

MODELS | SJ 3220 SJ 3226 SJ 4620 SJ 4626 SJ 4632



# Service Manual

## SJIII Conventional Series (ANSI/CSA)

Part No. 157928AA February 2011

**SKYJACK**<sup>TM</sup>

**This manual is based on Serial Number(s):**

SJIII 3320 60,002,259 & Above  
SJIII 3226 27,006,432 & Above  
SJIII 46xx 70,007,139 & Above

Please refer to the website ([www.skyjack.com](http://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 SCHEDULE MAINTENANCE INSPECTIONS

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**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 SJIII Compact and Conventional series aerial platforms 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. It can be driven over uneven terrain only when the platform is fully lowered.

### **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](http://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 SJIII 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 the 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:**

 : 800 275-9522

 : 630 262-0006

#### **Europe:**

 : 44 1691-676-235

 : 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 and CE versions of the SJIII Series aerial platform models listed on [Table 2.1](#).

- **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 98/37/EC and EMC Directive 89/336/EEC 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 A92.6 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.

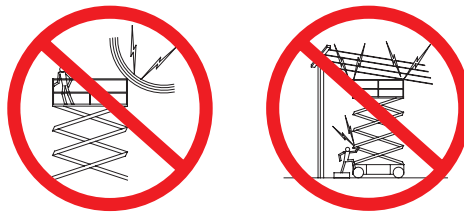
Common sense dictates the use of protective clothing when working on or near machinery. Use appropriate safety devices to protect your eyes, ears, hands, feet and body.


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

**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.

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



 <p><b>DANGER</b> Avoid Power Lines</p>		
<b>Minimum Safe Approach Distance</b>		
<b>ANSI/SIA A92.6-2006 and CSA B354.2-01 Requirements</b>		<b>CE Guidance Note “Avoidance of danger from overhead lines”</b>
<b>Voltage Range (Phase to Phase)</b>	<b>Minimum Safe Approach Distance (Feet)</b>	<b>Adhere strictly to the governmental rulings and regulations applicable in your country.</b>
0 to 300V	Avoid Contact	
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	
<b>FAILURE TO AVOID THIS HAZARD WILL RESULT IN DEATH OR SERIOUS INJURY!</b>		

60023AD

**Safety Precautions**

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

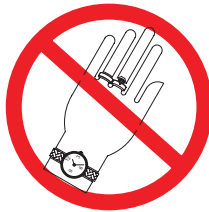


**WARNING**

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 jobsite.
- **TURN** emergency main power disconnect switch "O" 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, only grades up to rated maximum listed in [Tables 2-3](#) are permissible.



**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.



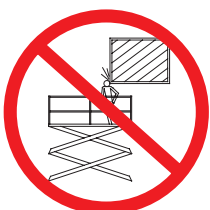
- **DO NOT** use the aerial platform as a crane. It is prohibited.



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



- **DO NOT** climb on scissor arm assembly. It is prohibited.

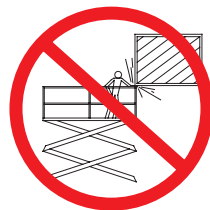


- **BE AWARE** of overhead obstructions or other possible hazards around the aerial platform when driving or lifting.

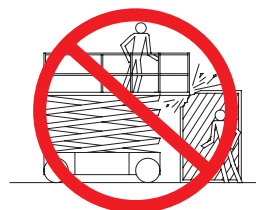
- **DO NOT** raise the aerial platform while the aerial platform is on a truck, fork lift or other device or vehicle.



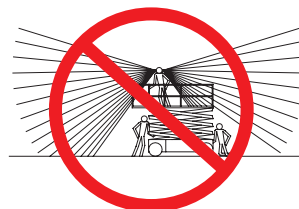
- **BE AWARE** of crushing hazards. Keep all body parts inside platform guardrail.



- **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.



- **BE AWARE** of blind spots when operating the aerial platform.

- **STUNT** driving and horseplay are prohibited.

- **ENSURE ALL** tires are in good condition and lug nuts are properly tightened.

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

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

### Safety Precautions (Continued)

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

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

#### 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 blocked out for non-use or repair.

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

#### Jobsite Inspection

- Do not use in hazardous locations.
- Perform a thorough jobsite 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 the "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 made 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.

#### NOTE

Samples of hydraulic oil should be drawn from the reservoir and tested annually. These samples should be taken when the oil is warmed through normal operation of the system. The sample should be analyzed by a qualified lubrication specialist to determine if it is suitable for continued use.

Oil change intervals will depend on the care used in keeping the oil clean, and the operating conditions. Dirt and/or moisture contamination will dictate that the oil should be changed more often. Under normal use and operating conditions, the hydraulic oil should be changed every two years. Refer to Table 1.2 of this manual.

7. All hydraulic components must be dis-assembled 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.skyjackinc.com](http://www.skyjackinc.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 the “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**

Model Number: _____		Serial Number: _____							
Recording Date									
Recording Year #	1	2	3	4	5	6	7	8	9
Owner’s Name									
Inspected By									

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As described earlier in this section, this decal is located on the control compartment cowling. It must be completed after an annual inspection has been completed. Do not use the aerial platform if an inspection has not been recorded in the last 13 months.



**Table 1.2 MAINTENANCE AND INSPECTION CHECKLIST**

Serial Number: \_\_\_\_\_

Model: \_\_\_\_\_

Hourmeter Reading: \_\_\_\_\_

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Name (Printed): \_\_\_\_\_

Signature: \_\_\_\_\_

Each item shall be inspected using the the appropriate section of the Skyjack operating manual.

As each item is inspected, write the appropriate grade in the box.

- P** - PASS
- F** - FAIL
- R** - REPAIRED

**INSPECTION FREQUENCY**

- DAILY
- FREQUENTLY
- ANNUALLY
- BI-ANNUALLY

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

Schedule	P	F	R
<b>Schedule Maintenance Inspections</b>			
Labels	A		
Limit Switches	A, B		
<b>Entrance Side</b>			
Main Power Disconnect Switch	A, B		
Base Control Switches	A, B		
Free-wheeling Valve Knob (Compacts - Front Side)	A, B		
Brakes	A, B, C		
AC Outlet Receptacle	A, B		
Ladder	A, B		
<b>Battery Tray Side</b>			
Pothole Protection Device	A, B		
Battery Tray	A, B		
Battery Charger	A, B		
Battery	A, B		
Steer Cylinder Assembly	A, B		
Wheel/Tire Assembly	A, B		
Tie Rod (Conventionals)	A, B		
Greasing Points	A, B, C		
<b>Hydraulic/Electric Tray Side</b>			
Pothole Protection Device	A, B		
Hydraulic Tank	A, B, C		
Hydraulic Oil	A, B, C		
Hydraulic Pump and Motor	A, B		
Electrical Panel	A, B		
Proportional and Main Manifolds	A, B		
Tilt Sensor	A, B		
Emergency Lowering Access Rod (If Equipped)	A, B		

Schedule	P	F	R
<b>Platform Assembly</b>			
Lanyard Attachment Anchors	A, B		
AC Outlet on Platform	A, B		
Platform Control Console	A, B		
Manuals	A, B		
Powered Extension Control Console (If Equipped)	A, B		
<b>Lift Mechanism</b>			
Maintenance Support	A, B		
Scissor Assembly	A, B		
Scissor Bumpers	A, B		
Rollers	A, B		
Lift Cylinder(s)	A, B		
<b>Function Tests</b>			
Test Main Power Disconnect Switch	A, B		
<b>Base Control Console</b>			
Test Base Emergency Stop	A, B		
Test Off/Platform/Base	A, B		
Test Lower/Neutral/Raise Switch	A, B		
Test Emergency Lowering	A, B		
Test Free-wheeling	A, B		
<b>Platform Control Console</b>			
Test Platform Emergency Stop	A, B		
Test Enable Trigger Switch	A, B		
Test Steering	A, B		
Test Driving	A, B		
Test Brakes	A, B		
Test Platform Raising/Lowering	A, B		
Test Horn	A, B		
Test Pothole Sensor	A, B		
Test Elevated Drive Speed	A, B		
Test Tilt Sensor	A, B		

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**A** - Perform Visual and Daily Maintenance Inspections & Functions Test. Refer to Section 2 of the Operating Manual.

**B** - Perform Scheduled Maintenance Inspection every three months or 150 hrs. Refer to Section 1 of this manual.

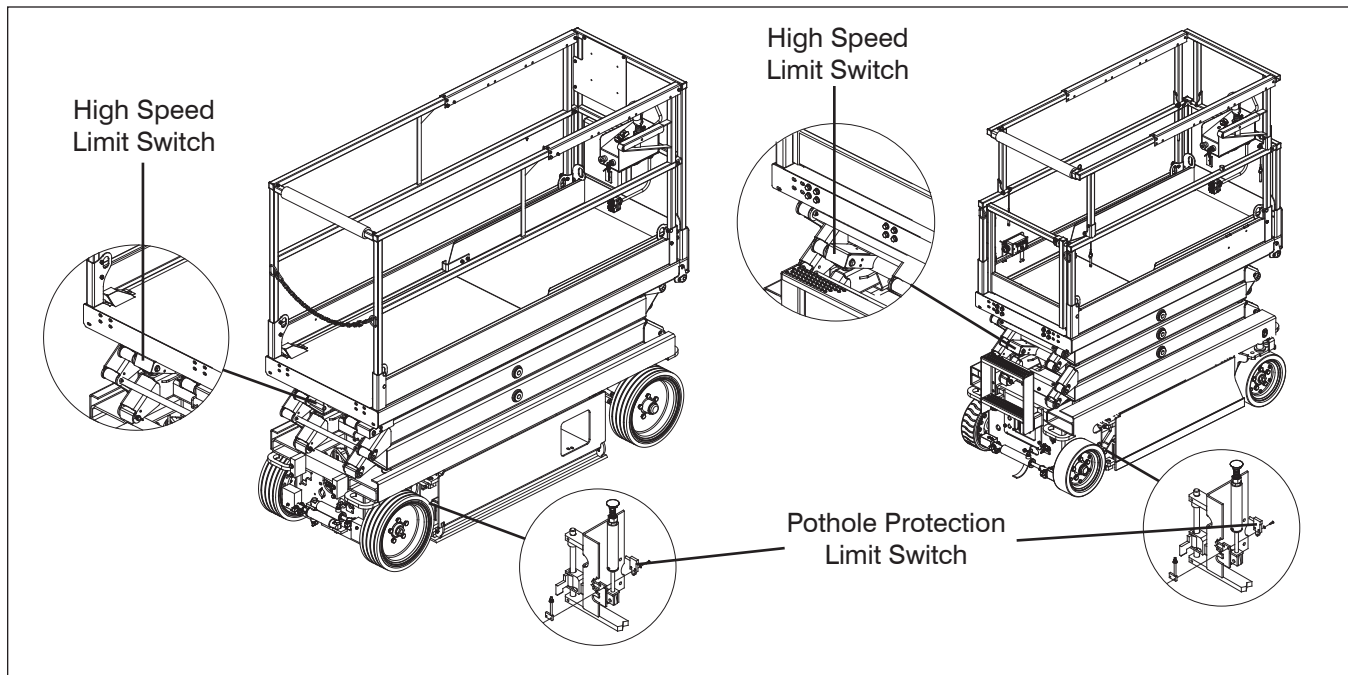
**C** - Perform Scheduled Maintenance Inspection every year. Refer to Section 1 of this manual.

**D** - Perform Scheduled Maintenance Inspection every 2 years. Refer to Section 1 of this manual.

\* Perform scheduled inspection every three months or 150 hours.

† - Refer to Skyjack's website @ [www.skyjack.com](http://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](http://www.skyjack.com) for a printable copy.



**1.1 Scheduled Maintenance Inspections**

Begin the scheduled 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.

**Electrical**

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

Inspect the following areas for chafed, corroded and loose wires:

- base to platform cables and wiring harness
- battery tray wiring harnesses
- hydraulic/electrical wiring harnesses

**Hydraulic**

Maintaining the 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
- all hydraulic cylinders
- all hydraulic manifolds
- the underside of the base
- ground area under the aerial platform

**1.1-1 Labels**

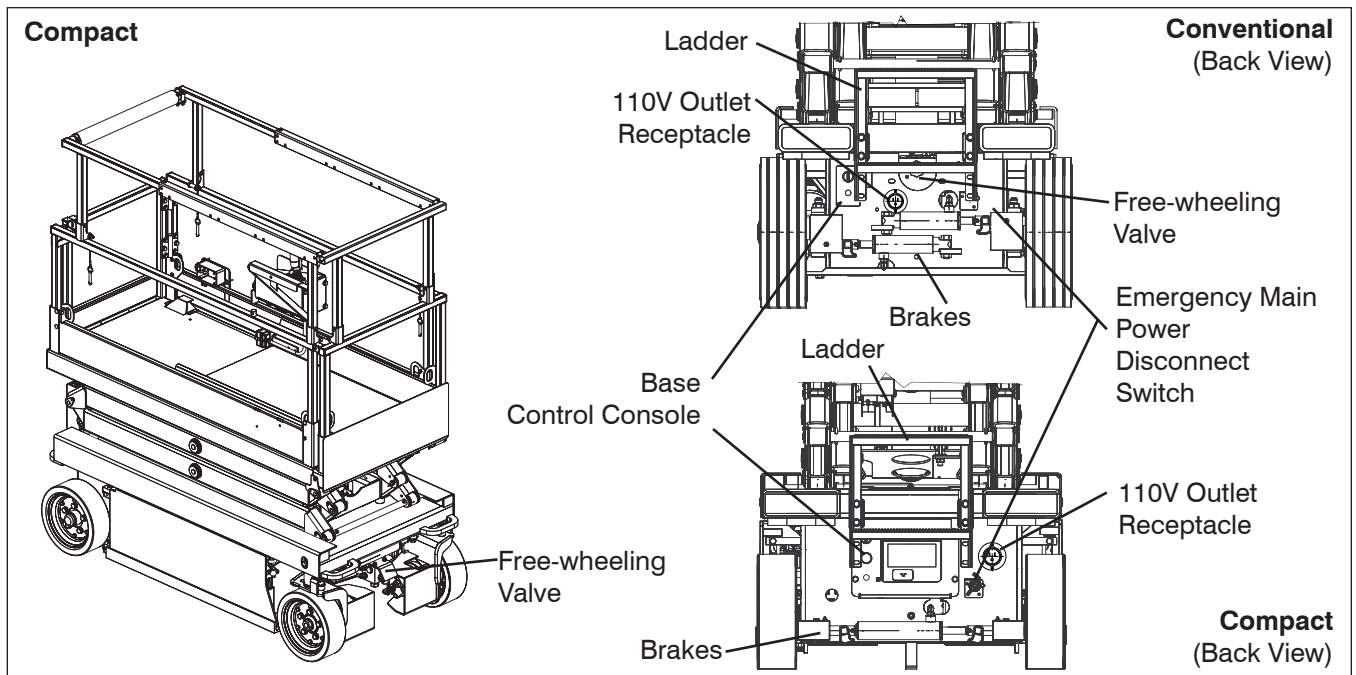
Refer to the labels section in this manual and determine that all labels are in place and are legible.

**1.1-2 Limit Switches**

Detecting limit switch malfunction is essential to safe aerial platform operation. Ensure limit switches are properly secured and movement is not obstructed.

Visually inspect all limit switch located inside the scissor arms and the outrigger assemblies for the following:

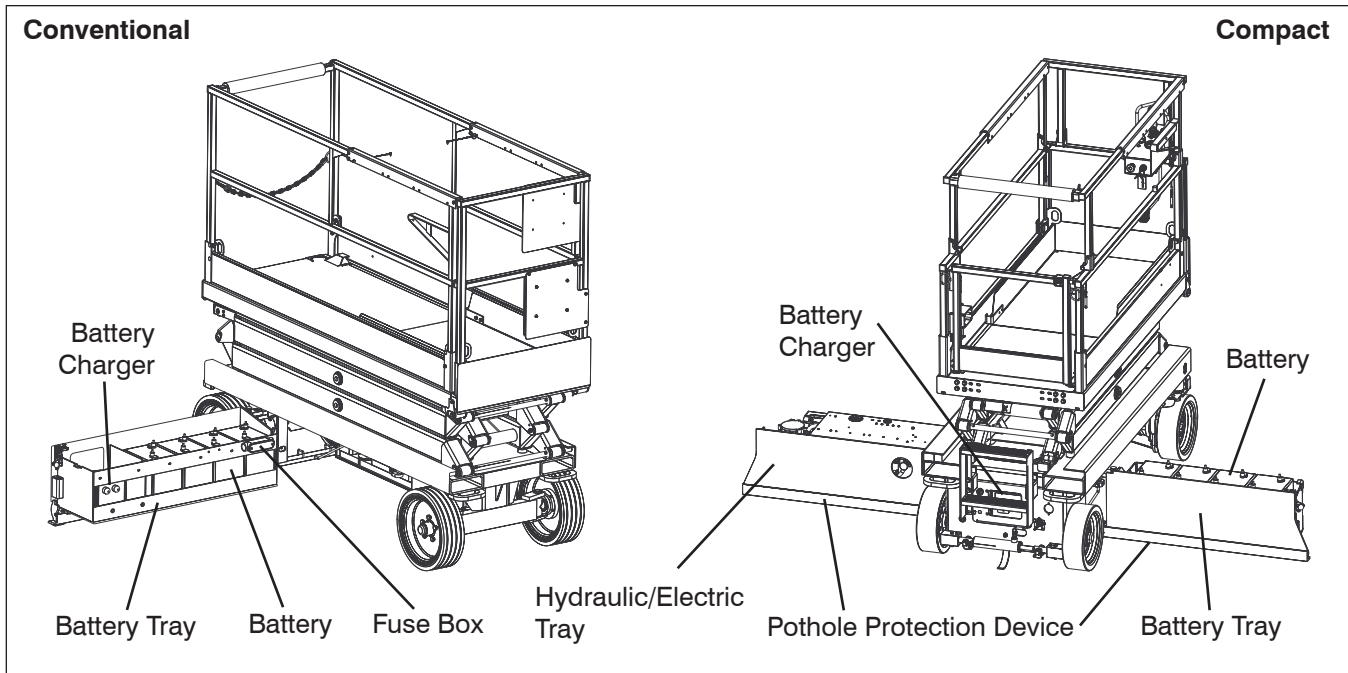
- broken or missing actuator arm
- missing fasteners
- loose wiring



### 1.1-3 Entrance Side

- **Main Power Disconnect Switch**
  - Turn emergency main power disconnect switch to “O” 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.
- **Free-wheeling Valve Knob**  
(Compacts - Front Side)
  - Ensure there are no loose or missing parts and there is no visible damage.
- **Brakes**
  - Ensure there are no loose or missing parts and there is no visible damage.
  - Ensure tabs are not locked.
- **AC Outlet Receptacle**
  - Ensure receptacle is free from dirt and obstructions.
- **Ladder**
  - Ensure there are no loose or missing parts and there is no visible damage.





**1.1-4 Battery Tray Side**

- **Pothole Protection Device**
  - Ensure mechanisms have no sign of visible damage and are free from dirt and obstructions.
- **Battery Tray**
  - Ensure tray latch is secure and in proper working order.
- **Battery Charger**  
(Compacts - Entrance Side)
  - Ensure charger is secure and shows no visible damage.
- **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**

**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.**

1. Check battery case for damage.
2. Clean battery terminals and cable ends thoroughly with a terminal cleaning tool or wire brush.
3. Ensure all battery connections are tight.
4. 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.
5. Replace battery if damaged or incapable of holding a lasting charge.

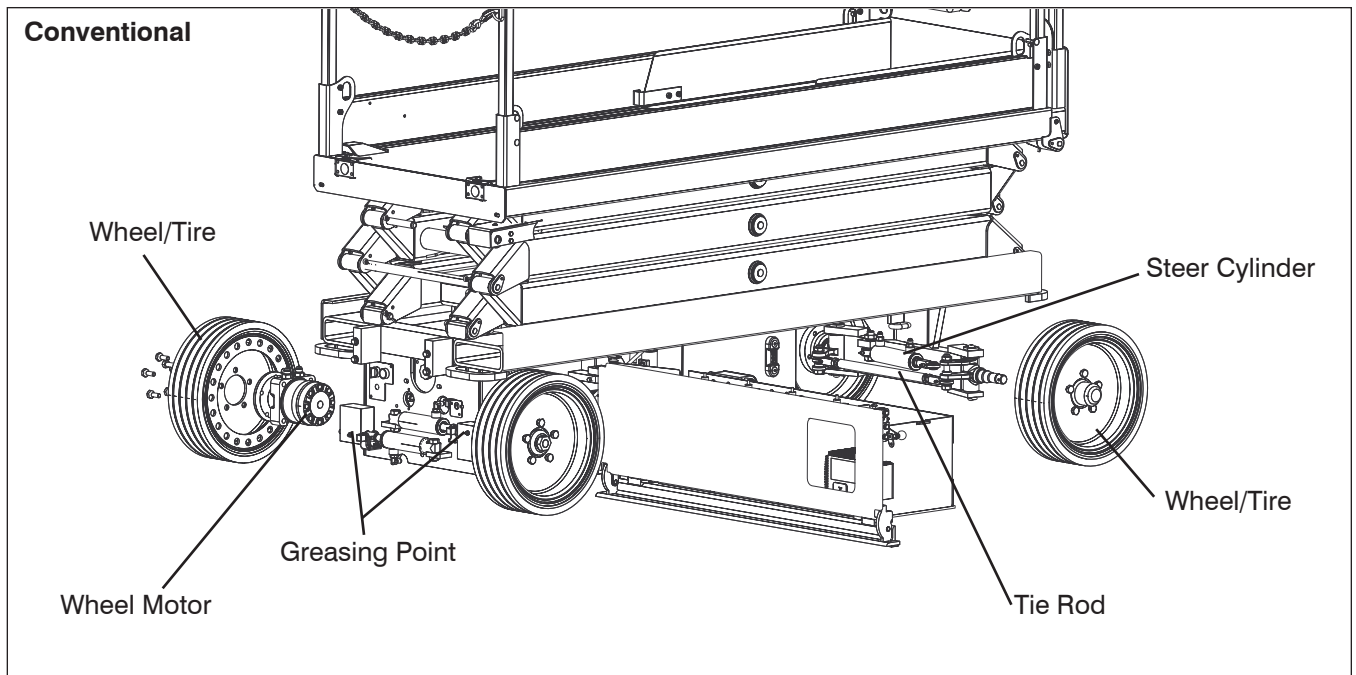
**! WARNING**

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



**! WARNING**

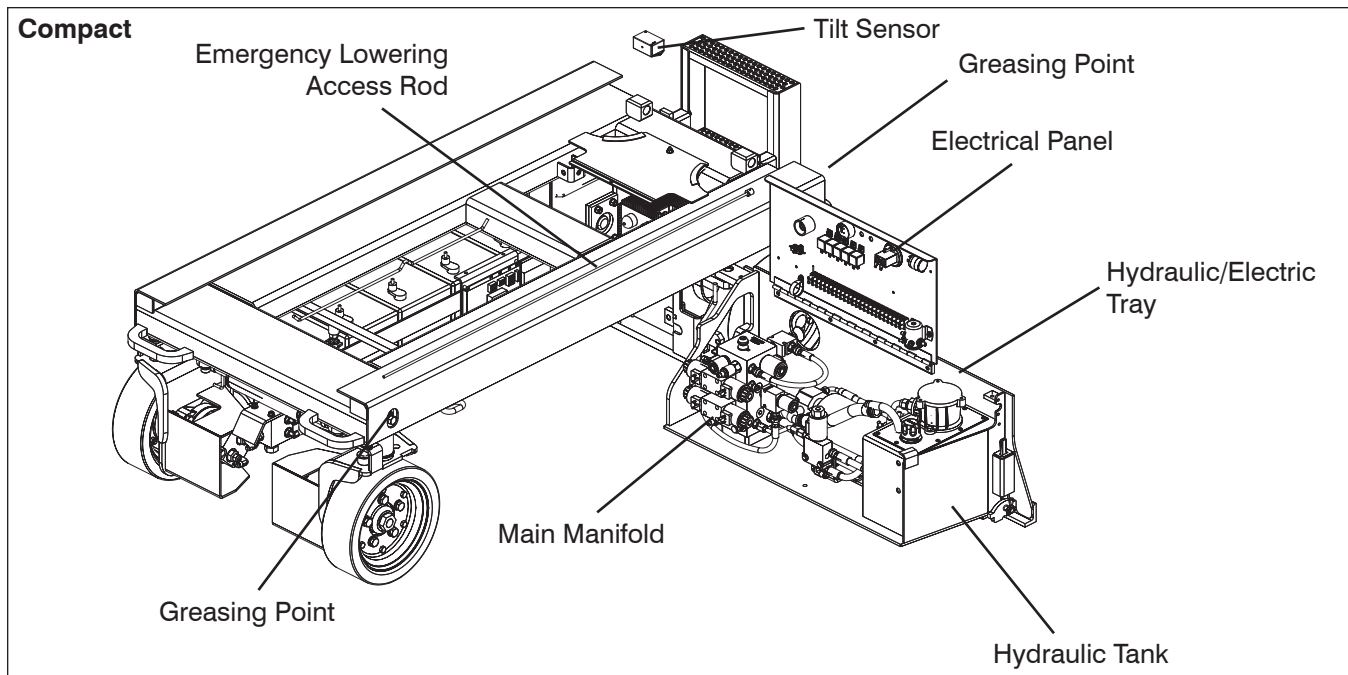
**Use original or manufacturer-approved parts and components for the aerial platform.**



- **Steer Cylinder Assembly**
    - Ensure steer cylinder assembly is properly secured and there are no loose or missing parts.
  - **Wheel/Tire Assembly**

The aerial platform is either equipped with solid rubber tires or foam-filled 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.
  - **Tie Rod (Conventionals)**
    - Ensure there are no loose or missing parts, tie rod end studs are locked and there is no visible damage.
  - **Greasing Points**
    - Ensure greasing points have no sign of visible damage and are free from dirt and obstructions.
- B - Frequent Inspection**
- Locate grease fittings and pump grease as needed.



### 1.1-5 Hydraulic/Electric Tray Side

- Ensure tray latch is secure and in proper working order.
- **Pothole Protection Device**
  - Ensure mechanisms have no sign of visible damage and are free from dirt and obstructions.
- **Hydraulic Tank**
  - Ensure hydraulic filler cap is secure.
  - Ensure tank shows no visible damage and no evidence of hydraulic leakage.
- **Hydraulic Oil**
  - Ensure platform is fully lowered, and then visually inspect the sight gauge located on the side of the hydraulic oil tank.
  - The hydraulic oil level should be at or slightly above the top mark of the sight glass.

### C - Annual Inspection

- For hydraulic oil replacement procedure, refer to [section 5](#).
- **Hydraulic Pump and Motor**
  - Ensure there are no loose or missing parts and there is no visible damage.

- **Electrical Panel**

- Ensure panel is properly secured and there is no visible damage.
- Ensure there are no loose wires or missing fasteners.

- **Proportional and Main Manifolds**

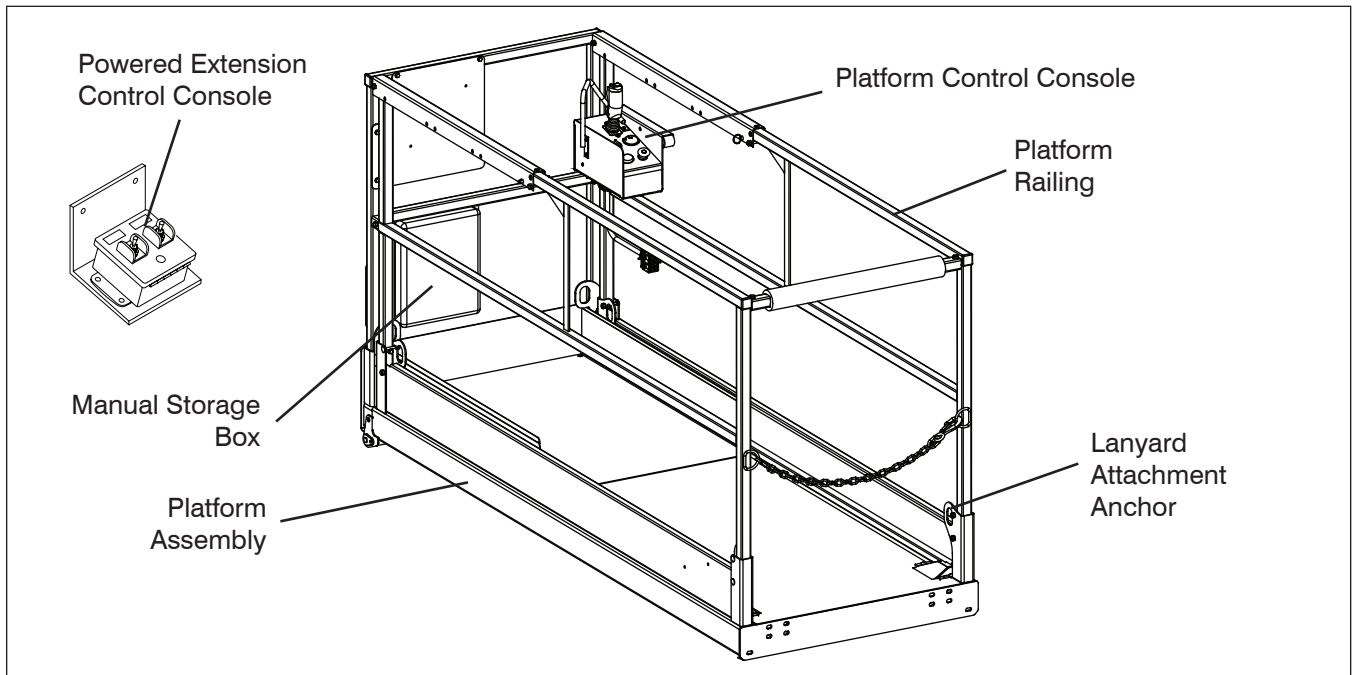
- Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.
- Ensure there are no loose wires or missing fasteners.

- **Tilt Sensor**

- Ensure tilt sensor is properly secured and there is no visible damage.

- **Emergency Lowering Access Rod (If Equipped)**

- Ensure rod is properly secured and there is no visible damage.



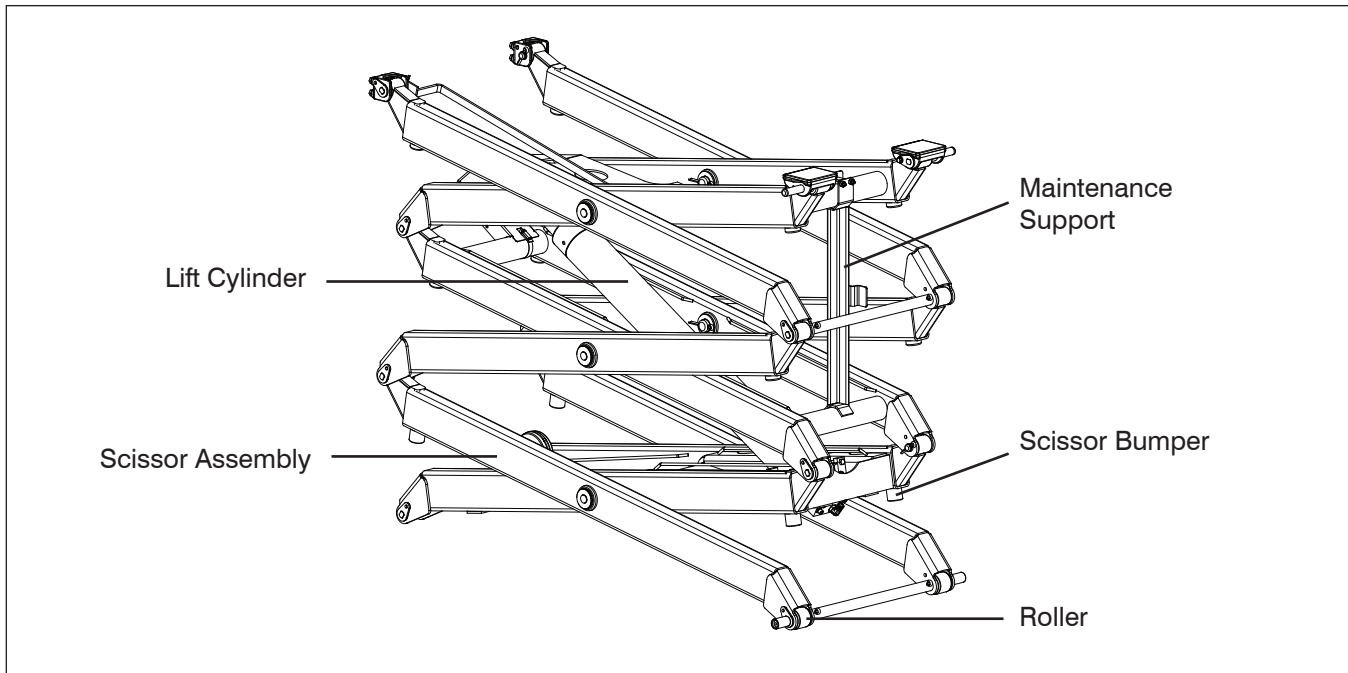
### 1.1-6 Platform Assembly



#### **WARNING**

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

1. Use the ladder of aerial platform to access platform.
  2. Close the gate.
    - Ensure there are no loose or missing parts and there is no visible damage.
    - Ensure all fasteners are securely in place.
    - Ensure all railings are properly positioned and secured.
    - Ensure gate is in good working order.
- **Lanyard Attachment Anchors**
    - Ensure attachment rings are secure and no visible damage.
  - **AC Outlet on Platform**
    - 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 other important documents 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.



- **Powered Extension Control Console (If Equipped)**
  - Ensure all switches are returned to neutral and are properly secured.
  - Ensure there are no loose or missing parts and there is no visible damage.



**WARNING**

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

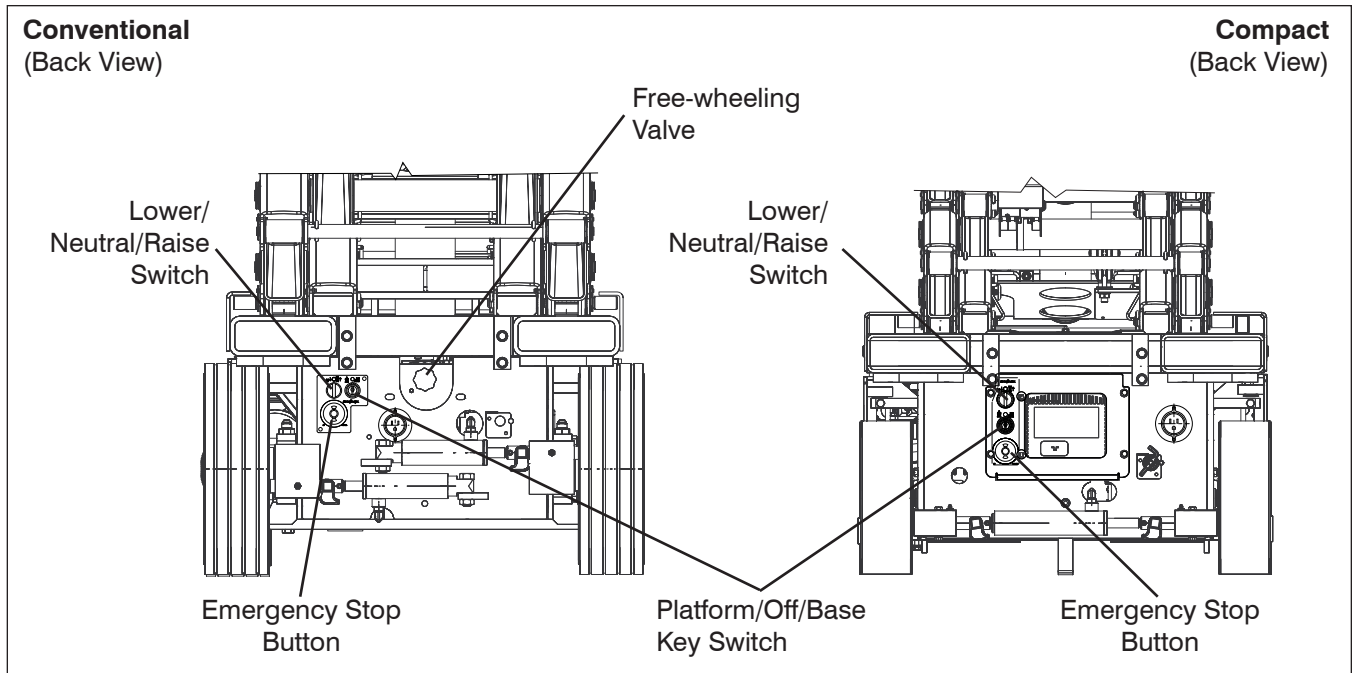
- **Scissor Bumpers**
  - Ensure bumpers are secure and shows no sign of visible damage.
- **Rollers**
  - Ensure rollers are secure and there is no visible damage.
  - Ensure rollers' path of travel are free from dirt and obstructions.
- **Lift Cylinder(s)**
  - Ensure each lift cylinder is properly secured, there are no loose or missing parts and there is no evidence of damage.
  - Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.

3. Use the ladder to dismount from platform.

**1.1-7 Lifting Mechanism**

1. Raise the platform until there is adequate clearance to swing down the maintenance support.
  - **Maintenance Support**
    - Ensure maintenance support is properly secured and shows no visible damage.
  - **Scissor Assembly**
    - Ensure scissor assembly shows no visible damage and no signs of deformation in weldments.
    - Ensure all pins are properly secured.
    - Ensure cables and wires are properly routed and shows no signs of wear and/or physical damage.

2. Raise the platform until there is adequate clearance to swing up the maintenance support.
3. Swing up maintenance support into storage bracket.
4. Fully lower the platform.



## 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 2.10 - 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.  
**Result:** Aerial platform functions should not operate.

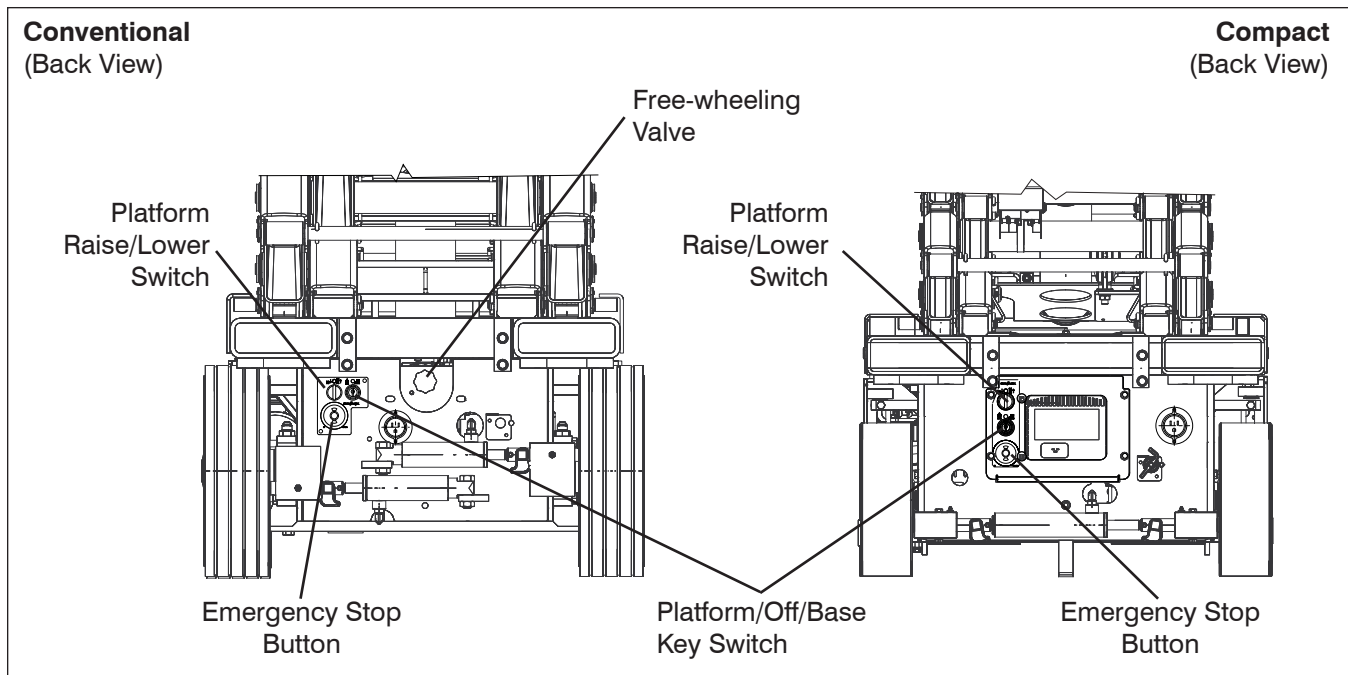
### 1.2-2 Base Control Console





### **WARNING**

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

1. Use the ladder of aerial platform to access platform.
2. Close the gate.
3. On platform control console, pull out “” emergency stop button.
4. Use the ladder to dismount from platform.
5. Turn main power disconnect switch to “|” on position.






• **Test Base Emergency Stop**

1. Push in “
  2. Pull out base “



• **Test Off/Platform/Base Switch**



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

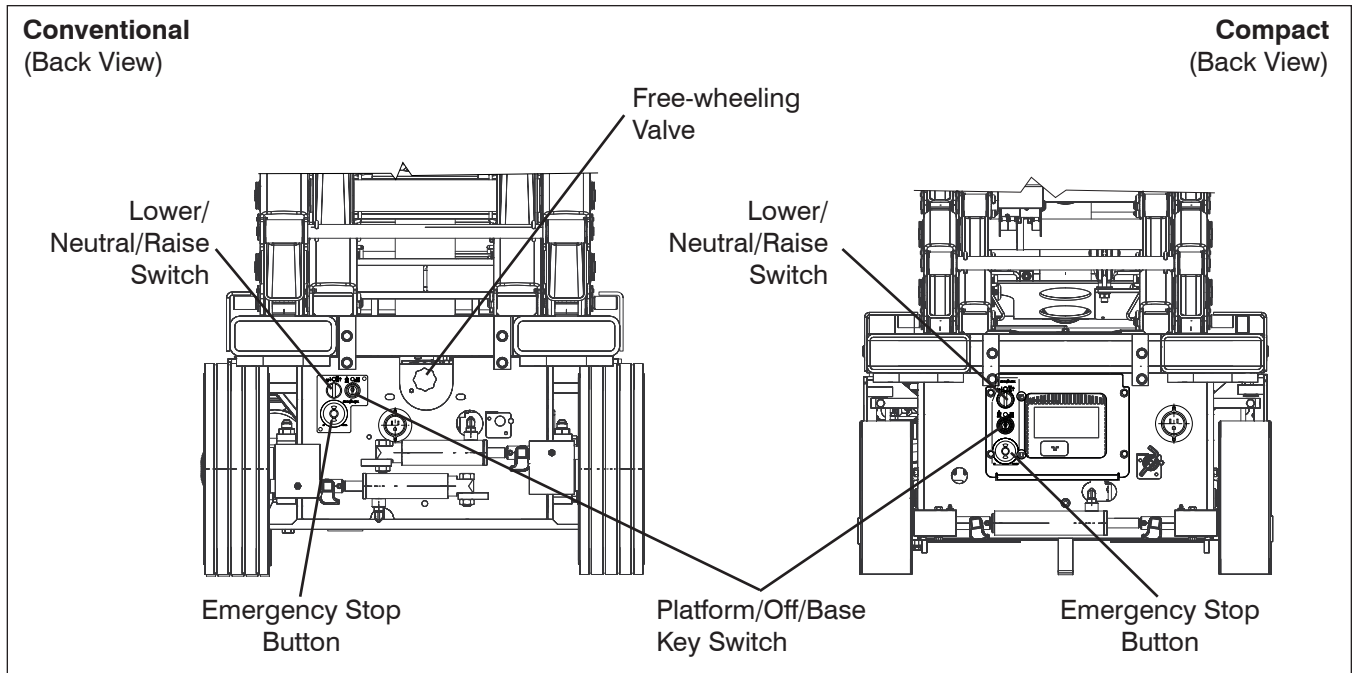
1. Select off/platform/base key switch “
  2. Select off/platform/base key switch to “
    3. Select and hold off/platform/base key switch to “

• **Test Lower/Neutral/Raise Switch**

1. Select and hold off/platform/base key switch to “
  2. Select and hold off/platform/base key switch to “

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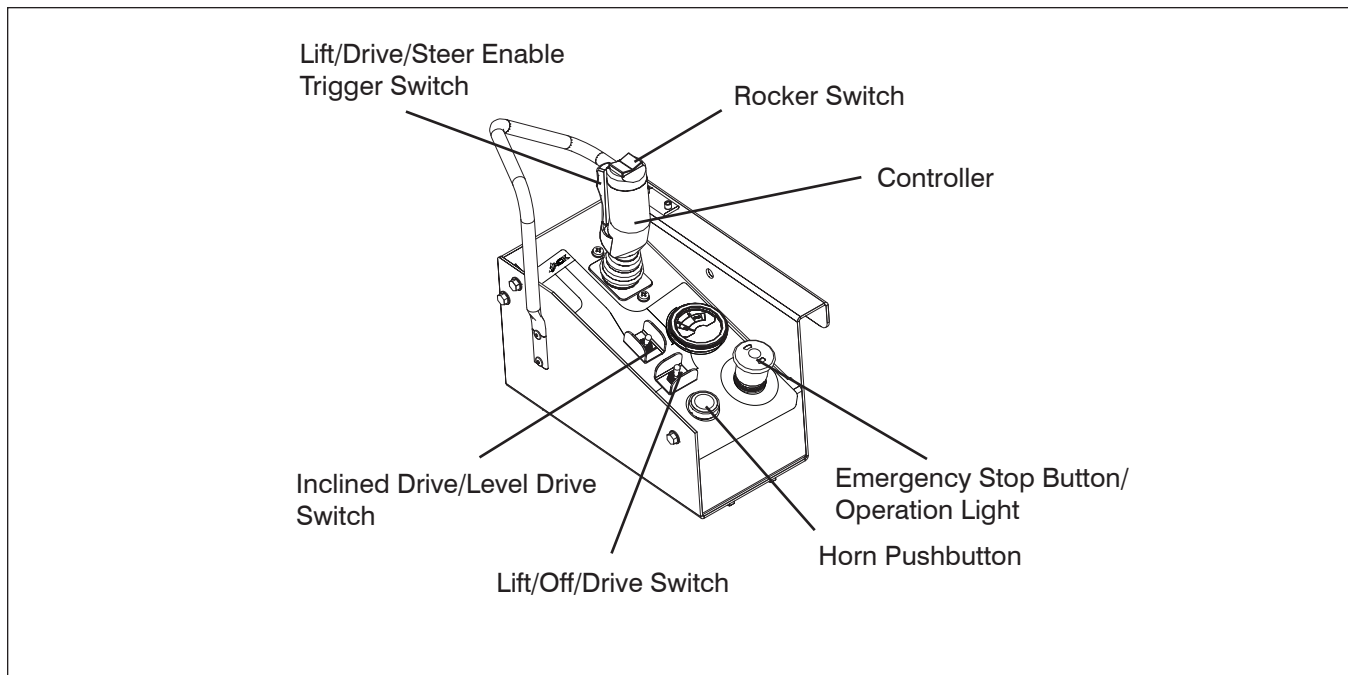


- **Test Emergency Lowering**




1. Raise the platform.
2. Locate holding valve manual override knob at the base of each lift cylinder. Depress and turn counterclockwise. If necessary, use access rod that is located on the base of the aerial platform.
3. On hydraulic/electric tray, pull out and hold emergency lowering valve to fully lower the platform.  
**Result:** The platform should lower.
4. To restore normal operation, depress and turn holding valve manual override knobs clockwise.

- **Test Free-wheeling**

1. Ensure path of intended motion is clear.
2. Release the brake manually.
3. Turn free-wheeling valve knob counterclockwise to a fully opened position and attempt to push/pull the aerial platform.  
**Result:** Platform should move.
4. Turn free-wheeling valve knob clockwise to a fully closed position for normal operation.
5. Reengage the brake.




**1.2-3 Platform Control Console**

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




**WARNING**


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

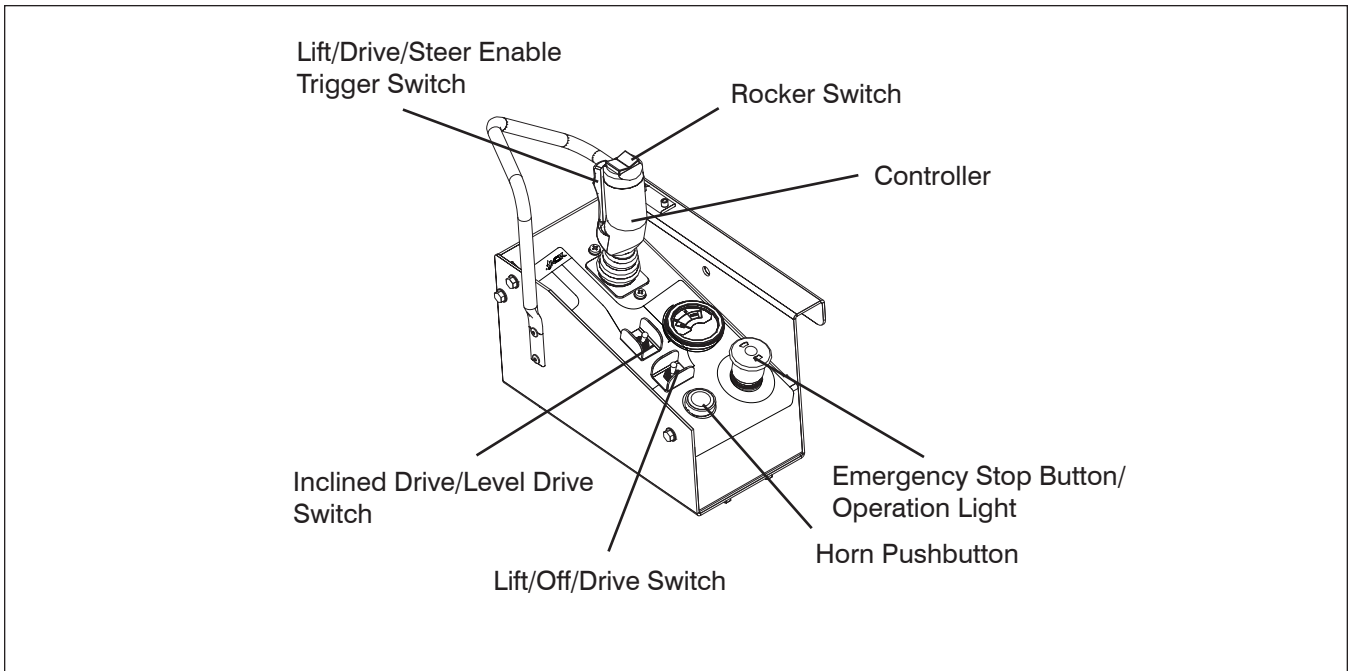
4. Use the ladder of aerial platform to access platform.
5. Close the gate.
6. On platform control console, pull out “” emergency stop button.

• **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.

• **Test Enable Trigger Switch**





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



- **Test Steering**




**NOTE**

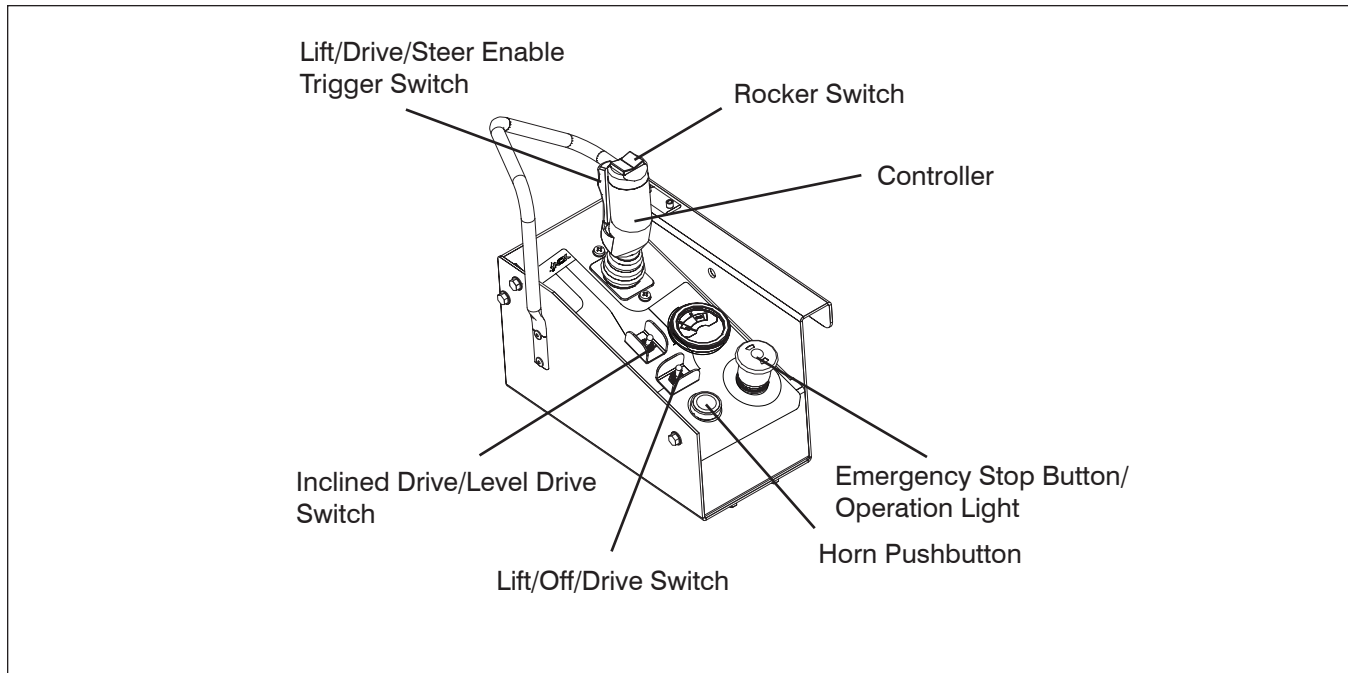
Inclined drive (low speed/high torque) is not available on 3215 and 3219 models.

1. Select lift/off/drive switch to “ drive” position.
2. Activate and hold “” enable trigger switch.
3. Press rocker switch on top of controller handle to “ left” and “ right”.

**Result:** Steer wheels should turn left and right.

- **Test Driving**

1. Ensure path of intended motion is clear.
2. Activate and hold “” enable trigger switch.
3. 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.
4. 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**

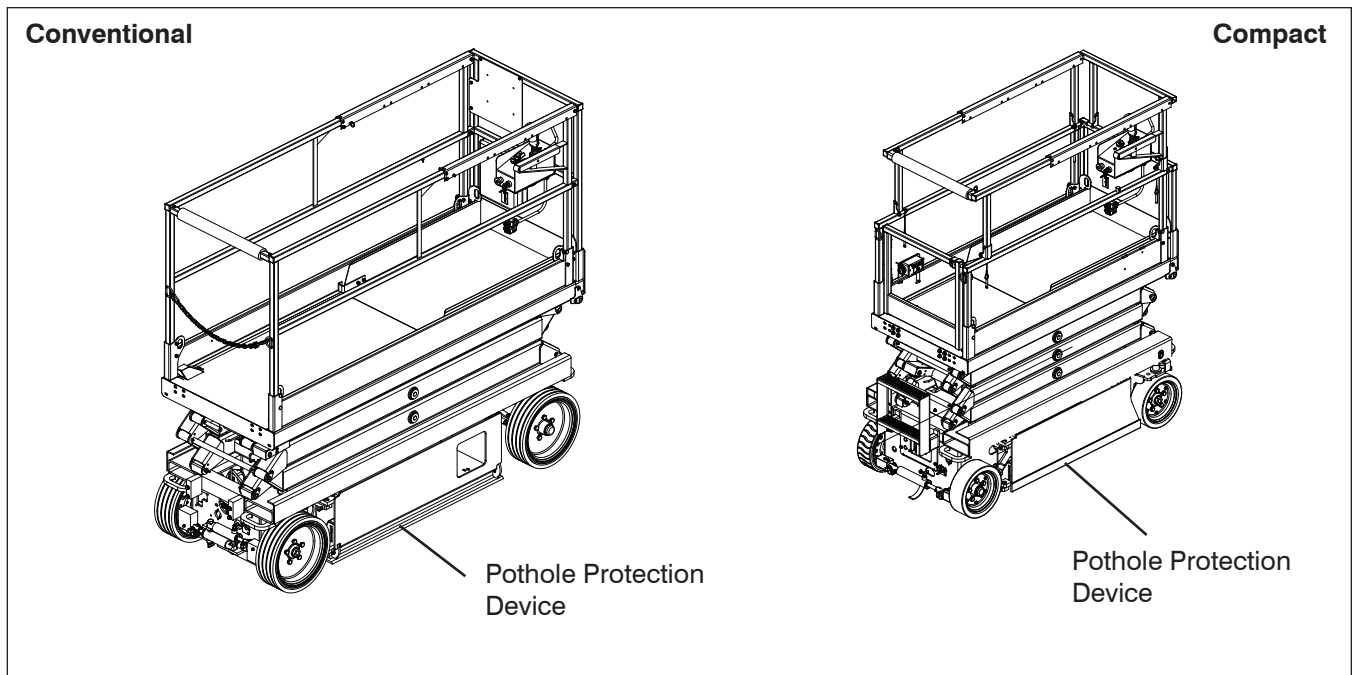
**Brakes will engage instantly when you release the controller handle, causing aerial platform to stop immediately.**

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 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. Activate and hold “” enable trigger switch.
3. Push controller handle and raise the platform to an approximate height of 1 ft. (30.5 cm).  
**Result:** Platform should rise.
4. Pull controller handle and lower the platform fully.  
**Result:** Platform should lower.

- **Test Horn**

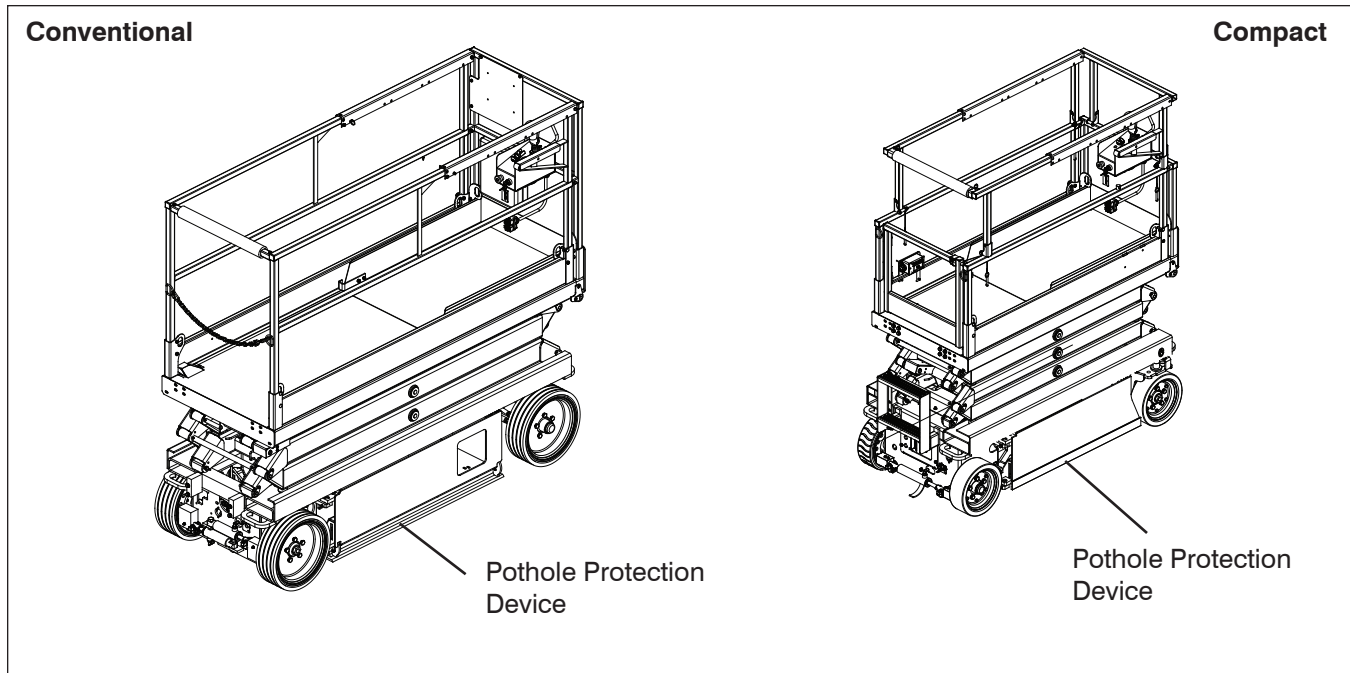
1. Push “” horn pushbutton.  
**Result:** Horn should sound.

- **Test Pothole Sensor**

**WARNING**

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

1. Use the ladder to dismount from platform and place a block, approximately 1.5” (3.75 cm), under the hydraulic/electric tray.
2. Use the ladder of aerial platform to access platform.
3. Close the gate.
4. Raise the platform until approximately a height of 7 feet (2 meters) 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 battery tray.  
**Result:** Aerial platform should not move forward or backward.



• **Test Elevated Drive Speed**



**WARNING**

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

1. Ensure path of intended motion is clear.
2. Raise the platform until approximately a height of 7 feet (2 meters) is reached and attempt to drive forward or reverse.  
**Result:** Aerial platform should move slower than when it was in stowed position.

• **Test Tilt Sensor**



**WARNING**

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



**WARNING**

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

1. Move the aerial platform on to a slope not greater than 4.5°.

2. Use the ladder to dismount from platform.

3. On base control console, slowly raise the platform.

**Result:** When platform reaches an appropriate height, a warning signal should sound and platform stop raising as lift and drive controls should be disabled.

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## Section 2 MAINTENANCE TABLES AND DIAGRAMS

### Table of Contents

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2.2	Floor Loading Pressure.....	5
2.3	Maximum Platform Capacities (Evenly Distributed) .....	6
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**Table 2.1 Specifications and Features**

MODEL	3215	3219	3220	3226
<b>Weight *</b>	2400 lb. 1089 kg	2580 lb. 1170 kg	3510 lb. 1592 kg	4135 lb. 1876 kg
<b>Overall width</b>	32" 0.81 m		32" 0.81 m	
<b>Overall length</b>	70.0" 1.78 m		91" 2.3 m	
<b>Platform Size (inside)</b>	26" x 64" 0.66 m x 1.63 m		28" x 83" 0.71 x 2.1 m	
<b>Height</b>				
<b>Working Height</b>	21' 6.4 m	25' 7.6 m	26' 8.1 m	32' 9.9 m
<b>Platform Elevated Height</b>	15' 4.6 m	19' 5.8 m	20' 6.1 m	26' 7.9 m
<b>Stowed Platform Height</b>	34.5" 0.88 m	39" 0.99 m	38" 0.97 m	45" 1.1 m
<b>Stowed Height (Railings Up)</b>	74" 1.88 m	78.5" 1.99 m	82" 2.1 m	89" 2.3 m
<b>Drive Height</b>	FULL			
<b>Standard Operating Time</b>				
<b>Lift Time (No Load)</b>	18 s	20 s	27 s	47 s
<b>Lower Time (No Load)</b>	32 s	39 s	41 s	63 s
<b>Lift Time (Rated Load)</b>	23 s	25 s	33 s	51 s
<b>Lower Time (Rated Load)</b>	24 s	29 s	29 s	46 s
<b>Chassis</b>				
<b>Normal Drive Speed</b>	2 mph 3.2 km/h		1.9 mph 3.0 km/h	2.4 mph 3.8 km/h
<b>Elevated Drive Speed</b>	0.65 mph 1.05 km/h		0.64 mph 1.0 km/h	0.64 mph 1.0 km/h
<b>High Torque Drive Speed</b>	N/A		0.95 mph 1.5 km/h	1.2 mph 1.9 km/h
<b>Gradeability (Ramp Angle)</b>	23%		25%	
<b>Tires</b>	12 x 4 x 8 Solid Rubber		16 x 5 x 12 Solid Rubber	
<b>Hydraulic Oil</b>				
<b>Type</b>	ATF Dexron III		ATF Dexron III	
<b>Tank Capacity</b>	2.9 gal. 10.9 L		7.93 gal. 30 L	

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\* Weight with standard 3' (0.9 m) or 4' (1.2 m) extension platform.  
Refer to nameplate for aerial platforms with 5' (1.5 m) or 6' (1.8 m) extension platform.

Table 2.1 Specifications and Features (Continued)

MODEL	4620	4626	4632
<b>Weight *</b>	4100 lb. 1860 kg	4700 lb. 2132 kg	5075 lb. 2302 kg
<b>Overall width</b>	46" 1.17 m		
<b>Overall length</b>	91" 2.31 m		
<b>Platform Size (inside)</b>	42" x 84" 1.07 m x 2.13 m		
<b>Height</b>			
<b>Working Height</b>	26' 7.92 m	32' 9.75 m	38' 11.6 m
<b>Platform Elevated Height</b>	20' 6.1 m	26' 7.9 m	32' 9.8 m
<b>Stowed Platform Height</b>	38" 0.97 m	45" 1.14 m	48.5" 1.23 m
<b>Stowed Height Railings Up</b>	77.25" 1.96 m	84.5" 2.15 m	88" 2.24 m
<b>Drive Height</b>	FULL		
<b>Standard Operating Time</b>			
<b>Lift Time (No Load)</b>	24 s	48 s	50 s
<b>Lower Time (No Load)</b>	48 s	45 s	62 s
<b>Lift Time (Rated Load)</b>	32 s	54 s	59 s
<b>Lower Time (Rated Load)</b>	32 s	32 s	49 s
<b>Chassis</b>			
<b>Normal Drive Speed</b>	2.0 mph 3.2 km/h		
<b>Elevated Drive Speed</b>	0.56 mph 0.90 km/h		
<b>High Torque Drive Speed</b>	1.0 mph 1.6 km/h		
<b>Gradeability</b>	25%		
<b>Tires</b>	16 x 5 x 12 Solid Rubber		
<b>Hydraulic Oil</b>			
<b>Type</b>	ATF Dexron III		
<b>Tank Capacity</b>	7.93 gal. 30 L		

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\* Weight with standard 3' (0.9 m) or 4' (1.2 m) extension platform.  
Refer to serial nameplate for specific applications.

<sup>1</sup> Fill hardness: 55 Durometer

Floor Loading Pressure

Locally Concentrated Pressure (LCP):

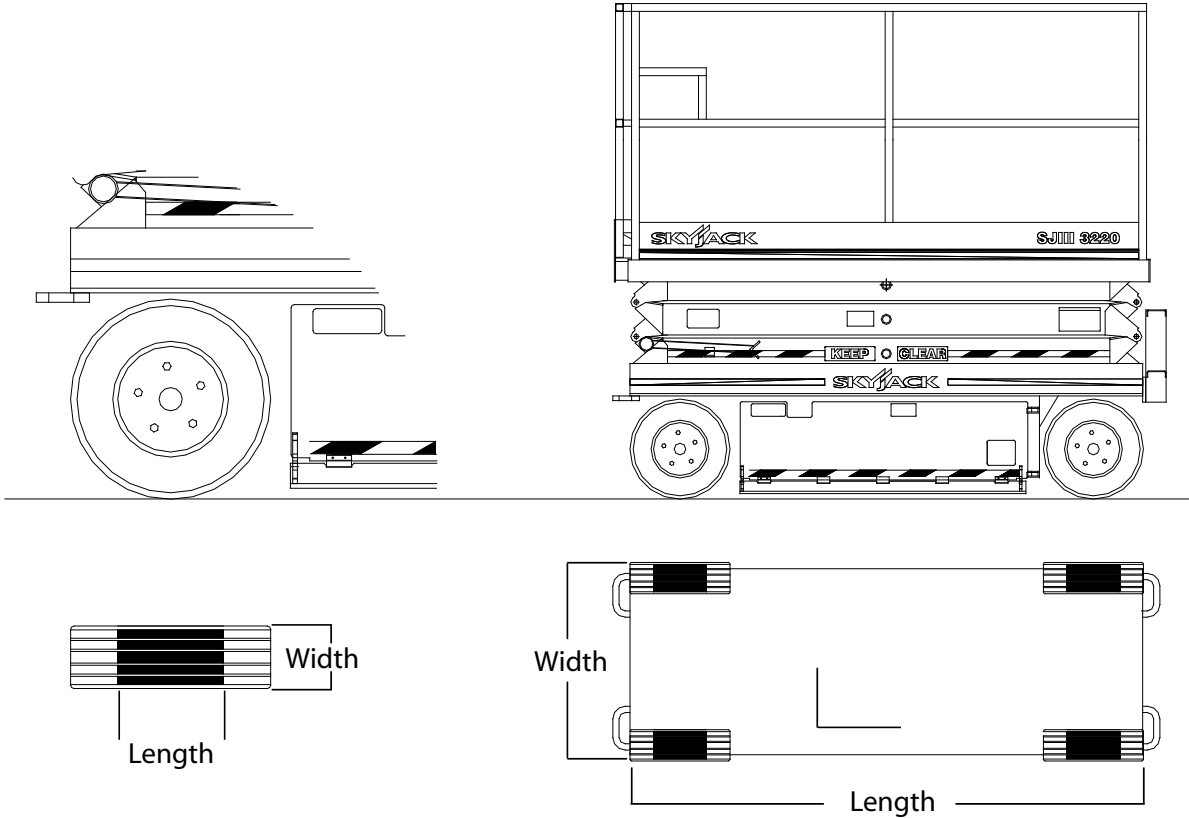
Foot Print Area = Length x Width

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

Overall Uniform Pressure (OUP):

Base Area = Length x Width

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



**! 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 2.2 Floor Loading Pressure

MODEL		Total Aerial Platform Weight		Total Aerial Platform Load					
				Wheel		LCP**		OUP**	
		lb.	kg	lb.	kg	psi	KPa (kN/m <sup>2</sup> )	psf	KPa (kN/m <sup>2</sup> )
3215	min*	2400	1089	960	435	100	689.48	160	7.66
	max*	3000	1361	1200	544	110	758.42	200	9.58
3219	min*	2580	1170	1032	468	100	689.48	170	8.14
	max*	3130	1420	1252	568	110	758.42	210	10.05
3220	min*	3400	1542	1396	633	110	758.42	175	8.38
	max*	4299	1950	1936	878	130	896.32	245	11.73
3226	min*	4100	1860	1644	746	120	827.37	210	10.05
	max*	4610	2091	1844	836	130	896.32	235	11.25
4620	min*	4100	1860	1640	744	191	1316.90	146	6.99
	max*	5620	2549	2250	1021	222	1530.64	199	9.53
4626	min*	4700	2132	1880	853	206	1420.32	168	8.04
	max*	5920	2685	2370	1075	224	1544.43	210	10.05
4632	min*	5075	2302	2030	921	208	1434.11	180	8.62
	max*	5775	2620	2310	1048	223	1537.53	205	9.82

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- \* **min** - Total 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 than 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 2.3 Maximum Platform Capacities (Evenly Distributed)**

MODEL	Manual Extension Platform				Powered Extension Platform				Maximum Wind Speed	Tilt Cutout Setting
	Total Capacity		Extension Capacity		Total Capacity		Extension Capacity			
<b>3215</b>	600 lb. 272 kg	2 Persons	250 lb. 113 kg	1 Person	N/A				28 mph 12.5 m/s	1.5 x 3.5
<b>3219</b>	550 lb. 249 kg	2 Persons	250 lb. 113 kg	1 Person	N/A				28 mph 12.5 m/s	1.5 x 3.5
<b>3220</b>	900 lb. 408 kg	2 Persons	300 lb. 136 kg	1 Person	800 lb. 363 kg	2 Persons	300 lb. 136 kg	1 Person	28 mph 12.5 m/s	1.5 x 3.5
<b>3226</b>	500 lb. 227 kg	2 Persons	250 lb. 113 kg	1 Person	N/A				28 mph 12.5 m/s	1.5 x 3.5
<b>4620</b>	1300 lb. 590 kg	3 Persons	300 lb. 136 kg	1 Person	1300 lb. 590 kg	3 Persons	300 lb. 136 kg	1 Person	28 mph 12.5 m/s	2.5 x 4.5
<b>4626</b>	1000 lb. 454 kg	3 Persons	300 lb. 136 kg	1 Person	1000 lb. 454 kg	3 Persons	300 lb. 136 kg	1 Person	28 mph 12.5 m/s	2.5 x 4.5
<b>4632</b>	700 lb. 318 kg	2 Persons	250 lb. 113 kg	1 Person	N/A				28 mph 12.5 m/s	2.5 x 4.5

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**NOTE:** Overall Capacity - Occupants and materials not to exceed rated load.

Table 2.4 Torque Specifications

Directional valve mounting bolts	28-32 lbf.in			2.2 – 3.6 Nm				
Wheel mounting bolts	70 lbf.ft			94.9 Nm				
Wheel motor castle nut (Models 32xx & 46xx)	280 lbf.ft			379.6 Nm				
Wheel motor castle nut (Model 68xx)	350 lbf.ft			474.5 Nm				
Parking brake cylinder rod nut	35 lbf.ft			47.5 Nm				
<b>Cartridge</b>								
	<b>Size</b>							
<b>Torque</b>	08	38	58	10	12	16		
Lbf.ft (max)	20	20	20	25	35	50		
Lbf.in (max)	240	240	240	300	420	600		
Nm (max)	27.12	27.12	27.12	33.90	47.46	67.80		
<b>Coils</b>								
	<b>Size</b>							
<b>Torque</b>	All coils							
Lbf.ft (max)	4 to 5							
Lbf.in (max)	48 to 60							
Nm (max)	5.42 to 6.78							
<b>SAE Plugs</b>								
	<b>Size</b>							
<b>Torque</b>	2	4	5	6	8	10	12	16
Lbf.ft (max)	3	10	15	15	25	25	30	35
Lbf.in (max)	36	120	180	180	300	300	360	420
Nm (max)	4.07	13.56	20.34	20.34	33.90	33.90	40.68	47.46
<b>Newton-meter = Nm</b>			<b>Pound-force foot = lbf.ft</b>			<b>Pound-force inch = lbf.in</b>		

60056AD

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## **Section 3**

# **SYSTEM COMPONENT IDENTIFICATION AND SCHEMATICS**

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

































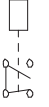
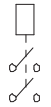
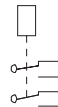

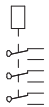


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





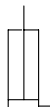

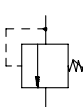
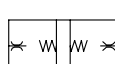


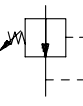




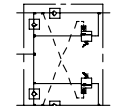



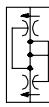



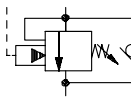





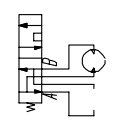
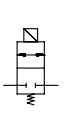

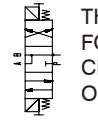
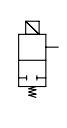
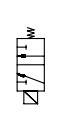
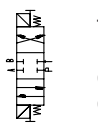
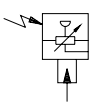


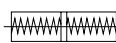


3.1 Electrical Symbol Chart

	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 THROW 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		



3.2 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						

## 3.3 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 original color coding, for example if wire 7 is red, wire 7A, 7B, and 7C will also be red.

## 3.4 Hydraulic Schematic Parts List

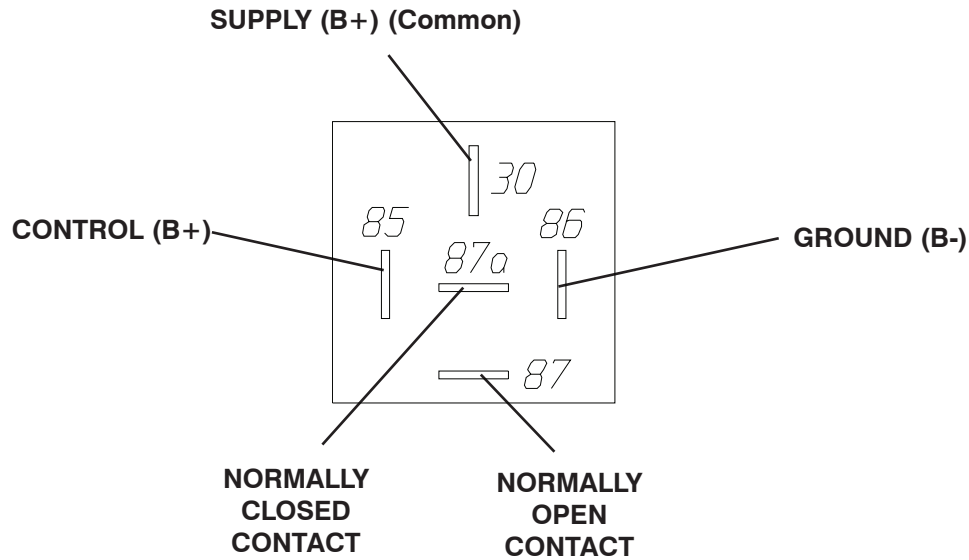
Index No.	Skyjack Part No.	Qty.	Description
2H-13	103655	1	VALVE, Control (Lowering) <b>(ANSI/CSA)</b>
2H-13-1	107269	1	VALVE, Control (Holding) <b>(ANSI/CSA)</b>
2H-13-2	107269	1	VALVE, Control (Holding) <b>(ANSI/CSA)</b>
2H-18A	104132	1	VALVE, Control (Differential)
2H-59B	132749	1	VALVE, Control (Proportional)
3H-14	106273	1	VALVE, Control (Lift)
3H-17A	103623	1	VALVE, Control (Brake)
3H-18A-1	103623	1	VALVE, Control (Speed A)
3H-18A-2	103623	1	VALVE, Control (Speed B)
4H-15	153334	1	VALVE, Control (Reverse drive) (Hytos) (includes 4H-16)
4H-16	-	1	VALVE, Control (Forward drive) (Hytos)
4H-23	153334	1	VALVE, Control (Right steer) (Hytos) (includes 4H-24)
4H-24		1	VALVE, Control (Left steer) (Hytos)
4H-26	113953	1	VALVE, Powered platform extend (includes 4H-27) <b>(Models 3220/4620/4626)</b>
4H-27	113953	1	VALVE, Powered platform retract (includes 4H-26) <b>(Models 3220/4620/4626)</b>
C1	124291	1	CYLINDER (Cushion)
C2	120989	1	CYLINDER (Lift) <b>(Models 3220/4620)</b>
	120989	2	CYLINDER (Lift) <b>(Models 3226/4626/4632)</b>
C3	120236	1	CYLINDER (Steer)
C4	120220	2	CYLINDER (Brake) <b>(Models 322x)</b>
C5	127100	1	CYLINDER (Powered extension platform) <b>(Models 3220/4620)</b>
	127100	2	CYLINDER (Powered extension platform) <b>(Model 4626)</b>
CB1	147889	1	VALVE, Counterbalance
CRV1	115299	1	VALVE, Cross-Over Relief (Option)
F1	109568	1	FILTER ASSEMBLY, Return
FD1	103354	1	VALVE, Flow divider/combiner
M1	103129	1	MOTOR, Hydraulic Wheel (Left hand) <b>(Models 322x)</b>
M2	103129	1	MOTOR, Hydraulic Wheel (Right hand) <b>(Models 322x)</b>
M3	134573	1	MOTOR, Hydraulic Wheel (Left hand) <b>(Models 46xx)</b>
M4	134573	1	MOTOR, Hydraulic Wheel (Right hand) <b>(Models 46xx)</b>
MB1	107354	1	BLOCK, Manifold (Main)
MB2	107493	1	BLOCK, Manifold (Emergency lowering)
MB3	111314	1	BLOCK, Manifold (Holding valve) <b>(Models 3220/4620 ANSI/CSA)</b>
	111320	1	BLOCK, Manifold (Upper holding valve) <b>(Models xx26/4632 ANSI/CSA)</b>
	111316	1	BLOCK, Manifold (Lower holding valve) <b>(Models xx26/4632 ANSI/CSA)</b>
MB4	108195	1	BLOCK, Manifold (Rear drive)
MB5	--	1	BLOCK, Manifold (Powered extension platform - part of cylinder weldment)
MB7	146563	1	MANIFOLD BLOCK (Brake release) <b>(Models 46xx)</b>
MB9	132748	1	MANIFOLD BLOCK (Proportional control)
O2	105530	1	ORIFICE (0.081" diameter) (Lowering) <b>(Model 4632)</b>
	122213	1	ORIFICE (0.073" diameter) (Lowering) <b>(Model 4620)</b>
O3	105811	1	ORIFICE (0.040" diameter) (Steer)
O4	105281	1	ORIFICE (0.067" diameter) (Emergency lowering) <b>(Models 3220/4620)</b>
	105281	2	ORIFICE (0.067" diameter) (Emergency lowering) <b>(Models 3226/4626/4632)</b>
O6	104434	1	ORIFICE (0.040" diameter) (Differential)
O7	104434	1	ORIFICE (0.040" diameter) (Brake) <b>(Models 322x)</b>
	137127	1	ORIFICE (0.020" diameter) (Brake) <b>(Models 46xx)</b>

**Parts list continued on the following page.**

3.4 Hydraulic Schematic Parts List (Continued)

Index No.	Skyjack Part No.	Qty.	Description
<b>Parts list continued from the following page.</b>			
P1	106577	1	PUMP, Hydraulic <b>(Model 4620, except EE rated)</b>
	106587	1	PUMP, Hydraulic <b>(Models 4626/4632, except EE rated)</b>
	129961	1	PUMP, Hydraulic <b>(ANSI/CSA EE rated)</b>
	129965	1	PUMP, Hydraulic <b>(EE rated)</b>
	310567	1	PUMP, Hydraulic (Standard)
P2	146560	1	PUMP, Handle (Brake release) <b>(Models 46xx)</b>
PS1	102863	1	SWITCH, Pressure (Option)
	113799	1	• BLOCK, Manifold
R1	104534	1	VALVE, Relief (System)
R2	104534	1	VALVE, Relief (Lift)
R3	106557	2	VALVE, Relief (Holding valve) <b>(Models 3226/4626/4632)</b>
V1	107271	1	VALVE (Emergency lowering)
V2	103136	1	VALVE (Free-wheeling)
V3	146562	1	VALVE (Auto reset - brake release) <b>(Models 46xx)</b>

3.5 Electrical Components Parts List



Index No.	Skyjack Part No.	Qty.	Description
17CR	108589	1	RELAY, 24 Volt (Transfer)
21CCR	108589	1	RELAY, 24 Volt (Proportional) <b>(ANSI/CSA &amp; EE rated)</b>
28CR	108589	1	RELAY, 24 Volt (Tilt switch) <b>(ANSI/CSA &amp; EE rated)</b>
2H-13	103605	1	COIL, 24 Volt (Lowering valve) <b>(ANSI/CSA)</b>
2H-13-1	104493	1	COIL, 24 Volt (Holding valve) <b>(ANSI/CSA)</b>
2H-13-2	104493	1	COIL, 24 Volt (Holding valve) <b>(ANSI/CSA)</b>
2H-18A	103605	1	COIL, 24 Volt (Differential valve)
2H-59	115370	1	COIL, 24 Volt (Proportional valve)
3H-14A	105610	1	COIL, 24 Volt (Lift valve) <b>(ANSI/CSA)</b>
3H-17A	103605	1	COIL, 24 Volt (Brake valve)
3H-18A-1	103605	1	COIL, 24 Volt (Speed A)
3H-18A-2	103605	1	COIL, 24 Volt (Speed B)
4H-15	153335	1	COIL, 24 Volt (Reverse drive spool valve) (Hytos)
4H-16	153335	1	COIL, 24 Volt (Forward drive spool valve) (Hytos)
4H-23	153335	1	COIL, 24 Volt (Right steer spool valve) (Hytos)
4H-24	153335	1	COIL, 24 Volt (Left steer spool valve) (Hytos)
4H-26	103605	1	COIL, 24 Volt (Power extension platform extend) (option)
4H-27	103605	1	COIL, 24 Volt (Power extension platform retract) (option)
AT1	130440	1	TRANSDUCER, Angle
B1-B4	103480	4	BATTERY, 6 Volt (U2200)
B1-B4	106552	4	BATTERY, 6 Volt (U2500)
B1-B4	\$	4	BATTERY, 6 Volt (T2200)

**Parts list continued on the following page.**

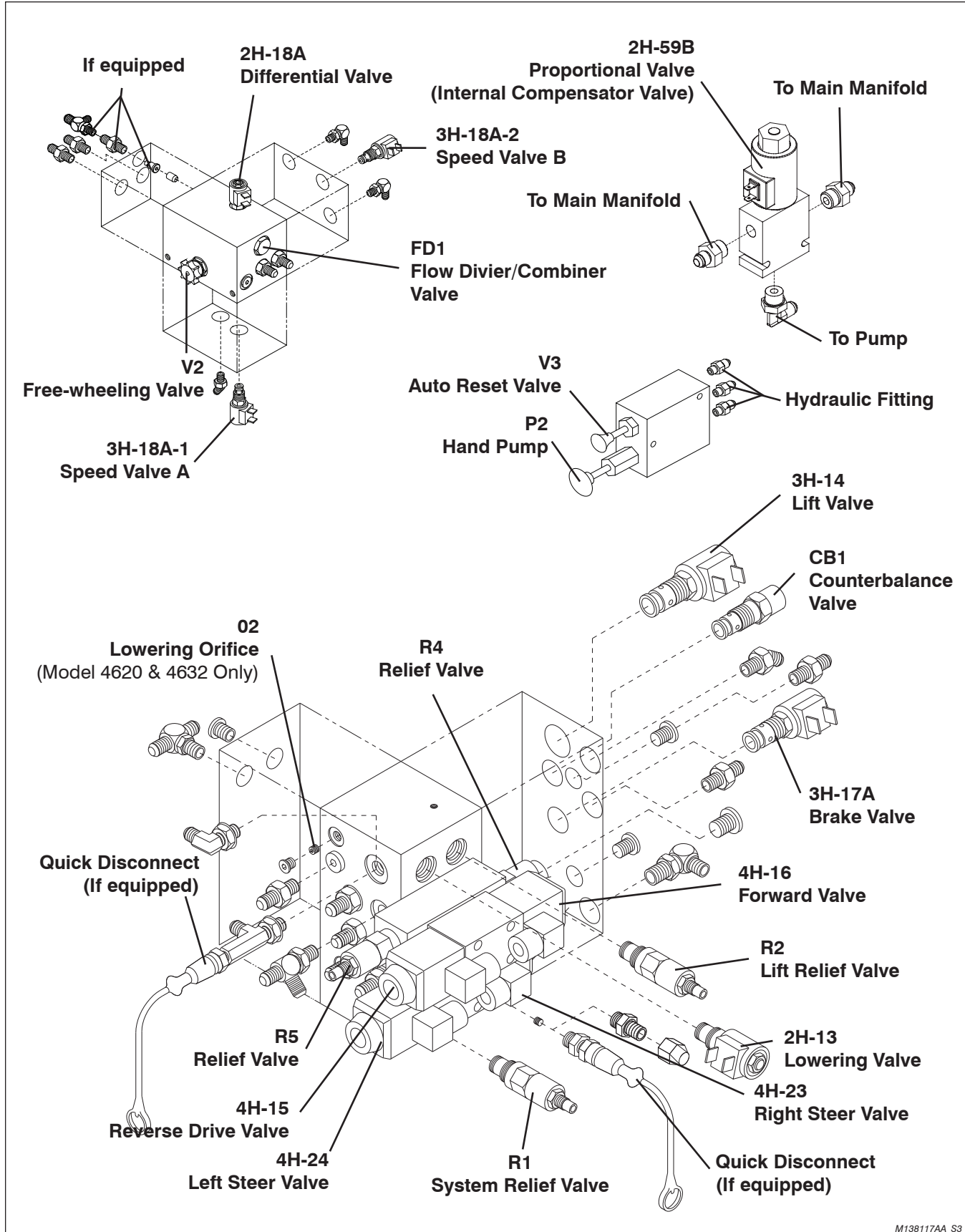
## 3.5 Electrical Component Parts List

Index No.	Skyjack Part No.	Qty.	Description
<b>Parts list continued from the following page.</b>			
BC	128537	1	CHARGER, 24VDC Battery (superior universal)
BCI	122093	1	BATTERY CHARGE INDICATOR
BP-29	103057	1	BEEPER, 24 VDC
C1	146475	1	CONTACTOR, Motor (24 Volt)
CAP1	110699	1	CAPACITOR (.47UF 50 Volts)
CB1	117325	2	BREAKER, Circuit (15 Amp)
CB2	117325	2	BREAKER, Circuit (15 Amp)
D02-X	129258	AR	DIODE
D19A	-		ALARM OPTION
DA1	119758	1	DIODE PACK
DA2	119520	1	DIODE ASSEMBLY
DA3	119624	1	DIODE ASSEMBLY
DCM1	147664	1	MOTOR (24 VDC)
	123477	1	MOTOR (24 VDC) <b>(EE rated)</b>
DXX	102921	AR	DIODE
F1	310517	1	FUSE (300 Amp in-line fuse)
FL-22	121477	1	FLASHING LIGHT, 24VDC (Option)
FL-29	103743	1	FLASHER (Option)
H1	146649	1	HORN, Operator (Low tone)
LED-1	147061	1	POWER INDICATOR LIGHT (Platform control console)
LED-2	147061	1	POWER INDICATOR LIGHT (Base control console)
LS1A	121975	1	LIMIT SWITCH (High speed)
LS1B	121975	1	LIMIT SWITCH (High speed)
LS3	122014	1	LIMIT SWITCH (End of stroke - option)
LS4	125887	1	LIMIT SWITCH, Pothole protection (Battery tray)
LS4	126051	1	LIMIT SWITCH, Pothole protection (Battery tray) <b>(EE rated)</b>
LS5	125885	1	LIMIT SWITCH, Pothole protection (Hydraulic tray)
LS5	126060	1	LIMIT SWITCH, Pothole protection (Hydraulic tray) <b>(EE rated)</b>
LS6	121975	1	LIMIT SWITCH (Drive override)
RST1	119629	1	RESISTOR (2.7K ohm)
RST2	146644	1	RESISTOR (25W-30 ohm)
RST3	116505	1	RESISTOR, Low voltage protection
<b>Parts list continued on the following page.</b>			

## 3.5 Electrical Component Parts List (Continued)

Index No.	Skyjack Part No.	Qty.	Description
<b>Parts list continued from the following page.</b>			
S1	119725	1	SWITCH, Main power disconnect
S2	147054	2	N.O. CONTACT (Raise/Lower)
S3	147053	3	N.C. CONTACT (Lift/Drive)
	147054	3	N.O. CONTACT (Lift/Drive) (without power extension platform)
		4	N.O. CONTACT (Lift/Drive) (with power extension platform)
S4	147053	2	N.C. CONTACT (Emergency stop) (Platform control console)
S7	123994	1	CONTROLLER ASSEMBLY, Proportional
S7-1	122869	1	SWITCH (Neutral)
S7-2	122877	1	SWITCH (Right steer)
S7-3	122877	1	SWITCH (Left steer)
S7-6	122872	1	SWITCH, Pushbutton (Enable)
S8	147054	1	N.O. CONTACT (Horn)
S10	147053	2	N.C. CONTACT (Off/Platform)
	147054	1	N.O. CONTACT (Base)
S11	102853	1	SWITCH (Powered extension platform extend/retract)
S12	102853	1	SWITCH (Powered extension platform enable)
S28	147053	1	N.C. CONTACT (Emergency stop) (Base control console)
TS1	146658	1	TILT SWITCH <b>(Model 32xx)</b>
	146661	1	TILT SWITCH <b>(Model 46xx)</b>
TT	103336	1	HOURMETER

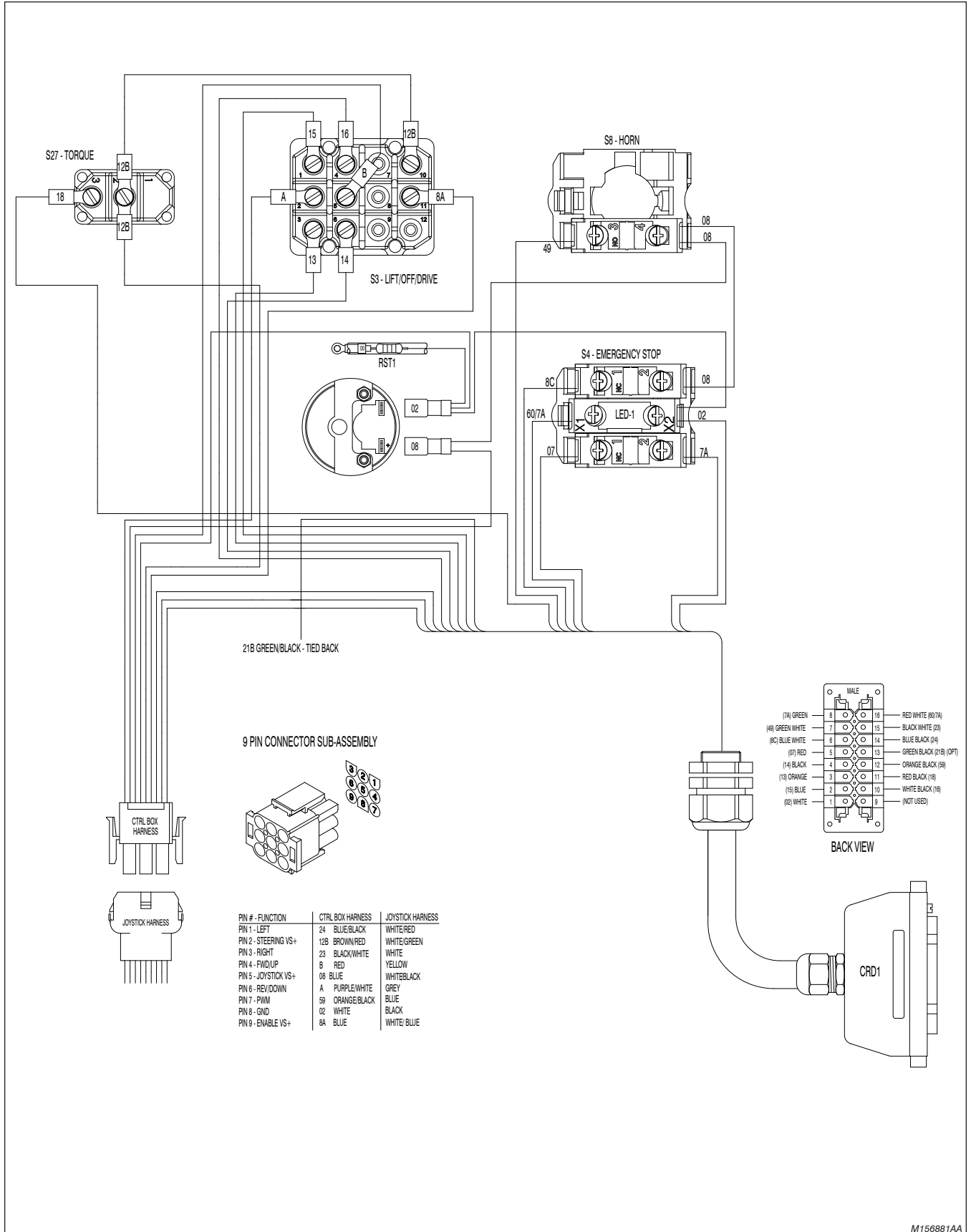
3.6 Hydraulic Manifold and Port Identifications



M138117AA\_S3

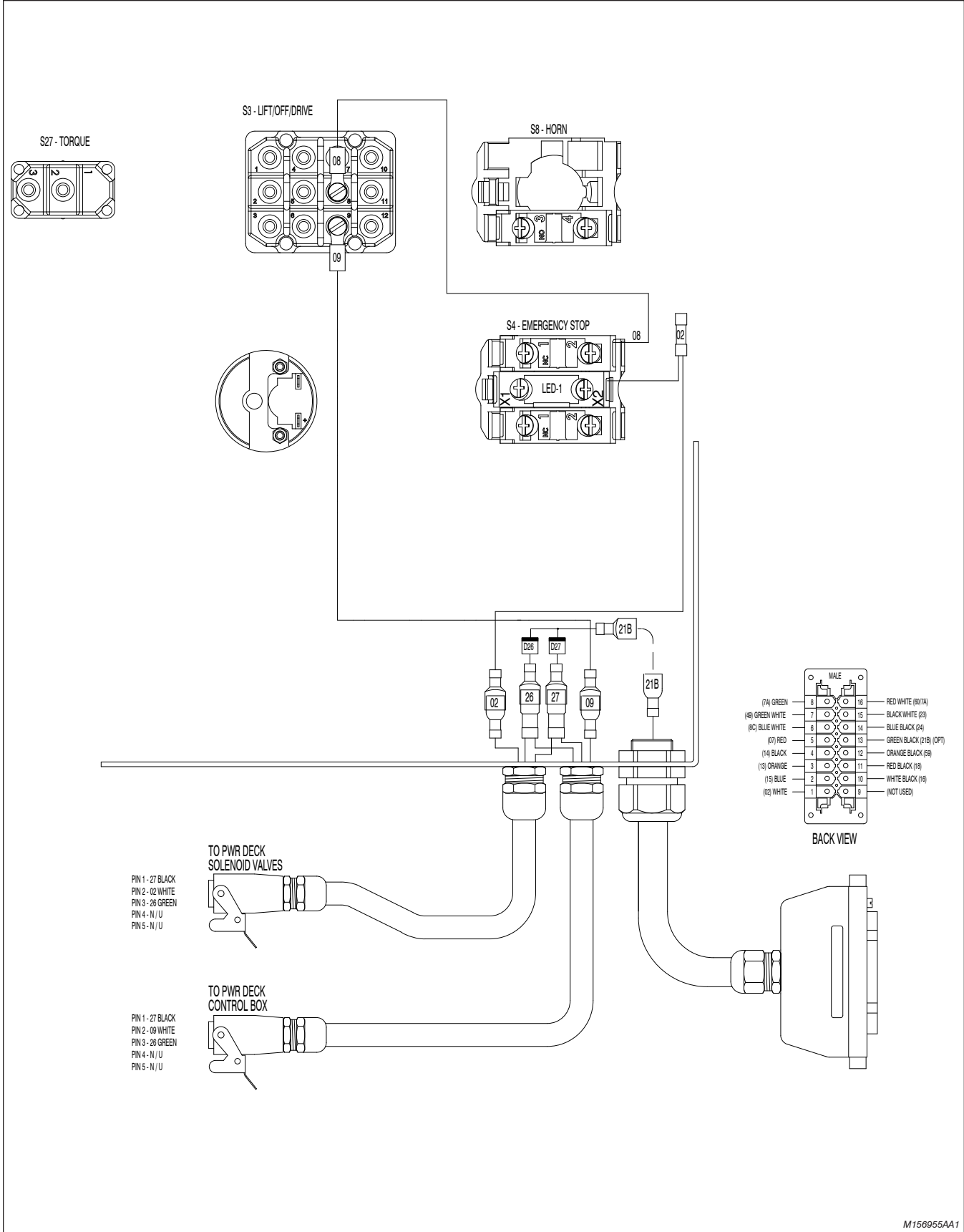


3.7 Platform Control Console Diagram



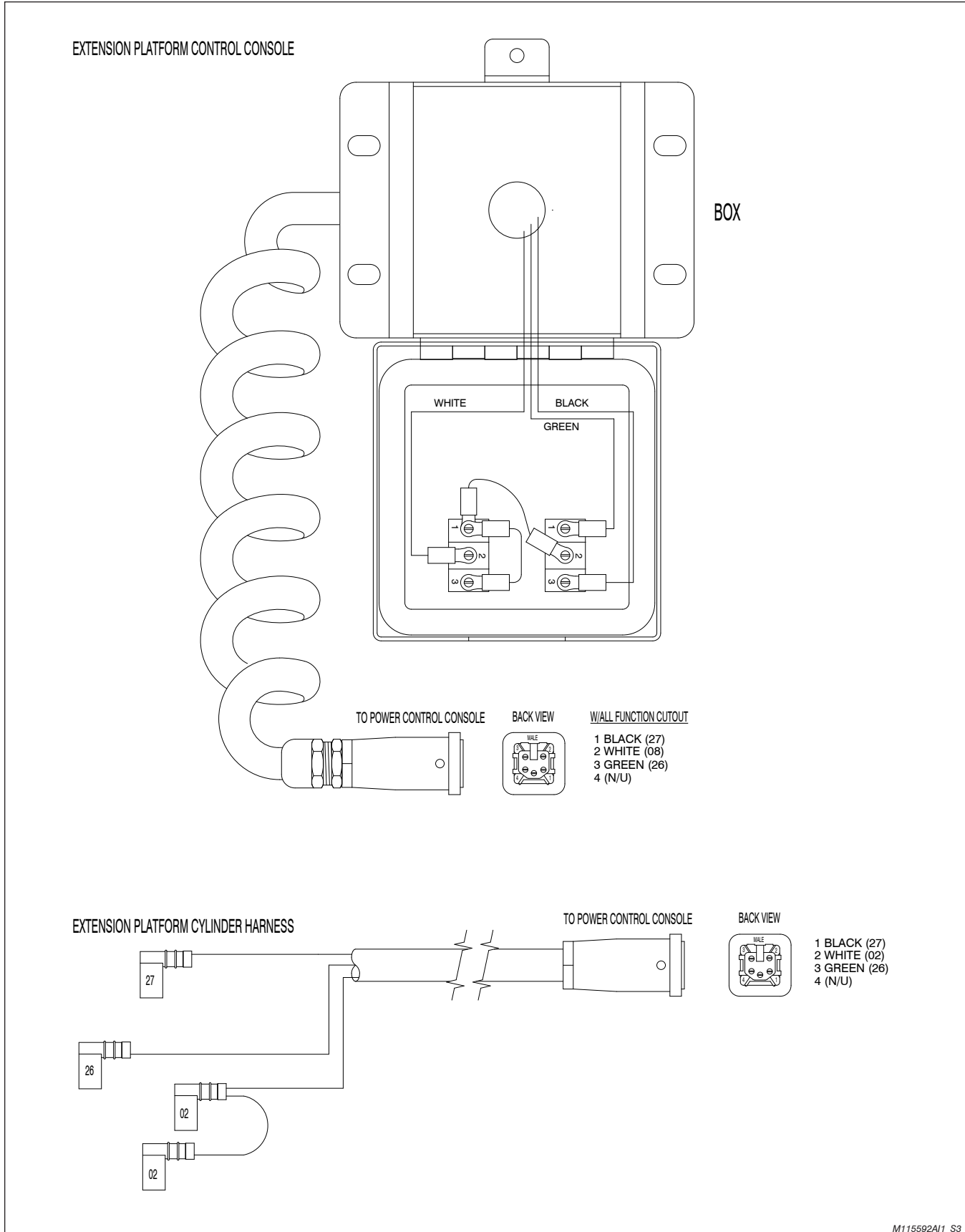
M156881AA

3.8 Platform Control Console - Powered Extension Platform Modification Diagram



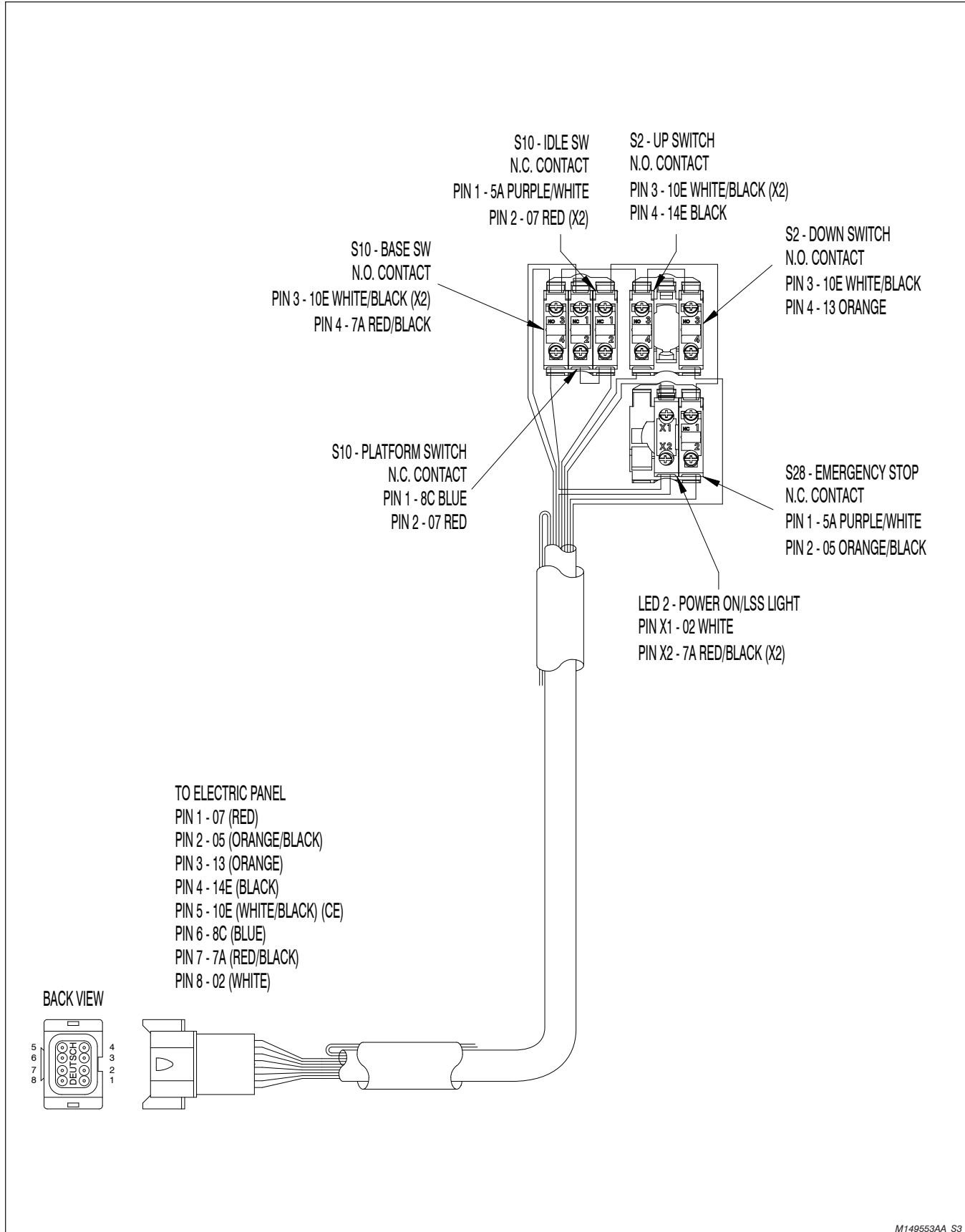
M156955AA1

3.9 Powered Extension Platform Control Console and Harness



M115592A11\_S3

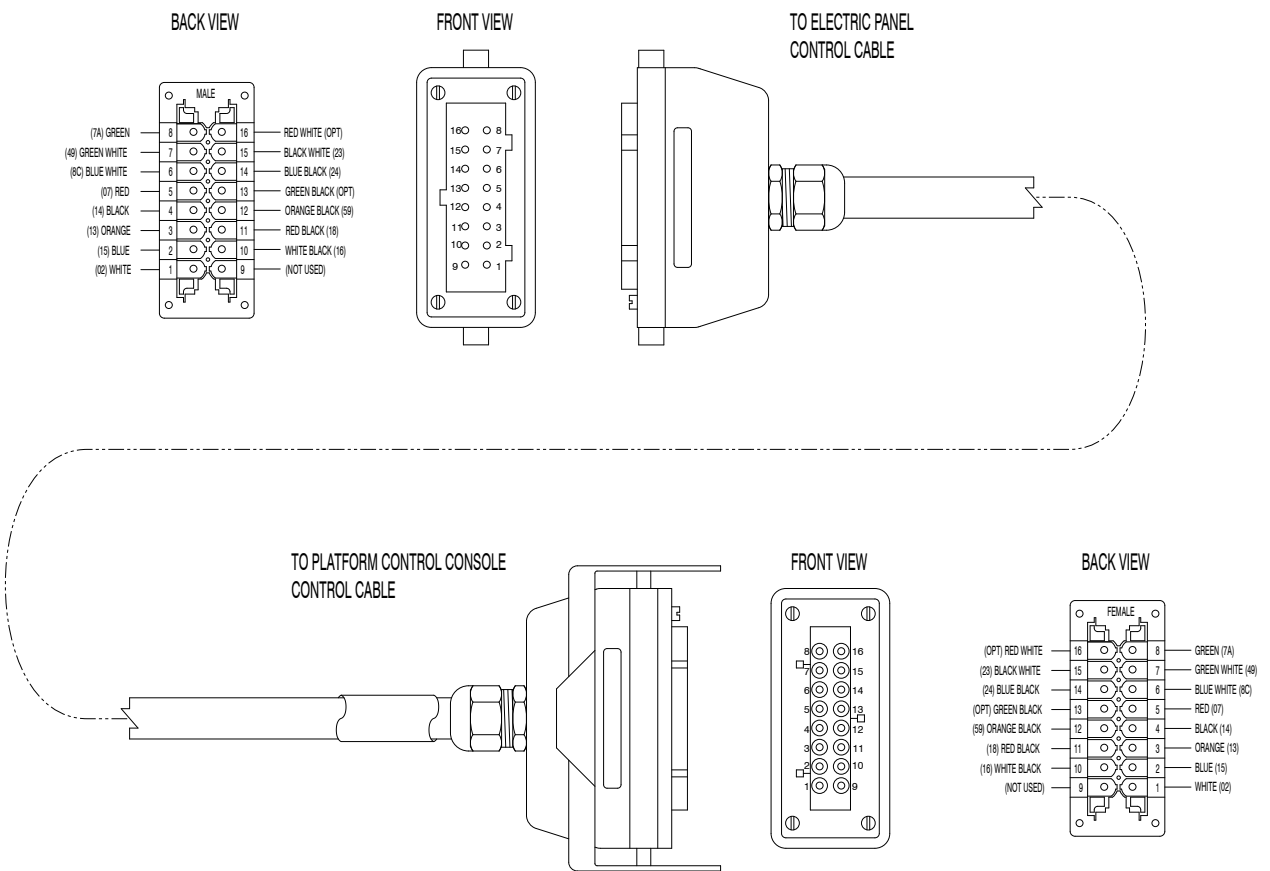
3.10 Base Control Console Diagram



M149553AA\_S3

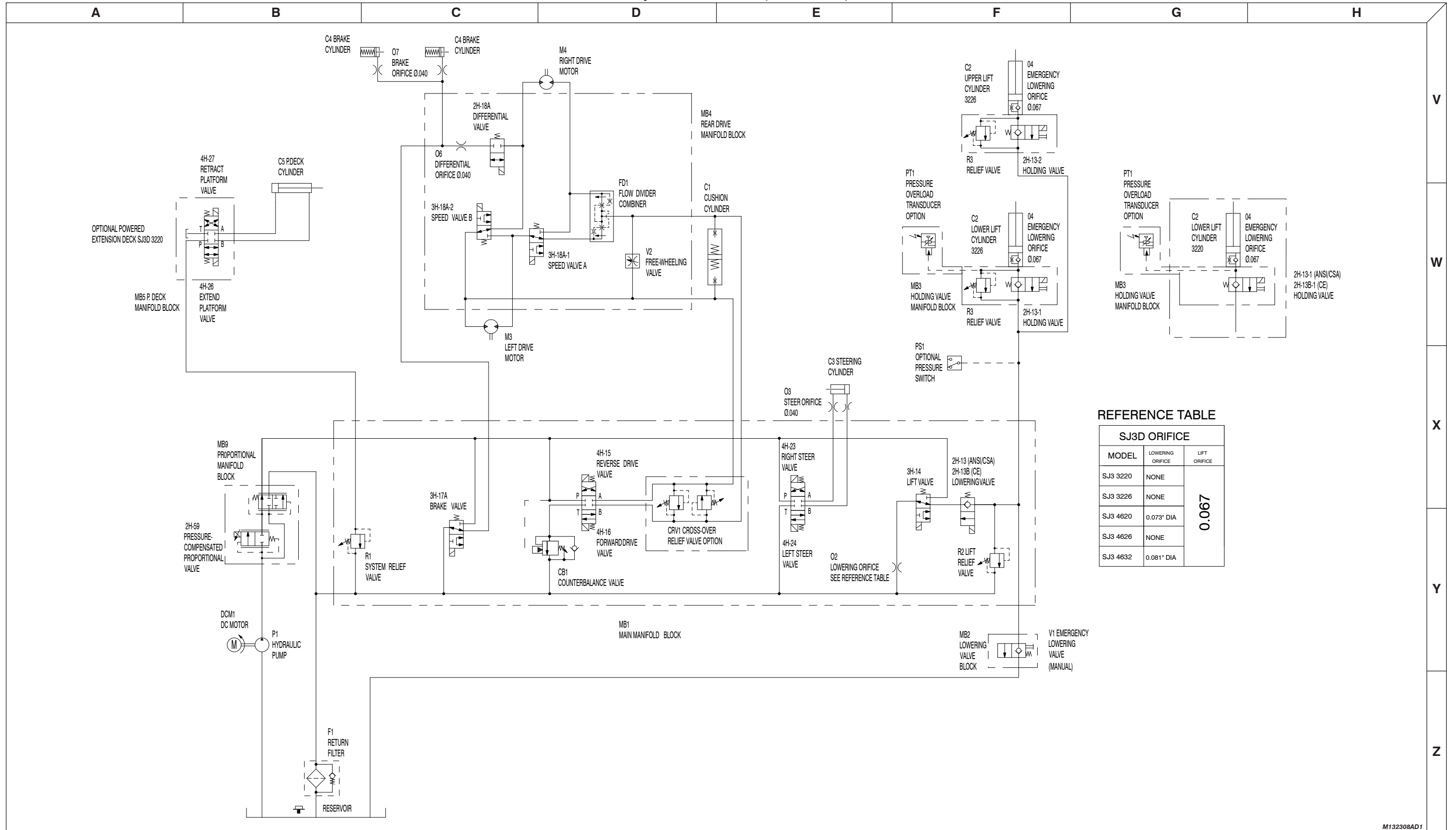
3.11 Scissor Arm Control Cable Diagram

CONTROL CABLE OPTIONS		
WIRE COLOUR	EUROPE WIRE NUMBER	N.A WIRE NUMBER
GREEN/BLACK	21B	21B
RED/WHITE	60	7A



M146650AB\_S3

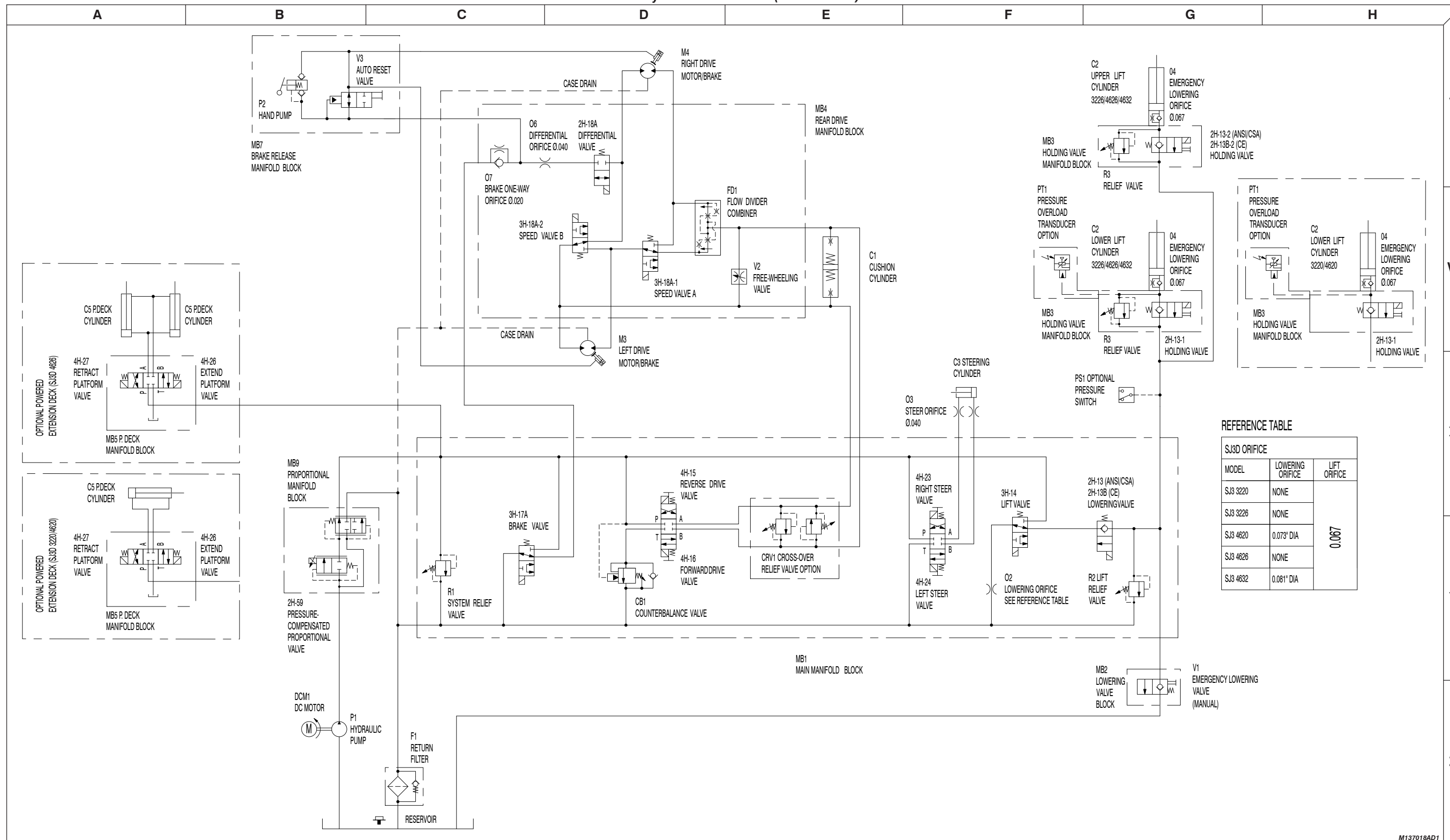
3.12 Hydraulic Schematic (Models 322x)



REFERENCE TABLE

SJ3D ORIFICE		
MODEL	LOWERING ORIFICE	LIFT ORIFICE
SJ3 3220	NONE	0.067
SJ3 3226	NONE	
SJ3 4620	0.073" DIA	
SJ3 4626	NONE	
SJ3 4632	0.081" DIA	

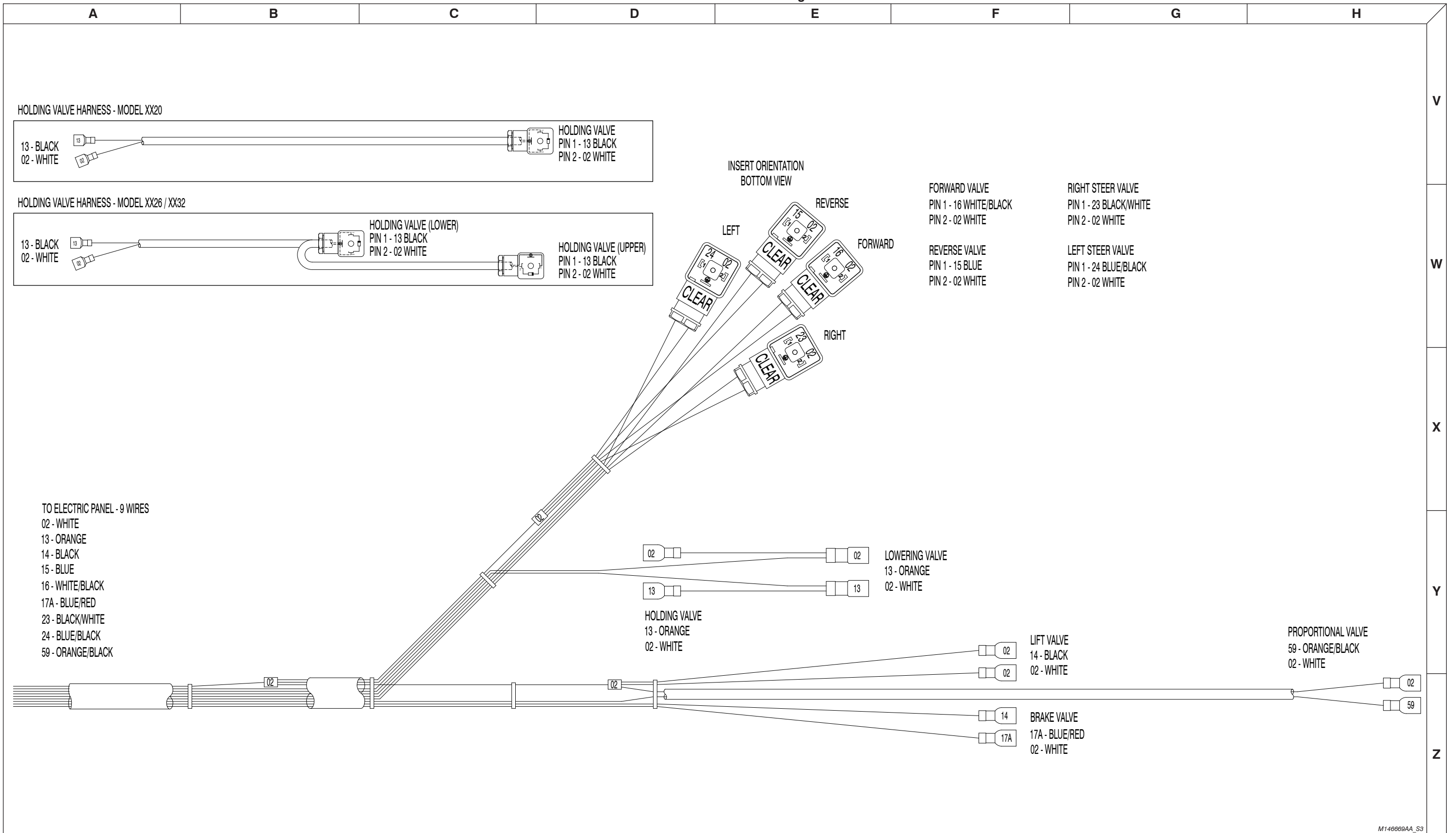
### 3.13 Hydraulic Schematic (Models 46xx)



REFERENCE TABLE

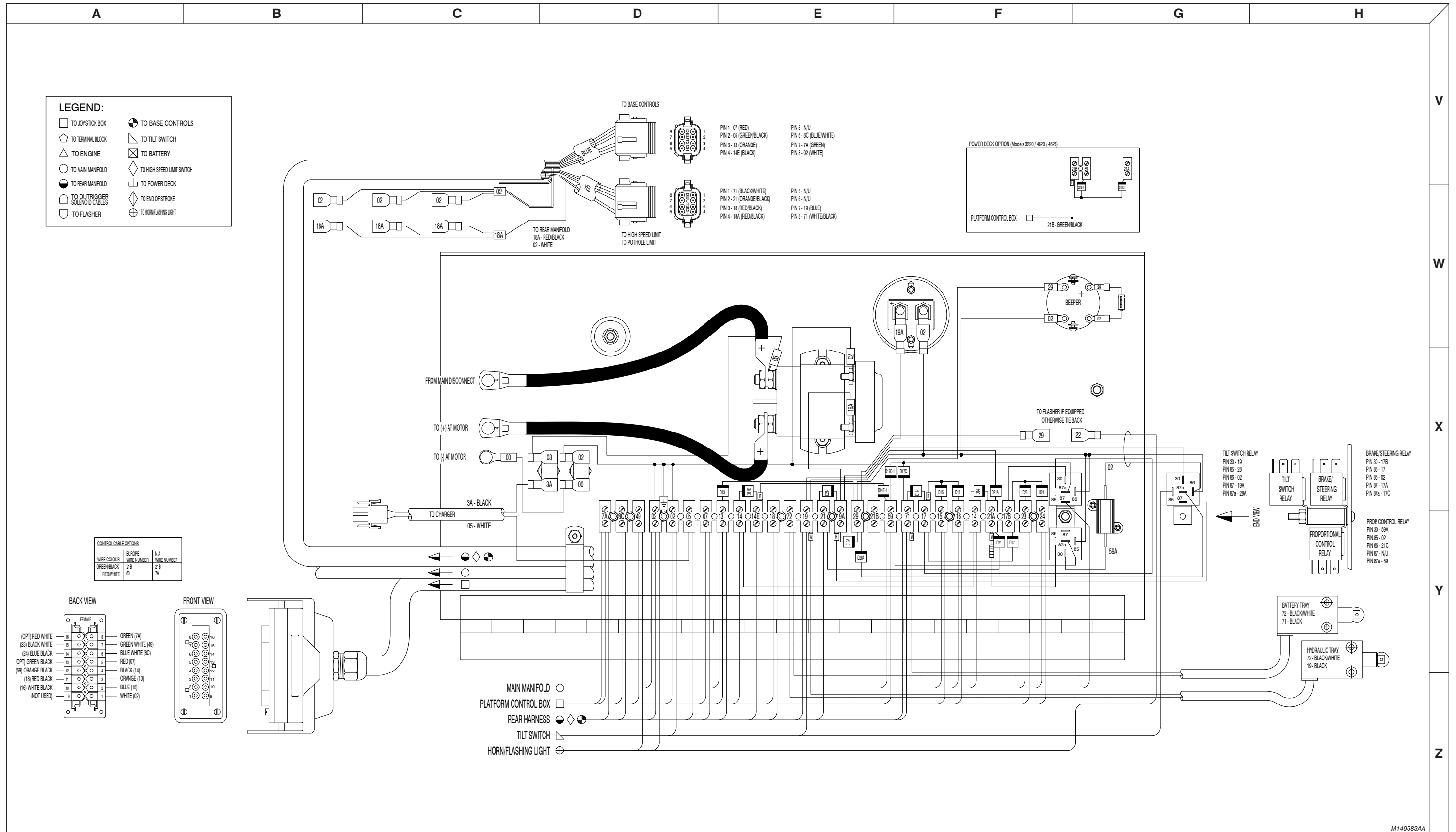
SJ3D ORIFICE		
MODEL	LOWERING ORIFICE	LIFT ORIFICE
SJ3 3220	NONE	0.067
SJ3 3226	NONE	
SJ3 4620	0.073" DIA	
SJ3 4626	NONE	
SJ3 4632	0.081" DIA	

3.14 Main Manifold Harness and Holding Valve Harness

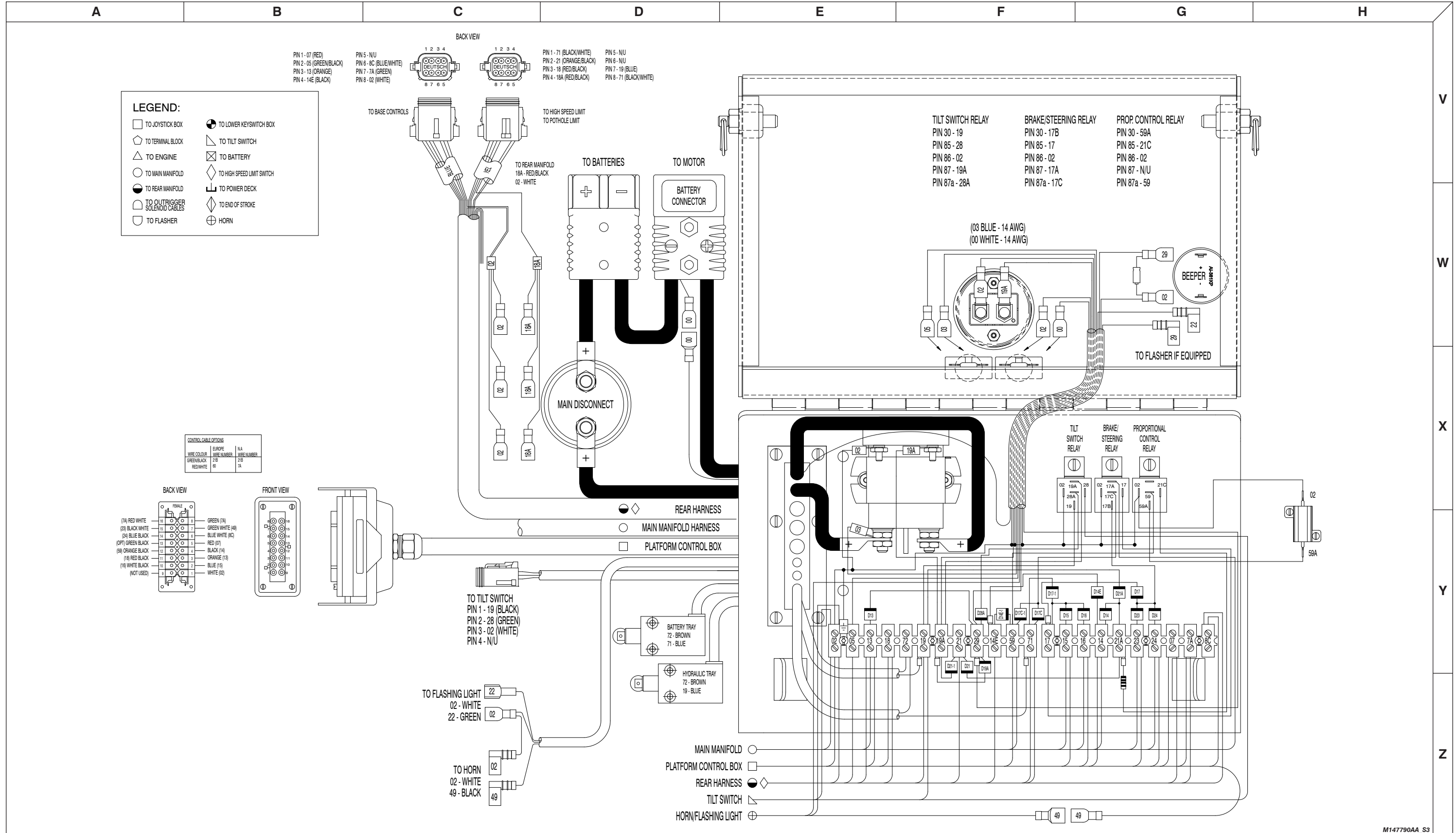




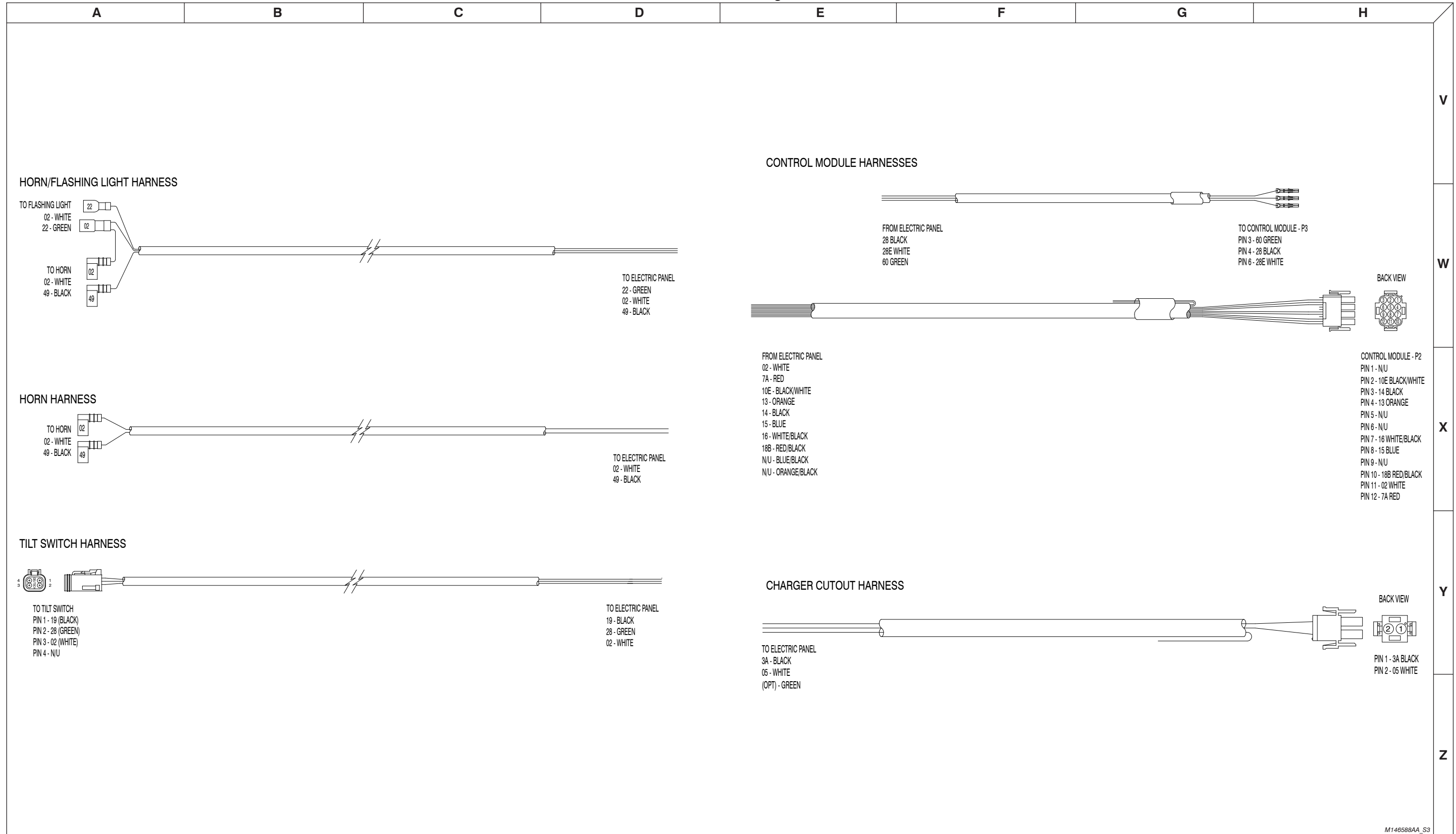
### 3.15 Electrical Panel Diagram



### 3.16 Electrical Panel Diagram (EE Rated)

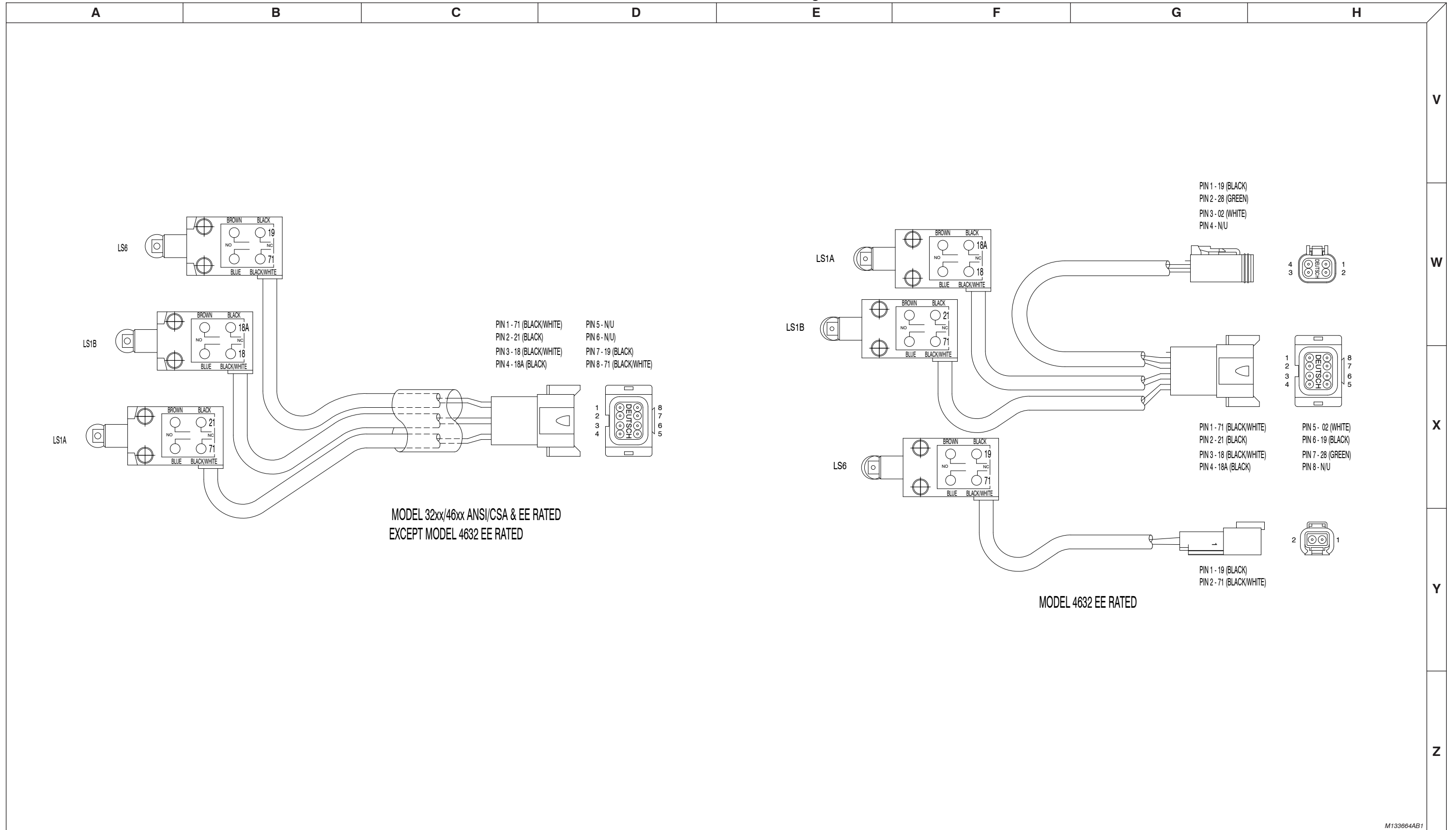


3.17 Harnesses Diagram

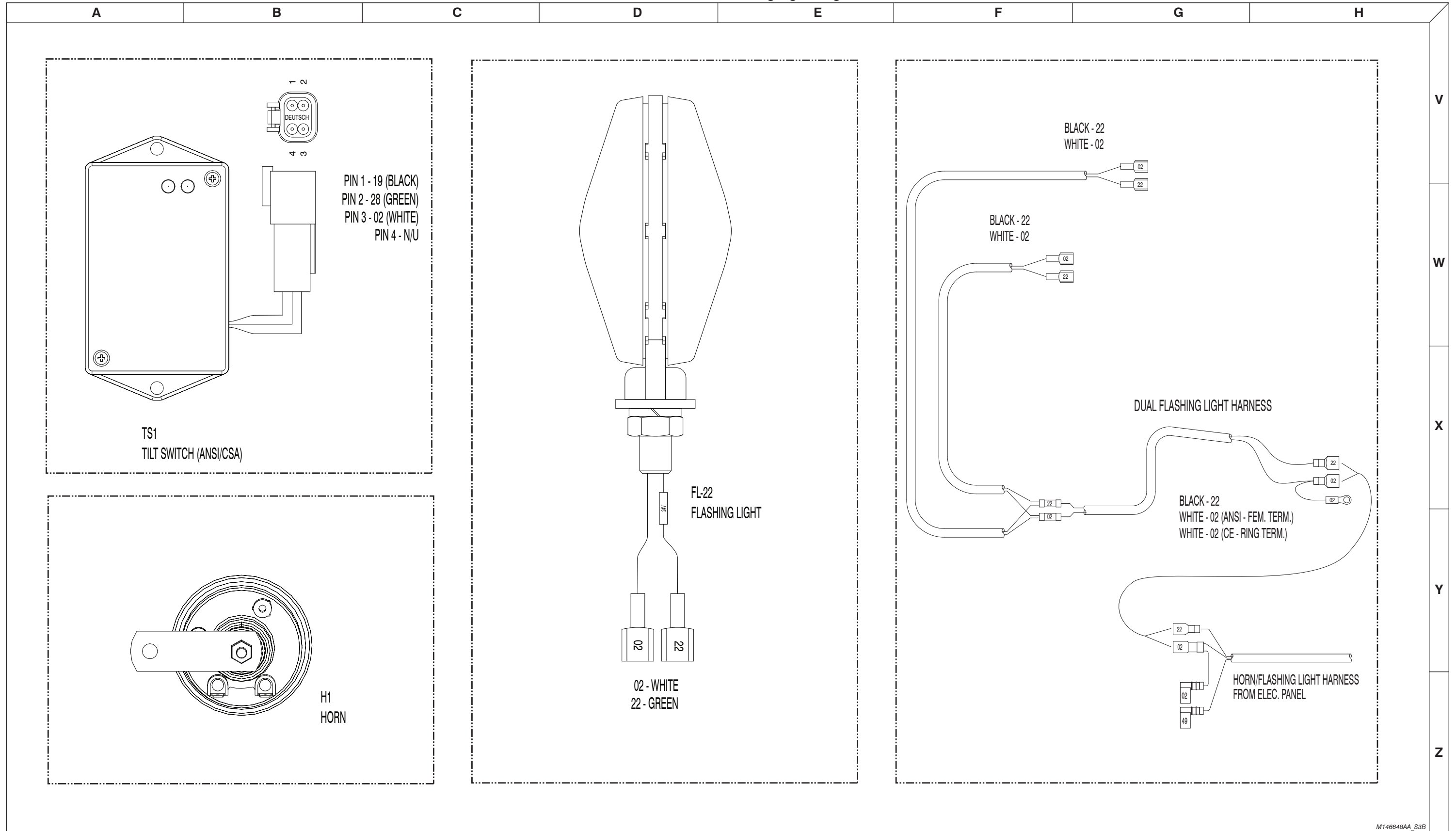


M146588AA\_S3

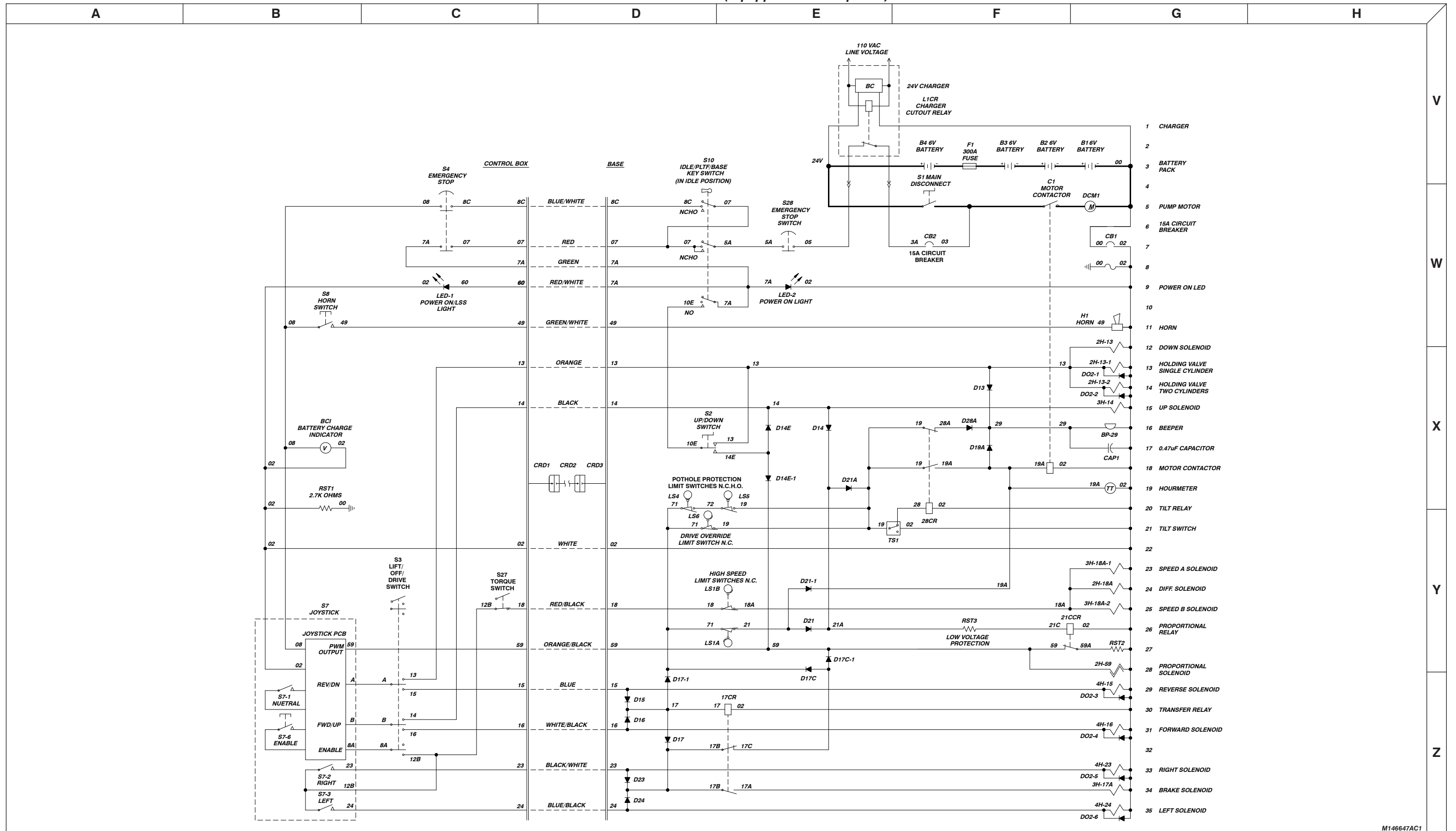
3.18 Limit Switch Assemblies Diagram



3.19 Horn/Tilt Switch/Flashing Light Diagram

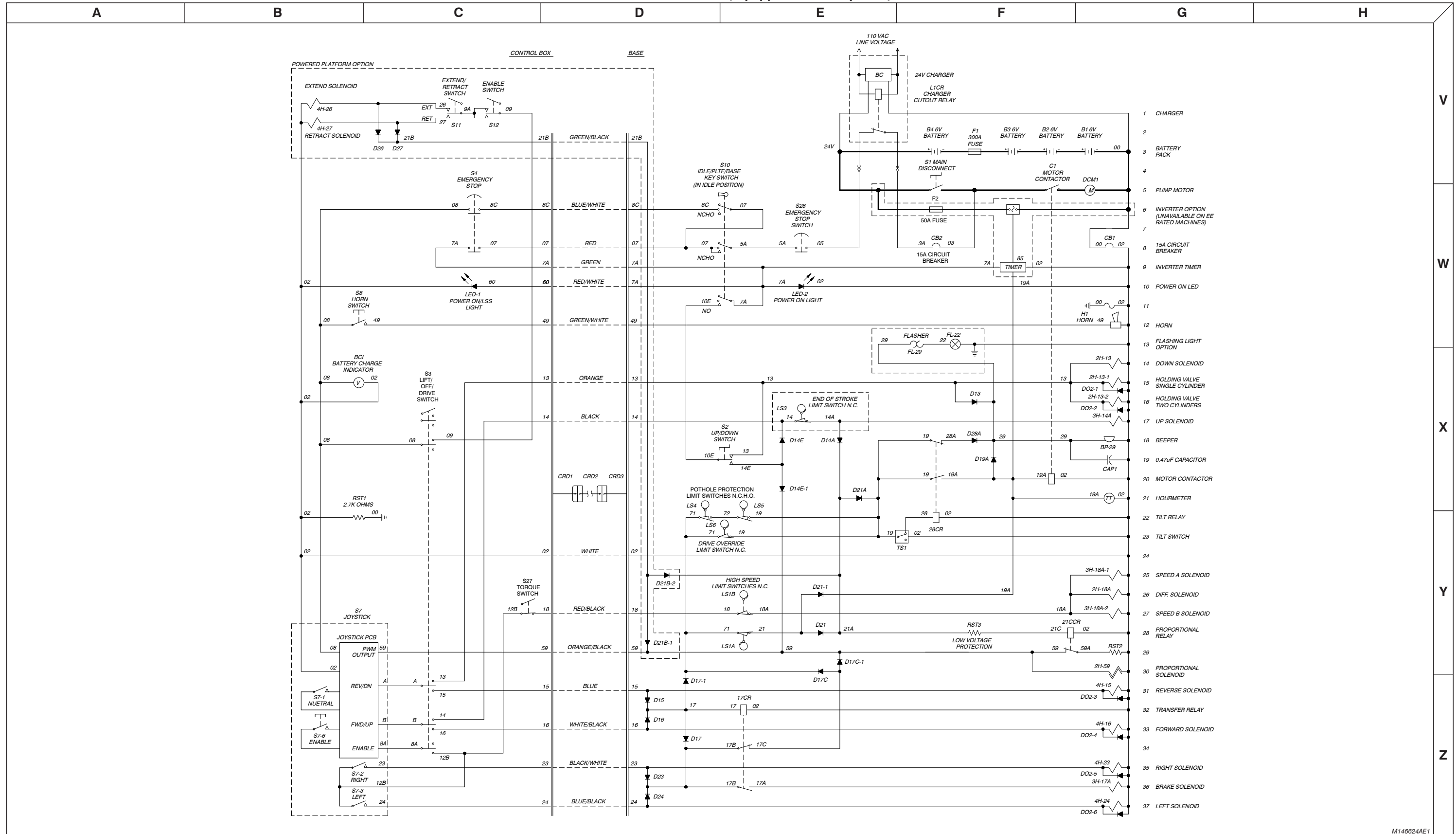


3.20 Electrical Schematic (Equipped with no options)



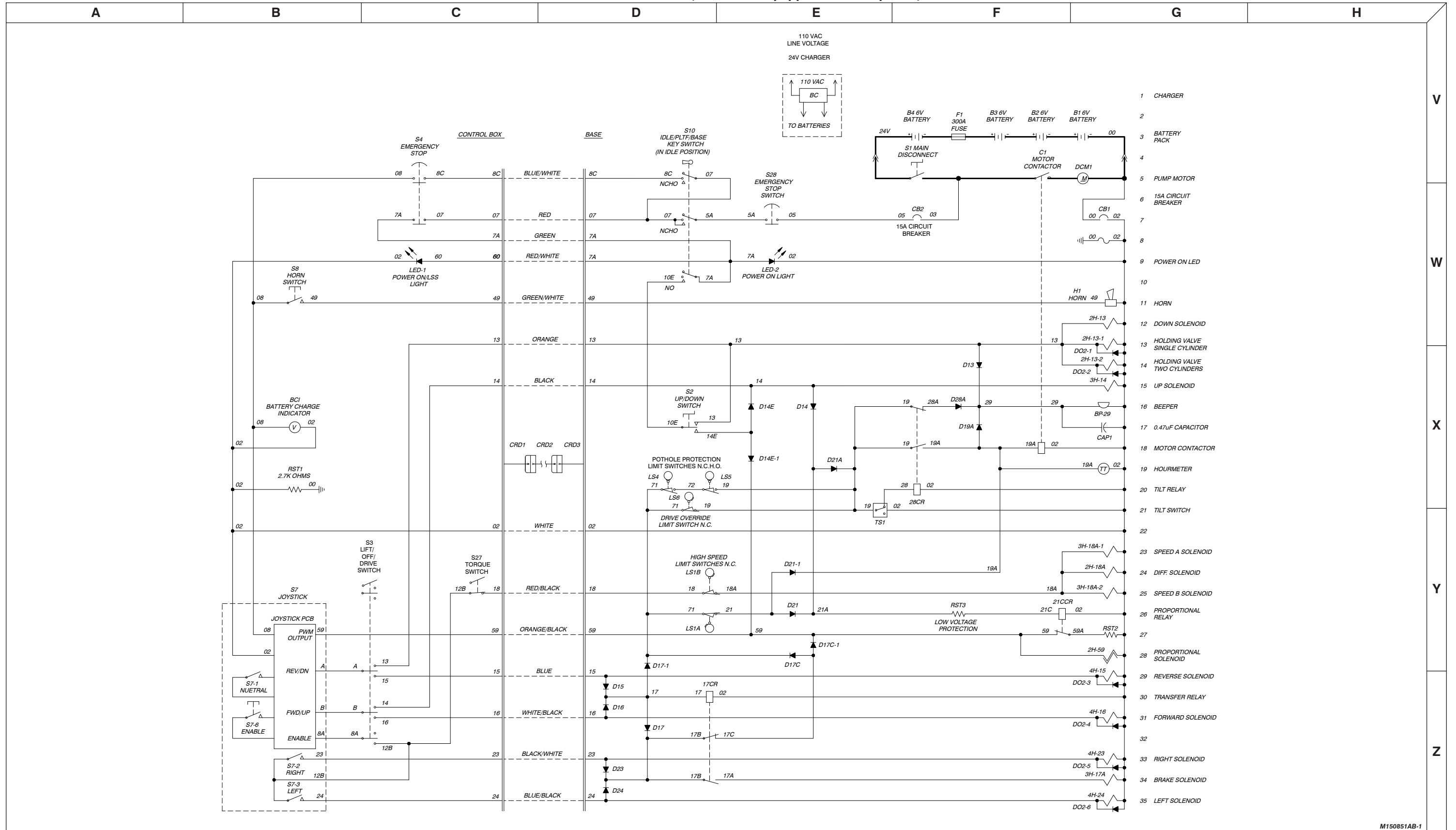
M146647AC1

3.21 Electrical Schematic (Equipped with all options)



M146624AE1

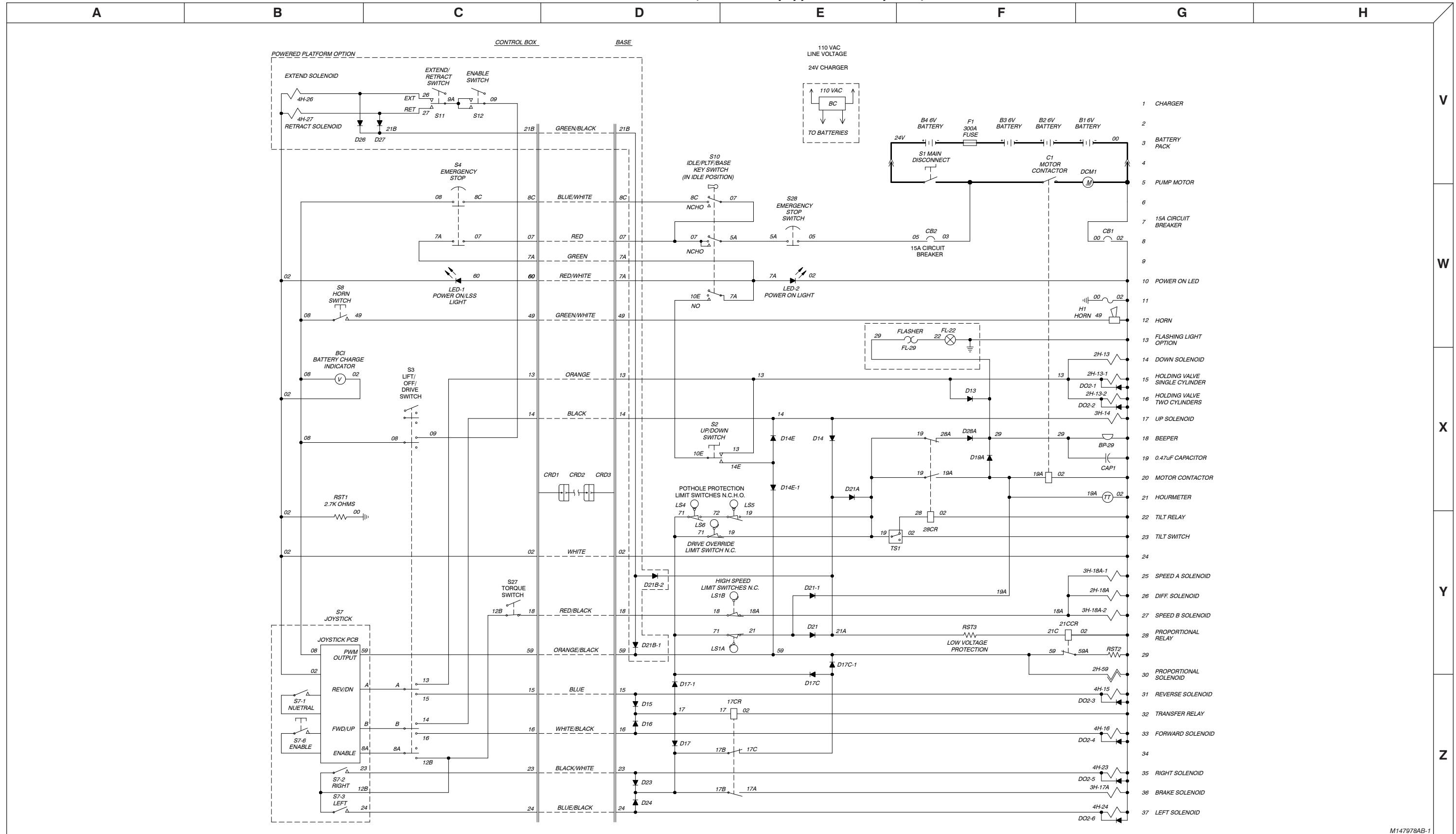
3.22 Electrical Schematic (EE Rated - Equipped with no options)



M150851AB-1



3.23 Electrical Schematic (EE Rated - Equipped with all options)



M147978AB-1

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## Section 4 TROUBLESHOOTING INFORMATION

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**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 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 CB2.
  - Check continuity. Replace if defective.
9. Loose or broken wire #3A from circuit breaker CB2 to charger relay L1CR.
  - Check continuity. Replace if defective.
10. Defective battery charger relay L1CR.
  - Check relay. Replace if defective.
11. Defective or tripped circuit breaker CB2.
  - Reset circuit breaker. Replace if defective.
12. Loose or broken wire #5 from charger relay L1CR to base terminal block TB-1.
  - Check continuity. Replace if defective.
13. Loose or broken wire #5 from base terminal block TB-1 to base emergency stop switch S28.
  - Check continuity. Replace if defective.
14. Open or defective base emergency stop switch S28.
  - Close switch. Check switch. Replace if defective.
15. Loose or broken wire #5A from base emergency stop switch S28 to base key switch S10.
  - Check continuity. Replace if defective.
16. Open or defective base key switch S10.
  - Select function with switch. Check switch. Replace if defective.
17. Loose or broken wire #00 from pump motor DCM1 to circuit breaker CB1.
  - Check continuity. Replace if defective.
18. Defective or tripped circuit breaker CB1.
  - Reset circuit breaker. Replace if defective.
19. Loose or broken wire #2 from circuit breaker CB1 to base terminal block TB-1.
  - Check continuity. Replace if defective.
20. Loose or broken wire #7A from base terminal block to CM1 control module pin P2-12. **(CE)**
  - Check continuity. Replace if defective.
21. Loose or broken wire #02 from base terminal block to CM1 control module pin P2-11. **(CE)**
  - Check continuity. Replace if defective.

### 4.1-2 All Controls Except for Down Function Inoperative

1. Loose or broken wire #19A **(ANSI/CSA)** or wire #19B **(CE)** from base terminal block TB-1 to contactor C1.
  - Check continuity. Replace if defective.

## Electrical System (Continued)

2. Contactor C1 defective.
  - Check contactor. Replace if defective.
3. Defective pump motor DCM1.
  - Check motor. Replace if defective.
4. Loose or broken wire #59 from relay 21CCR (ANSI/CSA) or relay 21ACR (CE) to proportional valve coil 2H-59.
  - Check continuity. Replace if defective.
5. Loose or broken wire #02 from proportional valve coil 2H-59 to base terminal block TB-1.
  - Check continuity. Replace if defective.
6. Defective proportional valve coil 2H-59.
  - Check continuity through coil. Reading should be 19ohms. Replace if defective.

### 4.1-3 All Controls Inoperative From Base Control Console

1. Loose or broken wire #07 from base terminal block to platform emergency stop switch S4.
  - Check continuity. Replace if defective.
2. Open or defective platform emergency stop switch S4.
  - Close switch. Replace if defective.
3. Loose or broken wire #7A from platform emergency stop switch S4 to base terminal block.
  - Check continuity. Replace if defective.
4. Loose or broken wire #7A from base terminal block to base key switch S10.
  - Check continuity. Replace if defective.
5. Open or defective base key switch S10.
  - Close switch. Replace if defective.
6. Loose or broken wire #10E from base key switch S10 to base up/down switch S2.
  - Check continuity. Replace if defective.
7. Loose or broken wire #10E from base terminal block TB-1 to CM1 control module pin P2-2. (CE)
  - Check continuity. Replace if defective.

### 4.1-4 All Controls Inoperative From Platform Control Console

1. Loose or broken wire #8C from base key switch S10 to base terminal block.
  - Check continuity. Replace if defective.
2. Loose or broken wire #8C or wire #02 from base terminal block to platform emergency stop switch S4.
  - Check continuity. Replace if defective.
3. Open or defective platform emergency stop switch S4.
  - Close switch. Replace if defective.
4. Loose or broken wire #8 or wire #02 from emergency stop switch S4 to battery charge indicator BCI.
  - Check continuity. Replace if defective.
5. Loose or broken wire #8 or wire #02 from battery charge indicator BC1 to joystick S7.
  - Check continuity. Replace if defective.
6. Defective joystick enable switch S7-6.
  - Check switch. Replace if defective.
7. Defective joystick neutral switch S7-1.
  - Check switch. Replace if defective.
8. Defective joystick S7.
  - Check joystick. Replace if defective.

## Electrical System (Continued)

### 4.1-5 No Drive or Up Function from Platform or Base Controls (CE only)

1. Defective tilt relay 28CR1 or Aux. tilt relay 28ECR1.
  - Check relay. Replace if defective.
2. Loose or broken wire #02 from base terminal block to tilt relay 28CR1 or Aux. tilt relay 28ECR1.
  - Check continuity. Replace if defective.
3. Loose or broken wire #28 from CM1 control module pin P3-4 to tilt relay 28CR1.
  - Check continuity. Replace if defective.
4. Loose or broken wire #28E from CM1 control module pin P3-6 to Aux. tilt relay 28ECR1.
  - Check continuity. Replace if defective.
5. Loose or broken wire #19 from base terminal block to Aux. tilt relay 28ECR1.
  - Check continuity. Replace if defective.
6. Loose or broken wire #19A from Aux. tilt relay 28ECR1 to tilt relay 28CR1.
  - Check continuity. Replace if defective.
7. Loose or broken wire #19B from tilt relay 28CR1 to base terminal block.
  - Check continuity. Replace if defective.
8. Loose or broken wire #19B from base terminal block to motor contactor C1.
  - Check continuity. Replace if defective.

### 4.1-6 No Down or Reverse Only Function from Platform Controls

1. Loose or broken wire "A" from proportional controller S7 to lift/drive switch S3.
  - Check continuity. Replace if defective.
2. Lift/Drive switch S3 defective.
  - Check switch. Replace if defective.
3. Defective PWM card on joystick S7.
  - Check joystick card. Replace if defective.
4. Loose or broken wire #13 down or #15 reverse from lift/drive switch S3 to base terminal block.
  - Check continuity. Replace if defective.

### 4.1-7 No Up or Forward Only Function from Platform Control Console

1. Loose or broken wire "B" from proportional controller S7 to lift/drive switch S3.
  - Check continuity. Replace if defective.
2. Lift/Drive switch S3 defective.
  - Check switch. Replace if defective.
3. Defective PWM card on joystick S7.
  - Check joystick card. Replace if defective.
4. Loose or broken wire #14 up or #16 forward from lift/drive switch S3 to base terminal block.
  - Check continuity. Replace if defective.

### 4.1-8 No Up Function from Platform or Base Control Console

1. Loose or broken wire #14 from base terminal block to up valve coil 3H-14.
  - Check continuity. Replace if defective.
2. Defective up valve coil 3H-14.
  - Check continuity through coil. Replace if defective.
3. Open diode D14.
  - Check diode. Replace if defective.
4. Open diode D21A (ANSI/CSA) or D21 (CE).
  - Check diode. Replace if defective.
5. Machine not level. (Above high speed limit switch)
  - Use on level surface.

## Electrical System (Continued)

6. Loose or broken wire #19 from base terminal block to tilt switch TS1 **(ANSI/CSA)**.
  - Check continuity. Replace if defective.
7. Defective tilt switch TS1 **(ANSI/CSA)**.
  - Test tilt switch. Replace if defective.
8. Loose or broken wire #28 from tilt switch TS1 to tilt relay 28CR **(ANSI/CSA)**.
  - Check continuity. Replace if defective.
9. Loose or broken wire #02 from tilt switch TS1 to base terminal strip **(ANSI/CSA)**.
  - Check continuity. Replace if defective.
10. Defective tilt relay 28CR **(ANSI/CSA)**.
  - Check relay. Replace if defective.
11. Loose or broken wire #19A from tilt relay 28CR to pump motor contactor **(ANSI/CSA)**.
  - Check continuity. Replace if defective.
12. See 4.1-5 of this section for more troubleshooting information for **(CE)**.

### 4.1-9 No Down Function from Platform or Base Control Console (ANSI/CSA)

**NOTE**

Down function is not proportionally controlled.

1. Loose or broken wire #13 from base terminal block to down valve 2H-13 or holding valve 2H-13-1 or holding valve 2H-13-2.
  - Check continuity. Replace if defective.
2. Loose or broken wire #02 from base terminal block to down valve 2H-13 or holding valve 2H-13-1 or holding valve 2H-13-2.
  - Check continuity. Replace if defective.
3. Defective down valve 2H-13.
  - Check continuity through coil. Replace if defective.
4. Defective lift cylinder holding valve 2H-13-1 or holding valve 2H-13-2.
  - Check continuity through coil. Replace if defective.

### 4.1-10 No Down Function from Platform or Base Control Console (CE)

**NOTE**

Down function is not proportionally controlled.

1. Loose or broken wire #13 from base terminal block to CM1 control module pin P2-4.
  - Check continuity. Replace if defective.
2. Defective down relay 28CR2 or Aux. down relay 28ECR2.
  - Check relay. Replace if defective.
3. Loose or broken wire #02 from base terminal block to down relay 28CR2 or Aux. down relay 28ECR2.
  - Check continuity. Replace if defective.
4. Loose or broken wire #13 from base terminal block to Aux. down relay 28ECR2.
  - Check continuity. Replace if defective.
5. Loose or broken wire #13A from Aux. down relay 28ECR2 to down relay 28CR2.
  - Check continuity. Replace if defective.
6. Loose or broken wire # 13B from down relay 28CR2 to down valve 2H-13B or holding valve 2H-13B-1 or holding valve 2H-13B-2.
  - Check continuity. Replace if defective.

## Electrical System (Continued)

7. Defective down valve 2H-13B.
  - Check continuity through coil. Replace if defective.
8. Defective lift cylinder holding valve 2H-13B-1 or holding valve 2H-13B-2.
  - Check continuity through coil. Replace if defective.
9. Loose or broken wire #02 from holding valve 2H-13B-1 or holding valve 2H-13B-2 or down valve 2H-13B to base terminal block.
  - Check continuity. Replace if defective.

### 4.1-11 No Up Function from Base Control Console

1. Defective up/down switch S2.
  - Check switch. Replace if defective.
2. Loose or broken wire #14E from up/down switch S2 to base terminal switch.
  - Check continuity. Replace if defective.
3. Open diode D14E-1.
  - Check diode. Replace if defective.
4. Open diode D14E (ANSI/CSA) or diode D14E-2 (CE).
  - Check diode. Replace if defective.

### 4.1-12 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.

### 4.1-13 Steer Only Inoperative

1. Defective relay 17CR.
  - Check relay. Replace if defective.
2. Loose or broken wire #17B from diodes D23 and D24 to base terminal block TB1.
  - Check continuity. Replace if defective.
3. Loose or broken wire #17B from 17CR steer relay to base terminal block TB1.
  - Check continuity. Replace if defective.
4. Loose or broken wire #17C from 17CR steer relay to diodes D17C and D17C-1.
  - Check continuity. Replace if defective.
5. Open or defective diode D17C or diode D17C-1.
  - Check diode. Replace if defective.

### 4.1-14 Drive Only Inoperative

1. Open or defective diode D17-1.
  - Check diode. Replace if defective.

### 4.1-15 No Drive or Steer when Platform Fully Lowered

1. Loose or broken wire #71 from base terminal block to drive override limit switch LS6.
  - Check continuity. Replace if defective.
2. Defective drive override switch LS6.
  - Check switch. Replace if defective.
3. Loose or broken wire #19 from drive override limit switch LS6 to base terminal block.
  - Check continuity. Replace if defective.



## Electrical System (Continued)

### 4.1-16 No Drive or Steer when Platform Elevated

1. Pothole protection bars not fully lowered.
  - Clear obstructions. Repair as needed.
2. Loose or broken wire #71 from base terminal block to pothole protection limit switch LS4.
  - Check continuity. Replace if defective.
3. Defective pothole protection limit switch LS4.
  - Check switch. Replace if defective.
4. Loose or broken wire #72 from pothole protection limit switch LS4 to base terminal block.
  - Check continuity. Replace if defective.
5. Loose or broken wire #72 from base terminal block to pothole protection limit switch LS5.
  - Check continuity. Replace if defective.
6. Defective pothole protection limit switch LS5.
  - Check switch. Replace if defective.
7. Loose or broken wire #19 from pothole protection limit switch LS5 to base terminal block.
  - Check continuity. Replace if defective.

### 4.1-17 Elevated Drive Speed Does not Activate

1. Loose or broken wire #59 from base terminal strip proportional relay 21CCR (ANSI/CSA) or 21ACR (CE).
  - Check continuity. Replace if defective.
1. Loose or broken wire #59A from proportional relay 21CCR (ANSI/CSA) or 21ACR (CE) to resistor RST2.
  - Check continuity. Replace if defective.
2. Resistor RST2 open.
  - Check resistor ohms, it should be 30 ohms. Replace if defective.
3. Loose or broken wire #02 from resistor RST2 to base terminal block.
  - Check continuity. Replace if defective.
4. Proportional relay 21CCR (ANSI/CSA) or 21ACR (CE) defective.
  - Check relay, replace if defective.

### 4.1-18 Work Platform Drives in Slow Speed Only

1. Loose or broken wire #71 from base terminal block to high speed limit switch LS1A.
  - Check continuity. Replace if defective.
2. Open or defective high speed limit switch LS1A.
  - Check switch. Replace if defective.
3. Loose or broken wire #21 from high speed limit switch LS1A to low voltage protection resistor RST3.
  - Check continuity. Replace if defective.
4. Defective low voltage protection resistor RST3.
  - Check resistor. Replace if defective.
5. Loose or broken wire #21C (ANSI/CSA) or #21A (CE) from low voltage protection resistor RST3 to proportional relay 21CCR (ANSI/CSA) or 21ACR (CE).
  - Check continuity. Replace if defective.
6. Proportional relay 21CCR (ANSI/CSA) or 21ACR (CE) defective.
  - Check relay, replace if defective.
7. Loose or broken wire #02 from proportional relay 21CCR (ANSI/CSA) or 21ACR (CE) to base terminal block.
  - Check continuity. Replace if defective.
8. Proportional controller S7 out of adjustment.
  - Adjust controller. Refer to Section 5, Joystick Adjusting Procedure.

## Electrical System (Continued)

### 4.1-19 Forward Drive Function Inoperative

1. Loose or broken wire #16 from lift/drive switch S3 to base terminal block.
  - Check continuity. Replace if defective.
2. Loose or broken wire #16 from base terminal block to forward drive valve coil 4H-16.
  - Check continuity. Replace if defective.
3. Forward drive valve coil 4H-16 defective.
  - Check continuity through coil. Replace if defective.
4. Loose or broken wire #02 from forward drive valve coil 4H-16 to base terminal block.
  - Check continuity. Replace if defective.
5. Open diode D16.
  - Check diode. Replace if defective.

### 4.1-20 Reverse Drive Function Inoperative

1. Loose or broken wire #15 from lift/drive switch S3 to base terminal block.
  - Check continuity. Replace if defective.
2. Loose or broken wire #15 from base terminal block to reverse drive valve coil 4H-15.
  - Check continuity. Replace if defective.
3. Reverse drive valve coil 4H-15 defective.
  - Check continuity through coil. Replace if defective.
4. Loose or broken wire #02 from reverse drive valve coil 4H-15 to base terminal block.
  - Check continuity. Replace if defective.
5. Open diode D15.
  - Check diode. Replace if defective.

### 4.1-21 Brake will not Release

1. Diode D-16 forward or D-15 reverse is shorted or open.
  - Check diode. Replace if defective.
2. Loose or broken wire #17 from base terminal strip to transfer relay 17CR.
  - Check continuity. Replace if defective.
3. Loose or broken wire #02 from base terminal strip to transfer relay 17CR.
  - Check continuity. Replace if defective.
4. Defective transfer relay 17CR.
  - Check relay. Replace if defective.
5. Open or defective diode D17.
  - Check diode. Replace if defective.
6. Loose or broken wire #17B from base terminal strip to transfer relay 17CR.
  - Check continuity. Replace if defective.
7. Loose or broken wire #17A from transfer relay 17CR to brake coil 3H-17A.
  - Check continuity. Replace if defective.
8. Brake valve coil 3H-17A defective.
  - Check continuity through coil. Replace if defective.
9. Loose or broken wire #02 from brake valve coil 3H-17A to base terminal block.
  - Check continuity. Replace if defective.

### 4.1-22 High/Low Torque Inoperative

1. Open diode D15-1 (reverse) or D16-1 (forward).
  - Check diode. Replace if defective.
2. Loose or broken wire #7B from diodes D15-1 and D16-1 to lift/drive switch S3.
  - Check continuity. Replace if defective.

## Electrical System (Continued)

3. Defective lift/drive switch S3.
  - Check switch. Replace if defective.
4. Loose or broken wire #18 from lift/drive switch S3 to base terminal block TB-1.
  - Check continuity. Replace if defective.
5. Loose or broken wire #18 from base terminal block TB-1 to high speed limit switch LS1-B.
  - Check continuity. Replace if defective.
6. Defective high speed limit switch LS1-B.
  - Check switch. Replace if defective.
7. Loose or broken wire #18A from high speed limit switch LS1-B to rear drive manifold.
  - Check continuity. Replace if defective.
8. Defective speed valve coil 3H-18A-1 or 3H-18A-2.
  - Check continuity through coil. Replace if defective.
9. Loose or broken wire #02 from rear drive manifold to base terminal block TB-1.
  - Check continuity. Replace if defective.

### 4.1-23 Right Steer Inoperative

1. Loose or broken wire #12B from lift/drive switch S3 to right steer switch S7-2.
  - Check continuity. Replace if defective.
2. Defective right steer switch S7-2.
  - Check switch. Replace if defective.
3. Loose or broken wire #23 from right steer switch S7-2 to base terminal block TB-1.
  - Check continuity. Replace if defective.
4. Loose or broken wire #23 from base terminal block TB-1 to steer right valve coil 4H-23.
  - Check continuity. Replace if defective.
5. Defective steer right valve coil 4H-23.
  - Check continuity through coil. Replace if defective.
6. Loose or broken wire #02 from steer right valve coil 4H-23 to base terminal block TB-1.
  - Check continuity. Replace if defective.
7. Open diode D23.
  - Check diode. Replace if defective.

### 4.1-24 Left Steer Inoperative

1. Loose or broken wire #12B from lift/drive switch S3 to left steer switch S7-3.
  - Check continuity. Replace if defective.
2. Defective left steer switch S7-3.
  - Check switch. Replace if defective.
3. Loose or broken wire #24 from left steer switch S7-3 to base terminal block TB-1.
  - Check continuity. Replace if defective.
4. Loose or broken wire #24 from base terminal block TB-1 to steer left valve coil 4H-24.
  - Check continuity. Replace if defective.
5. Defective steer left valve coil 4H-24.
  - Check continuity through coil. Replace if defective.
6. Loose or broken wire #02 from steer left valve coil 4H-24 to base terminal block TB-1.
  - Check continuity. Replace if defective.
7. Open diode D24.
  - Check diode. Replace if defective.

## Electrical System (Continued)

### 4.1-25 Power Extension Platform will not Extend or Retract

1. Lift/Drive switch S3 not in lift position.
  - Move switch to lift position.
2. Loose or broken wire #09 from lift/drive switch S3 to power extension platform enable switch S12.
  - Check continuity. Replace if defective.
3. Power extension platform enable switch S12 defective.
  - Check switch. Replace if defective.
4. Loose or broken wire #09A from power extension platform enable switch S12 to platform extend/retract switch S11.
  - Check continuity. Replace if defective.
5. Loose or broken wire #21B from platform control box to base terminal block TB-1.
  - Check continuity. Replace if defective.
6. Open diode D21B-1.
  - Check diode. Replace if defective.
7. Open diode D21B-2.
  - Check diode. Replace if defective.
8. Loose or broken wire #02 from extend valve coil 4H-26 to retract valve coil 4H-27 to platform control box.
  - Check continuity. Replace if defective.

### 4.1-26 Power Extension Platform will not Extend

1. Powered extension platform extend/retract switch S11 defective.
  - Check switch. Replace if defective.
2. Loose or broken wire #26 from power extension platform extend/retract switch S11 to extend valve coil 4H-26.
  - Check continuity. Replace if defective.
3. Extend valve coil 4H-26 defective.
  - Check continuity through coil, replace if defective.
4. Open diode D26.
  - Check diode. Replace if defective.
5. Loose or broken wire #02 from extend valve coil 4H-26 to platform control box.
  - Check continuity. Replace if defective.

### 4.1-27 Power Extension Platform will not Retract

1. Powered Platform extend/retract switch S11 defective.
  - Check switch. Replace if defective.
2. Loose or broken wire #27 from power extension platform extend/retract switch S11 to retract valve coil 4H-27.
  - Check continuity. Replace if defective.
3. Retract valve coil 4H-27 defective.
  - Check continuity through coil, replace if defective.
4. Open diode D27.
  - Check diode. Replace if defective.
5. Loose or broken wire #02 from retract valve coil 4H-27 to platform control box.
  - Check continuity. Replace if defective.

### 4.1-28 Two or more Functions at one time

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

## Hydraulic System

### 4.2-1 All Function Inoperative

1. Proportional valve 2H-59 defective or is sticking.
  - Check valve. Replace if defective.
2. Pump P1 defective.
  - Check pump. Replace if defective.

### 4.2-2 Platform Drifts Down

1. Defective lift cylinder seals at the gland or holding valve manifold.
  - Replace if damaged. Note: There are no piston seals, just wear rings.
2. Combination of defective holding valves 2H-13-1 and 2H-13-2, and either defective lowering valve 2H-13 or relief valve R2 or manual lowering valve V1. **(ANSI/CSA)**
  - Check valves. Replace if defective.Combination of defective holding valves 2H-13B-1 and 2H-13B-2, and either defective lowering valve 2H-13B or relief valve R2 or manual lowering valve V1. **(CE)**
  - Check valves. Replace if defective.

### 4.2-3 Platform Lifts Slowly

1. Open or leaking manual lowering valve V1.
  - Close valve. Replace if defective.
2. Lift relief valve R2 defective.
  - Check valve. Replace if defective.
3. Open manual override on holding valve 2H-13-1 or 2H-13-2. **(ANSI/CSA)**
  - Depress and turn manual override clockwise to close. Replace if defective.Open manual override on holding valve 2H-13B-1 or 2H-13B-2. **(CE)**
  - Depress and turn manual override clockwise to close. Replace if defective.

### 4.2-4 Platform does not Lift

1. Open manual lowering valve V1.
  - Close valve. Replace if defective.
2. Hydraulic oil level too low.
  - Fully lower the platform. Fill hydraulic tank until fluid is at or slightly above the top mark on the sight glass.
3. Platform weight excessive.
  - Reduce platform load to maximum capacity.
4. Up valve 3H-14 or 3H-14A (Machines with end of stroke limit switch LS3 only) defective or is sticking.
  - Check valve. Replace if defective.

### 4.2-5 Platform will not Lower

#### **NOTE**

Down function is not proportionally controlled.

#### **ANSI/CSA Machines only**

1. Lowering valve 2H-13 defective or is sticking.
  - Clean valve. Replace if defective.
2. Defective holding valve 2H-13-1 or 2H-13-2.
  - Clean valve. Replace if defective.

## Hydraulic System (Continued)

### CE Machines only

3. Lowering valve 2H-13 defective or is sticking.
  - Clean valve. Replace if defective.
4. Defective holding valve 2H-13B-1 or 2H-13B-2.
  - Clean valve. Replace if defective.

### 4.2-6 Platform Drives Slow

1. Free-wheeling valve V2 open or defective.
  - Close valve. Replace if defective.
2. Flow divider/combiner FD1 defective or is plugged.
  - Close valve. Replace if defective.
3. Drive motor M1 or M2 defective.
  - Check motors. Replace if defective.
4. Cushion cylinder C1 defective.
  - Check cylinder. Replace if defective.

### 4.2-7 Platform will not Drive in Forward or Reverse

1. Open free-wheeling valve V2.
  - Close Valve. Replace if defective.
2. Forward drive valve 4H-16 or reverse drive valve 4H-15 defective or is sticking.
  - Close Valve. Replace if defective.
3. Flow/Divider/Combiner valve FD1 defective or is plugged.
  - Close Valve. Replace if defective.
4. Counterbalance valve CB1 defective or is plugged.
  - Close Valve. Replace if defective.

### 4.2-8 Brake(s) will not Release

1. Brake valve 3H-17A defective or is sticking.
  - Clean valve. Replace if defective.
2. Brake orifice(s) 07 plugged.
  - Remove orifice(s). Clean and reinstall.
3. Brake cylinder(s) C4 defective.
  - Rebuild cylinder(s). Replace if damaged.

### 4.2-9 Brake(s) will not Release (Additional for machines with Integral Brakes)

1. Stuck or defective auto reset valve V3.
  - Check valve operation. Clean valve. Replace if defective.
2. Stuck or defective hand pump P2.
  - Check pump operation. Clean pump. Replace if defective.
3. Defective internal brake piston seals.
  - Check brake pack will maintain pressure. If pressure is not maintained replace seals.
4. Plugged or defective brake orifice 07.
  - Clear obstruction. Replace if defective.
5. Damaged integral brake in wheel motor.
  - Inspect wheel motor assembly. Repair and replace as necessary.

## Hydraulic System (Continued)

### 4.2-10 Aerial Platform will not hold on a Grade (Machines with Integrals Brakes)

1. Worn or damaged brake discs.
  - Inspect brake discs for wear. Replace if worn or damaged.
2. Broken or damaged brake compression springs.
  - Check springs. 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 C3 seals leaking.
  - Rebuild cylinder(s). Replace if damaged.
3. Mechanical binding in king pins.
  - Check for binding. Repair as needed.
4. Orifices 03 plugged.
  - Clean orifices, and reinstall.

### 4.2-12 All System sluggish

1. System Relief Valve defective or not adjusted properly.
  - Adjust valve. Replace if defective.
2. Hydraulic pump P1 worn.
  - Check pump. Replace if defective.
3. Proportional valve 2H-59 contaminated or defective.
  - Clean. Replace if defective.

### 4.2-13 Power Extension Platform will not Extend or Retract

1. Platform extend valve 4H-26 or platform retract valve 4H-27 defective or is sticking.
  - Clean valve. Replace if defective.
2. Powered platform cylinder C5 seals defective.
  - Rebuild cylinder. Replace if damaged.
3. Mechanical binding in power extension platform mechanism.
  - Check for binding. Repair as needed.

### 4.2-14 High/Low Torque Inoperative

1. Stuck speed valve 3H-18A-1.
  - Clean valve. Replace if defective.
2. Stuck speed valve 3H-18A-2.
  - Clean valve. Replace if defective.

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## **Section 5 PROCEDURES**

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## General

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

## 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.

## Platform

### 5.1-1 OEM Controller Electronics Information

#### Flow Control

Single coil or solenoid for single direction. The coil has two connections; one is wired to the P.C. Board (A) terminal and the other is wired to (-), or the negative side of the supply voltage. Switches to control directional valves may be provided on the controller.

#### Adjustment Procedures

Adjustments are made by turning a trimpot adjustment screw. The trimpots are multi-turn, end to end-devices. It may be necessary to turn the adjustment screw several turns to observe a change in output.

Clockwise (CW) adjustment of the trimpot increases the output.

Counter-clockwise (CCW) adjustment of the trimpot decreases the output.

Adjustments affect output current, voltage or percentage of duty cycle to the coil. The minimum and maximum output is preset at the factory. However, for optimum performance, they must be adjusted while the equipment is operating.

Although the following adjustments affect the current/voltage or percentage of duty cycle, the best way to adjust the function is to observe the response or speed of the function. The following adjustments affect function response, or speed. There may be some interaction between adjustments, making it necessary to repeat the adjustment in order to achieve the desired response.

#### “Threshold” Adjustments

Adjusts the initial current flow or duty cycle, affecting the function response or speed when the handle is first moved from the off position. Deflect the handle slowly to the position where the controller first turns on. Adjust the threshold trimpot screw to the point where the controlled function just starts to move, then turn the trimpot screw one, full turn in the counterclockwise direction. This adjustment should be done first.

#### “Maxout” Adjustments

Adjusts the full stroke current or duty cycle affecting the maximum function response, or speed when the handle is deflected to its full travel. Fully deflect the handle, and adjust the maxout trimpot for maximum desired function response or speed. To obtain proportional resolution, it is important that the function starts to slow down as soon as the handle is moved back from the fully deflected position.

The ideal adjustment occurs when the function just begins to move when the handle is deflected, and the output increases until it reaches its maximum desired response or speed at the end of handle travel.

### 5.1-2 OEM Controller Troubleshooting

#### Problem

1. The function will not operate when the handle is moved. The LEDs do not light
  - A. Check that voltage is present at the positive (+) input terminal.
  - B. Check that ground is connected to the negative (-) terminal.
  - C. If there is an in-line fuse, check to see if it is good.
  - D. Check the controller on/off switch and the connectors. Voltage should be present at the (X) terminal when the controller is turned on.
  - E. Check that valve wiring is not shorted to ground. The LEDs will not light.
  - F. Check that valve wiring is not open. The LEDs will light, but the intensity will not vary.
  - G. Check trimpot settings. Fully "CCW" turns output off, "CW" turns output fully on.
2. The function jumps or lurches when turned on.
  - A. Perform "Threshold" adjustment procedures.
3. The function reaches maximum speed before the handle is fully deflected,
  - A. Perform "Maxout" adjustment procedures.
4. The function speed remains constant regardless of the degree of handle deflection.
  - A. Perform "Maxout" adjustment procedures.

#### IRS Option

1. Function speed reacts too slowly or too quickly in relation to handle deflection.
  - A. Check "IRS" (Ramp) trimpot adjustment. "CW" increases ramp time, "CCW" decreases ramp time.

#### Integrated Ramp System (IRS)

Provides smooth function response ,when reacting to an abrupt change in handle deflection. "CW" rotation of the trimpot increases ramp time and slows the response time. "CCW" decreases ramp time and increases the response time. To increase the ramp time, turn the adjusting screw "CW" a few turns, then move the controller handle abruptly. Continue to adjust until a smooth response is observed. Most controllers have on/off contacts which remove power from the P.C. Board when the handle is returned to the off position. When the handle is abruptly returned to neutral, the output will not ramp down, and the function will stop.

#### Ramp Thru Off

The P.C. Board should be adjusted as outlined in the IRS adjustment procedure. If the handle is abruptly returned to neutral (OFF) the output will ramp down to off. Ramp time is factory set to 2 seconds, unless otherwise specified.

#### NOTE

Trimpots should be sealed with nail polish or enamel based paint.

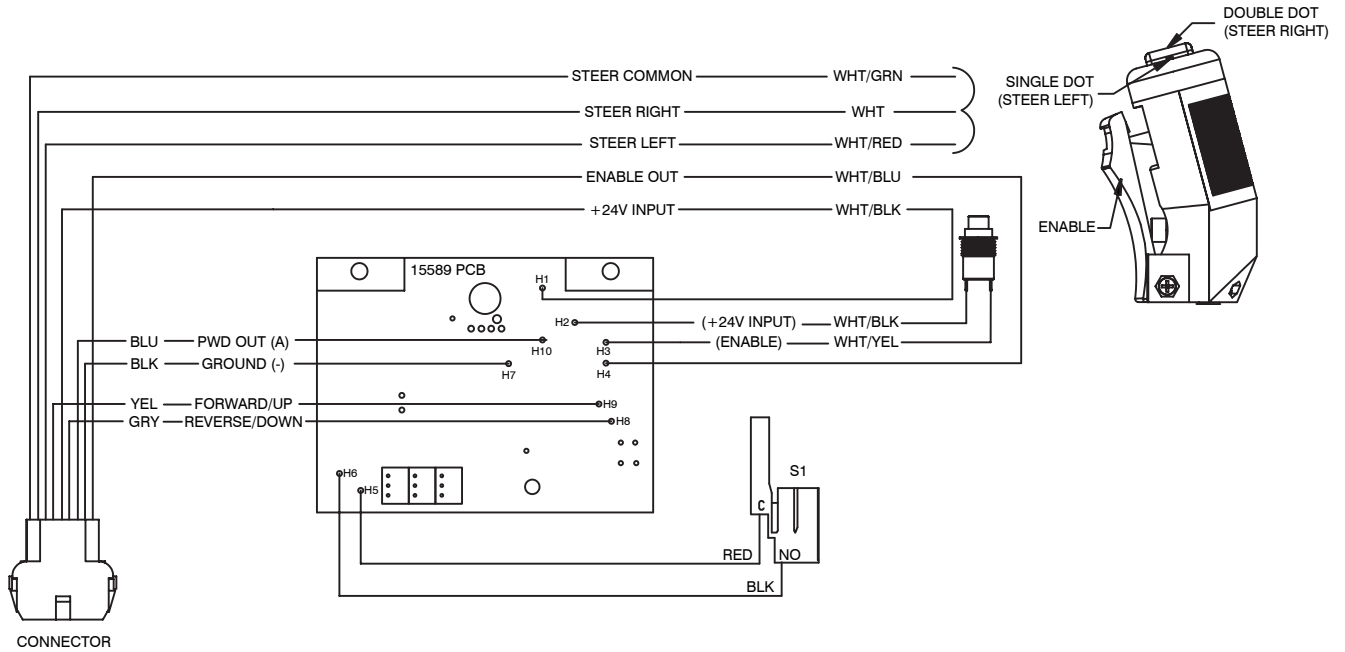


#### WARNING

Do not use RTV silicone.

5.1-3 OEM Controller switch wiring

WIRE CHART		
COLOR	FROM	TO
WHT/RED	STEER LEFT	PIN #1
WHT/GRN	STEER COMMON	PIN #2
WHT	STEER RIGHT	PIN #3
YEL	FORWARD/UP	PIN #4
WHT/BLK	+24V INPUT	PIN #5
GRY	REVERSE/DOWN	PIN #6
BLU	PWM OUT (A)	PIN #7
BLK	GROUND (-)	PIN #8
WHT/BLU	ENABLE OUT	PIN #9



**Base****5.2-1 System Relief Pressure Adjustment**

1. Locate the system pressure quick disconnect port on the main manifold.
2. Install a calibrated 5000 psi gauge to the system pressure quick disconnect port.
3. Remove the platform control console the guardrail and disconnect from the main control cable.
4. Locate the main control cable plug at the rear of the aerial platform.
5. Disconnect the main cable and connect the platform control console into the plug.
6. At the main manifold, loosen the locknut on the system relief valve R1.
7. Select drive with the lift/drive select switch on the platform control console.
8. Engaged steer right and hold.
9. Observe reading on gauge. Adjust the R1 system relief valve listed on the serial number plate. Turning the stem on the relief valve clockwise will increase pressure. Turning the stem counterclockwise will decrease pressure.
10. Release steer switch and tighten the locknut.
11. Remove the gauge from system pressure test port.

**5.2-2 Lift Pressure Adjustment****NOTE**

Adequate area to raise the platform to full height is required for the following steps.

1. Locate the lift pressure test port on the main manifold.
2. Install a calibrated 3000 psi gauge to the lift pressure quick disconnect port.
3. At the main manifold, loosen the locknut on the lift relief valve R2.
4. Close the manual lowering valve. Use the lift switch at the base control console to raise the platform to full height and hold the lift up switch on.
5. Observe the reading on the gauge. Adjust the R2 relief valve to the value listed on the serial number plate. Turning the stem of the relief valve clockwise will increase pressure. Turning the stem counterclockwise will decrease pressure.
6. Remove the gauge from lift pressure test port.

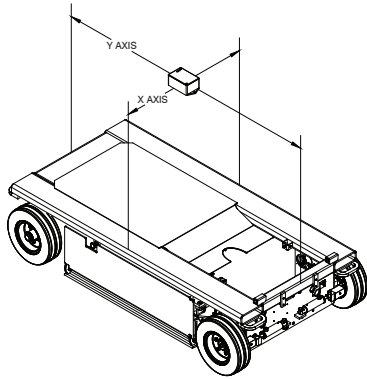
**NOTE**



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

**5.2-3 Electronic Tilt Switch Setup Procedure**

The following information is supplied for replacement or reprogramming of the electronic tilt switch. Also included are test and verification instructions. Follow the appropriate procedures below.

**Tilt Switch Replacement**



1. Ensure aerial platform is parked on a firm level surface.
2. Chock or block wheels to keep the aerial platform from rolling forward or backward.
3. Lower/Raise the platform and secure the scissors using the maintenance bar. (Refer to Operating manual for Maintenance Support Procedure)
4. Push in “” emergency stop buttons and turn main disconnect switch to “” off position.
5. Remove any covers to locate and view the tilt switch.
6. Disconnect tilt switch from 4 pin connector.
7. Remove old tilt switch from mount.


**NOTE**

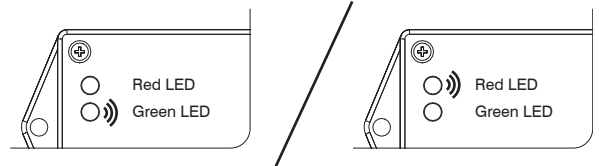
Ensure part number of old and new tilt switch are the same.

8. Install new switch to mount (in the same orientation as the old switch) and connect switch plug to 4 pin connector.

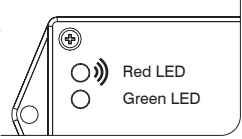
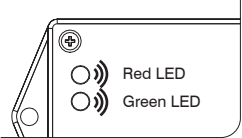
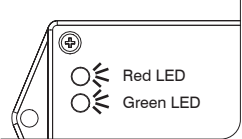
**NOTE**

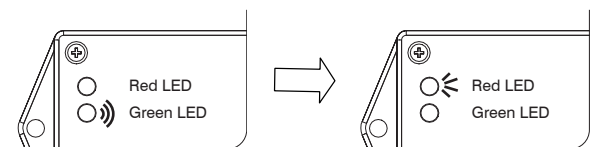
The tilt circuit is only powered when activating a function.

9. Disconnect all wires #02 from motor contactor.
10. Install jumper wire between #7 and #19 to terminal strip.
11. Turn main disconnect switch to “” ON position.
12. Verify switch is powered. (Red or green LED will be continually blinking)

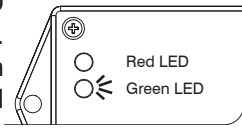


**13. Program the Tilt Switch**

- a. Press and release the set up button 3 times.
- b. Observe program delay / stabilization time. (Only the red LED will blink for 4 seconds) 
- c. Both LEDs will flash for 1 second. **Results:** The switch is learning the new zero position. 
- d. Both LEDs will turn on solid for 1 second. **Results:** The new zero position has been learned. 
- e. The green LED will flash and then the red LED will turn on solid for 2 seconds.



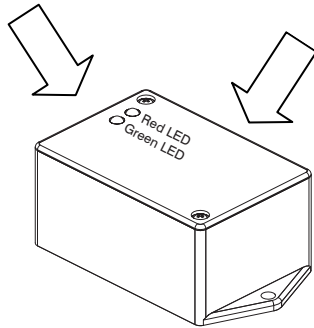
**Results:** The switch is verifying the new zero position.

- f. The green LED will turn on solid. **Results:** The switch is ready for normal operation. 

14. Turn main disconnect switch to “○” off position.
15. Remove jumper wire between #7 and #19 from terminal block.
16. Reattach all wires #02 to motor contactor.
17. Reinstall any covers that was removed.
18. Remove chock or wheel blocks.
19. Proceed to Test and Verify Tilt Circuit.

Reprogramming Existing Tilt Switch

Light Indicators      Set up button is located on this face next to harness

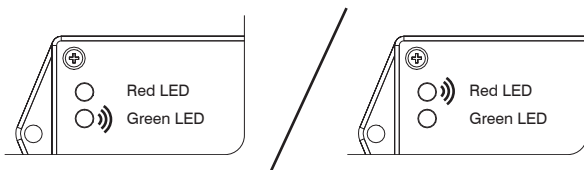


1. Ensure aerial platform is parked on a firm level surface.
2. Chock or block wheels to keep the aerial platform from rolling forward or backward.
3. Lower/Raise the platform and secure the scissors using the maintenance bar. (Refer to Operating manual for Maintenance Support Procedure)

**NOTE**

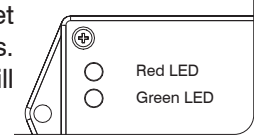
The tilt circuit is only powered when activating a function.

4. Remove any covers to locate and view the tilt switch.
5. Disconnect all wires #02 from motor contactor.
6. Install jumper wire between #7 and #19 to terminal strip.
7. Turn main disconnect switch to "I" ON position.
8. Verify switch is powered. (Red or green LED will be continually blinking)

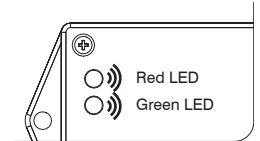


9. Reprogram the Tilt Switch

- a. Press and hold the set up button for 3 seconds. **Results:** Both LEDs will be OFF.



- b. Both LEDs will flash.

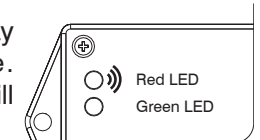


**IMPORTANT**

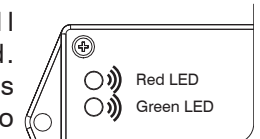
Step "c" must be completed within a 5 second period, or the switch will automatically exit program mode and return to normal operation using previously stored data.

- c. Press and release set up button 3 times.
- d. If 5 second period has expired prior completion, repeat Step "a", "b" and "c".

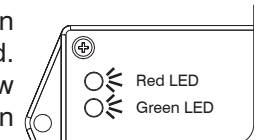
- e. Observe program delay / stabilization time. (Only the red LED will blink for 4 seconds)



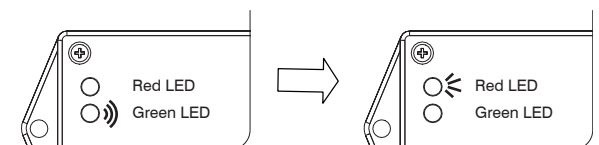
- f. Both LEDs will flash for 1 second. **Results:** The switch is learning the new zero position.



- g. Both LEDs will turn on solid for 1 second. **Results:** The new zero position has been learned.

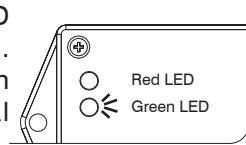


- h. The green LED will flash and then the red LED will turn on solid for 2 seconds.



**Results:** The switch is verifying the new zero position.

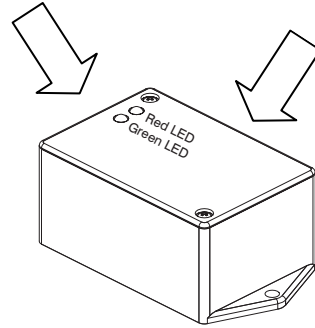
- i. The green LED will turn on solid.  
**Results:** The switch is ready for normal operation.



10. Turn main disconnect switch to “○” off position.
11. Remove jumper wire between #7 and #19 from terminal block.
12. Reattach all wires #02 to motor contactor.
13. Reinstall any covers that was removed.
14. Remove chock or wheel blocks.
15. Proceed to Test and Verify Tilt Circuit.

**Test and Verify Tilt Circuit**

Light Indicators      Set up button is located on this face next to harness



**Operations of Tilt Switch**

The following describes the LED’s and what they indicate.

<b>Green LED</b>	Illuminated whenever both tilt axes are within the specified degrees of the zero/ home learned position. Flashes when transitioning in or out of tilt angle limits, but built in time delay has not fully occurred.
<b>Red LED</b>	Illuminated whenever tilt on one or more axes is more than the specified degrees out from the zero/ home position.
<b>Green &amp; Red LED</b>	On together, no blinking when fault detected.

**Tilt Circuit Test**

1. Refer to section 2 for test tilt sensor procedure.





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