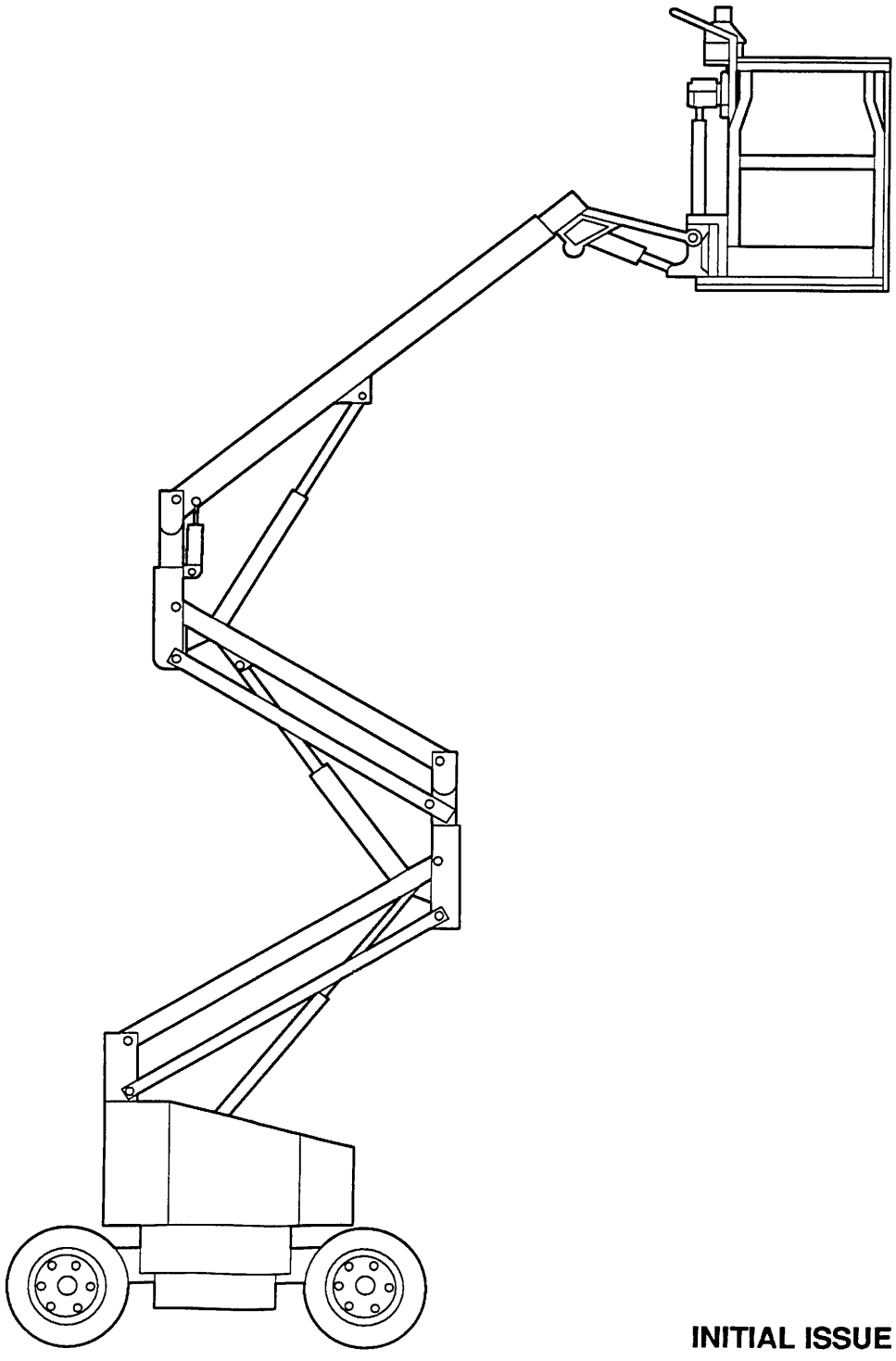
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SERVICE MANUAL

MODEL
SILVER EAGLE SERIES ELECTRIC

32/21
41/24



PART NO. 89-410717

INITIAL ISSUE

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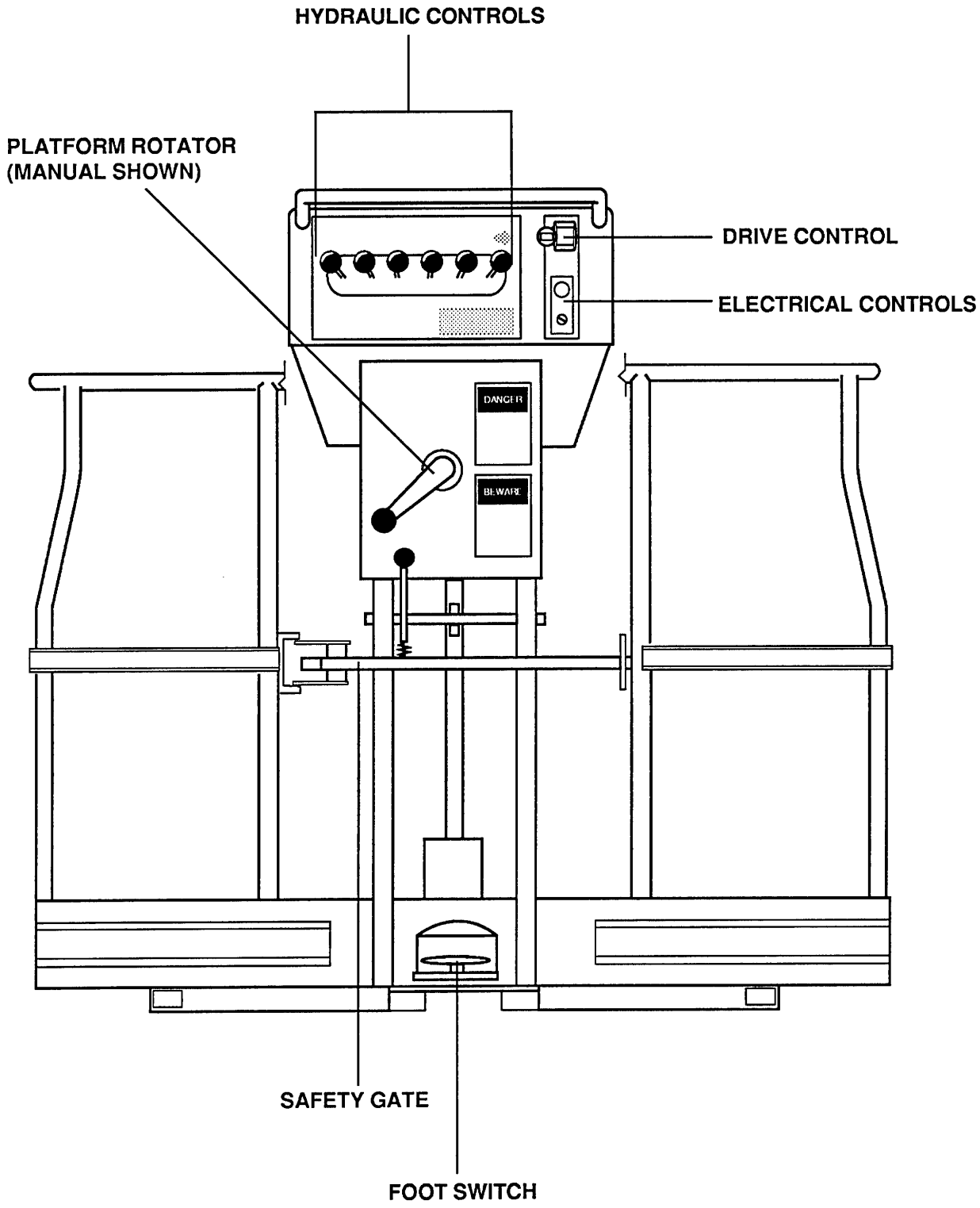
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PLATFORM COMPONENT LOCATOR
(MODEL 41/24 SHOWN)

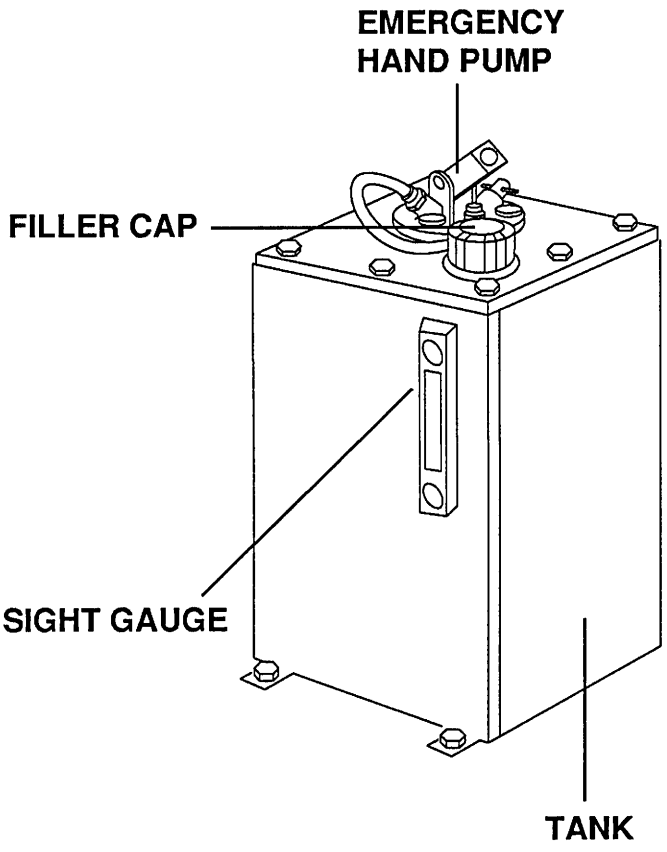


HYDRAULIC FLUID RESERVOIR

The hydraulic fluid reservoir consists of the tank, a filler cap with strainer, a return line defuser, and a suction filter. An emergency hand pump is also included as a permanent part of the hydraulic circuit, for emergency use.

HYDRAULIC RESERVOIR MAINTENANCE

Check tank for signs of leakage. Inspect tank securing bolts for tightness. Check hand pump operation by closing the release valve, engaging one of the machine function levers and operating the pump handle.



Hydraulic Tank.

EMERGENCY HAND PUMP

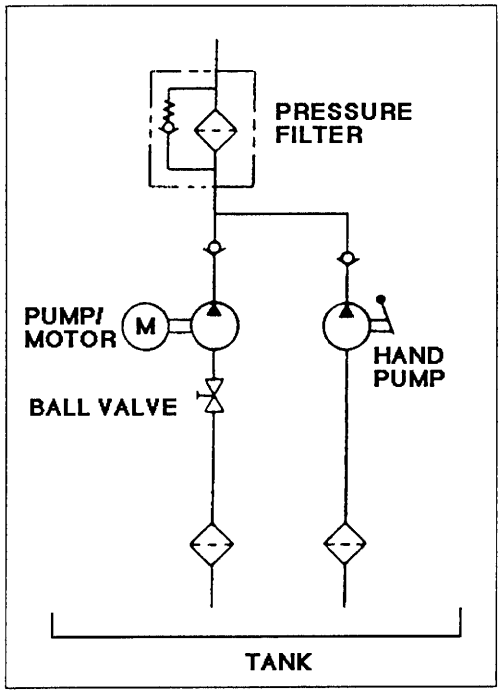
The emergency hand pump is located on top of the hydraulic tank. It is meant to be used only when the ground and platform controls are inoperative due to motor, pump or control system failure.

The pump handle is stored near the tank, and a release valve mounted on the pump must be closed before operating the hand pump.

There are also two check valves in the system. One prevents hydraulic fluid from entering the hand pump from the hydraulic pump. The other allows the fluid to flow from the hand pump to the filter, then to the manifold block and to the ground valve bank.

Check the operation of the emergency hand pump (see "Hydraulic reservoir maintenance").

Check for leaks around the pump gasket. If the hand pump will not operate, the internal filter may be clogged. Remove the filter and clean it by backwashing.



Emergency Pump Hydraulic Schematic.

ELECTRICAL SYSTEM

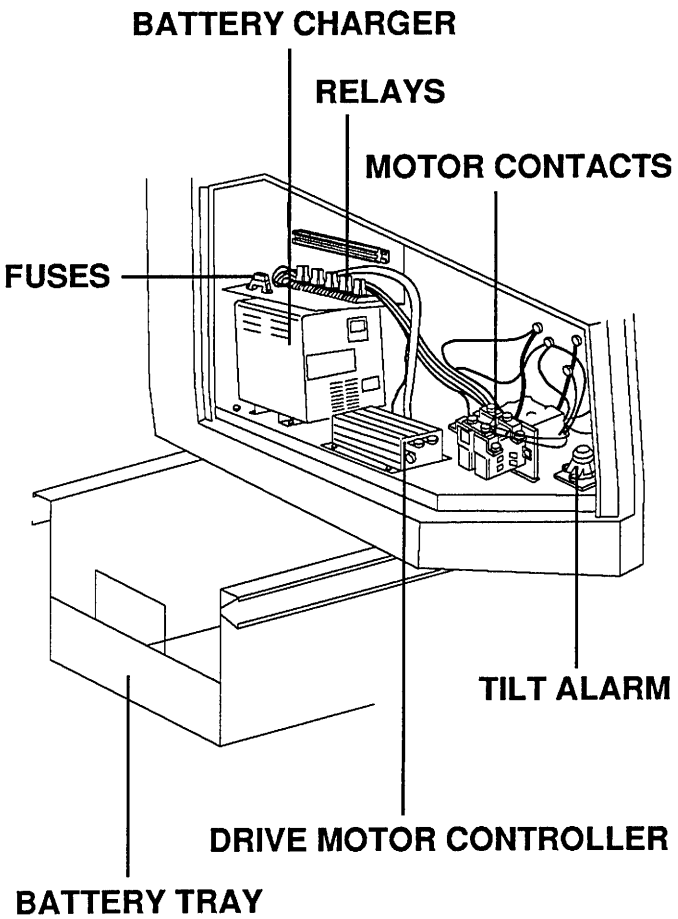
Following is a description of the major components of the SILVER-EAGLE electrical system.

ELECTRICAL CIRCUIT

The main electrical components of the unit are in the electrical cabinet, located on the superstructure. The electrical circuit consists of two distinct parts: the lift circuit and the drive circuit.

The lift circuit consists of two duplicate circuits, controlling lift, telescope, swing and steering functions from either the ground or platform control panel, and selected by a switch on the ground control panel.

The drive circuit controls the drive motor through the motor controller and directional circuitry.



Electrical System Components.

BATTERIES

Eight 6 volt lead-acid batteries are connected in series to provide a 48 volt DC power supply to operate all functions on the electric powered SILVER-EAGLES.

BATTERY MAINTENANCE (IN STORAGE)

Follow these procedures for maintenance of stored batteries:

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, as 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 batteries and mounting frame 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.

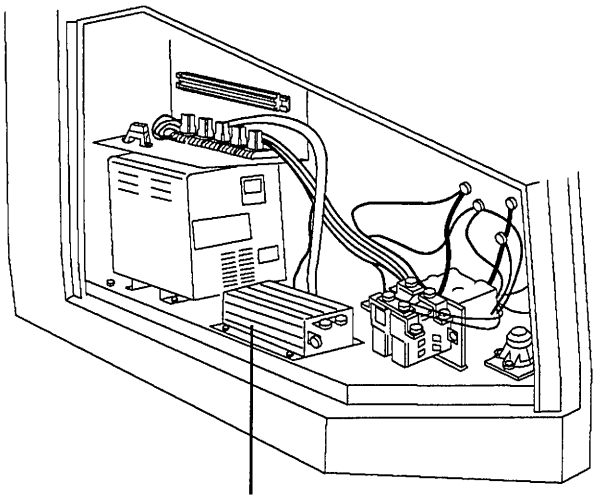
DRIVE MOTOR CONTROLLER

The drive motor controller used on electric operated SILVER-EAGLES is silent in normal operation. However, during "plug braking" (reversing the motor while the unit is moving), a slight "whistle" may be noticed while the controller regulates the motor to a smooth stop. This is normal, and will cease when the machine reverses.

The SILVER-EAGLE is wired so the following conditions must be met before the controller receives power to drive the machine:

- The key switch must be "ON",
- the ground/ platform switch must be in the "PLATFORM" position,
- the lift/ drive switch must be in the "DRIVE" position, and
- the foot pedal switch must be depressed.

When the drive controller lever on the platform control console is moved from its center (neutral) position under the above conditions, the vehicle will respond by moving forward or back.



DRIVE MOTOR CONTROLLER

Drive Motor Controller Location.

Sudden application of "full power" to the lever may switch off controller output. This feature is designed to protect the controller, and returning the lever to its center (neutral) position will reset the circuit. If the controller cuts out during normal lever movement, the lever potentiometer is out of adjustment, and should be corrected.

The drive motor controller is a sealed unit, and no servicing of internal components is possible. Normal maintenance consists of occasional checking of the controller mounting and all electrical connections for tightness, and removing dirt and corrosion from the terminals and surrounding areas.

⚠ WARNING

DISCONNECT THE BATTERIES BEFORE WORKING ON MOTOR CONTROL CIRCUITRY. USE INSULATED TOOLS TO PREVENT ACCIDENTAL SHORT CIRCUITS, AND ALWAYS WEAR SAFETY GLASSES.

When tightening the controller bus bar connections, AVOID STRESSING THE BARS, which could crack the surrounding seals. The controller may be hosed off, or wiped with a damp rag. Do not reconnect the batteries until the terminal area is completely dry.

DRIVE MOTOR CONTROLLER TROUBLESHOOTING

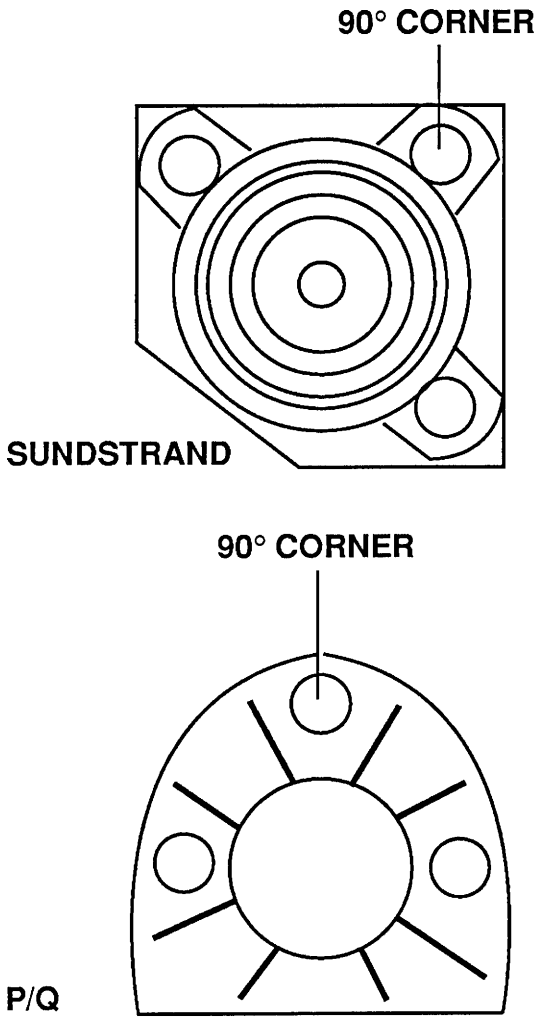
The following procedures are intended to help diagnose problems in the drive motor controller. Since the controller is sealed, and not field serviceable, the intent is to determine if trouble lies in the controller, or in some other part of the motor control circuitry.

Two controller troubleshooting sections follow. The first deals with tests that can be made to controllers while they are mounted on the machine. The second section covers "bench testing" of the controller. To avoid reaching

TILT ALARM

The tilt alarm gives an audible warning when the machine is five degrees or more out of level. The alarm can be tested by manually tipping the alarm sensor (see test procedure, below). If the tilt alarm does not function, check the horn, then check the output relay.

Check the wiring. If wiring is correct, replace the alarm.



Tilt Alarm 90 Degree Corner.

TILT ALARM ADJUSTMENT

The tilt alarm can be adjusted. Before attempting to adjust the alarm, park the machine on a flat, level surface. Fill the tires to the proper pressure (liquid ballasted tires only).

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 the OTHER corner adjacent to the 90° corner in the same manner. 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.

TILT ALARM TEST

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. If not, the flange nuts have been tightened too far. Loosen the nut on the 90° corner, and repeat the adjustment procedure above. This "Push-to-Test" feature enables the tilt alarm to be tested without losing its adjustment.

TROUBLESHOOTING

Before investigating a malfunction, check the following items:

- The ignition switch should be in the "ON" position.
- The emergency stop buttons on both the ground and platform control panels should be released (turn clockwise to reset).
- The ground/ platform selector switch on the ground control panel should be at the correct setting. The lift/ drive selector switch on the platform control panel must also be set to the correct function.
- When attempting to operate any function from the ground control panel, the "Pump" push button must be depressed.
- When attempting to operate any function from the platform, the foot pedal on the platform floor must be depressed.
- Check that battery connections are secure, and batteries have sufficient charge.
- Hydraulic fluid should be at the correct level.

Problem: Pump motor will not operate.

Operate pump and check voltage at batteries.

Check voltage at pump.

Examine electrical circuit for loose connections.

Check the contactor for proper operation.

Inspect pump motor brushes.

Check pump for mechanical defect

Problem: Pump motor operates, but does not generate hydraulic pressure.

Check for hydraulic fluid leaks.

Examine pump assembly for mechanical defect.

Check pressure relief valve for correct pressure setting.

Check 3-way, 2 position lift/ steer valve on hydraulic system manifold block for correct operation (refer to "MANIFOLDS" section under "HYDRAULIC SYSTEM").

Problem: Pump motor is slow in operation.

Check that the safe working load has not been exceeded.

Check pressure relief valve for correct pressure setting.

Verify that the correct grade of hydraulic fluid is being used.

Check for sufficient battery output.

Check electrical circuit for bad or loose connections.

MONTHLY OPERATIONAL CHECKLIST

MODEL NUMBER _____ **INSPECTED BY** _____

SERIAL NUMBER _____ **DATE** _____

- Keep inspection records up-to-date.
- Record and report all discrepancies to your supervisor.
- A dirty machine cannot be properly inspected.
  Keep your SIMON SILVER-EAGLE clean!!

THIS CHECKLIST MUST BE USED AT MONTHLY INTERVALS . FAILURE TO DO SO COULD ENDANGER THE LIFE OF THE OPERATOR. ALWAYS REMEMBER, A LITTLE PREVENTIVE MAINTENANCE CAN SAVE MUCH MORE THAN IT COSTS.

INITIAL	DESCRIPTION OF CHECKS
_____	1. Perform all checks listed on Daily Operational Checklist.
_____	2. Lubricate all grease fittings (including those on drive shaft).
_____	3. Inspect condition of hydraulic fluid in the reservoir. Fluid should be a clear, amber color.
_____	4. Check hydraulic system for leaks. Examine hoses for signs of excessive wear, chafing or twisting. Replace worn hoses if necessary.
_____	5. Inspect the work platform and boom structure for damage and condition of welds.
_____	6. Check the low speed drive to ensure it is within specified limits.
_____	7. Check emergency descent system.
_____	8. Check all decals for legibility.
_____	9. Clean and lubricate all valve controls so they do not stick.
_____	10. Check joints and linkage pins for security.
_____	11. Check tires for cracks and other damage.
_____	12. Check for unit damage, broken welds, improper or quick fixes, (i.e. wired parts, improper parts).

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