ground cable (1)	Attach cables to reel with velcro strap; manually wind reel counter-clockwise until slack is removed from cables.

2-26. REMOVE/REPLACE CABLES W-126, W-131 AND W-132

Equipment Condition: Trailer and tower in shutdown/stowed condition.



Location	Item	Action
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REMOVAL

NOTE

Cables W-126, W-131 and W-132 are tie wrapped together to form one cable assembly.

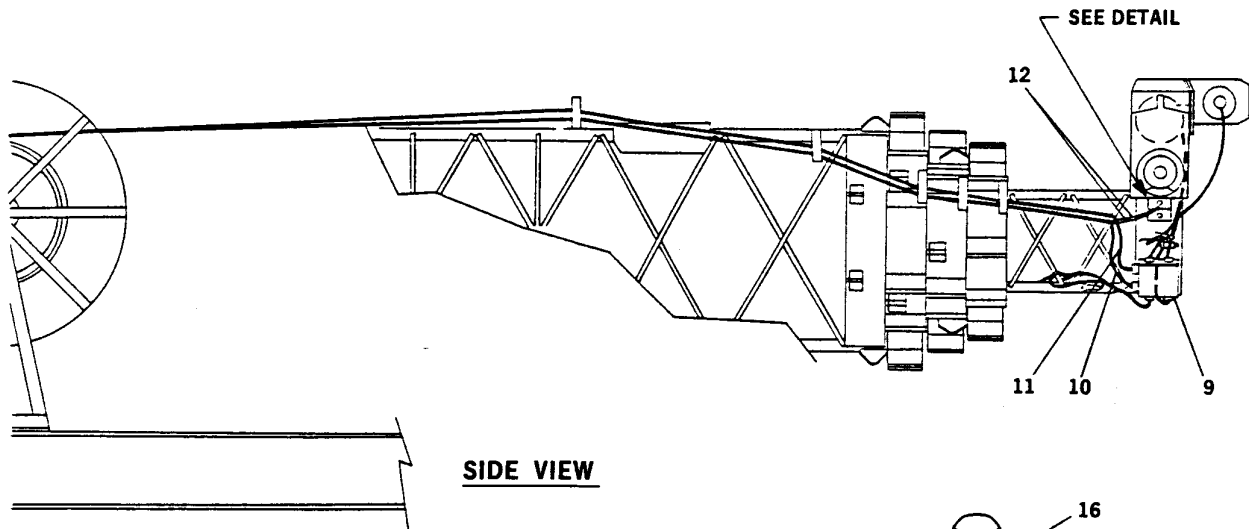
1. Second stage height encoder

Cable W-126 connector (2)

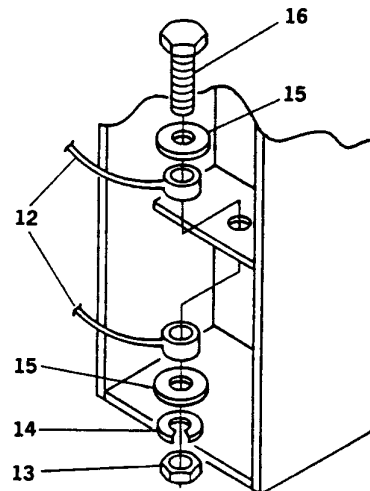
Disconnect connector (2) from second stage height encoder (1).
Disconnect connector (2) from second stage height encoder (1).

2-26. REMOVE/REPLACE CABLES W-126, W-131 AND W-132 - Continued

Location	Item	Action
REMOVAL - Continued 2. No. 6 tower	Cable securing tie wraps (3)	Remove three tie wraps (3) securing cable.
3.	Plastic tie mounts (4)	Remove self tapping (4) screws (5) and nut (6), lockwashers (7) and flatwasher (8) securing mounts.



DETAIL



2-26. REMOVE/REPLACE CABLES W-126, W-131 AND W-132- Continued

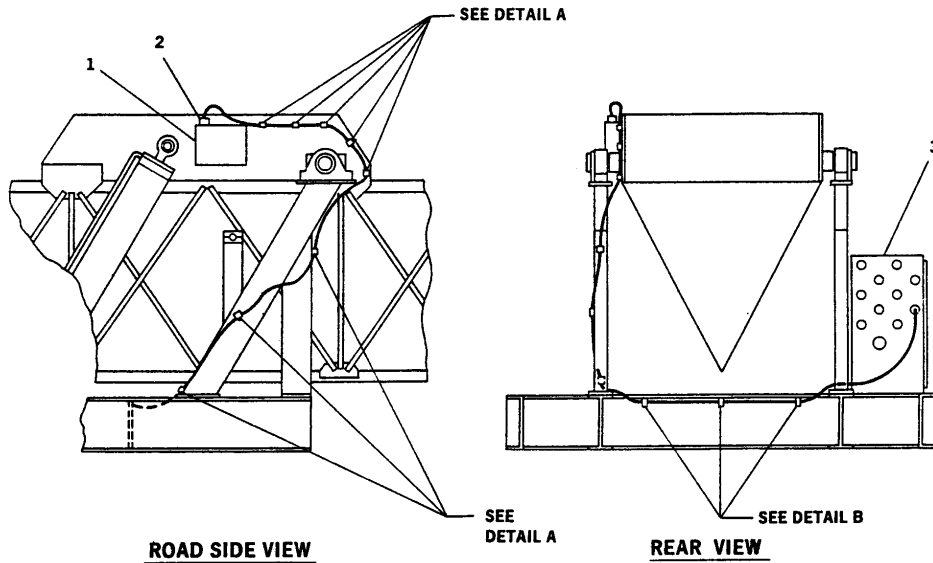
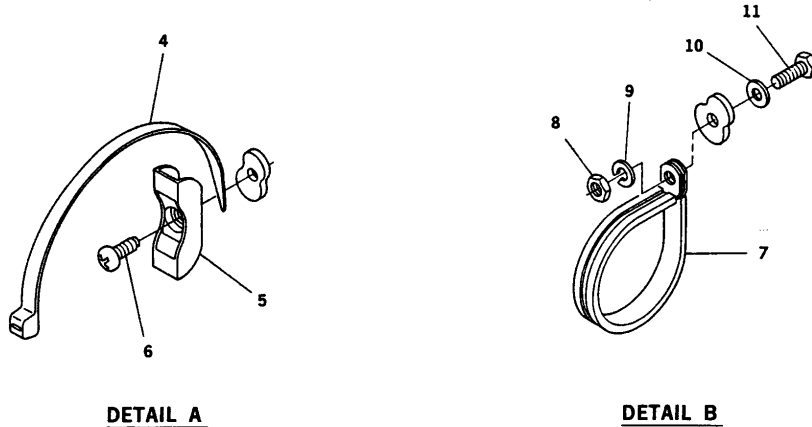
Location	Item	Action
REMOVAL - Continued		
4. Second stage junction box	cover (9)	Loosen two screws and clips securing cover and open cover.
5.	Cable W-131 (10) and W-131 (11) wires	Tag and disconnect all and W-132 (11) wires of both cables from wires terminal block.
6.	Strain relief connectors	Remove cables from strain connectors relief connectors; tape cable ends to protect wires.
7. No. tower Section	Cable mesh grips (12)	Remove nut (13), lockwasher (14), two flat washers (15) and bolt (16) securing grips.
8. Tower curbside cable guides and cable reel	Cables W-126 (2), W-131 (10) and W-132 (11)	Remove from guides and wind onto cable reel remove all cable from reel
REPLACEMENT		
1. Cables W-126, W-131 and W-132	Tie wraps	If cables (2), (10) and W-131 and (11) have been separated, use a tie wrap every three feet to secure cables together.
2. Tower curbside cable guides and outermost curb side cable reel	Cables W-126 (2), W-131- (10) and W-132 (11)	Route cables over top of cable reel and route to end of No. 6 tower section
3. No. 6 tower Section	Cable mesh grips (12)	Secure with bolt (16), two flat washers (15). new lockwashers (14) and nut (13).
4. Second stage junction box	Cables W-131 (10) and W-132 (11) wires	Remove protective tape from ends of cables; route cables through strain relief connectors and tighten.

2-26. REMOVE/REPLACE CABLES W-126, W-131 AND W-132 - Continued

Location	Item	Action
REPLACEMENT - Continued		
5.	Terminal block	Connect wires to terminal block as tagged during removal.
6.	Cover (9)	Close cover and secure with two clips and screws.
7. No. 6 tower	Plastic tie mounts (4)	Install two mounts using self tapping screws (5);install other one with flat washer (8), new lock-washer (7) and nut (6).
8.	Cable securing tie wraps (3)	Install three tie wraps securing cables to mounts installed in step 7.
9. Second stage height encoder	Cable W-126 connector (2)	Connect connector (2) to second stage height encoder (1).
10. Innermost curb-side cable reel	Cables W-126 (2), W-131 (10) and W-132 (11)	Attach cables to reel with velcro strap; manually wind reel counterclockwise until slack is removed from cables.

2-27. REMOVE/REPLACE CABLE W-127

Equipment Condition: Trailer and tower in shutdown/stowed condition.



Location	Item	Action
1. First stage height encoder	Cable W-127 (2) connector	Disconnect from encoder (1) and control box (3) at receptacle J10.

2-27. REMOVE/REPLACE CABLE W-127 - Continued

Location	Item	Action
REMOVAL - Continued		
2. Road side of No. 10 tower section and support assembly	Eight tie wraps (4)	Remove tie wraps securing cable.
3.	Eight plastic tie mounts (5)	Remove self tapping screws (6) securing mounts.
4. Trailer frame	Three cable clamps (7)	Remove nuts (3), lock washers:(9), flat washers (10) and bolts (11) securing each clamp; remove cable.
REPLACEMENT		
1. Trailer frame	Cable W-127 (2)	Position cable on trailer frame and connect plug P10 to J10 on control box (3).
2.	Three cable clamps (7)	Secure cable with clamps using bolts (11), flat washers (10), new lockwashers (9) and nuts (8).
3. Road side support assembly and No. 10 : tower section	Cable W-127 (2)	Position cable on support and tower section and connect cable connector to first stage height encoder (1).
4.	Eight plastic tie mounts (5)	Secure using self tapping screws;(6).
NOTE		
The longer self tapping screws are used on the support assembly.		
5.	Eight tie wraps (4)	Secure-cable to mounts.

2-28. REMOVE/REPLACE CABLES W-122 AND W-123 - Continued

Location	Item	Action
REMOVAL		
1. Control box	Cable W-122 (2) and W-123 (3) connectors	Disconnect from J02 and J07 on control box (1).
2. Curbside of trailer and support assembly Item	Size cable clamps (4)	Remove self tapping screws (5).
NOTE		
Note location of shorter screw for replacement.		
3. No. 10 tower section truss assembly	Two cable clamps (6)	Remove bolt (7) and lock washer (8).
4. First stage junction box	Cover (9)	Loosen two screws and clips securing cover and open cover.
5.	Cables W-122 (23 and W-123 (3) wires	Tag and disconnect all wires of both cables from terminal block.
6.	Strain relief connectors	Remove cables from strain relief connectors; tape cable ends to protect wires.
7. Trailer and tower	Cables	Remove cables.
REPLACEMENT		
1. First stage junction box	Cable W-122 (2) and W-123 (3) wires	Remove protective tape from ends of cables; route cables through strain relief connectors and tighten.
2.	Terminal block	Connect wires to terminal block as tagged during removal.

2-28. REMOVE/REPLACE CABLES W-122 AND W-123 - Continued

Location	Item	Action
REPLACEMENT - Continued		
3.	Tie wraps	Secure wire bundles inside junction box.
4.	Cover (9)	Close cover and secure with two clips and screws.
5. Cables W- 122 and W- 123	Spiral cable wrap	Install as necessary to protect cables (2) and (3) from sharp corners.
6. No. 10 tower section truss assembly	Two cable clamps (6)	Secure cables with clamps bolt (7) and new lock washer (8).
7. Curbside of trailer and support assembly	Six cable clamps (4)	Secure cables with clamps and self tapping screws; use shorter screw as noted during removal.
8. Control box	Cable W-122 (2) connector.	Connect to control box (J02).
9.	Cable W-123 (3) connector.	Connect to control box (J07)

2-29. REMOVE/REPLACE TOWER ASSEMBLY

- Equipment Conditions:
1. Trailer shut down and tower in horizontal position.
 2. Trailer stabilized on front and rear jacks.
 3. Antennas removed from positioners.
 4. Positioners removed from positioner platform assembly.
 5. Tower front and rear tie downs removed.
 6. Three antenna cables removed from tower section cable guides and wound onto cable reels.
 7. The following cables disconnected/removed from tower as necessary to allow removal of tower.

Lightning rod ground cable

W-110

W-122

W-123

W-126

W-127

W-131

W- 132

8. Hinge limit switch assembly removed.
9. Both tilt hydraulic cylinders removed. (Refer to paragraph 2-18.)

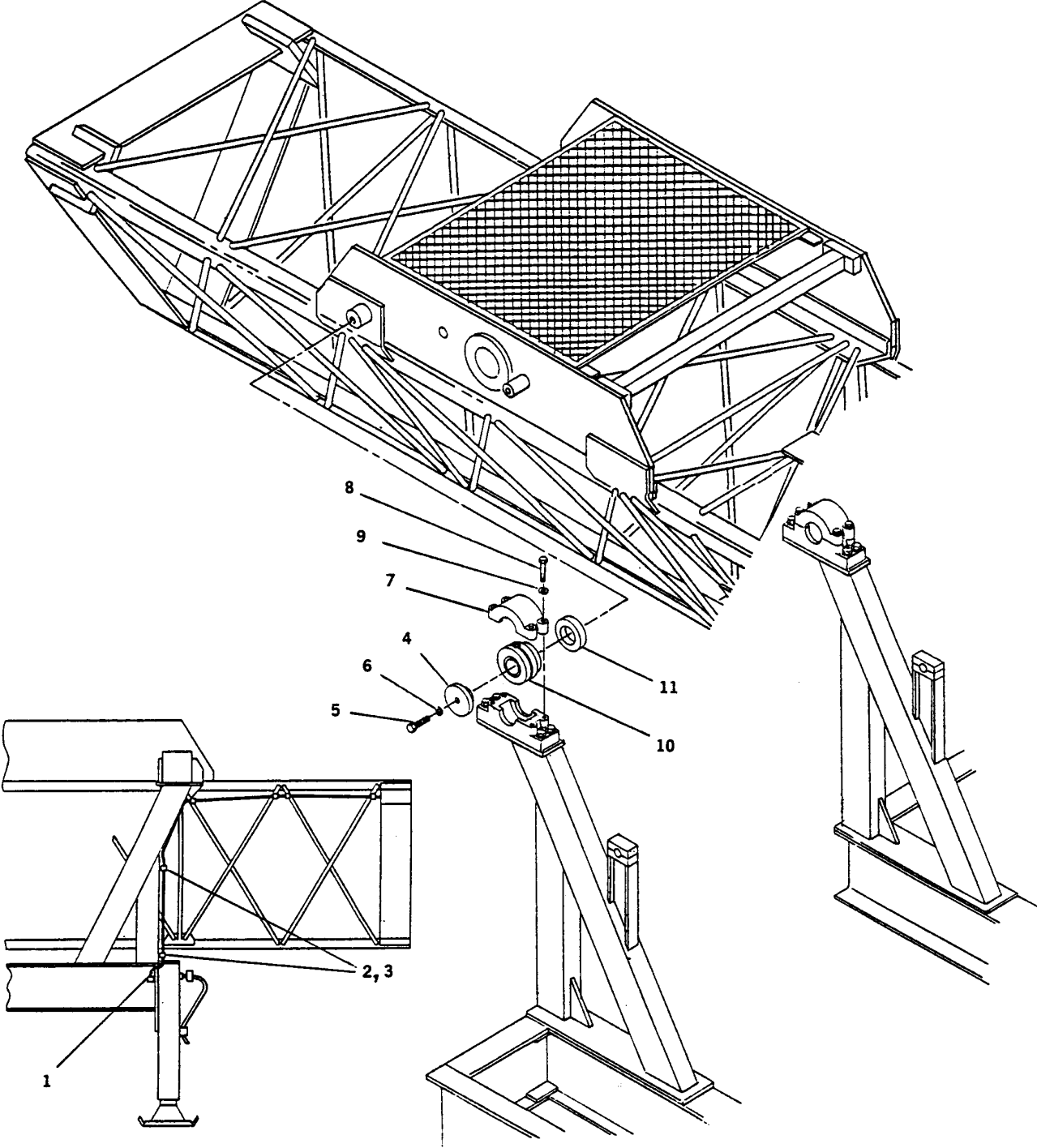
WARNING

Tower assembly weight 5625 pounds. Ensure lifting device and slings are capable of supporting this weight.

CAUTION

To prevent damage to tower sections, use web type slings not chains when lifting tower.

2-29. REMOVE/REPLACE TOWER ASSEMBLY - Continued



2-29. REMOVE/REPLACE TOWER ASSEMBLY - Continued

Location	Item	Action
REMOVAL		
1. Tower assembly	Lifting device	Attach lifting device to tower and take up slack.
2. Road rear side of trailer	Tower blackout light harness (1)	Disconnect harness (6) from trailer wiring and remove two self tapping screws (2) and clamp (3) securing harness to road side support.
3. Curbside hinge point	End cap (4)	Remove bolt (5) and lock washer (6); remove end cap.
4. Road and curb side hinge points	Pillow blocks (7)	Remove four bolts (8) and lockwashers (9) securing upper half pillow block; remove upper half.
5. Lifting device	Tower assembly	Use lifting device to remove tower from trailer and place on adequate supports/cribbing.
6. Tower hinge point shaft	Two bearings (10)	Loosen setscrew in bearing collar and remove bearings .
7.	Two spacers (11)	Remove spacers from shaft.
REPLACEMENT		
1. Tower hinge point shaft	Two spacers (11)	Install spacer on each side of shaft.
2.	Two bearings (10)	Install bearings on shaft so one setscrew is pointing up; do not tighten setscrews.

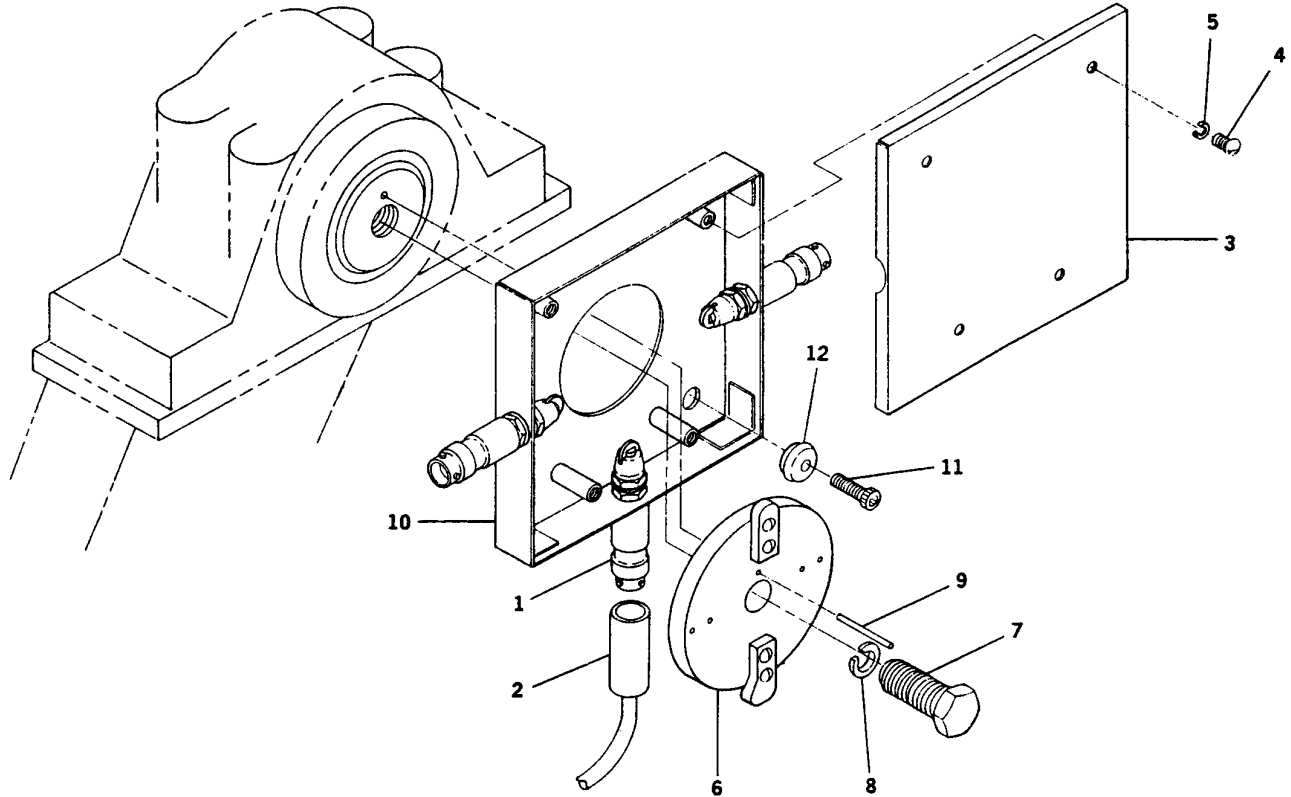
2-29. REMOVE/REPLACE TOWER ASSEMBLY - Continued

Location	Item	Action
REPLACEMENT - Continued		
3. Lifting Device	Tower assembly	Using lifting device and web type slings, position tower on trailer aligning hinge point bearings with pillow blocks and front of tower with support cones.
4. Road and curbside hinge points	Pillow blocks (7)	Position upper half pillow block and secure with four bolts (8) and new lockwashers (9).
5.	Two bearings (10)	Remove setscrews from inside bearing collar; apply Loctite to these setscrews and install in collar until heads are flush with O.D. of collar. Do not tighten outer collar setscrews.
6. Curbside hinge point	End cap (4)	Install end cap and secure with new lockwasher (6) and bolt (5); torque to 150 ft-lbs.
7. Road rear side of trailer	Tower blackout light harness (1)	Route harness from tower down road side support assembly and secure with two clamps (3) and self tapping screws (2). Connect harness to trailer wiring.

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REMOVE/REPLACE HINGE LIMIT SWITCH ASSEMBLY

Equipment Conditions: Trailer shutdown condition.



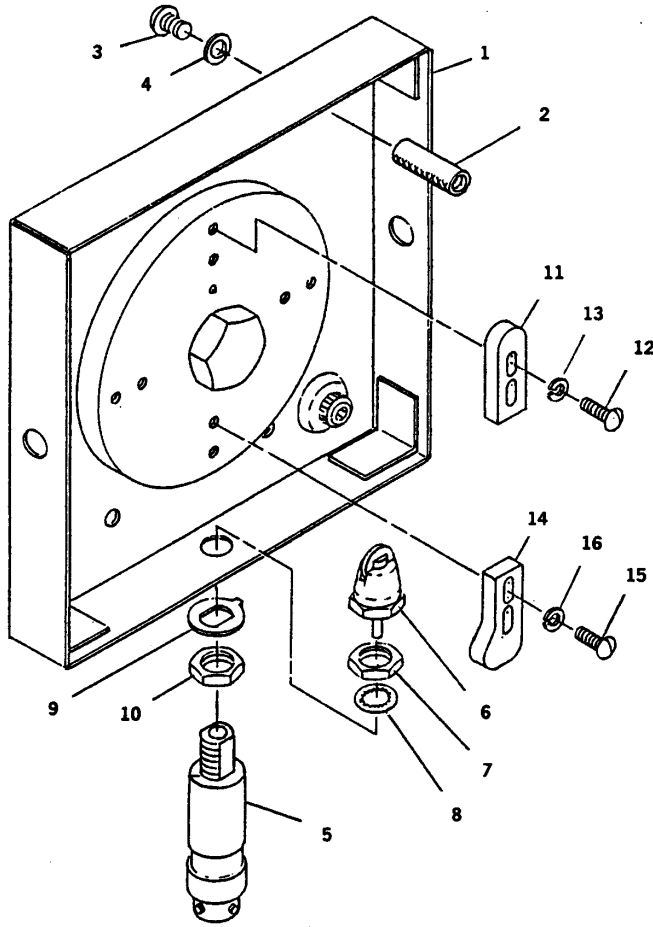
Location	Item	Action
REMOVAL		
1. Three hinge limit switches	Cable connectors (2)	Tag and disconnect from each switch.
2. Hinge limit switch assembly	Cover (3)	Remove four screws (4) and lockwashers (5); remove cover.
3.	Mounting cam (6)	Remove bolt (7) and lock washer (8); remove mounting cam from spring pin (9).

2-30. REMOVE/REPLACE HINGE LIMIT SWITCH ASSEMBLY- Continued

Location	Item	Action
REMOVAL - Continued		
4.	Spring pin (9) Box (10)	Remove and discard.
5.		Remove screw (11) and grommet (12); remove box with limit switches.
REPLACEMENT		
1. Hinge limit switch assembly	Box (10)	Position box on pillow block and secure with grommet (12) and screw (11); do not tighten at this time.
2.	Spring pin (9)	Install new spring pin (9) in mounting cam (6).
3.	Mounting cam (6)	Position on shaft in box aligning spring pin (9) with hole in shaft. Gently tap spring pin into place. Secure cam with bolt (7) and new lockwasher (8).
4.	Bolt (7)	Torque to 150 ft-lbs.
5.	Screw (11)	Ensure box is level and tighten screw.
6.	Cover (3)	Install and secure with four screws (4) and new lockwashers (5).
7.	Three limit switches (1)	Connect connectors (2) as tagged during removal

2-31. REPAIR OF BINGE LIMIT SWITCH ASSEMBLY

Equipment Conditions: Hinge Limit switch assembly removed.



Location	Item	Action
1. Box	Four spacers (2)	Remove screws (3) and lockwashers (4); remove spacers (2) from box (1).
2.	Three limit switches (5)	Remove roller actuator and housing (6), hex nut (7), lockwasher (8), keyway washer (9) and outer locknut (10); remove each switch

2-31. REPAIR OF HINGE LIMIT SWITCH ASSEMBLY- Continued

Location	Item	Action
DISASSEMBLY - Continued		
3.	0° Cam (11) (Activates tilt upperlimit indicator light)	Remove two screws (12) and lockwashers (13); remove and inspect cam.
4.	5° and 10° Cam (14) (Allows 15° total operating range for 1st stage)	Remove two screws (15) and lockwashers (16); remove and inspect cam.
ASSEMBLY		
1. Box	0° Cam (11)	Position cam on mounting as shown and secure with two screws (12) and new lockwashers (13).
2.	5° and 10° Cam (14)	Position cam on mounting 180 degrees from 0° cam and secure with two screws (15) and new lockwashers (16).
3.	Three limit switches (5)	Thread outer locknut (10) all the way onto limit switch (5) and install keyway washer (9).
4.		Position each switch in box (1) and secure with new lockwasher (8), and hex nut (7); install roller actuator and housing assembly (6) ensuring it is flush with hex nut (7).
5.	Four spacers (2)	Position spacers on box and secure with new lockwashers (4) and screws (3).

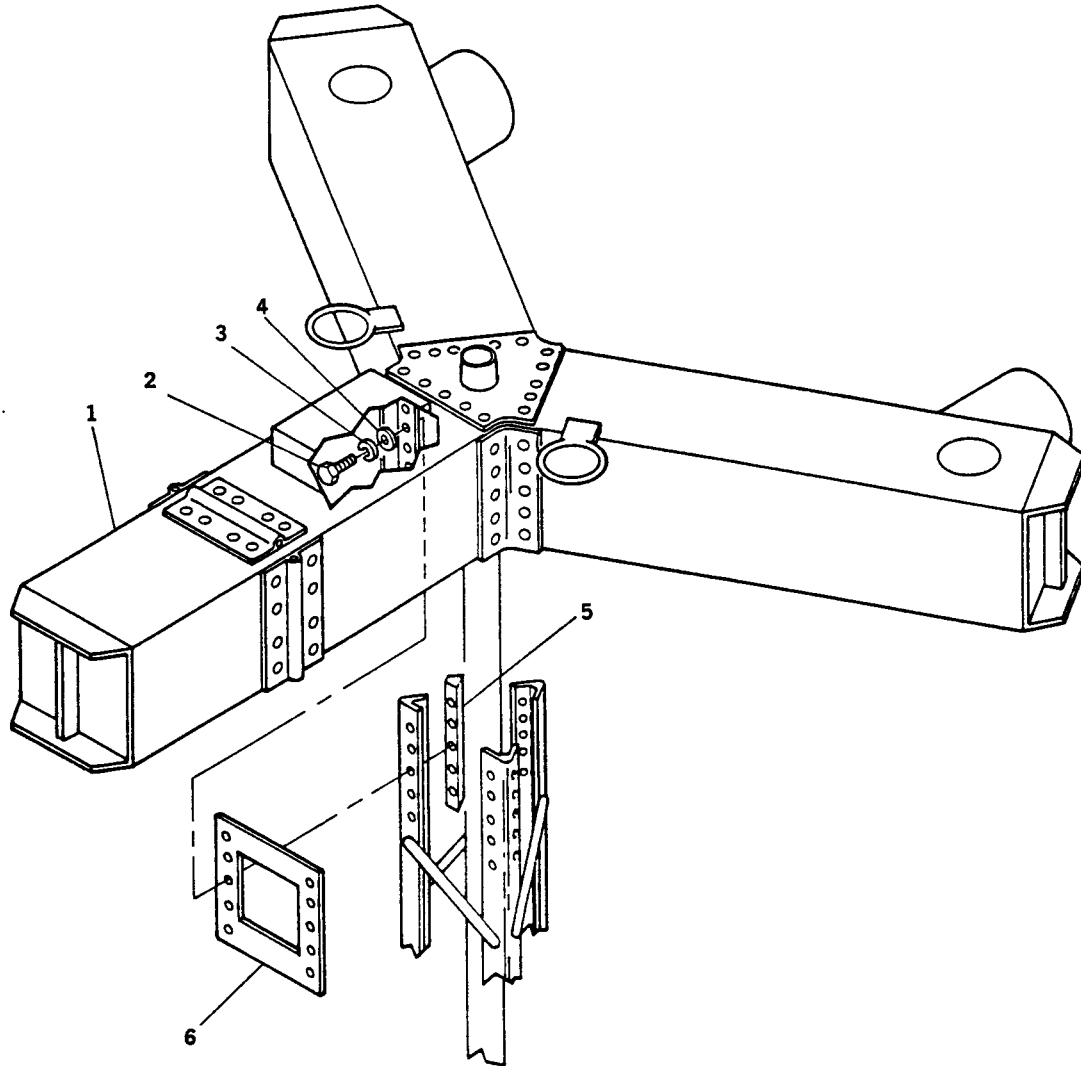
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REPAIR OF HINGE LIMIT SWITCH ASSEMBLY- Continued

Location	Item	Action
<hr/>		
ADJUST		
1. Adjust 5° and 10° cam (14) until it actuates bottom limit switch. Tighten screws (15).		
2. The procedure in step 1 will also ensure the left limit switch is also adjusted (15° total operating range for 1st stage allowance).		
3. Tilt the tower to vertical position (90° plumb when trailer is level). (Refer to TM 11-5985-387-12)		
4. Adjust 0° cam (11) until it actuates right side limit switch (Check if tilt upper indicator lamp illuminates). Tighten screw (12).		
5. Return tower to stowed position. (Refer to TM 11-5985-387-12)		

2-32. REMOVE/REPLACE POSITIONER PLATFORM ASSEMBLY

Equipment Conditions: Obstruction light assembly removed. No. 4 tower section and positioner assemblies removed.



WARNING

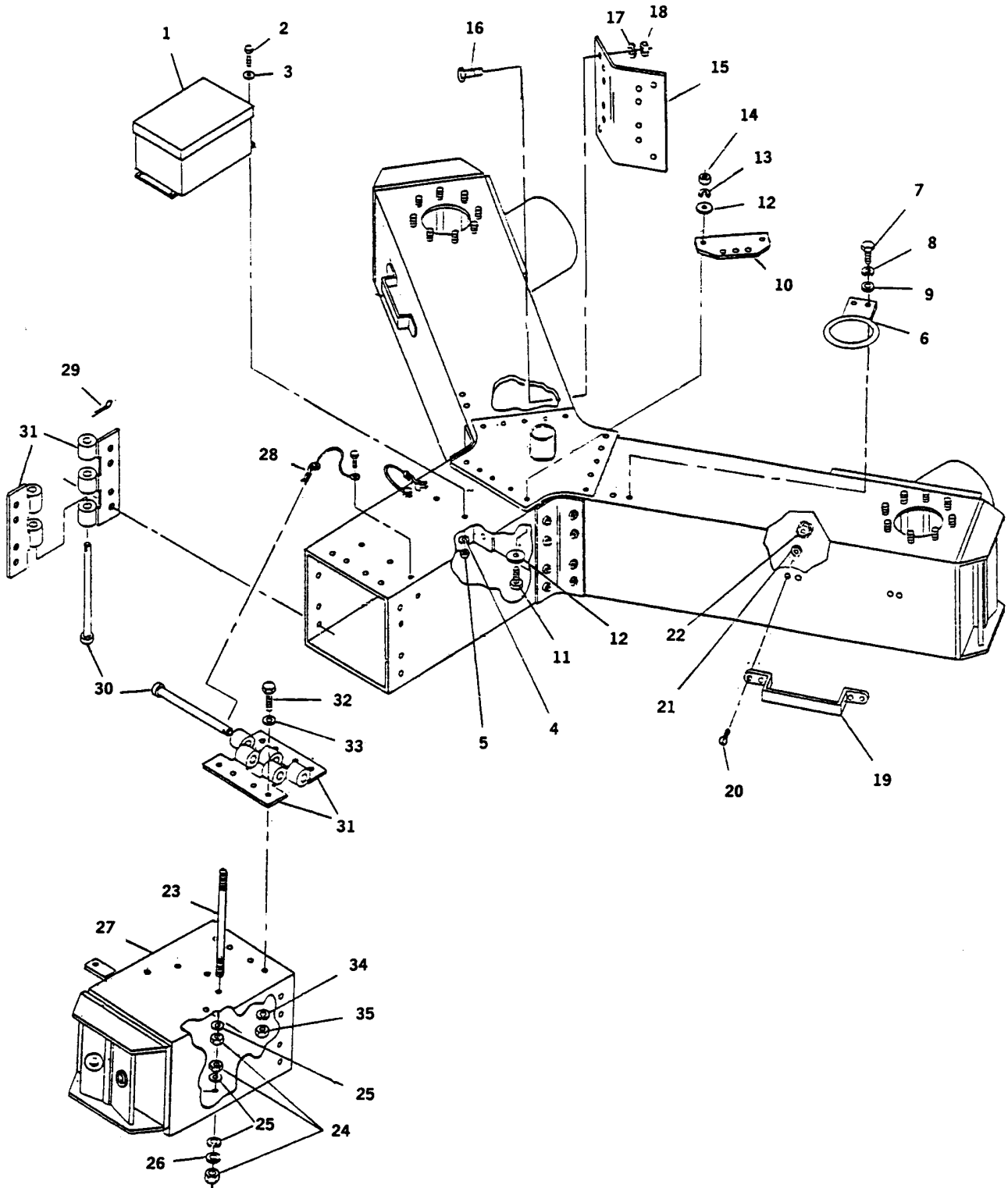
Positioner platform weighs 175 pounds. Ensure lifting device is capable of supporting weight.

2-32. REMOVE/REPLACE POSITIONER PLATFORM ASSEMBLY - Continued

Location	Item	Action
REMOVAL		
1. Positoner platform assembly	Lifting device	Attach lifting device to support weight of Positoner Platform
NOTE		
Access to attach hardware is up through No. 4 tower section and through ends of		
2. End of No. 4 tower section	Positoner platform assembly (1)	Remove 30 bolts (2), lock washers (3), washers (4) and three leg stiffeners (5).
NOTE		
3.	Mark locations of longer bolts. Tower section No. 4	Using lifting device, remove from No. 4 tower section;; remove three top plates (6).
REPLACEMENT		
1. End of No. 4 tower section	Positoner platform assembly (1)	Using lifting device, position on end of No. 4 tower section.
2.	Top plates (5)	Install three top plates (5) and secure them with 30 bolts (2), new lockwashers:(3), washers (4) and three leg stiffeners (5). Use longer bolts in locations marked during removal.
3. Positoner platform assembly	Lifting device	Remove.

2-33. REPAIR OF POSITIONER PLATFORM ASSEMBLY

Equipment Condition: Positioner platform assembly removed from tower section No. 4.



2-33. REPAIR OF POSITIONER PLATFORM ASSEMBLY - Continued

Repair consists of removal and replacement of junction box, coaxial cable arm brackets, cable grip mounts, tie down anchor plate, assist handles, positioner anchor bolts and top hinged positioner tube.

Location	Item	Action
REMOVAL		
1. Hinge side positioner tube	Junction box electrical connectors	Tag and disconnect all electrical connectors from junction box (1).
2.	Junction box (1)	Remove four bolts (2), washers (3), lockwashers (4), and nuts (5); remove junction box. Discard lockwashers (4).
3. Side #2 and #3 positioner tubes	Two Coaxial cable arm brackets (6)	Remove two bolts (7), lockwashers (8) and washers (9); remove each bracket. Discard lock washers (8).
4.	Two cable grip mounts (10)	Remove two bolts (11), four washers (12), two lockwashers (13) and two nuts (14); remove each mount. Discard lockwashers (13).
5.	Tie down anchor plate (15)	Remove eight bolts (16), lockwashers (17) and nuts (18); remove plate. Discard lockwashers (17).
6.	Two assist handles (19)	Remove two bolts (20), washers (21) and locknuts (22); remove each handle.
7.	24 positioner anchor bolts (23)	Remove three nuts (24), three washers (25), and one lockwasher (26) from each bolt and remove bolt. Discard lockwasher (26).

2-33. REPAIR OF POSITIONER PLATFORM ASSEMBLY - Continued

Location	Item	Action
REMOVAL - Continued		
8.	Top hinged positioner tube (27)	Remove two clip pins (28) and one cotter pin (29) securing hinge pins (30).
9.	Tube (27)	Support weight of tube (27) and remove the three hinge pins (30); remove tube.
10.	Three hinges (31)	If necessary, remove four bolts (32), washers (33), lockwashers (34) and nuts (35) securing each half of hinge and remove hinge half. Discard lockwashers (34).
REPLACEMENT		
1. Positioner platform tubes	Three hinges (31)	If removed, position each hinge half and secure with four bolts (32), washers (33), new lockwashers (34) and nuts (35).
2.	Top hinged positioner tube (27)	Position tube and mate hinge halves (31) and insert three pins (30). Safety pin with two clip pins (28) and one new cotter pin (29).
3.	24 positioner anchor bolts (23)	Apply Loctite #271 (Item 3, Appendix B) to threads of each bolt (23) and position each bolt through tube and secure with three nuts (24), three washers (25) and one new lockwasher (26).

2-33. REPAIR OF POSITIONER PLATFORM ASSEMBLY - Continued

Location	Item	Action
REPLACEMENT - Continued		
4.	Two assist handles (19)	Position each handle and secure with two bolts (20), washers (21) and locknuts (22).
5.	Tie down anchor plate (15)	Position anchor plate and secure with eight bolts (16), new lockwashers (17) and nuts (18).
6.	Two cable grip mounts (10)	Position: each mount and secure with two bolts (11), four washers (12), two new lockwashers (13) and two nuts (14).
7.	Two coaxial cable arm brackets (6)	Position each bracket and secure with two bolts (7), new lockwashers (8) and washers (9).
8.	Junction box (1)	Position junction box and secure with four bolts (2), washers (3), new lockwashers (4) and nuts (5)*
9.	Electrical connectors	Connect electrical connectors to junction box as tagged.

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2-34. REMOVE/REPLACE TOWER SECTION NO. 4

Equipment Conditions: Ensure that equipment conditions in paragraph 2-29, steps 1 thru 7 are met before proceeding.

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WARNING

Tower section No. 4 with positioner platform weighs 475 pounds. Ensure lifting device is capable of supporting this weight.

CAUTION

To prevent damage to tower section, use web type slings not chains when lifting sections. Watch cables during removal/installation.

2-34. REMOVE/REPLACE TOWER SECTION NO. 4 - Continued

Location	Item	Action
REMOVAL		
1. Lower front jack 2. Bottom of No. 4 section	Locknuts (1) securing two steel cables (2) to anchor fittings (3) during procedures.	Lower front jack to angle tongue down, remove camlock tiedowns, and manually tilt tower to just clear alignment cones. Loosen and remove locknuts (1).
<u>CAUTION</u>		
Do not pinch, kink, or snag steel cables		
	Steel cables (2)	Remove cables (2) from anchor fittings (3).
NOTE		
If necessary for easier access, manually slide section 4 out slightly for clearance. This can be accomplished by two people applying pressure behind the positioner platform assembly, or by use of a come -a- long.		
4. Top of No. 5 section	Pulley frames	Remove pulley frames. Refer to paragraph 2-61.
5. Top of No. 5 section	Slide blocks	Remove slide blocks. Refer to paragraph 2-37.a.
6. Tower section No. 4		Attach lifting device to section No. 4 and carefully slide the section with positioner platform assembly from the tower. Be careful not to damage steel cables.

2-34. REMOVE/REPLACE TOWER SECTION NO. 4 - Continued

Location	Item	Action
REPLACEMENT		
1. Tower section. No. 4		Attach lifting device to section and carefully slide it into the tower being careful not to damage steel cables.
2. Top of No. 5 section	Slide blocks	Install slide blocks. Refer to paragraph 2-37.a.
3.	Pulley frames	Install pulley frames. Refer to paragraph 2-61.

CAUTION

Do not pinch, kink, or snag steel cables during procedures. Check that steel cables are free and are not interfered with by truck bolts or other items.

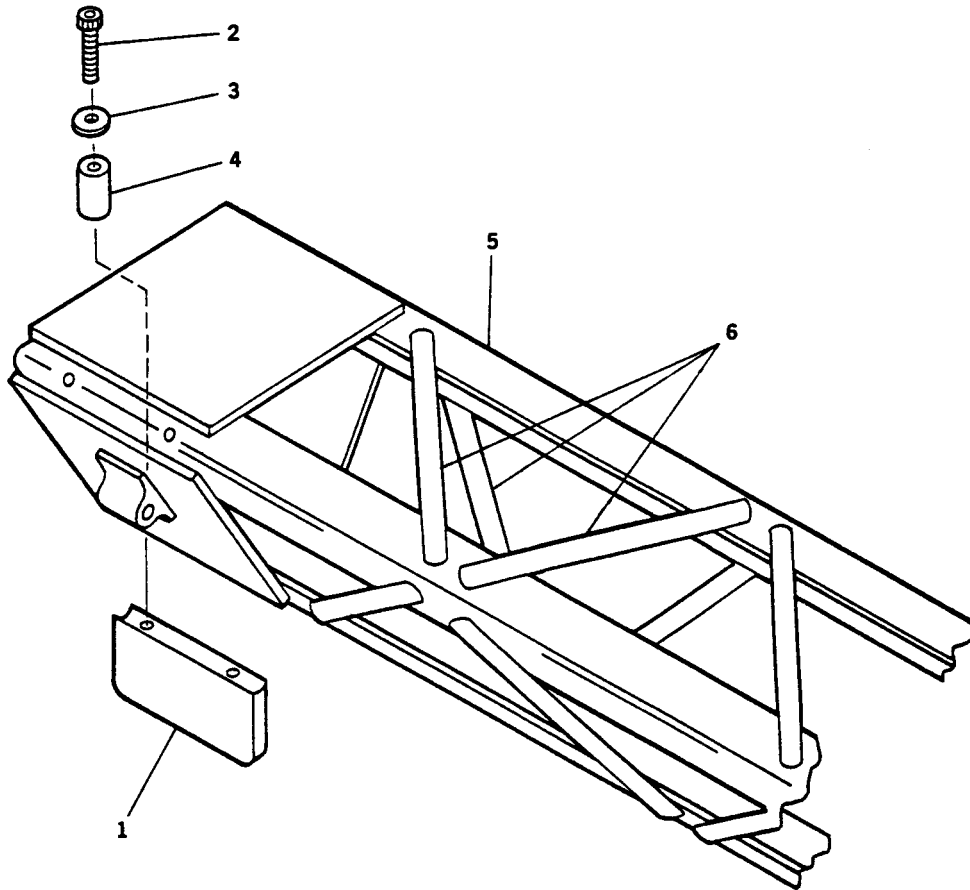
Bottom of No. 4 Section	Steel cables (2)	Insert cable ends into anchor fittings (3) and secure with new locknuts (1).
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2-35. REPAIR OF TOWER SECTION NO. 4

Repair consists of removal of positioner platform assembly (refer to paragraph 2-32), removal and replacement of slide blocks, and inspection of tower section.

Equipment Conditions: Tower section removed from tower.

a. Slide Blocks Replacement



NOTE

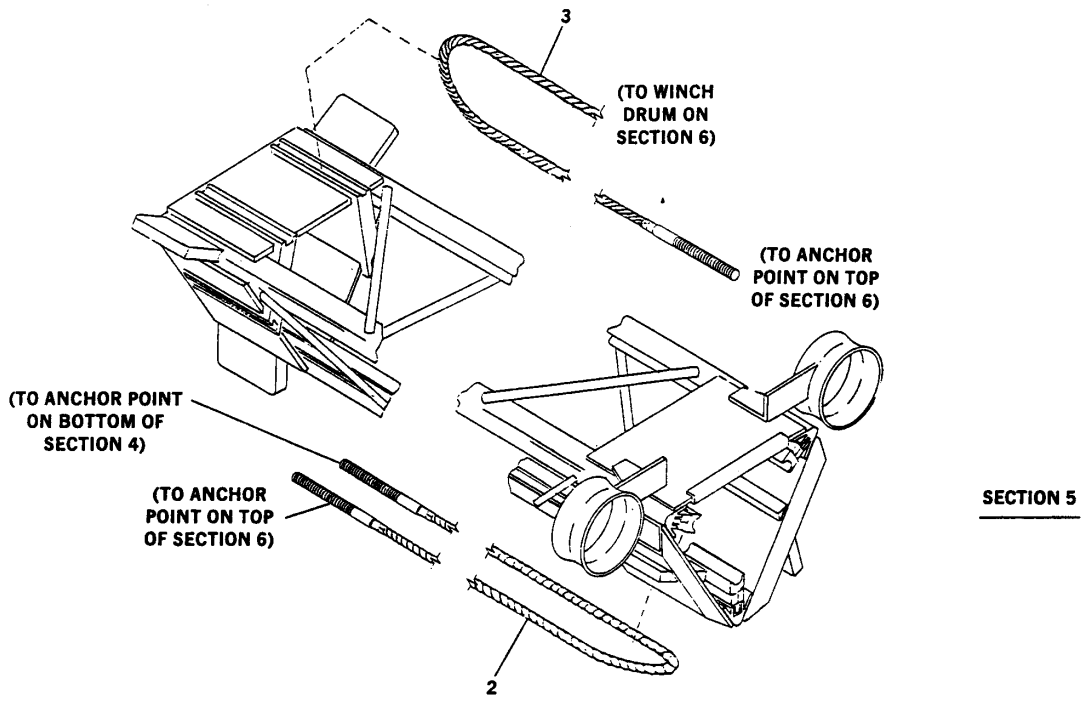
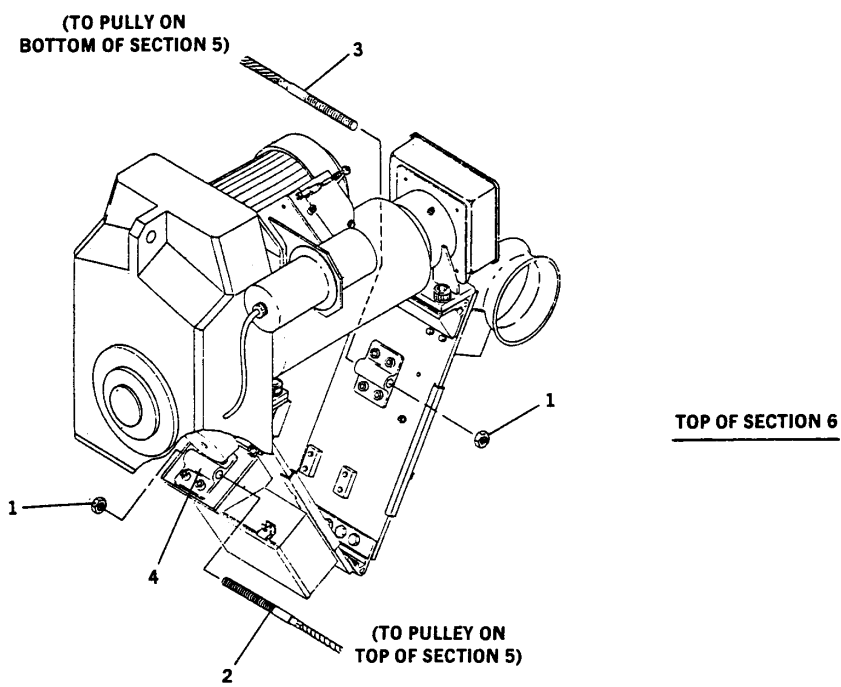
Components of each slide block should be kept together and identified to their location on the tower section. Spacers (4) are press fitted to the tower section and may not need to be removed. Inspect to ensure that spacers are present during slide block replacement.

2-35. REPAIR OF TOWER SECTION NO. 4 - Continued

Location	Item	Action
a. <u>Slide Blocks Replacement</u> - Continued		
REMOVAL		
1. Bottom of tower Section.	Three slide blocks (1)	(1) Remove two screws (2), lockwashers (3) and if loose, spacers (4); remove slide block. Discard lockwashers (3)
REPLACEMENT		
1. Bottom of tower Section	Three slide blocks (1)	Position slide block on end leg member (5) and secure with two screws (2), new lockwashers (3), and spacers (4). Torque screws 25 to 30 ft-lbs.
b. <u>Inspection</u>		
1. Tower section	Leg (5) and web (6) members	Inspect for damaged, corroded or missing parts and replace as necessary. Refer to Depot for repair.
2.	Slide blocks (1)	Inspect for damage. Replace as necessary.

2-36. REMOVE/REPLACE TOWER SECTION NO. 5

Equipment Conditions: Tower section no. 4 removed.



2-36. REMOVE/REPLACE TOWER SECTION NO. 5 - Continued

WARNING

Tower section No. 5 weighs 375 pounds. Ensure lifting device is capable of supporting this weight.

CAUTION

To prevent damage to tower section, use web type slings not chains when lifting sections.

Location	Item	Action
REMOVAL		
1. Top of No. 6 Section	Locknuts (1) securing four steel cables (2 and 3) to anchor fittings (4).	Loosen and remove locking nuts (1)
2.	Steel cables (2 and 3)	Remove cables (2 and 3) from anchor fittings (4).
3.	Side #2 and #3	Remove Side #2 and #3. Refer to paragraph 2-40.d.
4.	Upper slide blocks	Remove upper slide blocks. Refer to paragraph 2-39.d.
5.	Upper limit switch and bracket	Remove upper limit switch and bracket. Refer to paragraph 2-39.c.
6. Tower section No. 5		Attach lifting device to section No. 5 and carefully slide the section from the tower. Be careful not to damage steel cables.
NOTE		
Note routing of steel cables prior to removing them from pulleys.		
7. Bottom of No. 5 section	Steel cables (3)	Remove steel cables (3) from pulleys at bottom of section.

2-36. REMOVE/REPLACE TOWER SECTION NO. 5 - Continued

Location	Item	Action
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REMOVAL - Continued

NOTE

Steel cables (3) are attached to the winch drum at the top of section No. 6.

8. Top of No. 5	Steel cables (2)	If necessary, remove section steel cables (2) from pulleys.
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2-36. REMOVE/REPLACE TOWER SECTION NO. 5 - Continued

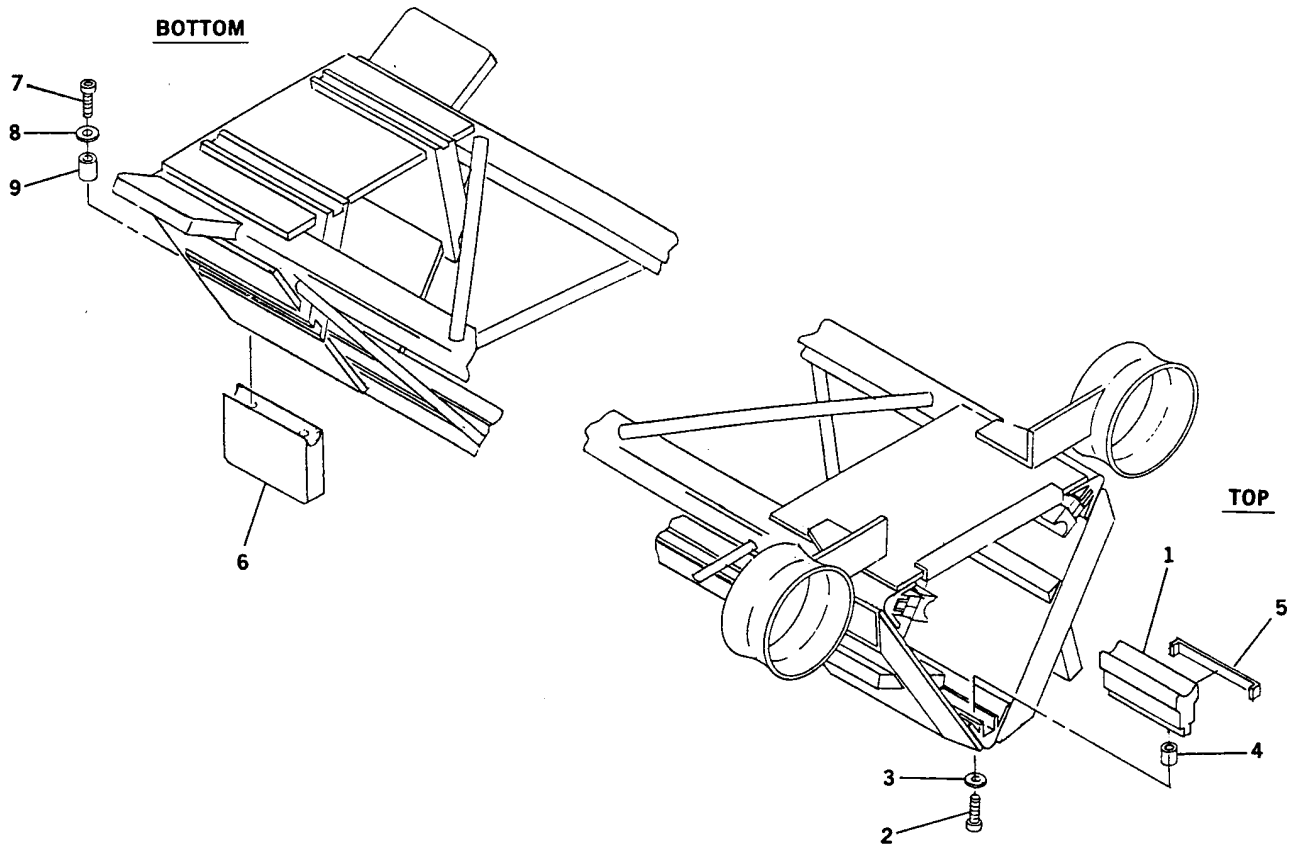
Location	Item	Action
REPLACEMENT		
1. Top of No. 5 section	Steel cables (2)	If removed, route steel cables (2) over pulleys as noted during removal.
NOTE		
Steps 2 and 3 must be completed simultaneously.		
2.	Tower section No. 5	Attach lifting device to section No. 5 and carefully slide the section into the tower being careful not to damage steel cables (2 and 3).
3. Bottom of No. 5 section	Steel cables (3)	Route steel cables (3) over pulleys as noted during removal.
NOTE		
As section slides into tower, maintain tension on steel cables (3).		
4. Top of No. 6	Steel cables (2 and 3)	Insert cable ends into anchor fittings (4) and secure with new locknuts (1).
5.	Upper limit switch and bracket	Install upper limit switch and bracket. Refer to paragraph 2-39.c.
6.	Upper slide blocks	Install upper slide blocks. Refer to paragraph 2-39.d.
7.	Side #2 and #3	Install Side #2 and #3. Refer to paragraph 2-40.d.

REPAIR OF TOWER SECTION NO. 5

Repair consists of removal and replacement of slide blocks, pulleys, and upper limit switch stop bracket and inspection of tower section.

Equipment Conditions: Tower section removed from tower.

a. Slide Blocks Replacement



NOTE

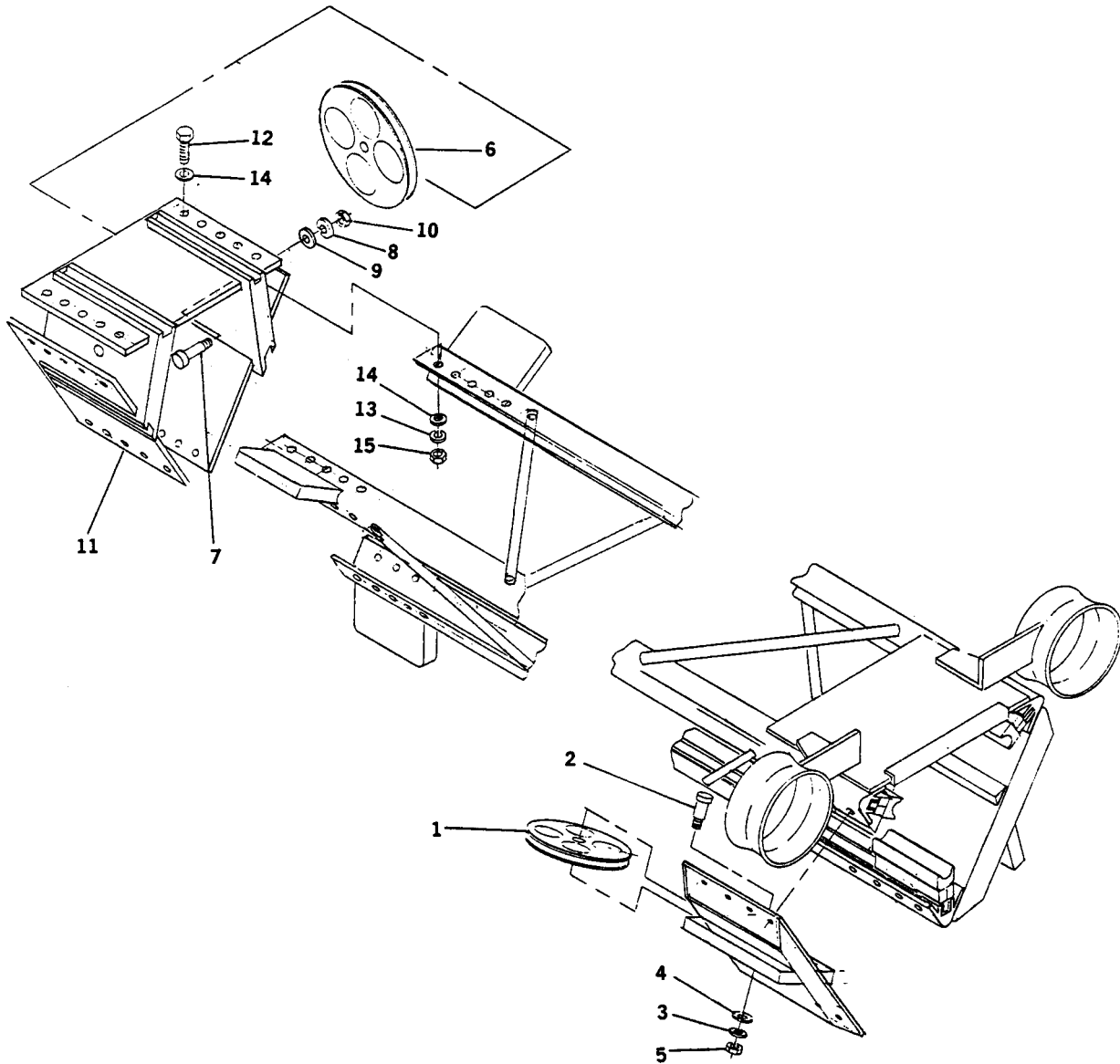
Components of each slide block should be kept together and identified to their location on the tower section. Spacers (4 and 9) are press fitted to the tower section and may not need to be removed. Inspect to ensure that spacers are present during slide block replacement.

2-37. REPAIR OF TOWER SECTION NO. 5 - Continued

Location	Item	Action
a. Slide Blocks Replacement - Continued		
REMOVAL		
1. Top of tower Section	Three slide blocks (1)	Remove two screws (2), lockwashers (3) and if loose, spacers (4); remove slide block and shims (5). Keep slide block and shims together. Discard lockwashers (3).
2. Bottom of tower section	Three slide blocks (6)	Remove two screws (7), lockwashers (8) and if loose, spacers (9); remove slide block. Discard lockwashers (8).
REPLACEMENT		
1. Bottom of tower section	Three slide blocks (6)	Position slide block on tower leg and secure with two screws (7), new lock washes (8) and spacers (9). Torque screws 25 to 30 ft-lbs.
NOTE		
Each slide block (1) with matched paired shims (5) must produce a sliding fit between slide block and leg member.		
2. Top of tower Section	Three slide blocks (1)	Position each slide block and matched shims (5) in groove on tower leg and secure with two screws (2), new lockwashers (3) and spacers (4). Torque screws 40 to 45 ft-lbs.

REPAIR OF TOWER SECTION NO. 5 - Continued

b. Pulley Replacement

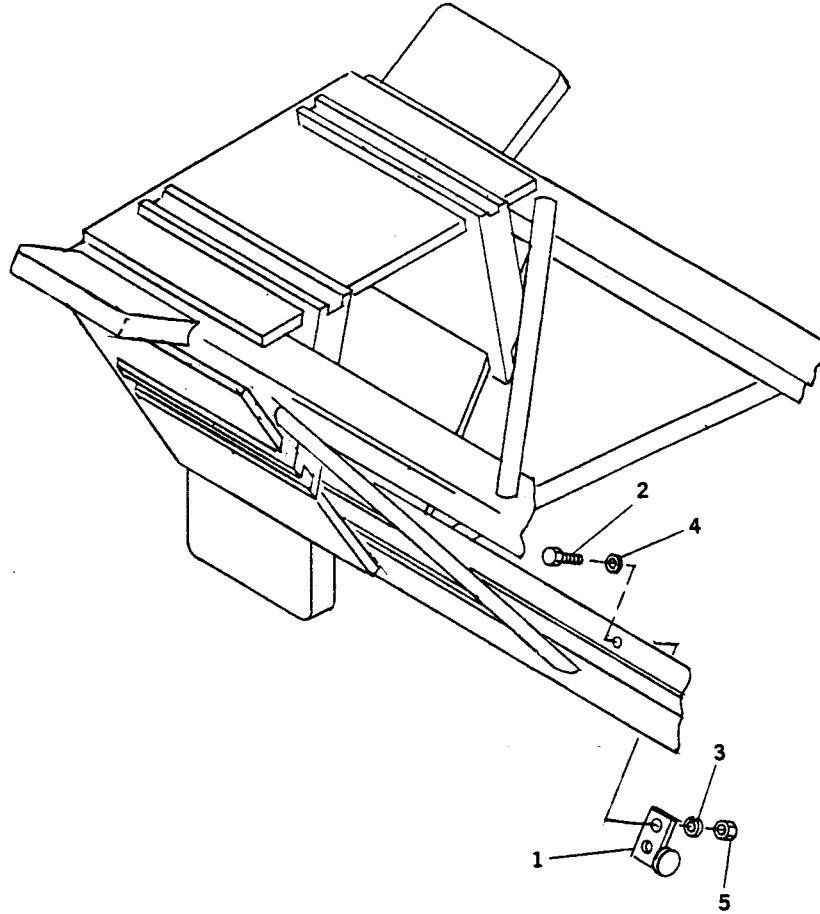


2-37. REPAIR OF TOWER SECTION NO. 5 - Continued

Location	Item	Action
b. Pulley Replacement - Continued		
REMOVAL		
1. Top of tower Section	Pulley (1)	Remove screw (2), lock washer (3), washer (4), and nut (5) securing pulley; remove pulley (1). Discard lockwasher (3).
2. Bottom of tower Section	Two pulleys (6)	Remove screw (7), lock washer (8), washer (9), and nut (10) securing pulley; remove pulley (6). Discard lockwashers (8).
3.	Pulley frame (11)	Remove 30 bolts (12), 30 lockwashers (13), 60 washers (14) and 30 nuts (15) securing frame; remove frame (11). Discard lockwashers (13).
REPLACEMENT		
1. Bottom of tower Section	Pulley frame (11)	Position pulley frame on tower legs and secure with 30 bolts (12), 60 washers (14), 30 new lockwashers (13) and 30 nuts (15).
2.	Two pulleys (6)	Position each pulley in frame (11) and secure with screw (7), new lock washer (8), washer (9) and nut (10).
3. Top of tower section Section	Pulley (1)	Position pulley in bracket and secure with screw (2) new lockwasher (3), washer (4) and nut (5).

2-37. REPAIR OF TOWER SECTION NO. 5 - Continued

c. Upper Limit Switch Stop Bracket Replacement



Location	Item	Action
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REMOVAL

1. Bottom of tower Section	Upper limit switch stop bracket (1)	Remove two bolts (2), lockwashers (3), washers (4) and nuts (5); remove bracket. Discard lockwashers (3).
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REPLACEMENT

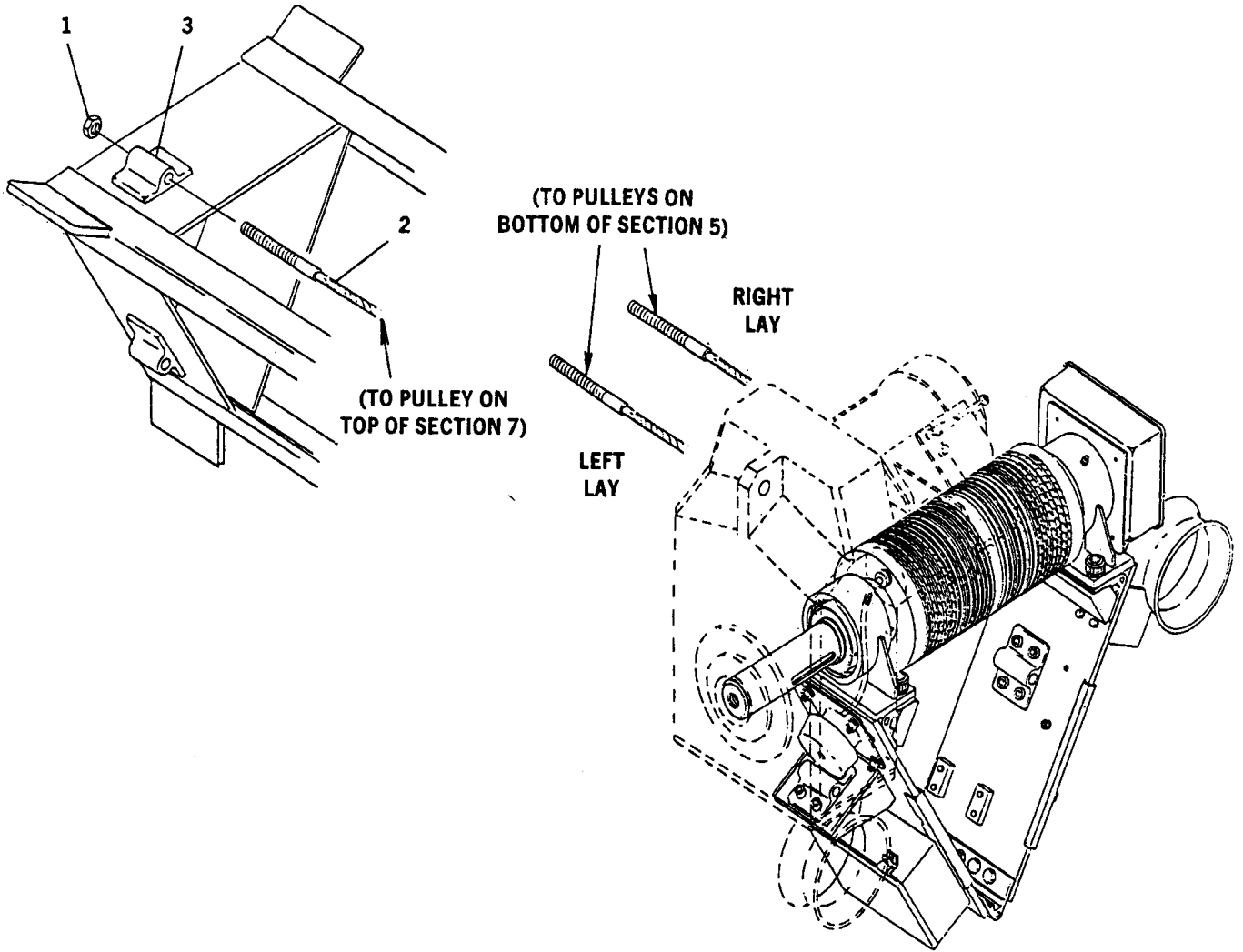
1. Bottom of tower section	Upper limit switch stop bracket (1)	Position bracket on tower leg and secure with two bolts (2), new lockwashers (3), washers (4) and nuts (5).
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2-37. REPAIR OF TOWER SECTION NO. 5 - Continued

Location	Item	Action
d. <u>Inspection</u>		
1. Tower section	Leg and web members	Inspect for damaged, corroded or missing parts and replace as necessary. Refer to Depot for repair.
2.	Slide blocks	Inspect for damage. Replace as necessary.
3.	Pulleys	Inspect for damage or sharp edges that could cause damage to steel cables. Replace as necessary.
4.	Upper limit switch stop bracket	Inspect for bent or broken bracket. Replace as necessary.
5.	Two steel cables	Inspect cables for damage in accordance with paragraph 2-49.
6. Top support plate	Plastic protective strip	Inspect for missing or damaged strip. Replace as necessary using adhesive (Item 4, Appendix B).

2-38. REMOVE/REPLACE TOWER SECTION NO. 6

Equipment Conditions: Tower sections No. 4 and 5 removed.



2-38. REMOVE/REPLACE TOWER SECTION NO. 6 - Continued

WARNING

Tower section No. 6 weighs 4517 pounds. Ensure lifting device is capable of supporting this weight.

CAUTION

To prevent damage to tower section, use web type slings not chains when lifting sections.

Location	Item	Action
REMOVAL		
1. Bottom of No. 6 Section	Locknuts (1) securing three steel cables (2) to anchor fittings (3).	Loosen and remove locknuts (1).
2.	Three steel cables (2)	Remove cables (2) from anchor fittings (3).
3. Top of No. 7 Section	Pulley frames	Remove pulley frames. Refer to paragraph 2-61.
4.	Slide blocks	Remove slide blocks. Refer to paragraph 2-43.c.
5. Tower section No. 6		Attach lifting device to section No. 6 and carefully slide from tower. Be careful not to damage steel cables.

NOTE

Steel cables that were over pulleys at bottom of section No. 5 come out with this section.

REPLACEMENT

1.	Tower section No. 6	Attach lifting device to section No. 6 and carefully slide into tower being careful not to damage steel cables.
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2-38. REMOVE/REPLACE TOWER SECTION NO. 6 - Continued

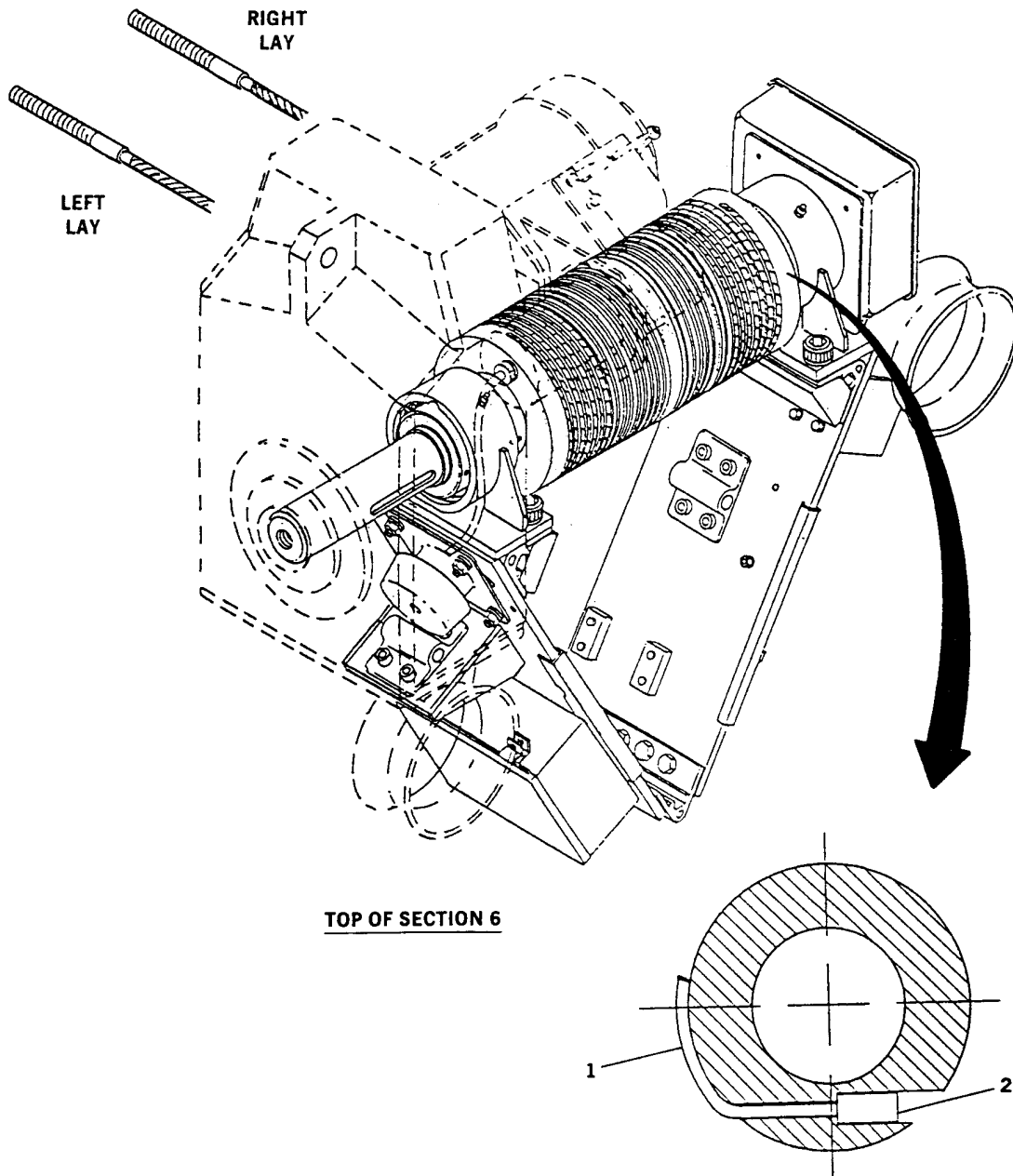
Location	Item	Action
REPLACEMENT - Continued		
2. Bottom of No. 6 Section	Three steel cables (2)	Insert cable ends into anchor fittings (3) and secure with new locknuts (1) .
3. Top of No. 7 Section	Slide blocks	Install slide blocks. Refer to paragraph 2-43.c.
4.	Pulley frames	Install pulley frames. Refer to paragraph 2-61.

2-39. REPAIR OF TOWER SECTION NO. 6

Repair consists of removal and replacement of steel cables, winch drum assembly (refer to paragraph 2-40), lower slide blocks, upper limit switch, upper slide blocks and guy wire anchor ears, and inspection of tower section.

Equipment Conditions: Tower section removed from tower.

a. Steel Cable Replacement



2-39. REPAIR OF TOWER SECTION NO. 6 - Continued

Location	Item	Action
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a. Steel Cable Replacement - Continued

REMOVAL

NOTE

Make note of cable routing on winch drum (off top or bottom), position of right and left lay cable, and number of wraps on winch drum.

1. Gearmotor	Brake release lever	Remove gearmotor brake release lever. Remove end housing from gearmotor. Install brake release lever.
2. Winch drum	Two steel cables (1)	Manually release gearmotor brake by pulling on brake arm and rotating gearmotor fan to turn drum as necessary to provide slack in cables. Pull cable ends from recess in drum to allow cutting off anchor sleeve.
3.	Oval sleeve anchor (2)	Remove oval sleeve (2) from cable by cutting cable next to sleeve. Pull cables back through winch drum and remove them from tower. Inspect steel cables (paragraph 2-49).

REPLACEMENT

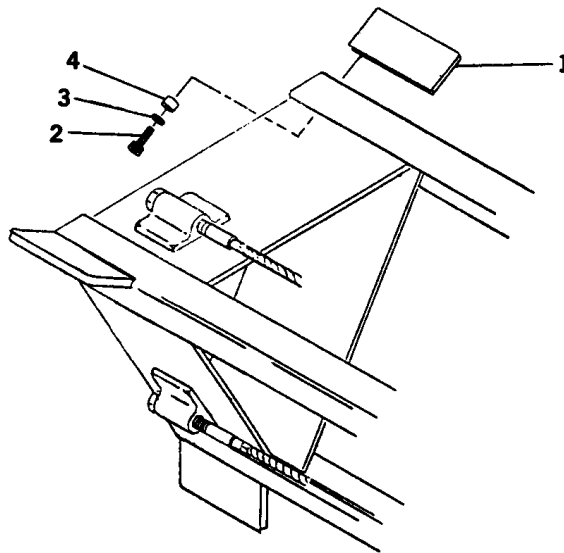
CAUTION

One cable is right lay and the other is left lay and must be installed on the correct side of winch drum in the same manner (wraps and direction) as noted during removal. When installing cable on drum, maintain tension on cable to ensure proper seating in grooves.

2-39. REPAIR OF TOWER SECTION NO. 6 - Continued

Location	Item	Action
a. <u>Steel Cable Replacement</u> - Continued		
REPLACEMENT - Continued		
1. Winch drum	Two steel cables (1) and oval sleeve anchor (2)	Reeve cables through pulleys and insert end of cables through drum. Install oval sleeves (2) on end of cables using swaging tool and die.
2.	Winch drum	Remove gearmotor end cover. Manually release brake by pulling on brake arm. Rotate gearmotor fan in the proper direction to tighten cables on drum.
3. Gearmotor	3. Brake release lever	3. Remove brake release lever. Install end housing on gearmotor. Install brake release lever.

b. Lower Slide Block Replacement



2-39. REPAIR OF TOWER SECTION NO. 6 - Continued

Location	Item	Action
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b. Lower Slide Blocks Replacement - Continued

NOTE

Components of each slide block should be kept together and identified to their location on the tower section. Spacers (4) are press fitted to the tower section and may not need to be removed. Inspect to ensure that spacers are present during slide block replacement.

REMOVAL

1. Bottom of tower section	Three slide blocks(1)	Remove two screws (2), lockwashers (3) and if loose, spacers (4) securing each side block; remove slide block. Discard lockwashers (3).
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REPLACEMENT

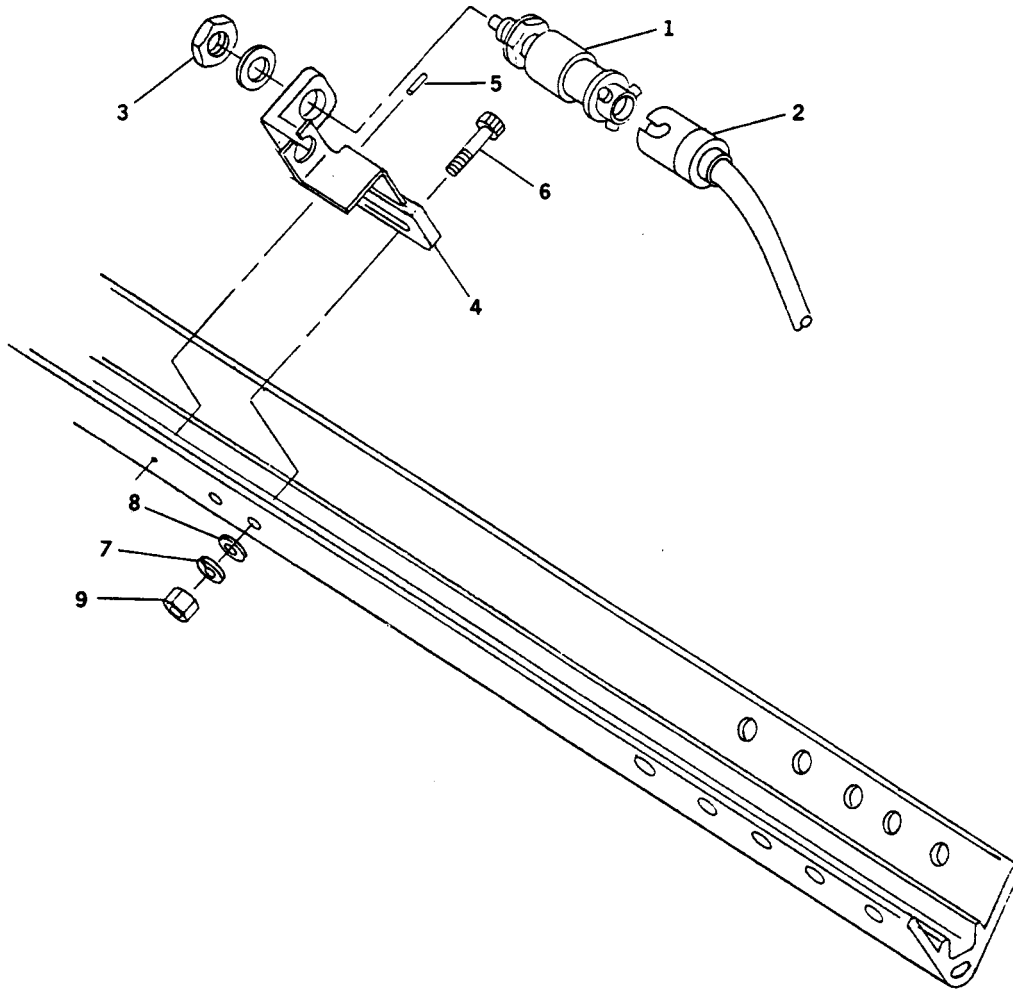
1. Bottom of tower section	Three slide blocks (1)	Position each slide block on tower leg and secure with two screws (2), new lockwashers (3), and spacers (4). Torque screws 25 to 30 ft-lbs.
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2-39. REPAIR OF TOWER SECTION NO. 6 - Continued

Location	Item	Action
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REPLACEMENT - Continued

c. Upper Limit Switch Replacement



REMOVAL

1. Top of tower section	Upper limit switch (connector)	(1) If not already done, disconnect electrical connector (2) from switch (1).
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2-39. REPAIR OF TOWER SECTION NO. 6 - Continued

Location	Item	Action
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c. Upper Limit Switch Replacement - Continued

REMOVAL - Continued

- | | | |
|----|---|--|
| 2. | Upper limit switch (1) and mounting bracket (4) | Remove spring pin (5), accessible screw (6), lockwasher (7), washer (8), and nut (9). Rotate bracket (4) making other screw (6) accessible. Remove screw (6), lockwasher (7), washer (8), nut (9) and bracket (4). Discard lockwashers (7) and spring pin (5). |
| 3. | | Loosen and remove locknut (3) securing switch (1) to bracket (4); remove switch. |

REPLACEMENT

- | | | |
|-------------------------|-------------------------------------|--|
| 1. Top of tower section | Upper limit switch (1) and mounting | Position switch on mounting bracket (4) so tip of switch is approximately 1.0 inch above top of mounting bracket (4) and secure with locknut (3). |
| 2. | | Position mounting bracket (4) on tower leg and secure with one screw (6), new lockwasher (7), washer (8) and nut (9). Rotate switch and install other screw (6), new lockwasher (7), washer (8) and nut (9). Install new spring pin (5). |
| 3. | Electrical connector (2) | Connect electrical connector (2) to switch (1) . |

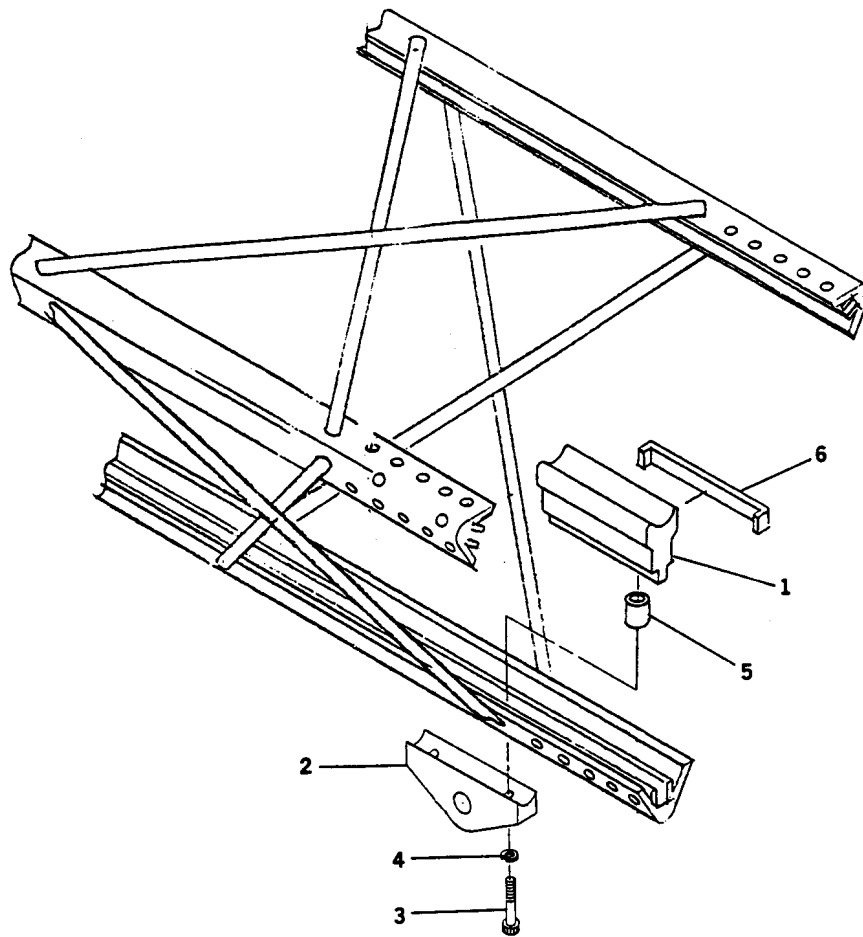
2-39. REPAIR OF TOWER SECTION NO. 6 - Continued

Location	Item	Action
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c. Upper Limit Switch Replacement - Continued

4.	Upper limit switch (1)	Adjust switch (1) as necessary after tower assembly is complete to activate when tower is at upper travel limit. Loosen screws (6) securing bracket (4) and retighten when switch is positioned against actuator (to activate limit switch). Tighten screws (6).
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d. Upper Slide Block and Guy Wire Ears Replacement



2-39. REPAIR OF TOWER SECTION NO. 6 - Continued

Location	Item	Action
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d. Upper Slide Block and Guy Wire Ears Replacement - Continued

NOTE

Components of each slide block should be kept together and identified to their location on the tower section. Spacers (5) are press fitted to the tower section and may not need to be removed. Inspect to ensure that spacers are present during slide block replacement.

REMOVAL

1. Top of tower section	Three slide blocks (1) and guy wire ears (2)	Remove two screws (3), lockwashers (4), and if loose, spacers (5); remove ear (2), slide block (1) and shims (6). Keep slide block and shims together as a matched set. Discard lockwashers (4).
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REPLACEMENT

NOTE

Each slide block (1) with matched paired shims (6) must produce a sliding fit between slide block and leg member.

1. Top of tower section	Three slide blocks (1) and guy wire ears (2)	Position each slide block and matched shims (6) in groove on tower leg. Position ear (2) on outside of leg and secure blocks (1) and ear (2) with two screws (3), new lockwashers (4) and spacers (5). Torque screws 40 to 45 ft-lbs.
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e. Inspection

1. Tower section	Leg and web members	Inspect for damaged, corroded or missing parts and replace as necessary. Refer to Depot for repair.
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2-39. REPAIR OF TOWER SECTION NO. 6 - Continued

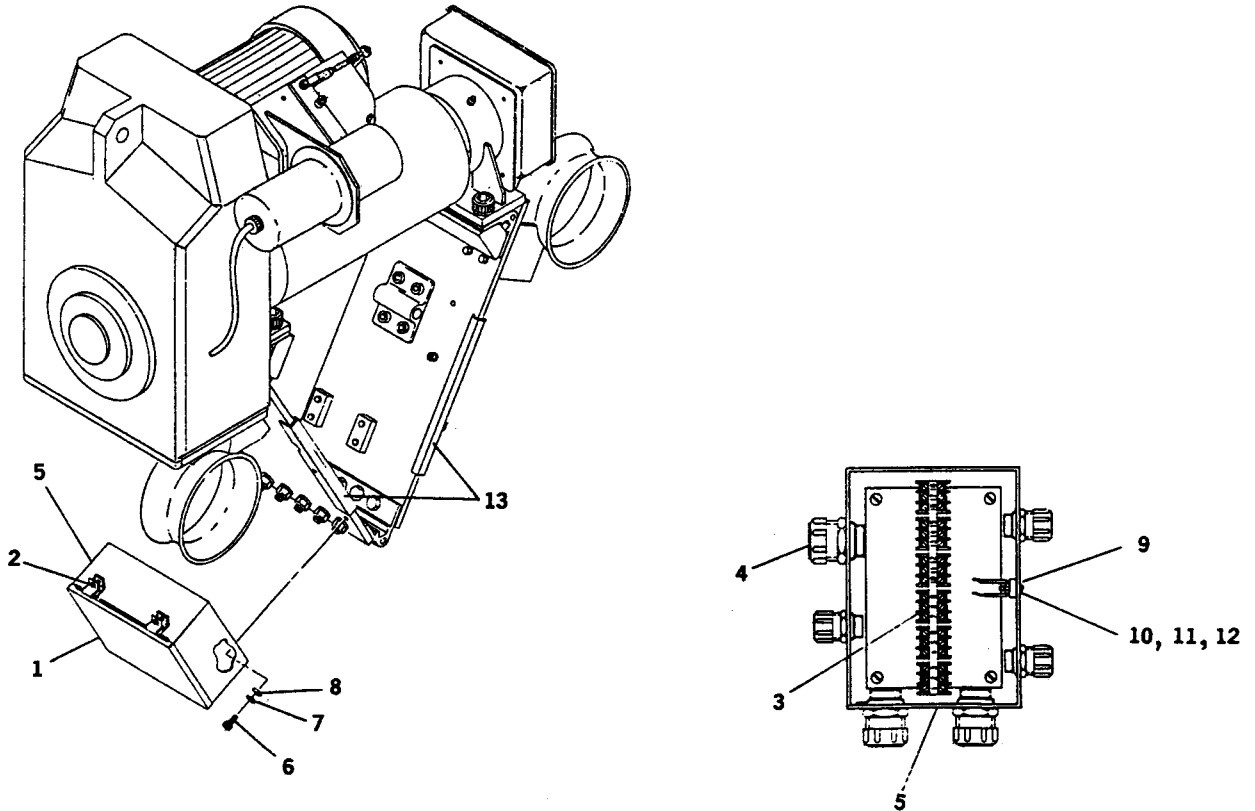
Location	Item	Action
e. Inspection - Continued		
2.	Slide blocks.	Inspect for damage. Replace as necessary.
3.	Upper limit switch and bracket	Inspect for damaged switch and damaged or bent mounting bracket. Replace as necessary.
4	Two steel cables	Inspect cables for damage in accordance with paragraph 2-49.
5. Winch drum assembly	Two plastic protective strips (13)	Inspect for missing or damaged strips. Replace as necessary using adhesive (Item 4, Appendix B).

2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY

Repair consists of removal and replacement of electrical junction box, gearmotor, coaxial cable arm assembly, and winch mounting assembly.

Equipment Conditions: Tower in horizontal position (removed).

a. Electrical Junction Box Replacement



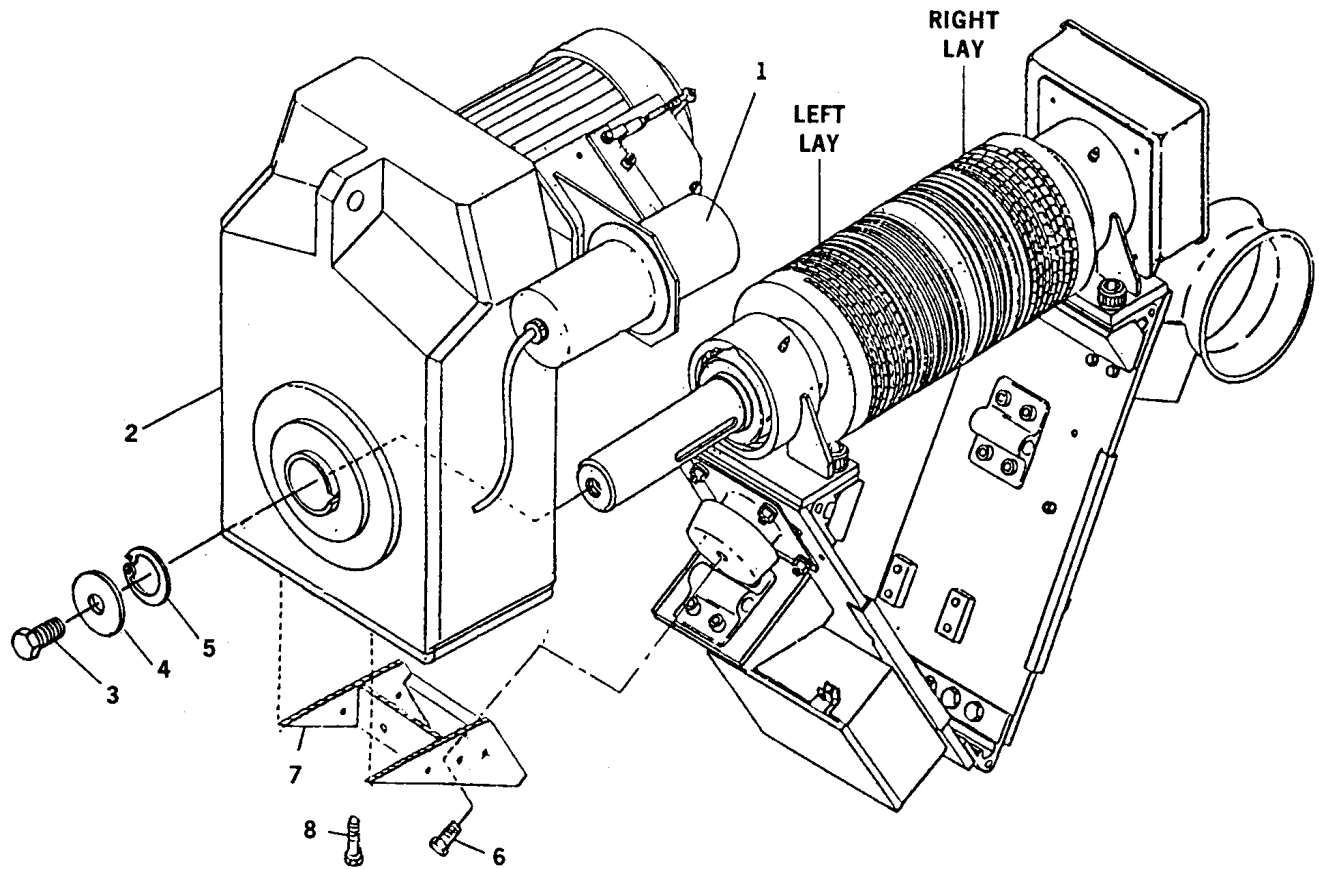
Location	Item	Action
REMOVAL		
1. Junction box (5)	Cover lid (1)	Loosen two screws and clamps (2) and open cover lid (1).
2.	Terminal block (3)	Tag and disconnect all wires from terminal block.

2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY
- Continued

Location	Item	Action
a. <u>Electrical Junction Box Replacement</u> - Continued		
REMOVAL - Continued.		
3.	Strain relief connectors	(4) Loosen nut on strain relief connectors and remove cables.
4.	Junction box (5)	Remove four screws (6), lockwashers (7) and washers (8) securing junction box; remove junction box. Discard lockwashers (7).
5.	Rectifier assembly (9)	If necessary, remove screw (10), plastic washer (11), and nut (12); remove rectifier assembly (9).
REPLACEMENT		
1.	Junction box (5)	Rectifier assembly (9)
		If removed, position rectifier assembly (9) on box and secure with screw (10), plastic washer (11) and nut (12).
2.	Junction box (5)	Position junction box on winch drum assembly and secure with four screws (6), new lockwashers (7) and washers (8).
3.	Cable assemblies	Install each cable through the applicable strain relief connector (4) and tighten nut.
4.	Terminal block (3)	Connect wires of each cable to terminal block as tagged during removal.
5.	Cover lid (1)	Close cover lid and secure with two clamps and screws (2).

2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY
-Continued

b. Gearmotor Replacement



WARNING

Gear motor assembly weighs 297 pounds.
Ensure lifting device is capable of supporting
this weight.

2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY
- Continued

Location	Item	Action
b. Gearmotor Replacement - Continued		
1. Winch drum assembly	Brake release mechanism (1)	Remove brake release mechanism. (Refer to TM 11-5985-387-12.)
2.	Electrical cable	Tag and disconnect electrical wires at gearmotor and remove wires from cable support.
3.	Gearmotor (2)	Wedge a block of wood under winch drum to prevent cables from unwinding. Support weight of gearmotor and remove bolt (3), retaining cap (4) and retaining ring (5) securing gearmotor to winch drum shaft.
4.	Gearmotor (2)	Remove bolt (6) securing gearmotor to shock mount cap, tap shaft lightly and remove gearmotor by sliding off shaft.
5.	Motor mount (7)	If new gearmotor is to be installed, remove bolts (8) securing motor mount (7) to end plate of gearmotor.

REPLACEMENT

1. Winch drum assembly	Gearmotor (2)	If motor mount was removed, secure to gearmotor end plate with bolts (8). Position gearmotor on winch drum shaft. Apply loctite #242 (Item 5, Appendix B) to bolt (6) and secure gearmotor to shock mount cup. Torque bolt to 90 ft-lbs.
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2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY
- Continued

Location	Item	Action
b. Gearmotor Replacement - Continued		
REPLACEMENT - Continued		
2.	Gearmotor (2)	Install retaining ring (5), retaining cap (4) and bolt (3). Torque bolt to 75 ft-lbs.
3.	Electrical cable	Connect electrical leads to motor as tagged during removal.
4.	Brake release mechanism (1)	Install brake release mechanism. (Refer to TM 11-5985-12.)

c. Coaxial Cable Arm Assembly Replacement

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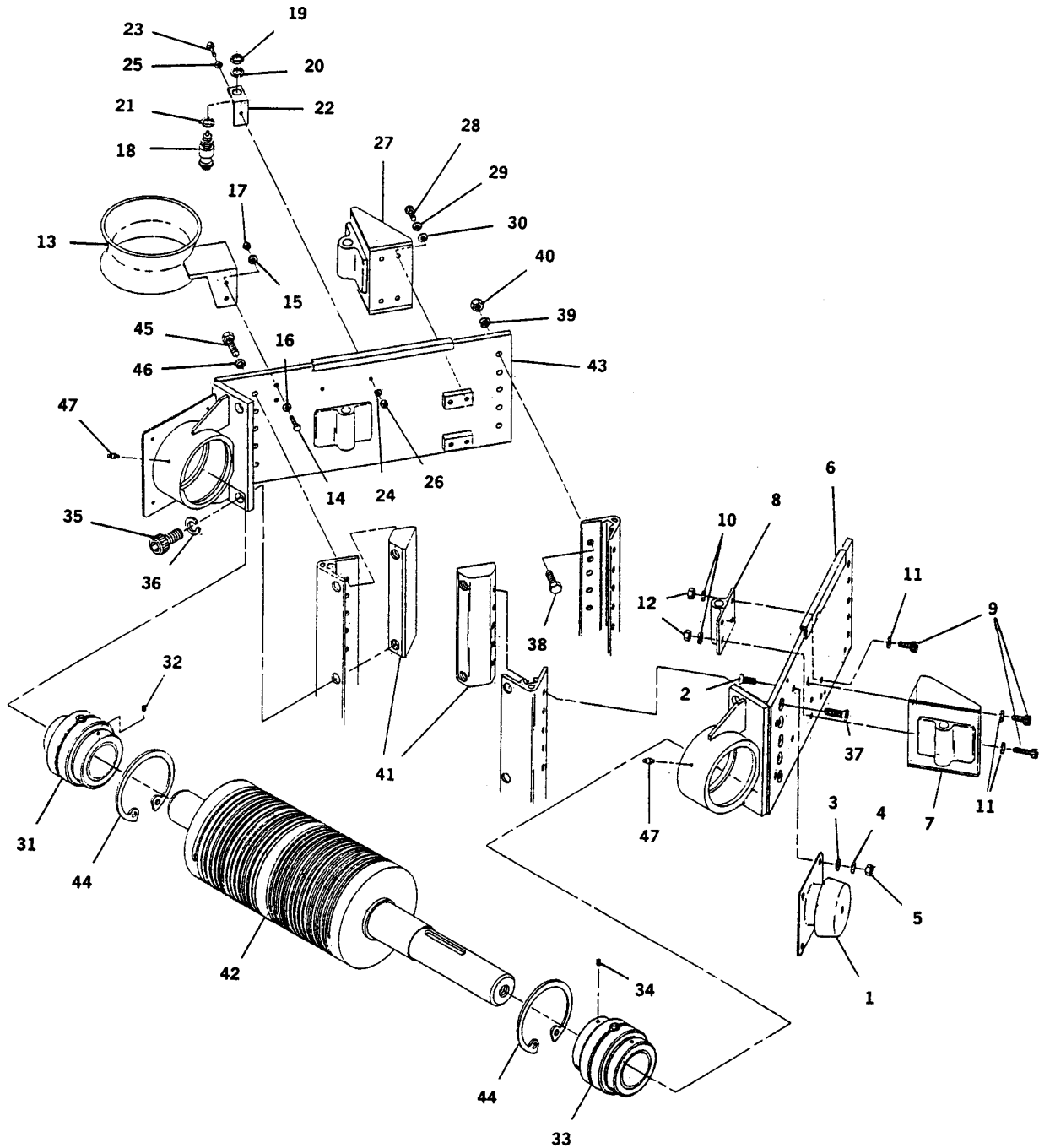
2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY - Continued

Location	Item	Action
REMOVAL		
1. Winch drum assembly	Coaxial cable arm (1)	Remove two bolts (2), lockwashers (3), washers (4) and nuts (5); remove cable arm (1). Discard lockwashers (3).
REPLACEMENT		
1. Winch drum assembly	Coaxial cable arm (1)	Position cable arm (1) on mounting arm and secure with two bolts (2), new lockwashers (3), washers (4) and nuts (5).

TM 11-5985-387-34

2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY Continued.

d. Winch Mounting Assembly Replacement



**2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DROM ASSEMBLY Location Item Action
Continued**

Location	Item	Action
d. <u>Winch Mounting Assembly Replacement</u> - Continued		
REMOVAL		
1. Side #2	Shock cupmount (1)	Remove two screws (2), four lockwashers (4), four washers (3) and four nuts (5); remove shock cupmount (1). Discard lockwashers (3).
NOTE		
Two screws (2) cannot be removed until side #2 mounting bracket (6) is removed.		
2.	Cable anchor fittings (7 and 8)	Remove six screws (9), four lockwashers (10), six washers (11) and four nuts (12); remove anchor fittings (7 and 8). Discard lockwashers (10).
3. Side #3	Coaxial cable arm (13)	Remove two bolts (14), lockwashers (15), washers (16) and nuts (17); remove cable arm (13). Discard lockwashers (15).
4.	Lower limit switch (18)	Disconnect electrical connector.
5.		Remove locknut (19), lockwasher (20) and keying washer (21); remove limit switch (18).
6.	Lower limit switch mounting bracket 22	Remove bolt (23), lock washer (24), washer (25) and nut (26); remove bracket (22). Discard lockwasher (24).

Location	Item	Action
d. <u>Winch Mounting Assembly Replacement</u> - Continued		
REMOVAL - Continued		
7.	Cable anchor fitting bracket (27)	Remove four screws (28), lockwashers (29) and washers (30); remove bracket (27). Discard lockwashers (29).
8.	Bearing (31)	Loosen two setscrews (32) in bearing collar.
9. Side # 2	Bearing (33)	Loosen four setscrews (34) in bearing collars.

NOTE

When removing mounting bracket (6) it will be necessary to support winch drum (42) to protect it from damage.

10.	Mounting bracket (6)	Remove two cap screws (35) and lockwashers (36); five screws (37), five bolts (38), lockwasher (39) and nuts (40). Remove reinforcing brace (41). Slide mounting bracket (6) from winch drum shaft (42). Discard lockwashers (36 and 39).
11.	Winch drum (42) Bearing (33)	Remove winch drum from side #3 mounting bracket (43).
12. Mounting bracket	Two screws (2)	Remove the two screws that could not be removed in step 1 from mounting bracket (6).
13.	Bearing (33)	Remove retaining ring (44) and remove bearing.

2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY - Continued

Location	Item	Action
d. <u>Winch Mounting Assembly Replacement</u> - Continued		
REMOVAL - Continued		
14. Side #4	Mounting bracket (43)	Remove two capscrews (35) and lockwashers (36); five bolts (45) and lockwashers (46); five bolts (38), lockwashers (39) and nuts (40). Remove reinforcing brace (41) and mounting bracket (43). Discard lockwashers (36, 46 and 39).
15. Mounting bracket	Bearing (31)	Remove retaining ring (44) and remove bearing from mounting bracket (43).
16. Mounting brackets	Grease fitting (47)	If necessary, remove grease fitting from each bracket (6 and 43).
REPLACEMENT		
1. Mount brackets	Grease fitting (47)	If removed, install grease fitting in each bracket (6 and 43).

NOTE

Bearing (31) has one collar removed and this end goes into mounting bracket (43) first.

2. Mounting bracket	Bearing (31)	Install bearing into mounting bracket (43) and install retaining ring (44).
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2-40. REPAIR OF TOWER SECTION NO. 6 - WINCH DRUM ASSEMBLY - Continued

Location	Item	Action
d. <u>Winch Mounting Assembly Replacement</u> - Continued		
REPLACEMENT - Continued		
3. Side #3	Mounting bracket (43)	Position mounting bracket (43) and reinforcing brace (41) on side #3 tower legs. Secure with five bolts (38), new lockwashers (39) and nuts (40); five bolts (45) and new lockwashers (46); two capecrews (35) and new lockwashers (36).
4. Mounting bracket	Bearing (33)	Install bearing into mounting bracket (6) and install retaining ring (44).
5.	Two screws (2)	Install these two in mounting bracket (6) for later installation of shock cupmount (1).
6.	Winch drum (42)	Slide winch drum (42) into mounting bracket (43) and support until mounting bracket (6) is installed.
7. Side #2	Mounting bracket (6)	Slide mounting bracket (6) over winch drum shaft. Secure to tower legs with reinforcing brace (41); five bolts (38), new lock washers (39) and nuts (40); five screws (37); two cap screws (35) and new lock-washers (36).

Location	Item	Action
d. <u>Winch Mounting Assembly Replacement</u> - Continued		
REPLACEMENT - Continued		
8. Side #2 and #3	Bearings (31 and 33)	Remove six setscrews (32 and 34). Apply locking sealant (Item 6, Appendix B) to setscrews; install and tighten setscrews in bearing collars.
9. Mounting Brackets	Grease fittings (47)	Lubricate bearings in mounting brackets
10. Side #3	Cable anchor fitting bracket (27)	Position bracket (27) on mounting bracket and secure with four screws (28), new lockwashers (29) and washers (30).
11.	Lower limit switch mounting bracket (22)	Position bracket (22) on mounting bracket and secure with bolt (23), new lockwasher (24), washer (25) and nut (26).
12.	Lower limit switch (18)	Install switch (18) in mounting bracket (22) and secure with keying washer (21), lockwasher (20) and locknut (19).
13.		Adjust switch (18) as necessary after tower assembly is complete to activate when tower is at lower travel limit. Loosen locknut (19) and adjust locknut (next to switch) until switch is positioned against stop bracket (to activate limit switch). Tighten locknut (19).
14.	Electrical connector	Connect electrical connector to lower limit switch (18).

Location	Item	Action
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d. Winch Mounting Assembly Replacement - Continued

REPLACEMENT - Continued

15.	Coaxial cable arm (13)	Position cable arm (13) on mounting bracket and secure with two bolts (14), new lockwashers (15), washers (16) and nuts (17).
16. Side #2	Cable anchor fittings (7 and 8)	Position anchor fittings (7 and 8) on mounting bracket. Secure with six screws (9), four new lock washers (10), six anchors (11), and four nuts (12).

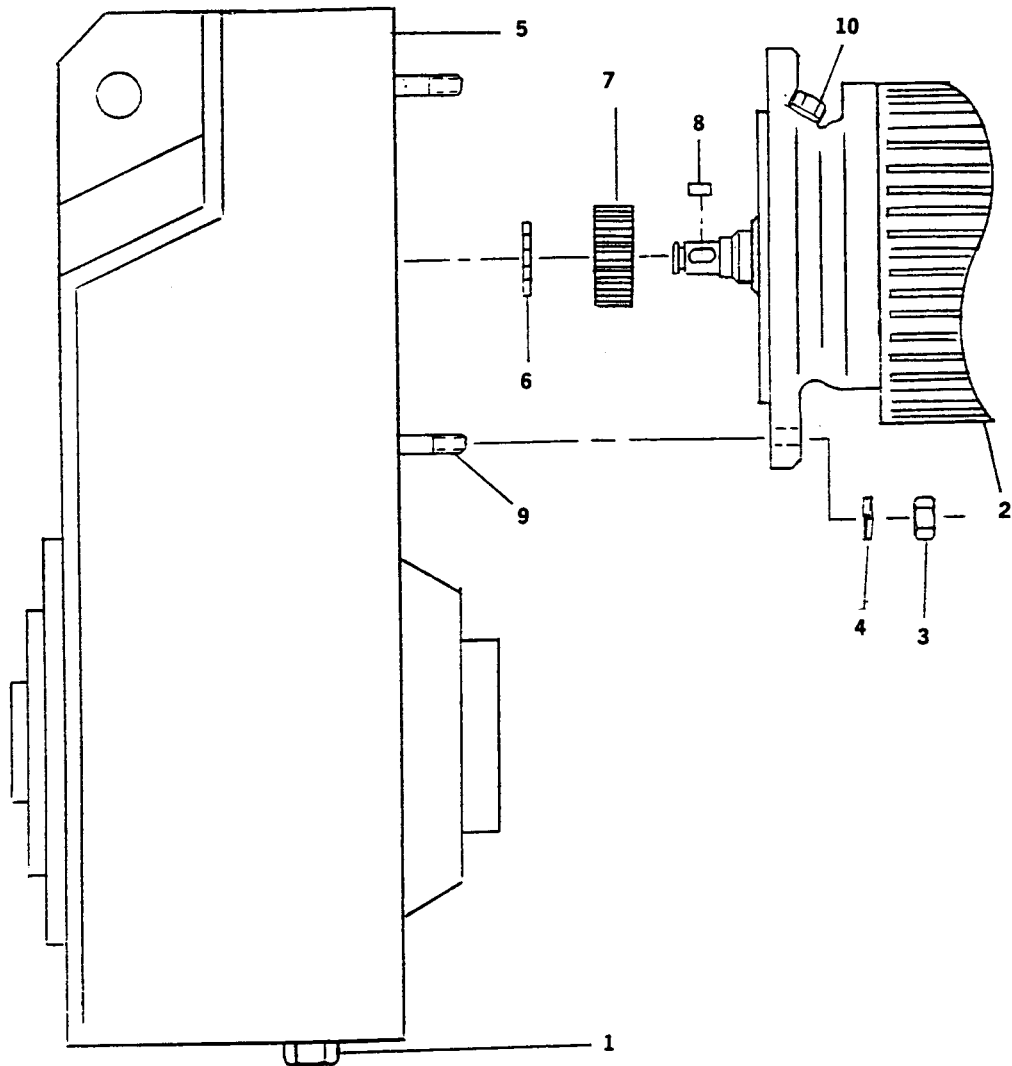
NOTE

Two screws (2) that secure shock cupmount (1) are installed when mounting bracket (6) is installed.

17.	Shock cupmount (1)	Position shock cupmount (1) on mounting bracket (6) and secure with two screws (2), four new lockwashers (4), four washers (3) and four nuts (5).
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2-41. REPAIR OF GEARMOTOR ASSEMBLY - TOWER SECTION NO. 6

Repair of gearmotor is limited to separating motor and gearbox for replacement of faulty unit.
 Equipment Condition: Gearmotor removed from tower.



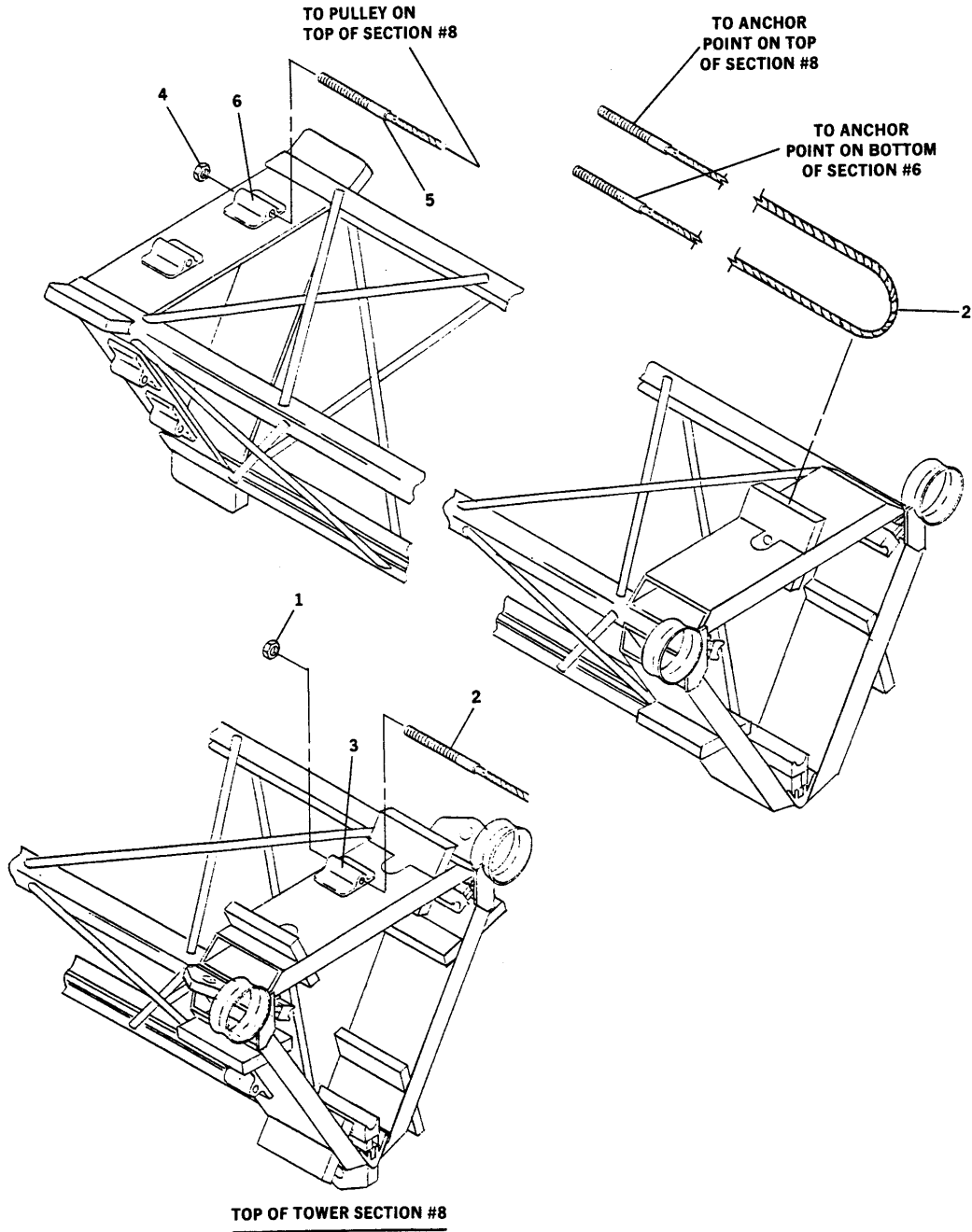
Location	Item	Action
DISASSEMBLY		
1. Gearmotor	Drain plug (1)	Remove one of the seven drain plugs (1) and drain oil from gearbox into a suitable container.

2-41. REPAIR OF GEARMOTOR ASSEMBLY - TOWER SECTION NO. 6-
Continued

Location	Item	Action
DISASSEMBLY - Continued		
2.	Motor (2)/ gearbox (5)	Remove four nuts (3) and lockwashers (4) securing motor (2) to gearbox (5). Discard lockwashers (4).
3.	Motor (2)/ gearbox (5)	Separate motor (2) from gearbox (5).
4.	Motor (2)	If new motor is to be installed, remove snap ring (6) and remove gear (7) from motor shaft key (8). Discard snap ring (6). Inspect key.
5.	Gearbox (5)	If new gearbox is to be installed, remove four mounting studs (9) from gearbox.
ASSEMBLY		
1. Gearmotor	Gearbox (5)	If removed, install four mounting studs (9) in gearbox.
2.	Motor (2)	If removed, install gear (7) on motor shaft key (8) and secure with new snap ring (6).
3.	Gearmotor	Install motor (2) on gearbox mounting studs (9) meshing gears and secure with four new lockwashers (4) and nuts (3).
4.	Gearbox (5)	Ensure all drain plugs (1) are installed and service gearbox through fill plug (10). Refer to TM 11-5985387-12.

2-42. REMOVE/REPLACE TOWER SECTION NO. 7

Equipment Conditions: Tower sections No. 4, 5 and 6 removed.



2-42. REMOVE/REPLACE TOWER SECTION NO. 7 - Continued

WARNING

Tower section No. 7 weighs 575 pounds.
Ensure lifting device is capable of supporting this weight.

CAUTION

To prevent damage to tower section, use web type slings not chains when lifting sections.

Location	Item	Action
REMOVAL		
1. Top of No. 8 section	Locknuts (1) securing three steel cables (2) to anchor fittings (3).	Loosen and remove locknuts (1).
2.	Three steel cables (2)	Remove cables (2) from anchor fittings (3).
3.	Pulley frames	Remove pulley frames. Refer to paragraph 2-61.
4.	Slide blocks	Remove slide blocks. Refer to paragraph 2-45.c.
5. Bottom of No. 7 section	Locknuts (4) securing six steel cables (5) to anchor fittings (6).	Loosen and remove locknuts (4).
6.	Six steel cables (5)	Remove cables (5) from anchor fittings (6).

NOTE

Steel cables (5) will remain in tower with section No. 8 and steel cables (2) will come out with this section.

2-42. REMOVE/REPLACE TOWER SECTION NO. 7 - Continued

Location	Item	Action
REMOVAL - Continued		
7.	Tower section No. 7	Attach lifting device to section No. 7 and carefully slide the section from the tower. Be careful not to damage steel cables.
NOTE		
Note routing of steel cables (2) prior to removing them from pulleys.		
8. Top of No. 7 section	Steel cables (2)	If necessary, remove steel cables (2) from pulleys at top of section.
REPLACEMENT		
1. Top of No. 7 section	Steel cables (2)	If removed, route steel cables (2) over pulleys as noted during removal.
2.	Tower section No. 7	Attach lifting device to section No. 7 and carefully slide the section into the tower being careful not to damage steel cables (2 and 5).
3. Bottom of No. 7 section	Six steel cables (5)	Insert cable end into anchor fittings (6) and secure with new locknuts (4).
4. Top of No. 8 section	Slide blocks	Install slide blocks. Refer to paragraph 2-45.c.

TM 11-5985-387-34

2-42. REMOVE/REPLACE TOWER SECTION NO. 7 - Continued

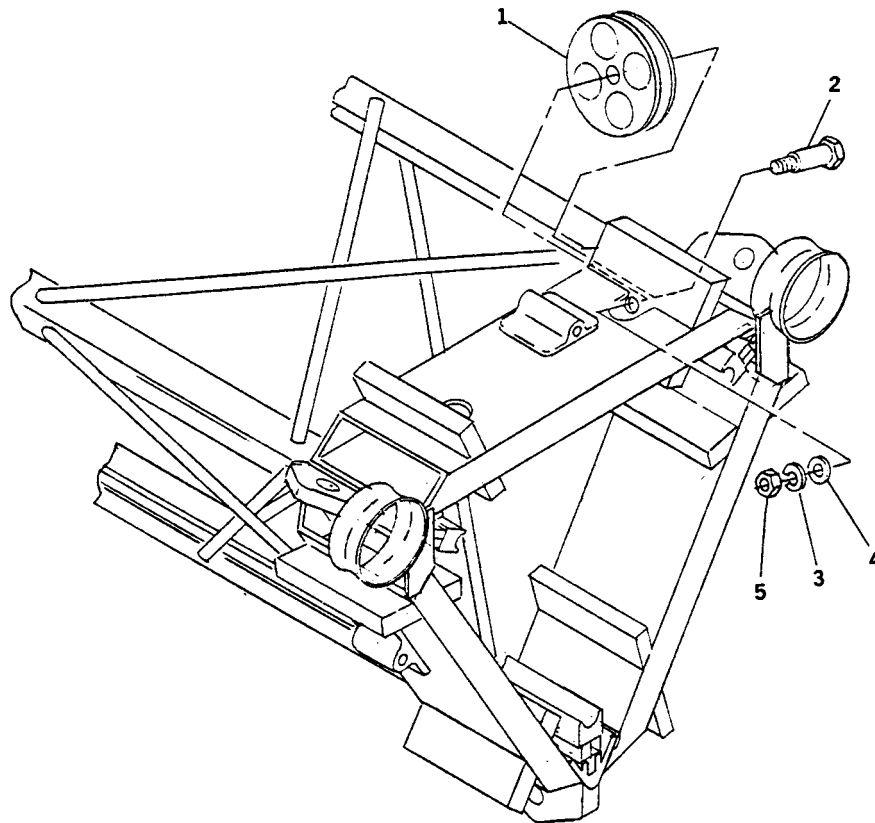
Location	Item	Action
REPLACEMENT - Continued		
5.	Pulley frames	Install pulley frames. Refer to paragraph 2-61.
6.	Three steel cables (2)	Insert cable ends into anchor fittings (3) and secure with new locknuts (1)

2-43. REPAIR OF TOWER SECTION NO. 7

Repair consists of removal and replacement of pulleys, coaxial cable arm, slide blocks and inspection of tower section.

Equipment Conditions: Tower section removed from tower.

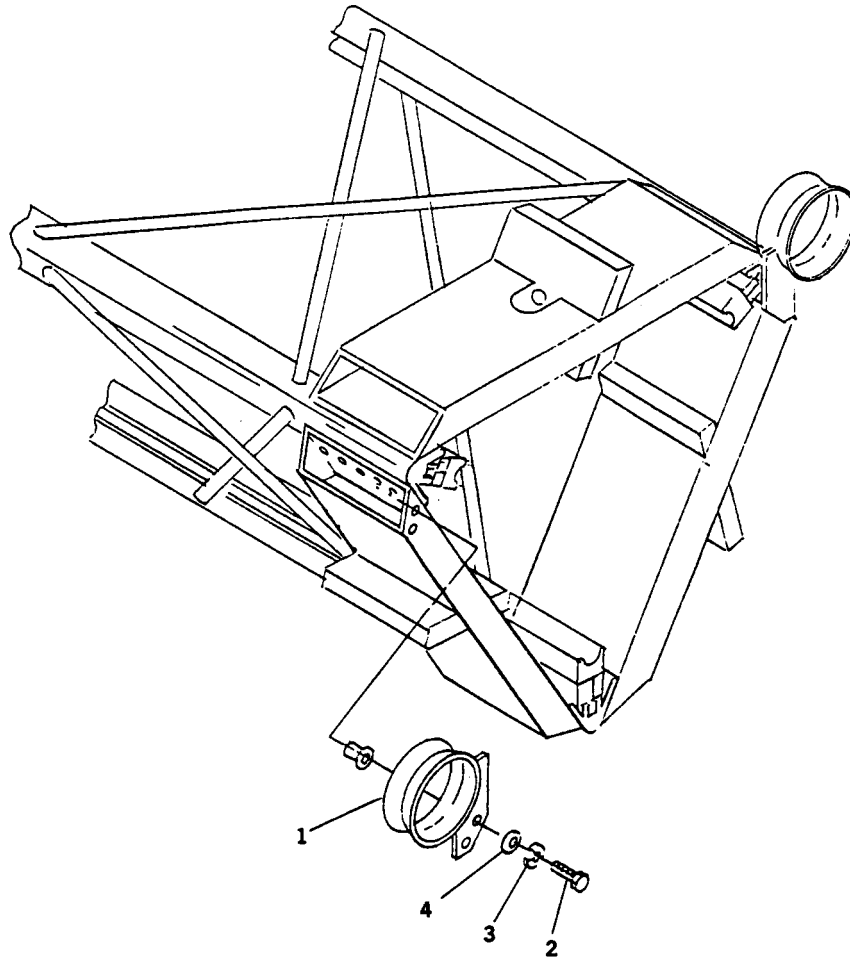
a. Pulley Replacement



Location	Item	Action
REMOVAL		
1. Top of tower section	Three pulleys (1)	Remove bolt (2), lock washer (3), washer (4) and nut (5); remove each pulley (1). Discard lockwashers (3).
REPLACEMENT		
1. Top of tower section	Three pulleys (1)	Position each pulley (1) and secure with bolt (2), new lockwasher (3), washer (4) and nut (5).

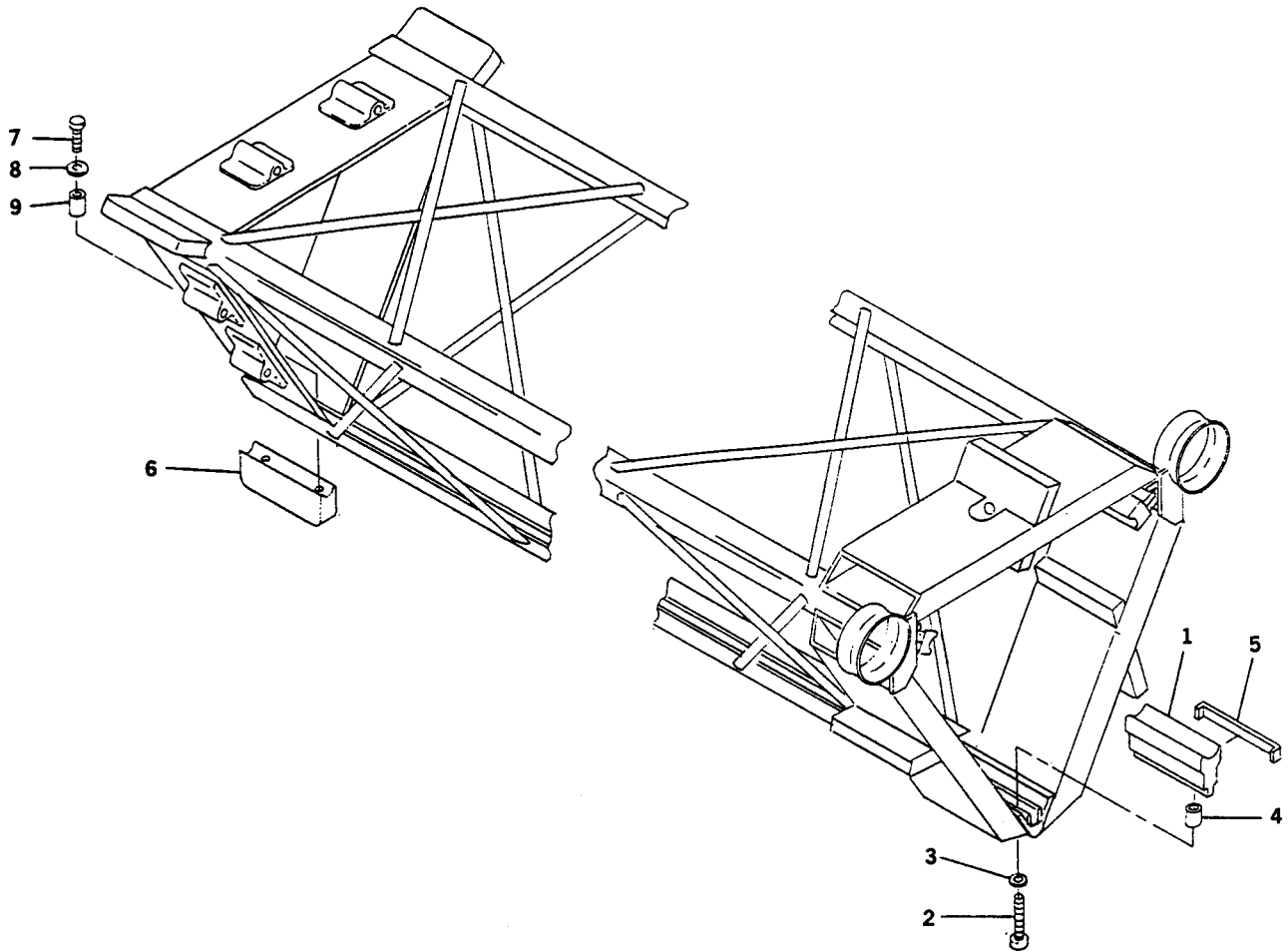
2-43. REPAIR OF TOWER SECTION NO. 7 - Continued

b. Coaxial Cable Arm Replacement



Location	Item	Action
REMOVAL		
1. Top of tower section	Two coaxial cable arms (1)	Remove two bolts (2), lockwashers (3) and washers (4); remove each arm. Discard lockwasher (3).
REPLACEMENT		
1. Top of tower section	Two coaxial cable arms (1)	Position each arm (1) and secure with two bolts (2), new lockwashers (3) and washers (4).

2-43. REPAIR OF TOWER SECTION NO. 7 - Continued
 c. Slide Blocks Replacement



NOTE

Components of each slide block should be kept together and identified to their location on the tower section. Spacers (4 and 9) are press fitted to the tower section and may not need to be removed. Inspect to ensure that spacers are present during slide block replacement.

2-43. REPAIR OF TOWER SECTION NO. 7 - Continued

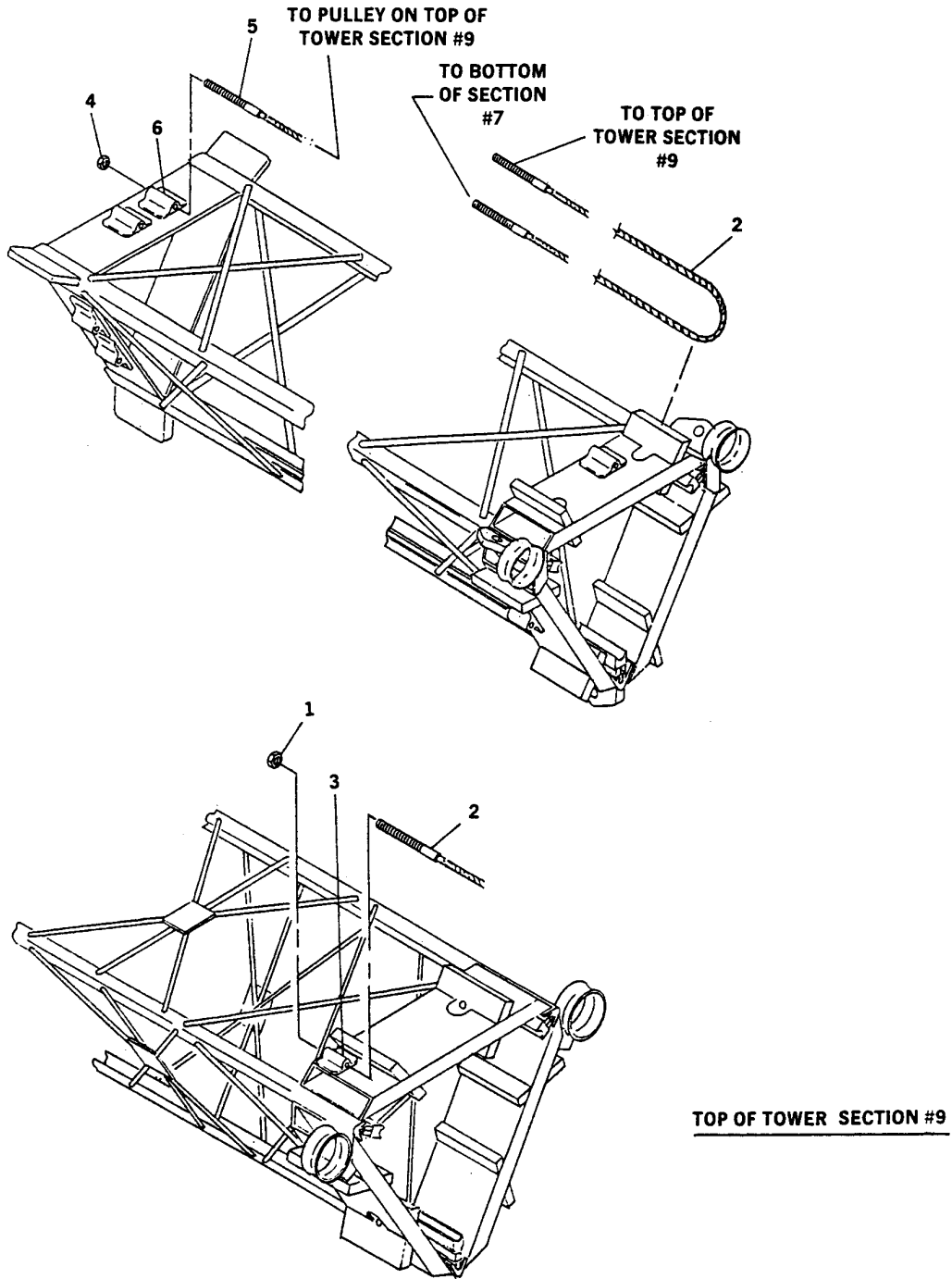
Location	Item	Action
c. Slide Blocks Replacement - Continued		
REMOVAL		
1. Top of tower section	Three slide blocks (1)	Remove two screws (2), lockwashers (3) and if loose, spacers (4); remove slide block and shims (5). Keep slide block and shims together. Discard lockwashers (3).
2. Bottom of tower section	Three slide blocks (6)	Remove two screws (7), lockwashers (8), and if loose, spacers (9); remove slide block. Discard lockwashers (8).
REPLACEMENT		
1. Bottom of tower section	Three slide blocks (6)	Position each slide block on tower leg and secure with two screws (7), new lockwashers (8) and spacers (9). Torque screws 25 to 30 ft-lbs.
NOTE		
Each slide block (1) with matched paired shims (5) must produce a sliding fit between slide block and leg member.		
2. Top of tower section	Three slide blocks (1)	Position each slide block and match shims (5) in groove on tower leg and secure with two screws (2), new lockwashers (3) and spacers (4). Torque screws 40 to 45 ft-lbs.
d. <u>Inspection</u>		
1. Tower section	Leg and web members	Inspect for damaged, corroded or missing parts and replace as necessary. Refer to Depot for repair.

2-43. REPAIR OF TOWER SECTION NO. 7 - Continued

Location	Item	Action
d. <u>Inspection</u> - Continued		
2.	Slide blocks	Inspect for damage. Replace as necessary.
3.	Pulleys	Inspect for sharp edges that could cause damage to steel cables. Replace as necessary.
4.	Three steel cables	Inspect cables for damages in accordance with paragraph 2- 49.

2-41. REMOVE/REPLACE TOWER SECTION NUMBER 8

Equipment Conditions: Tower sections numbers 4, 5, 6 and 7 removed.



2-44. REMOVE/REPLACE TOWER SECTION NO. 8 - Continued

WARNING

Tower section No. 8 weighs 750 pounds. Ensure lifting devise is capable of supporting this weight.

CAUTION

To prevent damage to tower section, use web type slings not chains when lifting sections.

Location	Item	Action
REMOVAL		
1. Top of No. 9 section	Locknuts (1) securing six steel cables (2) to anchor fittings (3)	Loosen and remove locknuts (1).
2.	Six steel cables (2)	Remove cables (2) from anchor fittings (3).
3.	Pulley frames	Remove pulley frames. Refer to paragraph 2-61.
4.	Slide blocks	Remove slide blocks. Refer to paragraph 2-47.c.
5. Bottom of No. 8 section	Locknuts (4) securing six steel cables (5) to anchor fittings (6)	Loosen and remove locknuts (4).
6.	Six steel cables (5)	Remove cables (5) from anchor fittings (6).

NOTE

Steel cables (5) will remain in tower with section No. 9 and steel cables (2) will come out with this section.

2-44. REMOVE/REPLACE TOWER SECTION NO. 8 - Continued

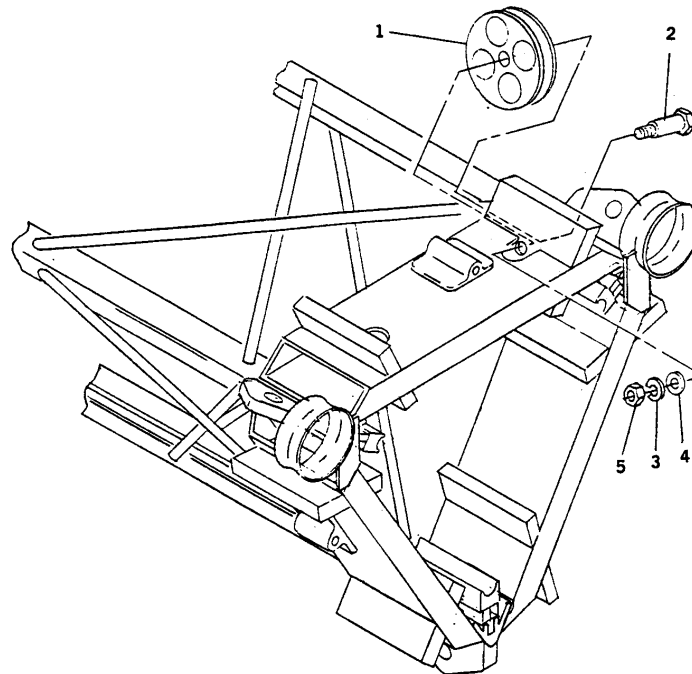
Location	Item	Action
REMOVAL - Continued		
7.	Tower section No. 8	Attach lifting device to section No. 8 and carefully slide the section from the tower. Be careful not to damage steel cables.
<p>NOTE Note routing of steel cables (2) prior to removing them from pulleys.</p>		
8. Top of No. 8 section	Steel cables (2)	If necessary, remove steel cables (2) from pulleys at top of section.
REPLACEMENT		
1. Top of No. 8 section	Steel cables (2)	If removed, route steel cables (2) over pulleys as noted during removal.
2.	Tower section No. 8	Attach lifting device to section No. 8 and carefully slide the section into the tower being careful not to damage steel cables (2 and 5).
3. Bottom No. 8 section	Six steel cables (5)	Insert cable ends into anchor fittings (6) and secure with new locknuts (4).
4. Top of No. 9 section	Slide blocks	Install slide blocks Refer to paragraph 2-47.c.
5.	Pulley frames	Install pulley frames. Refer to paragraph 2-61.
6.	Six steel cables (2)	Insert cable ends into anchor fittings (3) and secure with new locknuts (1)

2-45. REPAIR OF TOWER SECTION NO. 8

Repair consists of removal and replacement of pulleys, coaxial cable arm, slide blocks and guy wire ears, and inspection of tower section.

Equipment Conditions: Tower section removed from tower.

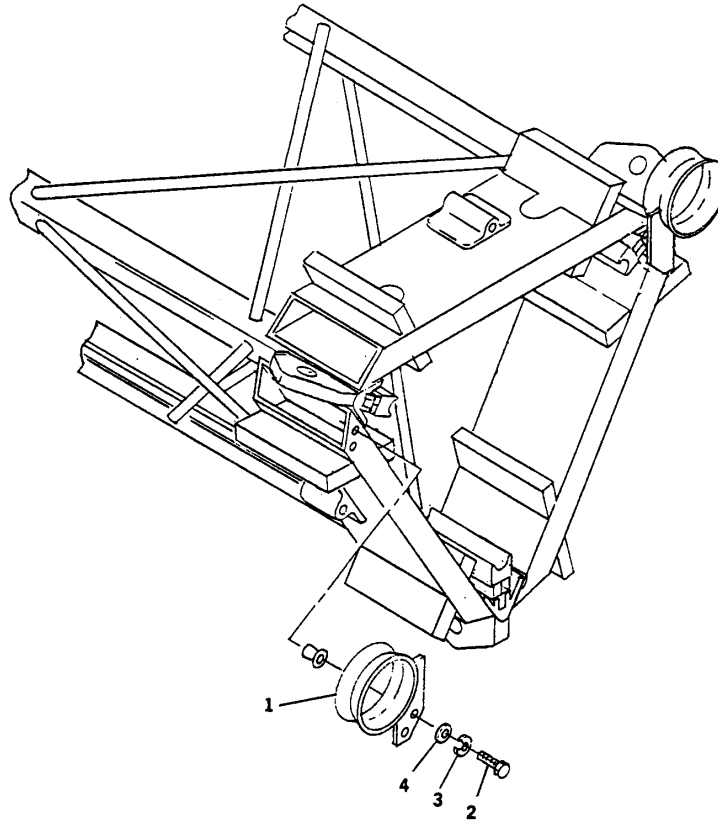
a. Pulley Replacement



Location	Item	Action
REMOVAL		
1. Top of tower section	Six pulleys (1)	Remove bolt (2), lock washer (3), washer (4), and nut (5); remove each pulley (1). Discard lock washers (3).
REPLACEMENT		
1. Top of tower section	Six pulleys (1)	Position each pulley (1) and secure with bolt (2) new lockwasher (3), washer (4) and nut (5).

2-45. REPAIR OF TOWER SECTION NO. 8 - Continued

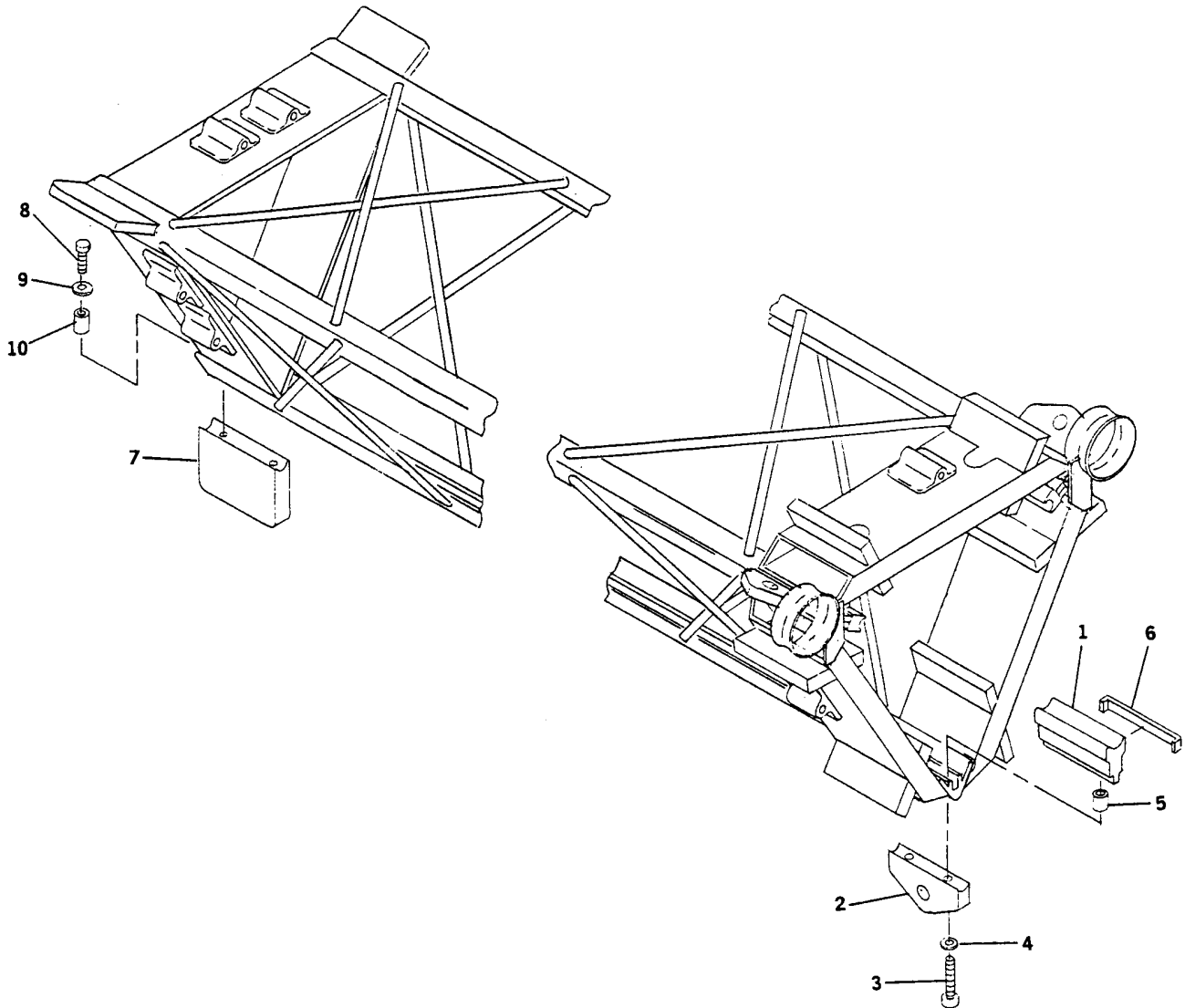
b. Coaxial Cable Arm Replacement



Location	Item	Action
REMOVAL		
1. Top of tower section	Two coaxial cable arms (1)	Remove two bolts (2), lockwashers (3) and washers (4); remove each arm. Discard lock washers (3).
REPLACEMENT		
1. Top of tower section	Two coaxial cable arms (1)	Position each arm (1) and secure with two bolts (2), new lockwashers (3) and washers (4).

2-45. REPAIR OF TOWER SECTION NO. 8 - Continued

c. Slide Blocks and GUY Wire Ears Replacement



NOTE

Components of each slide block should be kept together and identified to their location on the tower section. Spacers (5 and 10) are press fitted to the tower section and may not need to be removed. Inspect to ensure that spacers are present during slide block replacement.

2-45. REPAIR OF TOWER SECTION NO. 8 - Continued

Location	Item	Action
c. Slide Blocks and Guy Wire Ears Replacement - Continued		

REMOVAL

1. Top of tower section	Three slide blocks (1) and guy wire ears (2)	Remove two screws (3), lockwashers (4), and if loose, spacers (5); remove slide block (1), shims (6), and ear (2). Keep slide block and shims together. Discard lock washers (4).
2. Bottom of tower section	Three slide blocks (7)	Remove two screws (8), lockwashers (9), and if loose, spacers (10); remove slide block. Discard lockwashers (9).

REPLACEMENT

1. Bottom of tower section	Three slide blocks (7)	Position each slide block on tower leg and secure with two screws (8), new lockwashers (9) and spacers (10). Torque screws 25 to 30 ft-lbs.
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NOTE

Each slide block (1), with matched paired shims (6), must produce a sliding fit between slide block and leg member.

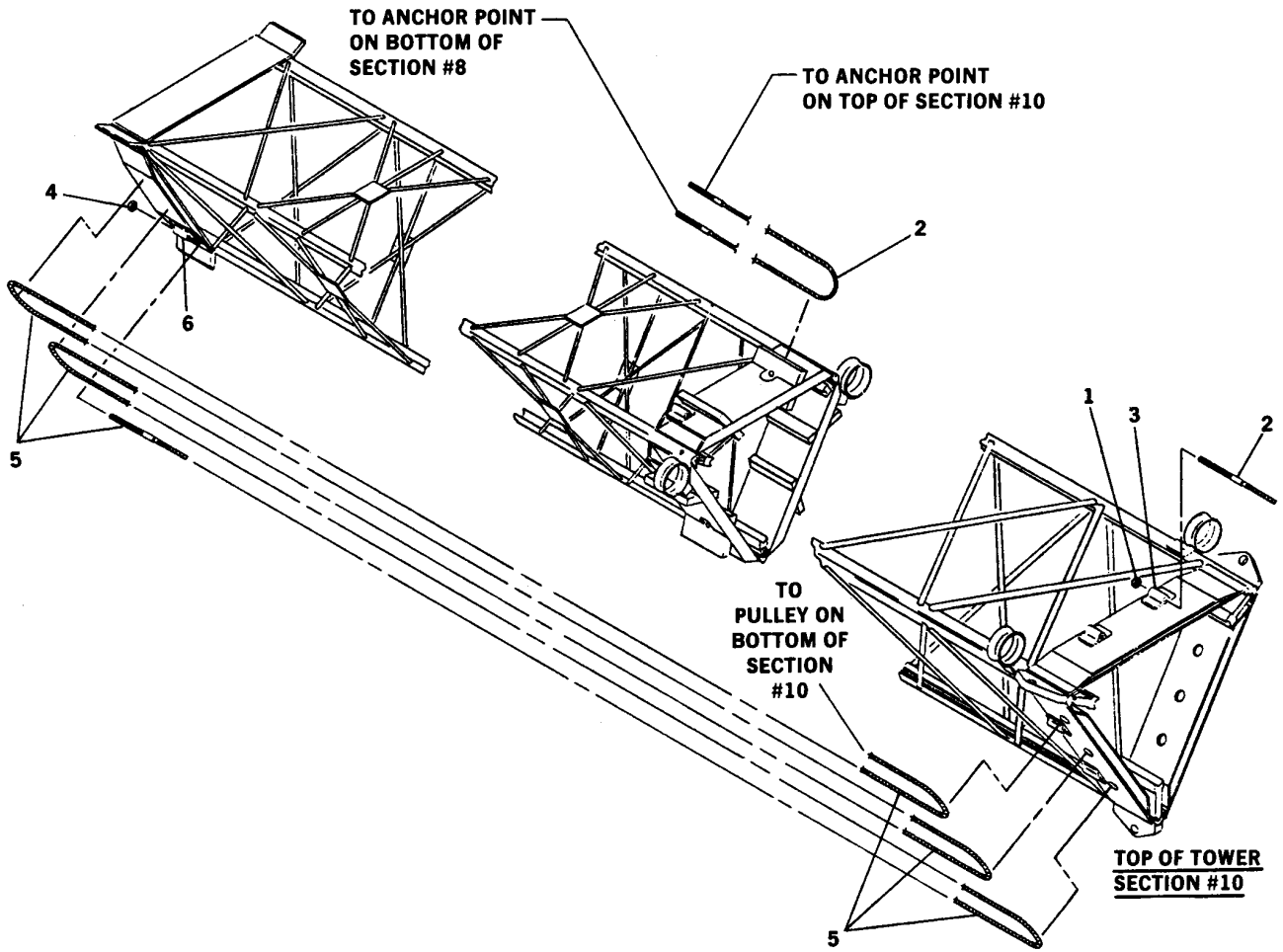
2. Top of tower section	Three slide blocks (1) and guy wire ears (2)	Position each slide block (1) and matched shims (6) in groove on tower leg. Position each ear (2) on outside of leg and secure block (1) and ear (2) with two screws (3), new lockwashers (4) and spacers (5). Torque screws 40 to 45 ft-lbs.
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2-45. REPAIR OF TOWER SECTION NO. 8 - Continued

Location	Item	Action
d. <u>Inspection</u>		
1. Tower section	Leg and web members	Inspect for damaged, corroded, or missing parts and replace as necessary. Refer to Depot for repair.
2.	Slide blocks	Inspect for damage. Replace as necessary.
3.	Pulleys	Inspect for sharp edges that could cause damage to steel cables. Replace as necessary.
4.	Six steel cables	Inspect cables for damage in accordance with paragraph 2-49.

2-46. REMOVE/REPLACE TOWER SECTION NO. 9

Equipment Conditions: Tower sections numbers 4, 5, 6, 7 and 8 removed.



2-46. REMOVE/REPLACE TOWER SECTION NO. 9 - Continued

WARNING

Tower section No. 9 weighs 950 pounds. Ensure lifting device is capable of supporting this weight.

CAUTION

To prevent damage to tower section, use web type slings not chains when lifting sections.

Location	Item	Action
REMOVAL		
1. Top of No. 10 section	Locknuts (1) securing six steel cables (2) to anchor fittings (3)	Loosen and remove locknuts (1).
2.	Six steel cables (2)	Remove cables (2) from anchor fittings (3).
3.	Pulley frames	Remove pulley frames. Refer to paragraph 2-61.
4.	Slide blocks	Remove slide blocks. Refer to paragraph 2-48.e.
5. Bottom of No. 9 section	Locknuts (4) securing two steel cables (5) to	Loosen and remove locknuts (4). anchor fittings (6)
6.	Two steel cables (5)	Remove cables (5) from anchor fittings (6).
7.	Tower section No. 9	Attach lifting device to section No. 9 and carefully slide the section from the tower. Be careful not to damage steel cables.

2-46. REMOVE/REPLACE TOWER SECTION NO. 9 - Continued

Location	Item	Action
REMOVAL - Continued		
NOTE		
Note routing of steel cables prior to removing them from pulleys. Steel cables (2) that are routed over top pulleys will come out with the section.		
8. Bottom of No. 9 and top of No. 10 sections	Two steel cables (5)	Remove steel cables (5) from bottom pulleys of No. 9 section and top of No. 10 section.
NOTE		
Steel cables (5) are attached to winch drum on the truss assembly of section No. 10.		
9. Top of No. 9 section	Steel cables (2)	If necessary, remove steel cables (2) from pulleys.
REPLACEMENT		
1. Top of No. 9 section	Steel cables (2)	If removed, route steel cables (2) over pulleys as noted during removal.
NOTE		
Steps 2 and 3 must be completed simultaneously. As section slides into tower, maintain tension on cables (5).		
2.	Tower section No. 9	Attach lifting device to section No. 9 and carefully slide the section into the tower being careful not to damage steel cables (2 and 5).
3. Bottom of No. 9 and top of No. 10 sections	Two steel cables (5)	Route steel cables (5) over pulleys at bottom of No. 9 and top of No. 10 as noted during removal

2-46. REMOVE/REPLACE TOWER SECTION NO. 9 - Continued

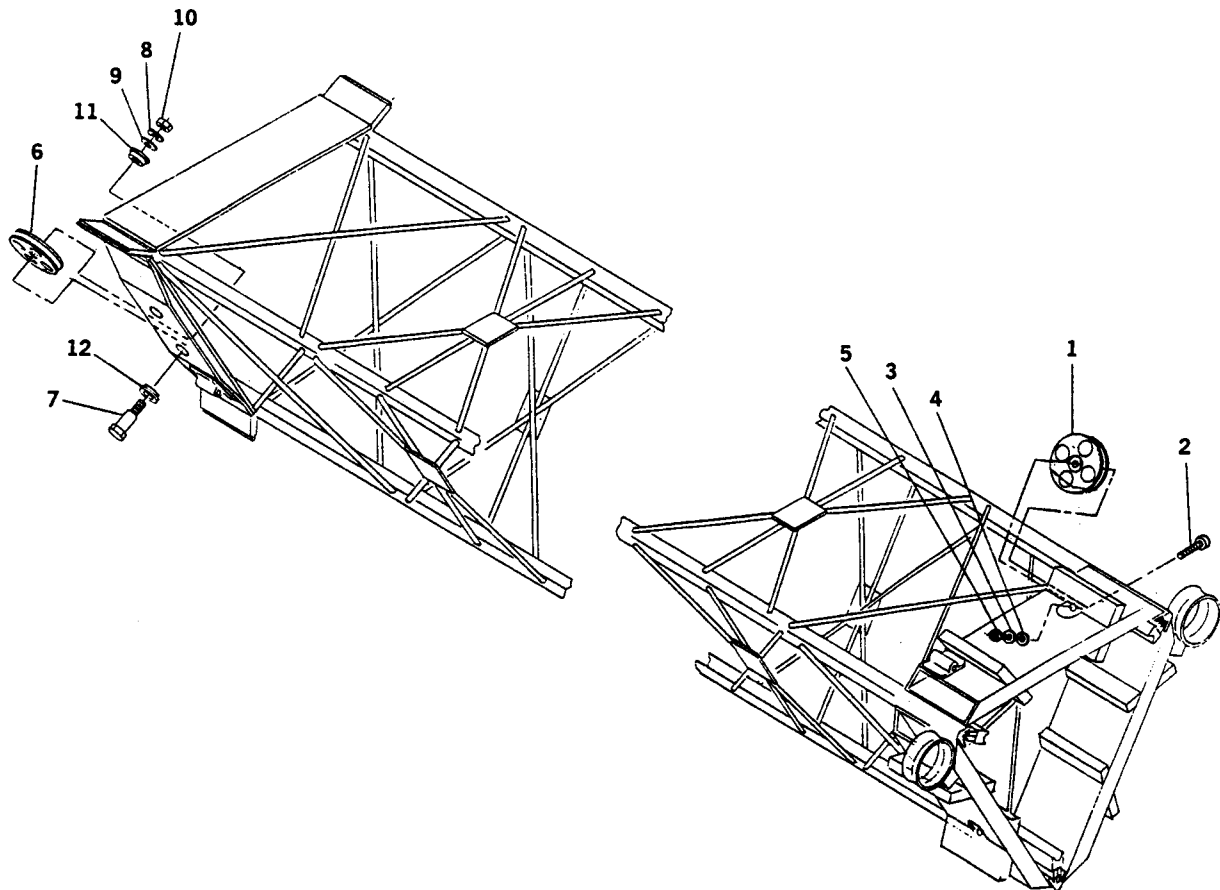
Location	Item	Action
REPLACEMENT - Continued		
4. Bottom of No. 9 section	Two steel cables (5)	Insert cable ends into anchor fittings (6) and secure with new locknuts (4).
5. Top of No. 10 section	Slide blocks	Install slide blocks Refer to paragraph 248.e.
6.	Pulley frames	Install pulley frames Refer to paragraph 261.
7.	Six steel cables (2)	Insert cable ends into anchor fittings (3) and secure with new locknuts (1).

2-47. REPAIR OF TOWER SECTION NO. 9

Repair consists of removal and replacement of pulleys, coaxial cable arms, and slide blocks and inspection of the tower section.

Equipment Conditions: Tower section removed from tower.

a. Pulley Replacement

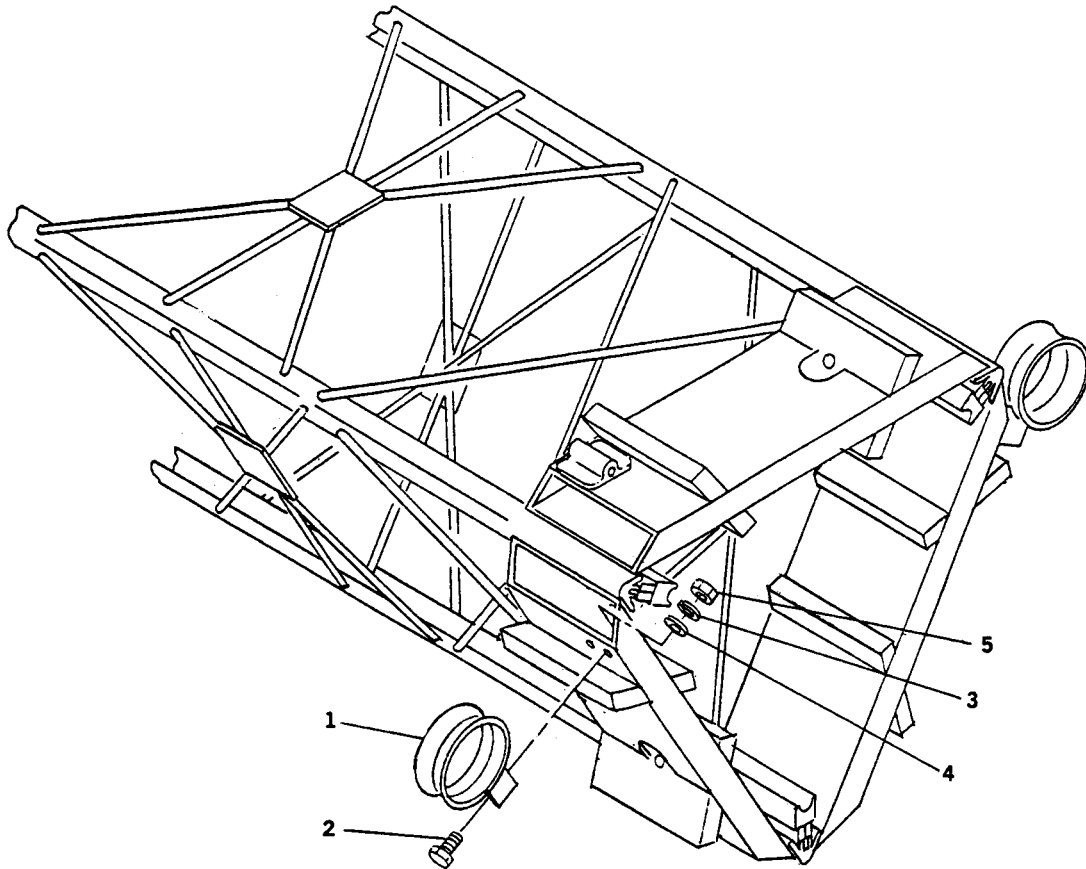


2-47. REPAIR OF TOWER SECTION NO. 9 Continued

Location	Item	Action
a. <u>Pulley Replacement - Continued</u>		
REMOVAL		
1. Top of tower section	Six pulleys (1)	Remove bolt (2), lockwasher (3), washer (4) and nut (5); remove pulley Discard lock washer (3).
2. Bottom of tower section	Four pulleys (6)	Remove bolt (7), lock washer (8), washer (9), nut (10), collar (11) and bolt collar (12); remove pulley. Discard lockwasher (8).
REPLACEMENT		
1. Bottom of tower section	Four pulleys (6)	Position pulley (6) in frame and install bolt collar (12) and collar (11). Secure with bolt (7), new lockwasher (8), washer (9) and nut (10). Torque bolt to 82 ft-lbs.

2-47. REPAIR OF TOWER SECTION NO. 9 Continued

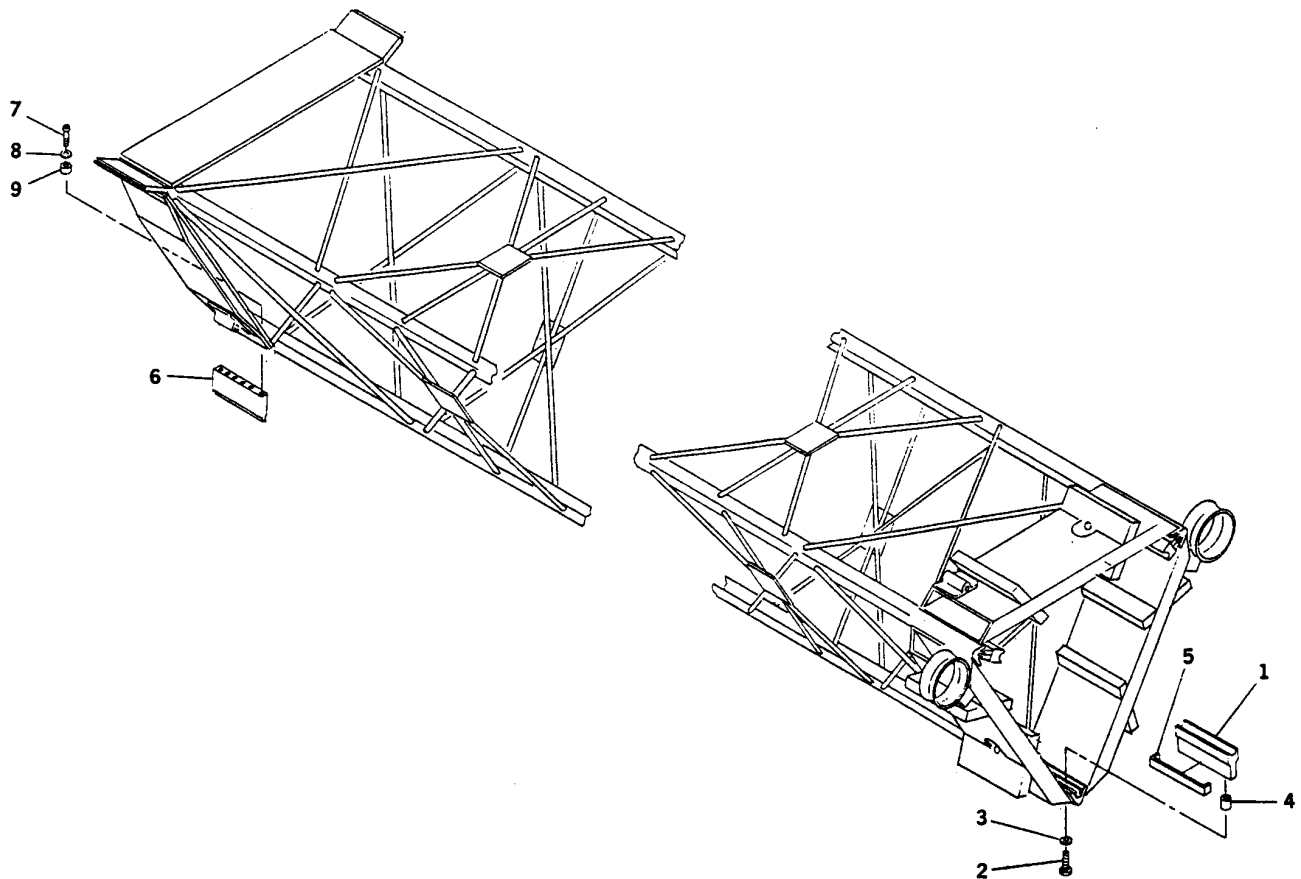
b. Coaxial Cable Arms Replacement



Location	Item	Action
REMOVAL		
1. Top of tower section	Two coaxial cable arms (1)	Remove two bolts (2), lockwasher (3), washers (4) and nuts (5);
REPLACEMENT		
1. Top of tower section	Two coaxial cable arms (1)	Position each arm (1) and secure with two bolts (2), new lockwashers (3), washers (4), and nuts (5).

2-47. REPAIR OF TOWER SECTION NO. 9 Continued

c Slide Blocks Replacement



NOTE

Components of each slide block should be kept together and identified to their location on the tower section Spacers (5 and 10) are press fitted to the tower section and may not need to be removed Inspect to ensure that spacers are present during slide block replacement.

2-47. REPAIR OF TOWER SECTION NO. 9 Continued

Location	Item	Action
c. Slide Blocks REPLACEMENT - Continued		
REMOVAL		
1. Top of tower section	Three slide blocks (1)	Remove two screws (2), lockwashers (3) and if loose, spacers (4); remove slide block (1) and shims (5)Keep slide block and shims together Discard lockwashers (3).
1. Bottom of tower section	Three slide blocks (6)	Remove six screws (7), lockwashers (8), and if loose, spacers (9); remove slide block Discard lock washers (8).
REPLACEMENT		
1. Bottom of tower section	Three slide blocks (6)	Position each slide block on tower leg and secure with six screws (7), new lockwashers (8), and spacers (9)Torque screws to 65 ft-lbs
NOTE		
Each slide block (1) with matched paired shims (5) must produce a sliding fit between slide block and leg member.		
2. Top of tower section	Three slide blocks (1)	Position each slide block (1) and matched shims (5) in groove on tower leg and secure with two screws (2), new lock washers (3) and spacers (4)Torque screws 40 to 45 ft lbs.

2-47. REPAIR OF TOWER SECTION NO. 9 Continued

Location	Item	Action
d <u>Inspection</u>		
Tower section	Leg and web members	Inspect for damaged, corroded, or missing parts and replace as necessary Refer to Depot for repair.
2.	Slide blocks	Inspect for damage. Replace as necessary.
3.	Pulleys	Inspect for sharp edges that could cause damage to steel cables Replace as necessary.
4.	Six steel cables	Inspect cables for damage in accordance with paragraph

2-49.

2-48 REPAIR OF TOWER SECTION NO. 10

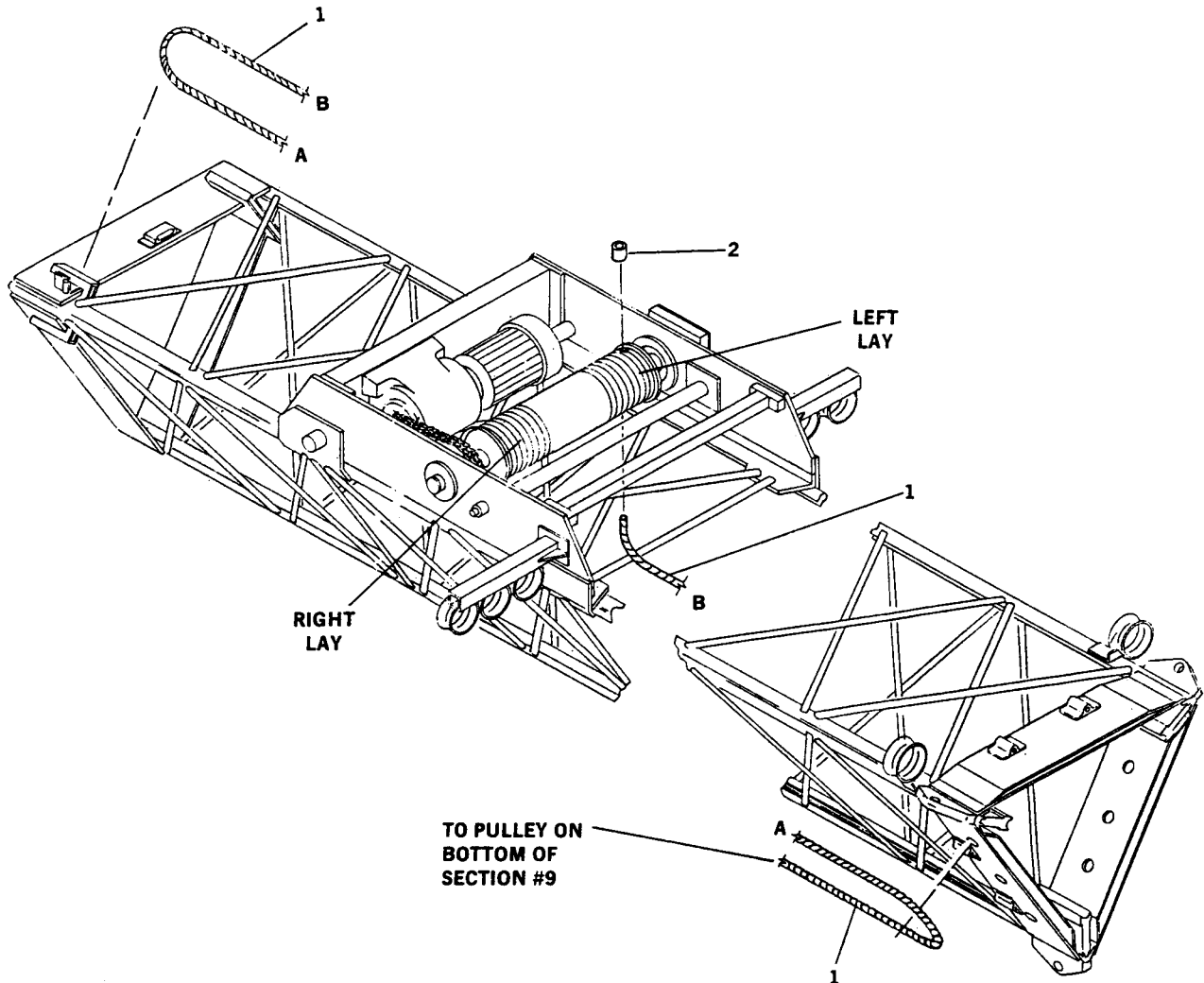
Repair consists of replacement of two steel cables, pulleys, levels, lockout assembly, slide blocks and guy wire ears, limit switches, coaxial cable arms, blackout light, harness and reflector, and inspection.

Equipment Condition: All other tower sections removed from this section.

WARNING

Tower section No. 10 weighs 1,000 pounds
Ensure lifting device is capable of supporting this weight.

a Steel Cable Replacement



2-48. REPAIR OF TOWER SECTION NO. 10 Continued

Location	Item	Action
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a. Steel Cable REPLACEMENT - Continued

REMOVAL

NOTE

Note routing of steel cables prior to removing them from pulleys and on winch drum (off top or bottom)Count number of wraps on winch drum for reassembly.

Top and bottom of tower section	Two steel cables (1)	Remove cables from pulleys at top and bottom of tower section.
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NOTE

To allow for manual rotation of winch drum, disconnect height gage indicator belt and remove roller chain from sprocket.

2. Winch drum	Two steel cables (1)	Manually rotate drum as necessary to provide enough slack in cables. Pull cable ends from recess in drum.
3.	Oval sleeve anchors (2)	Remove oval sleeve anchors (2) from cables by cutting cables next to anchor Remove cables from winch drum Inspect steel cables in accordance with paragraph 249.

REPLACEMENT

CAUTION

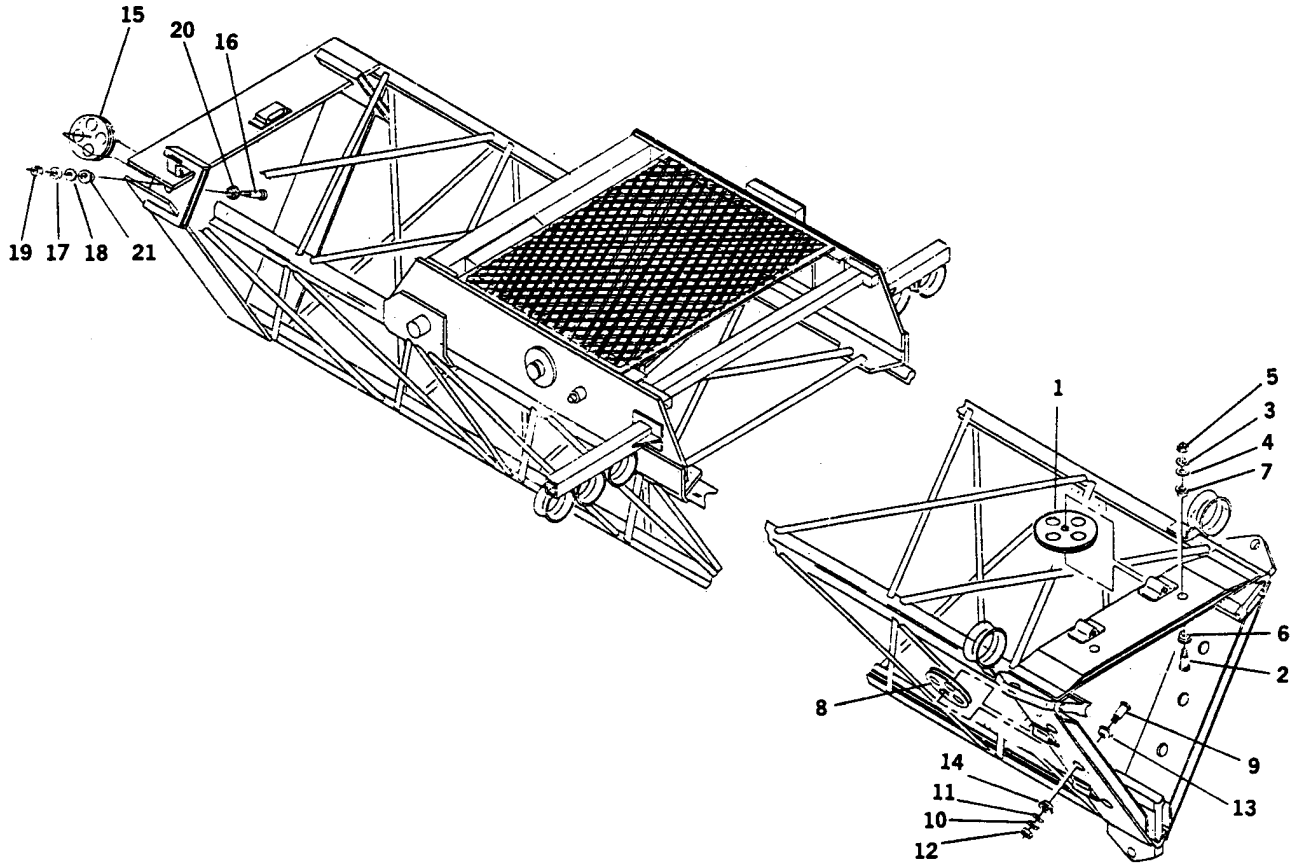
One cable is right lay and the other is left lay and must be installed on the correct side of winch drum in the same manner (wraps and direction) as noted during removal When installing cable on drum, maintain tension on cable to ensure proper seating in grooves.

2-48. REPAIR OF TOWER SECTION NO. 10 Continued

Location	Item	Action
a. <u>Steel Cable REPLACEMENT - Continued</u>		
REPLACEMENT - Continued		
1. Winch drum	Two steel cables (1) and oval sleeve anchor (2)	Insert end of cables through drum and install oval sleeves (2) on end of cables using swaging tool and die.
	Winch drum	Manually rotate winch drum in proper direction to wind correct number of wraps of cable on drum.
Top and bottom of tower section	Two steel cables (1)	Route cables over pulleys at top and bottom of tower section as noted during removal.
4. Install roller chain on sprocket and connect height gage indicator belt.		

2-45. REPAIR OF TOWER SECTION NO. 10 Continued

b. Pulley Replacement



2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
<p>b. <u>Pulley REPLACEMENT - Continued</u></p>		
REMOVAL		
1. Top of tower section (winch side)	Two pulleys (1)	Remove bolt (2), lock washer (3), washer (4), nut (5), bolt collar (6), and collar (7); remove each pulley. Discard lockwashers (3).
2. Top of tower section (#2 and #3 side)	Six pulleys (8)	Remove bolt (9), lock washer (10), washer (11), nut (12), bolt collar (13) and collar (14) remove each pulley. Discard lockwashers (10).
NOTE		
<p>Center pulley on each side has a bolt (9) with a thinner head than the other two bolts (9).</p>		
3. Bottom of tower section	Two pulleys (15)	Remove bolt (16), lock washer (17), washer (18), nut (19), bolt collar (20) and collar (21); remove each pulley Discard lockwashers (17).
REPLACEMENT		
1. Bottom of tower section	Two pulleys (15)	Position each pulley and secure with collar (21), bolt collar (20), bolt (16), new lockwasher(17), washer (18) and nut (19).
NOTE		
<p>Bolt (9) with thinner head is used for center pulley on each side.</p>		

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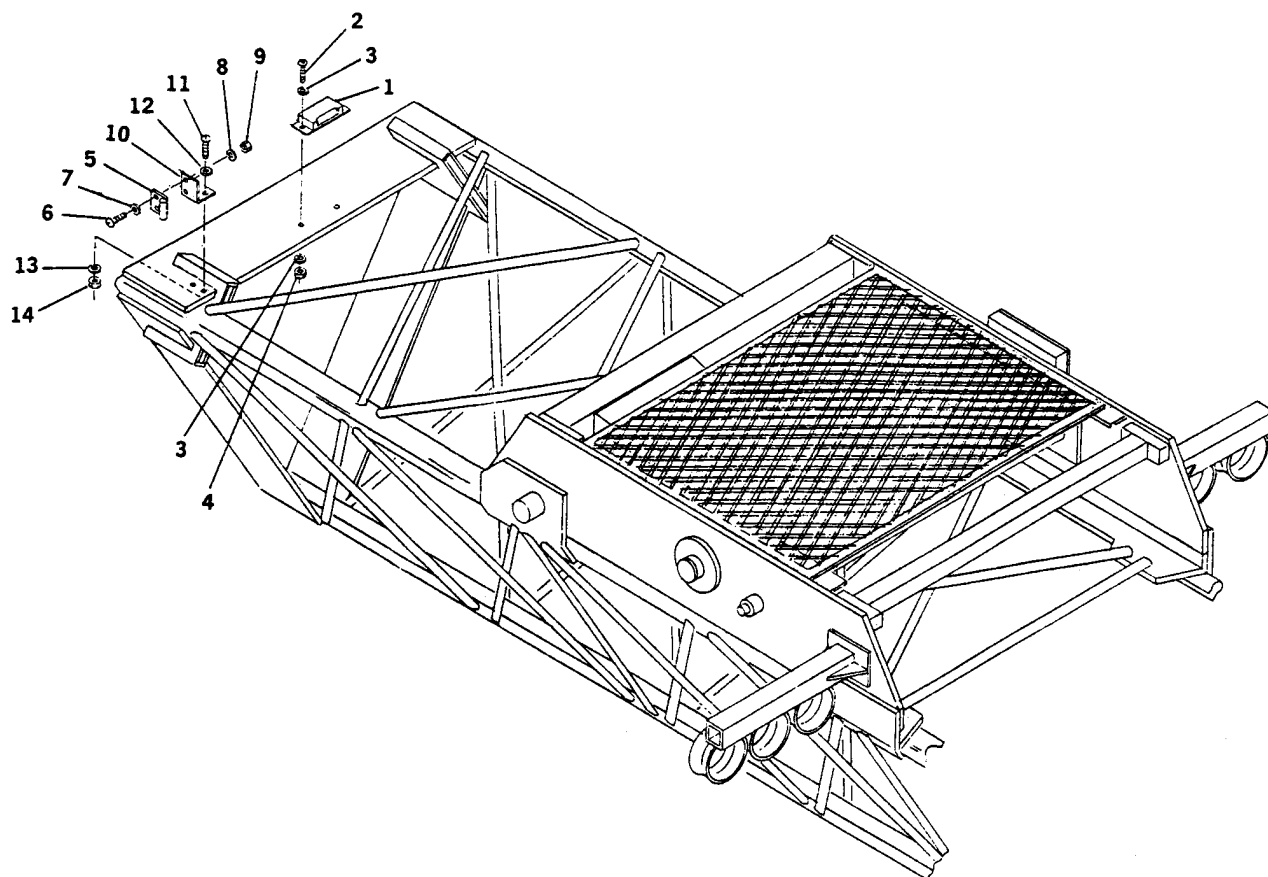
2-48 REPAIR OF TOWER SECTION NO. 10 Continued

b. Pulley REPLACEMENT - Continued

Location	Item	Action
REPLACEMENT - Continued		
2. Top of tower section (#2 and #3 sides)	Six pulleys (8)secure with bolt collar	Position each pulley and (13), collar (14), bolt (9), new lockwasher (10), washer (11), and nut (12).
3. Top of tower section (winch side)	Two pulleys	Position each pulley and (1)secure with bolt collar(6), collar (7), bolt (2), new lockwasher (3), washer (4) and nut (5).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

c. Levels Replacement

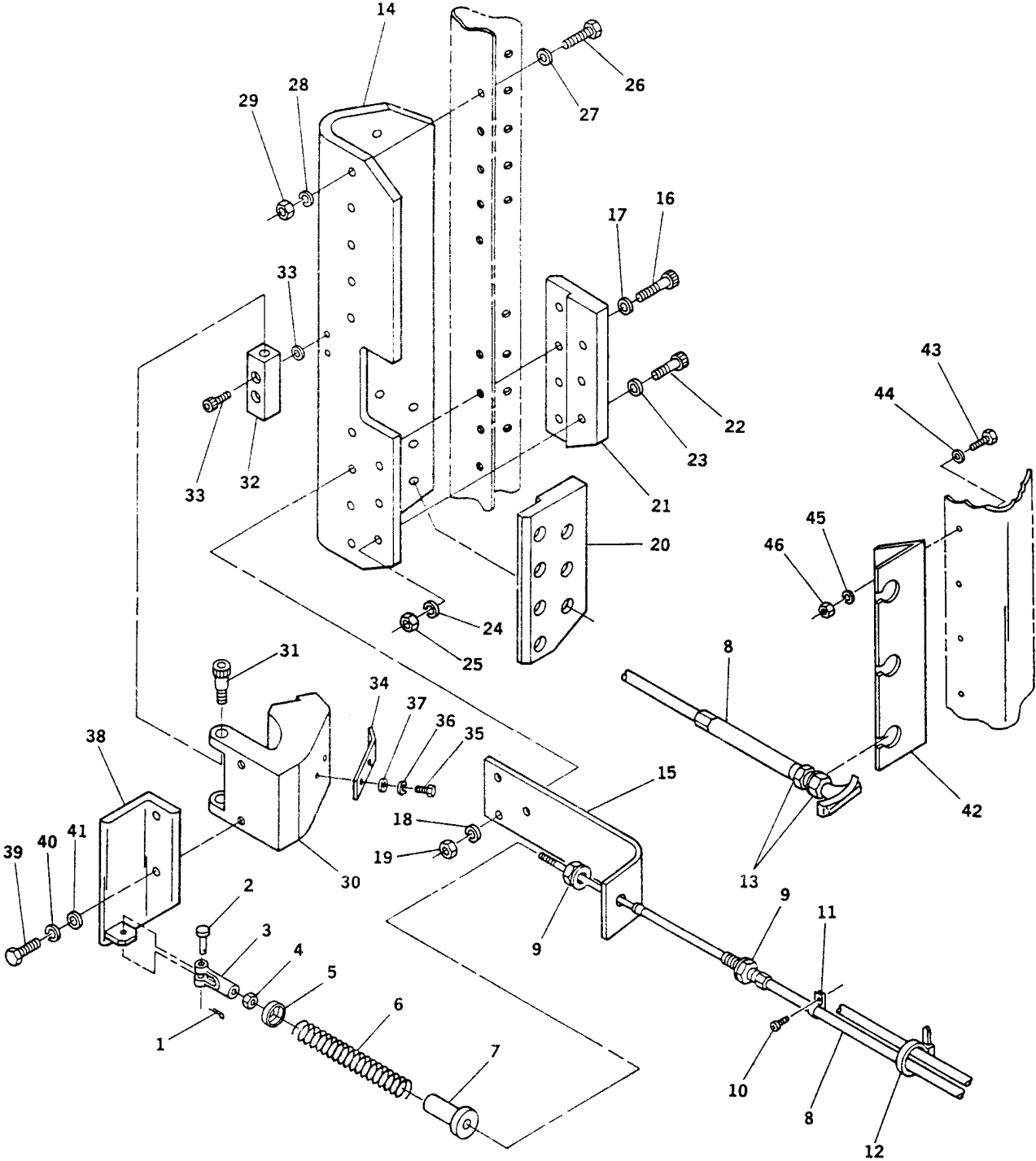


2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
c. Levels Replacement		
REMOVAL		
1. Bottom of tower section	Tubular level (1)	Remove two screws (2), four washers (3), and two locknuts (4); remove level.
2.	Adjustable level (5)	Remove two screws (6), lockwashers (7), washers (8) and nuts (9); remove level from mounting bracket (10)Discard lockwashers (7).
3.	Mounting bracket (10)	Remove two screws (11), lockwashers (12), washers (13), and nuts (14); remove mounting bracket Discard lock washers (12). Continued
REPLACEMENT		
1. Bottom of tower section	Mounting bracket (10)	Position mounting bracket and secure with two screws (11), new lock washers (12), washers (13), and nuts (14).
2.	Adjustable level (5)	Position a carpenter level on mounting bracket (10) and secure with two screws (6), new lockwashers (7), washers (8), and nuts (9).
3.	Tubular level (1)	Position a carpenter level and secure with two screws (2), four washers (3) and two locknuts (4).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

d. Lockout Assembly Replacement



2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

d Lockout Assembly Replacement - Continued

NOTE

The following procedures are for one lockout assembly. All three assemblies are replaced in the same manner.

Location	Item	Action
REMOVAL		
1. Tower section	Yoke (3)	Remove cotter pin (1) and pin (2); remove yoke from hinge arm (38). Discard cotter pin (1).
2.	Yoke (3)	Loosen jam nut (4) and unscrew yoke (3) from end of control cable (8). Remove jam nut.
NOTE		
Count the number of turns required to unscrew yoke (3) for replacement.		
3.	Control cable (8)	Remove cup (5), spring (6) and guide (7) from control cable (8).
4.	Control cable (8)	Loosen and remove one locknut (9) and remove control cable from mounting bracket (15).
5.	Control cable (8)	Remove screws (10), clamps (11) and tie wraps (12) securing control cable to tower section.
6.	Control cable (8)	Loosen locknuts (13) and remove control cable (8) from mounting bracket (42).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
d. Lockout Assembly REPLACEMENT - Continued		
REMOVAL - Continued		
7.	Mounting bracket (15)washers	Remove three screws (16), (17), lock washers (18), and nuts (19); remove bracket. Discard lockwashers (18).
8.	Lockout Support plates (20 and 21)	Remove all screws (22), washers (23), lock washers (24), and nuts
9.	Lockout mounting plate (14)	Remove 10 screws (26), washers (27), lock washers (28), and nuts (29); remove mounting plates. Discard lockwashers (28).
10.	Lock (30)	Remove two bolts (31); remove lock from mounting. block (32).
11.	Mounting block (32)	Remove two screws and washers (33); remove mounting block.
12.	Lockout stop (34)	Remove two bolts (35), lockwashers (36).washers washers (37); remove lockout stop from block (30) Discard lockwasher (36).
13.	Hinge arm (38)	Remove two bolts (39), lockwashers (40). Remove hinge arm (38). Discard lock washers (40);

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

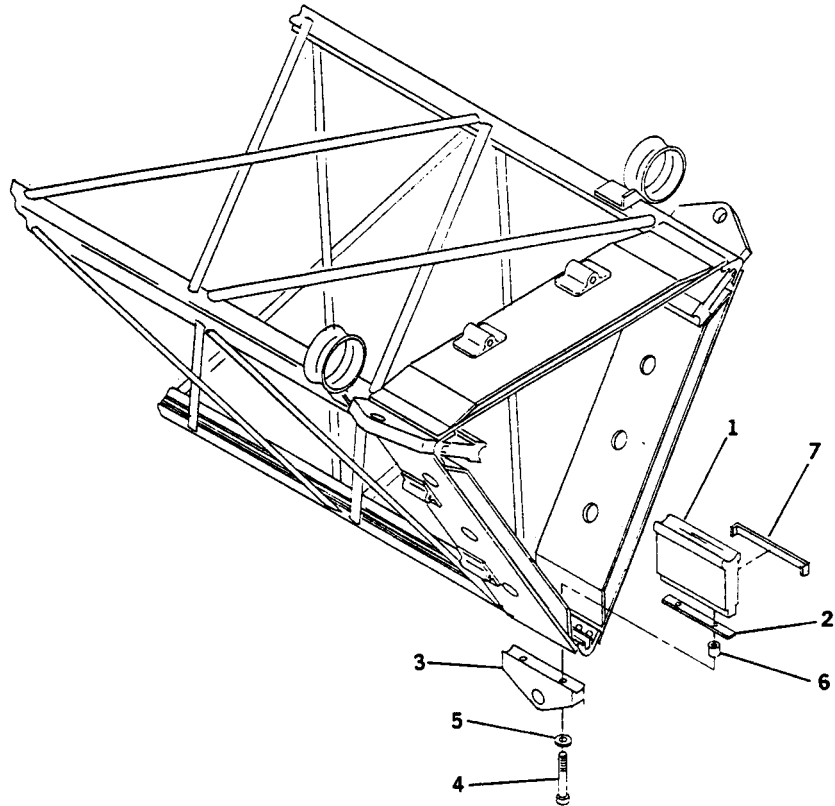
Location	Item	Action
d. <u>Lockout Assembly Replacement</u> - Continued		
REMOVAL - Continued		
14. Bottom of tower section	Cable mounting bracket (42)	Remove four bolts (43), washers (44), lock washers (45) and nuts (46); remove bracket (42). Discard lock washers (45).
REPLACEMENT		
1. Bottom of tower section	Cable mounting bracket (42)	Position bracket on tower and secure with four bolts (43), washers (44), new lockwashers (45) and nuts (46).
2. Lock	Hinge arm (38)	Position hinge arm on lock (30) and secure with new lock two bolts (39), new lock washers (40), and washers (41).
3.	Lockout stop (34)	Position stop on lock (30) and secure with two bolts (35), new lockwashers (36), and washers (37).
4. Lockout mounting plate	Mounting block (32)	Position lock on mounting plate (14) and secure with two screws and washers (33). The washers go between the block and plate.
5.	Lock (30)	Position plate on mounting plate (14) and secure to block (32) with two bolts (31).
6. Tower section	Lockout mounting plate (14)	Position block on legs and secure with ten screws (26), washers (27), new lockwashers (28) and nuts (29).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
d. Lockout Assembly Replacement - Continued		
REPLACEMENT - Continued		
7.	Lockout support plates (20 and 21)	Position plates and secure with eleven screws (22), washers (23), new lockwashers (24), and nuts (25).
8.	Mounting bracket (15)	Position bracket and secure with three screws (16), washers (17), new lockwashers (18), and nuts (19).
9.	Control cable (8)	Position control cable in mounting bracket (42) and tighten locknuts (13).
10.	Control cable (8)	Route control cable up tower to mounting bracket (15) and secure with screws (10), clamps (11) and tie wraps (12).
11.	Control cable (8)	Position control cable in mounting bracket (15) and secure with locknuts (9)
12.	Control cable (8)	Install guide (7), spring (6) and cup (5) on control.
13.	Control cable (8)	Install jam nut (4) and yoke (3) on control cable. Screw yoke on the same number of turns as counted during removal.
14.	Yoke (3)	Secure yoke to hinge arm (38) with pin (2) and new cotter pin (1).
15. Adjust control cables for proper operation.		

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

e. Slide Blocks and Guy Wire Ears Replacement



NOTE

Components of each slide block should be kept together and identified to their location on the tower section. Spacers (6) are press fitted to the tower section and may not need to be removed. Inspect to ensure that spacers are present during slide block replacement.

Location	Item	Action
REMOVAL 1. Top of tower section	Three slide blocks (1) and guy wire ears (3)	Loosen two screws (4) and remove slide block (1), shims (7), flat spacer (2) and if loose, standoff spacers (6). Keep slide block and shims together. Remove screws (4), lockwashers (5) and wire ear (3). Discard lockwashers (5).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
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e. Slide Blocks and Guy Wire Ears Replacement - Continued

REPLACEMENT

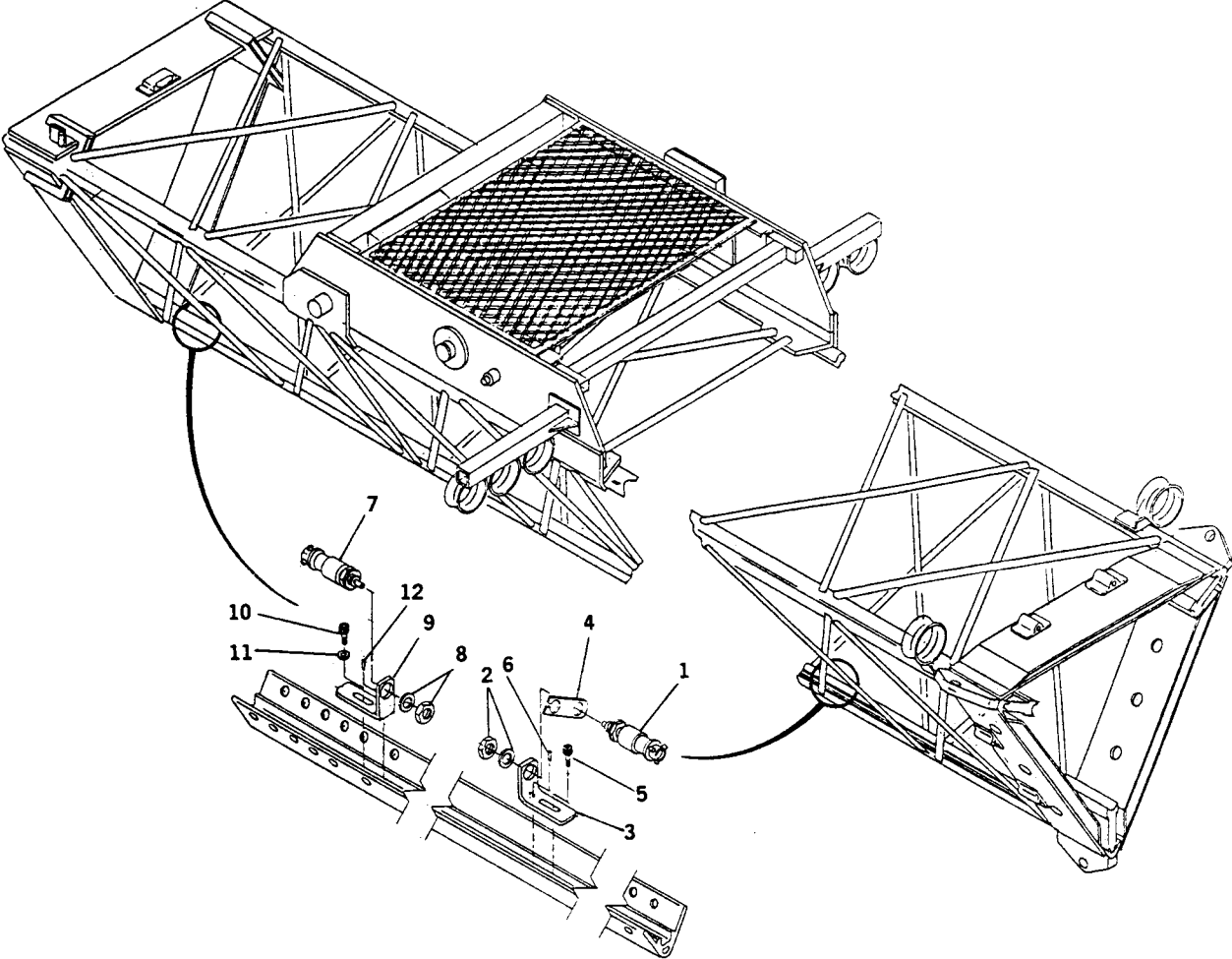
NOTE

Each slide block (1) with matched paired shims (7) must produce a sliding fit between slide block and leg member.

1. Top of tower section	Three slide blocks (1) and guy wire ears (3)	Position wire ear (3), new lockwashers (5) and screws (4) on outside of tower leg. Position standoff spacers (6) flat spacers (2), slide block (1) and matched shims (7) in groove on inside of tower leg. Torque screws 40 to 45 ft-lbs.
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2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

f. Limit Switches Replacement



2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
f. <u>Limit Switches Replacement</u> - Continued		
REMOVAL		
1. Top of tower section	Electrical connector	Disconnect electrical connector from switch (1). Remove cable from breakaway bracket (4).
2.	Limit switch (1)	Loosen and remove nut and lockwasher (2) securing switch to mounting arm (3); remove switch (1) and breakaway bracket (4).
NOTE		
Count number of threads between remaining locknut and end of switch to aid in approximate location for replacement.		
3.	Mounting arm (3)	Remove screw (5) and spring pin (6); remove mounting arm.
4. Bottom of tower section	Electrical connector	Disconnect electrical connector from limit switch (7).
5.	Limit switch (7)	Loosen and remove nut and lockwasher (8); remove switch (7) from mounting arm (9).
NOTE		
Count number of threads between remaining locknut and end of switch to aid in approximate location for replacement.		
6.	Mounting arm (9)	Remove screw (10), washer (11) and spring pin (12); remove mounting arm (9).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

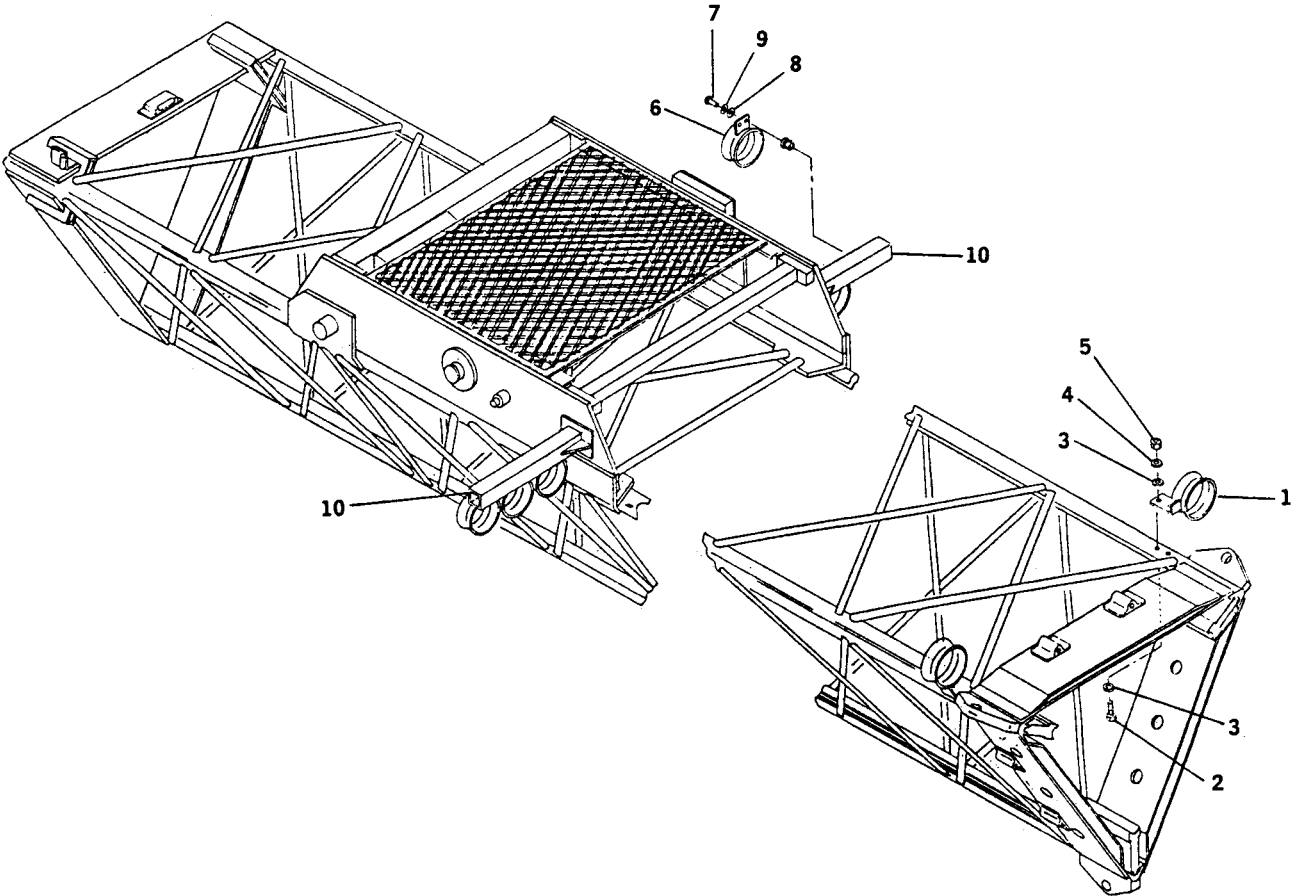
Location	Item	Action
f. <u>Limit Switches Replacement</u> - Continued		
REPLACEMENT		
1. Bottom of tower section	Mounting arm (9)	Position arm (9) on tower leg and secure with screw (10), washer (11) and spring pin (12).
2.	Limit switch	(7)Position inner locknut to have the same number of threads counted during removal. Position switch in mounting arm (9) so tip of switch is approximately 3/4 to 1 inch from top of mounting arm (9), and secure with lockwasher and nut (8).
3.		Operate tower and adjust switch (7) as necessary after tower assembly is complete to activate when tower is at lower travel limit. Loosen nut (8) and adjust inner locknut until switch is positioned against stop bracket (to activate switch). Tighten nut
4.	Electrical connector	Connect electrical connector to limit switch (7).
5. Top of tower section	Mounting arm (3)	Position arm (3) on tower leg and secure with screw (5) and spring pin (6).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
f. <u>Limit Switches Replacement</u> - Continued		
REPLACEMENT - Continued		
6.	Limit switch (1)	Position inner locknut to have same number of threads counted during removal. Position switch (1) so tip of switch is approximately 3/4 inch from top of mounting arm (3) and breakaway bracket (4) on mounting arm (3) and secure with lockwasher and nut (2).
7.		Operate tower and adjust switch (1) as necessary to activate switch when tower is at upper travel limit. Loosen nut (2) and adjust inner locknut until switch is positioned against stop bracket (to activate switch)Tighten nut (2).
8.	Electrical connection	Position electrical cable in breakaway bracket (4) and connect electrical connector to switch.

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

g. Coaxial Cable Arms Replacement

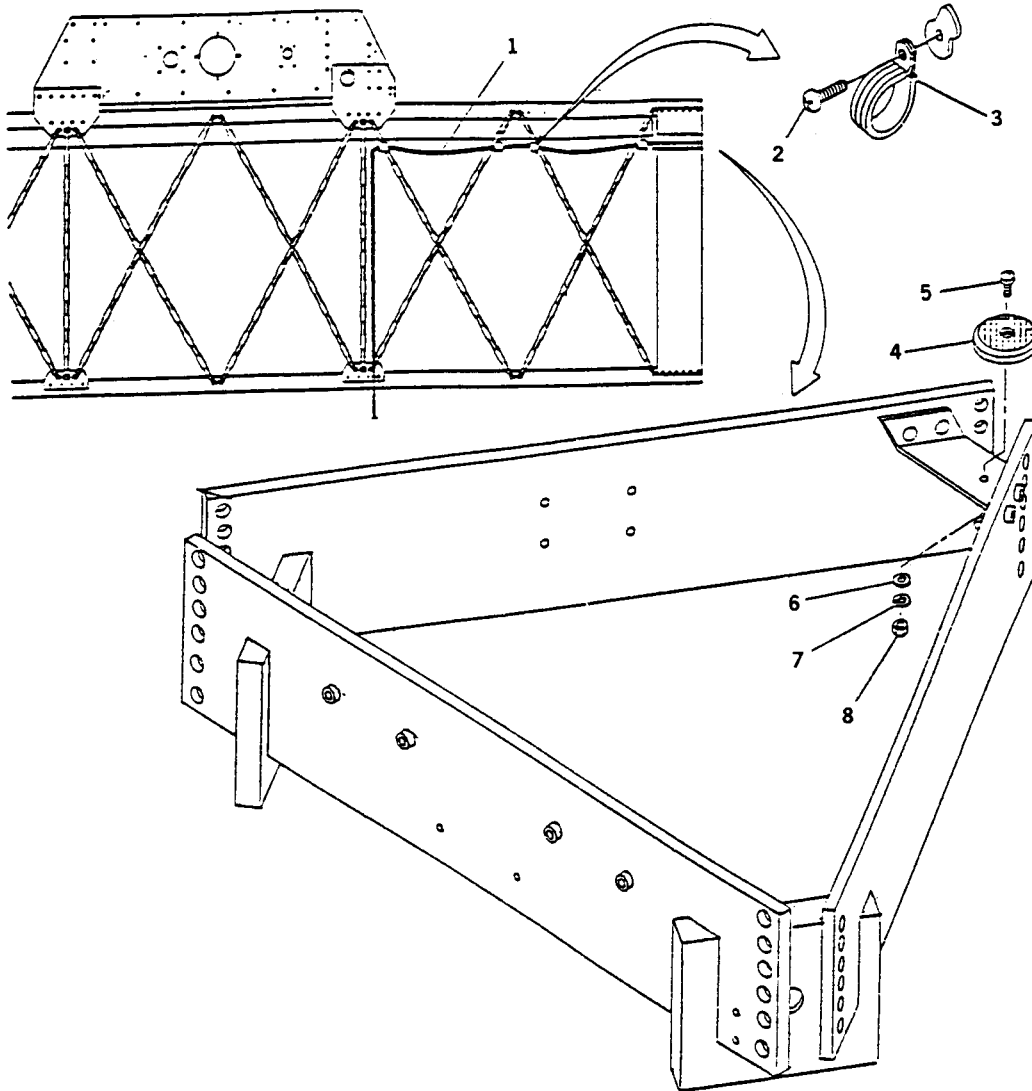


2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
g. <u>Coaxial Cable Arms Replacement</u> - Continued		
REMOVAL		
1. Tower section	Four coaxial cable arm (1) legs (top)arms (1)	Remove two bolts (2), four washers (3), two lockwashers (4) and two nuts (5); remove each Discard lock washers (4).
2. Guide brackets	Five coaxial cable arms (6)	Remove two bolts (7), washers (8) and lock washers (9); remove each arm (6) from guide brackets (10) Discard lockwashers (9).
REPLACEMENT		
1. Guide brackets	Five coaxial cable arms (6)	Position arms (6) on guide brackets (10) and secure with bolts (7), washers (8) and new lock washers (9).
2. Tower section legs (top)	Four coaxial cable arms (1)	Position arms (1) on tower legs and secure with bolts (2), washers (3), new lockwashers (4) and nuts (5).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

h. Blackout Light, Harness and Reflector Replacement



Location	Item	Action
REMOVAL		
1. Left side tower section	Wiring harness (1)	Remove self tapping screws (2) and clamps(3) securing harness to tower
2. Bottom of tower section	Two blackout lights	Remove lights. Refer to TM 11-5985-387-12.

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
h. Blackout Light, Harness and Reflector Replacement Continued		
REMOVAL - Continued		
3.	Wiring harness (1)	Disconnect harness from each light and remove harness.
4.	Reflector (4)	Remove screw (5), washer (6), lockwasher (7) and nut (8); remove reflector. Discard lockwasher (7).
REPLACEMENT		
1. Bottom of tower section	Reflector (4)	Position reflector on bracket and secure with screw (5), washer (6), new lockwasher (7) and nut (8).
2.	Two blackout lights	Install lights Refer to TM 11-5985-387-12.
3. Left side tower section	Wiring harness (1)	Route harness on tower and secure with four clamps (3) and self tapping screws (2).

2-48. REPAIR OF TOWER SECTION NO. 10 - Continued

Location	Item	Action
i. <u>Inspection</u>		
1. Tower section	Leg and web members	Inspect for damaged, corroded or missing parts and replace as necessary. Refer to Depot for repair.
2.	Slide blocks	Inspect for damage. Replace as necessary
3.	Pulleys	Inspect for sharp edges that could cause damage to steel cables. Replace as necessary.
4.	Limit switches and brackets	Inspect for damaged switch and damaged or bent mounting bracket. Replace as necessary
5.	Two steel cables	Inspect cables for damage in accordance with paragraph 2-49.

2-49. REPAIR OF STEEL CABLES

Repair consists of replacement and inspection of steel cables. Replacement and inspection can be performed without disassembly of the tower. It will be necessary to manually pull out some sections to replace certain cables. Use a crane or other lifting device and web type slings to pull out and support those sections as necessary after manually releasing first or second stage gear motor brake. Equipment Conditions: Trailer and tower in a shutdown/stowed condition.

Location	Item	Action
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a. First and Second Stage Interconnecting Steel Cables

REMOVAL

NOTE

Make note of cable routing prior to removal to aid in replacement and refer to Figure FO-11.

1. Anchor fittings	Lockouts	Loosen and remove cable end locknuts. Discard locknuts.
2. Anchor fittings and pulleys	Cable	Remove cable from anchor fittings and pulleys

REPLACEMENT

1. Anchor fittings pulleys	Cable	Route cable over pulleys as noted during removal and install threaded ends in anchor fittings
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NOTE

Install threaded steel cable end with flat surface.

2. Anchor fittings	Locknuts	Secure cable with new locknuts. Tighten locknuts until slack is removed from cable. Do not tighten to point that section starts to extend.
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2-49. REPAIR OF STEEL CABLES - Continued

Location	Item	Action
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b. Section Number 6 Winch Drum Steel Cables

REMOVAL

NOTE

Make note of cable routing prior to removal to aid in replacement and refer to Figure FO-11. Note how cable is wound on winch drum.

1. Top of tower section number 6 inside anchor fitting	Lockout	Loosen and remove locknut. Remove cable end from anchor fitting. Discard locknut.
2. Bottom of tower section number 5	Cable	Remove cable from pulley
3. Gearmotor	Brake release lever	Remove gearmotor brake release lever. Remove end housing from gearmotor. Install brake release lever.
4. Tower section number 6	Winch drum	Manually release gear motor brake by pulling on brake arm and rotating gearmotor fan to turn drum to loosen cable.

CAUTION

If cable is to be reused, carefully cut off anchor so cable can be inserted in drum and anchor before crimping.

5.	Cable	Pull cable from drum recess and cut cable as close to oval sleeve anchor as possible. Remove cable from drum.
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2-49. REPAIR OF STEEL CABLES - Continued

Location	Item	Action
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b. Section Number 6 Winch Drum Steel Cables - Continued

REMOVAL - Continued

NOTE

Approximately one foot of cable can be cut off this end and cable reused. If more than one foot is cut off, cable must be replaced.

REPLACEMENT

CAUTION

One cable is right lay and the other is left lay and must be installed on the correct side of winch drum in same manner (wraps and direction) as noted during removal (refer to paragraph 2-39).

1. Bottom of tower section number 5	Cable	Route threaded end of cable over pulleys as noted during removal.
2. Top of tower section number 6	Cable	Install threaded end in anchor fitting and install new locknut Do not tighten.

NOTE

There should be approximately three feet of cable to extend beyond winch drum.

3.	Winch drum	Insert cable end through hole in winch drum in direction noted during removal
4.	Oval sleeve anchor	Install oval sleeve anchor on end of cable using swaging tool and die.

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2-49. REPAIR OF STEEL CABLES - Continued

Location	Item	Action
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b. Section Number 6 Winch Drum Steel Cables - Continued

REPLACEMENT - Continued

5.	Winch drum	Remove gearmotor end cover. Manually release brake by pulling on brake arm. Rotate gearmotor fan in the proper direction to tighten cables on drum.
6. Gearmotor	Brake release lever	Remove brake release lever. Install end housing on gearmotor. Install brake release lever.

NOTE

There should be approximately three wraps of cable on drum.

7.	Locknut	Tighten locknut at anchor fitting until slack in cable is removed. Do not tighten to point where section starts to extend.
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c. Section Number 10 Winch Drum Steel Cables

REMOVAL

NOTE

Make note of cable routing prior to removal to aid in replacement and refer to Figure FO-11. Note how cable is wound on winch drum.

1. Bottom of tower section number 9 anchor fitting	Locknut	Loosen and remove locknut. Remove cable end from anchor fitting. Discard locknut.
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2-49. REPAIR OF STEEL CABLES - Continued

Location	Item	Action
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b. Section Number 6 Winch Drum Steel Cables - Continued

REMOVAL - Continued

2. Top and bottom of tower section number 10 and bottom of tower section number 9	Cable	Remove cable from pulleys.
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NOTE

To allow for manual rotation of winch drum, disconnect height gage indicator belt and remove roller chain from sprocket.

3. Tower section number 10	Winch drum	Manually rotate drum to loosen cable
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CAUTION

If cable is to be reused, carefully cut off anchor so cable can be inserted in drum and anchor before crimping.

4.	Cable	Pull cable from drum recess and cut cable as close to oval sleeve anchor as possible. Remove cable from drum.
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NOTE

Approximately one foot of cable can be cut off this end and cable reused. If more than one foot is cut off, cable must be replaced.

REPLACEMENT

CAUTION

One cable is right lay and the other is left lay and must be installed on the correct side of winch drum in same manner (wraps and direction) as noted during removal (refer to paragraph 2-48).

2-49. REPAIR OF STEEL CABLES - Continued

Location	Item	Action
c. <u>Section Number 10 Winch Drum Steel Cables</u> - Continued		
REPLACEMENT - Continued		
1. Top and bottom of tower section number 10 and bottom of tower section number 9	Cable	Route threaded end of cable over pulleys as noted during removal.
2. Bottom of tower section number 9 anchor fitting	Cable	Install threaded end in anchor fitting and install new locknut. Do not tighten.
NOTE		
There should be approximately three feet of cable to extend beyond winch drum.		
3. Tower section number 10	Winch drum	Insert cable end through hole in winch drum in direction noted during removal.
4.	Oval sleeve anchor	Install oval sleeve anchor on end of cable using crimping tool. Ensure oval sleeve anchor is installed correctly by testing with gauge.
5.	Winch drum	Manually rotate drum in proper direction to wind correct number of wraps of cable on drum.
NOTE		
There should be approximately four wraps of cable on drum.		
6.	Locknut	Tighten locknut at anchor fitting until slack in cable is removed. Do not tighten to point where section starts to extend.

2-49. REPAIR OF STEEL CABLES - Continued

c. Section Number 10 Winch Drum Steel Cables - Continued

REPLACEMENT - Continued

7. Install roller chain on sprocket and connect height gage indicator belt.

d. Inspection

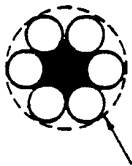
NOTE

Each steel cable will eventually deteriorate to a point where it is no longer useable.

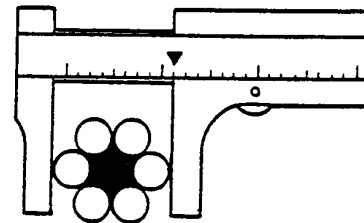
WARNING

Steel cables shall be taken out of service when any of the following conditions exist.

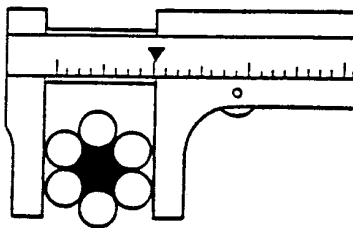
1. Six randomly distributed broken wires in one lay or three broken wires in one strand.
2. Wear of one-third the original diameter of outside individual wires .
3. Evidence of heat damage from any cause.
4. Reductions from nominal diameter more than 1/32 inch for 5/16 diameters (allowable limits -0 +5~). Measure or caliper a wire rope as follows:



A. "TRUE" DIAMETER



B. CORRECT



C. INCORRECT

To measure wire rope correctly, always measure the larger dimension.

*Measurement methods are for 1/4" (6.35 mm) and larger wire

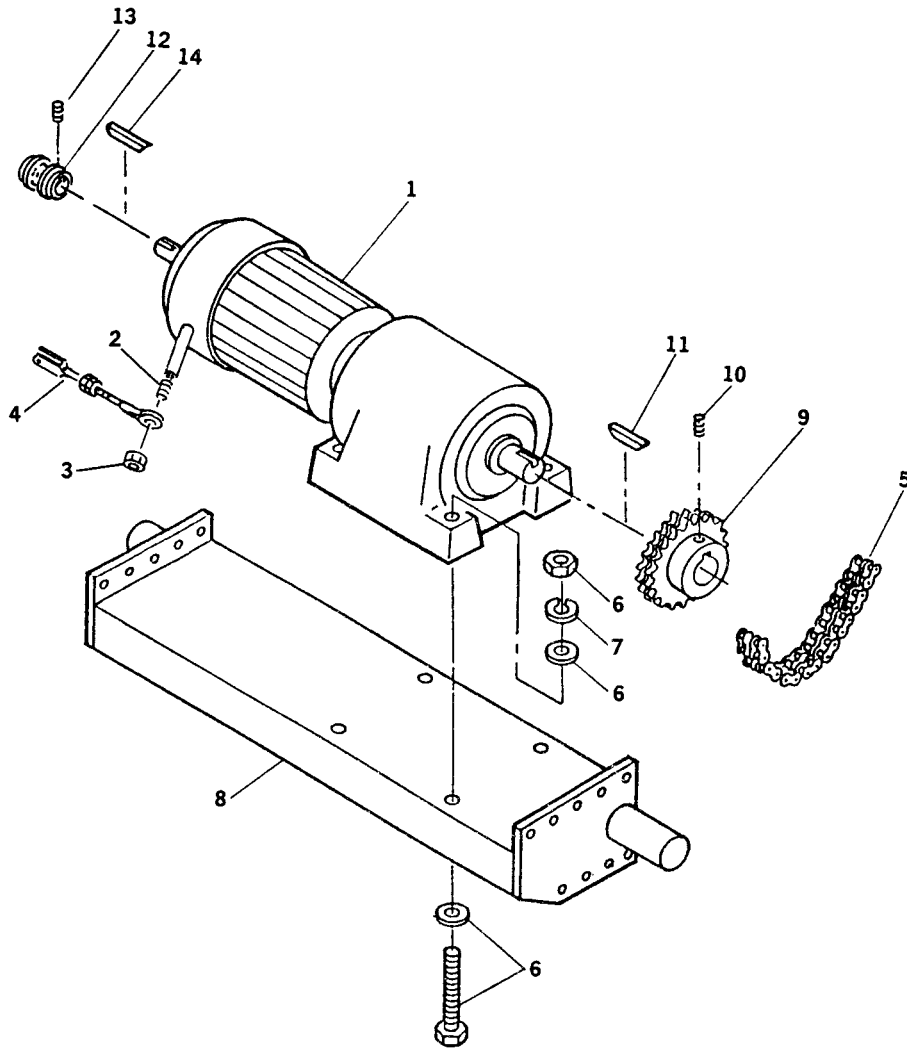
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2-49. REPAIR OF STEEL CABLES - Continued

d. Inspection - Continued

5. More than two broken wires in one lay in sections beyond end connections or more than one broken wire at an end connection.
6. Crushing - Because of loose windings on a drum, cable was pulled between laying wraps of wire rope and crushed when the loose wraps were tightened.
7. Birdcaging - Sudden release of a load where the layer of cable separate and light can be seen between lays.
8. Locking, Corrosion, Pitting and Abrasion - Lack of lubrication, premature braking of wires, excessive dirt, sand or gravel embedded in the strands of the cable.
9. Reverse Bending - Caused by running the steel cable over one sheave and under another sheave.
10. Pinch - Caused by undersized sheave grooves; breaking wire strands.

2-50. REMOVE/REPLACE NO. 10 SECTION GEARMOTOR ASSEMBLY



WARNING

Ensure there is no tension on cable drum and electrical power is disconnected to gearmotor to preclude injury.

NOTE

Removal/installation is performed with tower horizontal in its nested position. Prepare general area around gearmotor for removal such as removing obstructions, cover, etc. and erecting or securing platforms for maintenance personnel. Use suitable hoist/slings to support and remove/install gearmotor.

2-50. REMOVE/REPLACE NO. 10 SECTION GEARMOTOR ASSEMBLY - Continued

Location	Item	Action
REMOVE		
1.	Gearmotor	Electrical connections Ensure power source is disconnected from gearmotor and remove wiring from motor junction box (tag wires for installation).
2.	Brake release (2)	Remove nut (3), securing turnbuckle (4) to brake release (2).
CAUTION		
Unscrew/remove brake release (2) when hoisting to prevent damage.		
3.	Roller chain (5)	Remove roller chain (5) by disconnecting at master link. Inspect roller chain for damage/wear.
4.	Gearmotor	Secure hoist/slings around gearmotor for support during removal. Remove fasteners (6) and (7), securing gearmotor to base (8). Lift out gearmotor and move to a suitable work area.
5.	Roller chain sprocket (9)	Remove setscrew (10) and slide sprocket (9) off motor shaft and shaft key (11). Inspect key and sprocket for damage/wear.
6.	Coupling (12)	Remove setscrew (13) and slide coupling (12) off shaft key (14) and shaft. Inspect coupling and key for damage/wear.

2-50. REMOVE/REPLACE NO. 10 SECTION GEARMOTOR ASSEMBLY - Continued

Location	Item	Action
REPLACE		
1. Gearmotor	Coupling (12)	Fit key (14) into shaft slot and slide coupling (12) into place. Install setscrew (13) to tighten coupling onto key (14).
2.	Roller chain sprocket (9)	Fit key (11) into shaft slot and slide roller chain sprocket (9) into place. Install setscrew (10) to tighten sprocket (9) onto key (11).
CAUTION		
Unscrew/remove brake release (2) when hoisting to prevent damage.		
3.	Gearmotor	Using hoist/slings, position gearmotor into place on base (8). Secure with fasteners (6) and new lockwashers (7).
CAUTION		
Chain and sprockets must be aligned to prevent binding.		
4.	Roller chain (5)	Position roller chain (5) onto drum sprocket and gearmotor sprocket. Connect roller chain with master link.
5.	Brake release (2)	Connect turnbuckle (4) to brake release arm (2) with nut (3).
6.	Electrical connections	Reconnect electrical wires to gearmotor at motor junction box. Reconnect electric power source to gearmotor circuit.

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2-50. REMOVE/REPLACE NO. 10 SECTION GEARMOTOR ASSEMBLY - Continued

Location	Item	Action
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REPLACE - Continued

7. Replace cover, remove maintenance platform(s), hoist/slings, etc., and functionally check gearmotor for proper operation.

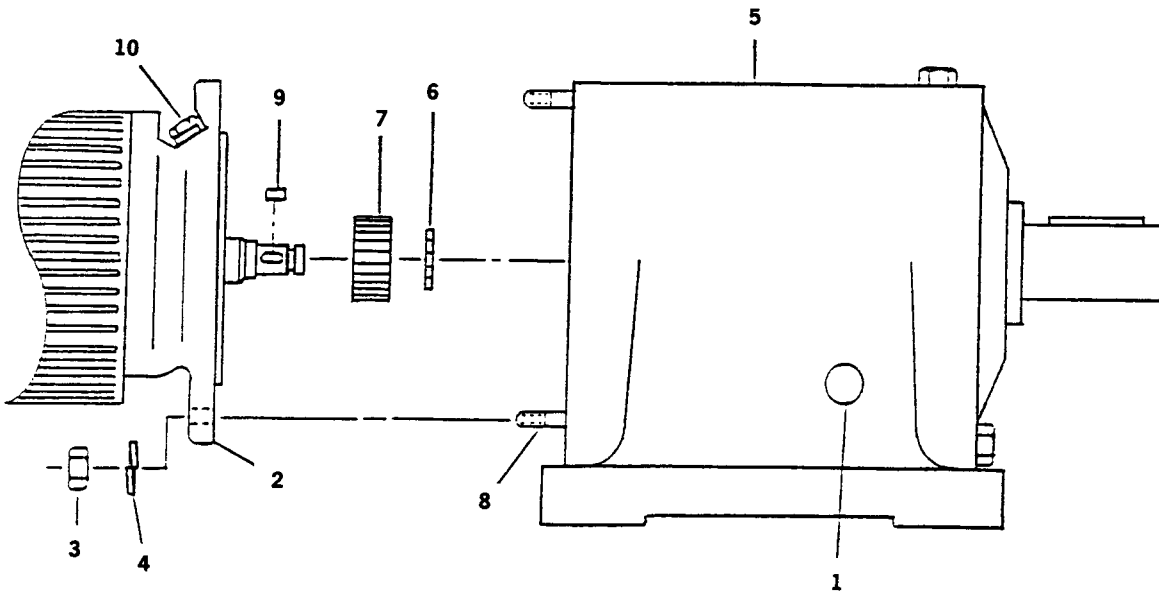
2-51. REPAIR OF GEARMOTOR ASSEMBLY - TRUSS ASSEMBLY, TOWER SECTION NO. 10

Repair of gearmotor is limited to separating the motor and gearbox for replacement of faulty unit.

Equipment Condition: Gearmotor removed from truss assembly (refer to paragraph 2-50).

WARNING

Tower section No. 10 gearmotor weighs 282 pounds. Ensure lifting device is capable of supporting this weight.



2-51. REPAIR OF GEARMOTOR ASSEMBLY - TRUSS ASSEMBLY, TOWER SECTION NO. 10 -
Continued

Location	Item	Action
DISASSEMBLY		
1. Gearmotor	Drain plug (1)	Remove one of these drain plugs (1) and drain oil from gearbox into a suitable container. Dispose of properly.
2.	Motor (2)/ gearbox (5)	Remove four nuts (3) and lockwashers (4) securing motor (2) to gearbox (5). Separate motor from gearbox. Discard lockwashers (4).
3.	Motor (2)	If new motor is to be installed, remove snap ring (6) and remove gear (7) from motor shaft key (9). Discard snap ring (6). Inspect key.
4.	Gearbox (5)	If new gearbox is to be installed, remove four mounting studs (8) from gearbox.
ASSEMBLY		
1. Gearmotor	Gearbox (5)	If removed, install four mounting studs (8) in gearbox.
2.	Motor (2)	If removed, install key (9) and gear (7) on motor shaft and secure with new snap ring (6).
3.	Motor (2)/ gearbox (5)	Install motor (2) on gearbox mounting studs (8), meshing gears, and secure with new lockwashers (4) and nuts (3).

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2-51. REPAIR OF GEARMOTOR ASSEMBLY - TRUSS ASSEMBLY, TOWER SECTION NO. 10 -
Continued

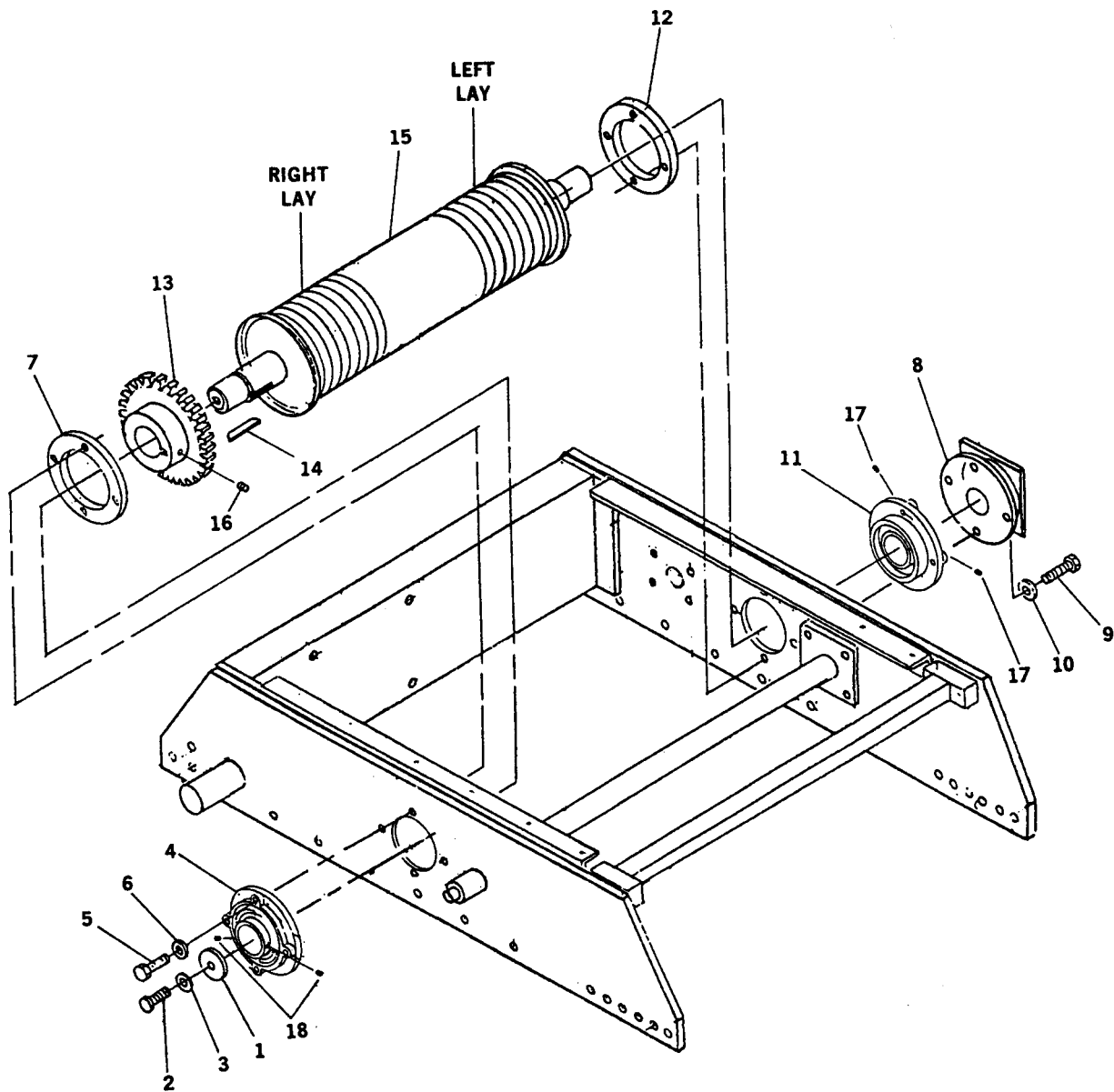
Location	Item	Action
ASSEMBLY - Continued		
4.	Gearbox (5)	Ensure all drain plugs (1) are installed and service gearbox through fill plug (10). Refer to TM 11-5985-387-12.

2-52. REPAIR OF TRUSS ASSEMBLY

Repair consists of removal and replacement of drum assembly.

Equipment Conditions: Tower in horizontal position. Steel cables, chain, and height indicator removed.

a. Drum Assembly Replacement



2-52. REPAIR OF TRUSS ASSEMBLY - Continued

Location	Item	Action
a. <u>Drum Assembly Replacement</u> - Continued		
REMOVAL		
1. Right side of drum	End cap (1)	Remove bolt (2) and lockwasher (3); remove end cap. Discard lockwasher (3).
2.	Flange bearing (4)	Remove four bolts (5), and lockwashers (6) securing bearing to side plate and flange ring (7). Discard lockwashers (6). Inspect bearing.
3.	Flange bearing (4)	Loosen two setscrews (18) in bearing (4) and remove bearing.
4. Left side of drum	Mounting bracket (8)	Remove four bolts (9), and lockwashers (in) securing bracket (8) and flange bearing (11) to side plate and flange ring (12). Discard lockwashers (10).
5.	Flange bearing (11)	Loosen two setscrews (17) in bearing (11) and remove bearing. Inspect bearing.
6.	Chain sprocket (13)	Loosen setscrew (16) securing sprocket to drum shaft key (14). This allows extra space needed clear drum from side plates.
7.	Drum (15)	Attach lifting device to drum and slide drum to the right and remove left side shaft from side plate and then from right side plate.

2-52. REPAIR OF TRUSS ASSEMBLY - Continued

Location	Item	Action
a. <u>Drum Assembly Replacement</u> - Continued		
REMOVAL - Continued		
8.	Flange rings (7 and 12)	Remove both flanges from drum shafts.
9.	Chain sprocket (13)	Remove sprocket from keyed shaft. Inspect sprocket.
10.	Shaft key (14)	If necessary remove key from shaft.
REPLACEMENT		
1. Drum	Shaft key (14)	If removed, install key in shaft slot.
2. Drum right side	Chain sprocket (13)	Slide sprocket on shaft over key. Do not tighten setscrew (16).
3.	Flange rings (7 and 12)	Slide both flanges on drum shafts.
4.	Drum (15)	Position drum right side shaft through side plate and then position left side in side plate.
5.	Chain sprocket (13)	Position sprocket over key and tighten set screw (16).
6. Drum left side	Flange bearing (11) and mounting bracket (8)	Position flange bearing and bracket on shaft and secure to side plate and flange ring (12) with four bolts (9) and new lockwashers (10).

2-52. REPAIR OF TRUSS ASSEMBLY - Continued

Location	Item	Action
a. <u>Drum Assembly Replacement</u> - Continued		
REPLACEMENT - Continued		
7. Right side of drum	Flange bearing (4)	Position bearing on shaft and secure to side plate and flange ring (7) with four bolts (5) and new lockwashers (6).
8. Both sides of drum	Flange bearings (4 and 11)	Tighten two setscrews (17 and 18) in each bearing securing them to shaft.
9. Right side of drum	End cap (1)	Position cap on end of shaft and secure with bolt (2) and new lockwasher (3).

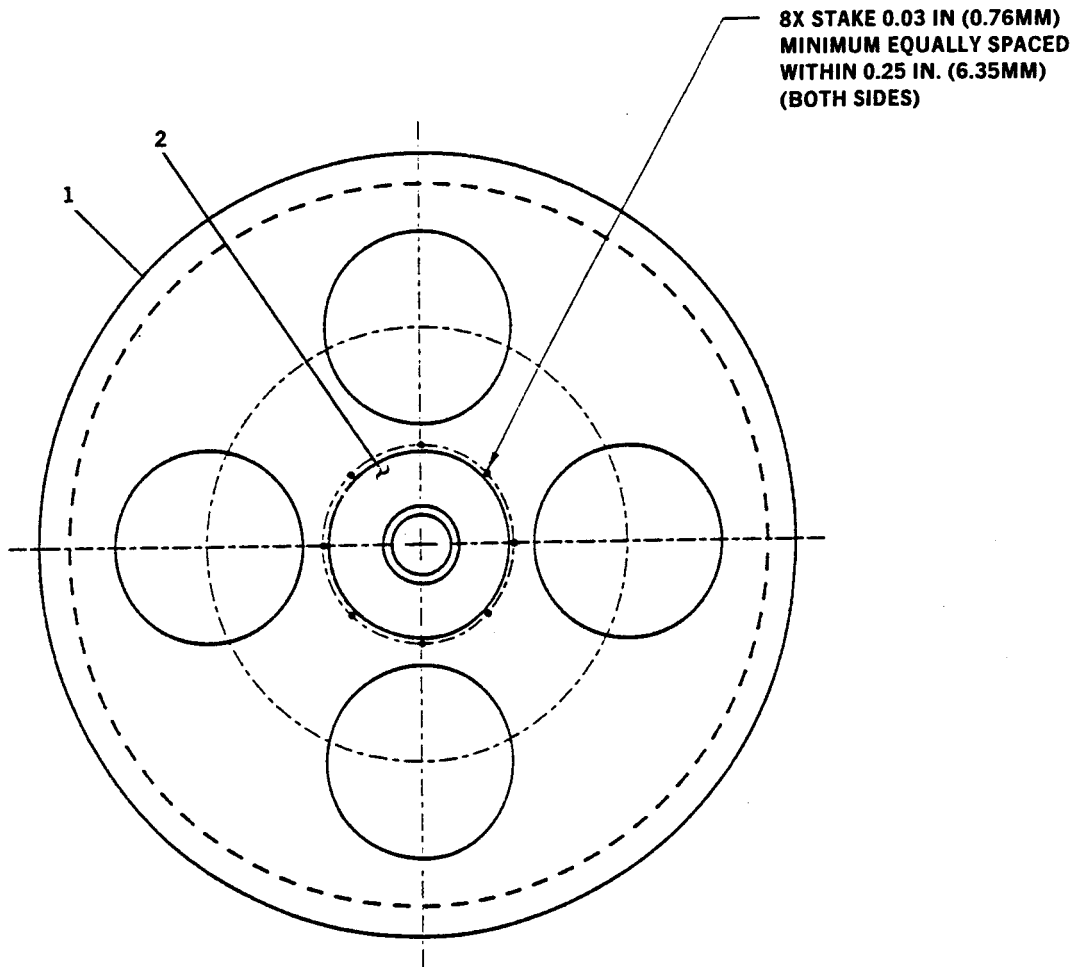
2-53. REPAIR OF STEEL CABLE PULLEYS

Repair of pulleys consists of assembling new pulley and new bearing. Since bearing is staked to pulley, removal of bearing from pulley is not authorized.

NOTE

Pulley and bearing can not be ordered assembled.

Equipment Conditions: Pulleys removed from tower section.

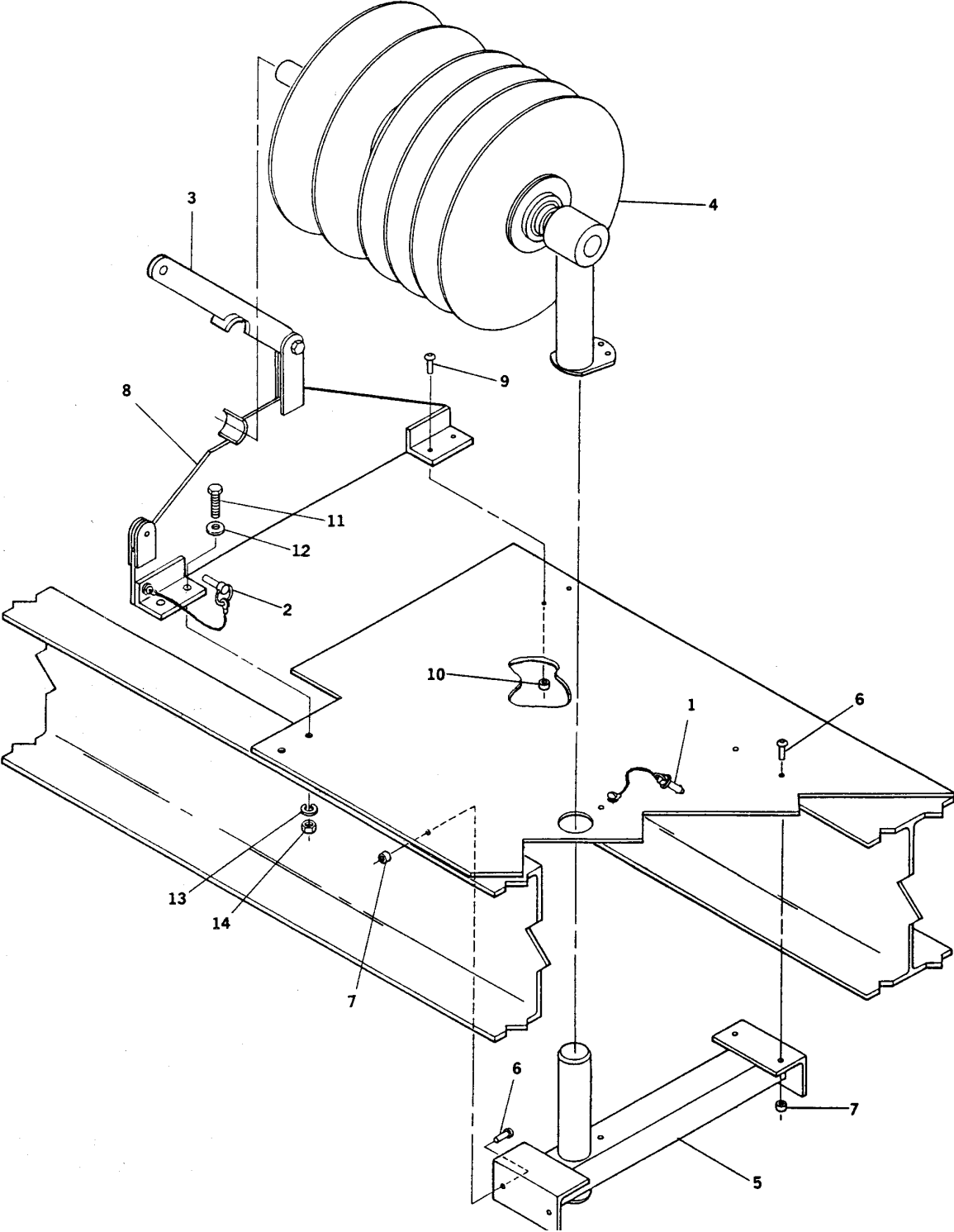


Location	Item	Action
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1. Install new bearing (2) in new pulley (2) and using a center punch, stake bearing 0.03-inch (0.76 mm) minimum eight times equally spaced within 0.25-inch (6.35 mm) on both sides.

2-54. REMOVE/REPLACE RACK ASSEMBLY

Removal and replacement procedure are same for both road and curbsides. Road side is shown



2-54. REMOVE/REPLACE RACK ASSEMBLY - Continued

Location	Item	Action
REMOVAL		
1. Rack assembly	Pin (1)	Remove pin (1).
2.	Pin (2)	Remove pin (2).
3.	Clamp handle (3)	Raise clamp handle (3).
4.	Cable reel assembly (4)	Lift cable reel assembly (4) off tube support assembly (5).
5.	Tube support assembly (5)	Refer to paragraph 2-63 to remove truck bolts (6) and collars (7). Remove support assembly (5).
6.	Plate assembly (8)	Refer to paragraph 2-63 to remove truck bolts (9) and collars (10). Remove bolts (11), washers (12), lockwashers (13) and nuts (14). Remove plate assembly (8).
REPLACEMENT		
1. Rack assembly	Plate assembly (8)	Position plate assembly (8) on frame and secure with bolts (11), washers (12), new lockwashers(13), nuts (14), new truck bolts (9) and new collars (10). Refer to paragraph 2-62 for truck bolt installation.
2.	Tube support assembly (5)	Position tube support assembly (5) on frame and secure with new truck bolts (6) and new collars (7). Refer to paragraph 2-62 for truck bolt installation.
3.		Apply Loctite #242 (Item 5, Appendix B) to support shaft of tube support assembly (5).

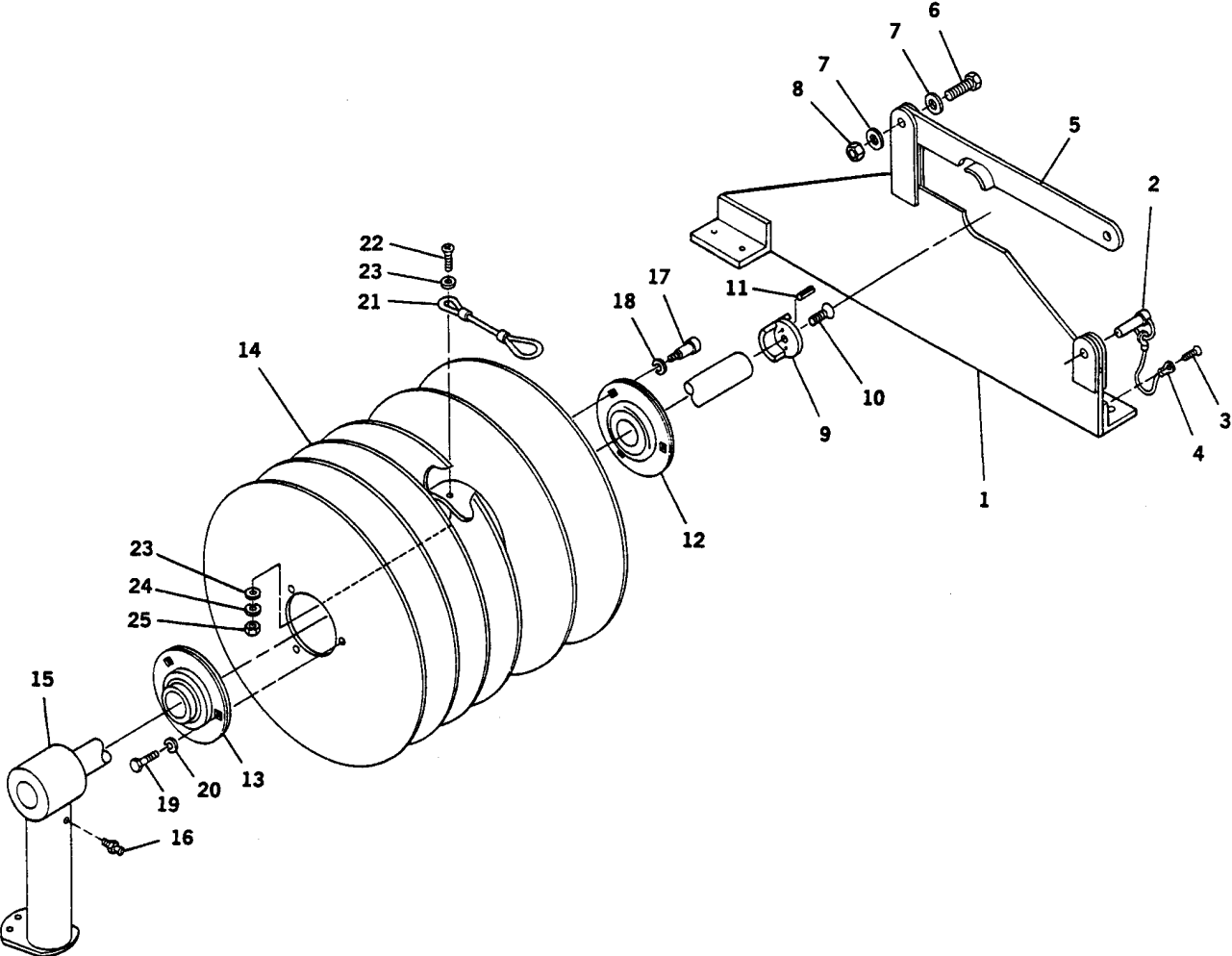
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2-54. REMOVE/REPLACE RACK ASSEMBLY - Continued

Location	Item	Action
REPLACEMENT - Continued		
4.	Cable assembly (4)	Place cable reel assembly (4) on support shaft of tube support assembly.
5.	Clamp handle (3)	Lower clamp handle (3) and secure with pin (2).
6.	Pin (1)	Install pin (1).

2-55. REPAIR RACK ASSEMBLY

Repair procedures are same for both road and curbsides. Curbside 40 degree cable reel shown.



2-55. REPAIR RACK ASSEMBLY - Continued

Location	Item	Action
DISASSEMBLY		
1. Plate assembly (1)	Pin (2)	Remove screw (3) securing cable assembly (4) and remove cable assembly (4) and pin (2).
2.	Clamp handle (5)	Remove bolt (6), washers (7) and self-locking nut (8). Remove clamp handle (5).
3. Cable reel assembly	Shaft support cup (9)	Remove bolt (10) and two spring pins (11). Remove shaft support cup (9).
NOTE		
Items 9, 10, and 11 are used only on curbside 40 degree cable reel.		
4.	Flanged bearings (12 and 13)	Loosen two setscrews in each flanged bearing (12) and 13) and slide cable reel (14) from shaft of support tube assembly (15).
5.	Support tube assembly (15)	Remove grease fitting (16).
6.	Flanged bearing (12)	Remove three shoulder capscrews (17) and washers (18). Remove flanged bearing (12).
7.	Flanged bearing (13)	Remove three bolts (19) and lockwashers (20). Remove flanged bearing (13).
8.	Lanyard assembly (21)	Remove screws (22), washers (23), lockwashers (24) and nuts (25). Remove five lanyard assemblies (21).

2-55. REPAIR RACK ASSEMBLY - Continued

Location	Item	Action
ASSEMBLY		
1. Cable reel	Lanyard assembly (21)	Secure each of the five assembly lanyard assemblies to the cable reel (14) with a screw (22), two washers (23), new lockwasher (24) and nut (25).
2.	Flanged bearing (13)	Position flanged bearing(13) on cable reel (14) and secure with three bolts (19) and new lockwashers (20).
3.	Flanged bearing (12)	Position flanged bearing (12) on cable reel (14) and secure with three shoulder capscrews (17) and washers (18).
4.	Support tube assembly (15)	Apply Loctite #242 (Item 5, Appendix B) to grease fitting (16) and install. Tighten grease fitting (16) only until it is flush with ID of support tube assembly (15).
5.	Cable reel (14)	Slide cable reel (14) on shaft of support tube assembly (15). Apply Loctite #242 (Item 5, Appendix B) to setscrews of flanged bearings (12 and 13). Tighten two setscrews in each flanged bearing.
6.	Shaft support cup (9)	Install two new spring pins (11) in shaft and install shaft support cup (9) and bolt (10).

NOTE

Items 9, 10, and 11 are used only on curbside 40 degree cable reel.

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2-55. REPAIR RACK ASSEMBLY - Continued

Location	Item	Action
ASSEMBLY - Continued		
7. Plate assembly (1)	Clamp handle (5)	Position clamp handle and secure with bolt (6), washers (7) and self-locking nut (8).
8.	Pin (2)	Position cable assembly (4) with pin (2) and secure cable assembly with screw (3).

2-56. REPAIR OF POSITIONER ASSEMBLY

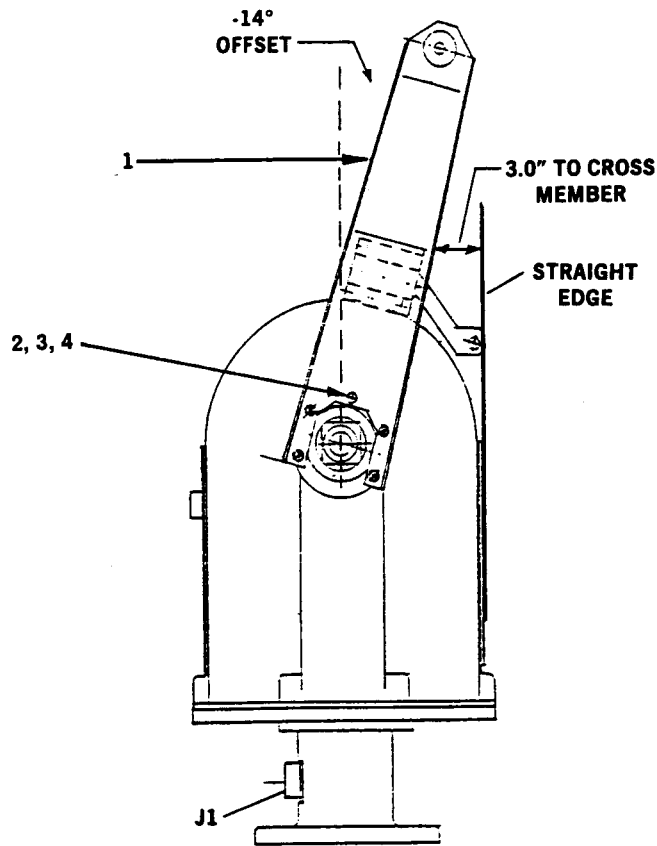
Repair consists of removal and replacement of antenna dish support arm, access panels, elevation motor and drive belt, azimuth motor and drive belt, elevation gearbox, azimuth gearbox, elevation data pack, azimuth data pack, heaters, heater control module and -14° antenna dish support arm offset.

Equipment Conditions: Tower in horizontal position and/or positioner assembly removed.

WARNING

If positioner is not removed, ensure electrical connector J1 is disconnected from positioner before working on or within positioner.

a. Antenna Dish Support Arm Replacement



2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

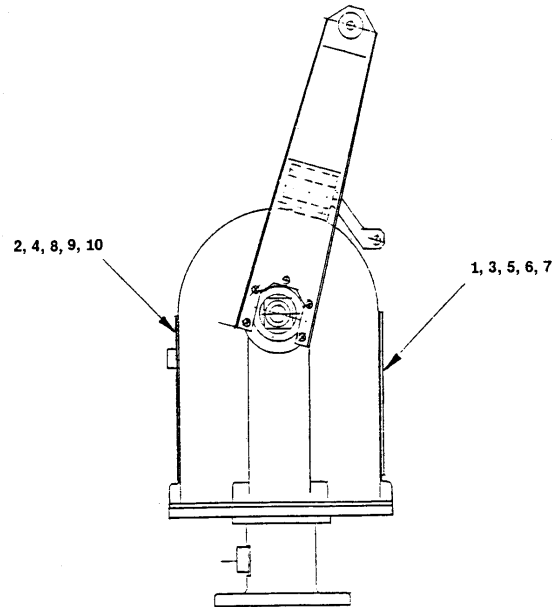
Location	Item	Action
a. <u>Antenna Dish Support Arm Replacement</u> - Continued		
REMOVAL		
1. POSITIONER assembly	Support arm (1)	Remove ten screws (2), washers (3) and lockwashers (4) securing arm; remove arm. Discard lockwashers (4).
REPLACEMENT		
1. POSITIONER assembly	Support arm (1)	Position support arm (1) on azimuth shaft and secure with ten screws (2), washers (3) and new lockwashers (4). Torque screws to 25 ft-lbs.

b. Antenna Dish Support Arm Orientation Verification

1. Mechanically zero elevation drive shaft as follows:
 - a. Remove both access covers. (Refer to paragraph c.)
 - b. Locate mechanical stop block on elevation drive shaft.
 - c. Rotate elevation shaft until elevation shaft stop block is perpendicular to rotator azimuth base.
2. Offset support arms from zero degree elevation by -14° as follows:
 - a. Loosen 2-inch square locknut on each end of elevation drive shaft.
 - b. Place a straight edge vertically (parallel to support arm) on housing cover flange opposite of connector J1.
 - c. Slip support arms on drive shaft so that top of horizontal cross tube is 3.0 inches from straight edge. This should be -14° offset.
 - d. Tighten 2-inch square locknuts to 225 ft-lbs.
3. Perform data pack potentiometer adjustment for elevation. (Refer to paragraph 2-57.b.)

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

c. Access Panels Replacement



Location	Item	Action
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REMOVAL

1. Positioner assembly	Access cover (1)	Remove 14 screws (5), washers (6) and lockwashers (7) securing access cover (1); remove access cover (1) and gasket (3). Discard lockwashers (7).
2.	Receptacle panel cover (2)	Remove 14 screws (8), washers (9) and lockwashers (10) securing cover (2). Remove cover and lay off to the side as far as receptacle wire will allow. Remove gasket (4) and old RTV sealant. Discard lockwashers (10).

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

Location	Item	Action
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c. Access Panels Replacement - Continued

REPLACEMENT

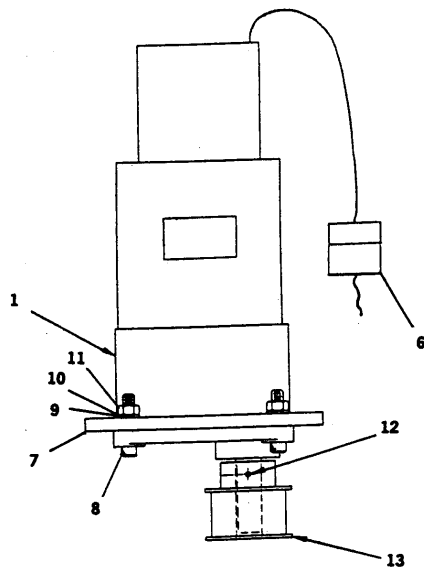
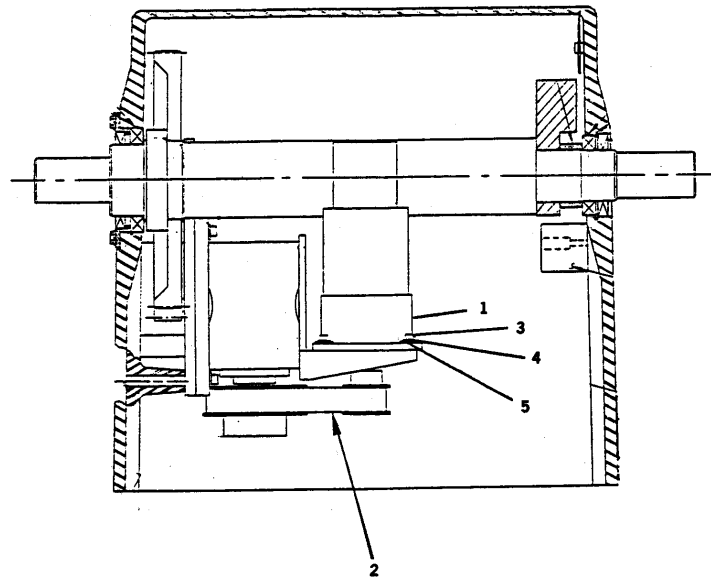
NOTE

There is a corrosion inhibitor attached to the inside of access cover (1). It must be replaced anytime either access cover is removed. Use Hoffman, A-HC1-5E or equivalent corrosion inhibitor.

1. Positioner assembly	Receptacle panel cover (2)	Place a bead of RTV 738 sealant (Item 7, Appendix B) around panel cover opening. Install new gasket (4) and cover (2). Secure with 14 screws (8), washers (9) and new lockwashers (10).
2.	Access cover (1)	Position cover (1) and new gasket (3) on rotator and secure with 14 screws (5), washers (6) and new lockwashers (7).

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

d. Elevation Motor and Drive Belt Replacement



2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

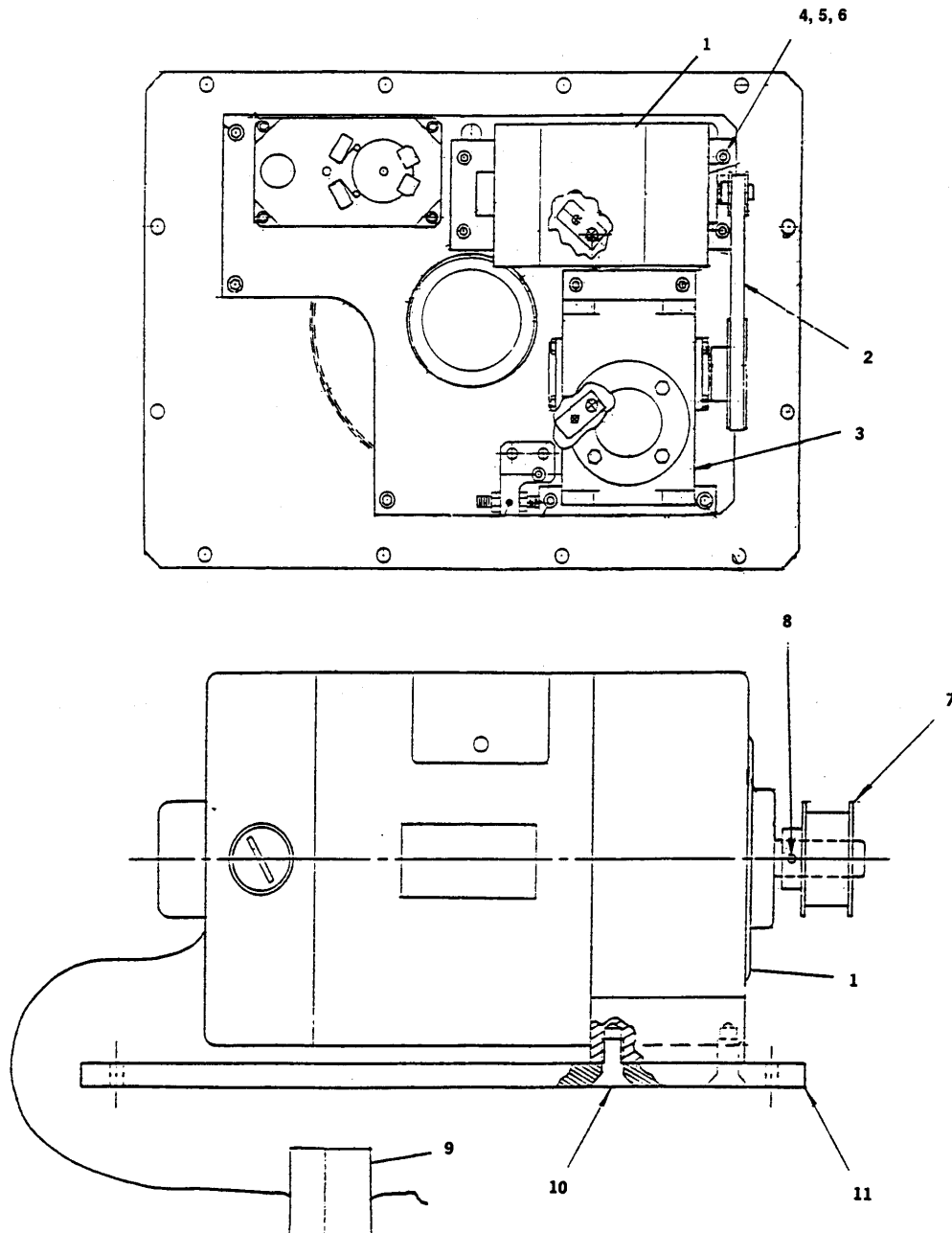
Location	Item	Action
d. <u>Elevation Motor and Drive Belt Replacement</u> - Continued		
REMOVAL		
1. Positioner assembly	Access panels	Refer to paragraph c and remove access panels.
2.	Elevation motor electrical connector A2P1 (6).	Disconnect electrical connector A2P1 (6)
3.	Elevation motor (1)	Remove four screws (3) securing motor adapter plate (7) and slide motor toward gearbox.
4.	Drive belt (2)	Remove drive belt (2) from motor and gearbox pulleys.
5.	Elevation motor (1)	Remove motor
6. Elevation motor	Adapter plate (7)	Remove four screws (8), motor washers (9), lockwasher (10) and nuts (11); remove adapter plate from motor (1). Discard lockwashers (10).
7.	Belt pulley (13)	Remove spring pin (12) and remove pulley (13) from motor shaft. Discard spring pin (12).

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

Location	Item	Action
d. <u>Elevation Motor and Drive Belt Replacement</u> - Continued		
REPLACEMENT		
1. Elevation motor	Belt pulley (13)	Position pulley (13) on motor shaft and secure with new spring pin (12).
2.	Adapter plate (7)	Position adapter plate (7) on motor (1) and secure with four screws (8), washers (9), new lock washers (10), and nuts (11).
3. Positioner assembly	Elevation motor (1)	Position motor and adapter plate on mounting and secure with four screws (3), washers (4) and new lockwashers (5). Do not tighten at this time.
4.	Drive belt (2)	Slide motor (1) toward gearbox and install belt (2) on gearbox and motor pulleys.
5.	Elevation motor (1)	Slide motor away from gearbox to place tension on drive belt (2). Tighten four screws (3) to hold motor in this position.
6.	Access panels	Refer to paragraph c and install access panels.
7.	Electrical connector A2P1 (6)	Connect electrical connector A2P1 (6).

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

e. Azimuth Motor and Drive Belt Replacement



2-56. REPAIR OF POSITIONER ASSEMBLY- Continued

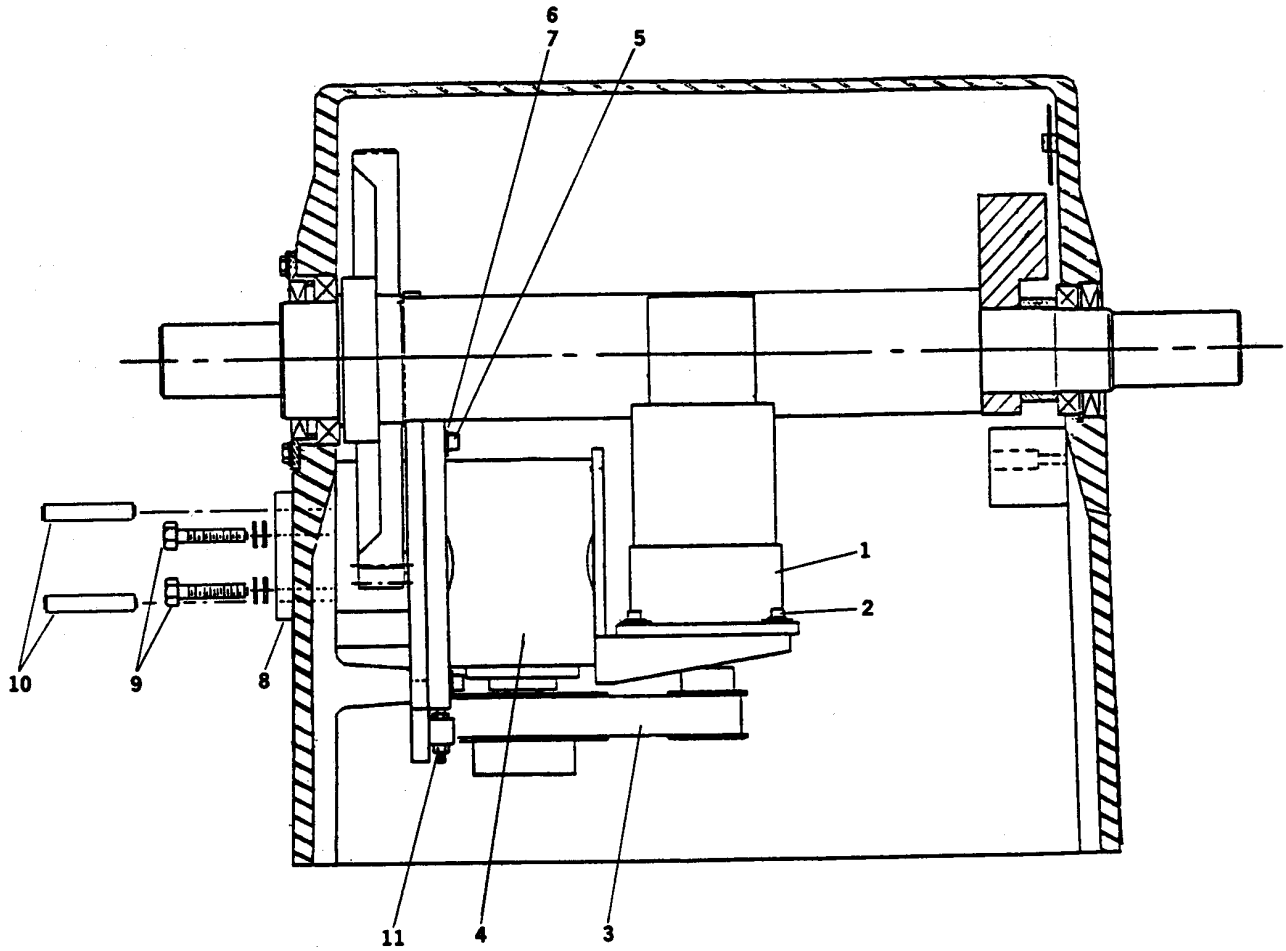
Location	Item	Action
e. <u>Azimuth Motor and Drive Belt Replacement</u> - Continued		
REMOVAL		
1. Positioner assembly	Access panels	Refer to paragraph c and remove access panels.
2.	Azimuth motor electrical connector A1P1 (9)	Disconnect electrical connector A1P1 (9).
3.	Azimuth motor (1)	Loosen four screws (4) securing motor adapter plate (11) and slide motor toward gearbox.
4.	Drive belt (2)	Remove drive belt (2) from motor and gearbox pulleys.
5.	Azimuth motor (1)	Remove four screws (4), washers (5) and lockwashers (6); remove motor (1). Discard lockwashers (6).
6. Azimuth motor	Adapter plate (11)	Remove four screws (10) and remove adapter plate (11) from motor(1) .
7.	Belt pulley (7)	Remove dowel pin (8) and remove pulley from motor shaft.
REPLACEMENT		
1. Azimuth motor	Belt pulley (7)	Position pulley (7) on motor shaft and secure with dowel pin (8).
2.	Adapter plate (11)	Position adapter plate (11) on motor (1) and secure with four screws(10).

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

Location	Item	Action
e. <u>Azimuth Motor and Drive Belt Replacement</u> - Continued		
REPLACEMENT - Continued		
3. Positioner assembly	Azimuth motor (1)	Position motor and adapter plate on mounting and secure with four screws (4), washers (5), and new lockwashers (6).
4.	Drive belt (2)	Slide motor (1) toward gearbox and install belt (2) on gearbox and motor pulleys.
5.	Azimuth motor (1) and drive belt (2)	Slide motor away from gearbox to place tension on drive belt (2). Tighten four screws (4) to hold motor in this position.
6.	Access Panels	Refer to paragraph c and install access panels.
7.	Electrical connection (9)	Reconnect plug (9).

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

f. Elevation Gearbox Replacement



Location	Item	Action
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REMOVAL

1. Positioner assembly	Elevation motor (1)	Loosen four screws (2) securing motor and move motor toward gearbox and remove drive belt (3). Move motor away and tighten screws (2).
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2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

f. Elevation Gearbox Replacement - Continued

Location	Item	Action
REMOVAL - Continued		
2.	Gearbox (4)	Loosen and remove outer bearing support cap (8) by removing two bolts, washers, and lockwashers (9) and pushing out two pins (10). Loosen the backlash adjustment bolt (11), Support the gearbox (4) and remove four screws (5), washers (6) and lockwashers (7). Discard lockwashers (7). Remove wire clamp. Lift gearbox away from mounting face enough to clear guide pin in mounting face. Slowly remove gearbox, unmeshing the drive gears.
REPLACEMENT		
1. Positioner assembly	Gearbox (4)	Mesh drive gear, slide gearbox over guide pins, press snugly against backlash adjustment screw and start, but not tighten two screws (5), washers (6) and new lockwashers (7) on far side.
2.	Gearbox (4)	Keeping gears meshed and drive belt pulleys aligned, install two screws (5), washers (6) and new lockwashers (7) on near side. Place the outer bearing cap (8) on positioner. Install two pins (10) and two bolts, washers and lockwashers (9). Tighten the four screws (5).

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

Location	Item	Action
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f. Elevation Gearbox Replacement - Continued

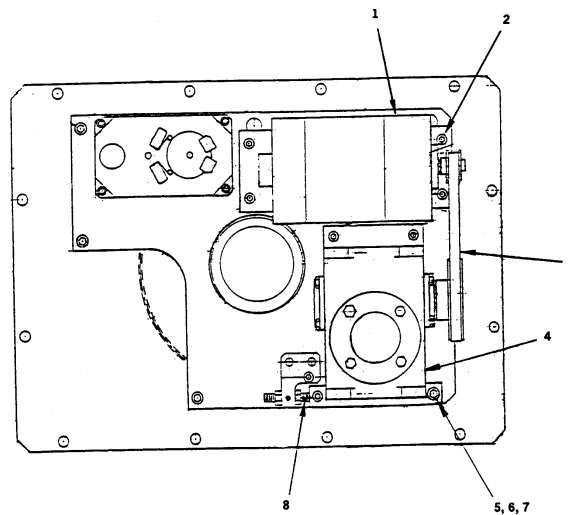
REPLACEMENT - Continued

3.	Elevation motor (1)	Loosen four screws (2) and move motor (1) towards gearbox and install drive belt (3) on drive pulleys. Move motor away from gearbox to put tension on belt and tighten four screws (2).
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NOTE

Elevation axis backlash adjustment is not recommended. It is adjusted and pinned at the factory.

g. Azimuth Gearbox Replacement



2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

Location	Item	Action
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g. Azimuth Gearbox Replacement - Continued

REMOVAL

1. Positioner assembly	Azimuth motor (1)	Loosen four screws (2) securing motor and move motor toward gearbox and remove drive belt (3). Move motor away and tighten screws (2).
2.	Gearbox (4)	Support the gearbox (4) and remove the four screws (5), washers (6) and lockwashers (7). Discard lockwashers (7). Disconnect connectors A3P1 and J4. Loosen backlash adjustment screw (8). Lift gearbox straight up enough to clear guide pin in mounting face. Remove gearbox, unmeshing the drive gears.

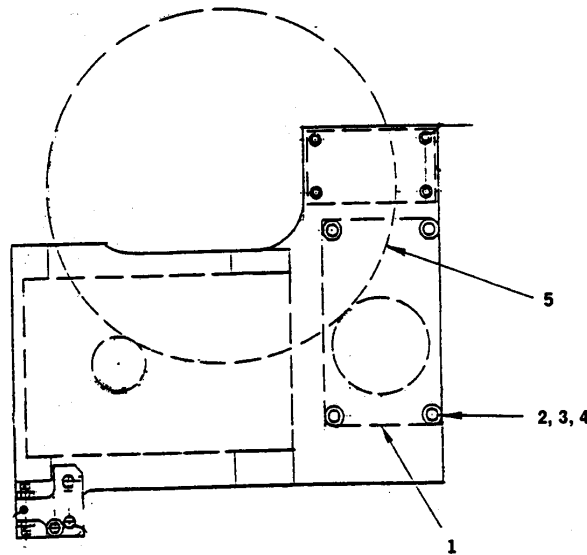
REPLACEMENT

1. Positioner assembly	Gearbox (4)	Mesh drive gears, slide gearbox over guide pins, press snugly against backlash adjustment screw and secure with two screws (5), washers (6) and new lockwashers (7) on far side.
2.	Gearbox (4)	Keeping gears meshed and drive belt pulleys aligned, install and tighten two screws (5), washers (6) and new lock washers (7) on near side. Connect connectors A3P1 and J4.

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

Location	Item	Action
g. <u>Azimuth Gearbox Replacement</u> - Continued		
REPLACEMENT - Continued		
3.	Azimuth motor (1)	Loosen four screws (2) and move motor (1) towards gearbox and install drive belt (3) on drive pulleys. Move motor away from gearbox to put tension on belt and tighten four screws (2).
4. Gearbox (4)	Backlash adjustment screw (8)	Adjust backlash. (Refer to paragraph 2-57.)

h. Elevation Data Pack Replacement



2-56. REPAIR OF POSITIONER ASSEMBLY- Continued

Location	Item	Action
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h. Elevation Data Pack Replacement - Continued

REMOVAL

NOTE

Note and record elevation angle displayed on Positioner Control Unit for positioner involved.

1. Positioner assembly	Elevation data pack electrical connector A2P2	Disconnect electrical connector A2P2.
2.	Elevation data pack (1)	Support the data pack and remove four screws (2), washers (3) and lockwashers (4). Discard lockwashers (4). Carefully unmesh the gear and lift the data pack out of assembly.

CAUTION

Failure to comply with steps 2 and 4 will result in damage to limit switches and potentiometers.

REPLACEMENT

1. Positioner assembly	Elevation data pack electrical connector A2P2	Connect electrical connector A2P2.
2. Positioner control unit	Angle display	Power up system and note elevation angle displayed for positioner involved. Rotate potentiometer (5) on data pack to indicate value noted before removal. Turn off power.

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

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

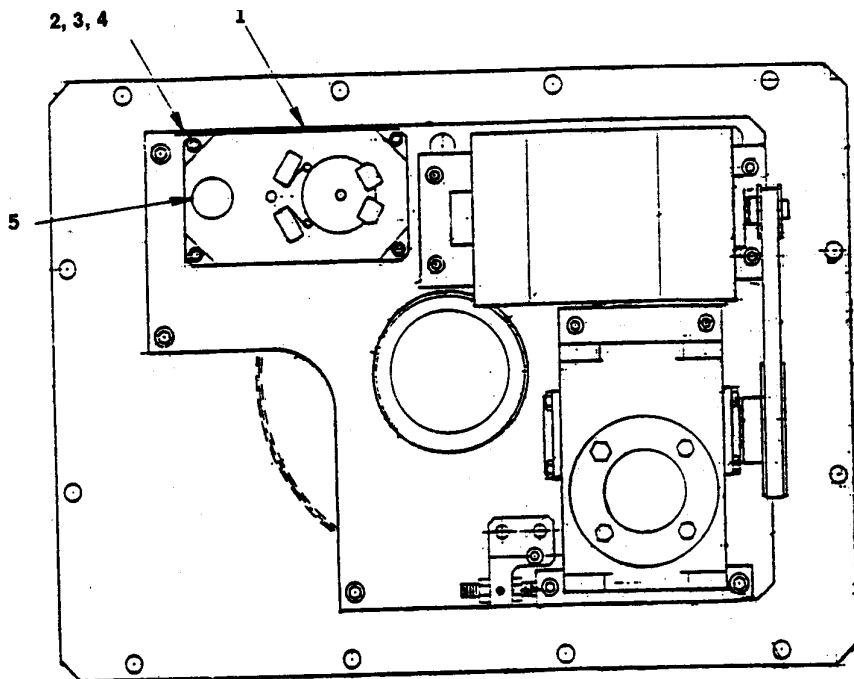
h. Elevation Data Pack Replacement - Continued

REPLACEMENT - Continued

3. Positioner assembly	Elevation data pack (1)	Carefully mesh gears, moving potentiometer (5) as little as possible. Secure data pack with four screws (2), washers (3) and new lockwashers (4).
------------------------	-------------------------	---

4. Adjust positioner assembly in accordance with paragraph 2-57.

i. Azimuth Data Pack Replacement



2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

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

i. **Azimuth Data Pack Replacement** - Continued

REMOVAL

NOTE

Note and record the azimuth angle displayed on Positioner Control Unit for positioner involved.

1. Positioner assembly	Azimuth data pack electrical connector A1P2	Disconnect electrical connector A1P2
2.	Azimuth data pack (1)	Support the data pack and remove four screws (2), washers (3) and lockwashers (4). Carefully unmesh the gear and lift the data pack out of assembly.

CAUTION

Failure to comply with steps 2 and 4 will result in damage to limit switches and potentiometers.

1. Positioner assembly	Azimuth data pack electrical connector A1P2.	Connect electrical connector A1P2
2. Positioner control unit	Angle display	Power up system and note azimuth angle displayed for positioner involved. Rotate potentiometer (5) on data pack to indicate value noted before removal. Turn off power.

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

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

i. Azimuth Data Pack Replacement - Continued

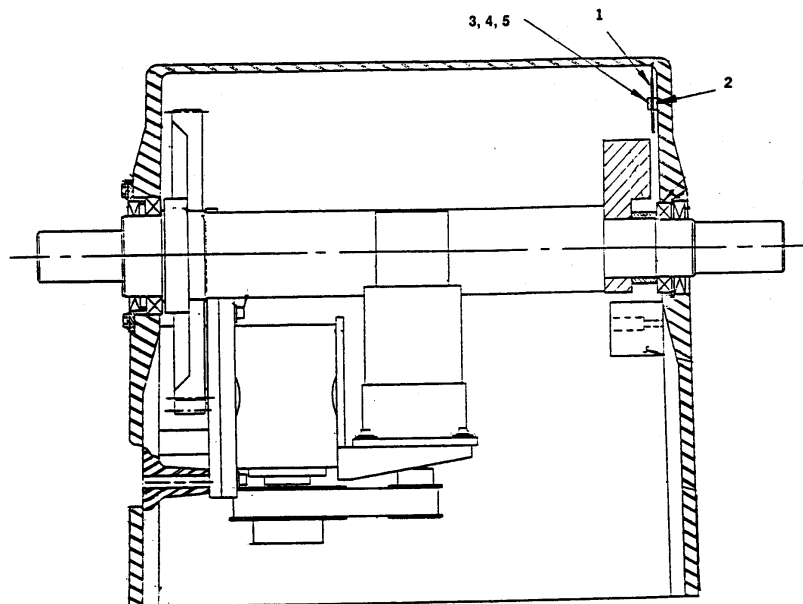
REPLACEMENT - Continued

- | | | |
|------------------------|-----------------------|--|
| 3. Positioner assembly | Azimuth data pack (1) | Carefully mesh gear, moving potentiometer (5) as little as possible. Secure data pack with four screws (2), washers (3) and new lockwashers (4). |
|------------------------|-----------------------|--|
4. Adjust positioner assembly in accordance with paragraph 2-57.

j. HR1 Heater Replacement

NOTE

Heater HR1 is for the elevation drive assembly. Heaters HR2 and HR3 are replaced the same way for the azimuth drive assembly.



2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

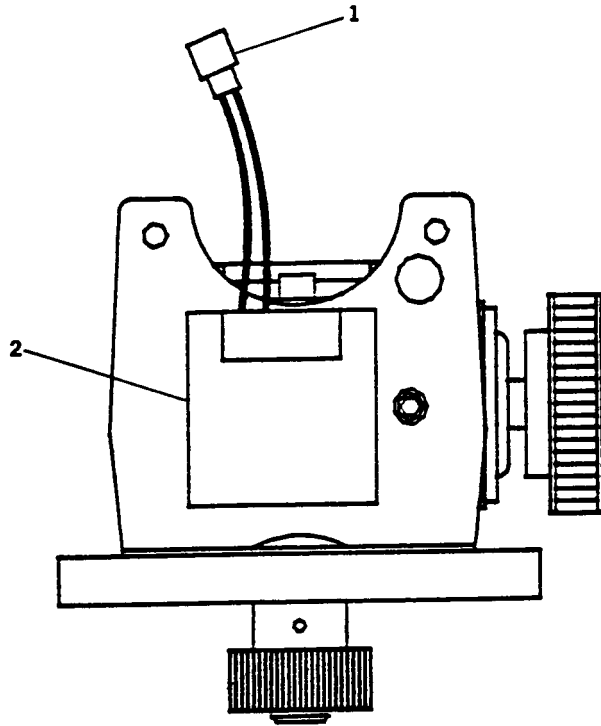
Location	Item	Action
j. <u>HR1 Heater Replacement</u> - Continued		
REMOVAL		
1. Elevation Drive Assembly	Access panel(s)	Remove access panel(s). (Refer to paragraph c.)
2.	Heater electrical connector P3	Disconnect electrical connector.
	Heater (1)	Remove two screws (3), washers (4), lockwashers (5) and four insulators (2); remove heater. Discard lockwashers (5).
REPLACEMENT		
1. Elevation Drive assembly	Heater (1)	Position heater and secure with two screws (3), washers (4), new lockwashers (5) and four insulators (2).
2.	Heater electrical connector P3	Connect electrical connector P3.
3.	Access panel(s)	Install access panel(s). (Refer to paragraph c.)

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

k. HR2 and HR3 Heater Replacement

NOTE

Heaters HR2 and HR3 are for the azimuth drive assembly.



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

REMOVAL

1. Azimuth Drive Assembly	Access panel(s)	Remove access panel(s). (Refer to paragraph c.)
2.	Heater electrical connector P4 (1)	Disconnect electrical connector (1).

2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

Location	Item	Action
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k. HR2 and HR3 Heater Replacement - Continued

REMOVAL - Continued

NOTE

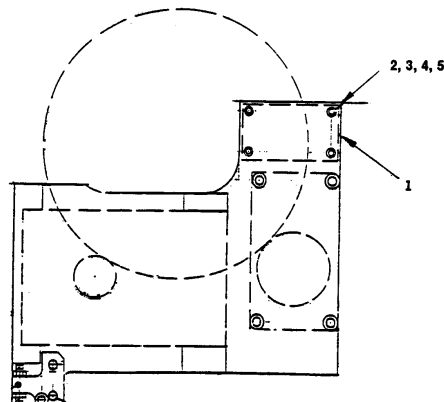
The heaters (HR2 and HR3) are connected to a common connector (P4) and one is glued to each side of the azimuth gearbox.

3.	Heaters (2)	Remove each heater (2) from side of gearbox using a scraper.
----	-------------	--

REPLACEMENT

1. Azimuth Drive Assembly	Heaters (2)	Place one heater (2) on each side of azimuth gearbox and secure with adhesive (Item 11, Appendix B).
2.	Heater electrical connector P4 (1)	Connect electrical connector P4 (1).
3.	Access panel (2)	Install access panel (3). (Refer to paragraph c.)

1. Heater Control Module Replacement



2-56. REPAIR OF POSITIONER ASSEMBLY - Continued

j. Heater Control Module Replacement - Continued

REMOVAL

- | | | |
|-----------------------------|---------------------------|--|
| 1. Elevation drive assembly | Electrical connections | Disconnect electrical connector A3P1 and two wires from terminals on module (1). Tag wires for installation. |
| 2. | Heater control module (1) | Remove four screws (2), washers (3), lockwashers (4), and spacers (5); remove module. Discard lockwashers (4). |

REPLACEMENT

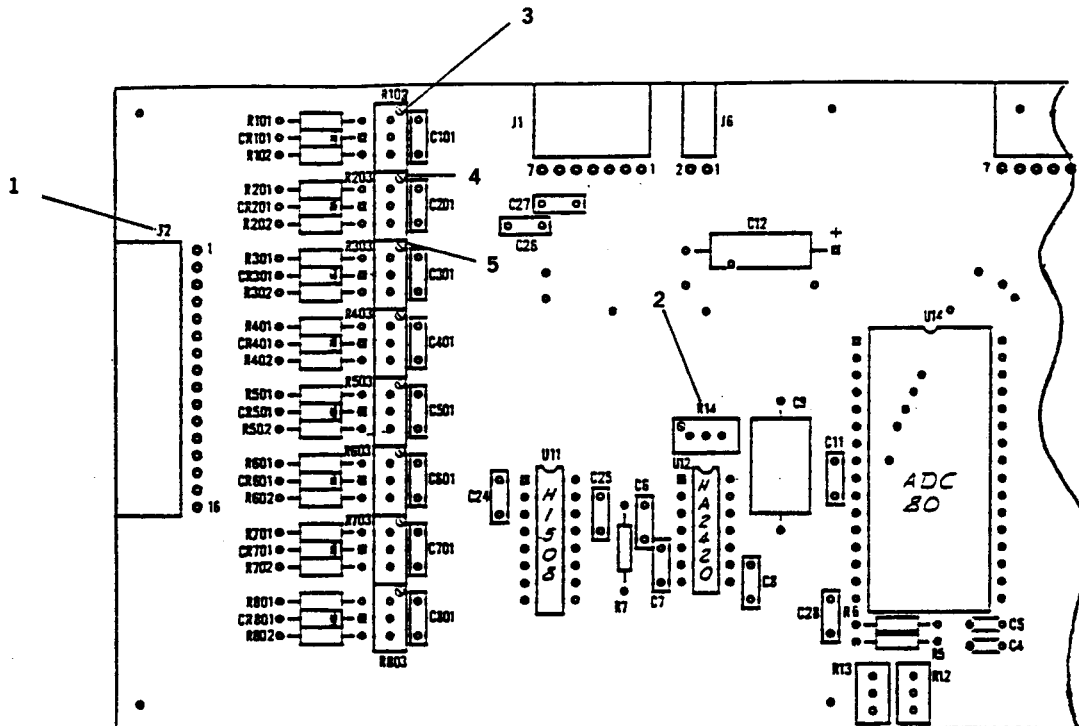
- | | | |
|-----------------------------|---------------------------|---|
| 1. Elevation drive assembly | Heater control module (1) | Position module on mounting and secure with four screws (2), washers (3), new lockwashers (4), and spacers (5). |
| 2. | Electrical connections | Connect electrical connector A3P1 and two wires to terminals on module. |

2-57. POSITIONER ADJUSTMENTS

Positioner adjustments consist of display processor unit adjustment, data pack potentiometer adjustment and azimuth gearbox backlash adjustment.

Equipment Condition: Tower in horizontal position.

a. Display Processor Unit Adjustment



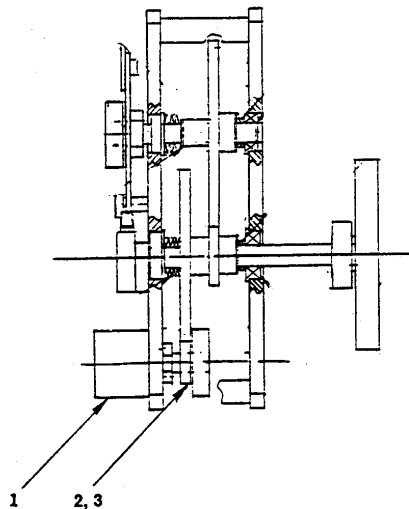
1. Remove access panels from positioner control unit to gain access to processor unit.
2. Disconnect plug at input connector J2 (1) on processor unit
3. Adjust offset trim resistor R14 (2) fully counterclockwise and then 15 turns clockwise.
4. On positioner control unit, position PEDESTAL SELECT switch to 1.
5. Connect a 12 VDC source to pins 1 and 2 on connector J2 (1). Adjust resistor R103 (3) until azimuth display on positioner control unit indicates zero degrees.
6. Disconnect voltage source from pins 1 and 2, and connect to pins 3 and 4. Adjust resistor R203 (4) to obtain an elevation display of zero degrees.

2-57. POSITIONER ADJUSTMENTS - Continued

a. Display Processor Unit Adjustment - Continued

7. Disconnect voltage source from pins 3 and 4, and connect to pins 5 and 6. Observe azimuth display and adjust resistor R303 (5) until display indicates 289 degrees.
8. Disconnect voltage source from input connector and reconnect plug.
9. Install positioner control unit access panels.

b. Data Pack Potentiometer Adjustment



NOTE

Prior to adjusting potentiometers, perform display processor assembly input and offset adjustments. (Refer to paragraph a.)

Azimuth Adjust

1. Power up the system.
2. Mount positioner on #1 positioner platform arm.
3. On positioner control unit, position PEDESTAL SELECT switch to 1.
4. Rotate positioner mounted on platform arm until it lines up exactly on zero location.

2-57. POSITIONER ADJUSTMENTS - Continued

b. Data Pack Potentiometer Adjustment - Continued

5. On positioner control unit note azimuth display. If display indicates zero, no adjustment is necessary. If not, adjust positioner 1 data pack potentiometer in azimuth drive assembly by loosening clamp (2) on potentiometer (pot) gear (3) using an alien wrench. Rotate shaft on potentiometer (1) until display indicates zero degrees. Tighten gear clamp (2). Do not allow potentiometer(1) to rotate while tightening.

NOTE

Rotator arms are -14 degrees downward look angle with antenna at horizontal. Prior to performing step 6, alignment of rotator arms to elevation shaft must be verified. Refer to paragraph 2-56.b.

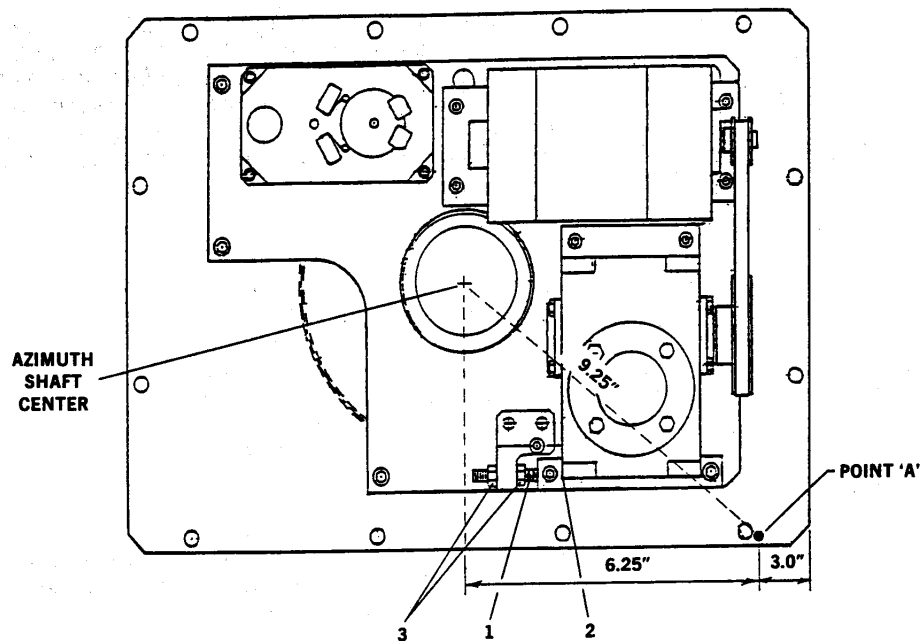
6. Move antenna until it is exactly on horizontal.

Elevation Adjust

7. Position PEDESTAL SELECT switch to 2 and repeat steps 3 thru 6 on positioner 2 data pack potentiometers, except azimuth display should indicate 120 degrees instead of zero degrees.
8. Position PEDESTAL SELECT switch to 3 and repeat steps 3 thru 6 on positioner 3 data pack potentiometers, except azimuth display should indicate 240 degrees instead of zero degrees.
9. On positioner control unit note elevation display. Remove access covers. If display indicates zero, no adjustment is necessary. If not, adjust pedestal 1 data pack potentiometer in elevation drive assembly by loosening clamp (2) on potentiometer (pot) gear (3) using an alien wrench. Rotate shaft on potentiometer (1) until display indicates zero degrees. Tighten gear clamp (2). Do not allow potentiometer (1) to rotate while tightening. Install access covers.

2-57. POSITIONER ADJUSTMENTS - Continued

c. Azimuth Gearbox Backlash Adjustment .



1. Set up a dial indicator with plunger at corner of pad (Point 'A'), facing longer edge of flange, 9.25 (23.5 cm) inches from center of azimuth shaft. Zero dial indicator. Three inches in from outer edge of longer edge of positioner base flange.
2. Move shaft to measure backlash in each direction. Determine that total (combined) indicator reading is between 0.004 and 0.006 inches (0.10 and 0.15 mm).
3. To adjust backlash, (with cover panels removed) locate adjusting screw (1) that bears against gearbox (2).
4. To decrease backlash, move gearbox (2) toward main drive gear and to increase it move gearbox away from main drive gear.
5. Determine direction gearbox (2) must move and loosen locknut (3) on side of bracket toward which screw (1) must move.

CAUTION

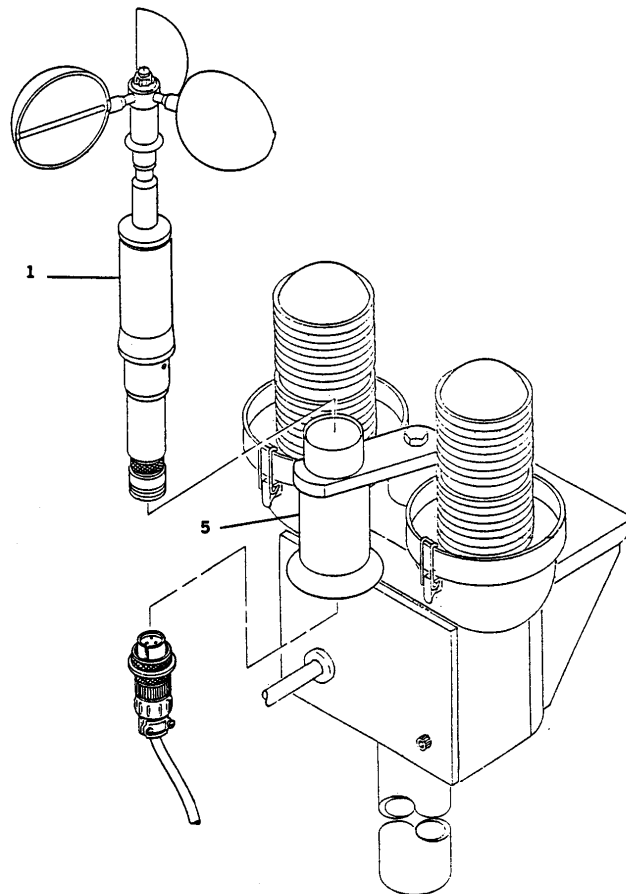
Do not tighten to a smaller backlash than specified minimum as excessive wear and equipment damage can result.

2-57. POSITIONER ADJUSTMENTS - Continued

c. Azimuth Gearbox Backlash Adjustment - Continued

6. Adjust backlash to be within limits specified in step 2. Be certain that gearbox (1) is snug against adjusting screw (2). Light tapping with a soft face mallet will aid in obtaining this contact.
7. With backlash properly set, tighten locknut (3) ensuring adjustment does not move.
8. Remove dial indicator.
9. Install cover panels.

2-58. REMOVE/REPLACE ANEMOMETER



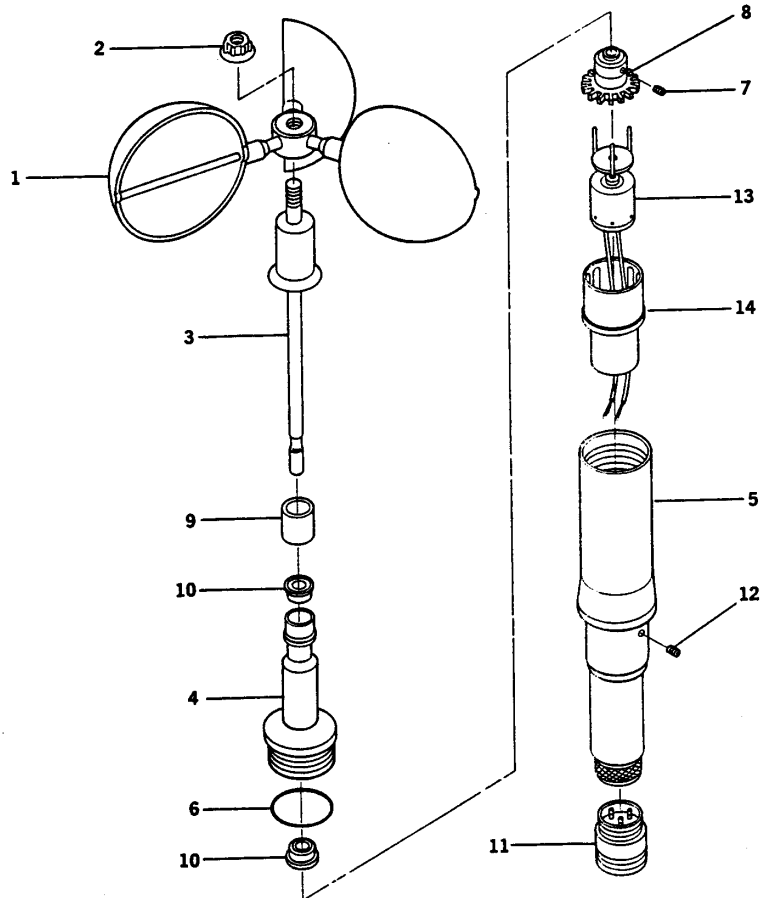
Location	Item	Action
REMOVE		
1. Anemometer (1)	Electrical connector (3)	Disconnect electrical connector (3) from anemometer (1); remove anemometer from mounting bracket (2).
2.	Mounting bracket (2)	Remove. Refer to Repair of Obstruction Light in TM 11-5985-387-12.

2-58. REMOVE/REPLACE ANEMOMETER - Continued

Location	Item	Action
REPLACE		
1. Anemometer (1)	Mounting bracket (2)	Install. Refer to ,Repair of Obstruction Light in TM 11-5985- 387-12.
2.	Electrical connector (3)	Position anemometer (1) in mounting bracket (5) and connect electrical connector (3) to anemometer.

TM 11-5985-387-34 2-59. REPAIR OF ANEMOMETER

Repair of anemometer consists of testing, disassembly and assembly. Equipment Condition: Anemometer removed.



Location

Item

Action

TESTING

1. Check for freedom of operation by blowing on the cup wheel. Cup wheel should accelerate and decelerate smoothly without any friction points.
2. Connect multimeter to connector pins and check resistance of generator. Should be approximately 71 ohms between pins A and B on connector (11)

2-59. REPAIR OF ANEMOMETER - Continued

Location	Item	Action
TESTING - Continued		
3.	Check open circuit output voltage of generator by driving it with a synchronous motor calibrating unit or similar device whose rotational speed is accurately known. Output voltage when driven at 1800 rpm should be 2.4 + 0.012 vdc or at 1500 rpm should be 2.0 + 0.01 vdc.	
DISASSEMBLY		
1. Anemometer	Cup wheel (1)	Remove nut (2) and remove cup wheel (1) from shaft (3).
2.	Shaft housing (4)	Unscrew shaft housing (4) from generator housing (5) and separate the two assemblies. Remove and discard preformed packing (6).
3.		Loosen setscrew (7) in shaft collar and coupling disc (8) and remove it from shaft (3).
4.		Remove shaft (3) from housing (4). Remove dust shield (9).
5.		With aid of knife blade between bearing (10) flange and housing (4) carefully work both bearings (10) from housing bore.
6.	Electrical connector	Unscrew connector (11) from generator housing(5).
7.	Generator leads	Tag and unsolder two leads from connector (11). Remove connector.

2-59. REPAIR OF ANEMOMETER - Continued

Location	Item	Action
DISASSEMBLY - Continued		
8.	Generator housing (5)	Loosen setscrew (12) and remove generator (13) and cell (14) from housing.
<u>CAUTION</u>		
Use care to prevent damage to generator or cell when separating from each other.		
9.	Generator cell (14)	Generator (13) is held in cell with silicone rubber cement. Gently twisting by hand or use of pliers will remove it from cell.
10.		Remove all excess cement from cell (14)
ASSEMBLY		
1. Anemometer	Generator cell (14)	Use silicone rubber cement (Item 8, Appendix B) and cement generator (13) into cell (14).
<u>CAUTION</u>		
Do not overtighten setscrew (12) or housing may crack.		
2.	Generator housing (5)	Place cell assembly in housing (5) and secure with setscrew (12).
3.	Generator leads	Solder two leads to connector (11) as tagged during disassembly.
4.	Electrical connector (11)	Screw connector (11) into generator housing (5).
5.	Shaft housing (4)	Install new bearings (10) in both ends of housing.

2-59. REPAIR OF ANEMOMETER - Continued

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

ASSEMBLY - Continued

NOTE

Bearing bore in housing is 0.375 inches (9.5 mm) and bearings (10) should require very little pressure to install them.

- | | | |
|----|--|--|
| 6. | | Install dust shield (9) on shaft (3) and install in housing (4). |
|----|--|--|

CAUTION

Use care to avoid any undue pressure on inner race relative to outer race of bearings (10) as they are easily damaged.

- | | | |
|----|---------------|---|
| 7. | | Install shaft collar and coupling disc (8) and with bearings (10) properly seated, adjust collar to obtain a shaft end play of 0.010 inches (0.254 mm). Tighten setscrew (7). |
| 8. | | Position new preformed packing on shaft housing (4) and screw it into generator housing (5). |
| 9. | Cup wheel (1) | Position cup wheel (1) on shaft (3) and secure with nut (2). |

2-60. REPAIR OF POWER DISTRIBUTION BOX

NOTE

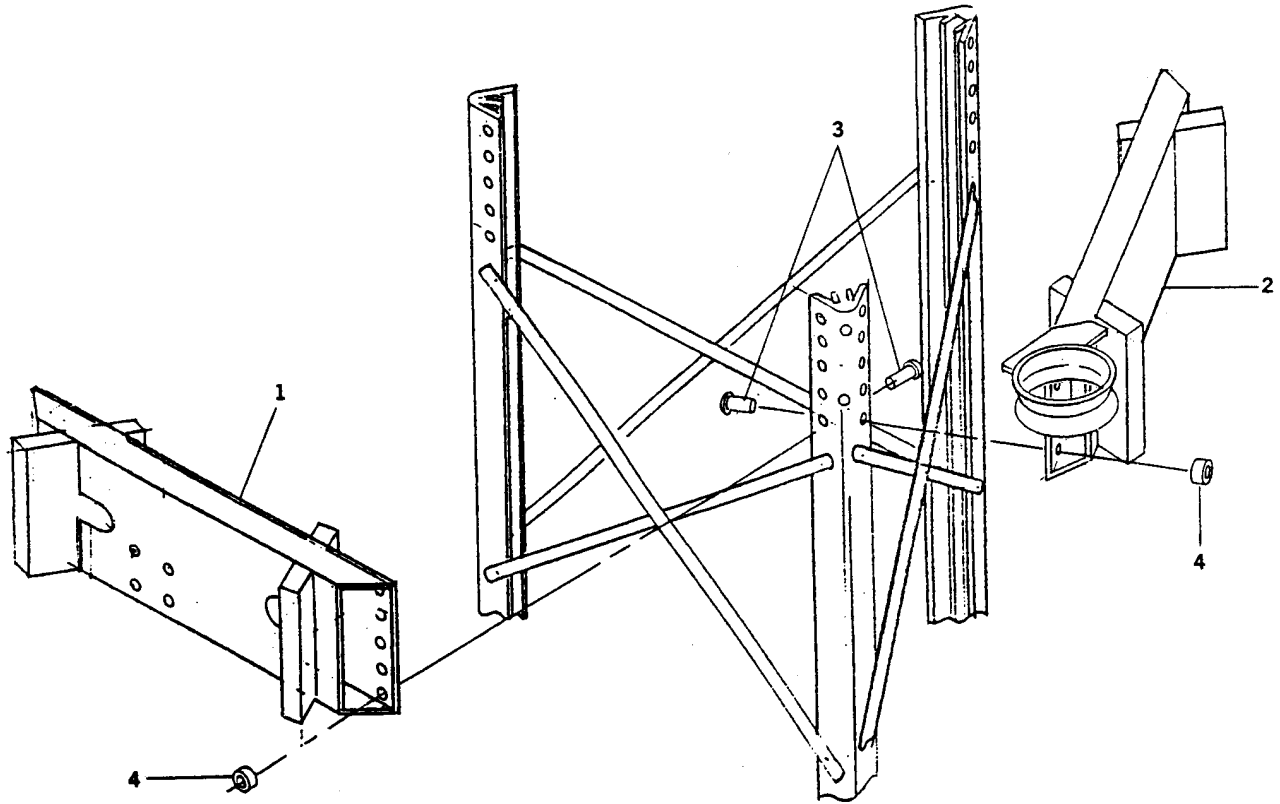
Index numbers used in these procedures are referenced on Figure FO-9 in back of manual.

Location	Item	Action
DISASSEMBLY		
1. Power Distribution Box	Cover (2)	Remove 16 screws (43), lockwashers (48) and washers (39); lift cover off as far as wires will allow.
2.	Rotary switch (9)	Tag and disconnect electrical leads from A and B terminals of rotary switch.
3.	Terminal posts (54)	Tag and disconnect electrical leads from LO terminal inside box.
4.	SB/GND-1 terminal (54)	Tag and disconnect electrical leads.
5.	Wiring connectors (6)	Loosen stuffing nut and (6)pull electrical cables (16 and 17) from both connectors.
ASSEMBLY		
1. Power Distribution Box	Wiring connectors (6)	Install electrical cables (16 and 17) through connectors and tighten stuffing nuts.
2.	SB/GND-6 terminal (54)	Connect electrical leads as tagged during removal.
3.	Terminal posts (540)	Inside box, connect electrical leads to terminal LO as tagged during removal

2-60. REPAIR OF POWER DISTRIBUTION BOX - Continued

Location	Item	Action
ASSEMBLY - Continued		
4.	Rotary switch (9)	Connect electrical leads to terminals A and B of switch as tagged during removal.
5.	Cover (2)	Position cover on box and secure with 16 screws (43), new lockwashers (48), and washers (39).

2-61. REMOVE/REPLACE PULLEY FRAMES (TYPICAL)



Location

Item

Action

REMOVAL

- | | | | |
|----|--------------------------------|-----------------------|---|
| 1. | Top or Bottom of Tower Section | Pulley Frame (1 or 2) | Remove collar (4) and huck-bolt (3) using Section procedure in paragraph 2—63. Remove pulley frame. |
|----|--------------------------------|-----------------------|---|

REPLACEMENT

- | | | | |
|----|--------------------------------|-----------------------|---|
| 1. | Top or Bottom of Tower Section | Pulley Frame (1 or 2) | Position pulley frame (1 or 2) on tower legs and secure with huck—bolts (3) and collar (4) using procedure in paragraph 2-62. |
|----|--------------------------------|-----------------------|---|

2-62. INSTALLATION PROCEDURES FOR HUCK-BOLTS

Two different tools are required: Huck Model 4801 and Huck Model 5901.

WARNING

Huck recommends that only Huck hydraulic powerrigs be used as power source for Huck installation tools. Hydraulic power units that deliver high pressure for both pull and return and are not equipped with relief valves are specifically not recommended and may be dangerous.

a. Connecting Tool to Powerrig

- (1) Coat hose fitting threads with a non-hardening teflon thread compound such as Slic-tite (Item 9, Appendix B). Do not use teflon tape.
- (2) Screw pull pressure hose, with coupler nipple, into port P of tool. Screw return pressure hose, with coupler nipple, into port R of tool.
- (3) Use a Huck Powerrig that has been prepared for operation. Check that pull pressure is set to 5400 to 5700 psi (37,250 to 39,300 kPa) and return pressure is set to 2200 to 2400 psi (15,200 to 16,500 kPa).
- (4) Turn Powerrig off and couple tool hoses to Powerrig hoses. Be sure that hoses run from tool port P to powerrig PULL PRESSURE port and from tool port R to Powerrig RETURN PRESSURE port.
- (5) Connect trigger cord to Powerrig cord.
- (6) Attach proper nose assembly to tool.

WARNING

Do not use tool without pintail deflector to prevent injury when pintail breaks loose.

2-62. INSTALLATION PROCEDURES FOR HUCK-BOLTS - Continued

b. Installing Huck Bolts

WARNING

Be sure there is adequate clearance for tool and operator's hands before starting installation.

WARNING

Do not pull on a Huck bolt (pin) without a collar. If a Huck bolt is pulled without a collar, the pin will eject forcibly when pintail breaks off.

- (1) Check installation and excessive gap (space) between components. Gap is excessive if not enough pintail sticks through collar for nose assembly jaws of tool to grab onto.
- (2) Put pin in hole.
- (3) Slide collar over pin with beveled end of collar towards nose assembly of tool.
- (4) Push nose assembly on pin until nose assembly anvil stops against collar. Tool and nose assembly must be held at right angles (90 degrees) to work.
- (5) Start powerrig.
- (6) Depress tool trigger to start installation cycle.
- (7) When forward motion of nose assembly anvil stops and pintail breaks off, release trigger. Tool will go into its return stroke, push off installed fastener and release pintail.
- (8) Tool and nose assembly is ready for next installation cycle.

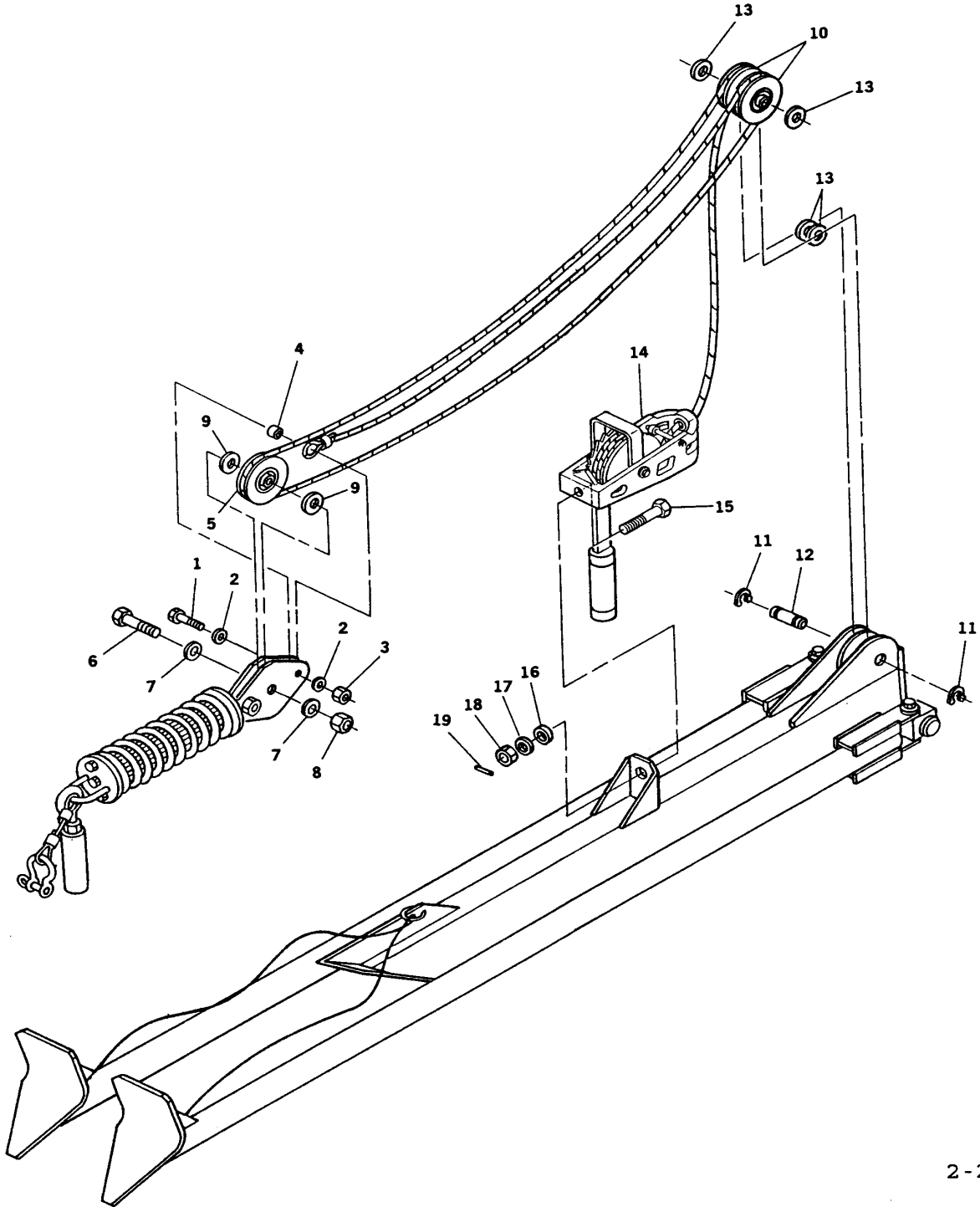
TM 11-5985-387-34

2-63. REMOVAL PROCEDURES FOR HUCK-BOLTS

Several methods may be used to remove truck-bolts. Use hydraulic collar cutters (1/2 inch or 3/8 inch), air chisel, or hammer and chisel.

2-64. REPAIR OF ANCHOR SETTING AND RETRIEVAL TOOL ASSEMBLY

Repair is limited to replacement of the winch assembly with cable only.



2-64. REPAIR OF ANCHOR SETTING AND RETRIEVAL TOOL ASSEMBLY Continued

Location	Item	Action
DISASSEMBLY		
1. Tool Assembly	Cable dead end	Remove cap screw (1), washers (2) and lock nut (3). Remove spacer (4) and remove cable dead end from pulley block assembly.
2.	Sheave assembly (5)	Remove capscrew (6), washers (7) and lock nut(8). Remove sheave assembly (5) and shims (9). Remove winch cable from sheave assembly (5).
3.	Sheave assemblies (10)	Remove retaining rings (11), shaft (12), sheave assemblies (10) and four shims (13). Remove winch cable from sheave assemblies (10).
4.	Winch assembly (14)	Remove spring pin (19),bolt (15), thrust washer(16), washer (17) and lock nut (18). Remove winch assembly (14) from rear leg.
ASSEMBLY		
1. Tool assembly	Winch assembly (14)	Position winch assembly (14) on rear leg and secure with bolt (15), thrust washer (16), washer (17), lock nut (18) and new spring pin (19).
2.	Sheave assemblies (10)	Position winch cable on sheave assemblies (10) and position sheave assemblies (10) and four shims (13) on rear leg. Secure with shaft (12) and retaining rings (11).

2-64. REPAIR OF ANCHOR SETTING AND RETRIEVAL TOOL ASSEMBLY Continued

Location	Item	Action
ASSEMBLY - Continued		
3.	Sheave assembly (5)	Position winch cable on sheave assembly (5) and position sheave assembly (5) and shims (9) in pulley block assembly. Secure with capscrew (6), washers (7) and lock nut (8).
4.	Cable dead end	Install spacer (4) in cable dead end loop and position in pulley block assembly. Secure with capscrew (1), washers (2) and lock nut (3).

CHAPTER 3

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS

Due to a change in the maintenance concept for the AB-1309, no general support maintenance is required.

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 Product 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 Communications-
Electronics Equipment

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

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A-6. TECHNICAL MANUALS (TM)

TM for AN/TRC-138, 175, & 173

11-5820-864-12-1 Operator's and Unit Maintenance Manual
11-5820-864-12-2 for Radio Repeater Set AN/TRC-174(NSN 5820-01-161-9420)
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	NSN
MEP-003A	Utility	60	6115-00-465-1030
MEP-112A	Utility	400	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

11-5985-387-12 Operators and Unit Maintenance Manual for AL-1309(V)/4 TRC
Quick Erect Expandable Mast

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 Mobile Tower (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
662501-139-2512)

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)

A-7. MILITARY SPECIFICATIONS AND STANDARDS

MIL-I-23053 General Specifications for Insulation Sleeving, Electrical, Heat
Shrinkable

MIL-C-85049/48 Connector Accessories, Electrical, Strain Relief, Straight,
Category 4c (for MIL-C-24308 Connectors)

MIL-STD-130 Identification Marking of U.S. Military Property

MIL-STD-454 Standard General Requirements for Electronic Equipment

TM 11-5985-387-34

A-8. 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)

A-3/A-4 Blank

APPENDIX B

EXPENDABLE/DURABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

B-1. SCOPE

This appendix lists expendable/durable supplies and materials you will need to operate and maintain the 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), or CTA 8-100, Army Medical Department Expendable/Durable Items.”

B-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) 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.

EXPENDABLE MATERIAL LIST

(1)	(2)	(3)	(4)	(5)
<u>Item Number</u>	<u>Level</u>	<u>National Stock Number</u>	<u>Description</u>	<u>U/M</u>
1	F		Solvent, Dry Cleaning P-O-680, Type II	
2	F		Crous Cloth, Fine	
3	F		Loctite #271	
4	F		Adhesive, 3M #1357	
5	F		Loctite #242	
6	F		Locking Sealant, MIL-S-22473, Grade C	
7	F		RTV 738 Sealant	
8	F		Silicone rubber cement	
9	G		Teflon thread compound (Slic-tite)	
10	F		Hydraulic Fluid, MIL-H-5606	
11	F		Dow Corning High Temperature Adhesive #736	

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.
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.

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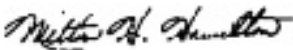
W. X, Y. Z

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TM 11-5985-387-34

By Order of the Secretary of the Army:

GORDON R. SULLIVAN
General, United States Army
Chief of Staff


Official: 

MILTON H. HAMILTON
Administrative Assistant to the
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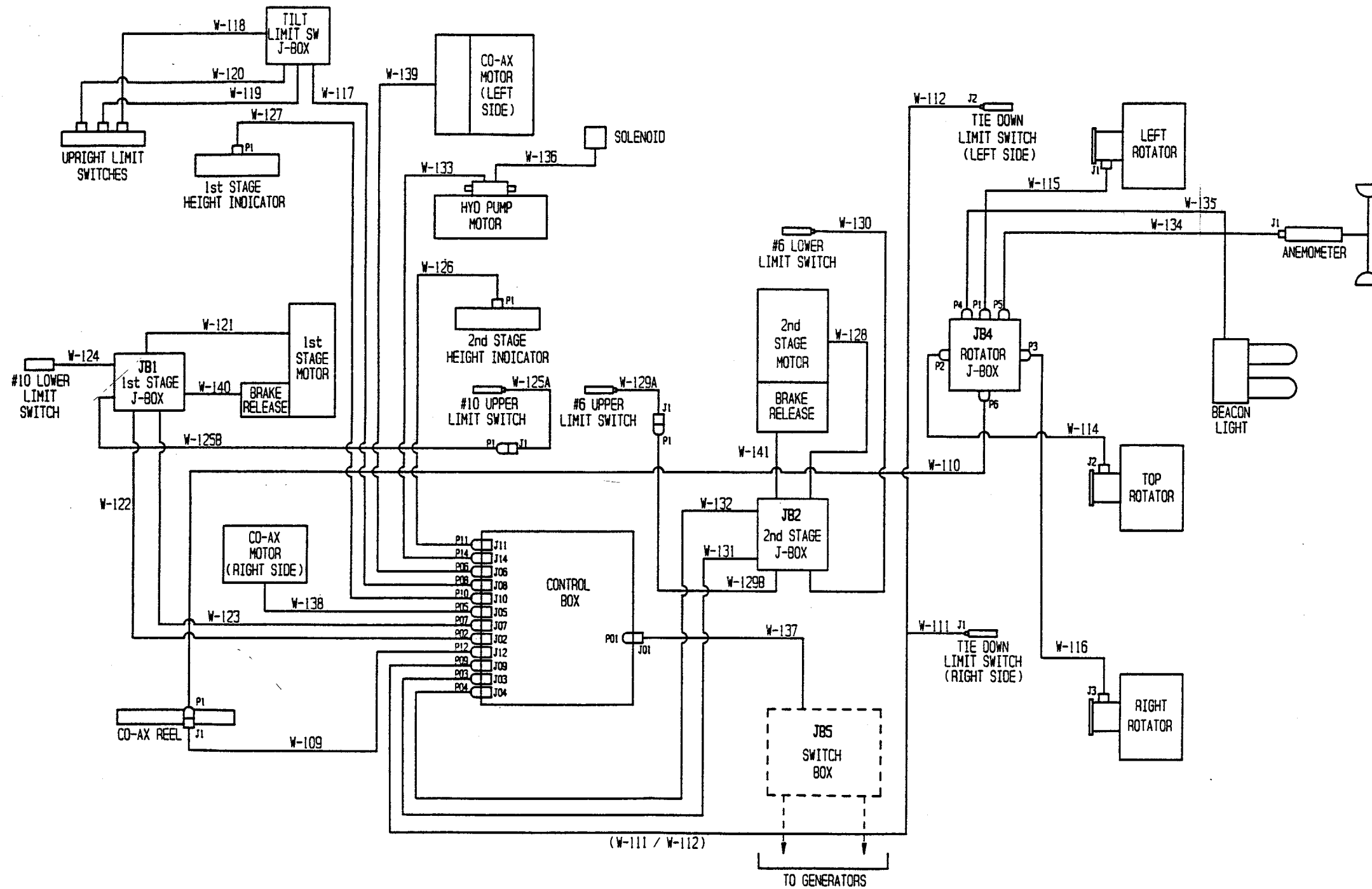
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TEAR ALONG PERFORATED LINE



NOTES:

1. FOR ELECTRICAL INSTALLATION SEE FO-8.
2. FOR SYSTEM ELECTRICAL SCHEMATIC SEE FO-1.

LINE NO.	CABLE ASSY		CABLE WIRING DATA		SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS	
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR- GA-KIND	FROM		TO	FROM			TO
1	W-109	A3142992		J1-	P12-		W110 P1 CONN MS3101F32-75	E1J12 CONN MS3108R32-7P	7.0	CONNECT W-109 J1 TO CABLE W-110 P1.
2	W-109		BLK/BRN STR	A	A	+ (SENSE) POWER SUPPLY				
3	W-109		WHT/BRN STR	B	B	- (SENSE) POWER SUPPLY				
4	W-109		BLK/BLK STR	C	C	- ANEMOMETER				
5	W-109		WHT/BLK STR	D	D	+ ANEMOMETER				
6	W-109		BLK/RED STR	E	E	AZIMUTH POSITION				
7	W-109		WHT/RED STR	F	F	DATA GND				
8	W-109		BLK/ORG STR	G	G	ELEVATION POSITION				
9	W-109		WHT/ORG STR	H	H	DATA GND				
10	W-109			I	I	ANEMOMETER SHIELD				
11	W-109		BLK/YEL STR	J	J	SPARE				
12	W-109		WHT/YEL STR	K	K	SPARE				
13	W-109		BLK	L	L	+ POT. POWER				
14	W-109		WHT	M	M	- POT. POWER				
15	W-109			N	N	SHIELD 1				
16	W-109		BLK TWST TRI	O	O	CHASSIS GND				
17	W-109		BLK TWST PR	P	P	SPARE				
18	W-109		WHT TWST PR	R	R	SPARE				
19	W-109		BRN STR	S	S	NEUT 115 VAC HEATER				
20	W-109		BLK STR	T	T	HI 115 VAC HEATER				
21	W-109		TWST TRI RED	U	U	NEUT 115 VAC (DE-ICE)				
22	W-109		TWST TRI WHT	V	V	HI 115 VAC (DE-ICE)				
23	W-109		BLK/GRN STR	W	W	+ MOTOR DRIVE INPUT				
24	W-109		WHT GRN STR	X	X	- MOTOR DRIVE INPUT				
25	W-109		BRN 16AWG	Y	Y	SPARE				
26	W-109		RED 16AWG	Z	Z	SPARE				
27	W-109		BLK/BLU STR	a	a	HI 115 VAC BEACON				
28	W-109		WHT/BLU STR	b	b	NEUT 115 VAC BEACON				
29	W-109			c	c	SHIELD 2				
30	W-109		ORG	d	d	LAZIMUTH				
31	W-109		YEL	e	e	LRTUP				
32	W-109		GRN	f	f	LANTCD1				
33	W-109			g	g	BEACON CHASSIS GND				
34	W-109		BLU	h	h	LANTCD2				
35	W-109		VIO	i	i	LSENCO1				
36	W-109		GRY	j	j	LSENCO2				
37				k	k					
38										
39										
40										

NOTES:

- CONTROL BOX ASSEMBLY (P/N A3143022) UNIT DESIGNATION HAS BEEN DESIGNATED AS E1.
- CABLES SHALL BE PART NUMBER J-C-5808-SO-6-C-F-2/18-R-NJ.
- FOR SYSTEM ELECTRICAL SCHEMATIC SEE FO-1.
- FOR SYSTEM INTERCONNECTING CABLING SEE FO-2.
- FOR SYSTEM ELECTRICAL INSTALLATION SEE FO-8.

LINE NO.	CABLE ASSY		CABLE WIRING DATA		SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS	
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR- GA-KIND	FROM		TO	FROM			TO
1	W-110	A314299131		P1-	P6-		W109-J1 CONN	E1J12 CONN	120.0	
2	W-110		BLK/BRN STR	A	A	+ (SENSE) POWER SUPPLY	MS3108R32-7P	MS3106F32-7SX		
3	W-110		WHT/BRN STR	B	B	- (SENSE) POWER SUPPLY				
4	W-110		BLK/BLK STR	C	C	- ANEMOMETER				
5	W-110		WHT/BLK STR	D	D	+ ANEMOMETER				
6	W-110		BLK/RED STR	E	E	AZIMUTH POSITION				
7	W-110		WHT/RED STR	F	F	DATA GND				
8	W-110		BLK/ORG STR	G	G	ELEVATION POSITION				
9	W-110		WHT/ORG STR	H	H	DATA GND				
10	W-110			I	I	ANEMOMETER SHIELD				
11	W-110		BLK/YEL STR	J	J	SPARE				
12	W-110		WHT/YEL STR	K	K	SPARE				
13	W-110		BLK	L	L	+ POT. POWER				
14	W-110		WHT	M	M	- POT. POWER				
15	W-110			N	N	SHIELD 1				
16	W-110		BLK TWST TRI	O	O	CHASSIS GND				
17	W-110		BLK TWST PR	P	P	SPARE				
18	W-110		WHT TWST PR	R	R	SPARE				
19	W-110		BRN STR	S	S	NEUT 115 VAC HEATER				
20	W-110		BLK STR	T	T	HI 115 VAC HEATER				
21	W-110		TWST TRI RED	U	U	NEUT 115 VAC (DE-ICE)				
22	W-110		TWST TRI WHT	V	V	HI 115 VAC (DE-ICE)				
23	W-110		BLK/GRN STR	W	W	+ MOTOR DRIVE INPUT				
24	W-110		WHT GRN STR	X	X	- MOTOR DRIVE INPUT				
25	W-110		BRN 16AWG	Y	Y	SPARE				
26	W-110		RED 16AWG	Z	Z	SPARE				
27	W-110		BLK/BLU STR	a	a	HI 115 VAC BEACON				
28	W-110		WHT/BLU STR	b	b	NEUT 115 VAC BEACON				
29	W-110			c	c	SHIELD 2				
30	W-110		ORG	d	d	LAZIMUTH				
31	W-110		YEL	e	e	LRTUP				
32	W-110		GRN	f	f	LANTCD1				
33	W-110			g	g	BEACON CHASSIS GND				
34	W-110		BLU	h	h	LANTCD2				
35	W-110		VIO	i	i	LSENC01				
36	W-110		GRY	k	k	LSENC02				
37										
38										
39										
40										

LINE NO.	CABLE ASSY		CABLE WIRING DATA			SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR-GA-KIND	FROM	TO		FROM	TO		
1	W-111	A3143016		P9-	J1-		E1J9	TDNRP1	19.5	CABLES W-111 AND W-112 TERMINATE AT E1J9.
2	W-111		BLK 20AWG	A	A	TIE DOWN	CONN	CONN		
3	W-111		WHT 20 AWG	C	C	LIMIT SWITCH. (R.S.)	MS3108R16S-5P	MS3476W10-6S		
4										
5										
6										
7	W-112			P9-	J2-		E1J9	TDNLP2	26.0	
8	W-112		BLK 20AWG	C	A	TIE DOWN		MS3476W10-6S		
9	W-112		WHT 20AWG	B	C	LIMIT SWITCH. (L.S.)				
10										
11										
12										
13	W-114	A3142994		P2-	J2-		JB4J2	ROTATOR(TOP)	4.0	
14	W-114		BLK/YEL STR	A	A	ELEVATION MOTOR	CONN	P2		
15	W-114		WHT/YEL STR	B	B	ELEVATION MOTOR	MS3108R28-28P	CONN		
16	W-114		BLK/GRN STR	E	E	AZIMUTH MOTOR		MS3108R28-11S		
17	W-114		WHT/GRN STR	F	F	AZIMUTH MOTOR				
18	W-114		RED 16AWG	G	G	SHIELD 2				
19	W-114		WHT/BRN STR	T	T	HIGH 115 VAC HEATER				
20	W-114		BLK/BRN STR	S	S	HI 115 VAC HEATER				
21	W-114		BLK 12AWG	M	M	HIGH 115 VAC (DE-ICE)				
22	W-114		RED 12AWG	L	L	NEUT 115 VAC (DE-ICE)				
23	W-114		BLK/ORG STR	C	C	AZIMUTH DATA				
24	W-114		BLK/RED STR	D	D	ELEVATION DATA				
25	W-114		WHT	N	N	+ POT. POWER				
26	W-114		BLK	P	P	- POT. POWER				
27	W-114			H	H	SHIELD 1				
28	W-114		BLK 12AWG	K	K	CHASSIS GND				
29										
30										
31										
32	W-115	A3142993		P1-	J1-		JB4J1	ROTATOR(LEFT)	4.0	
33	W-115		BLK/YEL STR	A	A	ELEVATION MOTOR	CONN	P1		
34	W-115		WHT/YEL STR	B	B	ELEVATION MOTOR	MS3106F28-11P	CONN		
35	W-115		BLK/GRN STR	E	E	AZIMUTH MOTOR		MS3106F28-11S		
36	W-115		WHT/GRN STR	F	F	AZIMUTH MOTOR				
37	W-115		RED 16AWG	G	G	SHIELD 2				
38	W-115		WHT/BRN STR	T	T	HIGH 115 VAC HEATER				
39	W-115		BLK/BRN STR	S	S	HIGH 115 VAC HEATER				
40	W-115		BLK 12AWG	M	M	HIGH 115 VAC (DE-ICE)				

LINE NO.	CABLE ASSY		CABLE WIRING DATA			SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR- GA-KIND	FROM	TO		FROM	TO		
1	W-115		RED 12AWG	L	L	NEUT 115 VAC (DE-ICE)				
2	W-115		BLK/ORG STR	C	C	AZIMUTH DATA				
3	W-115		BLK/RED STR	D	D	ELEVATION DATA				
4	W-115		WHT	N	N	+ POT. POWER				
5	W-115		BLK	P	P	- POT. POWER				
6	W-115			H	H	SHIELD 1				
7	W-115		BLK 12AWG	K	K	CHASSIS GND				
8										
9										
10										
11										
12										
13	W-116	A3142995		P3-	J3-		JB4J3	ROTATOR (RT)	4.0	
14	W-116		BLK/YEL STR	A	A	ELEVATION MOTOR	CONN	P1		
15	W-116		WHT/YEL STR	B	B	ELEVATION MOTOR	MS3106F28-11P	CONN		
16	W-116		BLK/GRN STR	E	E	AZIMUTH MOTOR		MS3106F28-11S		
17	W-116		WHT/GRN STR	F	F	AZIMUTH MOTOR				
18	W-116		RED 16AWG	G	G	SHIELD 2				
19	W-116		WHT/BRN STR	T	T	HIGH 115 VAC HEATER				
20	W-116		BLK/BRN STR	S	S	HI 115 VAC HEATER				
21	W-116		BLK 12AWG	M	M	HIGH 115 VAC (DE-ICE)				
22	W-116		RED 12AWG	L	L	NEUT 115 VAC (DE-ICE)				
23	W-116		BLK/ORG STR	C	C	AZIMUTH DATA				
24	W-116		BLK/RED STR	D	D	ELEVATION DATA				
25	W-116		WHT	N	N	+ POT. POWER				
26	W-116		BLK	P	P	- POT. POWER				
27	W-116			H	H	SHIELD 1				
28	W-116		BLK 12AWG	K	K	CHASSIS GND				
29										
30										
31										
32	W-117	A3142996		P8-	JB3TB1-		E1J8	TILT SWITCH	9.0	
33	W-117		BLK	A	01	TILT-UP LIMIT SW N.C.	CONN	SWITCH JB3		
34	W-117		WHT	B	05	TILT-DN LIMIT SW N.C.	MS3108R20-7P			
35	W-117		RED	C	08	FROM K2				
36	W-117		GRN	D	06	TILT-UP, TILT-DN C				
37	W-117		ORG	E	04	5 DEGREE LIMIT SW N.O.				
38	W-117		BLU	F	03	TILT-UP LIMIT SW N.O.				
39	W-117		WHT/BLK	G	07	TILT-DN LIMIT SW N.O.				
40	W-117		RED/BLK	H	02	5 DEGREE LIMIT SW N.O.				

LINE NO.	CABLE ASSY		CABLE WIRING DATA			SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR- GA-KIND	FROM	TO		FROM	TO		
1	W-118	A3142997		P1-	JB3TB1-		5 DEGREE SW	TILT LIMIT	6.5	
2	W-118		WHT	A	04	5 DEGREE LIMIT SW C	J1	SWITCH JB3		
3	W-118		BLK	B	08	FROM K2	CONN			
4	W-118		RED	C	02	5 DEGREE LIMIT SW N.O.	MS3476W10-6S			
5										
6										
7										
8	W-119	A3142998		P1-	JB3TB1-		TILT-DN SW	TILT LIMIT	6.0	
9	W-119		WHT	A	08	FROM K2	J1	SWITCH JB3		
10	W-119		BLK	B	05	TILT-DN LIMIT SW N.C.	CONN			
11	W-119		GRN	D	06	TILT-UP, TILT-DN C	MS3476W10-6S			
12	W-119		RED	E		SPARE				
13	W-119		BLU	F	07	TILT-DN LIMIT SW N.O.				
14										
15										
16										
17	W-120	A3142999		P1-	JB3TB1-		TILT-UP SW	TILT LIMIT	6.7	
18	W-120		BLK	A	08	FROM K2	J1	SWITCH JB3		
19	W-120		GRN	B	01	TILT-UP LIMIT SW N.C.	CONN			
20	W-120		WHT	D	06	TILT-UP, TILT DN COMMON				
21	W-120		RED	F	03	TILT-UP LIMIT SW N.O.				
22										
23										
24										
25	W-121	A3143000		MTR-	JB1TB1-		1st STAGE MTR	FIRST STAGE	4.0	TERMINATE ACTIVE WIRES W/RING TERM- INALS MS25036-156 AND GROUND WIRE W/ MS25036-112
26	W-121		BLK	T1(U1)	01	PHASE A		JUNCTION BOX		
27	W-121		WHT	T3(W1)	03	PHASE B		JB1TB1		
28	W-121		GRN	T2(V1)	02	PHASE C				
29	W-121		RED	GND	GND STUD	EGND				
30										
31										
32										
33	W-122	A3143001		P2-	JB1TB1-		E1J2	FIRST STAGE	13.3	
34	W-122		BLK	A	01	PHASE A	CONN	JUNCTION BOX		
35	W-122		RED	B	02	PHASE B	MS3108R24-10P	JB1TB1		
36	W-122		ORG	C	03	PHASE C				
37	W-122		WHT	D	18	NUJET				
38	W-122		GRN	E	GND STUD	EGND				
39										
40										

LINE NO.	CABLE ASSY		CABLE WIRING DATA			SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR-GA-KIND	FROM	TO		FROM	TO		
1	W-123	A3143002		E1P7-	JB1TB1-		E1J7	FIRST STAGE	13.3	
2	W-123		BLK	A	04	UPPER LIMIT SW N.C. 1	CONN	JUNCTION BOX		
3	W-123		WHT	B	09	LOWER LIMIT SW N.C. 1	MS3108R24-SP	JB1TB1		
4	W-123		RED	C	14	UPPER LIMIT SW C2				
5	W-123		GRN	D	05	UPPER LIMIT SW N.O. 2				
6	W-123		ORG	E	11	LOWER LIMIT SW N.O. 2				
7	W-123		BLU	F	13	LOWER LIMIT SW N.O. 3				
8	W-123		WHT/BLK	G	06	LOWER LIMIT SW N.C. 3				
9	W-123		RED/BLK	H	07	UPPER LIMIT SW C1				
10	W-123		GRN/BLK	J	12	LOWER LIMIT SW C1				
11	W-123		ORG/BLK	K	10	UPPER LIMIT SW N.O. 3				
12	W-123		BLU/BLK	L	08	UPPER LIMIT SW C3				
13	W-123		BLK/WHT	M	15	115 VAC				
14										
15										
16										
17	W-124	A3143021		J1-	JB1TB1-		LIMIT SWITCH	FIRST STAGE	9.6	
18	W-124		GRN	A	12	LOWER LIMIT SW C1	DN P1	JUNCTION BOX		
19	W-124		WHT	B	09	LOWER LIMIT SW N.C. 1		JB1TB1		
20	W-124		RED	D	14	LOWER LIMIT SW C2				
21	W-124		BRN	F	11	LOWER LIMIT SW N.O. 2				
22	W-124		BLK	G	06	LOWER LIMIT SW N.C. 3				
23	W-124		BLU	J	13	LOWER LIMIT SW N.O. 3				
24										
25										
26										
27	W-125A	A3143017		P1-	J1-		LIMIT SWITCH	PLUG	0.8	
28	W-125A		BRN	A	2	UPPER LIMIT SW C1	UP	P1		
29	W-125A		BLK	B	5	UPPER LIMIT SW N.C. 1	CONN			
30	W-125A		RED	D	3	UPPER LIMIT SW C2	MS3476W12-10S	PLUG		
31	W-125A		GRN	F	1	UPPER LIMIT SW N.O. 2		A3144044-1		
32	W-125A		WHT	G	6	UPPER LIMIT SW C3				
33	W-125A		BLU	J	4	UPPER LIMIT SW N.O. 3				
34										
35										
36										
37	W-125B	A3143018		P1-	JB1TB1-		RECEPTACLE	FIRST STAGE	0.7	
38	W-125B		BLK	5	04	UPPER LIMIT SW N.C. 1	J1	JUNCTION BOX		
39	W-125B		WHT	6	08	UPPER LIMIT SW C3	A3144044-2	JB1TB1		
40	W-125B		BRN	2	07	UPPER LIMIT SW C1				

LINE NO.	CABLE ASSY		CABLE WIRING DATA			SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR-GA-KIND	FROM	TO		FROM	TO		
1	W-1258		RED	3	14	UPPER LIMIT SW C2				
2	W-1258		GRN	1	05	UPPER LIMIT SW N.O. 2				
3	W-1258		BLU	4	10	UPPER LIMIT SW N.O. 3				
4										
5										
6										
7	W-126	A3143003		P11-	J3-		E1J11	HYTEP2	90.0	
8	W-126		BLK	A	A	+ 15V	CONN	CONN		
9	W-126		WHT	B	B	15V RTN	MS3108R18-8PW	MS3106F18-8SW		
10	W-126		SLATE	C	C	SHIELD				
11	W-126		GRN	D	D	HT SIGNAL				
12	W-126		RED	E	E	DATA GND				
13	W-126			F	F					
14										
15										
16										
17	W-127	A3143004		P10-	J1-		E1J10	HYTEP1	90.6	
18	W-127		BLK	A	A	+ 15V	CONN	CONN		
19	W-127		WHT	B	B	15V RTN	MS3108R18-8PW	MS3106F18-8SW		
20	W-127		SLATE	C	C	SHIELD				
21	W-127		GRN	D	D	HT SIGNAL				
22	W-127		RED	E	E	DATA GND				
23	W-127			F	F					
24										
25										
26										
27	W-128	A3143005		MTR-	JB2TB1-		END STAGE	SECOND STAGE	3.7	TERMINATE ACTIVE
28	W-128		BLK	T1(U1)	01	PHASE A	AMTR	JUNCTION BOX		WIRES W/RING TERM-
29	W-128		RED	T2(V1)	02	PHASE B		JB2TB1		INALS MS25036-156.
30	W-128		WHT	T3(W1)	03	PHASE C				AND GND WIRE W/
31	W-128		GRN	GND	GND	EGND				MS25036-112
32										
33										
34										
35	W-129A	A3143019		RECP-	J2-		PLUG	UP LIMIT SW	0.7	
36	W-129A		BLK	4	A	2nd STAGE LIMIT SW C1	A3144044-1	P2		
37	W-129A		RED	5	B	2nd STAGE LIMIT SW N.C.1		CONN		
38	W-129A		GRN	1	G	2nd STAGE LIMIT SW C3		MS3476W12-10S		
39	W-129A		RED	2	J	2nd STAGE LIMIT SW N.O.3				
40										

LINE NO.	CABLE ASSY		CABLE WIRING DATA		SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS	
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR-GA-KIND	FROM		TO	FROM			TO
1	W-1298	A3143020		PLUG-	JB2TB1-		RECEPTICLE A3144044-2	SECOND STAGE JUNCTION BOX JB2TB1	3.1	
2	W-1298		BLK	4	4	2nd STAGE LIMIT SW C1				
3	W-1298		WHT	5	5	2nd STAGE LIMIT SW N.C.1				
4	W-1298		GRN	1	7	2nd STAGE LIMIT SW C3				
5	W-1298		RED	2	12	2nd STAGE LIMIT SW N.O.3				
6										
7										
8										
9	W-130	A3143006		J2-	JB2TB1		P2 LIMIT SW SECOND STAGE CONN MS3476W12-10S	SECOND STAGE JUNCTION BOX JB2TB1	1.8	
10	W-130		YEL	A	8	2nd STAGE LIMIT SW C1				
11	W-130		RED	B	13	2nd STAGE LIMIT SW N.C.1				
12	W-130		GRN	D	11	2nd STAGE LIMIT SW C2				
13	W-130		BLU	E	6	2nd STAGE LIMIT SW N.C.2				
14	W-130		ORG	F	10	2nd STAGE LIMIT SW N.O.2				
15	W-130		BRN	G	12	2nd STAGE LIMIT SW C3				
16	W-130		BLK	J	9	2nd STAGE LIMIT SW N.O.3				
17	W-130		WHT	K						
18										
19										
20										
21	W-131	A3143007		P3-	JB2TB1		E1J03 CONN MS3106F24-10PW	SECOND STAGE JUNCTION BOX JB2TB1	88.4	TERMINAL GND WIRE WITH RING TERMINAL MS25036-112
22	W-131		BLK	A	01	PHASE A				
23	W-131		RED	B	02	PHASE B				
24	W-131		ORG	C	03	PHASE C				
25	W-131		WHT	D	17	NEUT				
26	W-131		GRN	E	GND STUD	EGND				
27										
28										
29										
30	W-132	A3143008		P4-	JB2TB1		E1J04 CONN MS3106F24-5PW	SECOND STAGE JUNCTION BOX JB2TB1	90.0	
31	W-132		GRN/BLK	A	04	2nd STAGE U SW C1				
32	W-132		RED/BLK	B	05	2nd STAGE U SW N.C.1				
33	W-132		BLK	C	13	2nd STAGE L SW N.C.1				
34	W-132		ORG/BLK	D	11	2nd STAGE L SW C2				
35	W-132		WHT/BLK	E	10	2nd STAGE L SW N.O.2				
36	W-132		BLU/BLK	F	06	2nd STAGE L SW N.C.2				
37	W-132		WHT	G	08	2nd STAGE L SW C1				
38	W-132		BLU	H	12	2nd STAGE L SW C3				
39	W-132		BLK/WHT	J	07	2nd STAGE U SW C3				
40	W-132		RED	K	09	2nd STAGE L SW N.O.3				

LINE NO.	CABLE ASSY		CABLE WIRING DATA			SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS	
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR- GA-KIND	FROM	TO		FROM	TO			
1	W-132	A3143009	GRN	L	14	SPARE	E1J14 CONN MS3108R24-6P	PUMP MTR JB08 WIRE NUTS (RED)	9.7		
2	W-132		ORG	M		115 VAC					
3											
4											
5											
6	W-133		P14-			JB08TB1-					
7	W-133			A		01					PHASE A
8	W-133			B		02					PHASE B
9	W-133			C		03					PHASE C
10	W-133			D							NEUT
11	W-133			E		GND STUD					GND
12	W-133			F		WIRE NUT					UP
13	W-133			G		WIRE NUT					DOWN
14	W-133			H							SPARE
15											
16											
17											
18	W-134	A3143010		J1-	P5-		JUNCTION BOX JN4P5 CONN MS3106F10SL-3S	ANEMOMETER P1 CONN MS3106A-14S-1S	8.2		
19	W-134		WHT	A		A					WIND (-)
20	W-134		BLK	B		B					WIND (+)
21	W-134		SHIELD	C		C					SHIELD
22											
23											
24											
25	W-135	A3143011		P4-	B1DS1- + NEUT		JB4J04 CONN MS3106F10SL-3P	BEACON LIGHT B1DS1	8.9		
26	W-135		BLK	A							115 VAC
27	W-135		WHT	B							AC NEUT
28	W-135		RED								SPARE
29											
30											
31											
32	W-136	A3143012		MTR-	HYD SOLENOID		PUMP MOTOR WIRE NUTS, RED	SOLENOID VALVE WIRE NUTS, RED	2.2	WIRE NUTS, BLUE WIRE NUTS, RED WIRE NUTS, BLUE	
33	W-136		BLK	WIRE NUTS							HYDRAULIC SOLENOID UP
34	W-136		WHT	WIRE NUTS							HYDRAULIC SOLENOID DN
35	W-136		RED	WIRE NUTS							COMMON PHASE C
36	W-136		GRN								SPARE
37											
38											
39											
40											

LINE NO.	CABLE ASSY		CABLE WIRING DATA			SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR-GA-KIND	FROM	TO		FROM	TO		
1	W-137	A3143013		J1-	JB5-		E1P01	SWITCH BOX	13.5	
2	W-137		BLK	A	L1	PHASE A	CONN	JB5		
3	W-137		RED	B	L2	PHASE B	MS3108R24-10S			
4	W-137		ORG	C	L3	PHASE C				
5	W-137		WHT	D	L0	NEUT				
6	W-137		GRN	E		EGND				
7										
8										
9										
10	W-138	A3143014		POS-	MTR		E1J05	MOTOR, COAX	3.8	TERMINATE ACTIVE
11	W-138		BLK	A	T1(U1)	PHASE A	CONN	RIGHT SIDE		WIRES W/RING TERM-
12	W-138		RED	B	T2(V1)	PHASE B	MS3108R22-28PZ			INALS MS25036-156
13	W-138		ORG	C	T3(W1)	PHASE C				AND GROUND WIRE W/
14	W-138		WHT	D		NEUT				MS25036-112
15	W-138		GRN	E	GND STUD	EGND				
16										
17										
18										
19	W-139	A3143015		POS-	MTR		E1J06	MOTOR, COAX	10.5	TERMINATE ACTIVE
20	W-139		BLK	A	T1(U1)	PHASE A	CONN	LEFT SIDE		WIRES W/RING TERM-
21	W-139		RED	B	T2(V1)	PHASE B	MS3108R22-28P			INALS MS25036-156
22	W-139		ORG	C	T3(W1)	PHASE C				AND GROUND WIRE W/
23	W-139		WHT	D		NEUT				MS25036-112
24	W-139		GRN	E	GND STUD	EGND				
25										
26										
27										
28	W-140	5		JB1TB1-	BRK		JB1TB1	BRAKE SOLENOID	3.0	
29	W-140		BLK	16	SOLENOID	1st STAGE BRK RELEASE		+, - TERMINALS		WIRE NUT (+)
30	W-140		WHT	17						WIRE NUT (-)
31										
32										
33										
34	W-141	5		JB2TB1-	BRK		JB2TB1	BRAKE SOLENOID	4.0	
35	W-141		BLK	15	SOLENOID	2nd STAGE BRK RELEASE		+, - TERMINALS		WIRE NUT (+)
36	W-141		WHT	16						WIRE NUT (-)
37										
38										
39										
40										

LINE NO.	CABLE ASSY		CABLE WIRING DATA			SYSTEM/FUNCTION VOLTS-AMPS	SYSTEM ADDRESS		LENGTH FEET	REMARKS
	REF DES	PART NO.	CABLE TYPE-WIRE NO-COLOR- GA-KIND	FROM	TO		FROM	TO		
1	W-	A3143018		JBS-	GENERATOR		SWITCH BOX		A/R	CABLES FROM GENERATORS TO THE SWITCH BOX (JBS) WILL BE SUPPLIED BY THE INSTALLING ACTIVITY
2	W-		BLK	L1	L1	JBS				
3	W-		RED	L2	L2					
4	W-		ORG	L3	L3					
5	W-		WHT	L0	L0					
6	W-		GRN							
7										
8										
9										
10										
11										
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
TABLE I		
WIRE		
AWG	FUNCTION	PART NUMBER
16	T84-9 TO T84-10	M16878/18JE9
16	T84-10 TO T84-11	M16878/18JE9
22	T86-1 TO T86-2	M16878/18FE9
22	T86-2 TO T86-10	M16878/18FE9
16	FLASHER MODULE	M16878/18JE9
22	K1-K6 COILS (SEE NOTE 3)	M16878/18JE9
20	K1-K6 CONTACTS (SEE NOTE 3)	M16878/18JE9
14	CB04, CB05, CB06	M16878/18FE9
18	INDICATOR LAMP GND WIRING	M16878/18JE9
22	INDIVIDUAL INDICATOR LAMP; LAMP TEST WIRING	M16878/18JE9
14	REEL DRIVE AC POWER	M16878/18JE9
12	HYD PUMP AC POWER	
14	2ND STAGE AC POWER	
12	1ST STAGE AC POWER	
20	RELAY X1	
16	RELAY X2	

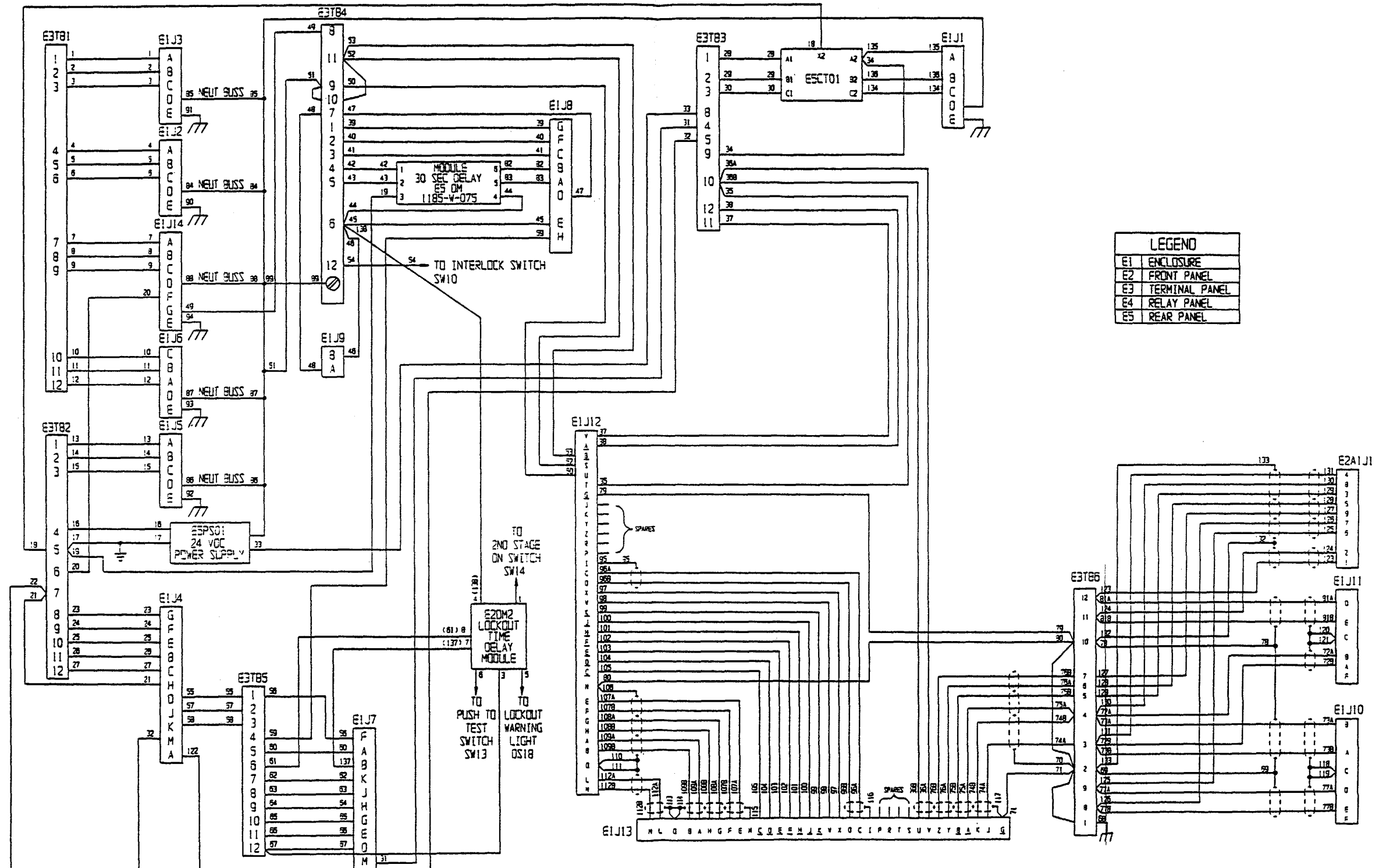
TABLE II			
CRIMP TERMINALS			
PART NUMBER	TERMINAL SIZE	STUD SIZE	COLOR
MS25036-148	22-18	4	RED
MS25036-101		6 SHORT	
MS25036-102		6 LONG	
MS25036-149		8	
MS25036-103	10		
MS25036-152	16-14	4	BLUE
MS25036-106		6 SHORT	
MS25036-107		6 LONG	
MS25036-153		8	
MS25036-108	10		
MS25036-111	12-10	6	YELLOW
MS25036-156		8	
MS25036-112		10	

TABLE III		
SHRINK TUBING		
PART NUMBER	AS SUPPLIED ID MINIMUM	AFTER UNRESTRICTED SHRINKAGE ID MAXIMUM
M23053/5-101-9	.046 (1.17)	.023 (.58)
M23053/5-102-9	.063 (1.60)	.031 (.79)
M23053/5-103-9	.093 (2.63)	.046 (1.17)
M23053/5-104-9	.125 (3.18)	.062 (1.58)
M23053/5-105-9	.187 (4.75)	.093 (2.36)
M23053/5-106-9	.250 (6.35)	.125 (3.18)
M23053/5-107-9	.375 (9.53)	.187 (4.75)
M23053/5-108-9	.500 (12.7)	.250 (6.35)
M23053/5-109-9	.750 (19.1)	.375 (9.53)
M23053/5-110-9	1.000 (25.4)	.500 (12.7)
M23053/5-111-9	1.500 (38.1)	.750 (19.1)
M23053/5-112-9	2.000 (50.8)	1.000 (25.4)
M23053/5-113-9	3.000 (76.2)	1.500 (38.1)
M23053/5-114-9	4.000 (101.6)	2.000 (50.8)

TABLE IV
CABLE TIES
SPECIFICATION
MS3367-1-9
MS3367-4-9

NOTES:

1. USE TIE-RAPS TO STAY IN A ORGANIZED PATTERN. USE TABLE IV FOR SIZE.
2. APPLY SHRINK TUBING OVER NOTED SOLDER CONNECTIONS.
3. ALL WIRING NOT SPECIFIED SHALL BE 18 AWG.
4. APPLY SHRINK TUBING OVER ALL TERMINAL BOARD SOLDER CONNECTIONS.
5. CONNECTOR WIRING TO TERMINAL PANEL SEE SHEET 2.
USE TABLE I FOR PROPER HOOK-UP WIRE SIZE AND CONNECTIONS.
6. USE TABLE I AND TABLE II FOR PROPER CRIMP TERMINAL SIZE.
7. USE TABLE I AND TABLE III FOR PROPER SHRINK TUBING SIZE.
8. GROUND BUSS 
9. FOR WIRING LIST SEE FO-5, SHEET 2 OF 7.
10. FOR CONTROL PANEL SCHEMATIC SEE FO-7.



LEGEND	
E1	ENCLOSURE
E2	FRONT PANEL
E3	TERMINAL PANEL
E4	RELAY PANEL
E5	REAR PANEL

FO-4. Wiring Diagram - Control Box
(Sheet 2 of 2)

TABLE I CRIMP TERMINALS			
PART NUMBER	TERMINAL SIZE	STUD SIZE	COLOR
MS25036-148 MS25036-101 MS25036-102 MS25036-149 MS25036-103	22-18	4 6 SHORT 6 LONG 8 10	RED
MS25036-152 MS25036-106 MS25036-107 MS25036-153 MS25036-108	16-14	4 6 SHORT 6 LONG 8 10	BLUE
MS25036-111 MS25036-156 MS25036-112	12-10	6 8 10	YELLOW
MS25036-115	8	10	RED

TABLE II SHRINK TUBING		
PART NUMBER	AS SUPPLIED ID MINIMUM	AFTER UNRESTRICTED SHRINKAGE ID MAXIMUM
M23053/5-101-9	.046 (1.17)	.023 (.58)
M23053/5-102-9	.063 (1.60)	.031 (.79)
M23053/5-103-9	.093 (2.63)	.046 (1.17)
M23053/5-104-9	.125 (3.18)	.062 (1.58)
M23053/5-105-9	.187 (4.75)	.093 (2.36)
M23053/5-106-9	.250 (6.35)	.125 (3.18)
M23053/5-107-9	.375 (9.53)	.187 (4.75)
M23053/5-108-9	.500 (12.7)	.250 (6.35)
M23053/5-109-9	.750 (19.1)	.375 (9.53)
M23053/5-110-9	1.000 (25.4)	.500 (12.7)
M23053/5-111-9	1.500 (38.1)	.750 (19.1)
M23053/5-112-9	2.000 (50.8)	1.000 (25.4)
M23053/5-113-9	3.000 (76.2)	1.500 (38.1)
M23053/5-114-9	4.000 (101.6)	2.000 (50.8)

TABLE III WIRE		
PART NUMBER	SPECIFICATION	AWG
M16878/48G89	MIL-W-16878/4	20
M16878/48H89	MIL-W-16878/4	18
M16878/48J89	MIL-W-16878/4	16
M16878/48L89	MIL-W-16878/4	12
M16878/38N89	MIL-W-16878/3	8
LS2SJ-20	MIL-C-24643	18
(SEE NOTE 6)		

TABLE IV CABLE TIES
SPECIFICATION
MS3367-1-9
MS3367-4-9

NOTES:

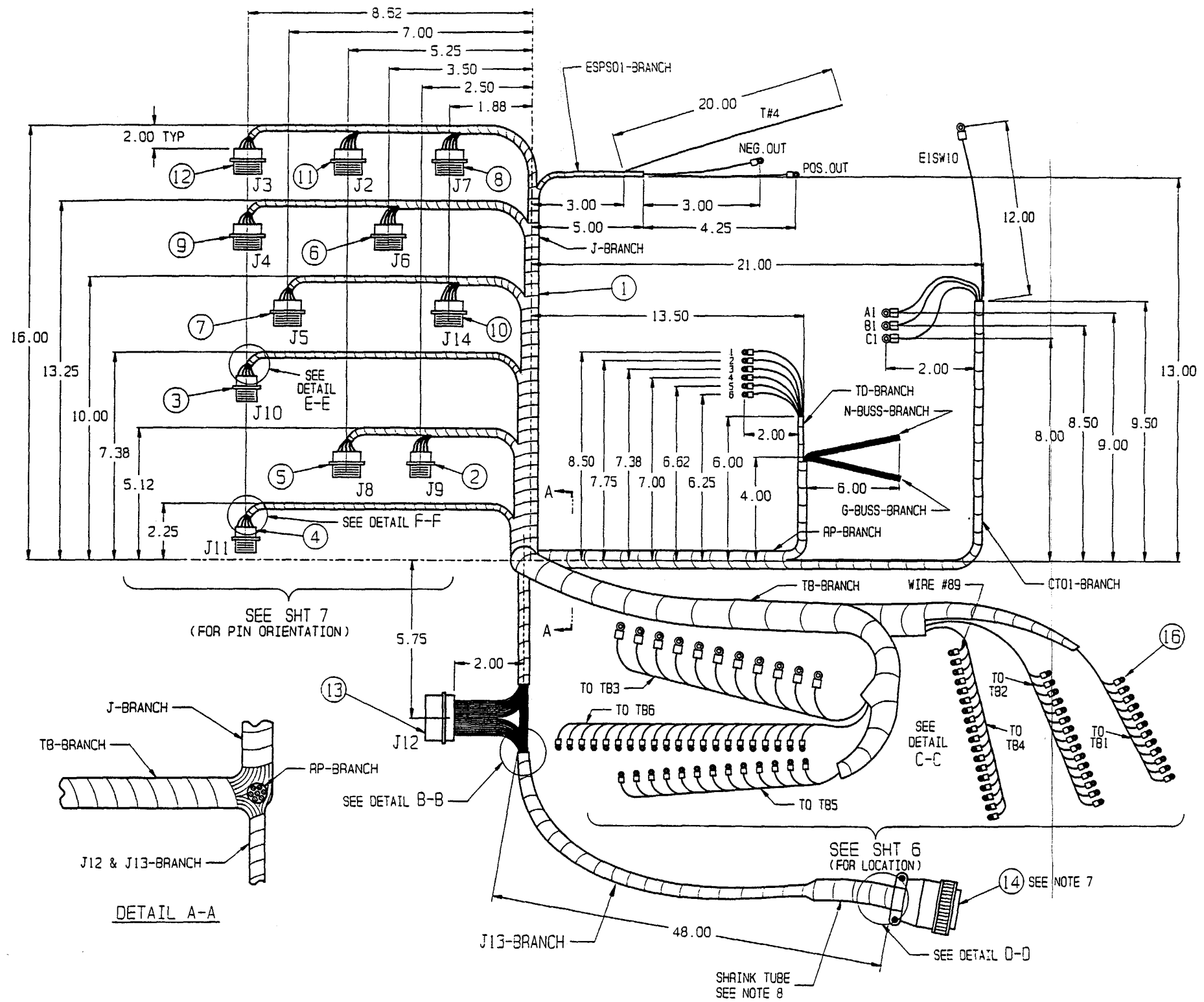
- INSULATE ALL SOLDER CONNECTIONS WITH HEAT SHRINKABLE SLEEVING USING TABLE II FOR SIZING.
- CHECK WIRE SIZE, SCREW SIZE, AND CONNECTION FOR PROPER TERMINAL LUG SIZING. THEN SELECT PROPER CRIMP TERMINAL FROM TABLE I.
- TWISTED PAIR CABLE, 18 AWG.
- ALL CONNECTIONS J2 THRU J14 MUST HAVE SHRINK TUBING OVER SOLDER CONNECTIONS. USE TABLE II FOR SIZE.
- SLIDE TWO 5 INCH LENGTHS OF 1-1/2 INCH SHRINK TUBING (MS23053/5-111-9) AND THE NECESSARY CONNECTOR PARTS OVER THE WIRES BEFORE SOLDERING. AFTER SOLDERING, HEAT SHRINKING SOLDER JOINTS. SLIDE ONE OF THE SHRINK TUBE PIECES UP UNTIL IT BUTTS AGAINST CONNECTOR AND APPLY HEAT TO SHRINK REPEAT FOR THE OTHER PIECE ASSEMBLE CONNECTOR.
- SELECT APPROPRIATE WIRE FROM TABLE III, USING WIRE LIST ON SHEET 2, AS A GUIDE.
- CABLE TIES SHOULD BE AT INTERVALS OF APPROXIMATELY 3". USE TABLE IV FOR SELECTION OF CABLE TIES.
- FOR CONTROL BOX ASSEMBLY SCHEMATIC SEE FO-7.

WIRE LIST				
WIRE NO.	FROM	TO	AWG	COMMENTS
1	T81-1	J3-A	12	
2	T81-2	J3-B	12	
3	T81-3	J3-C	12	
4	T81-4	J2-A	12	
5	T81-5	J2-B	12	
6	T81-6	J2-C	12	
7	T81-7	J14-A	12	
8	T81-8	J14-B	12	
9	T81-9	J14-C	12	
10	T81-10	J6-C	12	
11	T81-11	J6-B	12	
12	T81-12	J6-A	12	
13	T82-1	J5-A	12	
14	T82-2	J5-B	12	
15	T82-3	J5-C	12	
16	T82-4	J4-D	16	
17	T82-5	J4-E	16	
18	T82-5	J4-F	18	
19	T82-5	J4-G	18	
20	T82-6	J4-F	12	
21	T82-7	J4-H	16	
22	T82-7	J7-C	18	
23	T82-8	J4-G	16	
24	T82-9	J4-F	16	
25	T82-10	J4-E	16	
26	T82-11	J4-B	16	
27	T82-12	J4-C	16	
28	T83-1	ESCT01-A1	8	
29	T83-2	ESCT01-B1	8	
30	T83-3	ESCT01-C1	8	
31	T83-4	J7-M	16	
32	T83-5	J4-M	14	
33	T83-8	J4-M	16	
34	T83-9	CT01-A2	12	
35	T83-10	J12-T	12	
36A	T83-10	J13-V	18	SEE NOTE 6
36B	T84-10	J13-U	18 BLK	SEE NOTE 6
37	T83-11	J12-V	12	
38	T83-12	J12-Q	16	
39	T84-1	J8-G	16	
40	T84-2	J8-F	16	
41	T84-3	J8-C	16	
42	T84-4	J8-E	18	
43	T84-5	J8-E	18	
44	T84-6	J8-E	18	
45	T84-6	J8-E	16	
46	T84-6	J9-B	16	
47	T84-7	J8-D	16	

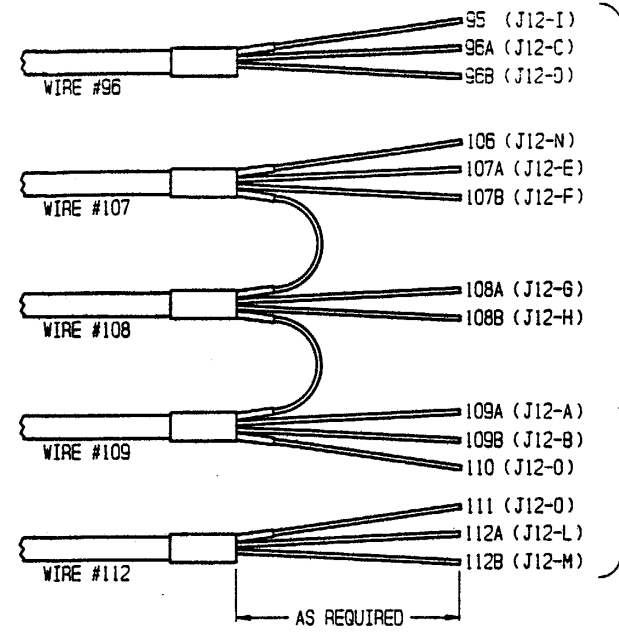
WIRE LIST				
WIRE NO.	FROM	TO	AWG	COMMENTS
48	T84-7	J9-A	16	
49	T84-8	J14-G	12	
50	T84-9	J12-U	12	
51	T84-9	NEUT. BUSS	12	
52	T84-11	J12-S	12	
53	T84-11	J12-b	16	
54	T84-12	INTERLOCK SHIELD	20	
55	T85-1	J4-D	16	
56	T85-1	J7-F	16	
57	T85-2	J4-J	16	
58	T85-3	J4-K	16	
59	T85-4	J8-H	16	
60	T85-5	J7-A	16	
61	T85-6	LK. COU. TOR-3	22	
62	T85-7	J7-K	16	
63	T85-8	J7-J	16	
64	T85-9	J7-H	16	
65	T85-10	J7-G	16	
66	T85-11	J7-E	16	
67	T85-12	J7-D	16	
68	T86-1	GND. BUSS	20	
69	T86-2	SHIELD	20	SHIELD WIRE #77
70	T86-2	SHIELD	20	SHIELD WIRE #76
71	T86-2	J13-g	20	
72A	T86-4	J11-B	18	SEE NOTE 6
72B	T86-3	J11-A	18 BLK	SEE NOTE 6
73A	T86-4	J10-B	18	SEE NOTE 6
73B	T86-3	J10-A	18 BLK	SEE NOTE 6
74A	T86-3	J13-J	18	SEE NOTE 6
74B	T86-4	J13-K	18 BLK	SEE NOTE 6
75A	T86-4	J13-a	18	SEE NOTE 6
75B	T86-5	J13-b	18 BLK	SEE NOTE 6
76A	T86-6	J13-Y	18	SEE NOTE 6
76B	T86-7	J13-Z	18 BLK	SEE NOTE 6
77A	T86-9	J10-D	18	SEE NOTE 6
77B	T86-9	J10-E	18 BLK	SEE NOTE 6
78	T86-10	SHIELD	18	SHIELD WIRE #81
79	T86-10	J12-g	16	
80	T86-10	J12-N	20	
81A	T86-12	J11-D	18	SEE NOTE 6
81B	T86-11	J11-E	18 BLK	SEE NOTE 6
82	J8-B	J8-B	18	
83	J8-A	J8-A	18	
84	J2-D	NEUT. BUSS	12	
85	J3-D	NEUT. BUSS	12	
86	J5-D	NEUT. BUSS	12	
87	J6-D	NEUT. BUSS	12	
88	J14-D	NEUT. BUSS	12	

WIRE LIST				
WIRE NO.	FROM	TO	AWG	COMMENTS
89	GND. BUSS	THA STRAIN R.	16	ATTACH TO THA MOUNTING SCREW
90	J2-E	GND. BUSS	12	
91	J3-E	GND. BUSS	12	
92	J5-E	GND. BUSS	12	
93	J6-E	GND. BUSS	12	
94	J14-E	GND. BUSS	12	
95	J12-I	SHIELD	18	SHIELD WIRE #86
96A	J12-C	J13-C	18	SEE NOTE 6
96B	J12-D	J13-D	18 BLK	SEE NOTE 6
97	J12-X	J13-X	18	
98	J12-W	J13-W	18	
99	J12-k	J13-k	18	
100	J12-j	J13-j	18	
101	J12-h	J13-h	18	
102	J12-f	J13-f	18	
103	J12-e	J13-e	18	
104	J12-d	J13-d	18	
105	J12-c	J13-c	18	
106	J12-N	SHIELD	18	SHIELD WIRE #107
107A	J12-E	J13-E	18	SEE NOTE 6
107B	J12-F	J13-F	18 BLK	SEE NOTE 6
108A	J12-G	J13-G	18	SEE NOTE 6
108B	J12-H	J13-H	18 BLK	SEE NOTE 6
109A	J12-A	J13-A	18	SEE NOTE 6
109B	J12-B	J13-B	18 BLK	SEE NOTE 6
110	J12-D	SHIELD	18	SHIELD WIRE #109
111	J12-D	SHIELD	18	SHIELD WIRE #112
112A	J12-L	J13-L	18	SEE NOTE 6
112B	J12-M	J13-M	18 BLK	SEE NOTE 6
113	J13-D	SHIELD	18	SHIELD WIRE #112
114	J13-D	SHIELD	18	SHIELD WIRE #109
115	J13-N	SHIELD	18	SHIELD WIRE #107
116	J13-I	SHIELD	18	SHIELD WIRE #86
117	J13-g	SHIELD	18	SHIELD WIRE #76
118	J10-C	SHIELD	18	SHIELD WIRE #73
119	J10-C	SHIELD	18	SHIELD WIRE #77
120	J11-C	SHIELD	18	SHIELD WIRE #72
121	J11-C	SHIELD	18	SHIELD WIRE #81
122	J4-A	J7-L	18	
JUMPER	T86-1	T86-2	22	
JUMPER	T86-2	T86-10	22	
JUMPER	T84-9	T84-10	16	
JUMPER	T84-10	T84-11	16	
123	T86-12	2A1J1-1	18	
124	T86-11	2A1J1-2	18	
125	T86-9	2A1J1-5	18	

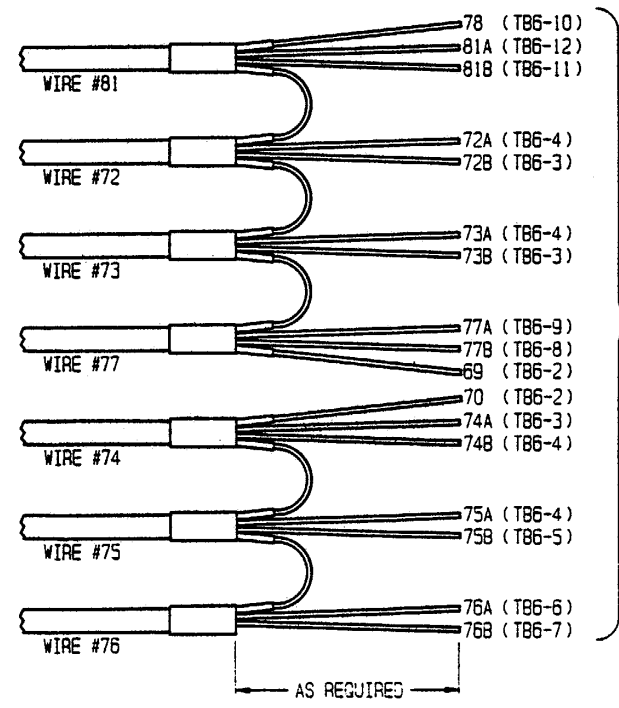
WIRE LIST				
WIRE NO.	FROM	TO	AWG	COMMENTS
126	T86-8	2A1J1-7	18	
127	T86-7	2A1J1-9	18	
128	T86-6	2A1J1-5	18	
129	T86-5	2A1J1-3	18	
130	T86-4	2A1J1-8	18	
131	T86-3	2A1J1-4	18	
132	T86-10	SHIELD	18	
133	T86-2	SHIELD	20	
134	J1-C	ESCT01-C2	8	
135	J1-A	ESCT01-A2	8	
136	J1-B	ESCT01-B2	8	
137	J7-B	LK. COU. TOR-3	22	
138	T84-6	LK. COU. TOR-3	22	
139	T85-12	LK. COU. TOR-3	22	



FO-5. Harness, Wire Assembly - Control Box (Sheet 3 of 7)



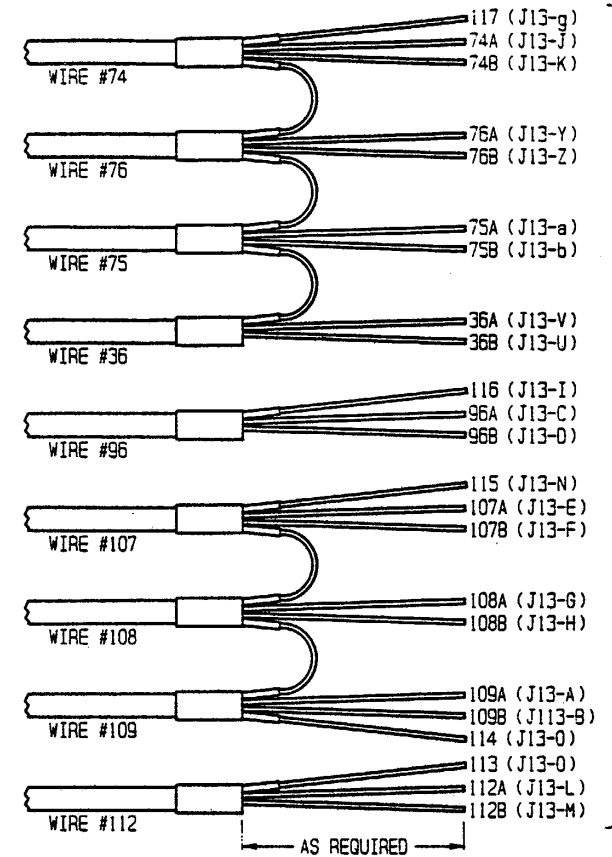
DETAIL B-B



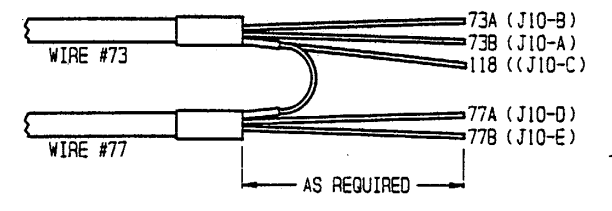
DETAIL C-C

TO RECEPTACLE J12

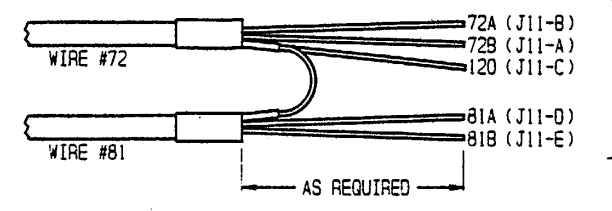
TO TERMINAL BOARD, T86



DETAIL D-D



DETAIL E-E

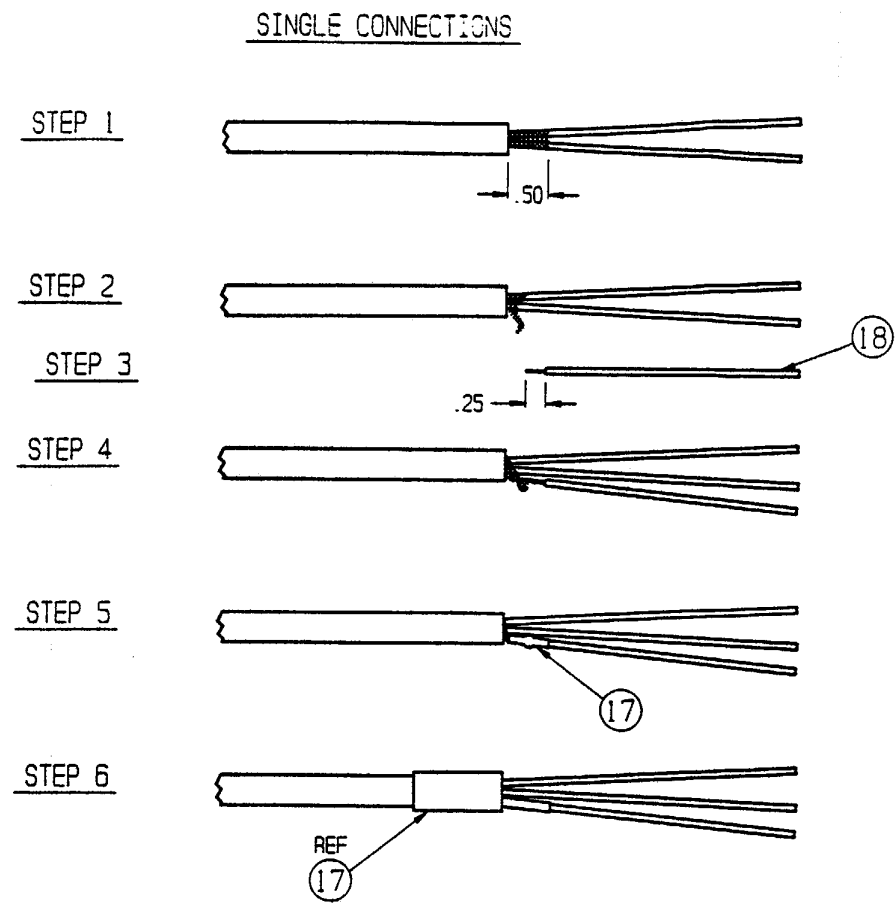


DETAIL F-F

TO PLUG J13

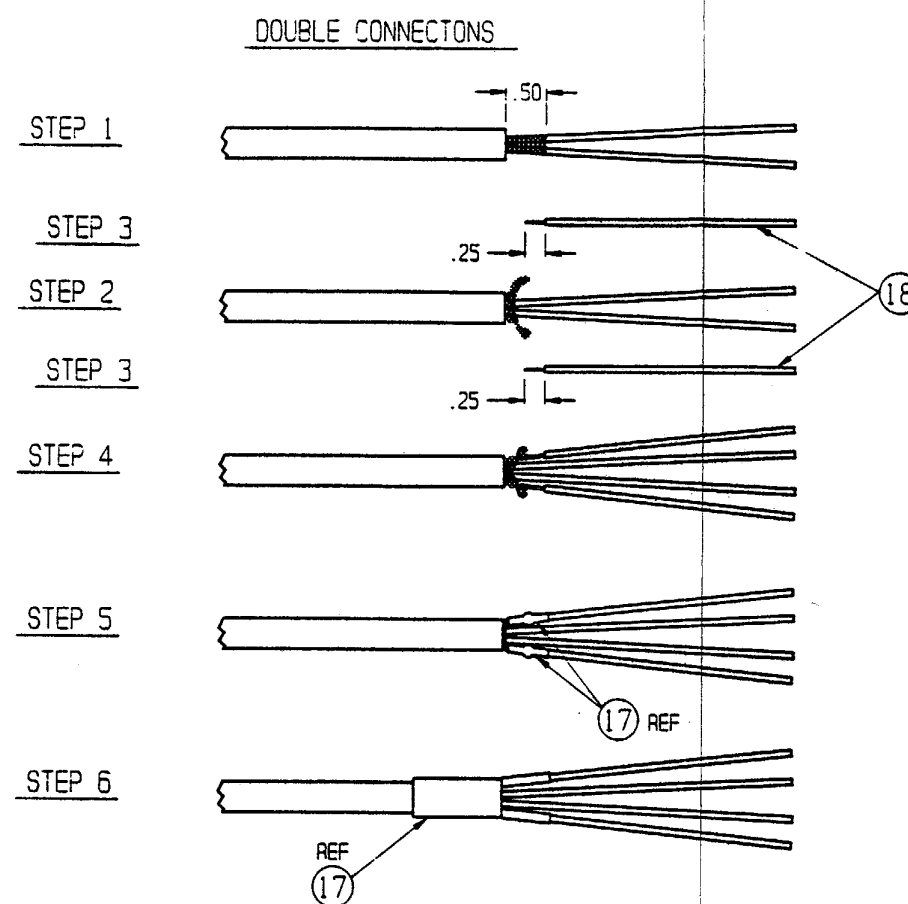
TO RECEPTACLE J10

TO RECEPTACLE J11



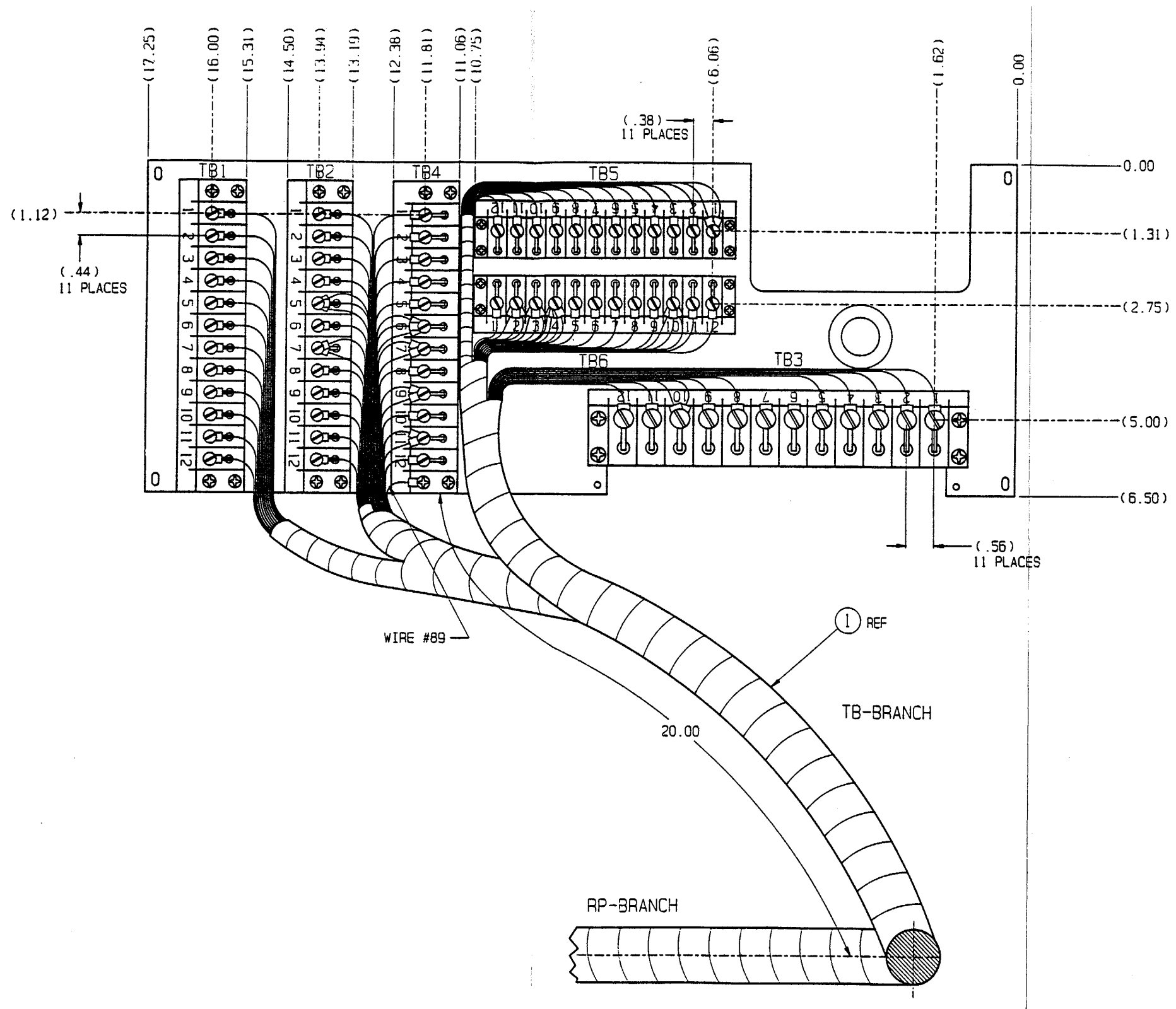
PROCEDURE

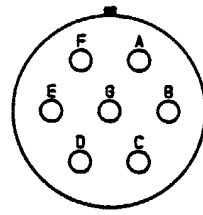
- STEP 1 - STRIP OUTER INSULATION AND TRIM SHIELD BRAID TO .50 INCH LENGTH.
- STEP 2 - SEPERATE BRAID AND TWIST TIGHTLY, THEN TIN.
- STEP 3 - STRIP INSULATION OF WIRE .25 INCH AND TIN.
- STEP 4 - BEND HOOK ON BRAID AND WIRE, THEN PLACE TOGETHER AND CRIMP WITH PLIERS. SOLDER, THEN CLEAN JOINT WITH ISOPROPYL ALCOHOL. ALLOW TO DRY.
- STEP 5 - PLACE 1 INCH LENGTH OF .12 INCH WHITE SHRINK TUBE (MS23053/5-104-9) OVER SOLDER JOINT AND APPLY HEAT TO SHRINK.
- STEP 6 - PLACE 1 INCH LENGTH OF .25 INCH WHITE SHRINK TUBING (MS23053/5-106-9) OVER CABLE AND WIRES AND APPLY HEAT TO SHRINK.



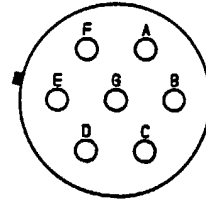
PROCEDURE

- STEP 1 - STRIP OUTER INSULATION AND TRIM SHIELD BRAID TO .50 INCH LENGTH.
- STEP 2 - SEPERATE BRAID INTO TWO EQUAL PARTS AND TWIST EACH TIGHTLY, THEN TIN.
- STEP 3 - STRIP INSULATION OF EACH WIRE .25 INCH AND TIN.
- STEP 4 - BEND HOOK ON EACH SIDE OF BRAID AND EACH WIRE, THEN PLACE TOGETHER AND CRIMP WITH PLIERS. SOLDER, THEN CLEAN JOINT WITH ISOPROPYL ALCOHOL. ALLOW TO DRY.
- STEP 5 - PLACE 1 INCH LENGTH OF .12 INCH WHITE SHRINK TUBE (MS23053/5-104-9) OVER EACH SOLDER JOINT AND APPLY HEAT TO SHRINK.
- STEP 6 - PLACE 1 INCH LENGTH OF .25 INCH WHITE SHRINK TUBING (MS23053/5-106-9) OVER CABLE AND WIRES AND APPLY HEAT TO SHRINK.

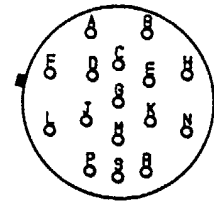




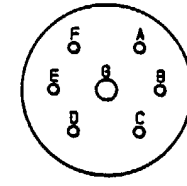
J2-PIN ORIENTATION



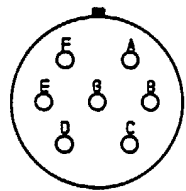
J3-PIN ORIENTATION



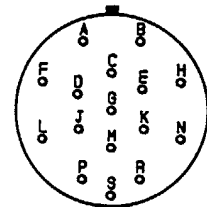
J4-PIN ORIENTATION



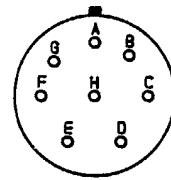
J5-PIN ORIENTATION



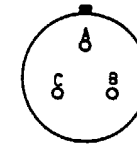
J6-PIN ORIENTATION



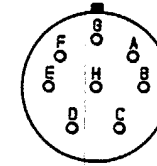
J7-PIN ORIENTATION



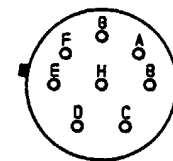
J8-PIN ORIENTATION



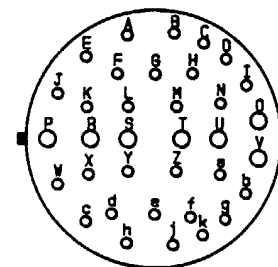
J9-PIN ORIENTATION



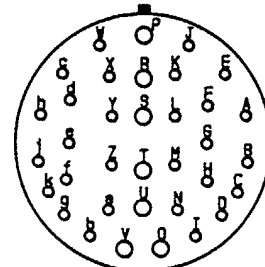
J10-PIN ORIENTATION



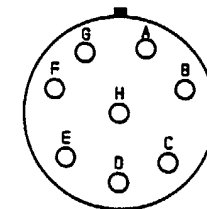
J11-PIN ORIENTATION



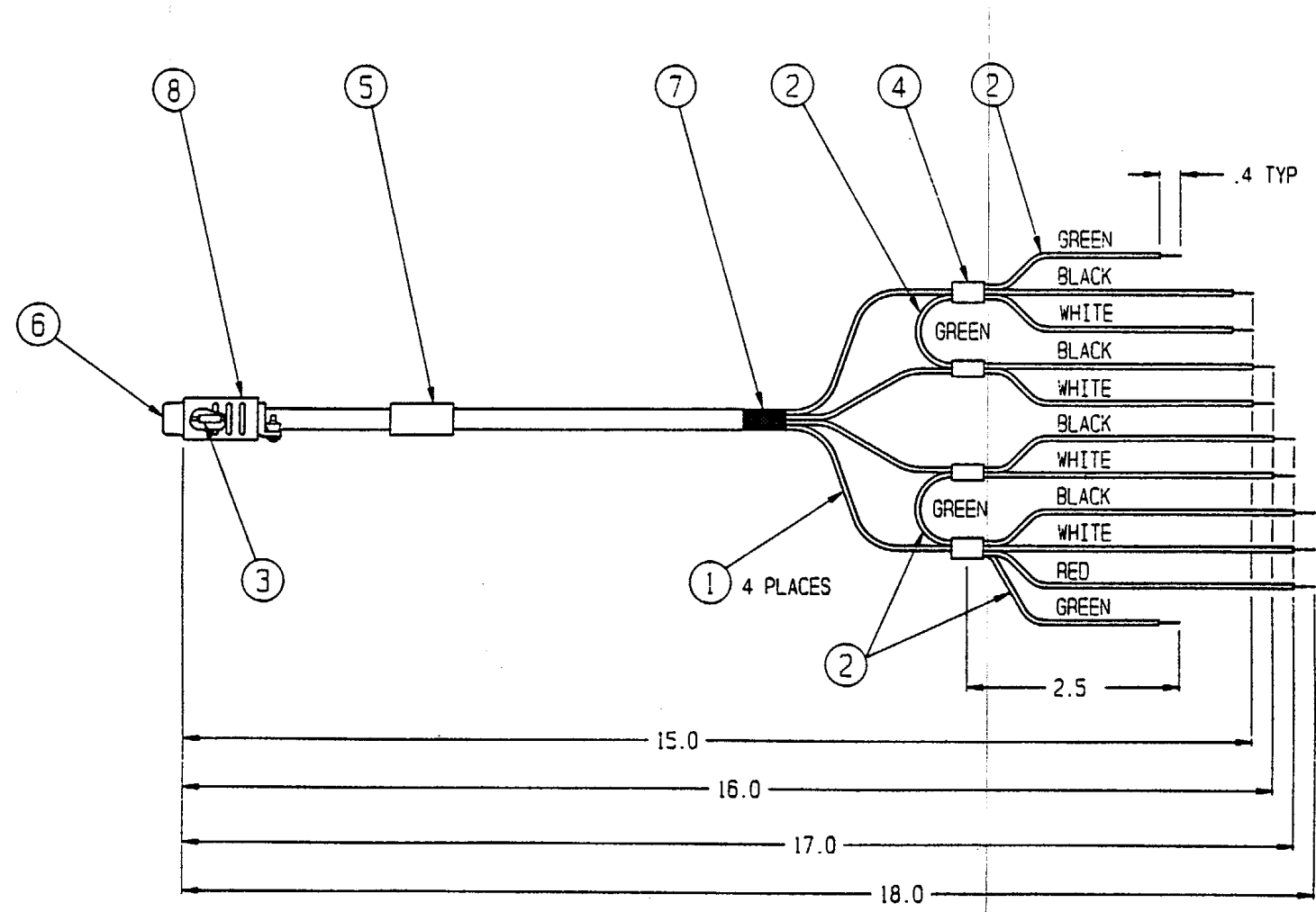
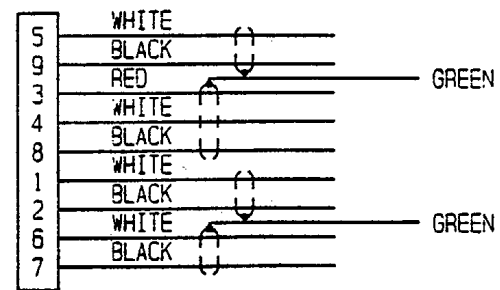
J12-PIN ORIENTATION



J13-PIN ORIENTATION

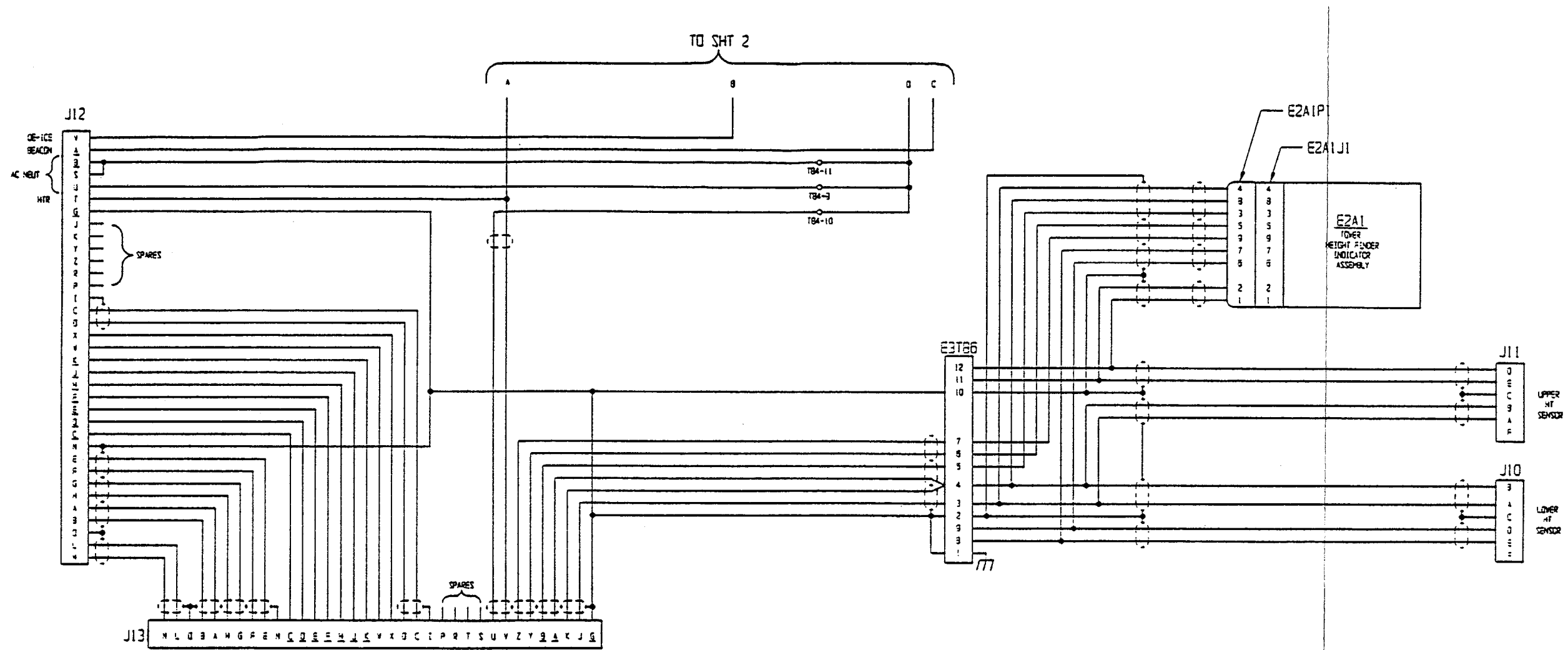


J14-PIN ORIENTATION

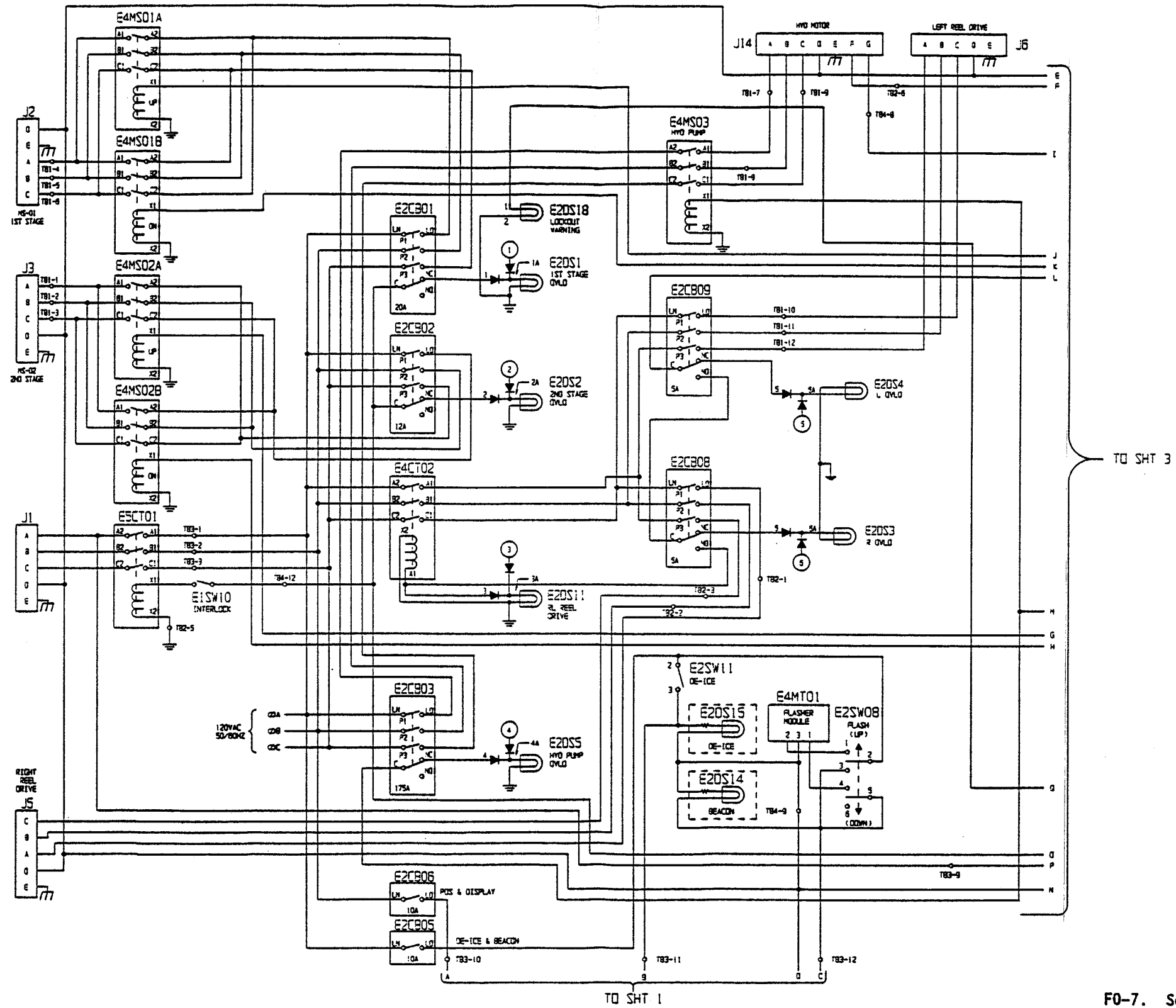


NOTE:

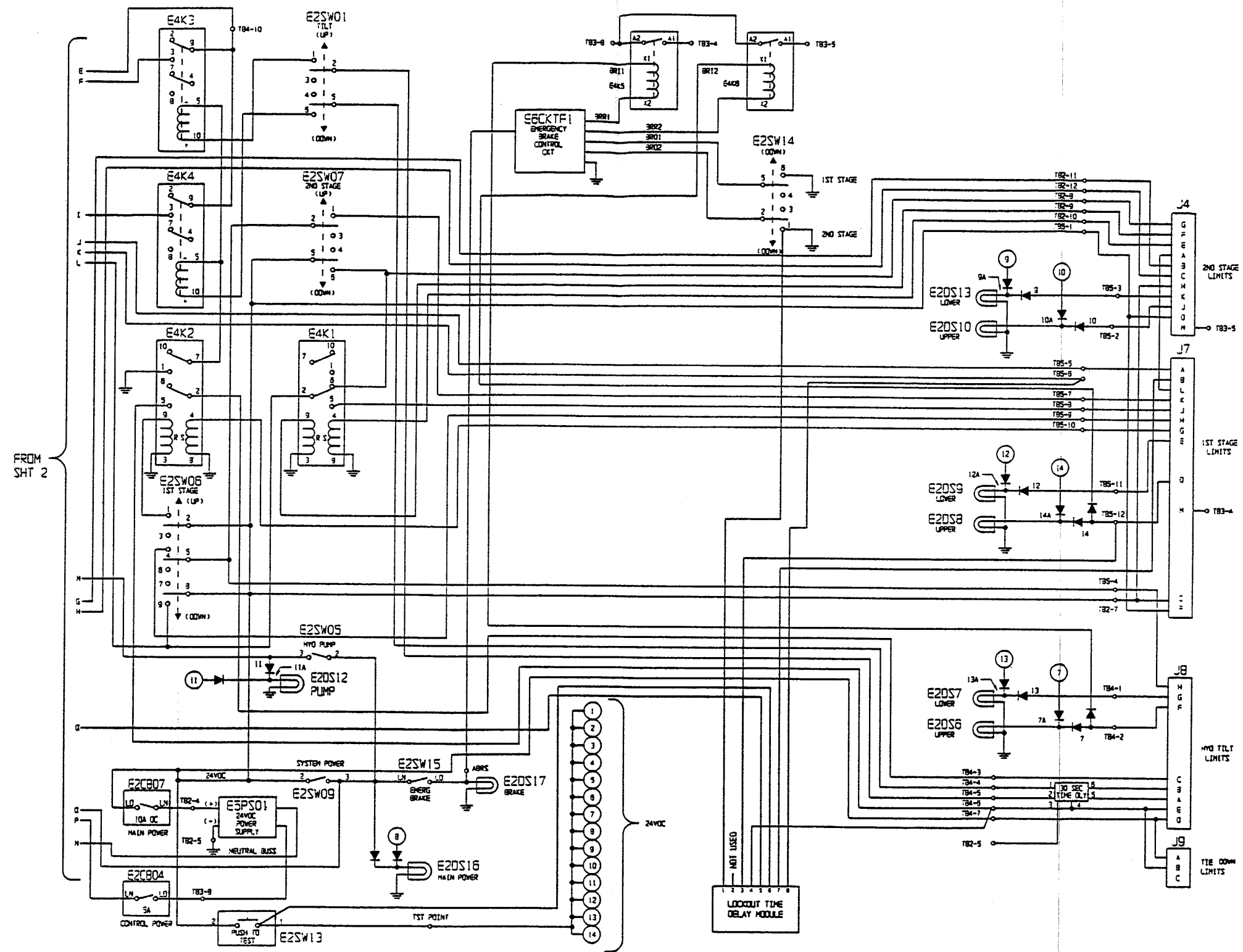
1. CABLE ASSEMBLY IS USED WITH PART NUMBER A3143833.



NOTE:
FOR CONTROL BOX WIRING DIAGRAM SEE FO-4.



F0-7. Schematic Diagram - Control Panel

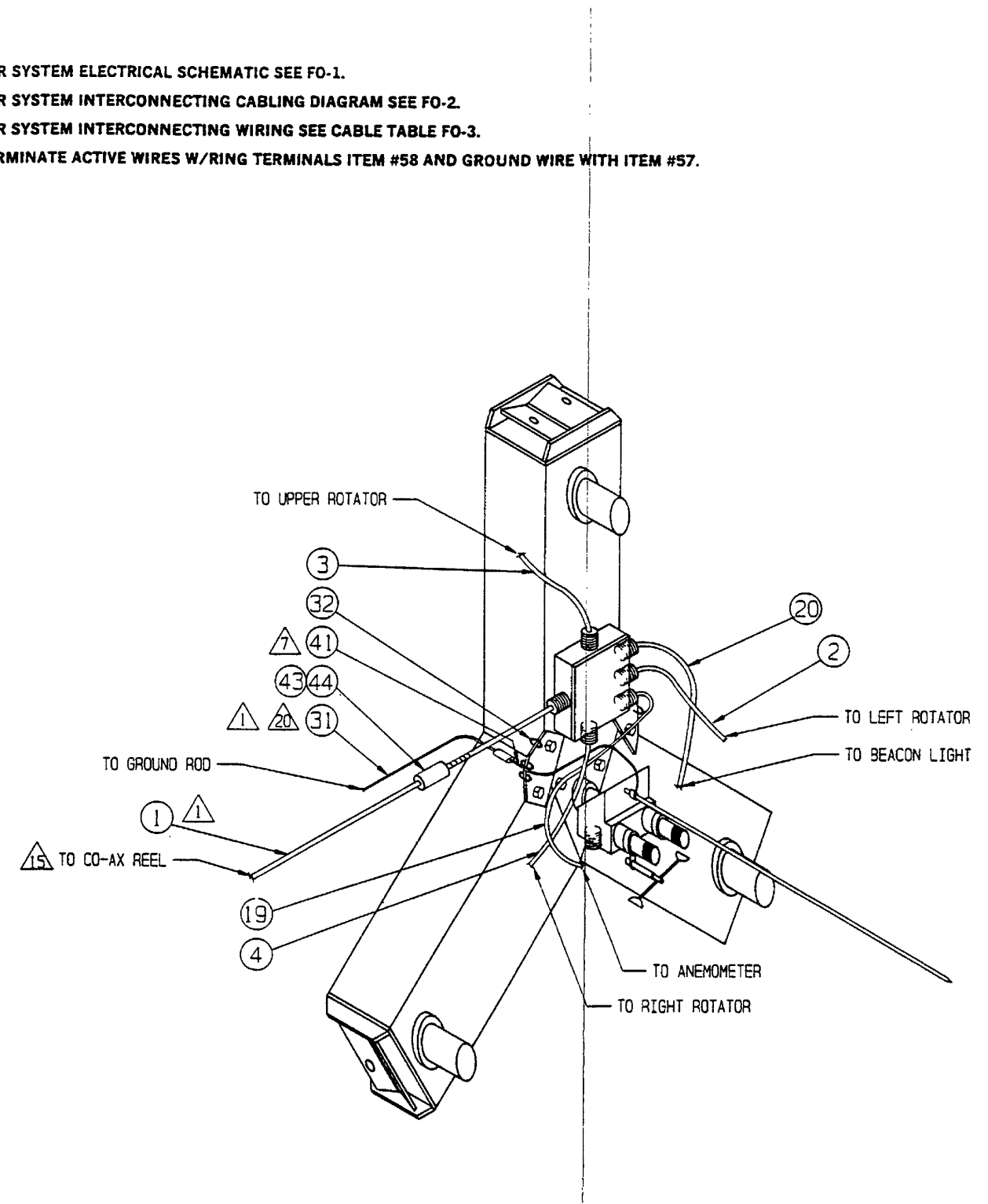


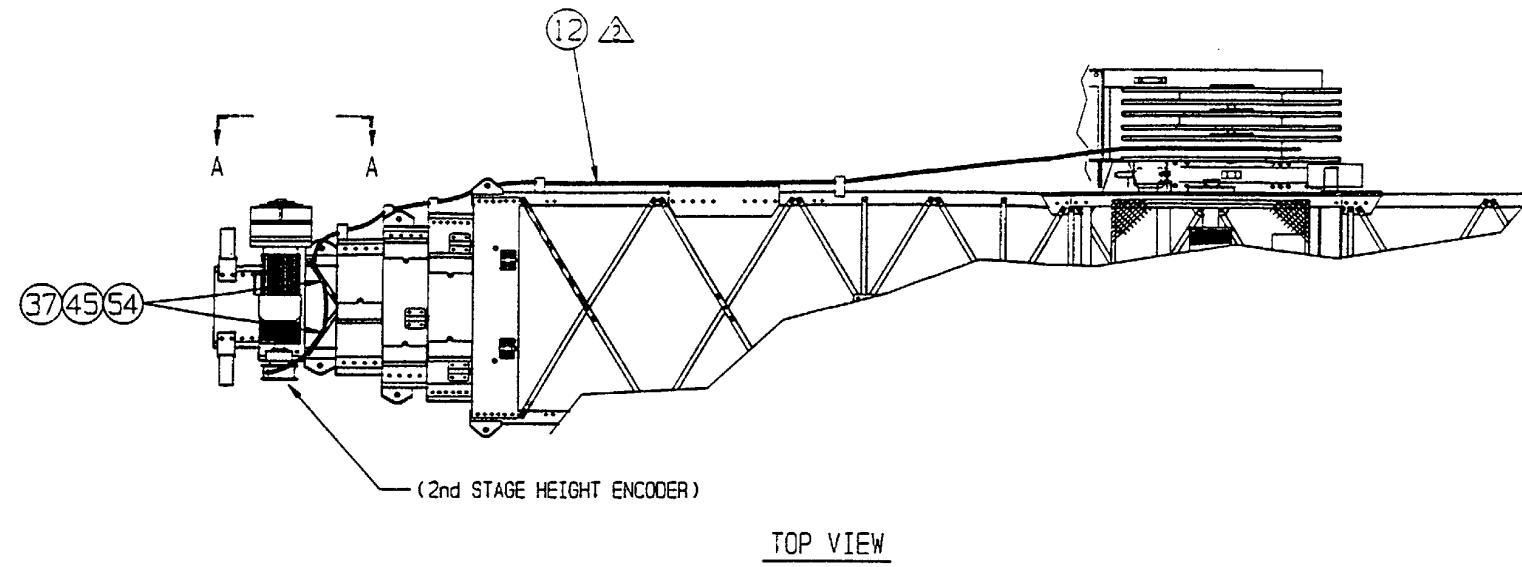
FO-7. Schematic Diagram - Control Panel (Sheet 3 of 3)

NOTES:

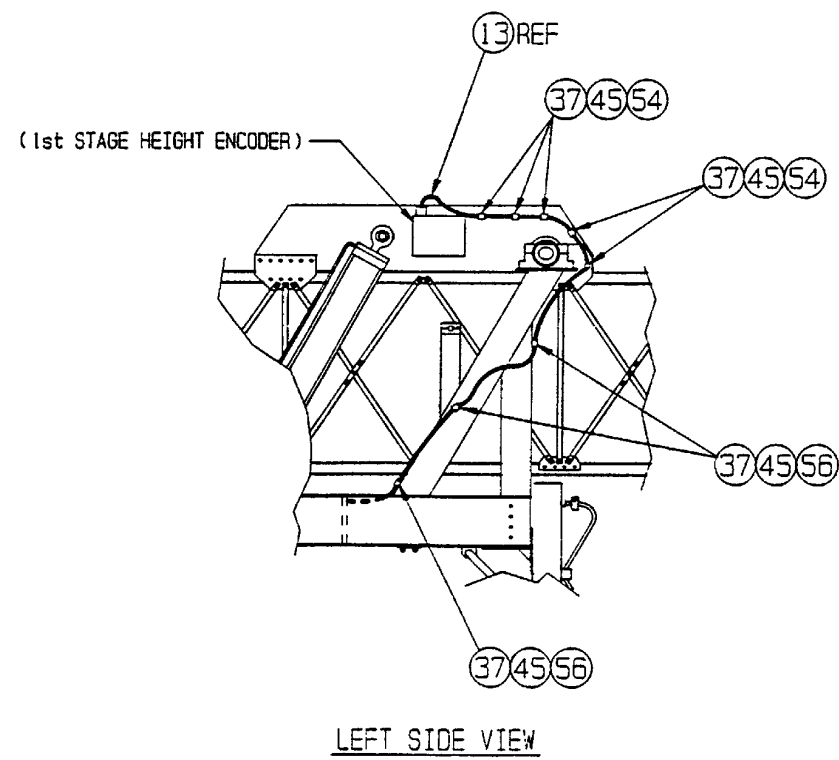
- 1 GROUND CABLE (P/N A3143514-2) AND CABLE W-110 (P/N A3142991) WILL BE TY-RAP TOGETHER. START TY-RAPS FROM OUTER RIGHT HAND CO-AX REEL TO 6 FT FROM END OF CABLES BY PLACING TY-RAPS EVERY 3 FT APART.
- 2 ITEMS #12, 16 & 17 WILL BE TY-RAP TOGETHER FROM HOOK-UP POINTS TO INNER RIGHT HAND CO-AX REEL BY TY-RAPPING EVERY 3 FT.
- 3 CUT HEAT SINK TUBING INTO 4 INCH LENGTHS.
- 4 WHERE INDICATED HARDWARE WILL BE SHARED BETWEEN AIR BRAKE LINES AND LIMIT SWITCH TIE DOWN CABLE.
- 5 WHERE INDICATED HARDWARE WILL BE SHARED BETWEEN TRAILER LIGHT WIRING HARNESS AND LIMIT SWITCH TIE DOWN CABLE.
- 6 USE 2 EA MS21919F6 (ITEM #49) WITH THE MOUNTING HARDWARE FOR THE CLEARANCE LIGHT ON THE BOTTOM OF THE #10 TOWER SECTION.
- 7 INSTALL HEAT SHRINK TUBING M23053/5-113-0 APPROX CENTERED ON THE LOWER EDGE OF THE CABLE GRIP ITEM #41 AND SHRINK. INSTALL HEAT SHRINK TUBING M23053/5-113-0 APPROX CENTERED AND SHRINK.
- 8 INSTALLING ACTIVITY SHALL PROVIDE ATTACHING HARDWARE FOR CLAMPING CABLE.
- 9 INSTALLING ACTIVITY SHALL FURNISH TWO (2) CABLES, SWITCH, AND ATTACHING HARDWARE.
- 10 USE RING TERMINALS P/N MS25036-156 TO TERMINATE WIRES AT THE MOTORS.
- 11 TERMINATE CABLE AT HYDRAULIC SOLENOID WITH THREE (3) WIRE NUTS 2 FOR 16-18 GAGE WIRES AND 1 FOR 20-22 GAGE WIRES.
- 12 TERMINATE CABLE AT HYDRAULIC MOTOR WITH SIX (6) WIRE NUTS FOR 20-22 GAGE.
- 13 INSTALL WIRE RAP MS3367-4-0, OR MS3367-1-0 TO SECURE WIRE BUNDLES OF EACH CABLE ASSY INSIDE JUNCTION BOX.
- 14 CABLE ASSEMBLY P/N A3143016 (CABLE W-111/112) CONNECTS TO LEFT TIE DOWN LIMIT SWITCH (CONNECTING CABLE W-112) AND TO THE RIGHT TIE DOWN LIMIT SWITCH (CONNECTING CABLE W-111).
- 15 CABLE ASSEMBLY (P/N A3142992) (W-109) STORED IN TOOL BOX (P/N A3142893) IS USED TO CONNECT CABLE W-110 TO THE CONTROL BOX THROUGH THE CO-AX REEL.
- 16 INSTALL HEAT SHRINK TUBING P/N M23053/5-110-0 ITEM #42 ON CABLES W-131 AND W-132 (P/N A3143007 AND A3143008) PRIOR TO INSERTING CABLES INTO JUNCTION BOX.
- 17 INSTALL SPIRAL WRAP P/N A3143988-1 OVER CABLE TO OVERLAP THE BUSHING WITH ONE LOOP OF THE SPIRAL WRAP.
- 18 SHRINK TUBING AFTER INSTALLING CABLE TO CONNECTOR BRACKET. THEN TY-RAP (AT END OF HEAT SHRINK TUBING) WITH MS3367-1-0.
- 19 USE APPROX 13 INCHES OF SPIRAL CABLE WRAP (P/N A3143988-2) TO PROTECT CABLES FROM SHARP CORNERS.
- 20 SIX (6) FEET OF GROUND CABLE (P/N A3143514-2) MUST EXTEND BEYOND THE TOP SURFACE OF THE ROTATOR PLATFORM.

- 21 FOR SYSTEM ELECTRICAL SCHEMATIC SEE FO-1.
- 22 FOR SYSTEM INTERCONNECTING CABLING DIAGRAM SEE FO-2.
- 23 FOR SYSTEM INTERCONNECTING WIRING SEE CABLE TABLE FO-3.
- 24 TERMINATE ACTIVE WIRES W/RING TERMINALS ITEM #58 AND GROUND WIRE WITH ITEM #57.

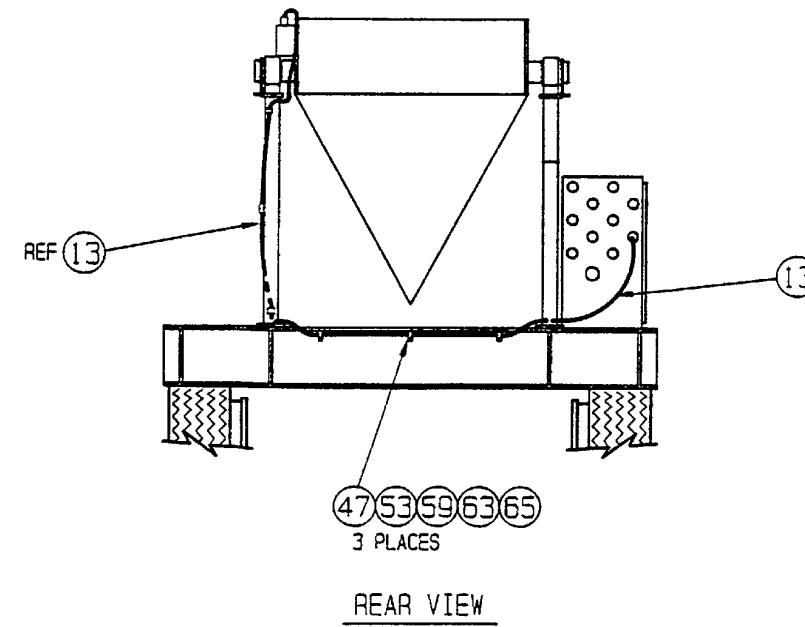




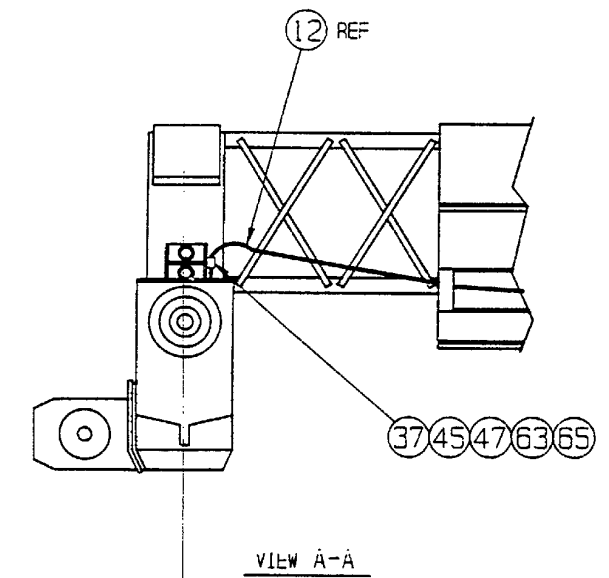
TOP VIEW



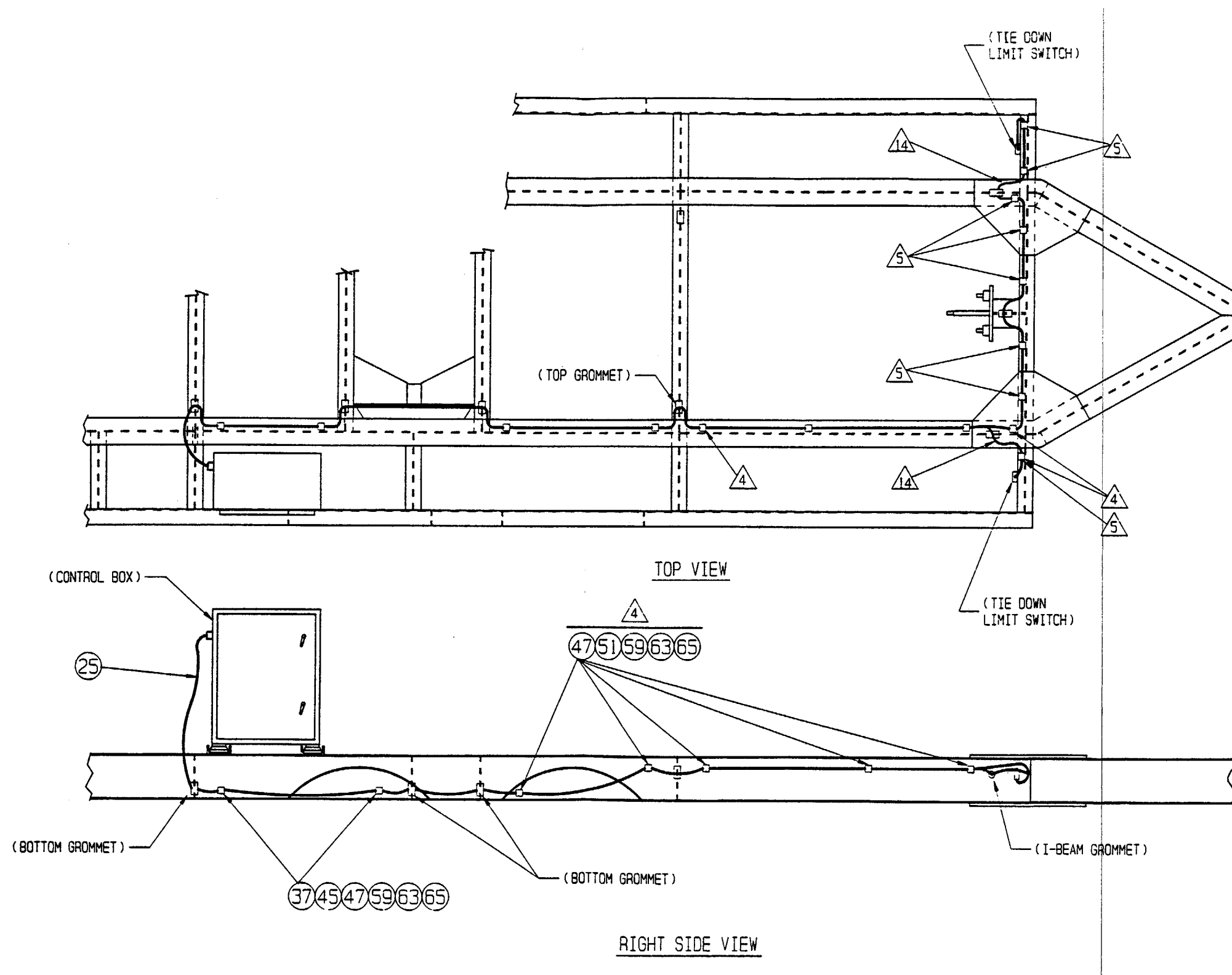
LEFT SIDE VIEW

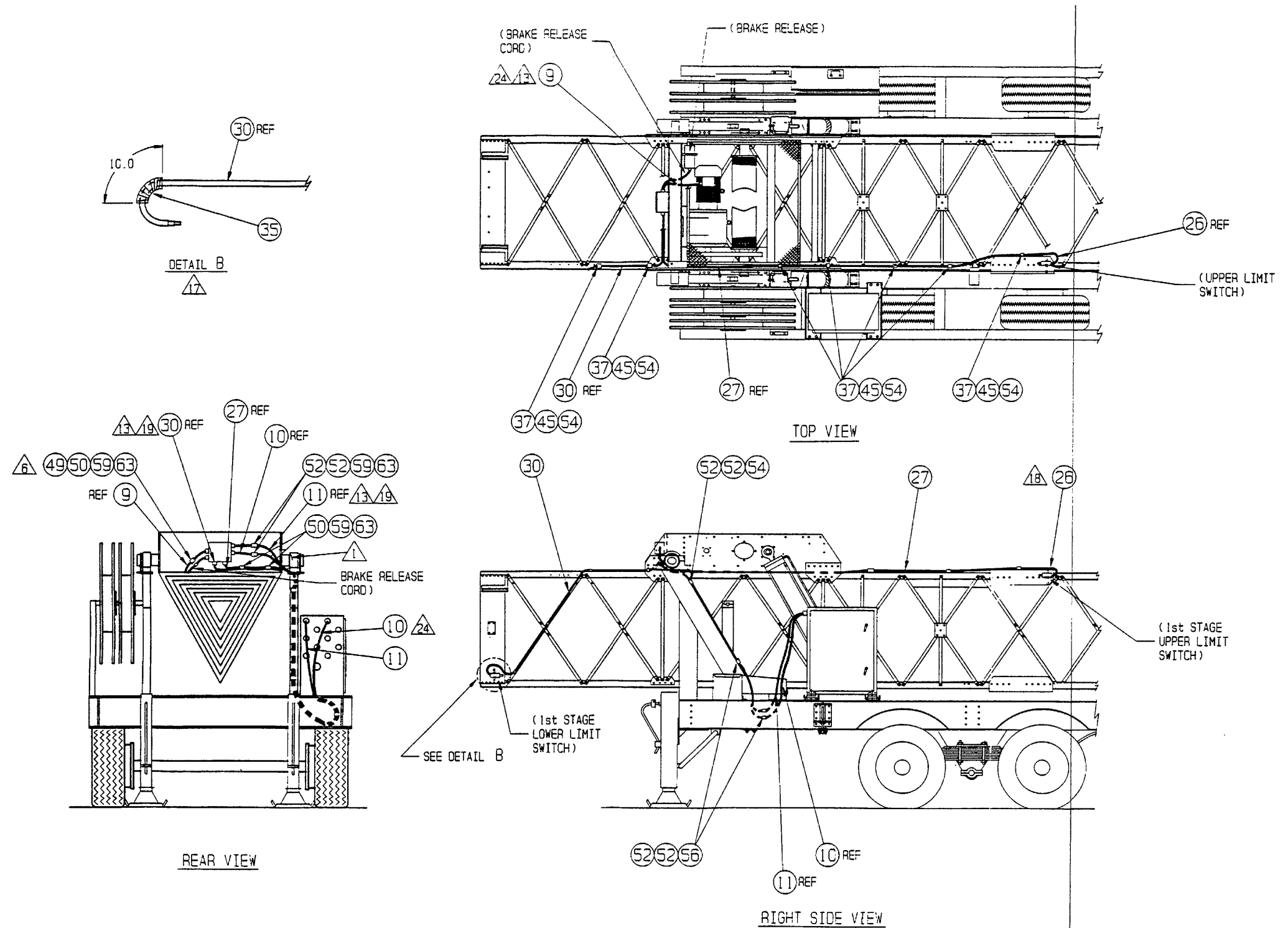


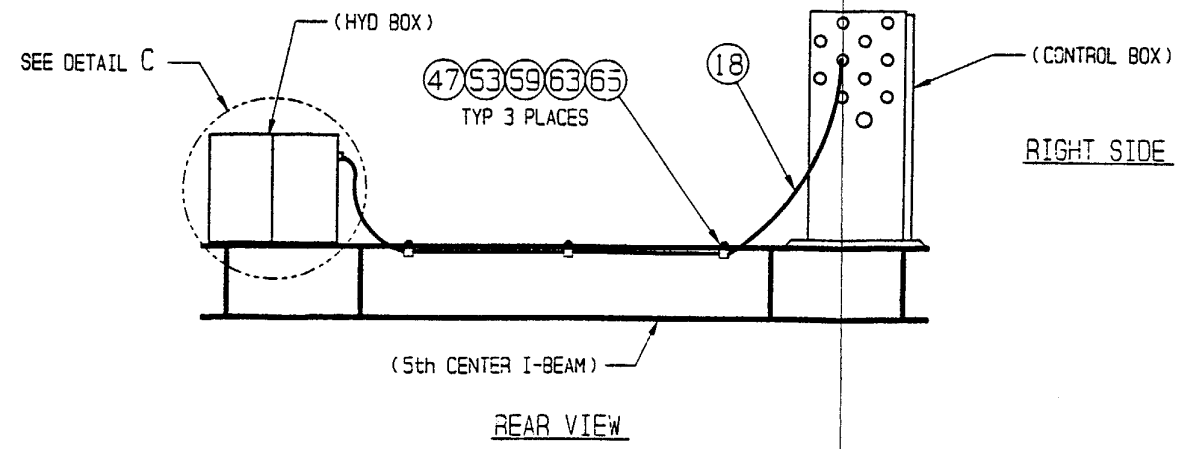
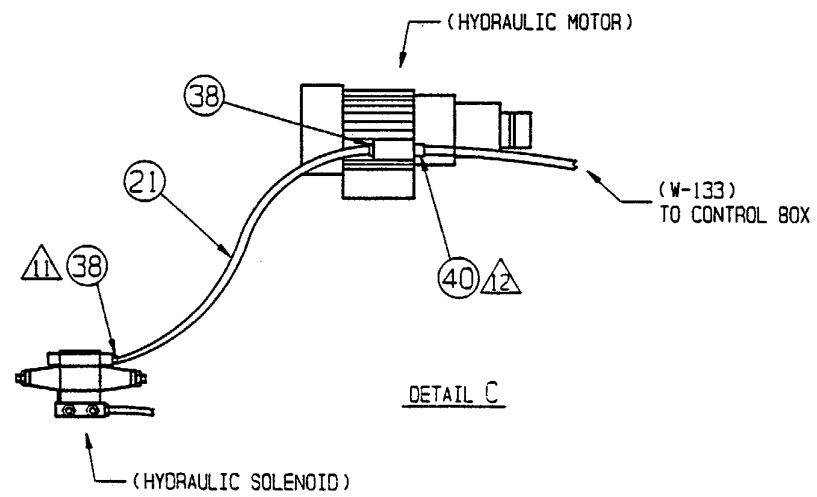
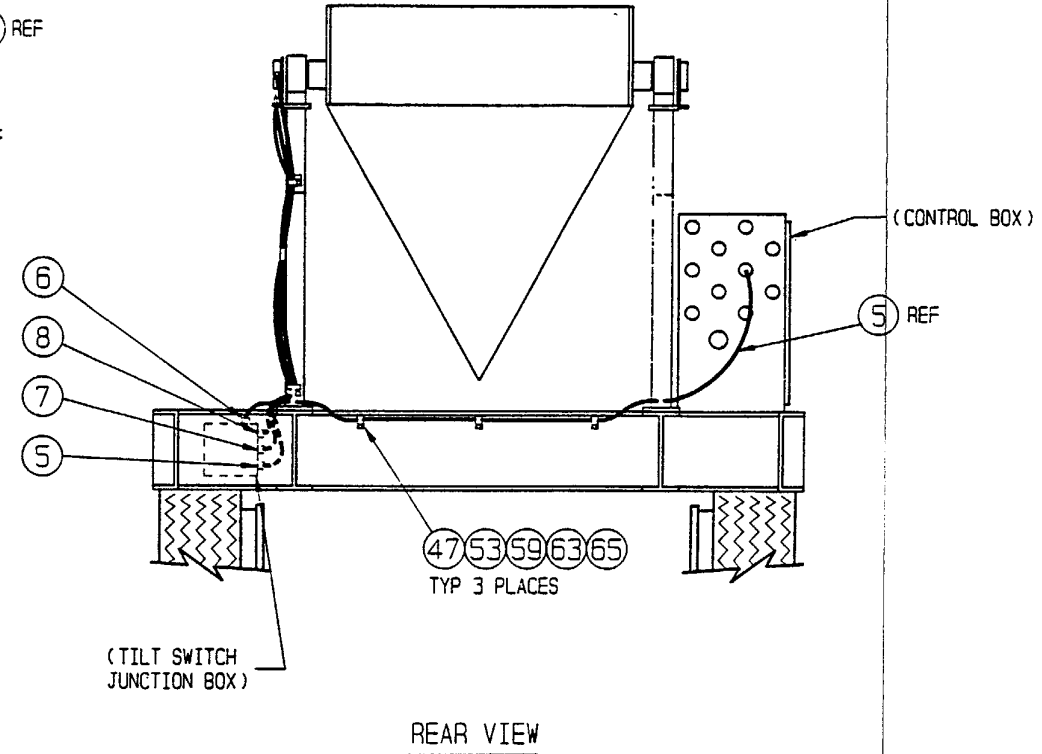
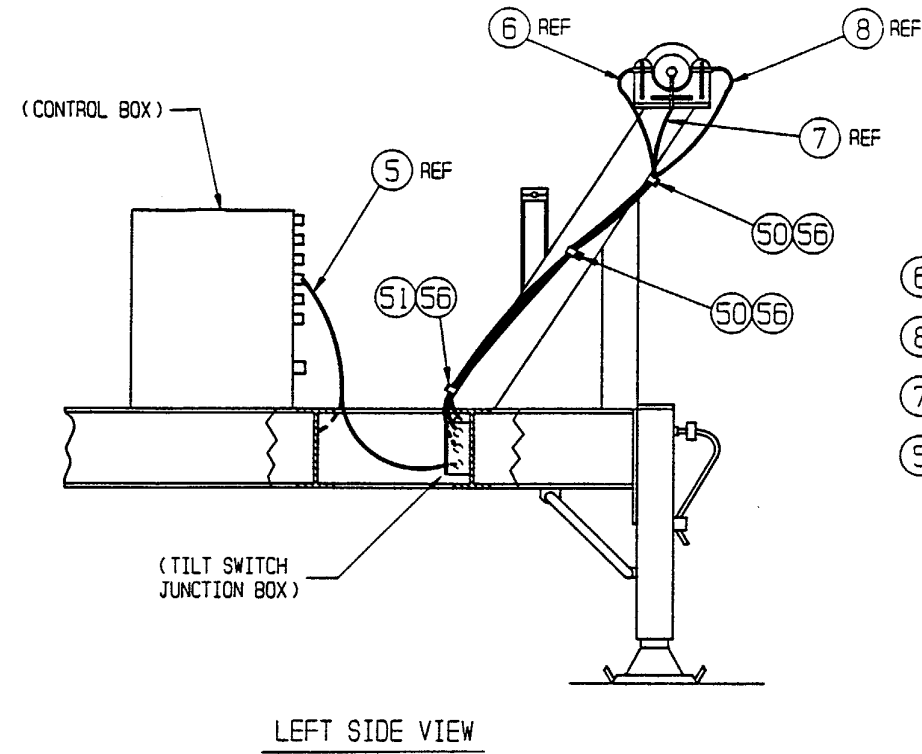
REAR VIEW

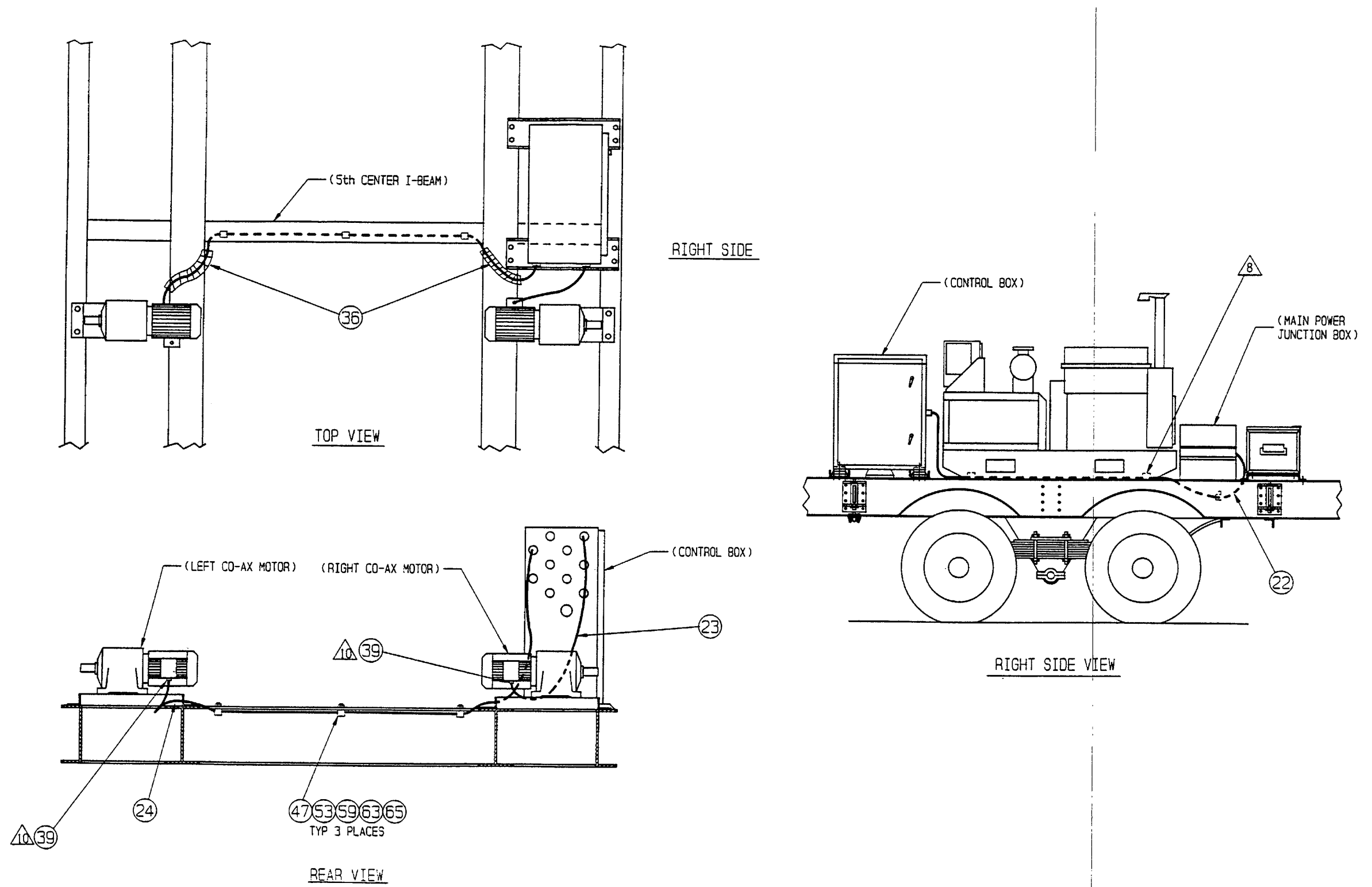


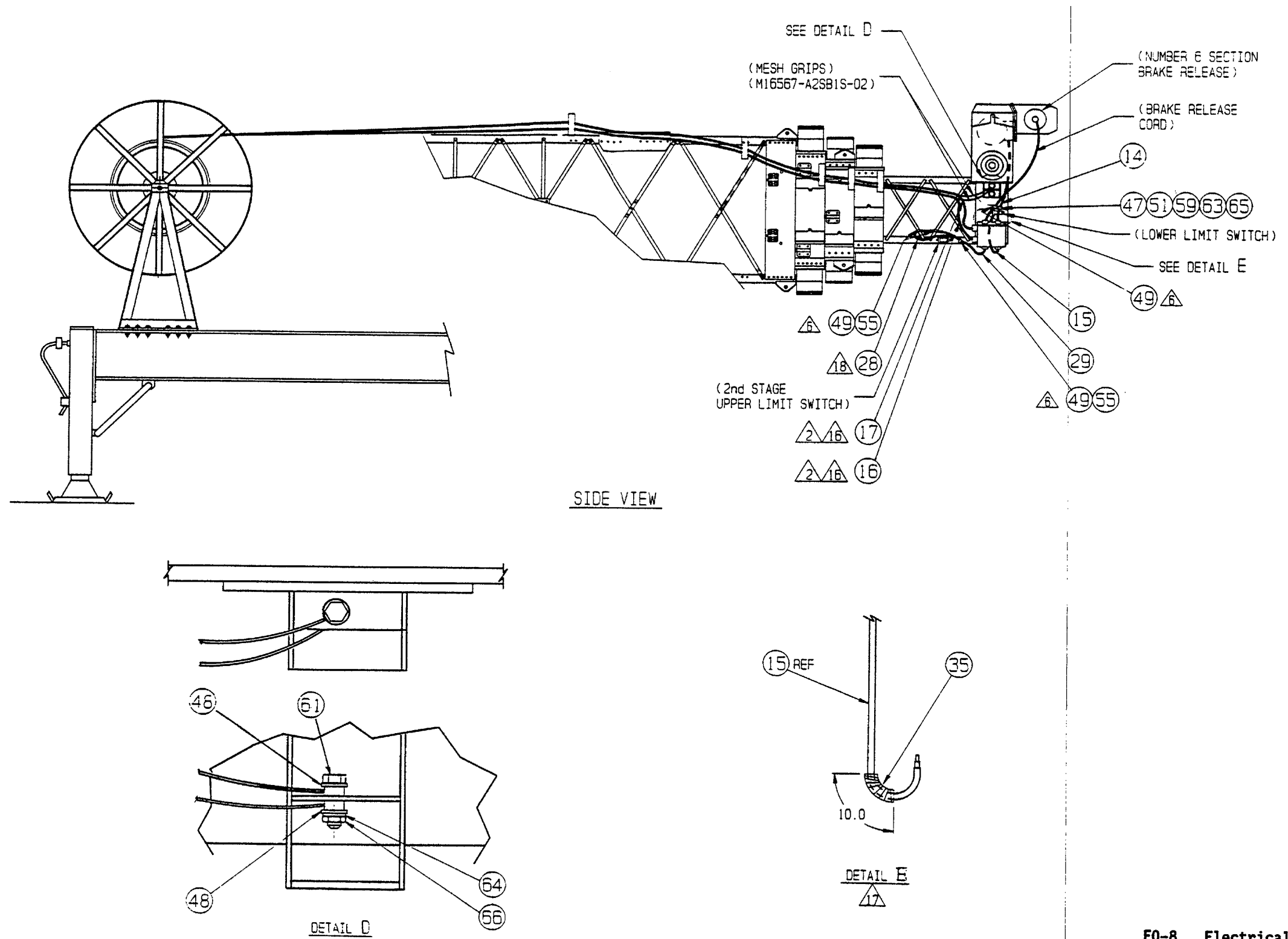
VIEW A-A



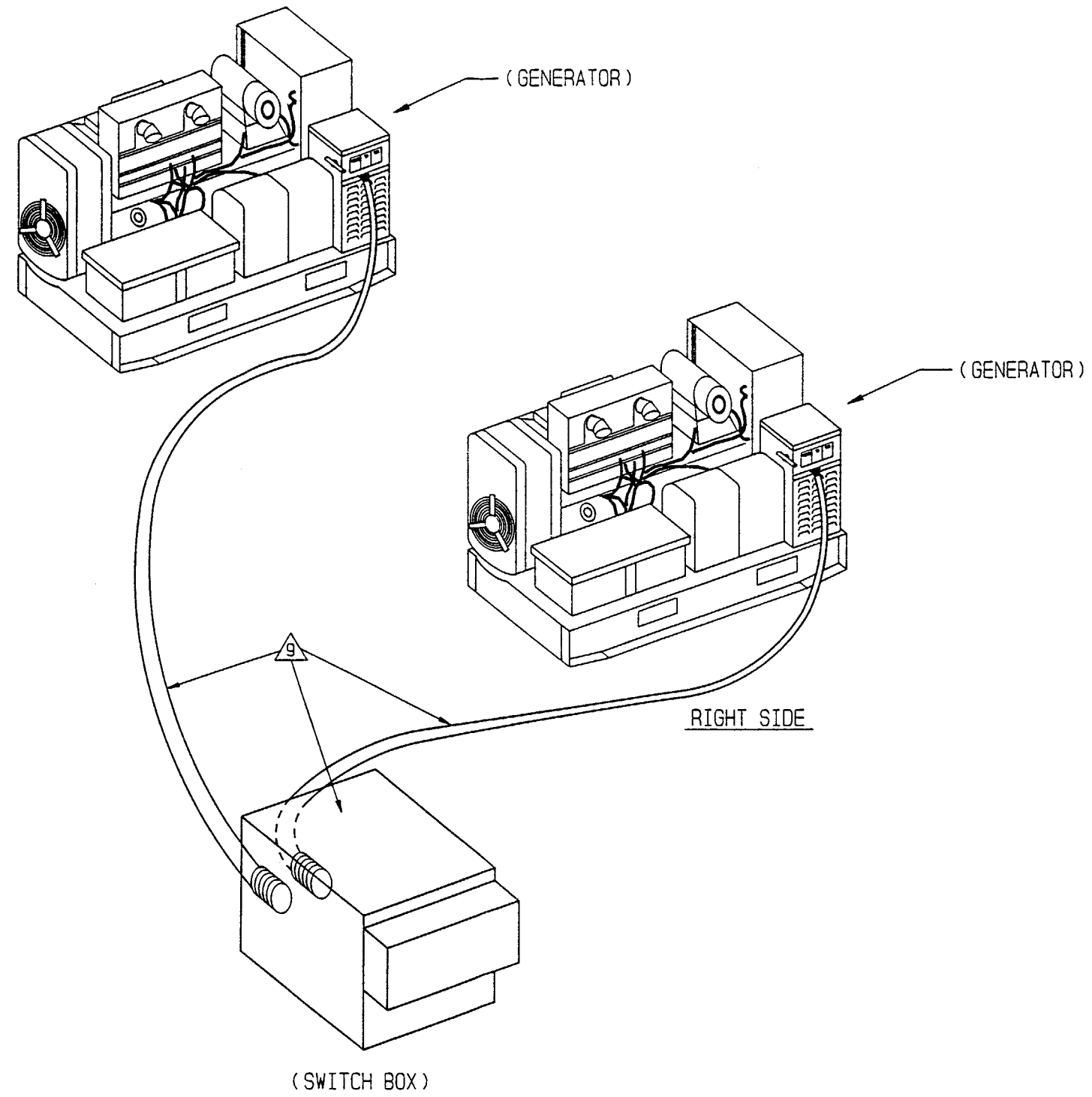


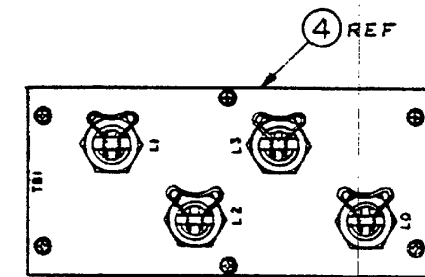
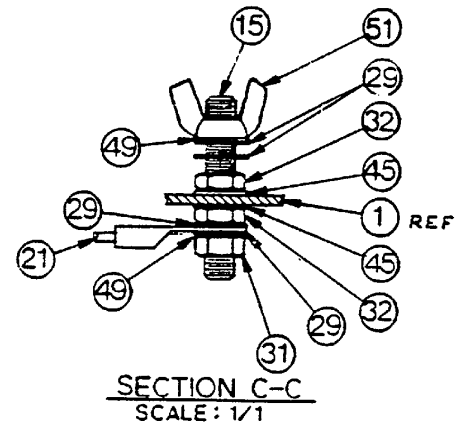
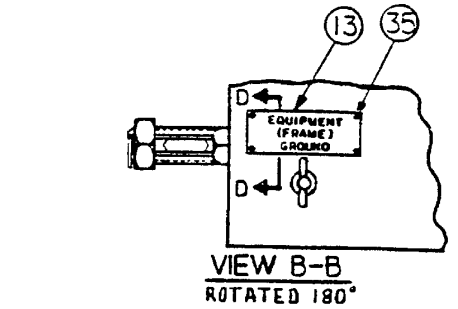
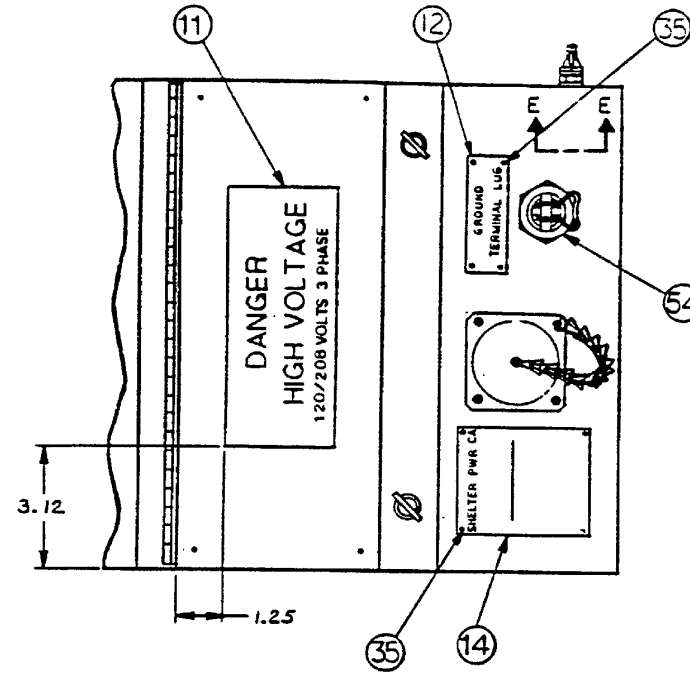
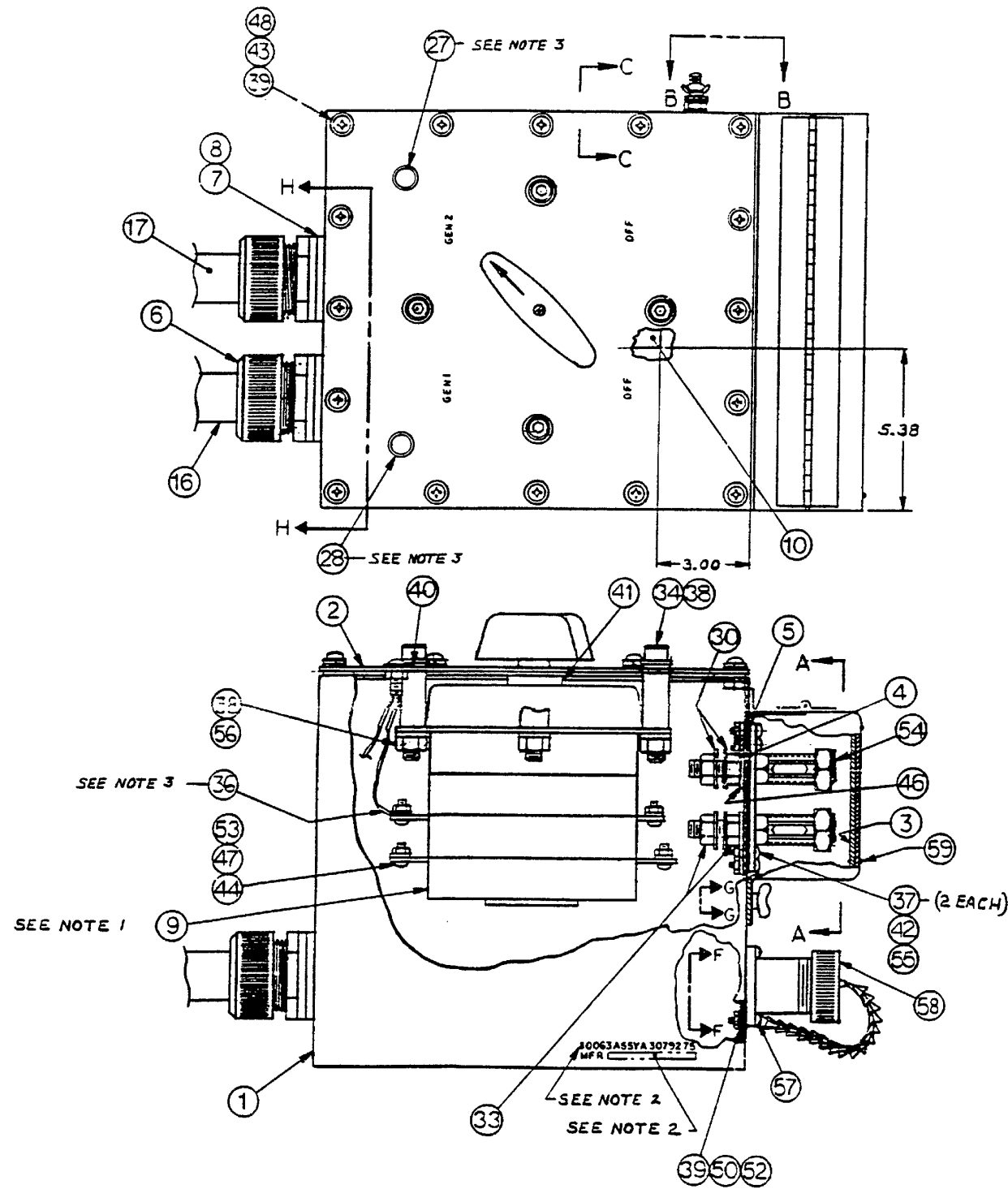






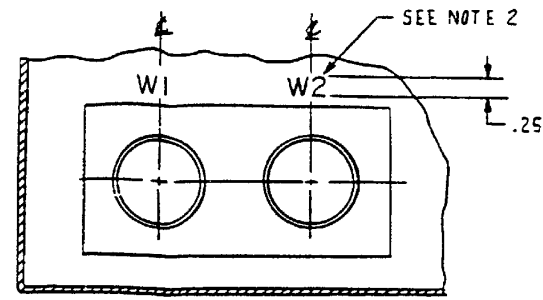
FO-8. Electrical Installation



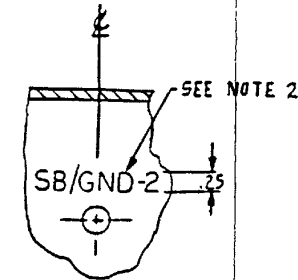


NOTES:

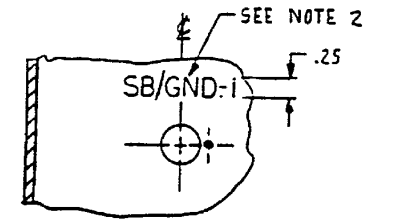
1. SWITCH, FIND NUMBER 9 SHALL BE POSITIONED TO BE COMPATIBLE WITH THE SWITCHING POSITIONS SHOWN ON COVER, FIND 2.
2. MARKINGS SHALL BE STANDARD GOTHIC .12 IN HIGH, BLACK CHARACTERS UNLESS INDICATED OTHERWISE ON DRAWING.
3. AFTER ASSEMBLY OF FIND NO. 27 AND 28 TO FIND NO. 2, SECURELY CRIMP FIND NO. 36 TO WIRE ENDS AS SHOWN.
4. THE COMPLETED SWITCH BOX ASSEMBLY SHALL MEET THE FOLLOWING REQUIREMENTS:
 - A. END TO END CONTINUITY IN BOTH SWITCH POSITIONS.
 - B. DIELECTRIC WITHSTANDING VOLTAGE, WITH NO EVIDENCE OF BREAKDOWN WHEN 500 VOLTS DC IS APPLIED TO BOX.
 - C. INSULATION RESISTANCE OF NOT LESS THAN 100 MEGAOHMS.



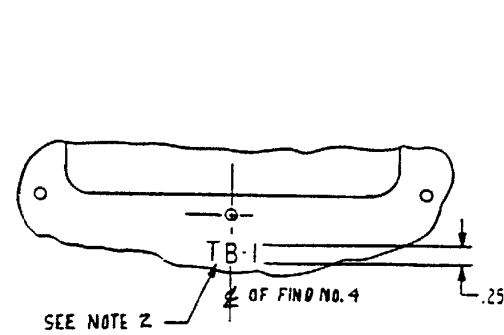
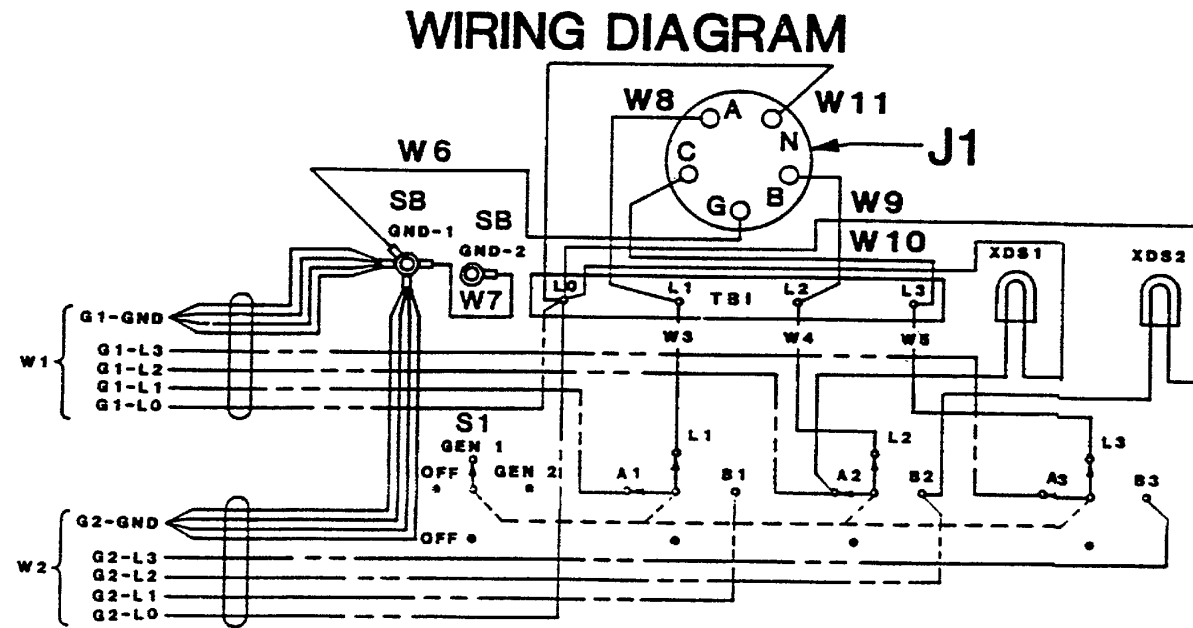
SECTION H-H



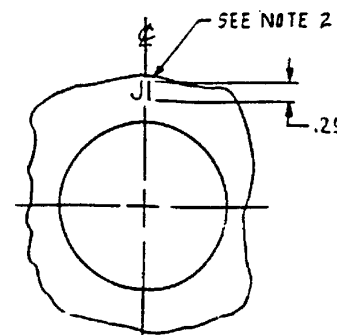
SECTION E-E
GROUND STUD ASSY NOT SHOWN
SCALE: 1/1



SECTION D-D
FIND NO. 54 NOT SHOWN
SCALE: 1/1

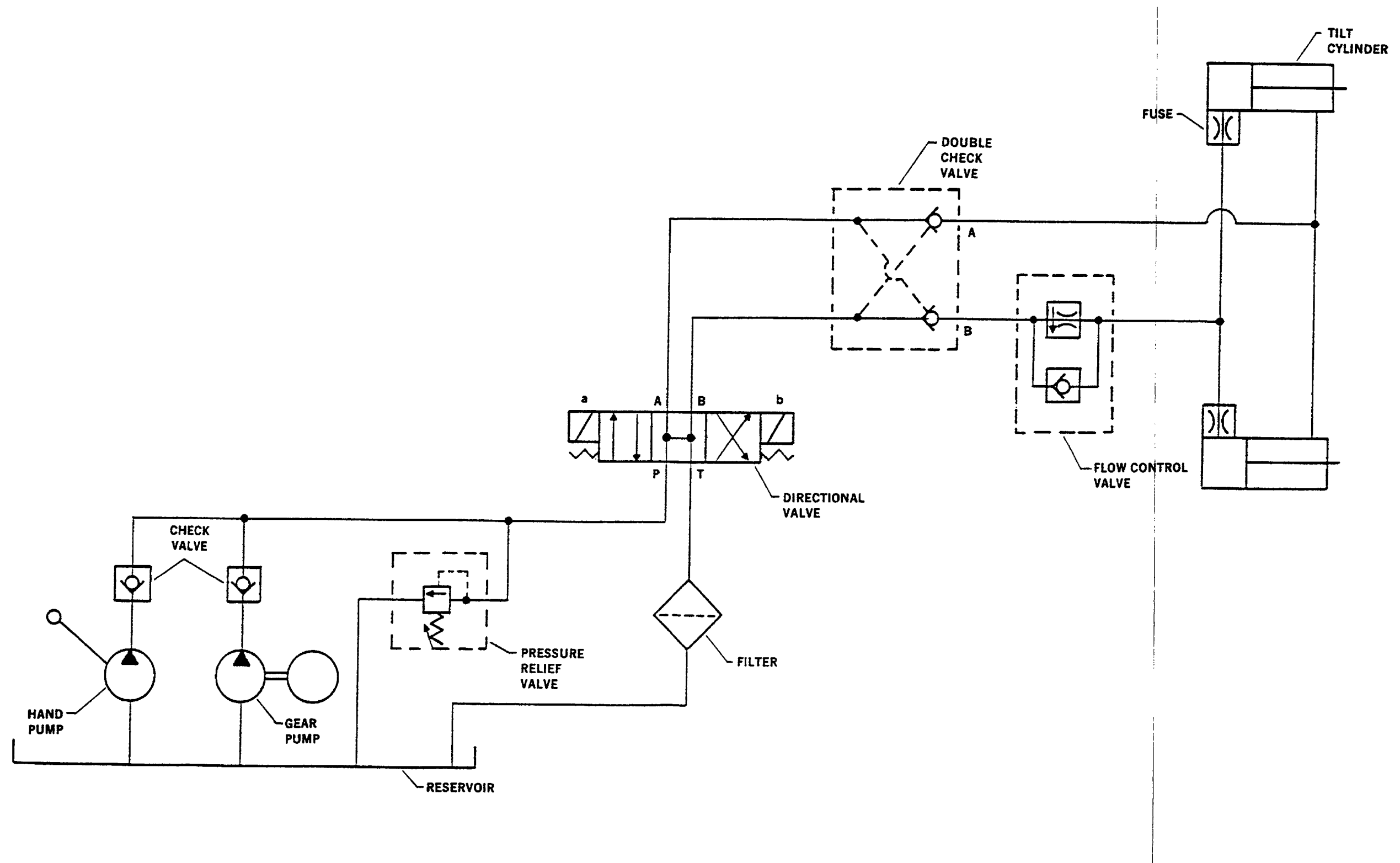


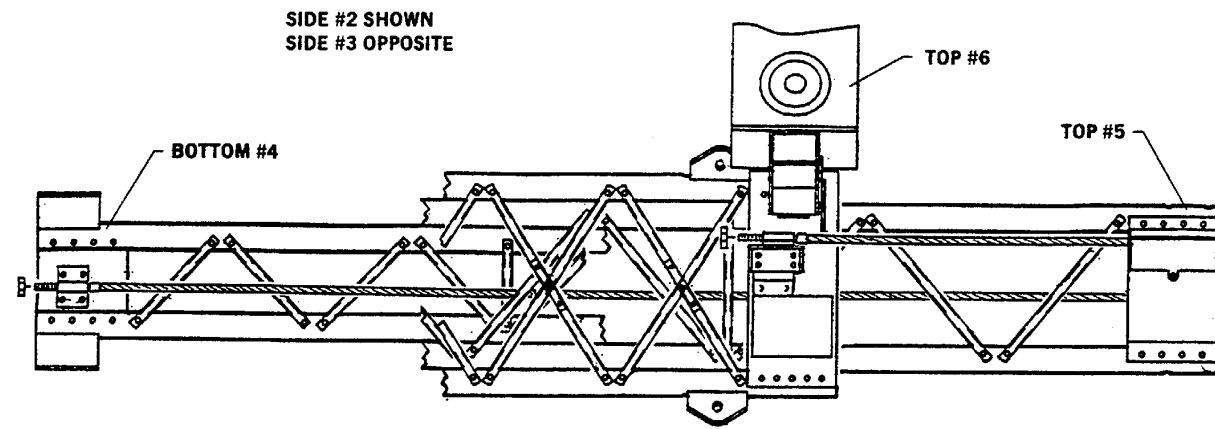
VIEW G-G
FIND NO. 4 NOT SHOWN



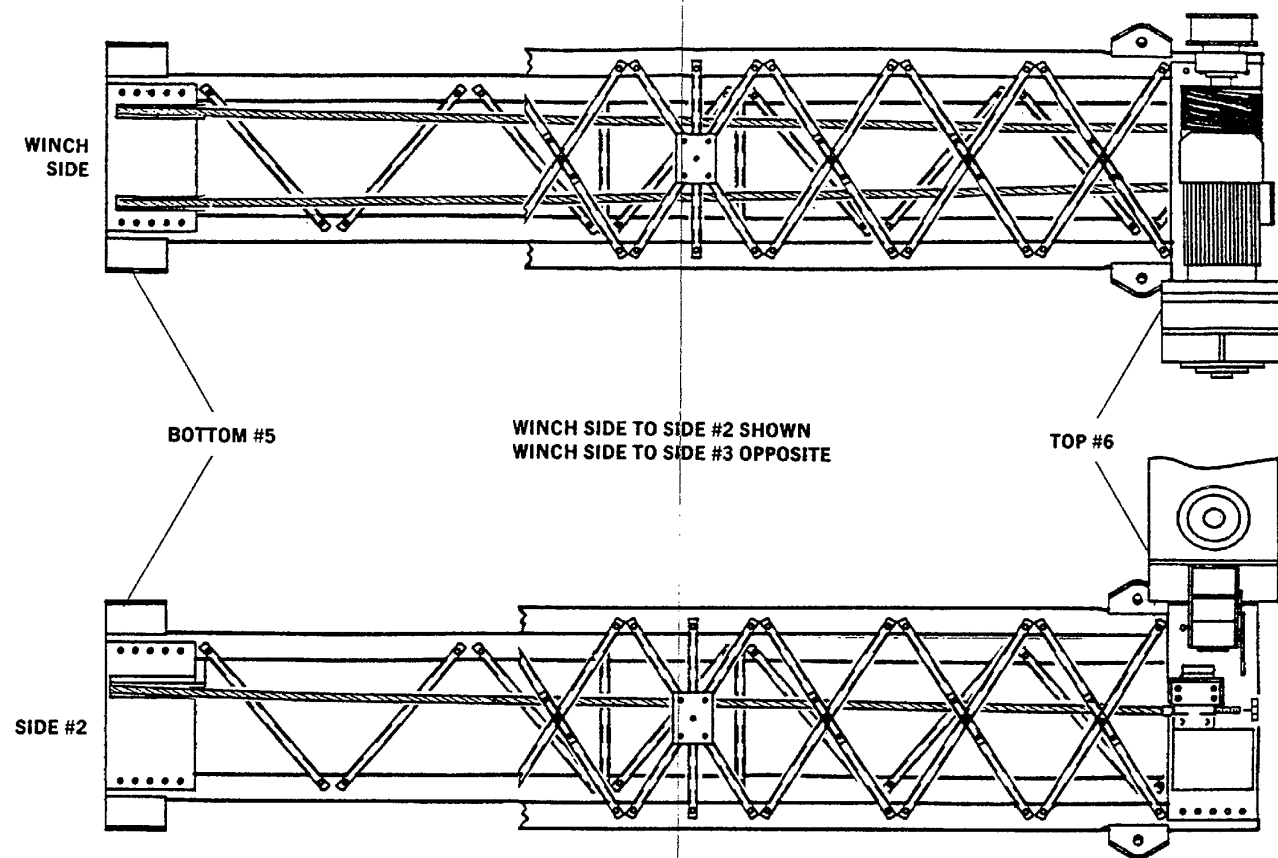
VIEW F-F
FIND NO. 55 NOT SHOWN
SCALE: 1/1

J1	58 REF	MS90555 C32412S	CONNECTOR, RECEPTACLE
SB/GND-2	15 REF	A3079294	STUD
SB/GND-1	54 REF	MS39347-4	TERMINAL POST
XDS2	28 REF	-002	↑
XDS1	27 REF	A3079298-001	WIRE ASSY, INDICATOR LIGHT
W11	26	-005	↑
W10	25	-004	↑
W9	24	-003	↑
W8	23	A3079279-002	↑
W7	22	A3079297-004	↑
W6	21 REF	A3079279-001	↑
W5	20	-003	↑
W4	19	-002	↑
W3	18	A3079297-001	LEAD ASSY, ELECTRICAL
W2	17 REF	-002	↑
W1	16 REF	A3079295-001	CABLE ASSEMBLY
S1	9 REF	A3079289	SWITCH, ROTARY, 200AMP
TB1	4 REF	A3079284	TERMINAL BOARD
DESIGNATION	FIND NO.	PART NO.	DESCRIPTION

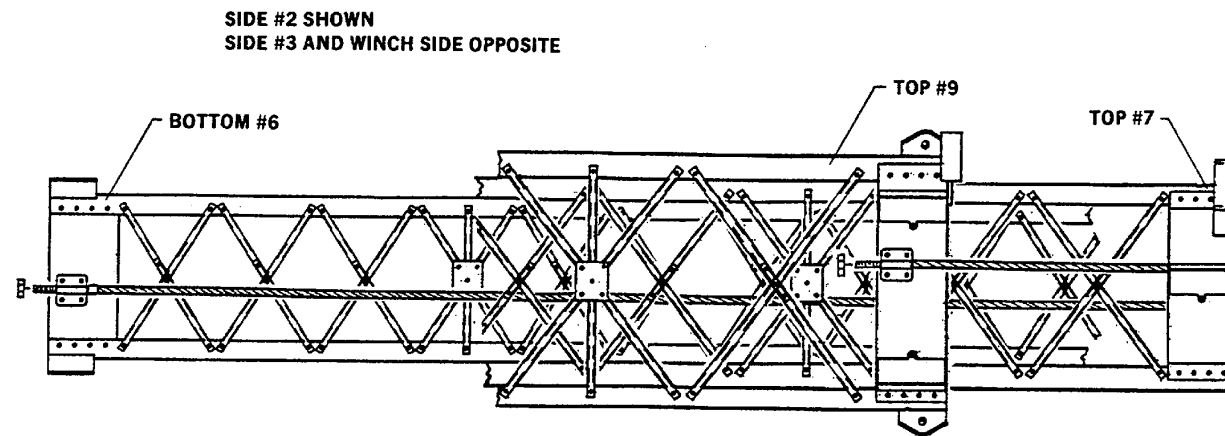




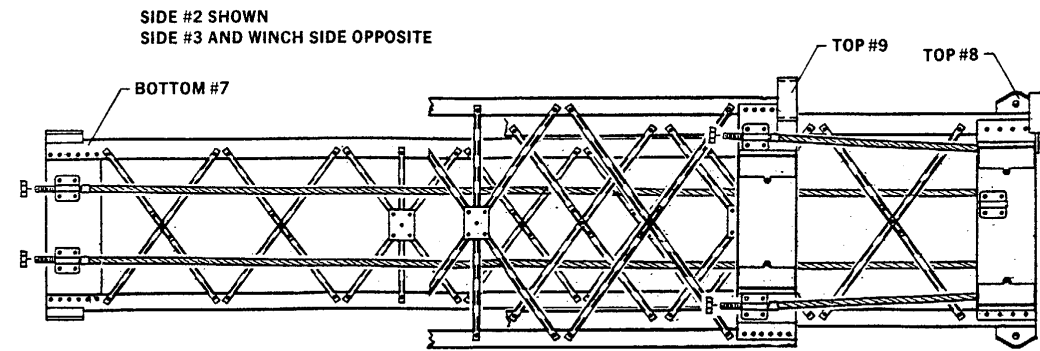
SECTION NO. 4 EXTENSION CABLE ROUTING



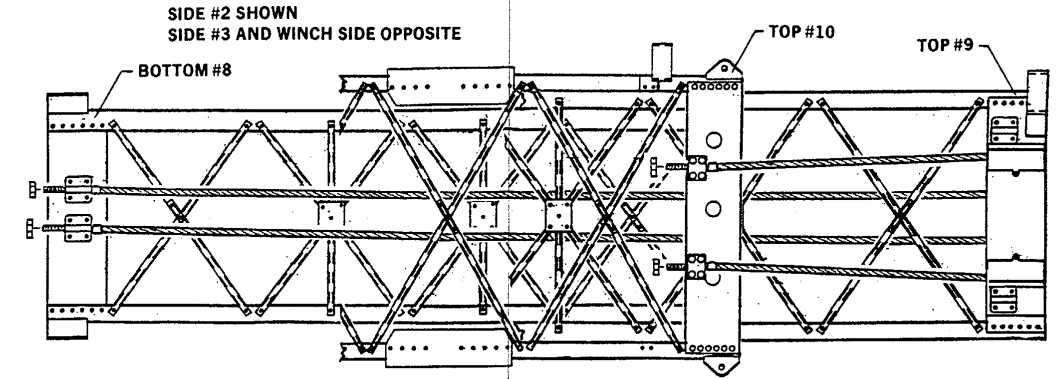
SECTION NO. 5 EXTENSION CABLE ROUTING



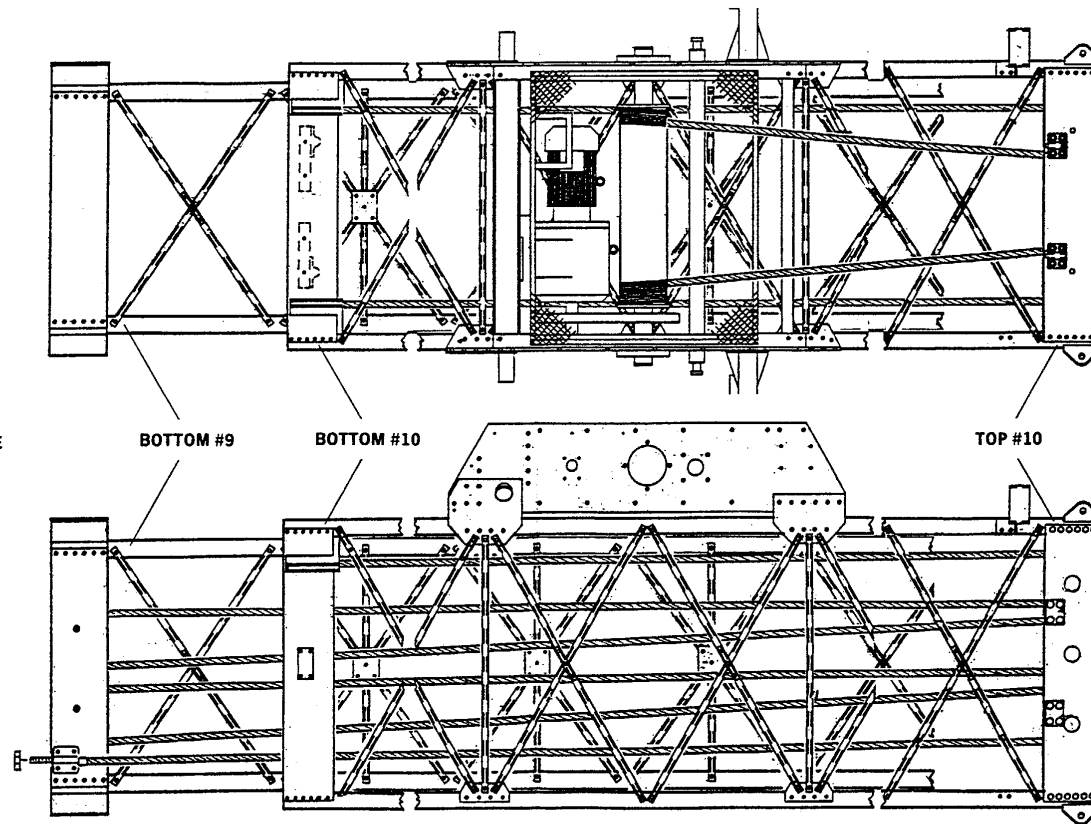
SECTION NO. 6 EXTENSION CABLE ROUTING



SECTION NO. 7 EXTENSION CABLE ROUTING



SECTION NO. 8 EXTENSION CABLE ROUTING



SECTION NO. 9 EXTENSION CABLE ROUTING

