SERVICE MANUAL

VERTICAL MAST

MODEL SJ12

155185AD October 2012

SKYJACK

This manual is based on Serial Numbers:

SJ 12 14,001,105 & Below

Please refer to the website (www.skyjack.com) for older Serial Numbers.

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SERVICE AND MAINTENANCE

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The Safety Alert Symbol identifies important safety messages on aerial platforms, safety signs in manuals or elsewhere. When you see this symbol, be alert to the possibility of personal injury or death. Follow the instructions in the safety message.

This Safety Alert Symbol means attention!

Become alert! Your safety is involved.

DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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.

IMPORTANT

IMPORTANT indicates a procedure essential for safe operation and which, if not followed, may result in a malfunction or damage to the aerial platform.

Section 1
SCHEDULED MAINTENANCE

1

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Notes

SKYJACK is continuously improving and expanding product features on its equipment, therefore, specifications and dimensions are subject to change without notice.

Aerial Platform Definition
A mobile device that has an adjustable position platform supported from ground level by a structure.

Purpose of Equipment
The SKYJACK Vertical Mast series aerial platform are designed to transport and raise personnel, tools and materials to overhead work areas.

Use of Equipment
The aerial platform is a highly maneuverable, mobile work station. Lifting and driving must be on a flat, level, compacted surface.

Manuals
Operating
The operating manual is considered a fundamental part of the aerial platform. It is a very important way to communicate necessary safety information to users and operators. A complete and legible copy of this manual must be kept in the provided weather-resistant storage compartment on the aerial platform at all times.

Service & Maintenance
The purpose of this is to provide the customer with the servicing and maintenance procedures essential for the promotion of proper machine operation for its intended purpose.

All information in this manual should be read and understood before any attempt is made to service the machine. The updated copy of the manuals are found on the company's website: www.skyjack.com.

Operator
The operator must read and completely understand both this operating manual and the safety panel label located on the platform and all other warnings in this manual and on the aerial platform. Compare the labels on the aerial platform with the labels found within this manual. If any labels are damaged or missing, replace them immediately.

Service Policy and Warranty
SKYJACK warrants each new SJT series work platform to be free of defective parts and workmanship for the first 24 months. Any defective part will be replaced or repaired by your local SKYJACK dealer at no charge for parts or labor. Contact SKYJACK Service Department for warranty statement extensions or exclusions.

Optional Accessories
The SKYJACK aerial platform is designed to accept a variety of optional accessories. These are listed under "Standard and Optional Features" in Table 2.1 of the operating manual. Operating instructions for these options (if equipped) are located in Section 2 of the operating manual.

For non-standard components or systems, contact the SKYJACK Service Department at

North America & Asia:	Europe:
☎ : 800 275-9522	☎ : 44-1691-676-235
🖷 : 630 262-0006	🖷 : 44-1691-676-239

Include the model and serial number for each applicable aerial platform.

Scope of this Manual

a. **This manual applies** to the ANSI/SIA, CSA, AS and CE versions of the Vertical Mast Series aerial platform models listed on Table 2.1 of the operating manual.

- **Equipment identified** with "ANSI" meets the ANSI SIA-A92.6-2006 standard.
- **Equipment identified** with "CSA" meets the CSA B354.2-01 standard.
- **Equipment identified** with "CE" meets the requirements for the European countries, i.e., Machinery Directive 2006/42/EC and Directive 2004/108/EC and the corresponding EN standards.

b. **CSA (Canada) and CE (Europe)**
Operators are required to conform to national, territorial/provincial and local health and safety regulations applicable to the operation of this aerial platform.

c. **ANSI/SIA (United States)**
Operators are required by the current ANSI/SIA A92.5 standards to read and understand their responsibilities in the manual of responsibilities before they use or operate this aerial platform.

WARNING

Failure to comply with your required responsibilities in the use and operation of the aerial platform could result in death or serious injury!

Operator Safety Reminders

A study conducted by St. Paul Travelers showed that most accidents are caused by the failure of the operator to follow simple and fundamental safety rules and precautions.

You, as a careful operator, are the best insurance against an accident. Therefore, proper usage of this aerial platform is mandatory. The following pages of this manual should be read and understood completely before operating the aerial platform.

Common sense dictates the use of protective clothing when working on or near machinery. Use appropriate safety devices to protect your eyes, ears, hands, feet and body.

Any modifications from the original design are strictly forbidden without written permission from SKYJACK.

Electrocution Hazard

This aerial platform is not electrically insulated. Maintain a Minimum Safe Approach Distance (MSAD) from energized power lines and parts as listed below. The operator must allow for the platform to sway, rock or sag. This aerial platform does not provide protection from contact with or proximity to an electrically charged conductor.

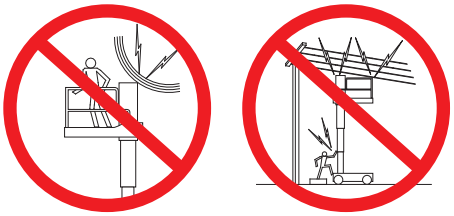
Per ANSI A92.5-2006 8.10(7)
"The operator shall perform only the work for which he or she is qualified, in compliance with all applicable safety related work practices intended to prevent electric shock covered by the Code of Federal Regulations (CFR) 1910.333. The operator's level of competence shall be established only by persons qualified to do so. Operators shall maintain the appropriate minimum approach distance (MAD) from energized power lines and parts covered by CFR 1910.333 (c)."

Unqualified persons must maintain a minimum approach distance of 10 feet from any energized power line up to 50 kV. Energized power lines over 50 kV require a greater minimum approach distance to be maintained. Refer to CFR 1910.333.

As per CSA B354.4-02
"The operator shall maintain the minimum safe approach distance (MSAD) from energized conductors at all times in accordance with the authority having jurisdiction."

Refer to CFR 1910.333 or the authority having jurisdiction.

DO NOT USE AERIAL PLATFORM AS A GROUND FOR WELDING.
DO NOT OPERATE AERIAL PLATFORM DURING LIGHTNING OR STORMS.



DANGER
Avoid Power Lines

Minimum Safe Approach Distance

ANSI/SIA A92.6-2006 and CSA B354.2-01 Requirements		CE Guidance Note "Avoidance of danger from overhead lines"
Voltage Range (Phase to Phase)	**Minimum Safe Approach Distance (Feet)**	
0 to 300V	Avoid Contact	**Adhere strictly to the governmental rulings and regulations applicable in your country.**
Over 300V to 50KV	10	
Over 50KV to 200KV	15	
Over 200KV to 350KV	20	
Over 350KV to 500KV	25	
Over 500KV to 750KV	35	
Over 750KV to 1000KV	45	

FAILURE TO AVOID THIS HAZARD WILL RESULT IN DEATH OR SERIOUS INJURY!

60023AD

Safety Precautions

Know and understand the safety precautions before going on to next section.

WARNING

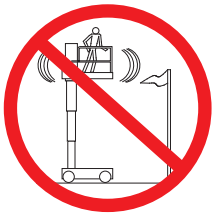
Failure to heed the following safety precautions could result in tip over, falling, crushing, or other hazards leading to death or serious injury.

- **KNOW** all national, state or territorial/provincial and local rules which apply to your aerial platform and job site.
- **TURN** main power disconnect switch "◯" off when leaving the aerial platform unattended. Remove the key to prevent unauthorized use of the aerial platform.
- **WEAR** all the protective clothing and personal safety devices issued to you or called for by job conditions.
- **DO NOT** wear loose clothing, dangling neckties, scarves, rings, wristwatches or other jewelry while operating this lift.

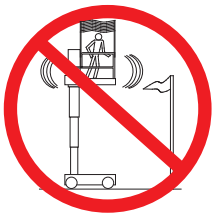
- **AVOID** entanglement with ropes, cords or hoses.

- **AVOID** falling. Stay within the boundaries of the guardrails.

- **DO NOT** raise the aerial platform in windy or gusty conditions.



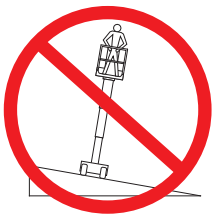
- **DO NOT** increase the lateral surface area of the platform. Increasing the area exposed to the wind will decrease aerial platform stability.



- **DO NOT** drive or elevate the aerial platform if it is not on a firm level surface. Do not drive elevated near depressions or holes of any type, loading docks, debris, drop-offs and surfaces that may affect the stability of the aerial platform.

- **If operation in areas with holes or drop-offs is absolutely necessary**, elevated driving shall not be allowed. Position the aerial platform horizontally only with the platform fully lowered. After ensuring that all 4 wheels or outriggers (if equipped) have contact with level firm surface, the aerial platform can be elevated. After elevation, the drive function must not be activated.

- **Elevated driving** must only be done on a firm level surface.



- **DO NOT** ascend or descend a grade when elevated. When fully lowered, ascending or descending grades up to maximum rated inclines listed in Table 2.3.

Safety Precautions (Continued)

Know and understand the safety precautions before going on to next section.

- **DO NOT** operate on surfaces not capable of holding the weight of the aerial platform including the rated load, e.g., covers, drains, and trenches.
- **DO NOT** operate an aerial platform that has ladders, scaffolding or other devices mounted on it to increase its size or work height. It is prohibited.

- **DO NOT** exert side forces on aerial platform while elevated.

- **DO NOT** use the aerial platform as a crane. It is prohibited.

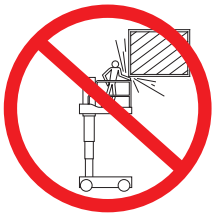
- **DO NOT** sit, stand or climb on the guardrails. It is prohibited.

- **DO NOT** climb on base and mast. It is prohibited.

- **BE AWARE** of overhead obstructions or other possible hazards around the aerial platform when driving or lifting.

- **DO NOT** raise the aerial platform while the aerial platform is on a truck, fork lift or other device or vehicle.

- **BE AWARE** of crushing hazards. Keep all body parts inside platform guardrail.



- **DO NOT** lower the platform unless the area below is clear of personnel and obstructions.

- **ENSURE** that there are no personnel or obstructions in the path of travel, including blind spots.

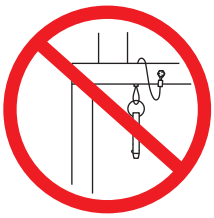
- **DO NOT** use with improperly inflated/damaged tires or wheels. Tires should be checked daily for pressure, torn side walls and soft spots.

- **DO NOT** alter or disable limit switches or other safety devices.

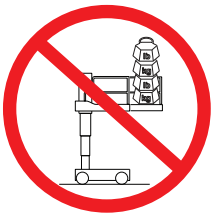
Safety Precautions (Continued)

Know and understand the safety precautions before going on to next section.

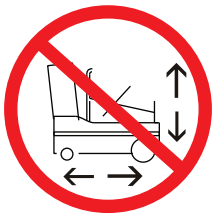
- **DO NOT** use the aerial platform without guardrails, locking pins and the entry gate in place.



- **DO NOT** exceed the rated capacity of the aerial platform. Do make sure the load is evenly distributed on the platform.



- **DO NOT** operate if aerial platform is not working properly or if any parts are damaged or worn.



- **DO NOT** leave aerial platform unattended with key in key switch.

- **DO NOT** use under influence of alcohol or drugs.

- **DO NOT** access the hydraulic/electrical compartment while the platform is raised.

- **BE AWARE** of blind spots when operating the aerial platform.
- **STUNT** driving and horseplay are prohibited.
- **DO NOT** attempt to free a snagged platform with lower controls until personnel are removed from the platform.
- **DO NOT** position the aerial platform against another object to steady the platform.
- **DO NOT** place materials on the guardrails or materials that exceed the confines of the guardrails unless approved by Skyjack.

Safety Precautions (Continued)

Know and understand the safety precautions before going on to next section.

Fall Protection

As per the ANSI A92.6-2006 standard, "The guardrail system of the aerial platform provides fall protection. If occupant(s) of the platform are required to wear personal fall protection equipment (PFPE), occupants shall comply with instructions provided by the aerial platform manufacturer (remanufacturer) regarding anchorage(s)."

If additional fall protection is required, by an employer or the authority having jurisdiction, Skyjack recommends the use of a fall restraint system to keep an occupant within the confines of the platform, and thus not expose the occupant to any fall hazard requiring a fall arrest.

All personal fall protection equipment must comply with applicable governmental regulations and must be inspected and used in accordance with the manufacturer's recommendations.

All personal fall protection equipment must be attached only to approved anchorage points within the platform of the aerial platform.

WARNING

Entering and exiting the aerial platform should only be done using the three points of contact.

- Use only equipped access openings.
- Enter and exit only when the aerial platform is in the fully retracted position.

- Do use three points of contact to enter and exit the platform. Enter and exit the platform from the ground only. Face the aerial platform when entering or exiting the platform.
- Three points of contact means that two hands and one foot or one hand and two feet are in contact with the aerial platform or the ground at all times during entering and exiting.

WARNING

An operator should not use any aerial platform that:

- does not appear to be working properly.
- has been damaged or appears to have worn or missing parts.
- has alterations or modifications not approved by the manufacturer.
- has safety devices which have been altered or disabled.
- has been tagged or locked out for non-use or repair.

Failure to avoid these hazards could result in death or serious injury.

Job site Inspection

- Do not use in hazardous locations.
- Perform a thorough job site inspection prior to operating the aerial platform, to identify potential hazards in your work area.
- Be aware of moving equipment in the area. Take appropriate actions to avoid collision.

Maintenance and Inspection Schedule

The actual operating environment of the work platform governs the use of the maintenance schedule. The inspection points covered in Table 1.2. Maintenance and Inspection Checklist, indicates the areas of the aerial platform to be maintained or inspected and at what intervals the maintenance and inspections are to be performed.

Owner's Annual Inspection Record

It is the responsibility of the owner to arrange quarterly and annual inspections of the aerial platform. Table 1.1. Owner's Annual Inspection Record is to be used for recording the date of the inspection, owner's name, and the person responsible for the inspection of the work platform.

Replacement Parts

Use only original replacement parts. Parts such as batteries, wheels, railings, etc. with weight and dimensions different from original parts will affect stability of the aerial platform and must not be used without manufacturer's consent.

All replacement tires must be of the same size and load rating as originally supplied tires; to maintain safety and stability of aerial platform.

Consult SKYJACK's Service Department for optional tires specifications and installation.

WARNING

Any unit that is damaged or not operating properly must be immediately tagged and removed from service until proper repairs are completed.

Maintenance and Service Safety Tips

Maintenance and repair should only be performed by personnel who are trained and qualified to service this aerial platform.

All maintenance and service procedures should be performed in a well lighted and well ventilated area.

Anyone operating or servicing this aerial platform must read and completely understand all operating instructions and safety hazards in this manual and operating manual.

All tools, supports and lifting equipment to be used must be of proper rated load and in good working order before any service work begins. Work area should be kept clean and free of debris to avoid contaminating components while servicing.

All service personnel must be familiar with employer and governmental regulations that apply to servicing this type of equipment.

Keep sparks and flames away from all flammable or combustible materials.

Properly dispose of all waste material such as lubricants, rags, and old parts according to the relative law provisions obtaining in the country.

Before attempting any repair work, turn Battery Disconnect Switch to "◯" off position.

Preventive maintenance is the easiest and least expensive type of maintenance.

Hydraulic System & Component Maintenance and Repair

The following points should be kept in mind when working on the hydraulic system or any component:

1. Any structure has limits of strength and durability. To prevent failure of structural parts of hydraulic components, relief valves which limit pressure to safe operating values are included in the hydraulic circuits.

2. Tolerance of working parts in the hydraulic system is very close. Even small amounts of dirt or foreign materials in the system can cause wear or damage to components, as well as general faulty operation of the hydraulic system. Every precaution must be taken to assure absolute cleanliness of the hydraulic oil.

3. Whenever there is a hydraulic system failure which gives reason to believe that there are metal particles or foreign materials in the system, drain and flush the entire system and replace the filter cartridges. A complete change of oil must be performed under these circumstances.

4. Whenever the hydraulic system is drained, check the magnets in the hydraulic reservoir for metal particles. If metal particles are present, flush the entire system and add a new change of oil. The presence of metal particles also may indicate the possibility of imminent component failure. A very small amount of fine particles is normal.

5. All containers and funnels used in handling hydraulic oil must be absolutely clean. Use a funnel when necessary for filling the hydraulic oil reservoir, and fill the reservoir only through the filter opening. The use of cloth to strain the oil should be avoided to prevent lint from getting into the system.

6. When removing any hydraulic component, be sure to cap and tag all hydraulic lines involved. Also, plug the ports of the removed components.

7. All hydraulic components must be disassembled in spotlessly clean surroundings. During disassembly, pay particular attention to the identification of parts to assure proper reassembly. Clean all metal parts in a clean mineral oil solvent. Be sure to thoroughly clean all internal passages. After the parts have been dried thoroughly, lay them on a clean, lint-free surface for inspection.

8. Replace all O-rings and seals when overhauling any component. Lubricate all parts with clean hydraulic oil before reassembly. Use small amounts of petroleum jelly to hold O-rings in place during assembly.

9. Be sure to replace any lost hydraulic oil when completing the installation of the repaired component, and bleed any air from the system when required.

10. All hydraulic connections must be kept tight. A loose connection in a pressure line will permit the oil to leak out or air to be drawn into the system. Air in the system can cause damage to the components and noisy or erratic system operation.

Maintenance Hints

Three simple maintenance procedures have the greatest effect on the hydraulic system performance, efficiency and life. Yet, the very simplicity of them may be the reason they are so often overlooked. What are they? Simply these:

1. Change filters annually. The filters will need to be changed more often depending on the operating conditions. Dirty, dusty, high moisture environments may cause the hydraulic system to be contaminated more quickly.

2. Maintain a sufficient quantity of clean hydraulic oil of the proper type and viscosity in the hydraulic reservoir.

3. Keep all connections tight.

About this Section

This section contains the maintenance and inspection schedule that is to be performed.

References are made to the procedures in Section 5 that outline detailed step-by-step instructions for checks and replacements.

Service Bulletins

Before performing any scheduled maintenance inspection procedure, refer to service bulletins found in our web site: www.skyjack.com for updates related to service and maintenance of this aerial platform.

Maintenance and Inspection

Death or injury can result if the aerial platform is not kept in good working order. Inspection and maintenance should be performed by competent personnel who are trained and qualified on maintenance of this aerial platform.

WARNING

Failure to perform each procedure as presented and scheduled may cause death, serious injury or substantial damage.

NOTE

Preventive maintenance is the easiest and least expensive type of maintenance.

- Unless otherwise specified, perform each maintenance procedure with the aerial platform in the following configuration:

  - Aerial platform parked on a flat and level surface
  - Disconnect the battery by turning the main power disconnect switch to "◯"off position.

- Repair any damaged or malfunction components before operating aerial platform.
- Keep records on all inspections.

Maintenance Instructions

This manual consists of four schedules to be done for maintaining on an aerial platform. Inspection schedule frequency is shown below:

Inspection Schedule

Daily	A
Frequently	A + B
Annually	A + B + C
Bi-annually	A + B + C + D

- Make copies of the maintenance and inspection checklist to be used for each inspection.
- Check the schedule on the checklist for the type of inspection to be performed.
- Place a check in the appropriate box after each inspection procedure is completed.
- Use the maintenance and inspection checklist and step-by-step procedures in Section 5 to perform these inspections.
- If any inspection receives a fail, tag and remove the aerial platform from service.
- If any aerial platform component(s) has been repaired, an inspection must be performed again before removing the tag. Place a check in the repair column.

Legend

P = Pass
F = Fail
R = Repaired

Table 1.1 Owner's Annual Inspection Record

WARNING

Do not use the aerial platform if an inspection has not been recorded in the last 6 months (CE) or 13 months (ANSI/CSA).

	Model _____ S/N _____									
	20__	20__	20__	20__	20__	20__	20__	20__	20__	20__
	SKYJACK									

This decal must be completed, dated and signed, after each inspection time intervals as stated above.

Table 1.2 MAINTENANCE AND INSPECTION CHECKLIST

Serial Number: _____

Model: _____

Hourmeter Reading: _____ Name (Printed): _____

Date: _____

Time: _____ Signature: _____

Each item shall be inspected using the the appropriate section of the Skyjack service manual.
As each item is inspected, write the apropriate grade in the box.

INSPECTION FREQUENCY

- ❑ DAILY
- ❑ FREQUENTLY
- ❑ ANNUALLY
- ❑ BI-ANNUALLY

P - PASS
F - FAIL
R - REPAIRED

Inspection Schedule	
Daily	A
Frequently*†	A + B
Annually†	A + B + C
Bi-annually†	A + B + C + D

Schedule		P	F	R
Schedule Maintenance Inspections				
Labels	A			
Limit Switches	A, B			
Base				
Main Power Disconnect Switch	A, B			
Base Control Switches	A, B			
100V Outlet Receptacle - ANSI/CSA	A, B			
Pothole Protection Device	A, B			
Wheel/Tire Assembly	A, B			
Platform Assembly				
Lanyard Attachment Anchors	A, B			
AC Outlet - ANSI/CSA	A, B			
Platform Control Console	A, B			
Manuals	A, B			
Hydraulic/Electrical Compartment				
Battery	A, B			
Battery Charger	A, B			
Main Manifolds	A, B, C			
Hydraulic Tank	A, B			
Hydraulic Pump and Motor	A, B			
Hydraulic Oil	A, B, C			
Motor Controller	A, B			
Tilt Sensor	A, B			
Pothole Protection Device	A, B			
Limit Switches	A, B			
Lift Mechanism				
Mast Assembly	A, B			
Wear Pads	A, B			
Chains	A, B			
Cables	A, B			

Schedule		P	F	R
Function Tests				
Test Main Power Disconnect Switch	A, B			
Base Control Console				
Test Base Emergency Stop	A, B			
Test Off/Platform/Base Switch	A, B			
Test Lower/Neutral/Raise Switch	A, B			
Test Platform Self-leveling	A, B			
Test Emergency Power	A, B			
Test Platform Maintenance Limit Switch	A, B			
Platform Control Console				
Test Platform Emergency Stop	A, B			
Test Enable Trigger Switch	A, B			
Test Lift/Off/Drive Switch Off Position	A, B			
Test Steering	A, B			
Test Drive Cutout Limit Switch - CE	A, B			
Test Driving	A, B			
Test Brakes	A, B			
Test Horn	A, B			
Test Platform Raising/Lowering	A, B			
Test Pothole Sensor	A, B			

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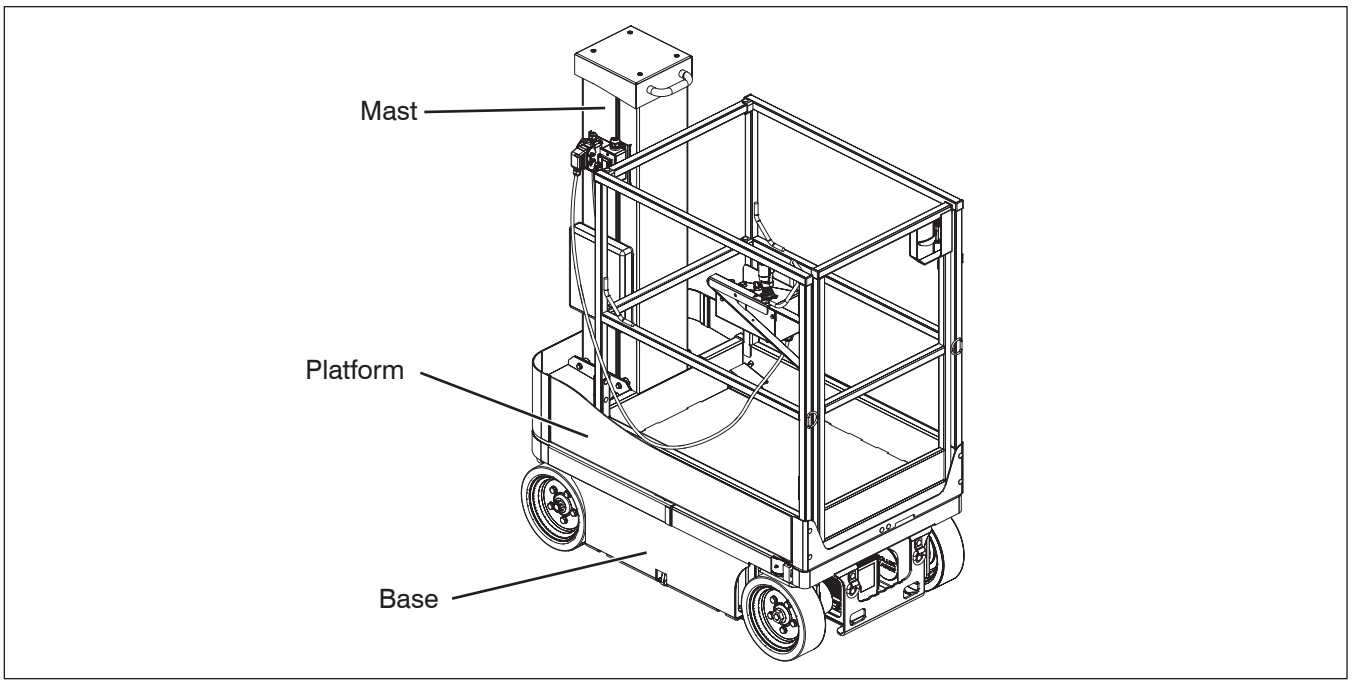
A - Perform Visual and Daily Maintenance Inspections & Functions Test. Refer to Section 2.7 of the Operating Manual.
B - Perform Scheduled Maintenance Inspection every three months or 150 hrs. Refer to Section 1.0 of this manual.
C - Perform Scheduled Maintenance Inspection every year. Refer to Section 1.0 of this manual.
D - Perform Scheduled Maintenance Inspection every 2 years. Refer to Section 1.0 of this manual.
***** Perform scheduled inspection every three months or 150 hours.
† - Refer to Skyjack's website @ www.skyjack.com for latest service bulletins prior to performing quarterly or yearly inspection.

Note: Make a copy of this page or visit the Skyjack web site:www.skyjack.com for a printable copy.



1.1 Scheduled Maintenance Inspections

Begin the visual and daily maintenance inspections by checking each item in sequence for the conditions listed in this section.

WARNING

To avoid injury, do not operate an aerial platform until all malfunctions have been corrected.

WARNING

To avoid possible injury, ensure aerial platform power is off during your visual and daily maintenance inspections.

NOTE

While performing visual and daily inspections in different areas, be aware to also inspect limit switches, electrical and hydraulic components.

CAUTION

Ensure aerial platform is on firm and level ground.

Electrical

Maintaining electrical components is essential to good performance and service life of aerial platform.

Perform a visual inspection around the following areas:

- all wiring harnesses
- hydraulic/electrical wiring harnesses

Hydraulic

Maintaining hydraulic components is essential to good performance and service life of the aerial platform.

Perform a visual inspection around the following areas:

- hoses and fittings
- hydraulic cylinder
- all hydraulic manifolds
- the underside of the base
- ground area under the aerial platform

1.1-1 Labels

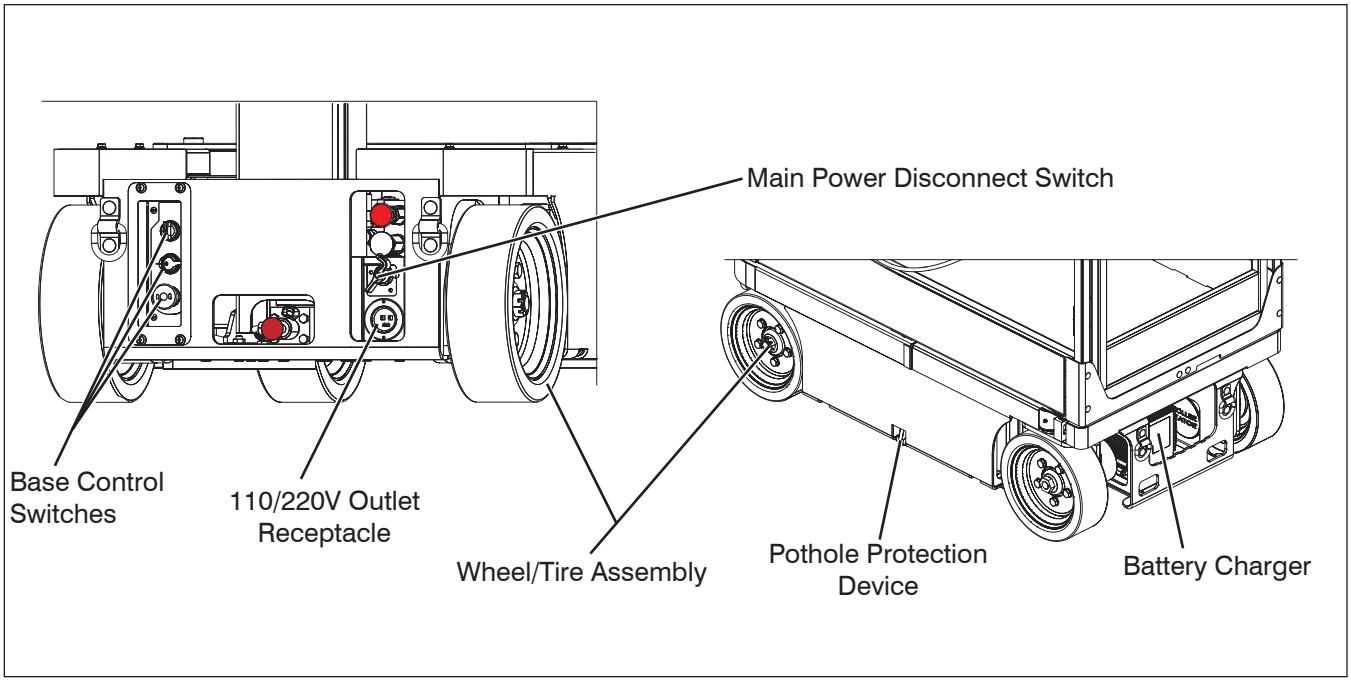
Refer to the labels section in the operating manual and ensure that all labels are in place and are legible.

1.1-2 Limit Switches

Ensure limit switches are properly secured and no signs of visible damage and movement is not obstructed. Detecting limit switch malfunction is essential to safe aerial platform operation.

Visually inspect all limit switch for the following:

- broken or missing actuator arm
- missing fasteners
- loose wiring

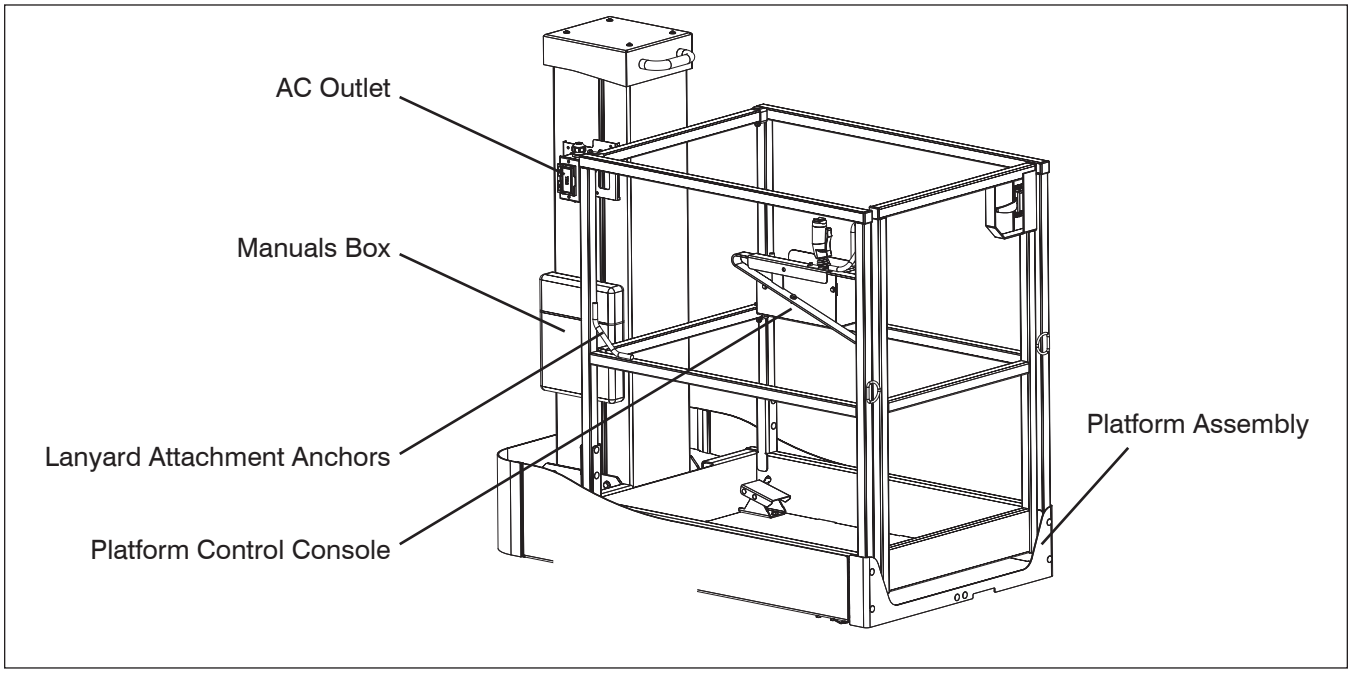


1.1-3 Base

- **Main Power Disconnect Switch**
  - Turn main power disconnect switch to "◯" off position.
  - Ensure all cables are secure and switch is in proper working condition.
- **Base Control Switches**
  - Ensure there are no signs of visible damage and all switches are in their neutral positions.
- **110/220V Outlet Receptacle - ANSI/CSA**
  - Ensure receptacle is free from dirt and obstructions.
- **Battery Charger**
  - Ensure charger is secure and shows no visible damage.
- **Steer Cylinder Assembly**
  - Ensure steer cylinder assembly is properly secured and there are no loose or missing parts.
- **Pothole Protection Device**
  - Ensure mechanisms have no sign of visible damage and are free from dirt and obstructions.
- **Wheel/Tire Assembly**

The aerial platform is equipped with solid rubber tires. Tire and/or wheel failure could result in an aerial platform tip-over. Component damage may also result if problems are not discovered and repaired in a timely fashion.

  - Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.
  - Check each wheel for damage and cracked welds.
  - Check each lug nut for proper torque to ensure none are loose.
  - Check wheel motor assembly for loose or missing parts and signs of visible damage.
  - Ensure wheels are aligned and true vertically and horizontally.



1.1-4 Platform Assembly

WARNING

Ensure that you maintain three points of contact to mount/dismount platform.

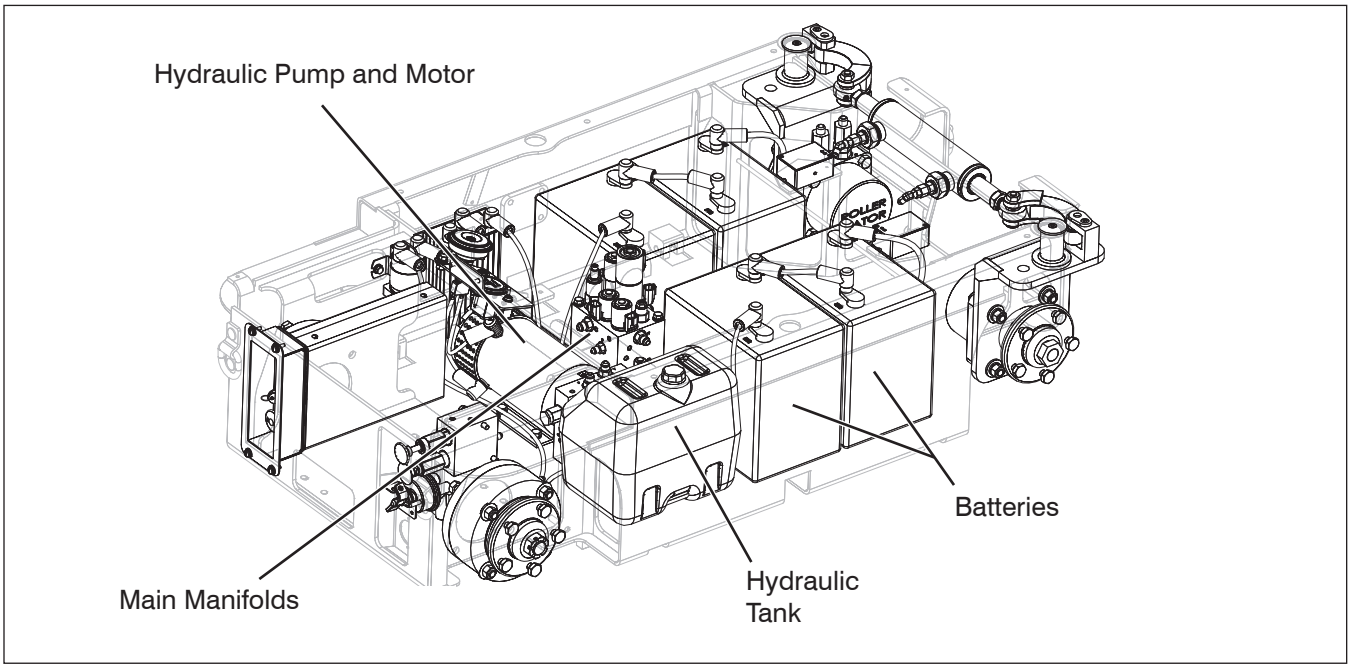
1. Open the gate and access the platform.
2. Close the gate.
   - Ensure all railings are properly positioned and secured.
   - Ensure all fasteners are securely in place.
   - Ensure gate is in good working order.
   - Ensure there are no loose or missing parts and there is no visible damage.
   - Ensure platform foot pedal is in good working order and no loose or missing parts and there is no visible damage

- **Lanyard Attachment Anchors**
  - Ensure attachment anchors are secure and no visible damage.
- **AC Outlet - ANSI/CSA**
  - Ensure outlet has no visible damage and free from dirt or obstructions.
- **Platform Control Console**
  - Ensure all switches and controller are returned to neutral and are properly secured.
  - Ensure there are no loose or missing parts and there is no visible damage.
- **Manuals**
  Ensure a copy of operating manual and certificate are enclosed in manual storage box.
  - Check to be sure manual storage box is present and in good condition.
  - Ensure manuals are legible and in good condition.
  - Always return manuals to the manual storage box after use.

WARNING

Ensure that you maintain three points of contact to mount/dismount platform.

3. Dismount from platform.
4. Close the gate.



1.1-5 Hydraulic/Electrical Compartment

1. Access the hydraulic/electrical compartment.

- **Battery**
  Proper battery condition is essential to good performance and operational safety. Improper fluid levels or damaged cables and connections can result in component damage and hazardous conditions.

WARNING

Explosion hazard. Keep flames and sparks away. Do not smoke near batteries.

WARNING

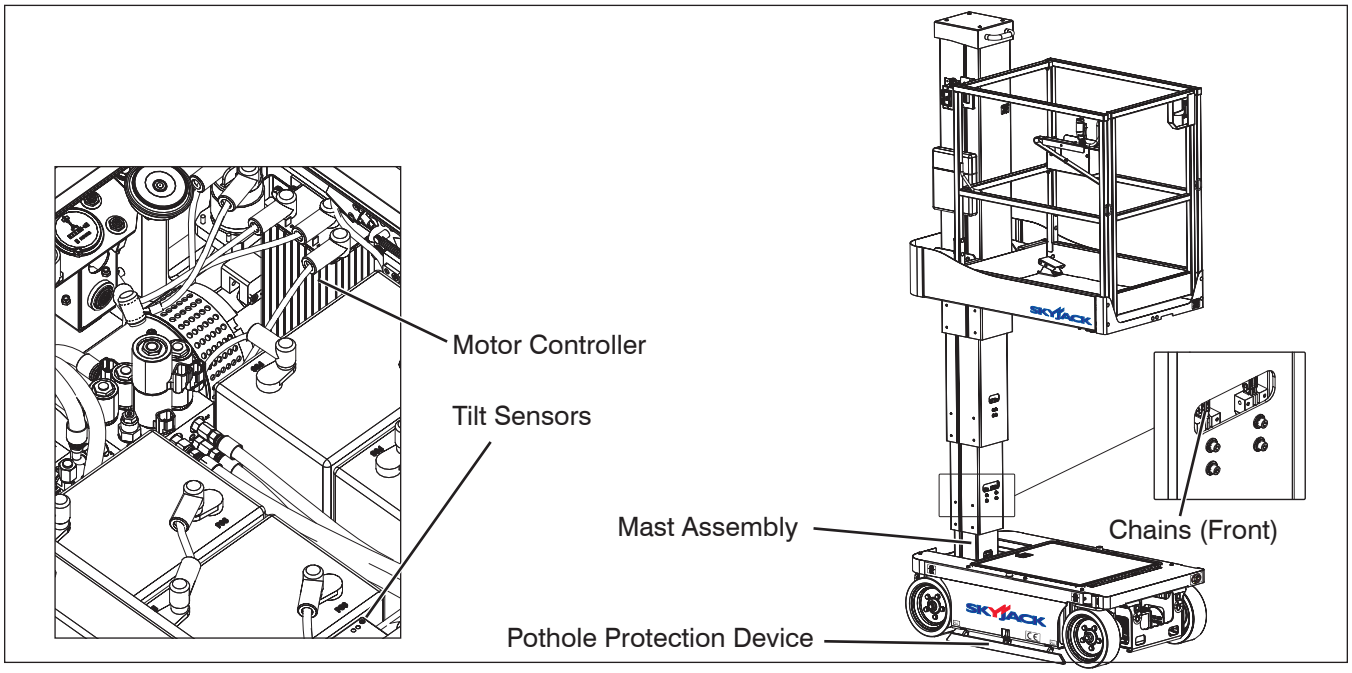
Battery acid is extremely corrosive - Wear proper eye and facial protection as well as appropriate protective clothing. If contact occurs, immediately flush with cold water and seek medical attention.

a. Check battery case for damage.
b. Clean battery terminals and cable ends thoroughly with a terminal cleaning tool or wire brush.
c. Ensure all battery connections are tight.
d. If applicable, check battery fluid level. If plates are not covered by at least 1/2" (13 mm) of solution, add distilled or demineralized water.
e. Replace battery if damaged or incapable of holding a lasting charge.

WARNING

Use original or manufacturer-approved parts and components for the aerial platform.

- **Battery Charger**
  - Ensure charger is secure and shows no visible damage.
- **Main Manifolds**
  - Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.
  - Ensure there are no loose wires or missing fasteners.
- **Hydraulic Tank**
  - Ensure hydraulic filler cap is secure.
  - Ensure tank shows no visible damage and no evidence of hydraulic leakage.
- **Hydraulic Pump and Motor**
  - Ensure there are no loose or missing parts and there is no visible damage.



- **Hydraulic Oil**
  - Ensure platform is fully lowered, and then visually inspect the hydraulic oil level
- **Motor Controller**
  - Ensure the controller is properly secured and there is no visible damage.
  - Ensure there are no loose wires or missing fasteners.
- **Tilt Sensors**
  - Ensure tilt sensors are properly secured and there is no visible damage.
- **Pothole Protection Device**
  - Ensure mechanisms have no sign of visible damage and are free from dirt and obstructions.
- **Limit Switches**
  - Ensure limit switches are properly secured with no signs of visible damage and movement is not obstructed.

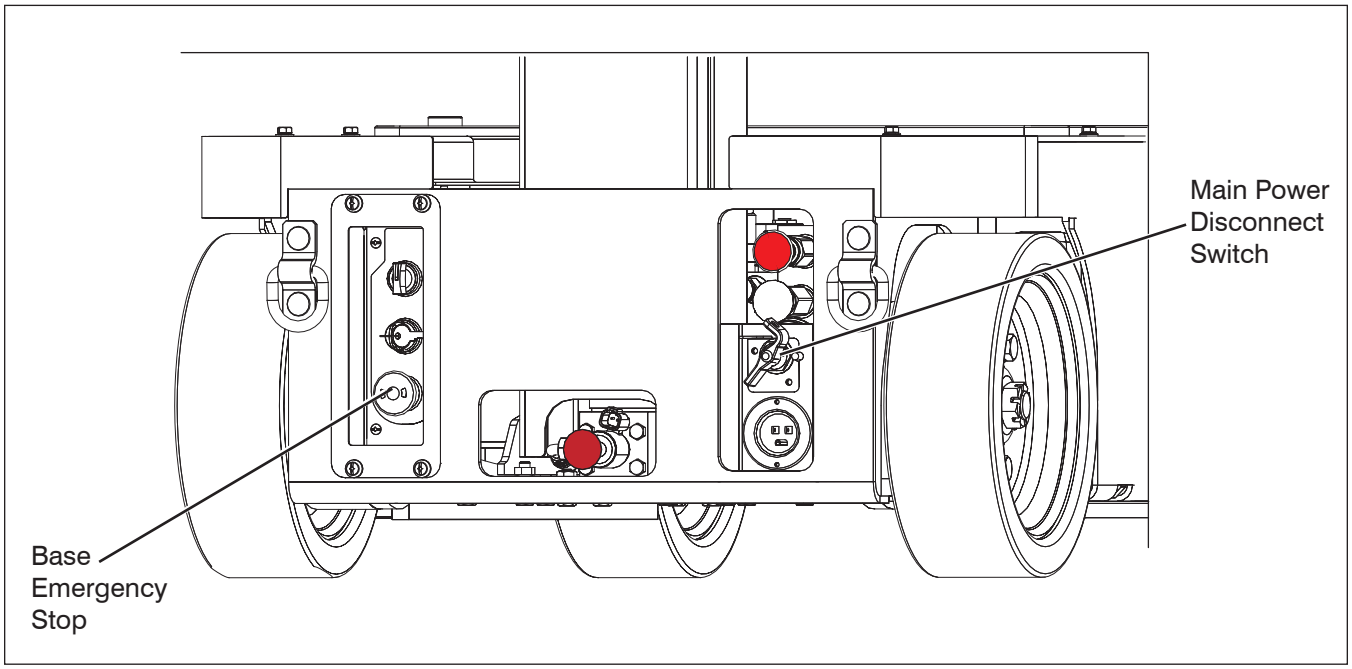
2. Close the compartment access door and latch in place.
3. Push the platform back to its operating position and latch in place.

1.1-6 Lifting Mechanism

- **Mast Assembly**
  - Ensure mast assembly shows no visible damage and no signs of deformation in weldments.

1. Complete section 1.2 Function Tests.
2. Raise the platform.

- **Wear Pads**
  - Ensure all bolts are tight, there is no visible damage to the wear pads and that no parts are missing.
- **Chains**
  - Ensure there are no missing parts, and all bolts are tight with no signs of visible damage.
  - Ensure chains are securely anchored.



1.2 Function Tests

Function tests are designed to discover any malfunctions before aerial platform is put into service. The operator must understand and follow step-by-step instructions to test all aerial platform functions.

WARNING

Never use a malfunctioning aerial platform. If malfunctions are discovered, aerial platform must be tagged and placed out of service. Repairs to aerial platform may only be made by a qualified service technician.

After repairs are completed, operator must perform a pre-operation inspection and a series of function tests again before putting aerial platform into service.

Prior to performing function tests, be sure to read and understand Section 2.9 - Start Operation of the Operating manual.

1.2-1 Test Main Power Disconnect Switch

1. At rear of the base, turn main power disconnect switch to "◯" off position and attempt to activate all aerial platform functions.
   Result: Aerial platform functions should not operate.

1.2-2 Base Control Console

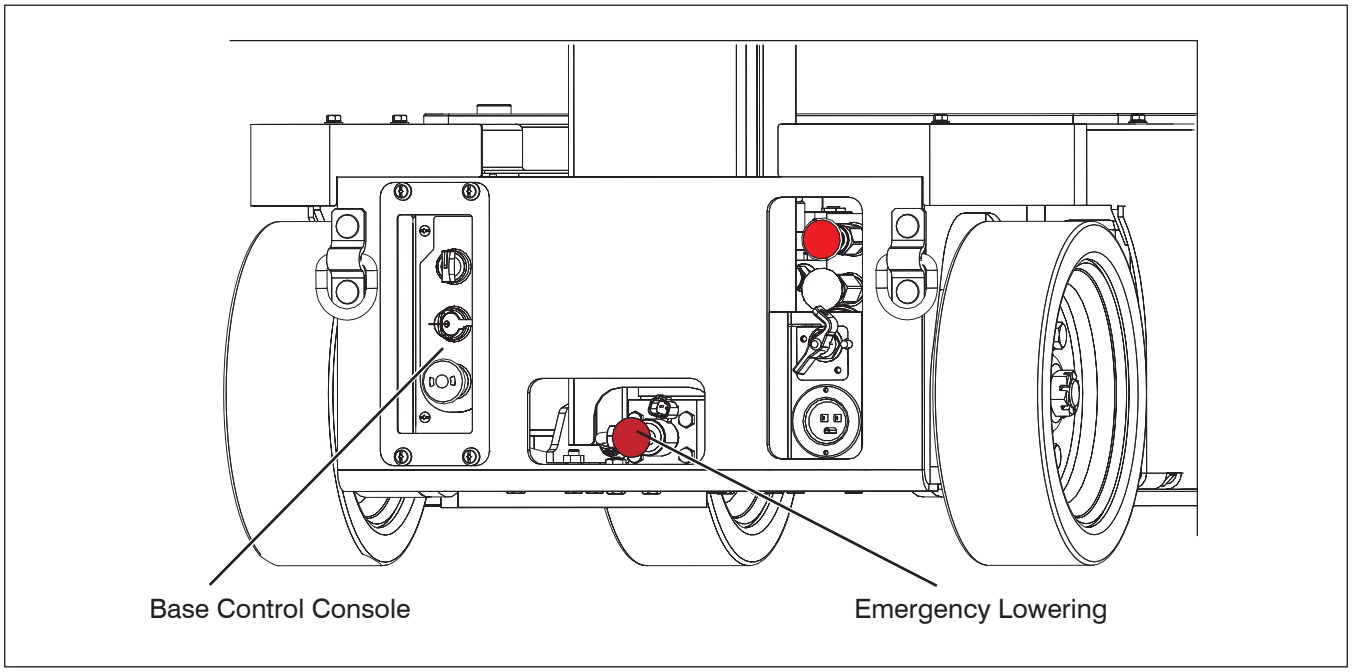
1. Turn main power disconnect switch to "|" on position.
2. On platform control console, pull out "●" emergency stop button.

- **Test Base Emergency Stop Light**

  1. Pull out base "●" emergency stop button.
     Result: Emergency stop light should continuously illuminate.

- **Test Base Emergency Stop**

  1. Push in "●" emergency stop button and attempt to raise or lower the platform.
     Result: Platform raising and lowering functions should not operate.



- **Test Off/Platform/Base Switch**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

1. Select off/platform/base key switch to "◯" off position. Attempt to raise or lower the platform.
   Result: Platform raising and lowering functions should not operate.
2. Select off/platform/base key switch to "" platform position. Attempt to raise or lower the platform.
   Result: Platform raising and lowering functions should not operate.
3. Select and hold off/platform/base key switch to "" base position. Attempt to raise or lower the platform.
   Result: Platform raising and lowering functions should operate.

- **Test Lower/Neutral/Raise Switch**

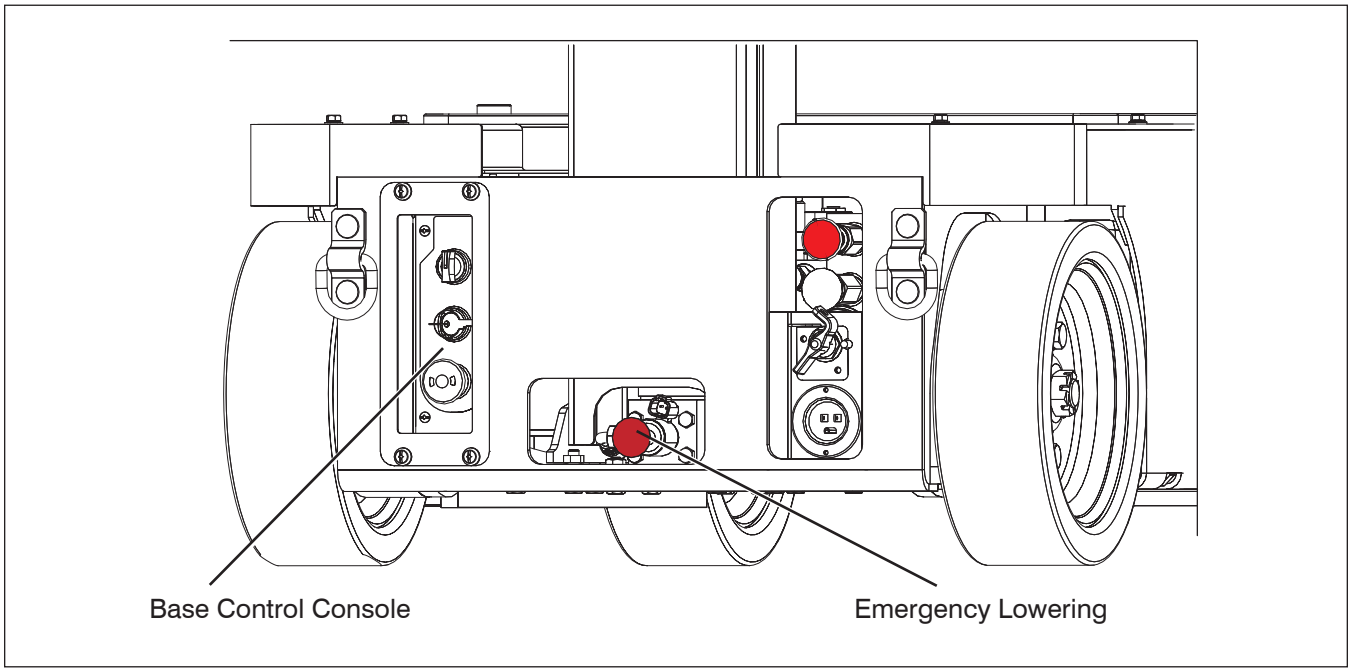
1. Select and hold off/platform/base key switch to "" base position and "" raise the platform with lower/neutral/raise switch.
   Result: Platform should rise.
2. Select and hold off/platform/base key switch to "" base position and "" lower the platform with lower/neutral/raise switch.
   Result: Platform should lower.

- **Test Emergency Lowering**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

1. Raise the platform.
2. On rear of the base, pull out and hold emergency lowering valve to fully lower the platform.
   Result: The platform should lower.



1.2-3 Test Platform Maintenance Limit Switch

1. Traverse the platform to maintenance position.
2. At the platform control console, attempt to activate any function.
   Result: All functions should not operate.
3. Push the platform back to its operating position and latch in place.

1.2-4 Platform Control Console

1. Ensure main power disconnect switch is in "|" on position.
2. Ensure base "●" emergency stop button is pulled out.
3. Select off/platform/base key switch to "" platform position.

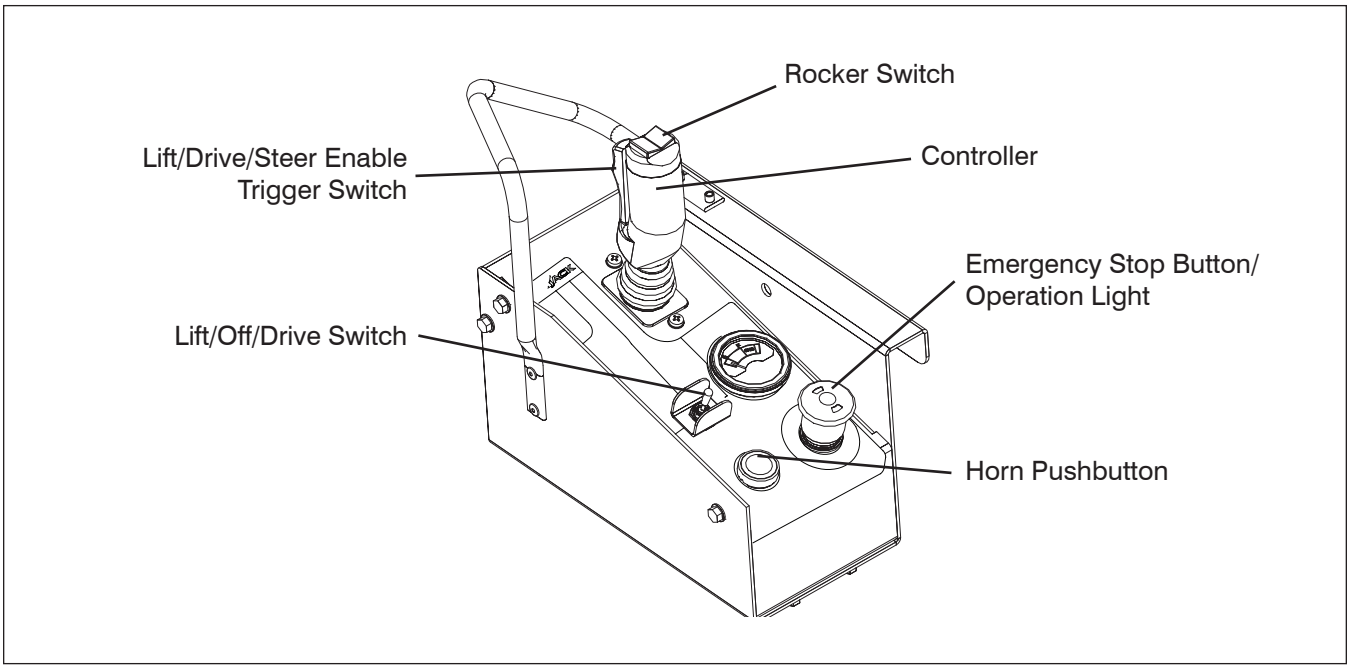
WARNING

Ensure that you maintain three points of contact to mount/dismount platform.

4. Open the gate and access the platform.
5. Close the gate.
6. On platform control console, pull out "●" emergency stop button.

- **Test Platform Emergency Stop**

1. Push in "●" emergency stop button and attempt to activate any platform function.
   Result: All selected platform functions should not operate.
2. Pull out "●" emergency stop button.
3. While activating any platform functions, push in emergency stop button.
   Result: Current activated aerial platform function should immediately stop operating.



- **Test Enable Trigger Switch**

  1. Without activating "" enable trigger switch, attempt to activate any platform function.
     Result: All platform functions should not operate.

- **Test Lift/Off/Drive Switch Off Position**

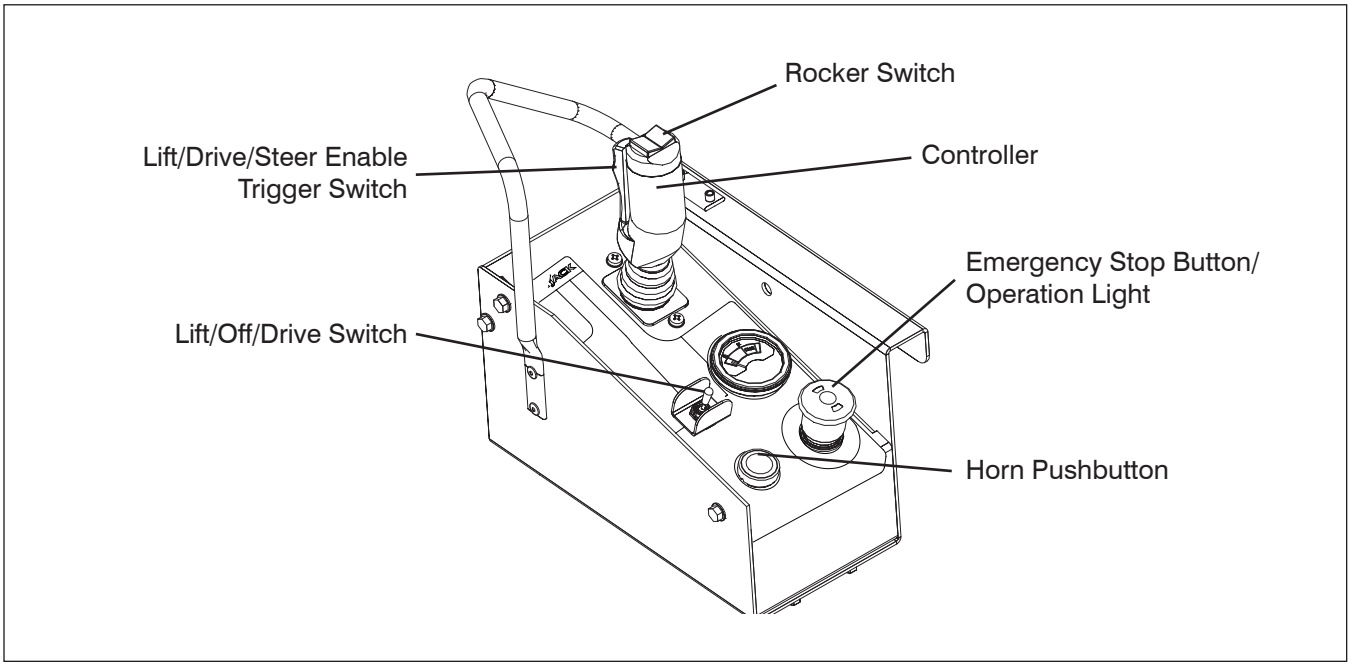
  1. Select lift/off/drive switch to"" off position, attempt to activate any platform function.
     Result: All platform functions should not operate.

- **Test Steering**

  1. Select lift/off/drive switch to "" drive position.
  2. Without activating "" enable trigger switch.
  3. Press rocker switch on top of controller handle to "" left and "" right.
     Result: Steer wheels should not operate
  4. Activate and hold "" enable trigger switch.
  5. Press rocker switch on top of controller handle to "" left and "" right.
     Result: Steer wheels should turn left and right.

- **Test Drive Cutout Limit Switch - CE**

  1. Traverse platform to any position, then attempt to drive "" forward and "" reverse.
     Result: Forward and reverse drive functions should not operate.
  2. Fully retract platform, then attempt to drive "" forward and "" reverse.
     Result: Forward and reverse drive functions should operate.



- **Test Driving**

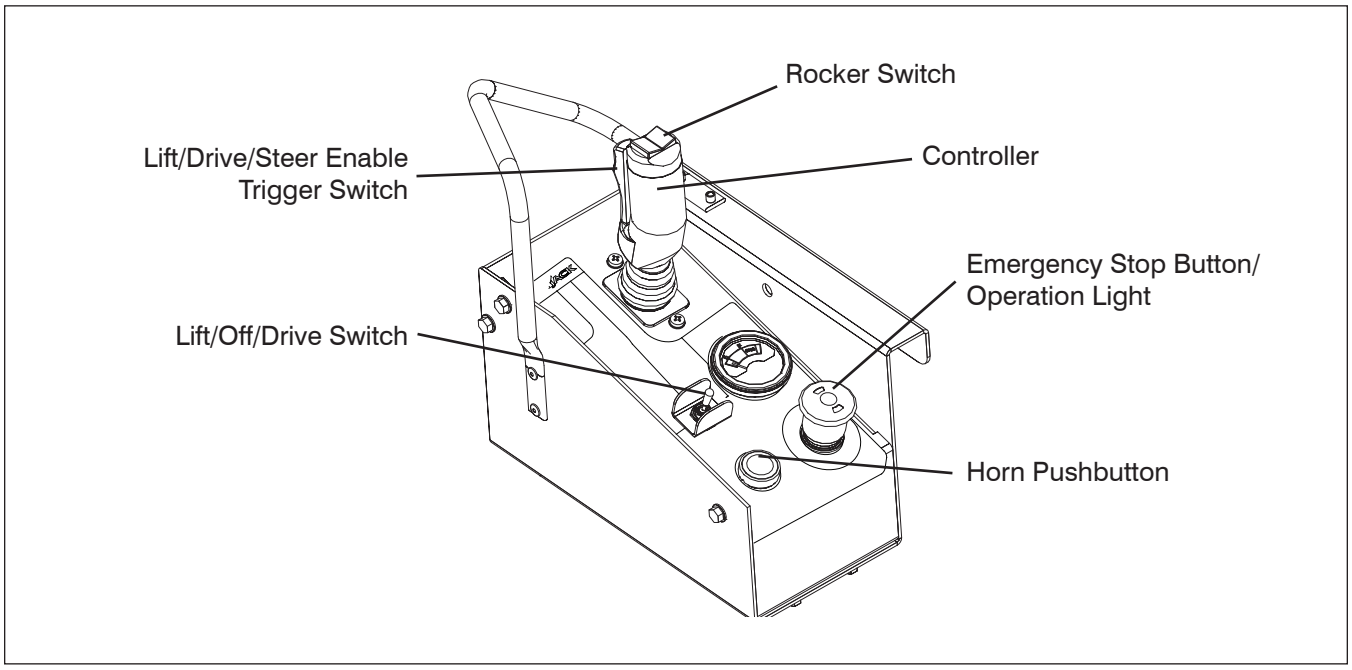
1. Ensure path of intended motion is clear.
2. Without activating "" enable trigger switch attempt to drive "" forward and reverse "".
   Result: Aerial platform drive functions should not operate.
3. Activate and hold ""enable trigger switch.
4. Slowly move controller handle in "" forward direction until aerial platform begins to move, and then return handle to center position.
   Result: Aerial platform should move in forward direction, and then come to a stop.
5. Slowly move controller handle in "" reverse direction until aerial platform begins to move, and then return handle to center position.
   Result: Aerial platform should move in reverse direction, and then come to a stop.

- **Test Brakes**

WARNING

Brakes will engage instantly when you release the controller handle, causing aerial platform to stop immediately.

1. Ensure path of intended motion is clear.
2. Activate and hold "" enable trigger switch.
3. Drive aerial platform "" forward and then "" backward. Test brake by releasing controller handle.
   Result: Aerial platform should come to a stop. If aerial platform pulls to one side while stopping, do not operate aerial platform until brake adjustments have been checked.
4. Drive aerial platform "" forward and then "" backward. Test brake again by releasing "" enable trigger switch only.
   Result: Aerial platform should come to an instant and abrupt stop. If aerial platform does not stop immediately, or if aerial platform pulls to one side while stopping, do not operate aerial platform until brake adjustments have been checked.



- **Test Horn**

  1. Push "" horn pushbutton.
     Result: Horn should sound.

- **Test Platform Raising/Lowering**

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

  1. Select lift/off/drive switch to "" lift position.
  2. Without activating "" enable trigger switch attempt to lift/lower the platform.
     Result: Aerial platform lift/lower functions should not operate.
  3. Activate and hold "" enable trigger switch.
  4. Push controller handle and raise the platform to an approximate height of 1 ft. (30.5 cm).
     Result: Platform should rise.
  5. Pull controller handle and lower the platform fully.
     Result: Platform should lower.

- **Test Pothole Sensor**

WARNING

Ensure that you maintain three points of contact to mount/dismount platform.

  1. Dismount from platform and place a block, approximately 1.5" (3.75 cm), under one side of the pothole protection device.
  2. Open the gate and access the platform.
  3. Close the gate.
  4. Raise the platform until approximately a height of 2 feet is reached and attempt to drive forward or reverse.
     Result: Aerial platform should not move forward or backward.
  5. Repeat the steps above with block placed under the other-side of the pothole protection device.

     Result: Aerial platform should not move forward or backward.

Section 2
MAINTENANCE TABLES

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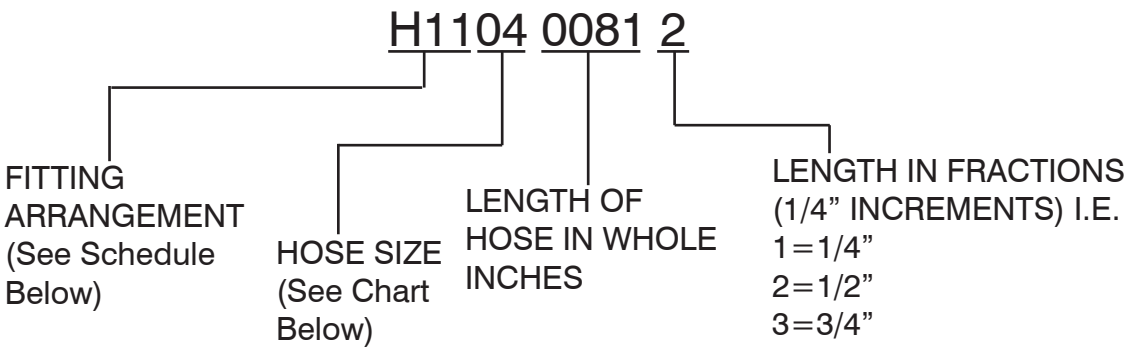
Tables

Table 2.1 Standard Hose Numbering System



Using the number above as an example (H1104 0081 2). This hose requires a 37° JIC, female swivel fitting on one end. A medium length 90° JIC, female swivel fitting for the other end. The Hose must meet or exceed S.A.E. 100R13 hose specification, and be a total of 81-1/2" long. NOTE: Hose ends and hose must be from same manufacturer per S.A.E. J1273 Nov. '91, Sections 3.10 and 4.2. Hose ends and hose must be of the same size i.e. #4 size fittings must be used with #4 size hose.

Hose Size Chart

SIZE	03	04	06	08	10	12	16	20	24	32	40	48	56	64
ID	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	3-1/2"	4"

Fitting Arrangement Schedule (Continued on the following page)

Hose Prefix	Hose End Fitting	Hose End Fitting	S.A.E. Hose Specification
H01	FEMALE, 37º JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H02	FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R13
H03	FEMALE, 37º JIC, SWIVEL	45º, FEMALE, 37º JIC, SWIVEL	100R17
H04	FEMALE, 37º JIC, SWIVEL	45º, FEMALE, 37º JIC, SWIVEL	100R13
H05	FEMALE, 37º JIC, SWIVEL	LONG 90º, FEMALE, 37º JIC, SWIVEL	100R17
H06	FEMALE, 37º JIC, SWIVEL	SHORT 90º, FEMALE, 37º JIC, SWIVEL	100R17
H07	LONG 90º, FEMALE, 37º JIC, SWIVEL	LONG 90º, FEMALE, 37º JIC, SWIVEL	100R17
H08	FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R4
H09	FEMALE, 37º JIC, SWIVEL	45º, FEMALE, 37º JIC, SWIVEL	100R4
H10	FEMALE, 37º JIC, SWIVEL	MALE PIPE THREAD FITTING	100R17
H11	FEMALE, 37º JIC, SWIVEL	MEDIUM 90º, FEMALE, 37º JIC, SWIVEL	100R13
H12	SHORT 90º, FEMALE, 37º JIC, SWIVEL	SHORT 90º, FEMALE, 37º JIC, SWIVEL	100R17
H13	FEMALE, 37º JIC, SWIVEL	REUSABLE MALE PIPE THREAD FITTING	300 PSI
H14	REUSABLE MALE PIPE THREAD FITTING	NO FITTING	300 PSI
H15	REUSABLE, FEMALE, 37º JIC, SWIVEL	REUSABLE, FEMALE, 37º JIC, SWIVEL	300 PSI

Table 2.1 Standard Hose Numbering System (Continued)

Fitting Arrangement Schedule (Continued from the previous page)

Hose Prefix	Hose End Fitting	Hose End Fitting	S.A.E. Hose Specification
H16	NO FITTING	NO FITTING	100R4
H17	NO FITTING	NO FITTING	300 PSI
H18	REUSABLE, FEMALE, 37º JIC, SWIVEL	NO FITTING	300 PSI
H19	LONG 90º, FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R13
H20	FEMALE, 37º JIC, SWIVEL	SHORT 90º, FEMALE, 37º JIC, SWIVEL	100R4
H21	FEMALE, 37º JIC, SWIVEL	SHORT 90º, FEMALE, 37º JIC, SWIVEL	100R2AT
H22	FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R2AT
H23	FEMALE, 37º JIC, SWIVEL	LONG 90º, FEMALE, 37º JIC, SWIVEL	100R2AT
H24	FEMALE, 37º JIC, SWIVEL	SHORT 90º, FEMALE, 37º JIC, SWIVEL	100R13
H25	FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R4
H26	SHORT 90º, FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R17
H27	LONG 90º, FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R17
H28	FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R17
H29	45º, FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R17
H30	MEDIUM 90º, FEMALE, 37º JIC, SWIVEL	FEMALE, 37º JIC, SWIVEL	100R17

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Table 2.2 Specifications and Features

MODEL	CE	ANSI
	SJ12	SJ12
Weight *	780 kg	1720 lb.
Overall Width	76.2 cm	30 in.
Overall Length	137.2 cm	54 in.
Platform Size (inside)	67.3 x 97.8 cm	26.5 x 38.5 in.
Platform Traversing	40.6 cm	20 in.
Height		
Working Height	5.6 m	18.6 ft.
Platform Elevated Height	3.6 m	11.8 ft.
Stowed Height	166.4 cm	65.5 in.
Drive Height	Full	Full
Standard Operating Times		
Lift Time (Rated Load)	15.2 s	
Lower Time (Rated Load)	12.1 s	
Chassis		
Normal Drive Speed	4.8 km/h	3.0 mph
Elevated Drive Speed	0.8 km/h	0.5 mph
Gradeability (Ramp Angle)**	30% / 25%	
Tires (Solid Rubber)	309 x 100 mm	12 x 4 in.
Hydraulic Oil		
Type	ATF Dexron III	
Tank Capacity	4.92 L	1.3 gal.

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* Weights are approximate; refer to serial nameplate for specific weight.
** Refer to Section 2.10 Loading/Unload of Operating manual for more details.

Table 2.3 Maximum Platform Capacities

MODEL	Capacity		Maximum Wind Speed	Tilt Cutout Setting
SJ12 (CE)	227 kg	2 Person(s)	No wind	1.5 x 3
		1 Person(s)	12.5 m/s	
SJ12 (ANSI)	500 lb.	2 Person(s)	28 mph	1.5 x 3

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Table 2.4a Floor Loading Pressure - CE

MODEL		Total Aerial Platform Weight	Total Aerial Platform Load	
			Wheel	OUP**
		kg	kg	kPa (kN/m^2)
SJ12	min*	780	195	7.3
	max*	1007	402	9.4

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* **min** - Aerial platform weight with no options
max - Aerial platform weight + all options + full capacity

** **LCP - Locally Concentrated Pressure** is a measure of how hard the aerial platform presses on the areas in direct contact with the floor. The floor covering (tile, carpet, etc.) must be able to withstand more that the indicated values above.

OUP - Overall Uniform Pressure is a measure of the average load the aerial platform imparts on the whole surface directly underneath it. The structure of the operating surface (beams, etc.) must be able to withstand more than the indicated values above.

NOTE:

The LCP or **OUP** that an individual surface can withstand varies from structure to structure and is generally determined by the engineer or architect for that particular structure.

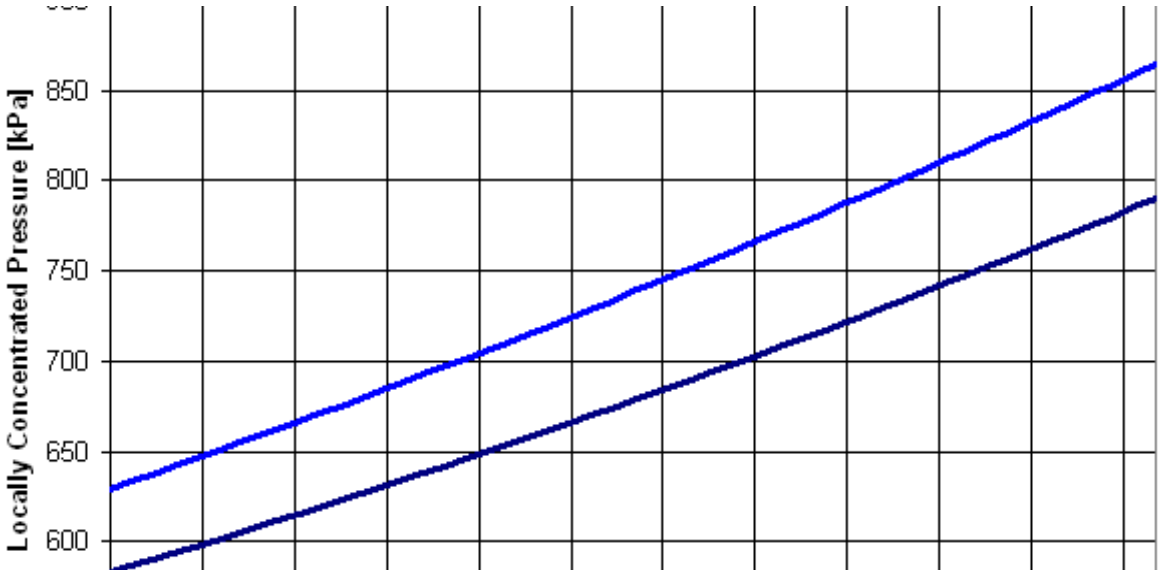

Table 2.4b Floor Loading Pressure - ANSI/CSA

MODEL		Total Aerial Platform Weight		Total Aerial Platform Load			
				Wheel		OUP**	
		lb.	kg	lb.	kg	psf	kPa (kN/m^2)
SJ12	min*	1720	780	430	195	150	7.3
	max*	2220	1007	880	402	195	9.4

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* **min** - Aerial platform weight with no options

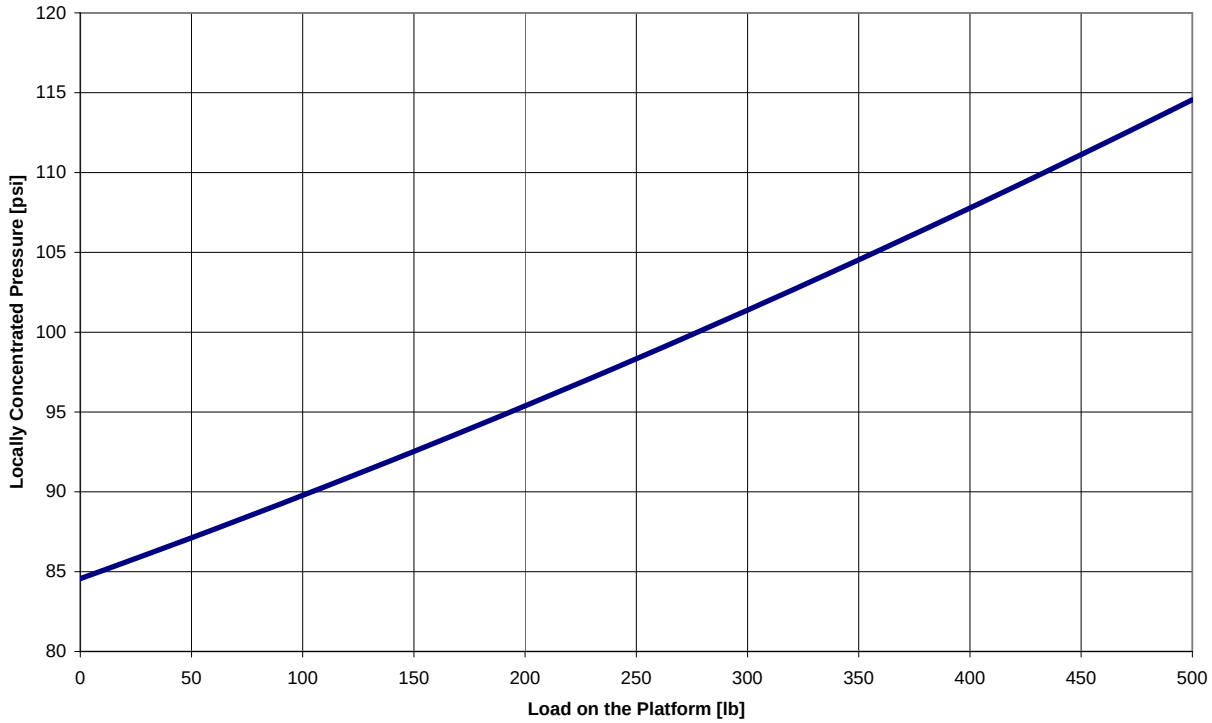
max - Aerial platform weight + all options + full capacity

** **LCP - Locally Concentrated Pressure** is a measure of how hard the aerial platform presses on the areas in direct contact with the floor. The floor covering (tile, carpet, etc.) must be able to withstand more that the indicated values above.

OUP - Overall Uniform Pressure is a measure of the average load the aerial platform imparts on the whole surface directly underneath it. The structure of the operating surface (beams, etc.) must be able to withstand more than the indicated values above.

NOTE:

The LCP or **OUP** that an individual surface can withstand varies from structure to structure and is generally determined by the engineer or architect for that particular structure.



Floor Loading Pressure

Locally Concentrated Pressure (LCP):

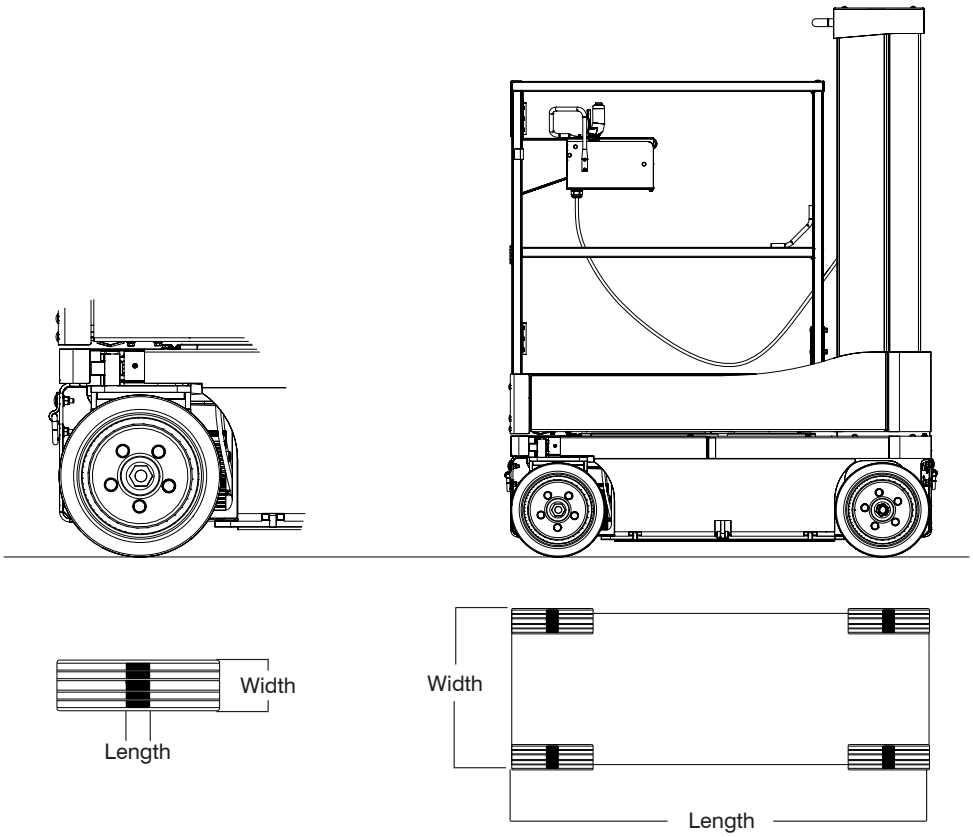
Foot Print Area = Length x Width

$$LCP = 0.4\ X\ \frac{\text{Weight of Aerial Platform + Capacity}}{\text{Foot Print Area}}$$

Overall Uniform Pressure (OUP):

Base Area = Length x Width

$$OUP = \frac{\text{Weight of Aerial Platform + Capacity}}{\text{Base Area}}$$



WARNING

Intermixing tires of different types or using tires of types other than those originally supplied with this equipment can adversely affect stability. Therefore, replace tires only with the exact original Skyjack-approved type. Failure to operate with matched approved tires in good condition may result in death or serious injury.

Table 2.5 Torque Specifications

Location	Description	Torque (ft-lb)	Torque (Nm)
Base			
Wheel Mount	BOLT, Wheel (.5"-20 x 1 9/16")	90	122
Power Pack Mount	BOLT, Hex head (3/8”-16 x 5/8”, Grade 5)	85	115
Hydraulic Motor	Wheel Nut	280	380
Hydraulic Motor Mount	BOLT, Hex head (1/2”-13 x 2.75”, Grade 5)	85	115
Wheel Brake	Wheel Nut	175	237
Wheel Brake Mount	BOLT, Hex head (1/2”-13 x 4”, Grade 5)	85	115
Mast			
Double-Roller Assy Mount (Mast 2)	SCREW, Socket head cap (1/4"-20 x 3/4", zinc)	100	136
Chain Mount Assy-Single (Mast 2)	SCREW, Socket head cap (zinc, 1/4”-20 x 7/8”)	200	271
Single-Roller Assy (Mast 3)	SCREW, Socket head cap (#10-24 x 3/4”)	79	107
Single-Roller Assy Mount (Mast 3)	SCREW, Button head cap (ZN, 1/4”-20 x 3/4”)	100	136
Chain Mount Assy-Double (Mast 3)	SCREW, Socket head cap (zinc, 1/4”-20 x 7/8”)	200	271
Spacer Plate (Mast 4)	BOLT, Hex head (3/8"-16 x 1.25", Grade 8)	35	47

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Section 3
SYSTEM COMPONENT IDENTIFICATION AND SCHEMATICS

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Charts

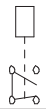
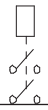
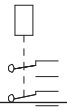
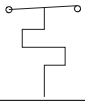
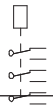
Parts List

Diagrams and Schematics

3.1 Hydraulic Symbol Chart

LINE CROSSING	VARIABLE DISPLACEMENT PUMP	SHUTTLE VALVE	VELOCITY FUSE
LINE JOINED	HAND PUMP	ACCUMULATOR, GAS CHARGED	SINGLE ACTING CYLINDER
HYDRAULIC TANK	RELIEF VALVE	CUSHION CYLINDER	DOUBLE ACTING CYLINDER
HYDRAULIC FILTER WITH BYPASS	PRESSURE REDUCING VALVE	PRESSURE SWITCH	DOUBLE ACTING DOUBLE RODDED CYLINDER
ELECTRIC MOTOR	FIXED ORIFICE	MOTION CONTROL VALVE	SPRING APPLIED HYDRAULIC RELEASED BRAKE
ENGINE	ADJUSTABLE FLOW CONTROL	FLOW DIVIDER COMBINER	BRAKE CYLINDER
FIXED DISPLACEMENT PUMP	CHECK VALVE	COUNTER BALANCE VALVE	ROTARY ACTUATOR
VARIABLE DISPLACEMENT HYDRAULIC MOTOR	OIL COOLER	VALVE COIL	BI DIRECTIONAL HYDRAULIC MOTOR
SERIES PARALLEL HYDRAULIC MOTOR	TWO POSITION TWO WAY NORMALLY CLOSED VALVE	TWO POSITION THREE WAY VALVE	THREE POSITION FOUR WAY CLOSED CENTER OPEN PORT
TWO POSITION TWO WAY NORMALLY OPEN VALVE	TWO POSITION THREE WAY VALVE	THREE POSITION FOUR WAY CLOSED CENTER CLOSED PORT	
PRESSURE TRANSDUCER	MAIN LINES Solid	PILOT LINES Dashed	
SERVO			

3.2 Electrical Symbol Chart

 CIRCUITS CROSSING NO CONNECTION	 HOURMETER	 KEY SWITCH	 LIMIT SWITCH N.O.
 CIRCUITS CONNECTED	 LIGHT	 FOOT SWITCH	 LIMIT SWITCH N.O. HELD CLOSED
 BATTERY	 HYDRAULIC VALVE COIL	 TOGGLE SWITCH	 LIMIT SWITCH N.C.
 GROUND	 PROPORTIONAL HYDRAULIC VALVE COIL	 PUSH BUTTON	 LIMIT SWITCH N.C. HELD OPEN
 FUSE	 ELECTRIC MOTOR	 ROTARY SWITCH	 SILICON CONTROLLED RECTIFIER
 CIRCUIT BREAKER	 HORN	 LIMIT SWITCH	 PROXIMITY SWITCH
 VOLT METER	 EMERGENCY STOP BUTTON	 CAM OPERATED LIMIT SWITCH	 PNP TRANSISTOR
 CAPACITOR	RESISTOR	 TILT SWITCH	 NPN TRANSISTOR
 POTENTIOMETER	 LEVEL SENSOR	 SINGLE POLE SINGLE THROWN RELAY	 PRESSURE/ VACUUM SWITCH
 SINGLE POLE DOUBLE THROW RELAY	 DOUBLE POLE SINGLE THROW RELAY	 DOUBLE POLE DOUBLE THROW RELAY	 TEMPERATURE SWITCH
 TRIPLE POLE DOUBLE THROW RELAY	 DIODE	 RHEOSTAT	

3.3 Wire Number and Color Code

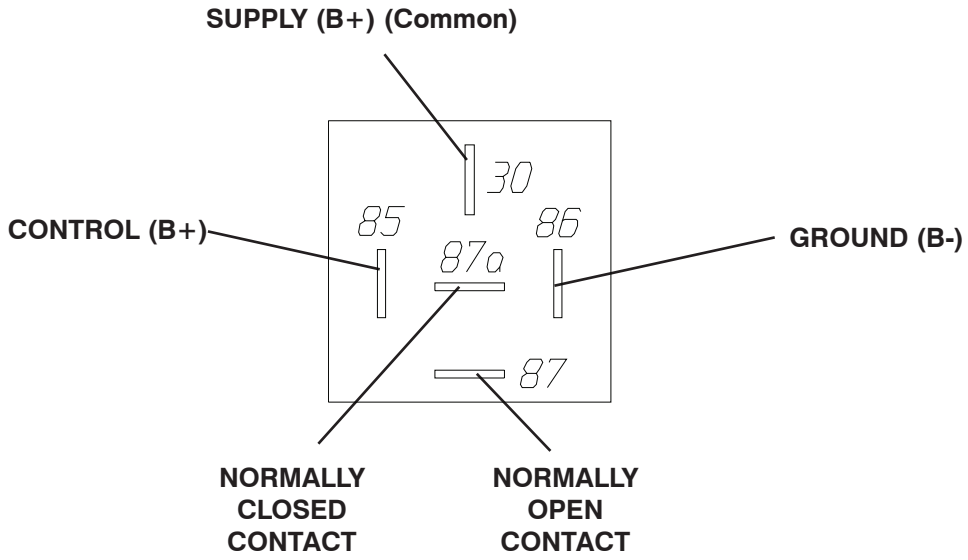
WIRE NO.	WIRE COLOR	WIRE NO.	WIRE COLOR	WIRE NO.	WIRE COLOR	WIRE NO.	WIRE COLOR	WIRE NO.	WIRE COLOR
00	WHT	20	ORG/BLU	44	YEL/WHT	67	ORG/BRN	92	GRN SHLD
000	WHT	21	WHT/RED	45	YEL/ORG	68	GREY	93	BLK SHLD
B1	BLU/PINK	23	BLK/WHT	46	RED/BLK	69	WHT/GRN	95	YEL/GREY
01	PUR/BLK	24	BLU/BLK	47	PUR/ORG	70	ORG/PINK	96	WHT/GREY
02	WHT	25	BRN/BLK	48	YEL/GREY	71	RED/ORG	97	ORG/GREY
03	GRN/PUR	26	BLU/YEL	49	GRN/RED	72	RED/BRN	98	RED SHLD
04	RED/YEL	27	RED/BLK/WHT	50	BRN	73	RED/PINK	98A	BLK SHLD
05	PUR	28	GRN	51	BLK/GRN	74	GRN/ GREY	99	BLK/GREY
06		29	GREY/ORG	52	GRN/BLU	75	GREY/PUR	103	BLK/PUR
07	RED	30	RED/GRN	53	BRN/RED	76	BRN/BLU	104	GRN/ORG
08	PUR/WHT	31	RED/WHT	54	PUR/RED	77	BRN/GREY	105	GRN/BRN
09	YEL	32	GRN/BLK	55	YEL/PUR	78	RED/BLU	106	GRN/PINK
10	BLU/WHT	33	GRN/WHT	56	YEL/BLK	79	BRN/PUR	107	BLK/BLU
11	WHT/ORG	34	ORG/BLK	57	BRN/GRN	80	GREY/ WHT	108	YEL/BRN
12	RED/YEL/ BLK	35	ORG/WHT	58	WHT/PUR	81	GREY/BLK	109	GRN/YEL
13	ORG	36	RED/PUR	59	YEL/BLU	82	BRN/WHT	110A	BLU
14	BLK	37	WHT/RED/ BLK	60	WHT/BLU	83	BLU/GREY	110B	BRN
15	BLU	38	ORG/RED	61	GREY/BRN	84	WHT/BLK/ PUR	111	GREY/GRN
16	WHT/BLK	39	BLK/RED	62	GREY/RED	85	GREY/BLU	112	BLU/ORG
17	BLU/GRN	40	BLU/RED	63	GREY/YEL	86/87	PUR/BLU	113	BLU/BRN
18	GRN/BLU	41	BLU/PUR	64	WHT/BRN	88	BLK/ORG	114	YEL/RED
19	ORG/GRN	42	PINK	65	YEL/PINK	90	RED/GREY	115	WHT/PUR
22	PUR/GRN	43	WHT/YEL	66	ORG/YEL	91	RED SHLD	118	PUR/PINK

This table is to be used as a wire number/color reference for all electrical drawings and schematics. All wire numbers will retain their origional color coding, for example if wire 7 is red, wire 7A, 7B, and 7C will also be red.

3.4 Hydraulic Component Parts List

Index No.	Skyjack Part No.	Qty.	Description
2H-13	151696	1	VALVE, Control (Emergency lowering)
2H-17	102626	1	VALVE, Control (Steer speed)
3H-14A	103623	1	VALVE, Control (Lift)
3H-17	103623	1	VALVE, Control (Brake)
4H-15A	156850	1	VALVE, Control (Reverse drive) (Includes 4H-16A)
4H-16A	-	-	VALVE, Control (Forward drive)
4H-23	113953	1	VALVE, Control (Right steer) (Includes 4H-24)
4H-24	-	-	VALVE, Control (Left steer)
BP1	154839	1	MOTOR, Brake (Right)
BP2	154839	1	MOTOR, Brake (Left)
C1	151690	1	CYLINDER (Steer)
C2	151692	1	CYLINDER (Lift) **(SJ12)**
CB1	147889	1	VALVE, Counterbalance (Main manifold)
EM1	156877	-	MOTOR, Electric
HP1	151678	1	HANDPUMP (Brake)
M1	139412	1	MOTOR, Drive (Right)
M2	139412	1	MOTOR, Drive (Left)
MB1	156959	1	BLOCK, Manifold (Powerpack)
MB2	151457	1	BLOCK, Manifold (Main)
MB3	151456	1	BLOCK, Manifold (Brake)
MB4	156866	1	BLOCK, Manifold (Lift cylinder)
MB5	157372	1	BLOCK, Manifold (Steer speed)
O1	151693	1	ORIFICE (0.035”) (Steering)
O2	108721	1	ORIFICE (0.032”) **(SJ12)**
O3	157389	1	ORIFICE (0.018”) (Steer speed)
P1	156875	1	PUMP
R1	156956	1	VALVE, Relief (System)
R2	151684	1	VALVE, Relief (Lift)
V1	113752	1	VALVE, Reset (Brake)

3.5 Electrical Component Parts List



Index No.	Skyjack Part No.	Qty.	Description
14CR	108589	1	RELAY, 24 Volt 40 Amp (Base control centre - Lift speed)
14CR1	108589	1	RELAY, 24 Volt 40 Amp (Base control centre - Lift speed 2)
15BCR	108589	1	RELAY, 24 Volt 40 Amp (Base control centre - Reverse cutout)
16BCR	108589	1	RELAY, 24 Volt 40 Amp (Base control centre - Forward cutout)
17CR	108589	1	RELAY, 24 Volt 40 Amp (Base control centre - Steer)
21CR	108589	1	RELAY, 24 Volt 40 Amp (Base control centre - High speed)
28CR	108589	1	RELAY, 24 Volt 40 Amp (Base control centre - Tilt)
59ACR	108589	1	RELAY, 24 Volt 40 Amp (Base control centre - Base control)
2H-13	151683	1	COIL, 24 Volt (Emergency lowering valve)
3H-14A	151683	1	COIL, 24 Volt (Lift valve)
3H-17	151683	1	COIL, 24 Volt (Brake valve)
4H-15A	151682	1	COIL, 24 Volt (Reverse drive valve)
4H-16A	151682	1	COIL, 24 Volt (Forward drive valve)
4H-23	151683	1	COIL, 24 Volt (Right steer valve)
4H-24	151683	1	COIL, 24 Volt (Left steer valve)
B1	103480	1	BATTERY, 6V
B2	103480	1	BATTERY, 6V
B3	103480	1	BATTERY, 6V
B4	103480	1	BATTERY, 6V
BC1	122093	1	BATTERY CHARGER INDICATOR (Platform control console)
BP-29	103057	1	BEEPER, 4-28 VDC Slow pulsing (Base control centre)
BP-49	146649	1	HORN, 24V (Low tone)
CB1	117325	1	CIRCUIT BREAKER (15 Amp)
CB2	117325	1	CIRCUIT BREAKER (15 Amp)

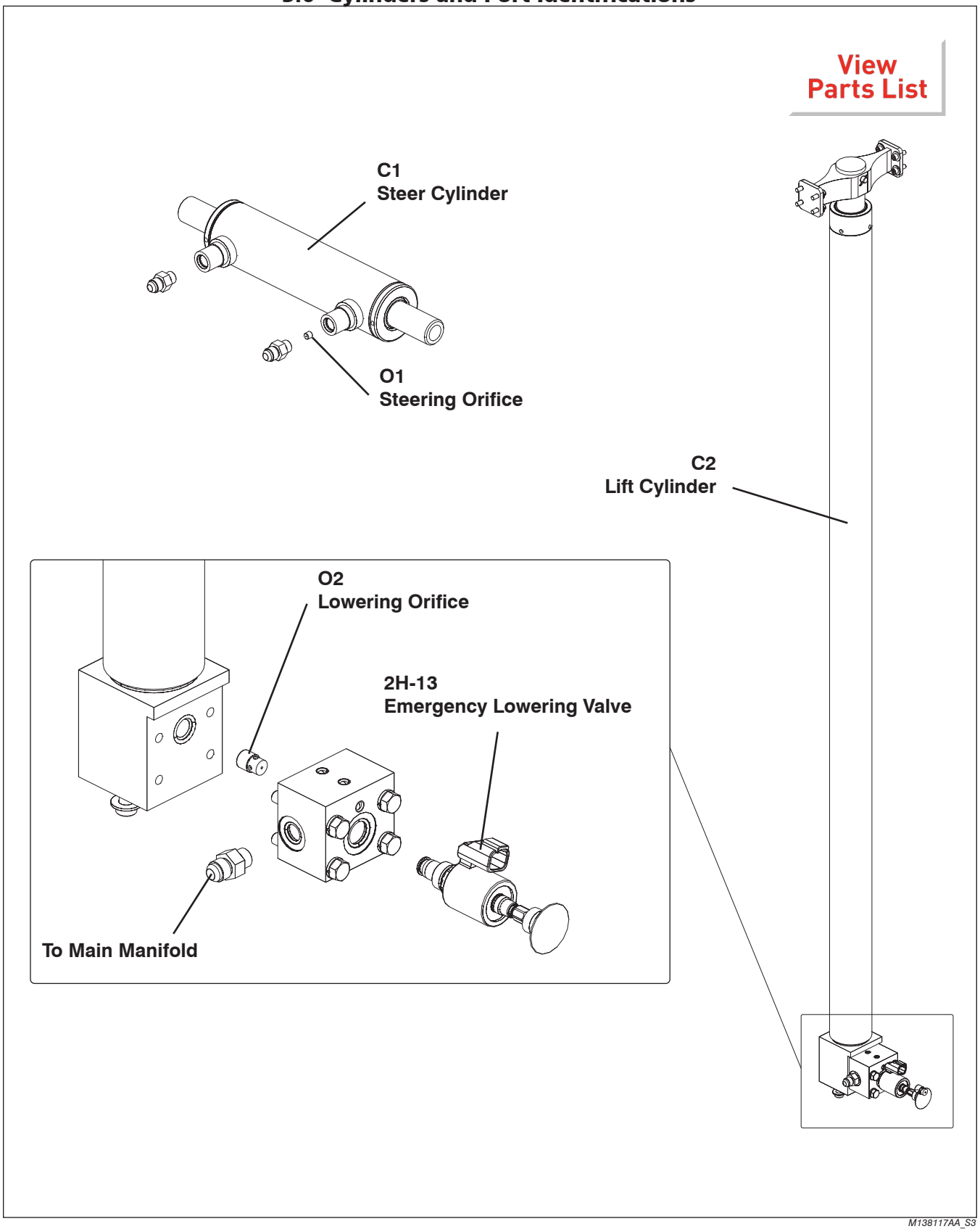
Parts list continued on following page.

3.5 Electrical Component Parts List

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from previous page.
C1	146475	1	CONTACTOR
DCM1	156877	1	MOTOR
F1	310517	1	FUSE (300 Amp)
LED-1	147061	1	POWER INDICATOR LIGHT (Platform control console)
LED-2	147061	1	POWER INDICATOR LIGHT (Base control centre)
LS1	156521	1	LIMIT SWITCH (High speed)
LS2	156520	1	LIMIT SWITCH (Pothole protection)
LS3	156520	1	LIMIT SWITCH (Pothole protection)
LS4	156522	1	LIMIT SWITCH (Service position) (Fixed position)
	156523	1	LIMIT SWITCH (Service position) (Variable position)
LS5	156522	1	LIMIT SWITCH (Drive cutout) **(CE)**
RST1	119629	1	RESISTOR (2.7k ohm) (Platform control console)
RST2	151646	1	RESISTOR (1k ohm, 1 watt) (Base control centre)
RST3	156515	1	RESISTOR (220 ohm, 3/4 watt) (Base control centre)
RST4	151645	1	RESISTOR (4.7k ohm, 1 watt) (Base control centre)
RST5	156527	1	RESISTOR (2k ohm, 2 watt) (Base control centre)
RST6	151643	1	RESISTOR (250 ohm, 1 watt) (Base control centre)
RST7	156564	1	RESISTOR (1.5 ohm, 1 watt) (Base control centre)
RST8	151647	1	RESISTOR (68 ohm, 1 watt) (Base control centre)
S1	119725	1	SWITCH, Main power disconnect
S2	147054	2	N.O. CONTACT, Lift/Drive (Base control centre)
S3	147053	3	N.C. CONTACT, Lift/Drive (Platform control console)
	147054	2	N.O. CONTACT, Lift/Drive (Platform control console)
S4	147053	2	N.C. CONTACT, Emergency stop (Platform control console)
S5	115573	1	SWITCH, Diagnostic
S7	151201	1	CONTROLLER ASSEMBLY
S8	147054	1	N.O. CONTACT, Horn (Platform control console)
S10	147053	2	N.C. CONTACT, Off/Platform/Base (Base control centre)
	147054	1	N.O. CONTACT, Off/Platform/Base (Base control centre)
S28	147053	2	N.C. CONTACT, Emergency stop (Base control centre)
TT1	103336	1	HOUR METER
TS1	156526	1	SWITCH, Tilt **(SJ12)**
	146659	1	SWITCH, Tilt **(CE SJ16)**
	146658	1	SWITCH, Tilt **(ANSI/CSA SJ12)**
TS2	155814	1	SWITCH, Tilt (Single axis) **(SJ12)**
	151207	1	SWITCH, Tilt (Single axis) **(SJ16)**

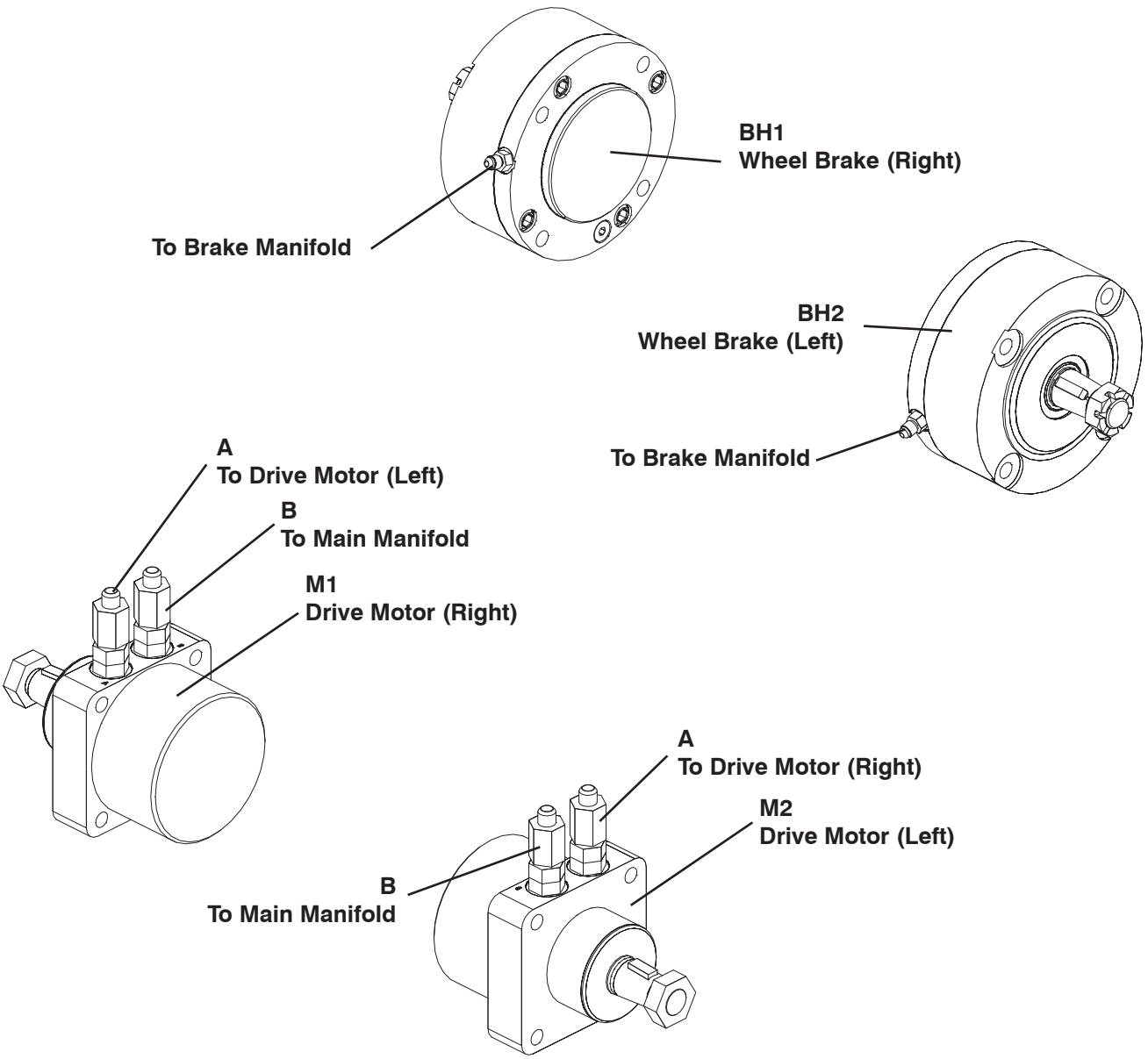
3.6 Cylinders and Port Identifications

View Parts List



3.7 Wheel Brake and Port Identifications

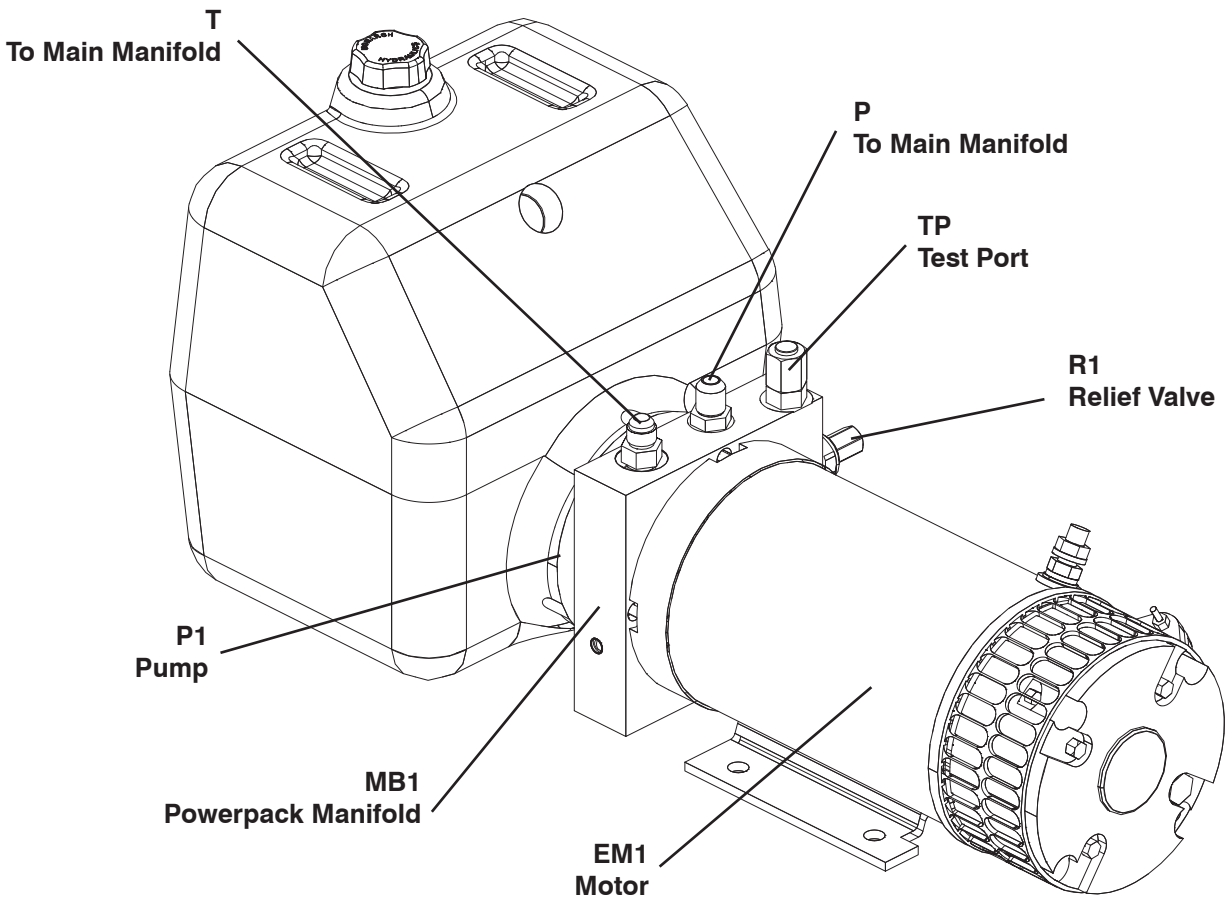
View Parts List



M149106AA_S3

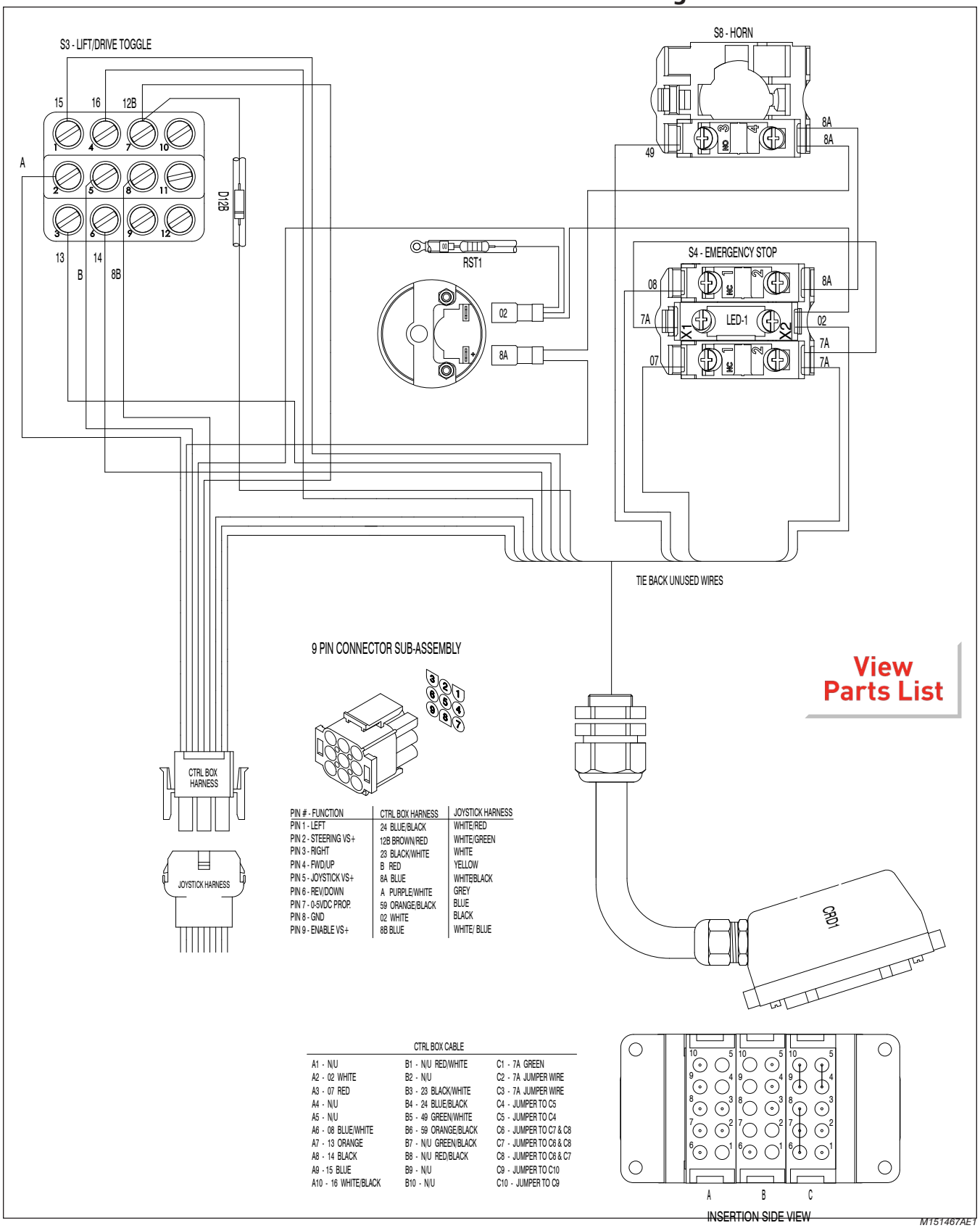
3.8 Powerpack and Port Identifications

View Parts List



M151460AD_s3b

3.9 Platform Control Console Wire Diagram



PIN # - FUNCTION	CTRL BOX HARNESS	JOYSTICK HARNESS
PIN 1 - LEFT	24 BLUE/BLACK	WHITE/RED
PIN 2 - STEERING VS+	12B BROWN/RED	WHITE/GREEN
PIN 3 - RIGHT	23 BLACK/WHITE	WHITE
PIN 4 - FWD/UP	B RED	YELLOW
PIN 5 - JOYSTICK VS+	8A BLUE	WHITE/BLACK
PIN 6 - REV/DOWN	A PURPLE/WHITE	GREY
PIN 7 - 0-5VDC PROP.	59 ORANGE/BLACK	BLUE
PIN 8 - GND	02 WHITE	BLACK
PIN 9 - ENABLE VS+	8B BLUE	WHITE/ BLUE

CTRL BOX CABLE

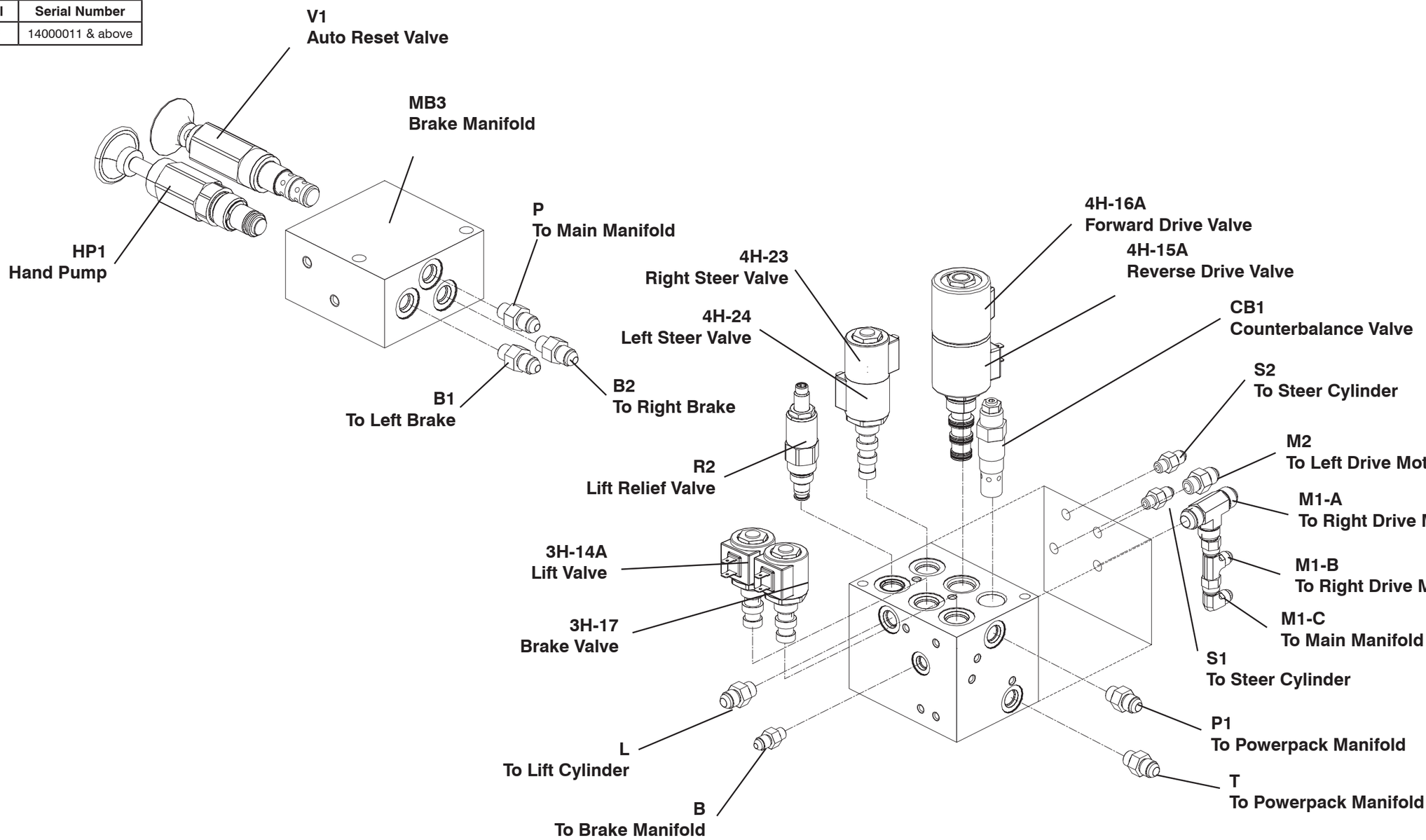
A1 - N/U	B1 - N/U RED/WHITE	C1 - 7A GREEN
A2 - 02 WHITE	B2 - N/U	C2 - 7A JUMPER WIRE
A3 - 07 RED	B3 - 23 BLACK/WHITE	C3 - 7A JUMPER WIRE
A4 - N/U	B4 - 24 BLUE/BLACK	C4 - JUMPER TO C5
A5 - N/U	B5 - 49 GREEN/WHITE	C5 - JUMPER TO C4
A6 - 08 BLUE/WHITE	B6 - 59 ORANGE/BLACK	C6 - JUMPER TO C7 & C8
A7 - 13 ORANGE	B7 - N/U GREEN/BLACK	C7 - JUMPER TO C6 & C8
A8 - 14 BLACK	B8 - N/U RED/BLACK	C8 - JUMPER TO C6 & C7
A9 - 15 BLUE	B9 - N/U	C9 - JUMPER TO C10
A10 - 16 WHITE/BLACK	B10 - N/U	C10 - JUMPER TO C9

INSERTION SIDE VIEW

M151467AE1

3.10a Brake and Main Manifold and Hydraulic Identifications

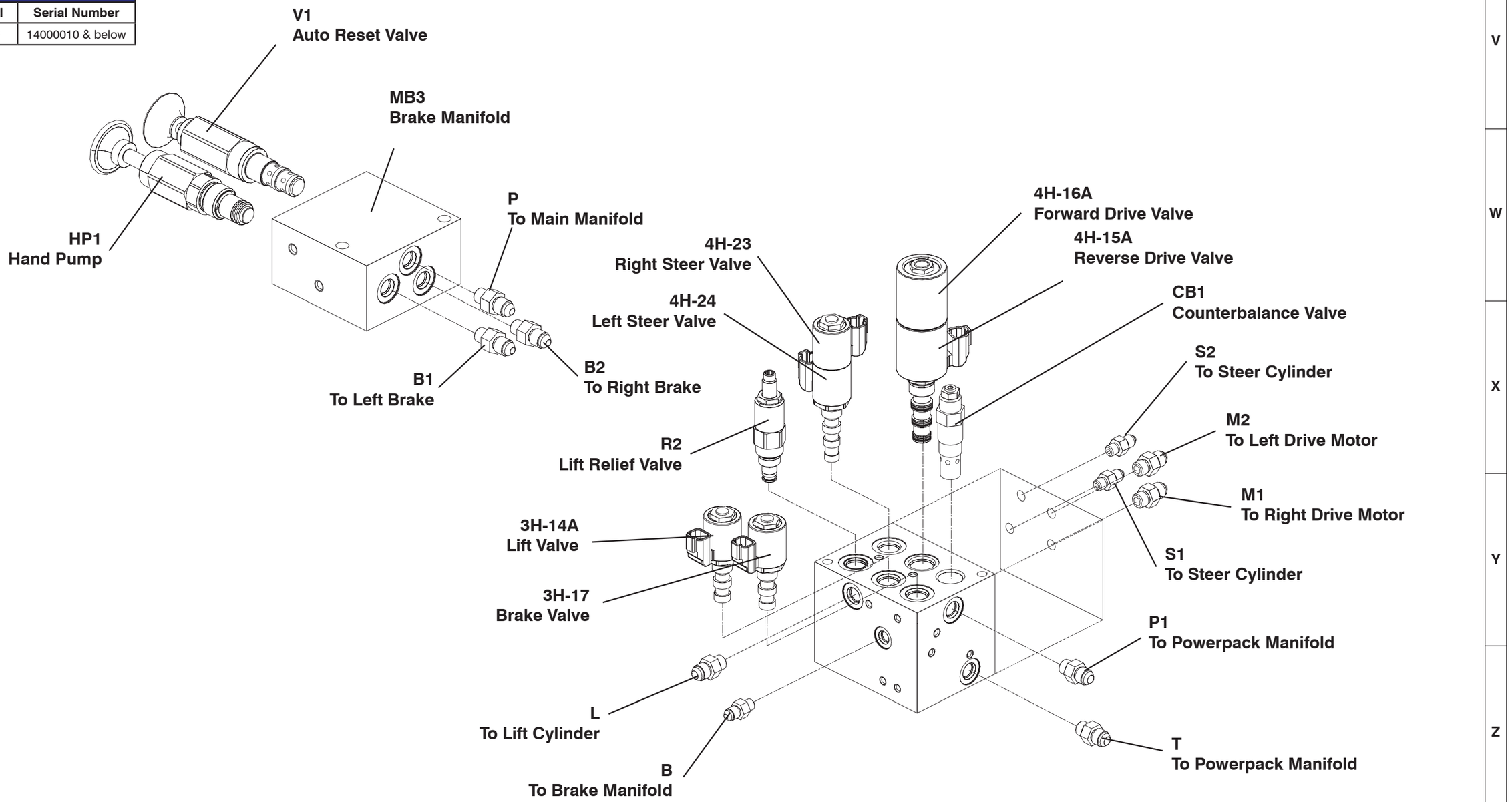
Serial Breakdown Reference Chart	
Model	Serial Number
SJ 12	14000011 & above



M151687AD

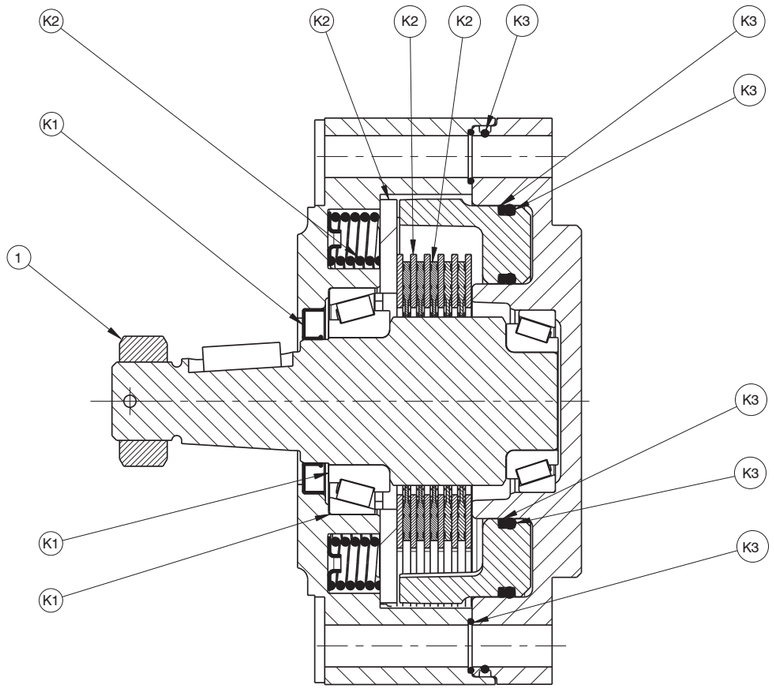
3.10b Brake and Main Manifold and Hydraulic Identifications

Serial Breakdown Reference Chart	
Model	Serial Number
SJ 12	14000010 & below

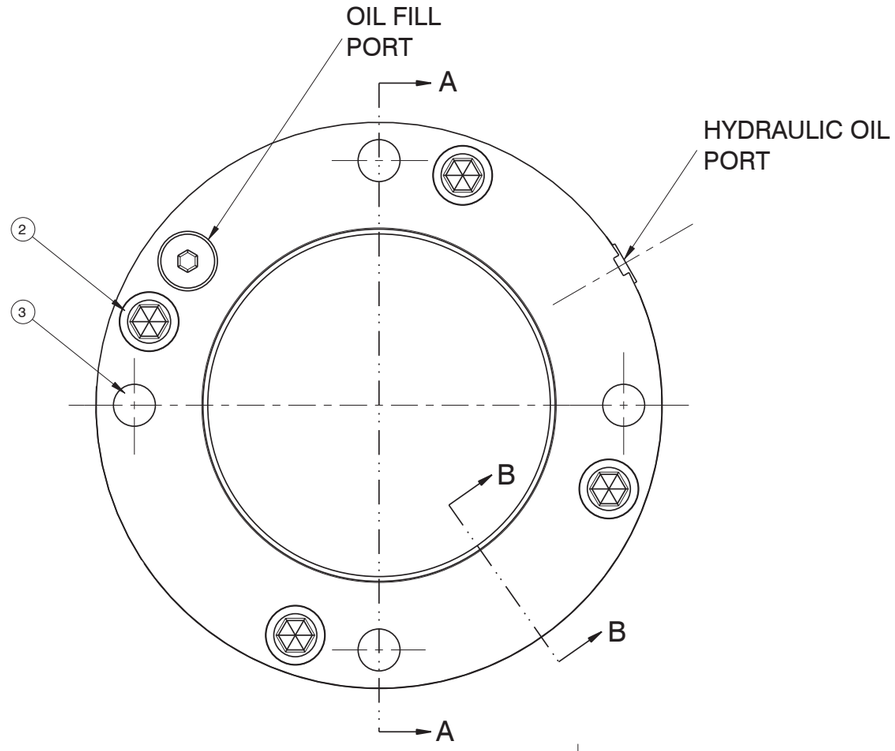


M151459AB

3.11 Disc Brake Kits and Torque Specifications



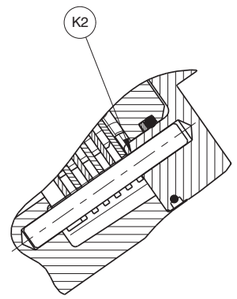
SECTION A-A



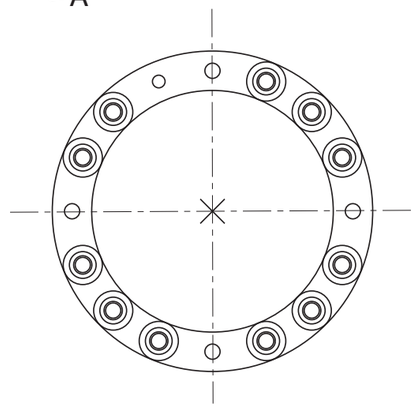
BRAKE KITS
K1 - KIT, BEARING AND SEAL
K2 - KIT, BRAKE STACK
K3 - KIT, O-RING

TORQUE SPECIFICATIONS
1 - TORQUE CASTLE NUT TO 237 Nm
2 - TORQUE BRAKE BOLTS TO 115 Nm
3 - TORQUE MOUNTING BOLTS TO 115 Nm

OIL TYPE
CATERPILLAR T0-4 SAE 30 HYDRAULIC OIL (200 mL)



SECTION B-B

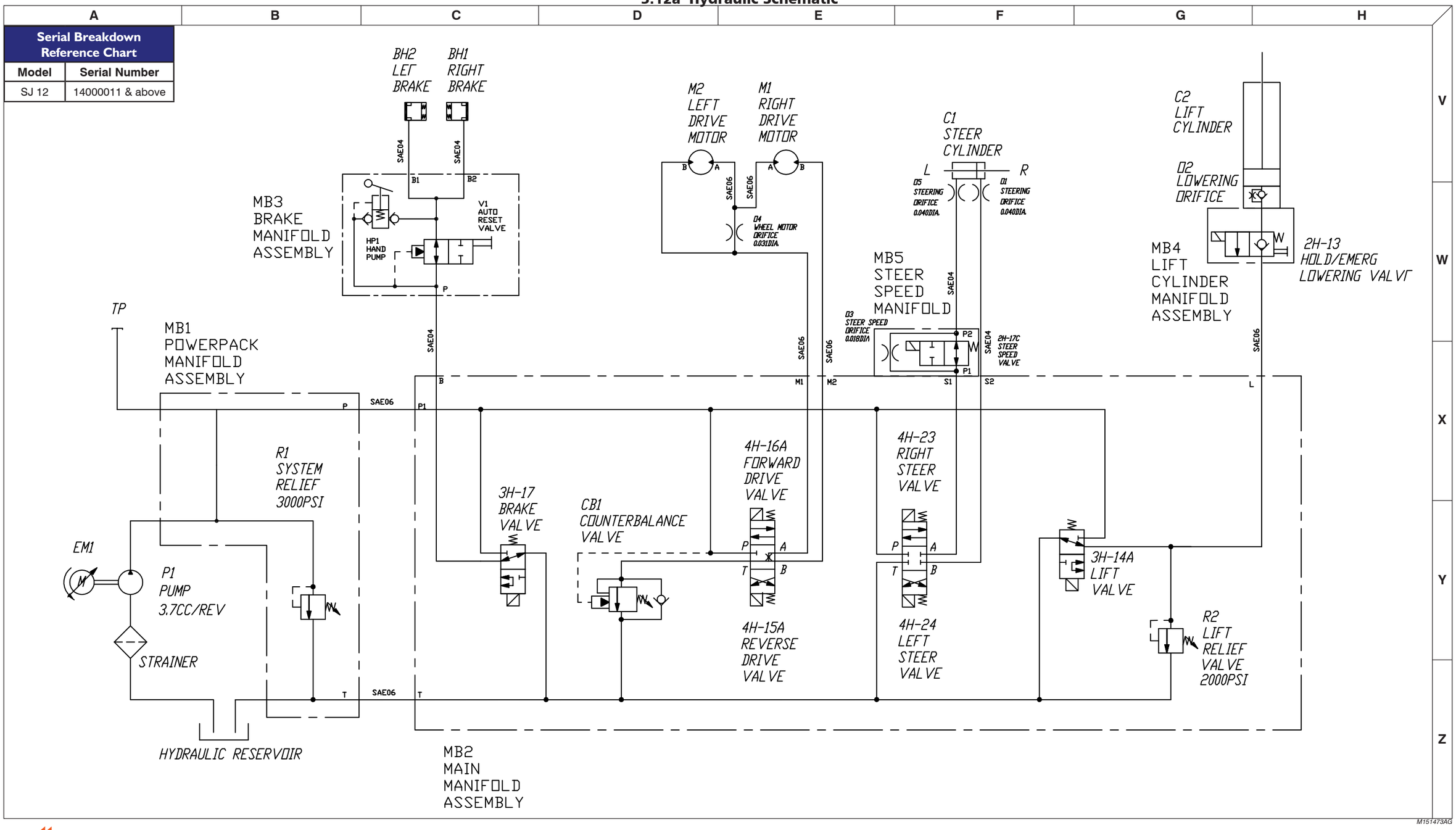


SPRING ARRANGEMENT

M154839AA_S3

3.12a Hydraulic Schematic

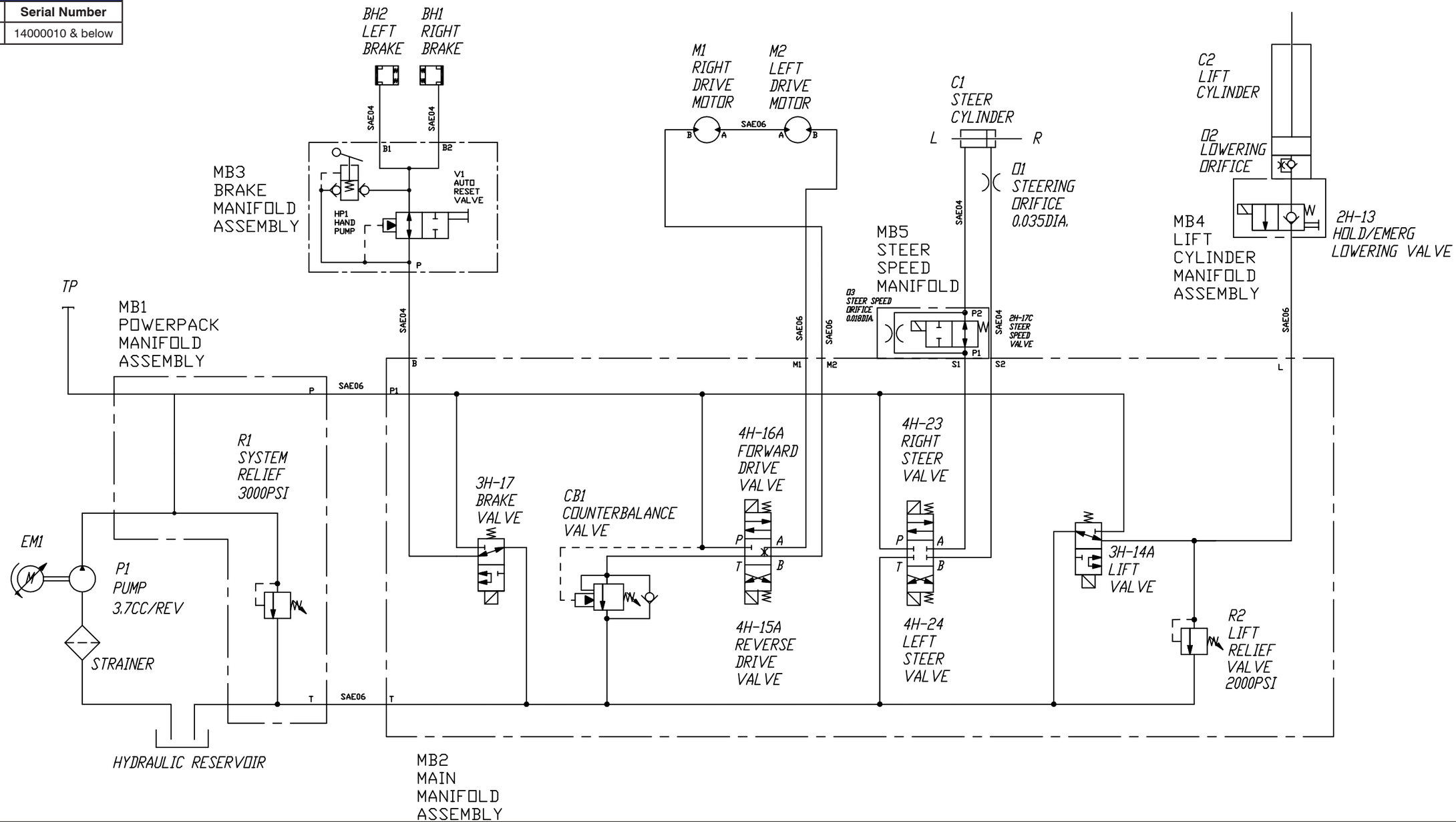
Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ 12	14000011 & above



M151473AG

3.12b Hydraulic Schematic

Serial Breakdown Reference Chart	
Model	Serial Number
SJ 12	14000010 & below



M151473AF

3.13a Main Electrical Harness

Serial Breakdown Reference Chart	
Model	**Serial Number**
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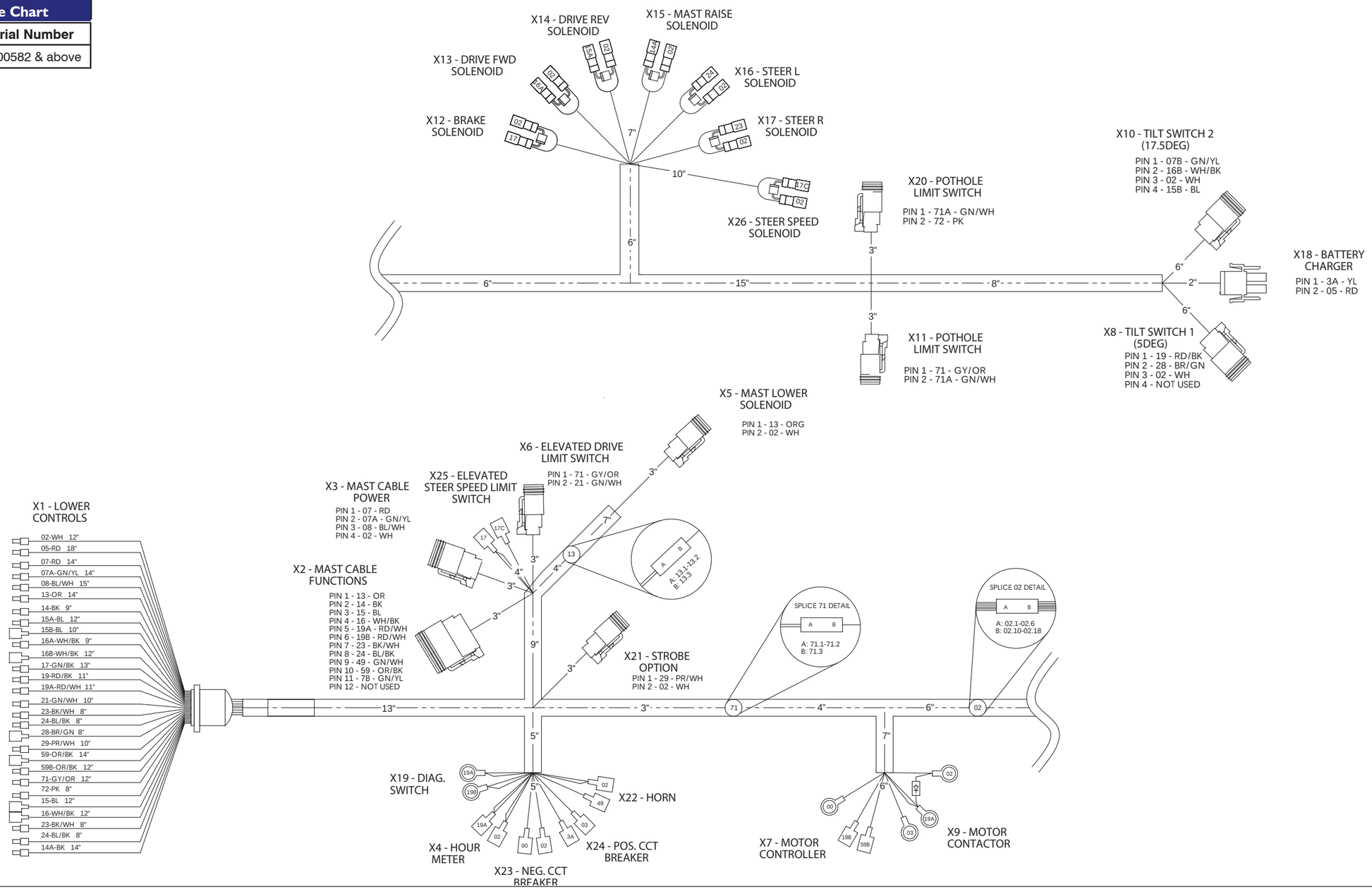
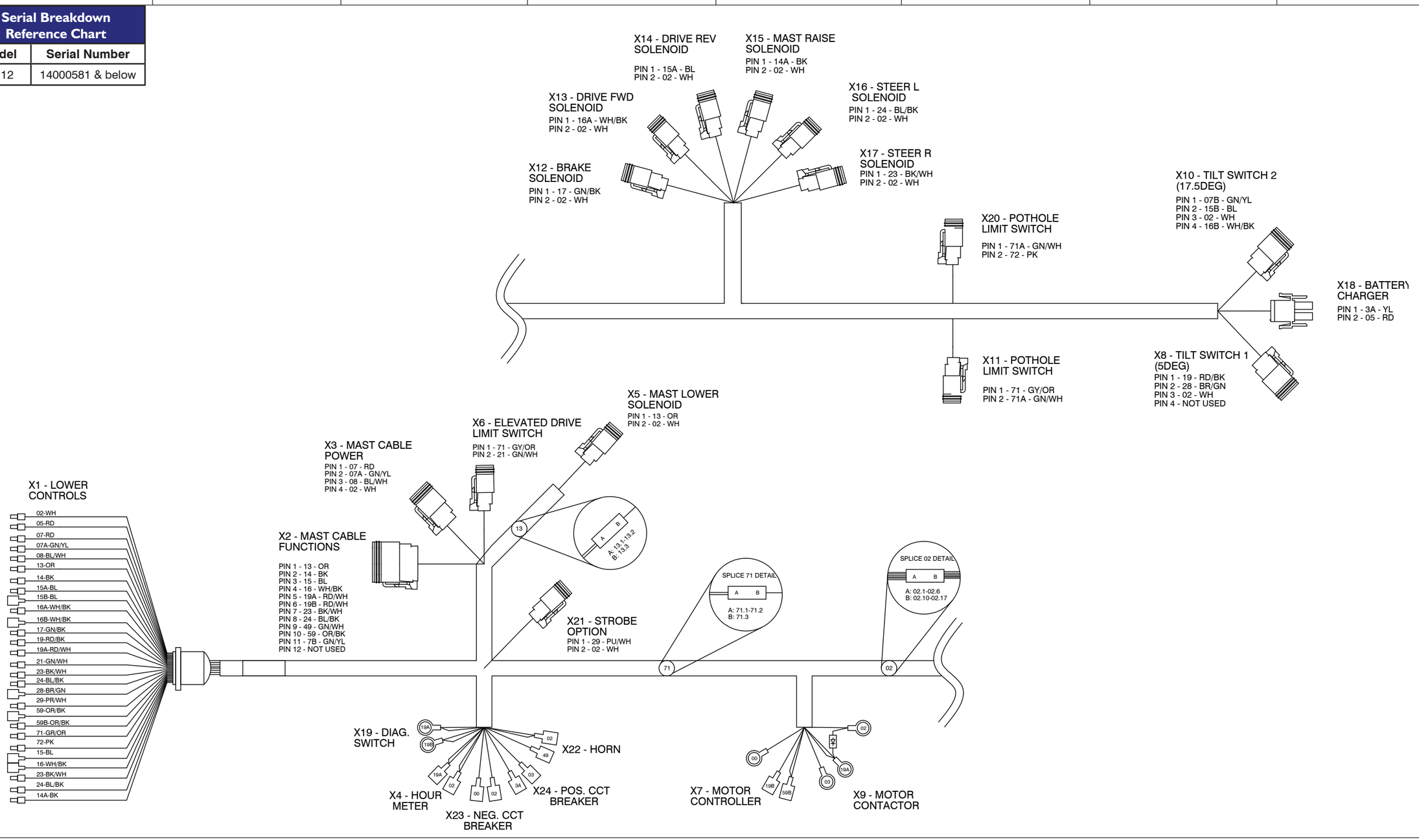


M151470AF

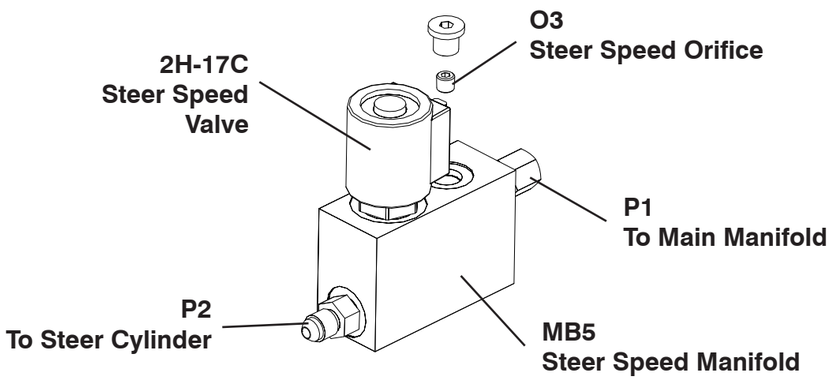
3.13b Main Electrical Harness

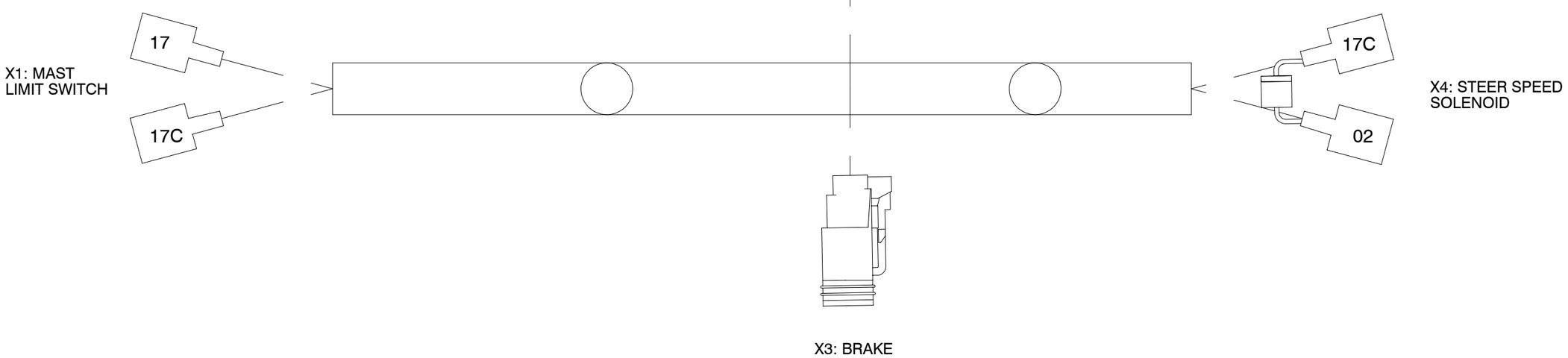
Serial Breakdown Reference Chart	
Model	**Serial Number**
SJ 12	14000581 & below



M151470AF

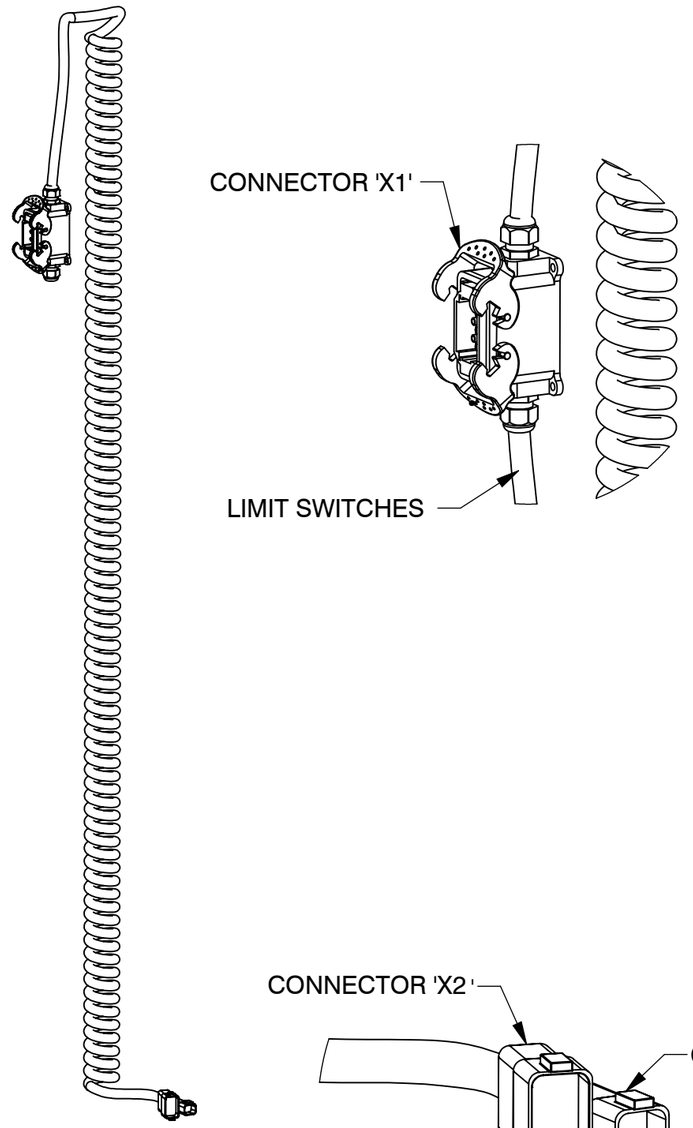
3.14 Steer Speed Valve Port Identification and Harness





M157371AA

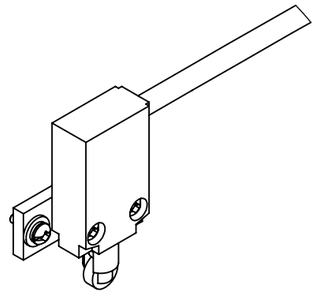
3.15 Mast Control Cable



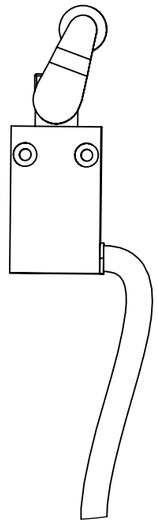
CONNECTION CHART

WIRE	NUMBER	TOP OF MAST CONNECTOR/CAVITY	BOTTOM OF MAST CONNECTOR/CAVITY
BLACK	14	X1/A8	X2/2
WHITE	02	X1/A2	X3/4
GREEN	7A	X1/C1	X3/2
RED	07	X1/A3	X3/1
ORANGE	13	X1/A7	X2/1
BLUE	15	X1/A9	X2/3
WHITE/BLACK	16	X1/A10	X2/4
RED/BLACK	19B	X1/C9	X2/6
GREEN/BLACK	7B	X1/C6	X2/11
ORANGE/BLACK	59	X1/B6	X2/10
BLUE/BLACK	24	X1/B4	X2/8
BLACK/WHITE	23	X1/B3	X2/7
RED/WHITE	19A	X1/C4	X2/5
GREEN/WHITE	49	X1/B5	X2/9
BLUE/WHITE	08	X1/A6	X3/3
WHITE JUMPER*	12A/7B	X1/B1 & C7	N/U
* ANSI/CSA ONLY			

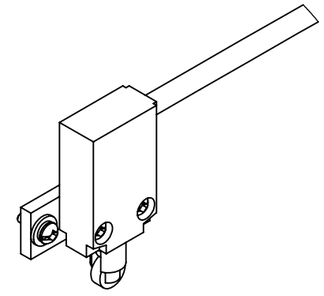
3.16 Limit Switches



LS4 - SERVICE 20” TRANSLATING PLATFORM - ANSI/CSA	
WIRE	CAVITY
BLACK	X1/C5
BLACK/WHITE	X1/C10
BROWN	X1/C3
BLUE	X1/C8
YELLOW/GREEN	NOT USED



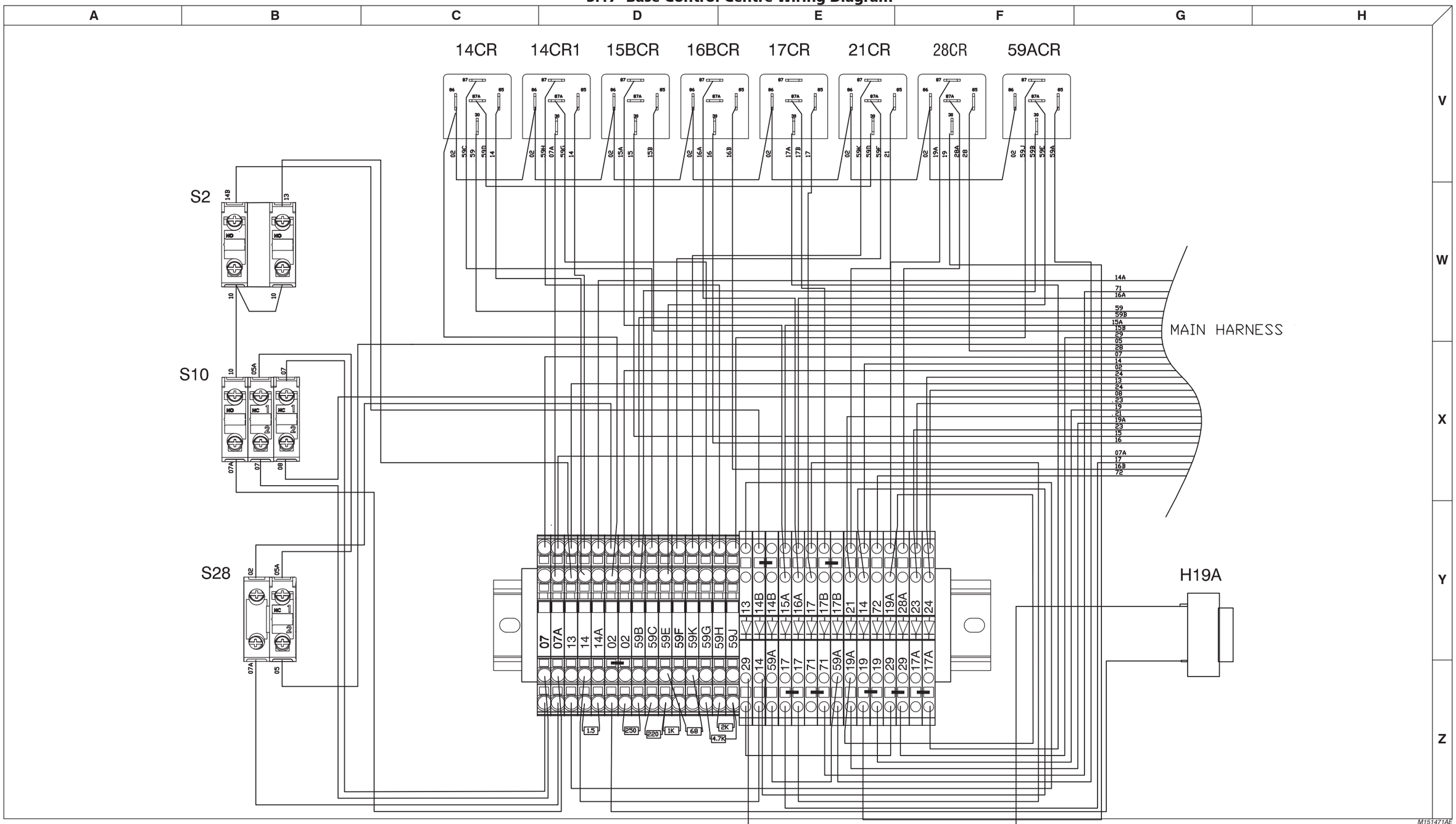
LS1 MAST LIMIT SWITCH		
WIRE	NUMBER	CAVITY
BLACK	71	1
BLACK/WHITE	21	2
BROWN	17	NOT USED
BLUE	17C	NOT USED
YELLOW/GREEN	-	NOT USED



16” TRANSLATING PLATFORM - CE			
LS5 - DRIVE CUTOUT		LS4 - SERVICE	
WIRE	CAVITY	WIRE	CAVITY
BLACK	X1/B1	BLACK	X1/C5
BLACK/WHITE	X1/C7	BLACK/WHITE	X1/C10
BROWN	NOT USED	BROWN	X1/C3
BLUE	NOT USED	BLUE	X1/C8
YELLOW/GREEN	NOT USED	YELLOW/GREEN	NOT USED

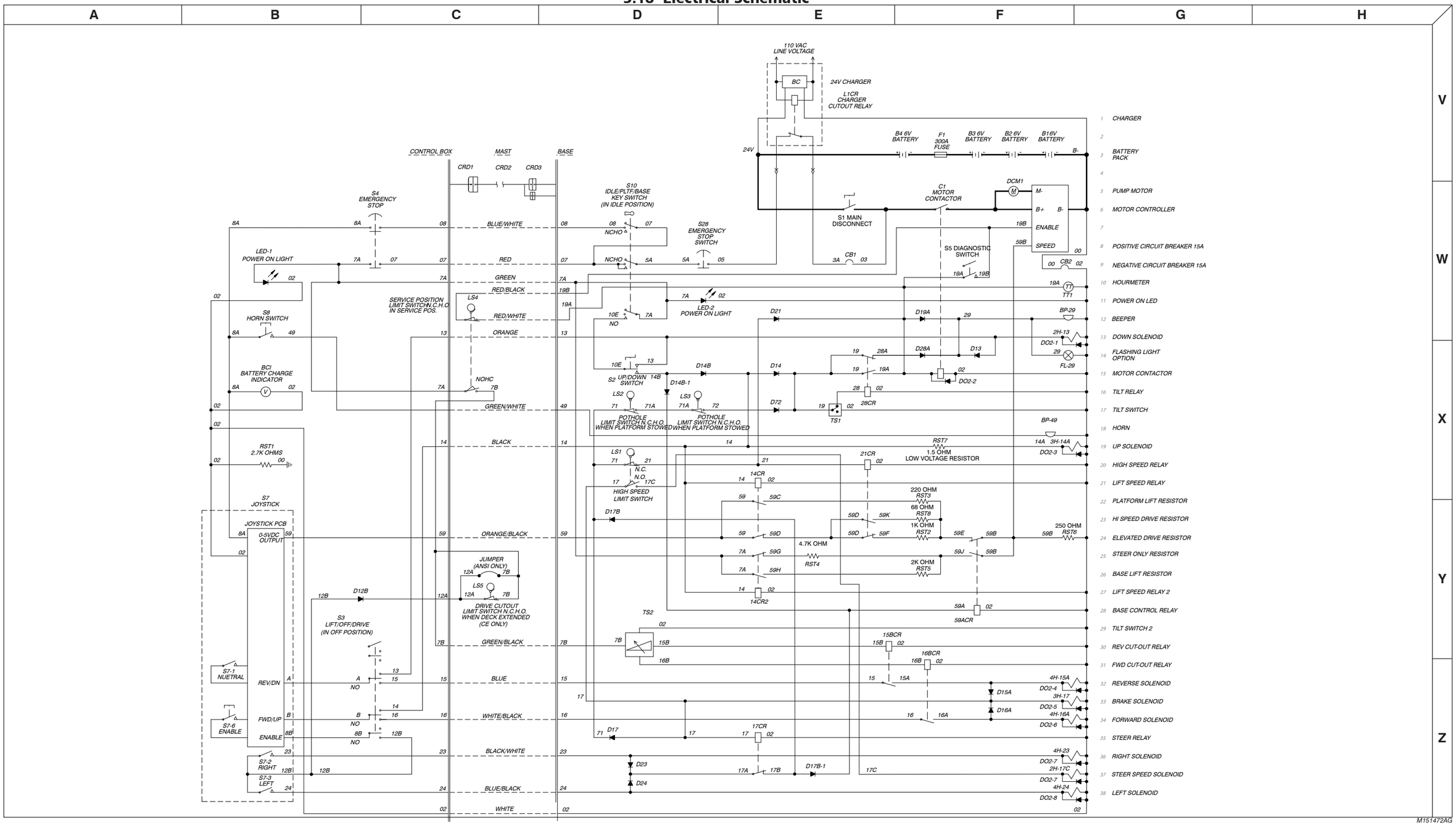
M156521AC_S3

3.17 Base Control Centre Wiring Diagram



M151471AE

3.18 Electrical Schematic



Section 4
TROUBLESHOOTING INFORMATION

Table of Contents

Introduction

The following pages contain a table of Troubleshooting Information for locating and correcting most service trouble which can develop. Careful and accurate analysis of the systems listed in the table of Troubleshooting Information will localize the trouble more quickly than any other method. This manual cannot cover all possible troubles and deficiencies that may occur. If a specific trouble is not listed, isolate the major component in which the trouble occurs, isolate whether the problem is electrical or hydraulic, and then isolate and correct the specific problem.

The content of this section is separated into “probable cause” and “remedy.” The information preceded by a number represents the “probable cause.” The following line, noted by a dash represents the “remedy” to the “probable cause” directly above it. See example below for clarification.

1. Probable Cause
   - Remedy

Electrical System

4.1-1 All Controls Inoperative

1. Battery charger plugged into external power source.
   - Disconnect charger cord.
2. Batteries disconnected.
   - Connect batteries.
3. Dirty or loose battery terminals.
   - Clean and tighten connections.
4. Battery charge low.
   - Check each cell with a hydrometer. Reading should be 1.275 (fully charged). Recharge if low reading. Replace if reading difference between cells is 0.050.
5. Main battery cables open or defective.
   - Check continuity. Replace if defective.
6. Fuse F1 defective.
   - Replace fuse.
7. Main battery disconnect switch S1 open or defective.
   - Close switch. Check continuity. Replace if defective.
8. Loose or broken wire #3 from motor contactor C1 to circuit breaker CB1.
   - Check continuity. Replace if defective.
9. Loose or broken wire #3A from circuit breaker CB1 to charger relay L1CR.
   - Check continuity. Replace if defective.
10. Defective or tripped circuit breaker CB1.
    - Reset circuit breaker. Replace if defective.
11. Defective battery charger relay L1CR.
    - Check relay. Replace if defective.
12. Loose or broken wire #5 from charger relay L1CR to base emergency stop switch S28.
    - Check continuity. Replace if defective.
13. Open or defective base emergency stop switch S28.
    - Close switch. Check switch. Replace if defective.
14. Loose or broken wire #5A from base emergency stop switch S28 to base key switch S10.
    - Check continuity. Replace if defective.
15. Open or defective base key switch S10.
    - Select function with switch. Check switch. Replace if defective.
16. Loose or broken wire #00 from motor controller to circuit breaker CB2.
    - Check continuity. Replace if defective.
17. Defective or tripped circuit breaker CB2.
    - Reset circuit breaker. Replace if defective.
18. Loose or broken wire #02 from circuit breaker CB1 to base terminal block.
    - Check continuity. Replace if defective.

4.1-2 All Controls Except for Down Function Inoperative

1. Loose or broken wire #59B from base terminal block to motor controller.
   - Check continuity. Replace if defective.
2. Loose or broken wire #19A from base terminal block to diagnostic switch S5.
   - Check continuity. Replace if defective.
3. Loose or broken wire #19A from diagnostic switch S5 to mast control cable.
   - Check continuity. Replace if defective.
4. Loose or broken wire #19A in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #5 and platform connector X1 pin #C4 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.

Electrical System (Continued)

5. Loose or broken wire #19A from control box connector pin #C4 to limit switch LS4.
   - Check continuity. Replace if defective.
6. Loose or broken wire #19B from limit switch LS4 to control box connector pin #C4.
   - Check continuity. Replace if defective.
7. Defective limit switch LS4.
   - Check limit switch. Replace if defective.
8. Loose or broken wire #19B in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #6 and platform connector X1 pin #C9 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
9. Loose or broken wire #19B from diagnostic switch S5 to mast control cable.
   - Check continuity. Replace if defective.
10. Loose or broken wire #19B from diagnostic switch S5 to motor controller.
    - Check continuity. Replace if defective.
11. Defective resistor RST6. (With joystick fully stroked)
    - Check resistor and make sure it is secure. Replace if defective.
12. Loose or broken B- cable from batteries to B- lug on motor controller.
    - Check continuity. Replace if defective.
13. Loose or broken B+ cable from main battery disconnect switch S1 to motor contactor C1.
    - Check continuity. Replace if defective.
14. Loose or broken B+ cable from motor contactor C1 to motor DCM1.
    - Check continuity. Replace if defective.
15. Loose or broken B+ cable from motor DCM1 to B+ lug on motor controller.
    - Check continuity. Replace if defective.
16. Loose or broken B- cable from motor DCM1 to M- lug on motor controller.
    - Check continuity. Replace if defective.
17. Defective motor controller.
    - Check motor controller input and output voltage. Replace if defective.
18. Defective motor DCM1.
    - Check motor for operation with 24 volt supply. Replace if defective.

4.1-3 All Controls Inoperative From Base Control Console

1. Loose or broken wire #07A from base terminal block to base key switch S10.
   - Check continuity. Replace if defective.
2. Open or defective base key switch S10.
   - Close switch. Replace if defective.
3. Loose or broken wire #10E from base key switch S10 to base up/down switch S2.
   - Check continuity. Replace if defective.

4.1-4 No Up Function from Base Control Console

1. Defective up/down switch S2.
   - Check switch. Replace if defective.
2. Loose or broken wire #14B from up/down switch S2 to base terminal block.
   - Check continuity. Replace if defective.
3. Open diode D14B-1.
   - Check diode. Replace if defective.
4. Open diode D14B.
   - Check diode. Replace if defective.
5. Loose or broken wire #14 on base terminal block between diode D14B and diode D14.
   - Check continuity. Replace if defective.

Electrical System (Continued)

6. Open diode D14.
   - Check diode. Replace if defective.
7. Loose or broken wire #14 on base terminal block between diode D14B and low voltage protection resistor RST7.
   - Check continuity. Replace if defective.
8. Defective low voltage protection resistor RST7.
   - Check resistor and make sure it is secure. Replace if defective.
9. Loose or broken wire #14A from base terminal block to up valve coil 3H-14A.
   - Check continuity. Replace if defective.
10. Loose or broken wire #02 from base terminal block to up valve coil 3H-14A.
    - Check continuity. Replace if defective.
11. Defective up valve coil 3H-14A.
    - Check continuity through coil. Replace if defective.
12. Machine not level. (Above high speed limit switch)
    - Use on level surface.
13. Loose or broken wire #19 from base terminal block to tilt switch TS1.
    - Check continuity. Replace if defective.
14. Defective tilt switch TS1.
    - Test tilt switch. Replace if defective.
15. Loose or broken wire #28 from tilt switch TS1 to tilt relay 28CR.
    - Check continuity. Replace if defective.
16. Loose or broken wire #02 from tilt switch TS1 to base terminal strip.
    - Check continuity. Replace if defective.
17. Defective tilt relay 28CR.
    - Check relay. Replace if defective.
18. Loose or broken wire #19A from tilt relay 28CR to base terminal block.
    - Check continuity. Replace if defective.
19. Loose or broken wire #19A on base terminal block between diode D19A and diode D21.
    - Check continuity. Replace if defective.
20. Loose or broken wire #19A from base terminal block to pump motor contactor.
    - Check continuity. Replace if defective.
21. Loose or broken wire #59A on base terminal block between diode D14B-1 and diode D17B-1.
    - Check continuity. Replace if defective.
22. Loose or broken wire #59A from base terminal block to base control relay 59ACR.
    - Check continuity. Replace if defective.
23. Loose or broken wire #02 from base terminal block to base control relay 59ACR.
    - Check continuity. Replace if defective.
24. Defective base control relay 59ACR.
    - Check relay. Replace if defective.
25. Loose or broken wire #7A from base terminal block to lift speed relay 14CR1.
    - Check continuity. Replace if defective.
26. Defective base lift resistor RST5.
    - Check resistor and make sure it is secure. Replace if defective.
27. Loose or broken wire #59J from base terminal block to base control relay 59ACR.
    - Check continuity. Replace if defective.

Electrical System (Continued)

4.1-5 Up Function Slow from Base Control Console

1. Loose or broken wire #14 from base terminal block to lift speed relay 14CR1.
   - Check continuity. Replace if defective.
2. Loose or broken wire #02 from base terminal block to lift speed relay 14CR1.
   - Check continuity. Replace if defective.
3. Defective lift speed relay 14CR1.
   - Check relay. Replace if defective.

4.1-6 No Down Function from Base Control Console

1. Defective up/down switch S2.
   - Check switch. Replace if defective.
2. Loose or broken wire #13 from up/down switch S2 to base terminal block.
   - Check continuity. Replace if defective.
3. Loose or broken wire #13 from base terminal block to down valve coil 2H-13.
   - Check continuity. Replace if defective.
4. Loose or broken wire #02 from base terminal block to down valve coil 2H-13.
   - Check continuity. Replace if defective.
5. Defective down valve coil 2H-13.
   - Check continuity through coil. Replace if defective.

4.1-7 All Controls Inoperative From Platform Control Console

1. Loose or broken wire #7 from base key switch S10 to base terminal block.
   - Check continuity. Replace if defective.
2. Loose or broken wire #8 from base terminal block to mast control cable.
   - Check continuity. Replace if defective.
3. Loose or broken wire #8 in mast control cable or its connectors.
   - Check for continuity between base connector X3 pin #3 and platform connector X1 pin #A6 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
4. Loose or broken wire #8 from control box connector pin #A6 to emergency stop switch S4.
   - Check continuity. Replace if defective.
5. Open or defective platform emergency stop switch S4.
   - Close switch. Replace if defective.
6. Loose or broken wire #8A or wire #02 from emergency stop switch S4 to joystick S7.
   - Check continuity. Replace if defective.
7. Defective joystick enable switch S7-6.
   - Check switch. Replace if defective.
8. Defective joystick neutral switch S7-1.
   - Check switch. Replace if defective.
9. Defective joystick S7.
   - Check joystick. Replace if defective.

4.1-8 No Up Function from Platform Control Console

1. Loose or broken wire “B” from proportional controller S7 to lift/off/drive switch S3.
   - Check continuity. Replace if defective.
2. Lift/Off/Drive switch S3 defective.
   - Check switch. Replace if defective.
3. Defective joystick S7.
   - Check joystick. Replace if defective.

Electrical System (Continued)

4. Loose or broken wire #14 from lift/off/drive switch S3 to control box connector pin #A8.
   - Check continuity. Replace if defective.
5. Loose or broken wire #14 in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #2 and platform connector X1 pin #A8 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
6. Loose or broken wire #14 from base terminal block to mast control cable.
   - Check continuity. Replace if defective.
7. Loose or broken wire #14 on base terminal block between diode D14B and diode D14.
   - Check continuity. Replace if defective.
8. Open diode D14.
   - Check diode. Replace if defective.
9. Loose or broken wire #14 on base terminal block between diode D14B and low voltage protection resistor RST7.
   - Check continuity. Replace if defective.
10. Defective low voltage protection resistor RST7.
    - Check resistor and make sure it is secure. Replace if defective.
11. Loose or broken wire #14A from base terminal block to up valve coil 3H-14A.
    - Check continuity. Replace if defective.
12. Loose or broken wire #02 from base terminal block to up valve coil 3H-14A.
    - Check continuity. Replace if defective.
13. Defective up valve coil 3H-14A.
    - Check continuity through coil. Replace if defective.
14. Machine not level. (Above high speed limit switch)
    - Use on level surface.
15. Loose or broken wire #19 from base terminal block to tilt switch TS1.
    - Check continuity. Replace if defective.
16. Defective tilt switch TS1.
    - Test tilt switch. Replace if defective.
17. Loose or broken wire #28 from tilt switch TS1 to tilt relay 28CR.
    - Check continuity. Replace if defective.
18. Loose or broken wire #02 from tilt switch TS1 to base terminal strip.
    - Check continuity. Replace if defective.
19. Defective tilt relay 28CR.
    - Check relay. Replace if defective.
20. Loose or broken wire #19A from tilt relay 28CR to base terminal block.
    - Check continuity. Replace if defective.
21. Loose or broken wire #19A on base terminal block between diode D19A and diode D21.
    - Check continuity. Replace if defective.
22. Loose or broken wire #19A from base terminal block to pump motor contactor.
    - Check continuity. Replace if defective.
23. Defective platform lift resistor RST3.
    - Check resistor and make sure it is secure. Replace if defective.
24. Loose or broken wire #59C from base terminal block to lift speed relay 14CR.
    - Check continuity. Replace if defective.

Electrical System (Continued)

4.1-9 Up Function Slow from Platform Control Console

1. Loose or broken wire #14 from base terminal block to lift speed relay 14CR.
   - Check continuity. Replace if defective.
2. Loose or broken wire #02 from base terminal block to lift speed relay 14CR.
   - Check continuity. Replace if defective.
3. Defective lift speed relay 14CR.
   - Check relay. Replace if defective.

4.1-10 No Down Function from Platform Control Console

NOTE

Down function is not proportionally controlled.

1. Loose or broken wire “A” from proportional controller S7 to lift/off/drive switch S3.
   - Check continuity. Replace if defective.
2. Lift/Off/Drive switch S3 defective.
   - Check switch. Replace if defective.
3. Defective joystick S7.
   - Check joystick. Replace if defective.
4. Loose or broken wire #13 from lift/off/drive switch S3 to control box connector pin #A7.
   - Check continuity. Replace if defective.
5. Loose or broken wire #13 in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #1 and platform connector X1 pin #A7 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
6. Loose or broken wire #13 from base terminal block to mast control cable.
   - Check continuity. Replace if defective.
7. Loose or broken wire #13 from base terminal block to down valve coil 2H-13.
   - Check continuity. Replace if defective.
8. Loose or broken wire #02 from base terminal block to down valve coil 2H-13.
   - Check continuity. Replace if defective.
9. Defective down valve coil 2H-13.
   - Check continuity through coil. Replace if defective.

4.1-11 Steer Only Inoperative

1. Loose or broken wire #8B from proportional controller S7 to lift/off/drive switch S3.
   - Check continuity. Replace if defective.
2. Lift/Off/Drive switch S3 defective.
   - Check switch. Replace if defective.
3. Loose or broken wire #12B from steer switches S7-2 and S7-3 to lift/off/drive switch S3.
   - Check continuity. Replace if defective.
4. Loose or broken wire #17A from diodes D23 and D24 to base terminal block.
   - Check continuity. Replace if defective.
5. Defective relay 17CR.
   - Check relay. Replace if defective.
6. Loose or broken wire #17B from relay 17CR to base terminal block.
   - Check continuity. Replace if defective.
7. Open diode D17B-1.
   - Check diode. Replace if defective.

Electrical System (Continued)

8. Open diode D17B.
   - Check diode. Replace if defective.
9. Defective lift speed relay 14CR1.
   - Check relay. Replace if defective.
10. Loose or broken wire #59G from 14CR1 lift speed relay to base terminal block.
    - Check continuity. Replace if defective.
11. Defective steer only resistor RST4.
    - Check resistor and make sure it is secure. Replace if defective.

4.1-12 Right Steer Inoperative

1. Loose or broken wire #23 from right steer switch S7-2 to control box connector pin #B3.
   - Check continuity. Replace if defective.
2. Loose or broken wire #23 in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #7 and platform connector X1 pin #B3 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
3. Loose or broken wire #23 from base terminal block to mast control cable.
   - Check continuity. Replace if defective.
4. Open diode D23.
   - Check diode. Replace if defective.
5. Loose or broken wire #23 from base terminal block to right steer valve coil 4H-23.
   - Check continuity. Replace if defective.
6. Loose or broken wire #02 from base terminal block to right steer valve coil 4H-23.
   - Check continuity. Replace if defective.
7. Defective right steer valve coil 4H-23.
   - Check continuity through coil. Replace if defective.

4.1-13 Left Steer Inoperative

1. Loose or broken wire #24 from left steer switch S7-3 to control box connector pin #B4.
   - Check continuity. Replace if defective.
2. Loose or broken wire #24 in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #8 and platform connector X1 pin #B4 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
3. Loose or broken wire #24 from base terminal block to mast control cable.
   - Check continuity. Replace if defective.
4. Open diode D24.
   - Check diode. Replace if defective.
5. Loose or broken wire #24 from base terminal block to left steer valve coil 4H-24.
   - Check continuity. Replace if defective.
6. Loose or broken wire #02 from base terminal block to left steer valve coil 4H-24.
   - Check continuity. Replace if defective.
7. Defective left steer valve coil 4H-24.
   - Check continuity through coil. Replace if defective.

Electrical System (Continued)

4.1-14 No Drive Forward or Reverse

1. Defective joystick S7.
   - Check joystick. Replace if defective.
2. Loose or broken wire #7A from emergency stop switch S4 to control box connector pin #C1.
   - Check continuity. Replace if defective.
3. Open or loose diode D12B.
   - Check diode. Replace if defective.
4. Loose or broken wire #12A from diode D12B to control box connector pin #B1.
   - Check continuity. Replace if defective.
5. Loose or broken jumper wire from #12A pin #B1 to #7B pin #C7 at mast connector X1. (ANSI/CSA only)
   - Check continuity. Replace if defective.
6. Loose or broken wire #12A from mast connector X1 pin #B1 to drive cutout limit switch LS5. (CE only)
   - Check continuity. Replace if defective.
7. Drive cutout limit switch LS5 defective or out of adjustment. (CE only)
   - Check switch for adjustment. Replace if defective.
8. Loose or broken wire #7B from drive cutout limit switch LS5 to mast connector X1 pin #C7. (CE only)
   - Check continuity. Replace if defective.
9. Loose or broken wire #7B in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #11 and platform connector X1 pin #C6 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
10. Loose or broken wire #7B from mast control cable to tilt switch TS2.
    - Check continuity. Replace if defective.
11. Loose or broken wire #02 from base terminal block to tilt switch TS2.
    - Check continuity. Replace if defective.
12. Tilt switch TS2 defective or out of adjustment.
    - Adjust the set up of the tilt switch using section 5 of this manual. Replace if defective.
13. Loose or broken wire #17 from diodes D16A and D15A to base terminal block.
    - Check continuity. Replace if defective.
14. Open diode D17.
    - Check diode. Replace if defective.

4.1-15 Brake will not Release

1. Diode D16A forward or D15A reverse is shorted or open.
   - Check diode. Replace if defective.
2. Loose or broken wire #17 from base terminal block to brake valve coil 3H-17.
   - Check continuity. Replace if defective.
3. Brake valve coil 3H-17 defective.
   - Check continuity through coil. Replace if defective.
4. Loose or broken wire #02 from brake valve coil 3H-17 to base terminal block.
   - Check continuity. Replace if defective.

4.1-16 No Elevated Drive

1. Pothole protection bars not fully lowered.
   - Clear obstructions. Repair as needed.
2. Loose or broken wire #71 from base wire harness to pothole protection limit switch LS2.
   - Check continuity. Replace if defective.

Electrical System (Continued)

3. Defective pothole protection limit switch LS2.
   - Check switch. Replace if defective.
4. Loose or broken wire #71A from pothole protection limit switch LS2 to pothole protection limit switch LS3.
   - Check continuity. Replace if defective.
5. Defective pothole protection limit switch LS3.
   - Check switch. Replace if defective.
6. Loose or broken wire #72 from pothole protection limit switch LS3 to base terminal block.
   - Check continuity. Replace if defective.
7. Open diode D72.
   - Check diode. Replace if defective.
8. Loose or broken wire #59F from base terminal block to relay21CR.
   - Check continuity. Replace if defective.
9. Defective relay 21CR.
   - Check relay. Replace if defective.
10. Defective elevated drive resistor RST2.
    - Check resistor and make sure it is secure. Replace if defective.

4.1-17 Work Platform Drives in Slow Speed Only

1. Loose or broken wire #71 from base wire harness to high speed limit switch LS1.
   - Check continuity. Replace if defective.
2. Open or defective high speed limit switch LS1.
   - Check switch. Replace if defective.
3. Loose or broken wire #21 from high speed limit switch LS1 to base terminal block.
   - Check continuity. Replace if defective.
4. Loose or broken wire #21 from base terminal block to high speed relay 21CR.
   - Check continuity. Replace if defective.
5. High speed relay 21CR defective.
   - Check relay, replace if defective.
6. Loose or broken wire #02 from high speed relay 21CR to base terminal block.
   - Check continuity. Replace if defective.
7. Loose or broken wire #59K from base terminal block to high speed relay 21CR.
   - Check continuity. Replace if defective.
8. Defective high speed drive resistor RST1.
   - Check resistor and make sure it is secure. Replace if defective.

4.1-18 Forward Drive Function Inoperative

1. Loose or broken wire #16 from Lift/Off/Drive switch S3 to control box connector pin #A10.
   - Check continuity. Replace if defective.
2. Loose or broken wire #16 in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #4 and platform connector X1 pin #A10 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
3. Loose or broken wire #16 from mast control cable to relay 16BCR.
   - Check continuity. Replace if defective.
4. Loose or broken wire #16B from tilt switch TS2 to relay 16BCR.
   - Check continuity. Replace if defective.
5. Loose or broken wire #02 from base terminal block to relay 16BCR.
   - Check continuity. Replace if defective.

Electrical System (Continued)

6. Forward drive relay 16BCR defective.
   - Check relay, replace if defective.
7. Loose or broken wire #16A from relay 16BCR to base terminal block.
   - Check continuity. Replace if defective.
8. Loose or broken wire #16A from base terminal block to forward drive valve coil 4H-16A.
   - Check continuity. Replace if defective.
9. Loose or broken wire #02 from forward drive valve coil 4H-16A to base terminal block.
   - Check continuity. Replace if defective.
10. Forward drive valve coil 4H-16A defective.
    - Check continuity through coil. Replace if defective.
11. Open diode D16A.
    - Check diode. Replace if defective.
12. Tilt switch TS2 defective or out of adjustment.
    - Adjust the set up of the tilt switch using section 5 of this manual. Replace if defective.

4.1-19 Reverse Drive Function Inoperative

1. Loose or broken wire #15 from Lift/Off/Drive switch S3 to control box connector pin #A9.
   - Check continuity. Replace if defective.
2. Loose or broken wire #15 in mast control cable or its connectors.
   - Check for continuity between base connector X2 pin #3 and platform connector X1 pin #A9 on cable. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
3. Loose or broken wire #15 from mast control cable to relay 15BCR.
   - Check continuity. Replace if defective.
4. Loose or broken wire #15B from tilt switch TS2 to relay 15BCR.
   - Check continuity. Replace if defective.
5. Loose or broken wire #02 from base terminal block to relay 15BCR.
   - Check continuity. Replace if defective.
6. Reverse drive relay 15BCR defective.
   - Check relay, replace if defective.
7. Loose or broken wire #15A from relay 15BCR to base terminal block.
   - Check continuity. Replace if defective.
8. Loose or broken wire #15A from base terminal block to reverse drive valve coil 4H-15A.
   - Check continuity. Replace if defective.
9. Loose or broken wire #02 from reverse drive valve coil 4H-15A to base terminal block.
   - Check continuity. Replace if defective.
10. Reverse drive valve coil 4H-15A defective.
    - Check continuity through coil. Replace if defective.
11. Open diode D16A.
    - Check diode. Replace if defective.
12. Tilt switch TS2 defective or out of adjustment.
    - Adjust the set up of the tilt switch using section 5 of this manual. Replace if defective.

4.1-20 Two or more Functions at one time

1. Shorted diode.
   - Check continuity of all diodes. Replace if defective.

Hydraulic System

4.2-1 All Functions Inoperative

1. Pump P1 defective.
   - Check pump. Replace if defective.
2. Pump coupler broken or defective.
   - Check coupler. Replace if defective.
3. System relief valve R1 stuck open.
   - Clean valve. Replace if defective.

4.2-2 All Functions Sluggish

1. System relief valve R1 defective or not adjusted properly.
   - Adjust valve. Replace if defective.
2. Hydraulic pump P1 worn.
   - Check pump. Replace if defective.
3. Suction strainer contaminated.
   - Clean strainer. Replace if defective.

4.2-3 Platform Drifts Down

1. Defective holding/emergency/lowering valve 2H-13.
   - Check valve. Replace if defective.
2. Defective lift cylinder gland seal.
   - Check for hydraulic oil leaking from the gland seal. Rebuild cylinder. Replace if damaged.

4.2-4 Platform Lifts Slowly

1. Holding/emergency/lowering valve 2H-13 stuck in the shifted position or is defective.
   - Check valve. Replace if defective.
2. Lift relief valve R2 defective or not adjusted correctly.
   - Adjust valve. Replace if defective.

4.2-5 Platform Does Not Lift

1. Up valve 3H-14A defective or is sticking.
   - Check valve. Replace if defective.
2. Lift relief valve R2 defective or not adjusted correctly.
   - Adjust valve. Replace if defective.
3. Hydraulic oil level too low.
   - Fully lower the platform. Fill hydraulic tank with recommended fluid to appropriate level.
4. Platform weight excessive.
   - Reduce platform load to maximum capacity.

4.2-6 Platform will not Lower

NOTE

Down function is not proportionally controlled.

1. Defective holding/emergency/lowering valve 2H-13.
   - Check valve. Replace if defective.
2. Lowering orifice O2 plugged or contaminated.
   - Clear debris. Replace Orifice. Replace if defective.

Hydraulic System (Continued)

4.2-7 Platform Drives Slow

1. Drive motor M1 or M2 defective.
   - Check motors. Replace if defective.

4.2-8 Platform will not Drive in Forward

1. Forward drive valve 4H-16A defective or is sticking.
   - Clean Valve. Replace if defective.
2. Counterbalance valve CB1 defective or is plugged.
   - Clean Valve. Replace if defective.

4.2-9 Platform will not Drive in Reverse

1. Reverse drive valve 4H-15A defective or is sticking.
   - Clean Valve. Replace if defective.
2. Counterbalance valve CB1 defective or is plugged.
   - Clean Valve. Replace if defective.

4.2-10 Brake(s) will not Release

1. Brake valve 3H-17 defective or is sticking.
   - Clean valve. Replace if defective.
2. Brake hubs BH1 or BH2 sticking or defective.
   - Check for hydraulic pressure at brake hubs. If pressure is available rebuild brake hubs. Replace if defective.

4.2-11 Platform does not Steer

1. Right steer valve 4H-23 or left steer valve 4H-24 defective or sticking.
   - Clean valve. Replace if defective.
2. Steer cylinder C1 seals bypassing.
   - Rebuild cylinder. Replace if damaged.
3. Mechanical binding in king pins.
   - Check for binding. Repair as needed.
4. Orifice 01 plugged.
   - Clean Orifices, and reinstall.

4.2-12 Platform does not Steer Elevated While Driving

1. Orifice 03 plugged.
   - Clean Orifices, and reinstall.

4.2-13 Platform Steers Very Slowly

1. Steer Speed valve 2H-17C stuck in the shifted position or is defective.
   - Check valve. Replace if defective.

Section 5
PROCEDURES

List of Procedures

5

General

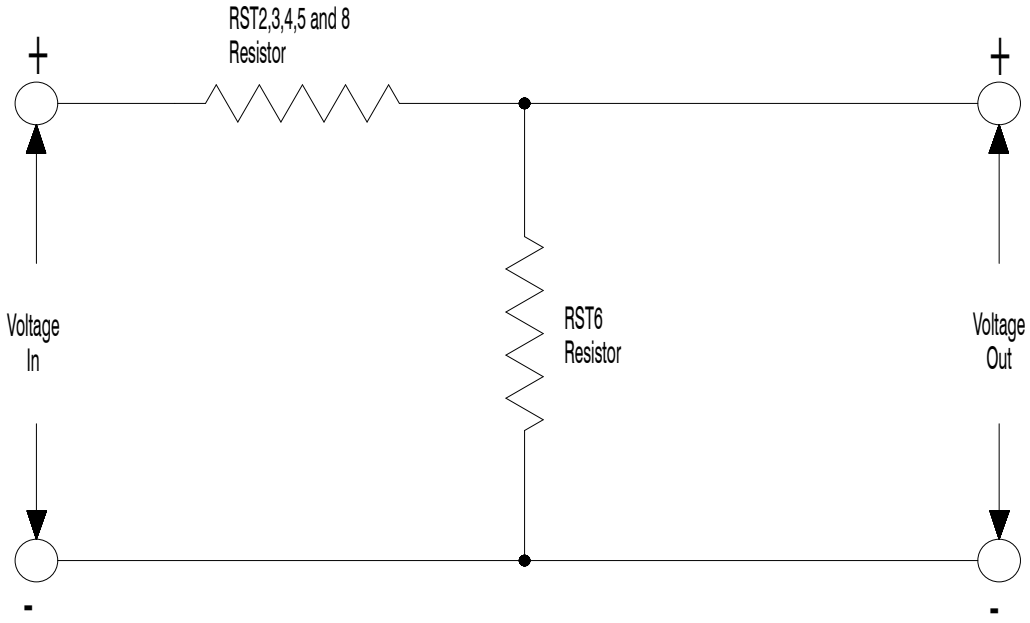
The following information is provided to assist you in the use and application of servicing and maintenance procedures contained in this section.

Safety and Workmanship

Your safety, and that of others, is the first consideration when engaging in the maintenance of equipment. Always be conscious of weight. Never attempt to move heavy parts without the aid of a mechanical device. Do not allow heavy objects to rest in an unstable position. When raising a portion of the equipment, ensure that adequate support is provided.

Electrical System

5.1-1 Resistor - Voltage Divider



Common Resistor	Resistor	Ohm	Function	Input voltage*	Output Voltage**
RST6 250 Ohm	RST3	220	Platform lift resistor	4.8	2.5
	RST8	68	Hi speed drive resistor	4.8	3.8
	RST2	1K	Elevated drive resistor	4.8	0.9
	RST4	4.7K	Steer only resistor	24	1.2
	RST5	2K	Base lift resistor	24	2.7

*** 4.8 volts refers to full stroke on the joystick. 24 volts represents a full charge on the battery pack.**

**** Values given are with all connections tight and free from corrosion + or - 10%.**

5.1-2 Troubleshooting - Diagnostic Switch

The SJ12-16 machines are equipped with a diagnostic switch for the purpose of troubleshooting. Once the deck is in the service position (deck fully extended out) the electric signal to the motor controller enable function is disengaged. All electrical wiring and components can be checked in the service position other than the signal to the enable of the motor controller. To accomplish this you would be required to engage the diagnostic switch.

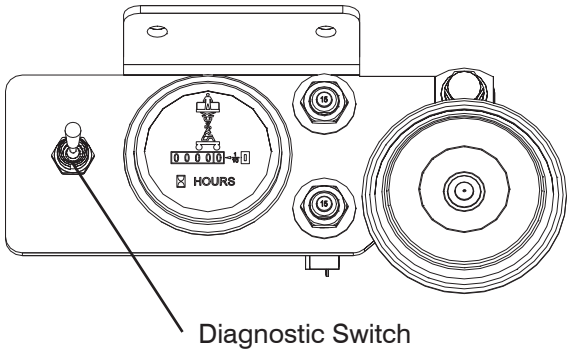


Figure 5-1. Horn and Hourmeter Assembly

5.1-3 Tilt Switch Orientation

The design of this equipment and the Tilt Switches require them to be installed in a specific direction. Below you will find a picture indicating the direction of both TS1 Tilt Switch as well as TS2 Tilt Switch. As indicated in the picture both Tilt Switches are orientated so the wiring harness as well as the reset buttons face the center of the machine.

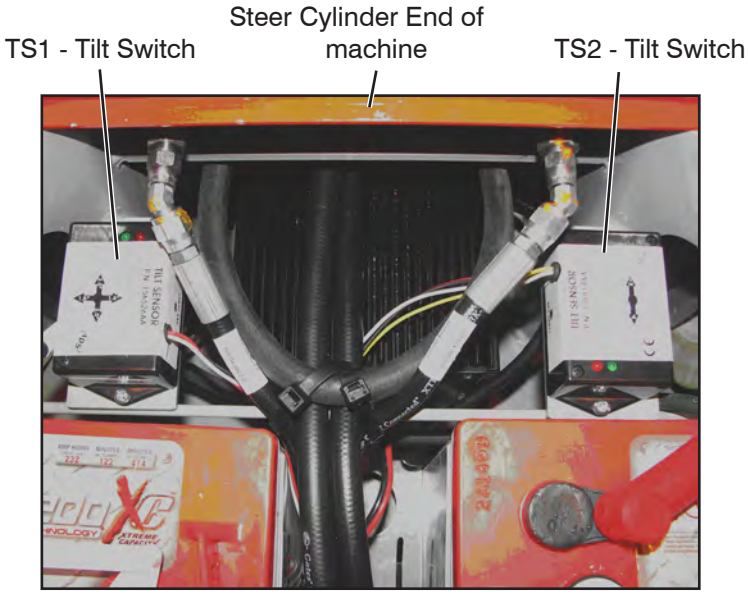


Figure 5-2. Tilt Switch Orientation

5.1-4 Mast Limit Switch Replacement

1. Ensure aerial platform is parked on a film level surface.

2. Using base control console, raise platform to approximately 61 cm (24 in.) high.

3. Place a 2 x 4 solid wood block, approximately 71 cm (28 in.) long, between base and platform (see Figure 5-3).

4. Using the base control console, carefully and gradually lower the platform until it is supported by the wood block.

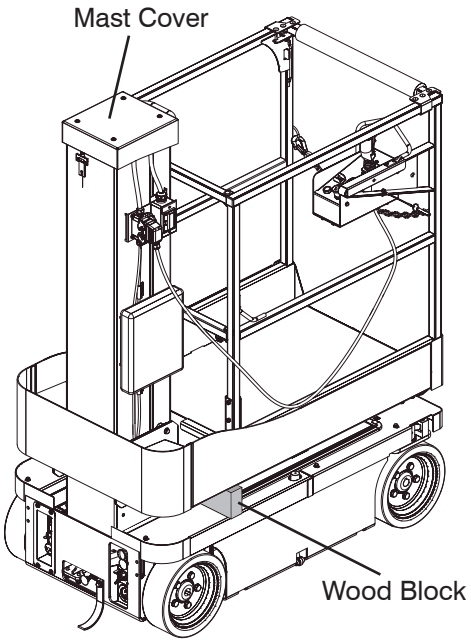


Figure 5-3. Limit Switch Inside the Mast Assembly

5. Push in "🔴" emergency stop buttons and turn main disconnect switch to "◯" off position. Lock switch to prevent unathorized use during this procedure.

⚠ WARNING

Ensure that you maintain three points of contact when using the ladder to mount/ dismount platform.

6. Locate and remove the mast cover (see Figure 5-3).

7. Locate the limit switch inside the mast (see Figure 5-4).

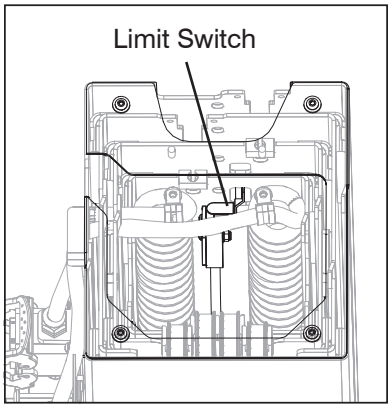


Figure 5-4. Limit Switch Inside the Mast Assembly

8. Using power tools, remove the limit switch from its mount.

⚠ WARNING

Ensure that you maintain three points of contact when using the ladder to mount/ dismount platform.

9. Traverse the platform to maintenance position and access the hydraulic/electrical compartment (see Figure 5-5).

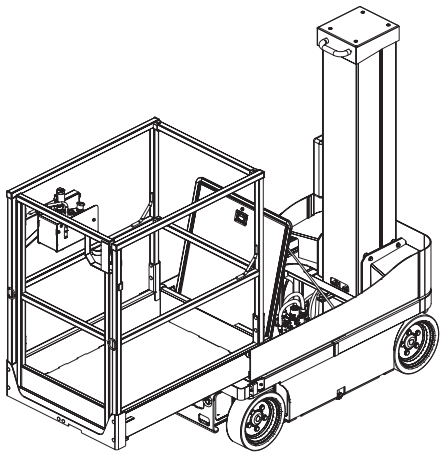


Figure 5-5. Accessing Hydraulic/Electrical Compartment

10. Locate and disconnect the limit switch connector (see Figure 5-6).

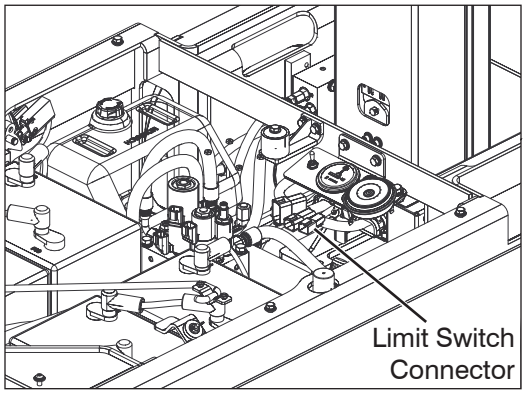


Figure 5-6. Limit Switch Inside the Mast Assembly

11. Remove the limit switch from top of the mast.

12. Carefully feed the new limit switch harness/ connector from top of mast to base.

13. Reconnect the limit switch connector at the base.

14. Close the compartment door and traverse the platform back to the home position.

WARNING

Ensure that you maintain three points of contact when using the ladder to mount/ dismount platform.

15. Using power tools, carefully install the new limit switch to its mount.

16. Reinstall the mast cover.

17. Using the base control console, carefully and gradually raise and remove the wood block.

18. Carefully lower the platform.

5.1-5 Testing Limit Switch

1. Ensure path of intended motion is clear.

2. With platform fully lowered, attempt to drive forward or reverse.

WARNING

Be aware of overhead obstructions or other possible hazards around the aerial platform when lifting.

3. Raise the platform approximately 30.5cm (12 in.) and attempt to drive forward or reverse.
Result: Aerial platform should move slower than when it was in stowed position.

Hydraulic System

All adjustments must be made with a calibrated gauge. Refer to the serial number plate located on the rear of the machine for system and lift pressure values.

5.2-1 System Relief Pressure Adjustment

1. Extend transverse deck to service position, then raise the service access door and secure in position with the prop rod provided.
2. Locate system pressure test port on power pack manifold. Refer to Section 3 Power pack and Port Identification for location.
3. Install a calibrated 5000 PSI gauge to the system pressure test port.
4. Remove platform control box from guardrail and locate it in the proximity of the work area of the power pack.
5. At the power pack manifold, loosen locknut on system relief valve R1. Refer to Section 3 Power pack and Port Identification for location.
6. Select drive with the Lift/Drive switch on the platform control box.
7. Engage steer right and hold. Engage diagnostic switch and hold.
8. Observe reading on gauge when steering is at full stroke. Adjust system relief valve R1 value listed on the serial number plate. Turn the stem on the relief valve clockwise to increase pressure. Turn the stem counterclockwise to decrease pressure.
9. Release steer switch, diagnostic switch and then tighten the locknut.
10. Remove the gauge from the system pressure test port.
11. Store prop rod back to its holder, then lower service access door and secure it. Push the transverse deck back to the working position.

5.2-2 Lift Pressure Adjustment

1. Extend transverse deck to service position, then raise the service access door and secure in position with the prop rod provided.
2. Locate the hose going to the lift cylinder on the main manifold. Remove and plug the hose. Refer to Section 3 Main Manifold Assembly for location.
3. Install a calibrated 5000 PSI gauge to the port on the manifold where the hose was disconnected.
4. At the main manifold, loosen the locknut on the lift relief valve R2.
5. Select lift with the Lift/Drive select switch on the platform control box.
6. Engage platform lift function and hold. Engage diagnostic switch and hold.
7. Observe reading on gauge. Adjust lift relief valve R2 to the value listed on the serial number plate. Turn the stem of the relief valve clockwise to increase pressure. Turn the stem counterclockwise to decrease pressure.
8. Release platform lift function, diagnostic switch and then tighten the locknut.
9. Remove the gauge from the lift port on the manifold. Reattach lift cylinder hose and tighten.
10. Store prop rod back to its holder, then lower Service access door and secure it. Push the transverse deck back to the working position.

NOTE

Pressure setting may vary as machine components wear. The lift pressure should be set for rated load only.

Service Procedures

5.3 Mast Assembly Procedure

5.3-1.0 Preparation

1. Ensure the aerial platform is on a flat level ground.
2. Use base control, raise the platform about 16” off the base.
3. Turn main disconnect switch to “◯” off position. Lock the switch to prevent unauthorized use during this procedure.

5.3-2.0 Platform/Mast removal

5.3-2.1 Platform/Mast 4 Removal

1. Remove the mast cover. See Figure 5-7,

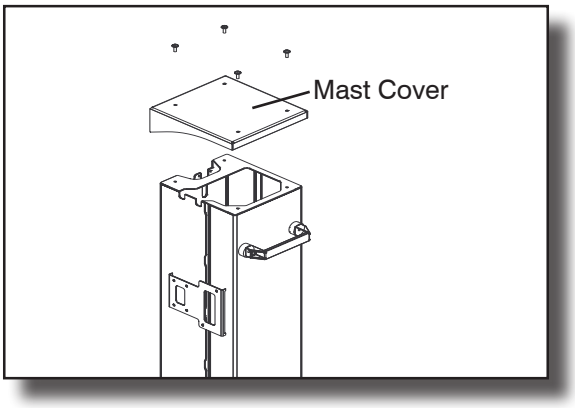


Figure 5-7. Mast Cover Removal

2. Remove the tie wraps and cable clamps off the cables at the mast top. See Figure 5-8.

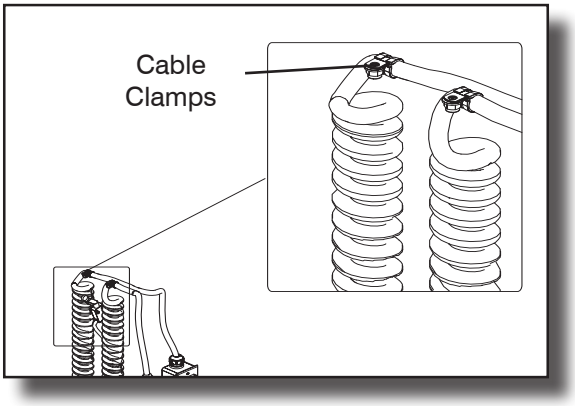


Figure 5-8. Tie Wraps and Cable Clamp Removal

3. Remove the power outlet box (If equipped) off the mast. See Figure 5-9.

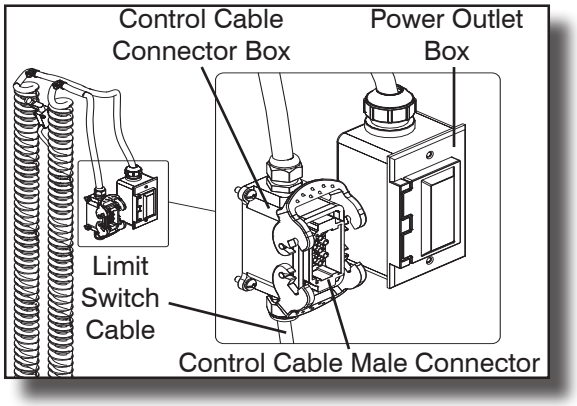


Figure 5-9. Control Box and Power Outlet

4. Disconnect the platform control cable from the control cable male connector. See Figure 5-9.

5. Remove the control cable male connector from the connector block. See Figure 5-9.

6. Remove the limit switch cable from the control cable connector, by using tool: Wieland Kontakt Gedreht 05.5020710.0

7. Remove the control cable connector box from the mast. See Figure 5-9.

8. Place all cables and connectors into mast 1.

WARNING

Be aware of overhead obstructions or other possible hazards around the machine when lifting.

WARNING

Ensure all components are secured before lifting.

9. Carefully lift the platform/mast 4 assembly up about 2” to 3” with use of suitable lifting equipment. Ensure the weight of the platform/mast 4 assembly is supported by the lifting equipment.

10. Remove the outer chain mount bolts on mast 4.

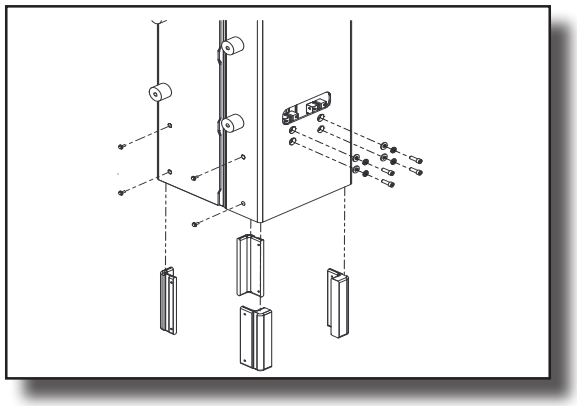


Figure 5-10. Mast 4 Components Removal

11. Remove the wear pads (front and back). See Figure 5-10.

NOTE

Ensure all the cables are clear and in place.

12. Carefully lift the platform/mast 4 assembly off the base with use of suitable lifting equipment.

13. Place the platform/mast 4 assembly on a suitable stand.

14. Un-roll the two outer chain off the mast 3 rollers and place them inside mast 1. See Figure 5-11.

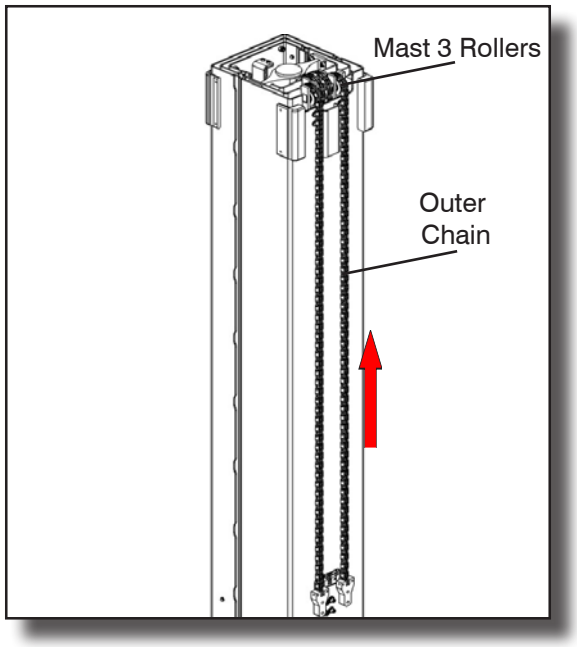


Figure 5-11. Positioning of Outer Chains on Mast 3

15. Inspect and replace any worn or damaged components if required.

5.3-2.2 Mast 3 Assembly Removal

1. Secure mast 3 assembly with suitable lifting equipment.
2. Carefully lift mast 3 assembly up about 2” to 3” with use of suitable lifting equipment. Ensure the weight of the mast 3 assembly is supported by the lifting equipment.
3. Remove the inner chain mount bolts and wear pads on mast 3. See Figure 5-12.

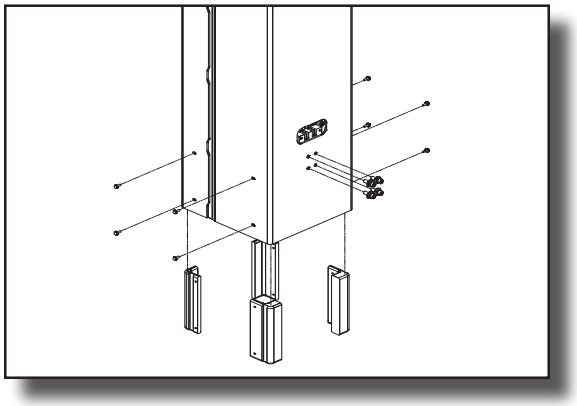


Figure 5-12. Mast 3 Components Removal

NOTE

Ensure all the cables are clear and in place.

4. Carefully lift mast 3 assembly off the base with use of suitable lifting equipment.
5. Place mast 3 assembly on a suitable stand.
6. Inspect and replace any worn or damaged components if required.

5.3-2.3 Mast 2 Assembly Removal

1. Roll the two outer chains out of mast 1. See Figure 5-13.

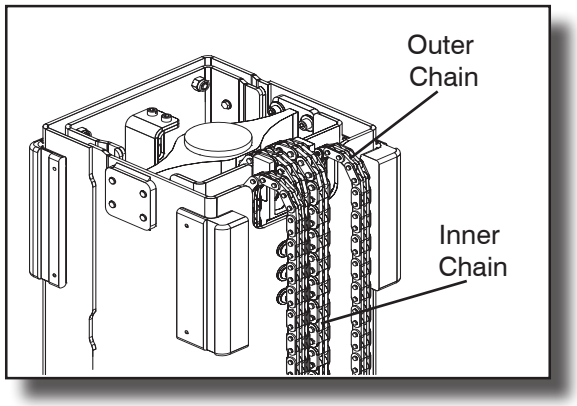


Figure 5-13. Positioning of the Outer Chains on Mast 2

2. Remove the cotter pin and the clevis pin at the cylinder mount bracket. See Figure 5-14.

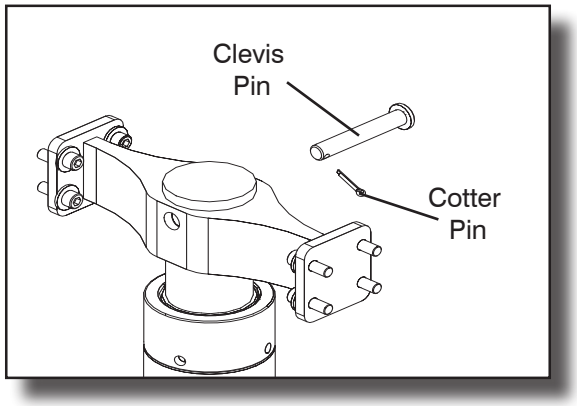


Figure 5-14. Cylinder Mount Bracket Removal

3. Secure and support mast 2 at the cylinder mount bracket using straps and suitable lifting equipment, as shown in Figure 5-15.

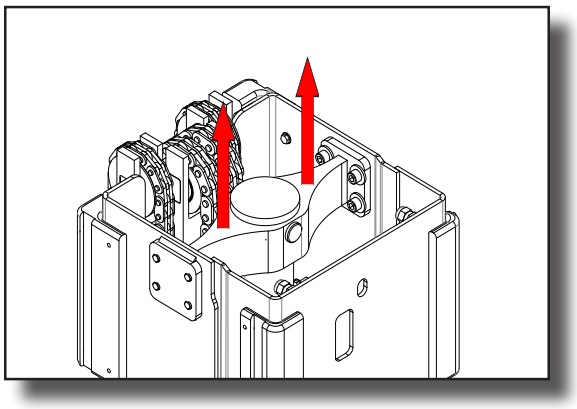


Figure 5-15. Mast 2 Backet Support

4. Carefully lift mast 2 assembly up about 5” with use of suitable lifting equipment, to allow access to the chain mount bolts. Ensure the weight of the mast 2 assembly is supported by the lifting equipment.

5. Remove the inner chain mount bolts on mast 1. See Figure 5-16.

6. Remove the wear pads on mast 2.

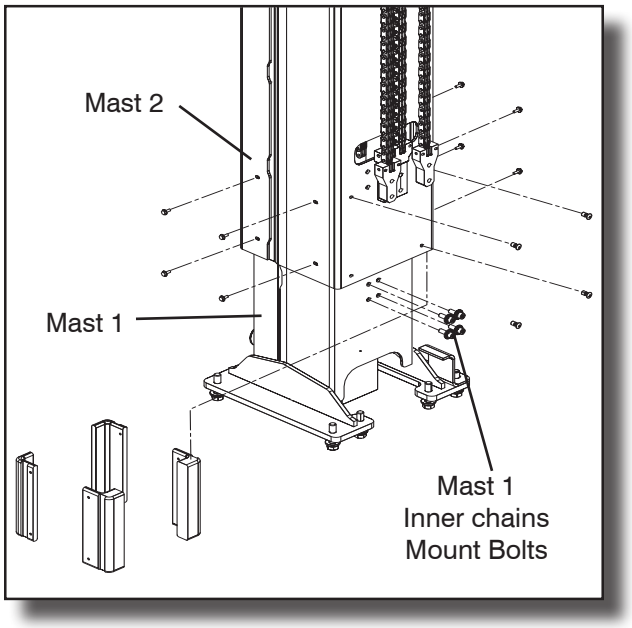


Figure 5-16. Mast 2 Components Removal

7. Carefully lift the mast 2 assembly off the base with suitable lifting equipment.

8. Place mast 2 assembly on a suitable stand.

9. Inspect and replace any worn or damaged components if required.

5.3-2.4 Mast 1 Assembly Removal

1. Place the machine on a suitable stand to allow access to the bottom of the machine base .

2. Disconnect and remove the emergency lowering valve electrical coil and pull knob from the lift cylinder manifold. See Figure 5-17.

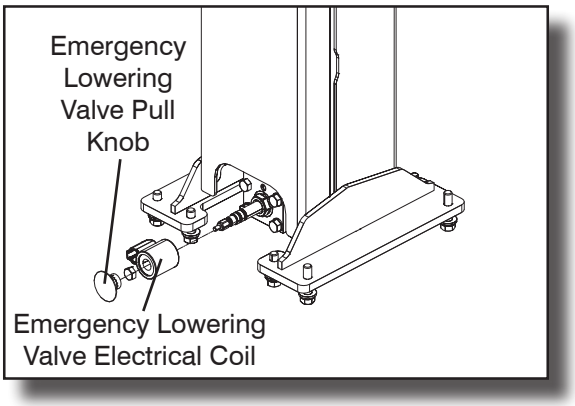


Figure 5-17. Emergency Lowering Pull Knob and Electrical Coil Removal

CAUTION

To prevent hydraulic system contaminations, cap all hydraulic hoses and fittings after removal.

3. Disconnect the lift cylinder hydraulic hose from the main hydraulic manifold (Port “L”). See Figure 5-18.

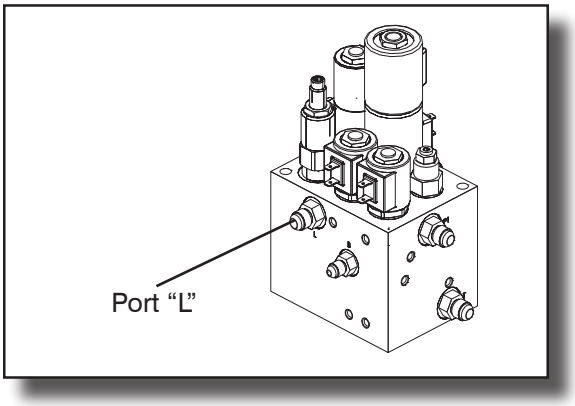


Figure 5-18. Lift Cylinder Hydraulic Hose Removal

CAUTION

To prevent hydraulic system contaminations, cap all hydraulic hoses and fittings after removal.

4. Remove the emergency lowering valve bolts (cylinder manifold) and the lift cylinder shoulder bolts. See Figure 5-19.

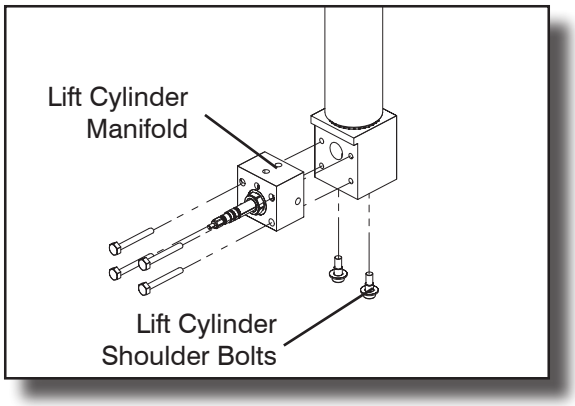


Figure 5-19. Lift Cylinder Manifold and Securing Bolts Removal

5. Remove all the cable clamps, base support plate and ground wire at the mast 1 base. See Figure 5-20 and 5-21.

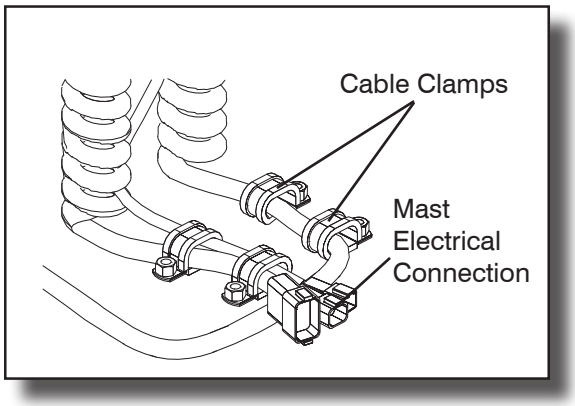


Figure 5-20. Base Wire Clamp Location

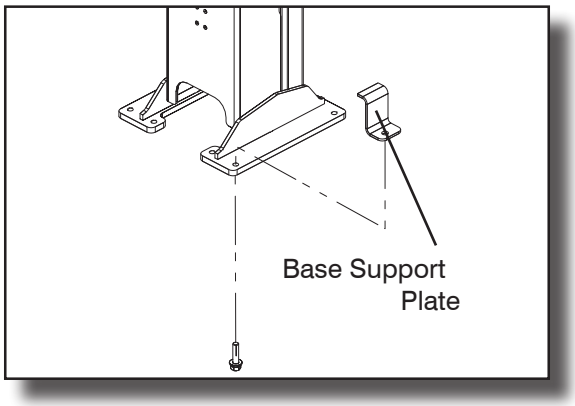


Figure 5-21. Base Support Plate

6. Insert a suitable pin at the lift cylinder end. See Figure 5-22.

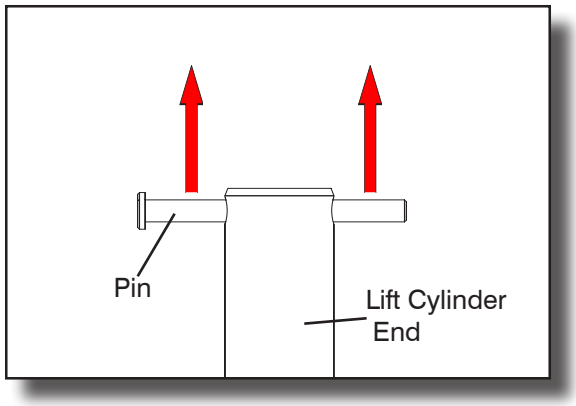


Figure 5-22. Cylinder Lifting Procedure

7. Carefully lift the lift cylinder with attached straps and suitable lifting equipment. Ensure all cables are clear out of the way and in place.

8. Place the cylinder on a suitable stand.

9. Remove the base inlet connector from the base. See Figure 5-23.

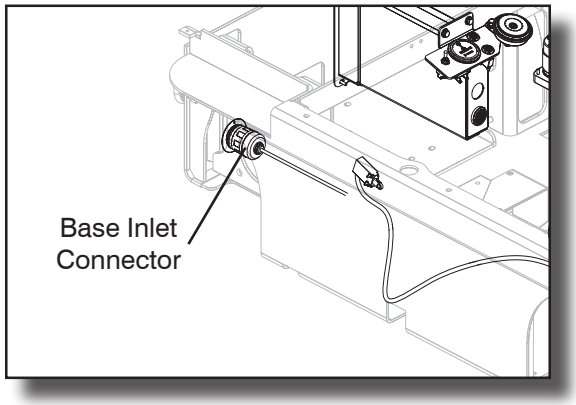


Figure 5-23. Base Inlet Connector Removal

10. Remove the electrical wires from the base inlet connector.

11. Disconnect the mast electrical connection from the main harness.

12. Remove the mast 1 mount bolts. See Figure 5-24.

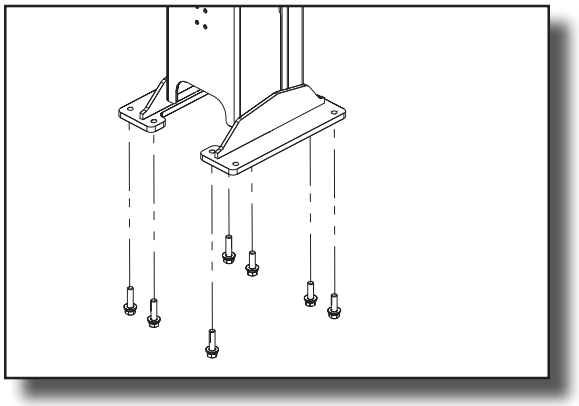


Figure 5-24. Mast 1 Mount Bolt Removal

13. Remove all the electrical cables from mast 1.

14. Carefully lift the mast 1 assembly off the base with suitable lifting equipment.

15. Place the mast 1 on a suitable stand.

16. Inspect and replace any worn or damaged components if required.

5.3-3.0 Mast Installation

5.3-3.1 Mast 1 Installation

1. Carefully lift and lower mast 1 assembly on the base in proper orientation with a suitable lifting equipment. See Figure 5-25.

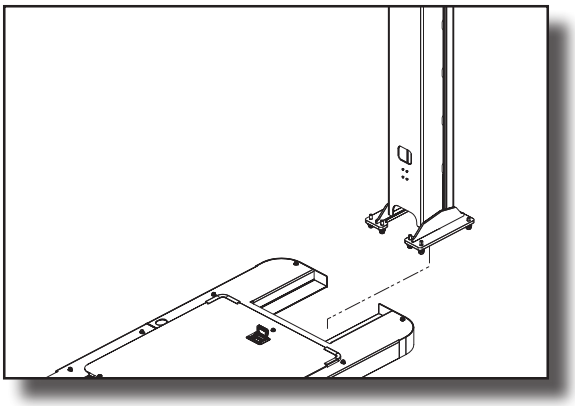


Figure 5-25. Orientation for Mast 1 Installation

2. Install the mast 1 base mount bolts. (Use Loctite 242 or equivalent on the mount bolts and torque to 23 lb-ft) See Figure 5-26.

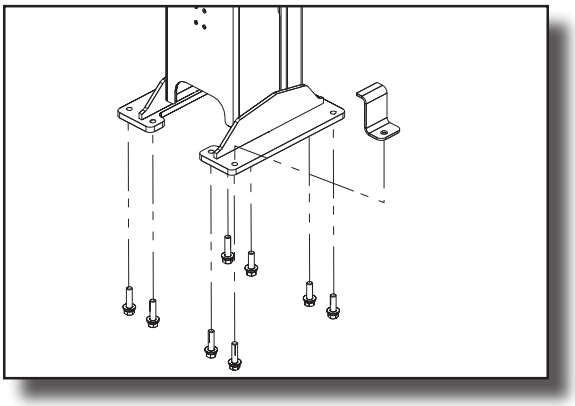


Figure 5-26. Mast 1 Base Mount Bolts Installation

3. Insert a suitable pin at the lift cylinder head and secure it with straps. See Figure 5-27.

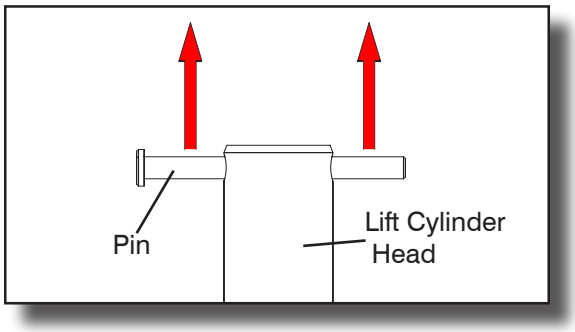


Figure 5-27. Lift Cylinder Securing Procedure

4. Carefully lift and lower the lift cylinder into mast 1. Ensure the orientation of the pin hole is aligned with driving direction of the machine.

5. Install the lift cylinder manifold bolts and shoulder bolts in the proper orientation. (Use Loctile 242 or equivalent on the shoulder bolts and torque them to 13 lb-ft). See Figure 5-28.

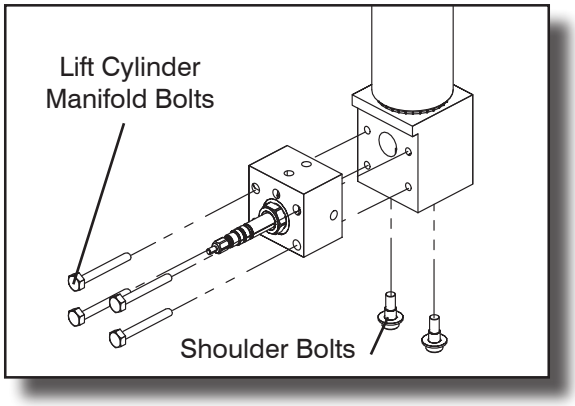


Figure 5-28. Lift Cyinder Manifold Installation

6. Install the emergency lowering valve electrical coil and the pull knob. Torque the jam nut to 60 lb-in. See Figure 5-29.

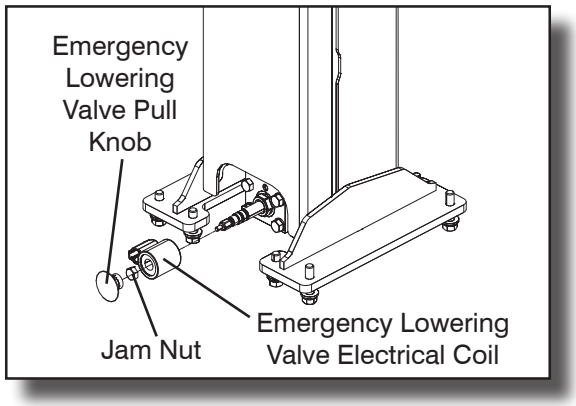


Figure 5-29. Emergency Lowering Valve Installation

7. Fish all the platform cables through mast 1. Ensure all cables are in place. Keep the connector block and the power outlet box inside mast 1.

8. Install all the cable clamps and the ground wire. See Figure 5-30.

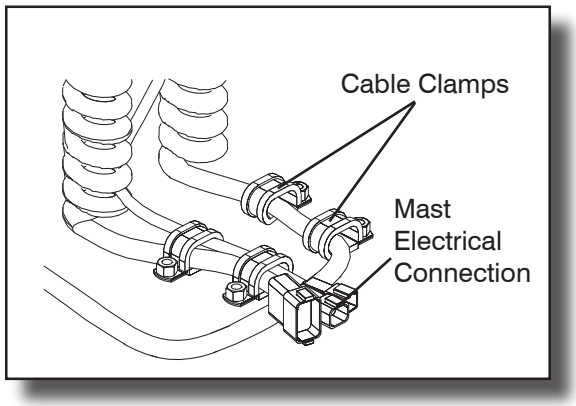


Figure 5-30. Cable Clamps and Mast Electrical Cables Installation

9. Connect all the mast electrical connections to the main harness and connect the electrical connection on the emergency lowering valve coil. See Figures 5-29 and 5-30.

10. Install the lift cylinder hydraulic hose back to the main manifold port L. See Figure 5-31.

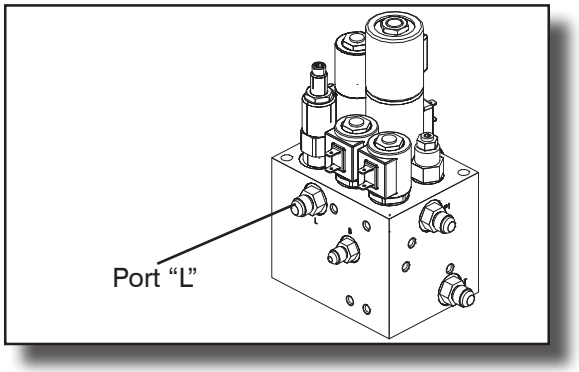


Figure 5-31. Lift Cylinder Hydraulic Hose Installation

11. Fish all power inlet electrical wires through a rubber boot and install the base power inlet. See Figure 5-32.

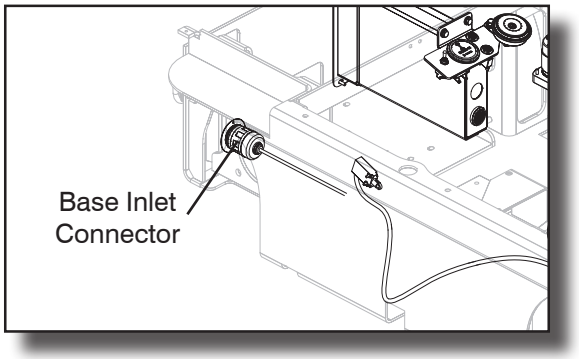


Figure 5-32. Base Power Inlet Installation

12. Secure the base power inlet with rivets.

5.3-3.2 Mast 2 Installation

1. Install the chains onto mast 2 if removed (see mast chain installation procedure in section 5.3-5 for more information)

2. Secure mast 2 at the cylinder mount bracket, with straps, as shown in Figure 5-33.

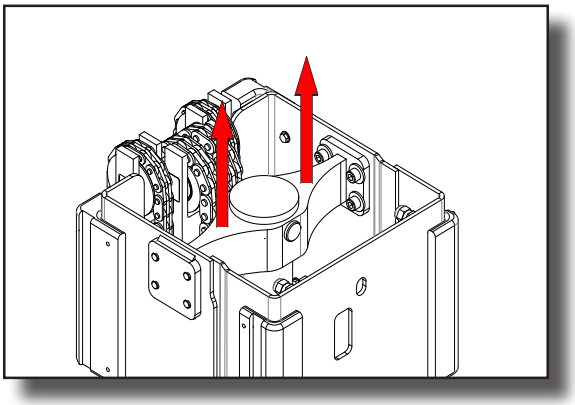


Figure 5-33. Mast 2 Securing Procedure

3. To avoid the limit switch impacting the mast 2 when lowering, press the limit switch arm inward as mast 2 is lowered. See Figure 5-34.

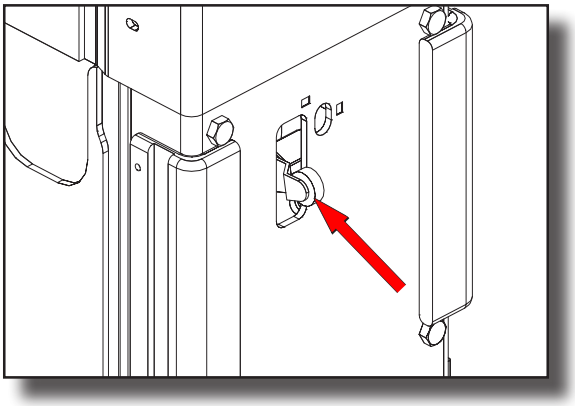


Figure 5-34. Limit Switch Installation Procedure

4. Carefully lift and lower mast 2 onto mast 1 along with chains. Ensure to place the inner chain into mast 1. Lower the mast partially to allow working space.

5. Align the inner chain within mast 1 and install the chain mounting bolts. (Use Loctite 242 or equivalent on the mounting bolts and torque to 200 lb-in) See Figure 5-35.

6. Install the wear pads. Put on the thicker front wear pads first, then the back wear pads (Use Loctite 770 or equivalent on the wear pad holes, and Loctite 431 or equivalent on the wear pad bolts).

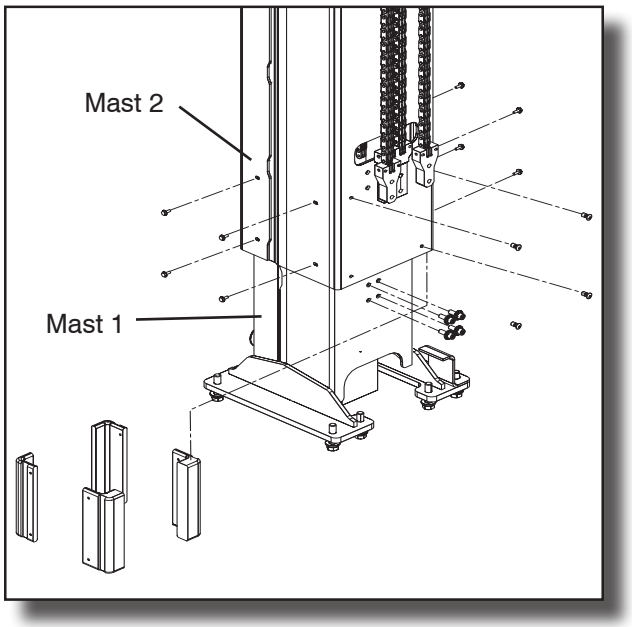


Figure 5-35. Mast 2 Installation Procedure

8. Fully lower mast 2 onto mast 1. Ensure the cylinder mount bracket is in place.

9. Install the clevis pin and the cotter pin at the top of mast 2. See Figure 5-36.

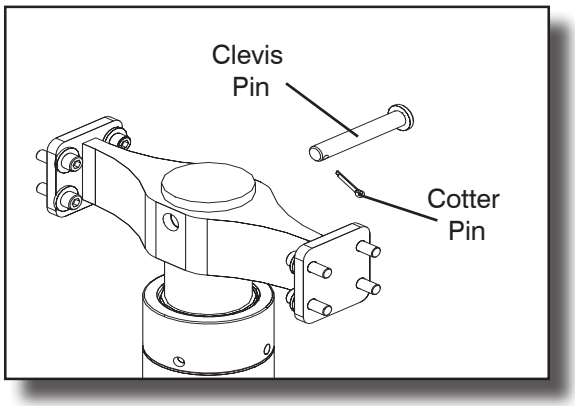


Figure 5-36. Lift Cylinder End Installation Procedure

10. Un-roll and place the two outer chain inside mast 1 temporarily.

5.3-3.3 Mast 3 Installation

1. Carefully lift mast 3 and partially lower it onto mast 2 with use of suitable lifting equipment.

2. Align the inner chain anchor to mast 3 bolt holes, then install the front wear pads. (Use Loctite 770 or equivalent on the wear pad holes, and Loctite 431 or equivalent on the wear pad bolts).

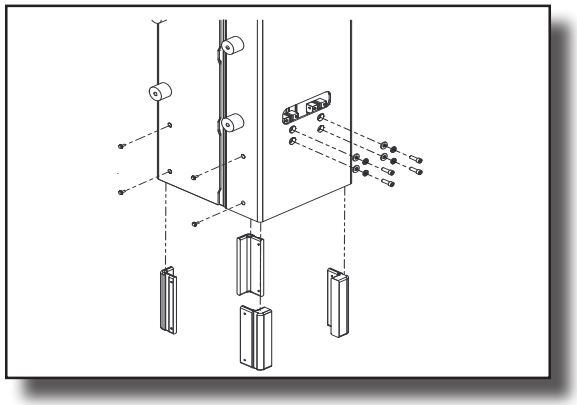


Figure 5-37. Mast 3 Installation Procedure

3. Install the inner chain mounting bolts. (Use Loctite 242 or equivalent on the mounting bolts and torque to 200 lb-in) See Figure 5-37.

4. Install the back wear pads. (Use Loctite 770 or equivalent on the wear pad holes, and Loctite 431 or equivalent on the wear pad bolts).

5. Roll the two outer chain out and onto the mast 3 rollers.

5.3-3.4 Platform/Mast 4 Assembly Installation

1. Carefully lift the platform/mast 4 assembly and partially lower it onto mast 3 with suitable lifting equipment.

2. Install the front wear pads, then the back ones. (Use Loctite 770 or equivalent on the wear pad holes, and Loctite 431 or equivalent on the wear pad bolts). See Figure 5-38.

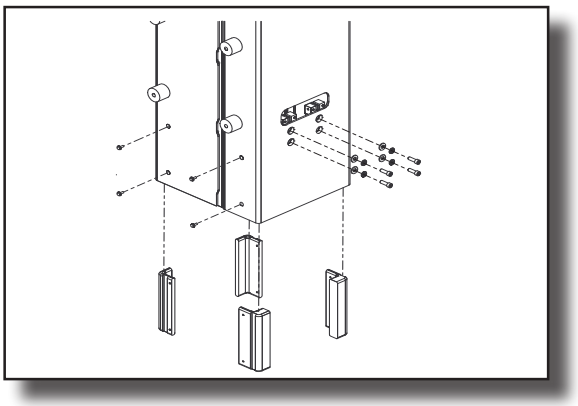


Figure 5-38. Mast 4 Installation Procedure

3. Align the two outer chain anchors and install the mast 4 mounting bolts. (Use Loctite 242 or equivalent on the mounting bolts and torque to 200 lb-in)

4. Fully lower the platform/mast 4 assembly.

5. Organize the platform cables and the platform power outlet box to their correct orientation, and install the cable clamps at the top of the mast 4. Use tie wraps if required. See Figure 5-39.

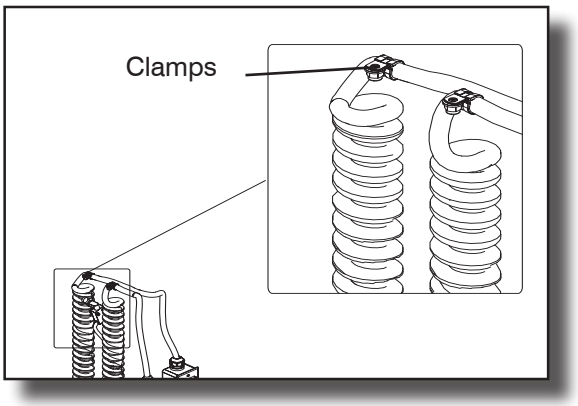


Figure 5-39. Mast 4 Electrical Cable Installation Procedure

7. Install the power outlet box and the control cable connector block to mast 4.

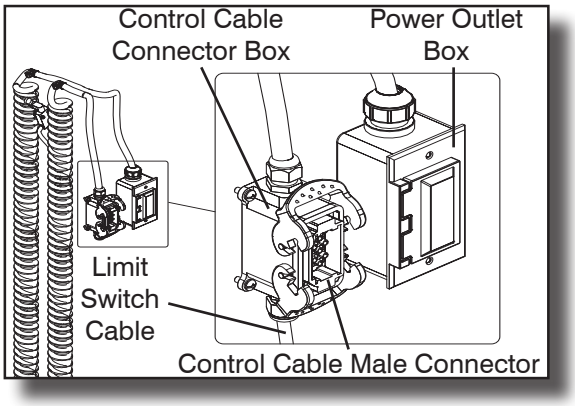


Figure 5-40. Electrical Connector Installation

8. Fish the limit switch cable behind the operating manual storage box, through the control cable connector block. See Figure 5-40.

9. Install the limit switch wires to control cable male connector. See Figure 5-41 for wiring information.

WIRE	CAVITY
BLACK	C5
BLACK/WHITE	C10
BROWN	C3
BLUE	C8
YELLOW/GREEN	NOT USED

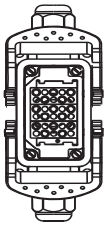


Figure 5-41. Control Cable Connector Wiring

10. Install the platform control cable to the control cable connector box.

11. Install the mast cover. See Figure 5-42.

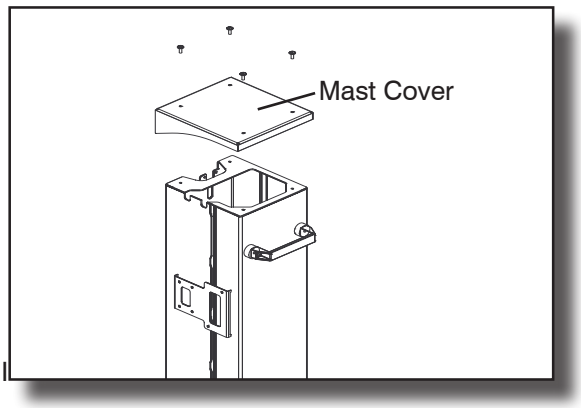


Figure 5-42. Mast Cover Installation

5.3-4.0 Function Test

1. Verify the all hydraulic and electrical connections are properly connected.
2. Verify no mechanical interference.
3. Perform Visual Inspections and the Function Tests as outlined in the Operating Manual.

5.3-5.0 Mast Chain Installation

5.3-5.1 Mast Chain Inspection

1. Lower the mast fully and remove the top cover plate.
2. Insepct each chain for slack. Each pairing chain should have same amount of slack. See Figure 5-43 for maximun allowable slack. Replace the chain if required.

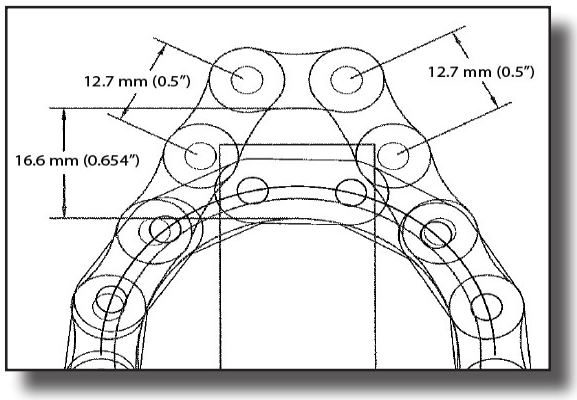


Figure 5-43. Mast Chain Slack Inspection

3. Inspect each chain for broken, cracked, stiff or worn links. See Figure 5-44. Replace the chain if required.

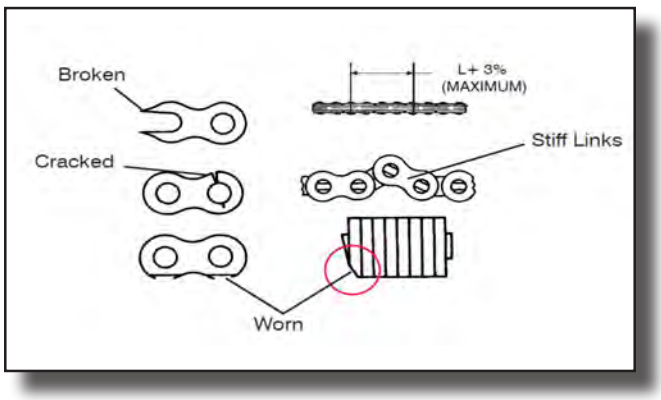


Figure 5-44. Mast Chain Condition Inspection

5.3-5.2 Outer chain Mount Installation

1. Align the chain to the chain mount pin slot and install the outer chain pin. See Figure 5-45.

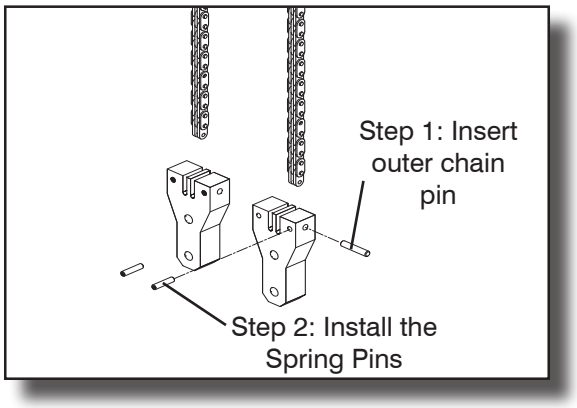


Figure 5-45. Outer Chain Mount Installation

2. Center the chain pin in the mount then install the spring pins and tap until flush.

3. Repeat steps 1 and 2 for the other end of the chain.

5.3-5.3 Double Chain Mount Installation

1. Align the chains to the chain mount pin slots and install the inner chain pin. Ensure the bevelled edge is facing up. See Figure 5-46.

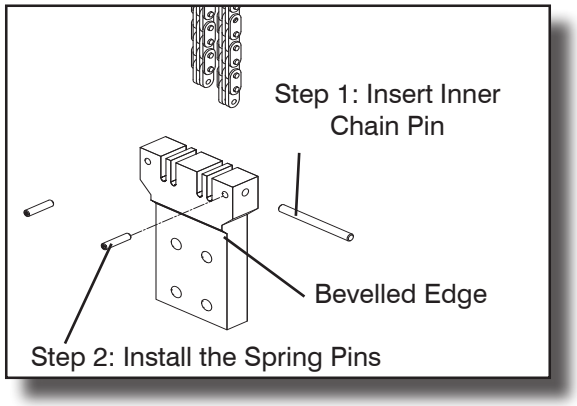


Figure 5-46. Inner Chain Mount Installation

2. Center the chain pin in the mount then install the spring pins and tap until flush. See Figure 5-47.

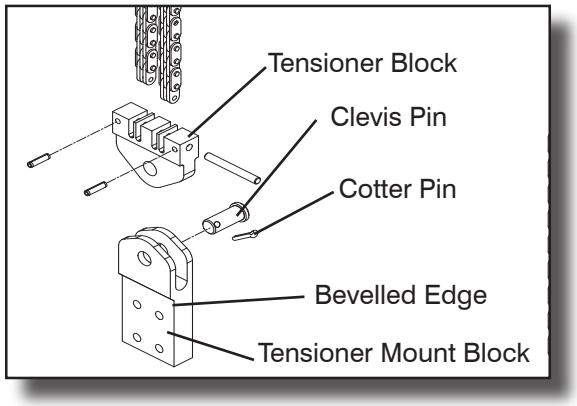


Figure 5-47. Inner Chain Mount Installation

3. Install the tensioner block to the tensioner mount block with use of the clevis pin and cotter pin. Ensure the bevelled edge side is facing up. See Figure 5-47.

4. Install the tensioner mount assembly to the other end of the double chain, following steps 1 and 2. Ensure chains are in the correct orientation. See Figure 5-47.

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