



SERVICE MANUAL (ANSI/CSA)
DC ELECTRIC SCISSORS

MODELS **SJIII 3219**

210276AD October 2025

SKYJACK

This manual is for MEWPs with serial numbers:

SJIII 3219 80 100 000 to 80 149 999

Please refer to the website www.skyjack.com for older serial numbers.

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



WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT

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

Section 1 SCHEDULED MAINTENANCE

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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 and Mobile Elevating Work Platform Definition

A mobile device that has a positionable platform supported from ground level by a structure.

Purpose of Equipment

The SKYJACK SJIII DC Electric 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. Work platform elevation and elevated driving must only be done on a firm level surface.

Manuals**Operating**

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

Service & Maintenance

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

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

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.

Operator Safety Reminders, Warnings and Precautions

Operator safety is SKYJACK's priority. The operator should comply with all applicable safety-related reminders, warnings and precautions found in the Operating Manual. They should be read and understood completely before operating the aerial platform.

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 Pre-Delivery/Maintenance Inspection Checklist](#). 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:

**WARNING**

Escaping fluid from a hydraulic pressure leak can damage your eyes, penetrate the skin and cause serious injury. Use proper personal protection at all times.

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 Pre-Delivery/Maintenance Inspection Checklist](#) 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.

Railing Maintenance and Repair

Skyjack MEWPs have been designed to ensure compliance with the relevant design standards applicable for that particular unit at the time of manufacture. As such, any repairs made to the guardrail or basket structure need to ensure this compliance is not compromised and must return the structure to its original condition.

Any damage must be repaired by returning the railing assembly to its undamaged state. Damage includes, but is not limited to, the items listed below:

- bent/deformed guardrail sections
- cracks or broken welds in railing sections
- damaged pin connections
- missing pins or broken pin lanyards
- missing railing hardware
- loose or missing parts
- additional holes in guardrail sections other than those approved by Skyjack

Additionally, the guardrails must be properly positioned and secured, and the entry gate/chain must be in good working order.

The strength of the guardrail system, and therefore its ability to provide fall protection for platform occupants, depends upon the design being secure and undamaged.

Skyjack railings are designed for modular replacement, and Skyjack recommends replacement of any damaged railing section. Skyjack-approved replacement parts will meet this requirement.

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 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

PDI / Frequent	B
Annual	B + C
Additional	*

- B** - Perform PDI prior to each delivery, or Frequent Inspection every 3 months or 150 hours.
- C** - Perform Scheduled Maintenance Inspections every year.
- * - Perform at time sensitive maintenance intervals.
 - 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 1** 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
N/A = Not applicable

Table 1.1 Owner's Annual Inspection Record

  Model _____ S/N _____										
*		20__	20__	20__	20__	20__	20__	20__	20__	20__
**		SKYJACK								
ZZ 156441AB										

This decal is located on the scissor assembly. 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.

	Pictorial	Description
*		Inspection Date
**		Inspector Signature



Pre-Delivery/Maintenance Inspection Checklist

Vertical Mast, SJIII, & Rough Terrain

Serial Number:

Product Owner:

Model:

Hourmeter Reading:

Date/Time:

Use this form for Pre-Delivery Inspections (PDI) prior to each rental, lease or sale, or as a guide for all Frequent Inspections and Annual Inspections. Refer to the applicable Operating and Service Manuals for inspection details (eg. Visual Inspection and Function Tests, Torque Specs., Engine Oil, Chain Inspection Intervals, etc.).

Inspection Type Schedule

<input type="checkbox"/>	PDI	B
<input type="checkbox"/>	Frequent	B
<input type="checkbox"/>	Annual	B + C

B - Perform PDI prior to each delivery or Frequent Inspections every 3 months or 150 hrs. For further details refer to Service & Operating Manuals.

C - Perform Scheduled Maintenance Inspections every year. For further details refer to Service & Operating Manuals.

P - Pass**F** - Fail**R** - Repaired**N/A** - Not Applicable

Check the appropriate box as each item is inspected. If an item is found to be not acceptable, please describe the issue in the comments box provided.

Items for Inspection	P	F	R	N/A
Refer to skyjack.com for the latest service bulletins.	B			
Ensure Annual Inspection has been completed within the last 13 months.	B			
Manuals & Required Documents. In storage box, in good condition & legible.	B			
Labels. In place, secure & legible.	B			
Limit Switches. Secured & no obstructions or damage.	B			
Main Power Disconnect Switch. Cables secure & in working order.	B			
Battery/ Hydraulic Tray. Latch is secure, & no missing parts.	B			
Battery Charger. Secure, & no damage.	B			
Battery. No damage, tight connections, fluid levels correct. Clean terminals and cable ends.	B			
Manifolds. Tight fittings and hoses & no damage or leaks. Tight wire connections & no missing parts.	B, C			
Motor Controller. Secure & no damage. No loose connections.	B			
Electrical Panel / Control Module. Secure & no damage. Tight wire connections and fasteners.	B			
Hydraulic Tank. Filler cap secure & no damage or leaks.	B			
Hydraulic Oil. Level at, or slightly above top mark.	B, C			
Hydraulic Components & Hoses. Secure & no damage or leaks.	B			
Base Weldment. No deformation or cracks.	B			
Base Control Switches. Switches to neutral position & no damage.	B			
Free-wheeling Valve Knob. Secure & no damage or missing parts.	B			
Ladder. Secure & no damage.	B			
AC Power to Platform (Plug Cord Receptacle). No obstructions, dirt or damage.	B			
Pothole Protection Device. Check both sides for obstructions, dirt, or damage.	B			
Brakes. Secure & no damage or leaks.	B, C			
Steer Cylinder Assembly. Secure & no damage, leaks or missing parts.	B			
Wheel/Tire Assembly. Check all tires for damage, wear & proper alignment. Lug nuts torqued as recommended.	B			
Axles. Secure & no missing parts. Tight fittings and hoses & no leaks.	B			
Tie Rod. End studs locked & no damage.	B			
Tilt (Load) Sensor. Secure & no damage.	B			
Emergency Lowering Access Rod. Secure & no damage.	B			
Engine Tray. No damage or missing parts.	B			

Items for Inspection	P	F	R	N/A
Engine Control Console. Secure & no damage.	B			
Engine Air Filter. No damage or missing parts.	B, C			
Engine Oil. Level between "L" and "H". Ensure oil change interval has not been exceeded.	B			
Radiator. Secure & no damage or missing parts. Check coolant level.	B, C			
Muffler and Exhaust. Secure & no damage.	B			
Fuel Shut-off Valve. No damage or missing parts.	B			
Fuel Tank. Filler cap is secure & no damage.	B			
Fuel Leaks. Tight fittings and hoses & no damage or leaks.	B			
Propane Tank. Straps fastened to brackets & coupler tight.	B			
Propane Tank Leaks. No leaks (refer to service manual for procedure).	B			
Scissor Assembly. No deformation/damage. Pins secure. Cables & wires routed with no damage.	B			
Mast Assembly. No damage or deformation.	B			
Mast Chains & Control Cables. No damage or missing parts.	B			
Rollers. Secure & no obstructions, dirt, or damage/wear.	B			
Wear Pads. No damage/wear or missing parts. Fasteners tightened.	B			
Scissor Bumpers. Secure & no damage.	B			
Sliders. Secure & no obstructions, dirt, or damage/wear.	B			
Maintenance Support. Secure & no damage.	B			
Lift Cylinder(s). No damage or missing parts. Tight fittings and hoses & no leaks.	B			
Scissor Pins. No damage/wear or missing parts.	B			
Platform Control Console. Switches to neutral position & secure. No missing parts.	B			
Railings and Gate/Chain. Secure & no damage or missing parts.	B			
Lanyard Attachment Anchorage. Attachment rings secure & no damage.	B			
AC Outlet. No obstructions, dirt, or damage.	B			
Powered Extension Control Console. Switches to neutral position & secure. No missing parts.	B			
Extension Deck. Secure & no damage or missing parts. Check fluid level (if applicable).	B			
Outriggers. No damage or missing parts.	B			
Scissor Guards. Secure & no damage.	B			
Greasing Points. No obstructions, dirt, or damage.	B, C			
Function Tests (Refer to your corresponding Serial #'s Operating Manual for information on running these tests.)	<input type="checkbox"/> PASS <input type="checkbox"/> FAIL			

Comments:

The undersigned confirms that all areas listed have been inspected, and any and all discrepancies have been brought to the attention of the owner. Furthermore, the undersigned confirms that all discrepancies have been corrected prior to using this machine.

Owner: _____ / _____
Print Name _____ Signature _____ Date (DD/MM/YY) _____

User: _____ / _____
Print Name _____ Signature _____ Date (DD/MM/YY) _____

Note: Visit skyjack.com for a printable copy of this form.

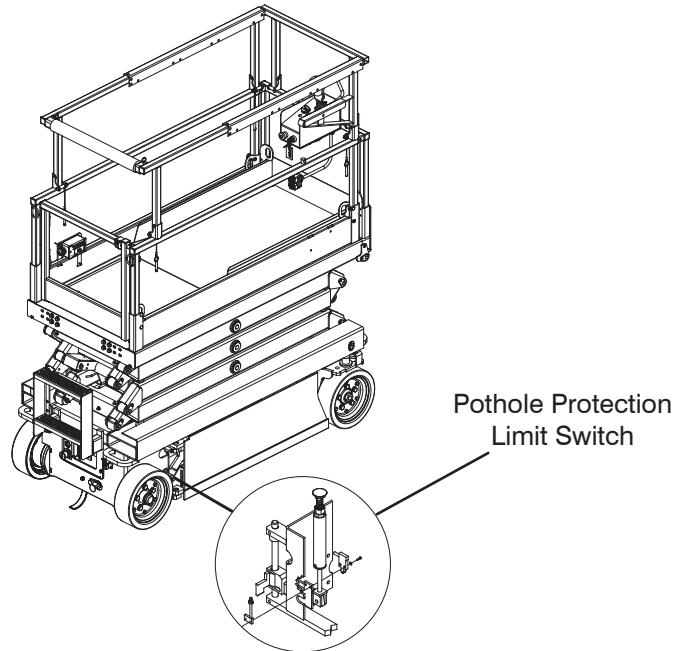
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SJIII DC Electric

SJIII 3219

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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

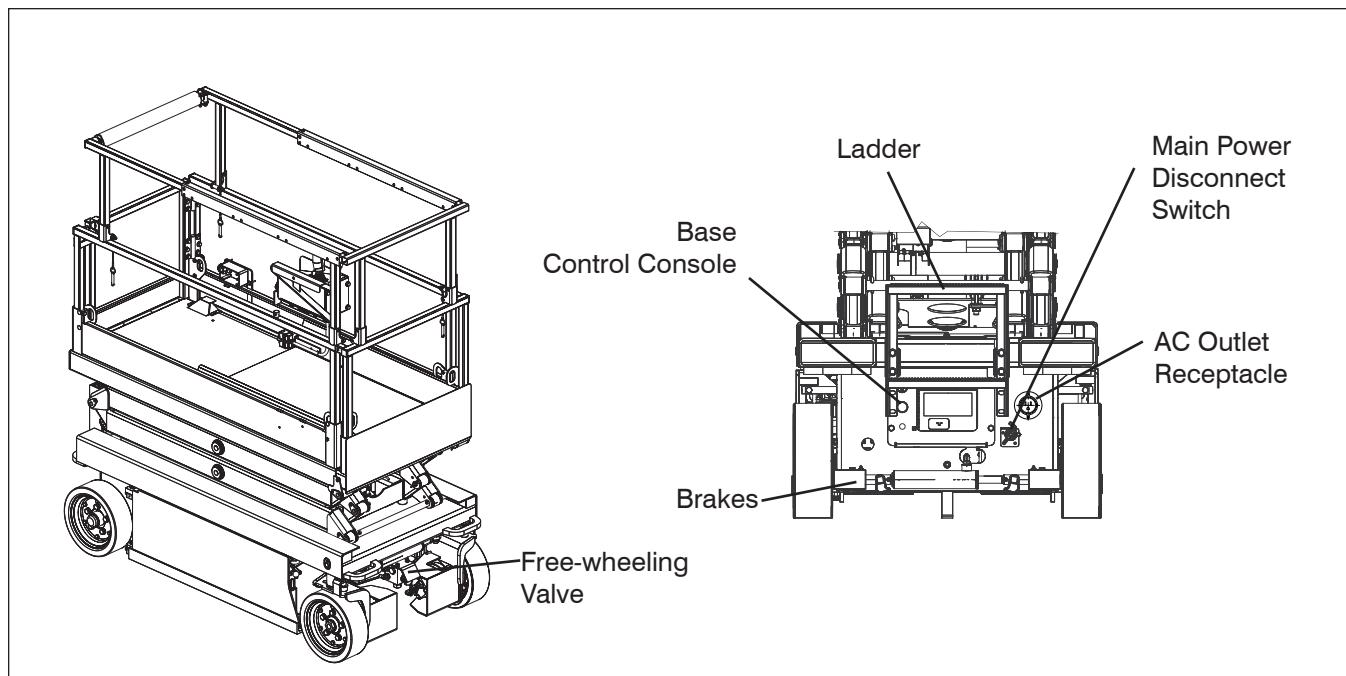
1.1-1 Manuals (B)

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.

1.1-2 Labels (B)

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



1.1-3 Limit Switches (B)

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

1.1-4 Entrance Side

- **Main Power Disconnect Switch (B)**
 - Turn main power disconnect switch to “○” off position.
 - Ensure all cables are secure and switch is in proper working condition.
- **Base Control Switches (B)**
 - Ensure there are no signs of visible damage and all switches are in their neutral positions.

- **Free-wheeling Valve Knob (B)**

(Compacts - Front Side)

- Ensure there are no loose or missing parts and there is no visible damage.

- **Brakes (B, C)**

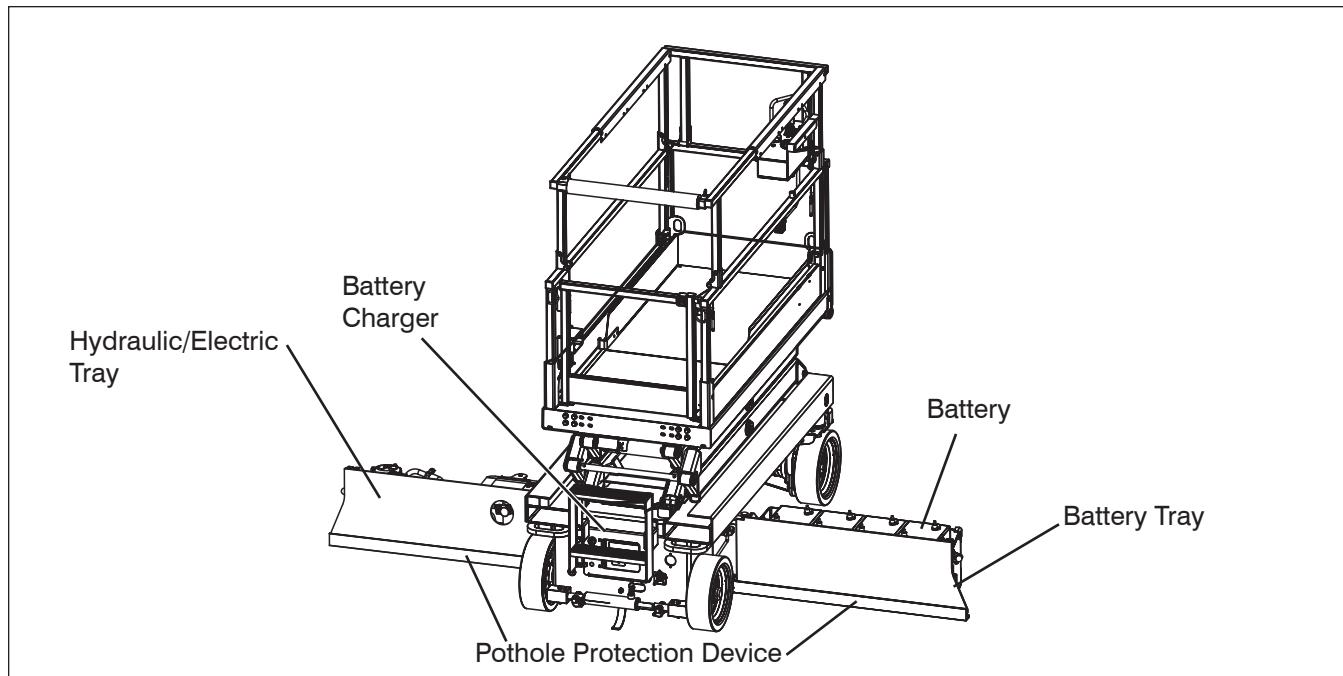
- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure brake override is not engaged.

- **AC Outlet Receptacle (B)**

- Ensure receptacle is free from dirt and obstructions.

- **Ladder (B)**

- Ensure there are no loose or missing parts and there is no visible damage.



1.1-5 Battery Tray Side

- **Pothole Protection Device (B)**
 - Ensure mechanisms have no sign of visible damage and are free from dirt and obstructions.
- **Battery Tray (B)**
 - Ensure tray latch is secure and in proper working order.
- **Battery Charger (B, C)**
(Compacts - Entrance Side)
 - Ensure charger is secure and shows no visible damage.
- **Battery (B)**
Proper battery condition is essential to good performance and operational safety. Improper fluid levels or damaged cables and connections can result in component damage and hazardous conditions.



WARNING

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



WARNING

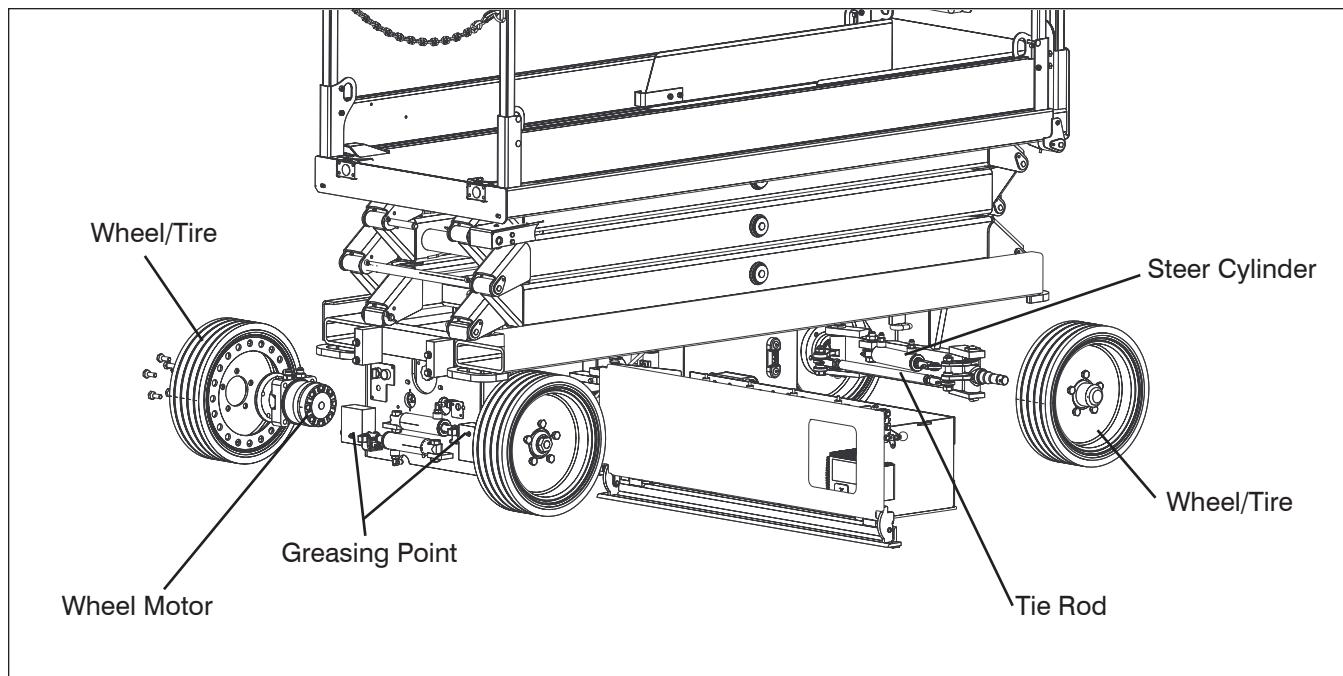
Battery acid is extremely corrosive
- Wear proper eye and facial protection as well as appropriate protective clothing. If contact occurs, immediately flush with cold water and seek medical attention.

1. Check battery case for damage.
2. **B - Frequent Inspection**
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.
B - Frequent Inspection
If plates are not covered by at least 1/2 in. (13 mm) of solution, add distilled or demineralized water.
5. **B - Frequent Inspection**
Replace battery if damaged or incapable of holding a lasting charge.



WARNING

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



- **Steer Cylinder Assembly (B)**
 - Ensure steer cylinder assembly is properly secured and there are no loose or missing parts.
- **Greasing Points (B, C)**
 - 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.

- **Wheel/Tire Assembly (B)**

A small amount of wear is permitted. But if any of the wear or damage meets the criteria mentioned below, the tire should be replaced.



WARNING

Do not use tires other than the tires that Skyjack specifies for this MEWP. Do not mix different types of tires or use tires that are not in good condition. Only replace the tires with the same types that are approved by Skyjack. The use of other tires can make the MEWP less stable. If you do not obey, there is a risk of death or serious injury.

The tire treads have been removed from the illustration for clarity.

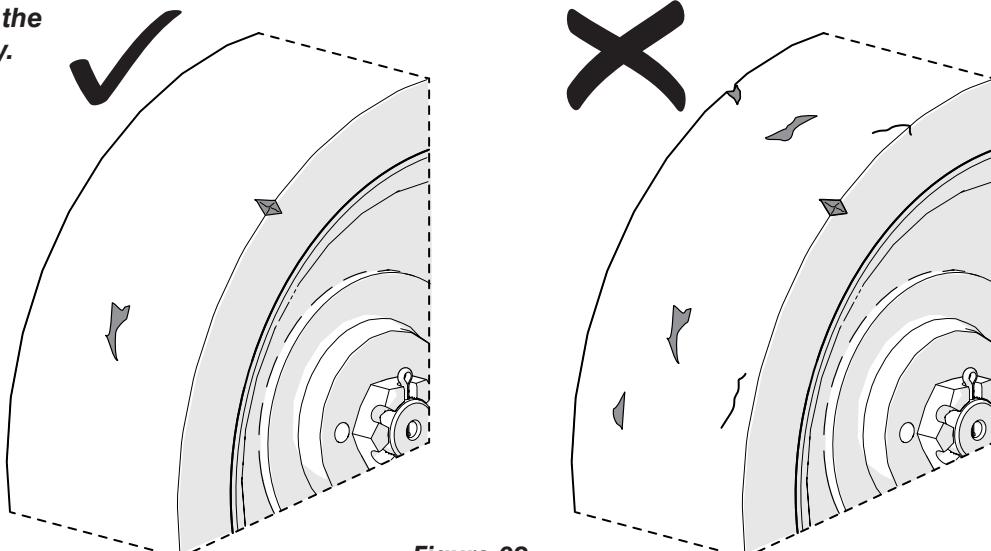


Figure 02

B - Frequent Inspection

Do a check for damage or wear on each tire and rim.

- Look for damage or cracked welds on each rim. The rims should be round.
- Look for uneven or unusual wear on the tire.
- Look for flat spots on the tread face of the tire.
- The tire tread should be visible and not worn down completely. Refer to Figure 01.

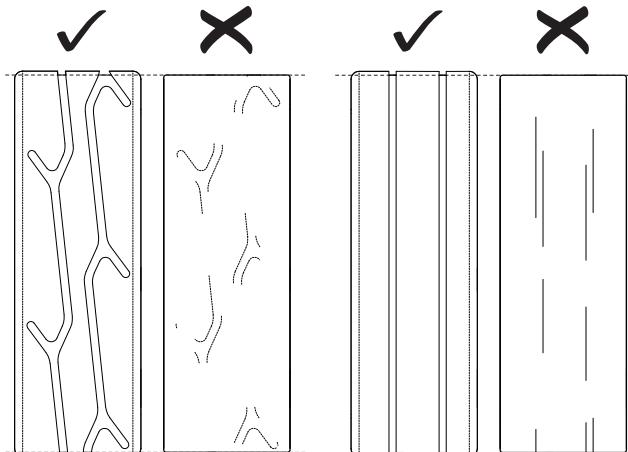


Figure 01

Do a check for cuts or missing chunks in the edges and tread face of the tire. Refer to Figure 02.

- The cut or missing chunk must not extend more than 10 mm (3/8") towards the centre of the tire.
- Each cut or chunk should not be larger than 25 mm x 10 mm (1" x 3/8"), or deeper than 20 mm (3/4").
- There should be no more than 2 cuts or chunks in each 1/4 section of the tire. There must be no more than 6 cuts or chunks in total in the tire.
- There should be no embedded debris.

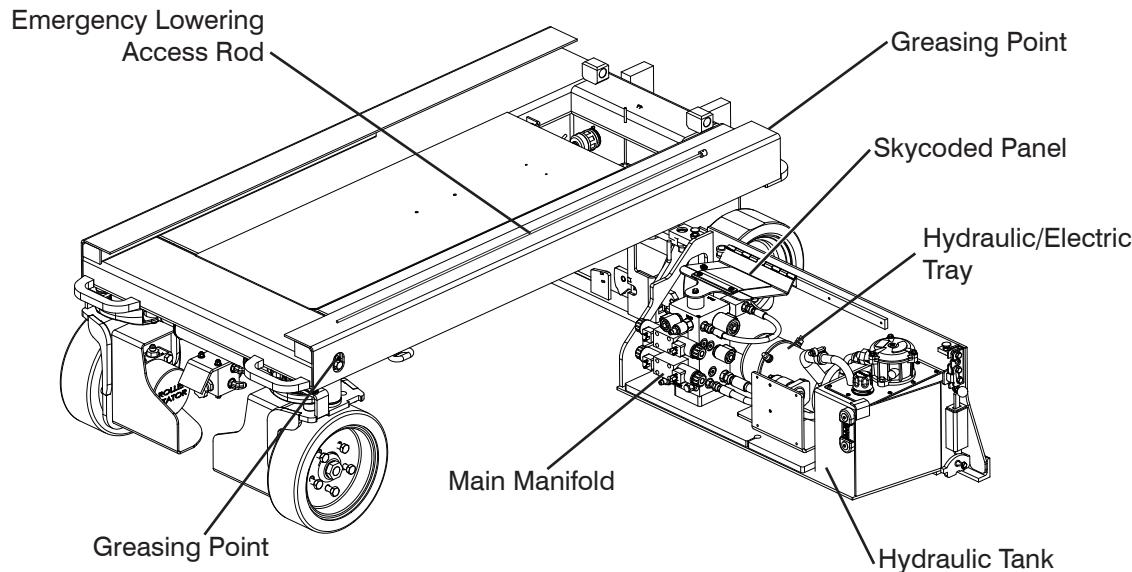
Do a check of the wheel components and mounts.

- Make sure the wheels are correctly aligned vertically and horizontally.
- Make sure the **wheel motors** have no loose or missing parts and there is no visible damage.

B - Frequent Inspection

C - Annual inspection

- Make sure the **castle nuts and/or wheel nuts** are in position and are tight.
- Make sure the **cotter pins** are correctly installed.
- If the cotter pin is not installed, refer to [Table 2.4 Torque Specifications](#) for proper torque information.
- See [Section 5 - Procedures](#) for procedures.



1.1-6 Hydraulic/Electric Tray Side

- Ensure tray latch is secure and in proper working order.
- **Pothole Protection Device (B)**
 - Ensure mechanisms have no sign of visible damage and are free from dirt and obstructions.
- **Hydraulic Tank (B, C)**
 - Ensure hydraulic filler cap is secure.
 - Ensure tank shows no visible damage and no evidence of hydraulic leakage.
- **Hydraulic Oil (B, C)**
 - 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**
 - Refer to Section 1 - Hydraulic System & Component Maintenance and Repair
- **Hydraulic Pump and Motor (B)**
 - Ensure there are no loose or missing parts and there is no visible damage.

- **Skycoded Panel (B)**

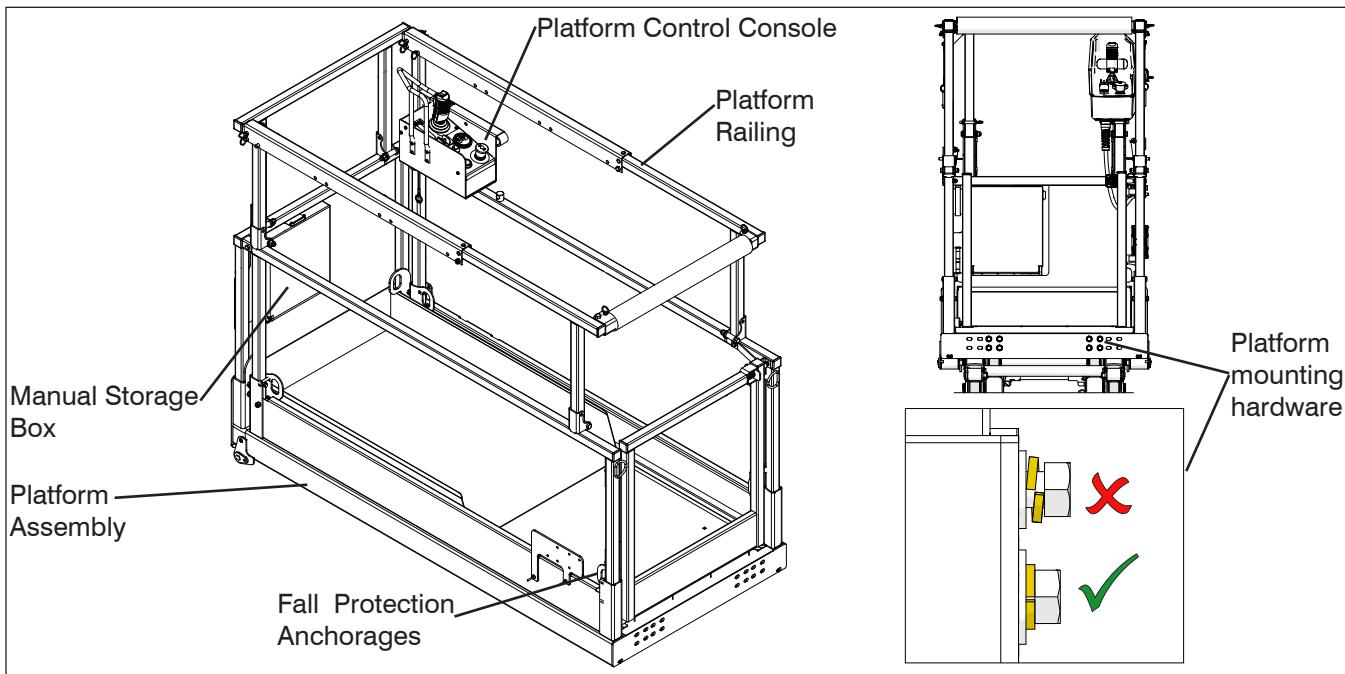
- Ensure panel is properly secured and there is no visible damage.
- Ensure there are no loose wire connections or missing fasteners.

- **Hydraulic Manifolds (B)**

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

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

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



1.1-7 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/ Secure chain.

- 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 Anchorage (B)**
 - Ensure attachment rings are secure and no visible damage.

- **AC Outlet on Platform (B)**
 - Ensure outlet has no visible damage and free from dirt or obstructions.

- **Platform Control Console (B)**
 - 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.

- **Powered Extension Control Console (If Equipped) (B)**

- 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.



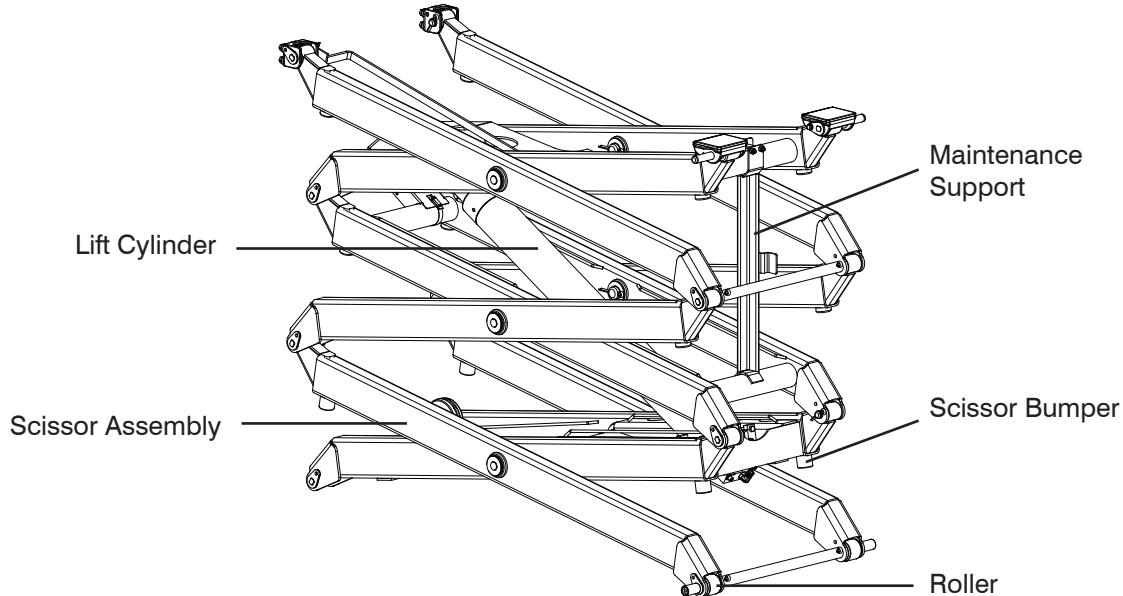
WARNING

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

3. Use the ladder to dismount from platform.

- **Platform Mounting Hardware (B)**

- Make sure the fasteners are correctly installed and there are no missing or loose bolts, flat washers, or spring washers.
- Make sure the spring washers are fully compressed.
- Make sure there is no damage on the platform surface next to the flat washers.
- If any of the above conditions are not met, immediately tag and lock the MEWP and remove it from service for repair.
- Refer to [5.1-5 Platform Mounting Hardware](#) for the maintenance/installation procedure.



1.1.8 Lifting Mechanism

1. Raise the platform until there is adequate clearance to swing down the maintenance support.

- **Maintenance Support (B)**

- Ensure maintenance support is properly secured and shows no visible damage.

- **Scissor Assembly (B)**

- 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.

- **Scissor Bumpers (B)**

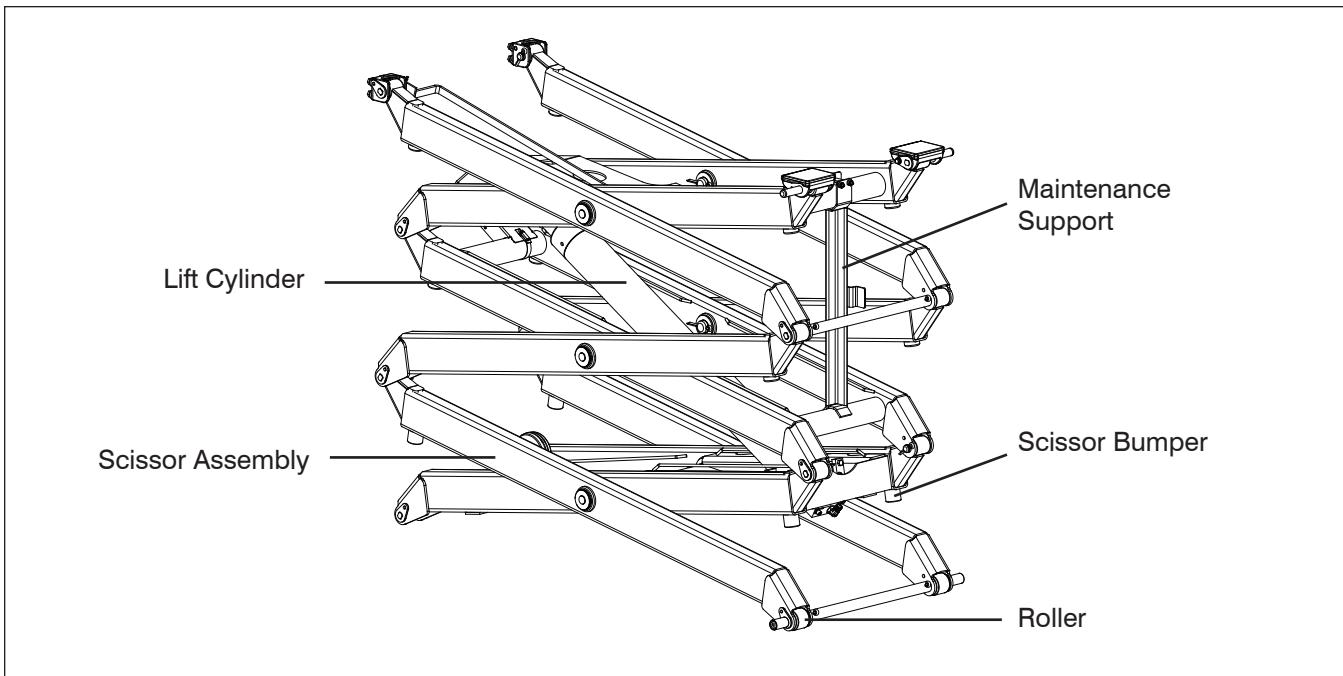
- Ensure bumpers are secure and shows no sign of visible damage.

- **Rollers (B)**

- Ensure rollers are secure and there is no visible damage.
- Ensure rollers' path of travel are free from dirt and obstructions.

- **Scissor Pin Inspection (B)**

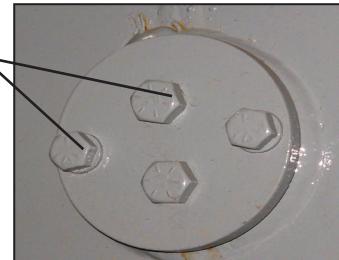
- Complete a structural inspection of the scissor pin connections, looking for indicators of pin and/or scissor arm damage. These indicators include, but are not limited to:
 - Noise coming from binding/seized pins
 - Rust forming near pin joint
 - Cracks in welds or in surrounding metal
 - Evidence of metal dust or shavings from wearing components
 - Broken/missing pin retainer bolts
 - Broken/missing pin retainers
 - Rotated pin
 - Elongation/enlargement of pin hole



Examples of pivot pin connections with no damage:

- No rust
- Pin has not rotated
- Area is clear of dust/metal shaving
- Pin retainer/retainer bolts are in place

Pin retainer bolts
in place



Center pin pivot - Outer

Pin retainer in place

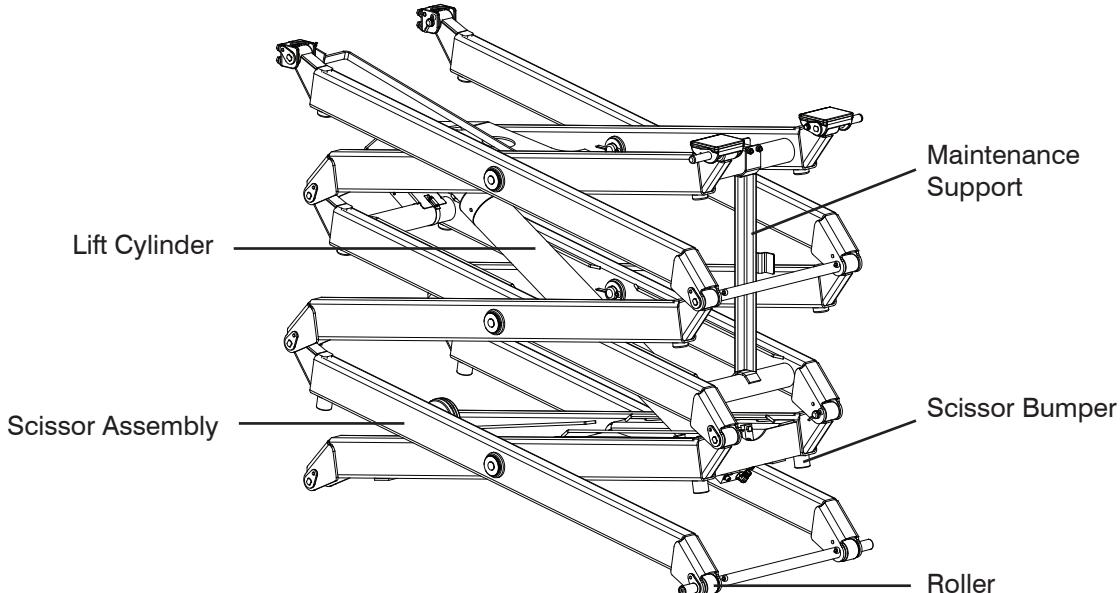
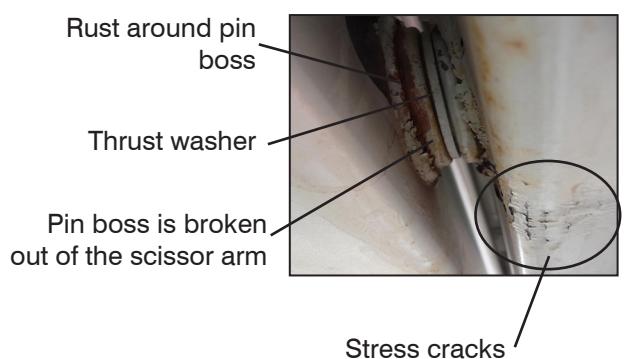
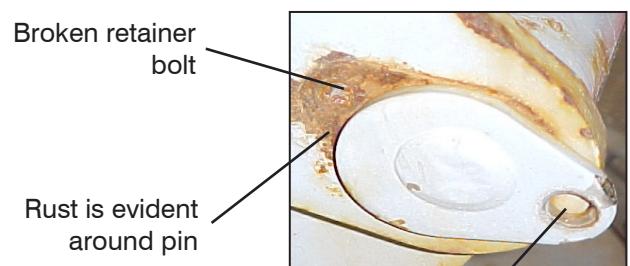


Center pin pivot - Middle

No rust. Pin has
not rotated. Area is
clean of dust/metal
shavings



Center pin pivot - Inner

**Examples of damaged pin connections:**

Scissor end pin connections showing symptoms of damage must be inspected after removing the applicable pins and bushings. The scissor bore should also be inspected at this time for any signs of damage, specifically elongation or ovality of the hole. Provided there is no structural damage to

the scissor arms, the pins and bushings can be replaced with new components.

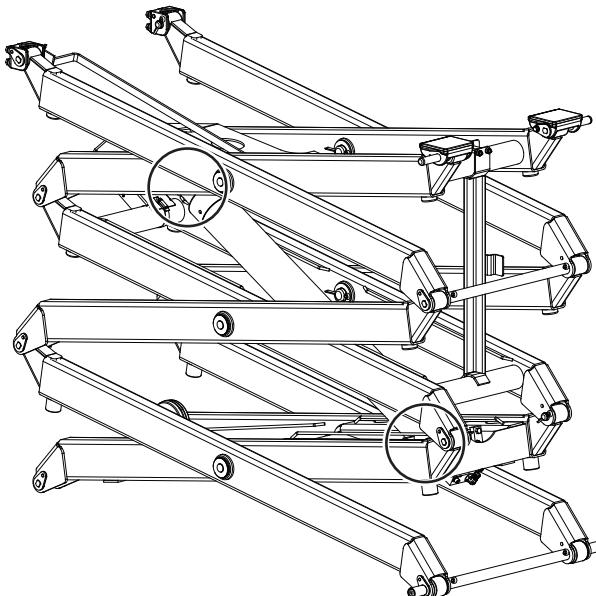
**WARNING**

Any units showing the above listed and/or depicted signs of damage should be immediately removed from service and repaired by a qualified technician.

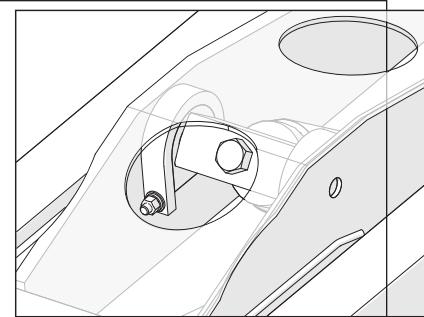
Any units with structural damage to any pin connection or scissor arm must be **immediately removed from service** and repaired by a qualified technician. Contact Skyjack Service for direction on how to repair the unit.

- **Lift Cylinder(s) (B)**

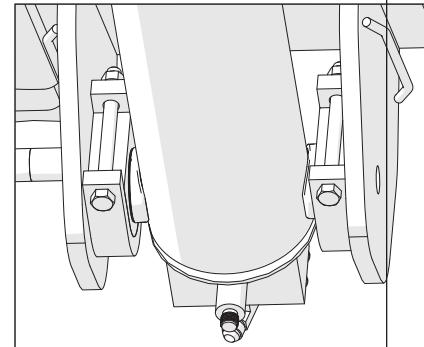
- Ensure each lift cylinder is properly secured, there are no loose or missing parts and there is no evidence of damage.
- Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.



Upper cylinder
mount area



Lower cylinder
mount area



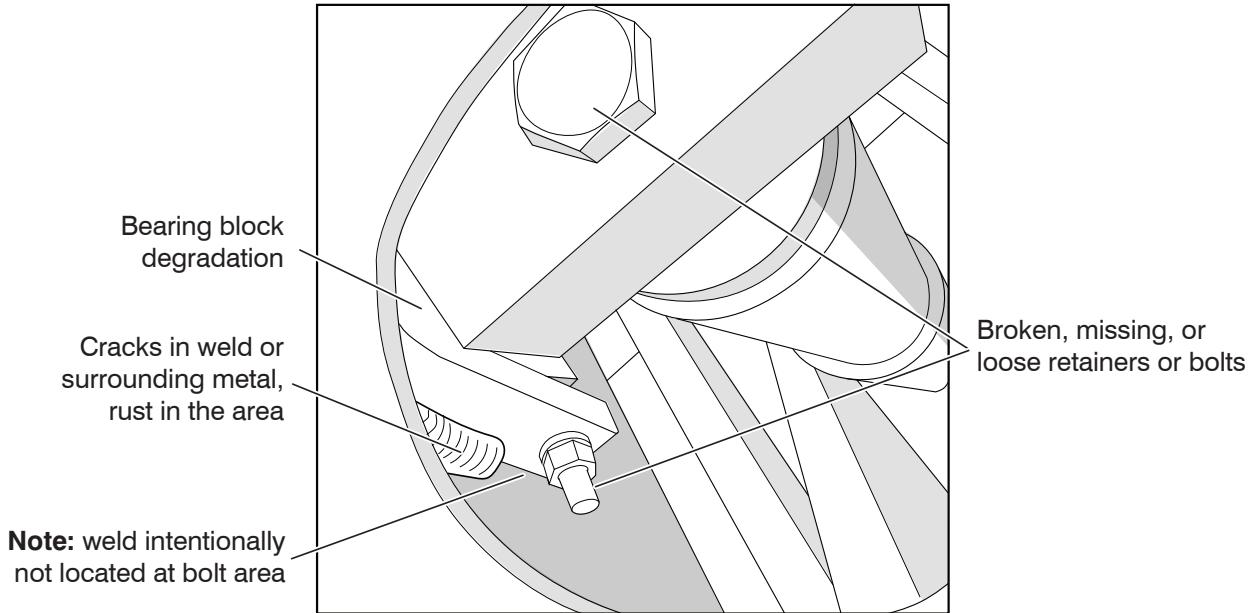
- Cylinder mount inspection (B)**

The inspection must be done as part of the scissor assembly inspection.

Do a structural inspection of the cylinder mount areas. Look for signs of damage to the mounts.

These signs can include:

- Broken, loose or missing retainers or bolts
- Bearing block degradation
- Cracks in welds or the surrounding metal, or rust forming in the area.



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, 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 **Start Operation** section of the operating manual.

For function tests that are to be run, please refer to the operating manual that corresponds to the correct serial number. Here, there will be detailed instructions for which tests to perform, as well as how to properly and successfully perform them.

Section 2 **MAINTENANCE TABLES AND DIAGRAMS**

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2

Table 2.1 Specifications and Features

MODEL	SJIII 3219
Weight *	2580 lb. 1170 kg
Overall width	32" 0.81 m
Overall length	70.0" 1.78 m
Platform Size (inside)	26" x 64" 0.66 m x 1.63 m
Height	
Working Height	25' 7.6 m
Platform Elevated Height	19' 5.8 m
Stowed Platform Height	39" 0.99 m
Stowed Height (Railings Up)	78.5" 1.99 m
Drive Height	FULL
Standard Operating Time	
Lift Time (No Load)	19 s
Lower Time (No Load)	36 s
Lift Time (Rated Load)	23 s
Lower Time (Rated Load)	30 s
Chassis	
Normal Drive Speed	2.55 mph 4.1 km/h
Elevated Drive Speed	0.6 mph 1.0 km/h
High Torque Drive Speed	1.6 mph 2.6 km/h
Gradeability (Ramp Angle)	25%
Tires	12 x 4 x 8 Solid Rubber
Hydraulic Oil	
Type	ATF Dexron III
	Shell Naturelle HF-E 32
Tank Capacity	2.9 gal. 10.9 L

1058_ANSI_Specs_SC_AB

* 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 2.2 Floor Loading Pressure

MODEL		Total Aerial Platform Weight		Total Aerial Platform Load					
				Wheel		LCP**		OUP**	
		lb.	kg	lb.	kg	psi	KPa (kN/m ²)	psf	KPa (kN/m ²)
SJIII 3219	min*	2580	1170	1032	468	100	689.5	170	8.0
	max*	3130	1420	1252	568	110	758.5	210	10.0

1058_ANSI_FL_SC_AA

* 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.

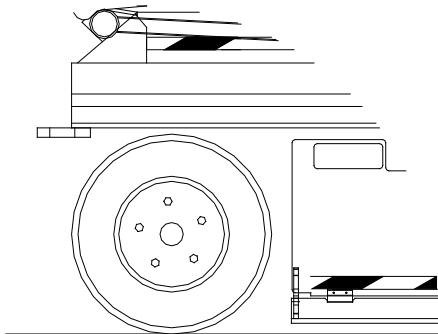
NOTE:

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.

Floor Loading Pressure**Locally Concentrated Pressure (LCP):**

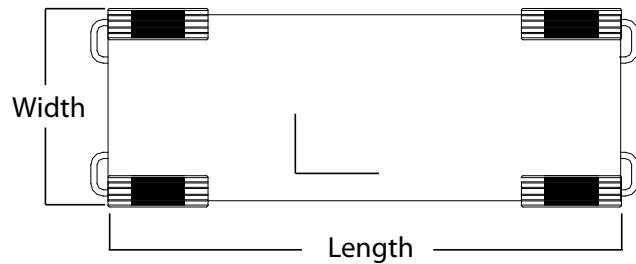
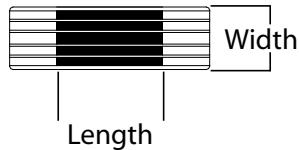
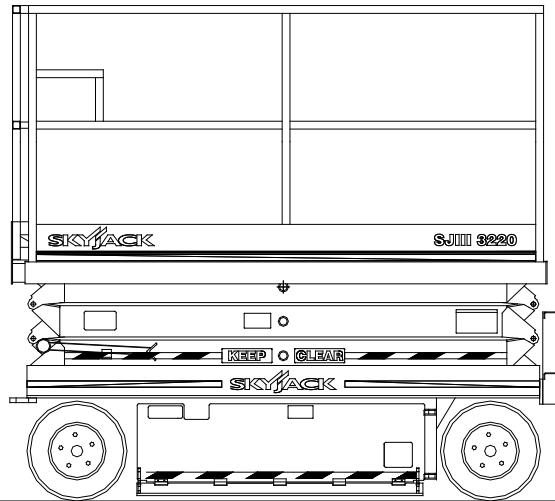
Foot Print Area = Length x Width

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

**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 2.3 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		
SJIII 3219	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

1058_ANSI_MPC_SC_AA

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

Table 2.4 Torque Specifications

Base						Torque (lb-ft)	Torque (Nm)	
Directional Valve Mounting Bolts						2.3-2.7 (28-32 lb-in)	3.2 – 3.6 Nm	
Wheel Mounting Bolts						90 lb-ft	122 Nm	
Wheel Motor Castle Nut (Front) - Models 3215/19						280 lb-ft	379.6 Nm	
Hydraulic Motor Mounting Bolts						85	115	
Cartridge							Coils	
Valve Size	8	38	58	10	12	16	All coil sizes	
Torque (lb-ft) max	20	20	20	25	35	50	4 to 5	
Torque (lb-in) max	240	240	240	300	420	600	48 to 60	
Torque (Nm) max	27.12	27.12	27.12	33.9	47.46	67.8	5.42 to 6.78	
SAE Plugs								
Port Size	2	4	5	6	8	10	12	16
Torque (lb-ft) max	3	10	15	15	25	25	30	35
Torque (lb-in) max	36	120	180	180	300	300	360	420
Torque (Nm) max	4.07	13.56	20.34	20.34	33.9	33.9	40.68	47.46
Newton-meter = Nm			Pound-foot = lb-ft			Pound-inch = lb-in		
Additional Torque Specifications may be found in Section 3.								

60663AA

Table 2.5 Torque Specifications for Fasteners (Imperial)

When specific torque values are not provided within this manual for a task, use the torque values given in the table below.

		IMPERIAL BOLT TORQUE CHART					
Size	Torque Type	SAE 2		SAE 5		SAE 8	
		Dry	Lubed	Dry	Lubed	Dry	Lubed
4-40	(in-lb)	(5)	(4)	(8)	(6)	(12)	(9)
	Nm	0.6	0.5	0.9	0.7	1.4	1.0
4-48	(in-lb)	(6)	(5)	(9)	(7)	(13)	(10)
	Nm	0.7	0.6	1.0	0.8	1.5	1.1
6-32	(in-lb)	(10)	(8)	(16)	(12)	(23)	(17)
	Nm	1.1	0.9	1.8	1.4	2.6	1.9
6-40	(in-lb)	(12)	(9)	(18)	(13)	(25)	(19)
	Nm	1.4	1.0	2.0	1.5	2.8	2.1
8-32	(in-lb)	(19)	(14)	(30)	(22)	(41)	(31)
	Nm	2.1	1.6	3.4	2.5	4.6	3.5
8-36	(in-lb)	(20)	(15)	(31)	(23)	(43)	(32)
	Nm	2.3	1.7	3.5	2.6	4.9	3.6
10-24	(in-lb)	(27)	(21)	(43)	(32)	(60)	(45)
	Nm	3.1	2.4	4.9	3.6	6.8	5.1
10-32	(in-lb)	(31)	(23)	(49)	(36)	(68)	(51)
	Nm	3.5	2.6	5.5	4.1	7.7	5.8
1/4-20	(in-lb) / ft-lb	(66)	(50)	8	(75)	12	9
	Nm	7.5	5.6	11	8.5	16	12
1/4-28	(in-lb) / ft-lb	(76)	(56)	10	(86)	14	10
	Nm	8.6	6.3	14	9.7	19	14
5/16-18	ft-lb	11	8	17	13	25	18
	Nm	15	11	23	18	34	24
5/16-24	ft-lb	12	9	19	14	25	20
	Nm	16	12	26	19	34	27
3/8-16	ft-lb	20	15	30	23	45	35
	Nm	27	20	41	31	61	47
3/8-24	ft-lb	23	17	35	25	50	35
	Nm	31	23	47	34	68	47
7/16-14	ft-lb	32	24	50	35	70	55
	Nm	43	33	68	47	95	75
7/16-20	ft-lb	36	27	55	40	80	60
	Nm	49	37	75	54	108	81
1/2-13	ft-lb	50	35	75	55	110	80
	Nm	68	47	102	75	149	108
1/2-20	ft-lb	55	40	90	65	120	90
	Nm	75	54	122	88	163	122

Inch-Pound Force = in-lb Foot-Pound Force = ft-lb Newton-Meter = Nm

NOTE: Lubed includes lubricants such as lubrizing, oil, grease, and some uncured thread lockers. Refer to the specific thread locker manufacturer's instructions for specific torque adjustments.

		IMPERIAL BOLT TORQUE CHART					
Size	Torque Type	SAE 2		SAE 5		SAE 8	
		Dry	Lubed	Dry	Lubed	Dry	Lubed
9/16-12	ft-lb	70	55	110	80	150	110
	Nm	95	75	149	108	203	149
9/16-18	ft-lb	80	60	120	90	170	130
	Nm	108	81	163	122	230	176
5/8-11	ft-lb	100	75	150	110	220	170
	Nm	136	102	203	149	298	230
5/8-18	ft-lb	110	85	180	130	240	180
	Nm	149	115	244	176	325	244
3/4-10	ft-lb	175	130	260	200	380	280
	Nm	237	176	353	271	515	380
3/4-16	ft-lb	200	150	300	220	420	320
	Nm	271	203	407	298	569	434
7/8-9	ft-lb	170	125	430	320	600	460
	Nm	230	169	583	434	813	624
7/8-14	ft-lb	180	140	470	360	660	500
	Nm	244	190	637	488	895	678
1-8	ft-lb	250	190	640	480	900	680
	Nm	339	258	868	651	1220	922
1-12	ft-lb	270	210	710	530	1000	740
	Nm	366	285	963	719	1356	1003
1-14	ft-lb	280	210	730	540	1020	760
	Nm	380	285	990	732	1383	1030
1 1/8-7	ft-lb	350	270	800	600	1280	960
	Nm	475	366	1085	813	1735	1302
1 1/8-12	ft-lb	400	300	880	660	1440	1080
	Nm	542	407	1193	895	1952	1464
1 1/4-7	ft-lb	500	380	1120	840	1820	1360
	Nm	678	515	1519	1139	2468	1844
1 1/4-12	ft-lb	550	420	1240	920	2000	1500
	Nm	746	569	1681	1247	2712	2034
1 3/8-6	ft-lb	670	490	1460	1100	2380	1780
	Nm	908	664	1979	1491	3227	2413
1 3/8-12	ft-lb	750	560	1680	1260	2720	2040
	Nm	1017	759	2278	1708	3688	2766
1 1/2-6	ft-lb	870	650	1940	1460	3160	2360
	Nm	1180	881	2630	1979	4284	3200
1 1/2-12	ft-lb	980	730	2200	1640	3560	2660
	Nm	1329	990	2983	2224	4827	3606

Table 2.6 Torque Specifications for Fasteners (Metric)

When specific torque values are not provided within this manual for a task, use the torque values given in the table below.

METRIC BOLT TORQUE CHART					
Size	Torque Units	8.8		10.9	
		Dry	Lubed	Dry	Lubed
M5 x 0.80	(in-lb)	(54)	(41)	(78)	(59)
	Nm	6.1	4.6	8.8	6.7
M6 x 1.00	(in-lb)	(92)	(69)	(133)	(99)
	Nm	10.4	7.8	15	11.2
M7 x 1.00	(in-lb)	(156)	(116)	(222)	(167)
	Nm	17.6	13.1	25.1	18.9
M8 x 1.25	(in-lb)	(225)	(169)	(333)	(242)
	Nm	25.4	19.1	37.6	27.3
M10 x 1.50	ft-lb	37	28	53	40
	Nm	50	38	72	54
M12 x 1.75	ft-lb	65	49	93	69
	Nm	88	66	126	94
M14 x 2.00	ft-lb	104	78	148	111
	Nm	141	106	201	150
M16 x 2.00	ft-lb	161	121	230	172
	Nm	218	164	312	233
M18 x 2.50	ft-lb	222	167	318	238
	Nm	301	226	431	323
M20 x 2.50	ft-lb	314	235	449	337
	Nm	426	319	609	457
M22 x 2.50	ft-lb	428	321	613	460
	Nm	580	435	831	624
M24 x 3.00	ft-lb	543	407	776	582
	Nm	736	552	1052	789
M27 x 3.00	ft-lb	796	597	1139	854
	Nm	1079	809	1544	1158
M30 x 3.50	ft-lb	1079	809	1543	1158
	Nm	1463	1097	2092	1570
M33 x 3.50	ft-lb	1468	1101	2101	1576
	Nm	1990	1493	2849	2137
M36 x 4.00	ft-lb	1886	1415	2699	2024
	Nm	2557	1918	3659	2744
Inch-Pound Force = in-lb Foot-Pound Force = ft-lb Newton-Meter = Nm					

NOTE: Lubed includes lubricants such as lubrizing, oil, grease, and some uncured thread lockers. Refer to the specific thread locker manufacturer's instructions for specific torque adjustments.

Table 2.7 Torque Specifications for Hydraulic Couplings & Hoses

HYDRAULIC COUPLING TORQUE CHART O-Ring Port Connectors				
SAE Size	Steel Ports		Non-ferrous Ports	
	ft-lb	Nm	ft-lb	Nm
4	14-16	20-22	9-10	12-13
6	24-26	33-35	15-16	20-21
8	50-60	68-78	30-36	41-47
10	72-80	98-110	43-48	60-66
12	125-135	170-183	75-81	102-110
16	200-220	270-300	120-132	162-180
20	210-280	285-380	126-168	171-228
24	270-360	370-490	162-216	222-294
32	-	-	-	-

HOSE END TORQUE CHART for JIC									
Size		Steel				Brass			
Dash	Frac.	ft-lb		Nm		ft-lb		Nm	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
-4	1/4"	10	11	13	15	5	6	6.75	9
-6	3/8"	17	19	23	26	12	15	17	20
-8	1/2"	34	38	47	52	20	24	27.66	33
-10	5/8"	50	56	69	76	34	40	46.33	55
-12	3/4"	70	78	96	106	53	60	72.33	82
-16	1"	94	104	127	141	74	82	100.5	111
-20	1 1/4"	124	138	169	188	75	83	101.5	113
-24	1 1/2	156	173	212	235	79	87	107	118
-32	2"	219	243	296	329	158	175	214	237

HOSE END TORQUE CHART for Flat-Face O-Ring Seal (Steel)					
Size		Torque Specification			
Dash	Frac.	ft-lb		Nm	
		Min.	Max.	Min.	Max.
-4	1/4"	10	12	14	16
-6	3/8"	18	20	24	27
-8	1/2"	32	40	43	54
-10	5/8"	46	56	60	75
-12	3/4"	65	80	90	110
-14	1"	65	80	90	110
-16	1 1/4"	92	105	125	240
-20	1 1/2	125	140	170	190
-24	2"	150	180	200	245

Notes

Section 3

SYSTEM COMPONENT IDENTIFICATION AND SCHEMATICS

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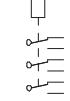
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3

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 FU
	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		

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 AC Cord Color Code

Standard Definition	NEC Colours	IEC Colours
Protective Ground/Protective Earth	Green	Green-Yellow
Neutral	White	Blue
Line, Single Phase	Black	Black/Brown/Grey

Note: Standard colours referenced from IEC 60445:2010, Annex A:Table A.1

3.5 Hydraulic Schematic Parts List

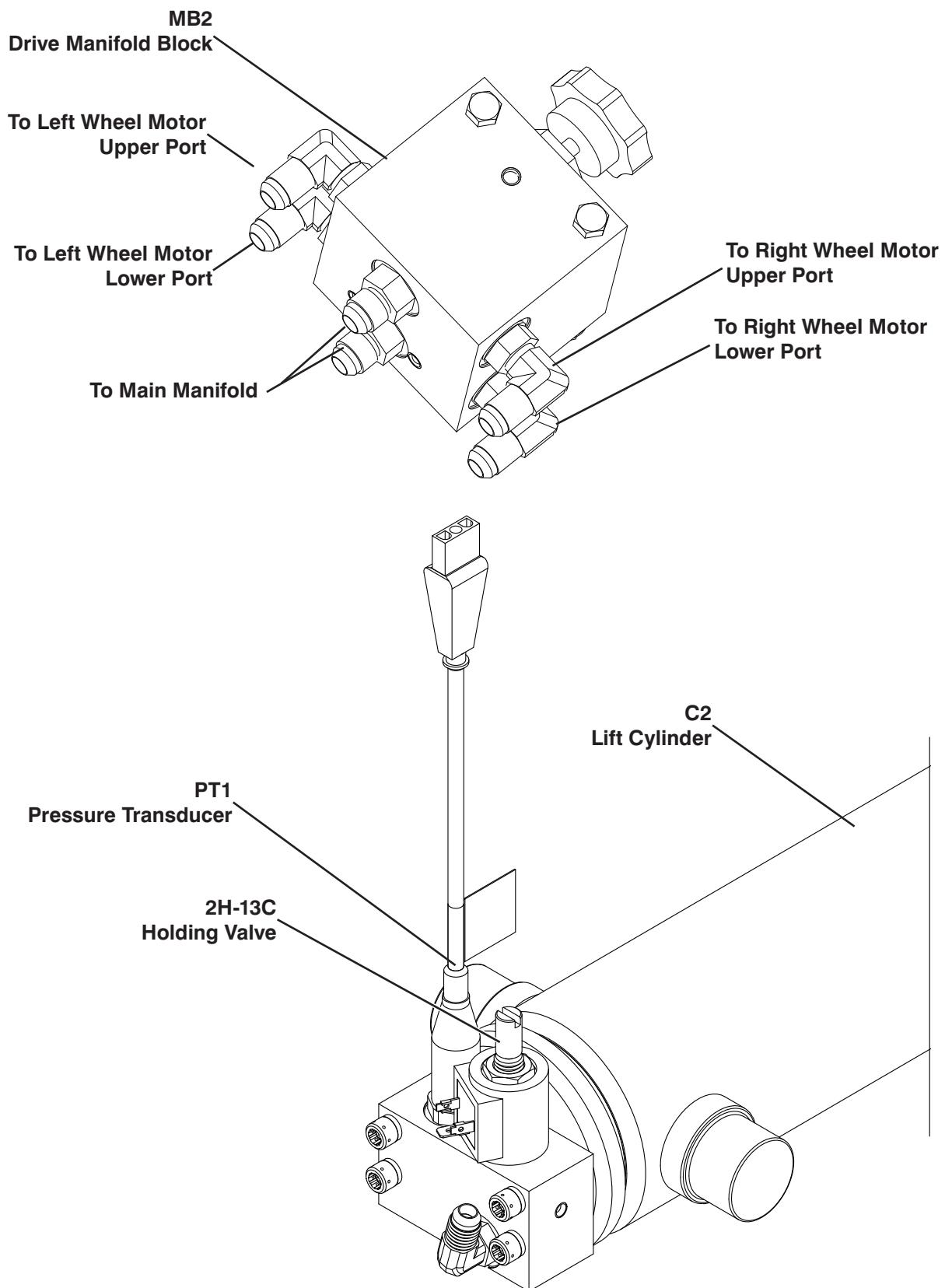
Index No.	Skyjack Part No.	Qty.	Description
2H-13	103655	1	VALVE, Control (Lowering)
2H-13C	107269	1	VALVE, Control (Holding)
3H-14A	106273	1	VALVE, Control (Lift)
3H-17B	103623	1	VALVE, Control (Brake)
4H-15	153334	1	VALVE, Control (Reverse drive) (Hytos)
4H-16	-	1	VALVE, Control (Forward drive) (Hytos)
4H-23	153334	1	VALVE, Control (Right steer) (Hytos)
4H-24	-	1	VALVE, Control (Left steer) (Hytos)
C2	199839	1	CYLINDER (Lift)
C3	121087	1	CYLINDER (Steer)
C4	204005	1	CYLINDER (Brake)
CB1	147888	1	VALVE, Counterbalance (2750 psi)
F1	109568	1	FILTER, Return
M3	149781	1	MOTOR, Hydraulic drive (Left)
M4	149784	1	MOTOR, Hydraulic drive (Right)
MB1	107354	1	BLOCK, Manifold (Main)
MB2	139307	1	BLOCK, Manifold (Free-Wheeling)
MB4	130480	1	BLOCK, Manifold (Holding valve)
MB5	129656	1	BLOCK, Manifold (Lowering valve)
O2	130046	1	ORIFICE (0.063" diameter) (Lowering)
O5	108002	2	ORIFICE (0.04" diameter) (Steering)
O6	105281	1	ORIFICE (0.067" diameter) (Emergency Lowering)
O7	147656	1	ORIFICE (0.024" diameter) (Free-Wheeling)
P1	169261	1	PUMP, Hydraulic
PT1	137669	1	TRANSDUCER, Pressure (3000 psi)
R1	104534	1	VALVE, Relief (System)
R2	104534	1	VALVE, Relief (Lift)
V1	107271	1	VALVE (Emergency lowering)
V2	103136	1	VALVE (Free-wheeling)

3.6 Electrical Component Parts List

Index No.	Skyjack Part No.	Qty.	Description
2H-13A	103605	1	COIL, 24 Volt (Down)
2H-13C	104493	1	COIL, 24 Volt (Holding)
3H-14A	106273	1	COIL, 24 Volt (Lift)
3H-17B	103605	1	COIL, 24 Volt (Brake)
4H-15	153335	1	COIL, 24 Volt (Reverse drive spool) (Hytos)
4H-16	-	1	COIL, 24 Volt (Forward drive spool) (Hytos)
4H-23	153335	1	COIL, 24 Volt (Right steer spool) (Hytos)
4H-24	-	1	COIL, 24 Volt (Left steer spool) (Hytos)
AT1	130440	1	TRANSDUCER, Angle
AT2	130440	1	TRANSDUCER, Angle
B1-B4	\$	4	BATTERY, 6 Volt
BC	161827	1	CHARGER, Battery (24 Volt)
BCI	122093	1	INDICATOR, Battery Charge
BP-29	170620	1	BEEPER, SP-1048
C1	146475	1	CONTACTOR, Motor (24 Volt)
CB1	117325	1	BREAKER, Circuit (15 Amp)
CMI	204716	1	SKYCODED MODULE
M	169260	1	MOTOR, 24 Volt
F1	310517	1	FUSE, 300 Amp
FL-22	121477	1	FLASHING LIGHT 24VDC (superior universal)
H1	146649	1	HORN, Operator (Low tone)
LED-1	147061	1	POWER INDICATOR LIGHT, Platform
LED-2	147061	1	POWER INDICATOR LIGHT, Base
LS1	119348	1	LIMIT SWITCH, Pothole Protection - Battery Tray
LS2	119348	1	LIMIT SWITCH, Pothole Protection - Hydraulic Tray
PL-1	147061	1	POWER INDICATOR LIGHT, Platform
PL-2	147061	1	POWER INDICATOR LIGHT, Base
PT1	137669	1	TRANSDUCER, Pressure (3000 psi)
S1	119725	1	SWITCH, Main Power Disconnect
S2	147054	2	N.O. CONTACT (Raise/Lower)
S3	116382	1	SWITCH, Toggle (Lift/Off/Drive)
S4	147053	1	N.C. CONTACT, Emergency Stop - Platform
S7	204714	1	ENABLE CONTROLLER ASSEMBLY
S7-2	159613	1	SWITCH, Right Steer
S7-3	159613	1	SWITCH, Left Steer
S7-6	159067	1	SWITCH, Pushbutton - Enable
S8	147054	1	N.O. CONTACT (Horn)
S10	147053	1	N.C. CONTACT (Off/Platform)
	147054	1	N.O. CONTACT (Base)
S27	115574	1	SWITCH, Toggle - Inclined/Level Drive
S28	147053	1	N.C. CONTACT, Emergency Stop - Base

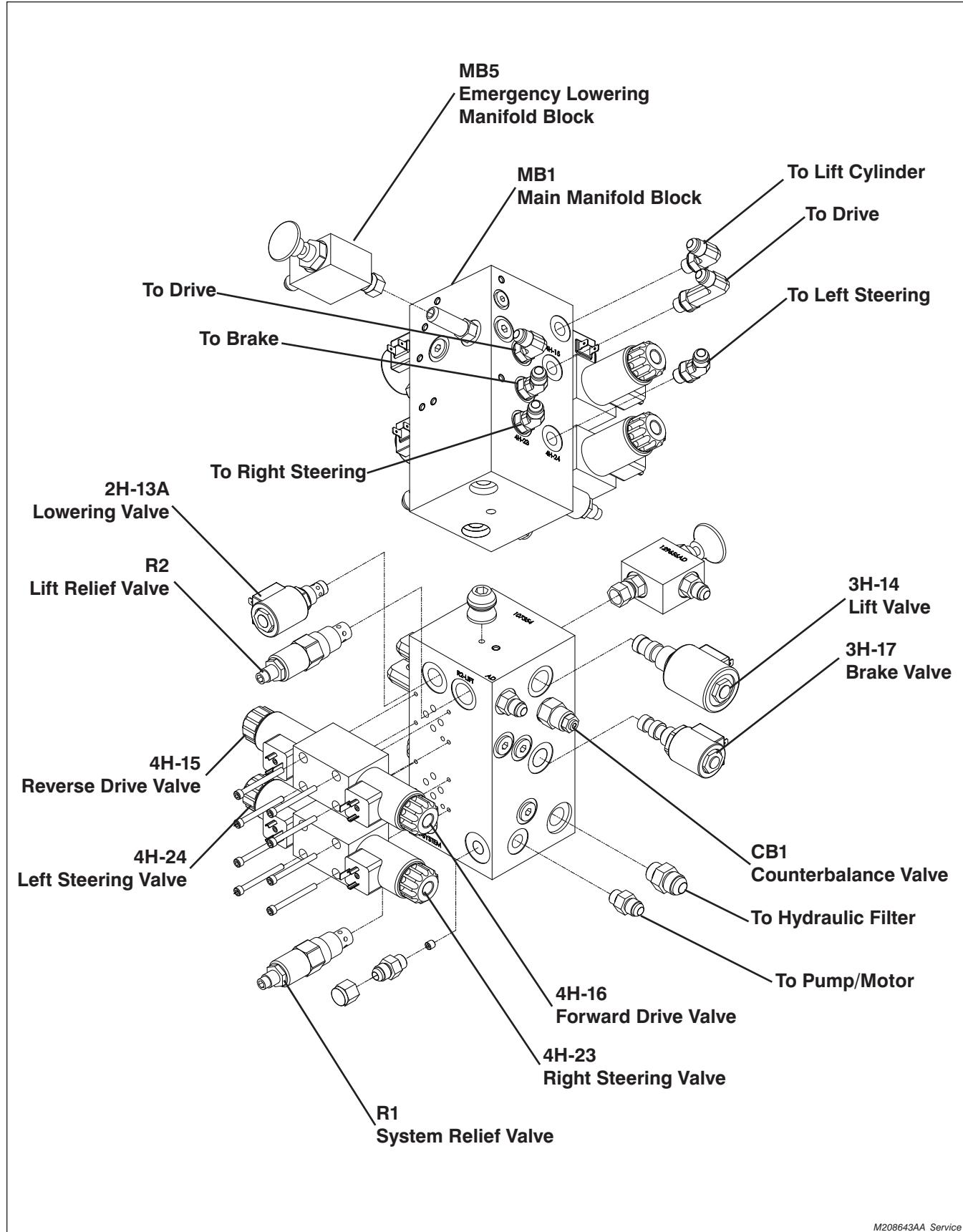
\$ - Purchased locally

Notes

3.7 Free-Wheeling and Holding Manifold and Port Identifications

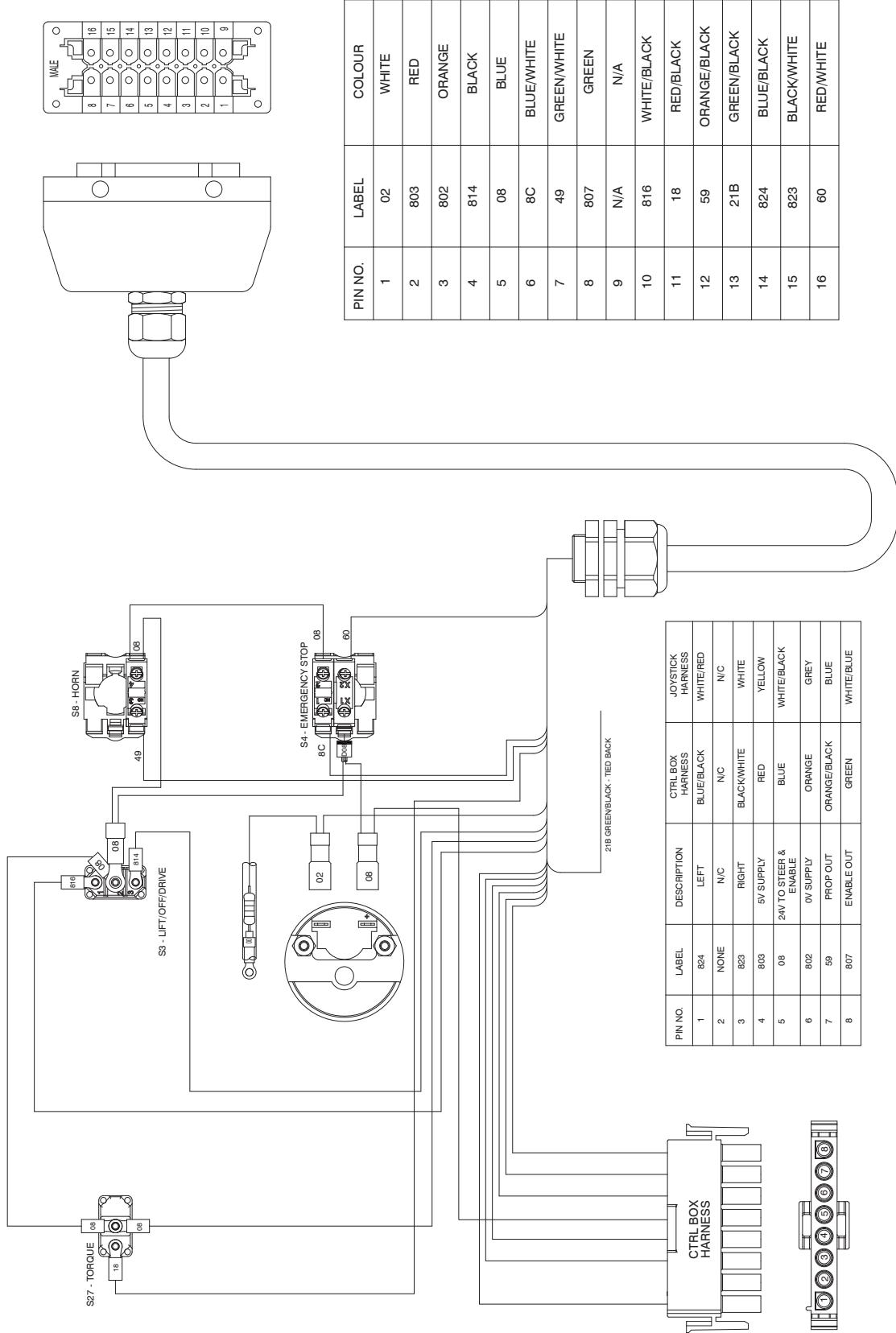
M10589AA_M208647AA_Service

3.8 Main Manifold and Port Identifications



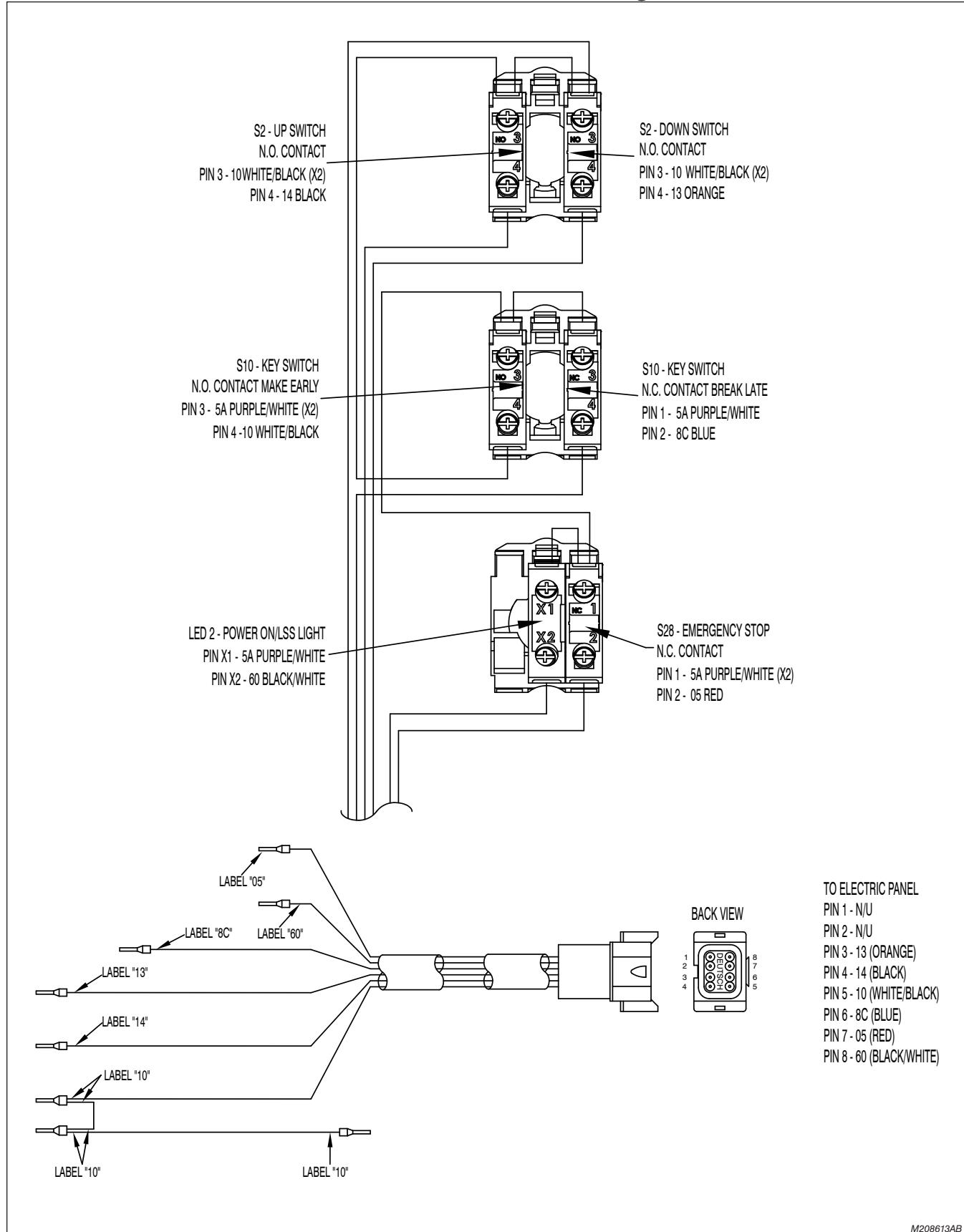
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3.9 Platform Control Console Diagram



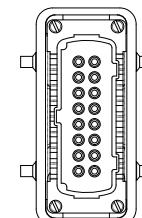
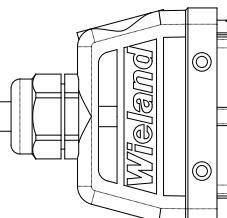
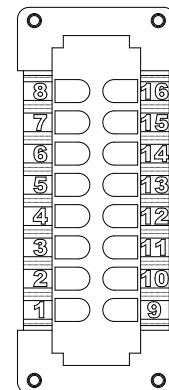
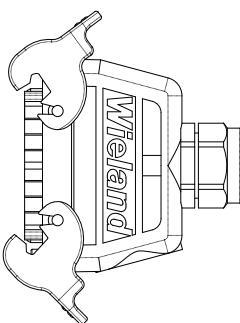
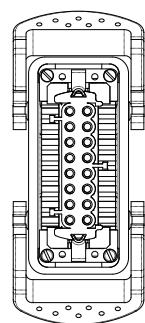
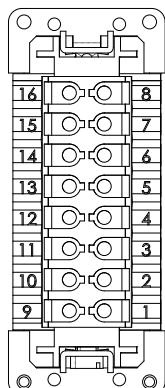
M211385AA

3.10 Base Control Console Diagram



3.11 Scissor Arm Control Cable

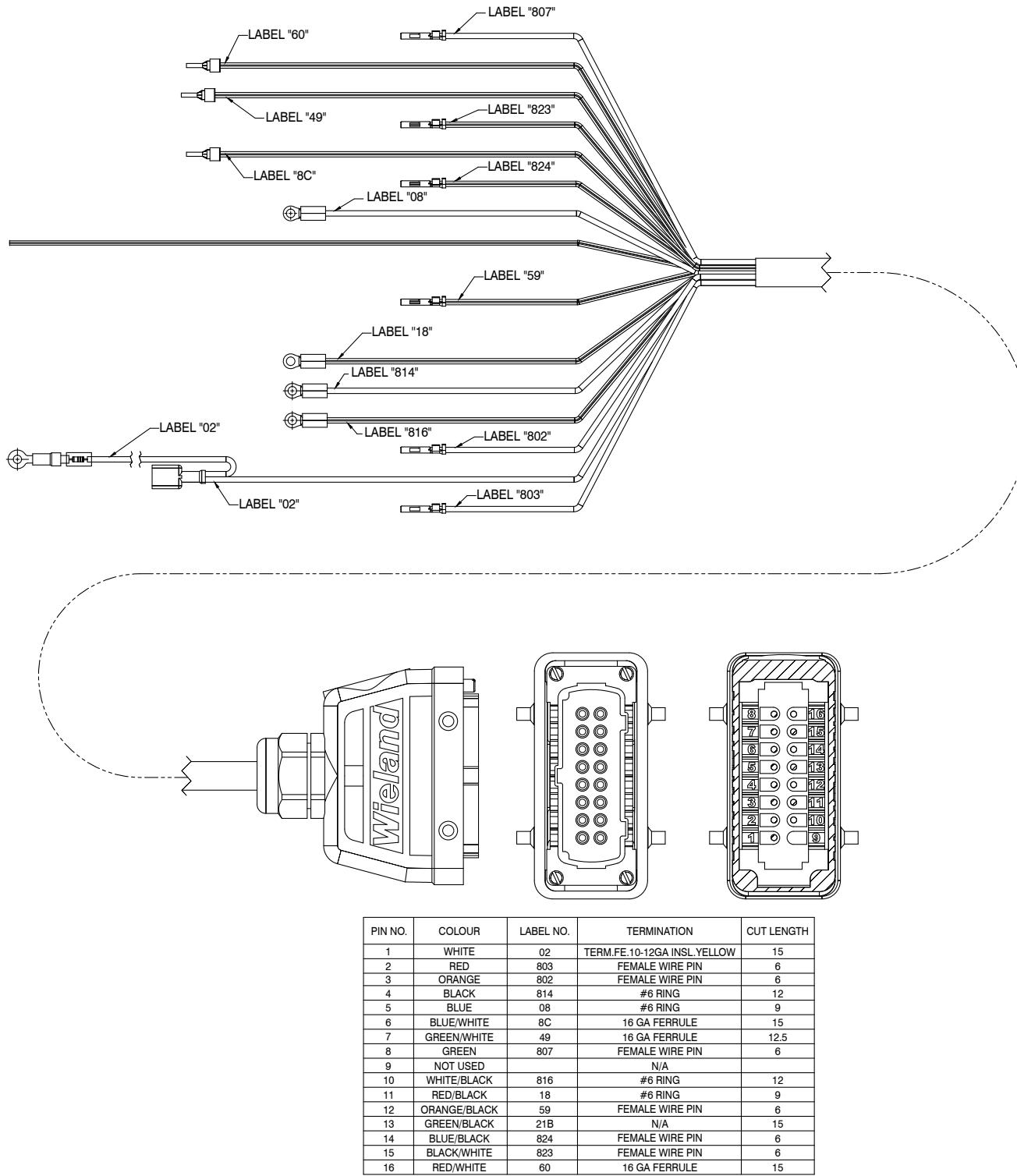
CAVITY #	COLOUR	CIRCUIT NO.
1	WHITE	02
2	BLUE	15
3	ORANGE	13
4	BLACK	14
5	RED	07
6	BLUE / WHITE	08C
7	GREEN / WHITE	49
8	GREEN	07A
9	NOT USED	
10	WHITE / BLACK	16
11	RED / BLACK	18
12	ORANGE / BLACK	59
13	NOT USED	
14	BLUE / BLACK	24
15	BLACK / WHITE	23
16	RED / WHITE	60



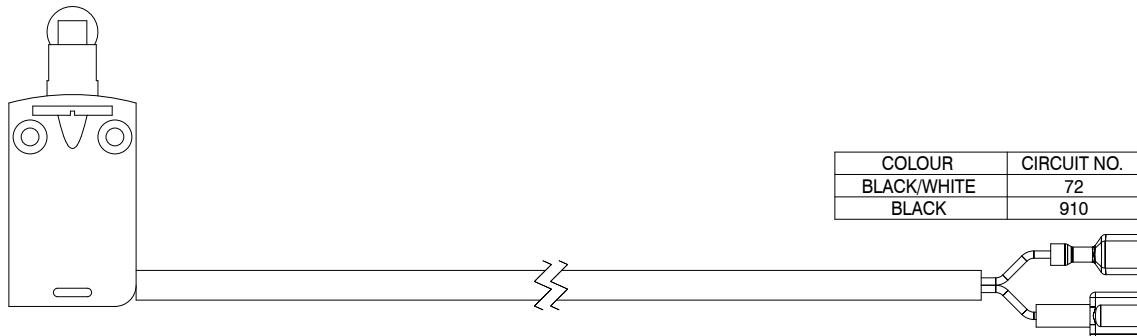
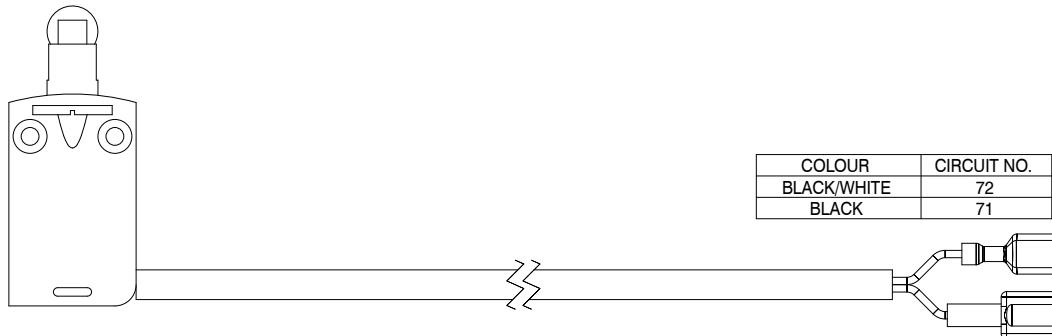
CAVITY #	COLOUR	CIRCUIT NO.
1	WHITE	02
2	BLUE	15
3	ORANGE	13
4	BLACK	14
5	RED	07
6	BLUE / WHITE	08C
7	GREEN / WHITE	49
8	GREEN	07A
9	NOT USED	
10	WHITE / BLACK	16
11	RED / BLACK	18
12	ORANGE / BLACK	59
13	NOT USED	
14	BLUE / BLACK	24
15	BLACK / WHITE	23
16	RED / WHITE	60

M208633AB_Service

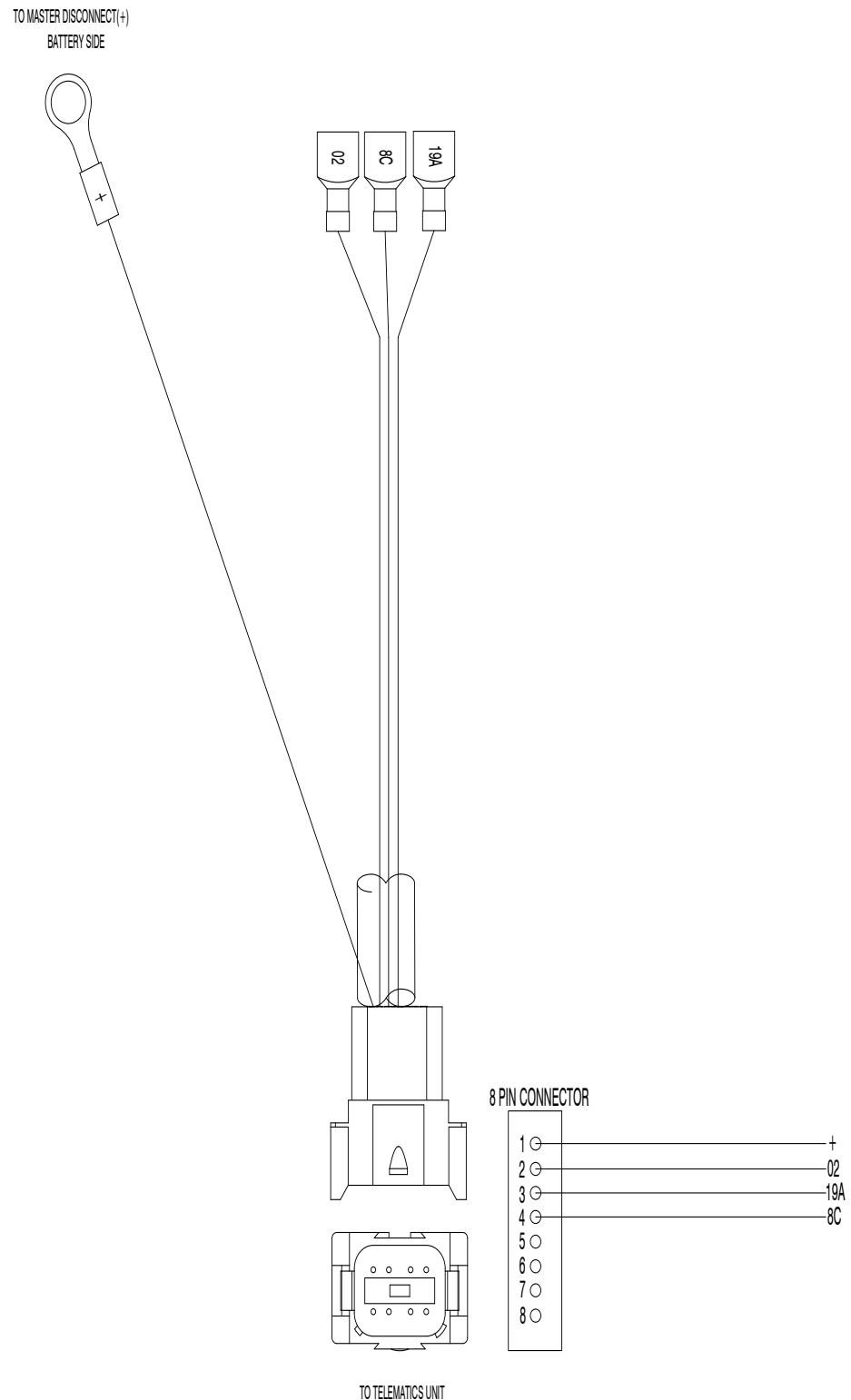
3.12 Platform Control Cable



M211386AA_Service

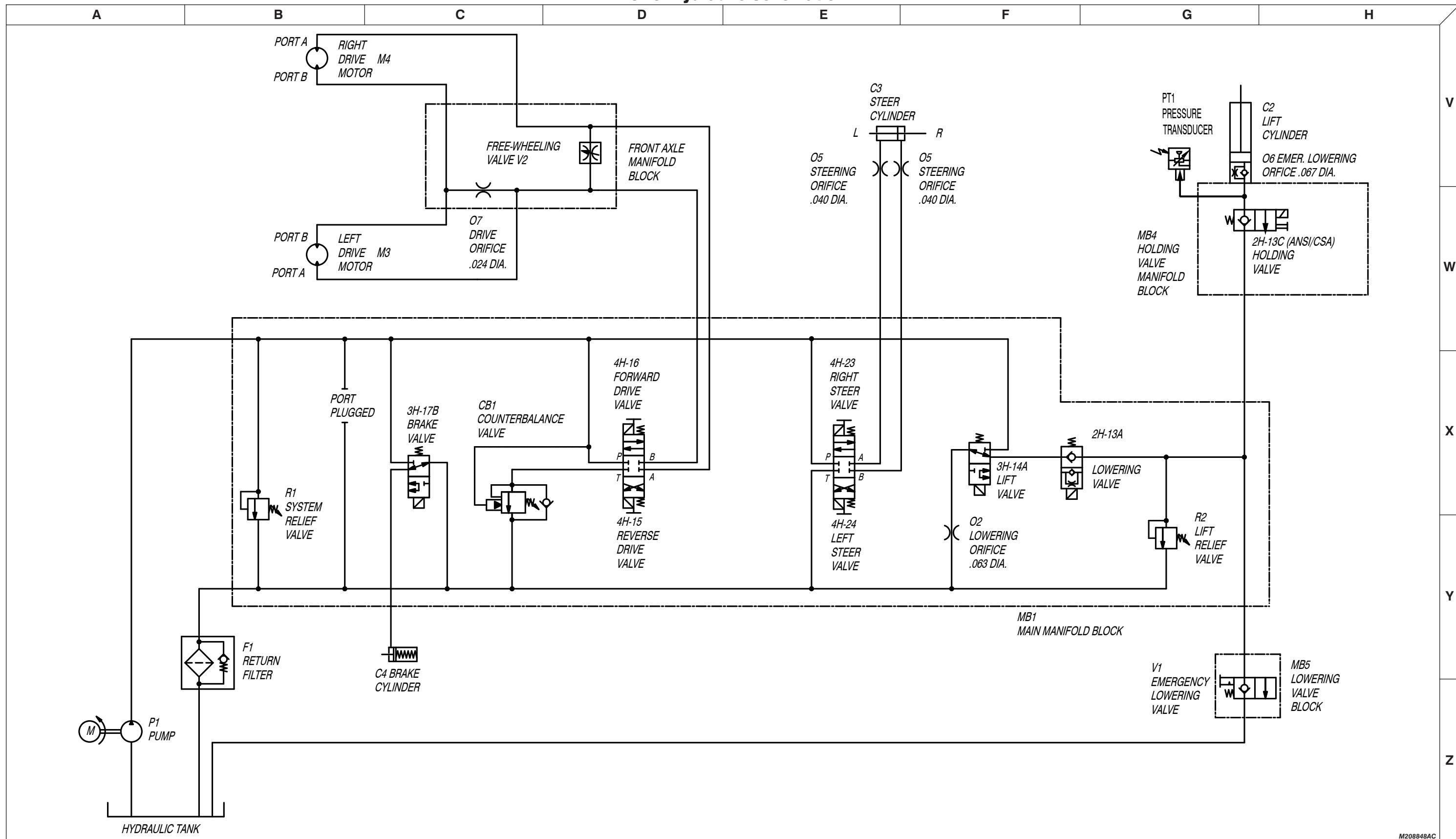
3.13 Pothole Limit Switch Assembly Diagrams**Pothole Limit Switch - Hydraulic Side****Pothole Limit Switch - Battery Side**

M208948AB_M208949AB

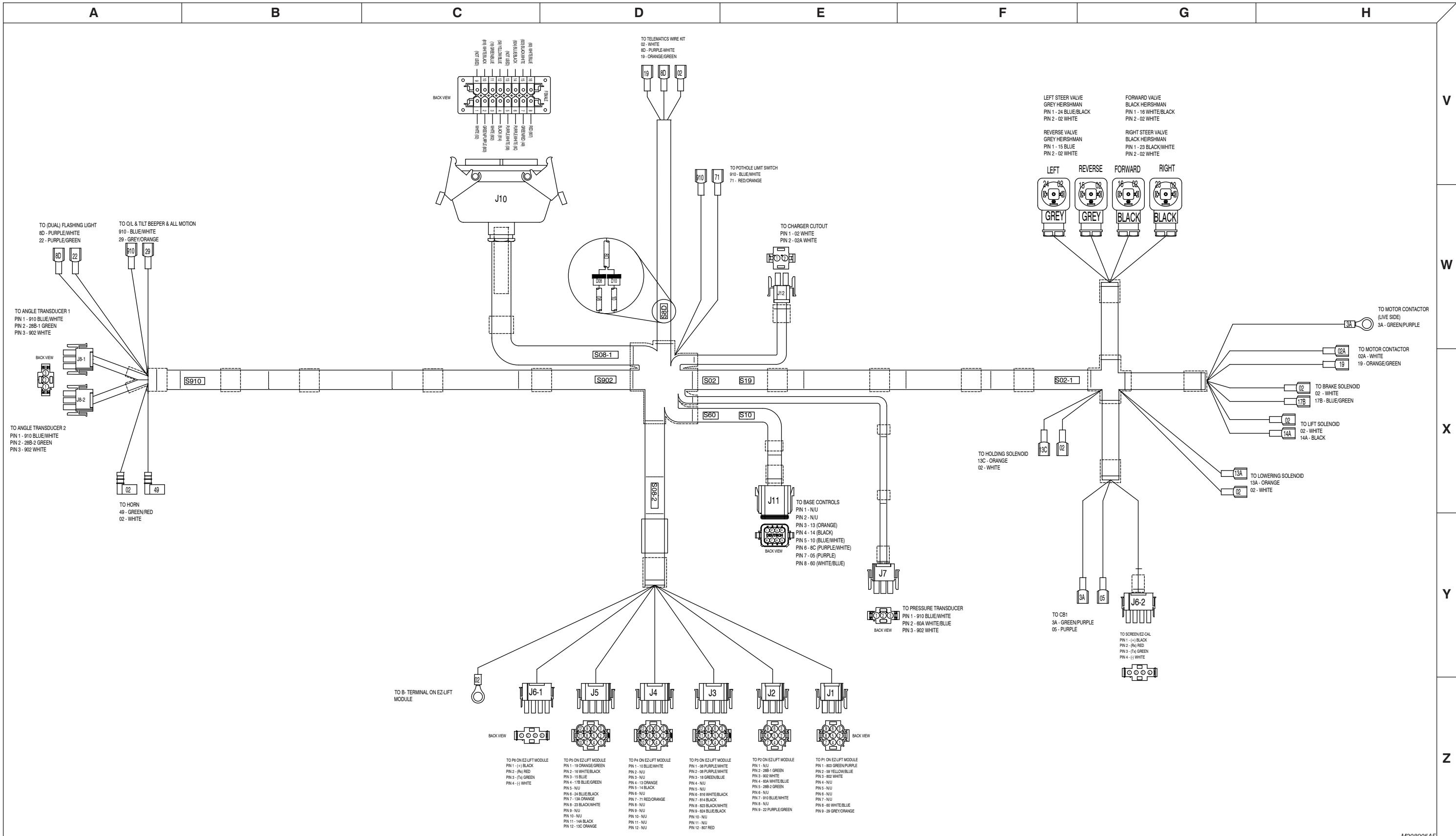
3.14 Telematics Harness - M6 Only

M170996AA1_Skycoded

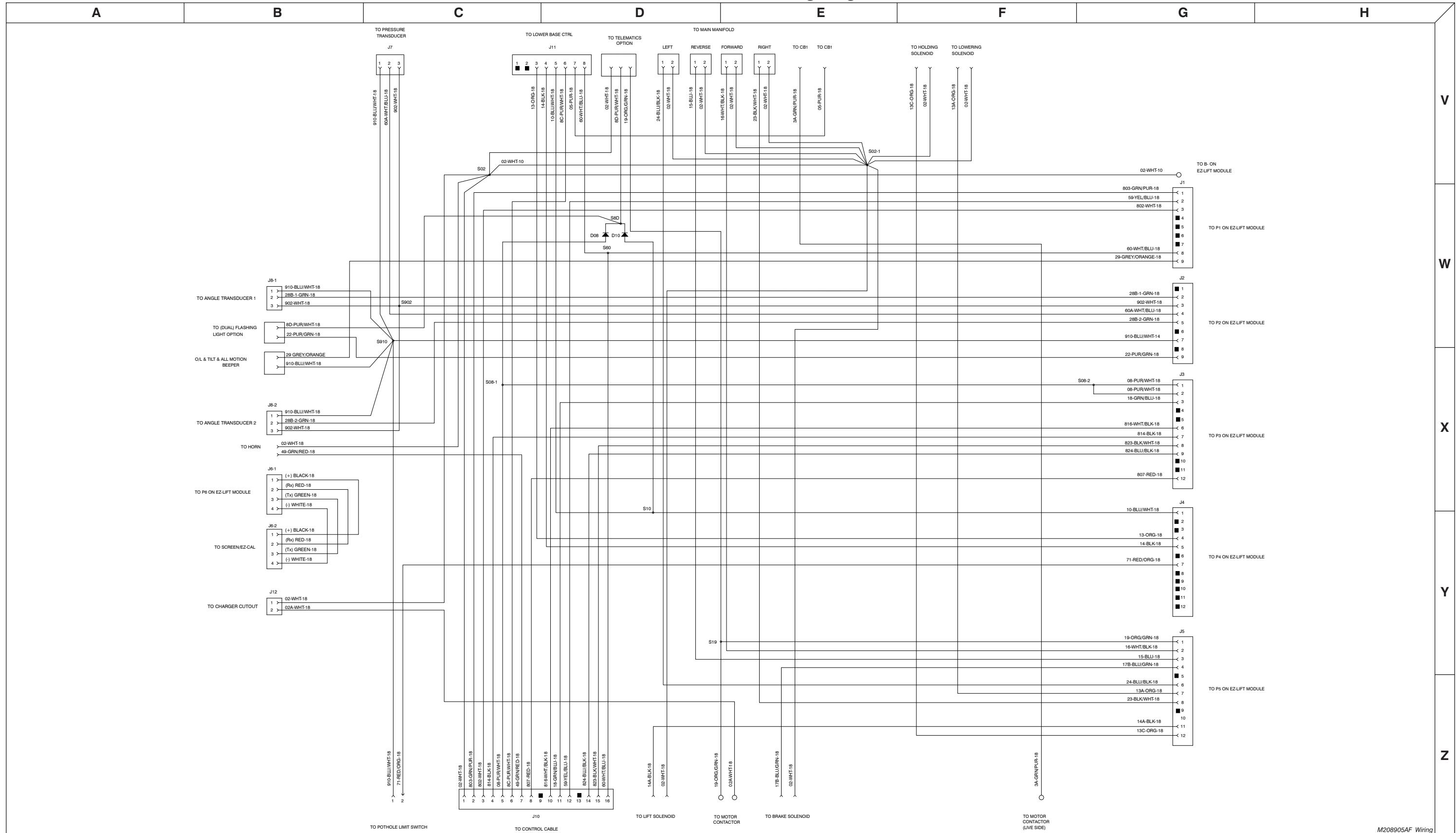
3.15 Hydraulic Schematic



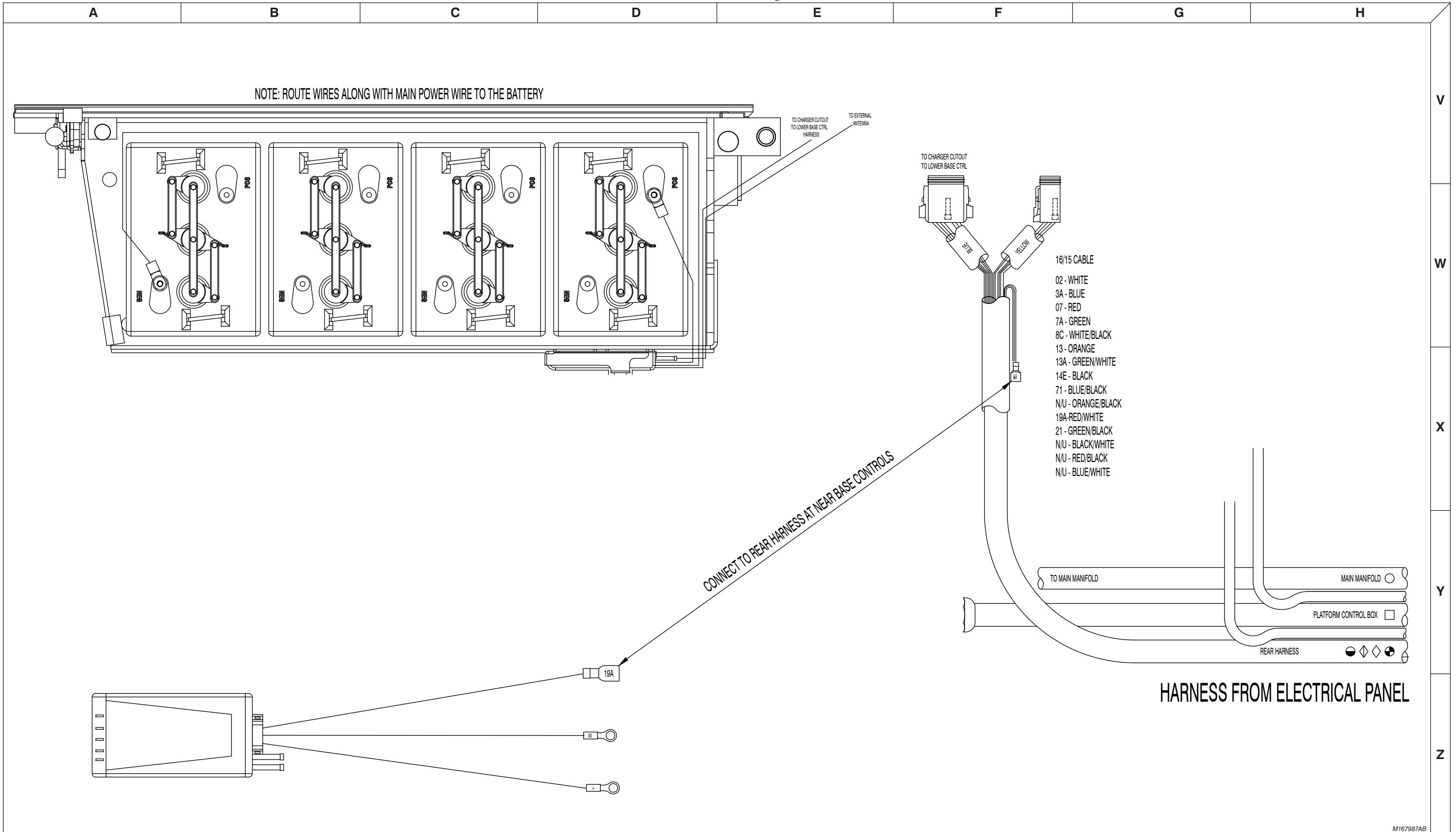
3.16 Electrical Harness



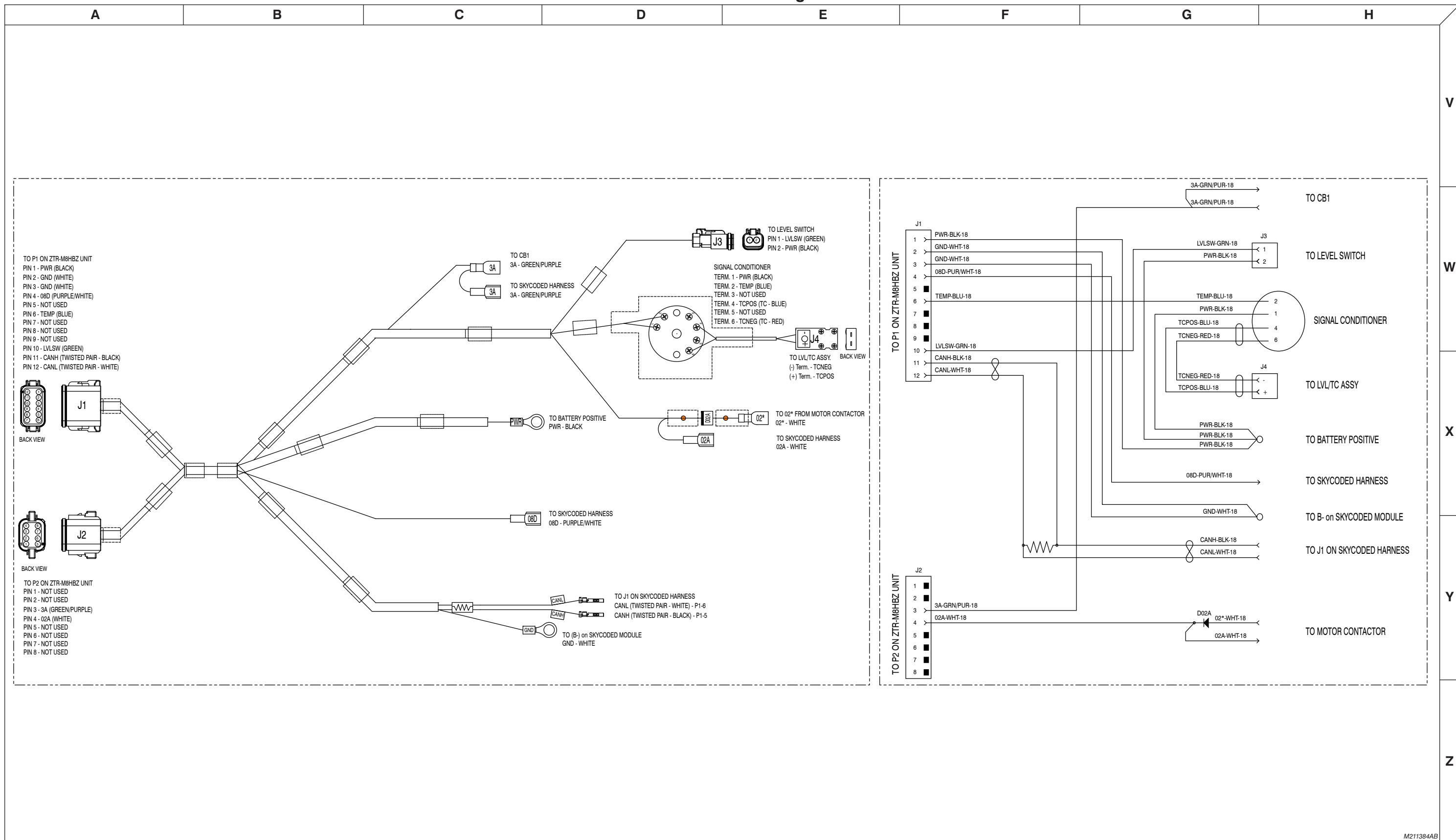
3.17 Electrical Harness Wiring Diagram



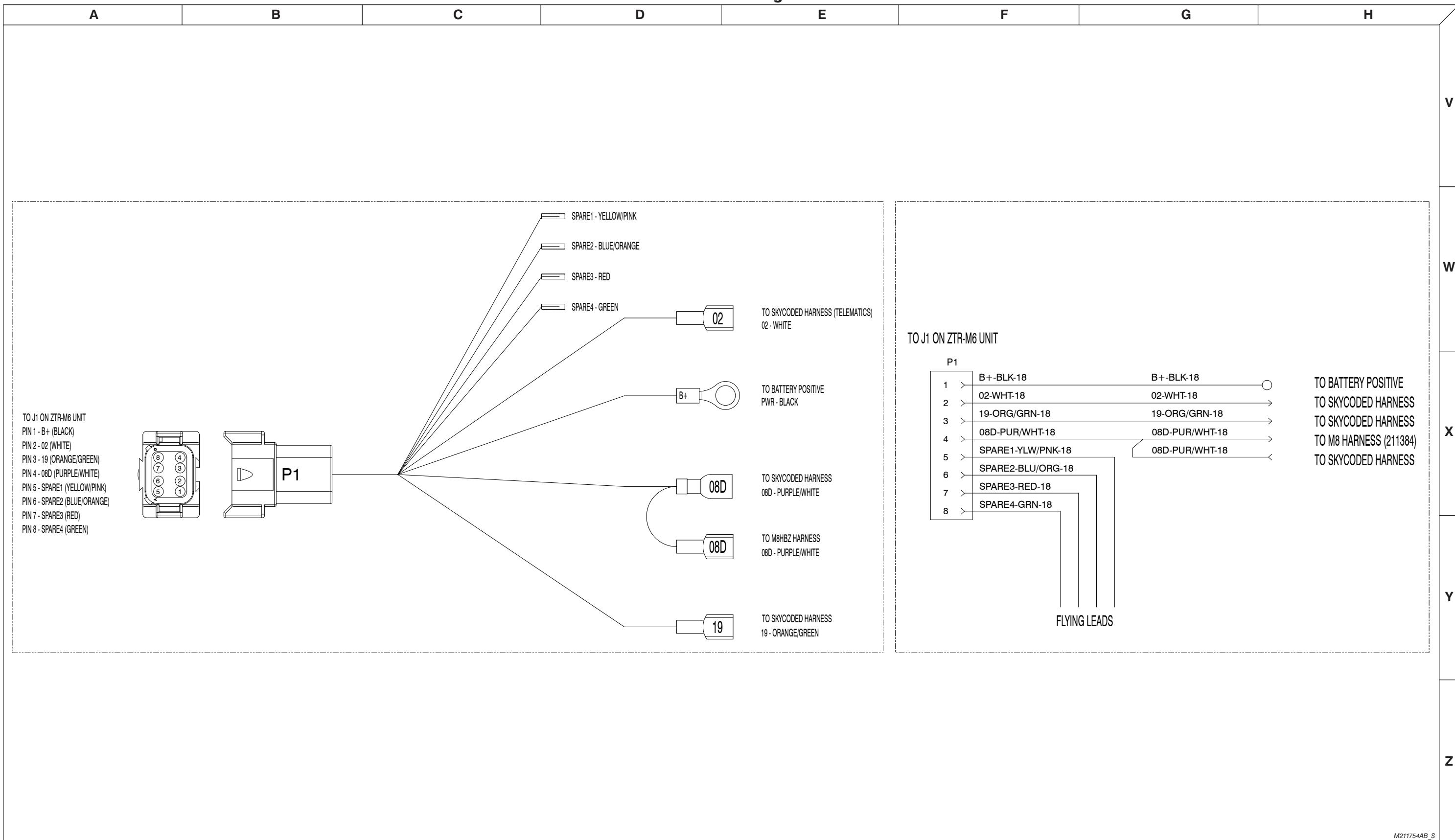
3.18 Telematics Wiring - MOREY



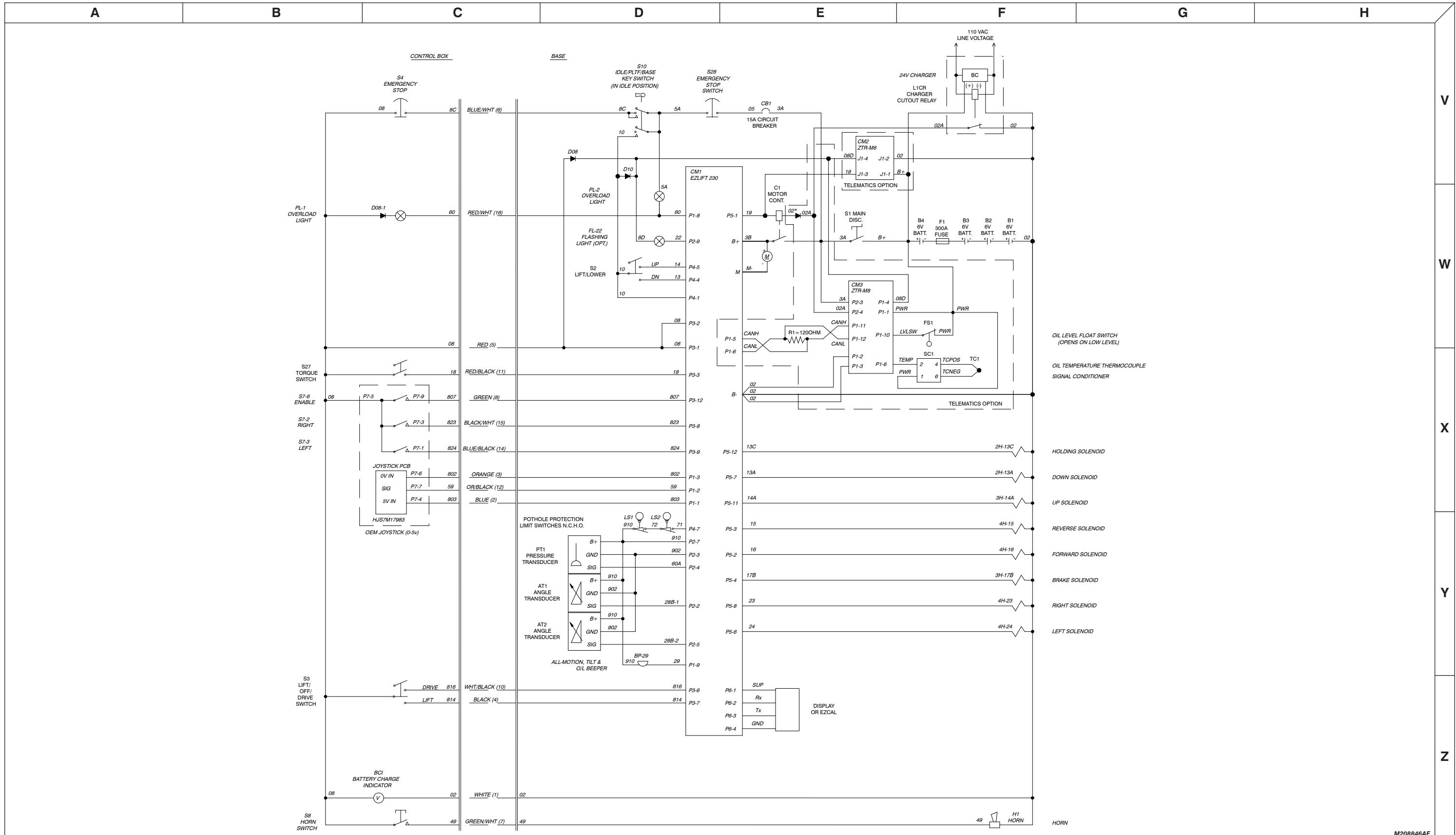
3.19 Telematics Wiring - M8



3.20 Telematics Wiring - M6 & M8



3.21 Electrical Schematic (All Options)



Note

A	B	C	D	E	F	G	H
							V
							W
							X
							Y
							Z

Section 4 TROUBLESHOOTING INFORMATION

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4

Introduction

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

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

1. Probable Cause

- Remedy

Electrical System

4.1-1 All Controls Inoperative

1. Battery charger plugged into external power source.
 - [Disconnect charger cord.](#)
2. Batteries disconnected.
 - [Connect batteries.](#)
3. Dirty or loose battery terminals.
 - [Clean and tighten connections.](#)
4. Battery charge low.
 - [Check each cell with a hydrometer. Reading should be 1.275 \(fully charged\). Recharge if low reading. Replace if reading difference between cells is 0.050.](#)
5. Main battery cables open or defective.
 - [Check continuity. Replace if defective.](#)
6. Fuse F1 defective.
 - [Replace fuse.](#)
7. Main battery disconnect switch S1 open or defective.
 - [Close switch. Check continuity. Replace if defective.](#)
8. Loose or broken wire #3A from motor contactor C1 to circuit breaker CB1.
 - [Check continuity. Replace if defective.](#)
9. Defective or tripped circuit breaker CB1.
 - [Reset circuit breaker. Replace if defective.](#)
10. Loose or broken wire #5 from circuit breaker CB2 to base emergency stop switch S28.
 - [Check continuity. Replace if defective.](#)
11. Open or defective base emergency stop switch S28.
 - [Close switch. Check switch. Replace if defective.](#)
12. Loose or broken wire #5A from base emergency stop switch S28 to base key switch S10.
 - [Check continuity. Replace if defective.](#)
13. Open or defective base key switch S10.
 - [Select function with switch. Check switch. Replace if defective.](#)
14. Loose or broken wire #8C from base key switch S10 to platform emergency stop switch S4.
 - [Check continuity. Replace if defective.](#)
15. Open or defective platform emergency stop switch S4.
 - [Close switch. Replace if defective.](#)
16. Loose or broken wire #8 from platform emergency stop switch S4 to control module CM1 pins #P3-1 and #P3-2.
 - [Check continuity. Replace if defective.](#)
17. Loose or broken B- cable from batteries to B- lug on control module CM1.
 - [Check continuity. Replace if defective.](#)
18. External or internal fault detected by control module CM1.
 - [Check control module display screen. Correct trouble code as displayed. Replace module if defective.](#)

4.1-2 All Controls Except for Down Function Inoperative

1. External or internal fault detected by control module CM1.
 - [Check control module display screen. Correct trouble code as displayed. Replace module if defective.](#)
2. Loose or broken wire #19 from motor control module CM1 to motor contactor C1.
 - [Check continuity. Replace if defective.](#)
3. Loose or broken wire #02A from motor contactor C1 to charger cut out relay L1CR.
 - [Check continuity. Replace if defective.](#)
4. Loose or broken wire #02 from charger cut out relay L1CR to battery negative.
 - [Check continuity. Replace if defective.](#)

Electrical System

5. Loose or broken wire #3B from motor control module CM1 to motor contactor C1.
 - Check continuity. Replace if defective.
6. Loose or broken wire #3A from motor contactor C1 to main disconnect switch S1.
 - Check continuity. Replace if defective.
7. Defective motor contactor C1.
 - Check contactor. Replace if defective.
8. Loose or broken B- cable from batteries to B- lug on control module CM1.
 - Check continuity. Replace if defective.
9. Defective motor DCM1.
 - Check motor for operation with 24 volt supply. Replace if defective.
10. Loose or broken B- cable from motor DCM1 to M- lug on control module CM1.
 - Check continuity. Replace if defective.

4.1-3 All Controls Inoperative From Base Control Console

1. Loose or broken wire #10 from base key switch S10 to base up/down switch S2.
 - Check continuity. Replace if defective.
2. Loose or broken wire #10 from base key switch S10 to control module CM1 pin #P4-1.
 - Check continuity. Replace if defective.
3. Open or defective diode D10.
 - Check diode located in harness at splice S8D. Replace if defective.

4.1-4 No Up Function from Base Control Console

1. Defective up/down switch S2.
 - Check switch. Replace if defective.
2. Loose or broken wire #14 from up/down switch S2 to control module CM1 pin #P4-5.
 - Check continuity. Replace if defective.
3. Loose or broken wire #14A from control module CM1 pin #P5-11 to up valve coil 3H-14A.
 - Check continuity. Replace if defective.
4. Loose or broken wire #02 in harness at splice S02-1 to up valve coil 3H-14A.
 - Check continuity. Replace if defective.
5. Defective up valve coil 3H-14A.
 - Check continuity through coil. Replace if defective.
6. Machine not level. (Above high speed cut out)
 - Use on level surface.

4.1-5 No Down Function from Base Control Console

NOTE

Down function is not proportionally controlled.

1. Defective up/down switch S2.
 - Check switch. Replace if defective.
2. Loose or broken wire #13 from up/down switch S2 to control module CM1 pin #P4-4.
 - Check continuity. Replace if defective.
3. Loose or broken wire #13A from control module CM1 pin #P5-7 to down valve coil 2H-13A.
 - Check continuity. Replace if defective.
4. Loose or broken wire #02 in harness at splice S02-1 to down valve coil 2H-13A.
 - Check continuity. Replace if defective.
5. Loose or broken wire # 13C from control module CM1 pin #P5-12 to holding valve coil 2H-13C.
 - Check continuity. Replace if defective.

Electrical System

6. Loose or broken wire #02 in harness at splice S02-1 to holding valve coil 2H-13C.
 - Check continuity. Replace if defective.
7. Defective down valve coil 2H-13A.
 - Check continuity through coil. Replace if defective.
8. Defective lift cylinder holding valve coil 2H-13C.
 - Check continuity through coil. Replace if defective.

4.1-6 All Controls Inoperative From Platform Control Console

1. Open or defective base key switch S10.
 - Select function with switch. Check switch. Replace if defective.
2. Loose or broken wire #8C from base key switch S10 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 from platform emergency stop switch S4 to control module CM1 pins #P3-1 and #P3-2.
 - Check continuity. Replace if defective.
5. Loose or broken wire #8 from emergency stop switch S4 to battery charge indicator BCI.
 - Check continuity. Replace if defective.
6. Loose or broken wire #8 from battery charge indicator BC1 to joystick S7.
 - Check continuity. Replace if defective.
7. Defective joystick enable switch S7-6.
 - Check switch. Replace if defective.
8. Defective joystick S7.
 - Check joystick. Replace if defective.
9. Loose or broken wire #803 from control module CM1 pin #P1-1 to joystick S7 pin #P7-4.
 - Check continuity. Replace if defective.
10. Loose or broken wire #802 from joystick S7 pin #P7-6 to control module CM1 pin #P1-3.
 - Check continuity. Replace if defective.
11. Loose or broken wire #59 from joystick S7 pin #P7-7 to control module CM1 pin #P1-2.
 - Check continuity. Replace if defective.

4.1-7 No Up Function from Platform Controls

1. Loose or broken wire #814 from lift/drive switch S3 to control module CM1 pin #P3-7.
 - Check continuity. Replace if defective.
2. Lift/Drive switch S3 in drive mode or is defective.
 - Select lift. Check switch. Replace if defective.
3. Loose or broken wire #59 from joystick S7 pin #P7-7 to control module CM1 pin #P1-2.
 - Check continuity. Replace if defective.
4. Loose or broken wire #14A from control module CM1 pin #P5-11 to up valve coil 3H-14A.
 - Check continuity. Replace if defective.
5. Loose or broken wire #02 in harness at splice S02-1 to up valve coil 3H-14A.
 - Check continuity. Replace if defective.
6. Defective up valve coil 3H-14A.
 - Check continuity through coil. Replace if defective.
7. Machine not level. (Above high speed cut out)
 - Use on level surface.

Electrical System (Continued)**4.1-8 No Down Function from Platform Controls****NOTE**

Down function is not proportionally controlled.

1. Loose or broken wire #814 from lift/drive switch S3 to control module CM1 pin #P3-7.
 - Check continuity. Replace if defective.
2. Lift/Drive switch S3 in drive mode or is defective.
 - Select lift. Check switch. Replace if defective.
3. Loose or broken wire #59 from joystick S7 pin #P7-7 to control module CM1 pin #P1-2.
 - Check continuity. Replace if defective.
4. Loose or broken wire #13A from control module CM1 pin #P5-7 to down valve coil 2H-13A.
 - Check continuity. Replace if defective.
5. Loose or broken wire #02 in harness at splice S02-1 to down valve coil 2H-13A.
 - Check continuity. Replace if defective.
6. Loose or broken wire #13C from control module CM1 pin #P5-12 to holding valve coil 2H-13C.
 - Check continuity. Replace if defective.
7. Loose or broken wire #02 in harness at splice S02-1 to holding valve coil 2H-13C.
 - Check continuity. Replace if defective.
8. Defective down valve coil 2H-13A.
 - Check continuity through coil. Replace if defective.
9. Defective lift cylinder holding valve coil 2H-13C.
 - Check continuity through coil. Replace if defective.

4.1-9 Right Steer Inoperative

1. Loose or broken wire #816 from lift/drive switch S3 to control module CM1 pin #P3-6.
 - Check continuity. Replace if defective.
2. Lift/Drive switch S3 in lift mode or is defective.
 - Select drive. Check switch. Replace if defective.
3. Defective right steer switch S7-2.
 - Check switch. Replace if defective.
4. Loose or broken wire #823 from right steer switch S7-2 pin #P7-3 to control module CM1 pin #P3-8.
 - Check continuity. Replace if defective.
5. Loose or broken wire #23 from control module CM1 pin #P5-8 to right steer valve coil 4H-23.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 in harness at splice S02 to right steer valve coil 4H-23.
 - Check continuity. Replace if defective.
7. Defective right steer valve coil 4H-23.
 - Check continuity through coil. Replace if defective.

4.1-10 Left Steer Inoperative

1. Loose or broken wire #816 from lift/drive switch S3 to control module CM1 pin #P3-6.
 - Check continuity. Replace if defective.
2. Lift/Drive switch S3 in lift mode or is defective.
 - Select drive. Check switch. Replace if defective.
3. Defective left steer switch S7-3.
 - Check switch. Replace if defective.
4. Loose or broken wire #824 from left steer switch S7-3 pin #P7-1 to control module CM1 pin #P3-9.
 - Check continuity. Replace if defective.
5. Loose or broken wire #24 from control module CM1 pin #P5-6 to left steer valve coil 4H-24.
 - Check continuity. Replace if defective.

Electrical System (Continued)

6. Loose or broken wire #02 in harness at splice S02 to left steer valve coil 4H-24.
 - Check continuity. Replace if defective.
7. Defective left steer valve coil 4H-24.
 - Check continuity through coil. Replace if defective.

4.1-11 Forward Drive Function Inoperative

1. Loose or broken wire #816 from lift/drive switch S3 to control module CM1 pin #P3-6.
 - Check continuity. Replace if defective.
2. Lift/Drive switch S3 in lift mode or is defective.
 - Select drive. Check switch. Replace if defective.
3. Defective joystick enable switch S7-6.
 - Check switch. Replace if defective.
4. Defective joystick S7.
 - Check joystick. Replace if defective.
5. Loose or broken wire #803 from control module CM1 pin #P1-1 to joystick S7 pin #P7-4.
 - Check continuity. Replace if defective.
6. Loose or broken wire #802 from joystick S7 pin #P7-6 to control module CM1 pin #P1-3.
 - Check continuity. Replace if defective.
7. Loose or broken wire #59 from joystick S7 pin #P7-7 to control module CM1 pin #P1-2.
 - Check continuity. Replace if defective.
8. Loose or broken wire #16 from control module CM1 pin #P5-2 to forward drive valve coil 4H-16.
 - Check continuity. Replace if defective.
9. Loose or broken wire #02 in harness at splice S02 to forward drive valve coil 4H-16.
 - Check continuity. Replace if defective.
10. Loose or broken wire #17B from control module CM1 pin #P5-4 to brake valve coil 3H-17B.
 - Check continuity. Replace if defective.
11. Loose or broken wire #02 in harness at splice S02-1 to brake valve coil 3H-17B.
 - Check continuity. Replace if defective.
12. Defective forward drive valve coil 4H-16.
 - Check continuity through coil. Replace if defective.
13. Defective brake valve coil 3H-17B.
 - Check continuity through coil. Replace if defective.

4.1-12 Reverse Drive Function Inoperative

1. Loose or broken wire #816 from lift/drive switch S3 to control module CM1 pin #P3-6.
 - Check continuity. Replace if defective.
2. Lift/Drive switch S3 in lift mode or is defective.
 - Select drive. Check switch. Replace if defective.
3. Defective joystick enable switch S7-6.
 - Check switch. Replace if defective.
4. Defective joystick S7.
 - Check joystick. Replace if defective.
5. Loose or broken wire #803 from control module CM1 pin #P1-1 to joystick S7 pin #P7-4.
 - Check continuity. Replace if defective.
6. Loose or broken wire #802 from joystick S7 pin #P7-6 to control module CM1 pin #P1-3.
 - Check continuity. Replace if defective.
7. Loose or broken wire #59 from joystick S7 pin #P7-7 to control module CM1 pin #P1-2.
 - Check continuity. Replace if defective.
8. Loose or broken wire #15 from control module CM1 pin #P5-3 to reverse drive valve coil 4H-15.
 - Check continuity. Replace if defective.

Electrical System (Continued)

9. Loose or broken wire #02 in harness at splice S02 to reverse drive valve coil 4H-15.
 - [Check continuity. Replace if defective.](#)
10. Loose or broken wire #17B from control module CM1 pin #P5-4 to brake valve coil 3H-17B.
 - [Check continuity. Replace if defective.](#)
11. Loose or broken wire #02 in harness at splice S02-1 to brake valve coil 3H-17B.
 - [Check continuity. Replace if defective.](#)
12. Defective reverse drive valve coil 4H-15.
 - [Check continuity through coil. Replace if defective.](#)
13. Defective brake valve coil 3H-17B.
 - [Check continuity through coil. Replace if defective.](#)

4.1-13 No Drive or Steer when Platform Elevated

1. Pothole protection bars not fully lowered.
 - [Clear obstructions. Repair as needed.](#)
2. Loose or broken wire #910 in harness at splice S910 to pothole protection limit switch LS1.
 - [Check continuity. Replace if defective.](#)
3. Defective pothole protection limit switch LS1.
 - [Check switch. Replace if defective.](#)
4. Loose or broken wire #72 from pothole protection limit switch LS1 to pothole protection limit switch LS2.
 - [Check continuity. Replace if defective.](#)
5. Defective pothole protection limit switch LS2.
 - [Check switch. Replace if defective.](#)
6. Loose or broken wire #71 from pothole protection limit switch LS2 to control module CM1 pin #P4-7.
 - [Check continuity. Replace if defective.](#)

4.1-14 Mid speed Inoperative

1. Loose or broken wire #8 from platform emergency stop switch S4 to torque switch S27.
 - [Check continuity. Replace if defective.](#)
2. Defective torque switch S27.
 - [Check switch. Replace if defective.](#)
3. Loose or broken wire #18 from torque switch S27 to control module CM1 pin #P3-3.
 - [Check continuity. Replace if defective.](#)

Hydraulic System

4.2-1 All Function Inoperative

1. Pump P1 defective.
 - Check pump. Replace if defective.

4.2-2 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.

4.2-3 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 valve 2H-13C and either defective lowering valve 2H-13A or relief valve R2 or manual lowering valve V1.
 - Check valves. Replace if defective.

4.2-4 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-13C.
 - Depress and turn manual override clockwise to close. Replace if defective.

4.2-5 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-14A defective or is sticking.
 - Check valve. Replace if defective.

4.2-6 Platform will not Lower

NOTE

Down function is not proportionally controlled.

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

4.2-7 Platform Lowers Slowly (3215 only)

1. Deceleration valve 2H-13A defective or is sticking in the restricted position.
 - Check valve. Replace if defective.

Hydraulic System (Continued)**4.2-8 Platform Drives Slow**

1. Free-wheeling valve V2 open or defective.
 - Close valve. Replace if defective.
2. Drive motor M3 or M4 defective.
 - Check motors. Replace if defective.

4.2-9 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.
 - Check Valve. Replace if defective.
3. Counterbalance valve CB1 defective or is plugged.
 - Check Valve. Replace if defective.

4.2-10 Brake(s) will not Release

1. Brake valve 3H-17B defective or is sticking.
 - Clean valve. Replace if defective.
2. Brake cylinder C4 defective.
 - Rebuild cylinder. Replace if damaged.

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 kingpins.
 - Check for binding. Repair as needed.
4. Orifices O5 plugged.
 - Clean orifices, and reinstall.

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.

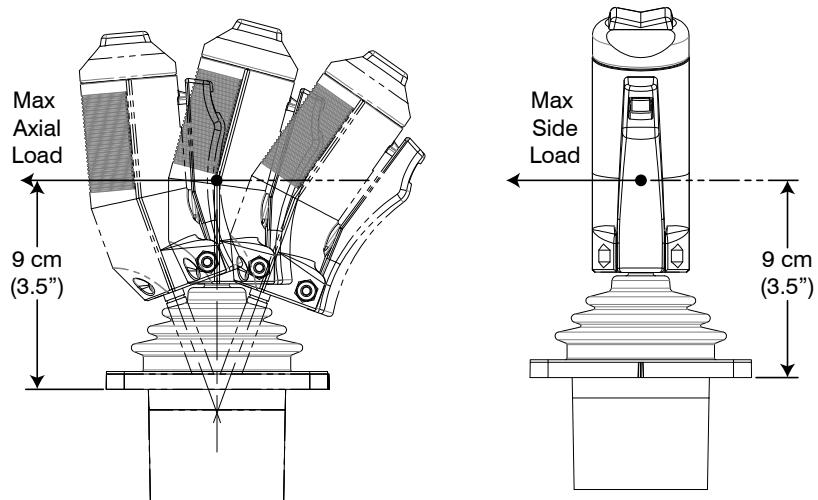
NOTE

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		
TO	COLOR	FUNCTION
PIN #1	WHITE/RED	HANDLE ROCKER STEER LEFT - N.O.
PIN #2	NONE	NO CONNECTION
PIN #3	WHITE	HANDLE ROCKER STEER RIGHT - N.O.
PIN #4	YELLOW	POWER (+5V)
PIN #5	WHITE/BLACK	HANDLE COM (+24V)
PIN #6	GRAY	GROUND
PIN #7	BLUE	PROPORTIONAL OUTPUT
PIN #8	WHITE/BLUE	ENABLE TRIGGER - N.O.

5.1-4 Gate Spring Hinge Adjustment

1. The tension of the spring hinges should be such that when the gate is opened halfway and released, it will close fully and latch.
2. To adjust the tension of the spring hinges, first remove the locking screw located at the bottom of each hinge. Retain the screw for reinstallation later.

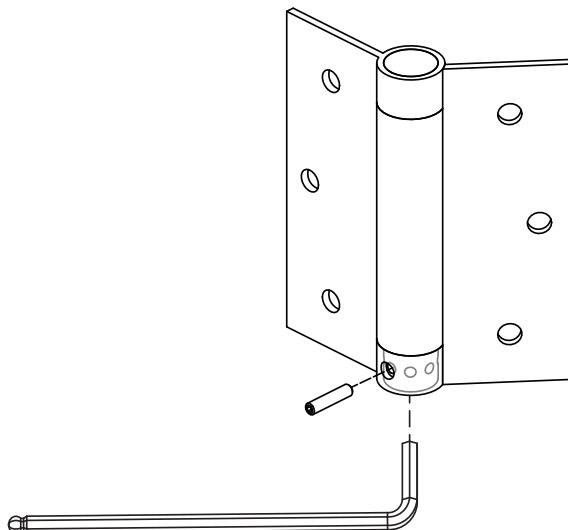
NOTE

Adjusting the tension on the spring hinge is a two handed operation.

3. To increase the tension, insert a 5/32" hex wrench in the screw socket. Turn the wrench clockwise to desired tension as well as aligning the locking screw hole. Hold the wrench in place, maintaining the selected tension, while reinstalling the locking screw.

NOTE

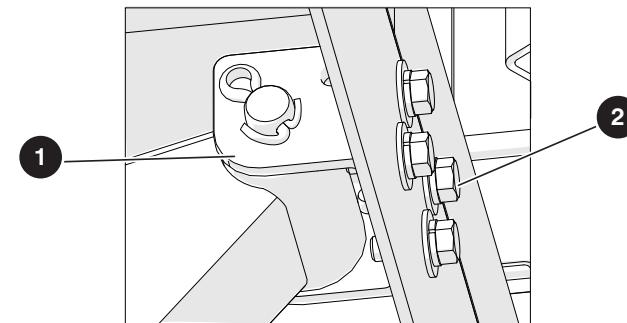
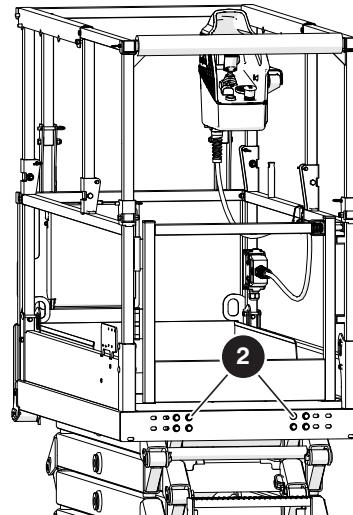
Ensure the holes inside the hinges are aligned before inserting the locking screw.



5.1-5 Platform Mounting Hardware

If damage is found during an inspection of the platform mounting hardware, or following maintenance or repair of the platform mounting hardware and/or removal of the platform, you must:

1. Inspect the platform, scissors, and the attachment area. Make sure you also do a check for damage to the threads on the scissor arm bracket ①. Remove any debris, oils or grease from the threads.
2. Replace all of the platform mounting hardware ② (bolts, flat washers, and spring washers) with new Skyjack-approved parts. Refer to the parts manual for the part numbers for your specific MEWP.
3. Apply a high-strength threadlocker (Loctite 270 or equivalent) to each bolt. Refer to the threadlocker manufacturer instructions for the specific requirements on its use.
4. Insert all of the bolts evenly. Then use a correctly calibrated torque wrench set to 41 Nm (30 ft-lb) to tighten each bolt. Use a smooth, even motion until an indication (audible click) is heard and felt.
5. When all of the bolts are torqued, repeat the tightening sequence to confirm the torque..



Notes

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 value listed on the serial number plate. Turning the stem on the relief valve clockwise will increases pressure. Turning the stem counterclockwise will decreases 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**

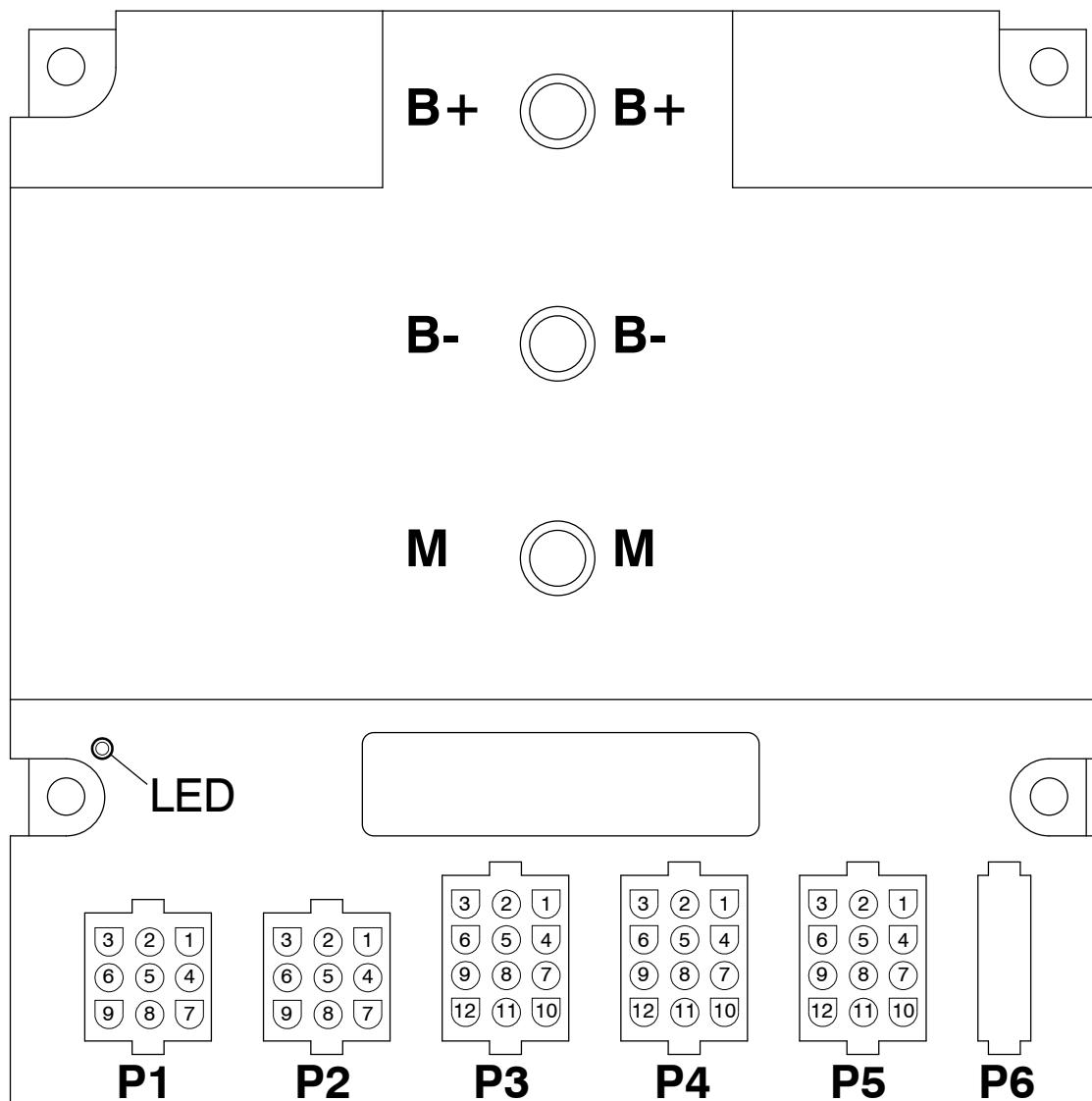
Adequate area to raise the platform to full height is required for the following steps.

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 increases pressure. Turning the stem counterclockwise will decreases 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 SKYCODED Control Module Pin Reference Chart



WIRING CONNECTIONS			
PIN	FUNCTION	PIN	FUNCTION
P1-1	5V to Joystick (low current)	P2-1	not used
P1-2	Joystick analog input	P2-2	SKYCODED height sensor #1 analog input
P1-3	0V to Joystick (low current)	P2-3	0V (low current, for sensors only)
P1-4	not used	P2-4	Pressure sensor analog input
P1-5	CAN H (optional CANbus/Telematics)	P2-5	SKYCODED height sensor #2 analog input
P1-6	CAN L (optional CANbus/Telematics)	P2-6	not used
P1-7	not used	P2-7	B+ feed (750mA max, for sensors & switches only)
P1-8	E-Stop Power On & Overload lamp low side output	P2-8	not used
P1-9	All-motion & Tilt alarm low side output	P2-9	Flashing lamp low side output (1700mA max)

WIRING CONNECTIONS	
PIN	FUNCTION
P3-1	E-Stop Platform (B+ during platform and base mode)
P3-2	Valve supply (high current B+ during platform mode, supplies all valve outputs)
P3-3	Torque/traction switch (B+ =active)
P3-4	not used
P3-5	Base operation select switch (B+ during base mode)
P3-6	Drive select switch (B+ =active)
P3-7	Lift select switch (B+ =active)
P3-8	Steer right switch (B+ =active)
P3-9	Steer left switch (B+ =active)
P3-10	not used, Spare switch input (B+ =active)
P3-11	not used, Spare switch input (B+ =active)
P3-12	Joystick Enable (trigger) switch (B+ =active)
P4-1	E-Stop Base (B+ during base mode)
P4-2	Power Deck (option) extend switch input
P4-3	Power Deck (option) retract switch input
P4-4	Platform down switch (B+ =active in ground mode only)
P4-5	Platform up switch (B+ =active in ground mode only)
P4-6	not used, Spare switch input (B+ =active)
P4-7	Pothole bars switch input (B+ =bars deployed)
P4-8	not used, Spare switch input (B+ =active)
P4-9	not used, Spare switch input (B+ =active)
P4-10	not used, Spare switch input (B+ =active)
P4-11	not used, Spare switch input (B+ =active)
P4-12	not used, Spare switch input (B+ =active)
P5-1	Line contactor output (B+ when active)
P5-2	Forward valve output (B+ when active)
P5-3	Reverse valve output (B+ when active)
P5-4	Brake Valve output (B+ when active)
P5-5	Motion light output (B+ when active)
P5-6	Steer left valve output (B+ when active)
P5-7	Down valve output (B+ when active)
P5-8	Steer right valve output (B+ when active)
P5-9	Torque valve output (B+ when active)
P5-10	not used, spare valve output
P5-11	Up valve output (B+ when active)
P5-12	Holding valve output (B+ when active)
P6	Connects to Display or EZcal hand-held device for set-up, adjustments and diagnostics

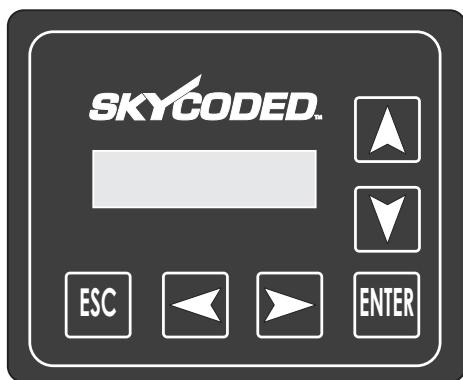
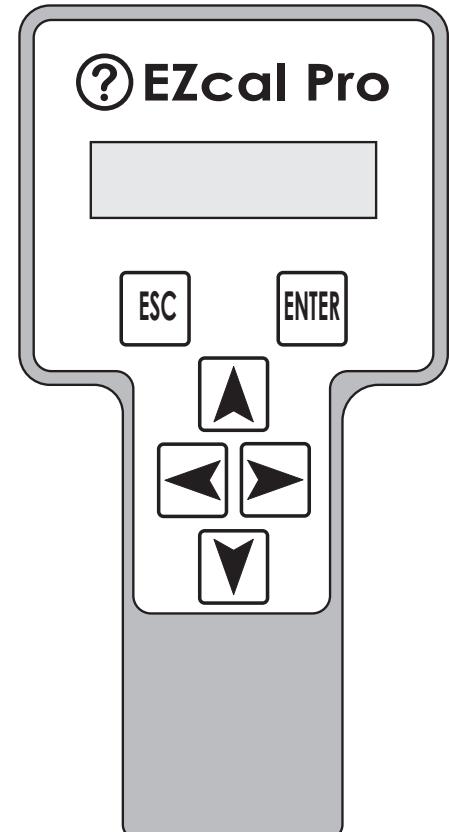
5.2-4 Hand Held Calibration and SKYCODED Diagnostic Tool Key Functions



Only trained and authorized personnel shall be permitted to service a mobile elevating work platform.



Read all instructions closely before attempting each phase of the calibration procedure.



Symbol	Key Functions
?	Help Displays the current help menu while viewing any controller menu. Release the button to return to the original menu display.
ESC ENTER	ESC/ENTER Use these to move back and forth between menus and submenus and to make a selection.
▲ ▼	Up/Down Adjust the settings values.
◀ ▶	Left/Right Select the menus and settings to be adjusted.

5.2-5 Hand Held Calibration/Diagnostic Tool Menu Options

Top Level Menu Options

HELP	Select this menu to see a description of current SKYCODED module status
DIAGNOSTICS	Select this menu to see switch & sensor input status & logged data
ACCESS LEVEL	Select this menu & enter correct code to enable adjustments and calibrations
RUN SYSTEM TEST	Select this menu to enter system test mode
ADJUSTMENTS	Select this menu to see and adjust SKYCODED module settings
SETUPS	Select this menu to carry out initial set-up of the SKYCODED module
CALIBRATIONS	This menu is intended for use by SKYCODED module design engineers only!
SERIAL NUMBER	Select this menu to view the serial number of the controller

Help Menu Options

(help message)	A message displays current SKYCODED module status, indicating if everything is OK or if there is a reason for restricted functionality
LOGGED HELP	Press ENTER when viewing the current HELP message to see a log of recent HELP messages; press ► to see older messages, and ◀ to see newer ones; press ESC to return to the current HELP message

Diagnostics Menu Options

SYSTEM	Select this menu to see general SKYCODED module system information
PLATFORM	Select this menu to see platform input status
GROUND	Select this menu to see ground input status
INPUTS	Select this menu to see other input status
ANALOGS	Select this menu to see analog input status
OUTPUTS	Select this menu to see SKYCODED module output status
LOG	Select this menu to see logged information

Diagnostics / System Menu Options

MODE	Displays current operating mode or interlock
MODE\INTERLOCK	When current operating mode shows INTERLOCKED, press ENTER to see the reason for the interlock; press ESC to return to the current operating mode
SUPPLY	Displays battery supply voltage
VALVESUPPLY	Displays valve supply
MOTOR V	Displays motor voltage
MOTOR I	Displays motor current
TEMPERATURE	Displays temperature (°C)
TILT	Displays tilt values (X°, Y°)
TILTED	Displays whether system is in tilted mode (measured tilt exceeds tilt trip points)
HEIGHT	Displays platform height, calculated from height sensor(s) and data stored during calibration If two angle transducer sensors are installed, press ENTER when viewing the HEIGHT (which is the average of the two sensors), to see the individual measurements of the two sensors, named HEIGHT1 and HEIGHT2 (press ► and ◀ to see both); press ESC to return to the average HEIGHT

Diagnostics / System Menu Options (Continued)

LOAD	Displays platform load, estimated from lift cylinder pressure measurement, platform height, and height/pressure curves stored during calibration
OVERLOADED	Displays whether system is in overload mode (platform load exceeds load trip point, at/above overload height)
LAST MOVED	Displays whether the most recent platform movement was UP or DOWN; this is important if the lift cylinder pressure is affected by the direction of movement (during calibration, separate measurements are collected during lifting and lowering)
ELEVATED	Displays whether system is in elevated mode

Diagnostics / Platform Menu Options

TRIGGER	Displays ON when platform trigger pressed
DLD	Displays drive / lift (deck) mode (from drive / lift switch)
JOYSTICK	Displays joystick position (%)
FWD/UP	Displays ON when joystick is moved toward FWD or UP
REV/DOWN	Displays ON when joystick is moved toward REV or DOWN
LEFT	Displays ON when steer left button pressed
RIGHT	Displays ON when steer right button pressed
EMSp	Displays ON, indicating platform EMS is active

Diagnostics / Ground Menu Options

UP	Displays ON when up switch pressed
DOWN	Displays ON when down switch pressed
OUT	Displays ON when (optional) deck out switch pressed
IN	Displays ON when (optional) deck in switch pressed
EMSp	Displays ON, indicating ground EMS is active

Diagnostics / Inputs Menu Options

P3-1	Shows P3-1 input status (E-Stop platform)
P3-2	Shows P3-2 input status (valve supply, ON with E-Stop platform)
P3-3	Shows P3-3 input status (traction select)
P3-4	Shows P3-4 input status (not used)
P3-5	Shows P3-5 input status (not used)
P3-6	Shows P3-6 input status (DRIVE select)
P3-7	Shows P3-7 input status (LIFT select)
P3-8	Shows P3-8 input status (STEER RIGHT from joystick)
P3-9	Shows P3-9 input status (STEER LEFT from joystick)
P3-10	Shows P3-10 input status (not used)
P3-11	Shows P3-11 input status (not used)
P3-12	Shows P3-12 input status (ENABLE from joystick)
P4-1	Shows P4-1 input status (E-Stop Base)
P4-2	Shows P4-2 input status (DECK EXTEND)

P4-3	Shows P4-3 input status (DECK RETRACT)
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Diagnostics / Inputs Menu Options (Continued)

P4-4	Shows P4-4 input status (LIFT DOWN at base station)
P4-5	Shows P4-5 input status (LIFT UP at base station)
P4-6	Shows P4-6 input status (not used)
P4-7	Shows P4-7 input status (POTHOLE LS)
P4-8	Shows P4-8 input status (not used)
P4-9	Shows P4-9 input status (not used)
P4-10	Shows P4-10 input status (not used)
P4-11	Shows P4-11 input status (not used)
P4-12	Shows P4-12 input status (not used)

Diagnostics / Analogs Menu Options

P1-2	Displays voltage measurement of joystick
P1-4	Displays voltage measurement of spare analog input P1-4 (not used)
P2-2	Displays voltage measurement of angle transducer height sensor #1
P2-4	Displays voltage measurement of pressure sensor
P2-5	Displays voltage measurement of angle transducer height sensor #2
P2-6	Displays voltage measurement of spare analog input P2-6 (not used)

Diagnostics / Outputs Menu Options

P1-5	Not configured as an output
P1-6	Not configured as an output
P1-7	Not used
P1-8	Displays state of P1-8 output (E-Stop power on & overload lamp)
P1-9	Displays state of P1-9 output (all-motion & tilt alarm)
P2-9	Displays state of P2-9 output (flashing lamp)
P5-1	Displays state of P5-1 output (line contactor)
P5-2	Displays state of P5-2 output (drive forward)
P5-3	Displays state of P5-3 output (drive reverse)
P5-4	Displays state of P5-4 output (brake release)
P5-5	Not used
P5-6	Displays state of P5-6 output (steer left)
P5-7	Displays state of P5-7 output (lift down)
P5-8	Displays state of P5-8 output (steer right)
P5-9	Displays state of P5-9 output (high torque)
P5-10	Not used
P5-11	Displays state of P5-11 output (lift up)
P5-12	Displays state of P5-12 output (lift down holding valve)
FEEDBACK	Select this sub-menu to view feedback status of outputs
TESTMODE	Press ▲ or ▼ to turn on test mode, which allows each output in this menu to be manually turned on / off using ▲ and ▼

PUMPMODE	Displays state of test mode (NORMAL or DISABLED) where pump operation is inhibited (set to DISABLE using PSWD = 1-2-3-4)
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Diagnostics / Outputs / Feedback Sub-Menu Options

P5-1	Displays P5-1 (line contactor) output status – LO when off, HI when on
P5-x	Displays output status of all P5 outputs except P5-1 (ie: valves) – LO when all valves off, HI when any valve on

Diagnostics / Log Menu Options

CALDATE	Displays date entered by operator at end of last calibration
SOFTWARE	Displays software version of SKYCODED module
POWERED	Displays total time that SKYCODED module has been powered
MAX.BATTERY	Displays maximum recorded battery supply voltage

Access Level Menu Options

CODE xxxx	“ACCESS LEVEL” 3 (default) prevents adjustments and calibrations
CODE 1122	“ACCESS LEVEL” 2 (when correct code entered) allows calibrations
CODE 1234	“PUMPMODE” (when correct code entered) allows all operations with P5-1 Line contactor output disabled i.e. a service/troubleshooting mode

Adjustments Menu Options

DRIVE	These adjustments control drive when the platform is NOT “elevated”
DRIVE/ELEVATED	These adjustments control drive when the platform IS “elevated”
LIFT	Select this menu to access adjustments related to platform lift
STEER	Select this menu to access adjustments related to steering
DECK	Select this menu to access adjustments related to deck extention
GROUNDMODE	Select this menu to access adjustments when in ground mode
TILT	Select this menu to access adjustments related to tilt
OVERLOAD	Select this menu to access adjustments related to overload
ALARMS	Select this menu to access adjustments related to alarms
HEIGHTS	Select this menu to access adjustments related to heights

Adjustments / Drive Menu Options

FWD MIN	Determines the slowest drive speed in the forward direction (when the joystick is at 0% demand)
FWD MAX	Determines the fastest drive speed in the forward direction (when the joystick is at 100% demand)
REV MIN	Determines the slowest drive speed in the reverse direction (when the joystick is at 0% demand)
REV MAX	Determines the fastest drive speed in the reverse direction (when the joystick is at 100% demand)
ACCEL	Determines the rate of increase of drive speed when higher speeds are demanded
DECCEL	Determines the rate of decrease of drive speed when lower speeds (or stop) are demanded

MAX HEIGHT	Determines the height above which drive is prevented. Set to zero to prevent drive above the "elevation" point, or to non-zero to prevent drive above the set height. If drive is allowed at all heights, set to 101%.
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Adjustments / Drive Menu Options (Continued)

HOLD-OFF	Sets a delay time to keep drive valve turned on after ramping to a stop (if needed to avoid locking wheels at stop) Set to zero to have no delay
TORQUEscale	Determines the Mid-speed output as a percentage of Max Speed output (applies to 3219 only)

Adjustments / Drive / Elevated Menu Options

FWD MIN	Determines the slowest drive speed in the forward direction (when the joystick is at 0% demand) when elevated
FWD MAX	Determines the fastest drive speed in the forward direction (when the joystick is at 100% demand) when elevated
REV MIN	Determines the slowest drive speed in the reverse direction (when the joystick is at 0% demand) when elevated
REV MAX	Determines the fastest drive speed in the reverse direction (when the joystick is at 100% demand) when elevated
ACCEL	Determines the rate of increase of drive speed when higher speeds are demanded when elevated
DECEL	Determines the rate of decrease of drive speed when lower speeds (or stop) are demanded when elevated
HOLD-OFF	Sets a delay time to keep drive valve turned on after ramping to a stop when elevated Set to zero to have no delay when elevated

Adjustments / Lift Menu Options

UP MIN	Determines the slowest lifting speed (when the joystick is at 0% demand)
UP MAX	Determines the fastest lifting speed (when the joystick is at 100% demand)
DOWN MIN	Determines the slowest lowering speed (when the joystick is at 0% demand) IMPORTANT: This adjustment is only effective if the lowering function is controlled by the pump or a proportional valve (otherwise, the lowering speed is fixed and determined by the machine hydraulics)
DOWN MAX	Determines the fastest lowering speed (when the joystick is at 100% demand) IMPORTANT: This adjustment is only effective if the lowering function is controlled by the pump or a proportional valve (otherwise, the lowering speed is fixed and determined by the machine hydraulics)
ACCEL	Determines the rate of increase of lift speed when higher speeds are demanded when platform is above ELEVATION height
ACCELstowed	Determines the rate of increase of lift speed when higher speeds are demanded when platform is below ELEVATION height
DECEL	Determines the rate of decrease of lift speed when lower speeds are demanded

MAX HEIGHT	Determines the height above which lifting is prevented. Set to zero to prevent lift above the “elevation” point, or to non-zero to prevent lift above the set height. If the lift cylinder goes to relief at full height, and overload features are required, ensure to set LIFT MAX HEIGHT so that the platform never goes to relief (if the platform goes to relief, it will not be possible to descend since the relief pressure will be interpreted as an overloaded platform!) If lift is allowed at all heights, set to 101%.
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Adjustments / Lift / Armguards Menu Options

TIME	Determines the time delay when armguard triggers during lowering, before lowering is allowed to continue.
@HEIGHT	Determines the height at which “soft armguard” occurs when lowering. Set to zero to trigger “soft armguard” at the ELEVATION@ height, or non-zero to trigger at the set height. IMPORTANT: If armguard function is not needed, choose 101% to disable. IMPORTANT: If no angle transducer is fitted to the machine, choose only 101% to disable, or 0% to determine ARMGUARD from the elevation switch.

Adjustments / Steer Menu Options

SPEED	Determines the pump speed when steering is used on its own (without drive).
DRIVE COMP	Determines the additional speed to apply to the current drive speed when steering is used while driving when not elevated – it can be adjusted to minimize any slow down in drive speed due to steering demand. If no steer-during-drive compensation is needed, set to zero.
ELEV DRIVE COMP	Determines the additional speed to apply to the current drive speed when steering is used while driving when elevated. If no steer-during-elevated-drive compensation is needed, set to zero.
ACCEL	Determines the rate of increase of pump speed when steering is selected on its own (without drive)
DECCEL	Determines the rate of decrease of drive speed when steering is selected on its own (without drive)

Adjustments / Deck Menu Options

OUT MIN	Determines the slowest deck out (extend) speed (when the joystick is at 0% demand)
OUT MAX	Determines the fastest deck out (extend) speed (when the joystick is at 100% demand)
IN MIN	Determines the slowest deck in (retract) speed (when the joystick is at 0% demand)
IN MAX	Determines the fastest deck in (retract) speed (when the joystick is at 100% demand)
ACCEL	Determines the rate of increase of deck speed when higher speeds are demanded
DECCEL	Determines the rate of decrease of deck speed when lower speeds are demanded

Adjustments / Groundmode Menu Options

UP	Determines the (fixed) lifting speed in ground mode
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DOWN	Determines the (fixed) lowering speed in ground mode IMPORTANT: This adjustment is only effective if the lowering function is controlled by the pump or a proportional valve (otherwise, the lowering speed is fixed and determined by the machine hydraulics)
OUT	Determines the (fixed) deck out (extend) speed in ground mode
IN	Determines the (fixed) deck in (retract) speed in ground mode
ACCEL	Determines the rate of increase of lift/lower/deck speeds in ground mode
DECEL	Determines the rate of decrease of lift/lower/deck speeds in ground mode

Adjustments / Tilt Menu Options

Xtrip Ytrip	Determines the amount of machine tilt needed to trigger the “tilted” condition; separate adjustments are provided for tilt in the two axes – the SKYCODEDt correctly combines tilt in each axis to determine an overall tilted / not-tilted condition. IMPORTANT: “TILT SHUTDOWN” in the SETUPS/TILT menu determines what functions (if any) should be restricted when the machine is tilted.
DELAYtrip DELAYclear	Determines the time delay (“debounce”) to go from not-tilted to tilted, and from tilted to not-tilted – “DELAYtrip” determines the time delay to go in to a “tilted” condition and “DELAYclear” determines the time delay to exit the “tilted” condition.
TILT#2	Select this sub-menu to access adjustments related to second tilt trip points

Adjustments / Tilt / Tilt #2 Sub-Menu Options

@HEIGHT	Determines the height above which second tilt trip points apply. Set to 101% if not required.
Xtrip2 Ytrip2	Determines the amount of machine tilt needed to trigger the “tilted” condition, when above the second tilt height. The same DELAY settings are used as for the normal tilt trip points.

Adjustments / Overload Menu Options (Disabled)

TRIP@	Determines the platform load estimate above which functions will be prevented. NOTE: Each machine must be individually calibrated with the platform fully loaded and also empty, before platform load estimates can be made. IMPORTANT: Set to zero if overload functions are not required. IMPORTANT: If overload functions are required (this setting is non-zero), at least one angle transducer height module must be fitted on the machine.
LAMP@	Determines the platform load estimate above which the overload warning lamp will be active. Set to zero to determine the lamp from the TRIP@ setting.
ALARM@	Determines the platform load estimate above which the overload warning alarm will be active. Set to zero to determine the alarm from the TRIP@ setting.
@HEIGHT	Determines the height above which an overloaded platform will prevent functions. Set to zero to trigger overload conditions at the “elevation” point, or to non-zero to trigger at the set height.

SAFE-DOWN	Determines the height below which an overloaded platform can still be lowered – this is because when the platform is fully lowered, overload cannot be determined since there is no load on the lift cylinder; instead the first overload is determined according to @HEIGHT, and if the platform is overloaded, it must be able to be lowered again so the operator can reduce weight. RECOMMENDATION: Set 3%-5% higher than where the @HEIGHT measurement occurs. IMPORTANT: If you set both @HEIGHT and SAFE-DOWN to 0%, overload will first be checked at the “elevation” point, and the SKYCODED module will ensure that the operator can lower again if overloaded – but only if the machine is not switched off and on again!
DELAYtrip DELAYclear	Determines the time delay (“debounce”) to go from not-overloaded to overloaded, and from overloaded to not-overloaded – “DELAYtrip” determines the time delay to go in to an “overloaded” condition and “DELAYclear” determines the time delay to exit the “overloaded” condition.
OVERLOAD#2	Select this sub-menu to access adjustments related to second overload trip points

Adjustments / Overload / Overload #2 Sub-Menu Options (Disabled)

@HEIGHT	For some applications, an additional lower overload level must be applied above a certain height – if needed, set @HEIGHT to the height where overload must be lower. NOTE: If a second overload is not needed, set to 101%
@SCALE	For some applications, an additional lower overload level must be applied above a certain height – if needed, set SCALE to the percentage reduction to apply to the TRIP@ / LAMP@ / ALARM@ settings, when the second height is reached (eg: set to 75% to reduce overload levels to 75% of their original level). NOTE: If a second overload is not needed, set to 100%

Adjustments / Alarms Menu Options

DRIVE	Determines when to sound the alarm – set to “NO” to not sound while driving, to “FWD” or “REV” to sound while driving in that direction, or to “BOTH” to sound for driving in either direction. IMPORTANT: If set to “ALL MOVEMENT”, the alarm is sounded for all machine movements, not just driving.
LIFT	Determines when to sound the alarm – set to “NO” to not sound while lifting/lowering, to “UP” or “DOWN” to sound while lifting or lowering, or to “BOTH” to sound for lifting and lowering. IMPORTANT: If set to “ALL MOVEMENT”, the alarm is sounded for all machine movements, not just lifting/lowering.
TIILT	Determines when to sound the alarm – set to “NO” to not sound depending on tilt, to “ELEVATED” to sound if tilted and elevated, or to “ALWAYS” to sound when tilted irrespective of platform height.

Adjustments / Heights Menu Options

ELEVATION@	Determines the “elevation” point – the platform height at which the machine is considered to be elevated. There are two options to determine the “elevation” point, either using a traditional switch/cam combination, or using angle transducer modules. Set to 0% to use the switch/cam, or to a non-zero value to determine by height. Of course, if no angle transducer is fitted to the machine, this setting must be left at 0%.
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MAX DRIVE	Determines the height above which drive is prevented. Set to zero to prevent drive above the ELEVATION@ height, or to non-zero to prevent drive above the set height. If drive is allowed at all heights, set to 101%. IMPORTANT: If set to a height 1%-100%, an angle transducer is required to determine that height.
MAX LIFT	Determines the height above which lift is prevented. Set to non-zero to prevent lift above the set height; this setting is useful in preventing the lift cylinder going to relief at full height, which can cause overload to trip. If lift is allowed at all heights, set to 101%. IMPORTANT: If set to a height 1%-100%, an angle transducer is required to determine that height.
ARMGUARD	Determines the height at which “soft armguard” occurs when lowering. Set to zero to trigger “soft armguard” at the ELEVATION@ height, or non-zero to trigger at the set height. IMPORTANT: If set to a height 1%-100%, an angle transducer is required to determine that height.

Setups Menu Options

CHANGE DEFAULTS	Select this menu to check correct customer / machine model configuration, and/or select new machine model defaults
TILT SETUPS	Select this menu to calibrate tilt (on level ground) and configure tilt shutdown
HEIGHT SETUPS	Select the menu to calibrate height measurement (using an angle transducer) and to configure certain height related options (such as tilt correction)
LOAD SETUPS	Select this menu to calibrate overload and to configure certain overload related options
INTERLOCKS	Select this menu to configure basic machine / operator interlocks

Setups / Change Defaults Menu Options

CUSTOMER	Factory set to configure the SKYCODED module to specific customer needs; confirm that the correct customer code is displayed
MODEL	Determines the initial default settings of all ADJUSTMENTS; change to the correct model code for the machine NOTE: ADJUSTMENTS and other settings can be altered after being set to default – the model does not indicate that all settings are currently at default (to ensure this, change to a different model code, then change back to the correct model code) IMPORTANT: Changing the model code will replace all ADJUSTMENTS back to their initial defaults

Setups / Tilt Setups Menu Options

CALIBRATE LEVEL	Calibrates SKYCODED module tilt to zero degrees X and Y
TILT SHUTDOWN	Determines if SKYCODED module will prevent functions when machine is tilted: NEVER – no functions prevented LIFT&DRIVE – lifting and driving prevented (lowering still allowed) LIFT – lifting prevented (lowering and driving still allowed) DRIVE – driving prevented (lifting and lowering still allowed)
ELEV. TILT SHUTDOWN	Determines if SKYCODED module will prevent functions when machine is both tilted and elevated

Setups / Height Setups Menu Options

ELEVATION@	Determines the “elevation” point – the platform height at which the machine is considered to be elevated. There are two options to determine the “elevation” point, either using a traditional switch/cam combination, or using angle transducer modules. Set to 0% to use the switch/cam, or to a non-zero value to determine by height. Of course, if only no angle transducer is fitted to the machine, this setting must be left at 0%.
CALIBRATE HEIGHT	Calibrates platform height from 0% to 100% as measured by angle transducer module
MIN LIFT	Determines the minimum time between each static measurement during load calibration (a shorter time may improve load calibration accuracy, while a longer time will reduce the number of static measurements if too many are taken)
SAMPLES@	Determines the time between samples during dynamic lifting load calibration (a maximum of 500 samples can be taken during dynamic lifting; increase the delay if machine lifting speed is slow)
TILT CORRECTION	Configures how to correct machine tilt so that angle transducer height measurement is correct

Setups / Interlocks Menu Options

TRIGGERonly	Determines whether and after what delay to trigger an interlock when trigger is closed with no other function selected Set to 0s to have no interlock If trigger is closed with no function, for longer than the adjustment, the operator will have to release and re-close trigger before any function is allowed
TRIGGERRwait	Determines whether and after what delay to trigger an interlock when a function is selected without trigger being closed Set to 0s to have no interlock If a function is selected without trigger, for longer than the adjustment, the operator will have to release and re-select the function before it is allowed
FUNCTIONhold	Only applicable if drive / lift mode is selected with momentary push switches; when using a drive / lift toggle switch, leave at default 0s

Calibrations Menu Options

Temp	Factory set to calibrate heatsink temperature (motor power may be reduced if the heatsink temperature is too high, due to poor mounting of SKYCODED module to machine chassis)
Current	Factory set to calibrate motor current
TiltGain TiltXoff TiltYoff	Factory set to calibrate SKYCODED module tilt sensor
UserXoff UserYoff	Set when the “CALIBRATE LEVEL” procedure is carried out, to correct for slight tilt offset due to mounting of the SKYCODED module to machine chassis, and chassis to ground
Height1Min Height1Max Height2Min Height2Max	Set when the “CALIBRATE HEIGHT” (or “CALIBRATE LOAD” dynamic) procedure is carried out, to determine the angle transducer module(s) measurements when the platform is fully lowered (0% height) and fully raised (100% height) NOTE: Height2 settings only relevant when two angle transducer modules are installed

ElevUp ElevDown	Set when the “CALIBRATE HEIGHT” (or “CALIBRATE LOAD” dynamic) procedure is carried out, to determine the platform height where the “elevation” switch/cam opened while lifting, and closed while lowering. NOTE: Only relevant when one angle transducer module is installed
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Serial Number

yyymm/nnnnn	Displays the SKYCODED module serial number The first five digits indicate year and month of manufacture (eg: 20811 means November 2008) The second five digits are a unique sequential serial number
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5.2-6 SKYCODED Help Messages - Quick Reference Chart

Help Message	LED Indication
STARTUP!	Steady On
EVERYTHING OK	Steady On
GROUND MODE ACTIVE!	Steady On
DRIVING!	Steady On
LIFTING!	Steady On
LOWERING!	Steady On
STEERING!	Steady On
EXTENDING DECK!	Steady On
RETRACTING DECK!	Steady On
CLOSE TRIGGER	Steady On
VEHICLE TILTED	Steady On
FACTORY OVERRIDE	Fast Flashing
HEIGHT NOT CALIBRATED	1/1
NOT CALIBRATED	1/1
FAULT: CUSTOMER	1/1
FUNCTIONS LOCKED - NOT CALIBRATED	1/1
SHUTDOWN - CHECK EMS SWITCHES!	2/1
CHECK DRIVE/LIFT SELECT SWITCH!	2/2
CHECK GROUND INPUT SWITCHES!	2/2
CHECK JOYSTICK SWITCHES!	2/2
FUNCTIONS LOCKED - ARMGUARD	2/2
FUNCTIONS LOCKED - EXTERNAL SHUTDOWN	2/2
FUNCTIONS LOCKED - OVERLOADED	2/2
RELEASE GROUND SWITCHES!	2/2
RELEASE JOYSTICK SWITCHES!	2/2
RELEASE TRIGGER!	2/2
SELECT DRIVE/LIFT MODE!	2/2
FUNCTIONS LOCKED - TEST MODE SELECTED	2/2
FUNCTIONS LOCKED - TILTED	2/2
FUNCTIONS LOCKED - TOO HIGH	2/2
FUNCTIONS LOCKED - UNDERLOADED	2/2
FAULT: ENERGIZED VALVE - CHECK P5 WIRING!	3/2
FAULT: VALVE FEEDBACK HIGH - CHECK VALVE WIRING!	3/2
FAULT: B+ STUD VOLTAGE TOO HIGH - CHECK LINE CONT!	3/3
FAULT: ENERGIZED LINE CONTACTOR - CHECK P5 WIRING!	3/4
FAULT: MOTOR OVERLOAD!	3/5

Help Message	LED Indication
FAULT: BAD INTERNAL TEMPERATURE SENSOR!	4/1
FAULT: BAD INTERNAL 5V!	4/2
FUNCTIONS LOCKED - TOO HOT!	4/2
FAULT: BAD INTERNAL 12V!	4/3
FAULT: BATTERY VOLTAGE TOO LOW!	4/4
FAULT: BATTERY VOLTAGE TOO HIGH!	4/4
FAULT: CHECK HEIGHT1 SENSOR	6/1
FAULT: CHECK HEIGHT2 SENSOR	6/1
FAULT: CHECK HEIGHT SENSORS	6/1
FAULT: CHECK PRESSURE SENSOR	6/2
FAULT: CHECK ELEVATION SWITCH	6/3
FAULT: CAN BUS!	6/6
FAULT: B+ STUD VOLTAGE TOO LOW!	7/7
FAULT: B+ STUD VOLTAGE TOO LOW!	7/7

Reading the Codes:

In order to read the fault codes, a sequence of pauses and flashes can be seen on the LED mounted on the SKYCODED module. The codes are continuously displayed by the LED until the fault is cleared, the SKYCODED module resets and no longer detects the fault, or idle timeout becomes active.

The sequence is as follows:

1. Quarter second flashes followed by quarter second pauses indicate the first digit.
2. A 1.5-second pause.
3. Quarter second flashes followed by quarter second pauses indicate the second digit.
4. A 4-second pause. Repeat steps 1-4

For example, the LED flash code 3/2 will look like:

on/off/on/off/on/off-short-delay/on/off/on/off-long-delay/repeat

Since the SKYCODED module only reports one error, only one code can be read from the LED per instance. If the error is cleared and another error is present, it will then be presented.

5.2-7 SKYCODED LED Flash Codes

Diagnosis	LED Indication
There is no fault; all functions should be working normally	LED on steady
There is no power to the SKYCODED module; check EMS wiring to P3-1 and P4-1	LED off always
The SKYCODED module has not been properly calibrated; Check height and load calibration (an EZcal is required).	1/x
Something is preventing functions operating normally; Check EMS inputs and all operator switch inputs (drive/lift mode, joystick, etc); Check for conditions which shut down functions (eg: tilted, too high to drive, platform overloaded, etc) NOTE: In ground mode, only the ground input switches are relevant; while in platform mode the ground input switches are ignored	2/x
There is a problem with the line contactor or valve wiring, or with the motor power wiring; disconnect connector P5 to see if the problem is caused by line contactor or valve wiring (if the fault clears, check for an illegal B+ supply in to P5) Also check motor power wiring; with the line contactor open power terminals B+ and A should both be at 10V-15V (significantly lower than B+) If the LED is steady at power-on, and the fault (3/5) occurs after a delay when attempting to drive or lift, the motor may be stalled and causing an overload of the SKYCODED module	3/x
There is a problem with battery supply, the height and/or pressure sensors, the supply to them, or the temperature sensor inside the SKYCODED module Check battery supply to EMS inputs P3-1 or P4-1 (relative to the B- stud); the battery supply should be between 15V and 32V Check the output from height and pressure sensors (P2/2, P2/4, P2-5); check the 5V sensor supply (P2-1) If the SKYCODED module heatsink is very hot then perhaps the controller has temporarily shut down – if so, platform lowering is still allowed; wait for the controller to cool down	4/x
There is a problem with load measurement – the height and/or pressure sensor measurements are out of range, or the elevation switch disagrees with the height sensor Check that the output from height and pressure sensors (P2/2, P2/4, P2-5) is in range (between 0.5V and 4.5V)	6/x
There is a problem with the power wiring – the voltage on the B+ stud is too low (it should be at least 10V at all times) Check for a short-circuit to the B+ stud	7/x
This indicates that “factory override” is active – this special controller mode is intended for use during machine manufacture only IMPORTANT: Never use a machine that is still in “factory override” – all safety and shutdown features are disabled!	LED flashing fast and continuously

5.2-8 SKYCODED Control Module - Access Level Code

The default “ACCESS LEVEL” of the SKYCODED control module is 3 – no adjustments can be altered or calibrations carried out.

Before adjustments or calibrations can be made, the “ACCESS LEVEL” must be changed to 2 using the correct access code. ACCESS LEVEL 2 allows calibrations and may allow some adjustments to be changed.

To set “ACCESS LEVEL” 2, carry out the following procedure using SKYCODED display;

1. Press and hold the ESC key on the for 5 seconds.
2. Find the “ACCESS LEVEL” menu (using **<** and **>**) and select it (using ENTER)
3. The display will show the initial code 0000 with the first 0 flashing
4. Set the first digit of the code (using **▲** and **▼**)
5. Press **>** to move to the next digit (the first digit will stop flashing, the second will start flashing)
6. Set the second digit of the code
7. Repeat steps 4 and 5 for all the code digits – ensure that the code is correctly entered (if a digit is wrong, press **<** and **>** to select it again, and **▲** and **▼** to correct it)
8. Press ENTER to confirm the code; the “ACCESS LEVEL” will change if the correct code is entered

NOTE: An EZcal hand-held device may be used by connecting it to P6 of the SKYCODED control module.

Access Level Menu Options

CODE xxxx	“ACCESS LEVEL” 3 (default) prevents adjustments and calibrations
CODE 1122	“ACCESS LEVEL” 2 (when correct code entered) allows calibrations
CODE 1234	“PUMPMODE” (when correct code entered) allows all operations with P5-1 Line contactor output disabled i.e. a service/troubleshooting mode

5.2-9 SKYCODED Control Module - Calibrate Level Procedure

The integral tilt sensor of the SKYCODED control module must be calibrated to compensate for errors due to installation and scissor lift machine construction.

1. Ensure the machine is parked on level ground.
2. Press and hold the ESC Key for 5 seconds on the Skycoded display and enter the “ACCESS LEVEL” 2 code to enable calibrations
3. Select the “TILT SETUPs” menu (available from the “SETUPs” menu) and select the “CALIBRATE LEVEL” option.
4. The display will show “YES: ENTER, NO:ESC”, asking for confirmation that the machine is level.
5. Press the ENTER button to confirm.
6. The display will now show the current tilt measurements; if the leveling procedure was successful then both the “X” and “Y” tilts should be about zero.
7. Press the ESC button to exit the “CALIBRATE LEVEL” option.
8. If the tilt measurements are not zero in step 6, try the procedure again – press the ESC button then the ENTER button and repeat from step 4.
9. If the tilt measurements still cannot be zeroed, check that the machine is properly parked on level ground, and check that the SKYCODED control module is correctly and securely installed on a vertical surface of the machine, with the connectors at the bottom.

NOTE: An EZcal hand-held device may be used by connecting it to P6 of the SKYCODED control module.

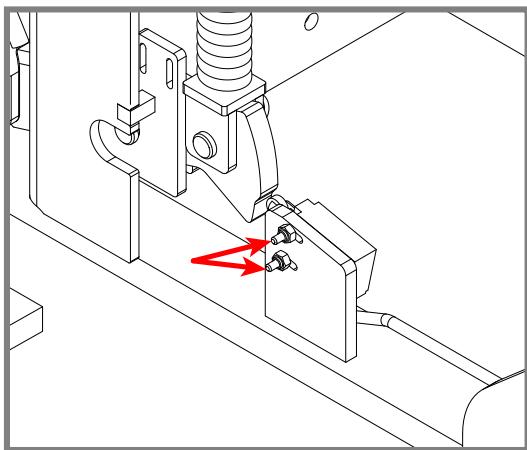
5.2-10 Pothole Limit Switches (LS1 & LS2) Replacement and Adjustment

Machine Preparation

1. Ensure the mobile elevating work platform is parked on a firm level surface.
2. Chock or block the wheels to keep the mobile elevating work platform from rolling forward or backward.

Limit Switch Removal

1. Raise the platform until the pothole bars are deployed.
2. Swing out the hydraulic tray and the battery tray to gain access to the pothole limit switches underneath the base.
3. Remove the bolts and nuts (x2) securing each limit switch to the pothole lock plate. Set the hardware aside for later reinstallation.



4. Remove the limit switch and free the limit switch cable by cutting the tie wraps.
5. Follow the cable into the **electrical panel**, and disconnect the limit switch wires from the **electrical panel**. Discard the limit switches.

Limit Switch Replacement

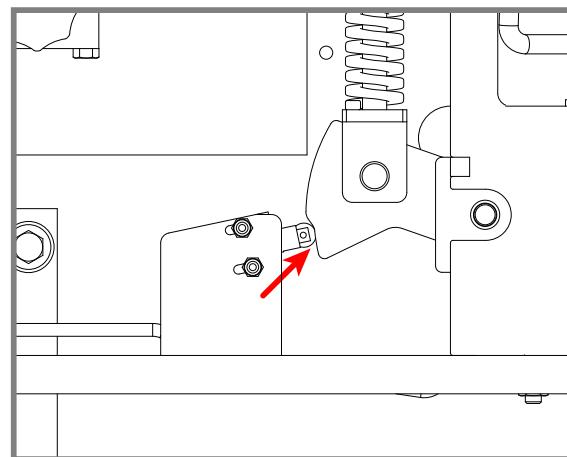
1. Mount loosely the new limit switch assemblies: 208949 (Battery Tray) & 208948 (Hydraulic Tray), using the hardware removed previously.

Limit Switch Electrical Connections

1. Route the new limit switch cable(s) along the same path as the old one(s) into the **electrical panel cabinet**. Use tie wraps as needed to secure them at regular intervals.
2. Strip the cable jacket back to separate the wires. Cut the wires to length if needed.
3. Strip the ends of wires 72-Black/White and 71-Black from the Battery Tray Limit Switch as well as wires 72-Black/White and 910-Black from the Hydraulic Tray Limit Switch and connect them to the **electrical panel** (refer to [3.16 Electrical Harness](#)).

Limit Switch Setup

1. Loosen the hardware securing the limit switch to the pothole lock plate. Adjust and move the limit switch towards the lever bar until it makes contact inside the notch with the lever bar without depressing the plunger roller.



2. Fully tighten the bolts securing the limit switch. Ensure the limit switch does not move while tightening the bolts and the plunger roller retaining pin is fully visible.

Limit Switch Testing

1. Place a block, approximately 1.5" (3.75 cm), under the hydraulic/electric tray and then raise the platform to an approximate height of 7 feet (2 meters) or until the pothole protection is activated. Attempt to drive forward or reverse. Mobile elevating work platform should not move forward or backward.

5.2-11 Wheel Replacement and Torquing Procedure

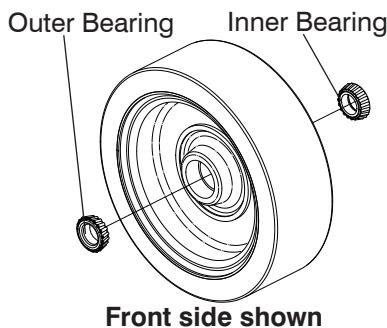
Tools Needed

- Adjustable Torque Wrench
Capacity 380 Nm (280 ft-lb)
- Hub Puller

Grease Application - New Rear Wheels with Pin Brakes Only (if required)

Model	Recommended Grease Type
SJIII 3215, SJIII 3219	STARPLEX EP2
	UNIREX EP2
	SHELL GADUS S2

1. If the bearings are provided separately, they will need to be coated in grease before installing on the rear wheels.



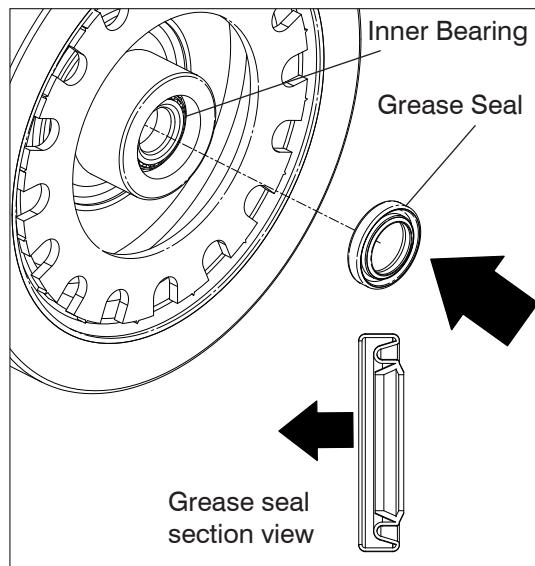
2. Thoroughly clean the bearings using solvent and allow them to dry.
3. Coat the inner and outer bearings with grease completely. Be careful not to contaminate the grease. This could cause internal damage and shorten the life span of the bearings. Contaminants include dust, dirt, sand, water or other foreign particles.
4. Install the inner and outer bearings. The grease should allow the bearings to stick to the bearing cups inside the wheel assembly.



NOTE

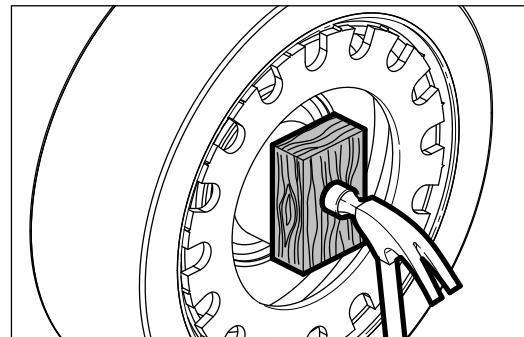
The inner bearing has a larger diameter than the outer bearing. When installing, ensure the bearings are inserted tapered-end first.

5. From the back side of the wheel, place the grease seal on the hub with the tapered end facing inwards.



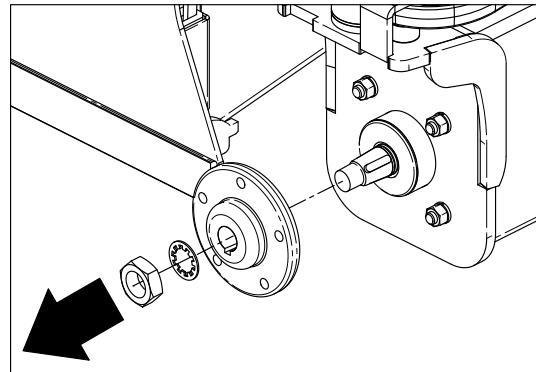
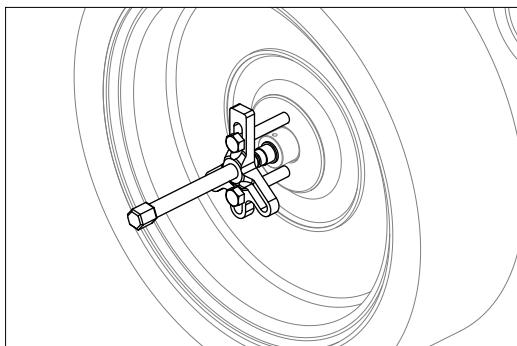
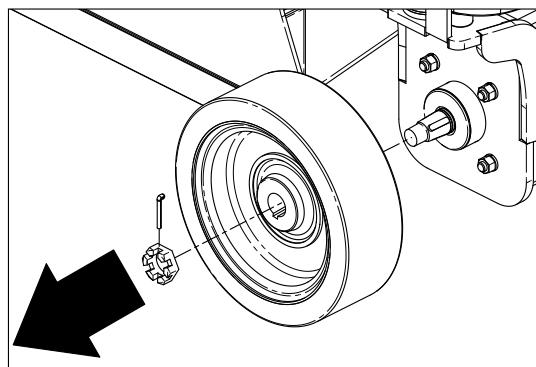
Back side shown

6. Lightly tap the grease seal into place using a hammer, protecting the grease seal with a flat piece of wood.



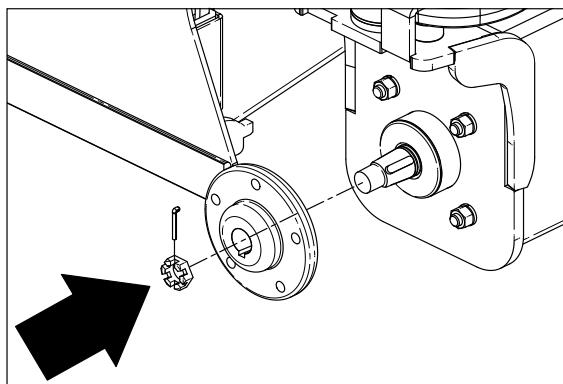
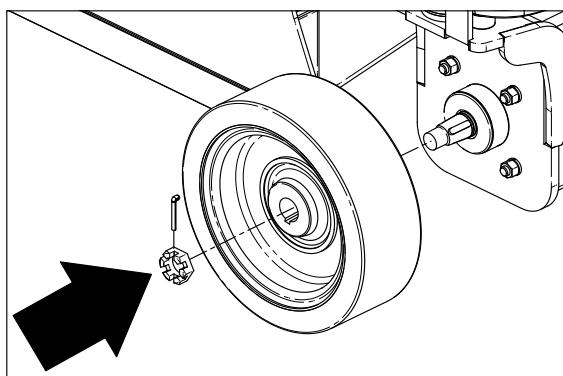
Hub/Integrated Hub Wheel Removal

1. Use an appropriately rated lifting device to raise up the MEWP until all the wheels are off the ground. Set the MEWP on stands adequately rated to support the weight of the machine.
2. Remove and set aside the wheel motor nut or castle nut.
3. Remove and discard the locktooth washer or cotter pin. A new one will be required for re-installing the hub/integrated hub wheel.
4. Use a hub puller to remove and discard the hub/integrated hub wheel from the wheel motor or brake.
5. For integrated hub wheels, use two 3/8"-24 bolts with a hub puller to remove the wheel.

**Remove Hub****Remove Integrated Hub Wheel**

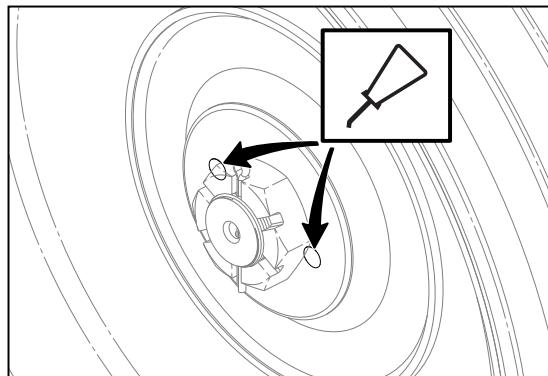
Front Hub/Integrated Hub Wheel Installation

1. Install the hub/integrated hub wheel onto the spindle.
2. Secure the hub/integrated hub using a castle nut.
3. Tighten the castle nut to 95 Nm (70 ft-lb).
4. Insert a 1/8" x 1-1/2" cotter pin.
5. If the holes do not align to install the cotter pin, continue to torque the castle nut clockwise until the next hole is visible.
6. Ensure the cotter pin is pushed in completely.
7. Bend the ends of the cotter pin to secure the castle nut.

***Hub Install******Integrated Hub Wheel Install***

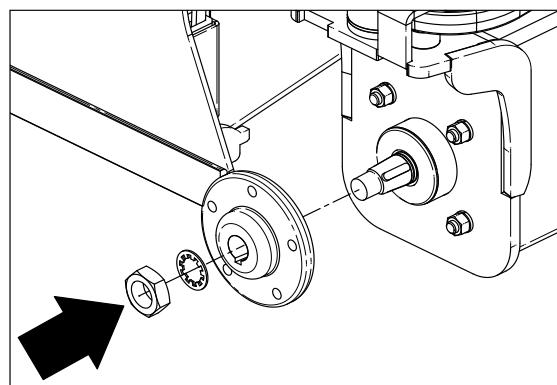
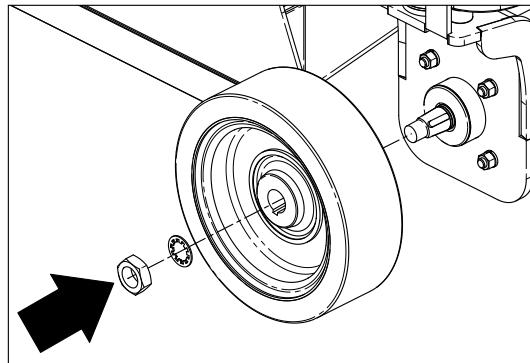
For integrated hub wheels only

8. To limit rust bleed, it is recommended that a few drops of grease be applied to the two small tapped holes on the front wheels.



If using a wheel motor nut

9. Install a wheel motor nut and the new locktooth washer onto the hub/wheel.
10. Torque the wheel motor nut to 380 Nm (280 ft-lb).
11. Apply torque seal to the wheel motor nut.

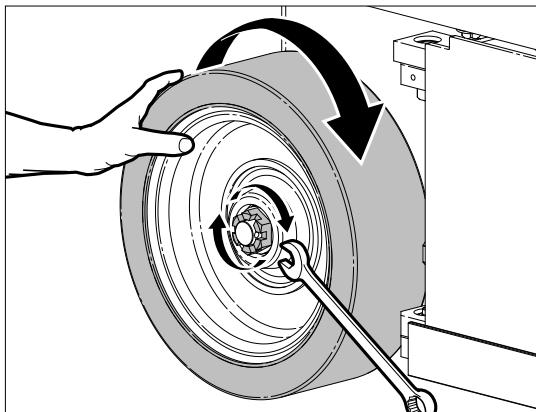
***Hub Install******Integrated Hub Wheel Install***

Rear Hub/Integrated Hub Wheel**Installation -****Pin Brakes**

1. Install the hub/integrated hub wheel onto the spindle.
2. Install the castle nut and the flat washer. Finger tighten the nut.
3. For integrated hub wheels, use a wrench to manually disengage the pin brakes on both sides. This will allow you to rotate the wheel.
4. Rotate the hub/wheel slowly while tightening the castle nut to approximately 68 Nm (50 ft-lb). This is to seat all the bearings in the wheel assembly.

**NOTE**

Do not over-torque the castle nut as the bearing life would be reduced.



5. Loosen the castle nut to remove the torque. Do not rotate the wheel.
6. Finger tighten the castle nut until it is snug.
7. Use a wrench to re-engage the pin brakes on both sides. Do not lower the machine while the pin brakes are disengaged.
8. Turn the castle nut back slightly until the next cotter pin hole is visible on the spindle.

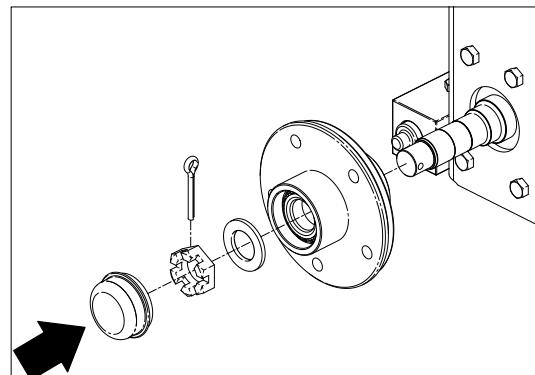
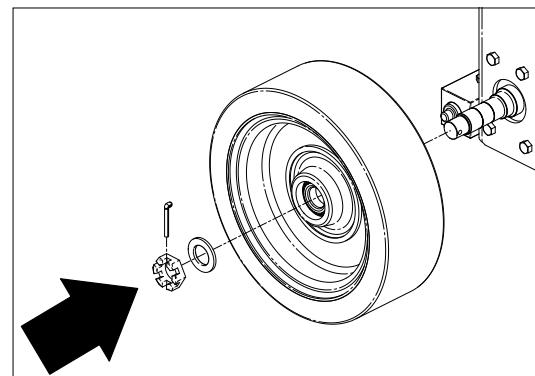
**NOTE**

The castle nut should be free to rotate, with the only restraint being the cotter pin.

9. Install a 1/8" x 1-1/2" cotter pin. Ensure the cotter pin is pushed in completely to allow the dust cap to fit.

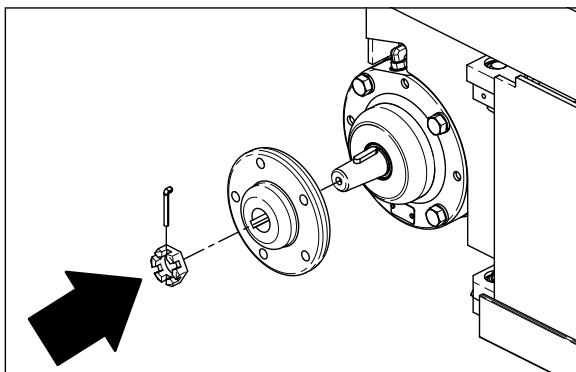
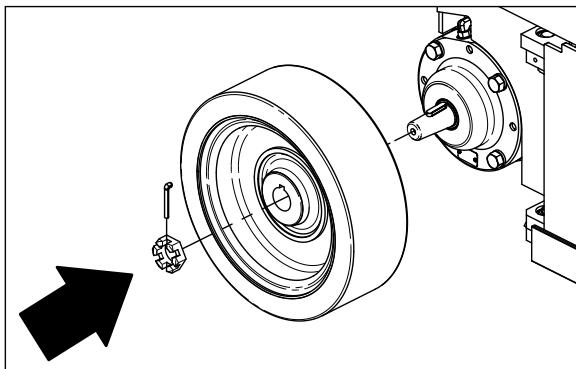
10. Bend the ends of the cotter pin to secure the castle nut.

11. Install the dust cap over the castle nut. Be sure not to damage the castle nut while installing the dust cap.

**Hub Install****Integrated Hub Wheel Install**

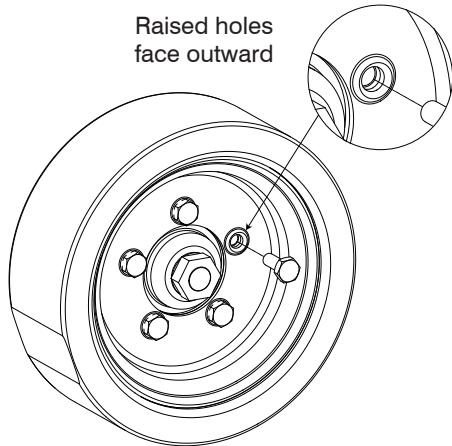
Rear Hub/Integrated Hub Wheel**Installation -****Wet Brakes**

1. Install the hub/integrated hub wheel onto the spindle.
2. Install a 1" castle nut onto the brake.
3. Tighten the castle nut to 95 Nm (70 ft-lb) and insert the 1/8" x 1-1/2" cotter pin.
4. If the holes do not align to install the cotter pin, continue to torque the castle nut clockwise until the next hole is visible.
5. Ensure the cotter pin is pushed in completely.
6. Bend the ends of the cotter pin to secure the castle nut.

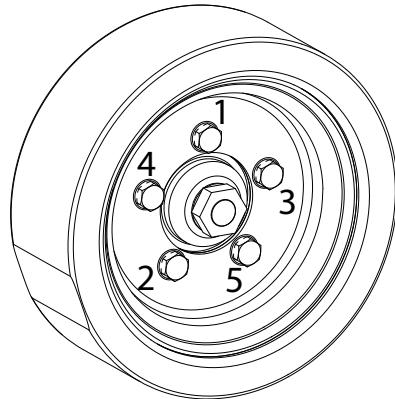
*Hub Install**Integrated Hub Install*

Wheel Installation (If applicable)

1. Install the wheel onto the hub.
2. Center the wheel mounting holes with the bolt holes from the hub.
3. Secure the wheel using wheel bolts and hand tighten to center the rim.



4. Torque the bolts to 68 Nm (50 ft-lb) in a criss-cross sequence.

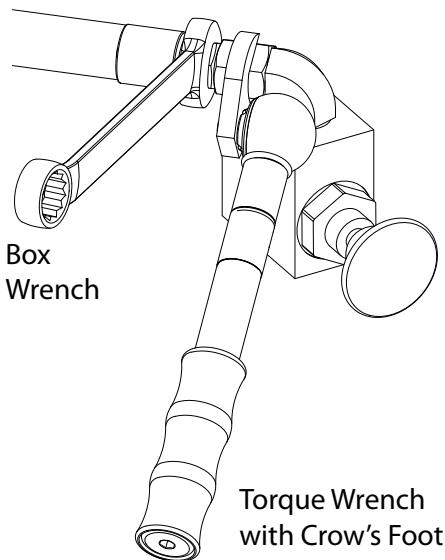


5. Torque the bolts again to 122 Nm (90 ft-lb) in a criss-cross sequence.
6. Repeat the tightening sequence to confirm that none have changed from 122 Nm (90 ft-lb). If any are found below 122 Nm (90 ft-lb), repeat complete sequence until there is no change in torque values. If possible, drive the machine prior to checking torques.
7. Apply dots of torque seal at the base of the wheel bolts.
8. Check torque values after 8 hours of operation.

5.2-12 Tightening and Torque Recommendations for Hydraulic Couplings and Hoses

General Work Practices

1. All components must be free of damage or contamination. O-rings cannot be reused anytime the component has been installed beyond finger tight. Clean or replace components, as required.
2. Over-tightening a coupling may result in overstressing and/or cracking, and may lead to leaking or failure.
3. When tightening hose couplings, ensure the hose does not twist on the adapter. Twisting will shorten hose life and scar the sealing surfaces of swivel type couplings (JIC, 45°, etc.), which can create leaks.
4. When tightening hose couplings, use a torque wrench (with crow's foot) on the hose end hex swivel nut, and a standard box wrench on the hose end stem hex to hold the hose from twisting.



5. Lubricate all o-ring surfaces with suitable hydraulic oil prior to installation in the flange head and o-ring seal grooves. This will minimize the possibility of damage to the O-ring when installed.
6. Install any 45° and 90° hydraulic hose ends first, then align direction and tighten. Adjust the swivel nut on the straight hose end before tightening to create the desired flow.

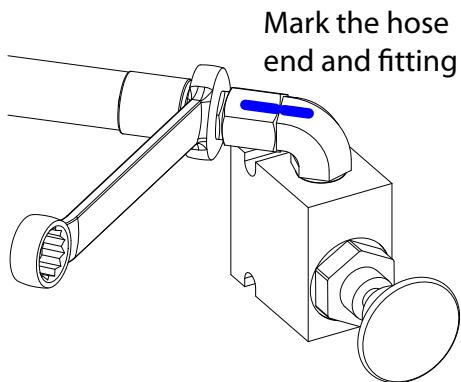
Torquing Using a Torque Wrench

1. This method is applicable for JIC (37°) and FFOR (Flat Face O-Ring) hose ends and fittings, wherever the components are accessible with torque wrench / crow's foot tools.
2. Align the hose end or fitting to the mating component.
3. Install the nut two or three turns by hand to assure proper alignment. Jiggle the hose while tightening to ensure the faces contact fully.
4. Using a properly calibrated torque wrench, tighten the coupling using a smooth, even motion until an indication (audible click) is heard and felt. Do NOT over tighten. For recommended torque values, refer to [Table 2.8 Torque Specifications for Hydraulic Couplings & Hoses](#).
5. Apply a drop of torque seal to the connection.

Torquing Using the Flats From Wrench Resistance Method

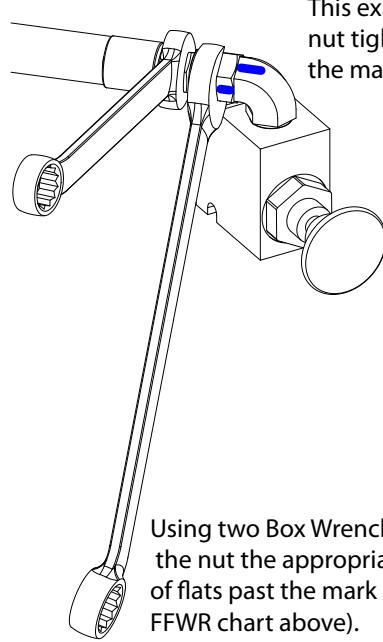
1. This method is applicable for JIC (37°) and FFOR (Flat Face O-Ring) hose ends only, wherever the components are inaccessible with torque wrench/ crow's foot tools, or when a properly calibrated torque wrench is not available.
2. Align the hose end or fitting to the mating component.
3. Install the swivel hose end nut hand tight to the fitting to assure proper alignment. Jiggle the hose while tightening to ensure the faces contact fully.
4. Tighten the nut using a box wrench until minor resistance is felt.

5. Note the position of the nut relative to the fitting with a marking device (i.e., paint marker).



6. Referencing the chart below, use a second box wrench to tighten the nut the appropriate number of flats past the mark. Do NOT over tighten.

FLATS FROM WRENCH RESISTANCE CHART for JIC Hose Ends			
Size		FFWR	
Dash	Frac. (in.)	37° Tube Nut	Swivel Nut
-4	1/4"	2	1.5
-5	5/16"	2	2
-6	3/8"	1.5	1.5
-8	1/2"	1.5	1.25
-10	5/8"	1.5	-
-12	3/4"	1.25	-
-16	1"	1	-
-20	1 1/4"	1	-
-24	1 1/2	1	-
-32	2"	1	-



7. Apply a drop of torque seal to the connection.

Notes

