GENIE

COMPACT PERSONNEL LIFT

(MODELS: PLC 19, 24, 30, 36; PLI 19, 24, 30)

OPERATION AND MAINTENANCE MANUAL

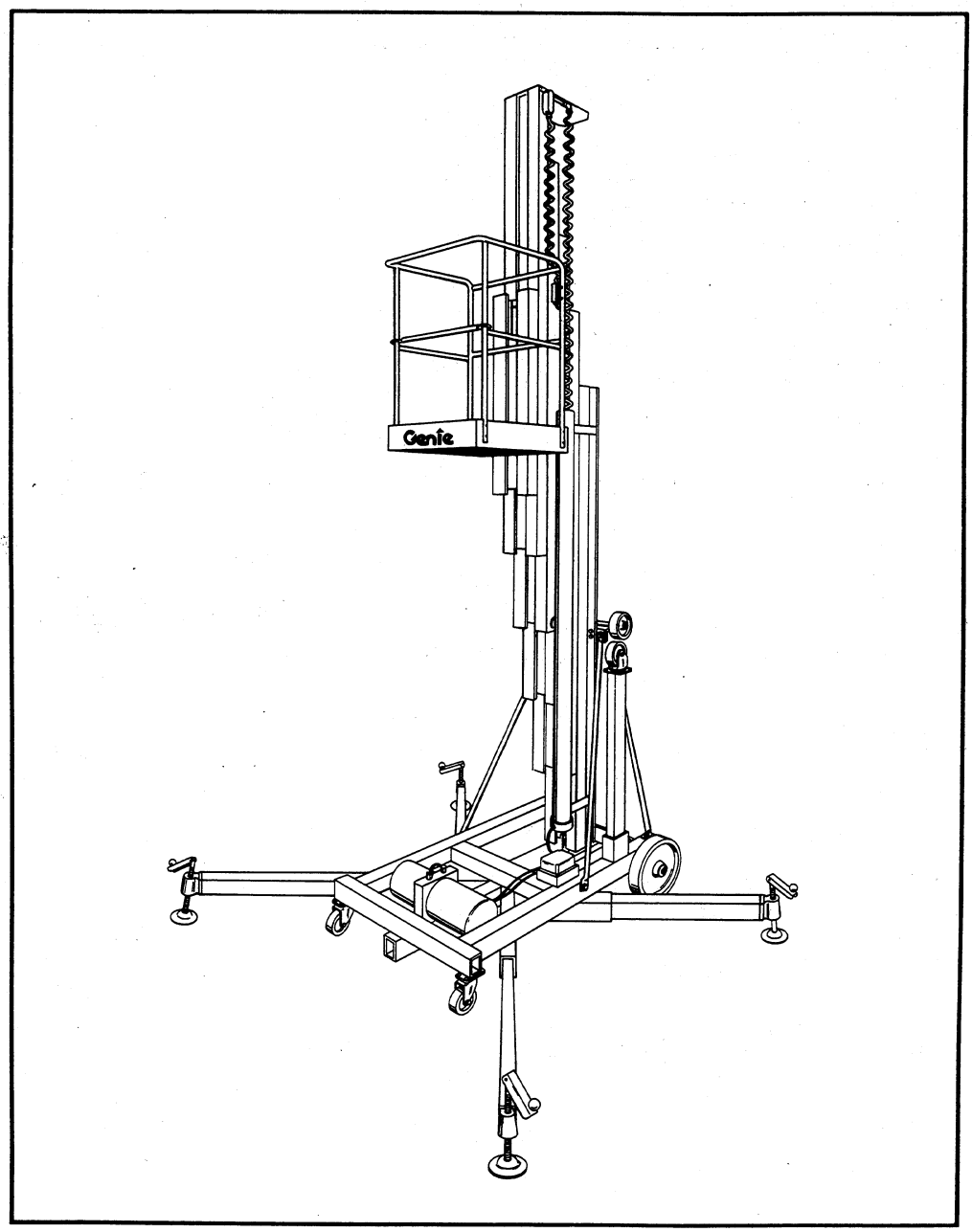


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1. INTRODUCTION AND GENERAL INFORMATION

1.1 PURPOSE

This manual provides instructions for the operation and maintenance of the Genie Powered Personnel Lift, compact models.

After reading this manual, be sure to keep it as a ready reference. Please call our Service Department at 18340 N.E. 76th Street, Redmond, Washington 98052, 1-800-426-8089, for any further information. We are happy to help you and we can answer any questions you may have about your Genie Personnel Lift.

1.2 SCOPE

This manual contains the information required to allow for proper use and the correct maintenance intervals and procedures to maintain the unit in a safe operating condition. The functions cover scheduled maintenance, troubleshooting, repair/replacement, and adjustment.

1.3 ITEM DESCRIPTION

The Genie Powered Personnel Lift is a manually propelled, hydraulically operated, electrically powered telescoping mast lift. It consists of a fabricated aluminum base frame which supports an aluminum telescoping mast that extends vertically, elevating a ground level entry operator's cage containing a control box and a 42" guard rail.

The standard power sources are either direct or alternating current or optional air motor power.

A hydraulic pump is powered by the electric motor to deliver working pressure to a hydraulic cylinder attached to the base frame and the five stage (six stage - compact units) mast assembly. As the cylinder extends, it causes the mast assembly to elevate by means of a dual chain system that sequences the individual mast columns to the unit's maximum height.

Mounted to the base frame are four wheels which provide mobility. Four removable outriggers attach to the base frame to increase the overall dimensions of the base for stability when elevating the platform. Optional outrigger "X" or "T" deployment patterns are possible. Each outrigger has a screw jack on the outboard end. The screw jacks and the base mounted bubble level are used to level the unit.

Platform controls are spring loaded to automatically return to the "OFF" position when released. Manual lowering of the platform from the base is provided by opening a release valve on the power unit which consists of a totally enclosed, non-ventilated electric motor, fixed displacement pump, and reservoir.

The Personnel Lift is intended to be an easily transported, quickly deployable, variable height work platform which provides indoor and outdoor access to overhead construction and maintenance projects. The unit must be on firm, level ground before elevating. It is not intended for use as a crane or material lift.

1.3.1 LEADING PARTICULARS

		PLC				
		15	19	24	30	36
1.	Width:					
	Outriggers Deployed	63"	80"	100"	124"	149"
	Outriggers Stowed	29"	29"	29"	29"	29"
2.	Length:					
	Outriggers Deployed	55"	71"	92"	116"	149"
	Outriggers Stowed	46"	46"	46"	46"	54"
	Transport Configuration	46"	46"	46"	88"	
3.	Height to Platform Floor:					
	Platform Lowered	19"	19"	19"	19"	15-43
	Maximum Platform Elevation	15'	19'	24'	30'	36'
4.	Maximum Overall Height:					
	Platform Lowered	79"	79"	79"	91"	109"
	Platform Elevated	15'	19'	24'	30'	36'
5.	Weight:					
	Operating	480#	480#	532#	596#	821#
	Shipping	500#	500#	552#	721#	946#
6.	Lift Capacity:	300#	300#	300#	300#	250#
7.	Hydraulic Fluid Capacity:					
8.	AC Power Unit:	5qt	5qt	5qt	5qt	5qt
9.	DC Power Unit:	3qt	3qt	3qt	3qt	5qt
10.	Battery Specifications:	All 30H, 109 Amp-Hour				
11.	Recommended AC Extension Cord Specifications:	12-3 Extension Cord 100' or less in length				
12.	Maximum Hydraulic Pressure	1600	1600	1600	2100	1800

1.3.2 CONSUMABLE MATERIALS

ITEM	SPECIFICATION
Chain Grease	Light, Cold Oil Rust prohib.
Hydraulic Oil	Shell Tellus 46
Aluminum Extrusion Track Lubricant	Teflon or silicon based lubricant
Hydraulic Fitting Thread Sealant	Teflon tape
Wheel Lubricant	Lithium Grease
Paint	Gray-Fed Std 26270
Fastener Thread Adhesive	Loctite removable Thread locker #242

2. SAFETY

Your safety is Genie's utmost concern. Make certain that each person operating or servicing this equipment reads and understands all of the following precautions. Please do not hesitate to call our Service Department, toll free, at 1-800-426-8089 if you have any questions relating to the proper use or maintenance of this equipment.

OPERATING PRECAUTIONS

WARNING

NEVER OPERATE without guard rail or cage entry properly closed.

NEVER ELEVATE PLATFORM unless on firm level ground. Do not operate from an elevated platform, scaffold, truck bed, or extended surface or support.

NEVER ELEVATE PLATFORM unless area directly above is clear of obstructions.

NEVER LOWER PLATFORM unless area below is clear of personnel and obstructions.

NEVER OPERATE the unit within 10 feet of power lines. The unit is not electrically insulated.

NEVER EXCEED THE RATED PLATFORM LOAD.

DO NOT CHANGE limit switch activators, interlocks, or relief valves from recommended settings.

NEVER ELEVATE the platform unless outriggers are correctly installed and the base is leveled.

NEVER ADJUST the leveling jacks when a person is in the platform.

NEVER ELEVATE the platform with more than one person aboard.

NEVER climb, sit, stand, or hang on the guard rails or cage.

NEVER lean a ladder against the Personnel Lift or subject the unit to a horizontal force or side load by pushing or pulling the platform or by hanging any load over the side.

NEVER attempt to move the unit while elevated.

HYDROGEN GAS IS GENERATED WHEN CHARGING BATTERIES. DO NOT EXPOSE TO SPARK OR FLAME.

BATTERY ACID is corrosive. Wear protective clothing, gloves, and safety glasses when servicing.

SERVICING PRECAUTIONS

DO NOT perform service or maintenance requiring access to components in the base assembly unless platform is securely blocked.

ALWAYS disconnect electrical input when servicing electrical components to prevent electric shock or machine operation.

NEVER leave battery charger receptacle connected while servicing the unit.

3. OPERATING INSTRUCTIONS

3.1 UNPACKING INSTRUCTIONS AND INSPECTION

Delivery of a Genie product to the customer is one of the most important events that takes place during its productive life. It is of the utmost importance that the unit is correctly and promptly unpacked and inspected prior to being put into service. Contained in this section are the instructions for unpacking and inspecting your machine.

When the unit is received, please complete the Inspection Report and return to:

Genie Industries
P.O. Box 69
Redmond, WA 98073-0069

ATTENTION: Service Department

UNPACKING AND SETUP

UNPACKING

1. Remove all steel banding restraints from the Personnel Lift, set outrigger assemblies aside. Insert an outrigger assembly into socket located at base front and slide unit backward off skid.

2. The hydraulic oil reservoir is shipped full. The filler elbow port is plugged to prevent fluid leakage. Remove the steel plug from the filler elbow fitting and install the vented filler cap. The cap is shipped with the unit in an envelope which is taped to the vertical mast support struts.

   IMPORTANT: The unit will not operate correctly if the tank is not vented.

DC UNITS ONLY:

3. Remove battery pack from cage floor and install in rear of base. Attach to mast bracket using lock pin.

4. Fill battery cells with electrolyte (also located in cage) and fully charge in accordance with instructions in Section 4.

   CAUTION: Battery electrolyte is corrosive. Wear protective clothing, gloves, and safety glasses when servicing.

5. Plug power cable into battery pack sockets so that colors are matched; black to black and red to red. Push plug in and twist clockwise to lock in place.

6. Set up unit as detailed in the following section. Inspect the unit and complete and return "Machine Delivery and Receiving Inspection Report" to Genie Industries.

3.2 OPERATING INSTRUCTIONS

1. The Personnel Lift mast consists of several telescoping sections interlocked together. If the unit is laid down, such as in a truck bed for transportation, these mast sections will slide apart. To prevent this from happening, a hold down bar is provided. To release the bar, pull it straight out from the mast, rotate until it points straight up, and allow the spring tension to pull it back in to its storage position in the channel in the side of the mast.

   ALWAYS RE-ENGAGE THE HOLD DOWN BAR OVER THE TOP OF THE CARRIAGE SECTION BEFORE TRANSPORTING OR LAYING THE UNIT DOWN. ALWAYS REMEMBER TO RELEASE HOLD DOWN BAR BEFORE OPERATING.

2. On AC models, attach pigtail power cord to your extension cord and connect to a 115V single phase 3 wire grounded circuit with at least 20 amp capacity. Circuit must be able to supply at least 105V WHILE THE PERSONNEL LIFT MOTOR IS RUNNING. An industrial grade extension cord with 12 gauge or larger wire should be used.

   IMPORTANT: The unit will not operate correctly if voltage measured at the motor is not at least 105 volts while the motor is running.

3. To raise or lower the platform in normal operation, use switch on the railing.

4. In case of emergency or power failure, the platform can be lowered from ground level using the emergency down lever. It is located at the side of the power unit clearly indicated by a yellow decal.

5. Observe all safety precautions as detailed in Section 2.

3.3 TRANSPORT AND STORAGE

1. The Personnel Lift may be tilted back if necessary to move it through doorways. On all models, the battery pack assembly must be removed prior to tilting the unit back.

2. On Personnel Lifts so equipped, the tilt back leg can be installed to allow for easier handling.

3. When laying the lift down on its back, make sure the hold down bar is engaged to prevent mast sections from telescoping apart.

SET-UP

All outriggers must be installed and the base must be leveled before using the Genie Personnel Lift.

1. Insert the four outriggers into the "X" pattern sockets on the base frame; lift lock pin, slide outrigger into socket, release pin, and continue sliding the outrigger until pin snaps into hold in outrigger tube.

2. The standard outrigger pattern is an "X" pattern and should be used in ALL CASES except as noted in Item 3 below.

3. When working next to a vertical wall THAT EXTENDS THE FULL HEIGHT OF THE EXTENDED PERSONNEL LIFT, the front two outriggers can be inserted in the front base tube as shown (a "T" pattern). NEVER USE THIS PATTERN UNLESS THE WALL EXTENDS TO THE FULL WORKING HEIGHT OF THE PLATFORM.

4. Adjust the leveling jacks at the end of the outriggers until the pads contact the ground. While watching the bubble level on the base, further adjust jacks until base is level (bubble is centered). If possible, allow wheels on base to remain in contact with ground.

5. On thirty and thirty-six foot models, install stabilizer braces to ALL outriggers:

   Unlock from storage position by removing lock pin at bottom of brace.

5a. Loosen lock knob so that stabilizer can telescope out.

5b. Attach stabilizer end to the clip on the outrigger and reinsert lock pin.

   Securely tighten knob so that stabilizer cannot telescope.

6. When using the front outriggers in the optional "T" pattern, attach the upper end of the two front stabilizers to the lug on the bottom of the support bracket as shown. Then proceed as in Step 5.

4. MAINTENANCE

4.1 SCHEDULED INSPECTIONS, CHECKS, AND SERVICES

INTERVAL	COMPONENT/LOCATION	INSPECTION, CHECK, OR SERVICE
Daily	Battery/Base	Check electrolyte level and specific gravity. If lower than 1.170, charge batteries. (Do not fill batteries before charging.)
	Lift Chains/Mast Assembly	Check chains for damage or wear. Maintain proper adjustment. Ensure tracks are free of debris and obstructions.
	Sequencing Cables/Mast Assy.	Check cables for damage or wear. Maintain proper adjustment.
Monthly	Outrigger/Base	Check screw jack pads for wear. Check outriggers and screw jacks for structural damage.
	Base Weldment/Base	Check for structural damage or cracked welds. Check all fasteners for tightness.
	Lift Chain Adjusting Nuts/ Mast Assembly	Check adjusting and jam nuts for tightness.
	Hydraulic Oil Reservoir/ Mast Assembly	Check oil level.
	Hydraulic Hoses and Tubes/ Mast & Base	Check hoses and tubes for leaks, binding, or cuts. Check cylinder fittings.
	Cage Assembly/Mast	Check cage for structural damage. Ensure gate entry mechanism operates correctly.

4.1 SCHEDULED INSPECTIONS, CHECKS, AND SERVICES (Continued)

INTERVAL	COMPONENT/LOCATION	INSPECTION, CHECK, OR SERVICE
	Mast	Check for structural damage. Check all fasteners for tightness.
3 Months	Lift Chains/Mast	Lubricate lift chains and sheaves. Adjust chain tension. (See Maintenance Procedures)
	Bubble Level/Base	Check bubble level for accuracy.
	Column Tracks/Mast	Lubricate column tracks. (See Maintenance Procedures)
	Electrical Connection	Check all conduit, cord, and cable assemblies for abrasion and tightness. Ensure all covers are in place and tight.
	Idler Wheel and Shaft/ Top of Mast Assembly	Check idler wheels and idler wheel shafts. (See Maintenance Procedures)
Yearly	Hydraulic Oil/Base	Change hydraulic oil.
	Wheels and Casters	Check wheels and casters for wear and proper operation.
	Paint	Check all painted surfaces for corrosion.

4.2 LIFT CHAIN TENSION ADJUSTMENT

Maintain even tension on lift chains. Do not allow any chain to go slack. Due to slight stretch after a period of use under load, the chain tension may need adjustment. Correct chain adjustment is required to ensure that the two chains in each column share the load equally and that all columns start off and come to rest on the base simultaneously.

PREPARATION:

1. Make certain unit is fully lowered and cylinder depressurized.

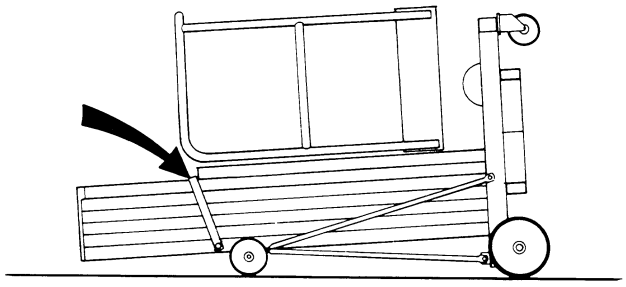
2. Any load is removed from platform.

3. Battery pack removed or AC input disconnected.

4. Assistance is available to lay unit to horizontal position.

PROCEDURE:

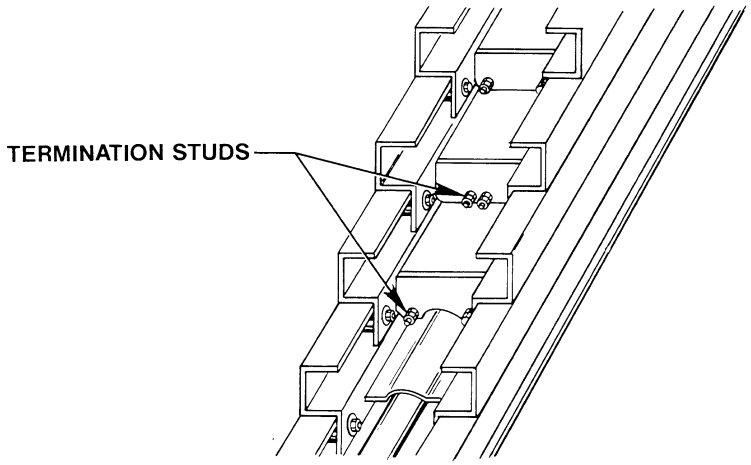
1. Secure column sections with hold down bar and lay unit back on horizontal transport wheels.



4.2 LIFT CHAIN TENSION ADJUSTMENT (CONTINUED)

2. Release hold down bar and slide column sections apart enough to allow access to chain termination studs.

3. Grasp each termination stud and pull toward base to remove any slack. Back off bottom locking jam nut and tighten top adjusting nut to contact column assembly. Make certain locking jam nut is again locked tight against adjusting nut after adjustment is complete. Make sure each pair of chains have equal tension.



4. Slide cage back to base and make certain all columns contact base simultaneously. Adjust chain tension to allow simultaneous contact of column sections to base. NOTE: The manual lowering valve may require actuation to completely retract the mast columns.

5. Re-engage hold down bar and return unit to upright position. Test unit through complete elevation cycle for proper operation.

4.3 SEQUENCING CABLE TENSION ADJUSTMENT

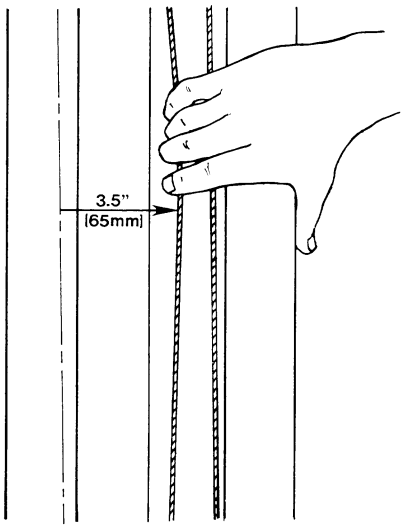
The sequencing cables located on the outside of the mast prevent the individual column sections from extending out of sequence and assure proper sequence of retraction when lowering. Adjust only to remove slackness -- DO NOT OVERTIGHTEN.

PREPARATION:

1. Make certain unit is fully lowered and cylinder is depressurized.

PROCEDURE:

1. Grasp sequencing cable at mid-point between top and bottom of column assembly. With a moderate pulling force the maximum deflection should be approximately 3.5 inches.



2. Adjustment of the cable tension is accomplished at the cable termination studs located at the top of the mast sections. Adjust only to remove slack. DO NOT OVERTIGHTEN.

3. Perform adjustment procedure on all sequencing cables and test unit for proper operation.

4.4 BATTERY SERVICE

BATTERY CHARGING

1. LEAVE BATTERY PACK COVER OPEN DURING ALL CHARGING. Dangerous gases are present during charging -- keep in a well ventilated area.

2. Connect charger extension cord to a grounded AC 3-wire electrical system that has adequate circuit breaker or fuse protection.

3. For lightly discharged battery, set timer to 7 hours. For well discharged battery, set to "on" (12 hrs). Charger automatically turns off at end of set period.

   KEEP BATTERY CHARGED -- DO NOT OPERATE THE PERSONNEL LIFT WITH A LOW BATTERY.

4. Check battery condition prior to each day's use. Turn on charger and see if ammeter needle jumps upward and then tapers down to finish rate area within 15 minutes. Check at least once a month if Personnel Lift is not being used.

5. The state of discharge of the batteries will be slightly different each time they are put on charge, but the charger automatically varies the initial charge rate and taper of charge rate over the charge period. For well discharged batteries, the charge rate at the start of the charge period should correspond to the "DC AMPS" rating on the charger nameplate. The rate should then taper gradually down to a lower finish rate. Normal charging at the low finish rate during the last 1-3 hours is necessary to achieve equalization of all battery cells. This equalization period allows the specific gravity of the battery electrolyte solution to rise to its full charge value. Since the taper of the charging rate (in amps, as indicated by the ammeter needle) is controlled by the rising voltage of the batteries being charged, proper performance of the charger and resulting good battery life is dependent upon the following factors:

   A. An adequate AC line to handle the power required (See Paragraph 2 above).

   B. All cells of the batteries must be good, rising to approximately 2.5 DC volts per cell while still on charge or near the end of a charging period. When in doubt, check each cell with a single cell volt meter while still on charge. If a low reading is obtained, check the low cells with a temperature corrected hydrometer. NOTE: Hydrometer float must be thoroughly clean to obtain accurate specific gravity readings.

4.4 BATTERY SERVICE (CONTINUED)

C. Connections on the battery terminals and connector wiring must be clean and tight.

The necessity of adding water more frequently than every two or three weeks and/or hot battery cases at the end of the charging cycle indicates the finish rate is too high due to one or both of the following:

A. One or more bad cells in the batteries.

B. Batteries are starting to age to the point where hours of charge should be reduced gradually to obtain prolonged battery life.

BATTERY CARE

1. New batteries should be given a full charge before their first use because it is difficult to know how long the batteries have been in storage without a charge.

2. Limit use of new batteries between charges for the first 5 cycles. New batteries and older batteries which have been discharged and charged a number of times.

3. During the first month of use, particularly when temperatures are below 60 degrees F, new batteries should be given an extra full charge once a week. The ampere-hours of energy that batteries can deliver and their charge acceptance varies directly with battery temperature.

4. As long as the charger tapers down to the specified finish charge rate near the end of the charge cycle, the batteries should be given a full charge. All cells in a set of batteries do not react identically to the same discharge and charge current. In a normal charge, the last 1 to 3 hours at the low finish charge rate equalize the cells for better battery life.

5. When batteries age to the point where the charge rate will no longer taper into the low finish rate area, reduce the hours of charge progressively. Reducing the charge period will prevent excessive battery heating and the resultant high water use rate.

6. Add water carefully to the proper level in cells as required AFTER they have been fully charged. Do not fill them so high that they bubble over while charging. New batteries require very little addition of water, whereas very old batteries may need additional water two or three times a week. Water (electrolyte) level in the cells settles when batteries are discharged and rises during charge. The probability of overfilling can be reduced by adding water when batteries are fully charged.

7. When the temperature falls below 65 degrees F, batteries should be placed on charge as soon after use as possible. In these low temperatures a 4-hour equalizing charge once a week will improve state of charge and battery life.

8. Keep the tops of batteries and battery hold downs clean and dry at all times. This will reduce the amount of current leakage between batteries and the frame.

4.5 LIFT RELIEF VALVE ADJUSTMENT

WARNING! The lift relief valve is factory set. Adjusting the relief valve to enable the platform to lift more than rate load could cause serious bodily injury to the machine operator or bystanders. The only time the relief valve adjustment should be required is if the valve or the power unit has been replaced.

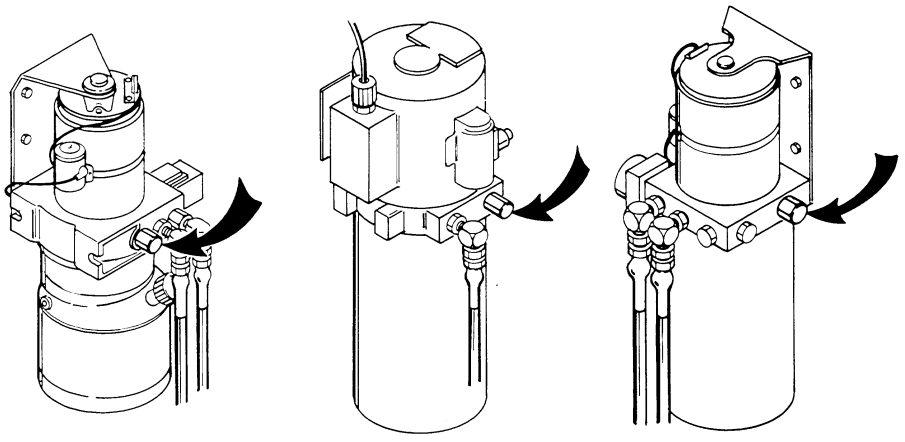
The only method which may be used to properly set the relief valve pressure requires that the rated load be placed in the operator's cage. Under no circumstances may the relief valve be adjusted with more than rated load in the cage. See Specifications Section for various models or consult Genie Industries.

During the adjustment procedure the cage may be elevated by manually closing the motor contactors (AC models) or jumping across the motor solenoid (DC models). See Adjustments and Service Procedure Section 4.8.

LIFT RELIEF VALVE ADJUSTMENT

1. Set up Personnel Lift for normal operation (see Operating Instructions).

2. Remove the relief valve adjusting screw cover located on the pump adaptor manifold.



FENNER-STONE "WORKFORCE" DC POWER UNIT 15778 OR 15777

JOHN S. BARNES AC POWER UNIT 12250 OR 12727

FENNER-STONE AC & DC POWER UNIT 6681, 6866 OR 14790

4.5 LIFT RELIEF VALVE ADJUSTMENT (CONTINUED)

3. Place maximum rated load, evenly distributed, in operator's cage.

4. Attempt to elevate the platform by either manually operating AC contactors or jumping the DC motor coil (Refer to Section 4.8).

5. If the platform elevates smoothly, turn the adjusting plug counter clockwise until the platform will not lift. Proceed to Step 6.

6. If platform does not lift, turn adjusting plug clockwise in 1/8 turn increments until the platform lifts smoothly throughout its entire lifting cycle.

7. Replace the relief valve adjusting plug cover and test unit for proper operation.

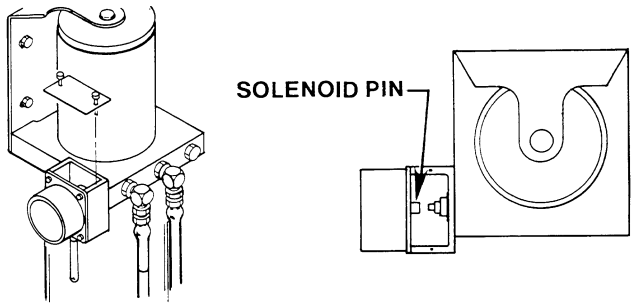
4.6 DOWN SOLENOID ACTUATOR ADJUSTMENT (Fenner-Stone Power Unit Only)

The down solenoid actuator is factory set to allow proper operation of platform elevation, descent, and manual down functions and should not require readjustment. Proper adjustment should be checked if the platform will not hold in the elevated position or if the platform will not lower using controls but will lower using manual down lever or if any related components have been removed or replaced.

ADJUSTMENT PROCEDURE

1. Make certain electrical supply is connected.

2. Remove solenoid actuator cover plate and observe movement of solenoid pin while activating the down button at the platform controls.



4.6 DOWN SOLENOID ACTUATOR ADJUSTMENT (CONTINUED)

There must be enough movement of the solenoid pin to push in the valve stem while activated. A small gap, approximately .020 to .030 inches between the adjusting screw and the solenoid pin will ensure the valve is able to reseat when deactivated.

3. From ground position, elevate platform to maximum height and energize "up" momentarily after full elevation to pressurize system. Check down function for proper operation.

4. Replace the cover plate and test unit for proper operation.

4.7 COLUMN TRACK LUBRICATION

The mast column sections may require lubrication periodically to prevent the squeaking noise which results as the flat face of the nylatron rollers make contact with the inside of the column tracks during normal operation. The noise in no way affects performance or reliability of the unit.

The lubrication procedure will require the unit to be laid back to the transport position and extended horizontally to its maximum height. This will require adequate floor space depending on the model being lubricated.

LUBRICATION PROCEDURE

PREPARATION

Make certain:

1. Unit is fully lowered and cylinder depressurized.

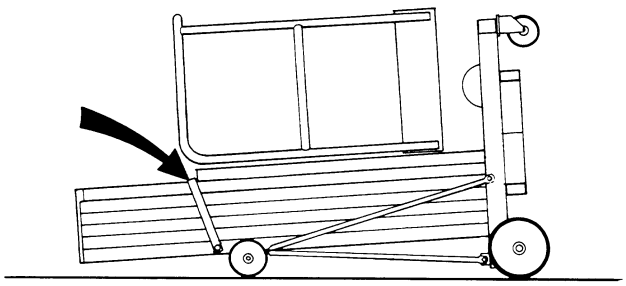
2. Any load is removed from platform.

3. Battery pack removed or AC input disconnected.

4. Assistance is available to lay unit to horizontal position.

PROCEDURE

1. Secure column sections with hold down bar and lay unit back on horizontal transport wheels.



2. Release the hold down bar and slide the column sections apart enough to place a support beneath the operator's cage. This will prevent the mast cover plate from bearing the load of the column sections as the mast assembly is extended.

3. While securing the cage assembly to prevent movement, walk the base assembly on the 8" transport wheels away from the cage until the mast assembly is fully extended.

4. Using a clean rag and solvent, thoroughly wipe out the mast track sections for each column.

5. Using a high quality teflon or silicon based lubricant, apply a thin layer to the internal track sections.

6. Fully retract the mast assembly, return the unit to its upright position, and test for proper operation. NOTE: It may be necessary to activate the Manual Release Valve to allow retraction of the mast assembly. This will allow any fluid trapped in the cylinder to exhaust to the reservoir.

4.8 CONTROL SWITCH BYPASS FOR ELECTRIC MOTOR START AND RUN

In order to perform certain tests, inspections, or services, it will be necessary to operate the unit from the ground position rather than the operator's cage. This will require bypassing the control switch to start the electric motor. Before performing the bypass procedure, make certain the following precautions are observed:

1. Electrical power source (AC or DC) is connected only while attempting to operate the electric motor. Electrical input must be disconnected at all other times while electrical components are uncovered.

4.8 CONTROL SWITCH BYPASS FOR ELECTRIC MOTOR START AND RUN (CONT'D.)

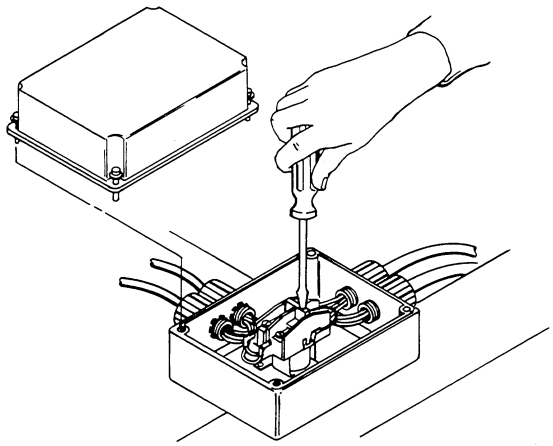
2. Any load is removed from the platform.

3. All normal safety precautions are observed as detailed in Section Two.

CONTROL SWITCH BYPASS, AC UNITS

1. Set up unit for normal operation. (Refer to Operating Instructions)

2. Remove the contactor box cover to expose the electrical contactor/coil assembly. Connect the AC input and, using a non-conducting insulated material such as wood or plastic, manually depress the contactors. The electric motor will start immediately and the platform will begin to elevate.



IMPORTANT: Disconnect AC line and replace all covers when finished performing the bypass process.

5. TROUBLESHOOTING

The information in this section should provide a means for pinpointing most electrical and hydraulic malfunctions which can occur on the Genie Personnel Lift.

This troubleshooting guide for the lift function is subdivided into three categories. First is the condition where the electric motor does not start. Second is the condition where the motor starts but the hydraulic oil bypasses to the tank along some path other than the intended one. Third is the condition where oil is restricted from following the intended path.

For the first category, the problem is exclusively electrical.

For the second category, pressure in the hydraulic system is always lower than normal working pressure. This lower system pressure is characterized by higher than normal electric motor RPM and a higher pitched sound from the motor. This condition can be simulated by trying to lift while holding the Manual Release Valve open.

For the third category, pump output pressure is always higher than normal working pressure. This higher than normal system pressure is characterized by lower than normal electric motor RPM and a lower pitched sound from the motor. This condition can be simulated in a properly functioning unit by elevating the unit to its maximum height and continuing to engage the up switch.

It should be noted that either of the latter two conditions may exist in varying degrees without a complete loss of lift function; i.e., platform will not elevate with the same power or speed of a properly functioning unit.

IMPORTANT NOTE: Proper diagnosis of problems can only be accomplished when batteries are fully charged and AC supply voltage TO THE MOTOR is adequate. Voltage drop through extension cords or low voltage at the receptacle is often the cause of sluggish operation.

It is important to be able to distinguish between low pressure bypass and high pressure restriction since the possible solutions to the two different types of problems are entirely different.

5. TROUBLESHOOTING (Continued)

TROUBLESHOOTING PROCEDURES

Listed below are the symptoms in the order in which they are presented in the Troubleshooting section:

1. Platform will not elevate.
   Electric motor does not start.

2. Platform will not elevate.
   Motor starts but will not run at full speed or stalls out and hums (AC power units only).

3. Platform will not elevate.
   Motor starts--low pressure. Hydraulic bypass condition.

4. Platform will not elevate.
   Motor starts--high pressure. Hydraulic restriction.

5. Platform will not remain elevated.

6. Platform will not lower using control switch.

7. Platform will not lower using Emergency/Manual lowering valve.

5. TROUBLESHOOTING (CONTINUED)

	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
1.	Platform will elevate; electric motor does not start.	1.1 No power at wall outlet (AC powered units) or battery defective (DC powered units).	1.1 Check for voltage at wall receptacle or battery connectors.
		1.2 Open circuit in extension cord (AC powered units).	1.2 Check for loose plugs or electrical connections and for damaged cords.
		1.3 Fault in control circuit.	1.3 Perform control switch bypass as detailed in Section 4.8. If motor starts, proceed directly to step 1.5. If motor does not start, go to 1.4.
		1.4 Electric motor defective.	1.4 Check continuity of field coils. If open, have motor repaired by Authorized Service Agency.
		1.5 Open circuit in control cable.	1.5 Check for voltage at control switch. Replace or repair cable if necessary.
		1.6 Defective "Up" control switch.	1.6 Test switch for continuity in closed position. Replace if circuit remains open while pushing "Up" button.

5. TROUBLESHOOTING (CONTINUED)

	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
2.	Platform will not elevate; Electric motor starts but then stalls out and hums (AC power units only).	2.1 Supply voltage insufficient. Motor will hum and not turn or may turn at less than normal speed.	2.1 Check voltage at input side of motor starter contacts while attempting to raise platform. If less than 105 volts, power supply is inadequate because of extension cord length or low voltage at receptacle.
		2.2 Platform over loaded or mechanical binding in mast assembly.	2.2 Check load and test hydraulic pressure required to lift platform. Refer to Leading Particulars Section for specific requirements. Consult factory if hydraulic pressure exceeds table amounts by 5%.
		2.3 Load Delay Valve stuck in closed position--not opening. (Fenner-Stone A.C. power units only)	2.3 Remove reservoir to expose load delay valve located on pump. Clean or replace valve. Refer to Illustrated Parts Reference Guide for part number and location.
		2.4 Electric motor capacitor defective.	2.4 Test capacitor. With volt ohmeter in OHM reading mode, connect test leads to capacitor poles. Meter should read zero resistance initially and then increase slowly to infinity (open circuit reading).
		2.5 Electric motor start windings or centrifugal switch defective.	2.5 Have motor checked by an Authorized Motor Service Agency.

5. TROUBLESHOOTING (CONTINUED)

	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
3.	Platform will not elevate. Motor starts; low pressure hydraulic bypass condition.	3.1 Reservoir plug not removed after transporting.	3.1 Remove plug; replace with breather cap.
		3.2 Hydraulic oil level low.	3.2 Ensure that reservoir is full with Shell Tellus 46 or equivalent when platform lowered.
		3.3 Down valve not functioning correctly due to debris on seat. (Platform may ascend but will not maintain elevated position.)	3.3 Operate the manual down valve while elevating the platform to flush debris back to reservoir.
		3.4 Down valve defective. (Platform may ascend but will not maintain elevated position.)	3.4 Remove & inspect valves. Replace or repair if the seat is rough or damaged.
		3.5 Load delay valve stuck open. (Fenner-Stone A.C. power unit only.)	3.5 Remove reservoir to expose load delay valve located on pump. Clean or replace valve.
		3.6 Relief valve misadjusted. (Platform will maintain elevated position.)	3.6 Check for bypass at relief valve. Remove cap and turn adjusting screw clockwise two or three revolutions while motor is running. Keep track of turns to reset to original position if necessary. If platform starts to rise, keep adjusting screw at the position where platform raises with rated load only.

5. TROUBLESHOOTING (CONTINUED)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
	3.7 Relief valve not seating correctly.	3.7 Remove cap and turn adjusting screw counter-clockwise and remove. Inspect ball and seat. Replace ball and reseat if necessary.
	3.8 Hydraulic cylinder defective (platform may raise but will not maintain elevated position).	3.8 Disconnect the drain line hose on power unit (hose farthest from center of pump adaptor manifold for Fenner-Stone units). If oil comes out of this hose and platform does not raise while depressing the up switch, replace cylinder seals. If oil comes out of power unit fitting, go back to Steps 3.3 and 3.4.
	3.9 Hydraulic pump defective.	3.9 Disconnect the hydraulic pressure hose. This hose is closest to center of power unit adaptor manifold on Fenner-Stone, or hose next to manual lowering valve on Barnes power units. Replace pump if firm oil stream does not come out of fitting.

5. TROUBLESHOOTING (CONTINUED)

	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
4.	Platform will not elevate. Motor starts; high pressure hydraulic bypass.	4.1 Platform hold down bar not released.	4.1 Be sure platform hold down bar has been released.
		4.2 Platform overloaded.	4.2 Ensure that load does not exceed maximum platform capacity.
		4.3 Mechanical restriction.	4.3 Test hydraulic operating pressure. Refer to Leading Particulars Section. If pressure exceeds normal operating parameters, check all mast sections, supporting chain drives, and sequencing cables to ensure there are no restrictions, chains off pulleys, or missing sequencing cables.
		4.4 Relief valve misadjusted or defective.	4.4 Test hydraulic operating pressure. If pressure is less than normal operating parameters, readjust relief valve as detailed in Section 4.5. Replace relief valve ball and spring if adjustment unsuccessful.
5.	Platform drifts down. Will not hold a fixed position when elevated.	5.1 Emergency lowering valve open.	5.1 Check emergency lowering valve to ensure it is fully closed.

5. TROUBLESHOOTING (CONTINUED)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
	5.2 External oil leak.	5.2 Check the entire unit for any evidence of an oil leak. Repair all leaks before proceeding.
	5.3 Down solenoid electrically energized.	5.3 Disconnect electrical input or remove the down solenoid. If platform holds, locate short circuit and repair.
	5.4 Debris lodged beneath down and/or check valve seat preventing proper seating (Fenner-Stone power units only).	5.4 To dislodge debris, pull emergency lowering valve lever out and hold while energizing platform lift function. This will flush the debris from the seat and deposit it in the reservoir.
	5.5 Emergency down valve level misadjusted. (Fenner-Stone power units only).	5.5 Check emergency down lever to ensure it is not partially opening the down valve. Remove the cover plate from the solenoid valve assembly and check the gap between the adjusting screw and the solenoid pin. The solenoid pin should not rest on the head of the adjusting screw. (Refer to Section 4.6.)

5. TROUBLESHOOTING (CONTINUED)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
	5.6 Check valve defective; not seating properly. Platform will elevate at normal rate, and pump and motor will turn backward as platform drifts down.	5.6 Remove check valve assembly. Inspect O-rings and valve seat. Replace if necessary.
	5.7 Down valve defective. Not seating properly. Platform will elevate at a reduced rate as a portion of total pump delivery flows back to tank.	5.7 Remove down valve assembly. Inspect O-rings and valve seat. Replace if necessary.
	5.8 Hydraulic cylinder seals leaking.	5.8 Engage the hold down bar. Disconnect the drain line, the left hand hose on power unit (hose farthest from the center of the pump adaptor manifold) and start the motor. If oil comes out of the hose, cylinder seals are defective. Remove cylinder and replace cylinder seals.

5. TROUBLESHOOTING (CONTINUED)

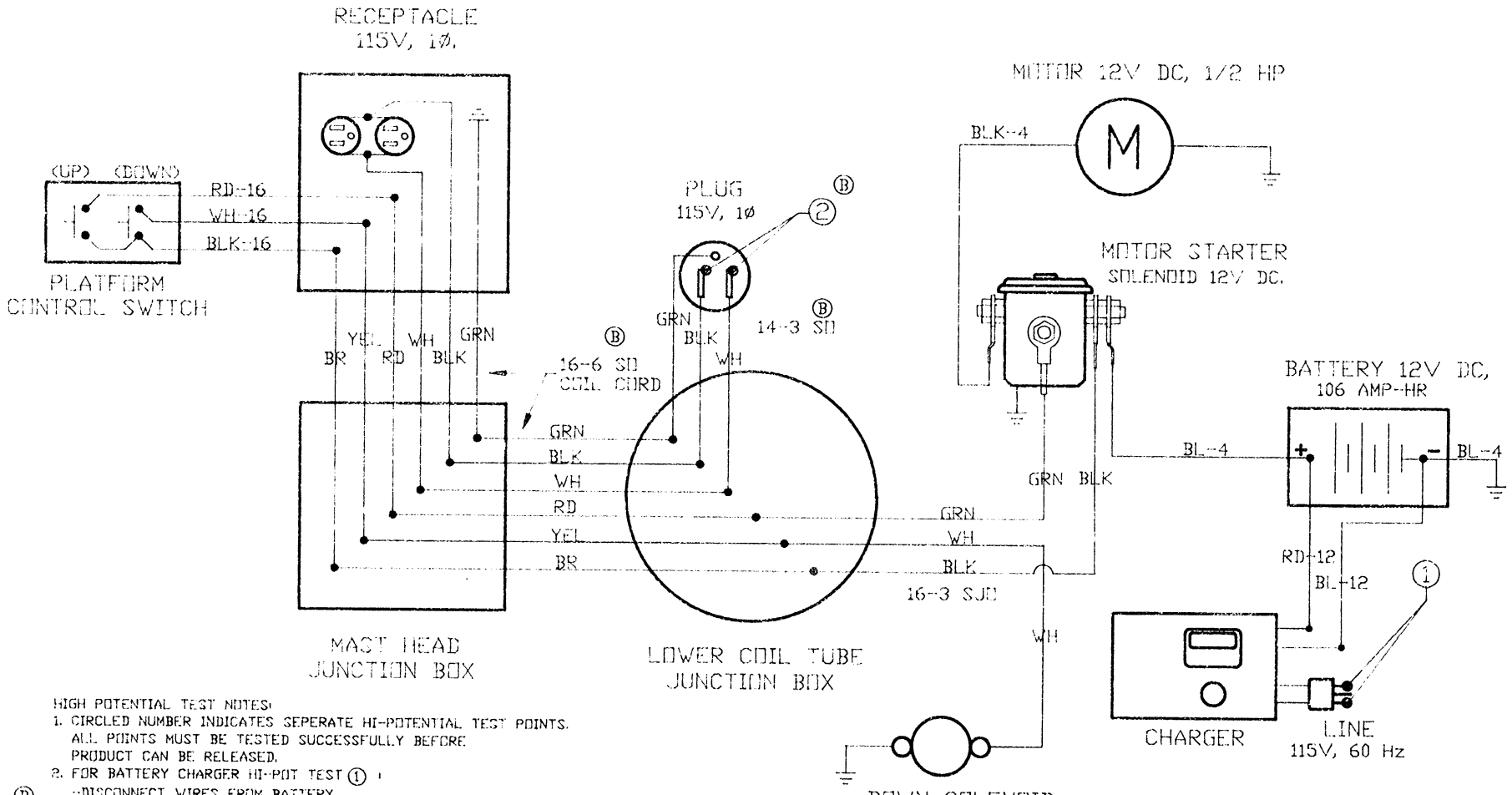
	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
6.	Platform will not lower using control switch.	6.1 Control circuit fault.	6.1 Manually operate emergency lowering valve. If platform does not lower, go to Troubleshooting Procedure #7. If platform lowers, proceed to 6.2. If the force required to manually operate the emergency lowering valve is excessive, the pressure relief valve is set too high. Reset relief valve as detailed in Section 4.5.
		6.2 Down solenoid coil defective.	6.2 Check voltage to down solenoid. If voltage is present, check coil for continuity. Replace if open.
		6.3 Down solenoid AC rectifier defective (applies to A.C. Fenner-Stone power units only).	6.3 Test voltage coming into and out of the rectifier. Power units wired for 115 VAC should have 115 volts AC in and 100 volts DC out to the coil. Power units wired for 220 VAC should have 220 volts AC in and 200 volts DC out to the coil.
		6.4 Control switch defective.	6.4 Check control switch for continuity. Replace switch if open while depressing down button.
		6.5 Open circuit in control cable.	6.5 Locate open circuit in control cables.

5. TROUBLESHOOTING (CONTINUED)

	SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
7.	Platform will not lower using emergency or manual lowering valve.	7.1 Down valve misadjusted (Fenner-Stone power units only).	7.1 Check operation of down valve. Remove cover plates and observe if there is full movement of the solenoid pin when the lever is operated. There may be too much clearance between the solenoid pin and the adjustment screw. Turn the screw out until there is approximately 3/16-1/4 inch solenoid pin movement.
		7.2 Relief valve misadjusted.	7.2 Elevate the platform to maximize height. Attempt to manually operate the emergency lowering valve. If the relief valve is set too high, the force required to overcome system pressure will prevent proper lever operation. Reset relief valve as detailed in Section 4.5.
		7.3 Flow control valve malfunction (cylindrical shaped valve located at lift cylinder base).	7.3 Lower platform and remove any load. This is important, as the removal of the flow control valve will allow uncontrolled platform descent. Remove flow control valve and clean or replace as required. (Contact factory Service Department for repair procedure.)

5. TROUBLESHOOTING (CONTINUED)

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
	7.4 Mast sections restricted.	7.4 Check all mast sections and supporting chain drives to be sure there are no restrictions.



HIGH POTENTIAL TEST NOTES:

1. CIRCLED NUMBER INDICATES SEPERATE HI-POTENTIAL TEST POINTS. ALL POINTS MUST BE TESTED SUCCESSFULLY BEFORE PRODUCT CAN BE RELEASED.
2. FOR BATTERY CHARGER HI-POT TEST (1) :
   Ⓑ -DISCONNECT WIRES FROM BATTERY.
   -ATTACH GROUND LEAD TO CHARGER CASE.
   -ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.
   -TURN TIMER SWITCH ON AND PERFORM TEST.
3. Ⓑ FOR TEST (2) :
   -ATTACH GROUND LEAD TO NO.1 (STATIONARY) MAST
   -ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.
   -PERFORM TEST

NOTE: FOR 115V, 60 Hz APPLICATIONS.

HIGH POTENTIAL TEST NOTES:

(A) 1. CIRCLED NUMBER INDICATES SEPERATE HI-POTENTIAL TEST POINTS. ALL POINTS MUST BE TESTED SUCCESSFULLY BEFORE PRODUCT CAN BE RELEASED.

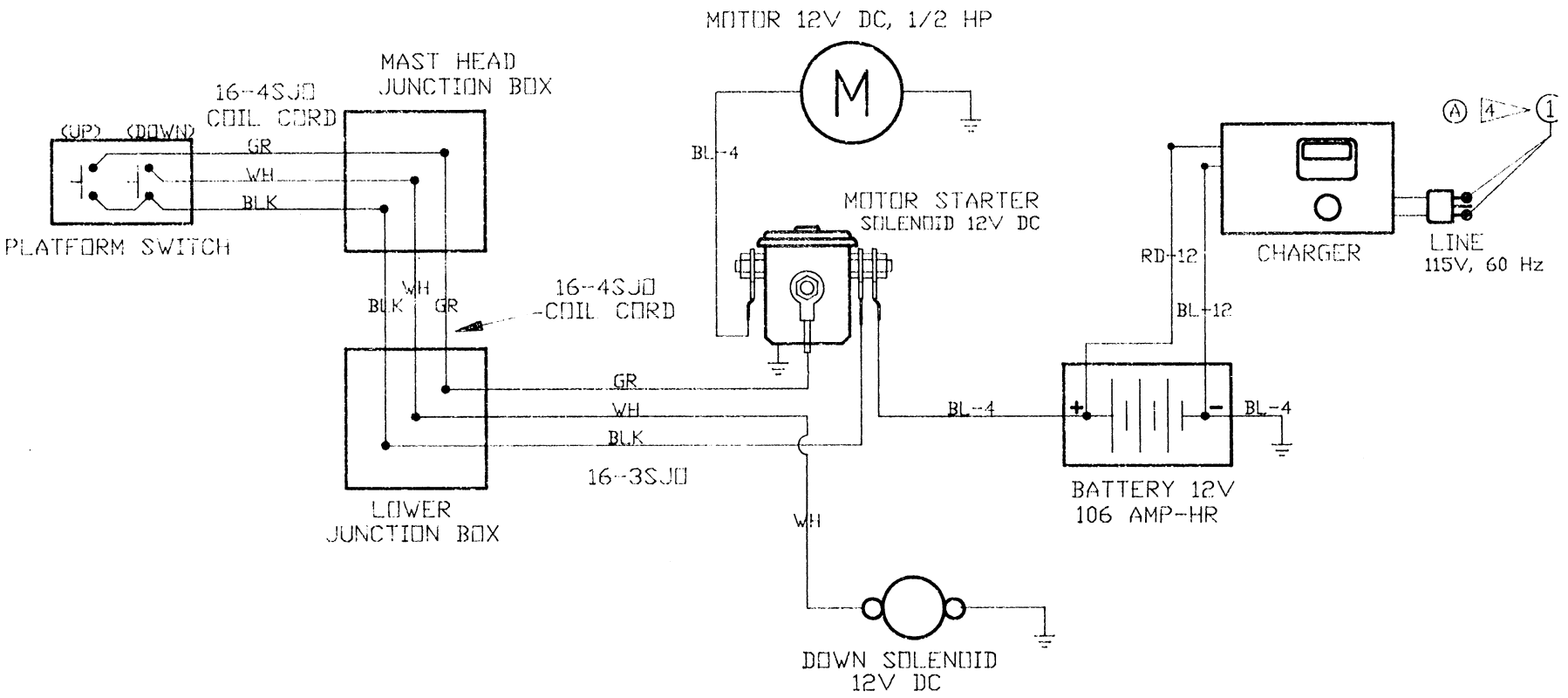
(A) 2. DISCONNECT WIRES FROM BATTERY.

(A) 3. ATTACH GROUND LEAD TO CHARGER CASE.

(A) 4 → ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.

(A) 5. TURN TIMER SWITCH ON AND PERFORM TEST.

NOTE: FOR 115V, 60 Hz APPLICATIONS.



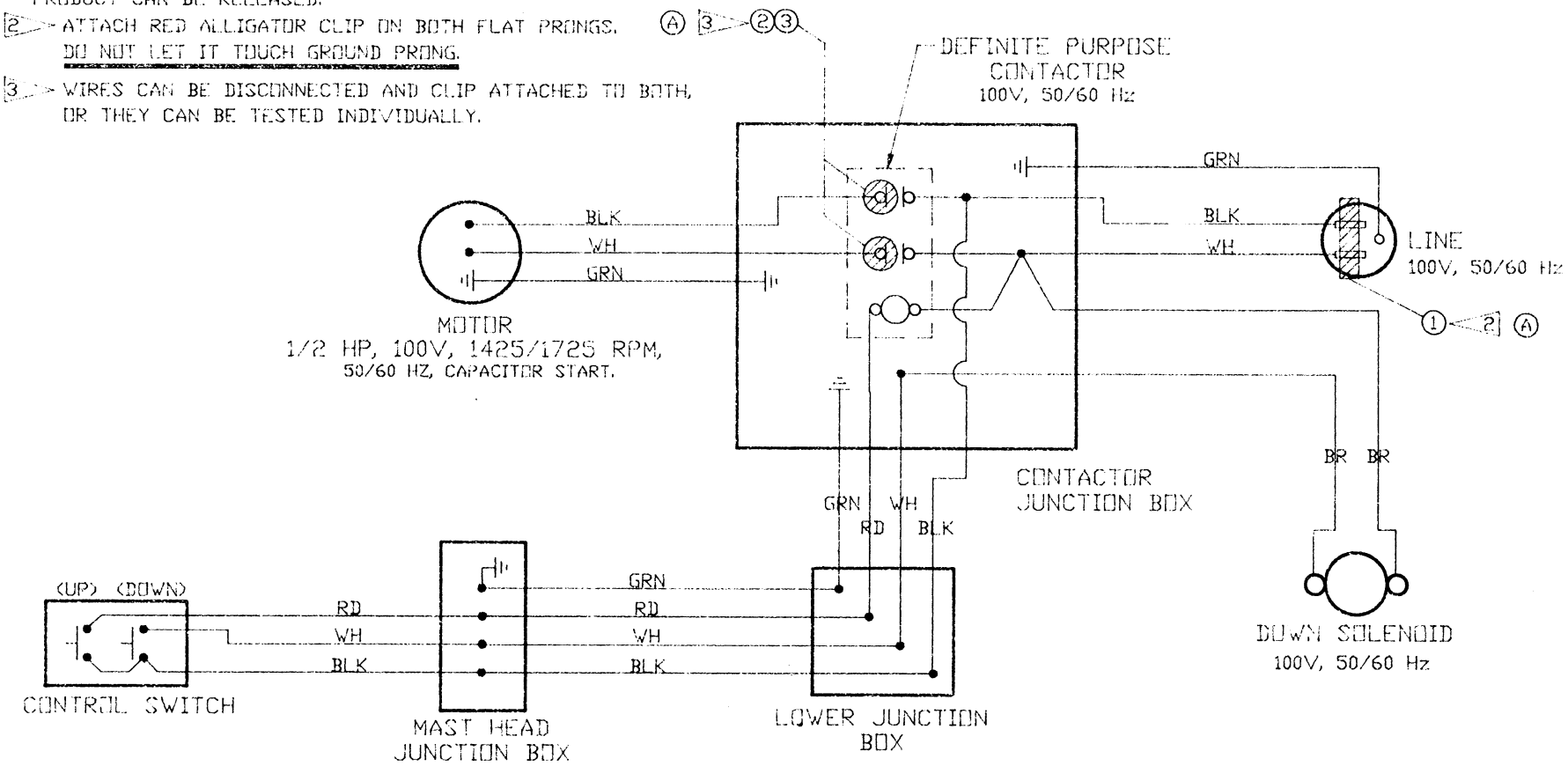
HIGH POTENTIAL TEST NOTES:

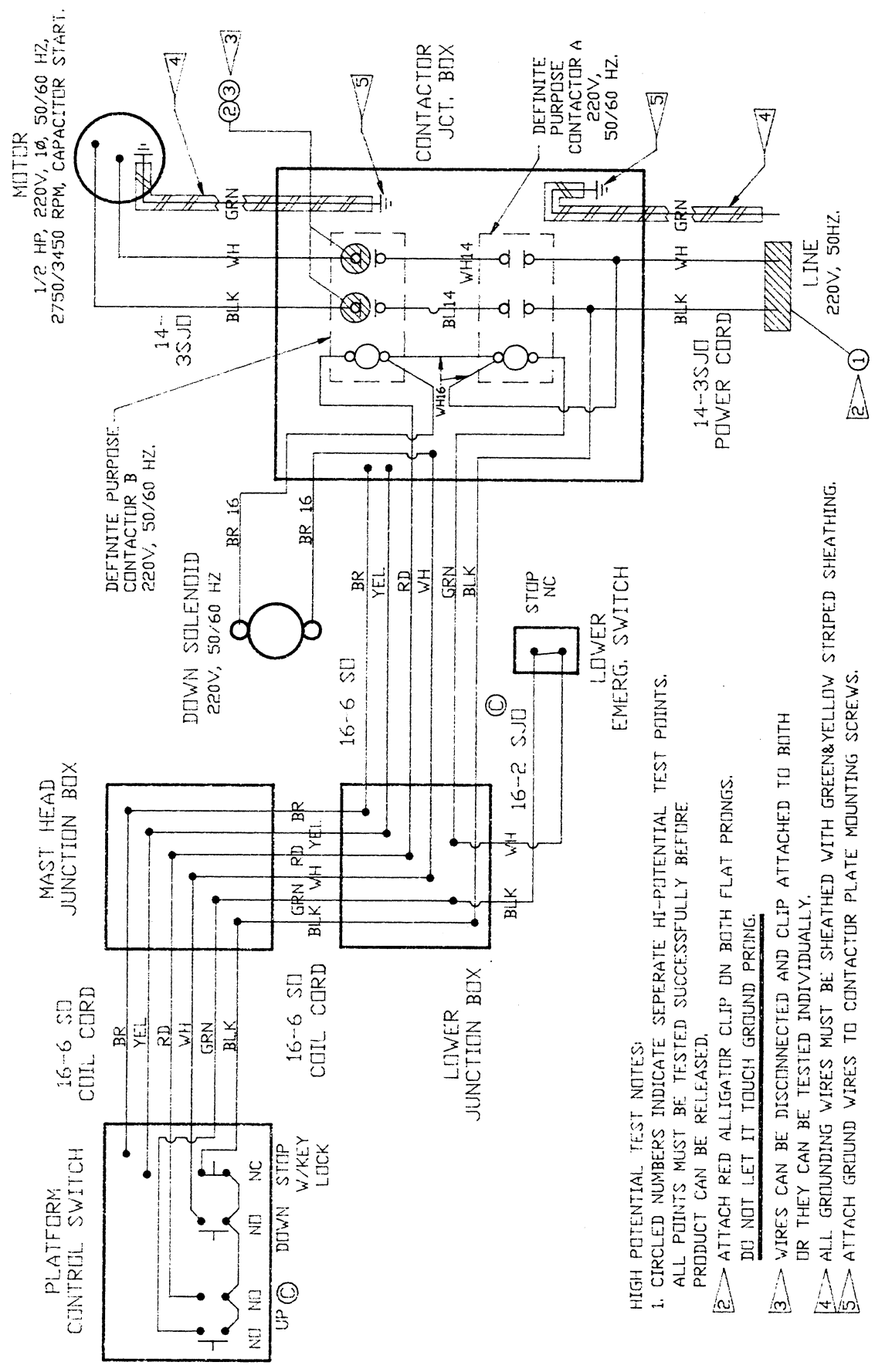
Ⓐ 1. CIRCLED NUMBERS INDICATE SEPERATE HI-POTENTIAL TEST POINTS. ALL POINTS MUST BE TESTED SUCCESSFULLY BEFORE PRODUCT CAN BE RELEASED.

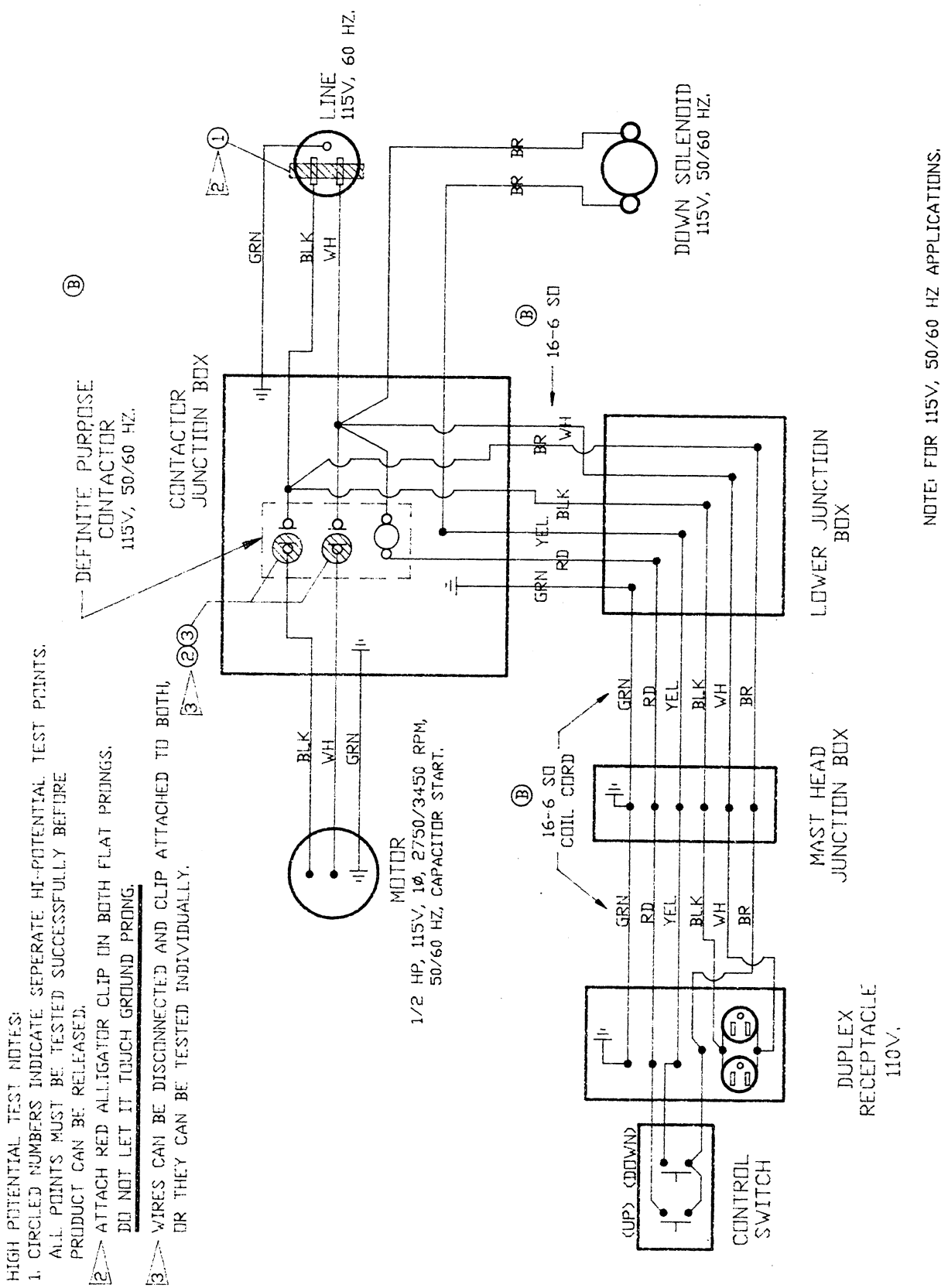
Ⓐ 2 → ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.

Ⓐ 3 → WIRES CAN BE DISCONNECTED AND CLIP ATTACHED TO BOTH, OR THEY CAN BE TESTED INDIVIDUALLY.

NOTES: FOR 100V, 50/60 Hz APPLICATIONS.




MOTOR
1/2 HP, 220V, 1Ø, 50/60 HZ,
2750/3450 RPM, CAPACITOR START.
CONTACTOR
JCT. BOX
DEFINITE
PURPOSE
CONTACTOR A
220V,
50/60 HZ.
LINE
220V, 50HZ.
14-3SJO
POWER CORD
14-
3SJO
DEFINITE PURPOSE
CONTACTOR B
220V, 50/60 HZ.
DOWN SOLENOID
220V, 50/60 HZ
16-6 SO
16-2 SJO
STOP
NC
LOWER
EMERG. SWITCH
MAST HEAD
JUNCTION BOX
16-6 SO
COIL CORD
16-6 SO
COIL CORD
LOWER
JUNCTION BOX
PLATFORM
CONTROL SWITCH
UP
DOWN
STOP
W/KEY
LOCK
NO
NO
NC
BR
YEL
RD
WH
GRN
BLK
GRN
WH
BLK
WH14
BL14
WH16
BR 16
BR 16
HIGH POTENTIAL TEST NOTES:
1. CIRCLED NUMBERS INDICATE SEPERATE HI-POTENTIAL TEST POINTS.
ALL POINTS MUST BE TESTED SUCCESSFULLY BEFORE
PRODUCT CAN BE RELEASED.
2 ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS.
DO NOT LET IT TOUCH GROUND PRONG.
3 WIRES CAN BE DISCONNECTED AND CLIP ATTACHED TO BOTH
OR THEY CAN BE TESTED INDIVIDUALLY.
4 ALL GROUNDING WIRES MUST BE SHEATHED WITH GREEN&YELLOW STRIPED SHEATHING.
5 ATTACH GROUND WIRES TO CONTACTOR PLATE MOUNTING SCREWS.



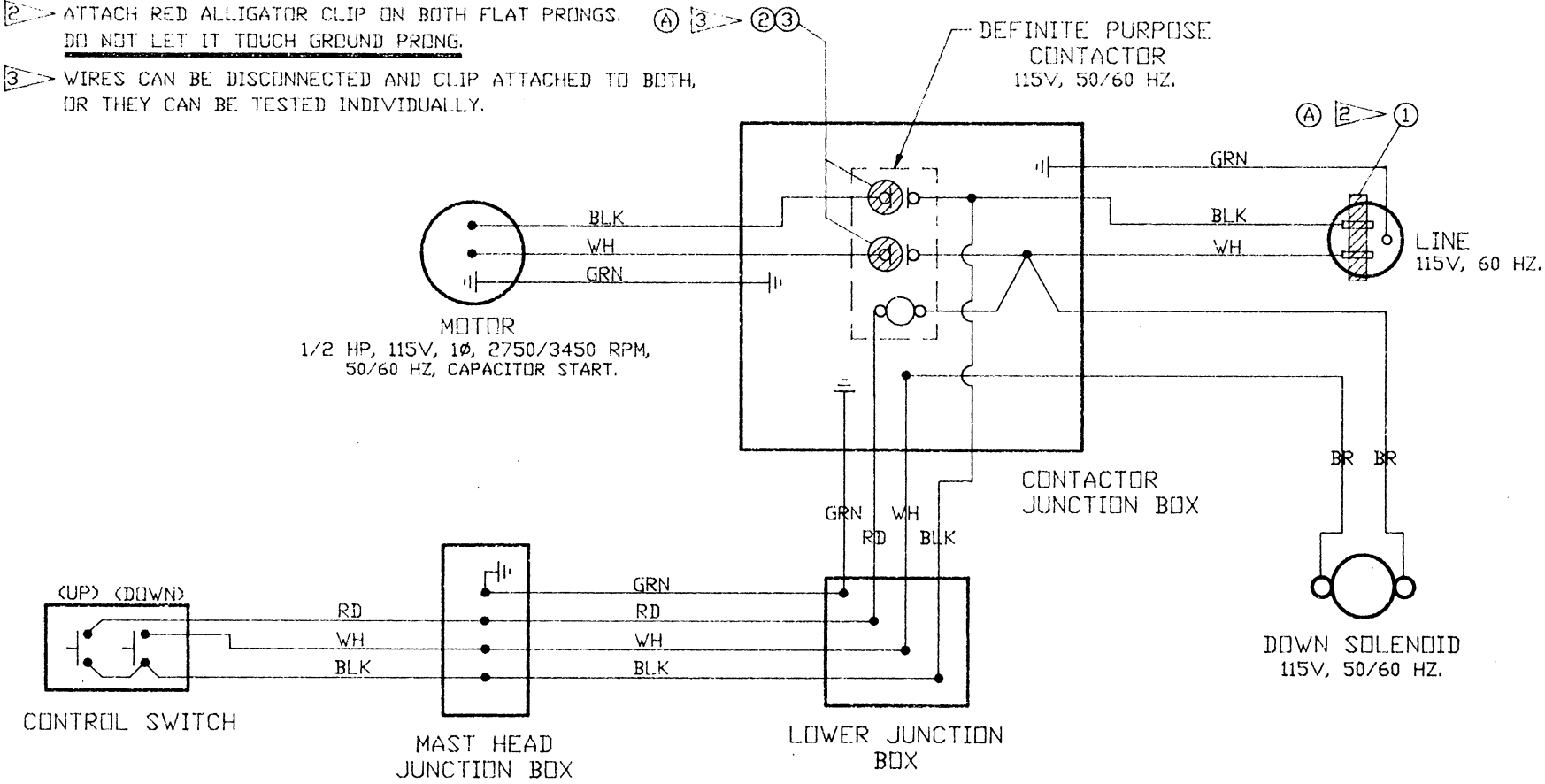
PLC AND EASY-UP (AC) WITH 115 VOLT AC WITH POWER TO PLATFORM OPTION

HIGH POTENTIAL TEST NOTES:

Ⓐ 1. CIRCLED NUMBERS INDICATE SEPERATE HI-POTENTIAL TEST POINTS. ALL POINTS MUST BE TESTED SUCCESSFULLY BEFORE PRODUCT CAN BE RELEASED.

Ⓐ 2 > ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.

Ⓐ 3 > WIRES CAN BE DISCONNECTED AND CLIP ATTACHED TO BOTH, OR THEY CAN BE TESTED INDIVIDUALLY.



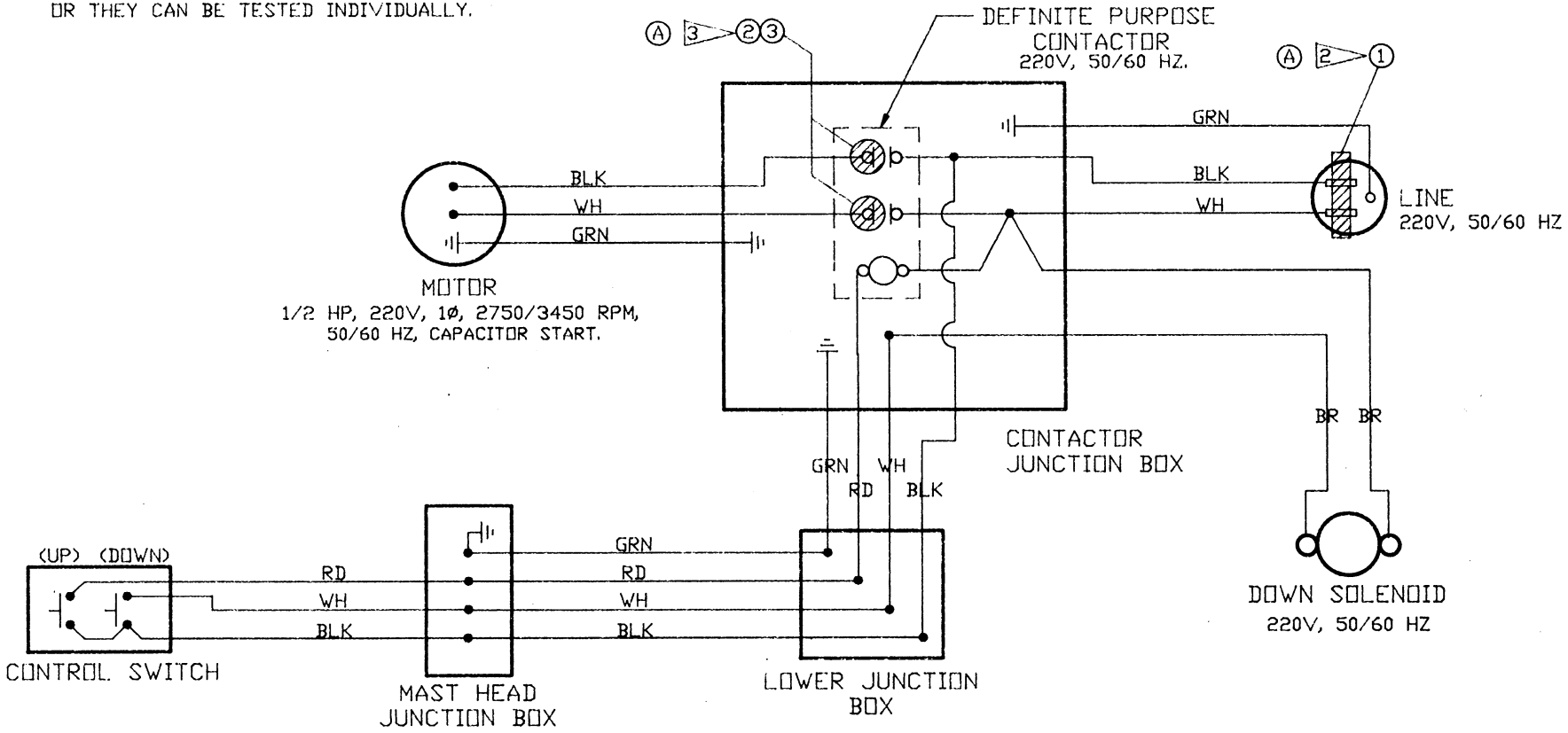
NOTE: FOR 115V, 50/60 HZ APPLICATIONS.

HIGH POTENTIAL TEST NOTES:

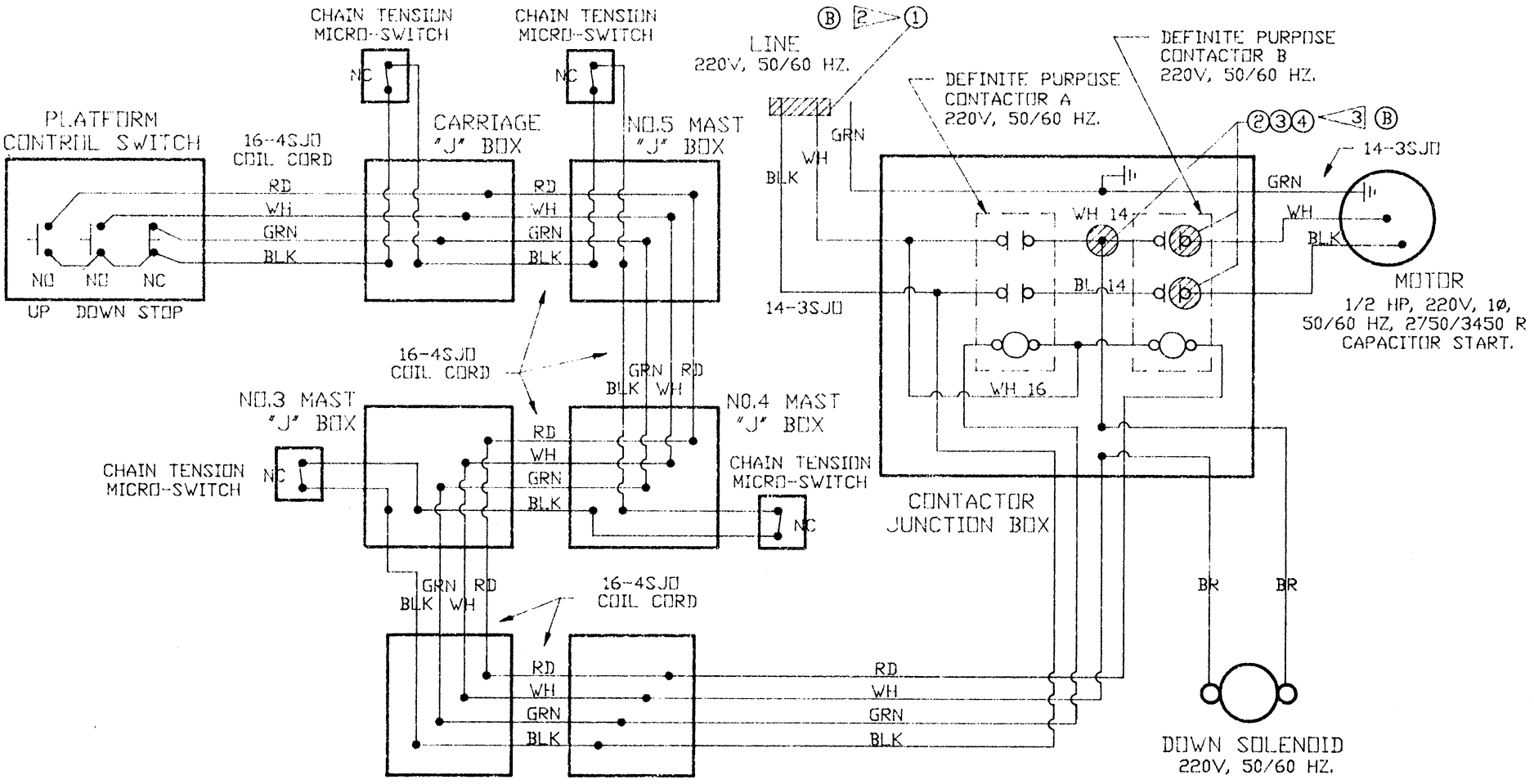
(A) 1. CIRCLED NUMBERS INDICATE SEPERATE HI-POTENTIAL TEST POINTS. ALL POINTS MUST BE TESTED SUCCESSFULLY BEFORE PRODUCT CAN BE RELEASED.

(A) 2 > ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.

(A) 3 > WIRES CAN BE DISCONNECTED AND CLIP ATTACHED TO BOTH, OR THEY CAN BE TESTED INDIVIDUALLY.



NOTE: FOR 220V, 50/60 HZ APPLICATIONS.

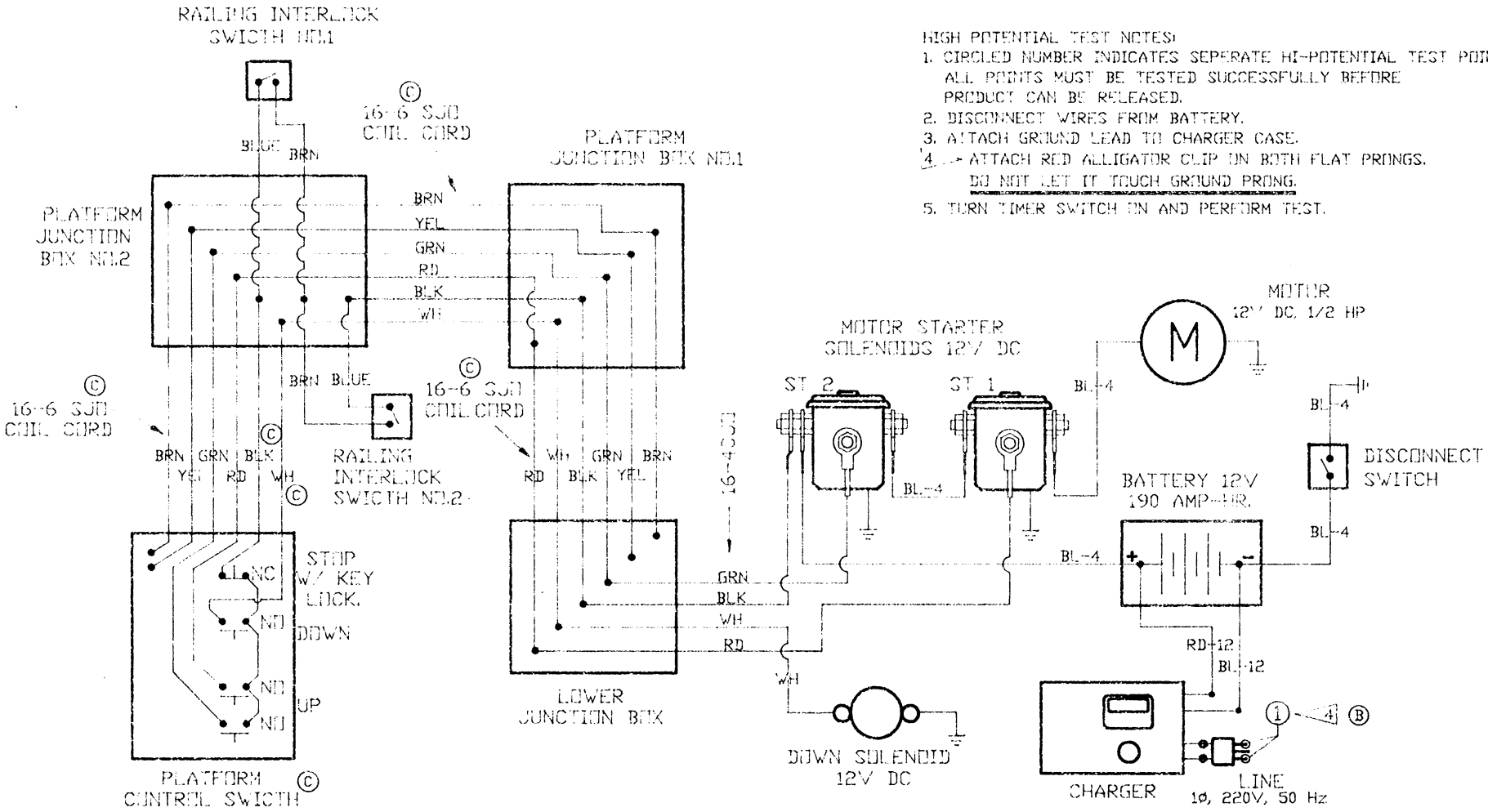


HIGH POTENTIAL TEST NOTES:

(B) 1. CIRCLED NUMBERS INDICATE SEPERATE HI-POTENTIAL TEST POINTS. ALL POINTS MUST BE TESTED SUCCESSFULLY BEFORE PRODUCT CAN BE RELEASED.

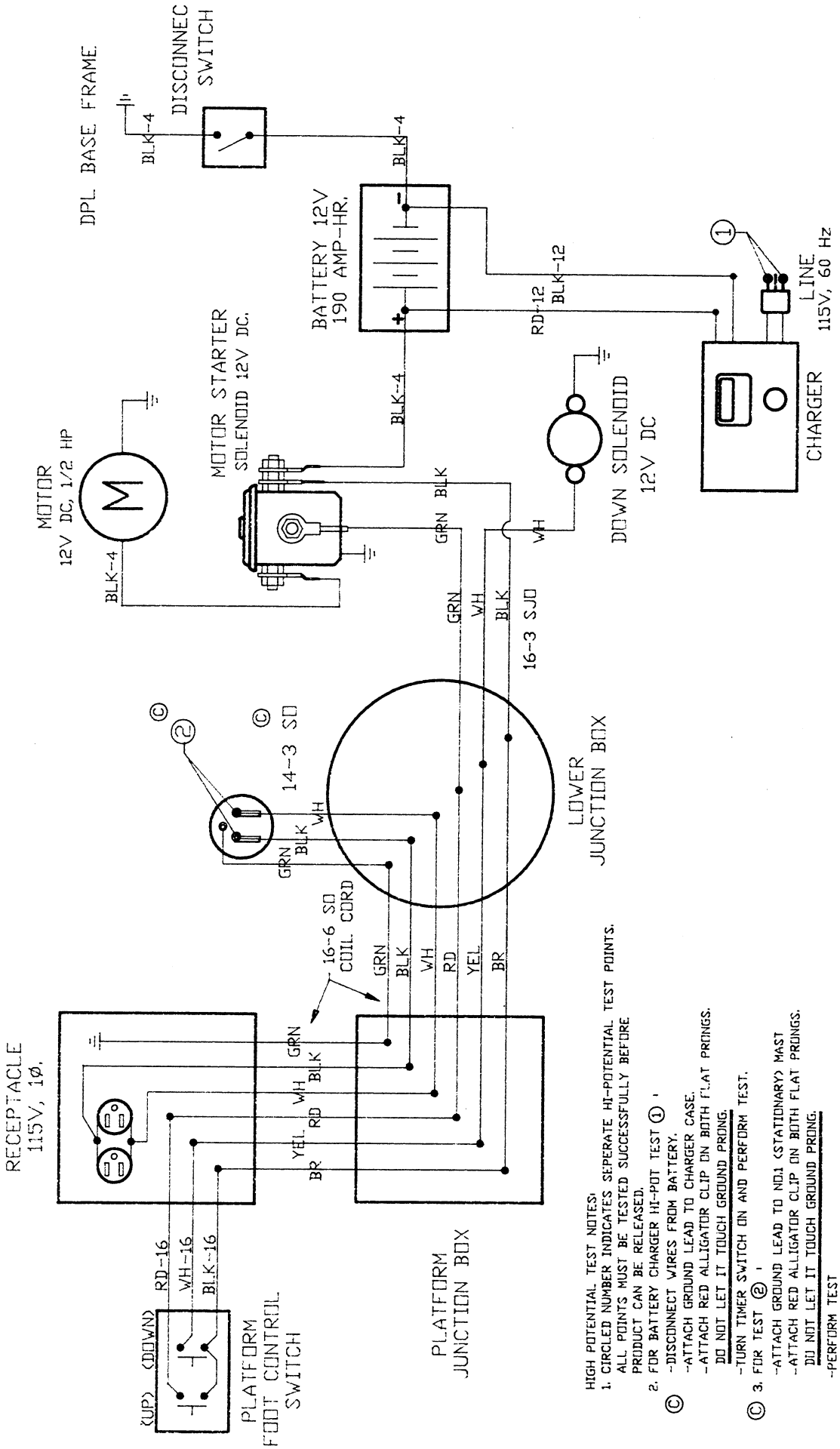
(B)(2)> ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.

(B)(3)> WIRES CAN BE DISCONNECTED AND CLIP ATTCHED TO ALL THREE OR THEY CAN BE TESTED INDIVIDUALLY.



HIGH POTENTIAL TEST NOTES:

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2. DISCONNECT WIRES FROM BATTERY.
3. ATTACH GROUND LEAD TO CHARGER CASE.
4. → ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.
5. TURN TIMER SWITCH ON AND PERFORM TEST.



DPL 12 VOLT (DC) WITH 115 VOLT AC POWER TO PLATFORM

HIGH POTENTIAL TEST NOTES:

(A) 1. CIRCLED NUMBER INDICATES SEPERATE HI-POTENTIAL TEST POINTS. ALL POINTS MUST BE TESTED SUCCESSFULLY BEFORE PRODUCT CAN BE RELEASED.

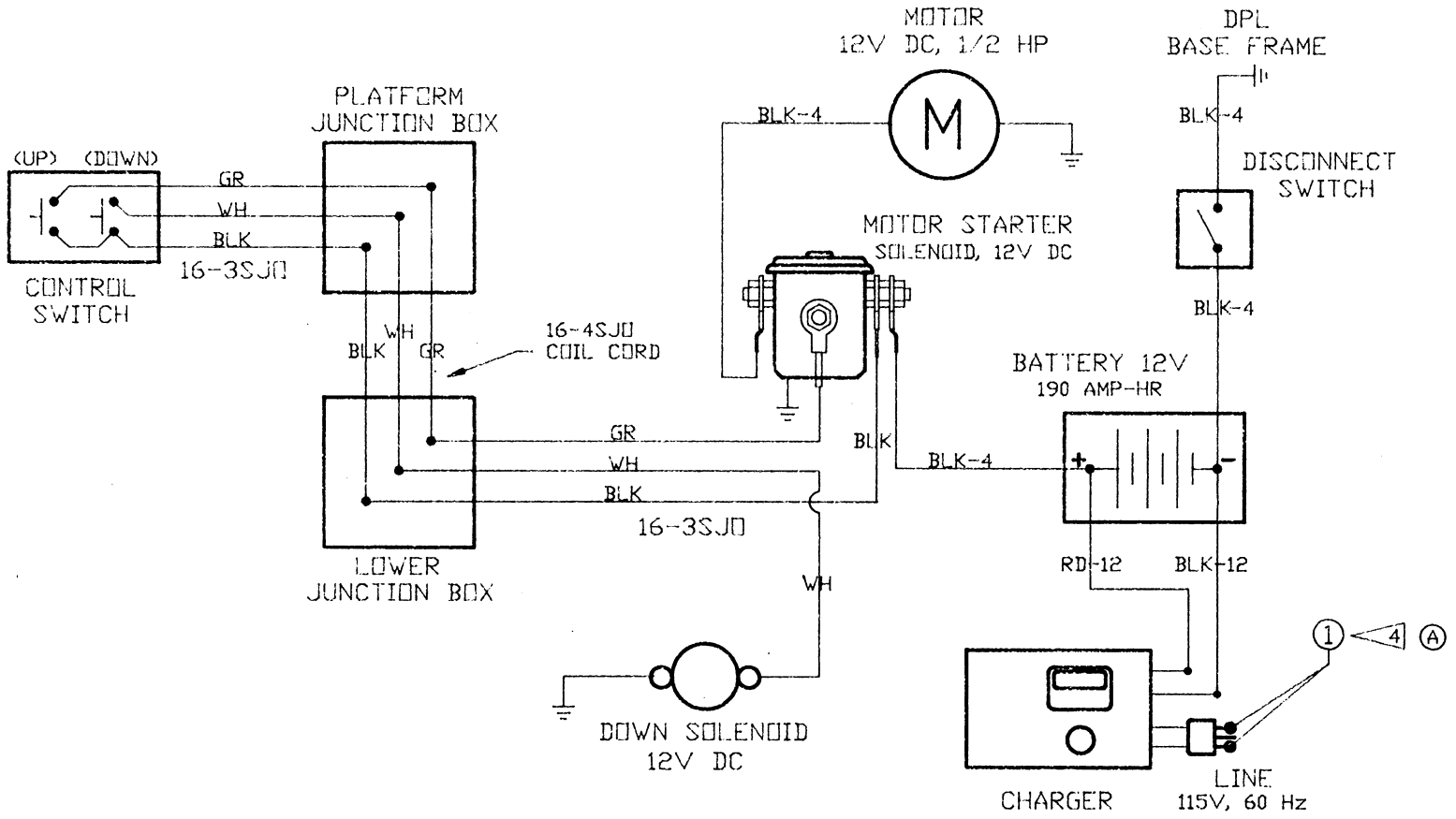
(A) 2. DISCONNECT WIRES FROM BATTERY.

(A) 3. ATTACH GROUND LEAD TO CHARGER CASE.

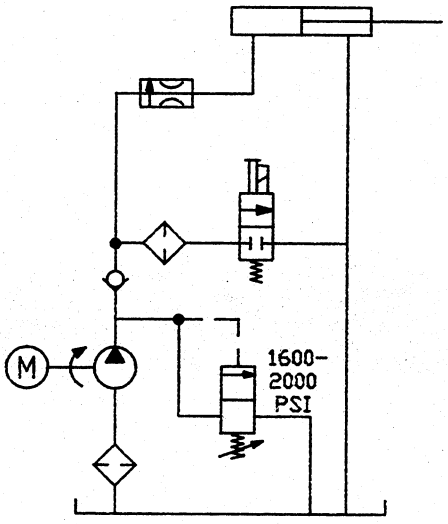
(A) 4 ATTACH RED ALLIGATOR CLIP ON BOTH FLAT PRONGS. DO NOT LET IT TOUCH GROUND PRONG.

(A) 5. TURN TIMER SWITCH ON AND PERFORM TEST.

NOTE: FOR 115V, 60 Hz APPLICATIONS.

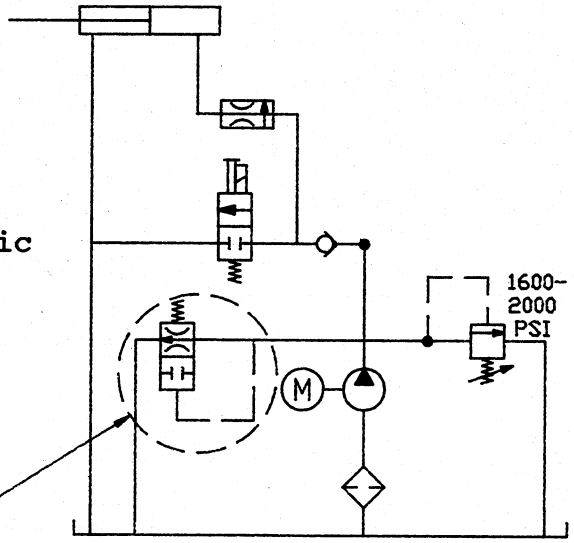


Hydraulic Schematic
6.12



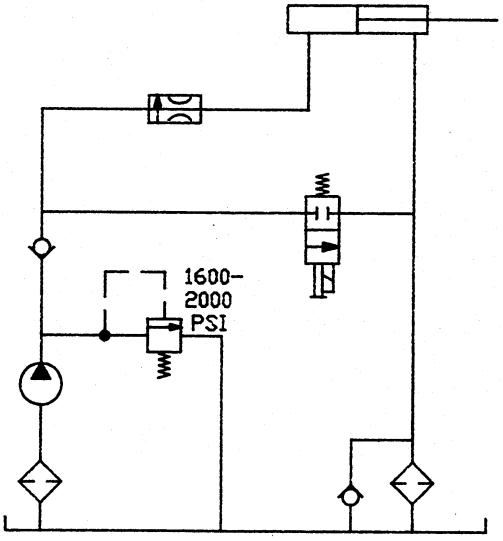
BARNES AC
GENIE PN. 12250 & PN. 12727

Hydraulic Schematic
6.13



FENNER DC
W/ ADJUSTABLE RELIEF VALVE
GENIE PN. 8056 & PN. 6681

Hydraulic Schematic
6.14



FENNER
GENIE PN. 15777 & PN. 15778