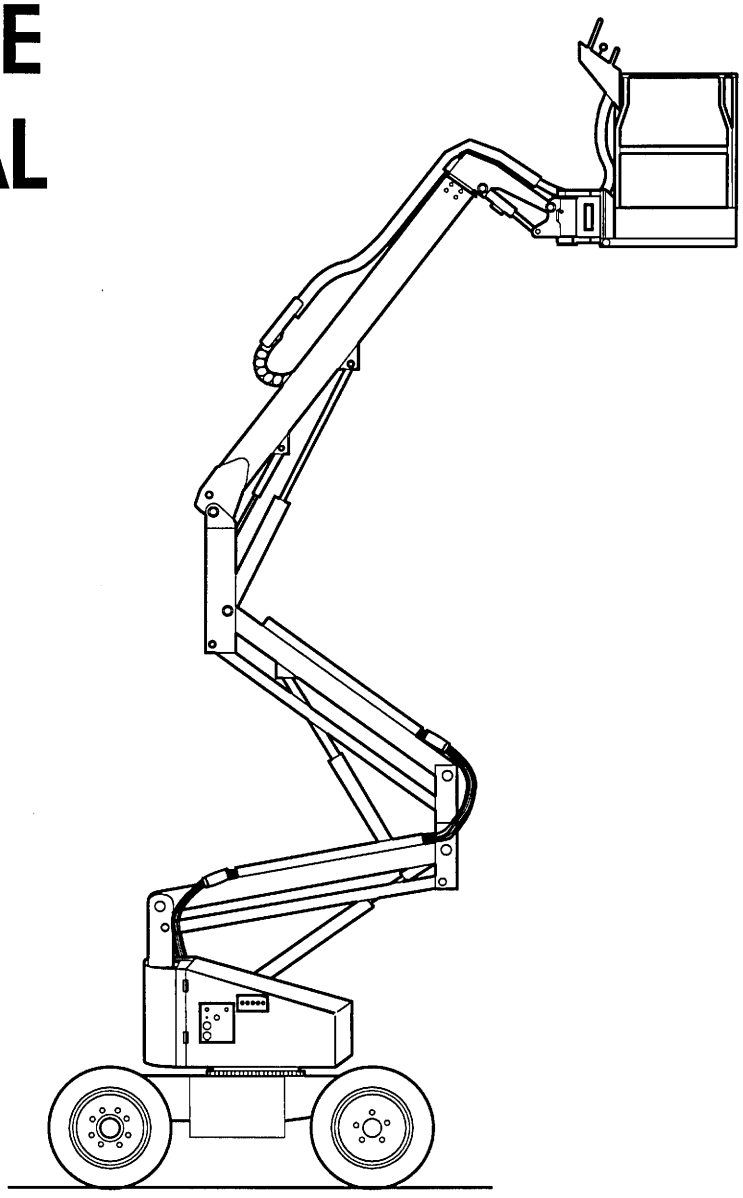
ELECTRIC EAGLE

32/21 S/N DBA 00101 and up

41/24 S/N DDA 00101 and up

SERVICE MANUAL



Part No. 89-410727 • Revision "0.2" dated Aug. 1995 •

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INTRODUCTION

This Service Manual is designed to provide you with the instructions needed to properly maintain the SIMON AERIALS INC. Electric Eagle. When used in conjunction with the Operators and Parts manuals (provided separately) this Service Manual will assist you in making necessary adjustments or repairs.

Simon Aerial mobile platforms are designed and built to provide many years of safe, dependable service. To obtain full benefits from your Electric Eagle, always follow the proper operating and maintenance procedures. Only trained, authorized personnel should be allowed to operate or service this machine. Service personnel should read and study the Operators, Service and Parts Manuals in order to gain a thorough understanding of the unit prior to making any repairs. Exercise all necessary safety precautions when performing maintenance not covered in this manual.

To help you recognize important safety information, we have identified warnings and instructions that directly impact on safety with the following signals:

⚠ DANGER

DANGER INDICATES AN IMMINENTLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, WILL RESULT IN DEATH OR SERIOUS INJURY. THIS SIGNAL WORD IS TO BE LIMITED TO THE MOST EXTREME SITUATIONS

⚠WARNING

WARNING INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY.

⚠ CAUTION

Caution indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. Caution is permitted for property-damage-only accidents.

Service personnel and machine operators must understand and comply with all warnings and instructional decals on the body of the machine, and at the ground controls and platform control console. Do not attempt to make a repair or use a procedure not specified in this manual unless you first ensure that you can do so safely, without the risk of injury to yourself or others.

⚠ DANGER

MODIFICATIONS OF THIS MACHINE FROM THE ORIGINAL DESIGN ARE STRICTLY FORBIDDEN WITHOUT WRITTEN PERMISSION FROM SIMON AERIALS INC. AND WILL VOID ANY REMAINING WARRANTY.

SIMON AERIALS INC. reserves the right to change, improve, modify or expand features of its equipment. Therefore, specifications, models or equipment are subject to change without notice, and without incurring obligations.

All SIMON AERIALS INC. manuals are periodically updated to reflect changes that occur in the equipment. Please contact the factory for information regarding changes which may affect your machine.

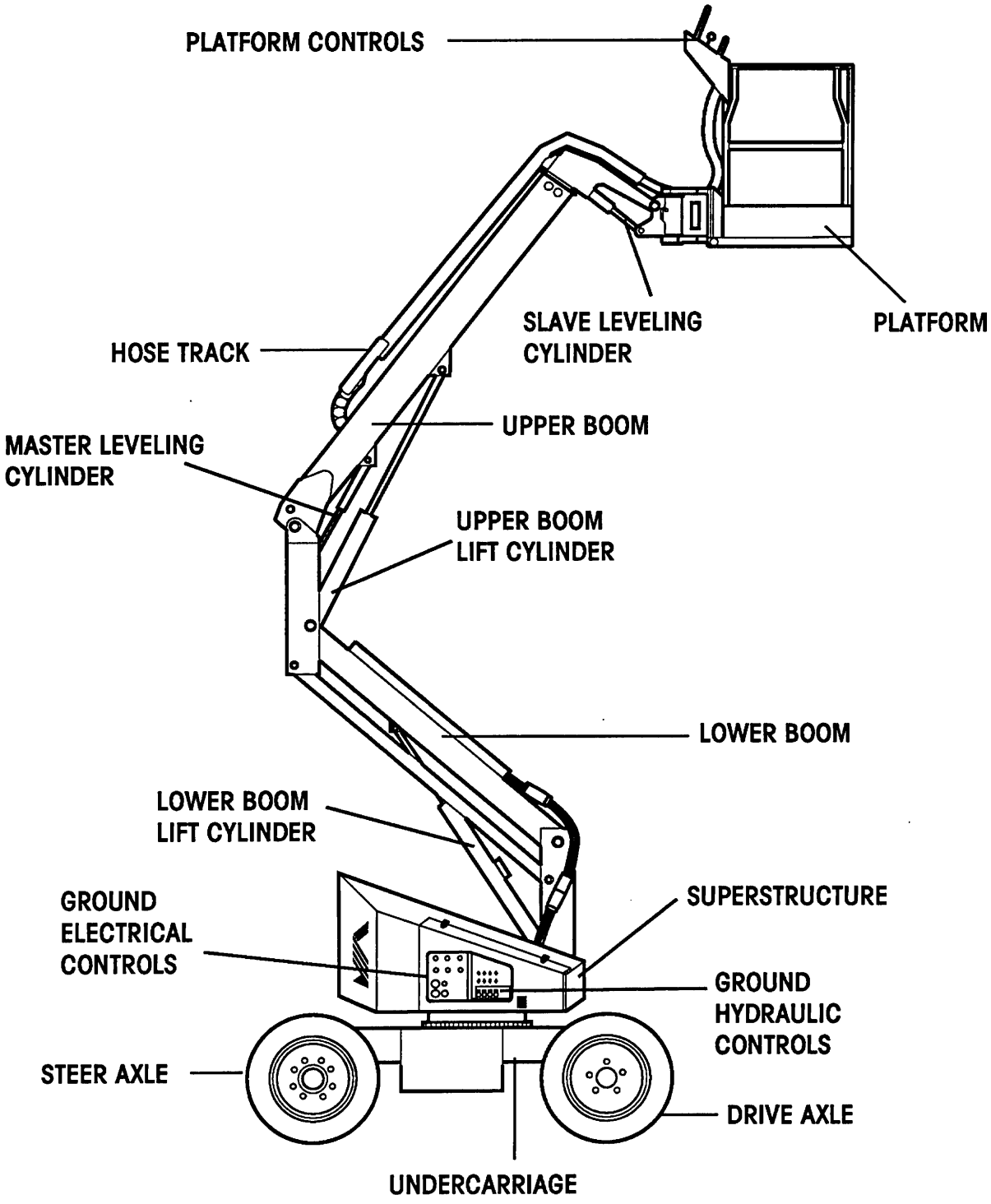
MACHINE SPECIFICATIONS FOR MODEL 32/21

Working Height	**38 Ft/** 11.58 M
Platform Height	**32 Ft/** 9.75 M
Horizontal Outreach	**21 Ft/** 6.40 M
Stowed Length	**15 Ft/** 4.57 M
Stowed Height	**79 In./** 2.01 M
Platform Capacity (unrestricted)	**500 Lbs./** 225 Kg
Platform Dimensions	**48 In. x 30 In./** 1.22 M x 0.76 M
Width	**70 In./** 1.78 M
Wheelbase	**75 In./** 1.91 M
Track	**42 In./** 1.07 M
Outside Turning Radius	**13 Ft 6 In./** 4.11 M
Inside Turning Radius	**6 Ft 1 In./** 1.85 M
Ground Clearance	**7 In./** 0.18 M
Gross Weight (approx.)	**12,500 Lbs./** 5675 Kg
Travel Speed	
Platform Stowed	**3.0 MPH/** 4.8 KPH
Platform Elevated	**0.5 MPH/** 0.8 KPH
Gradeability (on Hard Surface)	**12°/** 21%
Platform Rotation (Standard)	**Fixed**
Platform Rotation (Optional)	**180°**
Superstructure Rotation	**360° Non-Continuous**
Tires	**8.75" X 16.5LT** Load Range D
Tire Pressure	**65 PSI** 4.48 Bar, 4.57 Kg/CM^2
Hydraulic Fluid Capacity	**4 Gal./** 15 Liter
Hydraulic Operating Pressure	**2465 PSI/** 170 Bar
Wheel Lug Nut Torque	**120 Ft Lbs./** 162.7 Nm
Power System	
Electric	**48 Volt DC** (EIGHT 6 Volt, 220 AMP/ Hr. Lead-Acid Batteries)
Charger	**25 Amp Automatic**

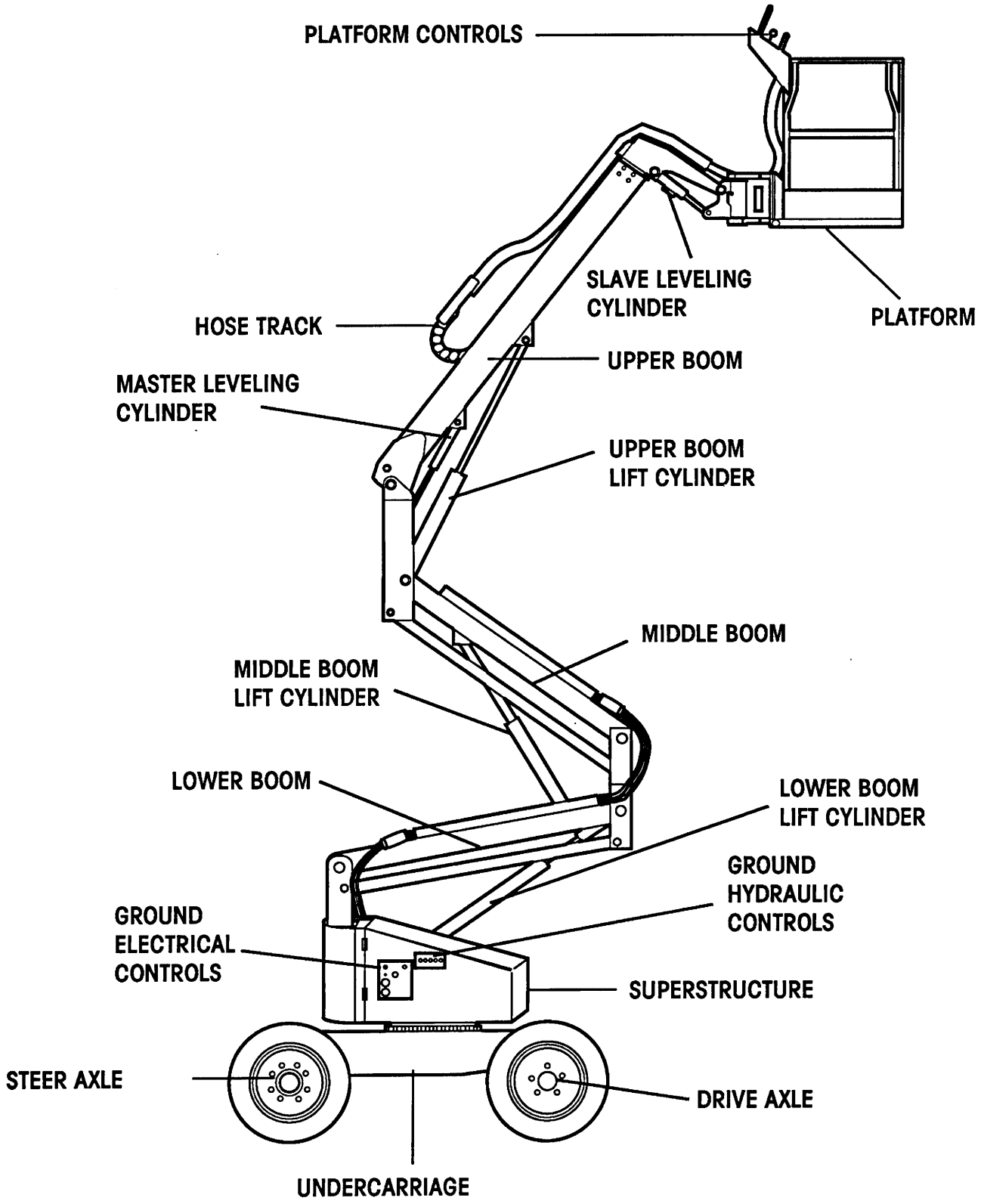
MACHINE SPECIFICATIONS FOR MODEL 41/24

Working Height	**47 Ft/** 14.33 M
Platform Height	**41 Ft/** 9.75 M
Horizontal Outreach	**24 Ft/** 7.32 M
Stowed Length	**17 Ft 6 In./** 5.33 M
Stowed Height	**79 In./** 2.01 M
Platform Capacity (unrestricted)	**500 Lbs./** 225 Kg
Platform Dimensions	**48 In. x 30 In./** 1.22 M x 0.76 M
Width	**70 In./** 1.78 M
Wheelbase	**75 In./** 1.91 M
Track	**42 In./** 1.07 M
Outside Turning Radius	**13 Ft 6 In./** 4.11 M
Inside Turning Radius	**6 Ft 1 In./** 1.85 M
Ground Clearance	**6 In./** 0.15 M
Gross Weight (approx.)	**14,000 Lbs./** 6350 Kg
Travel Speed	
Platform Stowed	**3.0 MPH/** 4.8 KPH
Platform Elevated	**0.5 MPH/** 0.8 KPH
Gradeability (on Hard Surface)	**12°/** 21%
Platform Rotation (Standard)	**Fixed**
Platform Rotation (Optional)	**180°**
Superstructure Rotation	**360° Non-Continuous**
Tires	**8.75" X 16.5LT** Load Range D
Tire Pressure	**Foam Filled**
Hydraulic Fluid Capacity	**4 Gal./** 15 Liter
Hydraulic Operating Pressure	**2465 PSI/** 170 Bar
Wheel Lug Nut Torque	**120 Ft Lbs./** 162.7 Nm
Power System	
Electric	**48 Volt DC** (EIGHT 6 Volt, 220 AMP/ Hr. Lead-Acid Batteries)
Charger	**25 Amp Automatic**

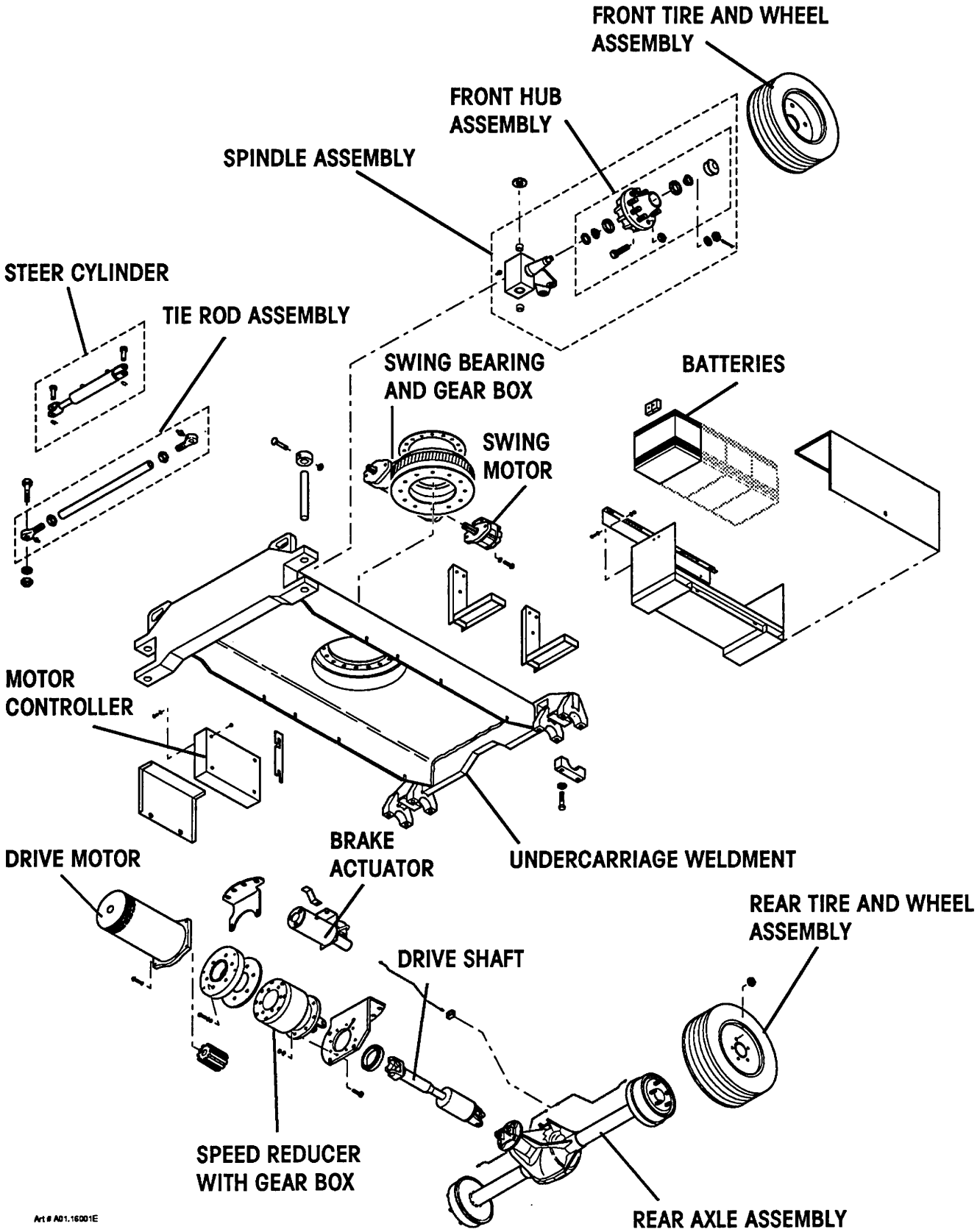
PRIMARY MACHINE COMPONENTS FOR MODEL 32/21



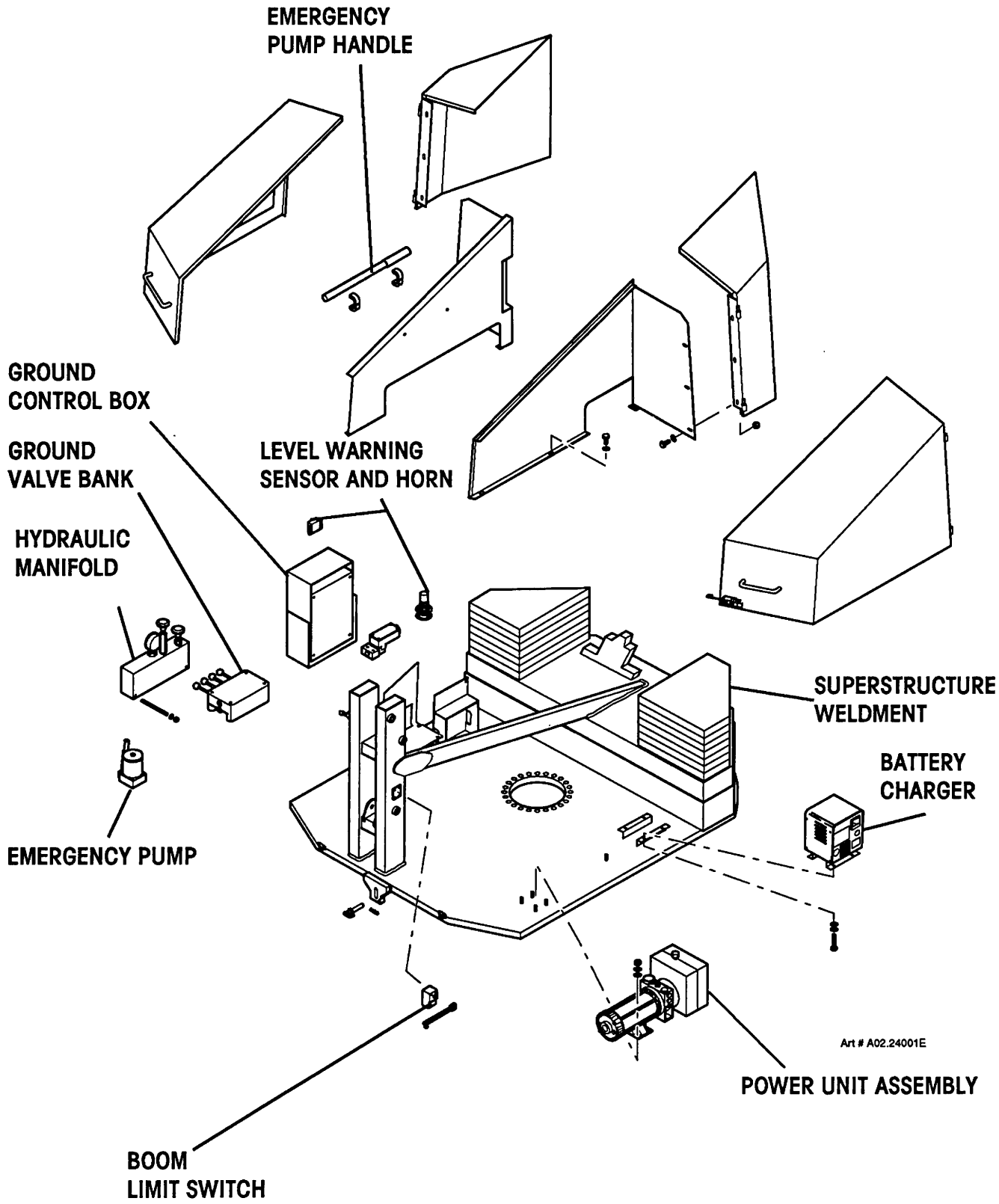
PRIMARY MACHINE COMPONENTS FOR MODEL 42/24



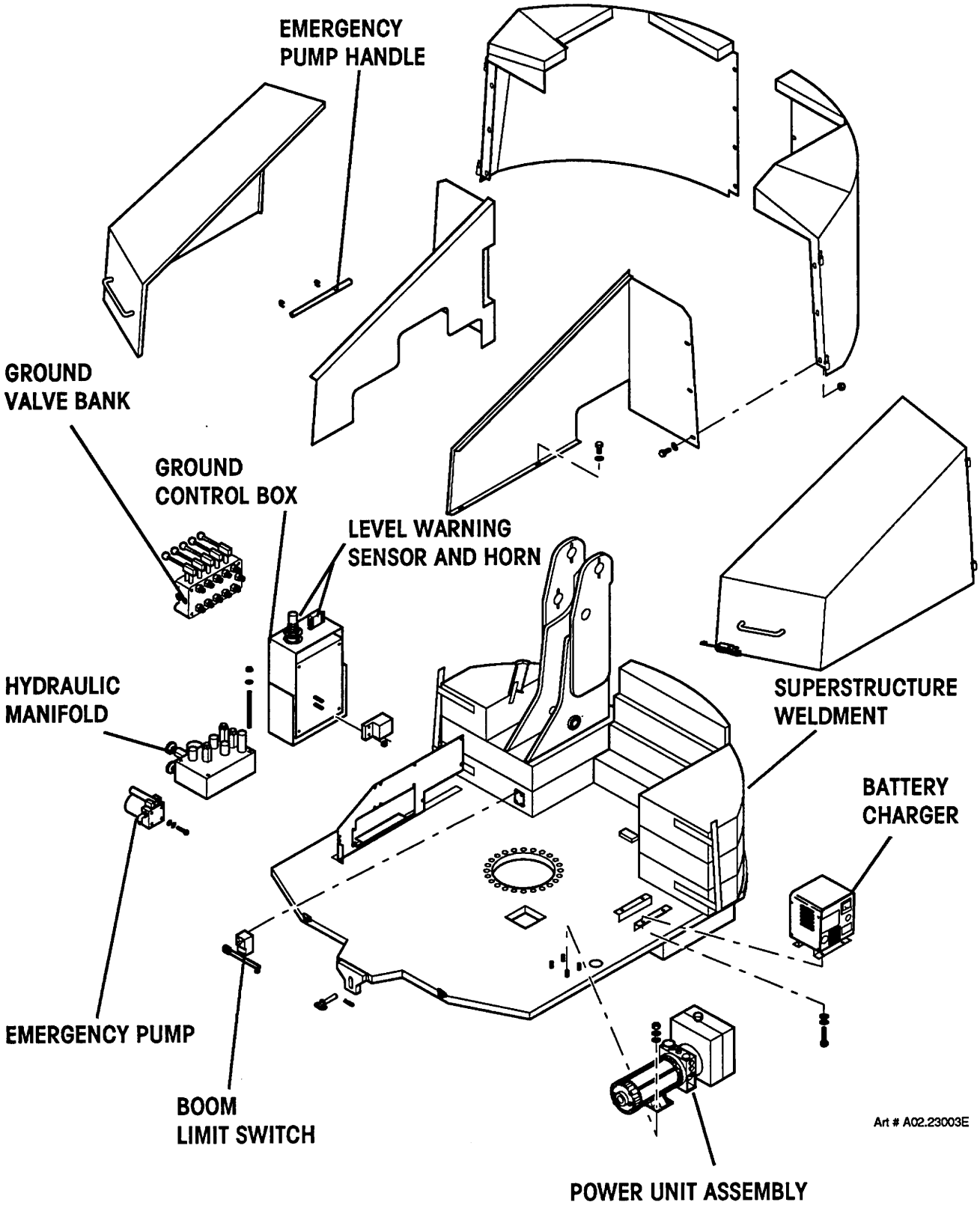
UNDERCARRIAGE COMPONENTS



SUPERSTRUCTURE COMPONENTS FOR MODEL 32/21



SUPERSTRUCTURE COMPONENTS FOR MODEL 42/24



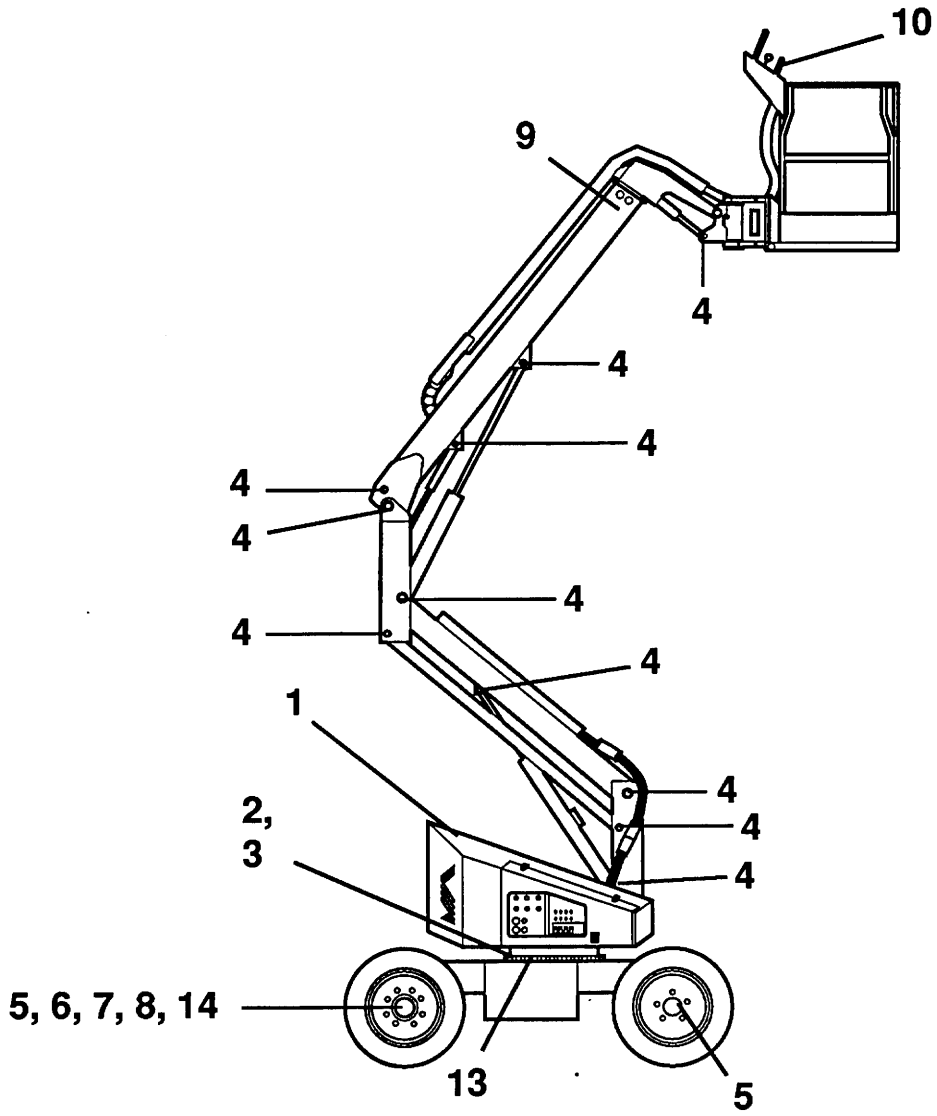
LUBRICATION CHART FOR MODEL 32/21

NO.	ITEM	SPECIFICATION AND QUANTITY	FREQUENCY OF LUBRICATION
1.	Hydraulic reservoir	Mobil DTE-15 to "Full" mark with booms down and retracted.	Check daily, Analyze every 6 months or 500 hrs.*†, Change yearly or every 1,000 hrs.*†
2.	Swing bearing	Lubriplate. #630-2. Purge old grease.	Monthly or every 100 hrs.*†
3.	Swing bearing gear teeth	Lithium N.L.G.I. #2 EP. Grease or Dri-Lube (Molykote 321 R).	Every 6 months or 500 hrs.*
4.	Boom pivot pins and Cylinder mounting pins	Lithium N.L.G.I. #2 EP. (Purge old grease)	Monthly or every 100 hrs.*
5.	Wheel bearings	Lubriplate #630-2. Clean and repack.	Yearly or every 1,000 hrs.*
6.	Steering spindles	Lithium N.L.G.I. #2 EP. Clean and repack.	Monthly or every 100 hrs.*
7.	Steering linkage	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hrs.*†
8.	Steering tie rod ends	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hrs.*†
9.	Boom wear pads	Silicone spray.	Monthly or every 100 hrs.*†
10.	Control valve handle pivot pins	WD 40 Spray or equivalent penetrating oil.	Monthly or every 100 hrs.*
11.	Drive brake chamber	Hydraulic fluid 3 oz. (88.7 cc).	Check monthly. Change every 6 months.
12.	Drive gear reducer	EP-90W 14 oz. (414 cc).	Check monthly. Change every 6 months.
13.	Wheel brake reservoir	Brake Fluid DOT 3 Fill to line	Check monthly. Change yearly.
14.	Differential	EP-90W (To fill plug).	Check monthly. Change every 6 months.

* Whichever occurs first.

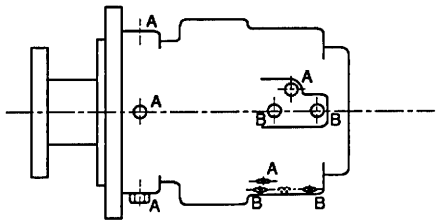
† Different requirements for severe duty applications. See check lists.

LUBRICATION DIAGRAM FOR MODEL 32/21



Use any hole marked "A" to fill the Gearbox.
Use 90W Oil only. 14 oz. (414 cc) for complete fill.

Use any hole marked "B" to fill the Brake chamber.
Use Hydraulic fluid only. 3 oz. (88.7 cc) for complete fill.



Drive Gearbox/ Brake Assembly.
View from top as installed in unit.

Drive Gear Box/ Brake Assembly

11, 12

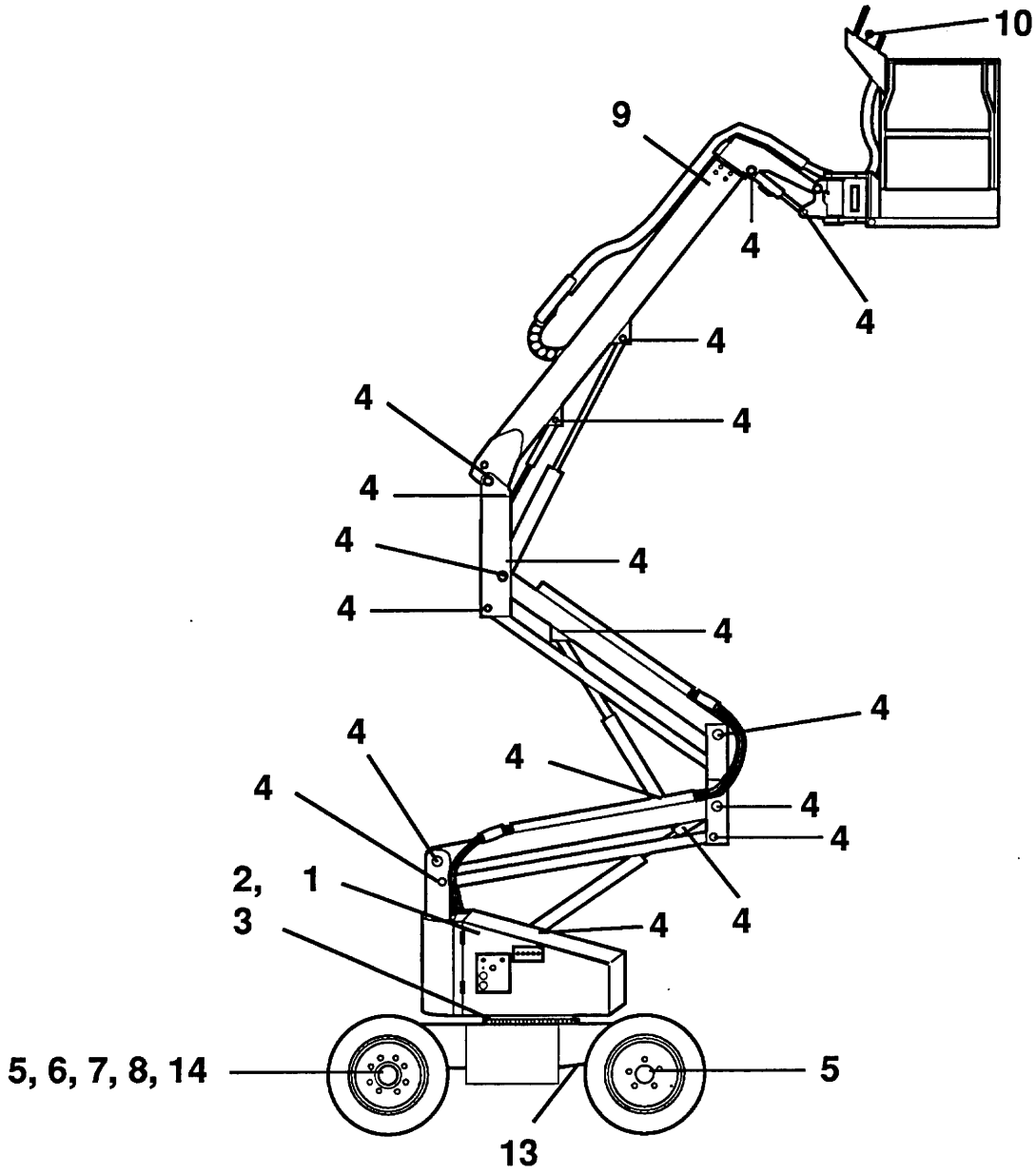
LUBRICATION CHART FOR MODEL 41/24

NO.	ITEM	SPECIFICATION AND QUANTITY	FREQUENCY OF LUBRICATION
1.	Hydraulic reservoir	Mobil DTE-15 to "Full" mark with booms down and retracted.	Check daily, Analyze every 6 months or 500 hrs.*†, Change yearly or every 1,000 hrs.*†
2.	Swing bearing	Lubriplate. #630-2. Purge old grease.	Monthly or every 100 hrs.*†
3.	Swing bearing gear teeth	Lithium N.L.G.I. #2 EP. Grease or Dri-Lube (Molykote 321 R).	Every 6 months or 500 hrs.*
4.	Boom pivot pins and Cylinder mounting pins	Lithium N.L.G.I. #2 EP. (Purge old grease)	Monthly or every 100 hrs.*
5.	Wheel bearings	Lubriplate #630-2. Clean and repack.	Yearly or every 1,000 hrs.*
6.	Steering spindles	Lithium N.L.G.I. #2 EP. Clean and repack.	Monthly or every 100 hrs.*
7.	Steering linkage	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hrs.*†
8.	Steering tie rod ends	Lithium N.L.G.I. #2 EP. Purge old grease.	Monthly or every 100 hrs.*†
9.	Boom wear pads	Silicone spray.	Monthly or every 100 hrs.*†
10.	Control valve handle pivot pins	WD 40 Spray or equivalent penetrating oil.	Monthly or every 100 hrs.*
11.	Drive brake chamber	Hydraulic fluid 3 oz. (88.7 cc).	Check monthly. Change every 6 months.
12.	Drive gear reducer	EP-90W 14 oz. (414 cc).	Check monthly. Change every 6 months.
13.	Wheel brake reservoir	Brake Fluid DOT 3 Fill to line	Check monthly. Change yearly.
14.	Differential	EP-90W (To fill plug).	Check monthly. Change every 6 months.

* Whichever occurs first.

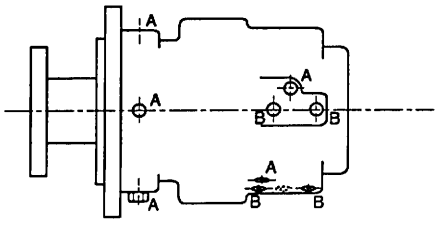
† Different requirements for severe duty applications. See check lists.

LUBRICATION DIAGRAM FOR MODEL 41/24



Use any hole marked "A" to fill the Gearbox.
Use 90W Oil only. 14 oz. (414 cc) for complete fill.

Use any hole marked "B" to fill the Brake chamber.
Use Hydraulic fluid only. 3 oz. (88.7 cc) for complete fill.



Drive Gearbox/ Brake Assembly.
View from top as installed in unit.

Drive Gear Box/ Brake Assembly

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SECTION 1:
TRANSPORTATION
AND
EMERGENCY PROCEDURES

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SECTION 1:

TRANSPORTATION AND EMERGENCY PROCEDURES

Transporting the Unit
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Loading the Unit 1-3
Emergency System and Procedures
Emergency Hand Pump 1-7
Emergency Towing Function 1-7
Emergency Procedures 1-8

TRANSPORTING THE UNIT

UNLOADING THE UNIT

- Inspect the outside of the unit for damage (including the underside). Inspect all hoses, boom sections and cables for chafing or road damage. Confirm that all wheel lug nuts and swing bearing bolts are tight.
- Remove the pin that locks the superstructure to the undercarriage. Stow the lock pin in the location provided.
- Unlock and open both side compartments. Inspect all, electrical and hydraulic connections for damage and security.
- Connect battery cable to battery if required. Check electrolyte level.
- Check fluid level using the dipstick on top of the hydraulic tank, and add fluid as required (see Lubrication Chart).
- Attach the unit to a winch for the unloading procedure.

⚠ CAUTION

Always attach the unit to a winch when loading or unloading from a truck or trailer. We do not recommend unassisted loading or unloading of any mobile platform.

Read and understand all safety, control and operating information found on the machine and in this manual before operating the unit.

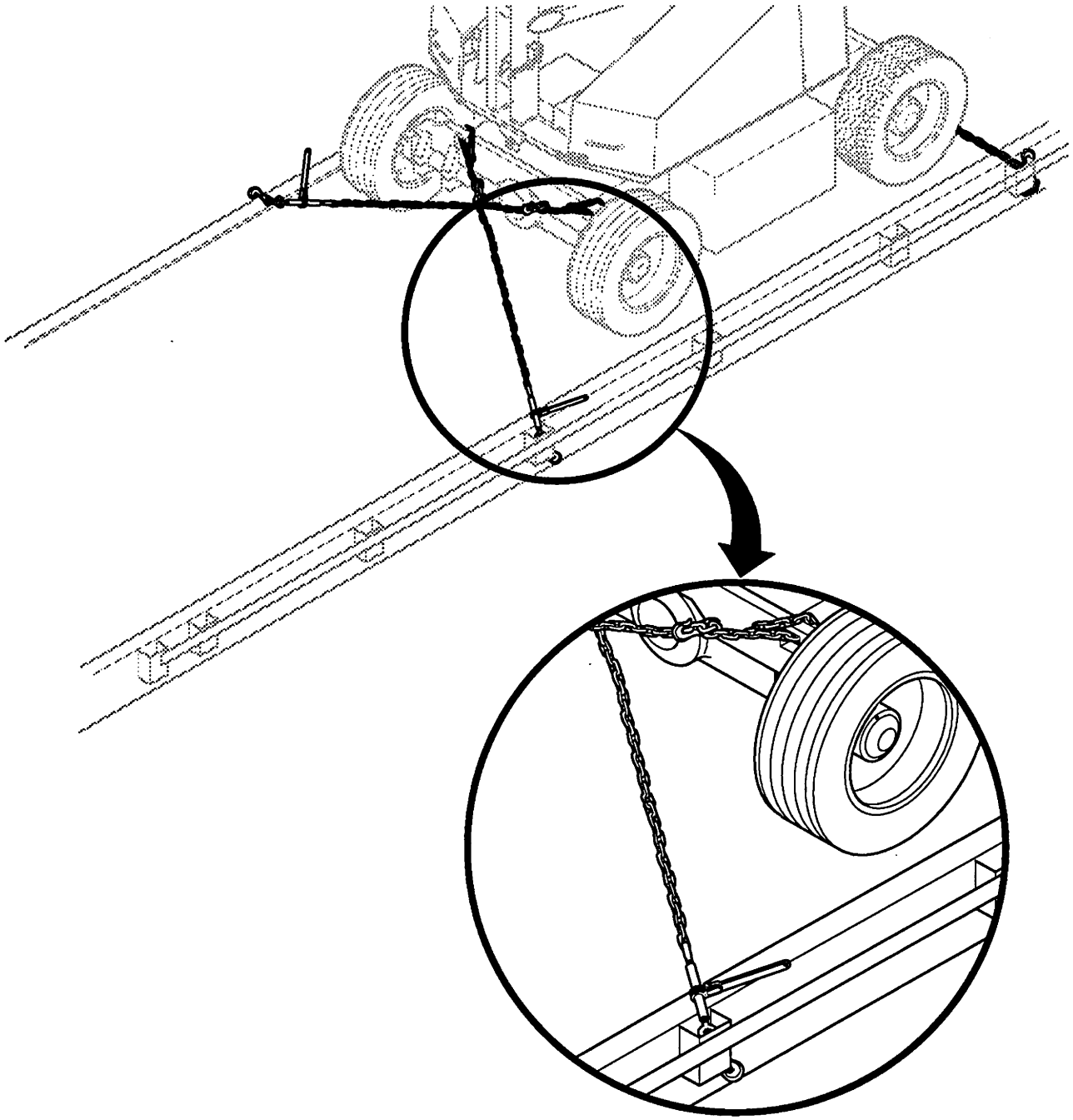
- Turn the Ground/ Off/ Platform selector switch to "GROUND". Activate the Power Switch, deadhead a function to generate pressure and check that the hydraulic pressure is as stated on the Data Plate.
- Remove machine tie downs. Remove wheel chocks. Turn the Ground/ Off/ Platform selector switch to "PLATFORM".
- Enter the platform and test all platform functions. (Reference Section 2 of this manual for control location and description.)
- Raise the boom so that the platform will clear any obstacles as the machine is driven down the loading ramp. It may be necessary to swing the superstructure to the side to allow greater ground clearance.
- Carefully drive the unit off the truck or trailer. The brakes are automatically released for driving, and will automatically apply when the Drive Control Handle is returned to the neutral position.
- Before placing the unit into service, all operators must read and understand the contents of this Operator's Manual. Upon initial unloading of the machine the Predelivery Inspection Report must be completed and returned in order to activate the Simon Limited Warranty. An Operator's Manual and a Predelivery Inspection Report are included with each machine leaving the factory.

LOADING THE UNIT

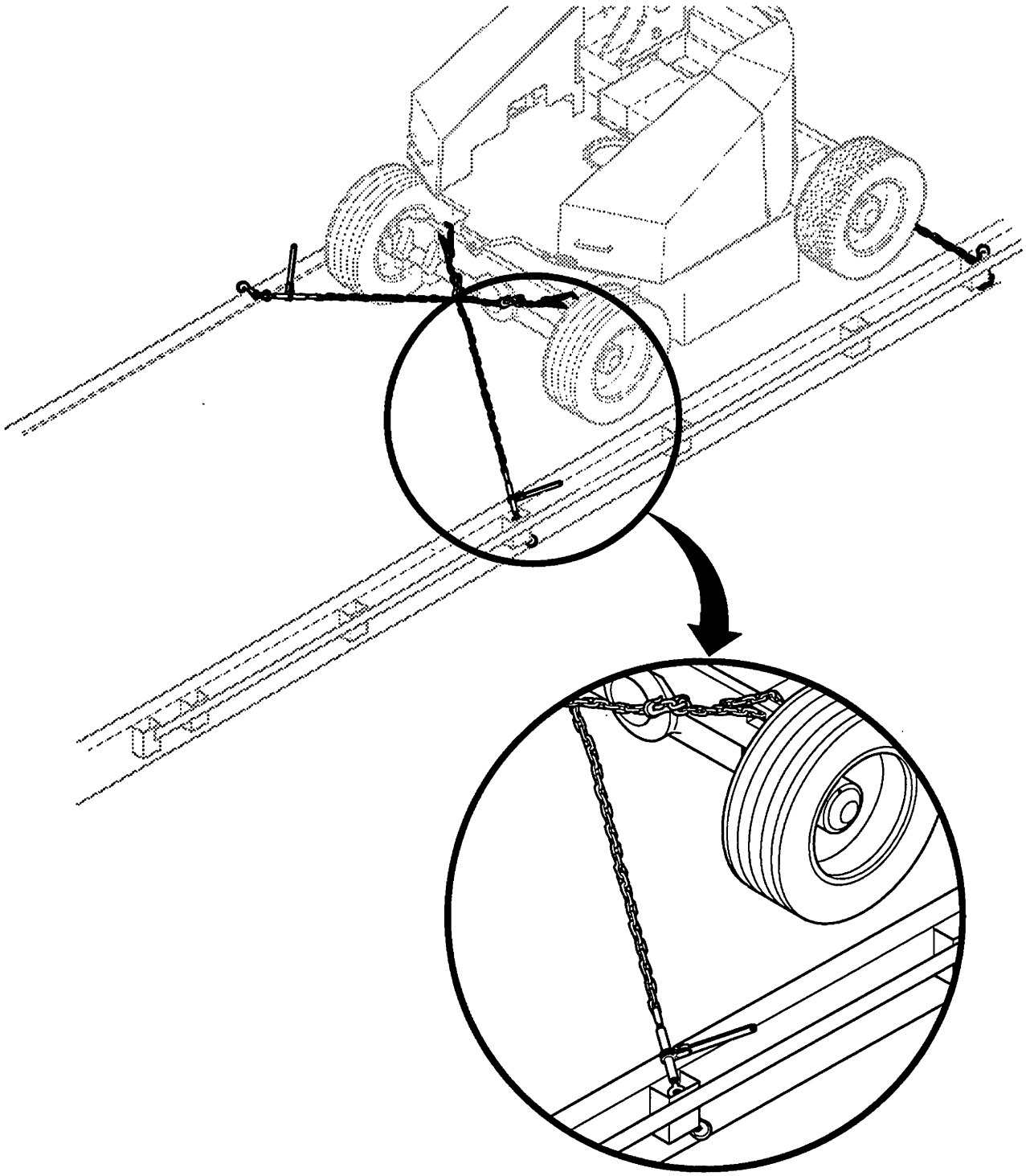
⚠ CAUTION

Always attach the unit to a winch when loading or unloading from a truck or trailer. We do not recommend unassisted loading or unloading of any mobile platform.

- Turn the Ground/ Off/ Platform selector switch to "Platform".



Tie Down for Model 32/21 (Recommended)



Tie Down for Model 41/24 (Recommended)

- Enter the platform, and activate the power using the foot pedal.

- Raise the boom so that the platform will clear any obstacles as the machine is driven up the loading ramp.

⚠WARNING

ALWAYS ATTACH THE UNIT TO A WINCH WHEN LOADING OR UNLOADING FROM A TRUCK OR TRAILER. WE DO NOT RECOMMEND UNASSISTED LOADING OR UNLOADING OF ANY MOBILE PLATFORM.

READ AND UNDERSTAND ALL SAFETY, CONTROL AND OPERATING INFORMATION FOUND ON THE MACHINE AND IN THIS MANUAL BEFORE OPERATING THE UNIT.

- Carefully drive the unit onto the truck or trailer.

- Install wheel chocks and lock the superstructure to the undercarriage by installing the lock pin provided.

- Confirm that the boom is fully retracted, and that the platform will not contact any other item, including the bed of the truck or trailer.

- Tie down locations are located on all four corners of the undercarriage.

⚠ CAUTION

The platform must not be tied to the trailer bed in any way.

- The negative battery cable may be disconnected for long distance transportation.

EMERGENCY SYSTEM AND PROCEDURES

⚠WARNING

IF THE UNIT FAILS WHILE THE OPERATOR'S PLATFORM IS RAISED OR EXTENDED, DO NOT ATTEMPT TO CLIMB DOWN THE BOOM ASSEMBLY. SERIOUS INJURY MAY RESULT.

EMERGENCY HAND PUMP

The emergency hand pump should only be used in emergency situations, when the ground and platform controls are inoperative or a power failure has resulted.

The emergency hand pump is located in the hydraulic side compartment. The handle is stored on back wall of the compartment behind the control box.

To operate the emergency hand pump:

- Push the emergency hand pump valve lever to the right to open it.
- Place the handle on the pump.
- Pump the handle and move the appropriate control lever to operate the desired function.
- Push the emergency hand pump lever to the left to close it for normal machine operation.
- Return the handle to the storage position.

Always use caution in selecting the correct valve lever to bring the operator to safety.

EMERGENCY TOWING FUNCTION

The control knobs for the following procedures are located in the left cabinet at the rear, on top of the valve manifold.

⚠WARNING

WHENEVER RELEASING THE BRAKES OR BEFORE DISCONNECTION FROM TOWING UNIT, ENSURE THAT THE UNIT CANNOT ROLL.

WITHOUT OPTIONAL TOWING PACKAGE:

- Securely attach the ELECTRIC EAGLE to a tow vehicle with tow chains or similar means.
- Lift black knob to its "Up" position and rotate it to lock in position.
- Lower red knob by rotating knob and releasing it to its lower position.
- Pump emergency hand pump four strokes.
- Disconnect steer cylinder to allow steering wheels to track behind tow vehicle.

WITH OPTIONAL TOWING PACKAGE:

- Securely attach the ELECTRIC EAGLE to a tow vehicle with tow bar provided.
- Lift black knob to its "Up" position and rotate it to lock in position.
- Lower red knob by rotating knob and releasing it to its lower position.
- Pump emergency hand pump four strokes.
- Pull control valve to allow steering wheels to track behind tow vehicle.

The tow vehicle must have sufficient braking capability to stop itself as well as the ELECTRIC EAGLE. Tow speed shall not exceed 3 mph.

EMERGENCY PROCEDURES

It is not possible for us to foresee every emergency situation that could arise during operation of this machine. The following information describes three such emergency situations, and lists appropriate actions that can be taken.

When faced with an emergency, above all please remember:

- Stay calm.
- Think through the situation before operating the machine.
- Get help if necessary.

SITUATION ONE: Platform elevated, operator not incapacitated, but unit will not respond to platform controls.

⚠ DANGER

DO NOT TRY TO CLIMB DOWN THE BOOM ASSEMBLY.
SERIOUS INJURY MAY RESULT

POSSIBLE CONDITION:

- One or more functions not operating correctly.
- Unit movement from unselected control.
- Unit function will not stop unless power is switched off.

CORRECTIVE ACTION

1. Press the emergency stop button.
2. Contact an experienced operator to lower the machine (and reposition, if necessary) using the emergency hand pump procedure.
3. **Report the incident to your supervisor immediately.**

SITUATION TWO: Unit elevated, with operator incapacitated at controls.

⚠ DANGER

DO NOT TOUCH UNIT !!!

DETERMINE THE CAUSE OF THE PROBLEM BEFORE YOU TOUCH THE MACHINE.

CORRECTIVE ACTION

1. Have someone summon first aid or rescue squad.
2. Attempt to talk to operator before taking any rescue measures.
3. **Check to see if operator is in a pinned position, or would be endangered if platform is moved, before attempting emergency hand pump procedure.**
4. After establishing that the machine is not in contact with live power lines, lower the platform and reposition the unit, if necessary, using the emergency hand pumpprocedure.
5. Render first aid to the operator.

SITUATION THREE: Platform in contact with live power lines and operator incapacitated.

⚠ DANGER

DO NOT TOUCH UNIT !!!

ELECTROCUTION HAZARD!!!

CORRECTIVE ACTION

1. Have someone summon first aid or rescue squad.
2. Contact authorized personnel to disconnect power supply touching unit.
3. If operator is unconscious, check to see if he is in a pinned position, or would be endangered if platform is moved.
4. AFTER POWER IS CUT, use the emergency lhand pump procedure to bring platform with operator to a safe location to render first aid.

IMPORTANT: Any incident involving personal injury must be immediately reported to the local Simon Aerials Distributorship as well as to Simon Aerials Inc.

SECTION 2:
HYDRAULIC SYSTEM

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HYDRAULIC SYSTEM

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HYDRAULIC FLUID

HANDLING PRECAUTIONS

⚠WARNING

PERSONS IN REGULAR CONTACT WITH MINERAL-BASED HYDRAULIC FLUID NEED TO BE AWARE OF THE IMPORTANCE OF THOROUGH HYGIENE, AND THE PROPER METHODS FOR HANDLING MINERAL OILS IN ORDER TO AVOID POTENTIAL HAZARDS TO HEALTH.

If mineral-based hydraulic fluid is SPLASHED INTO THE EYES, it must be WASHED OUT THOROUGHLY using abundant quantities of water. If irritation persists, medical advice should be sought.

Mineral oils act as solvents on the natural oils in the skin. FREQUENT AND PROLONGED SKIN CONTACT CAN CAUSE DERMATITIS OR SEVERE IRRITATION. Mineral-based hydraulic fluids normally present no health hazard when used properly. Protective clothing and proper washing facilities should be provided or be accessible.

⚠WARNING

HYDRAULIC FLUID UNDER PRESSURE CAN PENETRATE AND BURN THE SKIN, DAMAGE EYES, AND MAY CAUSE SERIOUS INJURY, BLINDNESS, AND EVEN DEATH.

FLUID LEAKS UNDER PRESSURE MAY NOT ALWAYS BE VISIBLE.

IF MINERAL-BASED HYDRAULIC FLUID HAS PENETRATED THE SKIN, IT MUST BE MEDICALLY TREATED, WITHIN A FEW HOURS, BY A DOCTOR FAMILIAR WITH THIS TYPE OF INJURY.

FLUID RECOMMENDATIONS

We strongly recommend the use of MOBIL DTE-15 HYDRAULIC FLUID. An EQUIVALENT substitute can be used if absolutely necessary. Mineral-based hydraulic fluids produced by different companies will USUALLY mix with each other satisfactorily, but this IS NOT RECOMMENDED. When in doubt, consult your supplier.

MOBIL DTE-15 has proven to be suitable for use in all climates. For continued operation in temperatures below 32° F (0° C), use of MOBIL DTE-13 or DTE-11 FLUID is satisfactory. For tropical climates use Mobil DTE-16.

HYDRAULIC FLUID ANALYSIS

Use the following as a guide to determine when analysis of the hydraulic fluid is necessary.

- Any time the hydraulic pump is replaced.
- If discoloration is noticed in the hydraulic fluid.
- If, after the first 50 hours of operation, the hydraulic filter element is plugged.
- Any time the hydraulic filter element shows signs of metal contamination.
- Once every six months, under normal operating conditions.
- Every 3 months, in extremely dusty or dirty operating conditions.

The hydraulic fluid analysis must be done by a qualified laboratory. To ensure that you receive accurate recommendations about the fluid being analyzed, always provide the following information with the test sample.

- Type of hydraulic fluid (see Lubrication Chart).
- Model and serial number of unit from which sample was taken.
- Purpose of analysis: pump failure, discoloration, etc.
- Type of analysis: complete to show additive breakdown, acid buildup, viscosity, type and percent of contaminants; also, comparison to new fluid and recommendations.

Comply with contamination analysis and recommendations to achieve a clean, contamination free hydraulic system.

Following the above guidelines will prevent premature failure of pumps, cylinder seals and swing motor, and unnecessary down time.

If system flushing and replacement of fluid is recommended, refer to the flushing procedure.

SYSTEM FLUSHING PROCEDURE

1. With platform fully down, drain hydraulic fluid from hydraulic tank into a clean, empty container. Use an oil filter cart so the fluid may be reused if analysis is good.
2. When the hydraulic tank is empty, remove return line hose from pump.
3. Operate all valve handles in platform and at ground station to drain hoses.
4. Flush the hoses.
5. Discard old return filter element and replace.
6. Flush out the tank.
7. Reinstall all hoses removed in the previous steps.
8. If the hydraulic fluid removed from the reservoir is good, pump it through a filter cart back into the tank. If fluid is not usable, dispose of it properly. Fill hydraulic tank with filtered, fresh hydraulic fluid (refer to Lubrication Chart).
9. Start up the unit. Briefly operate all functions. Two or three full lift cycles may be necessary to purge all air from lift cylinders.
10. When the above procedures have been completed, fill hydraulic tank to full mark on dip stick.
11. Check for leaks and correct as necessary. Unit is now ready to be placed back in operation.

HYDRAULIC SYSTEM COMPONENTS

HYDRAULIC FLUID RESERVOIR

The hydraulic fluid reservoir consists of the tank, a filler plug and breather, and a drain plug.

Perform the following steps on a weekly basis.

- Check tank for signs of leakage.
- Inspect tank securing bolts for tightness.

HYDRAULIC POWER UNIT ASSEMBLY

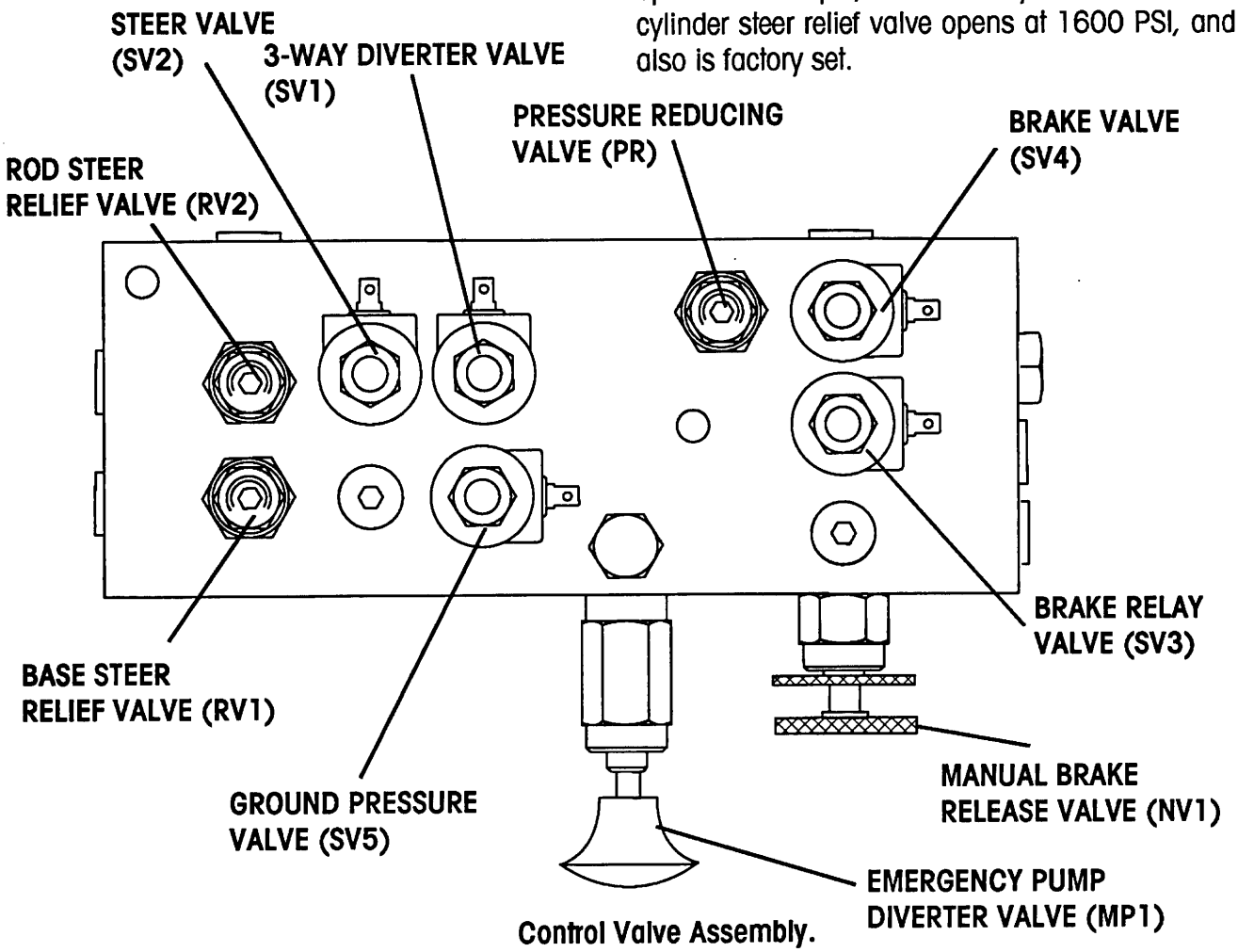
One 48 Volt DC permanent magnet motor rated at 4 HP (2.98 Kw) at 3600 RPM drives the gear pump. The pump provides hydraulic fluid flow to the functions. There are no adjustments on the pump.

CONTROL VALVE ASSEMBLY

The control valve assembly is a combination valve which controls the hydraulic fluid flow from the pump to the functions. It consists of a valve block and various type of valves which are detailed in this section. Seal kits are available for all of the following valves.

STEER RELIEF VALVES

These valves, located in cavity RV1 (base-end cylinder steer relief valve) and RV2 (rod-end cylinder steer relief valve) on the control valve assembly, are poppet relief valves. They are screw-in, cartridge-style, direct-acting valves used as pressure limiting devices. The base-end cylinder steer relief valve opens at 1300 psi, and is factory set. The rod-end cylinder steer relief valve opens at 1600 PSI, and also is factory set.



Control Valve Assembly.

To adjust the base-end cylinder steer relief valve:

1. Install a pressure gauge in Port S1 on the control valve assembly.
2. Remove cap from relief valve (hex socket head).
3. Operate steer function, and use a hex key to adjust pressure.

   Backing out hex socket screw decreases pressure; turning in hex socket screw increases pressure
4. Replace cap.

To set the rod-end cylinder steer relief valve:

1. Install a pressure gauge in Port S2 on the control valve assembly.
2. Remove cap from relief valve (hex socket head).
3. Operate steer function, and use a hex key to adjust pressure.

   Backing out hex socket screw decreases pressure; turning in hex socket screw increases pressure
4. Replace cap.

3-WAY DIVERTER VALVE

This valve, located in cavity SV1, is a solenoid-operated, 3-way, spool-type, screw-in hydraulic directional valve. When energized, it allows flow to the ground valve circuit. When de-energized it allows flow to the platform steer and brake circuits. There are no adjustments to this valve, but the solenoid can be replaced if it malfunctions.

GROUND PRESSURE VALVE

This valve, located in cavity SV5 on the control assembly, is a solenoid-operated, 2-way, normally open, spool-type, screw-in hydraulic cartridge valve. It functions as a bidirectional blocking valve for ground hydraulic controls operation. There are no adjustments to this valve.

BRAKE RELAY VALVE

This valve, located in cavity SV3, is a solenoid operated 2-way, normally open, piloted poppet-type, screw-in hydraulic cartridge valve. It is intended as a blocking or load holding device for low flow in the brake circuit. There are no adjustments to this valve, but the solenoid can be replaced if it malfunctions.

BRAKE VALVE

This valve, located in port SV4, is a solenoid-operated, 2-way, normally closed, spool-type, screw-in hydraulic cartridge valve. It operates as a bidirectional valve and supplies hydraulic pressure for the brake circuit. There are no adjustments to this valve, but the solenoid can be replaced if it malfunctions.

STEER VALVE

This valve, located in cavity SV2 on the control assembly, is a solenoid-operated, 4-way, 3-position, closed center valve. It is a screw-in, cartridge-style valve which directs hydraulic fluid flow to the steer cylinder. The steer valve opens when the steer toggle is pressed in either direction to allow steer right and left functions. There are no adjustments to this valve, but the solenoids can be replaced if they malfunction.

PRESSURE REDUCING VALVE

This valve, located in cavity PR on the control assembly, is a screw-in, cartridge-style, direct-acting, spool-type, hydraulic sequence valve with inernal pilot and internal spring chamber drain. In its steady state it allows flow to the brake circuit at a maximum of 1500 psi. There are no adjustments to this valve.

MANUAL BRAKE RELEASE VALVE

This valve is located in cavity NV1. This valve is normally kept in the open position. It is only closed when releasing the brakes is required. It is used for towing or emergency movement. For normal operation, this valve must be kept open while operating the machine. When the valve is closed , the brake system is disabled.

EMERGENCY PUMP DIVERTER VALVE

This valve is located in cavity MP1. With this valve in the in position, emergency pump flow is directed to the ground control valve for emergency lowering. With the valve in the out position, emergency pump flow is directed to the brake system, which can be released if valve NV1 is closed.

CHECK VALVES

These valves are located at cavities CV1, and CV2. Replacement seal kits for each are available.

CYLINDERS

There are six (model 32/21) or seven (model 41/24) hydraulic cylinders in the Electric Eagle circuit, including the master and slave, steering, extend and lift cylinders. All cylinders are of the double acting type. Refer to the Mechanical Section of this manual for assembly and disassembly, repair or replacement procedures.

EMERGENCY HYDRAULIC PUMP

This pump is located on the ground control box side inside the superstructure cabinet. The handle is stored on the on the back wall of the hydraulic compartment. The pump is used if normal operation is interrupted and a function must be enabled. For operating instructions, refer to Operator's Manual.

HYDRAULIC SYSTEM FUNCTIONAL DESCRIPTION

The hydraulic fluid pump assembly moves fluid from the reservoir to the hydraulic valve assembly.

There are three valves involved in the steer circuit: a solenoid-operated, 3-way, spool-type valve (SV1), a solenoid-operated, 4-way, 3-position, closed center valve (SV2), and a 2-way, normally open spool-type valve (SV5). SV2 is a steer direction valve which is normally closed until the steer function is selected. When SV1 is de-energized, it directs flow to the steer and brake circuits. When energized, it directs flow to the ground control bank. When SV5 is energized, it closes to create pressure for the steer circuit. When it is de-energized, it sends flow to the platform valve bank. There are also two relief valves for the steer circuit RV1 (for the base end of the steer cylinder) and RV2 (for the rod end of the steer cylinder.

For the brake circuit there are three valves involved: SV3, SV4, and PR. When de-energized, SV3 opens to the reservoir keeping the brakes applied. When energized, it closes to release the brakes. SV4 blocks flow when de-energized and releases the brakes when energized. PR is a sequence valve with internal pilot and internal spring chamber drain. In its steady state, it allows flow to the brake circuit at a maximum of 1500 psi.

For emergency lowering of the booms, flow and pressure are provided by the hand pump. Flow is directed through valve MP1, and when in its normal position, supplies flow to the ground valve bank for lowering the booms. This same hand pump also supplies flow and pressure for the emergency brake release. When valve MP1 is pulled out and valve NV1 is closed the brakes can be released.

All of the platform and ground controls are normally closed, 3-position, 4-way lever operated directional control valves. The telescope cylinder has two holding valves and a regenerative valve to assist retraction. The lift cylinder(s) have a holding valve for each, as required. The platform rotate circuit has a double piloted check valve with dual relief valves. The platform level function consists of a master and slave cylinder. The slave cylinder has double piloted check valves that locks the platform in position. The master cylinder has dual relief valves to protect the platform circuit.

SECTION 3:
ELECTRICAL SYSTEM

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SECTION 3:

ELECTRICAL SYSTEM

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ELECTRICAL SYSTEM

The following section is a description of maintenance for the major components of the Electric Eagle electrical system.

BATTERY

Eight 6 volt lead-acid batteries supply the electrical current required to operate the electrical circuits for the Electric Eagle. The circuit is composed of two sets of four batteries hooked up in series to provide 48 volts DC.

BATTERY MAINTENANCE (IN STORAGE)

Follow these procedures for maintenance of batteries on a machine not in use:

Keep batteries clean. Electrolyte of "wet" batteries should be checked regularly, and kept at proper levels.

Never stack one battery directly on top of another, because post or container damage can result. If batteries are stored individually, place supporting boards between layers. Do not stack more than three high, and rotate stock so that the oldest batteries are used first.

"Wet" batteries should be kept fully charged. A "wet" battery, while in storage, should be recharged to full charge at the following intervals:

If stored at:	Recharge:
Below 40° F (4° C)	None required
40° to 60° F (4° to 15° C)	Every 2 months
Above 60° F (15° C)	Every month

BATTERY MAINTENANCE (IN USE)

Check battery and surrounding area for signs of damage or corrosion.

Check battery terminals for:

- **Corrosion.** Regularly clean connections and apply a non-metallic grease or protective spray to retard corrosion.
- **Loose connections.** Be sure all cable connections are tight, and that good contact is made to terminals.
- **Broken or frayed cables.** Be sure all cable connections are good, and that no loose or broken wires are exposed. Replace as needed.

Check battery electrolyte level. Replenish the electrolyte, if necessary. Remove vent caps before filling, and USE ONLY DISTILLED WATER. Fill all cells to the proper level. Do not overfill. Fill to level indicator (or 1/2 inch over the top of the separators if there is no level indicator). Fill after charging to prevent overflow of acid due to expansion. Do not use a hose to add water to batteries.

Allowing the electrolyte level to drop below the top of the separators will lead to shortened battery life. Excessive water usage can indicate that a battery has been overcharged, has been subjected to excessively high temperatures, or is nearing the end of its service life.

Keep battery clean. Wash the top of the battery, making sure all vent caps are in place. Do not allow cleaning water or other foreign matter to enter the cells. Use a solution of bicarbonate of soda and water to wash the battery if there is an accumulation of acid.

BATTERY PREVENTIVE MAINTENANCE

Once a month, after battery has been charged, spot check the specific gravity of two or more cells. A fully charged battery should indicate 1.28 specific gravity. If low readings are noted, check the following:

- Check terminals for corrosion, loose connections and broken or frayed cables.
- Check all cells with a hydrometer for variation in specific gravity. A variation of 0.03 points or more between cells is cause for concern. Mark the low cells.

Recheck specific gravity of all cells after recharging.

BATTERY REPLACEMENT

To remove the batteries, follow these procedures:

⚠WARNING

BEFORE REMOVING BATTERIES FROM THE UNIT, TURN OFF THE PLATFORM/ GROUND KEY SWITCH. THERE SHOULD BE NO POWER TO THE MACHINE.

Always disconnect the negative battery cables first.

Remove battery hold down.

Lift the batteries from the tray. Put the batteries to the side and dispose of properly.

⚠ CAUTION

Always connect the positive battery cable first.

To install batteries lift and position them on tray. Secure batteries in position with battery hold downs. Connect battery cables.

BATTERY CHARGER

The battery charger supplied with the Electric Eagle is designed to recharge deep-cycle, lead-acid batteries. It is a highly reliable unit with a minimum of moving parts.

⚠WARNING

CONNECT CHARGER ONLY TO A PROPERLY GROUNDED THREE-PRONG, SINGLE PHASE OUTLET.

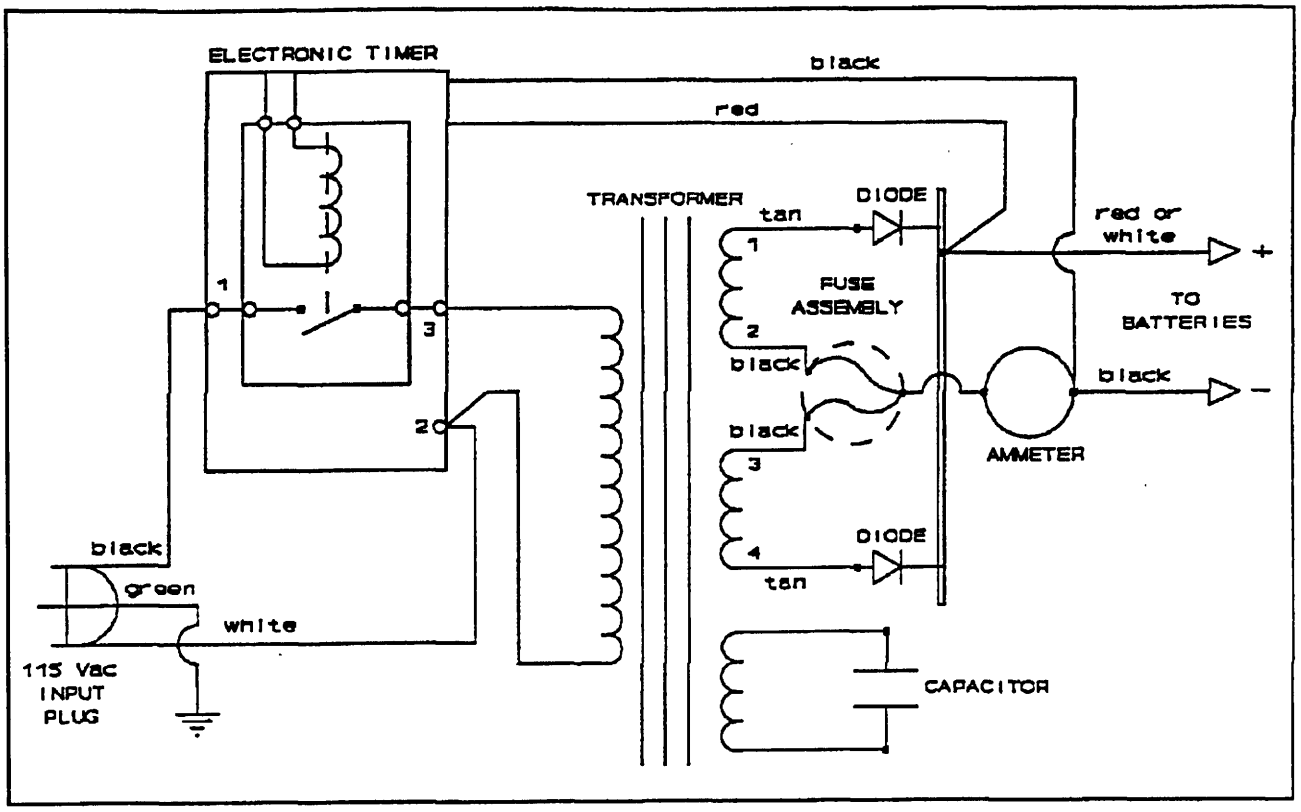
TO AVOID ELECTRIC SHOCK, DO NOT TOUCH UNINSULATED PARTS OF DC OUTPUT CONNECTOR, BATTERY CONNECTOR OR TERMINALS.

BE SURE CHARGER IS IN GOOD CONDITION, AND THAT BATTERY CONNECTORS MAKE ADEQUATE ELECTRICAL CONTACT AND ARE NOT CRACKED OR CORRODED. OVERHEATING AND PROPERTY DAMAGE MAY RESULT.

LEAD-ACID BATTERIES GENERATE EXPLOSIVE GASES. NO SMOKING! KEEP SPARKS AND FLAME AWAY FROM BATTERIES.

NEVER DISCONNECT THE DC OUTPUT CONNECTOR FROM THE BATTERIES WHILE THE CHARGER IS OPERATING.

IF THE CHARGE CYCLE MUST BE INTERRUPTED, DISCONNECT THE POWER SUPPLY CORD FROM ITS OUTLET; DO NOT DISCONNECT THE DC OUTPUT CONNECTOR FROM THE BATTERY CONNECTOR.



Battery Charger Schematic.

BATTERY CHARGER TROUBLESHOOTING

⚠WARNING

HIGH VOLTAGE! WITH THE CHARGER ON, THE INTERNAL CHARGER CAPACITOR VOLTAGE IS APPROXIMATELY 650 VOLTS.

Always unplug the electrical cords from the AC outlet and the batteries before attempting any repairs to the charger.

NOTE: Modifying charger for use other than that for which it was specifically intended, repairs by unqualified persons or not using original equipment replacement parts voids the warranty.

Perform the following checks:

1. Make sure battery connections are electrically and mechanically sound.
2. Check AC source for power.
3. For models that have an exterior fuse, check it and replace it, if required, with one having the same rating.
4. Check battery condition. A highly sulfated battery may take some additional time before current begins to flow through it.

⚠WARNING

IF THE PLUG OR RECEPTACLE IS BROKEN, TWISTED, BENT OR LOOSE AND DOES NOT MAKE GOOD ELECTRICAL CONTACT, HAVE IT REPLACED. DO NOT USE THIS CHARGER IN THIS CONDITION BECAUSE FIRE OR PERSONAL INJURY CAN RESULT.

4. If the charger malfunctions, identify the symptoms.

Problem: Charger does not turn on.

The charger DC output cord normally remains connected to the batteries. When the charger is turned on, a time delay of two to five seconds is provided before the charger switches on. After this time delay, the POWER RELAY CLOSES WITH AN AUDIBLE "CLICK", and AC power is supplied to the transformer.

When operating properly, the TRANSFORMER HUMS and the AMMETER INDICATES THE CHARGE RATE. If the charger does not turn on properly, one of three situations will exist:

1. Relay DOES NOT CLOSE, Transformer DOES NOT HUM, and Ammeter DOES NOT REGISTER.

2. Relay CLOSES, but Transformer DOES NOT HUM, and Ammeter DOES NOT REGISTER.

3. Relay CLOSES and Transformer HUMS, but Ammeter DOES NOT REGISTER.

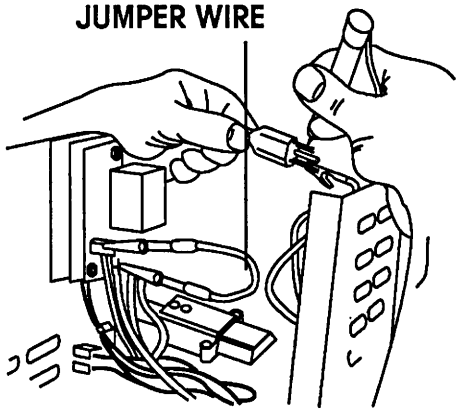
Following are the procedures to be used in each of the above circumstances.

1. If Relay DOES NOT CLOSE, Transformer DOES NOT HUM, and Ammeter DOES NOT REGISTER:

Check that both the power supply cord and DC output connector are securely connected. If so, disconnect the power supply cord from the power outlet. Measure the voltage at the battery connector using a suitable DC voltmeter.

The voltage reading SHOULD BE THE SAME as the battery terminal voltage (between 20 and 50 volts DC). If the DC voltage is within these limits, remove the charger cover and check the wiring against the wiring diagram. If correct, a malfunction in the electronic timer has probably occurred.

To verify a malfunction in the electronic timer, bypass the timer, then check for transformer hum and normal charging current.



Bypassing Electronic Timer.

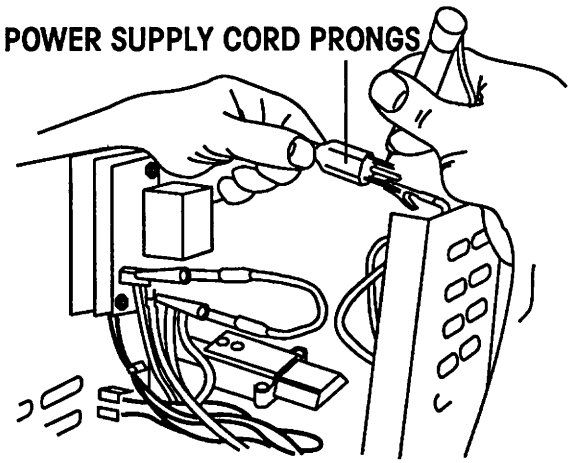
To bypass the timer, disconnect the charger power supply cord from the outlet, and the DC output connector from the battery connector. Place a jumper wire between terminals "1" and "3". The transformer should hum when the power supply cord is reconnected to the outlet.

If the transformer HUMS, disconnect the power cord. Reconnect the DC output connector to the battery connector. Reconnect the cord. If ammeter shows normal charging current, the timer is defective and must be replaced.

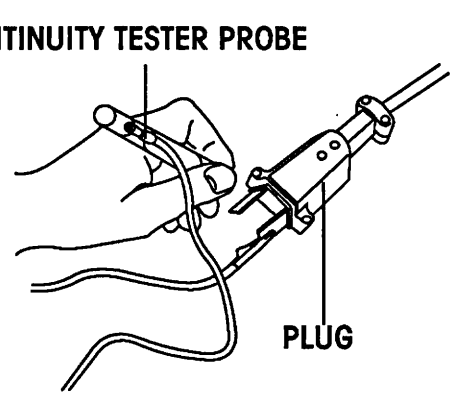
⚠ CAUTION

Do not charge batteries with the timer bypassed. The charger will remain on as long as the power supply cord is connected to a power source, and severe damage to batteries will result.

If the transformer DOES NOT HUM and the ammeter does not register with the timer bypassed, check the continuity of the charger AC circuit. disconnect the power cord from the outlet, and the DC output connector from the battery connector. With a suitable Continuity Tester, check the circuit across the power cord prongs. If the circuit is not complete, check the continuity of the power supply cord, primary transformer coil and all connections.



Charger AC Circuit Continuity Test.



Charger DC Circuit Continuity Test.

2. If Relay CLOSES, but Transformer DOES NOT HUM, and Ammeter DOES NOT REGISTER:

Check to be sure the power supply cord is securely connected to a live outlet.

Disconnect the cord from the outlet, and the DC output connector from the battery connector. By-pass the electronic timer (refer to situation #1, on previous page), and with a suitable Continuity Tester, check the circuit across the power cord prongs. If the circuit is complete, check the relay wiring and all connections. If the circuit is not complete, check the wiring of the power supply cord, transformer primary coil leads and the electronic timer.

Remove the charger cover, and check the wiring against the diagram. If correct, individually check the continuity of the power supply cord, transformer primary coil and relay.

3. If Relay CLOSES and Transformer HUMS, but Ammeter DOES NOT REGISTER:

In this situation, the charger AC circuit and electronic timer are functioning properly, and a fault in the charger DC circuit exists. A continuity check must be performed.

Disconnect the power cord from the outlet and the DC output connector from the battery connector. Check the charger fuse. If a fuse link is blown, further testing is required (see "Charger Fuse Blows", later in this section). If the fuse is good, use a low voltage Continuity Tester to perform the following tests:

3A. Connect the Tester leads to the charger DC output connector and note the reading. Reverse the Tester leads and check the reading again. The circuit should be complete IN ONLY ONE DIRECTION.

If the circuit DOES NOT CONDUCT IN EITHER DIRECTION and the fuse is good, check the continuity of the DC output cord, ammeter, diodes and all connections.

If the circuit CONDUCTS IN BOTH DIRECTIONS, a short exists in the charger DC circuit. Check the DC output cord. Check if one or both diodes have shorted (see "Charger Fuse Blows").

3B. Check the capacitor. Disconnect the power cord from the outlet and the DC output connector from the battery connector. Disconnect both transformer coil leads from the capacitor terminals, taking care that the wires do not break. Connect an Ohmmeter (with the scale set to R x 10K ohms) to the capacitor terminals, and test the capacitor.

If, when the Ohmmeter leads are connected to the capacitor terminals:

meter needle JUMPS TO MID-SCALE and RAPIDLY MOVES TO HIGH RESISTANCE, the capacitor is GOOD.

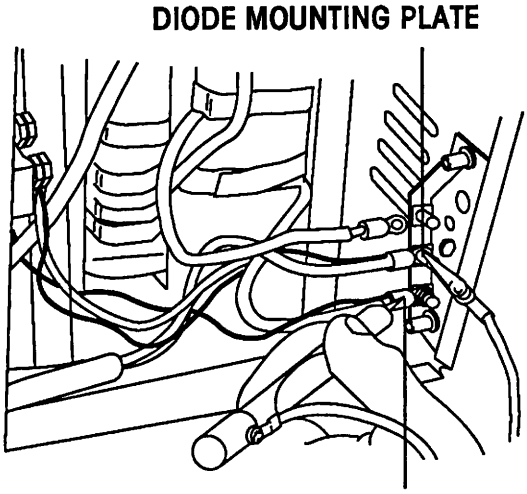
meter needle DOES NOT MOVE, and instead stays at high resistance, the capacitor is OPEN. A bulge in the top of the capacitor may be visible.

meter needle JUMPS IMMEDIATELY TO ZERO OHMS and remains there, capacitor is SHORTED.

If the capacitor is "open" or "shorted", it must be replaced.

⚠ CAUTION

Use only a "6 MFD, 660 VOLT AC" rated capacitor for replacement. The use of a capacitor of a different value may result in improper charging, capacitor failure, transformer burnout or battery damage.



Diode Continuity Test.

3C. If the charger DC circuit and capacitor are good, test the transformer (see "Transformer Short or Burn-Out", later in this section).

Problem: Charger fuse blows.

The charger fuse consists of two fusible links mounted as a single assembly on the charger front panel. Each link is connected in series with one diode to provide protection for the transformer in the event of diode failure. Visually check the fuse to determine if one or both links are blown.

⚠ CAUTION

Replace the complete fuse assembly if blown. DO NOT ATTEMPT TO REPAIR THE FUSIBLE LINK, as inadequate charger protection may result.

If a SINGLE FUSIBLE LINK BLOWS, the cause is normally a short circuit failure of one diode. The link will blow when the charger DC output connector is connected to the battery connector, whether or not the power cord is connected.

To check the diodes, disconnect the power cord and the DC output connector. Disconnect one transformer secondary coil lead from the diode terminal. Using a low voltage Continuity Tester, connect one Tester lead to the diode mounting plate and the other to a diode terminal. Note the reading and then reverse the Tester leads and check each diode again. If a diode CONDUCTS CURRENT IN BOTH DIRECTIONS, it is SHORTED. The complete heat sink assembly with diodes must be replaced.

Occasionally, a single fusible link may melt due to excessive heat caused by a loose internal fuse connection. Check that all three fuse connections inside the charger are clean and tight. Tighten the fuse connector nuts to the proper torque (see "Machine Specifications").

If BOTH FUSIBLE LINKS BLOW, the cause is normally a reverse polarity connection between the charger DC output connector and the battery connector. Check the battery pack and connections. Check the voltage and polarity at the battery connector with a DC voltmeter.

Check the charger DC output connector for correct polarity. The white wire should be connected to the positive (+) blade, and the black wire to the negative (-) blade. If polarity is reversed between the charger and batteries, BOTH FUSIBLE LINKS WILL BLOW whether or not the power supply cord is connected to an outlet.

BOTH FUSIBLE LINKS MAY ALSO BLOW due to a short circuit failure of both diodes. A lightning strike at the charging location can be a cause. Excessive heat due to a loose connection may also cause both fusible links to melt or blow.

Problem: Ammeter reads 30 amps for more than 30 minutes.

If the charger is connected to a battery system of less than 48 volts, the charge rate may not go below 30 amps within 30 minutes. Check that all batteries are correctly wired, and also check the battery pack voltage at the battery connector using a DC Voltmeter. For a 48 volt battery system, the charging voltage should be 45 to 51 volts DC.

This condition could also result if there is a shorted cell in one of the batteries.

⚠ CAUTION

Do not connect the charger to battery systems of other than 48 volts. Overheating and transformer burnout will result.

Problem: Charger output is low.

Low charger output is normally caused by a single fusible link blowing as the result of a short circuit failure of one diode (refer to "Charger Fuse Blows", in this section), or the transformer coils (refer to "Transformer Short or Burnout", in this section).

⚠ CAUTION

Do not use the charger if the output is low. Batteries will not reach full charge, and the possibility of a harmful deep discharge exists in subsequent usage.

Problem: Charger does not turn off.

The electronic timer turns the charger on and off. Proper charge time is determined by many factors, but larger, severely discharged batteries require more time to reach full charge than do smaller, lightly discharged batteries. Charge time should not exceed 18 hours.

If the charger remains on longer than that, verify that the green wire from the electronic timer and the secondary transformer coil lead are securely connected to the diode lead. The charger will not turn off if this wire is loose or disconnected. If the green wire is secure, the timer has malfunctioned and must be replaced (see "Electronic Timer needs replacement", later in this section).

Problem: Electronic timer needs replacement.

The electronic timer kit should always be replaced as a complete assembly. Tools required are a Phillips Head Screwdriver, Pliers, a 3/8" Wrench, and an 11/32" Wrench. To replace the timer kit, follow the procedures listed below:

Disconnect the charger power cord from the outlet, and the DC output connector from the battery connector. Remove the charger cover.

Disconnect the green, black and red wires of the timer kit. Remove the black and white leads of the power cord and both primary transformer coil leads

from the timer kit terminals. Remove the three mounting screws on the charger front panel, and the entire timer kit. Save all hardware for reassembly.

Install the replacement timer kit by reversing the above steps. When reconnecting the wires to the timer terminals, YOU SHOULD SUPPORT THE TERMINAL BOARD TO PREVENT DAMAGE TO THE ELECTRONIC CIRCUIT BOARD.

Connect one transformer primary lead to terminal "2", and the remaining lead to terminal "3".

Connect the black lead of the power supply cord to terminal "1" on the timer kit, and the white lead to terminal "2".

Connect the red wire of the timer kit and the white lead of the DC output cord to the heat sink assembly.

Connect the black wire of the timer kit and the black lead of the DC output cord to the ammeter post. DO NOT ALLOW THE POST TO TURN WHEN TIGHTENING THE NUT.

Connect the green wire of the timer kit and the transformer secondary lead to the diode lead terminal.

⚠ CAUTION

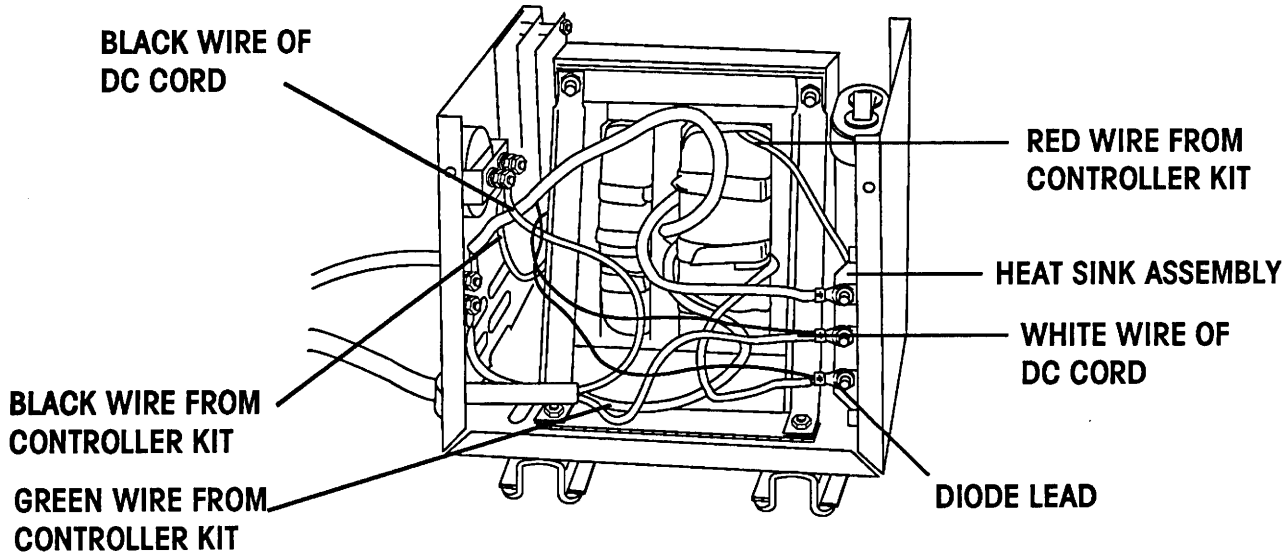
Be sure all connections are clean and tight. Insure that all wires and terminals are positioned so they do not short to the charger case or each other.

Replace the charger cover and check the timer kit for proper operation as follows:

With the DC output connector disconnected from the battery connector, plug the power cord into a suitable outlet. A DC Voltmeter connected across the DC output connector should indicate zero volts.

Disconnect the power cord from the outlet, and connect the DC output connector to the battery connector. The relay on the timer kit should close with an audible click after a two to five second delay.

If the timer does not operate as indicated in above, refer to the wiring diagram to insure the charger is wired correctly. If the timer operates properly, the charger is ready for use. Monitor the first charge cycle to verify that the charger turns off properly.



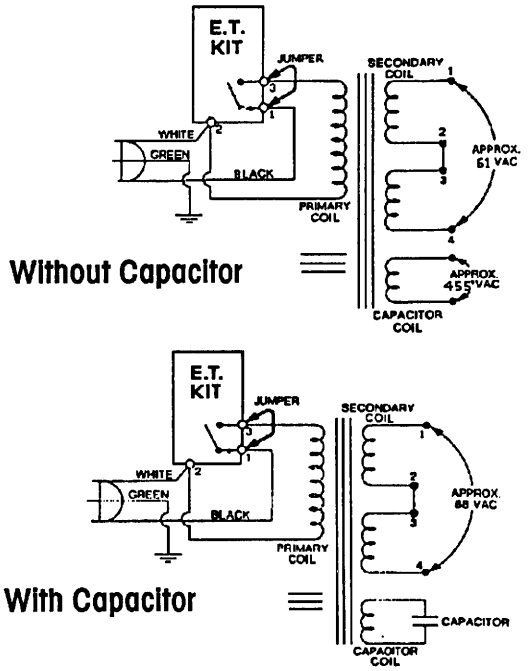
Electronic Timer Kit Wiring.

Problem: AC fuse or circuit breaker blows.

If this occurs when the charger is connected to an AC power source, but not to the batteries, the power cord may be shorted. Disconnect the cord from the outlet and the DC output connector from the battery connector. Check that the electronic timer kit has not been bypassed.

With a suitable Continuity Tester, check the circuit across the power cord prongs. The circuit should be open. If the circuit is complete, check the relay contacts to be sure they are open, and have not welded closed. If the relay contacts are open, the power cord is shorted and must be replaced.

If the power cord is good, the transformer coils may be shorted.



Transformer Coil Voltage Test.

Problem: Transformer shorted or burned out.

Transformer failure may be caused by natural aging, or shorting of adjacent coil turns. A low or complete lack of output will be observed on the ammeter, while the transformer may hum. The AC line fuse or circuit breaker may blow when the charger is turned on.

To test the transformer, disconnect the power cord from its outlet and the DC output connector from the battery connector. Disconnect transformer secondary coil leads "1" and "4" from the diode terminals, and the transformer capacitor coil leads from the capacitor terminals. When disconnecting capacitor leads, use care to avoid breaking wires .

⚠WARNING

HIGH VOLTAGE!
WITH THE CHARGER ON, THE INTERNAL CHARGER CAPACITOR VOLTAGE IS APPROXIMATELY 650 VOLTS. USE EXTREME CAUTION WHEN WORKING NEAR CAPACITOR TERMINALS.

In order to apply AC power directly to the transformer primary coil, the timer must be bypassed. With the timer bypassed, and TAKING CARE FOR PERSONAL SAFETY, connect the power cord to a proper outlet. If the AC line fuse or circuit breaker blows, the transformer is shorted internally and must be replaced. If the fuse or breaker does not blow, check the transformer secondary and capacitor coil voltages using a suitable AC voltmeter. If the measured voltages are substantially lower than those shown, the transformer is shorted internally and must be replaced.

If the transformer output voltages are good, disconnect the power cord from the outlet. Check the capacitor rating (should be 6 Mfd, 660 volts AC), then carefully reconnect the capacitor coil leads to the capacitor terminals. Then, TAKING CARE FOR PERSONAL SAFETY, reconnect the power cord to the outlet and again measure the transformer secondary and capacitor coil voltages.

If both read 88 volts AC, the transformer and capacitor are good (see DC Circuit Test Procedures under "Charger does not turn on"). If the secondary coil

voltage reading is 61 V AC, and capacitor coil 455 V AC, the capacitor may be defective (see Capacitor Test Procedures under "Charger does not turn on", earlier in this section) or the capacitor coil leads may not be making proper electrical contact .

If replacement of a transformer lead terminal is required, the new terminal MUST be crimped and soldered.

NOTE: Some transformer lead wires may be aluminum, and a solder intended for aluminum MUST then be used.

MOVEMENT ALARM

The movement alarm is activated as soon as the platform console drive control lever is moved off the center "Neutral" position.

⚠WARNING

THE MOVEMENT ALARM IS PROVIDED FOR YOUR PROTECTION, AND PROTECTION OF PERSONS WORKING IN IMMEDIATE AREA. DISABLING THIS IMPORTANT SAFETY DEVICE MAY RESULT IN DEATH OR SERIOUS INJURY.

The movement alarm is supported by a weldment next to the ground electrical box. To replace it, remove the movement alarm from the weldment and disconnect the wires.

TILT ALARM

The tilt alarm gives an audible warning when the machine is five degrees or more out of level with a boom raised. It is located near the ground electrical box. To replace the tilt alarm, remove it from the support and disconnect the wires.

TILT ALARM TEST

The alarm can be tested by manually tipping the alarm sensor when a boom is raised. This "Push-to-Test" feature enables tilt alarm to be tested without losing its adjustment.

Individually push down on each of the three fastened corners of the tilt alarm. There should be enough travel to cause the alarm to sound as each corner is pressed, when a boom is raised (there is approximately a three second delay).

If the alarm does not sound, the flange nuts have been tightened too far. Loosen the nut on the 90° corner and repeat this test procedure.

TILT ALARM ADJUSTMENT

The tilt alarm can be adjusted. Before attempting to adjust the alarm, park the machine on a flat, level surface.

Level the base of the alarm by tightening each of the three flange nuts to take up approximately one half of its spring's travel. During the remainder of the adjustment procedure, **DO NOT ADJUST THE NUT ON THE 90° CORNER.**

Check to be sure the electrical connections are correct. Slowly tighten the nut on one of the two corners **ADJACENT** to the 90° corner until the light-emitting diode (LED) just turns on, indicating that the circuit is closed. Note the position of the nut.

Loosen the nut (LED will go out), carefully counting the number and fraction of turns until the LED lights up again. Divide that number by two and tighten the nut by this number of turns.

Adjust the nut on **OTHER** corner adjacent to the 90° corner in the same manner. The level bubble should now be centered. The alarm is now level, to the degree of accuracy determined by the nut adjustments and the surface on which the machine is sitting. Test the tilt alarm for proper function.

DESCENT ALARM (OPTIONAL)

The descent alarm gives an audible warning when the platform is being lowered. It is located on the side of the ground electrical box. To replace the descent alarm, remove it from the ground electrical box and disconnect the wires.

AUTOMATIC WARNING BEACON (OPTIONAL)

The optional warning beacon has a rotating reflector with an amber light. The beacon activates whenever the key is turned to the platform position. During drive or lift, the beacon deactivates when the emergency stop button is pressed.

RELAYS

There are relays located in the ground control cabinet side. (Refer to the schematic at the end of this manual for relay functions and interconnect.)

ELECTRIC MOTORS

There are two electric motors (48 VDC). One is used for the drive function, the other powers the hydraulic pump.

EMERGENCY STOP BUTTONS

There are two emergency stop buttons: one on the platform control and the other at ground controls.

When the emergency stop button is pressed, all functions stop immediately and the wheel brake is automatically applied. Turn the button clockwise to reset.

To replace the emergency stop button, remove the control console cover screws to gain access for button removal. Remove the appropriate button mounting screws and wires.

SECTION 4:
MECHANICAL COMPONENTS

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SECTION 4:

MECHANICAL COMPONENTS

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MECHANICAL COMPONENTS

Following is a description of the major mechanical components of the Electric Eagle.

UNDERCARRIAGE

Two removable covers are used to protect the items mounted on the undercarriage.

⚠ CAUTION

When steam cleaning the undercarriage, cover the electrical components, to prevent water damage.

Steam clean the undercarriage once a year, and inspect all welds and brackets. Check for cylinder pins that turn in their mountings, which will indicate sheared lock pins.

TIRES

The Electric Eagle uses 8.75" - 16, 5LT tires (refer to specifications for tire type). Inspect tires for cuts, chunking, sidewall damage or abnormal wear. Any tire faults MUST BE CORRECTED before further machine operation.

CHANGING TIRES

⚠WARNING

FOAM FILLED TIRES ARE EXTREMELY HEAVY. CARE MUST BE TAKEN TO AVOID PERSONAL INJURY.

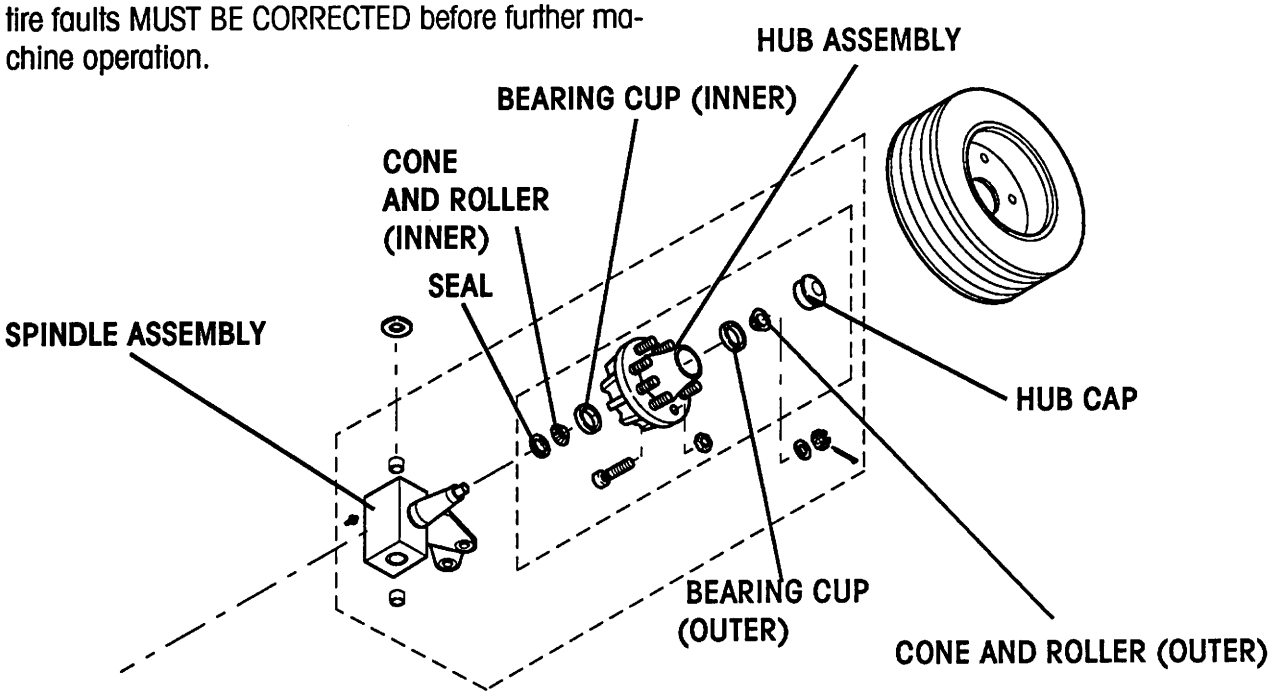
When a tire change is necessary, ALWAYS BLOCK THE WHEELS before you raise the machine. Loosen and remove lug nuts, and pull off the wheel. Install the replacement wheel. Fasten lug nuts or bolts, and tighten to proper torque (see Machine Specifications). Lower the machine and remove the blocks.

WHEELS AND LUG NUTS

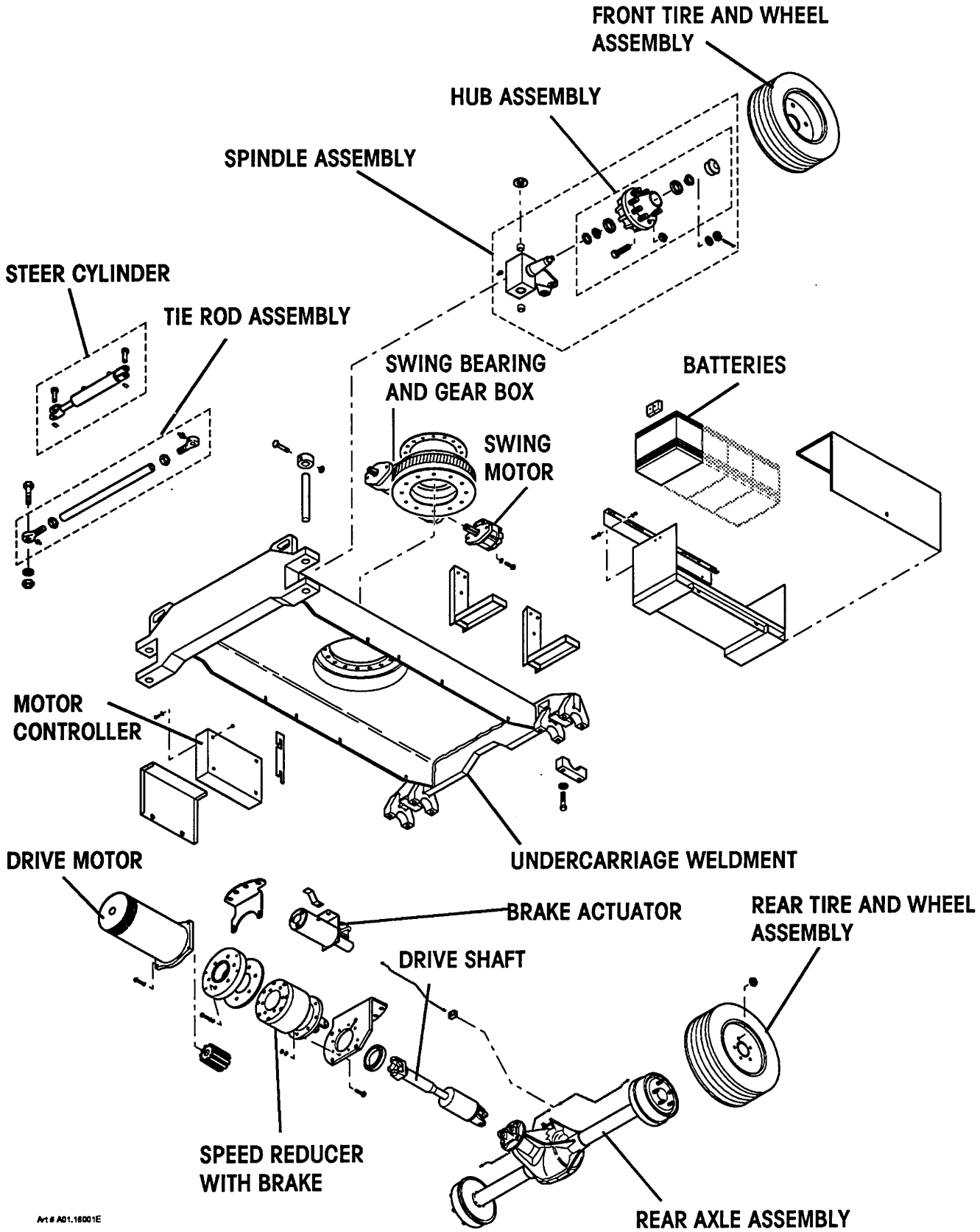
Check the torque of the wheel lug nuts or bolts (see Machine Specification for proper torque).

FRONT HUB ASSEMBLY

The front hub assemblies for the right and left side are identical, but should not be interchanged. Each consists of an inner and outer cup bearing, a wheel



Front Hub Assembly.



Components Found on the Undercarriage.

mounting stud, seal, and inner and outer cone and roller bearing, as well as associated hardware.

REPACKING FRONT WHEEL BEARINGS

1. Block the rear tires and raise the front end of undercarriage.
2. Remove front wheels.
3. Remove hub cap.
4. Remove cotter pin, 3/4"-16 castle nut and flat washer from each hub assembly.
5. Pull the front hub assembly from the spindle.
6. Remove the seal, and the inner and outer cone and roller bearings.
7. Inspect the inner and outer bearing cups for wear. If they are excessively worn or damaged, replace the appropriate front hub assembly.
8. Thoroughly clean the inner and outer cone and roller bearings. Inspect them for signs of wear. If they are excessively worn or damaged, replace the front hub assembly.
9. Pack the inner and outer cone and roller bearings with grease. (Refer to lubrication chart, earlier in this manual.)
10. Assemble the front hub and install it on the spindle assembly.
11. Replace the wheels and tighten to proper torque. (Refer to "Machine Specifications".)

STEER CYLINDER SEAL REPLACEMENT

The steer cylinder is of the double acting type. During operation, the cylinder should not leak, but a slight dampness at the rod seal is acceptable. The pins should be checked for wear.

1. Disconnect and plug the two hydraulic hoses.

⚠ CAUTION

To prevent damaging the internal components of the steer cylinder, keep the hydraulic hose ends free from contamination.

Take care not to damage rod surface and guard against dirt entering system.

2. Take the steer cylinder from the undercarriage by removing the two pins and hair pin clips that hold it in place.
3. Remove rod gland.
4. Remove cylinder rod and piston.
5. Replace seals.
6. Carefully, slide the cylinder rod and piston into the cylinder body assembly.
7. Secure the rod gland in place.
8. Secure the steer cylinder in place with the two pins and hair pin clips.
9. Unplug and reconnect the two hydraulic hoses.

DRIVE TRAIN

The drive train for the Electric Eagle consists of the brake actuator, electric motor, speed reducer with brake, drive shaft and rear axle assembly, along with associated hardware.

BRAKE ACTUATOR DISASSEMBLY

1. Disconnect and plug the two hydraulic hoses and brake line.

⚠ CAUTION

To prevent damaging the internal components of the brake actuator keep the hydraulic hose ends free from contamination.

Take care not to damage the rod surface and guard against dirt entering the system.

2. Remove three (3) lock nuts and washers that secure the brake actuator to the undercarriage.

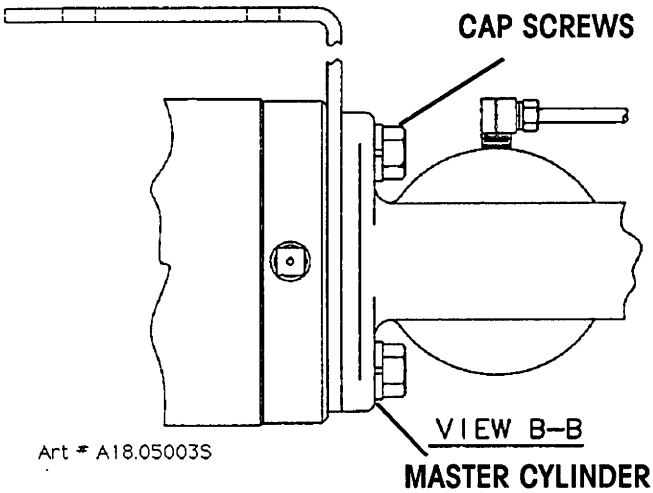
3. Remove the brake actuator.

4. Remove the three bolts and the two nuts on the rod that secure the brake actuator cap. (Internal spring may be under tension.)

5. Check inner and outer springs, as well as seals for wear and damage.

6. Remove the two cap screws that secure the master cylinder housing in place.

7. Replace seals and master cylinder as required.



Brake Actuator.

8. Carefully, slide the cylinder rod springs, and piston into the cylinder body assembly.

9. Secure the brake actuator cap and master cylinder housing in place.

10. Unplug and reconnect the two hydraulic hoses, as well as the brake line.

11. Bleed the brake line.

REAR AXLE REPLACEMENT

To replace the rear axle assembly:

1. Raise and support rear of undercarriage with the front wheels chocked.

2. Disconnect and cap brake lines.

3. Remove four (4) 12 point head bolts attaching drive shaft to rear axle.

4. Remove eight (four each side) mounting bolts and mounting brackets.

5. Remove rear axle assembly.

6. For installation of rear axle assembly torque axle mounting bolts to 285 Ft-Lbs, and back plate bolts to drive shaft to 110 Ft-Lbs. Use locktite on all bolts. Also, reconnect and bleed brake lines.

DRIVE SHAFT REPLACEMENT

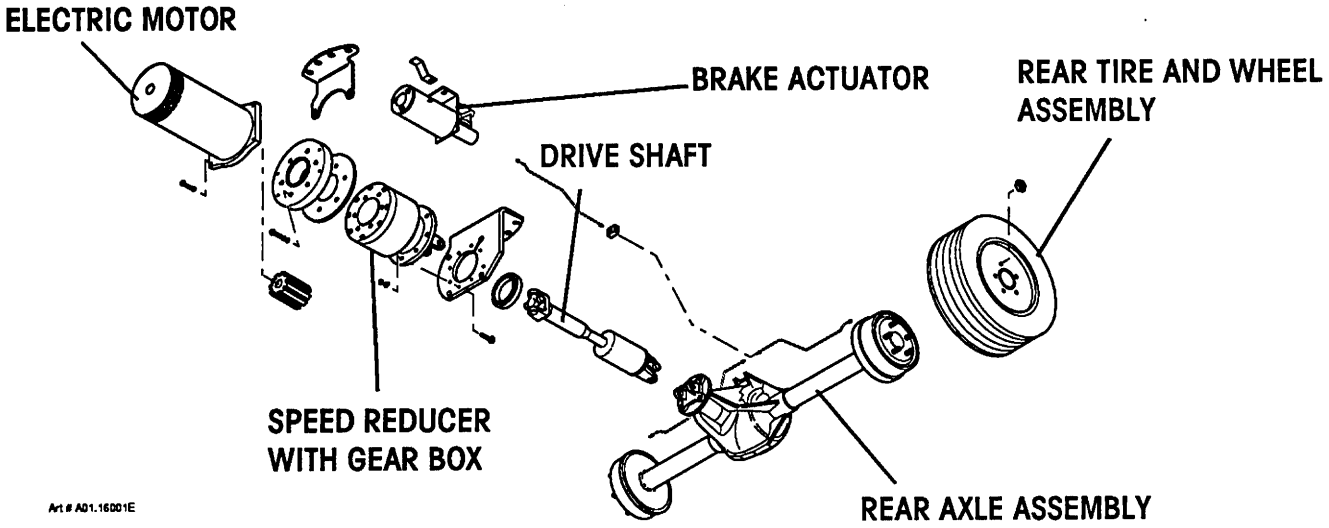
To replace the drive shaft:

1. Remove four (4) flange bolts from gear box end of drive shaft.

2. Remove four bolts from axle end of drive shaft.

3. Remove drive shaft.

4. For installation of drive shaft, torque back plate bolts to axle at 110 Ft-Lbs. Ensure flange bolts to gear box end of drive shaft are all tight.



Components Found on the Drive Train.

ELECTRIC MOTOR AND SPEED REDUCER REPLACEMENT

To replace the speed reducer with brake:

1. Remove the electric motor held in place by four (4) bolts
2. Disconnect and cap hydraulic hose.
3. Remove four (4) bolts that connect the speed reducer to the drive shaft.
4. Remove two (2) bolts securing the speed reducer to the mounting bracket.
5. Remove eight (8) bolts securing the speed reducer to mounting bracket.
6. Remove the speed reducer with brake.
7. For installation of speed reducer with brake, ensure that all bolts are tight, and uncap and connect hydraulic hose.

REAR BRAKE REPAIR AND ADJUSTMENT

Refer to Electric Eagle Component Maintenance Manual for rear brake repair and adjustment.

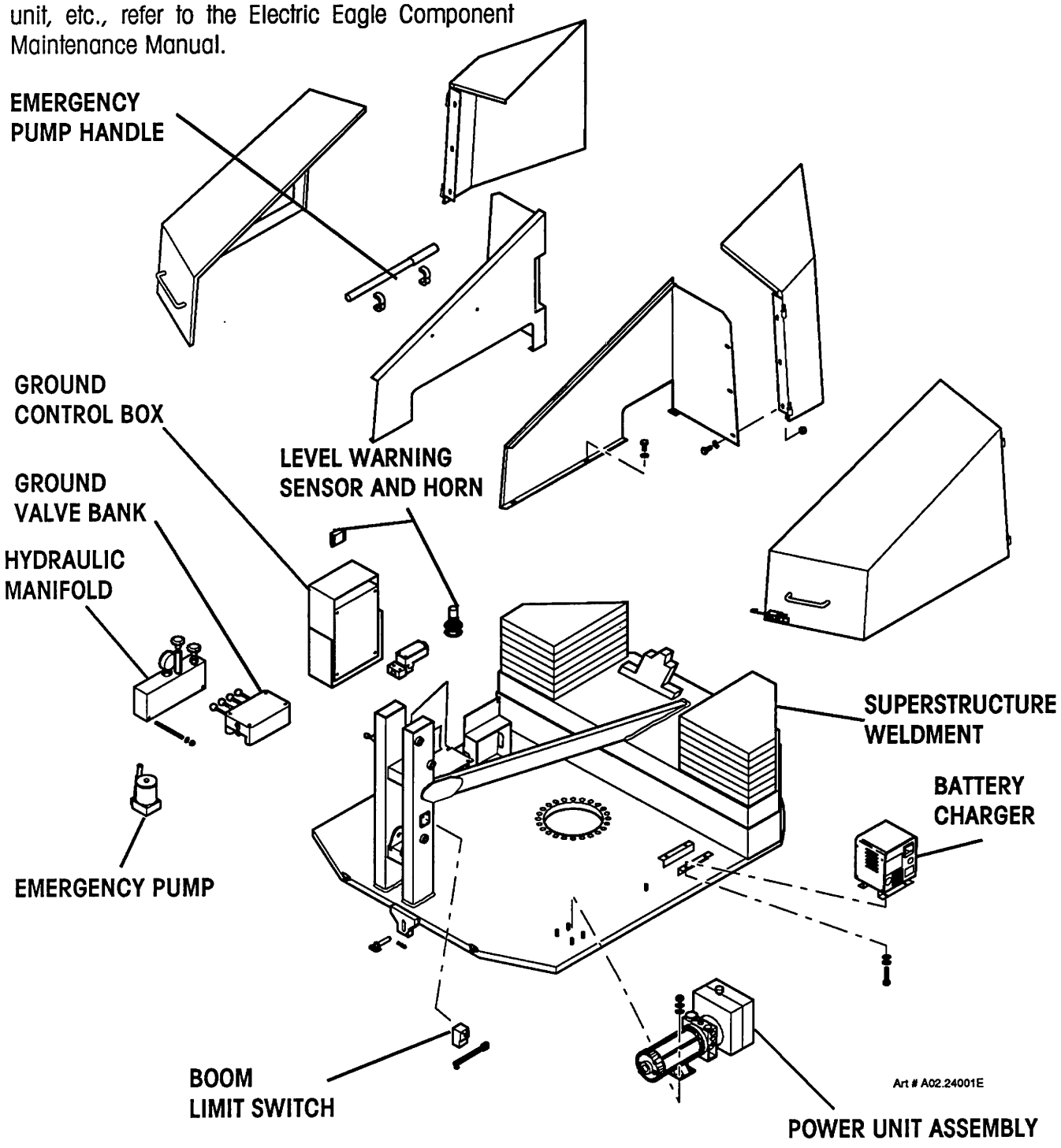
SWING MOTOR DISASSEMBLY

To disassemble the swing motor:

1. Remove and cap hydraulic lines.
2. Remove the hex head cap screws from the end cover of the swing motor
3. Install motor seal kit.
4. Reassemble the swing motor and mount it on the swing bearing.

SUPERSTRUCTURE FOR MODEL 32/21

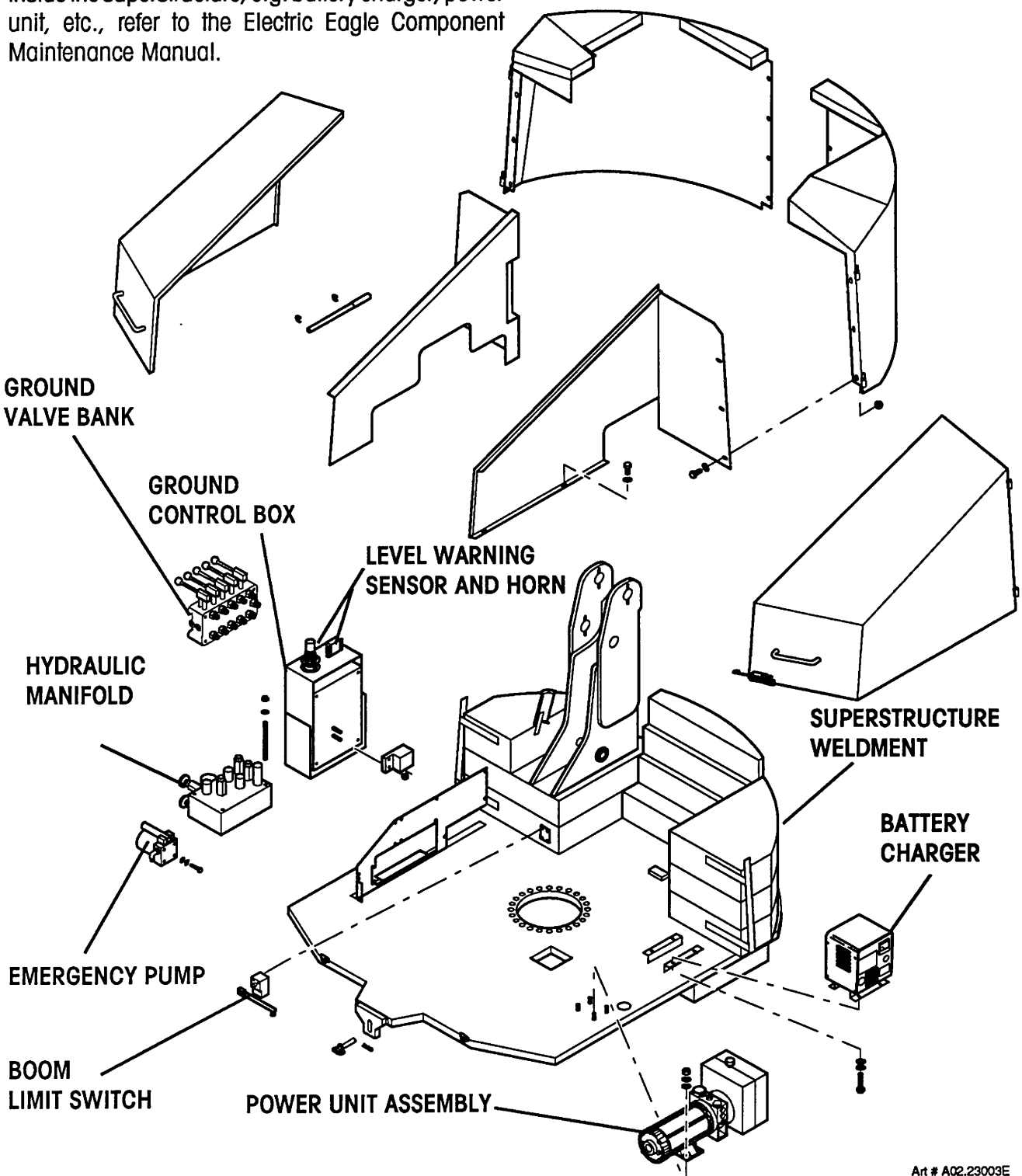
All components inside the superstructure are readily accessible for removal and replacement with the superstructure covers opened. For repair of any part inside the superstructure, e.g. battery charger, power unit, etc., refer to the Electric Eagle Component Maintenance Manual.



Superstructure Components for 32/21

SUPERSTRUCTURE FOR MODEL 41/24

All components inside the superstructure are readily accessible for removal and replacement with the superstructure covers opened. For repair of any part inside the superstructure, e.g. battery charger, power unit, etc., refer to the Electric Eagle Component Maintenance Manual.



Art # A02.23003E

Superstructure Components for 41/24

HOSES AND CABLES

Inspect all hoses and electrical cables for security and damage. Cables and hoses should be examined for rubbing and chafing. Check for leaks at fittings. REPLACE ANY DAMAGED HOSES OR CABLES.

LOWER BOOM FOR MODEL 32/21

Clean the boom once a year and inspect along the boom structure, especially all welds and brackets.

⚠WARNING

TO PREVENT PERSONAL INJURY WHILE SERVICING ANY PART OF THE LOWER BOOM, ENSURE THAT IT IS SUPPORTED BY A CRANE AT FRONT AND REAR, AND THAT THE BOOM CARRIES NO LOAD.

LOWER BOOM LIFT CYLINDER

The boom lift cylinder is of the double acting type. During operation, the cylinder should not leak, but a slight dampness at the rod seal is acceptable. The pins should be checked for wear. Check the pivot pin lock pins for tightness. The cylinder and holding valve should be inspected for fluid leakage, damage and security.

LOWER BOOM LIFT CYLINDER REMOVAL

1. Support the top boom.
2. Disconnect lower lift cylinder from lower boom weldment by removing the pivot pin after taking off retaining ring and keeper pin.
3. Disconnect and plug the hydraulic hoses.

⚠CAUTION

To prevent damaging internal components of boom lift cylinder, keep hydraulic hose ends free from contamination.

4. Remove the cylinder base pin.
5. Remove the cylinder.

LOWER BOOM LIFT CYLINDER REPLACEMENT

1. Carefully position the new cylinder in the machine with the holding valve and hose connections facing upward.
2. Connect the base end of cylinder to the machine by reinstalling the pin and all retainers.
3. Support the rod end of the cylinder and reconnect the hoses to the cylinder.
4. Use the controls to extend or retract the cylinder to align the cylinder so the rod end pin can be installed. Install the pin and retainers.
5. Use plastic wire ties to fasten the hose to the cylinder as it was prior to this installation.
6. Grease both ends of the cylinder pivot pins at the two (2) grease fittings.
7. Raise the platform with the lower controls and remove any blocking, straps, or chains which were used to support the platform.
8. Raise and lower the platform several times to confirm correct operation and purge all air from the cylinder. Initially, there may be a hesitation due to the presence of air in the cylinder.

LOWER BOOM LIFT CYLINDER SEAL REPLACEMENT

1. Remove lift cylinder.

⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

2. Remove end gland from lift cylinder.
3. Remove cylinder rod and piston.
4. Remove seals.
5. Replace boom lift cylinder seals.
6. Replace cylinder rod and piston.
7. Secure end gland to lift cylinder.
8. Replace boom lift cylinder in the unit.

LOWER LIFT CYLINDER HOLDING VALVE REPLACEMENT

The holding valve is integrated into the upperside of the lift cylinder. Make certain that all power is off and that the lift cylinder bears no load before proceeding with repairs.

1. Loosen holding valve and wiggle to bleed off any possible hydraulic pressure.
2. Remove valve.
3. When installing new valve, lubricate seals with clean oil and install valve.
4. Torque to 30 to 35 Ft Lbs.

LOWER BOOM AND CYLINDER PIVOT PIN AND BUSHING REPLACEMENT

Pivot pin and bushing removal from the boom and cylinder is required if they are worn or damaged.

1. Support the top boom.
2. For boom pivot pin and bushing replacement, remove retaining ring and lock pin from the boom weldment and parallel arm one at a time and replace before proceeding to next pivot pin and bushing.

   For cylinder pivot pin and bushing replacement, remove retaining ring and lock pin from one end of the cylinder at a time before proceeding to the other pivot pin and bushing.

   - Remove the pivot pin.
   - Split the bushings with a hammer and chisel, and remove them.
   - Seat replacement bushings, using an arbor press.
   - Lubricate the new pivot pin with a light grade of oil, and slide it in place.
   - Replace retaining rings and lock pin.

3. Grease all the bearing surfaces through the grease fittings with the appropriate lubricant.

UPPER BOOM FOR MODEL 32/21

Clean the boom once a year and inspect along the boom structure, especially all welds and brackets.

⚠WARNING

TO PREVENT PERSONAL INJURY WHILE SERVICING ANY PART OF THE UPPER BOOM, ENSURE THAT IT IS SUPPORTED BY A CRANE AT FRONT AND REAR, AND THAT THE BOOM CARRIES NO LOAD.

UPPER BOOM LIFT CYLINDER

The boom lift cylinder is of the double acting type. During operation, the cylinder should not leak, but a slight dampness at the rod seal is acceptable. The pins should be checked for wear. Check the pivot pin lock pins for tightness. The cylinder and holding valve should be inspected for fluid leakage, damage and security.

UPPER BOOM LIFT CYLINDER REMOVAL

1. Support the top boom.

2. Disconnect upper lift cylinder from upper boom weldment by removing the pivot pin after taking off retaining rings and keeper pin.

3. Disconnect and plug the hydraulic hoses.

⚠ CAUTION

To prevent damaging internal components of boom lift cylinder, keep hydraulic hose ends free from contamination.

UPPER BOOM LIFT CYLINdER SEAL REPLACEMENT

1. Remove lift cylinder.

⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

2. Remove end gland from lift cylinder.
3. Remove cylinder rod and piston.
4. Remove seals.
5. Replace boom lift cylinder seals.
6. Replace cylinder rod and piston.
7. Secure end gland to lift cylinder.
8. Replace boom lift cylinder in the unit.

UPPER LIFT CYLINDER HOLDING VALVE REPLACEMENT

The holding valve is integrated into the upperside of the lift cylinder. Make certain that all power is off and that the lift cylinder bears no load before proceeding with repairs.

1. Loosen holding valve and wiggle to bleed off any possible hydraulic pressure.
2. Remove valve.
3. When installing new valve, lubricate seals with clean oil and install valve.
4. Torque to 30 to 35 Ft Lbs.

UPPER BOOM AND CYLINDER PIVOT PIN AND BUSHING REPLACEMENT

Pivot pin and bushing removal from the boom and cylinder is required if they are worn or damaged.

1. Support the top boom.
2. For boom pivot pin and bushing replacement, remove retaining ring and lock pin from the boom weldment and parallel arm one at a time and replace before proceeding to next pivot pin and bushing.

   For cylinder pivot pin and bushing replacement, remove retaining ring and lock pin from one end of the cylinder at a time before proceeding to the other pivot pin and bushing.

   - Remove the pivot pin.
   - Split the bushings with a hammer and chisel, and remove them.
   - Seat replacement bushings, using an arbor press.
   - Lubricate the new pivot pin with a light grade of oil, and slide it in place.
   - Replace retaining rings and lock pin.

3. Grease all the bearing surfaces through the grease fittings with the appropriate lubricant

LOWER BOOM FOR MODEL 41/24

Clean the boom once a year and inspect along the boom structure, especially all welds and brackets.

⚠WARNING

TO PREVENT PERSONAL INJURY WHILE SERVICING ANY PART OF THE LOWER BOOM, ENSURE THAT IT IS SUPPORTED BY A CRANE AT FRONT AND REAR, AND THAT THE BOOM CARRIES NO LOAD.

LOWER BOOM LIFT CYLINDER

The boom lift cylinder is of the double acting type for all units. During operation, the cylinder should not leak, but a slight dampness at the rod seal - is acceptable. The pins should be checked for wear. Check the pivot pin lock pins for tightness. The cylinder and holding valve should be inspected for fluid leakage, damage and security.

LOWER BOOM LIFT CYLINDER REMOVAL

1. Support the top boom.
2. Disconnect lower lift cylinder from lower boom weldment by removing the pivot pin after taking off retaining ring and keeper rpin.
3. Disconnect and plug the hydraulic hoses.

⚠ CAUTION

To prevent damaging internal components of boom lift cylinder, keep hydraulic hose ends free from contamination.

4. Remove the cylinder base pin.
5. Support the cylinder and remove the cylinder base end pin.
7. Remove the cylinder.

LOWER BOOM LIFT CYLINDER REPLACEMENT

1. Carefully position the new cylinder in the machine with the holding valve and hose connections facing upward.
2. Connect the base end of cylinder to the machine by reinstalling the pin and all retainers.
3. Support the rod end of the cylinder and reconnect the hoses to the cylinder.
4. Use the controls to extend or retract the cylinder to align the cylinder so the rod end pin can be installed. Install the pin and retainers.
5. Use plastic wire ties to fasten the hose to the cylinder as it was prior to this installation.
6. Grease both ends of the cylinder pivot pins at the two (2) grease fittings.
7. Raise the platform with the lower controls and remove any blocking, straps, or chains which were used to support the platform.
8. Raise and lower the platform several times to confirm correct operation and purge all air from the cylinder. Initially, there may be a hesitation due to the presence of air in the cylinder.

LOWER BOOM LIFT CYLINDER SEAL REPLACEMENT

1. Remove lift cylinder.

⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

2. Remove end gland from lift cylinder.
3. Remove cylinder rod and piston.
4. Remove seals.
5. Replace boom lift cylinder seals.
6. Replace cylinder rod and piston.
7. Secure end gland to lift cylinder.
8. Replace boom lift cylinder in the unit.

LOWER LIFT CYLINDER HOLDING VALVE REPLACEMENT

The holding valve is integrated into the upperside of the lift cylinder. Make certain that all power is off and that the lift cylinder bears no load before proceeding with repairs.

1. Loosen holding valve and wiggle to bleed off any possible hydraulic pressure.
2. Remove valve.
3. When installing new valve, lubricate seals with clean oil and install valve.
4. Torque to 30 to 35 Ft Lbs.

LOWER BOOM AND CYLINDER PIVOT PIN AND BUSHING REPLACEMENT

Pivot pin and bushing removal from the boom and cylinder is required if they are worn or damaged.

1. Support the top boom.
2. For boom pivot pin and bushing replacement, remove retaining ring and lock pin from the boom weldment and parallel arm one at a time and replace before proceeding to next pivot pin and bushing.

   For cylinder pivot pin and bushing replacement, remove retaining ring and lock pin from one end of the cylinder at a time before proceeding to the other pivot pin and bushing.

   - Remove the pivot pin.
   - Split the bushings with a hammer and chisel, and remove them.
   - Seat replacement bushings, using an arbor press.
   - Lubricate the new pivot pin with a light grade of oil, and slide it in place.
   - Replace retaining rings and lock pin.

3. Grease all the bearing surfaces through the grease fittings with the appropriate lubricant

MIDDLE BOOM FOR MODEL 41/24

Clean the boom once a year and inspect along the boom structure, especially all welds and brackets.

⚠WARNING

TO PREVENT PERSONAL INJURY WHILE SERVICING ANY PART OF THE MIDDLE BOOM, ENSURE THAT IT IS SUPPORTED BY A CRANE AT FRONT AND REAR, AND THAT THE BOOM CARRIES NO LOAD.

MIDDLE BOOM LIFT CYLINDER

The boom lift cylinder is of the double acting type for all units. During operation, the cylinder should not leak, but a slight dampness at the rod seal - is acceptable. The pins should be checked for wear. Check the pivot pin pins for tightness. The cylinder and holding valve should be inspected for fluid leakage, damage and security.

MIDDLE BOOM LIFT CYLINDER REMOVAL

1. Support the top boom.
2. Disconnect middle lift cylinder from middle boom weldment by removing the pivot pin after taking off retaining ring and keeper pin.
3. Disconnect and plug the hydraulic hoses.

⚠ CAUTION

To prevent damaging internal components of boom lift cylinder, keep hydraulic hose ends free from contamination.

4. Remove the cylinder base pin.
5. Support the cylinder and remove the cylinder base end pin.
6. Remove the cylinder.

MIDDLE BOOM LIFT CYLINDER REPLACEMENT

1. Carefully position the new cylinder in the machine with the holding valve and hose connections facing upward.
2. Connect the base end of cylinder to the machine by reinstalling the pin and all retainers.
3. Support the rod end of the cylinder and reconnect the hoses to the cylinder.
4. Use the controls to extend or retract the cylinder to align the cylinder so the rod end pin can be installed. Install the pin and retainers.
5. Use plastic wire ties to fasten the hose to the cylinder as it was prior to this installation.
6. Grease both ends of the cylinder pivot pins at the two (2) grease fittings.
7. Raise the platform with the lower controls and remove any blocking, straps, or chains which were used to support the platform.
8. Raise and lower the platform several times to confirm correct operation and purge all air from the cylinder. Initially, there may be a hesitation due to the presence of air in the cylinder.

MIDDLE BOOM LIFT CYLINDER SEAL REPLACEMENT

1. Remove lift cylinder.

⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

2. Remove end gland from lift cylinder.
3. Remove cylinder rod and piston.
4. Remove seals.
5. Replace boom lift cylinder seals.
6. Replace cylinder rod and piston.
7. Secure end gland to lift cylinder.
8. Replace boom lift cylinder in the unit.

MIDDLE LIFT CYLINDER HOLDING VALVE REPLACEMENT

The holding valve is integrated into the upperside of the lift cylinder. Make certain that all power is off and that the lift cylinder bears no load before proceeding with repairs.

1. Loosen holding valve and wiggle to bleed off any possible hydraulic pressure.
2. Remove valve.
3. When installing new valve, lubricate seals with clean oil and install valve.
4. Torque to 30 to 35 Ft Lbs.

MIDDLE BOOM AND CYLINDER PIVOT PIN AND BUSHING REPLACEMENT

Pivot pin and bushing removal from the boom and cylinder is required if they are worn or damaged.

1. Support the top boom.
2. For boom pivot pin and bushing replacement, remove retaining ring and lock pin from the boom weldment and parallel arm one at a time and replace before proceeding to next pivot pin and bushing.

   For cylinder pivot pin and bushing replacement, remove retaining ring and lock pin from one end of the cylinder at a time before proceeding to the other pivot pin and bushing.

   - Remove the pivot pin.
   - Split the bushings with a hammer and chisel, and remove them.
   - Seat replacement bushings, using an arbor press.
   - Lubricate the new pivot pin with a light grade of oil, and slide it in place.
   - Replace retaining rings and lock pin.

3. Grease all the bearing surfaces through the grease fittings with the appropriate lubricant

UPPER BOOM FOR MODEL 41/24

Clean the boom once a year and inspect along the boom structure, especially all welds and brackets.

⚠WARNING

TO PREVENT PERSONAL INJURY WHILE SERVICING ANY PART OF THE UPPER BOOM, ENSURE THAT IT IS SUPPORTED BY A CRANE AT FRONT AND REAR, AND THAT THE BOOM CARRIES NO LOAD.

UPPER BOOM LIFT CYLINDER

The boom lift cylinder is of the double acting type for all units. During operation, the cylinder should not leak, but a slight dampness at the rod seal - is acceptable. The pins should be checked for wear. Check the pivot pin lock pins for tightness. The cylinder and holding valve should be inspected for fluid leakage, damage and security.

UPPER BOOM LIFT CYLINDER REMOVAL

1. Support the top boom.
2. Disconnect upper lift cylinder from upper boom weldment by removing the pivot pin after taking off retaining rings and keeper pin.
3. Disconnect and plug the hydraulic hoses.

⚠ CAUTION

To prevent damaging internal components of boom lift cylinder, keep hydraulic hose ends free from contamination.

4. Remove the cylinder base pin.
5. Support the cylinder and remove the cylinder base end pin.
7. Remove the cylinder.

UPPER BOOM LIFT CYLINDER REPLACEMENT

1. Carefully position the new cylinder in the machine with the holding valve and hose connections facing upward.
2. Connect the base end of cylinder to the machine by reinstalling the pin and all retainers.
3. Support the rod end of the cylinder and reconnect the hoses to the cylinder.
4. Use the controls to extend or retract the cylinder to align the cylinder so the rod end pin can be installed. Install the pin and retainers.
5. Use plastic wire ties to fasten the hose to the cylinder as it was prior to this installation.
6. Grease both ends of the cylinder pivot pins at the two (2) grease fittings.
7. Raise the platform with the lower controls and remove any blocking, straps, or chains which were used to support the platform.
8. Raise and lower the platform several times to confirm correct operation and purge all air from the cylinder. Initially, there may be a hesitation due to the presence of air in the cylinder.

UPPER BOOM LIFT CYLINDER SEAL REPLACEMENT

1. Remove lift cylinder.

⚠ CAUTION

Take care not to damage the rod surface and guard against dirt entering the system.

2. Remove end gland from lift cylinder.
3. Remove cylinder rod and piston.
4. Remove seals.
5. Replace boom lift cylinder seals.
6. Replace cylinder rod and piston.
7. Secure end gland to lift cylinder.
8. Replace boom lift cylinder in the unit.

UPPER LIFT CYLINDER HOLDING VALVE REPLACEMENT

The holding valve is integrated into the upperside of the lift cylinder. Make certain that all power is off and that the lift cylinder bears no load before proceeding with repairs.

1. Loosen holding valve and wiggle to bleed off any possible hydraulic pressure.
2. Remove valve.
3. When installing new valve, lubricate seals with clean oil and install valve.
4. Torque to 30 to 35 Ft Lbs.

UPPER BOOM AND CYLINDER PIVOT PIN AND BUSHING REPLACEMENT

Pivot pin and bushing removal from the boom and cylinder is required if they are worn or damaged.

1. Support the top boom.
2. For boom pivot pin and bushing replacement, remove retaining ring and lock pin from the boom weldment and parallel arm one at a time and replace before proceeding to next pivot pin and bushing.

   For cylinder pivot pin and bushing replacement, remove retaining ring and lock pin from one end of the cylinder at a time before proceeding to the other pivot pin and bushing.

   - Remove the pivot pin.
   - Split the bushings with a hammer and chisel, and remove them.
   - Seat replacement bushings, using an arbor press.
   - Lubricate the new pivot pin with a light grade of oil, and slide it in place.
   - Replace retaining rings and lock pin.

3. Grease all the bearing surfaces through the grease fittings with the appropriate lubricant

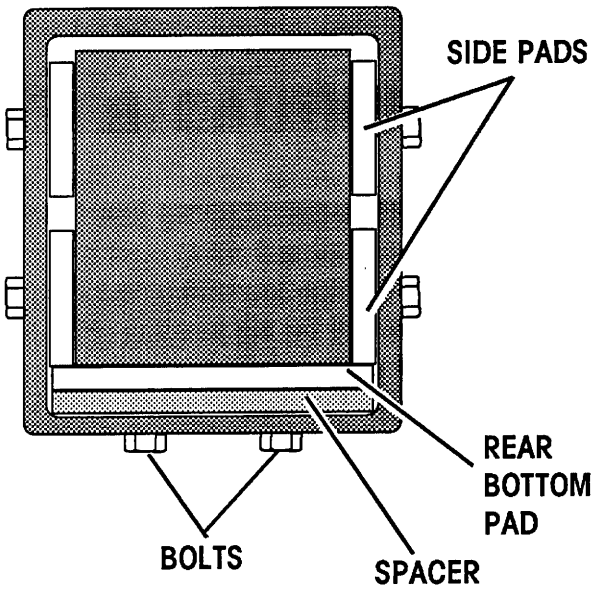
WEAR PADS

The nylon wear pads should be checked for wear approximately every six months. Fully retract the upper telescope boom section, and check the gap between the top wear pad and the outer boom section, at the front (lower) end of the boom. Inspect the side and bottom pads as well.

Then, extend the boom out, and check the gap between the bottom wear pad and the inner boom section, at the rear (upper) end of the outer boom section. Inspect the side and top pads as well.

⚠ CAUTION

If a pad wears to approximately 3/8" (9.5 mm) thick, it should be replaced. Generally, only the bottom pad at the upper end and the top pad at the lower end of the boom will show wear.



Rear (Upper) End Wear Pads.

REAR (UPPER END) WEAR PAD REPLACEMENT

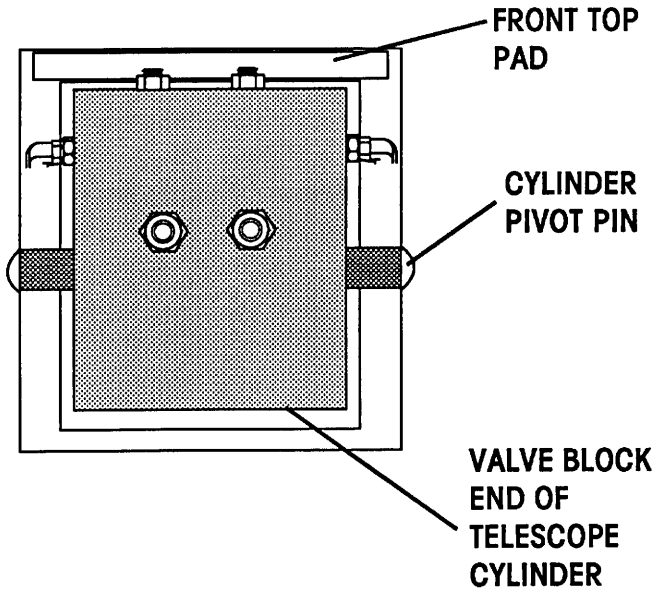
1. Remove the bolts holding the bottom spacer and pad.
2. Remove the pad (the boom may need to be extended out a short distance).
3. Install replacement pad by tapping into place, then securing pad and spacer with mounting bolts.

   Repeat this procedure for the side and top pads if required.

FRONT (LOWER END) WEAR PAD REPLACEMENT

1. Fully retract the telescope boom section.
2. Remove the pivot pin at the lower (valve block) end of the telescope cylinder, then extend the cylinder from the boom.

   Access can now be gained to the front top pad retaining bolts.
3. Remove and replace pad.
4. Retract cylinder and install the pivot pin.



Front (Lower) End Wear Pad.

SECTION: 5
TROUBLESHOOTING

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GENERAL TROUBLESHOOTING TIPS

Before investigating a malfunction, check the following items:

- The Main Power Key Switch should be in the "PLATFORM" or "GROUND" position, as appropriate.
- The Foot Pedal Switch is pressed and held for platform console operation.
- Check that battery connections are secure and batteries are fully charged.
- Check that the Emergency Stop Buttons are released.
- Check that hydraulic fluid is at the correct level.

Common causes of hydraulic system malfunctions:

- Incompatible hydraulic fluids mixed, destroying the additives and causing varnish build up resulting in the valves to stick.
- Water in the hydraulic fluid due to a damp climate.
- Improper hydraulic fluid used; viscosity too high cold climates, viscosity too low warm climates.

NOTE: Mobil DTE-15 is a multiple viscosity oil that is light enough for cold climates and resists thinning in warm climates.

TROUBLESHOOTING CHART

Problem	Probable Cause	Solution
• Excessive heat will cause excessive wear on seals and metal parts due to lowered viscosity. Symptoms to watch for are: pump case turns brown, hydraulic fluid darkens and premature pump failure.	1. Excessive water in the hydraulic fluid. 2. Improper oil viscosity. 3. Improper lubrication and hydraulic fluid.	1. Drain and flush hydraulic system. 2. Replace hydraulic fluid with the correct fluid. 3. Drain and flush hydraulic system.
• Water in hydraulic fluid. Symptoms to watch for are: pitting and etching of pump gear causing heat build up and premature pump failure.	1. Damp climate or condensation in the reservoir. 2. Hydraulic fitting or port open to contaminants.	1. Drain and flush hydraulic system. 2. Drain and flush hydraulic system. Replace worn pump components.
• Varnish, the dark brownish residue left from oxidation of hydraulic fluids. Symptoms to watch for are: residue will cause spools to stick and will hang up moving parts with close tolerances.	1. Incompatible fluids or poor quality fluids. 2. Excessive heating of the fluids.	1. Drain and flush hydraulic system, then fill with recommended hydraulic fluid and lubricant. 2. Drain and flush hydraulic system, then fill with recommended hydraulic fluid.
• Poor lubrication, parts break through lubricant causing metal to metal contact. Symptoms to watch for are: pump gear wear and side gear clearance and excessive heat build up.	1. Hydraulic fluid viscosity low. 2. Improper or poor grade hydraulic fluid or lubricant without proper anti-wear additives.	1. Drain and flush hydraulic system, then fill with recommended hydraulic fluid. 2. Drain and flush hydraulic system, then fill with recommended hydraulic fluid and lubricant.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Cavitation, a gaseous condition within the fluid stream where the pressure is reduced to the vapor pressure of the fluid. The higher the system pressure the more violent the reaction will be. Symptoms to watch for are: catastrophic pump failure or loss of pump pressure.	1. Low reservoir fluid level. 2. Air leaks in suction line. 3. Improper hydraulic fluid. 4. Vaporization of water.	1. Add hydraulic fluid. 2. Repair any suction hose leaks. 3. Have fluid analyzed regularly and drain and flush hydraulic system, then fill with recommended hydraulic fluid. 4. Have fluid analyzed regularly and drain and flush hydraulic system, then fill with recommended hydraulic fluid.
• Hose carrier cross braces breaking.	1. Hoses skiving in the boom track. 2. Hoses too tight in the track.	1. Adjust hose tension. 2. Adjust hose tension.
• Boom track sagging.	1. Track pin holes stretched usually caused by a damaged "I" beam support. 2. Improper lubrication and cleaning.	1. Check "I" beam support and replace if necessary. 2. Follow proper lubrication and cleaning procedures.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• No travel speed function for drive (creep speed only).	• Low speed pot or boom limit switch(es)	• A breakdown of any one of these components will cause the high speed function to be inoperable.
• Movement alarm will not sound.	• Movement alarm relay, diodes, or the travel alarm itself is faulty.	• A breakdown in any one of these components will cause the alarm not to function. Trace the available voltage to the horn. Replace the component(s) that are bad.
• Lift cylinder drifts down.	1. Holding valve cartridge dirty or faulty. 2. Cylinder packing is damaged.	1. Clean, repair or replace the holding valve. 2. Replace cylinder packing.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• No pump output (lift circuit).	1. Broken pump drive shaft.	1. Check for broken pump drive shaft and replace if broken.
	2. Fluid leaks.	2. Check for fluid at pump inlet.
	3. Motor not turning.	3. Low battery voltage. • Check that motor functions properly.
	4. Motor relays not engaging	4 Check for proper motor relay operation and replace if broken.
• Hydraulic functions slow.	1. Low pressure.	1. Bench test pump output.
	2. Low pump output (GPM).	2. Check for low system pressure and adjust to correct pressure.
	3. Slow motor speed.	3. Low battery voltage. • Loose wire connections.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Lift (hoist) cylinder drifts down.	1. Holding valve cartridge dirty or faulty. 2. Cylinder packing is damaged.	1. Clean, repair or replace the holding valve. 2. Replace cylinder packing.
• No hydraulic pump output	1. Water in hydraulic fluid. 2. Improper fluid viscosity. 3. Foot pedal blocked. 4. Pump cam bearing failure. 5. Broken pump drive shaft. 6 Fluid leaks.	1. Drain and flush hydraulic system. 2. Use correct fluid. See Lubrication Chart. 3. Unblock foot pedal. 4. Replace pump. 5. Check for broken pump drive shaft and replace if broken. 6. Check for excessive circuit leakage and fluid at pump inlet.
• Low hydraulic pump output.	• Pump component failure.	1. Check for plugged hydraulic return filter; replace filter element. 2. Bench test pump.
• Function chatter.	1. Hydraulic fluid low. 2. Broken pump components.	1. Check for sufficient inlet fluid and add fluid. 2. Contact Simon.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• No steer function.	1. Steer toggle switch is faulty. 2. Faulty steer relays. 3. Directional valve not shifting. 4. Faulty steer relief valve.	1. Check voltage available to the toggle switch. 2. See schematic. 3. Check voltage supply to valve and replace if necessary. 4. Check pressure setting.
• Steers left, but not right.	• Solenoid 1 malfunction in steer valve.	• Replace coil in solenoid 1.
• Steers right, but not left.	• Solenoid 2 malfunction in steer valve.	• Replace coil in solenoid 2.
• All hydraulic functions inoperable.	1. Ground/ platform switch in wrong position. 2. Low operating pressure.	1. Check ground platform switch. 2. Check for correct operating pressure.
• Telescope, swing, or hoist functions don't operate using ground control	1. Ground/ platform switch in wrong position. 2. Low operating pressure.	1. Turn ground/ platform switch to correct position. 2. Check for correct operating pressure.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Unit will not steer; all other functions operate.	1. Mechanical malfunction.	1. Steer cylinder may not be mechanically connected to steering linkage. Check for disconnected or damaged steering linkage; connect steering linkage or replace components as required.
	2. Steering directional control valve.	2. The steering directional control valve may not be shifting. The valve spools may be stuck. The directional control valve is defective or a valve spool is obstructed. Remove valve and inspect, clean, repair or replace as needed.
	3. Toggle switch or directional coils have no voltage.	3. Check voltage available to the toggle switch and directional coils.
	4. Faulty steer relief valve.	4. Adjust pressure or replace valve, if necessary.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• No drive function.	1. Brakes do not release.	1. Check pressure supply to brakes. If no pressure, consult factory.
	2. Motor shaft key is sheared.	2. Inspect, repair or replace.
	3. Drive directional control valve.	3. The drive directional control contacts may not be shifting. The directional control contactors are defective. Remove contactor and inspect, clean, repair or replace as needed.
	4. Micro switches or directional contacts have no voltage.	4. Check voltage available to the micro switches and contacts.
• Boom drifts down without lever actuated with power on or off.	1. Defective holding valve.	1. Check holding valve for foreign material or internal damage; replace if damaged.
	2. Damaged cylinder packing.	2. Replace packing.
• Boom drifts down without lever activation.	1. Defective holding valve.	1. Check holding valve for foreign material or internal damage; replace if damaged.
	2. Damaged cylinder packing.	2. Replace packing.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Swing gear and worm gear teeth failure.	1. Excessive side loading of boom.	1. Check for excessive side loading of boom; correct the situation.
	2. Torque on swing bearing bolts.	2. Check for correct torque on bearing bolts. A loose bearing will cause excessive backlash between gears.

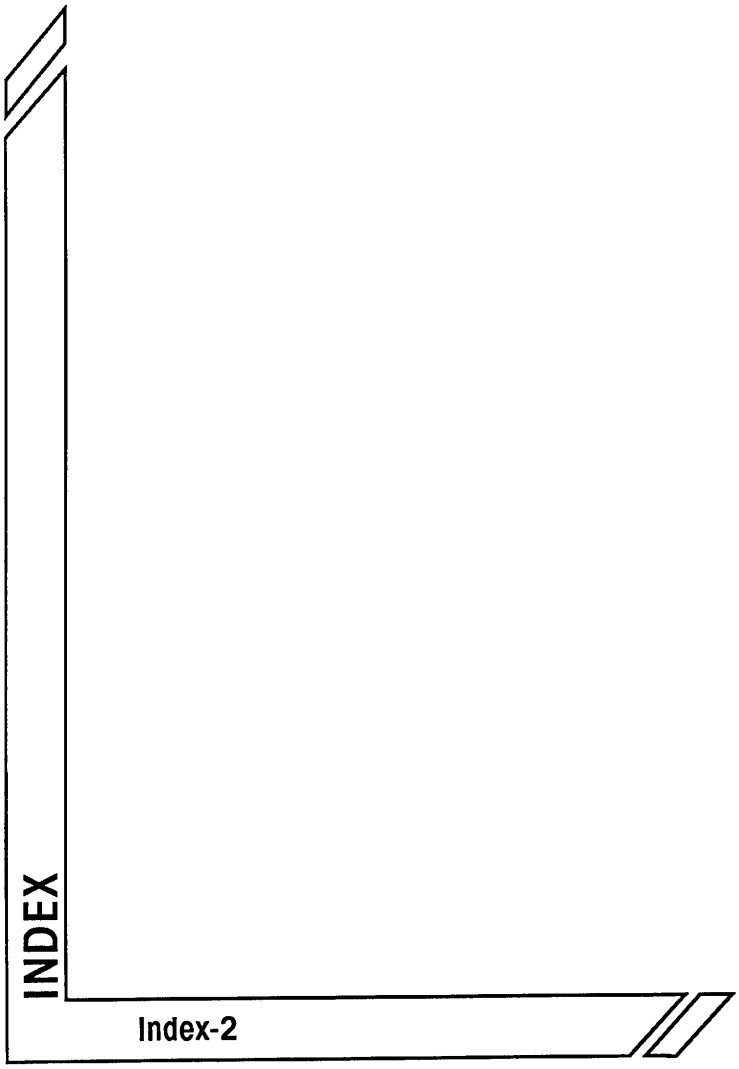
TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• No lift (hoist), lower, or extend function.	1. Faulty cylinder.	1. Possibly plugged lines, cylinder ports or damaged cylinder packings. Inspect, repair or replace cylinder.
	2. No pump output.	2. Check pump.
	3. Main relief pressure setting too low.	3. Check pressure.
• Swing motor will not run in either direction.	• Mechanical malfunction.	1. Check for an obstruction between the pinion gear and swing bearing; remove the obstruction.
		2. Swing gear box pinion shaft is broken; replace pinion shaft.
		3. Swing motor shaft is broken or seized; check the swing motor.

TROUBLESHOOTING CHART (CONTINUED)

Problem	Probable Cause	Solution
• Platform rotate selector valve body cracked or blown body seal.	1. Excessive system pressure.	1. Check that there is no back pressure on the return port. Check that inlet and return hoses are connected.
	2. Blocked hoses.	2. Check for blocked or partially blocked return hoses.
• Platform does not level properly (platform drifting).	1. Damaged parts.	1. Check for damaged parts such as bent pins or elongated pin holes; replace damaged parts. May need to replace slave cylinder.
	2. Defective holding valve.	2. Check holding valve for foreign material or internal damaged; replace if damaged.
• Platform level selector valve body cracked or blown body seal.	1. Excessive system pressure.	1. Check that there is no back pressure on the return port. Check that inlet and return hoses are connected.
	2. Blocked hoses.	2. Check for blocked or partially blocked return hoses.
• Unit will not steer; all other functions operate.	1. Excessive system pressure.	1. Check that there is no back pressure on the return port, and that inlet and return hoses are connected.
	2. Blocked hoses.	2. Check for blocked or partially blocked return hoses.

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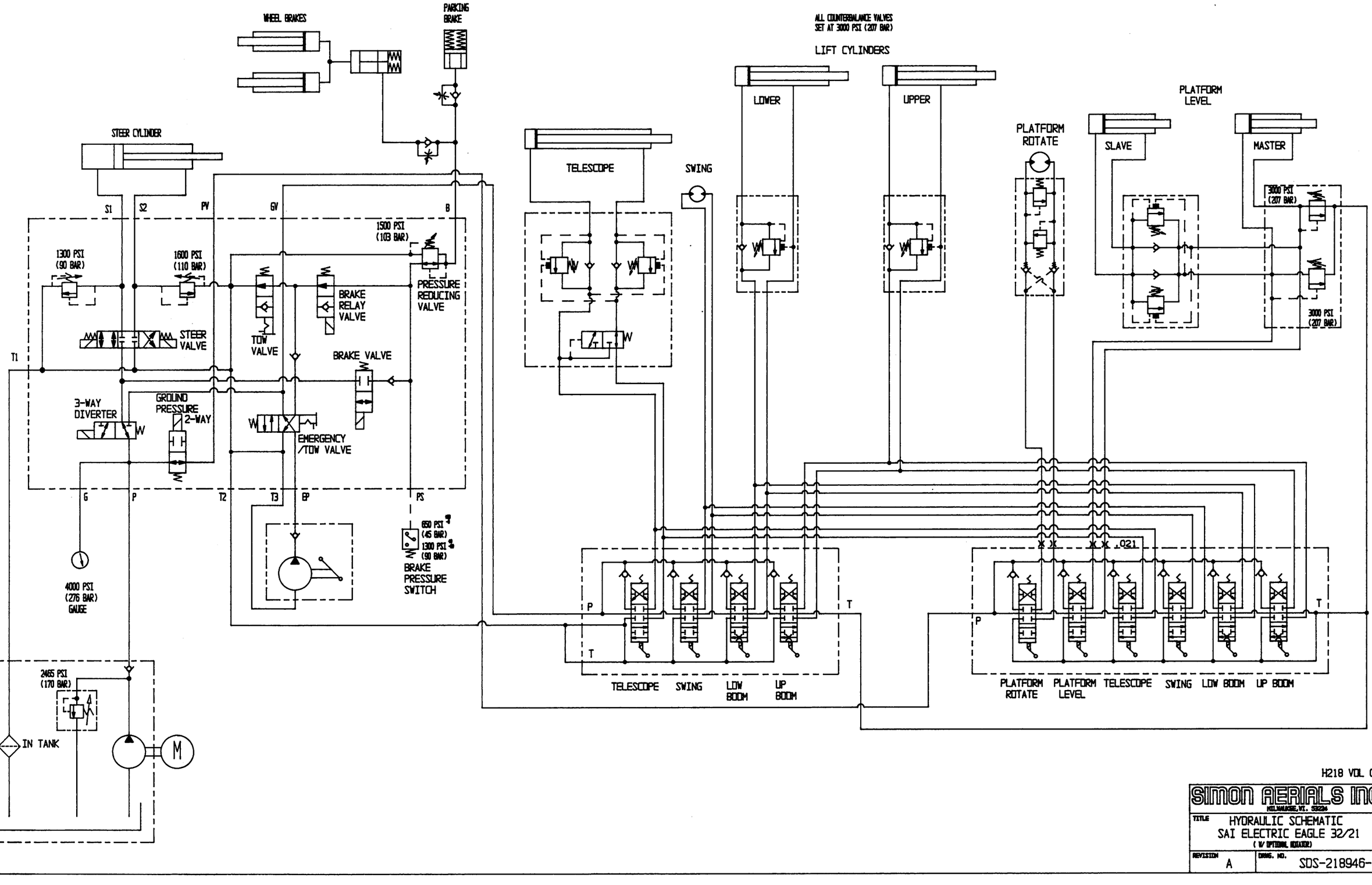
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Hydraulic Schematic Eagle 32/21 (after 1 Jan. 1994) ..... Ref. Dwg. No. SDS-232618-0
Hydraulic Schematic Eagle 32/21 w/Rotator (after 1 Jan. 1994 Ref. Dwg. No. SDS-232619-0
Hydraulic Schematic Eagle 41/24 (after 1 Jan. 1994) ..... Ref. Dwg. No. SDS-232620-0
Hydraulic Schematic Eagle 41/24 w/Rotator (after 1 Jan. 1994) Ref. Dwg. No. SDS-232621-0
Electrical Schematic Eagle 32/21, 41/24 (before 1 Jan. 1994). Ref. Dwg. No. SDS-218547-0
Electrical Schematic Eagle 32/21, 41/24 (after 1 Jan. 1994) ... Ref. Dwg. No. SDS-232714-0
Electrical Schematic Eagle 32/21, $1/24 (after 1 Jan. 1994..... Ref. Dwg. No. SDS-233637-0



H218 VOL 07

SIMON AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: HYDRAULIC SCHEMATIC
SAI ELECTRIC EAGLE 32/21
(W/ OPTIONAL ROTATOR)

REVISION: A

DRWG. NO.: SDS-218946-0

WHEEL BRAKES

PARKING BRAKE

ALL COUNTERBALANCE VALVES SET AT 3000 PSI (207 BAR)

LIFT CYLINDERS

STEER CYLINDER

TELESCOPE

SWING

LOWER

MID

UPPER

PLATFORM ROTATE

PLATFORM LEVEL

SLAVE

MASTER

S1 S2 PV GV B

1500 PSI (103 BAR)

1300 PSI (90 BAR)

1600 PSI (110 BAR)

T1

G P T2 T3 EP PS

650 PSI (45 BAR)

1300 PSI (90 BAR)

4000 PSI (276 BAR) GAUGE

2465 PSI (170 BAR)

IN TANK

M

3000 PSI (207 BAR)

3000 PSI (207 BAR)

P T

P T

.021

TELESCOPE SWING LOW BOOM MID BOOM UP BOOM

PLATFORM ROTATE PLATFORM LEVEL TELESCOPE SWING LOW BOOM MID BOOM UP BOOM

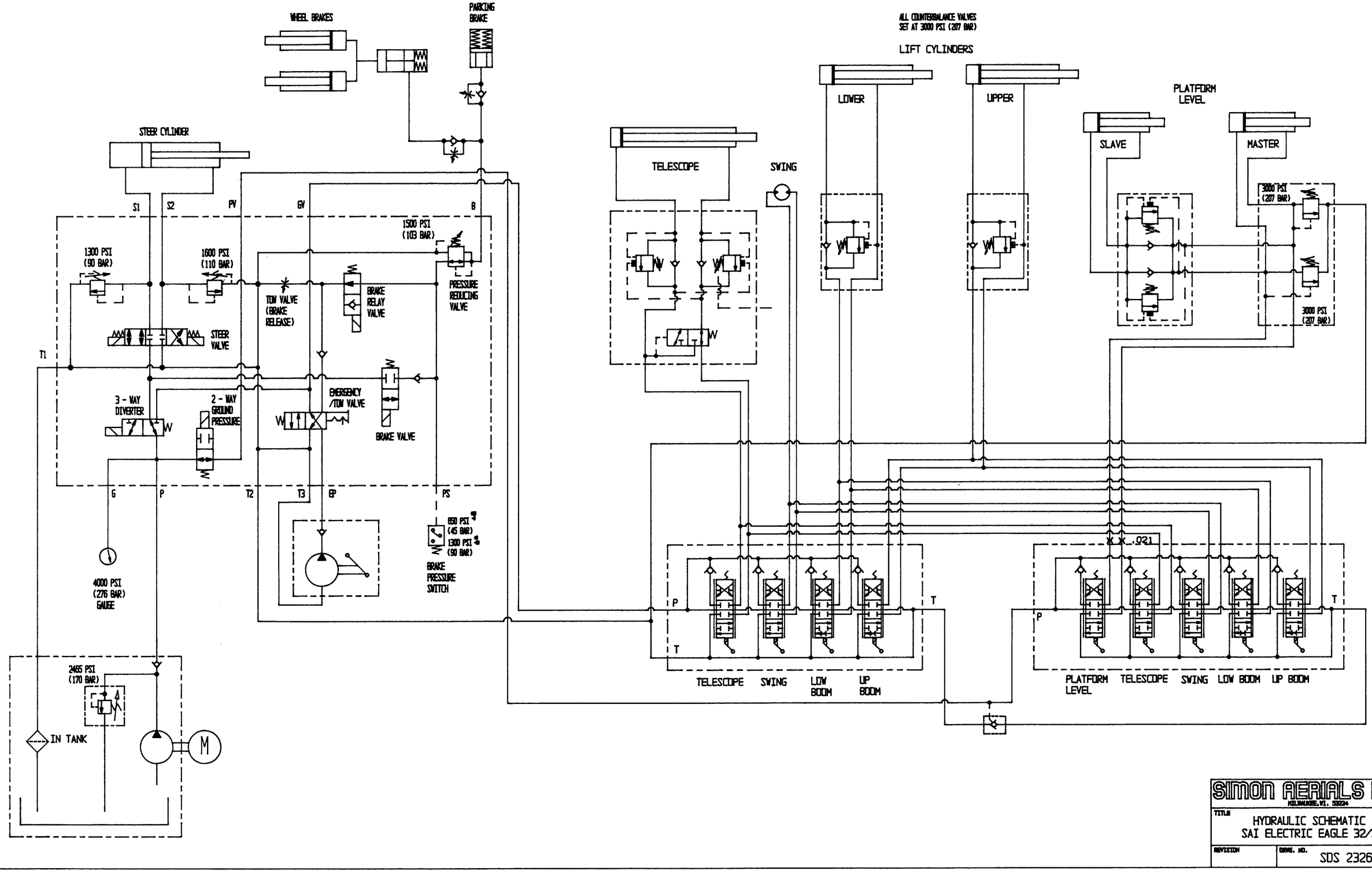
SIMON AERIALS INC.

MILWAUKEE, WI. 53224

TITLE: HYDRAULIC SCHEMATIC
SAI ELECTRIC EAGLE 41/24
(14 OPTIONAL MODEL)

REVISION

DWG. NO. SDS-218947-0

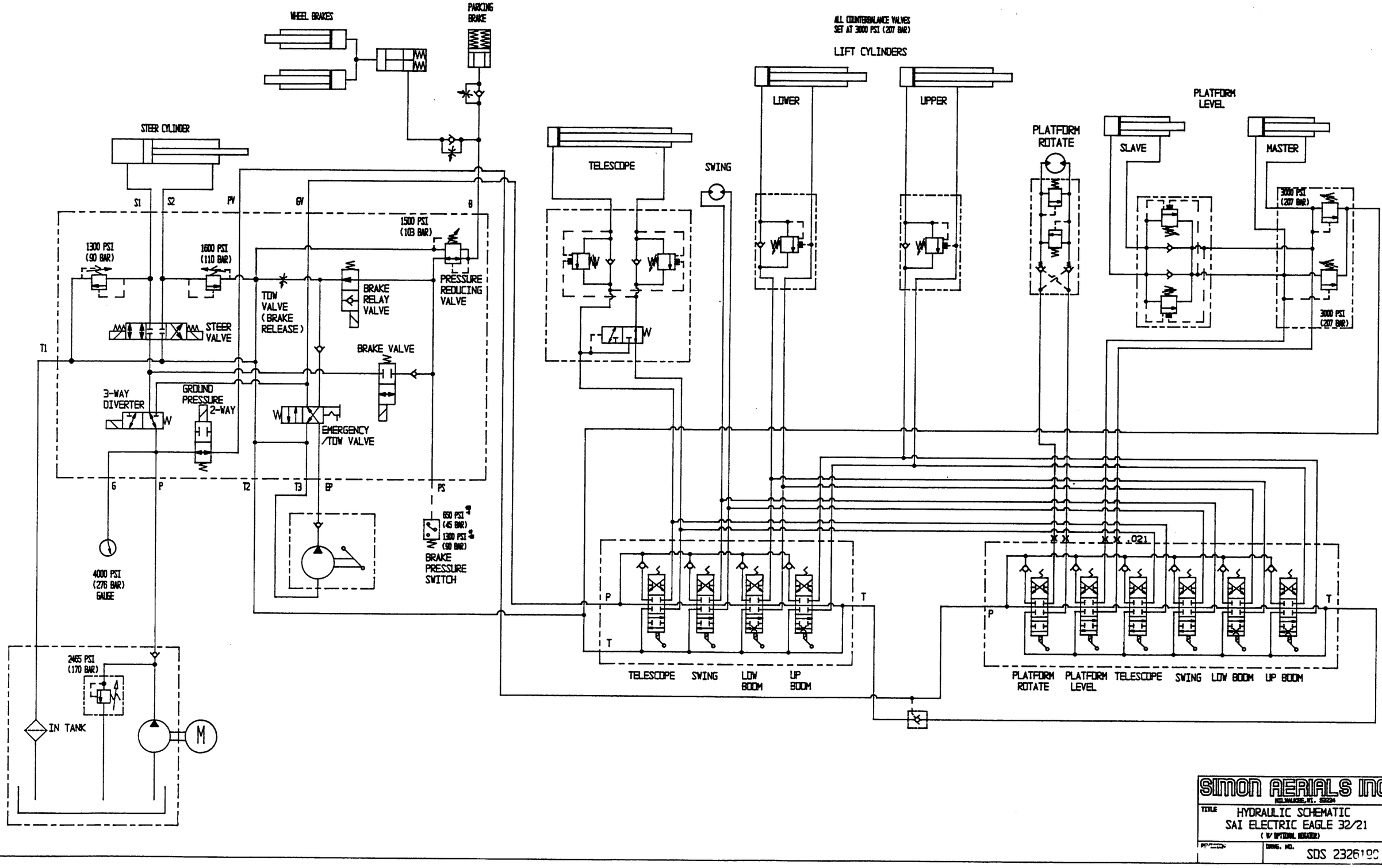


SIMON AERIALS INC.
MILWAUKEE, WI. 53224

TITLE
HYDRAULIC SCHEMATIC
SAI ELECTRIC EAGLE 32/21

REVISION

DRWG. NO.
SDS 2326180



SIMON AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: HYDRAULIC SCHEMATIC
SAI ELECTRIC EAGLE 32/21
(W/ OPTIONAL BOOM)

REVISION

DWG. NO. SDS 2326190

WHEEL BRAKES

PARKING BRAKE

STEER CYLINDER

S1 S2 PV GV B

1500 PSI (103 BAR)

1300 PSI (90 BAR)

1600 PSI (110 BAR)

TDW VALVE (BRAKE RELEASE)

BRAKE RELAY VALVE

PRESSURE REDUCING VALVE

T1

STEER VALVE

3 - WAY DIVERTER

2 - WAY GROUND PRESSURE

BRAKE VALVE

EMERGENCY /TDW VALVE

G P T2 T3 EP PS

650 PSI (45 BAR)

1300 PSI (90 BAR)

BRAKE PRESSURE SWITCH

4000 PSI (276 BAR) GAUGE

2465 PSI (170 BAR)

IN TANK

M

TELESCOPE

SWING

ALL COUNTERBALANCE VALVES SET AT 3000 PSI (207 BAR)

LIFT CYLINDERS

LOWER

MID

UPPER

P T

TELESCOPE SWING LOW BOOM MID BOOM UP BOOM

PLATFORM LEVEL

SLAVE

MASTER

3000 PSI (207 BAR)

3000 PSI (207 BAR)

.021

P T

PLATFORM LEVEL TELESCOPE SWING LOW BOOM MID BOOM UP BOOM

SIMON AERIALS INC.
MILWAUKEE, WI. 53224

TITLE
HYDRAULIC SCHEMATIC
SAI ELECTRIC EAGLE 41/24

REVISION

DRWG. NO.
SDS 2326200

WHEEL BRAKES

PARKING BRAKE

STEER CYLINDER

S1 S2 PV GV B

1500 PSI (103 BAR)

1300 PSI (90 BAR)

1600 PSI (110 BAR)

PRESSURE REDUCING VALVE

TDM VALVE (BRAKE RELEASE)

BRAKE RELAY VALVE

STEER VALVE

T1

3 - WAY DIVERTER

2 - WAY GROUND PRESSURE

BRAKE VALVE

EMERGENCY /TDM VALVE

G P T2 T3 EP PS

650 PSI (45 BAR)

1300 PSI (90 BAR)

BRAKE PRESSURE SWITCH

4000 PSI (276 BAR) GAUGE

2465 PSI (170 BAR)

IN TANK

M

ALL COUNTERBALANCE VALVES SET AT 3000 PSI (207 BAR)

LIFT CYLINDERS

TELESCOPE

SWING

LOWER

MID

UPPER

PLATFORM ROTATE

SLAVE

MASTER

PLATFORM LEVEL

3000 PSI (207 BAR)

3000 PSI (207 BAR)

P T

TELESCOPE SWING LOW BOOM MID BOOM UP BOOM

.021

P T

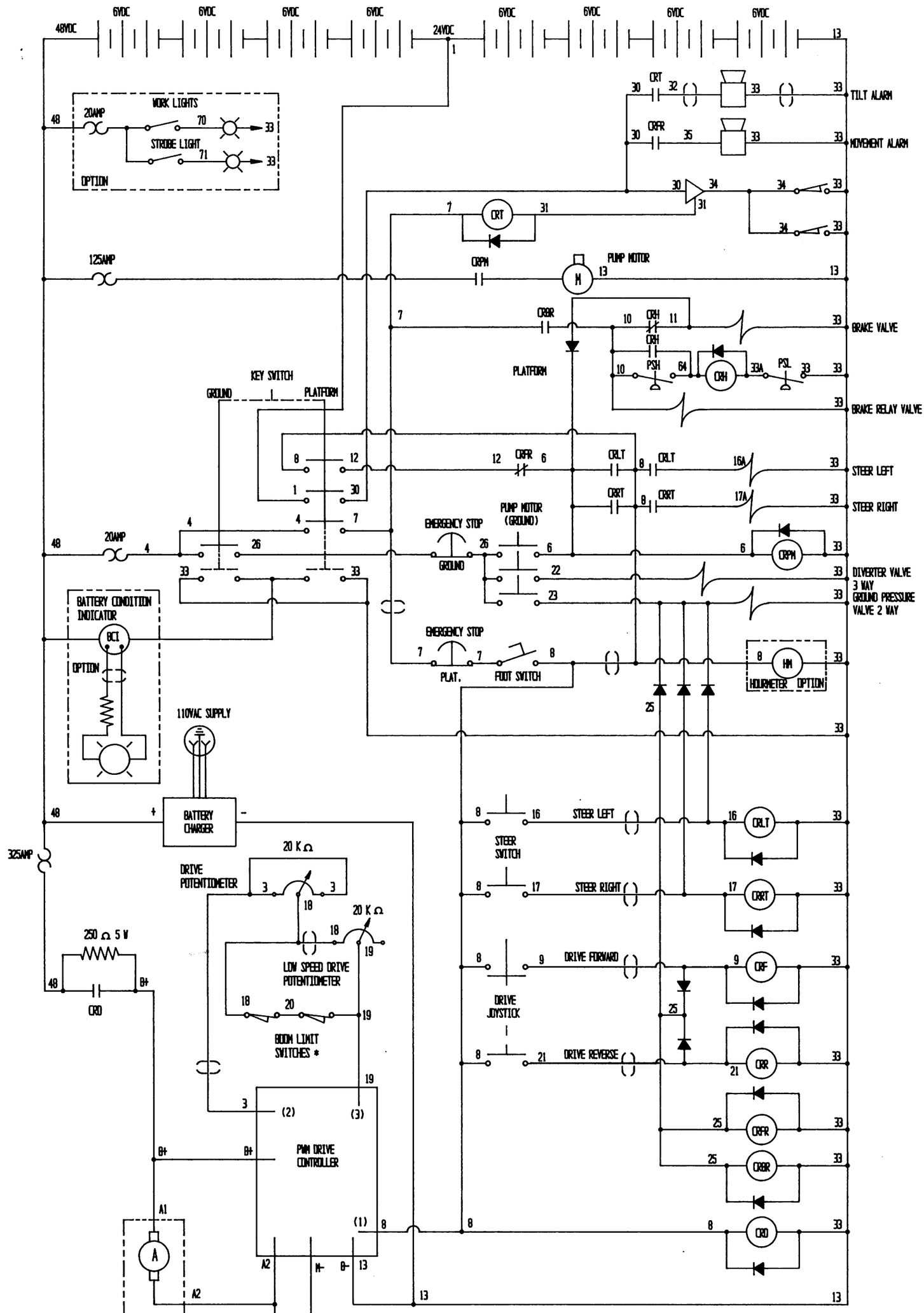
PLATFORM ROTATE PLATFORM LEVEL TELESCOPE SWING LOW BOOM MID BOOM UP BOOM

SIMON AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: HYDRAULIC SCHEMATIC
SAI ELECTRIC EAGLE 41/24
(W/ OPTIONAL ROTATOR)

REVISION

DWG. NO. SDS 2326210



NOTES: - WIRE NUMBERS 13&33 ARE BOTH BATTERY NEGATIVE- #13 DENOTES CABLE, #33 DENOTES WIRE.

- * BOOM LIMIT SWITCHES ARE DRAWN FOR 41/24. THE 32/21 MODEL HAS ONLY ONE BOOM LIMIT SWITCH. SWITCHES SHOWN IN THE MACHINE STOWED POSITION.

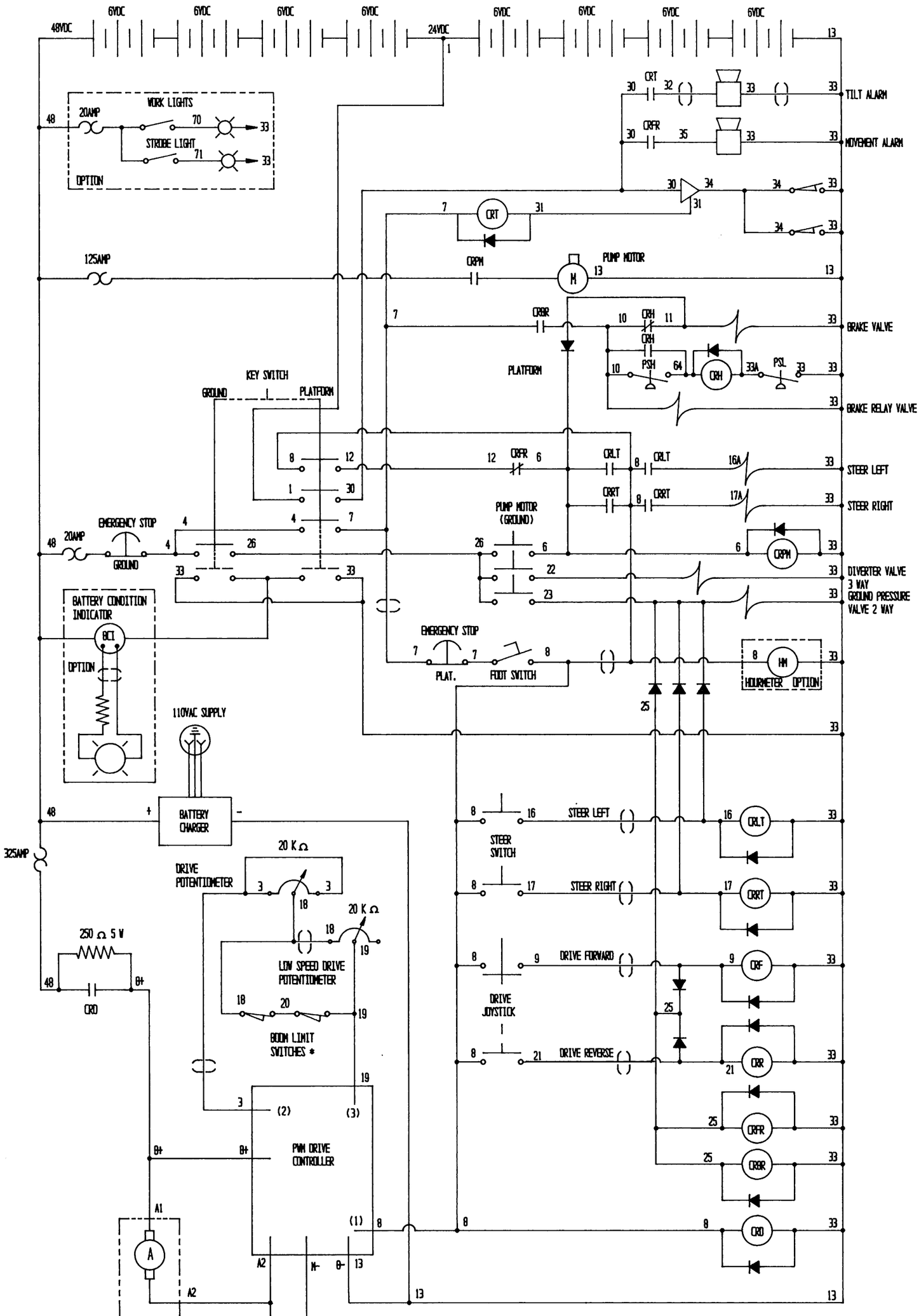
SIMON-AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: ELECTRICAL SCHEMATIC
EAGLE 32/21E & 41/24E

REVISION: A

DRWG. NO. SDS-218547-0

E218 VOL 03



NOTES: - WIRE NUMBERS 13&33 ARE BOTH BATTERY NEGATIVE- #13 DENOTES CABLE, #33 DENOTES WIRE.

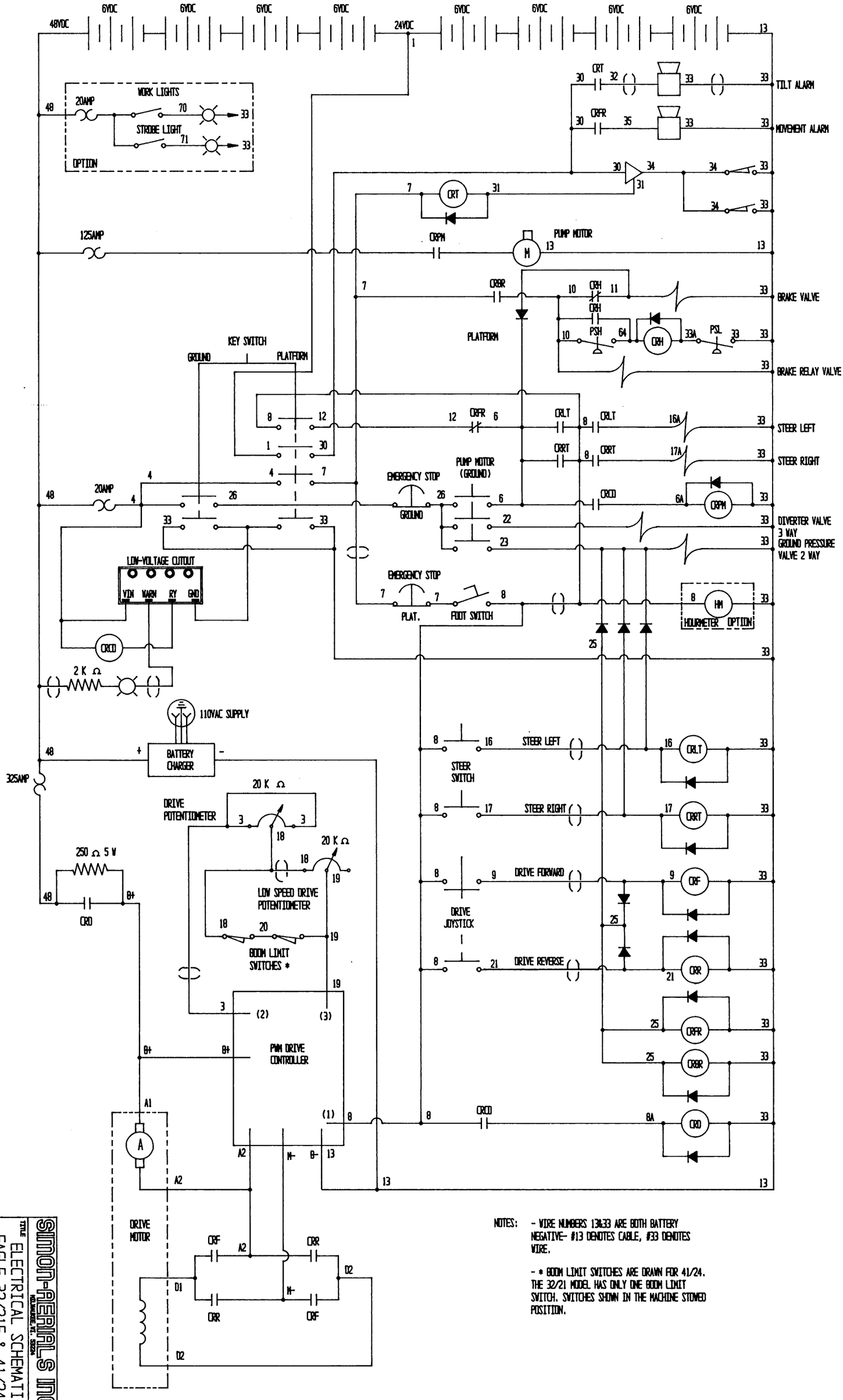
- * BOOM LIMIT SWITCHES ARE DRAWN FOR 41/24. THE 32/21 MODEL HAS ONLY ONE BOOM LIMIT SWITCH. SWITCHES SHOWN IN THE MACHINE STOWED POSITION.

SIMON-AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: ELECTRICAL SCHEMATIC
EAGLE 32/21E & 41/24E

REVISION:

DRWG. NO. SDS 2327140



NOTES: - WIRE NUMBERS 13&33 ARE BOTH BATTERY NEGATIVE- #13 DENOTES CABLE, #33 DENOTES WIRE.

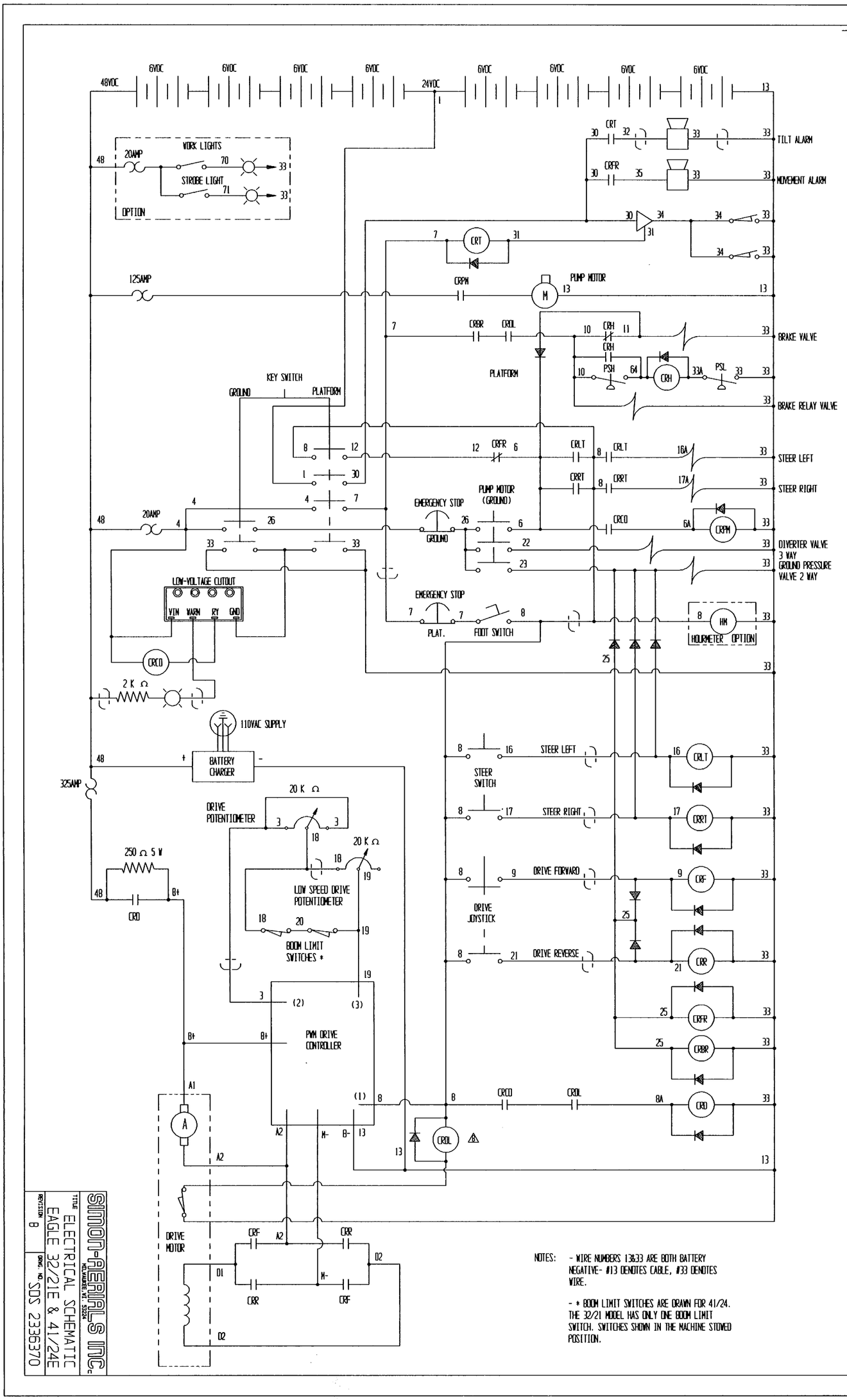
- * BOOM LIMIT SWITCHES ARE DRAWN FOR 41/24. THE 32/21 MODEL HAS ONLY ONE BOOM LIMIT SWITCH. SWITCHES SHOWN IN THE MACHINE STOWED POSITION.

SIMON-AERIALS INC.
MILWAUKEE, WI. 53224

TITLE: ELECTRICAL SCHEMATIC
EAGLE 32/21E & 41/24E

REVISION: A

DWG. NO. SDS 2336370



NOTES: - WIRE NUMBERS 13&33 ARE BOTH BATTERY NEGATIVE- #13 DENOTES CABLE, #33 DENOTES WIRE.

- * BOOM LIMIT SWITCHES ARE DRAWN FOR 41/24. THE 32/21 MODEL HAS ONLY ONE BOOM LIMIT SWITCH. SWITCHES SHOWN IN THE MACHINE STOWED POSITION.

SIMON-AERIALS INC
DELAWARE, WI. 53024

TITLE: ELECTRICAL SCHEMATIC EAGLE 32/21E & 41/24E

REVISION: B

DWG. NO. SDS 2336370