



SERVICE MANUAL

ARTICULATING BOOMS

MODELS **SJ46AJ** **SJ51AJ**

143921AJ August 2022

SKYJACK

This manual is for MEWPS with serial numbers:

SJ46AJ & SJ51AJ 95 000 001 to 95 000 656

Please refer to the website (www.skyjack.com) for contact information, other serial numbers, the most recent technical manuals, animations, and USB software.

SERVICE AND MAINTENANCE

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



This Safety Alert Symbol means attention!

Become alert! Your safety is involved.



DANGER

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



WARNING

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



CAUTION

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

IMPORTANT

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

Section 1

SCHEDULED MAINTENANCE

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

Aerial Platform Definition

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

Purpose of Equipment

The SKYJACK Articulating Boom Series (Models SJ 46A, 46AJ, & 51AJ) aerial platform is designed to transport and raise personnel, tools and materials to overhead work areas

Use of Equipment

The aerial platform is a highly maneuverable, mobile work station. Lifting and driving must be on a flat, level, compacted surface. It can be driven over uneven terrain only when the platform is fully lowered.

Manuals

Operating

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

Service & Maintenance

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

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

Operator

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

Service Policy and Warranty

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

Optional Accessories

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

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

North America & Asia:

☎ : 800 275-9522

📠 : 630 262-0006

Europe:

☎ : 44-1691-676-235

📠 : 44-1691-676-239

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

Scope of this Manual

- a. **This manual applies** to the ANSI/SIA, CSA, AS and CE versions of the Articulating Boom aerial platform models listed on [Table 2.1](#) of the operating manual.
- **Equipment identified** with "ANSI" meets the ANSI/SIA A92.5-2006 standard.
 - **Equipment identified** with "CSA" meets the CSA B354.4-02 standard.
 - **Equipment identified** with "AS" meets the AS 1418.10-2004 standard.
 - **Equipment identified** with "CE" meets the requirements of the Machinery Directive 98/37/EC and the EMC Directive 2004/108/EC.
- b. **CSA (Canada), AS (Australia) and CE (Europe)**
Operators are required to conform to national, territorial/provincial and local health and safety regulations applicable to the operation of this aerial platform.
- c. **ANSI/SIA (United States)**
Operators are required by the current ANSI/SIA A92.5 standards to read and understand their responsibilities in the manual of responsibilities before they use or operate this aerial platform.

**WARNING**

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

Operator Safety Reminders

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

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

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

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

Electrocution Hazard

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

Per ANSI A92.5-2006 8.10(7)

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

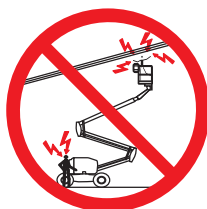
Unqualified persons must maintain a minimum approach distance of 10 feet from any energized power line up to 50 kV. Energized power lines over 50 kV require a greater minimum approach distance to be maintained. Refer to CFR 1910.333.

As per CSA B354.4-02

"The operator shall maintain the minimum safe approach distance (MSAD) from energized conductors at all times in accordance with the authority having jurisdiction."

Refer to CFR 1910.333 or the authority having jurisdiction.

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



DANGER Avoid Power Lines		
Minimum Safe Approach Distance		
ANSI/SIA A92.6-2006 and CSA B354.2-01 Requirements		CE Guidance Note “Avoidance of danger from overhead lines”
Voltage Range (Phase to Phase)	Minimum Safe Approach Distance (Feet)	Adhere strictly to the governmental rulings and regulations applicable in your country.
0 to 300V	Avoid Contact	
Over 300V to 50KV	10	
Over 50KV to 200KV	15	
Over 200KV to 350KV	20	
Over 350KV to 500KV	25	
Over 500KV to 750KV	35	
Over 750KV to 1000KV	45	
FAILURE TO AVOID THIS HAZARD WILL RESULT IN DEATH OR SERIOUS INJURY!		

60023AD

Safety Precautions

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



WARNING

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

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



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



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



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



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



- **DO NOT** elevate the aerial platform if it is not on a firm, level surface.

- **DO NOT** drive elevated near depressions or holes of any type, loading docks, debris, drop-offs and surfaces that may affect the stability of the aerial platform.



- **DO NOT** elevate or drive elevated on a slope. Elevated driving must be done on a firm, level surface.



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



- **DO NOT** drive elevated on a soft or uneven surface.



- **DO NOT** ascend or descend a grade steeper than 45% (2WD & 4WD). Boom elevated driving must only be done on firm, level surfaces.



Safety Precautions (Continued)

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

- **DO NOT** operate an aerial platform that has ladders, scaffolding or other devices mounted on it to increase its size or work height. It is prohibited.



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



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



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



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



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



- **AVOID** crushing hazards. Be aware of crushing hazards when lifting or driving. Keep all body parts inside the aerial platform.



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



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

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

- **DO NOT** use boom to push, pull other objects or to lift the chassis.



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



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

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

- **DO NOT** use with improperly inflated/damaged tires or wheels.



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

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

Safety Precautions (Continued)

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

- **DO NOT** exceed the rated capacity of the aerial platform.



- **DO NOT** distribute load unevenly.



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



- **DO NOT** attempt to free a snagged platform with lower controls until personnel are removed from the platform.

- **DO NOT** position the aerial platform against another object to steady the platform.
- **DO NOT** place materials on the guardrails or materials that exceed the confines of the guardrails unless approved by Skyjack.

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



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



Safety Precautions

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

Fall Protection

All occupants of this aerial platform must wear personal fall protection equipment.

As per the ANSI A92.5-2006 standard, "Principal fall protection is provided by the guardrail system. The user shall direct and monitor the operator to ensure that all components of the guardrail system are in place. The user shall direct and monitor the occupants of the work platform to ensure that they wear a personal fall arrest system to protect against the potential effects of ejection or a fall restraint system to prevent a free fall."

Fall restraint and fall arrest systems are defined within the ANSI A92.5 Manual of Responsibilities shipped with this aerial platform.

Skyjack recommends the use of a fall restraint system to keep an occupant within the confines of the platform, and thus not expose the occupant to any fall hazard requiring a fall arrest.

CSA B354.4-02 requires the use of a fall arrest system, therefore Canadian users must use personal fall arrest protection as opposed to fall restraint.

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

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



WARNING

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

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

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



WARNING

An operator should not use any aerial platform that:

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

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

Jobsite Inspection

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

Maintenance and Inspection Schedule

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

Owner's Annual Inspection Record

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

Replacement Parts

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

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

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



WARNING

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

Maintenance and Service Safety Tips

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

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

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

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

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

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

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

Before attempting any repair work, turn Battery Disconnect Switch to "○" 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 performed under these circumstances.
4. Whenever the hydraulic system is drained, check the magnets in the hydraulic reservoir for metal particles. If metal particles are present, flush the entire system and add a new change of oil. The presence of metal particles also may indicate the possibility of imminent component failure. A very small amount of fine particles is normal.
5. All containers and funnels used in handling hydraulic oil must be absolutely clean. Use a funnel when necessary for filling the hydraulic oil reservoir, and fill the reservoir only through the filter opening. The use of cloth to strain the oil should be avoided to prevent lint from getting into the system.
6. When removing any hydraulic component, be sure to cap and tag all hydraulic lines involved. Also, plug the ports of the removed components.
7. All hydraulic components must be disassembled in spotlessly clean surroundings. During disassembly, pay particular attention to the identification of parts to assure proper reassembly. Clean all metal parts in a clean mineral oil solvent. Be sure to thoroughly clean all internal passages. After the parts have been dried thoroughly, lay them on a clean, lint-free surface for inspection.
8. Replace all O-rings and seals when overhauling any component. Lubricate all parts with clean hydraulic oil before reassembly. Use small amounts of petroleum jelly to hold O-rings in place during assembly.
9. Be sure to replace any lost hydraulic oil when completing the installation of the repaired component, and bleed any air from the system when required.
10. All hydraulic connections must be kept tight. A loose connection in a pressure line will permit the oil to leak out or air to be drawn into the system. Air in the system can cause damage to the components and noisy or erratic system operation.

Maintenance Hints

Three simple maintenance procedures have the greatest effect on the hydraulic system performance, efficiency and life. Yet, the very simplicity of them may be the reason they are so often overlooked. They are 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 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 “○” off position.
- Repair any damaged or malfunction components before operating aerial platform.
- Keep records on all inspections.

Maintenance Instructions

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

Inspection Schedule

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

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

Legend

P = Pass
F = Fail
R = Repaired

Table 1.1 Owner’s Annual Inspection Record

										
 Model Number: _____ Serial Number: _____										
*		20__	20__	20__	20__	20__	20__	20__	20__	20__
**										

1001AA

This decal is located on the control compartment cowling. It must be completed after an annual inspection has been completed. Do not use the aerial platform if an inspection has not been recorded in the last 6 months.

	Pictorial	Description
*		Inspection Date
**		Inspector Signature



Table 1.2 MAINTENANCE AND INSPECTION CHECKLIST

Serial Number: _____

Model: _____

Hourmeter Reading: _____

Date: _____

Time: _____

Name (Printed): _____

Signature: _____

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

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

P - PASS
F - FAIL
R - REPAIRED

INSPECTION FREQUENCY

- ☐ DAILY
☐ FREQUENTLY
☐ ANNUALLY
☐ BI-ANNUALLY

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

Schedule	P	F	R
Schedule Maintenance Inspections			
Labels	A		
Limit Switches	A, B		
Engine Compartment			
Main Power Disconnect Switch	A, B		
Battery	A, B		
Swing Drive Motor	A, B, C		
Turret Rotation Gear	A, B, C		
Rotary Manifold	A, B		
High Pressure Filter	A, B, C		
Hydraulic Pumps	A, B		
Muffler and Exhaust	A, B		
Engine Pivot Tray	A, B		
Engine Oil Level	A, B		
Engine Air Filter	A, B, C		
Engine Fuel Leaks	A, B, C		
Engine Fuel Filter	A, B, C		
Control Compartment			
Base Control Console	A, B		
Hydraulic Tank	A, B		
Hydraulic Oil	A, B, D		
Hydraulic In-Tank Filter	A, B, C		
Brake and Main Manifolds	A, B, C		
Emergency Power Unit	A, B		
Fuel Tank	A, B, C		
Fuel Leaks	A, B		
Base			
Turret Transportation Lock	A, B		
Drive Axle	A, B, C		
Oscillating Axle Assembly	A, B, C		
Steer Cylinder Assembly	A, B		
Tie Rod	A, B		
Wheel/Tire Assembly	A, B, C		
Manuals	A, B		
Platform Assembly	A, B		
Platform Control Console	A, B		

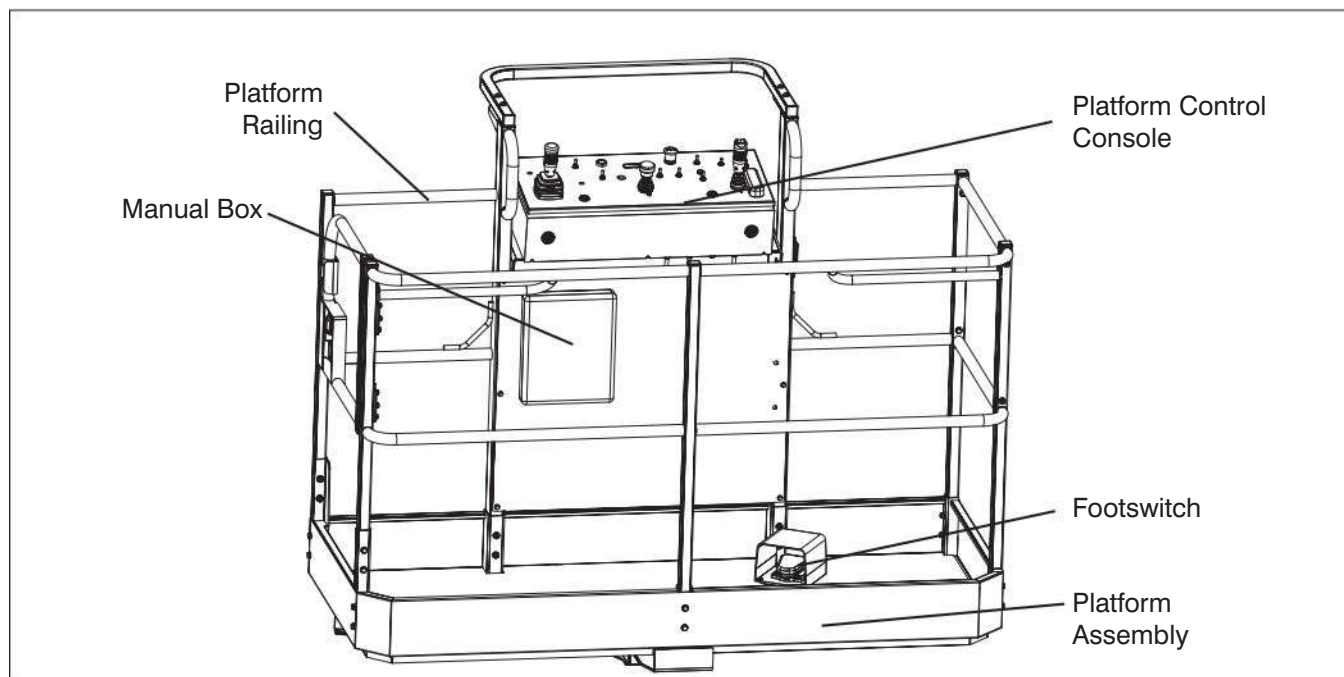
Schedule	P	F	R
Rotary Actuator	A, B, C		
Load Cell - CE	A, B		
Jib (If Equipped)	A, B		
Boom	A, B, C		
Cylinder	A, B, C		
Wear Pads	A, B, C		
Hoses	A, B, C		
Power Track	A, B, C		
Function Tests			
Test Main Power Disconnect Switch	A, B		
Test Charge Indicator - CE	A, B		
Base Control Console			
Test Base Emergency Stop Light	A, B		
Test Emergency Stop	A, B		
Test Function Enable Switch & All Boom Functions	A, B		
Test Platform Self-leveling	A, B		
Test Emergency Power	A, B		
Test Base/Off/Platform Switch	A, B		
Platform Control Console			
Test Platform Emergency Stop Light	A, B		
Test Platform Emergency Stop	A, B		
Test Footswitch	A, B		
Test Engine Enable Switch	A, B		
Test Steering	A, B		
Test Driving Function	A, B		
Test Driving Speed	A, B		
Test Tilt Sensor	A, B		
Test Load Sensing System - CE	A, B		
Test Emergency Power	A, B		
Test Horn	A, B		
Test Brakes	A, B		
Test Manual Platform Leveling	A, B		
Test Differential Lock Switch	A, B		
Test Oscillating Axles	A, B		

125AC

A - Perform Visual and Daily Maintenance Inspections & Functions Test. Refer to [Section 2.3](#) and [Section 2.4](#) of the Operating Manual.B - Perform Scheduled Maintenance Inspection every three months or 150 hrs. Refer to [Section 1.0](#) of this manual.C - Perform Scheduled Maintenance Inspection every year. Refer to [Section 1.0](#) of this manual.D - Perform Scheduled Maintenance Inspection every 2 years. Refer to [Section 1.0](#) of this manual.

* Perform scheduled inspection every three months or 150 hours.

† - Refer to Skyjack's website @ www.skyjack.com for latest service bulletins prior to performing quarterly or yearly inspection.**Note:** Make a copy of this page or visit the Skyjack web site: www.skyjack.com for a printable copy.



1.1 Scheduled Maintenance Inspections

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



WARNING

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



WARNING

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

Electrical

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

Perform a visual inspection around the following areas:

- boom to platform cable harness
- engine compartment electrical panel
- engine wiring harness
- rotary manifold wiring

Hydraulic

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

Perform a visual inspection around the following areas:

- hydraulic tank filter, fittings, hoses, emergency power unit and turret/base surface
- engine compartment fittings, hoses, main pump, filter and turret/base surface
- all hydraulic cylinders
- all hydraulic manifolds
- the underside of the turret
- the underside of the base
- ground area under the aerial platform

1.1-1 Labels

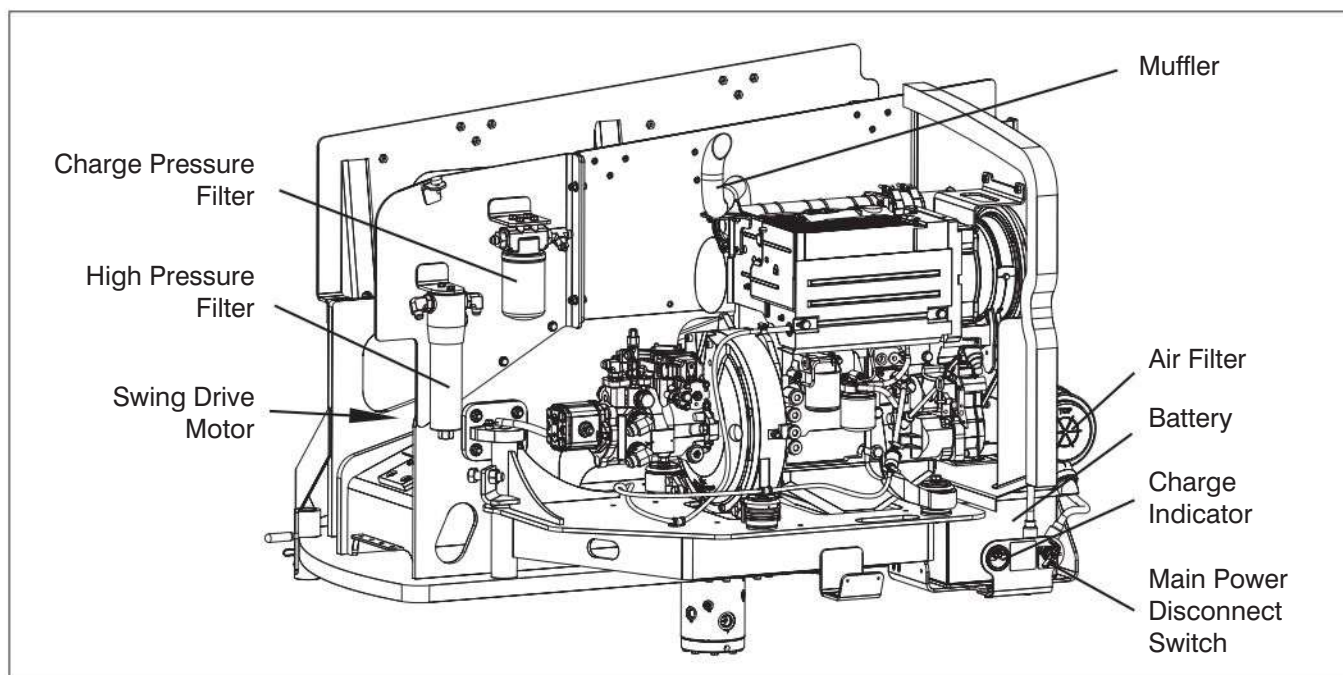
Refer to the labels section in the operating manual and ensure that all labels are in place and are legible.

1.1-2 Limit Switches

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

Visually inspect all limit switch located inside the turret and under the power track. Inspect for the following:

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



1.1-3 Engine Compartment

Ensure all compartment latches are secure and in proper working order.

- **Main Power Disconnect Switch**

- Turn main power disconnect switch to "O" off position.
- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure all cables are secure and switch is in proper working condition.

- **Batteries**

Proper battery condition is essential to good engine performance and operational safety. Improper fluid levels or damaged cables and connections can result in engine 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 cases for damage.
2. Clean battery terminals and cable ends thoroughly with a terminal cleaning tool or wire brush.
3. Ensure all battery connections are tight.
4. If applicable, check battery fluid level. If plates are not covered by at least 13 mm (1/2") of solution, add distilled or demineralized water.
5. Replace battery if damaged or incapable of holding a lasting charge.

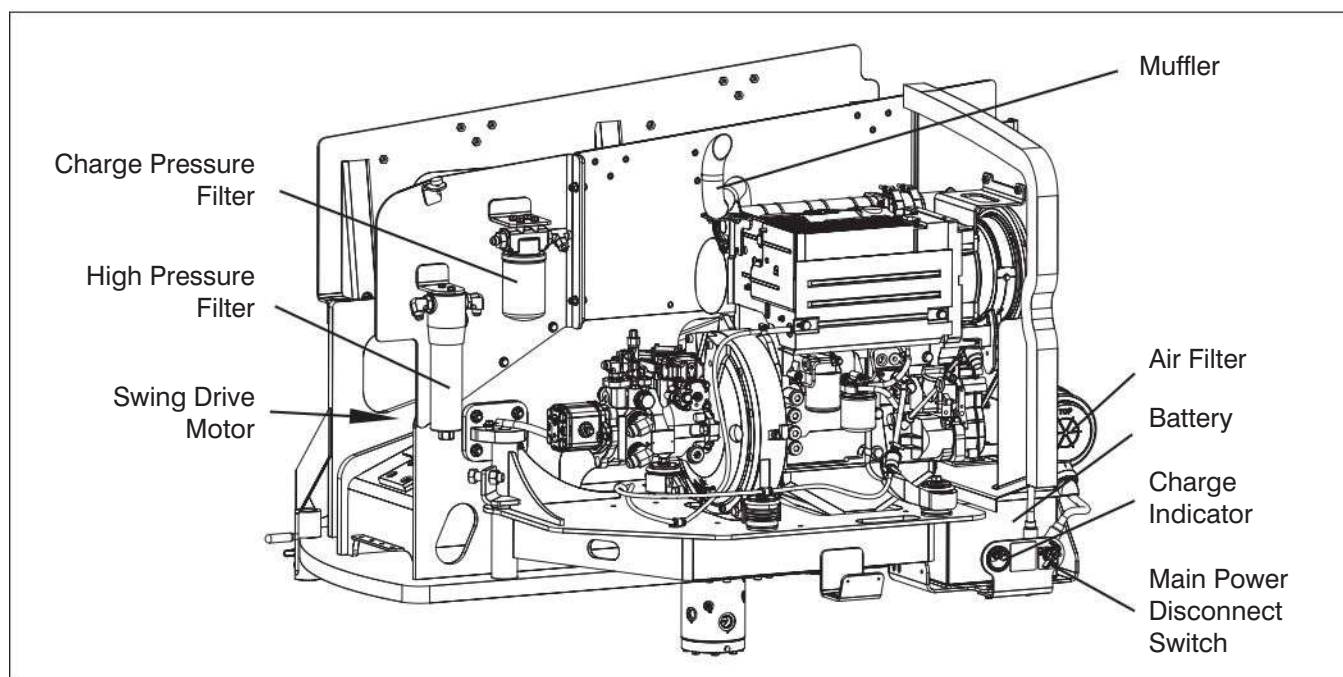


WARNING

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

- **Charge Indicator - CE**

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



- **Swing Drive Motor**

- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure all bolts are properly tightened.
- Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.

- **C - Annual Inspection**

- For berake/motor oil replacement procedure, refer to [Section 5](#).

- **Turret Rotation Gear**

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

- **C - Annual Inspection**

- For lubrication procedure, refer to [Section 5](#).

- **Rotary Manifold**

- Ensure all hoses are properly tightened and there is no evidence of hydraulic leakage.

- **High Pressure Filter**

- Ensure housing is secure and shows no visible damage or leakage.

- **C - Annual Inspection**

- For filter element replacement procedure, refer to [Section 5](#).

-

- **Hydraulic Pumps**

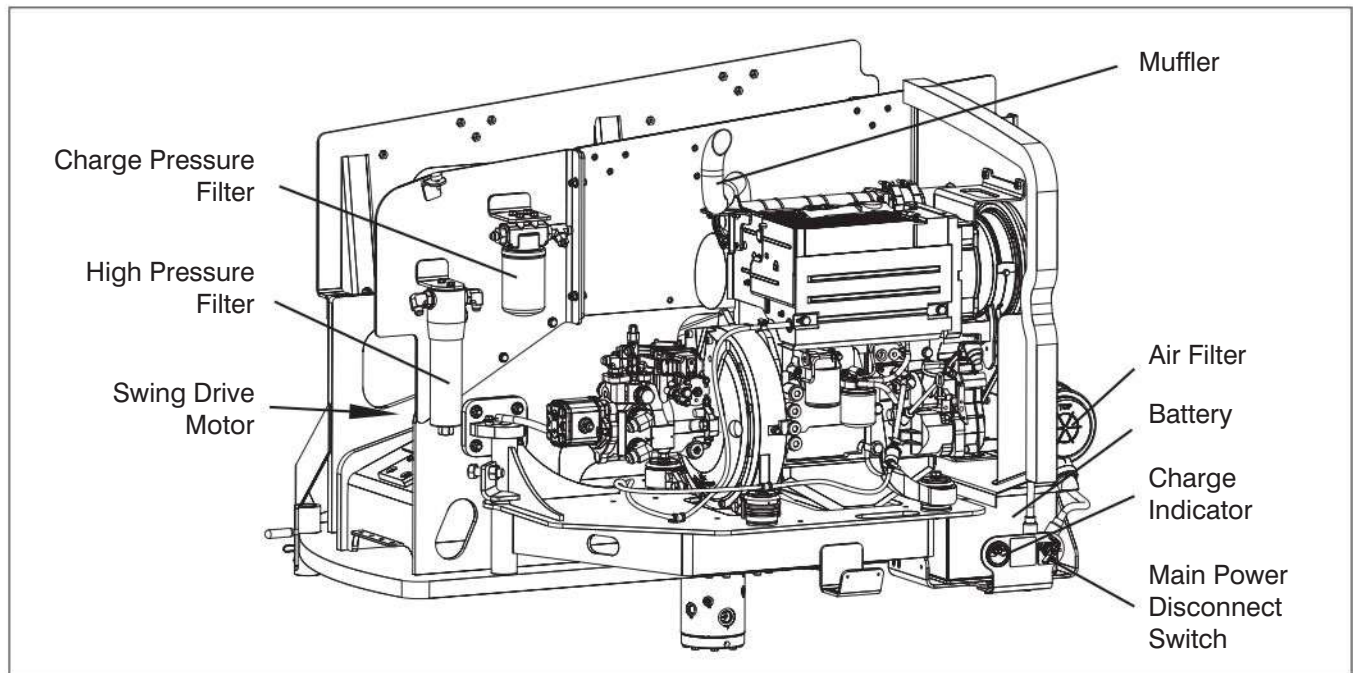
- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure all bolts are properly tightened.
- Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.

- **Muffler and Exhaust**

- Ensure muffler and exhaust system are properly secured, with no evidence of damage.

- **Engine Pivot Tray**

- Ensure there are no loose or missing parts and no visible damage to the engine pivot tray. Ensure that each tray-securing bolt is in place.



- **Engine Oil Level**

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

**WARNING**

Beware of hot engine components.

Check oil level on dipstick

- Oil level should be in the “safe” zone. Add oil as needed. Refer to [Section 2](#) for recommended oil type.

B - Frequent Inspection

- For recommend oil change, refer to engine manual

- **Engine Air Filter**

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

B - Frequent Inspection

- For engine air filter maintenance procedure, refer to engine manual.

C - Annual Inspection

- For engine air filter replacement procedure, refer to engine manual.

- **Engine Fuel Leaks**

- Ensure that there no fuel leaks.

**DANGER**

Engine fuels are combustible. Inspect the aerial platform in an open, well-ventilated area away from heaters, sparks and flames. Always have an approved fire extinguisher within easy reach.

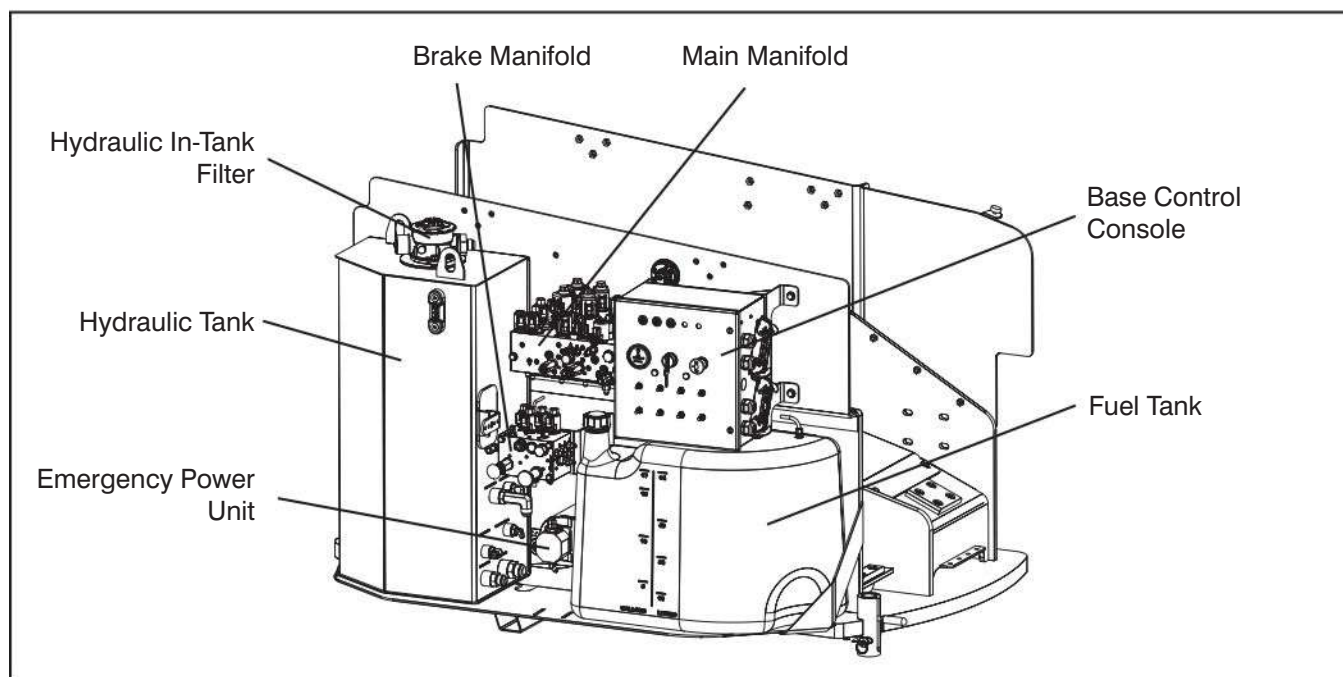
- Ensure fuel tank, shutoff valve, hoses and fittings show no visible damage and no evidence of fuel leakage.

- **Engine Fuel Filter**

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

C - Annual Inspection

- For engine fuel filter replacement procedure, refer to engine manual.



1.1-4 Control Compartment

- Ensure all compartment latches are secure and in proper working order.

- **Base Control Console**

- Ensure all switches are returned to their neutral positions.
- Ensure there are no loose or missing parts and there is no visible damage.

- **Hydraulic Tank**

- Ensure hydraulic filler cap is secure.
- Ensure tank shows no visible damage and no evidence of hydraulic leakage.

- **Hydraulic Oil**

- Be sure that the boom is in the stowed position, and then visually inspect the sight gauge located on the side of the hydraulic oil tank.
- The hydraulic oil level should be between the minimum and maximum marks on the sight glass. Add oil as needed. Refer to [Section 2](#) for recommended oil type.

D - Bi-Annual Inspection

- For hydraulic oil replacement procedure, refer to [Section 5](#).

- **Hydraulic In-Tank Filter**

C - Annual Inspection

- For hydraulic in-tank filter replacement procedure, refer to [Section 5](#).

- **Brake and Main Manifolds**

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

- **Emergency Power Unit**

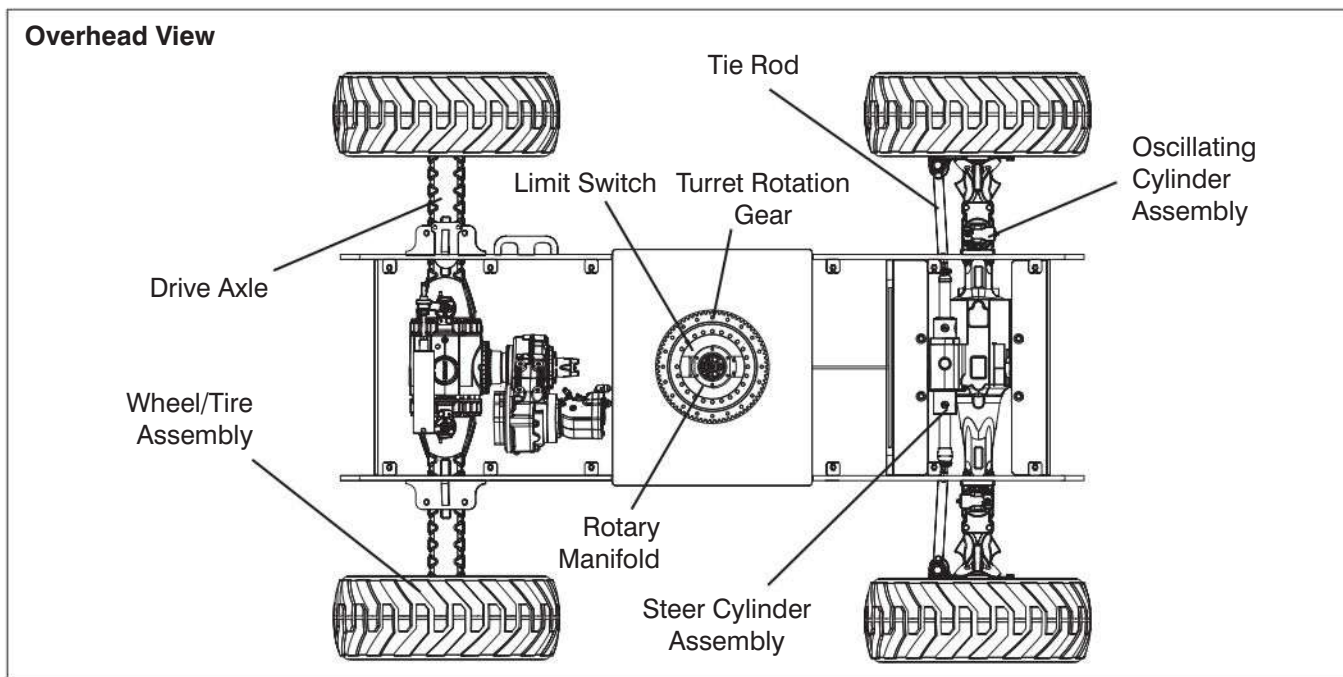
- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure there are no loose wires or missing fasteners.
- Ensure all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.

- **Fuel Tank**

IMPORTANT

Before using your aerial platform ensure there is enough fuel for expected use.

- Ensure fuel filler cap is secure.
- Ensure tank shows no visible damage and no evidence of fuel leakage.



- **Fuel Leaks**

- Ensure that there are no fuel leaks.

**DANGER**

Engine fuels are combustible. Inspect the aerial platform in an open, well-ventilated area away from heaters, sparks and flames. Always have an approved fire extinguisher within easy reach.

- Ensure fuel tank, shutoff valve, hoses and fittings show no visible damage and no evidence of fuel leakage.

1.1-5 Base

- **Turret Transportation Lock**

- Ensure turret transportation lock is unlocked, there are no loose or missing parts and there is no visible damage.

- **Drive Axle**

- Ensure drive axle is properly secured, there are no loose or missing parts, all fittings and hoses are properly tightened and there is no evidence of hydraulic leakage.
- Check the brakes annually. Refer to procedure [5.8-8 Brake Inspection](#).

- **Oscillating Cylinder Assembly**

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

NOTE

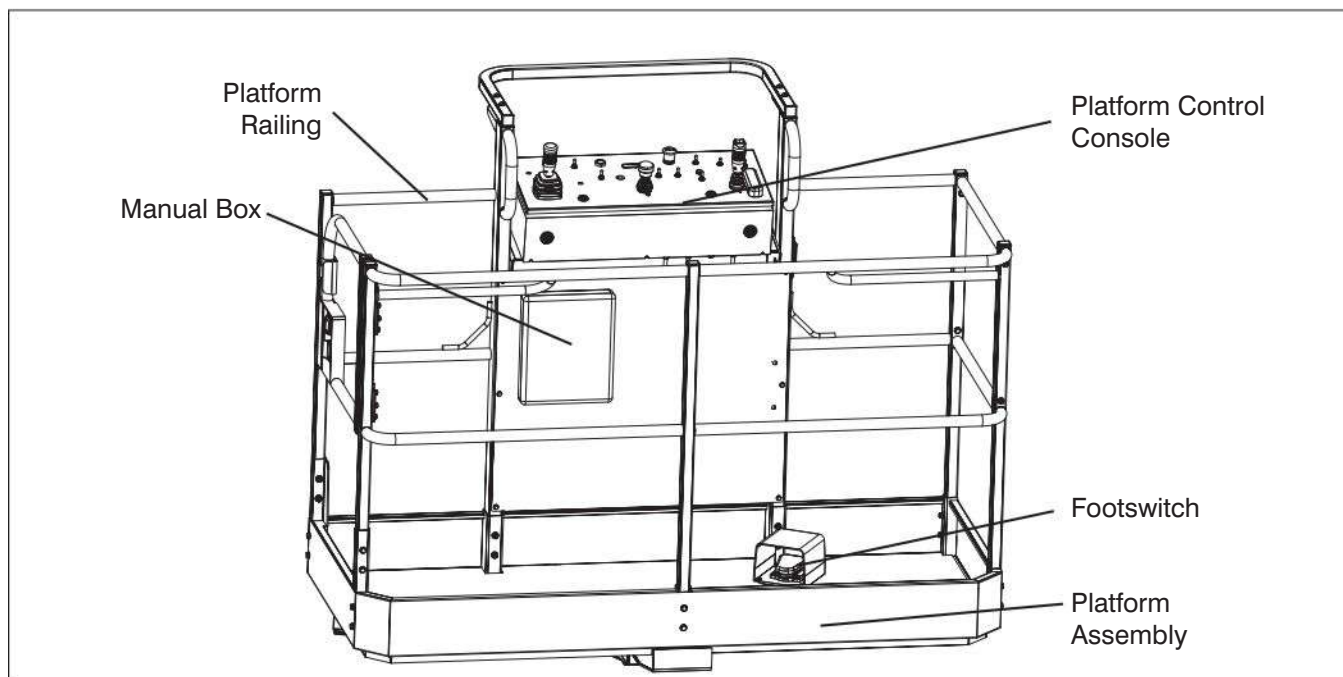
Oscillating axle is locked when aerial platform is in work mode. Refer to [Section 2](#). Axle Oscillation Diagram.

- **Steer Cylinder Assembly**

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

- **Tie Rod**

- Ensure there are no loose or missing parts, tie rod end studs are locked and there is no visible damage.



- **Wheel/Tire Assembly**

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

**WARNING**

An over-inflated tire can explode and may cause death or serious injury.

- Check all tire treads and sidewalls for cuts, cracks, punctures and unusual wear.
- Check each wheel for damage and cracked welds.
- Check each lug nut for proper torque to ensure none are loose.

To maximize stability, it is essential to maintain proper pressure in all air-filled tires.

- Check each tire with an air pressure gauge and add air as needed.

Refer to [Section 2](#) for wheel/tire specifications.

1.1-6 Manuals

Ensure a copy of operating manual, EC declaration (CE machines) and other important documents are enclosed in manual storage box.

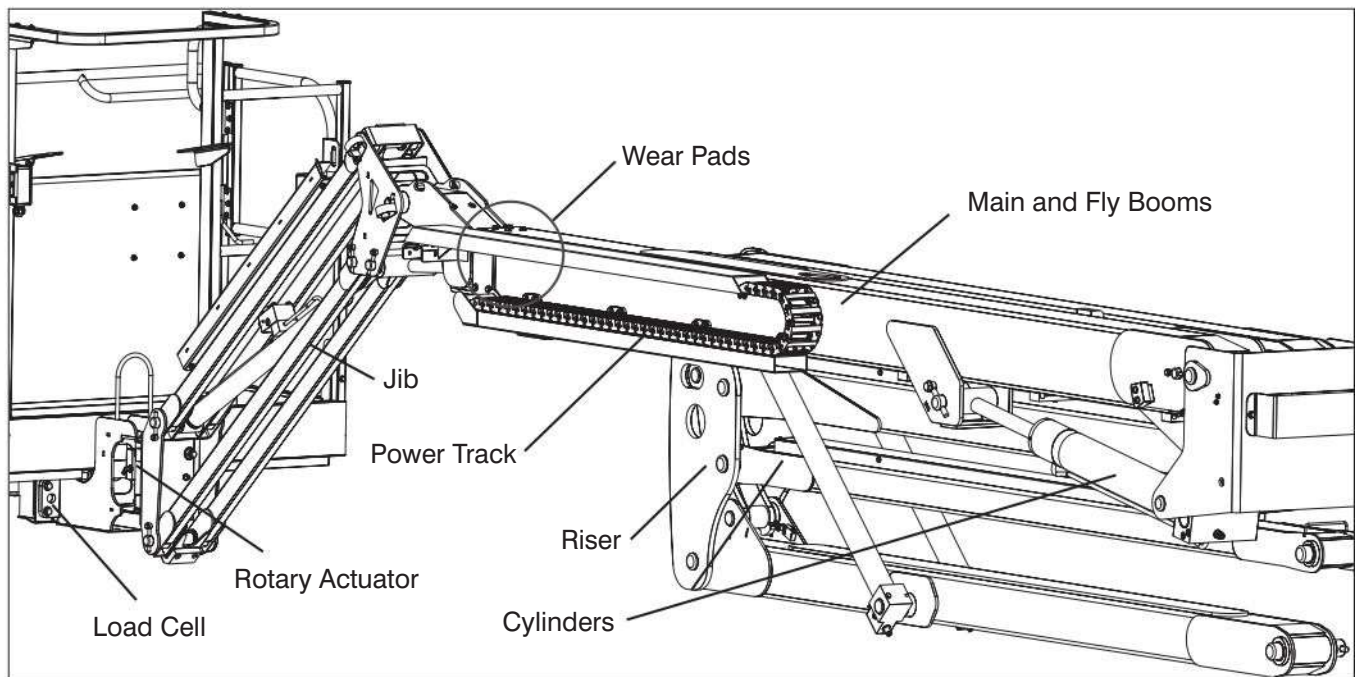
- Check to be sure manual storage box is present and in good condition.
- Ensure manuals are legible and in good condition.
- Always return manuals to the manual storage box after use.

1.1-7 Platform Assembly

- 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.
- Ensure footswitch is in good working order and has not been modified, disabled or blocked.

1.1-8 Platform Control Console

- Ensure all switches/controllers are returned to neutral and are properly secured.
- Ensure there are no loose or missing parts and there is no visible damage.

**1.1-9 Rotatory Actuator**

- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure all bolts and pins are properly tightened.
- Ensure all hoses are properly tightened and there is no evidence of hydraulic leakage.

1.1-10 Load Cell - CE

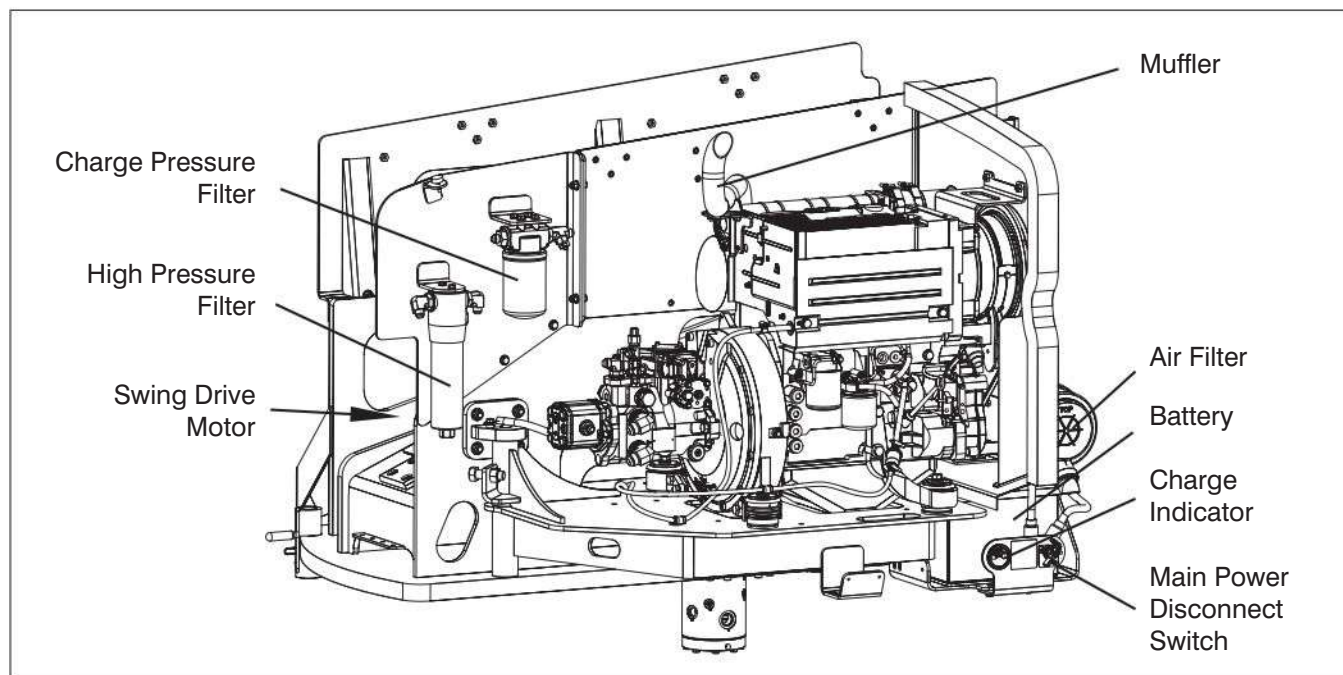
- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure all bolts are properly tightened.
- Ensure all cables are secure and are in proper working condition.
- Ensure debris is not lodged between the platform and boom adaptor.

1.1-11 Jib (If Equipped)

- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure all bolts and pins are properly tightened.
- Ensure all hoses are properly tightened and there is no evidence of hydraulic leakage.

1.1-12 Boom

- Ensure there are no loose or missing parts and there is no visible damage.
- Ensure all bolts and pins are properly tightened.
- Ensure there are no visible cracks in welds or structure and there are no signs of deformation.
- Ensure all hoses are properly tightened and there is no evidence of hydraulic leakage.
- **Cylinders**
 - Ensure all cylinders are properly secured and there is no evidence of leakage.
- **Wear Pads**
 - Ensure all bolts are tight, there is no visible damage to the wear pads and that no parts are missing.
- **Hoses**
 - Ensure all hoses are properly tightened and there is no evidence of hydraulic leakage.
- **Power Track**
 - Ensure there are no loose or missing parts and there is no visible damage.



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.

IMPORTANT

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

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

Prior to performing function tests, be sure to read and understand [Section 2.10](#) - Start Operation Start Operation of the operating manual.



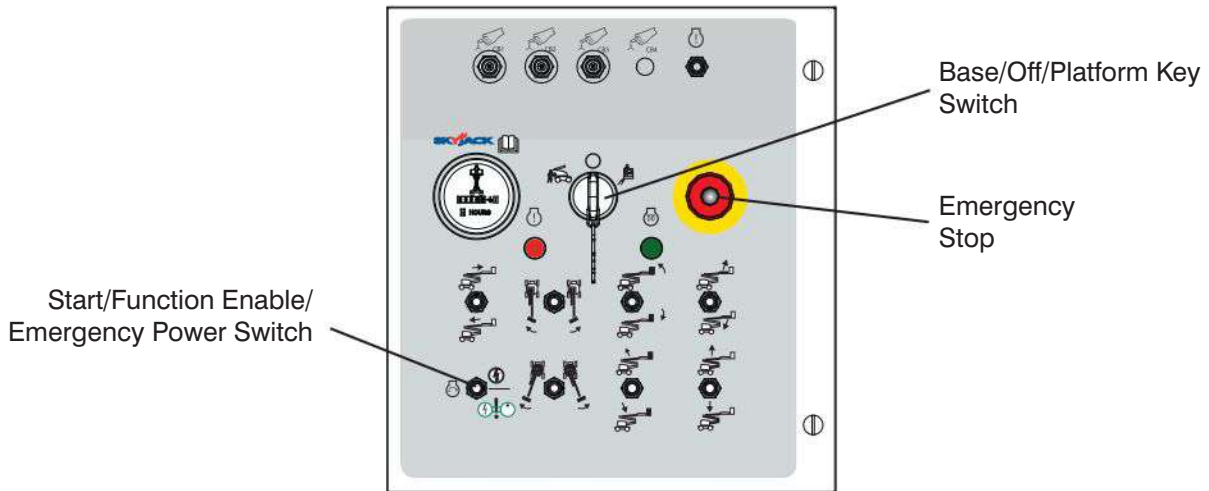
WARNING

Cold Weather - Caution must be exercised when operating aerial platform in cold temperature. Cold temperature can affect the performance of the aerial platform. Braking response and other functions may delay. Throughout the following procedures, test all functions several times until they are at acceptable operating performance.

NOTE

All-function motion alarm should sound while operating any boom and drive function.

Base Control Console



1.2-1 Test Main Power Disconnect Switch

1. In engine compartment, turn main power disconnect switch to “O” off position.
Result: Aerial platform functions should not operate.

1.2-2 Test Charge Indicator - CE

1. In engine compartment, turn main power disconnect switch to “I” on position.
Result: Charge indicator needle should move and stay within the green area.

Charge Indicator Levels

Green: This means that battery is adequately charged. No action required. This also indicates that charging system is working properly.

Yellow or Red: This indicates undercharge status. If charge indicator level is reasonably within yellow or red area, start engine and recharge battery before using any elevating function. After recharging battery for 15 - 30 minutes, turn engine off and ensure charge indicator needle is now in green area. If charge indicator needle is still within yellow or red area, inspect battery and charging system for fault, and do not elevate boom because emergency lowering system may not function properly.

NOTE

Close all cowlings before proceeding to next item.

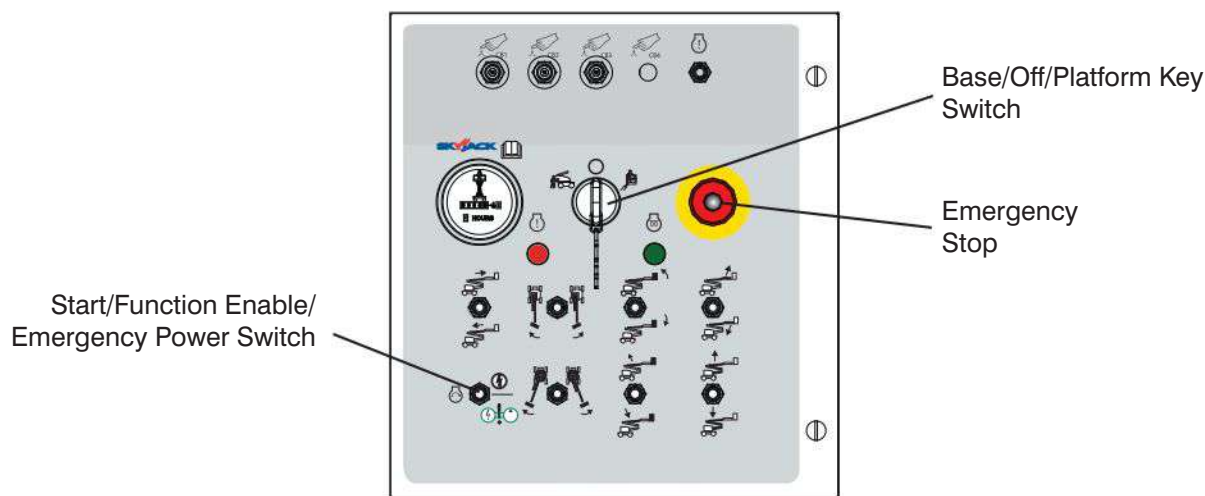
1.2-3 Base Control Console

**WARNING**

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

1. On platform control console, pull out “” emergency stop button.
2. **Dual fuel engine:** Select fuel supply by moving fuel switch to either “” gasoline or “” liquid propane gas position.

Base Control Console



- **Test Base Emergency Stop Light**

1. On base control console, pull out “” emergency stop button.

Result: Emergency stop light should continuously illuminate.

Diesel engine: Glow plug light should also turn on and turn off after a slight delay.

2. Turn base/off/platform key switch to “” base position.

3. Start engine by selecting “” start position from start/function enable/emergency power switch.

- **Test Emergency Stop**

1. Push in “” emergency stop button.
Result: Engine should shut down and aerial platform functions should not operate.

2. Pull out “” emergency stop button and restart engine.

- **Test Function Enable Switch and All Boom Functions**



Ensure that there are no personnel or obstructions in test area and there is sufficient room for boom to swing.

1. Do not hold “” function enable switch. Attempt to activate each boom and platform switch.

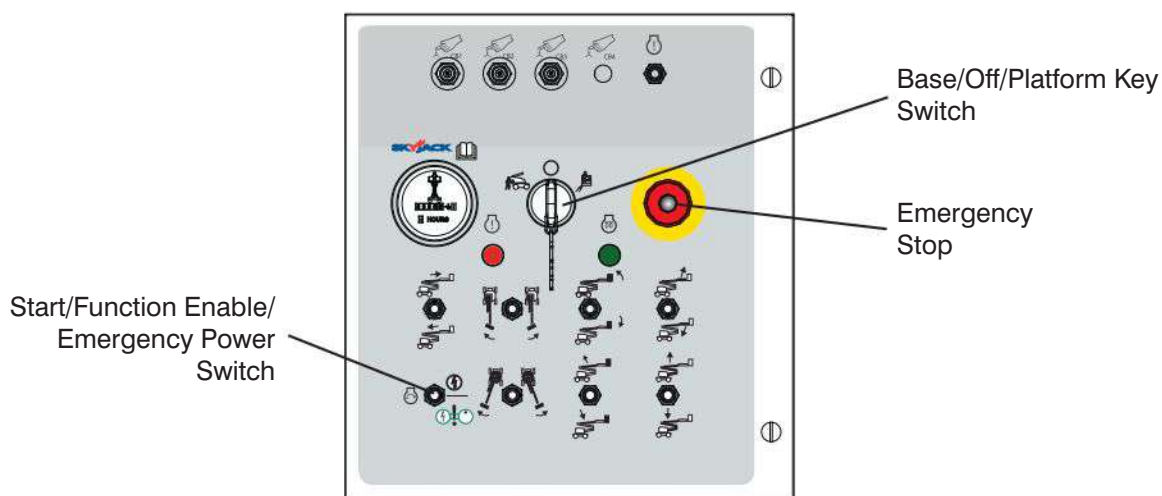
Result: All boom and platform functions should not operate.

2. Hold “” function enable switch and activate each boom and platform function.

Result: All boom and platform functions should operate as selected.

-

Base Control Console



- **Test Platform Self-leveling**

1. Lower boom to stowed position.
2. Adjust platform to a level position using platform leveling switch.
3. Raise “” and lower “” main boom through a full cycle.

Result: Platform should remain level at all time.

- **Test Emergency Power**

1. On base control console, push in “” emergency stop button to turn engine off.
2. On platform control console, push in “” emergency stop button.

**CAUTION**

When operating on auxiliary power, do not operate more than one function at a time to avoid overloading 12-Volt auxiliary pump motor. Do not use emergency power unit continuously for more than two minutes.

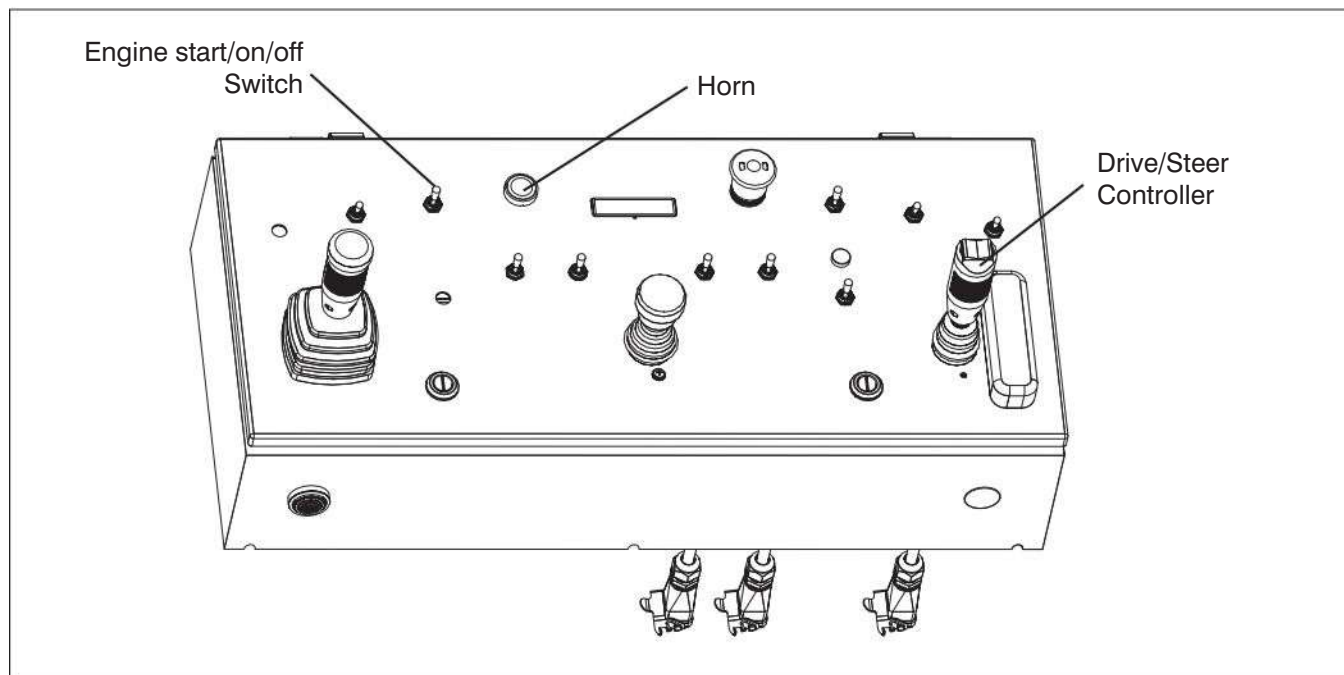
NOTE

To conserve battery power, test each function through a partial cycle.

3. On base control console, pull out “” emergency stop button.
4. On base control console, turn base/off/platform key switch to “” platform position.
5. Select “” emergency power position from start/emergency power switch and activate each boom function.
Result: All selected functions should operate.
6. Turn base/off/platform key switch to “” base position.
7. Select “” emergency power position from start/emergency power switch and activate each boom function.
Result: All selected functions should operate.

NOTE

The emergency power unit has two-minute duty cycle.



• **Test Base/Off/Platform Switch**

1. Ensure both “” emergency stop buttons are pulled out.

Diesel engine result: Glow plug light should turn on and turn off after a slight delay.

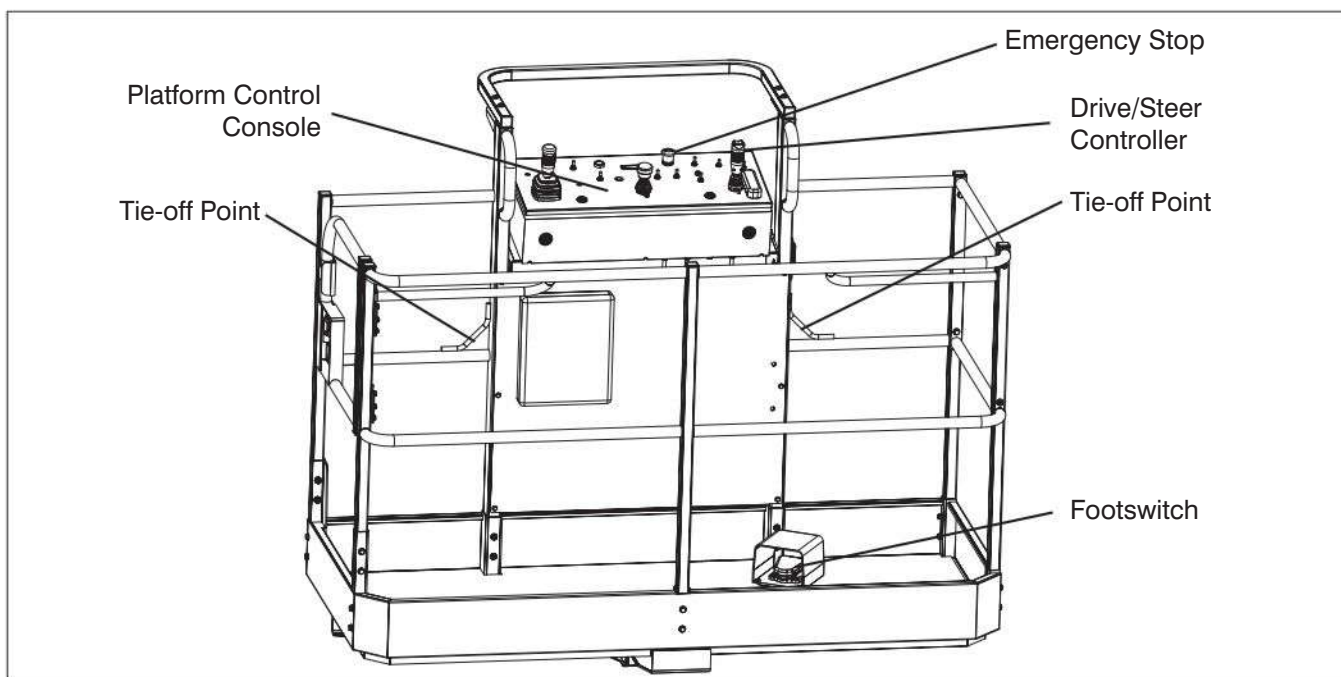
2. Start engine.
3. On base control console, turn base/off/platform key switch to “” off position.
Result: Engine should shut down and aerial platform functions should not operate.
4. On base control console, turn base/off/platform key switch to “” platform position.



WARNING

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

5. Enter platform and close gate.
6. On platform control console, select “” on position from engine enable switch.
7. Select “” start position from engine start/on/off switch to start engine.
8. Dismount from platform.
9. On base control console, attempt to activate each boom and platform switch while holding function enable switch.
Result: All boom and platform functions should not operate while holding function enable switch.
10. Push in “” emergency stop button to turn engine off.
11. Pull out “” emergency stop button.



1.2-4 Platform Control Console



WARNING

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

1. Enter platform and close gate.



WARNING

DO NOT operate any control on platform control console without proper fall protection secured to designated location in platform. Failure to avoid this hazard could result in death or serious injury!



WARNING

Ensure that there are no personnel or obstructions in test area and that there is sufficient room for boom to swing.

• Test Platform Emergency Stop Light

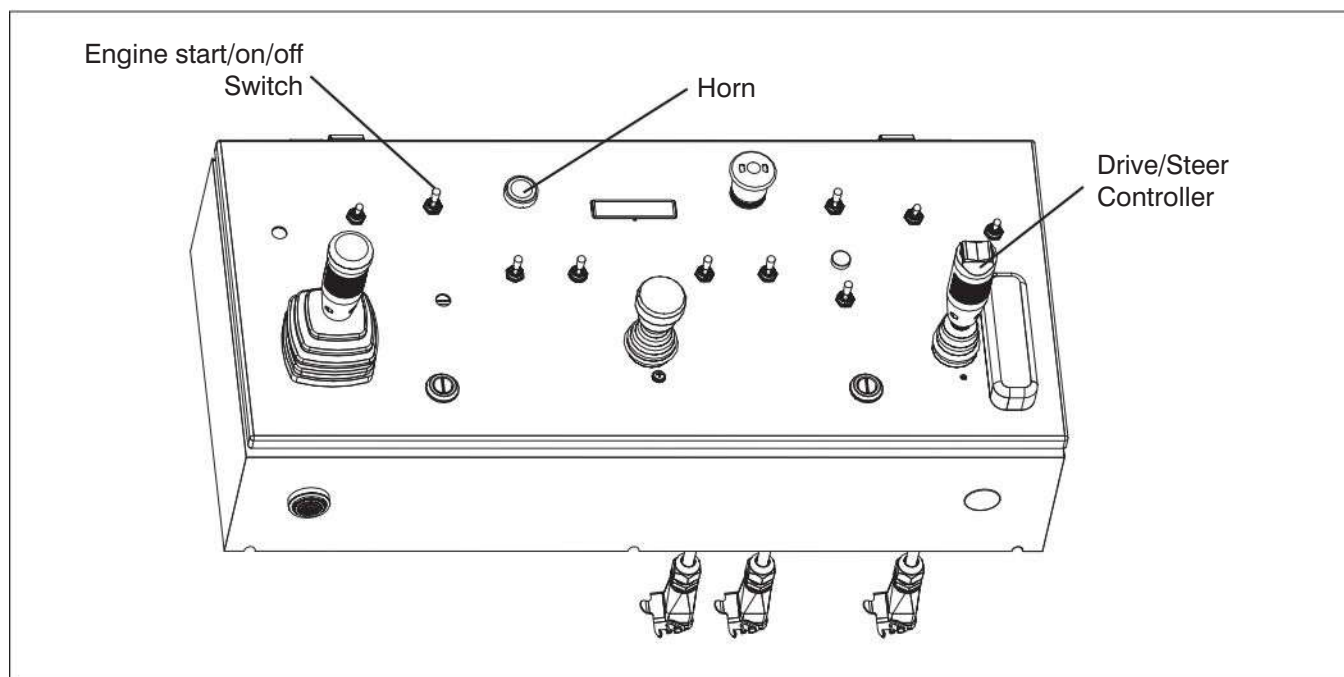
1. On platform control console, pull out "E" emergency stop button.
Result: Emergency stop light should continuously illuminate.

• Test Platform Emergency Stop

1. Start engine by selecting "I" start position from engine start/on/off switch.
Result: Engine should not start.
2. Push in "E" emergency stop button.
Result: Engine should shut down and aerial platform functions should not operate.

• Test Footswitch

1. Pull out "E" emergency stop button.
2. Ensure engine enable switch is in "I" on position.
3. Do not start engine.
4. Select generator on/off switch to off position (if equipped).
5. Depress and hold footswitch and attempt to start engine by selecting "I" start position from engine start/on/off switch.
Result: Engine should not start.



6. Without depressing footswitch, try to start engine.

Result: Engine should start.

7. With engine running and without depressing footswitch, test each boom and platform function.

Result: Aerial platform functions should not operate.

NOTE

A 15-second anti-tiedown feature deactivates footswitch when operator depresses it for 15 seconds without activating any function.

• Test Engine Enable Switch

1. Ensure engine is running.
2. Select “” off position from engine enable switch.
Result: Engine should shut down and platform control console is disabled.
3. Select “” on position from engine enable switch.
Result: Platform control console is enabled.
4. Start engine.

• Test Steering

1. Pull out “” emergency stop button.
2. Start engine by selecting “” start position from engine start/on/off switch.
3. Depress and hold footswitch.
4. Press rocker switch on top of drive/steer

controller to “” left and “” right.
Result: Steer wheels should turn left and right.

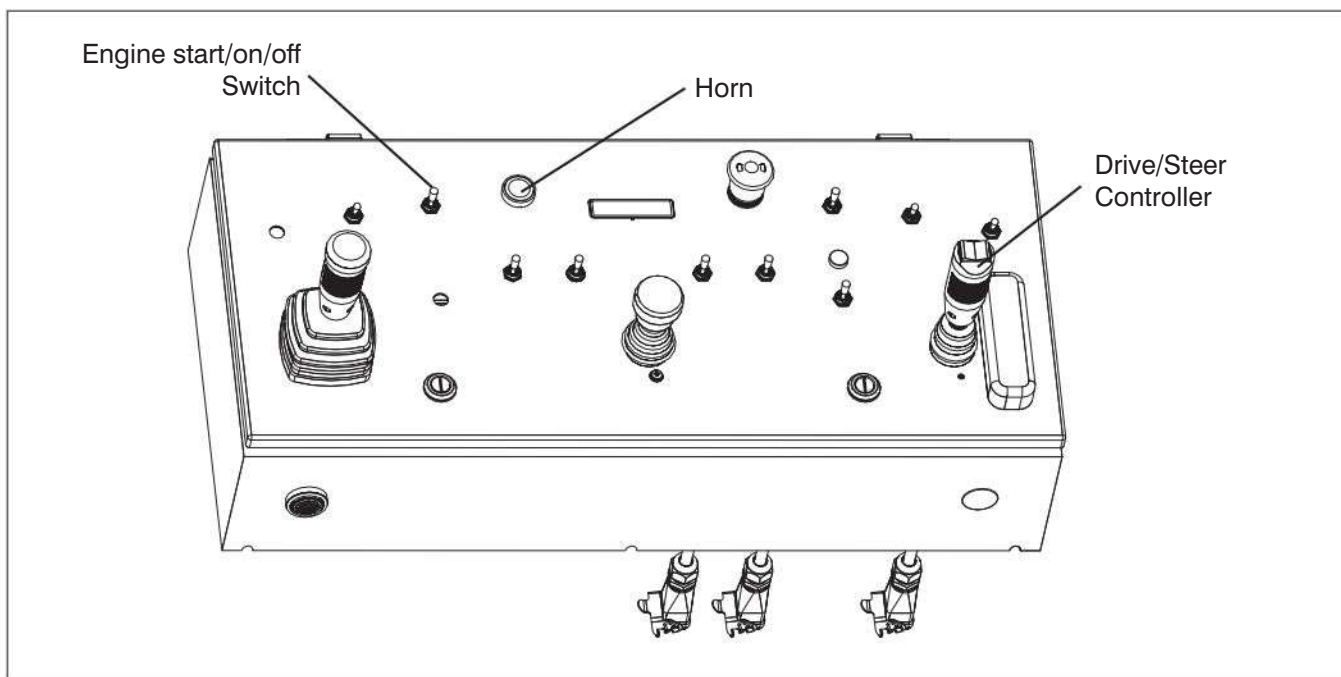
• Test Driving Function



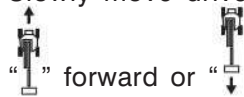
WARNING

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

1. Ensure path of intended motion is clear.
2. Ensure boom is in stowed position and fly boom fully retracted.
3. Depress and hold footswitch.



4. Slowly move drive/steer controller in



“ ” forward or “ ” reverse direction until aerial platform begins to move, and then return handle to center position.

Result: Aerial platform should move in forward or reverse direction, and then come to a stop.



WARNING

DRIVING ON A SLOPE

- When driving on a slope greater than 30%, the platform capacity is limited to 300 lbs.
- The platform must be between the non-steer wheels and must be on the downside of the hill.
- When slope increases to 45%, the forward drive is disabled but reverse drive remains active.



Test Driving Speed

1. Depress and hold footswitch.

2. Raise “ ” main boom 1.2 m (4 ft.) above ground and then slowly move drive/steer controller to full drive position.

Result: The maximum achievable drive speed should be significantly less than stowed drive speed.

3. Lower boom to stowed position.

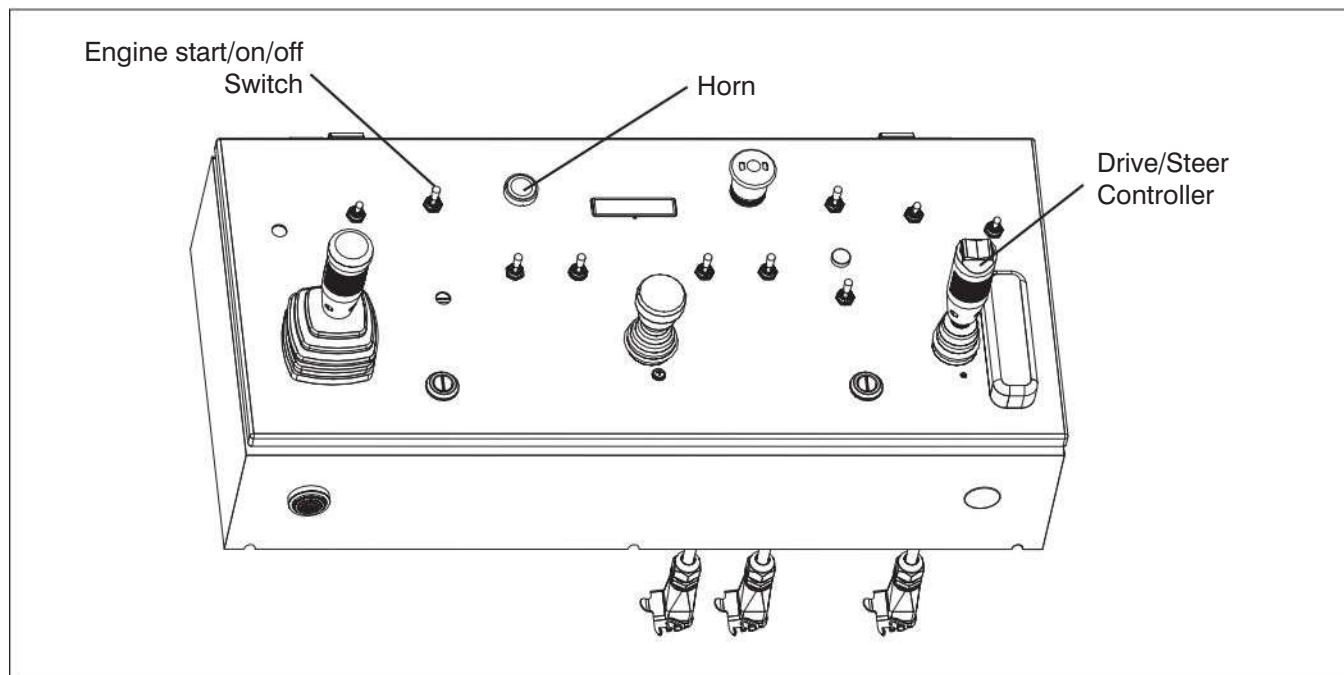
4. Extend “ ” fly boom approximately 30 cm (12 inch.) and then slowly move drive/steer controller to full drive position.

Result: The maximum achievable drive speed should be significantly less than stowed drive speed.

5. Retract fly boom.

6. Raise riser approximately 1.2 m (4 ft.) above ground.

Result: The maximum achievable drive speed should be significantly less than stowed drive speed.



- **Test Tilt Sensor**

**WARNING**

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

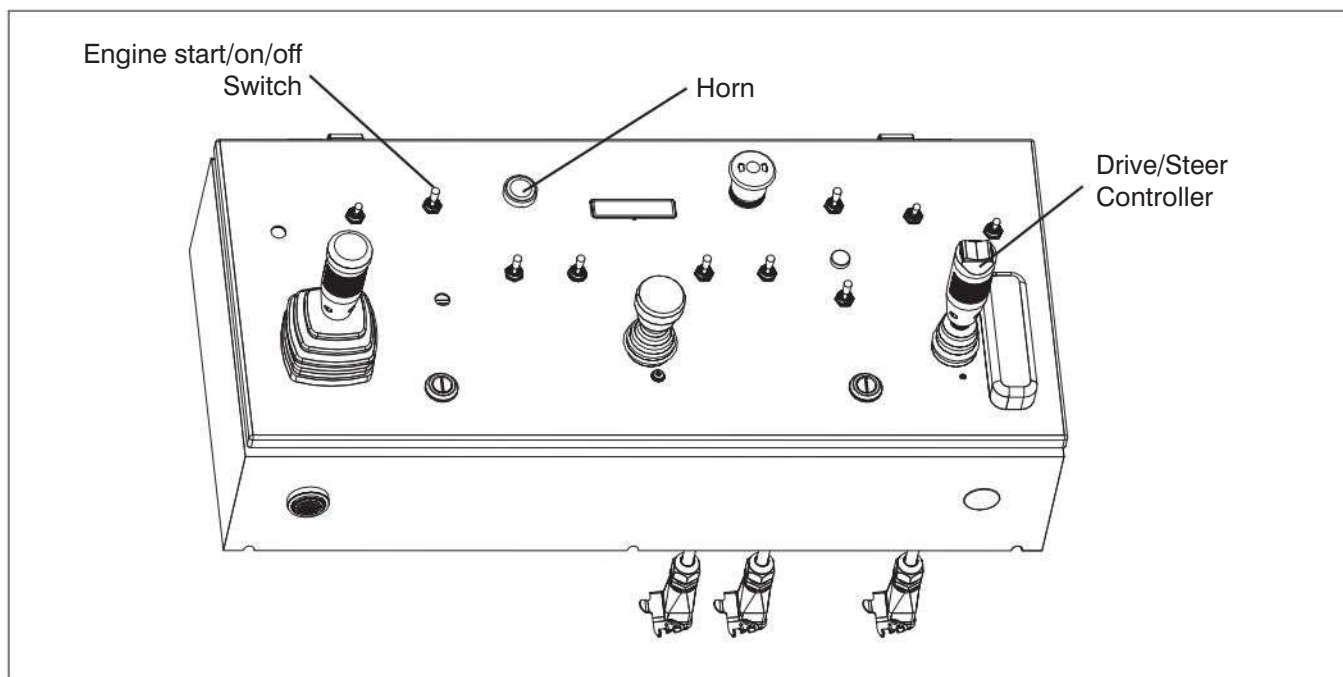
**WARNING**

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

1. Move the aerial platform on to a slope between 5° to 10°.
2. Dismount from platform.
3. On base control console, extend “” fly boom approximately 12 in. (30 cm).
Result: Platform alarm should sound, tilt warning light should come on and all drive functions should not operate.

- **Test Load Sensing System - CE**

1. Push in “” emergency stop button.
2. Pull out “” emergency stop button.
Result: After four seconds of time elapses, the red light and audible alarm pulse two times. This indicates the system is active and there are no faults.



- **Test Emergency Power**

**CAUTION**

When operating on auxiliary power, do not operate more than one function at a time to avoid overloading 12-Volt auxiliary pump motor. Do not use emergency power unit continuously for more than two minutes.

NOTE

To conserve battery power, test each function through a partial cycle.

1. On platform control console, push in “” emergency stop button to turn engine off.
2. Pull out “” emergency stop button.
3. Select “” on position from engine enable switch.
4. Depress and hold footswitch.

5. Push and hold “” emergency power switch and activate each function control handle or switch.

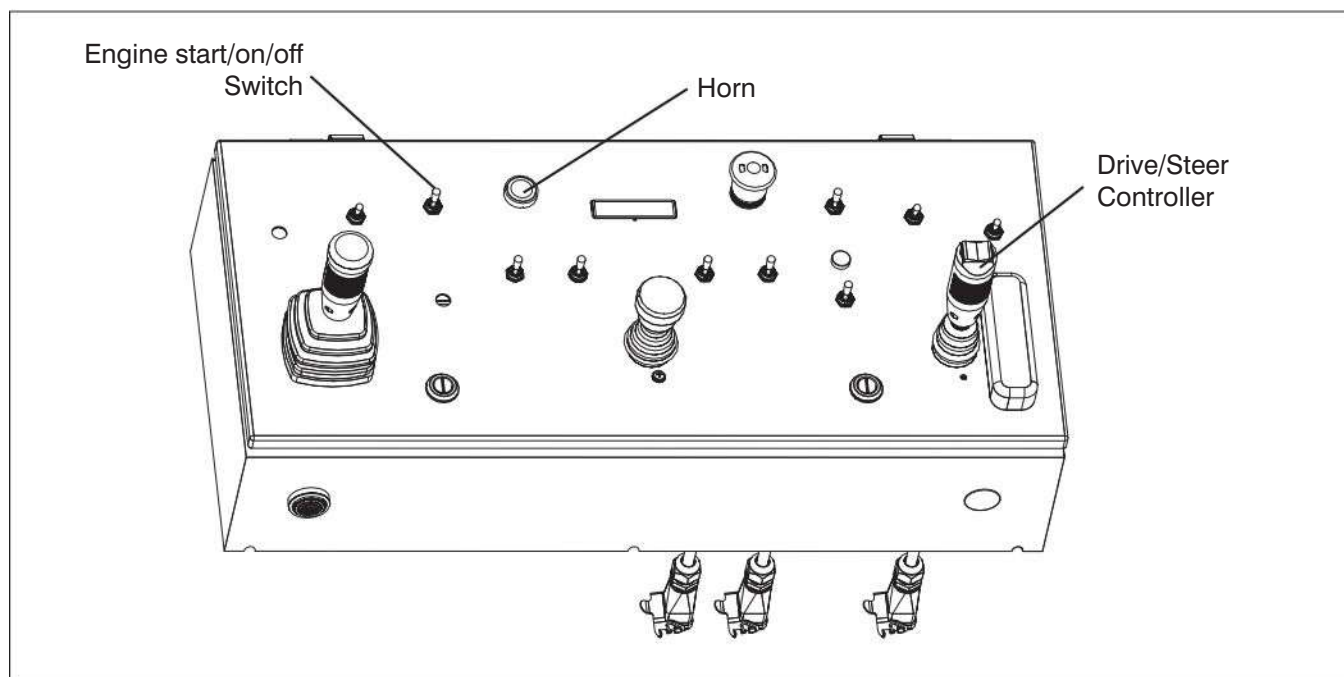
Result: All boom and steer functions should operate. Drive functions should not operate.

NOTE

The emergency power unit has two-minute duty cycle.

- **Test Horn**

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



- **Test Brakes**

**WARNING**

Brakes will engage instantly when you release footswitch, causing aerial platform to stop immediately.

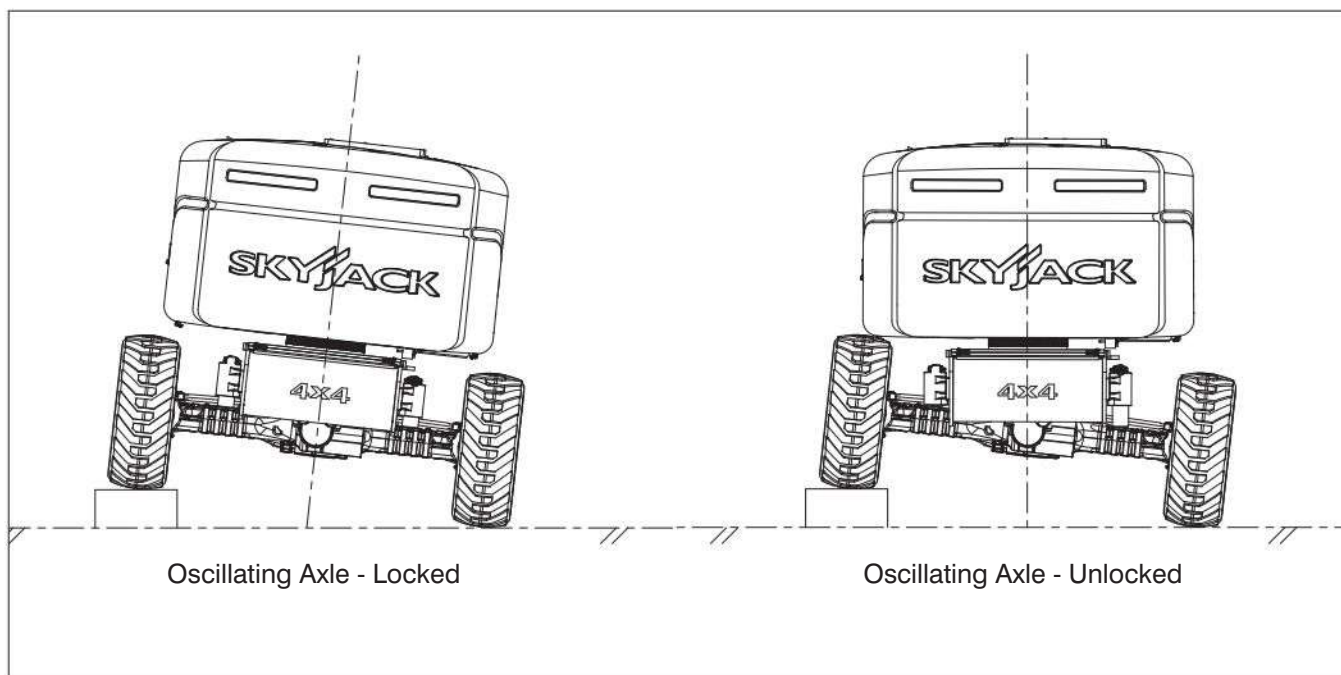
1. Restart engine.
2. Move aerial platform to a firm level surface to ensure similar traction on left and right.
3. Ensure boom is in stowed position.
4. Depress and hold footswitch and drive aerial platform first “” forward then “” reverse.

5. Remove your foot from footswitch.
Result: Aerial platform should come to an abrupt stop. If aerial platform does not stop immediately, or if aerial platform pulls to one side while stopping, do not operate aerial platform until brake adjustments have been checked.

- **Test Manual Platform Leveling**

1. Depress and hold footswitch.
2. On platform leveling override switch, pull and select “” up position to tilt platform up or “” down position to tilt platform down.

Result: Platform should tilt up or down.



- **Test Differential Lock Switch**



WARNING
Before engaging differential lock, ensure drive/steer controller is in neutral position.

1. On platform control console, push differential lock switch forward  to the locked position and then release.

Result: Differential lock is engaged and differential light should turn on.

2. Pull differential lock switch backward  to the unlocked position and then release.

Result: Differential lock is disengaged and differential light should turn off.

- **Test Oscillating Axles**



DO NOT operate any control on platform control console without proper fall protection secured to designated location in platform. Failure to avoid this hazard could result in death or serious injury!

1. Extend fly boom 12 in. (30 cm) while on a firm level ground.
Result: The steer axles should be locked.

2. Drive one of the steer tires up onto a 6 in. (15 cm) block or curb.
Result: An appropriate tilt of the aerial platform chassis should occur.

3. Retract fly boom while in tilt position.
Result: The steer axles should unlock and the aerial platform chassis should level itself to ground.

Section 2

MAINTENANCE TABLES AND DIAGRAMS

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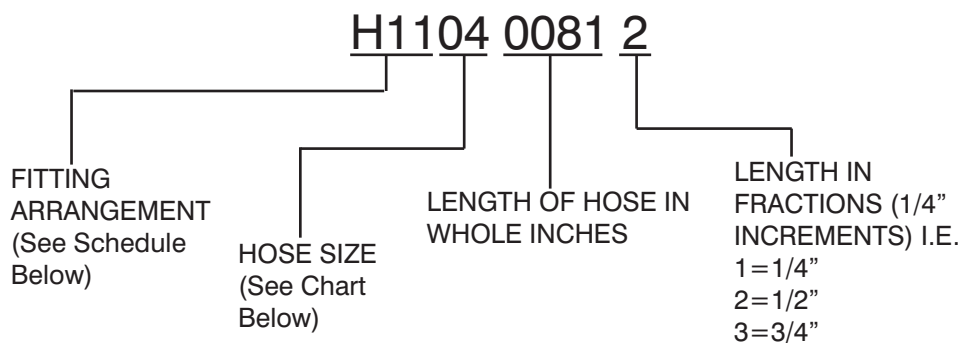
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2

Table 2.1 Standard Hose Numbering System



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

Hose Size Chart

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

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

Fitting Arrangement Schedule (Continued on the following page)

Table 2.1 Standard Hose Numbering System (Continued)

Fitting Arrangement Schedule (Continued from the previous page)

HOSE PREFIX	HOSE END FITTING	HOSE END FITTING	S.A.E. HOSE SPECIFICATION
H16	NO FITTING	NO FITTING	100R4
H17	NO FITTING	NO FITTING	300 PSI
H18	REUSABLE, FEMALE, 37° JIC, SWIVEL	NO FITTING	300 PSI
H19	LONG 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R13
H20	FEMALE, SHORT 37° JIC, SWIVEL	SHORT 90°, FEMALE, 37° JIC, SWIVEL	100R4
H21	FEMALE, SHORT 37° JIC, SWIVEL	SHORT 90°, FEMALE, 37° JIC, SWIVEL	100R2AT
H22	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R2AT
H23	FEMALE, LONG 37° JIC, SWIVEL	LONG 90°, FEMALE, 37° JIC, SWIVEL	100R2AT
H24	FEMALE, SHORT 37° JIC, SWIVEL	SHORT 90°, FEMALE, 37° JIC, SWIVEL	100R13
H25	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R4
H26	SHORT 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H27	LONG 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H28	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H29	SHORT 45°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H30	MEDIUM 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H31	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H32	SHORT 45°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H33	MEDIUM 45°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H34	SHORT 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H35	MEDIUM 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H36	LONG 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H37	SHORT 45°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R4
H38	SHORT 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R4
H39	LONG 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R4
H40	SHORT 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R16
H43	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R16
H51	FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H52	SHORT 45°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H53	MEDIUM 45°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H54	SHORT 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H55	MEDIUM 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17
H56	LONG 90°, FEMALE, 37° JIC, SWIVEL	FEMALE, 37° JIC, SWIVEL	100R17

Table 2.2 Aerial Platform Torque Specifications

Location	Description	Torque (ft-lb)	Torque (Nm)
Base			
Trunnion Mount	BOLT, Hex head (3/4"-10 x 5", Grade 8)	210	285
Rear Axle Mount	NUT, Torque lock (3/4"-10, Grade C)	210	285
Axle Lock	BOLT, Hex head (1/2"-13 x 2.25", Grade 8)	80	108
Swing Drive Motor	SCREW, Socket head cap (3/4"-10 x 2.25")	280	380
Rotation Gear	BOLT, Hex head (5/8"-11 x 4.5", Grade 8)	170	230
Hydraulic Drive Motor	BOLT, Hex head (M14 x 2 x 30mm, ZP, Grade 8.8)	80	108
Wheel Nut	NUT, Wheel	247-302	335-410
Turret			
Rotation Gear	BOLT, Hex head (5/8"-11 x 2.75", Grade 8)	170	230
	BOLT, Hex head (5/8"-11 x 3", Grade 8)		
Engine			
Deutz Engine Mount	BOLT, Hex head (1/2"-13 x 3.75", Grade 5)	55	75
Coupling Assembly (Deutz)	BOLT (M10)	40	55
	COUPLING CLAMP BOLT	45	61
GM Engine Mount	NUT, Hex head (1/2"-13, Grade 5)	50	68
Drive Pump	BOLT, Hex head (1/2"-13 x 1.5", Grade 5)	55	75
System Pump	BOLT, Socket (3/8"-16 x 1, Grade 5)	23	31
Cylinders			
Lift	ROD NUT	425	576
	GLAND	400	542
Extension	ROD NUT (46A / 51AJ)	300	407
	ROD NUT (46AJ)	150	203
	GLAND	450-500	610-678
Master	ROD NUT	350	475
	GLAND	350	475
Slave	ROD NUT	350	475
	GLAND	350	475
Axle Lock	BOLT, Hex head (1/2"-13 x 2.25", Grade 8)	80	108
Jib	BOLT, Hex head (0.312-18 x 2.75", Grade 5 \ ZP)	15	20
Riser	ROD NUT	350	475
	GLAND	350	475
Platform			
Rotary Mount	BOLT, Hex head, patch (3/8"-16 x 7/8", Grade 8 \ ZP)	35	48
	BOLT, Hex head (1"-8 x 10.5", zinc, Grade 8)	480	569
Rotary Actuator	BOLT, Hex head (3/4"-10 x 3", Grade 8)	210	285
Load Cell Mounting (CE)	BOLT, Hex head patch (M16 x 1.5 x 4.5, Grade 8.8 \ ZP)	130	177
	BOLT, Hex head (1/2"-13 x 2.5", Grade 8)	80	108

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Table 2.3 Axles Torque Specifications

Size of Bolt		Type of Bolt					
		8.8		10.9		12.9	
		Normali Loctite 242 (Nm)	Loctite 270 (Nm)	Normali Loctite 242 (Nm)	Loctite 270 (Nm)	Normali Loctite 242 (Nm)	Loctite 270 (Nm)
Course Pitch	M6 x 1	9.5-10.5	10.5-11.5	14.3-15.7	15.2-16.8	16.2-17.8	18.1-20.0
	M8 x 1.25	23.8-26.2	25.6-28.4	34.2-37.8	36.7-40.5	39.0-43.0	43.7-48.3
	M10 x 1.5	48-53	52-58	68-75	73-81	80-88	88-97
	M12 x 1.75	82-91	90-100	116-128	126-139	139-153	152-168
	M14 x 2	129-143	143-158	182-202	200-221	221-244	238-263
	M16 x 2	200-221	219-242	283-312	309-341	337-373	371-410
	M18 x 2.5	276-305	299-331	390-431	428-473	466-515	509-562
	M20 x 2.5	390-431	428-473	553-611	603-667	660-730	722-798
	M22 x 2.5	523-578	575-635	746-824	817-903	893-987	974-1076
	M24 x 3	675-746	732-809	950-1050	1040-1150	1140-1260	1240-1370
	M27 x 3	998-1103	1088-1202	1411-1559	1539-1701	1710-1890	1838-2032
	M30 x 3.5	1378-1523	1473-1628	1914-2115	2085-2305	2280-2520	2494-2757
Fine Pitch	M8 x 1	25.7-28.3	27.5-30.5	36.2-39.8	40.0-44.0	42.8-47.2	47.5-52.5
	M10 x 1.25	49.4-54.6	55.2-61.0	71.5-78.5	78.0-86.0	86.0-94.0	93.0-103.0
	M12 x 1.25	90-100	98-109	128-142	139-154	152-168	166-184
	M12 x 1.5	86-95	94-104	120-132	133-147	143-158	159-175
	M14 x 1.5	143-158	157-173	200-222	219-242	238-263	261-289
	M16 x 1.5	214-236	233-257	302-334	333-368	361-399	394-436
	M18 x 1.5	312-345	342-378	442-489	485-536	527-583	580-641
	M20 x 1.5	437-483	475-525	613-677	674-745	736-814	808-893
	M22 x 1.5	581-642	637-704	822-908	903-998	998-1103	1078-1191
	M24 x 2	741-819	808-893	1045-1155	1140-1260	1235-1365	1363-1507
	M27 x 2	1083-1197	1178-1302	1520-1680	1672-1848	1834-2027	2000-2210
	M30 x 2	1511-1670	1648-1822	2138-2363	2332-2577	2565-2835	2788-3082

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Note: 1 Nm = 0.7376 ft-lb

Screw-locking, Sealing and Lubricating Materials

Loctite 242

- Anaerobic product apt to prevent the loosening of screws, nuts and plugs. Used for medium-strength locking. Before using it, completely remove any lubricant by using the specific activator.

Loctite 270

- Anaerobic product apt to prevent the loosening of screws, nuts and plugs. Used for medium-strength locking. Before using it, completely remove any lubricant by using the specific activator. To remove parts, it may be necessary to heat them at 80°C approx.

Table 2.4 Axles Maintenance Intervals

Operation		Frequency	Lubricants
Check Levels	Differential	monthly	SAE85W90 (API GL4 - MIL L-2105) With additives for oil-bath brakes
	Planetary reduction	every 200 hours	
Oil Change	Differential	every 800 hours *	
	Planetary reduction	every 1000 hours *	
	Self-locking differential gear	every 700 * &	

Operation	Member	Conditions	Frequency	Lubricants
Greasing	Articulations	Normal work	monthly	MOLIKOTE
		Awkward work	weekly	

Adjustments and Checks			
Unit	Operation	Frequency	Service Brake Circuit
Negative Brake	Adjustment	every 1000 hours *	Only for mineral oil use, e.g., ATF Dexron II. Make sure that master cylinder seals are suitable for mineral oil.
Service Brake	Adjustment	every 500 hours	
Wheel Nuts	Tightening	every 200 hours	

* Initially after 100 working hours

& When it starts sounding noisy

Gear Box Lubricant Intervals	
Check levels	monthly
Oil change	once at 50 hours after every 1000 hours
Screw/bolt tighten	every 200 hours
Lubricant	SAE 90 oil API GL3

Torque Wrench Settings (Nm)			
Size of Screw	8G/8.8	10K/10.9	12K/12.9
M4	2.9	4.1	-
M6	10	14	-
M8	25	35	-
M12	49	69	-
M10 x 1.25	-	73	-
M12	86	120	-
M14	135	190	-
M14 x 1.5	-	-	250
M16	210	295	-
A18	325	-	-

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Note: 1 Nm = 0.7376 ft-lb

Table 2.5 Tire Specifications

	SJ 46AJ (ANSI/CSA)	SJ 46AJ & SJ 51AJ (CE & AS)
Tire Size	315/55 D20	315/55 D20
Type	Air/Foam-Filled	Foam Filled
Tire Ply Rating	12	12
Wheel Nuts Torque	290 ft-lb (393.2 Nm)	290 ft-lb (393.2 Nm)

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IMPORTANT

For proper function of each axle differential, all four wheels must have same tire size installed at all times. Failure to comply with this requirement will reduce the life of the differentials and reduce overall mobility of aerial platform.

Table 2.6 Maximum Platform Capacities

	SJ 46AJ (ANSI/CSA)	SJ 46AJ & SJ 51AJ (CE & AS)
Total Capacity*	500 lb. (227 kg)	315/55 D20
	2 Persons	Foam Filled
Maximum Wind	28 mph (12.5 m/s)	12
Maximum Side Force	90 lbg (400N)	290 ft-lb (393.2 Nm)

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*

**WARNING****DRIVING ON A SLOPE**

- When driving on a slope greater than 30%, the platform capacity is limited to 136 kg (300 lb.).
- The platform must be between the non-steer wheels and must be on the downside of the hill.
- When slope increases to above 45%, the forward drive is disabled but reverse drive remains active.

Table 2.7 Floor Loading Pressure

MODEL	Total Aerial Platform Weight		Total Aerial Platform Load					
			Wheel		LCP		OUP	
	lb.	kg	lb.	kg	psi	kPa	psf	kPa
SJ 46A (ANSI Standard configuration)	14,960	6,786	7,775	3,527	108	745.0	219	10.5
SJ 46AJ (ANSI Standard configuration)	15,230	6,908	7,775	3,527	108	745.0	219	10.5
SJ 46AJ (CE & AS Standard configuration)	15,830	7,180	7,775	3,527	120	827.0	227	10.9
SJ 51AJ (CE & AS Standard configuration)	16,630	7,543	8,470	3,842	133	917.0	239	11.4

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- ANSI Standard Configuration = 4WD + Oscillating Axle + 315/55 D20 Air Tires
- CE & AS Standard Configuration = 4WD + Oscillating Axle + 315/55 D20 Foam Tires
- Gross Aerial Platform Weight = Weight + platform capacity
- LCP – Locally Concentrated Pressure – is a measure of how hard the aerial platform tire tread presses on the area 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 projected directly underneath it. The structure of the operating surface (beams, etc.) must be able to withstand more than the indicated values above.
- Foam tires option will add approximately 600 lb. (272 kg) to total aerial platform weight and 150 lb. (68 kg) to max. wheel load. OUP will increase by 4% and LCP will increase by approx. 11%.

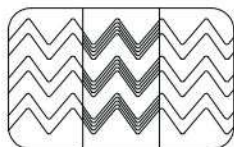
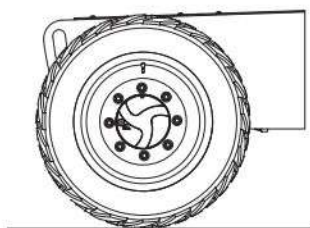
NOTE:

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.

Locally Concentrated Pressure (LCP):

Foot Print Area = Tread Contact Area

$$\text{LCP} = \frac{\text{Maximum Wheel Load}}{\text{Foot Print Area}}$$

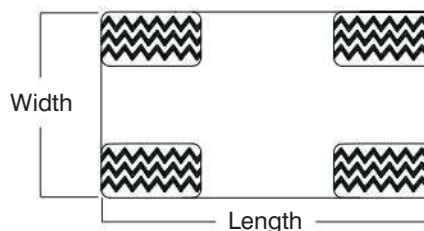
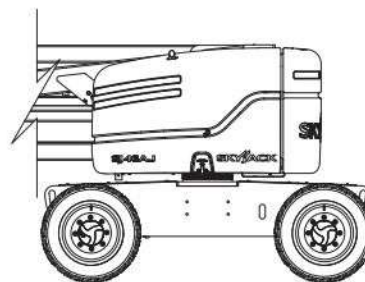


Tread Contact Area

Overall Uniform Pressure (OUP):

Base Area = Length x Width

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

**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 2.8 Hydraulic Specifications

DESCRIPTION			SJ 46AJ	SJ 46AJ / 51AJ	SJ 46AJ / 51AJ
			ANSI/CSA	CE	AS
Pump Specifications	Drive Pump	Displacement - 2000 rpm	2.8 CIR 24.3 gpm @ 2000 rpm	46 CC	46 CC
		Drive Pump Pressure	5000 psi	345 bar	345 bar
		Charge Pump Displacement	0.85 CIR	13.9 CC	13.9 CC
		Charge Pump Pressure	313 psi	22 bar	22 bar
	System Pump	Displacement - Static	0.67 CIR / 5.8 gpm @ 2000 rpm	11 CC	11 CC
		System Pump Pressure	3000 psi	207 bar	207 bar
Filter Specifications		Charge Pump Filter	50 psi	9 μm/35	9 μm/35
		High Pressure Filter	87 psi	10 μm/25	10 μm/25
		Return Filter	22 psi	10 μm/40	10 μm/40
Motor Specifications	Drive Motor	Displacement - Low	1.55 CIR	21 CC	21 CC
		Displacement - High	2.32 CIR	38 CC	38 CC
	Swing Motor	Motor Displacement	4 CIR	65.56 CC	65.56 CC
		Maximum Swing Pressure	1400 psi	97 bar	97 bar
Cylinder Specifications	Extension Cylinder	Bore	2 in.	5.1 cm	5.1 cm
		Rod Diameter	1.25 in.	3.2 cm	3.2 cm
		Stroke	67 in.	1.7 m	2.5 m
		Maximum Boom Pressure	3000 psi	207 bar	207 bar
	Lift Cylinder (Main)	Bore	4 in.	10.2 cm	10.2 cm
		Rod Diameter	1.75 in.	4.5 cm	4.5 cm
		Stroke	25.44 in.	64.6 cm	64.6 cm
		Maximum Lift Pressure	3000 psi	207 bar	207 bar
	Lift Cylinder (Riser)	Bore	2.5 in.	6.4 cm	6.4 cm
		Rod Diameter	1.75 in.	4.5 cm	4.5 cm
		Stroke	36.21 in.	92 cm	92 cm
		Maximum Lift Pressure	3000 psi	207 bar	207 bar
		Maximum Lower Pressure	2750 psi	190 bar	190 bar
	Steer Cylinder	Steering Cylinder Stroke	N/A	N/A	N/A
Maximum Steering Pressure		3000 psi	207 bar	207 bar	
For other component specifications, refer to hydraulic schematic.					

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Table 2.9 Specifications and Features

MODEL			SJ 46AJ (ANSI/CSA)	SJ 46AJ (CE & AS)	SJ 51AJ (CE & AS)
Maximum Load Capacity			500 lb. (227 kg)	500 lb. (227 kg)	500 lb. (227 kg)
Platform Size	Total Platform Length (Outside)		60 in. (152.4 cm) 72 in. (182.9 cm)	60 in. (152.4 cm) 72 in. (182.9 cm)	60 in. (152.4 cm) 72 in. (182.9 cm)
	Total Platform Depth (Outside)		30 in. (76.2 cm)	30 in. (76.2 cm)	30 in. (76.2 cm)
Height	Working		50 ft. 5 in. (15.37 m)	50 ft. 5 in. (15.37 m)	55 ft. 1 in. (16.8 m)
	Platform Elevated		46 ft. 5 in. (14.15 m)	46 ft. 5 in. (14.15 m)	51 ft. 1 in. (15.6 m)
	Drive		Driveable at all heights	Driveable at all heights	Driveable at all heights
	Turret		6 ft. 10 in. (2.08 m)	6 ft. 10 in. (2.08 m)	6 ft. 10 in. (2.08 m)
Length	Overall with platform		21 ft. 4 in. (6.5 m)	21 ft. 4 in. (6.5 m)	23 ft. 9 in. (7.25 m)
	Base and tires		9 ft. 6 in. (2.9 m)	9 ft. 6 in. (2.9 m)	9 ft. 6 in. (2.9 m)
Width	Outside std. tires		7 ft. 4 in. (2.2 m)	7 ft. 4 in. (2.2 m)	7 ft. 4 in. (2.2 m)
	Turret		6 ft. (1.8 m)	6 ft. (1.8 m)	6 ft. (1.8 m)
Weight	Weight (with air tires)		14,730 lb. (6,681 kg)	-	-
	Weight (with foam-filled tires)		15,330 lb. (6,954 kg)	15,390 lb. (6,981 kg)	16,130 lb. (7,316 kg)
Platform Rotation			180 degrees	180 degrees	180 degrees
Horizontal Reach			25 ft. 2 in. (7.68 m)	25 ft. 2 in. (7.68 m)	30 ft. 1 in. (9.16 m)
Horizontal Reach @ maximum height			8 ft. 6 in. (2.58 m)	8 ft. 6 in. (2.58 m)	9 ft. 9 in. (2.96 m)
Wheelbase			6 ft. 8 in. (2.03 m)	6 ft. 8 in. (2.03 m)	6 ft. 8 in. (2.03 m)
Turret Rotation			360 degrees continuous	360 degrees continuous	360 degrees continuous
Turret Tailswing			-5 in. (-12.7 cm)	-5 in. (-12.7 cm)	0
Gradeability (torque equivalent to)			45%	45%	45%
Ground Clearance Between Wheels			16 in. (40.6 cm)	16 in. (40.6 cm)	16 in. (40.6 cm)
Turning Radius	Inside	Differential lock engaged	12 ft. 6 in. (3.83 m)	12 ft. 6 in. (3.83 m)	12 ft. 6 in. (3.83 m)
		Differential lock disengaged	8 ft. 2 in. (2.48 m)	8 ft. 2 in. (2.48 m)	8 ft. 2 in. (2.48 m)
	Outside	Differential lock engaged	21 ft. 2 in. (6.45 m)	21 ft. 2 in. (6.45 m)	21 ft. 2 in. (6.45 m)
		Differential lock disengaged	16 ft. 11 in. (5.15 m)	16 ft. 11 in. (5.15 m)	16 ft. 11 in. (5.15 m)
System Voltage			12 VDC	12 VDC	12 VDC
Battery	Type		Lead Acid	Lead Acid	Lead Acid
	Cold Cranking Amperes		950 A	CE: 950 A AS: 800 A	CE: 950 A AS: 800 A
Operating Times	Main boom up		26 seconds	26 seconds	26 seconds
	Main boom down		26 seconds	26 seconds	26 seconds
	Riser boom up		26 seconds	26 seconds	26 seconds
	Riser boom down		26 seconds	26 seconds	26 seconds
	Fly boom extend		11 seconds	11 seconds	15 seconds
	Fly boom retract		19 seconds	19 seconds	26 seconds
	Jib up		39 seconds	39 seconds	39 seconds
	Jib down		23 seconds	23 seconds	23 seconds
	Turret rotate - counterclockwise 360° (fully stowed)		90 seconds	90 seconds	90 seconds
	Platform rotate - full		20 seconds	20 seconds	20 seconds
Driving Speeds	Drive Speed (maximum-stowed)		4.8 mph (7.7 km/h)	4.8 mph (7.7 km/h)	4.8 mph (7.7 km/h)
	Drive Speed (maximum-elevated)		0.5 mph (0.8 km/h)	0.5 mph (0.8 km/h)	0.5 mph (0.8 km/h)

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Table 2.9 Specifications and Features (Continued)

MODEL				SJ 46AJ (ANSI/CSA)	SJ 46AJ (CE & AS)	SJ 51AJ (CE & AS)
Engine - Deutz	Engine Type			Deutz D2011L03i		
	RPM Settings			1300 Low / 1650 / 2000 High		
	Gross Intermittent HP			35.8 kW / 48 Hp		
	Horsepower @ 2000 rpm (intermittent)			28.9 kW / 38.8 Hp		
	Fuel Type			Diesel		
	Fuel Tank Capacity			17 gal (63 L)		
	Standard Oil Factory Fill	Ambient Temperature Limits	0°F to 115°F (- 18°C to +45°C)	SAE 15W-40 API CF/CG/CH-4		
	Cold Lube Oil Option		- 20°F to 90°F (- 29°C to +32°C)	SAE 5W-30 API CF/CG/CH-4		
	Arctic Lube Oil Option		- 40°F to 115°F (- 40°C to +45°C)	SAE 0W-40 API CF/CG/CH-4		
	Apporved Alternates			See Engine Manual		
Lube Oil Sump Capacity			1.45 gal (5.5 L)			
Engine - GM	Engine Type			3.0L GM Dual Fuel	N/A	
	RPM Settings			900 Low / 1650 / 2000 High		
	Gross Intermittent HP			52.2 kW / 70 Hp		
	Horsepower @ 2000 rpm (intermittent)			40.8 kW / 54.8 Hp		
	Fuel Type - Dual			Gasoline/Propane		
	Fuel Tank Capacity			17 gal (63 L)		
	Standard Oil Factory Fill	Ambient Temperature Limits	- 40°F to 115°F (- 40°C to +45°C)	SAE 5W-30 API SL		
	Apporved Alternates			See Engine Manual		
	Lube Oil Capacity			1.19 gal (4.5 L)		
	Standard Coolant	Ambient Temperature Limits	- 20°F to 115°F (- 29°C to +45°C)	GM 50/50 Extended Life Coolant		
	Arctic Coolant Option		- 40°F to 115°F (- 40°C to +45°C)	GM 60/40 Extended Life Coolant		
	Coolant Capacity			3.0 gal (11.4 L)		
Hydraulic Oil	Hyd Cooler Option	Ambient Temperature Limits	100°F to 115°F (+38°C to +45°C)	Oil cooler option recommended		
	Standard Factory Fill		-15°F to 100°F (-26°C to +38°C)	Shell Tellus T46		
	Arctic Oil Option		- 40°F to 100°F (- 40°C to +38°C)	Esso/Mobil UNIVIS HVI 26 Petro-Canada HYDREX EXTREME		
	Apporved Alternates		-15°F to 100°F (-26°C to +38°C)	Mobilfluid 424, Esso UNIVIS N46, Chevron Rycon MV		
			- 40°F to 80°F (- 40°C to +27°C)	Mobil DTE 13M, Esso UNIVIS N22 Petro-Canada HYDREX MV Arctic 15		
	Hydraulic Tank Capacity			24 gal (91 L)		

1095-ALL Standards

Diagram 2.1 Dimension and Reach Diagram - SJ 46A

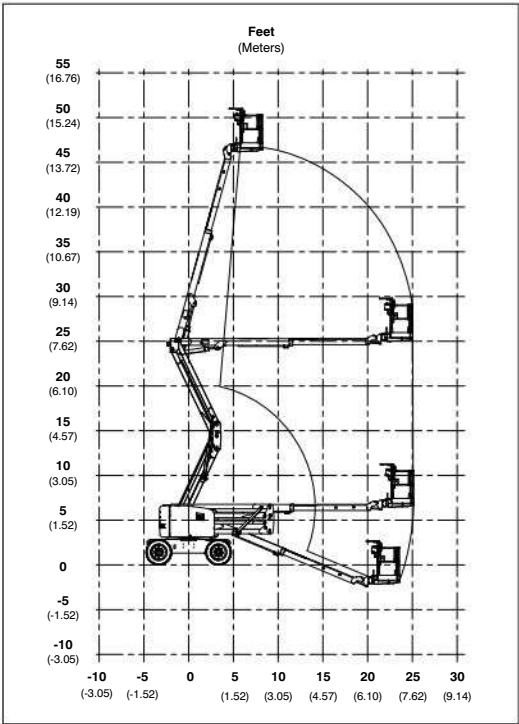


Figure 2-1. Reach Diagram - 46A

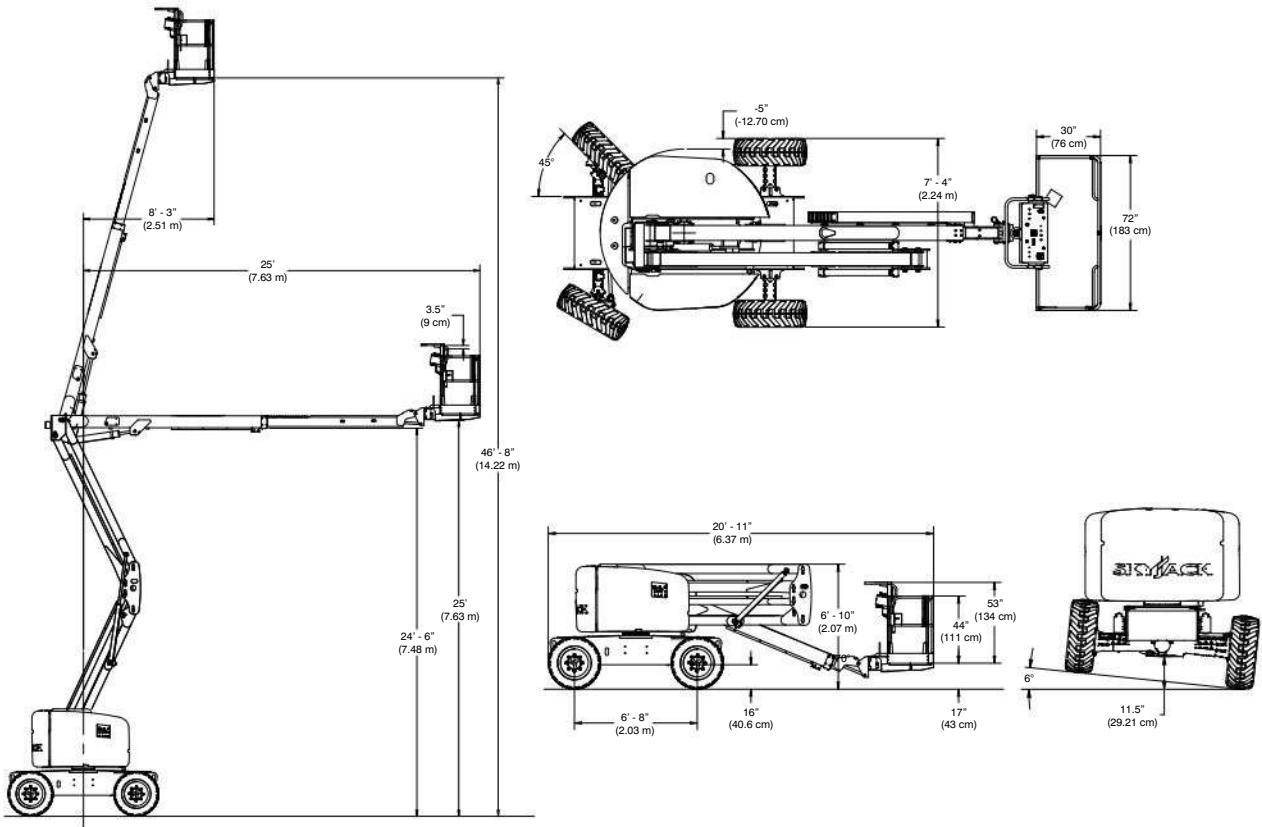


Figure 2-2. Dimension - 46A

Diagram 2.2 Dimension and Reach Diagram - SJ 46AJ

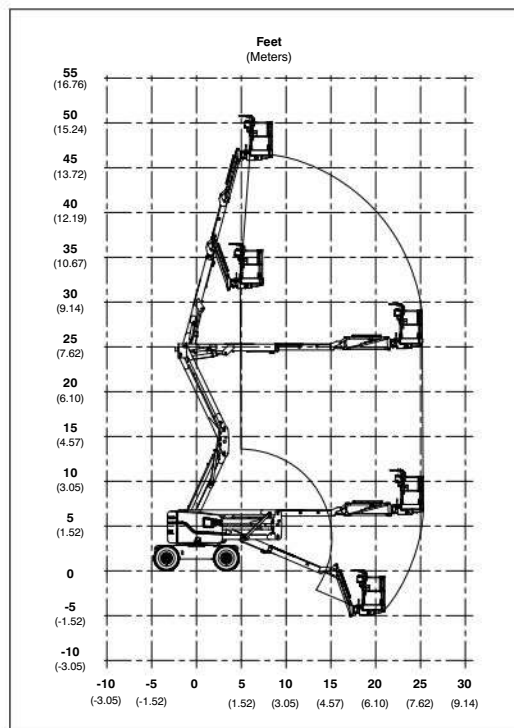


Figure 2-3. Reach Diagram - 46AJ

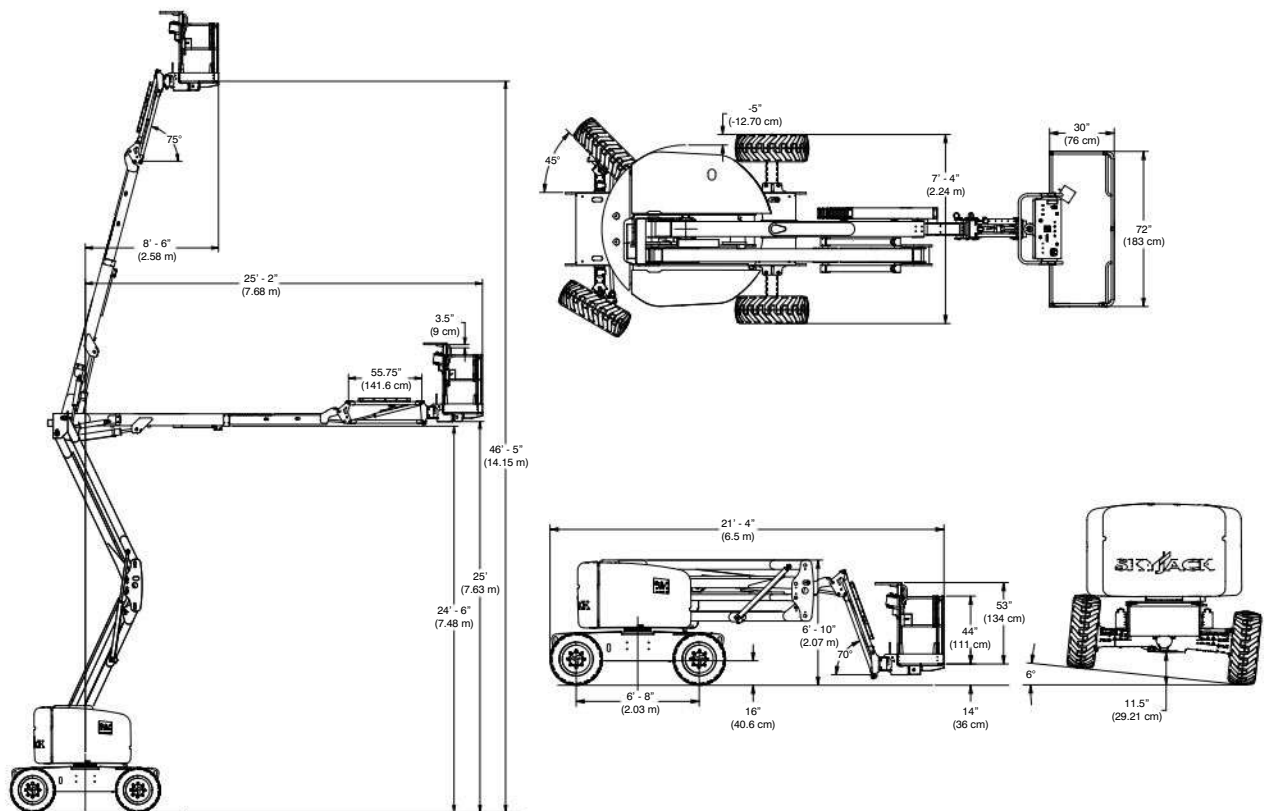


Figure 2-4. Dimension - 46AJ

Diagram 2.3 Dimension and Reach Diagram - SJ 51AJ

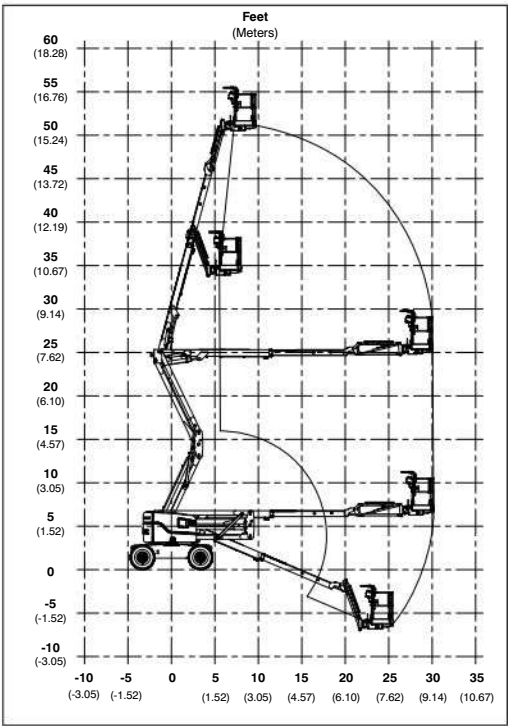


Figure 2-5. Reach Diagram - 51AJ

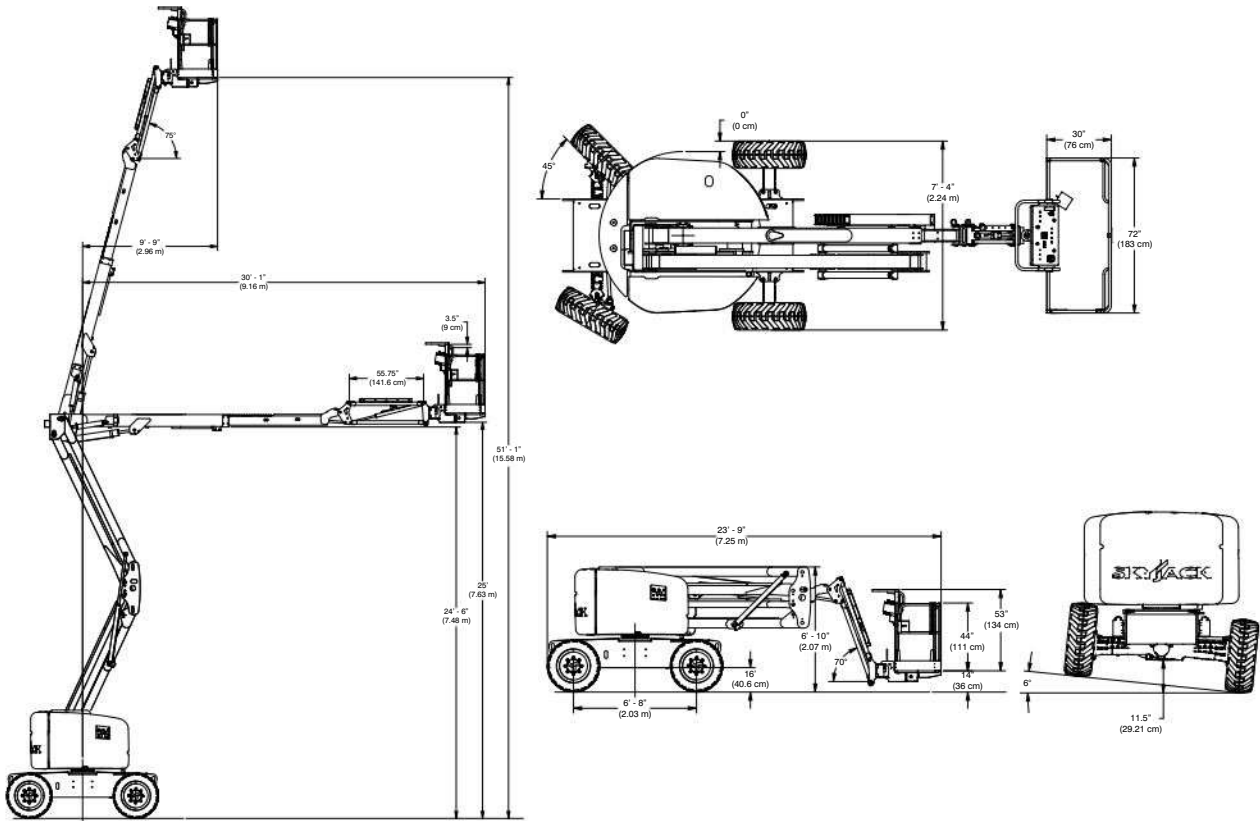
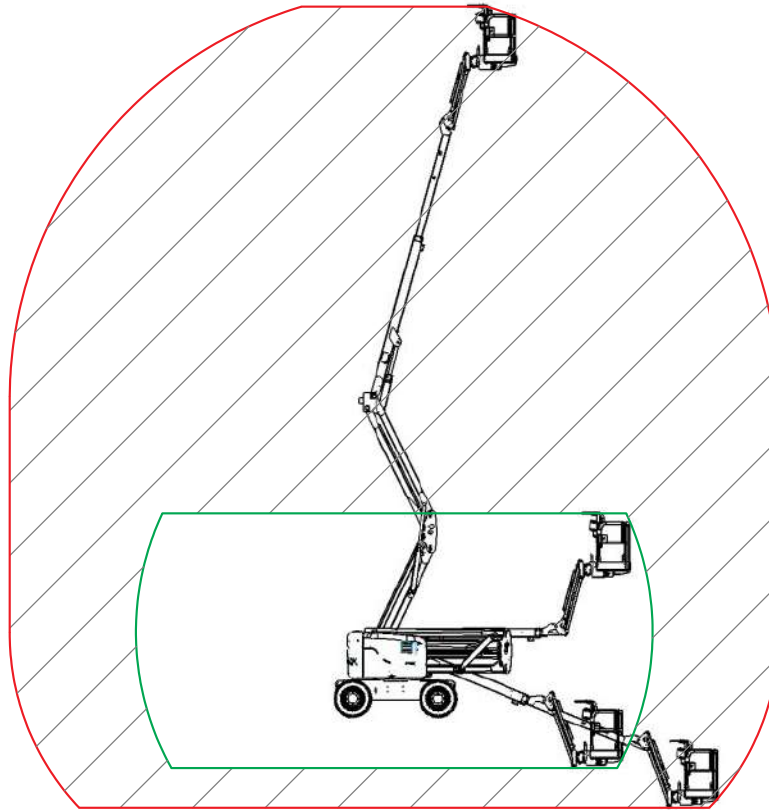


Figure 2-6. Dimension - 51AJ

Diagram 2.4 Axle Oscillation Diagram

**WARNING**

Do not raise the platform in work mode if it is not on a firm level surface.



-  Axle oscillation free (travel mode) - drive speed 7.7 km/h (4.8 mph) max.
-  Axle oscillation locked (work mode) - drive speed 0.8 km/h (0.5 mph) max.

Figure 2-7. Axle Oscillation

Section 3

SYSTEM COMPONENT IDENTIFICATION AND SCHEMATICS

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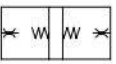
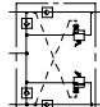
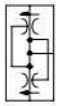
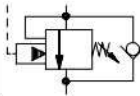
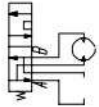
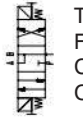
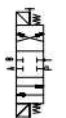
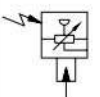
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3.1 Hydraulic Symbol Chart

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

3.2 Electrical Symbol Chart

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

3.3 Wire Number and Color Code

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

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

3.4 Hydraulic Schematic Parts List

Index No.	Skyjack Part No.	Qty.	Description
2H-21A	154664	1	VALVE, Control (Pressure dump)
2H-34A	154672	1	VALVE, Control (Jib select)
2H-36A	154672	1	VALVE, Control (Platform rotate select)
2H-V1	141436	1	VALVE, Control (Brake release override)
3H-XX	N/A	1	VALVE, Control (Generator select)
3H-15	141486	1	VALVE, Control (Drive pump displacement control)
3H-16	141486	1	VALVE, Control (Drive pump displacement control)
3H-26	141435	1	VALVE, Control (Brake apply)
3H-38	141435	1	VALVE, Control (Main boom retract)
3H-39	141435	1	VALVE, Control (Main boom extend)
3H-45	141435	1	VALVE, Control (2 speed motor)
3H-65	141435	1	VALVE, Control (Axle lockout)
3H-165	141435	1	VALVE, Control (Differential lock)
4H-13	154671	1	VALVE, Control (Boom lower)
4H-14	154671	1	VALVE, Control (Boom raise)
4H-23A	154668	1	VALVE, Control (Steering right)
4H-24A	154668	1	VALVE, Control (Steering left)
4H-30	154671	1	VALVE, Control (Riser lower)
4H-31	154671	1	VALVE, Control (Riser raise)
4H-32	154670	1	VALVE, Control (Boom rotation left)
4H-33	154670	1	VALVE, Control (Boom rotation right)
4H-34	141421	1	VALVE, Control (Jib lower)
4H-35	141421	1	VALVE, Control (Jib raise)
4H-36	141421	1	VALVE, Control (Platform rotate left)
4H-37	141421	1	VALVE, Control (Platform rotate right)
4H-40	N/A	1	VALVE, Control (Platform leveling down)
4H-41	N/A	1	VALVE, Control (Platform leveling up)
4H-V1	141410	1	VALVE, Control (Drive pump directional control)
C1	148714	1	CYLINDER (Jib lift)
C2	148712	1	CYLINDER (Extension) (46AJ)
C3	148711	1	CYLINDER (Main boom lift)
C4	148715	1	CYLINDER (Platform leveling - master)
C5	148716	1	CYLINDER (Platform leveling - slave)
C6	148710	1	CYLINDER (Riser lift)
C7	148710	1	CYLINDER (Riser lift)
C8	154641	1	CYLINDER (Front axle steering)
C9	148709	1	CYLINDER (Axle lockout)
C10	148709	1	CYLINDER (Axle lockout)
C11	148713	1	CYLINDER (Extension) (51AJ)
C12	141123	1	CYLINDER (Brake)
C13	N/A	1	CYLINDER (Differential lock)
CB1	160028	1	VALVE, Counterbalance (Axle lockout cylinder) (Order P/N 149414 for Machines with S/N 95,000,499 & Below)
CB2	160028	1	VALVE, Counterbalance (Axle lockout cylinder) (Order P/N 149414 for Machines with S/N 95,000,499 & Below)
CB3	141499	1	VALVE, Counterbalance (Swing drive)
CB4	141499	1	VALVE, Counterbalance (Swing drive)
CB5	149488	1	VALVE, Counterbalance (Riser lift)
Parts list continued on following page.			

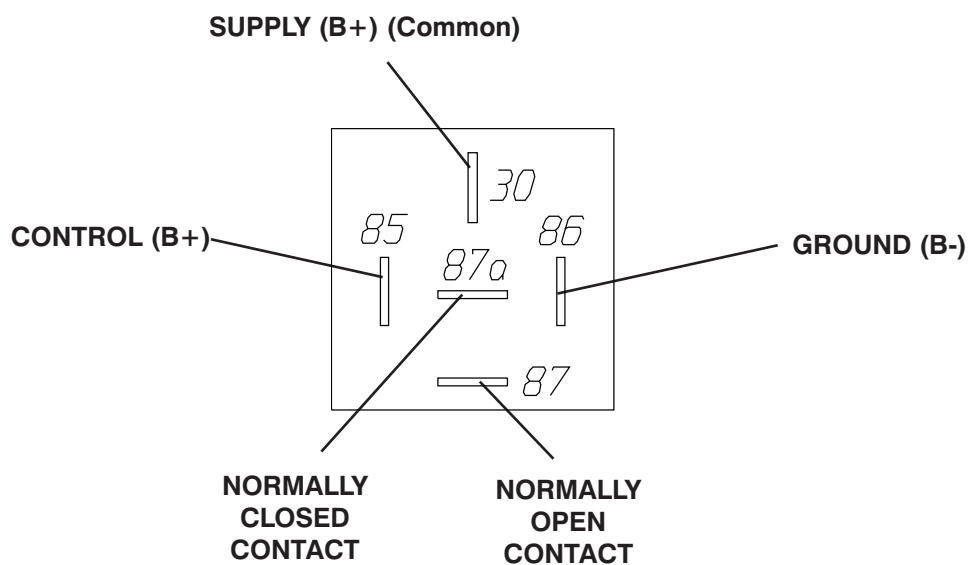
3.4 Hydraulic Schematic Parts List (Continued)

Index No.	Skyjack Part No.	Qty.	Description
Parts list continued from previous page.			
CB6	149488	1	VALVE, Counterbalance (Riser lift)
CB7	701827	1	VALVE, Counterbalance (Platform leveling - slave)
CB8	701827	1	VALVE, Counterbalance (Platform leveling - slave)
CB9	152326	1	VALVE, Counterbalance (Boom lift)
CB10	149228	1	VALVE, Counterbalance (Extension)
CB11	141453	1	VALVE, Counterbalance (Extension)
CB12	149372	1	VALVE, Counterbalance (Jib lift)
CB13	149372	1	VALVE, Counterbalance (Jib lift)
CB14	701827	1	VALVE, Counterbalance (Platform rotary actuator)
CB15	701827	1	VALVE, Counterbalance (Platform rotary actuator)
CV1	N/A	1	VALVE, Check (EPU)
CV2	141444	1	VALVE, Check (Brake valve)
CV3	154667	1	VALVE, Check (Main control pressure)
CV4	1546 73	1	VALVE, Check (Platform leveling - cross pilot)
CV5	154673	1	VALVE, Check (Platform leveling - cross pilot)
DSV1	154665	1	VALVE, System load sensing
DSV2	154674	1	VALVE, Swing differential sensing
DSV3	154674	1	VALVE, Riser differential sensing
DSV4	154674	1	VALVE, Main lift differential sensing
DSV5	154674	1	VALVE, Jib/Platform differential sensing
EPU	706921	1	EMERGENCY POWER UNIT
F1	138398	1	FILTER, Charge pump (9 micron abs, 50 psi bp)
F2	139148	1	FILTER, high pressure (10 micron abs, 87 psi bp)
F3	149018	1	FILTER, return (10 micron abs, 25 psi bp)
FV1	N/A	1	VALVE, Flow control (Fly boom)
FV2	N/A	1	VALVE, Flow control (Platform leveling)
M1	148833	1	MOTOR, Drive (2 speed)
M2	148992	1	MOTOR, Turret rotation
MP	151093	1	HAND PUMP, Brake
OR1	141415	1	ORIFICE, Main control valve (0.031")
OR2	154676	1	ORIFICE, Main control valve (0.050")
OR3	141415	1	ORIFICE, Boom extension
OR4	141415	1	ORIFICE, Leveling
OR5	141443	1	ORIFICE, Brake control valve (0.073")
P1	148331	1	PUMP, Drive
P1A	N/A	1	PUMP, Charge
P2	148832	1	PUMP, System
PFC1	154666	1	VALVE, Priority Steering (1.5 gpm @ 2000 psi)
PR1	151094	1	VALVE, Control (Pressure reducing)
RA1	138232	1	ROTARY ACTUATOR, Platform
RV1	141287	1	VALVE, Relief (Drive pump)
RV2	141287	1	VALVE, Relief (Drive pump)
RV3	141230	1	VALVE, Relief (Drive pump)
RV4	151095	1	VALVE, Relief (Brake)
RV5	N/A	1	VALVE, Relief (EPU)
Parts list continued on following page.			

3.4 Hydraulic Schematic Parts List (Continued)

Index No.	Skyjack Part No.	Qty.	Description
			Parts list continued from previous page.
RV6	154663	1	VALVE, Relief (Main control - clipping)
RV7	154678	1	VALVE, Relief (Main control - rotate)
RV8	154663	1	VALVE, Relief (Main control - riser down)
RV9	154663	1	VALVE, Relief (Main control - platform leveling)
SV1	141439	1	VALVE, Shuttle (Brake valve)
SV2	141441	1	VALVE, Shuttle (Brake valve - M1 / M2)
SV3	N/A	1	VALVE, Shuttle (Swing drive)
SV4	154677	1	VALVE, Shuttle (Load sensing)
SV5	154677	1	VALVE, Shuttle (Load sensing)
SV6	154677	1	VALVE, Shuttle (Load sensing)
SV7	154677	1	VALVE, Shuttle (Load sensing)
SV8	154677	1	VALVE, Shuttle (Load sensing)
SV9	154677	1	VALVE, Shuttle (Swing drive load sensing)
SV10	154677	1	VALVE, Shuttle (Riser load sensing)
SV11	154677	1	VALVE, Shuttle (Leveling load sensing)
SV12	154677	1	VALVE, Shuttle (Leveling load sensing)
SV13	154677	1	VALVE, Shuttle (Main boom load sensing)

3.5 Electrical Component Parts List



Index No.	Skyjack Part No.	Qty.	Description
01ACR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - E-pump)
07CR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - E-pump/Enable)
08CR	127131	1	RELAY, 12 Volt 40 Amp (Platform control console - Footswitch/Starter interlock)
09CR	127131	1	RELAY, 12 Volt 40 Amp (Engine power on)
21CR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - Dump valve)
27CR	127131	1	RELAY, 12 Volt 40 Amp (Platform control console - Tilt alarm)
45CR1	127131	1	RELAY, 12 Volt 40 Amp (Base control console - 2-SPD motor)
45CR2	127131	1	RELAY, 12 Volt 40 Amp (Base control console - 2-SPD motor controller)
49CR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - Horn)
57ACR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - Engine Start)
59CR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - Overload sensor) (CE&AS)
60CR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - System power)
78CR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - High idle)
79CR	127131	1	RELAY, 12 Volt 40 Amp (Base control console - Low idle)
82CR	127131	1	RELAY, 12 Volt 40 Amp (Platform control console - Load sensing alarm)
165CR	127131	1	RELAY, 12 Volt 40 Amp (Platform control console - Differential lock)
2H-21A	154681	1	COIL, 12 Volt (Dump valve)
2H-34A	154679	1	COIL, 12 Volt (Jib enable valve)
2H-36A	154679	1	COIL, 12 Volt (Platform rotate enable valve)
3H-26	141409	1	COIL, 12 Volt (Brake valve)
3H-45	141409	1	COIL, 12 Volt (Motor 2-speed valve)
3H-65	141409	1	COIL, 12 Volt (Axle lock valve)
3H-165	141409	1	COIL, 12 Volt (Differential lock valve)
4H-13	154682	1	COIL, 12 Volt (Boom down valve)
Parts list continued on following page.			

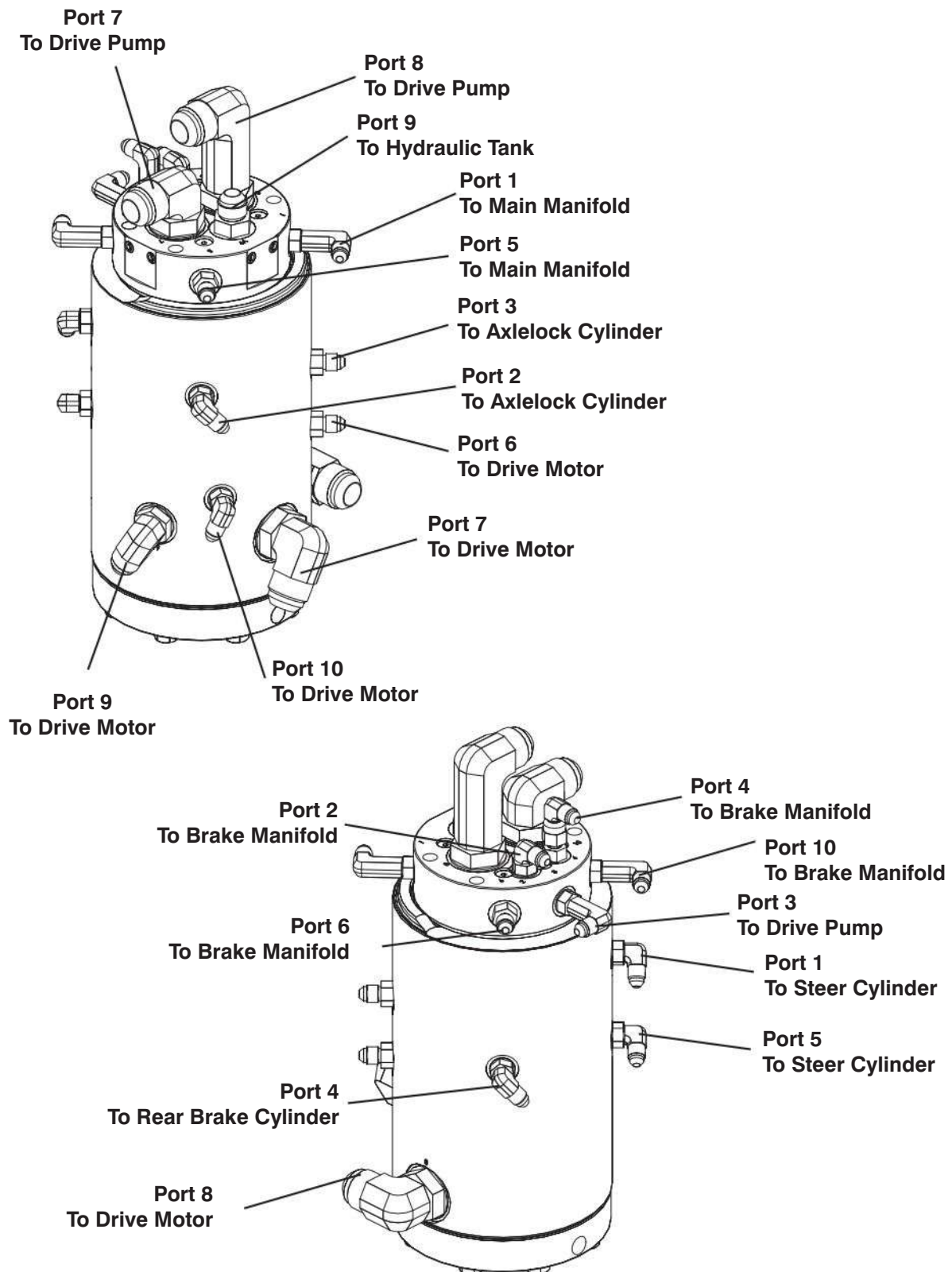
3.5 Electrical Component Parts List

Index No.	Skyjack Part No.	Qty.	Description
Parts list continued from previous page.			
4H-14	154682	1	COIL, 12 Volt (Boom up valve)
4H-23A	154680	1	COIL, 12 Volt (Right steer valve)
4H-24A	154680	1	COIL, 12 Volt (Left steer valve)
4H-30	154682	1	COIL, 12 Volt (Riser down valve)
4H-31	154682	1	COIL, 12 Volt (Riser up valve)
4H-32	154682	1	COIL, 12 Volt (Left turret rotate valve)
4H-33	154682	1	COIL, 12 Volt (Right turret rotate valve)
4H-34	154658	1	COIL, 12 Volt (Jib down valve)
4H-35	154658	1	COIL, 12 Volt (Jib up valve)
4H-36	154657	1	COIL, 12 Volt (Platform left rotate valve) (without Jib)
	154658	1	COIL, 12 Volt (Platform left rotate valve) (with Jib)
4H-37	154657	1	COIL, 12 Volt (Platform right rotate valve) (without Jib)
	154658	1	COIL, 12 Volt (Platform right rotate valve) (with Jib)
4H-38	154679	1	COIL, 12 Volt (Boom retract valve)
4H-39	154679	1	COIL, 12 Volt (Boom extend valve)
4H-40	154683	1	COIL, 12 Volt (Platform level down valve)
4H-41	154683	1	COIL, 12 Volt (Platform level up valve)
A1	138225	1	JOYSTICK (Fly boom/Turret)
A2	138224	1	JOYSTICK (Drive/Steer)
A3	148707	1	JOYSTICK (Riser boom)
AT1	149426	1	ANGLE TRANSDUCER
B1	138809	1	BATTERY, 12V (Wet)
BP1	103057	1	BEEPER, 4-28 VDC Slow pulsing (Platform control console)
BP2	103056	1	BEEPER, 7.5-16 VDC (Base control console) (ANSI/CSA)
BP3	144387	1	ALARM, Overload (CE&AS)
CB1	117325	1	CIRCUIT BREAKER (15 Amp)
CB2	117325	1	CIRCUIT BREAKER (15 Amp)
CB3	117325	1	CIRCUIT BREAKER (15 Amp)
CB4	117326	1	CIRCUIT BREAKER (20 Amp)
CB6	141630	1	CIRCUIT BREAKER (15 Amp)
CI	152323	1	INDICATOR, Charge
DXX	102921	AR	DIODE
FU1	138848	1	FUSE, 50 Amp
FS1	138230	1	SWITCH, Low fuel
H1	146652	1	HORN, 12 Volt
LS1	122007	1	LIMIT SWITCH, Direction sensing
LS2	122007	1	LIMIT SWITCH, High drive
LS3	148902	1	LIMIT SWITCH, High drive
M1	706921	1	PUMP, Emergency
PL1	148973	1	LIGHT, Pilot (Engine fault)
PL2	148972	1	LIGHT, Pilot (Glow plug)
PL3	147229	1	LED BLOCK, Red (12 volts) (Base control console)
PL4	147229	1	LED BLOCK, Red (12 volts) (Platform control console)
PL5	138229	1	MODULE, Upper indicating
PL6	148971	1	LIGHT, Pilot (Platform control console)
Parts list continued on following page.			

3.5 Electrical Component Parts List (Continued)

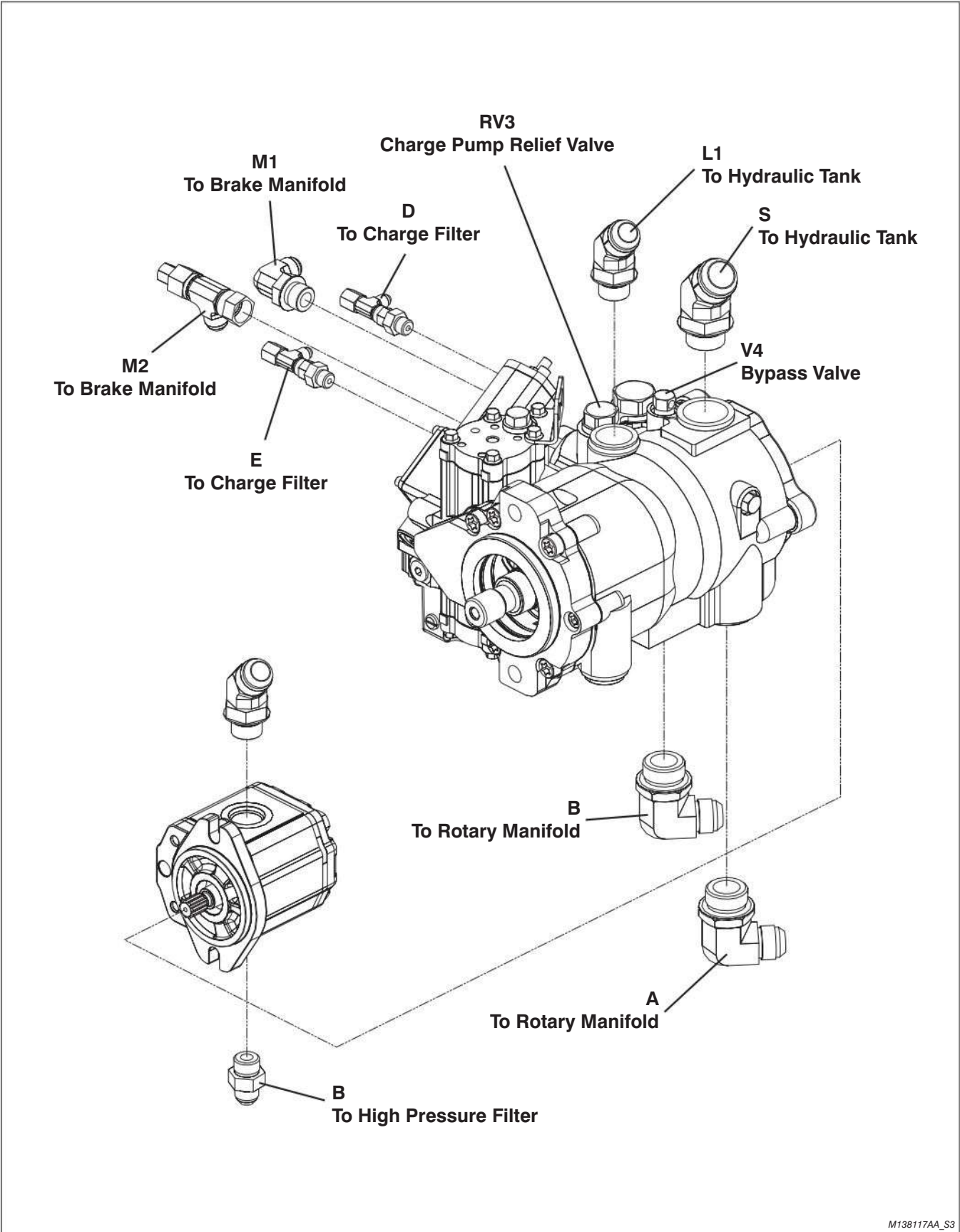
Index No.	Skyjack Part No.	Qty.	Description
Parts list continued from previous page.			
QD1	122420	1	QUICK DISCONNECT (CE&AS)
R1	139088	1	RESISTOR (6 OHM 25 watt)
R2	139088	1	RESISTOR (6 OHM 25 watt)
R3	139080	1	RESISTOR (30 OHM 3 Watt, wire wound)
R4	139080	1	RESISTOR (30 OHM 3 Watt, wire wound)
R5	143952	1	RESISTOR (51 OHM 2 Watt) (Deutz engine)
	117366	1	RESISTOR (150 OHM 2 Watt, axial lead) (GM engine)
R6	144492	1	RESISTOR (680 OHM 1 watt, axial lead 2%) (CE&AS)
R7	144492	1	RESISTOR (680 OHM 1 watt, axial lead 2%)
S1	119725	1	SWITCH, Main power disconnect
S2	138277	1	KEYSWITCH, Base/Off/Platform (Base control console) (ANSI/CSA)
	144366	1	KEYSWITCH, Base/Off/Platform (Base control console) (CE&AS)
S3	147053	1	N.C. CONTACT, Emergency stop (Base control console)
S4	147053	2	N.C. CONTACT, Emergency stop (Platform control console)
S5	138278	1	SWITCH, Ignition/emergency pump toggle (Base control console)
S6	138278	1	SWITCH, Ignition/emergency toggle (Platform control console)
S8	102853	1	SWITCH, Diagnose toggle (Base control console) (Deutz engine)
S9	124446	1	SWITCH, Ignition (Platform control console)
S10	115574	1	SWITCH, Throttle toggle (Platform control console)
S11	138721	1	ASSEMBLY, Footswitch
S12	138278	1	SWITCH, Boom up/down toggle (Base control console)
S13	102853	1	SWITCH, Turret rotate toggle (Base control console)
S14	102853	1	SWITCH, Telescope in/out toggle (Base control console)
S15	102853	1	SWITCH, Platform leveling toggle (Base control console)
S16	102853	1	SWITCH, Platform rotate toggle (Base control console)
S17	102853	1	SWITCH, Jib up/down toggle (Base control console) (Model 46/51AJ)
S18	138278	1	SWITCH, Telescope in/out toggle (Platform control console)
S19	138278	1	SWITCH, Platform leveling toggle (Platform control console) (ANSI/CSA)
S20	138278	1	SWITCH, Platform rotate toggle (Platform control console)
S21	138278	1	SWITCH, Jib up/down toggle (Platform control console) (Model 46/51AJ)
S23	147054	1	N.O. CONTACT, Horn (Platform control console)
S25	138278	1	SWITCH, Riser boom up/down toggle (Base control console)
S26	115574	1	SWITCH, Fuel select (Platform control console) (GM engine)
S28	148998	1	SWITCH, Differential (Platform control console)
S48	115747	1	SWITCH, Drive torque toggle (Platform control console)
TT1	103336	1	HOUR METER
X22	138576	1	PORT, Diagnose (Deutz engine)
X23	138575	1	CONNECTOR, Engine (Deutz engine)

3.6 Rotary Manifold and Port Identifications



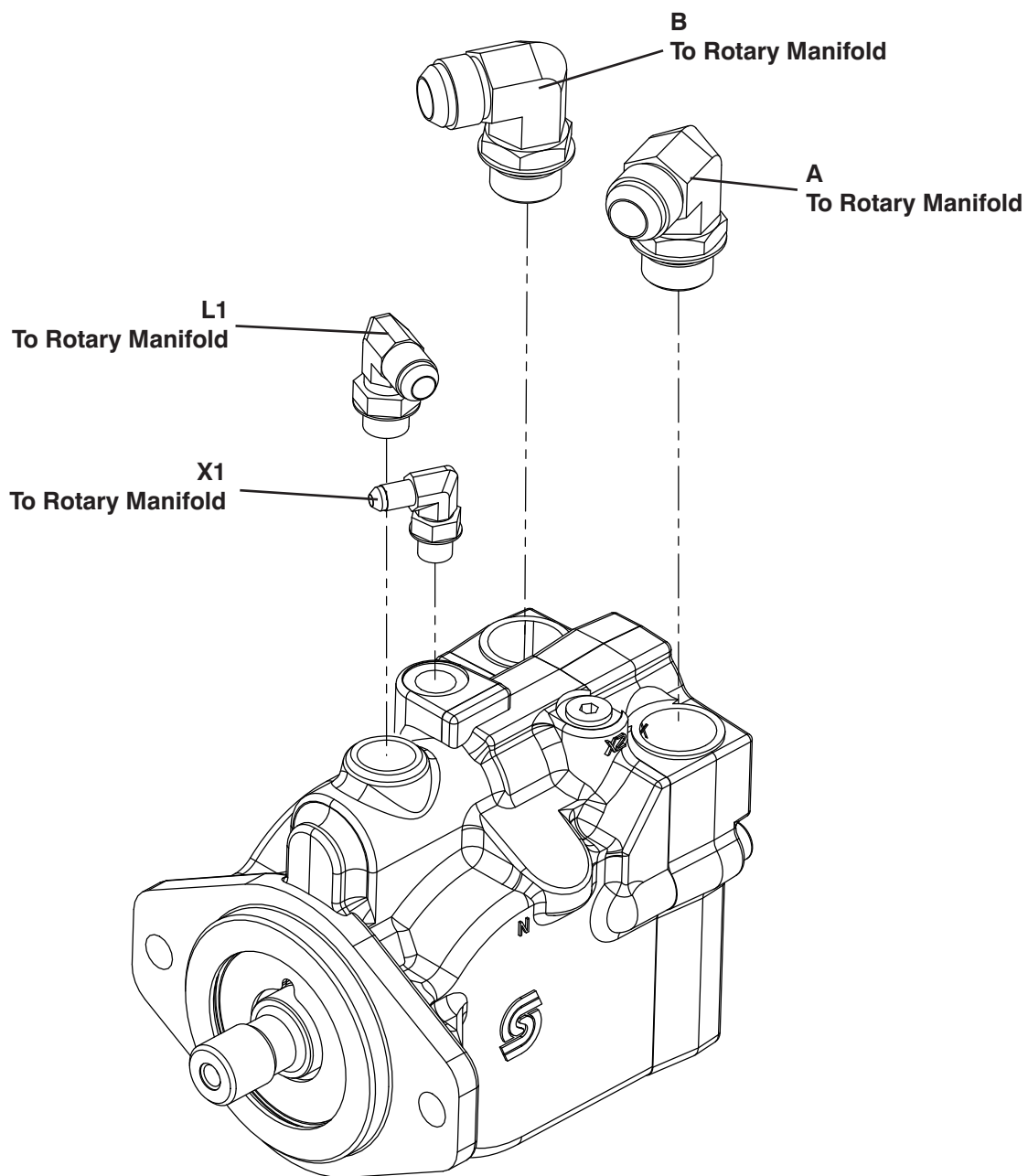
M149138AA_S3

3.8 Drive and System Pump and Port Identifications



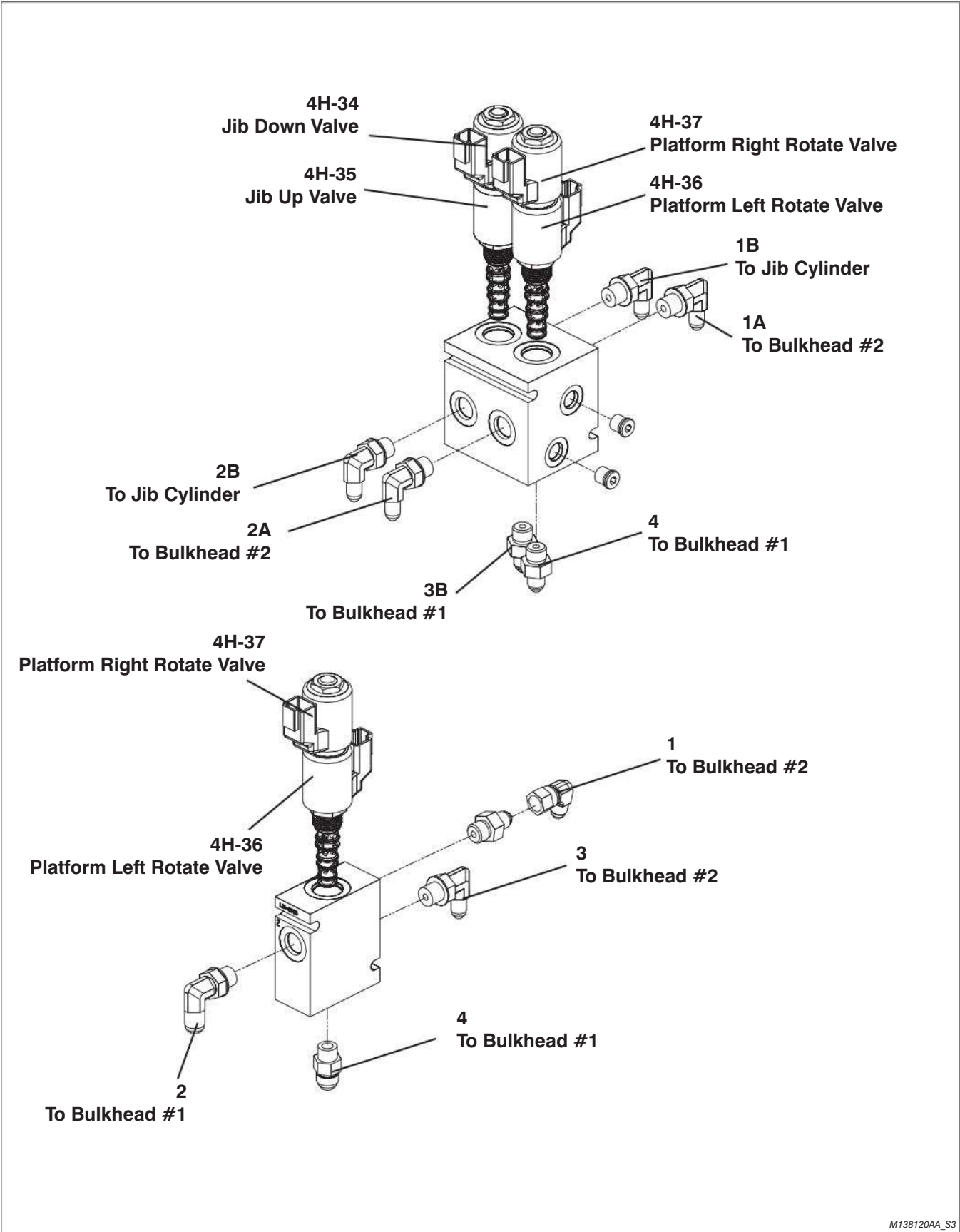
M138117AA_S3

3.9 Drive Motors and Port Identifications



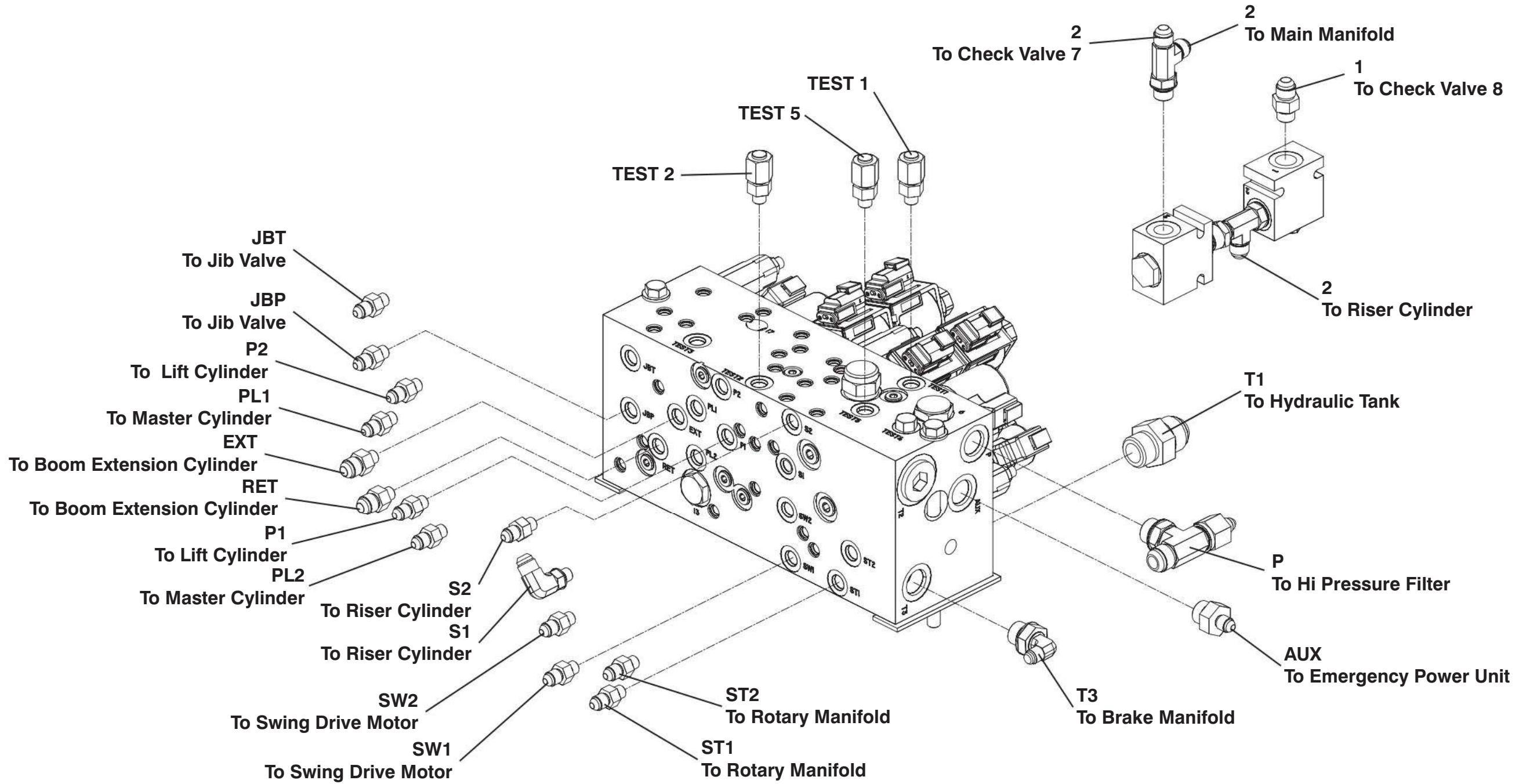
M146243AA_S3

3.10 Jib Valves and Port Identifications

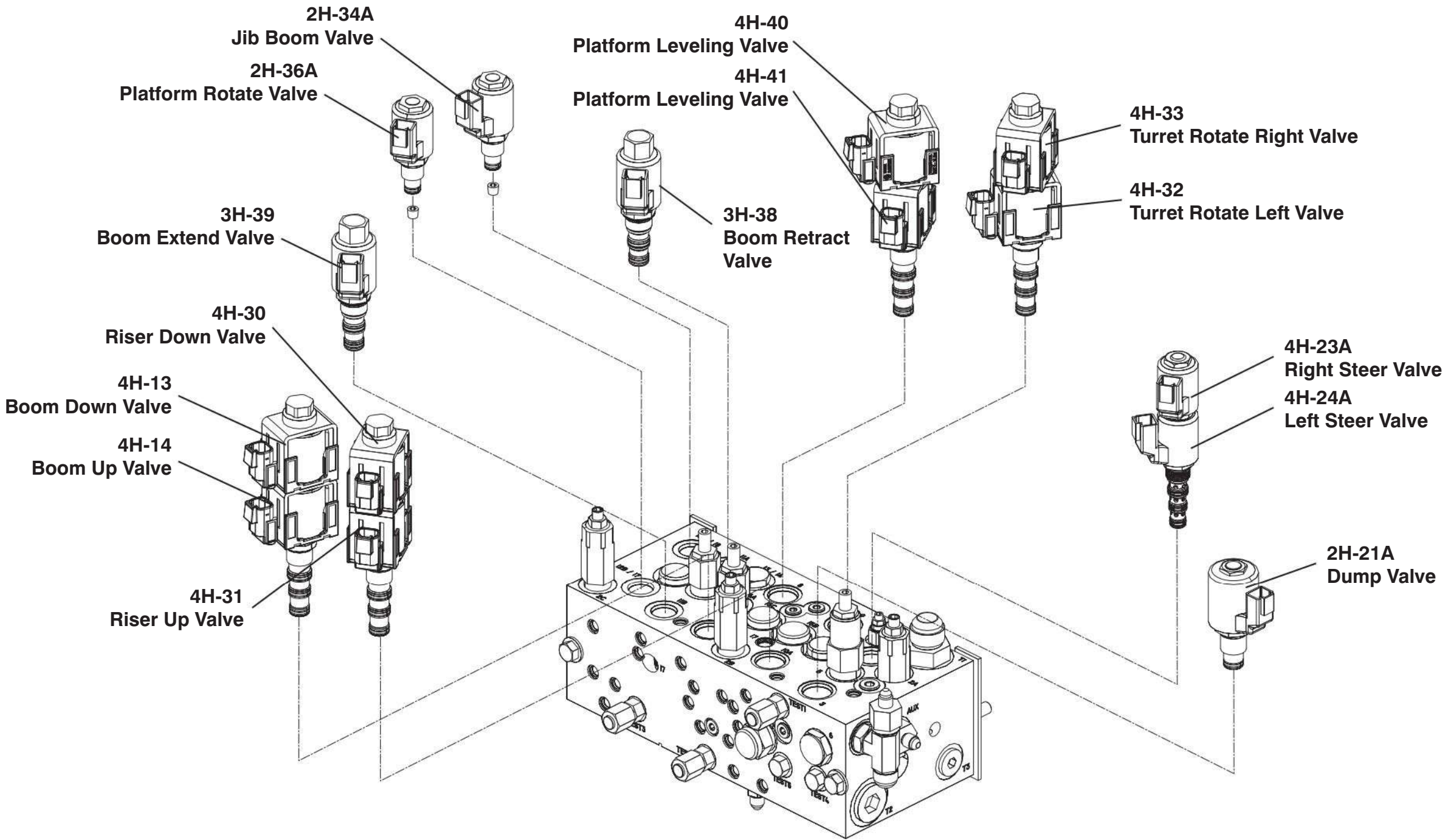


M138120AA_S3

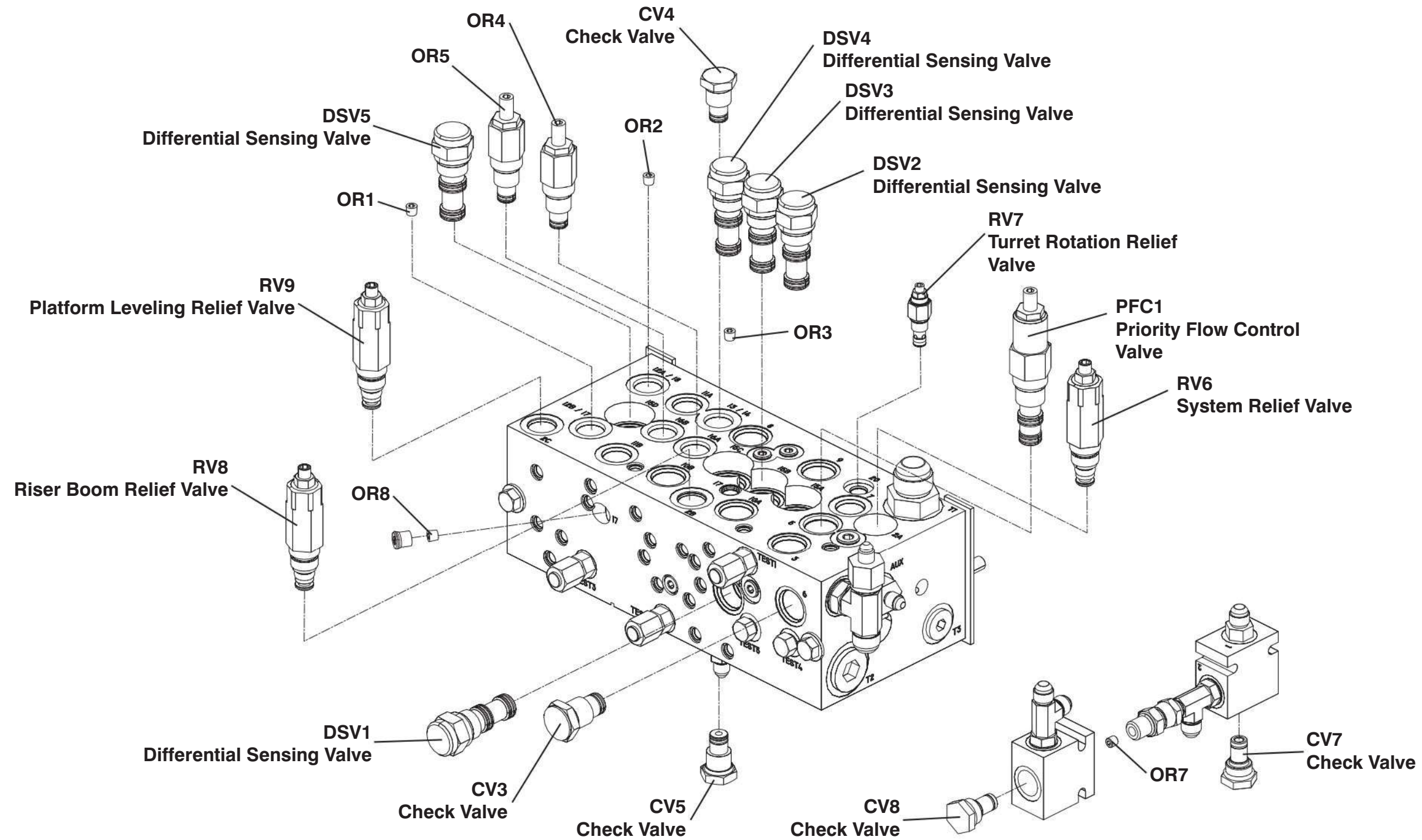
3.11a Main Manifold and Port Identifications



3.11b Main Manifold and Electrical Identifications

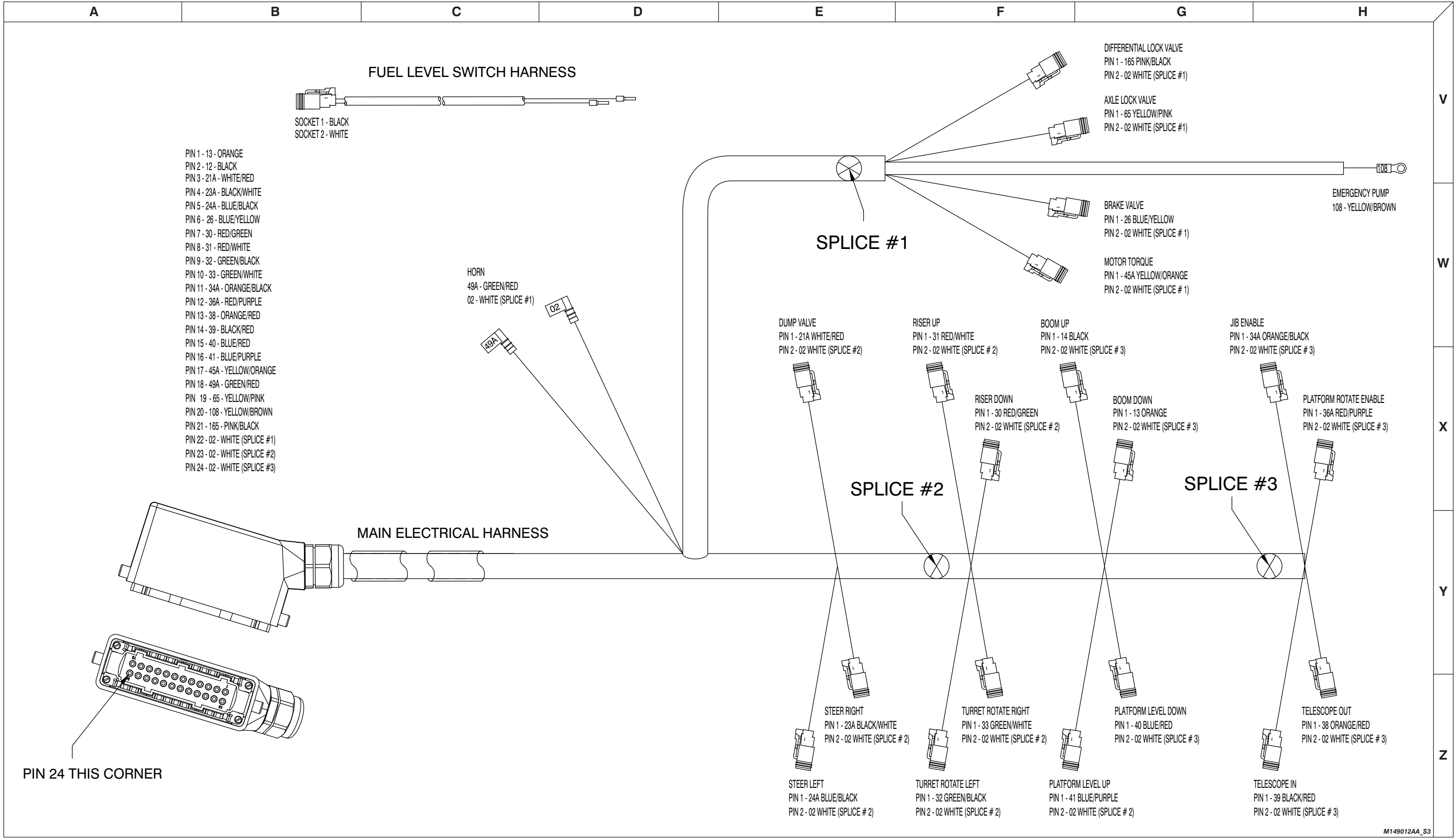


3.11c Main Manifold and Hydraulic Identifications

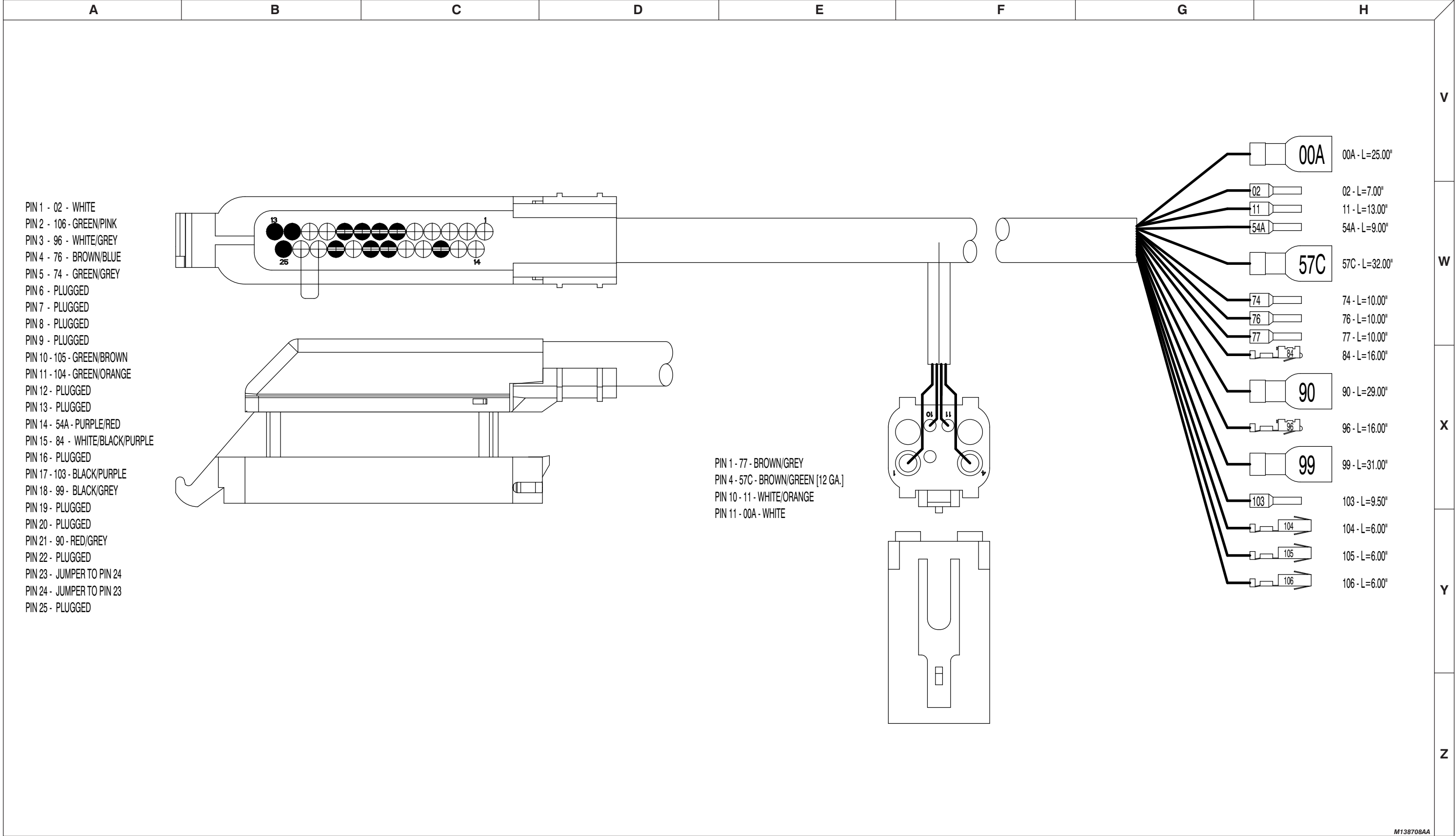


M149107AB_S3B

3.12 Main Electrical Harness and Fuel Level Switch Harness

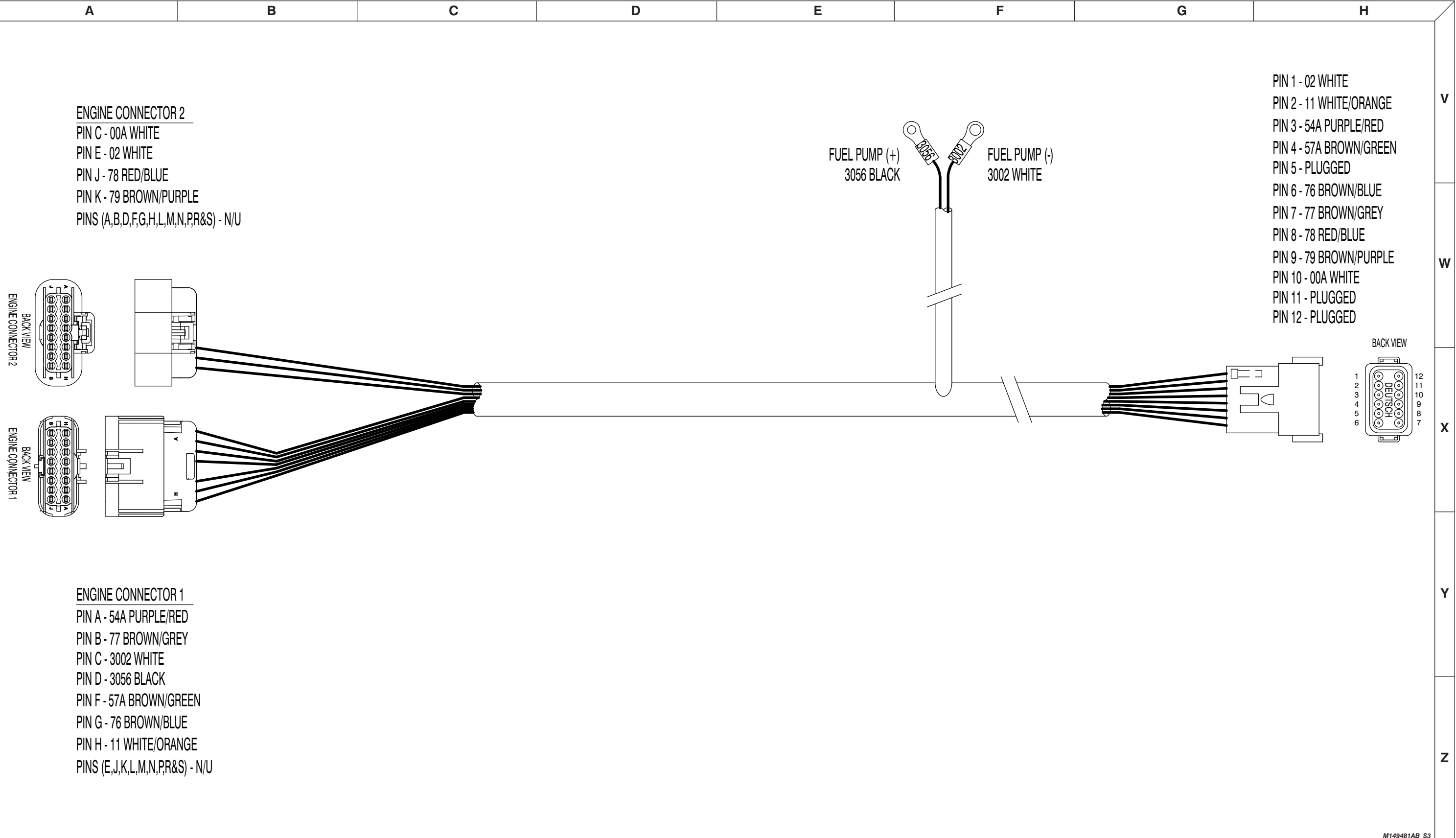


3.13 ECU Engine Wiring Diagram (Deutz Diesel Engine)

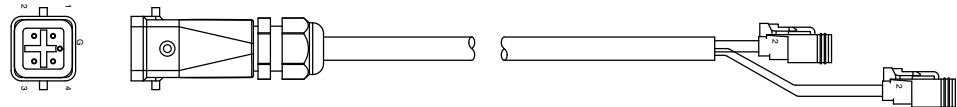
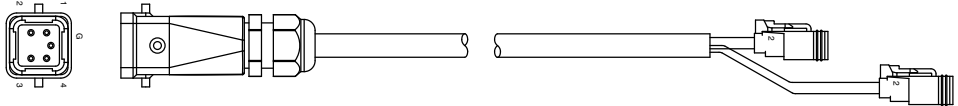
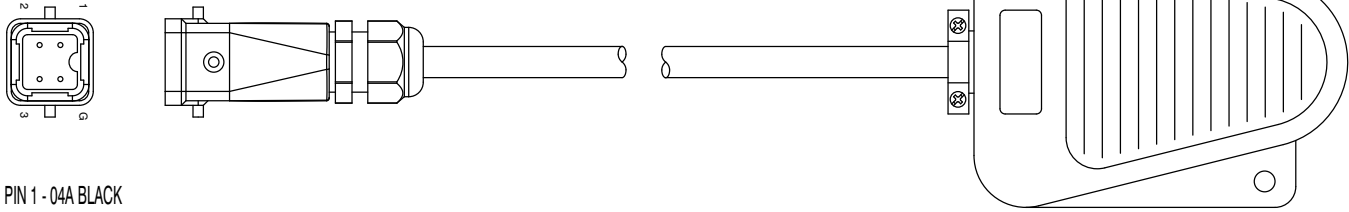


M138708AA

3.15 Engine Interface Harness (GM Dual Fuel Engine)

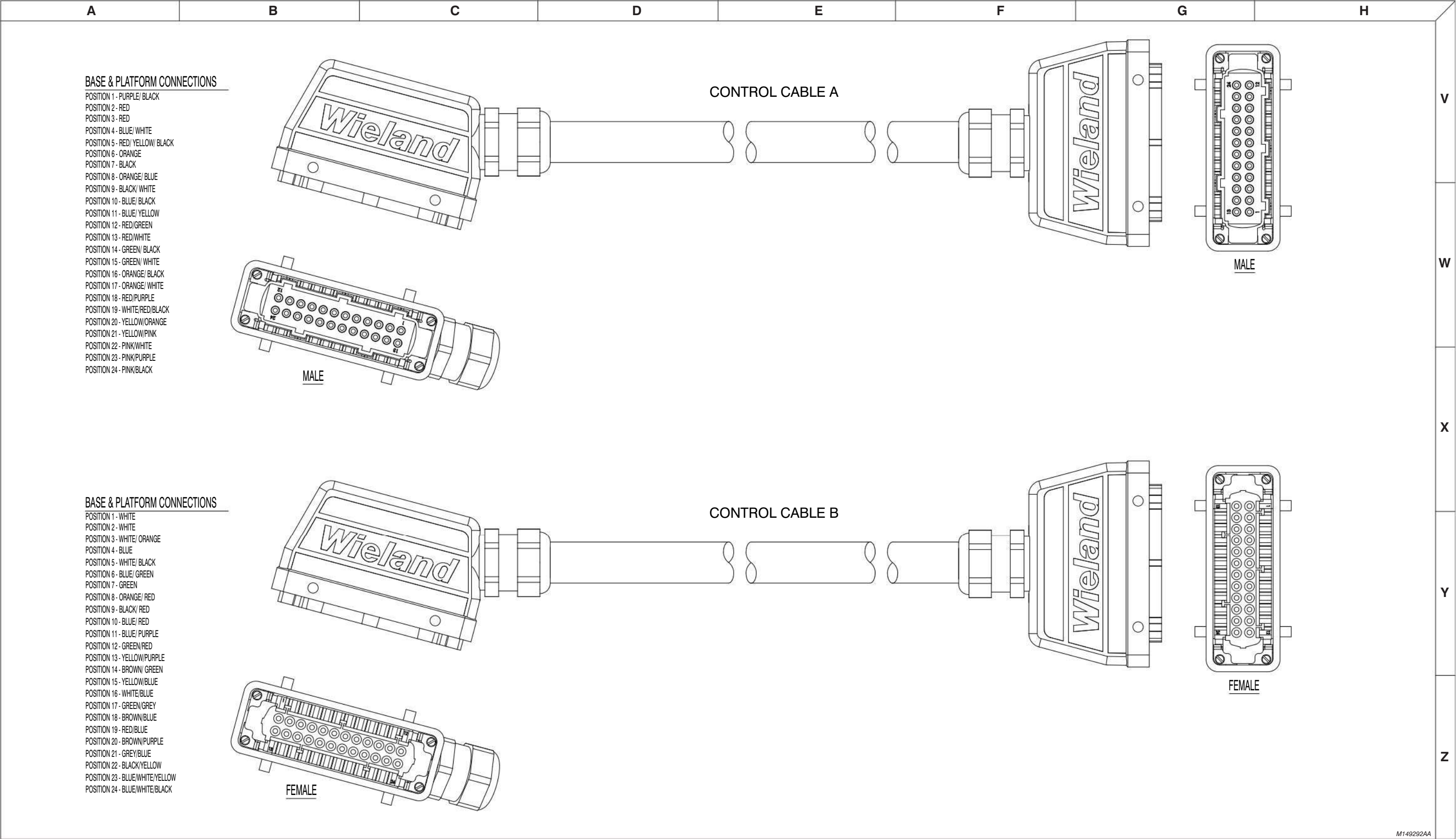


3.16 Harnesses

A	B	C	D	E	F	G	H
JIB VALVE HARNESS				ROTATE VALVE HARNESS			
 SOCKET 1 - 34 ORANGE/BLACK SOCKET 2 - 35 ORANGE/WHITE SOCKET 3 - 02 WHITE SOCKET 4 - 02 WHITE SOCKET G - N/C JIB DOWN PIN 1 - 34 ORANGE/BLACK PIN 2 - 02 WHITE JIB UP PIN 1 - 35 ORANGE/WHITE PIN 2 - 02 WHITE				 PIN 1 - 36 RED/PURPLE PIN 2 - 37 WHITE/RED/BLACK PIN 3 - 02 WHITE PIN 4 - 02 WHITE PIN G - N/C ROTATE CCW PIN 1 - 37 WHITE/RED/BLACK PIN 2 - 02 WHITE ROTATE CW PIN 1 - 36 RED/PURPLE PIN 2 - 02 WHITE			
FOOTSWITCH HARNESS							
 PIN 1 - 04A BLACK PIN 2 - 08A WHITE PIN 3 - N/C PIN G - N/C							

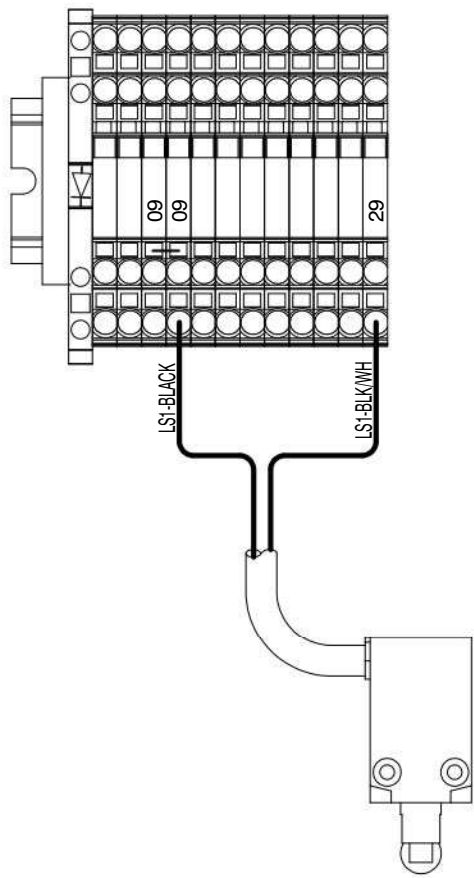
M138717AB M138719AB M138721AB

3.17 Platform Control Cable Harnesses

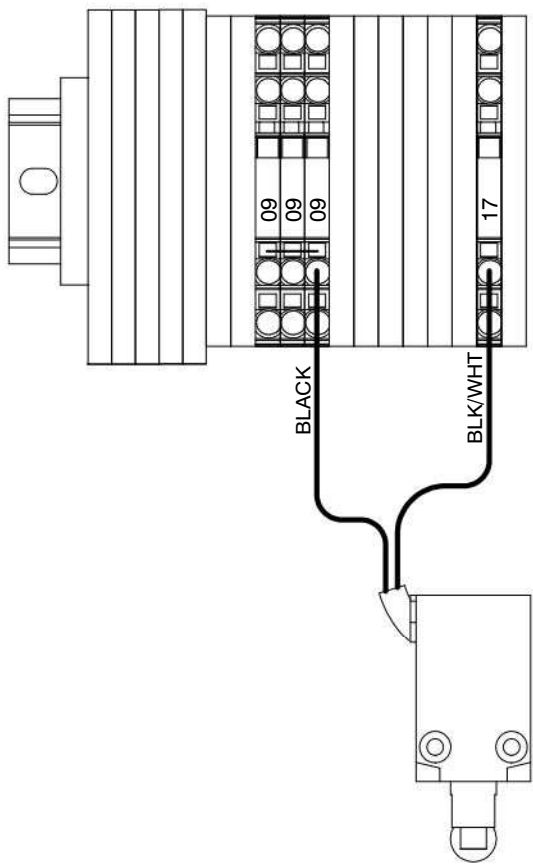


M149292AA

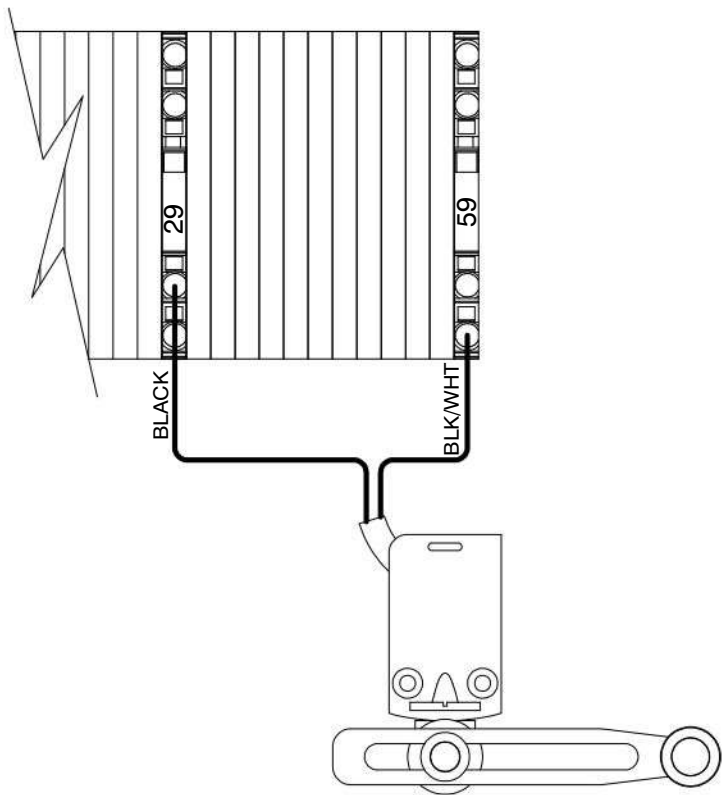
3.18 Limit Switch Connections at Base Control Console



15 DEGREES LIMIT SWITCH



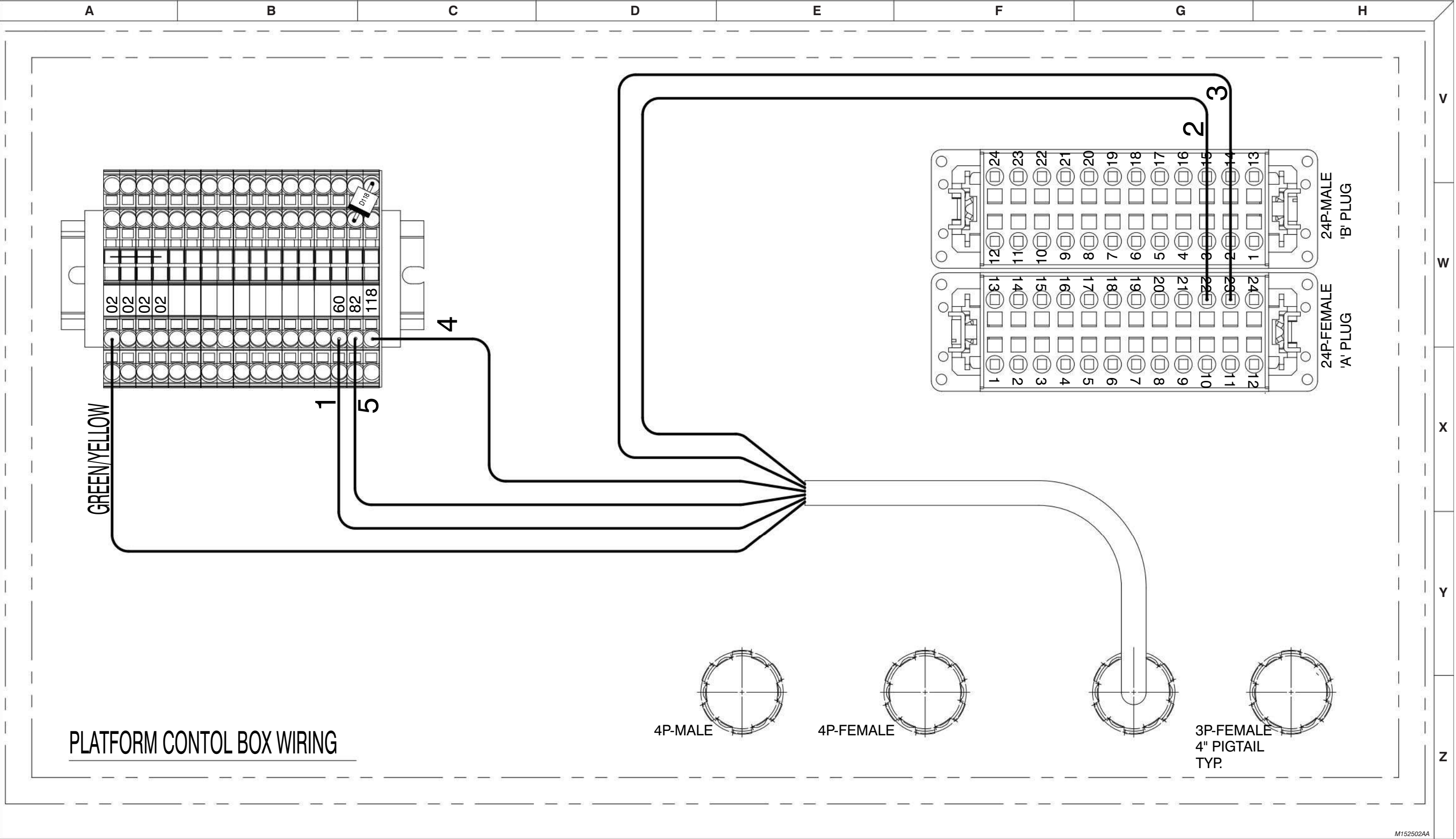
DIRECTIONAL SENSING LIMIT SWITCH



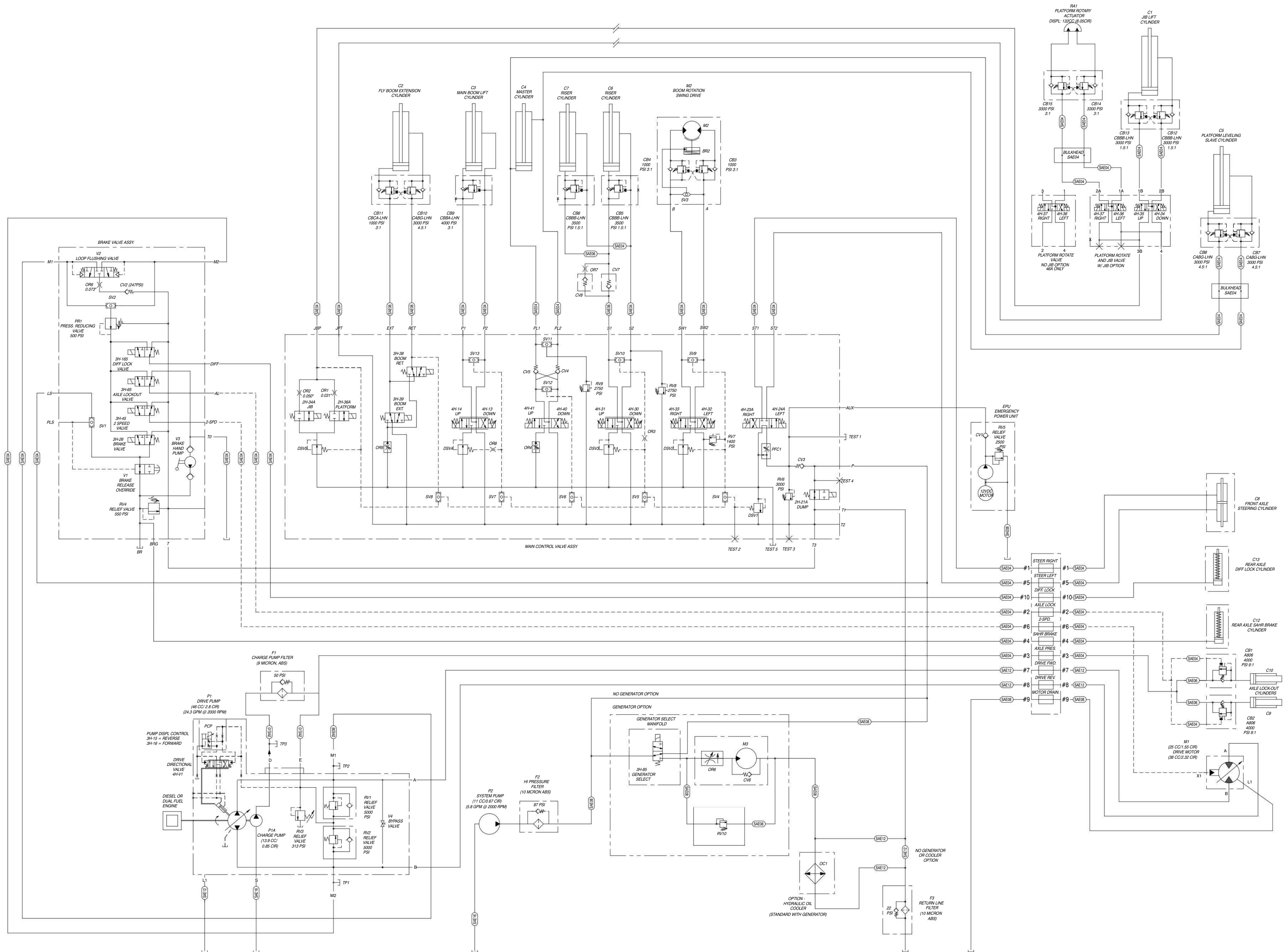
FLY BOOM EXTENSION LIMIT SWITCH

M146245AB_S3

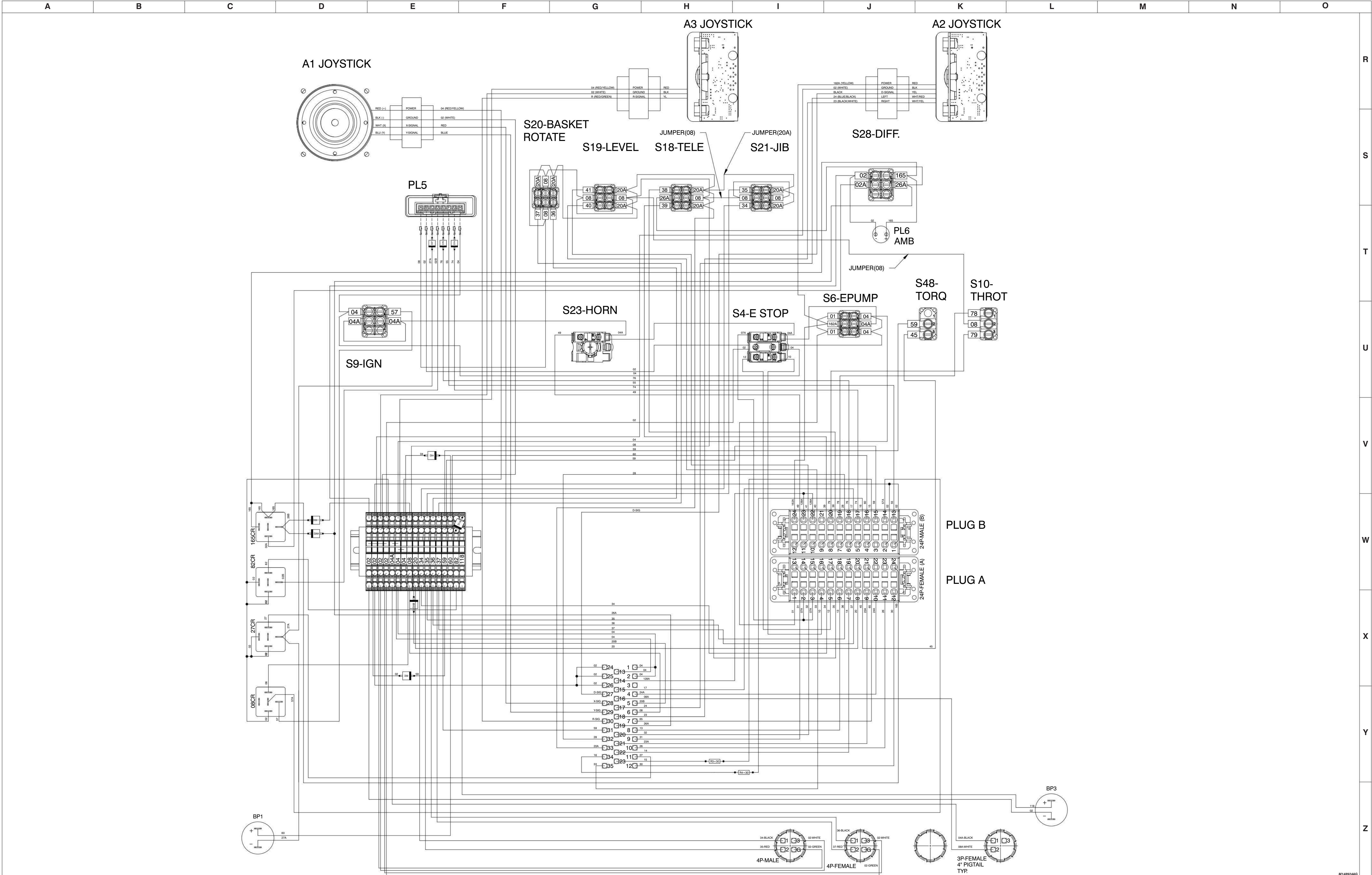
3.19 Load Sensing Cable Connection (CE & AS)

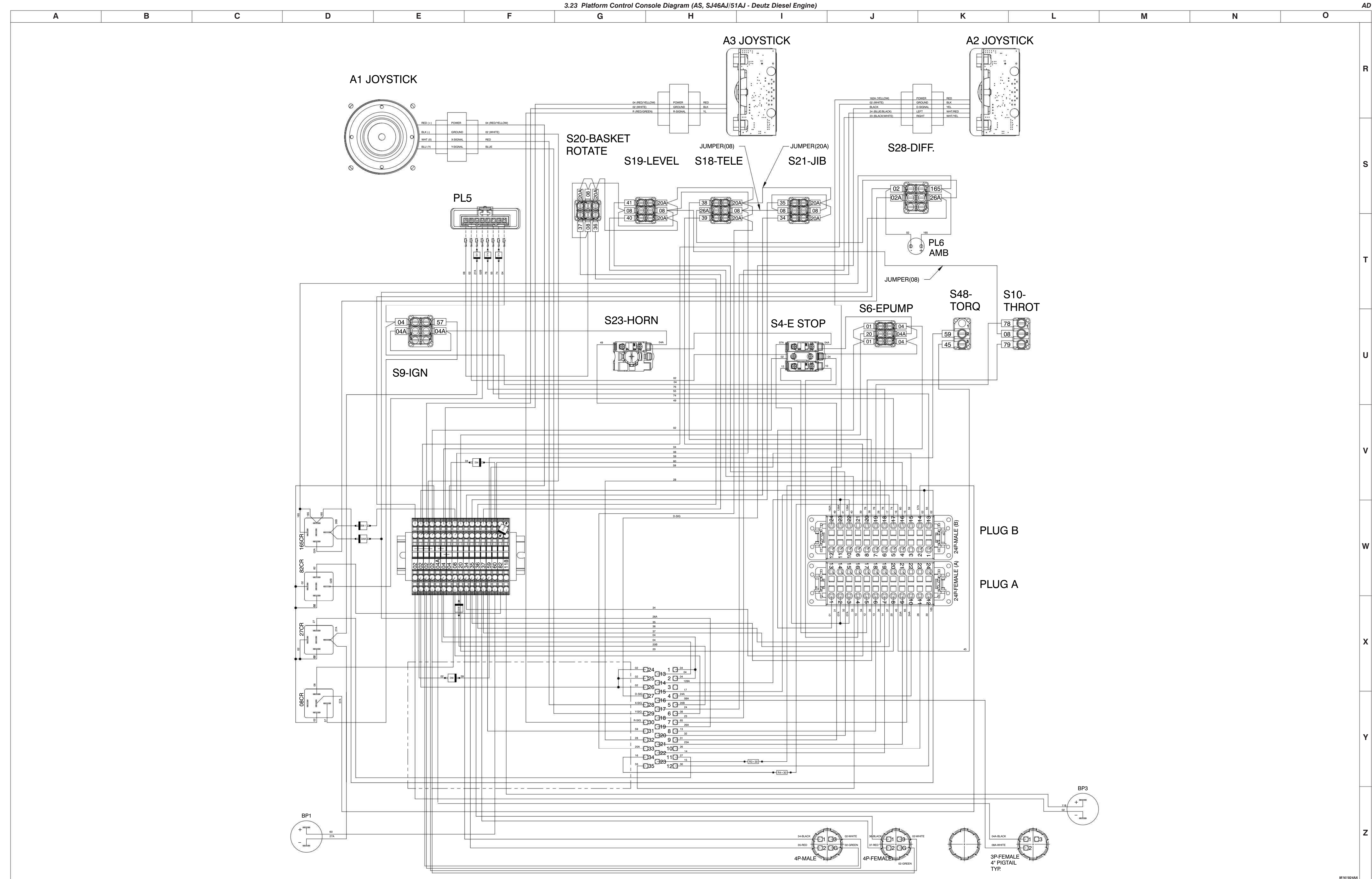


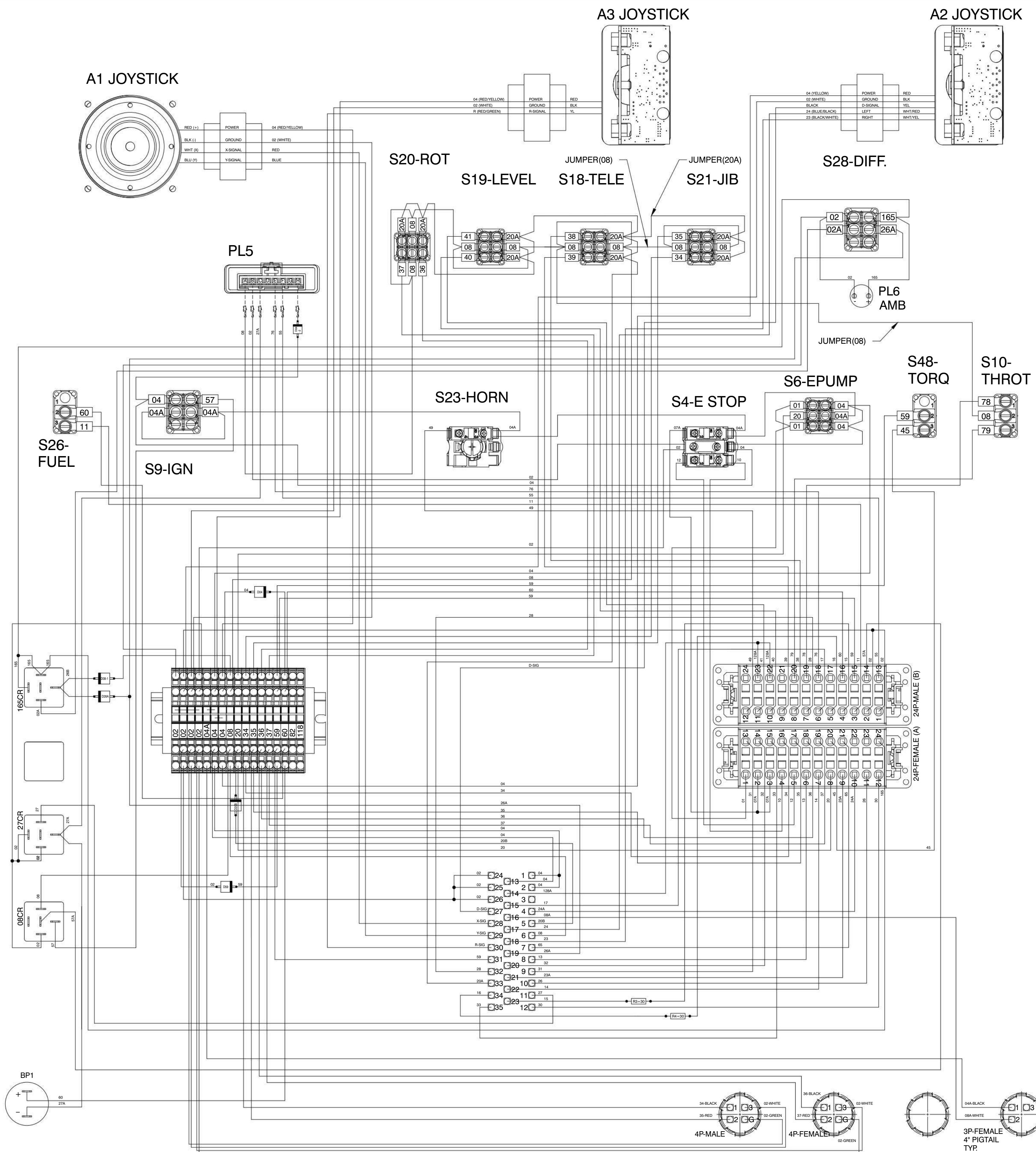
3.20 Hydraulic Schematic Diagram

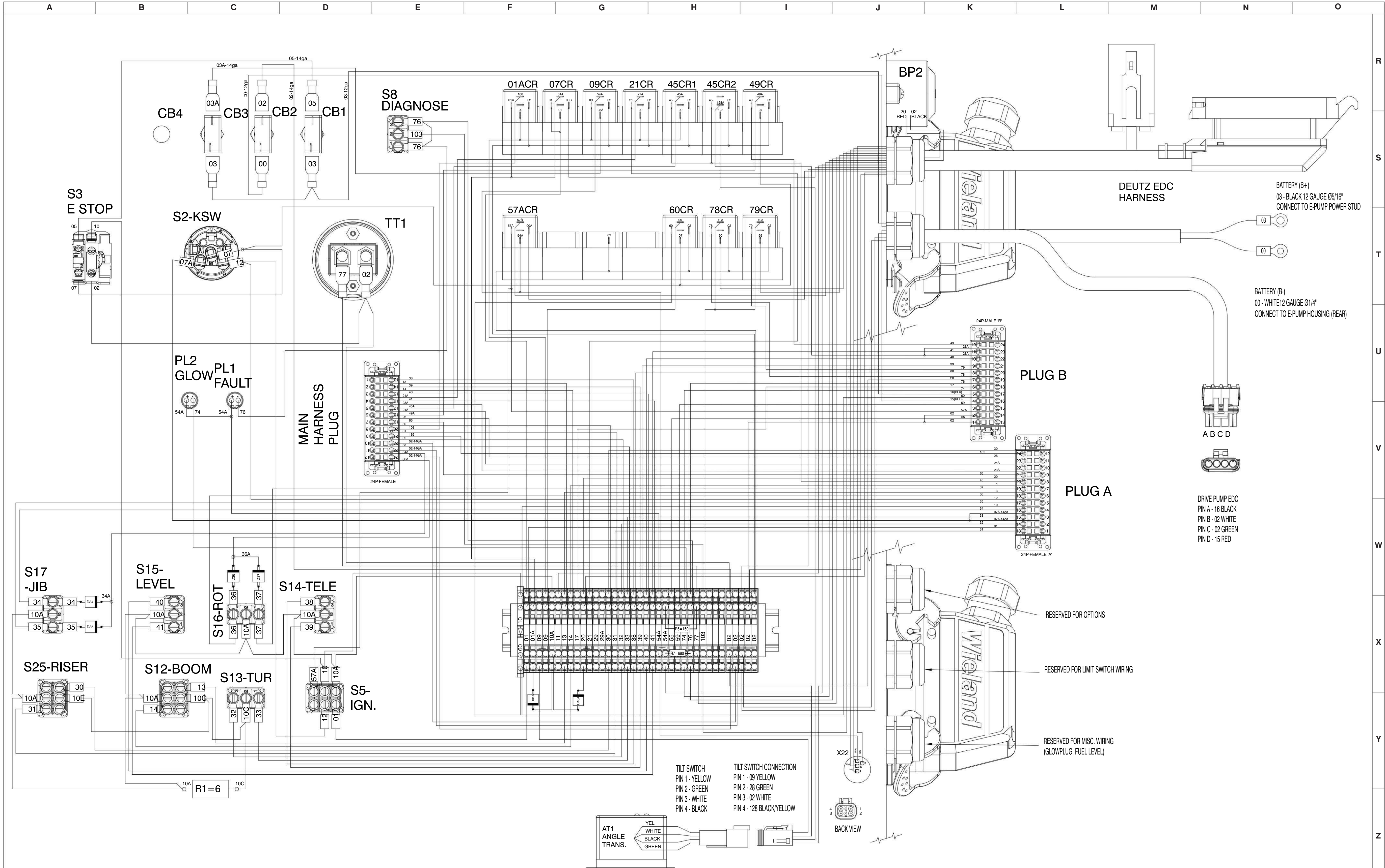












R

3.28b Base Control Console Diagram (ANSI/CSA, SJ46AJ - GM Dual Fuel Engine)

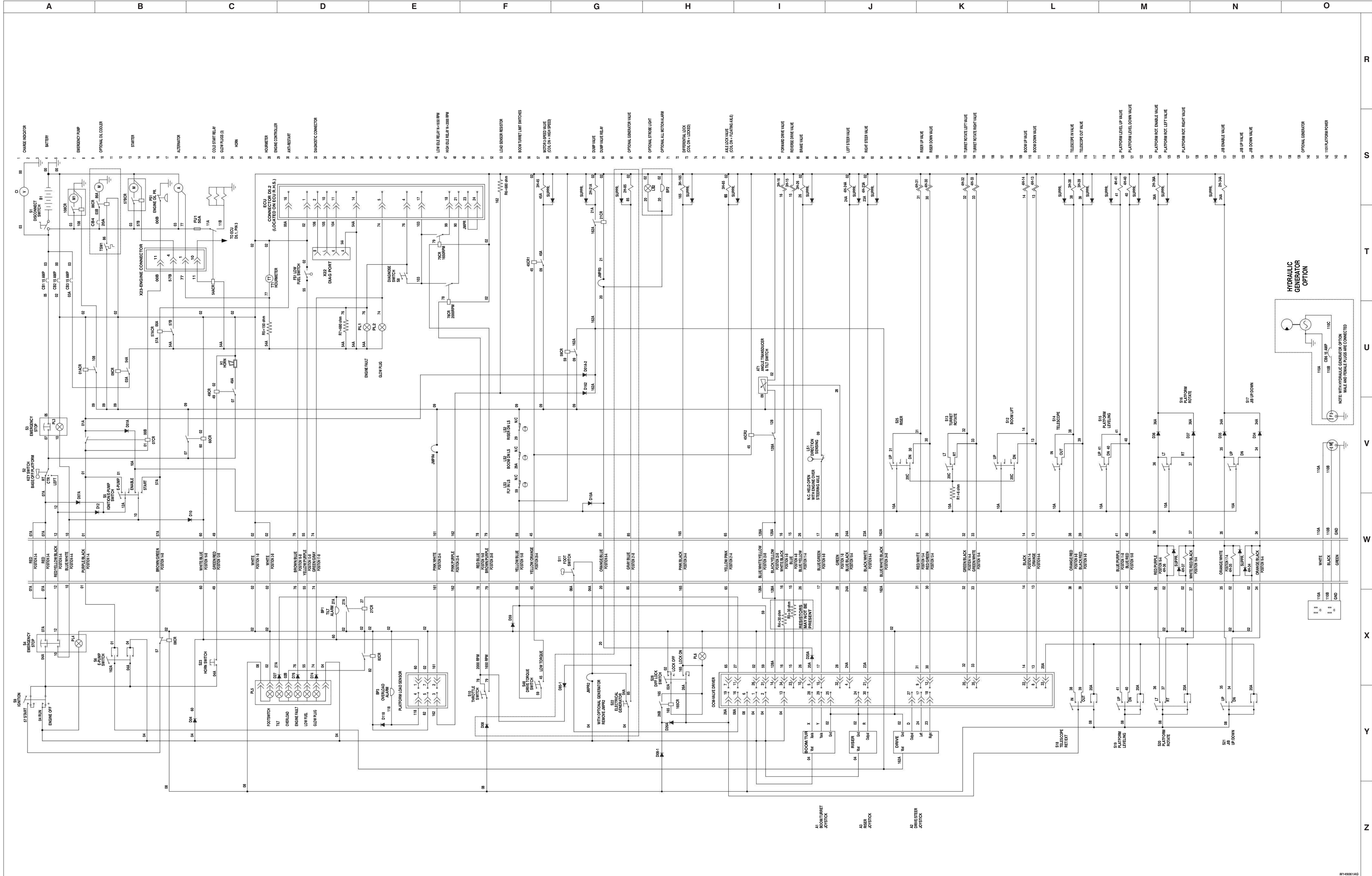
Serial Breakdown Reference Chart

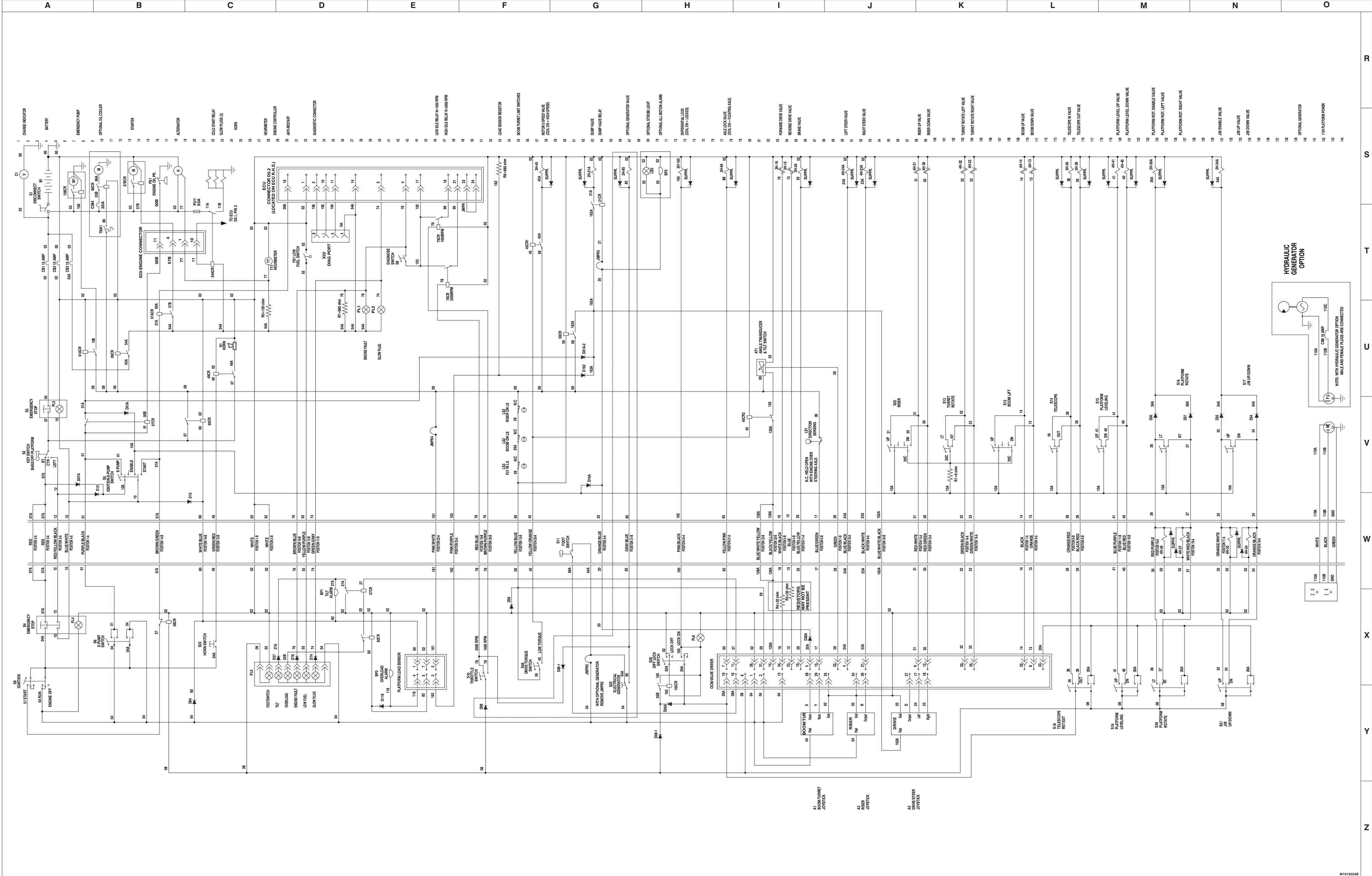
Figure	Serial Number
3.26a	95,000,234 & above
3.26b	95,000,233 & below

Diagram Components and Connections:

- Wiring Harness:** Includes components like S3 E STOP, S2-KSW, TT1, PL1 FAULT, MAIN HARNESS PLUG, S17 -JIB, S15-LEVEL, S16-ROT, S14-TELE, S25-RISER, S12-BOOM, S13-TUR, S5-IGN., and R1=6.
- Relays and Solenoids:** 01ACR, 07CR, 09CR, 21CR, 45CR1, 45CR2, 49CR, 60CR.
- Connectors:** 03A, 03, 00, 05, 03-12ga, 03A-14ga, 05-14ga, 00-12ga, 02, 02-14ga, 03-12ga, 07A, 07, 12, 77, 02, 54A, 76, 36A, 10A, 37, 38, 39, 34, 35, 40, 41, 32, 30, 31, 13, 10C, 14, 10A, 10C, 32, 10C, 33, 57A, 10, 10A, 12, 01, 10A.
- Wiring Diagram:** Shows the main harness plug with 24P-FEMALE and 24P-MALE 'B' connectors, and the engine control unit with 24P-FEMALE 'A' and 24P-MALE 'B' connectors.
- Legend:**
 - BACK VIEW:** PIN 1-02 WHITE, PIN 2-11 WHITE/ORANGE, PIN 3-54A PURPLE/RED, PIN 4-57A BROWN/GREEN, PIN 5-PLUGGED, PIN 6-76 BROWN/BLUE, PIN 7-77 BROWN/GREY, PIN 8-78 RED/BLUE, PIN 9-79 BROWN/PURPLE, PIN 10-00A WHITE, PIN 11-PLUGGED, PIN 12-PLUGGED.
 - BATTERY (B+):** 03 - BLACK 12 GAUGE 05/16" CONNECT TO E-PUMP POWER STUD.
 - BATTERY (B-):** 00 - WHITE 12 GAUGE 01/4" CONNECT TO E-PUMP HOUSING (REAR).
 - DRIVE PUMP EDC:** PIN A - 16 BLACK, PIN B - 02 WHITE, PIN C - 02 GREEN, PIN D - 15 RED.
 - TILT SWITCH:** PIN 1 - YELLOW, PIN 2 - GREEN, PIN 3 - WHITE, PIN 4 - BLACK.
 - TILT SWITCH CONNECTION:** PIN 1 - 09 YELLOW, PIN 2 - 28 GREEN, PIN 3 - 02 WHITE, PIN 4 - 128 BLACK/YELLOW.
 - AT1 ANGLE TRANS.:** YEL, GREEN, WHITE, BLACK.
 - RESERVED FOR OPTIONS, RESERVED FOR LIMIT SWITCH WIRING, RESERVED FOR MISC. WIRING (DIRECTION SWITCH, FUEL LEVEL):** Indicated on the engine control unit.

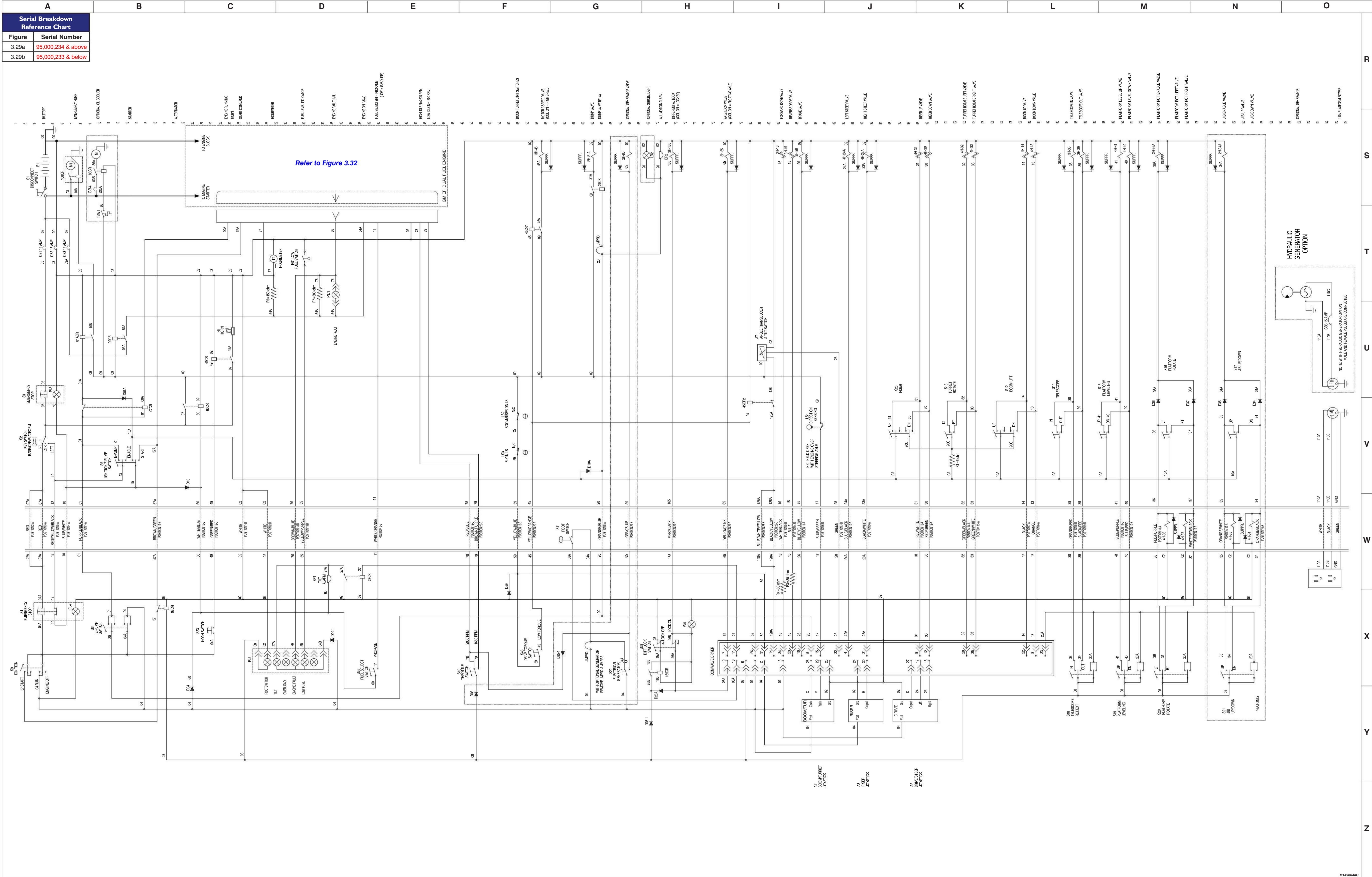


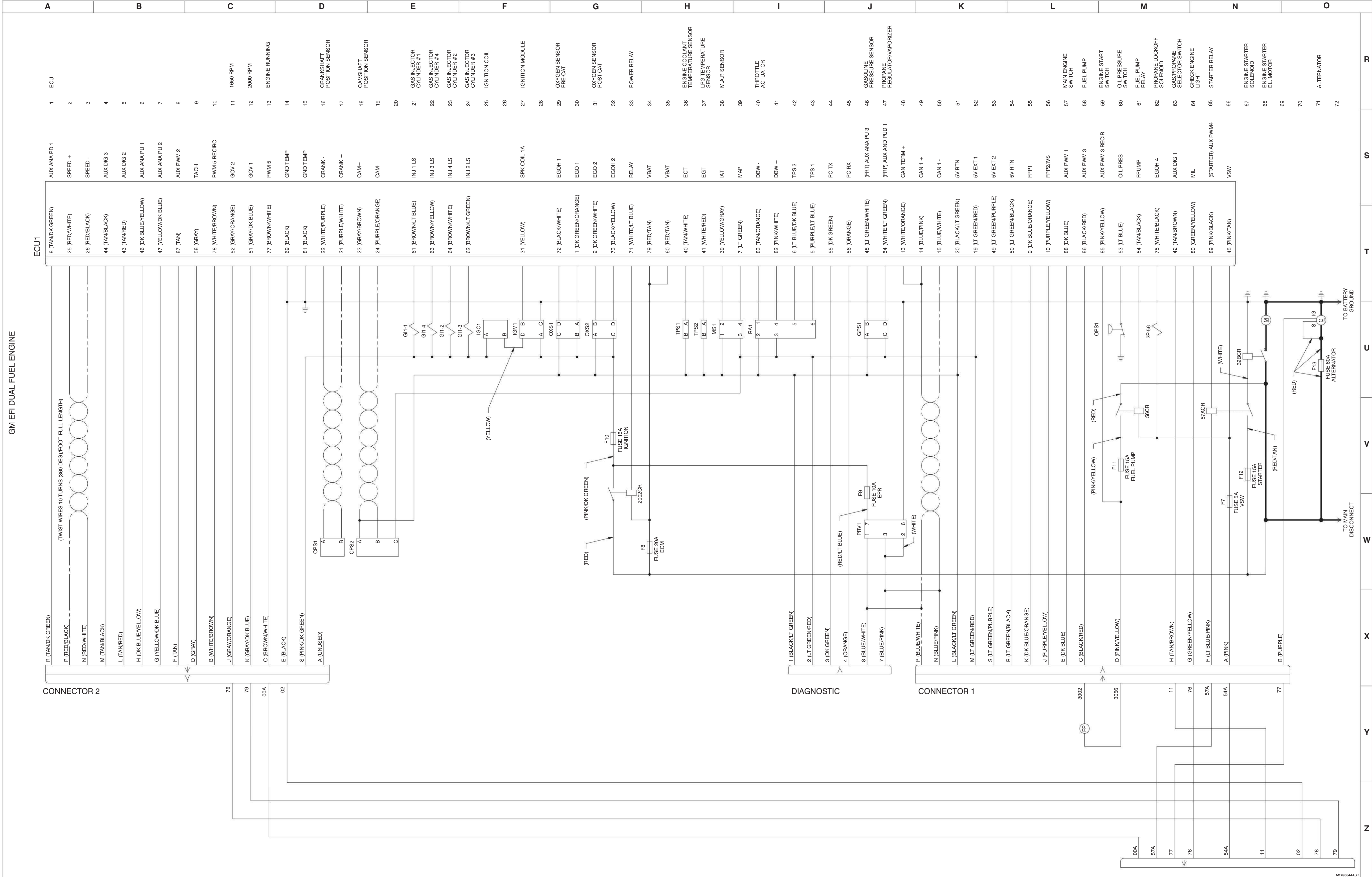




M14S064AJ

3.32b Electrical Schematic Diagram (ANSI/CSA, SJ46AJ - GM Dual Fuel Engine)





The diagram illustrates the electrical wiring for a vehicle's engine and related components. It features a GCP 90-way connector on the left, which is connected to various sensors and actuators. The wiring includes:

- Sensors:** GPS1 (Gasoline Sensor Interface), TPS2 (LPG Temperature), 2P-56 (Lockoff), OXS2 (EGO 2), OXS1 (EGO 1), MS1 (Bosch TMAP), ECT (Engine Coolant Temperature), TPS1 (Throttle Position Sensor), and a 12V Relay Power Connector.
- Vehicle Interface Connectors:** CONNECTOR 1 and CONNECTOR 2, which interface with the vehicle's electrical system.
- Diagnostic Connector:** A connector for diagnostic purposes.
- Engine Components:** IGC1 (Ignition Coil), IGM1 (Ignition Module), CPS1 (Crankshaft Position Sensor), CPS2 (Camshaft Position Sensor), RA1 (Bosch Throttle), Starter Solenoid, Starter Relay (57ACR), ECM (F8), Starter (F12), Ignition (F10), EPR (F9), Fuel Pump Relay (56CR), Fuel Pump (F11), and Alternator (F13).
- Wiring Details:** The diagram shows the specific wire colors and pin numbers for each component, along with the required twist wire turns and ground connections.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
														R
														S
														T
														U
														V
														W
														X
														Y
														Z

3.35 All Motion Alarm Connections (CE & AS)

A

B

C

D

E

F

G

H

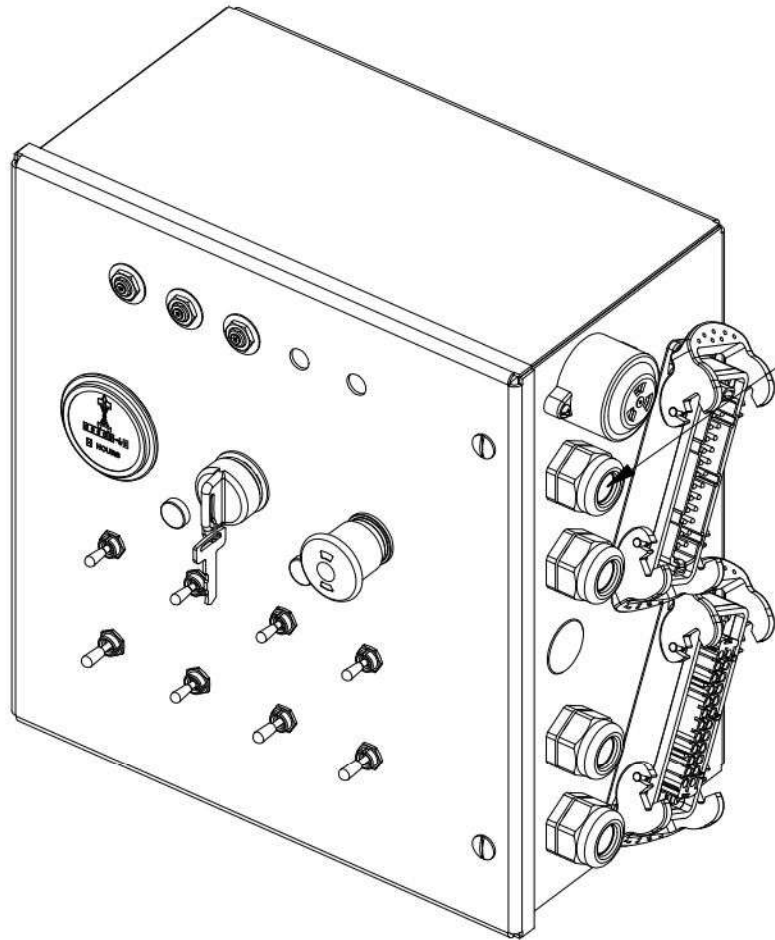
V

W

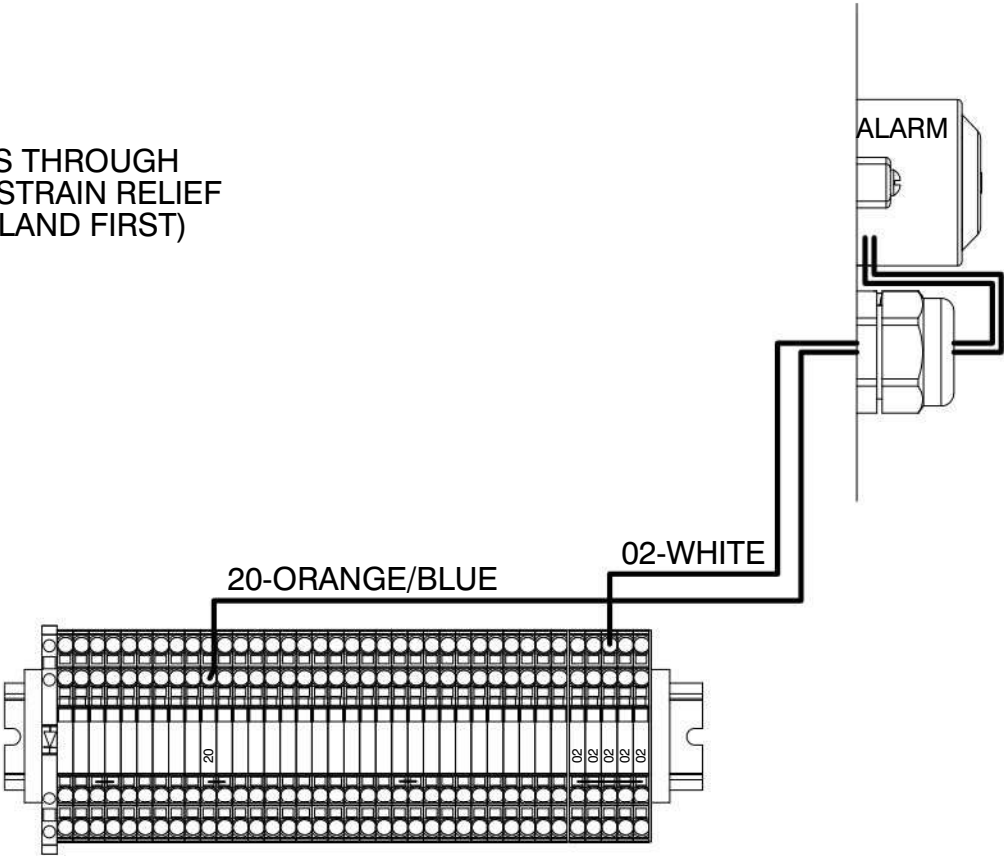
X

Y

Z

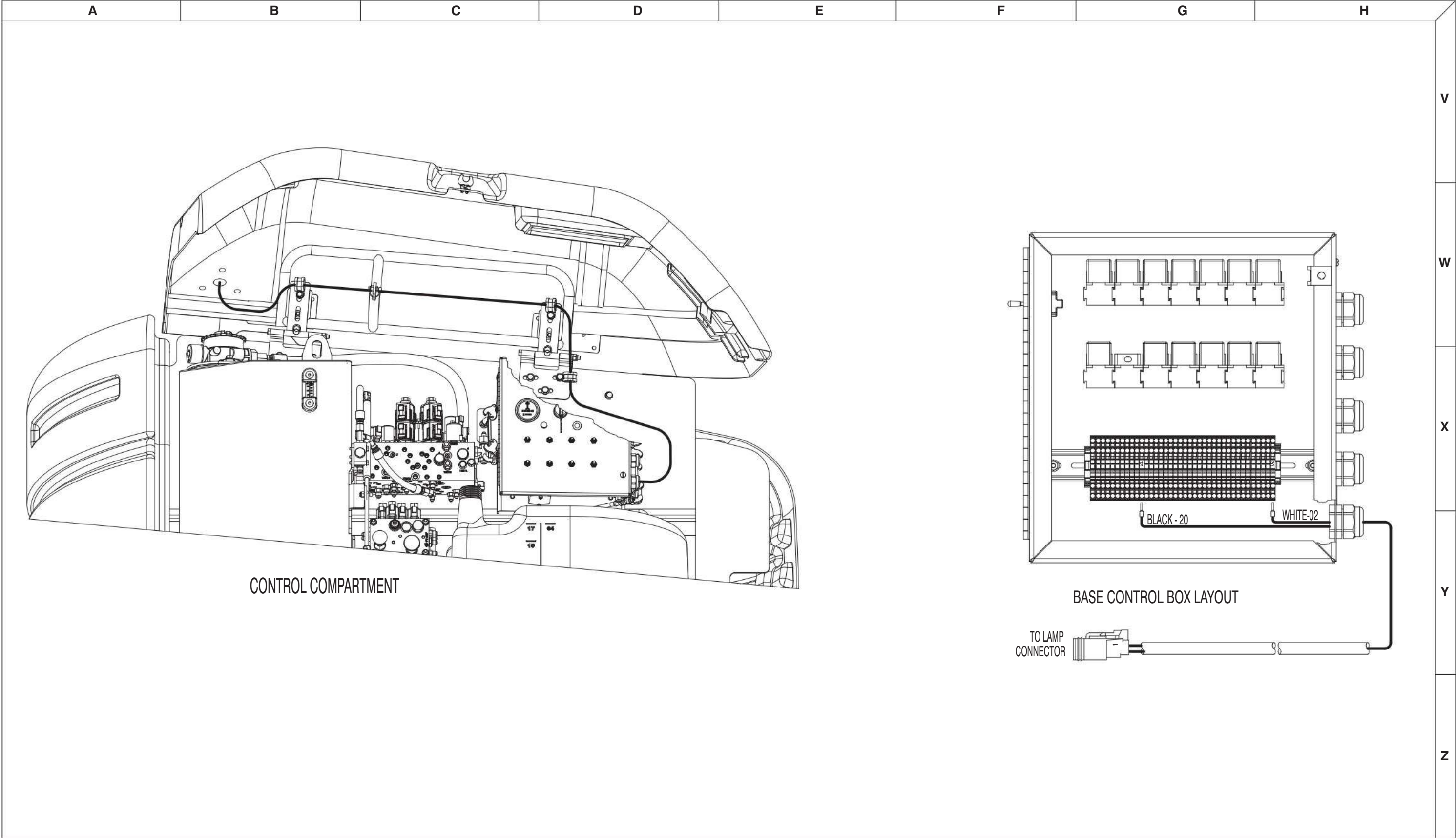


PASS WIRES THROUGH
TOP-MOST STRAIN RELIEF
(LOOSEN GLAND FIRST)



-WIRE INSTALLATION-

3.36 Flashing Amber Light Option



Section 4

TROUBLESHOOTING INFORMATION

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Introduction

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

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

1. Probable Cause
 - Remedy

NOTE

All tests should be performed with boom over non-steering axle.

4.1 Electrical System

4.1-1 All Controls Inoperative

1. Battery disconnected or discharged.
 - [Connect battery or recharge.](#)
2. Loose or broken wire #03 from battery to circuit breaker CB1.
 - [Check continuity. Replace if defective.](#)
3. Circuit breaker CB1 tripped or defective.
 - [Reset breaker, check for defective wiring. Replace if defective.](#)
4. Loose or broken wire #05 from circuit breaker CB1 to base emergency stop switch S3.
 - [Check continuity. Replace if defective.](#)
5. Open or defective base emergency stop switch S3.
 - [Close switch. Replace if defective.](#)
6. Loose or broken wire #07 from base emergency stop switch S3 to base key S2.
 - [Check continuity. Replace if defective.](#)
7. Open or defective key select switch S2.
 - [Close switch. Replace if defective.](#)
8. Loose or broken wire #60 from base terminal block to relay 60CR.
 - [Check continuity. Replace if defective.](#)
9. Loose or broken wire #07 from base emergency stop switch S3 to relay 60CR.
 - [Check continuity. Replace if defective.](#)
10. Loose or broken wire #02 from relay 60CR to base terminal block.
 - [Check continuity. Replace if defective.](#)
11. Defective relay 60CR.
 - [Check relay. Replace if defective.](#)
12. Loose or broken wire #9 from relay 60CR to base terminal block.
 - [Check continuity. Replace if defective.](#)
13. Loose or broken wire #02 from base terminal block to circuit breaker CB2.
 - [Check continuity. Replace if defective.](#)
14. Circuit breaker CB2 tripped or defective.
 - [Reset breaker, check for defective wiring. Replace if defective.](#)
15. Loose or broken wire #00 from circuit breaker CB2 to battery negative.
 - [Check continuity. Replace if defective.](#)

4.1-2 No Power To Platform

1. Open or defective key select switch S2.
 - [Close switch. Replace if defective.](#)
2. Loose or broken wire #07A from key select switch S2 to plug A pins # 2 & 3 in base control console.
 - [Check continuity. Replace if defective.](#)
3. Loose or broken wire #07A from plug A pins # 2 & 3 in platform control console to platform emergency stop switch S4.
 - [Check continuity. Replace if defective.](#)
4. Open or defective platform emergency stop switch S4.
 - [Check switch. Replace if defective.](#)

4.1-3 No Power to Base

1. Open or defective base key switch S2.
 - [Select base position on key switch. Check continuity through base key switch. Replace if defective.](#)

2. Loose or broken wire #12 from base key switch S2 to start switch S5. (ANSI/CSA)
 - Check continuity. Replace if defective.
3. Loose or broken wire #12 from base key switch S2 to diode D12. (CE)
 - Check continuity. Replace if defective.
4. Loose or broken wire #12A from diode D12 to start switch S5. (CE)
 - Check continuity. Replace if defective.
5. Loose or broken wire #12 from base key switch S2 to base connector plug A pin #5.
 - Check continuity. Replace if defective.
6. Loose or broken wire #12 in boom cable A or its connectors.
 - Check for continuity between pins #5 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
7. Loose or broken wire #12 from plug A pin #5 to emergency stop switch S4 in platform control console.
 - Check continuity. Replace if defective.
8. Open or defective emergency stop switch S4.
 - Check switch is in on position. Check continuity through switch. Replace if defective.
9. Loose or broken wire #10 from emergency stop switch S4 to plug A pin #4.
 - Check continuity. Replace if defective.
10. Loose or broken wire #10 in boom cable A or its connectors.
 - Check for continuity between pins #4 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
11. Loose or broken wire #10 from plug A pin #4 to base terminal block.
 - Check continuity. Replace if defective.
12. Loose or broken wire #10 from base terminal block to base start switch S5.
 - Check continuity. Replace if defective.

4.1-4 Engine Will Not Crank from Base

1. Loose or broken wire #10 from base terminal block to base start switch S5.
 - Check continuity. Replace if defective.
2. Loose or broken wire #57A from base start switch S5 to relay 08CR.
 - Check continuity. Replace if defective.
3. Defective base start switch S5.
 - Check start button. Replace if defective.

4.1-5 Engine Will Not Crank from Platform

NOTE

Engine will not crank from platform with footswitch depressed.

1. Loose or broken wire #4A from emergency stop switch S4 to start switch S6.
 - Check continuity. Replace if defective.
2. Defective start switch S6.
 - Check continuity through switch. Replace if defective.
3. Loose or broken wire #57 from start switch S6 to relay 08CR.
 - Check continuity. Replace if defective.
4. Defective relay 08CR.
 - Check continuity through contacts of relay. Replace if defective.
5. Loose or broken wire #57A from relay 08CR to plug B pin #14.
 - Check continuity. Replace if defective.
6. Loose or broken wire #57A in boom cable B or its connectors.
 - Check for continuity between pin #14 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.

7. Loose or broken wire #57A from plug B pin #14 to relay 57ACR in base control console.
 - Check continuity. Replace if defective.

4.1-6 Engine Will Not Crank from Platform or Base (Deutz Diesel)

1. Loose or broken wire #57A at relay 57ACR.
 - Check the connection at relay. Check for voltage on relay.
2. Loose or broken wire #54A from relay 57ACR to relay 09CR.
 - Check continuity. Replace if defective.
3. Loose or broken wire #00A from ECU connector pin #16 to relay 57ACR.
 - Check continuity. Replace if defective.
4. Defective relay 57ACR.
 - Check relay. Replace if defective.
5. Loose or broken wire #09 from base terminal block to relay 09CR.
 - Check continuity. Replace if defective.
6. Loose or broken wire #03A from circuit breaker CB3 to relay 09CR.
 - Check continuity. Replace if defective.
7. Tripped or defective circuit breaker CB3.
 - Reset circuit breaker. Check continuity through circuit breaker. Replace if defective.
8. Loose or broken wire #3 from circuit breaker CB3 to circuit breaker CB1.
 - Check continuity. Replace if defective.
9. Loose or broken wire #02 from relay 09CR to base terminal block.
 - Check continuity. Replace if defective.
10. Defective relay 09CR.
 - Check relay. Replace if defective.
11. Loose or broken wire #57B from relay 57ACR to X23 engine connector pin #4.
 - Check continuity. Replace if defective.
12. Loose or broken wire #57B from X23 engine plug to start solenoid 57BCR.
 - Check continuity. Replace if defective.
13. Loose or broken starter cable #03 from disconnect switch S1 to start solenoid 57BCR.
 - Check continuity. Replace if defective.
14. Defective start solenoid 57BCR.
 - Check solenoid. Replace if defective.
15. Defective starter motor.
 - Check starter motor. Replace if defective.

4.1-7 Engine Cranks but Will Not Start (Deutz Diesel)

1. Loose or broken wire #54A from base terminal block to ECU connector pin #14.
 - Check continuity. Replace if defective.
2. Glow plug circuit not operating.
 - See "Glow Plug Circuit Inoperative" in this section.
3. No fuel in fuel tank or fuel line obstructions.
 - Check fuel level and flow through lines. Fill or repair if necessary.

NOTE

For other engine related problems, consult engine manufacturer's manual.

4.1-8 Engine Will Not Crank from Platform or Base Control (GM Dual Fuel)

1. Loose or broken wire #54A from base terminal block TB1 to engine harness plug.
 - Check continuity. Replace if defective.
2. Loose or broken wire #54A from engine harness plug to GM engine connector 1.
 - Check continuity. Replace if defective.

3. Loose or broken pink wire from GM engine connector 1 to fuse F7.
 - Check continuity. Replace if defective.
4. Defective fuse F7.
 - Check fuse. Replace if defective
5. Loose or broken pink/tan wire from fuse F7 to ECU connector pin #45.
 - Check continuity. Replace if defective
6. Loose or broken red wire from battery positive to ECU fuse F8.
 - Check continuity. Replace if defective.
7. Defective fuse F8.
 - Check fuse. Replace if defective.
8. Loose or broken red/tan wire from fuse F8 to ECU connector pin #60 and pin #79.
 - Check continuity. Replace if defective.
9. Loose or broken black wire from engine ground to ECU connector pin #69 and #81.
 - Check continuity. Replace if defective.
10. Loose or broken light blue/pink wire from GM engine connector 1 to relay 57ACR.
 - Check continuity. Replace if defective.
11. Loose or broken pink/black wire from ECU connector pin #89 to relay 57ACR.
 - Check continuity. Replace if defective.
12. Defective relay 57ACR.
 - Check relay. Replace if defective.
13. Loose or broken red wire from battery positive to starter fuse F12.
 - Check continuity. Replace if defective.
14. Defective fuse F12.
 - Check fuse. Replace if defective.
15. Loose or broken red/tan wire from fuse F12 to relay 57ACR.
 - Check continuity. Replace if defective.
16. Loose or broken white wire from relay 57ACR to start solenoid 32BCR.
 - Check continuity. Replace if defective.
17. Defective starter solenoid 32BCR.
 - Check solenoid. Replace if defective.
18. Loose or broken battery cable from starter solenoid 32BCR to starter motor.
 - Check continuity. Replace if defective.
19. Defective starter motor.
 - Check motor. Repair or replace if defective.

4.1-9 Engine Cranks but Will Not Start (GM Dual Fuel)

NOTE

For additional engine troubleshooting refer to diagnostic trouble codes for use with the check engine light.

1. Loose or broken red wire from battery positive to relay 2002CR.
 - Check continuity. Replace if defective.
2. Loose or broken red/tan wire from ECU fuse F8 to relay 2002CR.
 - Check continuity. Replace if defective.
3. Loose or broken white/ light blue wire from ECU connector pin #71 to relay 2002CR.
 - Check continuity. Replace if defective.
4. Defective relay 2002CR.
 - Check relay. Replace if defective.
5. Loose or broken pink/dark green wire from relay 2002CR to ignition fuse F10.
 - Check continuity. Replace if defective.

6. Defective fuse F10.
 - [Check fuse. Replace if defective.](#)
7. Loose or broken pink/dark green wire from fuse F10 to ignition coil IGC1 pin #A.
 - [Check continuity. Replace if defective.](#)
8. Loose or broken yellow wire from ignition coil IGC1 pin #B to ignition module IGM1.
 - [Check continuity. Replace if defective.](#)
9. Defective ignition coil IGC1.
 - [Check coil for spark. Replace if defective.](#)
10. Loose or broken pink/dark green wire from fuse F10 to ignition module IGM1 pin #A.
 - [Check continuity. Replace if defective.](#)
11. Loose or broken black wire from ignition module IGM1 pin #C to engine ground.
 - [Check continuity. Replace if defective.](#)
12. Loose or broken yellow wire from ignition module IGM1 pin #B to ECU connector pin #31.
 - [Check continuity. Replace if defective.](#)
13. Defective ignition module IGM1.
 - [Check module for operation. Replace if defective.](#)
14. Loose or broken pink/dark green wire from fuse F10 to gas injectors GI-1, GI-2, GI-3 and GI-4.
 - [Check continuity. Replace if defective.](#)
15. Loose or broken pink/white wire from ECU connector pin #82 to throttle actuator RA1.
 - [Check continuity. Replace if defective.](#)
16. Loose or broken tan/orange wire from ECU connector pin #83 to throttle actuator RA1.
 - [Check continuity. Replace if defective.](#)
17. Loose or broken light green/red wire from ECU connector pin #19 to throttle actuator RA1.
 - [Check continuity. Replace if defective.](#)
18. Loose or broken black/light green wire from ECU connector pin #20 to throttle actuator RA1.
 - [Check continuity. Replace if defective.](#)
19. Loose or broken light blue/dark blue wire from ECU connector pin #6 to throttle actuator RA1.
 - [Check continuity. Replace if defective.](#)
20. Loose or broken purple/light blue wire from ECU connector pin #5 to throttle actuator RA1.
 - [Check continuity. Replace if defective.](#)

Fuel Related Problems (Gasoline Only)

21. Loose or broken pink/tan wire from fuse F7 to fuel pump relay 56CR.
 - [Check continuity. Replace if defective.](#)
22. Loose or broken red wire from battery positive to fuel pump relay 56CR.
 - [Check continuity. Replace if defective.](#)
23. Loose or broken tan/black wire from ECU connector pin #84 to fuel pump relay 56CR.
 - [Check continuity. Replace if defective.](#)
24. Defective fuel pump relay 56CR.
 - [Check relay. Replace if defective.](#)
25. Loose or broken pink/yellow wire from fuel pump relay 56CR to fuse F11.
 - [Check continuity. Replace if defective.](#)
26. Defective fuse F11.
 - [Check fuse. Replace if defective.](#)
27. Loose or broken pink/yellow wire from fuse F11 to fuel pump FP.
 - [Check continuity. Replace if defective.](#)
28. Defective fuel pump FP.
 - [Check fuel pump by putting 12 volts and a ground to it. Replace if defective.](#)
29. Loose or broken wire #3002 from fuel pump FP to GM engine connector 1.
 - [Check continuity. Replace if defective.](#)

30. Loose or broken black/red wire from GM engine connector to ECU connector pin #86.
 - Check continuity. Replace if defective.

(Propane Only)**NOTE**

The fuel select switch is defaulted to gasoline. The engine will run on gasoline if propane is selected from the switch and either the switch is bad or a wire is loose or broken from the switch. This is providing there is nothing wrong on the gasoline side of the system. Disconnect fuel pump to test propane side.

31. Loose or broken wire #60 from platform terminal block to fuel select switch S26.
 - Check continuity. Replace if defective.
32. Defective fuel select switch S26.
 - Check switch. Replace if defective.
33. Loose or broken wire #11 from fuel select switch S26 to plug B pin #15 in platform control console.
 - Check continuity. Replace if defective.
34. Loose or broken wire #11 in boom cable B or its connectors.
 - Check continuity between pins #15 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
35. Loose or broken wire #11 from plug B pin #15 to engine harness plug.
 - Check continuity. Replace if defective.
36. Loose or broken wire #11 from engine harness plug to GM engine connector 1.
 - Check continuity. Replace if defective.
37. Loose or broken tan/brown wire from GM engine connector 1 to ECU connector pin #42.
 - Check continuity. Replace if defective.
38. Loose or broken pink/tan wire from fuse F7 to propane lock off 2P-56.
 - Check continuity. Replace if defective.
39. Loose or broken white/black wire from ECU connector pin #75 to propane lock off 2P-56.
 - Check continuity. Replace if defective.
40. Defective propane lock off 2P-56.
 - Check lock off. Replace if defective.
41. Loose or broken pink/dark green wire from fuse F10 to fuse F9.
 - Check continuity. Replace if defective.
42. Defective fuse F9.
 - Check fuse. Replace if defective.
43. Loose or broken red/light blue wire from fuse F9 to propane regulator PRV1.
 - Check continuity. Replace if defective.
44. Loose or broken black wire from engine ground to propane regulator PRV1.
 - Check continuity. Replace if defective.

4.1-10 Glow Plug Circuit Inoperative

1. Defective glow plug fuse FU1 50 amp.
 - Check fuse. Replace if defective.
2. Loose or broken wire #03 from start solenoid 57BCR to fuse holder FU1.
 - Check continuity. Replace if defective.
3. Loose or broken wire #11A from fuse holder FU1 to relay 54ACR.
 - Check continuity. Replace if defective.
4. Loose or broken wire #11B from relay 54ACR to glow plugs.
 - Check continuity. Replace if defective.
5. Loose or broken wire #54A from base terminal strip to relay 54ACR.
 - Check continuity. Replace if defective.

6. Loose or broken wire #11 from base terminal block to relay 54ACR.
 - Check continuity. Replace if defective.
7. Defective relay 54ACR.
 - Check relay. Replace if defective.
8. Defective glow plugs.
 - Check glow plugs. Replace if defective.

NOTE

For other glow plug related problems, consult engine manufacturer's manual.

4.1-11 All Controls Inoperative from Base Console

1. Loose or broken wire #10 from base emergency stop switch S3 to base ignition/enable switch S5.
 - Check continuity. Replace if defective.
2. Defective ignition/enable switch S5.
 - Check continuity through switch when activated. Replace if defective.
3. Loose or broken wire #10A from ignition/enable switch S5 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #10A from base terminal block to diode D10A.
 - Check continuity. Replace if defective.
5. Open or defective diode D10A.
 - Check diode. Replace if defective.
6. Loose or broken wire #20 from diode D10A to base terminal block.
 - Check continuity. Replace if defective.
7. Missing or broken terminal block jumper between wire #20 and #21.
 - Check for jumper. Replace if missing or broken.

NOTE

Jumper is removed if equipped with generator option.

8. Loose or broken wire #21 from base terminal block to relay 21CR.
 - Check continuity. Replace if defective.
9. Loose or broken wire #02 from base terminal block to relay 21CR.
 - Check continuity. Replace if defective.
10. Loose or broken wire #09 from base terminal block to relay 21CR. (ANSI/CSA)
 - Check continuity. Replace if defective.
11. Loose or broken wire #09 from base terminal block to relay 59CR. (CE)
 - Check continuity. Replace if defective.
12. Loose or broken wire #162A from relay 59CR to base terminal block. (CE)
 - Check continuity. Replace if defective.
13. Loose or broken wire #162A from base terminal block to relay 21CR. (CE)
 - Check continuity. Replace if defective.

NOTE

For further CE troubleshooting refer to Load Sensing System.

14. Defective relay 21CR.
 - Check relay. Replace if defective.
15. Loose or broken wire #21A from relay 21CR to main harness plug pin #3.
 - Check continuity. Replace if defective.
16. Loose or broken wire #21A from main harness plug pin #3 to dump valve 2H-21A.
 - Check continuity. Replace if defective.

17. Loose or broken wire #02 from dump valve 2H-21A to main harness plug.
 - Check continuity. Replace if defective.
18. Defective dump valve coil 2H-21A.
 - Check continuity and resistance through coil. Replace if defective..

4.1-12 No Main Boom Down, Riser Down or Turret Rotate from Base Control Console

1. Loose or broken wire #10A from base terminal block to resistor R1.
 - Check continuity. Replace if defective.
2. Open resistor R1.
 - Check resistor for 6 ohms. If no resistance found, replace resistor.
3. Loose or broken wire #20C from resistor R1 to turret rotate switch S13, boom down switch S12 and resistor R2.
 - Check continuity. Replace if defective.

4.1-13 No Boom Up from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to boom switch S12.
 - Check continuity. Replace if defective.
2. Defective boom switch S12.
 - Check continuity through switch while activating up function between wires #10A and #14. Replace switch if no continuity.
3. Loose or broken wire #14 from boom switch S12 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #14 from base terminal block to main harness plug pin #2.
 - Check continuity. Replace if defective.
5. Loose or broken wire #14 from main harness plug pin #2 to boom up valve 4H-14.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to boom up valve 4H-14.
 - Check continuity. Replace if defective.
7. Defective boom up coil 4H-14.
 - Check continuity and resistance through coil. Replace if defective.

4.1-14 No Boom Down from Base Control Console

1. Loose or broken wire #10C from resistor R1 to boom down switch S12.
 - Check continuity. Replace if defective.
2. Defective boom switch S12.
 - Check continuity through switch while activating down function between wires #10C and #13. If no continuity found, replace switch.
3. Loose or broken wire #13 from boom down switch S12 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #13 from base terminal block to main harness plug pin #1.
 - Check continuity. Replace if defective.
5. Loose or broken wire #13 from main harness plug pin #1 to boom down valve 4H-13.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to boom down valve 4H-13.
 - Check continuity. Replace if defective.
7. Defective boom down coil 4H-13.
 - Check continuity and resistance through coil. Replace if defective.

4.1-15 No Riser Up from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to riser switch S25.
 - Check continuity. Replace if defective.

2. Defective riser switch S25.
 - Check continuity through switch while activating up function between wires #10A and #31. Replace switch if no continuity.
3. Loose or broken wire #31 from riser switch S25 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #31 from base terminal block to main harness plug pin #8.
 - Check continuity. Replace if defective.
5. Loose or broken wire #31 from main harness plug pin #8 to riser up valve 4H-31.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to riser up valve 4H-31.
 - Check continuity. Replace if defective.
7. Defective boom up coil 4H-31.
 - Check continuity and resistance through coil. Replace if defective.

4.1-16 No Riser Down from Base Control Console

1. Loose or broken wire #10C from boom switch S12 to resistor R2.
 - Check continuity. Replace if defective.
2. Open or defective resistor R2.
 - Check resistor for 6 ohms. If no resistance found, replace resistor.
3. Loose or broken wire #10D from resistor R2 to riser down switch S25.
 - Check continuity. Replace if defective.
4. Defective riser switch S25.
 - Check continuity through switch while activating down function between wires #10D and #30. If no continuity found, replace switch.
5. Loose or broken wire #30 from riser down switch S25 to base terminal block.
 - Check continuity. Replace if defective.
6. Loose or broken wire #30 from base terminal block to main harness plug pin #7.
 - Check continuity. Replace if defective.
7. Loose or broken wire #30 from main harness plug pin #7 to riser down valve 4H-30.
 - Check continuity. Replace if defective.
8. Loose or broken wire #02 from main harness plug to riser down valve 4H-30.
 - Check continuity. Replace if defective.
9. Defective riser down coil 4H-30.
 - Check continuity and resistance through coil. Replace if defective.

4.1-17 No Turret Rotate Left from Base Control Console

1. Loose or broken wire #10C from resistor R1 to turret rotate switch S13.
 - Check continuity. Replace if defective.
2. Defective turret rotate switch S13.
 - Check continuity through switch while activating rotate left function between wires #10C and #32. If no continuity found, replace switch.
3. Loose or broken wire #32 from turret rotate switch S13 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #32 from base terminal block to main harness plug pin #9.
 - Check continuity. Replace if defective.
5. Loose or broken wire #32 from main harness plug pin #9 to turret rotate left valve 4H-32.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to turret rotate left valve 4H-32.
 - Check continuity. Replace if defective.
7. Defective turret rotate left valve coil 4H-32.
 - Check continuity and resistance through coil. Replace if defective.

4.1-18 No Turret Rotate Right from Base Control Console

1. Loose or broken wire #10C from resistor R1 to turret rotate switch S13.
 - Check continuity. Replace if defective.
2. Defective turret rotate switch S13.
 - Check continuity through switch while activating rotate right function between wires #10C and #33. If no continuity found, replace switch.
3. Loose or broken wire #33 from turret rotate switch S13 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #33 from base terminal block to main harness plug pin #10.
 - Check continuity. Replace if defective.
5. Loose or broken wire #33 from main harness plug pin #10 to turret rotate right valve 4H-33.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to turret rotate right valve 4H-33.
 - Check continuity. Replace if defective.
7. Defective turret rotate right valve coil 4H-33.
 - Check continuity and resistance through coil. Replace if defective.

4.1-19 No Telescope Retract from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to telescope switch S14.
 - Check continuity. Replace if defective.
2. Defective telescope switch S14.
 - Check continuity through switch while activating retract function between wires #10A and #38. If no continuity found, replace switch.
3. Loose or broken wire #38 from telescope switch S14 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #38 from base terminal block to main harness plug pin #13.
 - Check continuity. Replace if defective.
5. Loose or broken wire #38 from main harness plug pin #13 to telescope retract valve 3H-38.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to telescope retract valve 3H-38.
 - Check continuity. Replace if defective.
7. Defective telescope retract valve coil 3H-38.
 - Check continuity and resistance through coil. Replace if defective

4.1-20 No Telescope Extend from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to telescope switch S14.
 - Check continuity. Replace if defective.
2. Defective telescope switch S14.
 - Check continuity through switch while activating extend function between wires #10A and #39. If no continuity found, replace switch.
3. Loose or broken wire #39 from telescope switch S14 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #39 from base terminal block to main harness plug pin #14.
 - Check continuity. Replace if defective.
5. Loose or broken wire #39 from main harness plug pin #14 to telescope extend valve 3H-39.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to telescope extend valve 3H-39.
 - Check continuity. Replace if defective.
7. Defective telescope extend valve coil 3H-39.
 - Check continuity and resistance through coil. Replace if defective.

4.1-21 No Platform Rotate Left from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to platform rotate switch S16.
 - Check continuity. Replace if defective.
2. Defective platform rotate switch S16.
 - Check continuity through switch while activating rotate left function between wires #10A and #36. If no continuity found, replace switch.
3. Open or defective diode D36.
 - Check diode. Replace if defective.
4. Loose or broken wire #36A from diode D36 to main harness plug pin #12.
 - Check continuity. Replace if defective.
5. Loose or broken wire #36A from main harness plug pin #12 to platform rotate enable valve 2H-36A.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to platform rotate enable valve 2H-36A.
 - Check continuity. Replace if defective.
7. Defective platform rotate enable valve 2H-36A.
 - Check continuity and resistance through coil. Replace if defective.
8. Loose or broken wire #36 from platform rotate switch S16 to base connector plug A pin #18.
 - Check continuity. Replace if defective.
9. Loose or broken wire #36 in boom cable A or its connectors.
 - Check for continuity between pins #18 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
10. Loose or broken wire #36 plug A pin #18 to platform terminal block.
 - Check continuity. Replace if defective.
11. Loose or broken wire #36 from platform terminal block to platform rotate left valve 4H-36.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from platform terminal block to platform rotate left valve 4H-36.
 - Check continuity. Replace if defective.
13. Defective platform rotate left valve coil 4H-36.
 - Check continuity and resistance through coil. Replace if defective.

4.1-22 No Platform Rotate Right from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to platform rotate switch S16.
 - Check continuity. Replace if defective.
2. Defective platform rotate switch S16.
 - Check continuity through switch while activating rotate right function between wires #10A and #37. If no continuity found, replace switch.
3. Open or defective diode D37.
 - Check diode. Replace if defective.
4. Loose or broken wire #36A from diode D37 to main harness plug pin #12.
 - Check continuity. Replace if defective.
5. Loose or broken wire #36A from main harness plug pin #12 to platform rotate enable valve 2H-36A.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to platform rotate enable valve 2H-36A.
 - Check continuity. Replace if defective.
7. Defective platform rotate enable valve 2H-36A.
 - Check continuity and resistance through coil. Replace if defective.
8. Loose or broken wire #37 from platform rotate switch S16 to base connector plug A pin #19.
 - Check continuity. Replace if defective.
9. Loose or broken wire #37 in boom cable A or its connectors.
 - Check for continuity between pins #19 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.

10. Loose or broken wire #37 plug A pin #19 to platform terminal block.
 - Check continuity. Replace if defective.
11. Loose or broken wire #37 from platform terminal block to platform rotate right valve 4H-37.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from platform terminal block to platform rotate right valve 4H-37.
 - Check continuity. Replace if defective.
13. Defective platform rotate right valve coil 4H-37.
 - Check continuity and resistance through coil. Replace if defective.

4.1-23 No Jib Up from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to jib switch S17.
 - Check continuity. Replace if defective.
2. Defective jib up switch S17.
 - Check continuity through switch while activating jib up function between wires #10A and #35. If no continuity found, replace switch.
3. Open or defective diode D35.
 - Check diode. Replace if defective.
4. Loose or broken wire #34A from diode D35 to main harness plug pin #11.
 - Check continuity. Replace if defective.
5. Loose or broken wire #34A from main harness plug pin #11 to jib enable valve 2H-34A.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from main harness plug to jib enable valve 2H-34A.
 - Check continuity. Replace if defective.
7. Defective jib enable valve 2H-34A.
 - Check continuity and resistance through coil. Replace if defective.
8. Loose or broken wire #35 from jib up switch S17 to base connector plug A pin #17.
 - Check continuity. Replace if defective.
9. Loose or broken wire #35 in boom cable A or its connectors.
 - Check for continuity between pins #17 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
10. Loose or broken wire #35 from plug A pin #17 to platform terminal block.
 - Check continuity. Replace if defective.
11. Loose or broken wire #35 from platform terminal block to jib up valve 4H-35.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from platform terminal block to jib up valve 4H-35.
 - Check continuity. Replace if defective.
13. Defective jib up valve coil 4H-35.
 - Check continuity and resistance through coil. Replace if defective.

4.1-24 No Jib Down from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to jib switch S17.
 - Check continuity. Replace if defective.
2. Defective jib down switch S17.
 - Check continuity through switch while activating jib down function between wires #10A and #34. If no continuity found, replace switch.
3. Open or defective diode D34.
 - Check diode. Replace if defective.
4. Loose or broken wire #34A from diode D34 to main harness plug pin #11.
 - Check continuity. Replace if defective.
5. Loose or broken wire #34A from main harness plug pin #11 to jib enable valve 2H-34A.
 - Check continuity. Replace if defective.

6. Loose or broken wire #02 from main harness plug to jib enable valve 2H-34A.
 - Check continuity. Replace if defective.
7. Defective jib enable valve 2H-34A.
 - Check continuity and resistance through coil. Replace if defective.
8. Loose or broken wire #34 from jib down switch S17 to base connector plug A pin #16.
 - Check continuity. Replace if defective.
9. Loose or broken wire #34 in boom cable A or its connectors.
 - Check for continuity between pins #16 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
10. Loose or broken wire #34 from plug A pin #16 to platform terminal block.
 - Check continuity. Replace if defective.
11. Loose or broken wire #34 from platform terminal block to jib down valve 4H-34.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from platform terminal block to jib down valve 4H-34.
 - Check continuity. Replace if defective.
13. Defective jib down valve coil 4H-34.
 - Check continuity and resistance through coil. Replace if defective.

4.1-25 No Manual Platform Level Up from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to platform level switch S15.
 - Check continuity. Replace if defective.
2. Defective platform level switch S15.
 - Check continuity through switch while activating level up function between wires #10A and #41. If no continuity found replace switch.
3. Loose or broken wire #41 from platform level switch S15 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #41 from base terminal block to main harness pin plug pin#16.
 - Check continuity. Replace if defective.
5. Loose or broken wire #41 from main harness pin plug pin#16 platform level up valve 4H-41.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from turret harness pin plug platform level up valve 4H-41.
 - Check continuity. Replace if defective.
7. Defective platform level up valve coil 4H-41.
 - Check continuity and resistance through coil. Replace if defective.

4.1-26 No Manual Platform Level Down from Base Control Console

1. Loose or broken wire #10A from ignition/enable switch S5 to platform level switch S15.
 - Check continuity. Replace if defective.
2. Defective platform level switch S15.
 - Check continuity through switch while activating level down function between wires #10A and #40. If no continuity found replace switch.
3. Loose or broken wire #40 from platform level switch S15 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #40 from base terminal block to main harness pin plug pin#15.
 - Check continuity. Replace if defective.
5. Loose or broken wire #40 from main harness pin plug pin#16 platform level down valve 4H-40.
 - Check continuity. Replace if defective.
6. Loose or broken wire #02 from turret harness pin plug platform level down valve 4H-40.
 - Check continuity. Replace if defective.
7. Defective platform level down valve coil 4H-40.
 - Check continuity and resistance through coil. Replace if defective.

4.1-27 All Controls Inoperative from Platform Control Console

1. Open or defective emergency stop switch S4.
 - Pull emergency switch out. Check continuity through switch. Replace if defective.
2. Loose or broken wire #4A from emergency stop switch S4 to platform start switch S9.
 - Check continuity. Replace if defective.
3. Loose or broken wire #4 platform start switch S9 to platform terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken pin jumper between #04 and #04A on platform terminal block (without generator option only).
 - Check continuity. Replace if defective.
5. Loose or broken wire #04 from platform terminal block to generator switch S22 (generator option only).
 - Check continuity. Replace if defective.
6. Generator switch S22 in generator mode or is open or defective (generator option only).
 - Select OFF mode on generator switch. Check continuity through switch from #04 to #04A. Replace if defective.
7. Loose or broken wire #04A from generator switch S22 to platform terminal block (generator option only).
 - Check continuity. Replace if defective.
8. Loose or broken wire #04A from platform terminal block to footswitch S11.
 - Check continuity. Replace if defective.
9. Open or defective footswitch S11.
 - Check continuity through switch while activating footswitch function between wires #04A and #08A. If no continuity found replace switch.
10. Loose or broken wire #08A from footswitch S11 to valve driver pin #16.
 - Check continuity. Replace if defective.
11. Loose or broken wire #04 from platform terminal block to valve driver pin #1, 2 & 13.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from platform terminal block to valve driver pin #24, 25 & 26.
 - Check continuity. Replace if defective.
13. No output on pin #6 of the valve driver to wire #08.
 - Check pin #6 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
14. Loose or broken wire #04 from platform terminal block to diode D04.
 - Check continuity. Replace if defective.
15. Open or defective diode D04.
 - Check diode. Replace if defective.
16. Loose or broken wire #60 from diode D04 to platform terminal block.
 - Check continuity. Replace if defective.
17. Loose or broken wire #60 from platform terminal block to plug B pin #16 in platform control console.
 - Check continuity. Replace if defective.
18. Loose or broken wire #60 in boom cable B or its connectors.
 - Check for continuity between pins #16 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
19. Loose or broken wire #60 from plug B pin #16 to base terminal block.
 - Check continuity. Replace if defective.

4.1-28 No Boom Up from Platform Control Console

1. Loose or broken wire #04 from platform terminal block to joystick controller A1.
 - Check continuity. Replace if defective.
2. Loose or broken wire #02 from platform terminal block to joystick controller A1.
 - Check continuity. Replace if defective.

3. No output on y-axis of joystick controller A1.
 - Refer to joystick test procedure in section 5.
4. Loose or broken wire "Y" from joystick controller A1 to valve driver pin #29.
 - Check continuity. Replace if defective.
5. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
6. No output on pin #22 of the valve driver to wire #14.
 - Check pin #22 for minimum 3.5 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
7. Loose or broken wire #14 from valve driver pin #22 to plug A pin #7 in platform control console.
 - Check continuity. Replace if defective.
8. Loose or broken wire #14 in boom cable A or its connectors.
 - Check for continuity between pins #7 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
9. Loose or broken wire #14 from base connector plug A pin #7 to base terminal block.
 - Check continuity. Replace if defective.
10. Loose or broken wire #14 from base terminal block to main harness plug pin #2.
 - Check continuity. Replace if defective.
11. Loose or broken wire #14 from main harness plug pin #2 to boom up valve 4H-14.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from main harness plug to boom up valve 4H-14.
 - Check continuity. Replace if defective.
13. Defective boom up valve coil 4H-14.
 - Check continuity and resistance through coil. Replace if defective.

4.1-29 No Boom Down from Platform Control Console

1. Loose or broken wire #04 from platform terminal block to joystick controller A1.
 - Check continuity. Replace if defective.
2. Loose or broken wire #02 from platform terminal block to joystick controller A1.
 - Check continuity. Replace if defective.
3. No output on y-axis of joystick controller A1.
 - Refer to joystick test procedure in section 5.
4. Loose or broken wire "Y" from joystick controller A1 to valve driver pin #29.
 - Check continuity. Replace if defective.
5. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
6. No output on pin #8 of the valve driver to wire #13.
 - Check pin #8 for minimum 1.5 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
7. Loose or broken wire #13 from valve driver pin #8 to plug A pin #6 in platform control console.
 - Check continuity. Replace if defective.
8. Loose or broken wire #13 in boom cable A or its connectors.
 - Check for continuity between pins #6 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
9. Loose or broken wire #13 from base connector plug A pin #6 to base terminal block.
 - Check continuity. Replace if defective.
10. Loose or broken wire #13 from base terminal block to main harness plug pin #1.
 - Check continuity. Replace if defective.
11. Loose or broken wire #13 from main harness plug pin #1 to boom down valve 4H-13.
 - Check continuity. Replace if defective.

12. Loose or broken wire #02 from main harness plug to boom down valve 4H-13.
 - [Check continuity. Replace if defective.](#)
13. Defective boom down valve coil 4H-13.
 - [Check continuity and resistance through coil. Replace if defective.](#)

4.1-30 No Riser Up from Platform Control Console

1. Loose or broken wire #04 from platform terminal block to joystick controller A3.
 - [Check continuity. Replace if defective.](#)
2. Loose or broken wire #02 from platform terminal block to joystick controller A3.
 - [Check continuity. Replace if defective.](#)
3. No output on R signal from joystick controller A3.
 - [Refer to joystick test procedure in section 5.](#)
4. Loose or broken wire "R" from joystick controller A3 to valve driver pin #30.
 - [Check continuity. Replace if defective.](#)
5. No output on pin #5 of the valve driver to wire #20.
 - [Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.](#)
6. No output on pin #9 of the valve driver to wire #31.
 - [Check pin #9 for minimum 3 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.](#)
7. Loose or broken wire #31 from valve driver pin #9 to plug A pin #13 in platform control console.
 - [Check continuity. Replace if defective.](#)
8. Loose or broken wire #31 in boom cable A or its connectors.
 - [Check for continuity between pins #13 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.](#)
9. Loose or broken wire #31 from base connector plug A pin #13 to base terminal block.
 - [Check continuity. Replace if defective.](#)
10. Loose or broken wire #31 from base terminal block to main harness plug pin #8.
 - [Check continuity. Replace if defective.](#)
11. Loose or broken wire #31 from main harness plug pin #8 to riser up valve 4H-31.
 - [Check continuity. Replace if defective.](#)
12. Loose or broken wire #02 from main harness plug to riser up valve 4H-31.
 - [Check continuity. Replace if defective.](#)
13. Defective riser up valve coil 4H-31.
 - [Check continuity and resistance through coil. Replace if defective.](#)

4.1-31 No Riser Down from Platform Control Console

1. Loose or broken wire #04 from platform terminal block to joystick controller A3.
 - [Check continuity. Replace if defective.](#)
2. Loose or broken wire #02 from platform terminal block to joystick controller A3.
 - [Check continuity. Replace if defective.](#)
3. No output on R signal from joystick controller A3.
 - [Refer to joystick test procedure in section 5.](#)
4. Loose or broken wire "R" from joystick controller A3 to valve driver pin #30.
 - [Check continuity. Replace if defective.](#)
5. No output on pin #5 of the valve driver to wire #20.
 - [Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.](#)
6. No output on pin #12 of the valve driver to wire #30.
 - [Check pin #12 for minimum 3 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.](#)

7. Loose or broken wire #30 from valve driver pin #12 to plug A pin #12 in platform control console.
 - Check continuity. Replace if defective.
8. Loose or broken wire #30 in boom cable A or its connectors.
 - Check for continuity between pins #12 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
9. Loose or broken wire #30 from base connector plug A pin #12 to base terminal block.
 - Check continuity. Replace if defective.
10. Loose or broken wire #30 from base terminal block to main harness plug pin #7.
 - Check continuity. Replace if defective.
11. Loose or broken wire #30 from main harness plug pin #7 to riser down valve 4H-30.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from main harness plug to riser down valve 4H-30.
 - Check continuity. Replace if defective.
13. Defective riser down valve coil 4H-30.
 - Check continuity and resistance through coil. Replace if defective.

4.1-32 No Turret Left from Platform Control Console

1. Loose or broken wire #04 from platform terminal block to joystick controller A1.
 - Check continuity. Replace if defective.
2. Loose or broken wire #02 from platform terminal block to joystick controller A1.
 - Check continuity. Replace if defective.
3. No output on x-axis of joystick controller A1.
 - Refer to joystick test procedure in section 5.
4. Loose or broken wire "X" from joystick controller A1 to valve driver pin #28.
 - Check continuity. Replace if defective.
5. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
6. No output on pin #20 of the valve driver to wire #32.
 - Check pin #20 for minimum 3.5 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
7. Loose or broken wire #32 from valve driver pin #20 to plug A pin #14 in platform control console.
 - Check continuity. Replace if defective.
8. Loose or broken wire #32 in boom cable A or its connectors.
 - Check for continuity between pins #14 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
9. Loose or broken wire #32 from base connector plug A pin #14 to base terminal block.
 - Check continuity. Replace if defective.
10. Loose or broken wire #32 from base terminal block to main harness plug pin #9.
 - Check continuity. Replace if defective.
11. Loose or broken wire #32 from main harness plug pin #9 to turret left valve 4H-32.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from main harness plug to turret left valve 4H-32.
 - Check continuity. Replace if defective.
13. Defective turret left valve coil 4H-32.
 - Check continuity and resistance through coil. Replace if defective.

4.1-33 No Turret Right from Platform Control Console

1. Loose or broken wire #04 from platform terminal block to joystick controller A1.
 - Check continuity. Replace if defective.
2. Loose or broken wire #02 from platform terminal block to joystick controller A1.
 - Check continuity. Replace if defective.

3. No output on x-axis of joystick controller A1.
 - Refer to joystick test procedure in section 5.
4. Loose or broken wire "X" from joystick controller A1 to valve driver pin #28.
 - Check continuity. Replace if defective.
5. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
6. No output on pin #35 of the valve driver to wire #33.
 - Check pin #35 for minimum 3.5 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
7. Loose or broken wire #33 from valve driver pin #35 to plug A pin #15 in platform control console.
 - Check continuity. Replace if defective.
8. Loose or broken wire #33 in boom cable A or its connectors.
 - Check for continuity between pins #15 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
9. Loose or broken wire #33 from base connector plug A pin #15 to base terminal block.
 - Check continuity. Replace if defective.
10. Loose or broken wire #33 from base terminal block to main harness plug pin #10.
 - Check continuity. Replace if defective.
11. Loose or broken wire #33 from main harness plug pin #10 to turret right valve 4H-33.
 - Check continuity. Replace if defective.
12. Loose or broken wire #02 from main harness plug to turret right valve 4H-33.
 - Check continuity. Replace if defective.
13. Defective turret right valve coil 4H-33.
 - Check continuity and resistance through coil. Replace if defective.

4.1-34 No Toggle Switch Functions from Platform Control Console

1. Loose or broken wire #8 from platform terminal block to toggle switches.
 - Check continuity. Replace if defective.
2. Loose or broken wire #20A from toggle switches to valve driver pin #33.
 - Check continuity. Replace if defective.
3. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.

4.1-35 No Telescope In from Platform Control Console

1. Loose or broken wire #08 from platform terminal block to telescope switch S18.
 - Check continuity. Replace if defective.
2. Defective telescope switch S18.
 - Check continuity through switch while activating in function between wires #08 and #38.
3. Loose or broken wire #20A from telescope switch S18 to valve driver pin #33.
 - Check continuity. Replace if defective.
4. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
5. Loose or broken wire #38 from telescope switch S18 to plug B pin #8 in platform control console.
 - Check continuity. Replace if defective.
6. Loose or broken wire #38 in boom cable B or its connectors.
 - Check for continuity between pins #8 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.

7. Loose or broken wire #38 from base connector plug B pin #8 to base terminal block.
 - Check continuity. Replace if defective.
8. Loose or broken wire #38 from base terminal block to main harness plug pin #13.
 - Check continuity. Replace if defective.
9. Loose or broken wire #38 from main harness plug pin #13 to telescope in valve 4H-38.
 - Check continuity. Replace if defective.
10. Loose or broken wire #02 from main harness plug to telescope in valve 4H-38.
 - Check continuity. Replace if defective.
11. Defective telescope in valve coil 4H-38.
 - Check continuity and resistance through coil. Replace if defective.

4.1-36 No Telescope Out from Platform Control Console

1. Loose or broken wire #08 from platform terminal block to telescope switch S18.
 - Check continuity. Replace if defective.
2. Defective telescope switch S18.
 - Check continuity through switch while activating out function between wires #08 and #39.
3. Loose or broken wire #20A from telescope switch S18 to valve driver pin #33.
 - Check continuity. Replace if defective.
4. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
5. Loose or broken wire #39 from telescope switch S18 to plug B pin #9 in platform control console.
 - Check continuity. Replace if defective.
6. Loose or broken wire #39 in boom cable B or its connectors.
 - Check for continuity between pins #9 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
7. Loose or broken wire #39 from base connector plug B pin #9 to base terminal block.
 - Check continuity. Replace if defective.
8. Loose or broken wire #39 from base terminal block to main harness plug pin #14.
 - Check continuity. Replace if defective.
9. Loose or broken wire #39 from main harness plug pin #14 to telescope out valve 4H-39.
 - Check continuity. Replace if defective.
10. Loose or broken wire #02 from main harness plug to telescope out valve 4H-39.
 - Check continuity. Replace if defective.
11. Defective telescope out valve coil 4H-39.
 - Check continuity and resistance through coil. Replace if defective.

4.1-37 No Platform Rotate Left from Platform Control Console

1. Loose or broken wire #08 from platform terminal block to platform rotate switch S20.
 - Check continuity. Replace if defective.
2. Defective platform rotate switch S20.
 - Check continuity through switch while activating rotate left function between wires #08 and #36.
3. Loose or broken wire #20A from platform rotate switch S20 to valve driver pin #33.
 - Check continuity. Replace if defective.
4. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
5. Loose or broken wire #36 from platform rotate switch S20 to platform terminal block.
 - Check continuity. Replace if defective.
6. Loose or broken wire #36 or #02 from platform terminal block to rotate left valve 4H-36.
 - Check continuity. Replace if defective.

7. Defective rotate left valve coil 4H-36.
 - Check continuity and resistance through coil. Replace if defective.
8. Loose or broken wire #36 from platform terminal block to plug A pin#18 in platform control console.
 - Check continuity. Replace if defective.
9. Loose or broken wire #36 in boom cable A or its connectors.
 - Check for continuity between pins #18 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
10. Loose or broken wire #36 from base connector plug A pin #18 to base platform rotate switch S16.
 - Check continuity. Replace if defective.
11. Defective base platform rotate switch S16.
 - Check continuity through switch while activating rotate left function between wires #10A and #36. If no continuity found, replace switch.
12. Open or defective diode D36.
 - Check diode. Replace if defective.
13. Loose or broken wire #36A from diode D36 to main harness plug pin #12.
 - Check continuity. Replace if defective.
14. Loose or broken wire #36A from main harness plug pin #12 to platform rotate enable valve 2H-36A.
 - Check continuity. Replace if defective.
15. Loose or broken wire #02 from main harness plug to platform rotate enable valve 2H-36A.
 - Check continuity. Replace if defective.
16. Defective platform rotate enable valve 2H-36A.
 - Check continuity and resistance through coil. Replace if defective.

4.1-38 No Platform Rotate Right from Platform Control Console

1. Loose or broken wire #08 from platform terminal block to platform rotate switch S20.
 - Check continuity. Replace if defective.
2. Defective platform rotate switch S20.
 - Check continuity through switch while activating rotate right function between wires #08 and #37.
3. Loose or broken wire #20A from platform rotate switch S20 to valve driver pin #33.
 - Check continuity. Replace if defective.
4. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
5. Loose or broken wire #37 from platform rotate switch S20 to platform terminal block.
 - Check continuity. Replace if defective.
6. Loose or broken wire #37 or #02 from platform terminal block to rotate right valve 4H-37.
 - Check continuity. Replace if defective.
7. Defective rotate right valve coil 4H-37.
 - Check continuity and resistance through coil. Replace if defective.
8. Loose or broken wire #37 from platform terminal block to plug A pin#19 in platform control console.
 - Check continuity. Replace if defective.
9. Loose or broken wire #37 in boom cable A or its connectors.
 - Check for continuity between pins #19 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
10. Loose or broken wire #37 from base connector plug A pin #19 to base platform rotate switch S16.
 - Check continuity. Replace if defective.
11. Defective base platform rotate switch S16.
 - Check continuity through switch while activating rotate right function between wires #10A and #37. If no continuity found, replace switch.
12. Open or defective diode D37.
 - Check diode. Replace if defective.

13. Loose or broken wire #36A from diode D37 to main harness plug pin #12.
 - Check continuity. Replace if defective.
14. Loose or broken wire #36A from main harness plug pin #12 to platform rotate enable valve 2H-36A.
 - Check continuity. Replace if defective.
15. Loose or broken wire #02 from main harness plug to platform rotate enable valve 2H-36A.
 - Check continuity. Replace if defective.
16. Defective platform rotate enable valve 2H-36A.
 - Check continuity and resistance through coil. Replace if defective.

4.1-39 No Jib Up from Platform Control Console

1. Loose or broken wire #08 from platform terminal block to jib switch S21.
 - Check continuity. Replace if defective.
2. Defective jib up switch S21.
 - Check continuity through switch while activating jib up function between wires #08 and #35.
3. Loose or broken wire #20A from jib switch S21 to valve driver pin #33.
 - Check continuity. Replace if defective.
4. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
5. Loose or broken wire #35 from jib switch S20 to platform terminal block.
 - Check continuity. Replace if defective.
6. Loose or broken wire #35 or #02 from platform terminal block to jib up valve 4H-35.
 - Check continuity. Replace if defective.
7. Defective jib up valve coil 4H-35.
 - Check continuity and resistance through coil. Replace if defective.
8. Loose or broken wire #35 from platform terminal block to plug A pin#17 in platform control console.
 - Check continuity. Replace if defective.
9. Loose or broken wire #35 in boom cable A or its connectors.
 - Check for continuity between pins #17 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
10. Loose or broken wire #35 from base connector plug A pin #17 to base jib up switch S17.
 - Check continuity. Replace if defective.
11. Defective base jib up switch S17.
 - Check continuity through switch while activating jib up function between wires #10A and #35. If no continuity found, replace switch.
12. Open or defective diode D35.
 - Check diode. Replace if defective.
13. Loose or broken wire #34A from diode D35 to main harness plug pin #11.
 - Check continuity. Replace if defective.
14. Loose or broken wire #34A from main harness plug pin #11 to jib enable valve 2H-34A.
 - Check continuity. Replace if defective.
15. Loose or broken wire #02 from main harness plug to jib enable valve 2H-34A.
 - Check continuity. Replace if defective.
16. Defective jib enable valve 2H-34A.
 - Check continuity and resistance through coil. Replace if defective.

4.1-40 No Jib Down from Platform Control Console

1. Loose or broken wire #08 from platform terminal block to jib switch S21.
 - Check continuity. Replace if defective.
2. Defective jib down switch S21.
 - Check continuity through switch while activating jib down function between wires #08 and #34.

3. Loose or broken wire #20A from jib switch S21 to valve driver pin #33.
 - Check continuity. Replace if defective.
4. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
5. Loose or broken wire #34 from jib switch S20 to platform terminal block.
 - Check continuity. Replace if defective.
6. Loose or broken wire #34 or #02 from platform terminal block to jib down valve 4H-34.
 - Check continuity. Replace if defective.
7. Defective jib up valve coil 4H-34.
 - Check continuity and resistance through coil. Replace if defective.
8. Loose or broken wire #34 from platform terminal block to plug A pin #16 in platform control console.
 - Check continuity. Replace if defective.
9. Loose or broken wire #34 in boom cable A or its connectors.
 - Check for continuity between pins #16 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
10. Loose or broken wire #34 from base connector plug A pin #16 to base jib down switch S17.
 - Check continuity. Replace if defective.
11. Defective base jib down switch S17.
 - Check continuity through switch while activating jib down function between wires #10A and #34. If no continuity found, replace switch.
12. Open or defective diode D34.
 - Check diode. Replace if defective.
13. Loose or broken wire #34A from diode D34 to main harness plug pin #11.
 - Check continuity. Replace if defective.
14. Loose or broken wire #34A from main harness plug pin #11 to jib enable valve 2H-34A.
 - Check continuity. Replace if defective.
15. Loose or broken wire #02 from main harness plug to jib enable valve 2H-34A.
 - Check continuity. Replace if defective.
16. Defective jib enable valve 2H-34A.
 - Check continuity and resistance through coil. Replace if defective.

4.1-41 No Manual Platform Level Up from Platform Control Console

1. Loose or broken wire #08 from platform terminal block to platform leveling switch S19.
 - Check continuity. Replace if defective.
2. Defective platform leveling switch S19.
 - Check continuity through switch while activating level up function between wires #08 and #41.
3. Loose or broken wire #20A from platform leveling switch S19 to valve driver pin #33.
 - Check continuity. Replace if defective.
4. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
5. Loose or broken wire #41 from platform leveling switch S19 to plug B pin #11 in platform control console.
 - Check continuity. Replace if defective.
6. Loose or broken wire #41 in boom cable B or its connectors.
 - Check for continuity between pins #11 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
7. Loose or broken wire #41 from base connector plug B pin #11 to base terminal block.
 - Check continuity. Replace if defective.
8. Loose or broken wire #41 from base terminal block to main harness plug pin #16.
 - Check continuity. Replace if defective.

9. Loose or broken wire #41 from main harness plug pin #16 to level up valve 4H-41.
 - Check continuity. Replace if defective.
10. Loose or broken wire #02 from main harness plug to level up valve 4H-41.
 - Check continuity. Replace if defective.
11. Defective level up valve coil 4H-41.
 - Check continuity and resistance through coil. Replace if defective.

4.1-42 No Manual Platform Level Down from Platform Control Console

1. Loose or broken wire #08 from platform terminal block to platform leveling switch S19.
 - Check continuity. Replace if defective.
2. Defective platform leveling switch S19.
 - Check continuity through switch while activating level down function between wires #08 and #40.
3. Loose or broken wire #20A from platform leveling switch S19 to valve driver pin #33.
 - Check continuity. Replace if defective.
4. No output on pin #5 of the valve driver to wire #20.
 - Check pin #5 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
5. Loose or broken wire #40 from platform leveling switch S19 to plug B pin #10 in platform control console.
 - Check continuity. Replace if defective.
6. Loose or broken wire #40 in boom cable B or its connectors.
 - Check for continuity between pins #10 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
7. Loose or broken wire #40 from base connector plug B pin #10 to base terminal block.
 - Check continuity. Replace if defective.
8. Loose or broken wire #40 from base terminal block to main harness plug pin #15.
 - Check continuity. Replace if defective.
9. Loose or broken wire #40 from main harness plug pin #15 to level down valve 4H-40.
 - Check continuity. Replace if defective.
10. Loose or broken wire #02 from main harness plug to level down valve 4H-40.
 - Check continuity. Replace if defective.
11. Defective level down valve coil 4H-40.
 - Check continuity and resistance through coil. Replace if defective.

4.1-43 Mid Throttle Inoperative

1. Loose or broken wire #08 from platform terminal block to throttle switch S10.
 - Check continuity. Replace if defective.
2. Open or defective diode D08. (Generator option only)
 - Check diode. Replace if defective.
3. Defective throttle switch S10.
 - Check continuity through switch while activating mid throttle function between wires #08 and #79. If no continuity found replace switch.
4. Loose or broken wire #79 from throttle switch S10 to plug B pin #20 in platform control console.
 - Check continuity. Replace if defective.
5. Loose or broken wire #79 in Cable B or its connectors.
 - Check for continuity between pins #20 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.

(Deutz Diesel Only)

6. Loose or broken wire #79 from base plug B pin #20 to relay 79CR.
 - Check continuity. Replace if defective.

7. Loose or broken wire #02 from base terminal block to relay 79CR.
 - Check continuity. Replace if defective.
8. Loose or broken wire #99 from relay 79CR to ECU connector pin #18.
 - Check continuity. Replace if defective.
9. Loose or broken wire #103 from relay 79CR to base terminal block.
 - Check continuity. Replace if defective.
10. Loose or broken wire #103 from base terminal block to ECU connector pin #17.
 - Check continuity. Replace if defective.
11. Defective relay 79CR.
 - Check relay. Replace if defective.

(GM Engine Only)

12. Loose or broken wire #79 from base plug B pin #20 to engine harness plug.
 - Check continuity. Replace if defective
13. Loose or broken wire #79 from engine harness plug to GM engine connector 2.
 - Check continuity. Replace if defective.
14. Loose or broken gray/dark blue wire from GM engine connector to ECU connector pin #51.
 - Check continuity. Replace if defective.
15. Loose or broken purple/light blue wire from ECU connector pin #5 to throttle actuator RA1.
 - Check continuity. Replace if defective.
16. Defective throttle actuator RA1.
 - Check actuator. Replace if defective.

4.1-44 High Throttle Inoperative

1. Loose or broken wire #08 from platform terminal block to throttle switch S10.
 - Check continuity. Replace if defective.
2. Open or defective diode D08. (Generator option only)
 - Check diode. Replace if defective.
3. Defective throttle switch S10.
 - Check continuity through switch while activating high throttle function between wires #08 and #78. If no continuity found replace switch.
4. Loose or broken wire #78 from throttle switch S10 to plug B pin #19 in platform control console.
 - Check continuity. Replace if defective.
5. Loose or broken wire #78 in Cable B or its connectors.
 - Check for continuity between pins #19 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.

(Deutz Diesel Only)

6. Loose or broken wire #78 from base plug B pin #19 to relay 78CR.
 - Check continuity. Replace if defective.
7. Loose or broken wire #02 from base terminal block to relay 78CR.
 - Check continuity. Replace if defective.
8. Loose or broken wire #90 from relay 78CR to ECU connector pin #21.
 - Check continuity. Replace if defective.
9. Loose or broken wire #103 from relay 78CR to base terminal block.
 - Check continuity. Replace if defective.
10. Loose or broken wire #103 from base terminal block to ECU connector pin #17.
 - Check continuity. Replace if defective.
11. Defective relay 78CR.
 - Check relay. Replace if defective.

(GM Engine Only)

12. Loose or broken wire #78 from base plug B pin #19 to engine harness plug.
 - Check continuity. Replace if defective.
13. Loose or broken wire #78 from engine harness plug to GM engine connector 2.
 - Check continuity. Replace if defective.
14. Loose or broken gray/orange wire from GM engine connector 2 to ECU connector pin #52.
 - Check continuity. Replace if defective.
15. Loose or broken light blue/dark blue wire from ECU connector pin #6 to throttle actuator RA1.
 - Check continuity. Replace if defective.
16. Defective throttle actuator RA1.
 - Check actuator. Replace if defective.

4.1-45 Brake will not Release

1. No output on pin #10 from valve driver to wire #26 when operating a drive function.
 - Check pin #10 for 12 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.
2. Loose or broken wire #26 from valve drive pin #10 to plug A pin #11 in platform control console.
 - Check continuity. Replace if defective.
3. Loose or broken wire #26 in Cable A or its connectors.
 - Check for continuity between pins #11 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
4. Loose or broken wire #26 from base plug A pin #11 to main harness plug pin #6.
 - Check continuity. Replace if defective.
5. Loose or broken wire #26 or #02 from main harness plug to brake valve 3H-26.
 - Check continuity. Replace if defective.
6. Defective brake valve coil 3H-26.
 - Check continuity and resistance through coil. Replace if defective.

4.1-46 Differential Lock will not Engage**NOTE**

Differential Lock cannot be engaged if a drive function has been selected.

1. No output on pin #19 from valve driver to wire #26A.
 - Check pin #19 for 12 volts when drive in neutral position. If no voltage present make sure drive joystick output "D" is between 4.2 and 4.8 volts.
2. Loose or broken wire #26A from valve drive pin #19 to differential lock switch S28.
 - Check continuity. Replace if defective.
3. Loose or broken wire #165 from differential lock switch S28 to plug A pin #24 in platform control console.
 - Check continuity. Replace if defective.
4. Loose or broken wire #165 in Cable A or its connectors.
 - Check for continuity between pins #24 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
5. Loose or broken wire #165 from base plug A pin #24 to main harness plug pin #21.
 - Check continuity. Replace if defective.
6. Loose or broken wire #165 or #02 from main harness plug to differential lock valve 3H-165.
 - Check continuity. Replace if defective.
7. Defective differential lock valve coil 3H-165.
 - Check continuity and resistance through coil. Replace if defective.

4.1-47 Differential Lock Engages Momentarily but will not stay Engaged**NOTE**

Differential Lock will engage without light being illuminated. Check bulb.

1. Loose or broken wire #26A at diode D26A.
 - Check continuity. Replace if defective.
2. Open or defective diode D26A.
 - Check diode. Replace if defective.
3. Loose or broken wire #26B from diode D26A to relay 165CR.
 - Check continuity. Replace if defective.
4. Loose or broken wire #165 from differential lock switch S28 to relay 165CR. (2 places)
 - Check for 12 volts on wire #165 (2 places) while activating differential lock at relay 165CR.
 - Check continuity. Replace if defective.
5. Defective relay 165CR.
 - Check relay. Replace if defective.
6. Loose or broken wire #02 from platform terminal block to differential lock switch S28.
 - Check continuity. Replace if defective.
7. Loose or broken wire #02A from differential lock switch S28 to relay 165CR.
 - Check continuity. Replace if defective.
8. Loose or broken wire #08 from platform terminal block to diode D08-1.
 - Check continuity. Replace if defective.
9. Open or defective diode D08-1.
 - Check diode. Replace if defective.
10. Loose or broken wire #26B from diode D08-1 to relay 165CR.

4.1-48 No Drive and Steer**NOTE**

Aerial platform will not drive or steer if it is tilted and off limit switches.

1. Loose or broken wire #162A from base terminal block to base plug B pin #24. (CE only)
 - Check continuity. Replace if defective.
2. Loose or broken wire #162A in Cable B or its connectors. (CE only)
 - Check for continuity between pins #24 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
3. Loose or broken wire #162A from plug B pin #24 in platform control console to drive joystick A2. (CE only)
 - Check continuity. Replace if defective.

NOTE

For further CE troubleshooting refer to Load Sensing System.

4. Loose or broken wire #09A in cable A or its connectors.
 - Check for continuity between pins #7 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
6. Loose or broken wire #09A from plug A pin #7 to drive joystick A1 in platform control console.
 - Check continuity. Replace if defective.
7. Loose or broken wire #09A from plug A pin #7 to generator switch S22. (Generator option only)
 - Check continuity. Replace if defective.

8. Loose or broken wire #09B from generator switch S22 to drive joystick A1. (Generator option only)
 - [Check continuity. Replace if defective.](#)
9. Defective generator switch S22. (Generator option only)
 - [Check switch. Replace if defective.](#)
10. Loose or broken wire #02 from platform terminal block to drive joystick A1.
 - [Check continuity. Replace if defective.](#)

4.1-49 No Forward Drive

1. No output on "D" when forward is selected on drive joystick A2.
 - [See drive joystick test procedure in section 5.](#)
2. Loose or broken wire "D-signal" from drive joystick A2 to valve driver pin #27.
 - [Check continuity. Replace if defective.](#)
3. No output from valve driver pin #34 to wire #16.
 - [Check pin #34 for minimum 2 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.](#)
4. Loose or broken wire #16 from valve driver pin #34 to resistor R4.
 - [Check continuity. Replace if defective.](#)
5. Open resistor R4.
 - [Check resistor for 30 ohms. If no resistance found replace resistor.](#)
6. Loose or broken wire #16 from resistor R4 to plug B pin #5 in platform control console.
 - [Check continuity. Replace if defective.](#)
7. Loose or broken wire #16 in cable B or its connectors.
 - [Check for continuity between pins #5 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.](#)
8. Loose or broken wire #16 from base plug B pin #5 to forward drive valve 3H-16.
 - [Check continuity. Replace if defective.](#)
9. Loose or broken wire #02 from base terminal block to forward drive valve 3H-16.
 - [Check continuity. Replace if defective.](#)
10. Defective forward drive valve coil 3H-16.
 - [Check continuity and resistance through coil. Replace if defective.](#)

4.1-50 No Reverse Drive

1. No output on "D" when reverse is selected on drive joystick A2.
 - [See drive joystick test procedure in section 5.](#)
2. Loose or broken wire "D-signal" from drive joystick A2 to valve driver pin #27.
 - [Check continuity. Replace if defective.](#)
3. No output from valve driver pin #23 to wire #15.
 - [Check pin #23 for minimum 2 volts. If no voltage present with foot on footswitch check section 5 for valve driver test procedure.](#)
4. Loose or broken wire #15 from valve driver pin #23 to resistor R3.
 - [Check continuity. Replace if defective.](#)
5. Open resistor R3.
 - [Check resistor for 30 ohms. If no resistance found replace resistor.](#)
6. Loose or broken wire #15 from resistor R3 to plug B pin #4 in platform control console.
 - [Check continuity. Replace if defective.](#)
7. Loose or broken wire #15 in cable B or its connectors.
 - [Check for continuity between pins #4 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.](#)
8. Loose or broken wire #15 from base plug B pin #4 to reverse drive valve 3H-15.
 - [Check continuity. Replace if defective.](#)
9. Loose or broken wire #02 from base terminal block to reverse drive valve 3H-15.
 - [Check continuity. Replace if defective.](#)

10. Defective reverse drive valve coil 3H-15.
 - Check continuity and resistance through coil. Replace if defective.

4.1-51 No High Speed Drive

NOTE

Aerial platform must be level and boom must be fully retracted and horizontal or below.

1. Loose or broken wire #09 from base terminal block to limit switch LS2.
 - Check continuity. Replace if defective.
2. Open or defective limit switch LS2.
 - Ensure boom is horizontal or below and fully retracted. Adjust switch if required. Check continuity through switch. Replace if required.
3. Loose or broken wire #29 from limit switch LS2 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #29 from base terminal block to limit switch LS3.
 - Check continuity. Replace if defective.
5. Open or defective limit switch LS3.
 - Ensure boom is fully retracted and horizontal or below. Adjust switch if required. Check continuity through switch. Replace if defective.
6. Loose or broken wire #59 from limit switch LS3 to base terminal block.
 - Check continuity. Replace if defective.
7. Loose or broken wire #59 from base terminal block to plug B pin #15.
 - Check continuity. Replace if defective.
8. Loose or broken wire #59 in boom cable B or its connectors.
 - Check for continuity between pins #15 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
9. Loose or broken wire #59 from plug B pin #15 to platform terminal block.
 - Check continuity. Replace if defective.
10. Loose or broken wire #59 from platform terminal block to valve driver pin #31.
 - Check continuity. Replace if defective.
11. Defective valve driver channel input for high drive enable.
 - See section 5 for test procedure on valve driver.
12. Loose or broken wire #59 from platform terminal block to torque switch S48.
 - Check continuity. Replace if defective.
13. Open or defective torque switch S48.
 - Check continuity through switch while activating low torque function between wires #59 and #45. If no continuity found replace switch.
14. Loose or broken wire #45 from torque switch S48 to plug A pin #20 in platform control console.
 - Check continuity. Replace if defective.
15. Loose or broken wire #45 in cable A or its connectors.
 - Check for continuity between pins #20 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
16. Loose or broken wire #45 from plug A pin #20 to relay 45CR1.
 - Check continuity. Replace if defective.
17. Loose or broken wire #09 from base terminal block to relay 45CR1.
 - Check continuity. Replace if defective.
18. Loose or broken wire #02 from relay 45CR1 to base terminal block.
 - Check continuity. Replace if defective.
19. Defective relay 45CR1.
 - Check relay. Replace if defective.

20. Loose or broken wire #45A from relay 45CR1 to main harness plug pin #17.
 - Check continuity. Replace if defective.
21. Loose or broken wire #45A or #02 from main harness plug to 2 speed valve 3H-45A.
 - Check continuity. Replace if defective.
22. Defective 2 speed valve 3H-45A.
 - Check continuity and resistance through coil. Replace if defective.

4.1-52 No Elevated Drive

NOTE

Aerial platform must be level to drive elevated.

1. Loose or broken wire #09 or #02 from base terminal block to level sensor TS1.
 - Check continuity. Replace if defective.
2. Misadjusted, no output or defective level sensor TS1.
 - Adjust level sensor if required. Check for 12 volts on wire #28. If no voltage present with level sensor adjusted or if defective, replace level sensor.
3. Loose or broken wire #28 from level sensor TS1 to plug B pin #7.
 - Check continuity. Replace if defective.
4. Loose or broken wire #28 in cable B or its connectors.
 - Check for continuity between pins #7 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
5. Loose or broken wire #28 from plug B pin #7 to platform terminal block.
 - Check continuity. Replace if defective.
6. Loose or broken wire #28 from platform terminal block to valve driver pin #32.
 - Check continuity. Replace if defective.

4.1-53 No Left Steer

1. Loose or broken wire #24 from drive joystick A2 to valve driver pin #17.
 - Check continuity. Replace if defective.
2. Loose or broken wire #24A from valve driver pin #4 to plug A pin #10 in platform control console.
 - Check continuity. Replace if defective.
3. Loose or broken wire #24A in boom cable A or its connectors.
 - Check for continuity between pins #10 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
4. Loose or broken wire #24A from base plug A pin #10 to main harness plug pin #5.
 - Check continuity. Replace if defective.
5. Loose or broken wire #24A or #02 from main harness plug to left steer valve 4H-24A.
 - Check continuity. Replace if defective.
6. Defective left steer valve coil 4H-24A.
 - Check continuity and resistance through coil. Replace if defective.

4.1-54 No Right Steer

1. Loose or broken wire #23 from drive joystick A2 to valve driver pin #18.
 - Check continuity. Replace if defective.
2. Loose or broken wire #23A from valve driver pin #21 to plug A pin #9 in platform control console.
 - Check continuity. Replace if defective.
3. Loose or broken wire #23A in boom cable A or its connectors.
 - Check for continuity between pins #9 on cable A. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
4. Loose or broken wire #23A from base plug A pin #9 to main harness plug pin #4.
 - Check continuity. Replace if defective.

5. Loose or broken wire #23A or #02 from main harness plug to right steer valve 4H-23A.
 - Check continuity. Replace if defective.
6. Defective right steer valve coil 4H-23A.
 - Check continuity and resistance through coil. Replace if defective.

4.1-55 Direction Sensing Inoperative

1. Loose or broken wire #09 from base terminal block to limit switch LS1.
 - Check continuity. Replace if defective.
2. Open or defective limit switch LS1.
 - Adjust limit switch if required. Check continuity through switch. Replace if defective.
3. Loose or broken wire #17 from limit switch LS1 to base terminal block.
 - Check continuity. Replace if defective.
4. Loose or broken wire #17 from base terminal block to base plug B pin #6.
 - Check continuity. Replace if defective.
5. Loose or broken wire #17 in boom cable B or its connectors.
 - Check for continuity between pins #6 on cable B. Check for loose or corroded connections on cable connectors. Replace if wire is defective.
6. Loose or broken wire #17 from platform plug B pin #6 to valve driver pin #15 in platform control console.
 - Check continuity. Replace if defective.
7. Defective valve driver channel input for direction sense enable.
 - See section 5 for test procedure on valve driver.

4.2 Hydraulic System

4.2-1 All Controls Inoperative

1. Broken or defective drive pump shaft or coupling.
 - Check pump shaft and coupling. Replace if defective.
2. Hydraulic oil level low.
 - Check oil level. Fill to proper level.

4.2-2 All Boom Functions Inoperative

1. Open or defective dump valve 2H-21A.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
2. Stuck or defective relief valve RV6.
 - Set valve to specifications. Check o-rings and clean valve. Repair or replace valve as required.
3. Stuck or defective Inlet Compensator/ differential sensing valve DSV1.
 - Check o-rings and clean valve. Check operation of valve. Repair or replace valve as required.
4. System pump P2 defective.
 - Test pump with flow meter. Replace if defective.
5. Plugged or defective high pressure filter F2.
 - Check filter. Replace if plugged or defective.

4.2-3 No Main Boom Up

1. Stuck or defective lift up valve 4H-14.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Stuck or defective shuttle valve SV13.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
3. Stuck or defective shuttle valve SV7.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective differential sensing valve DSV4.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective counterbalance valve CB9.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
6. Defective lift cylinder C3.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-4 No Main Boom Down

1. Stuck or defective lift down valve 4H-13.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Stuck or defective shuttle valve SV13.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
3. Stuck or defective shuttle valve SV7.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective differential sensing valve DSV4.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective counterbalance valve CB9.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.

6. Defective lift cylinder C3.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-5 No Riser Boom Up

1. Stuck or defective riser up valve 4H-31.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Stuck or defective shuttle valve SV10.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
3. Plugged or defective orifice OR3.
 - Check orifice. Replace if plugged or defective.
4. Stuck or defective shuttle valve SV5.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective check valve CV7.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective differential pressure sensing valve DSV3.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
7. Stuck or defective counterbalance valve CB5 or CB6.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
8. Defective riser cylinder C6 or C7.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-6 No Riser Boom Down

1. Stuck or defective riser down valve 4H-30.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Stuck or defective shuttle valve SV10.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
3. Plugged or defective orifice OR3.
 - Check orifice. Replace if plugged or defective.
4. Stuck or defective shuttle valve SV5.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective relief valve RV8.
 - Set valve to specifications. Check o-rings and clean valve. Repair or replace valve as required.
6. Plugged or defective orifice OR7.
 - Check orifice. Replace if plugged or defective.
7. Stuck or defective check valve CV8.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
8. Stuck or defective differential pressure sensing valve DSV3.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
9. Stuck or defective counterbalance valve CB5 or CB6.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
10. Defective riser cylinder C6 or C7.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-7 Riser Boom Down Jerky

1. Stuck open or defective check valve CV7.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Stuck or incorrectly set counterbalance valve CB5 or CB6.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.

4.2-8 No Turret Rotate Left

1. Stuck or defective rotate left valve 4H-32.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Stuck or defective shuttle valve SV9.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
3. Stuck or defective relief valve RV7.
 - Set valve to specifications. Check o-rings and clean valve. Repair or replace valve as required.
4. Stuck or defective differential pressure sensing valve DSV2.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective shuttle valve SV3.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective counterbalance valve CB4.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
7. Turret rotate brake BR2 not releasing.
 - Inspect brake for worn seals or broken components. Repair and replace as necessary.
8. Worn or defective swing drive motor M2.
 - Check motor. Repair or replace if defective.

4.2-9 No Turret Rotate Right

1. Stuck or defective rotate right valve 4H-33.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Stuck or defective shuttle valve SV9.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
3. Stuck or defective relief valve RV7.
 - Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.
4. Stuck or defective differential pressure sensing valve DSV2.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective shuttle valve SV3.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective counterbalance valve CB3.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
7. Turret rotate brake BR2 not releasing.
 - Inspect brake for worn seals or broken components. Repair and replace as necessary.
8. Worn or defective swing drive motor M2.
 - Check motor. Repair or replace if defective.

4.2-10 No Boom Extend

1. Stuck or defective boom extend valve 3H-39.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Plugged, incorrectly adjusted or defective orifice OR5.
 - Check orifice. Set flow rate to 2.1 GPM @ 2000 psi. Replace if plugged or defective.
3. Stuck in the shifted position or defective boom retract valve 3H-38.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective shuttle valve SV8.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective counterbalance valve CB10.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
6. Defective extension cylinder C2.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-11 No Boom Retract

1. Stuck or defective boom retract valve 3H-38.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
2. Plugged, incorrectly adjusted or defective orifice OR5.
 - Check orifice. Set flow rate to 2.1 GPM @ 2000 psi. Replace if plugged or defective.
3. Stuck or defective shuttle valve SV8.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective counterbalance valve CB11.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
5. Defective extension cylinder C2.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-12 No Jib Up

1. Stuck or defective jib enable valve 2H-34A.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
2. Plugged or defective orifice OR2.
 - Check orifice. Replace if plugged or defective.
3. Stuck or defective differential pressure sensing valve DSV5.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective shuttle valve SV8.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective jib up valve 4H-35.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective counterbalance valve CB12.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
7. Defective jib cylinder C1.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-13 No Jib Down

1. Stuck or defective jib enable valve 2H-34A.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.

2. Plugged or defective orifice OR2.
 - Check orifice. Replace if plugged or defective.
3. Stuck or defective differential pressure sensing valve DSV5.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective shuttle valve SV8.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective jib down valve 4H-34.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective counterbalance valve CB13.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
7. Defective jib cylinder C1.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-14 No Platform Rotation Right

1. Stuck or defective platform rotate enable valve 2H-36A.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
2. Plugged or defective orifice OR1.
 - Check orifice. Replace if plugged or defective.
3. Stuck or defective differential pressure sensing valve DSV5.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective shuttle valve SV8.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective platform rotate right valve 4H-37.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective counterbalance valve CB14.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
7. Defective rotary actuator RA1.
 - Check actuator. Repair or replace as necessary.

4.2-15 No Platform Rotation Left

1. Stuck or defective platform rotate enable valve 2H-36A.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
2. Plugged or defective orifice OR1.
 - Check orifice. Replace if plugged or defective.
3. Stuck or defective differential pressure sensing valve DSV5.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective shuttle valve SV8.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective platform rotate left valve 4H-36.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective counterbalance valve CB15.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
7. Defective rotary actuator RA1.
 - Check actuator. Repair or replace as necessary.

4.2-16 Platform will not Level Down Manually

1. Plugged, incorrectly adjusted or defective orifice OR4.
 - Check orifice. Set flow rate to 1 GPM @ 2000 psi. Replace if plugged or defective.
2. Stuck or defective platform level down valve 4H-40.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
3. Stuck or defective shuttle valve SV12.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective shuttle valve SV6.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective check valve CV4.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective relief valve RV9.
 - Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.
7. Stuck or defective counterbalance valve CB8.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
8. Stuck or defective check valve CV5.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
9. Defective leveling cylinder C4 or slave cylinder C5.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-17 Platform will not Level Up Manually

1. Plugged, incorrectly adjusted or defective orifice OR4.
 - Check orifice. Set flow rate to 1 GPM @ 2000 psi. Replace if plugged or defective.
2. Stuck or defective platform level up valve 4H-41.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
3. Stuck or defective shuttle valve SV12.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective shuttle valve SV6.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Stuck or defective check valve CV5.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
6. Stuck or defective relief valve RV9.
 - Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.
7. Stuck or defective counterbalance valve CB7.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
8. Stuck or defective check valve CV4.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
9. Defective leveling cylinder C4 or slave cylinder C5.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-18 Brake will not Release

1. Stuck or defective shuttle valve SV2.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.

2. Defective or misadjusted pressure reducing valve PR1.
 - Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.
3. Stuck or defective brake valve 3H-26.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Stuck or defective shuttle valve SV1.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
5. Defective or misadjusted relief valve RV4.
 - Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.
6. Stuck or defective brake release override valve V1.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
7. Bypassing or defective brake hand pump V3.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.
8. Bypassing or defective brake cylinder C12.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective

4.2-19 Brake will not Engage

1. Brake cylinder defective.
 - Check cylinders. Repair or replace as necessary.
2. Brake valve 3H-26 stuck in shifted position.
 - Check valve. Replace if defective.
3. Brake inside axle out of adjustment.
 - See section 5 for brake adjustment procedure.

4.2-20 Differential Lock will not Engage

1. Stuck or defective shuttle valve SV2.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
2. Defective or misadjusted pressure reducing valve PR1.
 - Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.
3. Stuck or defective differential lock valve 3H-165.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
4. Bypassing or defective differential lock cylinder C13.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective

4.2-21 No Drive Forward or Reverse

1. Brake not releasing.
 - See "brake will not release" in this section.
2. Defective or misadjusted charge pump relief valve RV3.
 - Set valve to specifications. Check O-rings and clean valve. Repair or replace valve as required.
3. Plugged or defective charge pump filter F1.
 - Check filter. Replace if plugged or defective.
4. Worn charge pump P1A.
 - Check pump. Replace if defective.
5. Defective pump displacement control 3H-15 and 3H-16.
 - Check control. Replace if defective.
6. Open bypass valve V4.
 - Close bypass valve.
7. Drive directional valve 4H-V1 stuck in neutral position.
 - Check valve. Replace if defective.

8. Worn drive pump P1.
 - Check pump. Replace if defective.
9. Worn or defective drive motor M1.
 - Check motor. Replace if defective.

4.2-22 No Forward Drive

1. Defective pump displacement control 3H-16.
 - Check control. Replace if defective.
2. Defective or misadjusted drive relief valve RV1.
 - See section 5 for drive pump set up procedures.
3. Drive directional valve 4H-V1 stuck or not shifting.
 - Check valve. Replace if defective.

4.2-23 No Reverse Drive

1. Defective pump displacement control 3H-15.
 - Check control. Replace if defective.
2. Defective or misadjusted drive relief valve RV2.
 - See section 5 for drive pump set up procedures.
3. Drive directional valve 4H-V1 stuck or not shifting.
 - Check valve. Replace if defective.

4.2-24 No High Speed Drive

1. Stuck or defective 2 speed valve 3H-45.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
2. Defective shift spool in drive motor M1.
 - Check motor. Repair or replace if necessary.

4.2-25 No Right Steer

1. Plugged, incorrectly adjusted or defective priority flow control PFC1.
 - Check operation. Set flow rate to 1.5 GPM @ 2000 psi. Replace if plugged or defective.
2. Stuck or defective right steer valve 4H-23A.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
3. Defective steer cylinder C8.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-26 No Left Steer

1. Plugged, incorrectly adjusted or defective priority flow control PFC1.
 - Check operation. Set flow rate to 1.5 GPM @ 2000 psi. Replace if plugged or defective.
2. Stuck or defective left steer valve 4H-24A.
 - Clean valve. Check operation of valve. Repair or replace valve as required.
3. Defective steer cylinder C8.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.

4.2-27 Axle Will Not Oscillate

NOTE

Axle will only oscillate when boom is fully retracted and is horizontal or below.

1. Stuck or defective axle lockout valve 3H-65.
 - Clean valve. Replace if defective.

2. One or more counterbalance valves (CB1 or CB2) failed to shift or is defective.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.

4.2-28 Axle Will Not Lock

NOTE

Axle is in constant float if boom is fully retracted and is horizontal or below.

1. Axle lockout valve 3H-65 is stuck in shifted position or is defective.
 - Clean valve. Check O-rings on valve. Check operation of valve. Repair or replace valve as required.
2. Bypassing or defective axle lock cylinders C9 and C10.
 - Check seals on cylinder. Replace as necessary. Replace cylinder if defective.
3. Counterbalance valves (CB1 or CB2) out of adjustment or are defective.
 - Clean valve. Check O-rings on valve. Repair or replace valve as required.

4.3 Load Sensing System - CE

4.3-1 Green Power LED is not Flashing

1. Loose or broken wires #60 and #02 at platform terminal block.
 - Check for connections. Check for voltage (12V).
2. Load cell has lost its calibration.
 - Refer to calibration procedure for recalibration of load cell.

4.3-2 Load Cell red Alarm LED is ON (with platform empty)

1. Load cell has lost its calibration.
 - Refer to calibration procedure for recalibration of load cell.

4.3-3 Red Error LED is ON

1. Open safety contact circuit.
 - Check for connections with wires #161 and #162A at platform terminal block and base terminal block. Check resistor R6 for 680 ohms.

4.3-4 Load Cell red Alarm LED is OFF (with platform overloaded)

1. Open safety contact circuit.
 - Check for connections with wires #161 and #162 at platform terminal block and base terminal block. Check resistor R6 for 680 ohms.

4.3-5 Platform Indicator Light does not turn ON

1. Defective lamp.
 - Check lamp. Replace if defective.
2. Defective relay 82CR.
 - Check relay. Replace if defective.
3. Load cell circuit not operating.
 - Check for connections with wire #02B at pilot light strip and relay 82CR, and wire #82 at platform terminal block and relay 82CR.
4. Defective load cell.
 - Defective if 0V is measured between wire #82 and #02 from platform terminal block.

4.3-6 Audible Alarm does not turn ON

1. Defective alarm BP3.
 - Check alarm. Replace if defective.
2. Open or defective diode D118.
 - Check diode. Replace if defective.
3. Load cell circuit not operating.
 - Check for connections with wires #02 and #118 at platform terminal block.
4. Defective load cell.
 - Defective if 0V is measured between wire #118 and #02 from platform terminal block.

4.3-7 Boom and Drive Functions are Enabled (with boom extended)

1. "Fly IN" limit switch LS3 is not operating properly.
 - Check for voltage (0V) between wires #59 and #02 from platform terminal block. If 12V is measured, check for proper actuation of limit switch. Readjust limit switch if necessary.
2. Defective load cell. Safety contact remains closed.
 - Check for voltage (0V) between wires #162 and #02 from base terminal block. Defective if 12V is measured.

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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 Human Machine Interface (HMI)

Maintaining proper calibration is essential for good performance of the aerial platform.

1. Ensure aerial platform is on a firm level surface, and is in stowed position and engine is off.
2. On base control, turn base/off/platform key switch to "platform" position.
3. Pull out "O" emergency stop button.



WARNING

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

4. Enter platform and close gate.



WARNING

DO NOT operate any control on platform control console without proper fall protection secured to designated location in platform. Failure to avoid this hazard could result in death or serious injury!



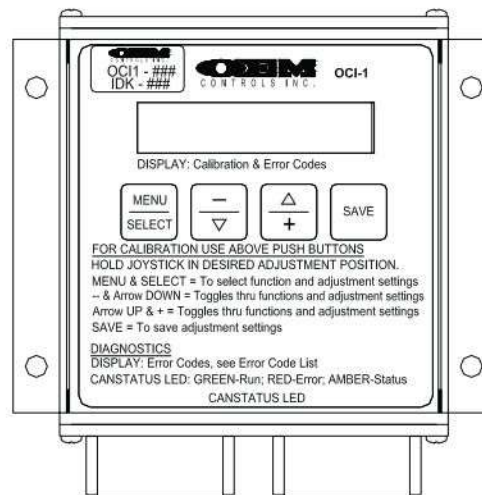
WARNING

Ensure that there are no personnel or obstructions in test area and that there is sufficient room for boom to swing.

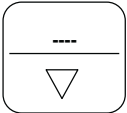
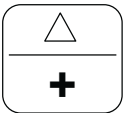
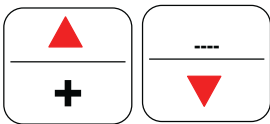
5. At platform control, open the cover of the console to access the OCI-1 console.

The OCI-1 has an integrated multi segment, two line display with membrane keys that allow it to be used as the main interface to system controls and adjustments. the Human Machine Interface (referred to as the HMI) will serve as your window into the application software to allow the operator to monitor/adjust the following information;

- Active Function Being Used
- Part Number and Serial Number
- Restore the Factory Default Settings
- Output Calibrations (Tresh, Max, Ramp.etc)
- I-O Status
- CANBus Status



5.1-2 User Interface Keys

1.0		1.0-1 <MENU> enters a new menu screen and/or 1.0-2 <SELECT> select the flashing item.
1.1		1.1-1 <MINUS> decreases an adjustable parameter such as ramp time. 1.1-2 <DOWN> selects the previous item in the current menu's list.
1.2		1.2-1 <PLUS> increases an adjustable parameter. 1.2-2 <UP> selects the next item in the current menu's list.
1.3		1.3-1 <SAVE> saves the new data to EEPROM (permanent memory storage).
1.4		Simultaneously press <UP> and <DOWN> will reset the HMI to menu screen 0.

OCM Character Functions Charts

OCM Keypad		Function Attribute	
Keys	Short Form	THRESH	Threshold
Menu/Select	(M/S)	RAMPDN	Ramp Down
▼/-	(-)	RAMPUP	Ramp Up
▲/+	(+)	LOWRNG	Low Range
Save/Exit	(S/E)	MAXOUT	Maximum Output

OCM Function (Channel) Names	
DRIVE REV Fn01A	Drive Reverse
DRIVE FWD Fn01B	Drive Forward
CHAN 2A Fn02A	Brakes
CHAN 2B Fn02B	Differential Lock Enable
BOOM DOWN Fn03A	Main Boom Down
BOOM UP Fn03B	Main Boom Up
ROTATE L Fn04A	Turret Rotate Left
ROTATE R Fn04B	Turret Rotate Right
RISER DN Fn05A	Riser Down
RISER UP Fn05B	Riser Up
RISER UP Fn06A	Virtual channel
RISER UP Fn06B	Virtual channel

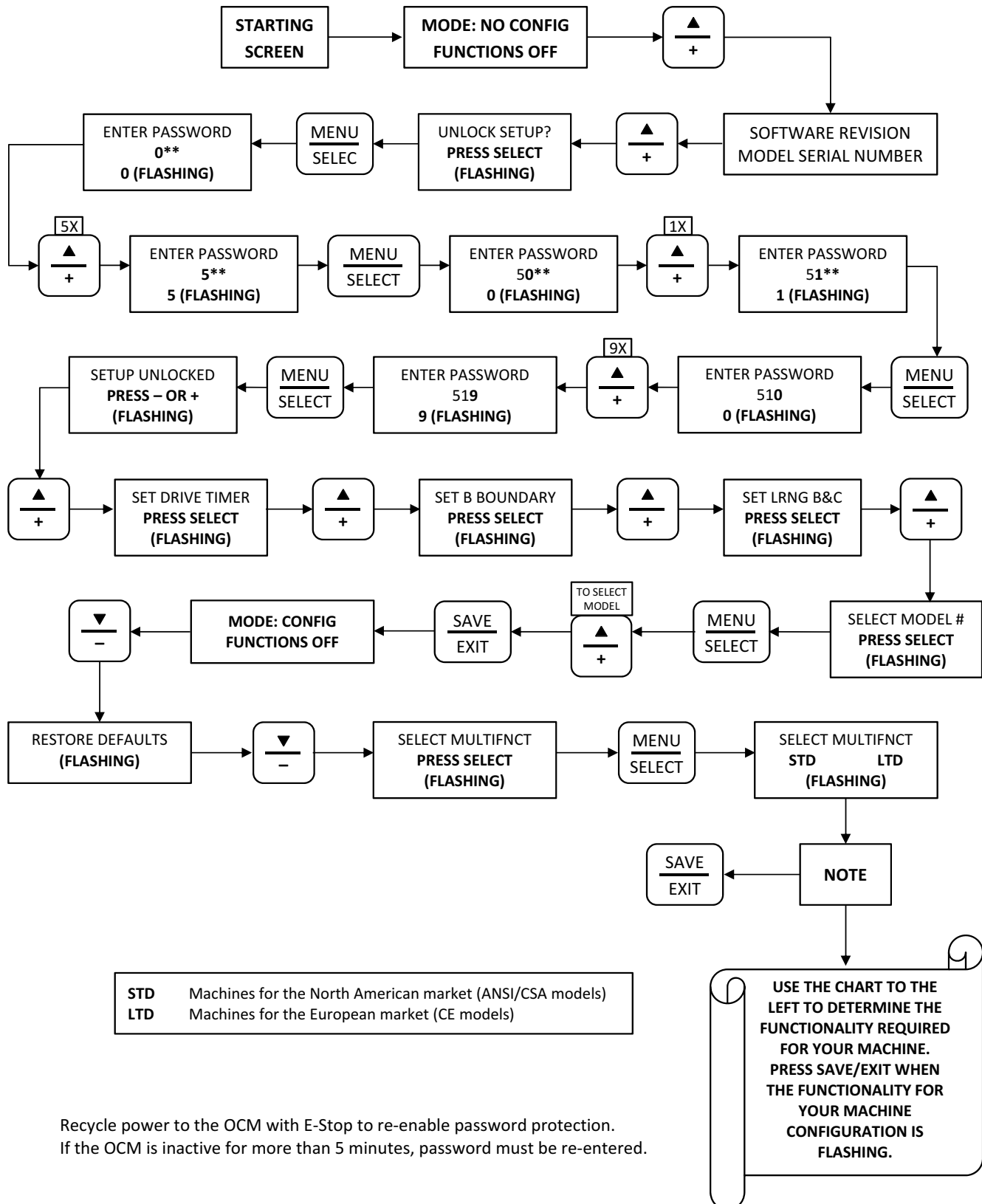
129AB

OCM Operating Values Chart

Input (Analog)	Expected Value	Description
AI 1	0.5V to 8.5V	Drive Controller
AI 2	0.5V to 8.5V	Turret Rotate Controller
AI 3	0.5V to 8.5V	Boom Elevation Controller
AI 4	0.5V to 8.5V	Riser Controller
AI 7	1.0V to 5.0V	Torque Mode (Angle Sensor)
Input (Digital)	Expected Value	Description
DI 1	0 or 1	Drive Direction Reverse Limit Switch
DI 2	0 or 1	Footswitch Actuated
DI 3	0 or 1	Steer Left Rocker Switch
DI 4	0 or 1	Steer Right Rocker Switch
DI 5	0 or 1	Boom Function Toggle Switch Enabled
DI 6	0 or 1	5 Degree Tilt Switch
DI 11	0 or 1	High Speed Drive Enable Limit Switch
Output (PWM)	Expected Value	Description
PWM 1	13% - 80%	Drive Reverse
PWM 2	13% - 80%	Drive Forward
PWM 3	0% or 100%	Brake (Energized to Release)
PWM 4	0% or 100%	Differential Lock Enable
PWM 5	27% - 45%	Main Boom Down
PWM 6	27% - 55%	Main Boom Up
PWM 7	30% - 50%	Turret Rotate Left
PWM 8	30% - 50%	Turret Rotate Right
PWM 9	50% - 55%	Riser Down
PWM 10	28% - 70%	Riser Up
Output (Digital)	Expected Value	Description
DOUT 1	0 or 1	Steer Left
DOUT 2	0 or 1	Load Sense Enable
DOUT 3	0 or 1	Footswitch Actuated Indicator
DOUT 4	0 or 1	Axle Lock (0=enabled)
DOUT 7	0 or 1	Tilt Alarm Indicator
DOUT 8	0 or 1	Steer Right

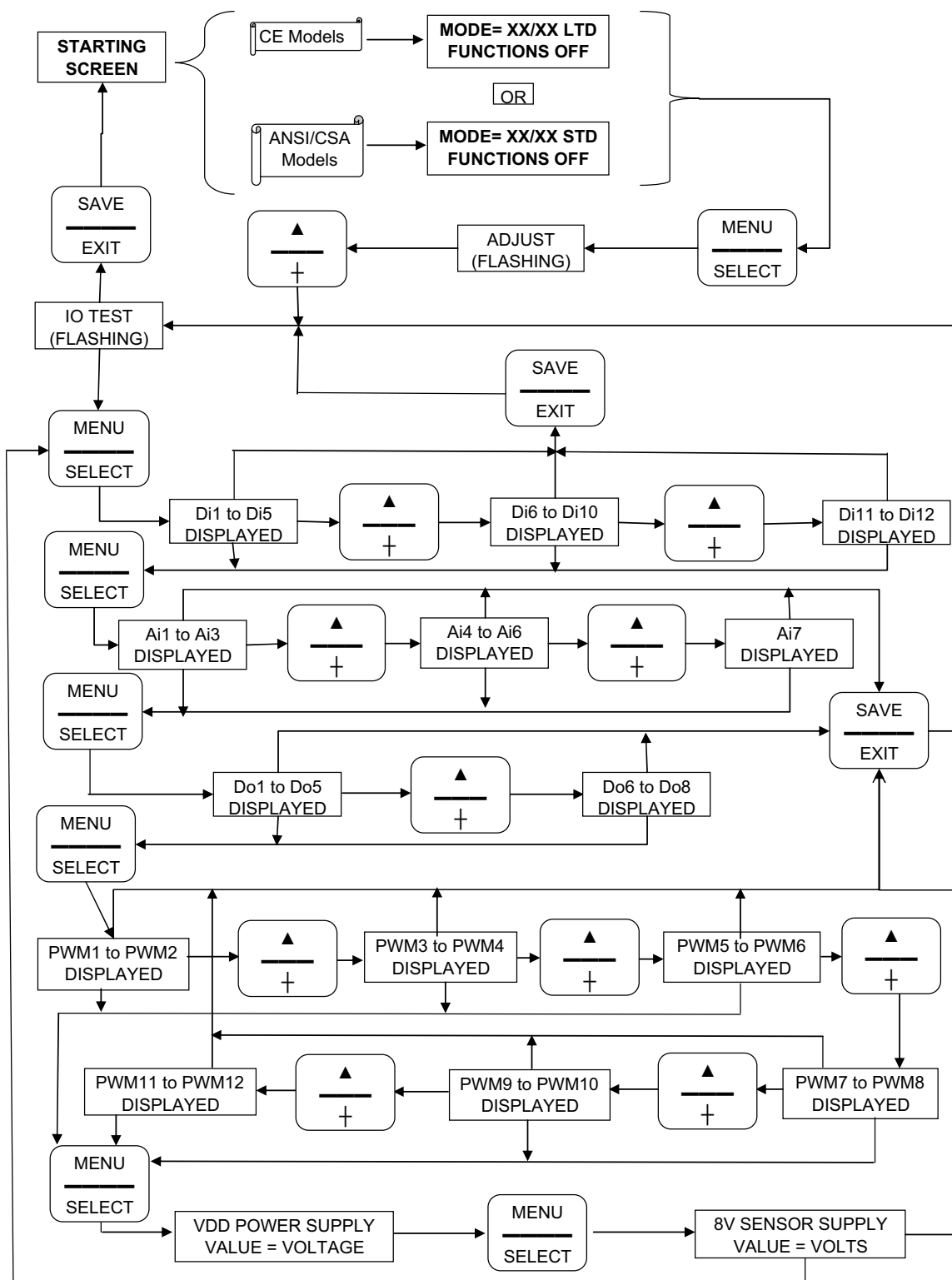
128AC

5.1-3 How to Select Functionality



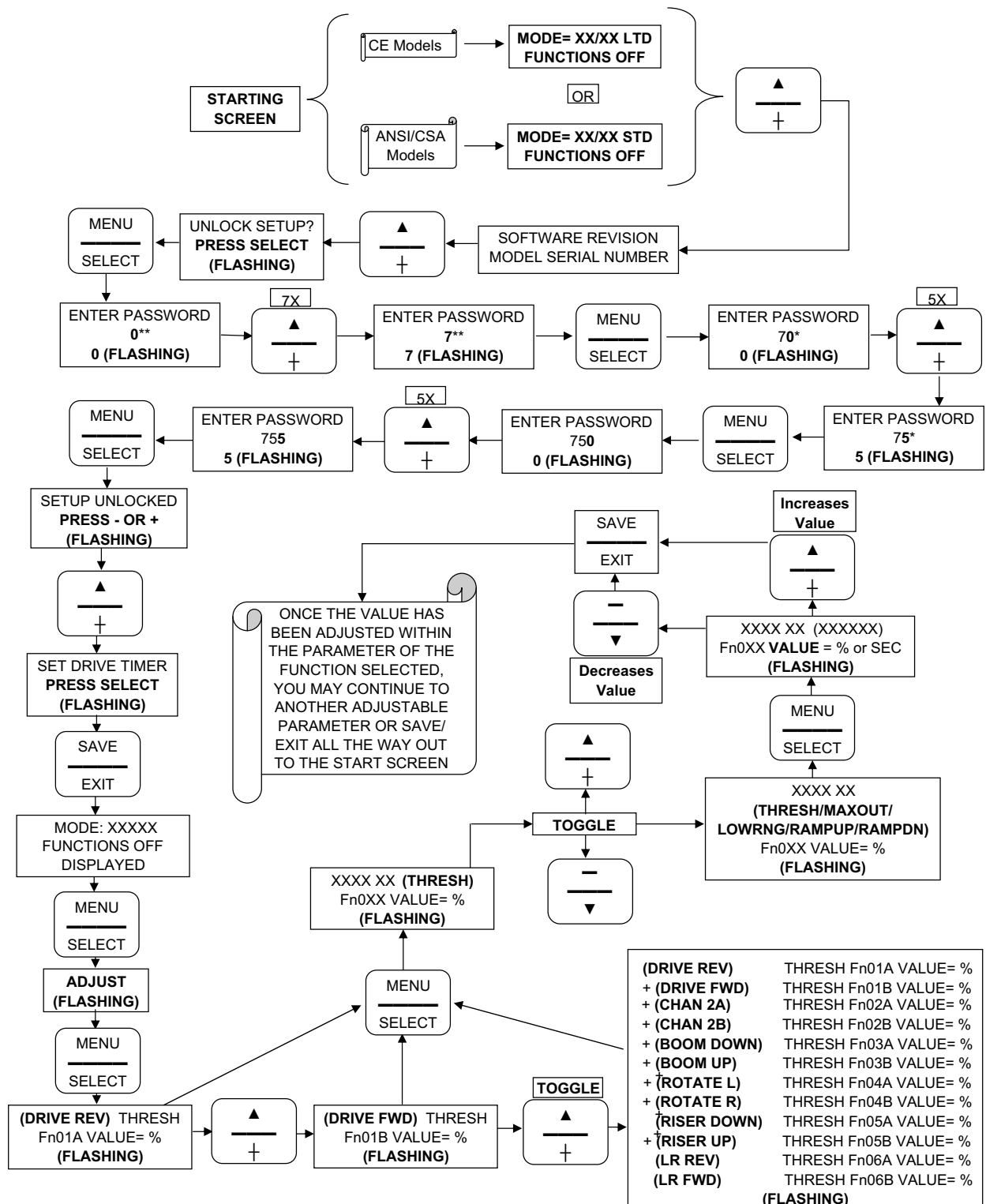
5.1-4 How to View OCM Operation

As a joystick or toggle switch is being activated, the OCM screen will display the active function and % output. Also, the following procedure will allow monitoring of all input and output channels:



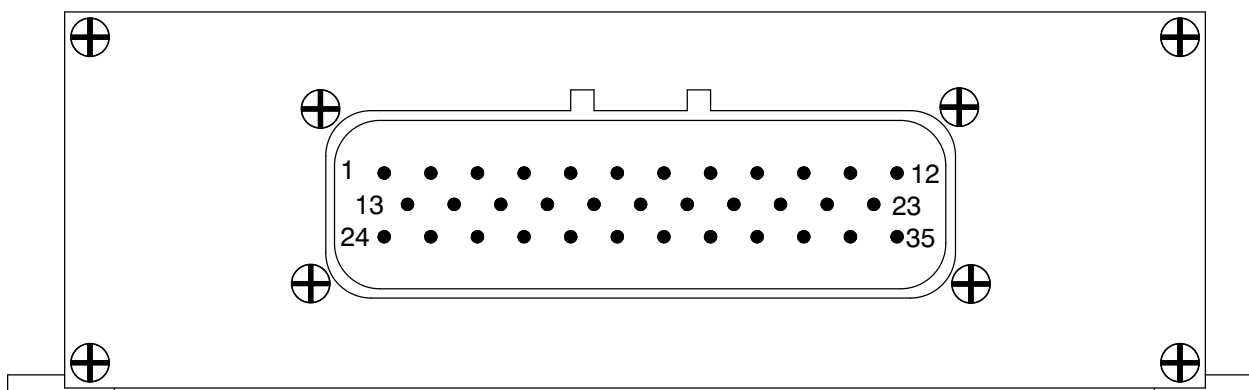
See [OCM Operating Values Chart on page 149](#) for operating valves for the previous observations.

5.1-5 How to Unlock and Modify OCM Settings



Recycle power to the OCM with the E-Stop to re-enable password protection.
If the OCM is inactive for more than 5 minutes, password must be re-entered.

5.1-6 OCM Pin Voltage Reference



All voltages given are with OCM controller at maximum % adjustable settings.

All voltages should be tested with key on, engine off and foot switch depressed.

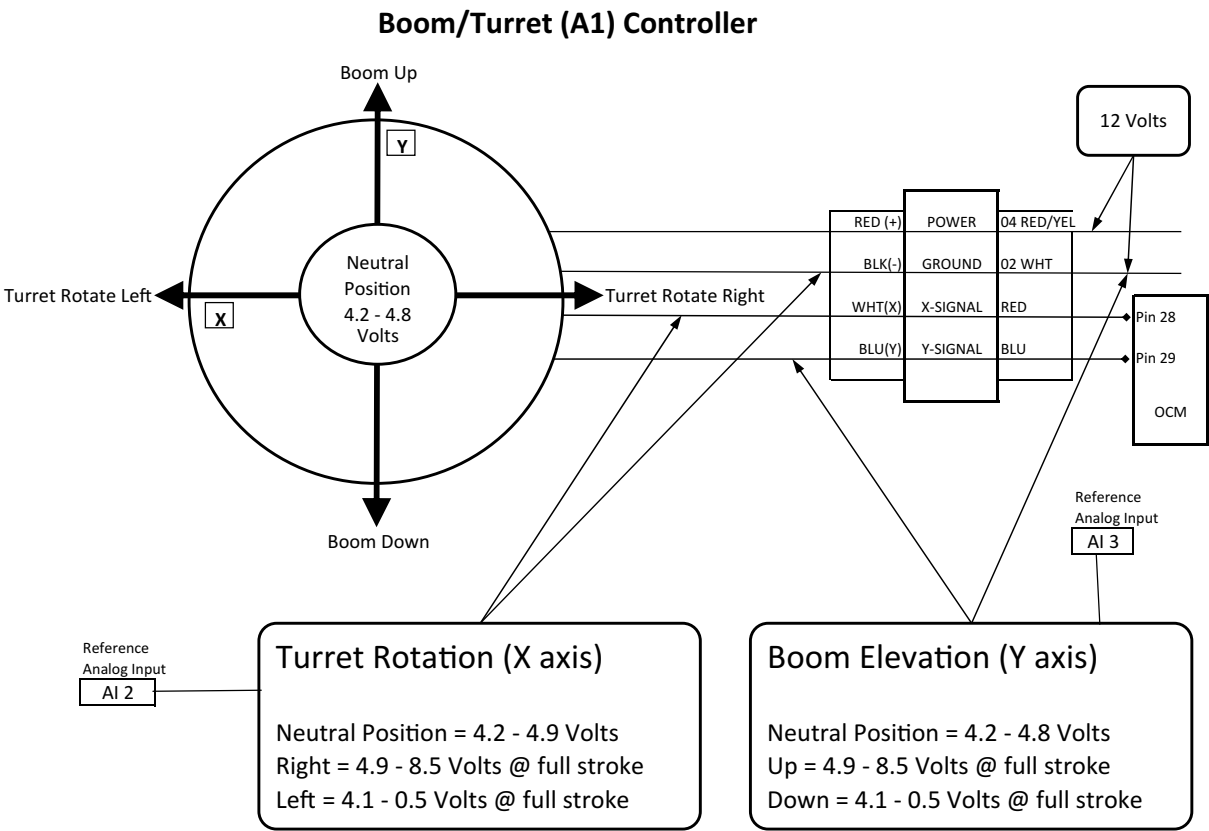
All tests should be performed with platform over drive axle, boom fully stowed and on flat level surface.

- Pin 1 - 12 volt input from wire 4.
Test between pin 1 and 02 wire.
- Pin 2 - 12 volt input from wire 4.
Test between pin 2 and 02 wire.
- Pin 3 - Not used.
- Pin 4 - 12 Volt output on wire 24A to left steer valve 4H-24A
Test between pin 4 and 02 wire.
- Pin 5 - 12 volt output on wire 20 to dump valve relay 21CR.
Test between pin 5 and 02 wire while selecting a function.
- Pin 6 - 12 volt output on wire 08 to toggle switch boom functions. (Foot switch activated)
Test between pin 6 and 02 wire.
- Pin 7 - 12 volt output on wire 65 to axle lock valve 3H-65.
Test between pin 7 and 02 wire.
- Pin 8 - Boom down selected. Proportional output on wire 13 to boom down valve 4H-13.
0 volts to 5.5 volts depending on position of joystick. Threshold= 1.0 volt.
Test between pin 8 and 02 wire while operating boom down.
- Pin 9 - Riser up selected. Proportional output on wire 31 to riser up valve 4H-31.
0 volts to 7.5 volts depending on position of joystick. Threshold= 2.8 volts.
Test between pin 9 and 02 wire while operating boom down.
- Pin 10 - 12 volt output on wire 26 brake valve 3H-26. 12V=Drive selected
Test between pin 10 and 02 wire.

- Pin 11 - 12 volt output on wire 27 to tilt alarm relay 27CR.
Test between pin 11 and 02 wire
- Pin 12 - Riser down selected. Proportional output on wire 30 to riser down valve 4H-30.
0 volts to 4.3 volts depending on position of joystick. Threshold= 2.8 volts.
Test between pin 12 and 02 wire.
- Pin 13 - 12 volt input from wire 4.
Test between pin 13 and 02 wire.
- Pin 14 - Variable input from wire 128A.
1 volt to 5 volts depending on angle of machine.
1 volt = Level
Test between pin 14 and 02 wire.
- Pin 15 - Turret position. 12 volt input from limit switch LS1 on wire 17.
0 volts= Platform over drive axle.
12 volts= Platform over steer axle.
Test between 15 and 02 wire.
- Pin 16 - Foot switch activated. 12 volt input from wire 08A.
Test between pin 16 and 02 wire.
- Pin 17 - Left steer selected. 12 volt input from wire 24.
Test between pin 17 and 02 wire.
- Pin 18 - Right steer selected. 12 volt input from wire 23.
Test between pin 18 and 02 wire.
- Pin 19 - 12 Volt output on wire 26A to differential lock switch.
Test between pin 19 and 02 wire.
- Pin 20 - Turret rotate left selected. Proportional output on wire 32 to turret rotate left valve 4H-32.
0 volts to 6.0 volts depending on position of joystick. Threshold= 3.5 volts.
Test between pin 20 and 02 wire while operating turret rotate left.
- Pin 21 - 12 Volt output on wire 23A to right steer valve 4H-23A
Test between pin 21 and 02 wire.
- Pin 22 - Boom up selected. Proportional output on wire 14 to boom up valve 4H-14.
0 volts to 6.5 volts depending on joystick position. Threshold= 3.2 volts.
Test between pin 22 and 02 wire while operating boom up.
- Pin 23 - Reverse drive selected. Proportional output on wire 15 to reverse drive valve 3H-15.
0 volts to 5.5 volts depending on joystick position. Threshold= 1.1 volts.
Test between pin 23 and 02 wire while operating reverse drive.
- Pin 24 - Battery negative. Wire 02.
- Pin 25 - Battery negative. Wire 02.

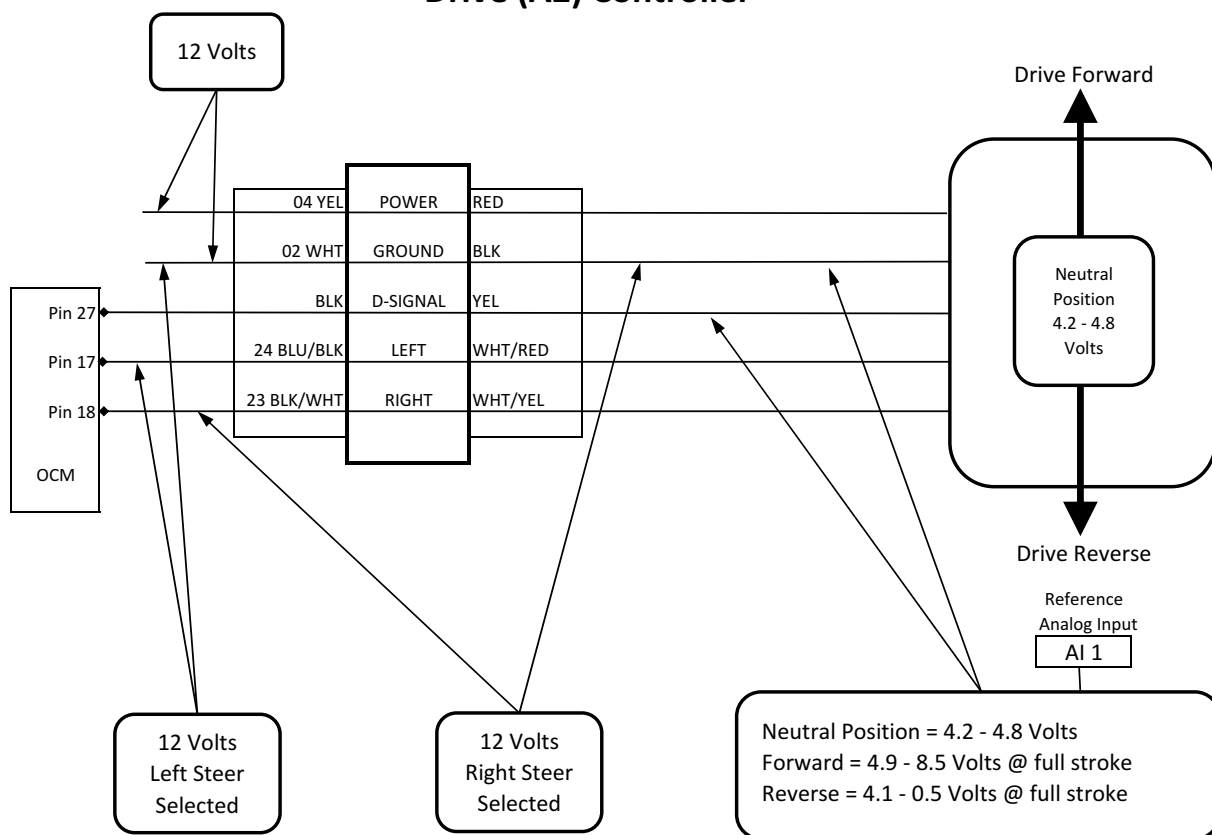
- Pin 26 - Battery negative. Wire 02.
- Pin 27 - Accelerator input. Wire D from drive joystick controller.
Neutral position= 4.2 volts to 4.8 volts.
Forward function= 4.9 volts to 8.5 volts.
Reverse function= 4.1 volts to .5 volts.
Test between pin 27 and 02 wire.
- Pin 28 - Turret rotate input. Wire X from boom joystick controller.
Neutral position= 4.2 volts to 4.8 volts.
Rotate right function= 4.9 volts to 8.5 volts.
Rotate left function= 4.1 volts to .5 volts.
Test between pin 28 and 02 wire.
- Pin 29 - Boom elevation input. Wire Y from boom joystick controller.
Neutral position= 4.2 volts to 4.8 volts.
Boom up function= 4.9 volts to 8.5 volts.
Boom down function= 4.1 volts to .5 volts.
Test between pin 29 and 02 wire.
- Pin 30 - Riser input. Wire R from riser joystick controller.
Neutral position= 4.2 volts to 4.8 volts.
Boom up function= 4.9 volts to 8.5 volts.
Boom down function= 4.1 volts to .5 volts.
Test between pin 30 and 02 wire.
- Pin 31 - 12 volt input from LS2 boom/riser elevation limit switch and LS3 telescope limit switch on wire 59.
12 volts= full speed. 0 volts= creep speed (one or more limit switches open).
Test between pin 31 and 02 wire.
- Pin 32 - 12 volt input from angle sensor on wire 28. 12V= <5%
Test between pin 32 and 02 wire.
- Pin 33 - Toggle switch boom function enable. 12 volt input from wire 20A.
Test between pin 33 and 02 wire.
- Pin 34 - Forward drive selected. Proportional output on wire 16 to forward drive valve 3H-16.
0 volts to 5.7 volts depending on joystick position. Threshold= 1.2 volts.
Test between pin 34 and 02 wire while operating forward drive.
- Pin 35 - Turret rotate right selected. Proportional output on wire 33 to turret rotate right valve 4H-33.
0 volts to 6.0 volts depending on position of joystick. Threshold= 3.5 volts.
Test between pin 10 and 02 wire while operating turret rotate right.

5.1-7 Platform Controller Voltage References

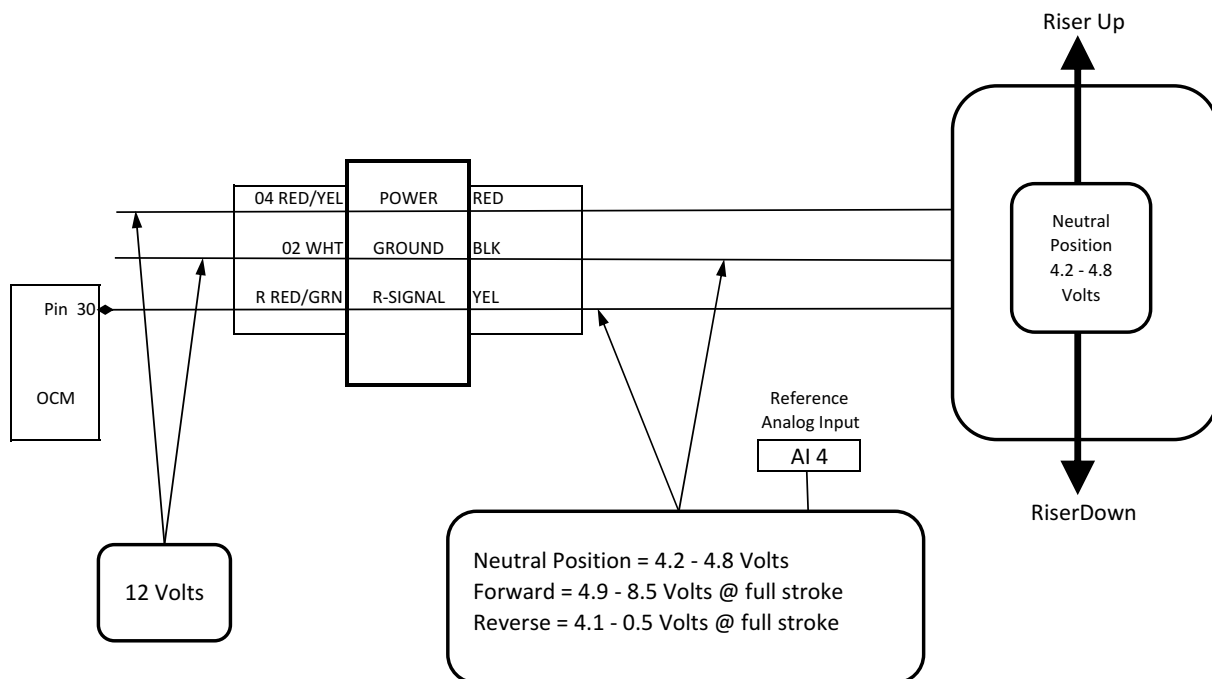


5.1-7 Platform Controller Voltage References (Cont'd)

Drive (A2) Controller



Riser (A3) Controller



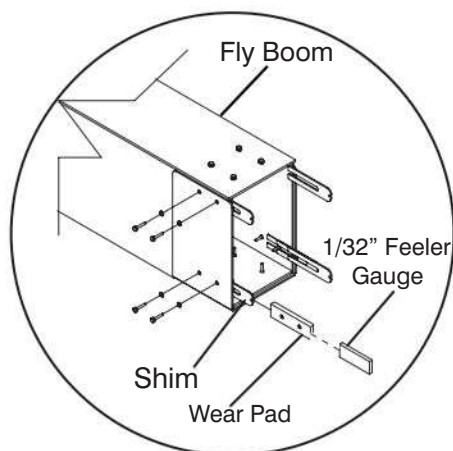
Boom

5.2-1 Check Wear Pads

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Start engine from base control console.
3. Raise main boom to a comfortable working height (chest high), and then extend fly boom approximately 1 foot (30 cm).
4. Measure the thickness of each wear pad and replace wear pad if it is less than 7/16 inches (11 mm)
5. If wear pad is within specified thickness, shim as necessary.

5.2-2 Shimming Wear Pads

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Raise main boom to a comfortable working height (chest high) and extend fly boom until wear pad are accessible.
3. Loosen wear pad fasteners.
4. Shim as necessary to obtain zero to 1/32" clearance and zero drag.



Shim & Feeler Gauge

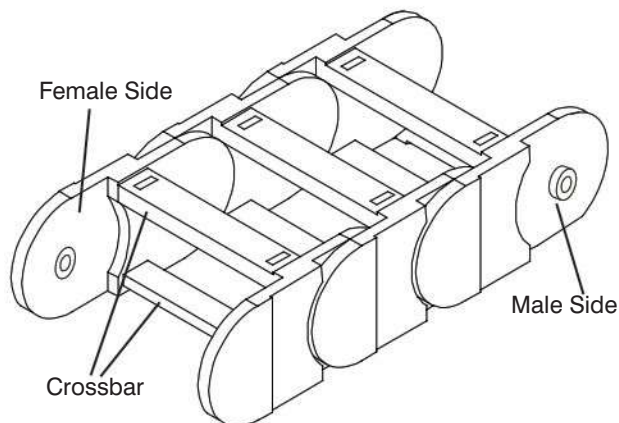
5. Extend and retract fly boom through the entire range of motion and observe for loose points.

NOTE

Always maintain squareness between the boom's outer and inner tubes.

5.2-3 Cable Carrier Repair

The cable carrier can be repaired by simply using a screwdriver. Each crossbar can be snapped off from either side of the chain either by hand or by using the screwdriver as a lever. New crossbars may be installed by snapping links together.



Cable Carrier Assembly

5.2-4 Master Cylinder Replacement

1. Ensure aerial platform is parked on a firm and level surface.



WARNING

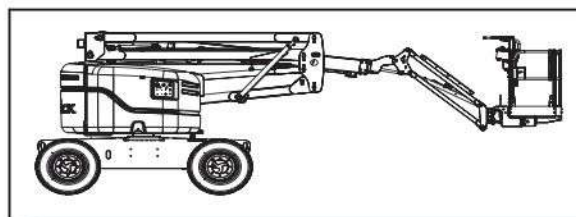
Ensure that there is sufficient room for boom to swing and elevate.



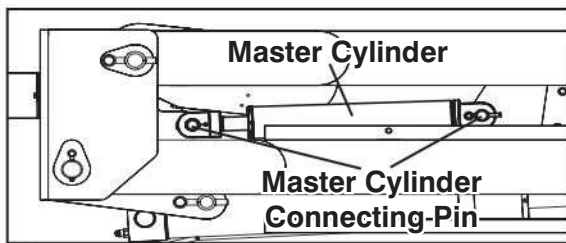
WARNING

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

2. By using the base controls, position the machine as below to allow for easy work access to the basket/jib boom and the master cylinder.



Machine Setup Position 1



Machine Setup Position 2

3. Turn main disconnect switch to "O" off position. Lock the switch to prevent unauthorized use during this procedure.

NOTE

Ensure the all components are secured before lifting or removing

4. Using straps, secure the main boom on a suitable lifting equipment such as a crane.
5. Secure the master cylinder with straps. For example see below.



Master Cylinder Secured with Straps



CAUTION

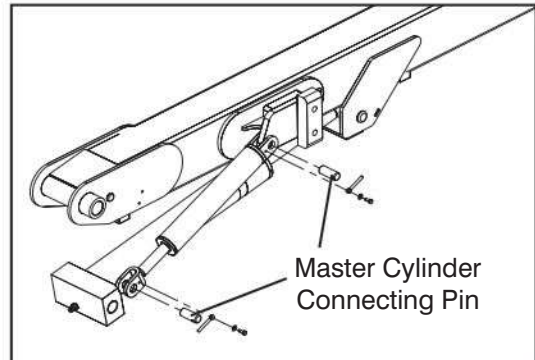
Label all electrical cables and hydraulic hoses before removal



CAUTION

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

6. Remove the hydraulic hoses and fittings on the master cylinder. Replace any worn or damaged component.
7. Disconnect the master cylinder from the main boom by removing the connecting pin, see below. Store all parts aside for reuse.



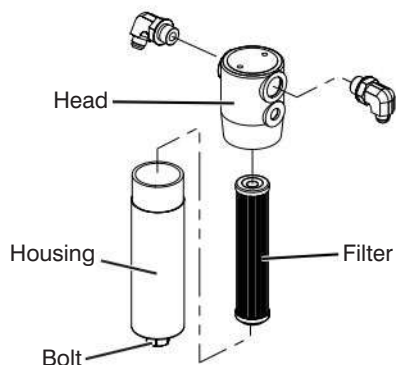
Master Cylinder Removal

8. Install the new master by installing the cylinder pins as shown above. Secure the keeper pin and the bolt with Loctite 242 (Blue) or equivalent.
7. Install the hydraulic hoses and fittings on the master cylinder.

Turret

5.3-1 High Pressure Filter Replacement

1. Turn engine off.
2. Place a suitable container under filter.

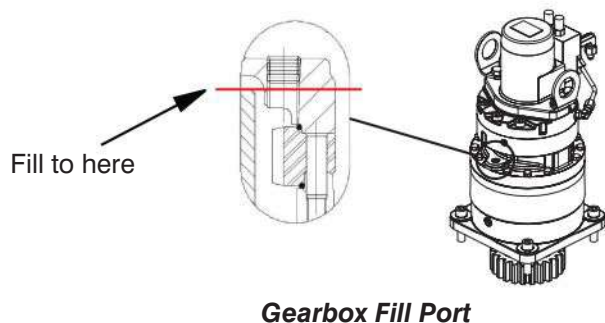


High Pressure Filter

3. Using a 30 mm box wrench, loosen bolt and remove high pressure filter housing from filter head.
4. Remove high pressure filter from filter head and install a new high pressure filter.
5. Apply hydraulic oil to the o-ring on the high pressure filter housing.
6. Reinstall filter and re-tighten bolt.

5.3-2 Check Swing Drive Motor Gearbox Oil

1. Remove gearbox fill plug.
2. Check oil level (oil level should be slightly below the plug, see below). Add oil if needed.
For oil specification, Refer to section 2.



Gearbox Fill Port

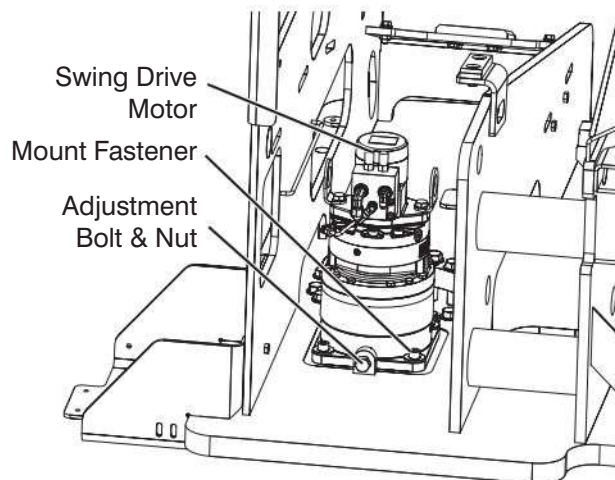
5.3-3 Turret Rotation Gear Backlash Adjustment

Adjusting the backlash clearance will allow proper mating between the turret rotation gear and the swing drive motor gear.



WARNING

Ensure that there are no personnel or obstructions in test area and there is sufficient room for boom to swing and elevate.



Swing Drive Assembly

NOTE

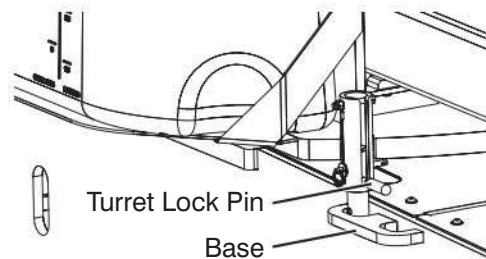
The adjustment of the backlash must be performed on a flat level surface.

1. Ensure aerial platform is on a firm level surface.



WARNING

Operator must lock the turret to base to prevent the turret from spinning spontaneously.



Turret Lock Pin

2. Lock the turret to base with the turret lock pin.
3. Raise riser boom to access the swing drive motor.
4. Support the boom with an overhang crane. Do not lift the boom.
5. Turn main disconnect switch to "O" off position.
6. Loosen mounting fasteners on the swing drive motor.
7. Pull the swing drive motor towards the center of turret as close as possible. (this will push the rotation gear into the rotation bearing)
8. Loosen lock nut on adjustment bolt.
9. Tighten adjustment bolt clockwise until it contacts the plate of gearbox.
10. Turn adjustment bolt 1/2 turn counterclockwise, then tighten lock nut on adjustment bolt.
11. Push the swing drive motor towards the counterweight until it contacts the adjustment bolt.
12. Tighten mounting fasteners on swing drive motor.
13. Unlock the turret lock pin.
14. Turn main disconnect switch to "I" ON position.
15. Rotate turret through an entire rotation and check for a smooth rotation of the turret.
16. Adjust adjustment bolt until smooth rotation of the turret is achieved.
17. Unsecure riser boom and lower boom.

5.3-4 Swing Drive Motor Removal

The swing drive motor is located near the center of the turret, underneath the riser/main boom.



WARNING

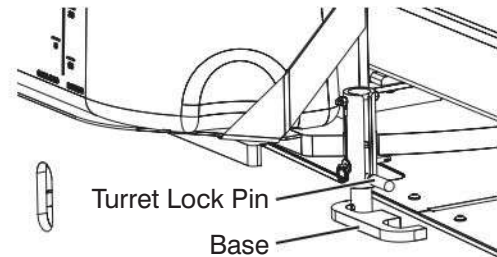
Ensure that there are no personnel or obstructions in test area and there is sufficient room for boom to swing and elevate.

1. Ensure aerial platform is on a firm level surface.



WARNING

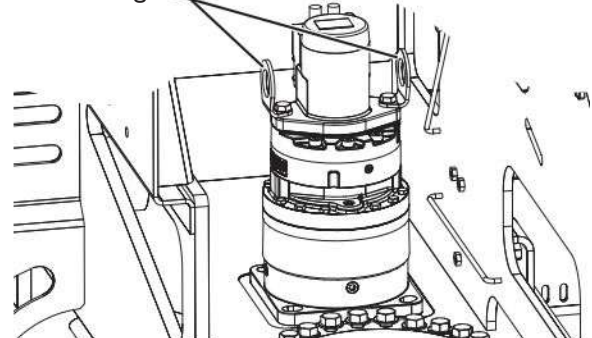
Operator must lock the turret to base to prevent the turret from spinning spontaneously.



Turret Lock Pin

2. Lock the turret to base with the turret lock pin.
3. Raise riser boom to access the swing drive motor.
4. Support the boom with an overhang crane. Do not lift the boom.
5. Turn main disconnect switch to "O" off position.
6. Remove mid-turret cover.
7. Label the hydraulic hoses connected to swing drive and then remove hoses from motor. Plug hoses and fittings to prevent hydraulic contamination.
8. Loosen adjustment bolt and remove mounting fasteners from the swing drive motor.
9. use a lift device to remove swing drive motor out away from turret and place it aside.

Lift Lugs



Swing Drive Lift Lugs

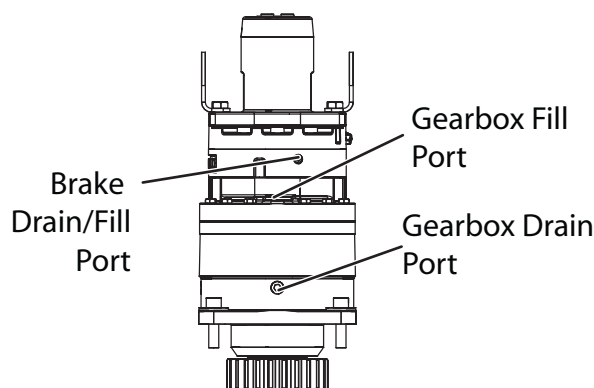
5.3-5 Swing Drive Motor Replacement

1. Refer to procedure [5.3-4 Swing Drive Motor Removal](#).
2. Use a lift device to position new swing drive motor onto turret and loosely bolt swing drive motor to turret.
3. Refer to step 7 to 18 of procedure [5.3-3 Turret Rotation Gear Backlash Adjustment](#) to complete this procedure.

5.3-6 Swing Drive Brake and Gearbox Oil Replacement

Periodic replacement of the motor/brake oil is essential to good motor performance.

1. Refer to procedure [5.3-4 Swing Drive Motor Removal](#).
2. Remove plug and drain old oil from the brake motor.

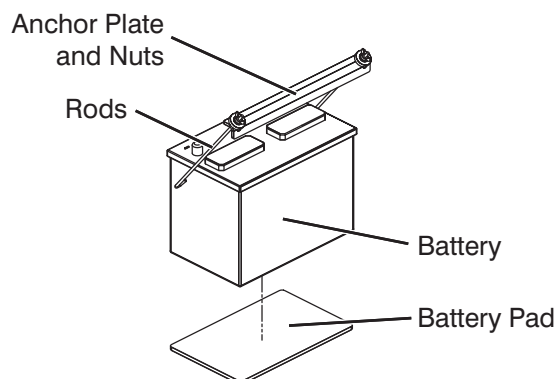


Gearbox Ports

3. Refill brake motor with new oil and plug the port. For oil specification, [Refer to Section 2](#).
4. Remove plug and drain old oil from gearbox.
5. Refill gearbox with new oil and plug the port. For oil specification, [Refer to Section 2](#).
6. Use a lift device to position swing drive motor onto turret and loosely bolt swing drive to turret.
7. Refer to step 7 to 18 of procedure [Refer to 5.3-3 Turret Rotation Gear Backlash Adjustment](#) to complete this procedure.

5.3-7 Battery Replacement

1. Turn main disconnect switch to "O" off position.



Battery Assembly

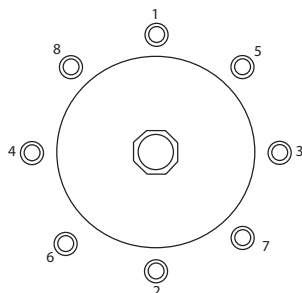
2. Unlock and swing out engine tray from turret.
3. Remove positive and negative connector from battery.
4. Remove the battery.
5. Replace battery pad if needed.
6. Replace and secure the new battery.
7. Clean terminal posts and clamps of battery, and apply acid-free and acid-resistant grease.
8. Re-connect battery with the positive and negative connector cables. (Ensure the clamps make good contact)
9. Swing back and lock engine tray.

5.3-8 Bolt Torque Procedure

Maintaining proper torque is essential to safe aerial platform operation. Improper bolt torque could result in an unsafe operating condition and component damage.

Rotary Actuator Bolt Torque Sequence

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Turn main power disconnect switch to off position.
3. Set the torque wrench to 17 ft.lb and tighten mounting bolts in a cross pattern sequence.

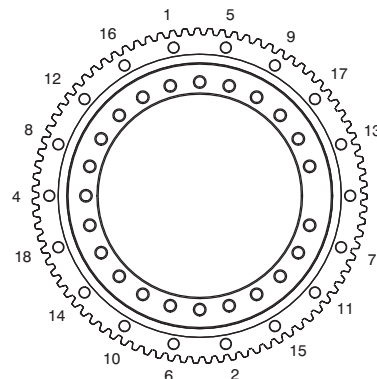


Bolt Torque Sequence

4. Set torque wrench to 35 ft.lb and tighten mounting bolts with the same sequence.
5. Torque the center bolt to 480 ft.lb.

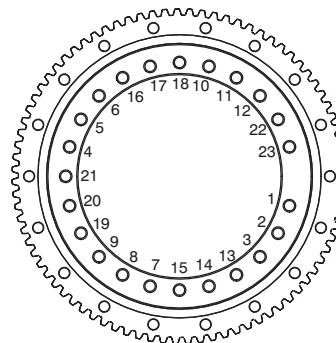
Turret Rotation Gear Bolt Torque Sequence

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Turn main power disconnect switch to off position.
3. Set the torque wrench to 100 ft.lb and tighten mounting bolts in a cross pattern sequence.



**Bolt Torque Sequence
Outer Ring Gear**

4. Set torque wrench to 205 ft.lb and tighten mounting bolts with the same sequence.
5. Repeat step 3-4 for bolt torque sequence inner ring gear.



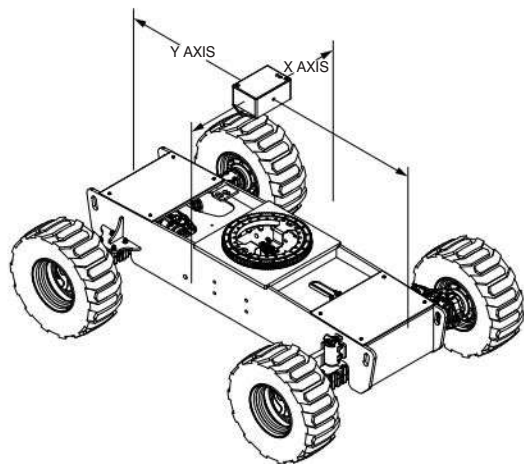
**Bolt Torque Sequence
Inner Ring Gear**

5.3-9 Electronic Tilt Switch Setup

Procedure

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

Tilt Switch Replacement

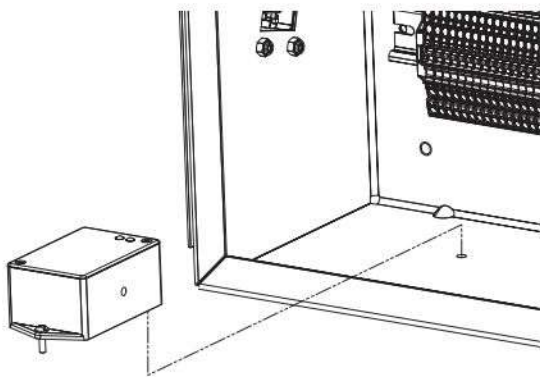


1. Ensure aerial platform is parked on a firm level surface.
2. Fully lower platform and retract fly boom.
3. Chock or block wheels to keep the aerial platform from rolling forward or backward.
4. Push in "●" emergency stop buttons and turn main power disconnect switch to "○" off position.
5. Disconnect tilt switch from 4 pin connector.

NOTE

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

6. Remove old tilt switch from mount.

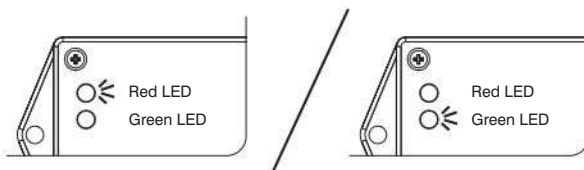


7. Install new switch to mount and connect switch plug to 4 pin connector.

NOTE

The tilt circuit is only powered when controls are powered up.

8. Turn main disconnect switch to "I" ON position.
9. Turn base/off/platform key switch to "●" base position.
10. Pull out "●" all emergency stop buttons.
11. Verify the switch is powered (the red or green LED will be solid).



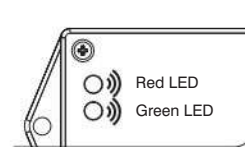
12. Program the tilt switch:

- a. Press and release the set to zero button 3 times. Observe LED flash codes as shown below.

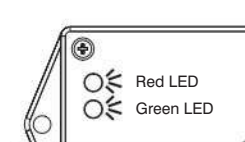
- b. Only the red LED will blink for 4 seconds.



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

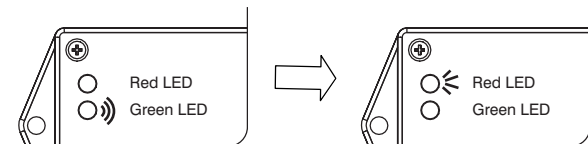


- d. Both LEDs will turn on solid for 1 second. Results: The new zero position has been learned.



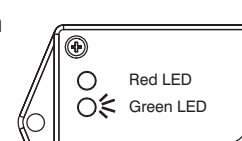
- e. The green LED will flash and then the red LED will turn on solid for 2 seconds.

Results: The switch is verifying the new zero position.



- f. The green LED will turn on solid.

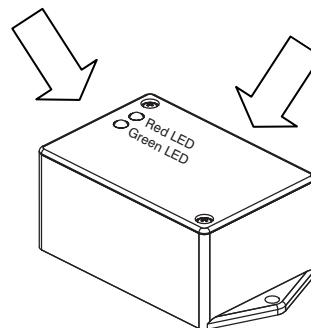
Results: The switch is ready for normal operation.



13. Turn main power disconnect switch to "O" off position.
14. Push in "●" emergency stop buttons.
15. Remove chock or wheel blocks.
16. Proceed to Test and Verify Tilt Circuit.

Reprogramming Existing Tilt Switch

Light Indicators The set to zero button is located on this face next to the harness

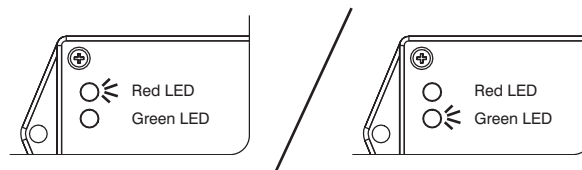


1. Ensure aerial platform is parked on a firm level surface.
2. Fully lower platform and retract fly boom.
3. Chock or block wheels to keep the aerial platform from rolling forward or backward.

NOTE

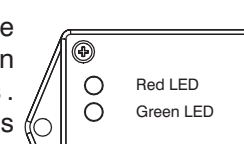
The tilt circuit is only powered when controls are powered up.

4. Turn main disconnect switch to "I" ON position.
5. Pull out "●" all emergency stop buttons.
6. Turn base/off/platform key switch to "⚙" base position.
7. Verify the switch is powered (the red or green LED will be solid).

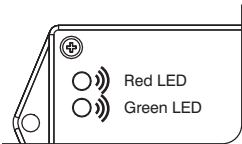


8. Reprogram the Tilt Switch

- a. Press and hold the set to zero button for 5 seconds.
Results: Both LEDs will be OFF.



- b. Both LEDs will flash.

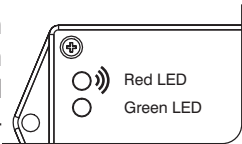


IMPORTANT

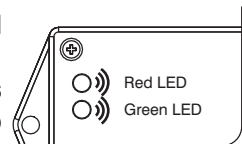
Step “c” must be completed within a 5 second period or the switch will automatically exit program mode and return to normal operation using previously stored data.

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

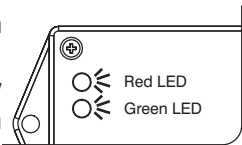
- e. Observe program delay / stabilization time. (Only the red LED will blink for 4 seconds)



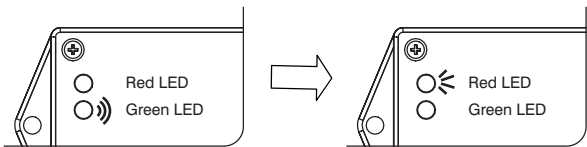
- f. Both LEDs will flash for 1 second.
Results: The switch is learning the new zero position.



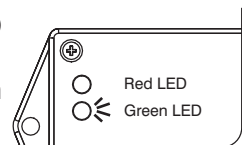
- g. Both LEDs will turn on solid for 1 second.
Results: The new zero position has been learned.



- h. The green LED will flash and then the red LED will turn on solid for 2 seconds.
Results: The switch is verifying the new zero position.



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

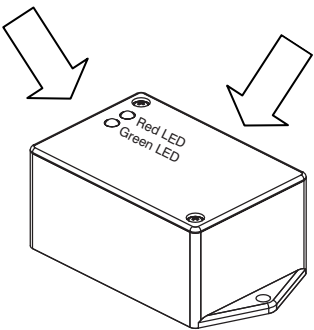


- 9. Turn main power disconnect switch to “O” off position.
- 10. Push in “” emergency stop buttons.
- 11. Remove chock or wheel blocks.
- 12. Proceed to Test and Verify Tilt Circuit.

Test and Verify Tilt Circuit

The set to zero button is located on this face next to the harness

Light Indicators



Operations of Tilt Switch

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

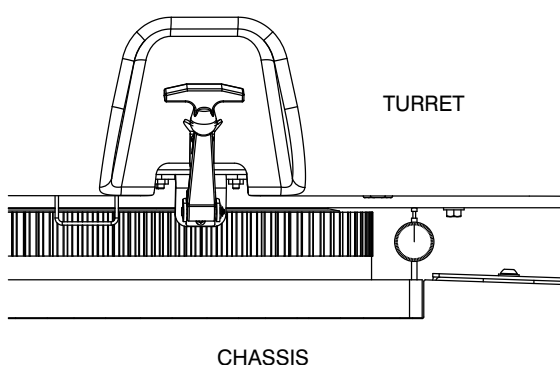
Green LED	Illuminated whenever both tilt axes are within the specified degrees of the zero/ home learned position. Flashes when transitioning in or out of tilt angle limits, but built in time delay has not fully occurred.
Red LED	Illuminated whenever tilt on one or more axes is more than the specified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

Tilt Circuit Test

- 1. Refer to [Test Tilt Sensor](#) procedure within Functions Tests.

5.3-10 Check Rotation Bearing for Axial Wear

1. Position the boom so that it is centered over the front drive and steer axle and is horizontal with the ground.
2. Extend the boom to its full extension length.
3. Mount a dial indicator on the chassis. Place the dial indicator set directly under the boom, close to the bearing teeth. Make sure to allow clearance as the turret assembly rotates.
4. Position the indicator arm or shaft so that the pointer touches the bottom surface of the turret weldment.



Check Axial Wear of the Rotation Bearing

5. Zero the dial indicator.
6. Rotate the turret 180° in the clockwise direction until the boom is centered over the rear axle. (Rotating the turret in the counterclockwise direction will cause the rotation gearbox pinion to impact the dial indicator).
7. If, when you are rotating the turret, the boom needs to be retracted or raised to avoid obstacles, be sure to again fully extend and level the boom when it is positioned over the rear axle. Do not be concerned with any dial indicator readings as the turret assembly rotates.
8. With the boom assembly rotation stopped and the boom centered over the rear axle, read the dial indicator and record the reading. This reading is the total amount of axial movement in the bearing assembly. If this reading is 0.100" (2.54 mm) or greater, the rotation bearing should be removed and replaced.

Deutz Diesel Engine

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

5.4-1 Engine Oil and Filter Replacement

Periodic replacement of the engine oil and filter is essential to good engine performance.

NOTE

Perform this operation after warming the engine to normal operating temperature.



CAUTION

Beware of hot engine components. Contact with hot engine components may cause severe burns.



CAUTION

When draining hot oil, there is a risk of scalding. Do not let used oil run into the soil, rather collect it in a container. Dispose of this in accordance with environmental regulations.

1. Ensure aerial platform is on a firm level surface.
2. Allow engine to warm up.
3. Place suitable container under engine.
4. Remove oil drain plug and allow all engine oil to drain into container.

5. Remove oil filter and catch any escaping oil.
6. Clean the filter mounting surface on engine.
7. Add clean engine oil to new oil filter.
8. Apply a thin layer of engine oil to the new oil filter gasket.
9. Install filter and tighten it by hand.
10. Install oil drain plug with new seal ring and tighten firmly.
11. Refill engine with new oil as per specifications (Refer to engine manual).
12. Clean up any oil that may have spilled during this procedure.
13. Start engine from base control console and allow engine to run for 30 seconds then stop the engine.
14. Check for oil leakage.
15. Check engine oil level on dipstick and add oil if needed.

NOTE

Refer to your national/local regulations on how to dispose of used filter and oil.

5.4-2 Fuel Filter Replacement

1. Place suitable container under engine filter.
2. Remove fuel filter and catch any escaping fuel.
3. Clean any dirt from filter carrier sealing surface.
4. Apply a thin layer of oil or diesel fuel to rubber gasket of new fuel filter.
5. Install fuel filter and tighten it by hand then tighten filter cartridge with final half-turn.
6. Use the fuel hand pump to pump fuel into filter.
7. Clean up any fuel that may have spilled during this procedure.
8. Check for fuel leakage.

NOTE

Refer to your national/local regulations on how to dispose of used filter and oil.

5.4-3 Air Filter Replacement

Engine specifications require that this procedure be performed more often if dusty conditions exist.



CAUTION

Perform this procedure with the engine off.

1. Remove end cap from air filter canister.
2. Remove both filters from inside of canister.
3. Use a dry cloth to clean inside of canister and gasket.
4. Insert two new filters to inside of canister.
5. Reinstall end cap to canister.

5.4-4 Check Engine Belt

The aerial platform will not operate properly with a loose or defective belt. Continuous usage may cause component damage.



WARNING

Do not inspect while the engine is running. Remove the key to secure from operation.



CAUTION

Beware of hot engine components. Contact with hot engine components may cause severe burns.

1. Inspect the engine belt for:
 - cracking
 - glazing
 - separation
 - breaks
2. For correct tension of engine belt, refer to engine manual.

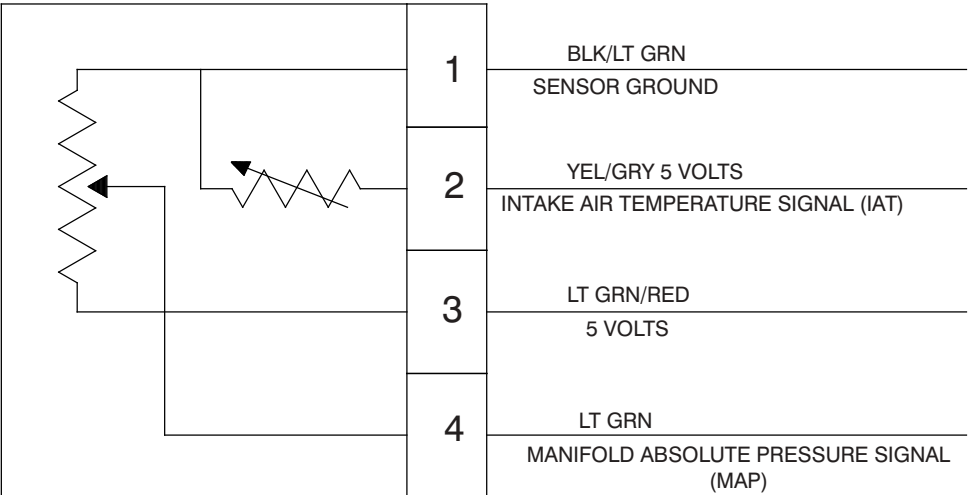
5.4-5 Check Oil Cooler

1. Remove cover from the side of engine.
2. Inspect oil cooler for leaks and physical damage.
3. Clean oil cooler of any kind of debris.
4. Reinstall cover.

GM Dual Fuel Engine

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

5.5-1 GM Map and IAT Sensor (3.0L GM Engine)

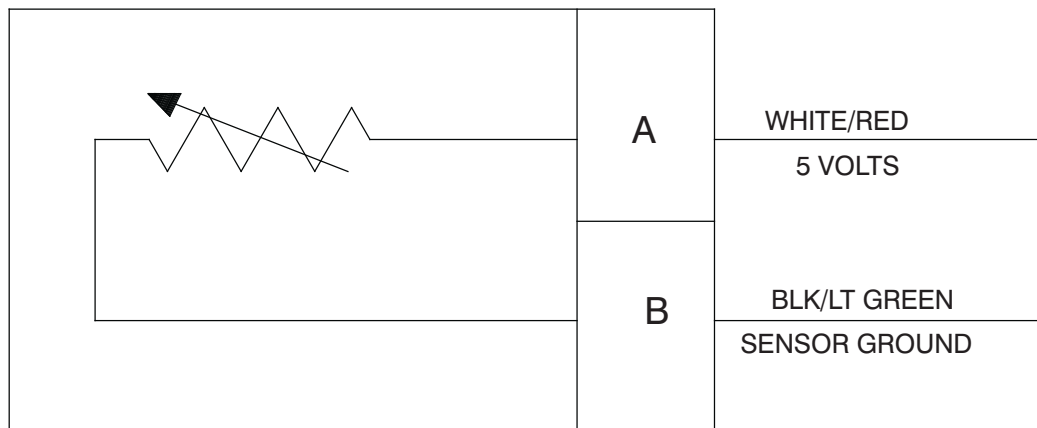


IAT Sensor Resistance

TEMPERATURE ° F	TOLERANCE ± 10% OHMS
248	110
239	125
221	162
203	214
185	284
167	383
149	522
131	721
104	1,200
77	2,063
50	3,791
23	7,419
-4	15,614
-22	26,854
-31	35,763
-40	48,153

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5.5-2 LPG Temperature Sensor (3.0L GM Engine)

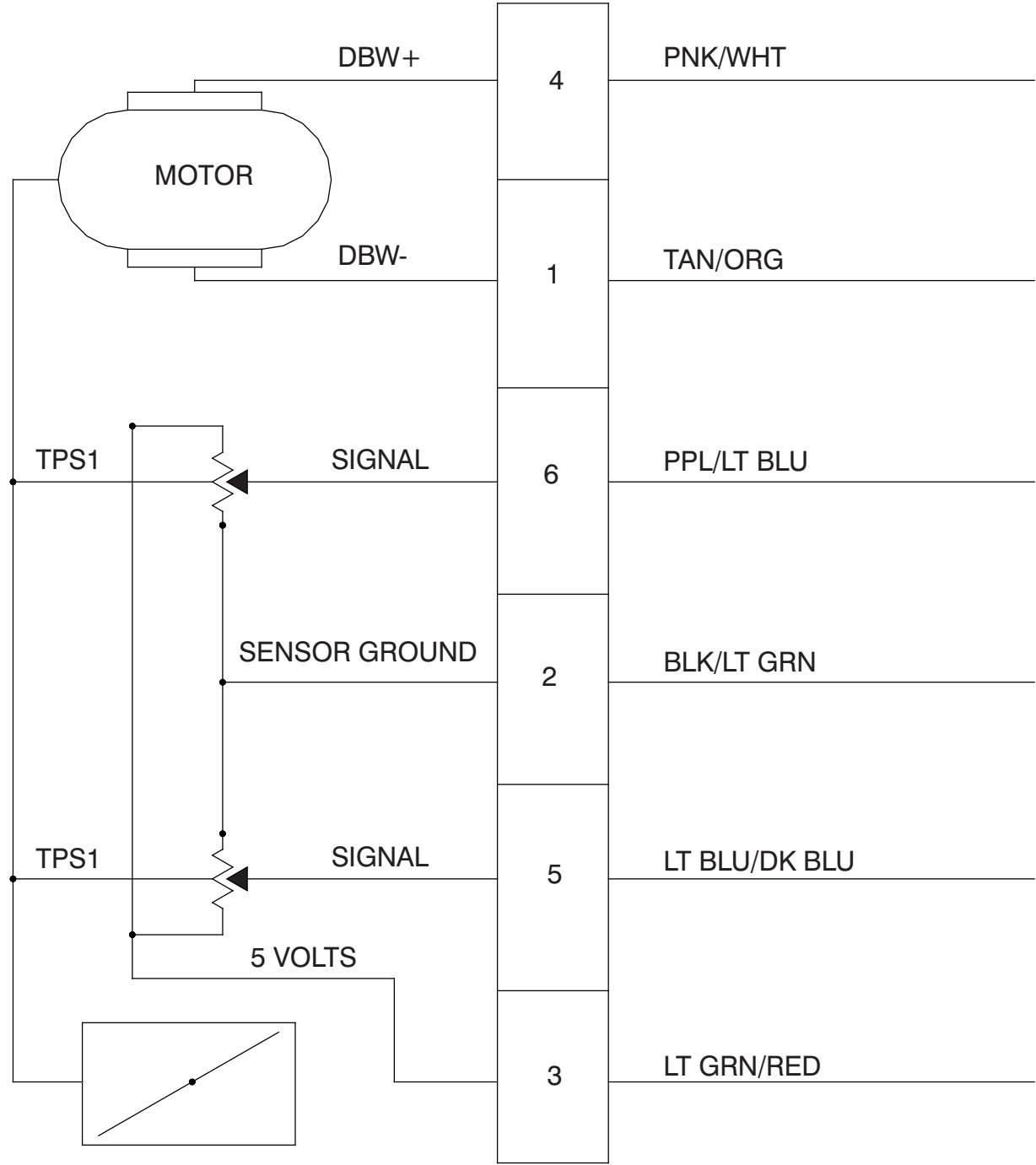


Temperature Sensor Resistance

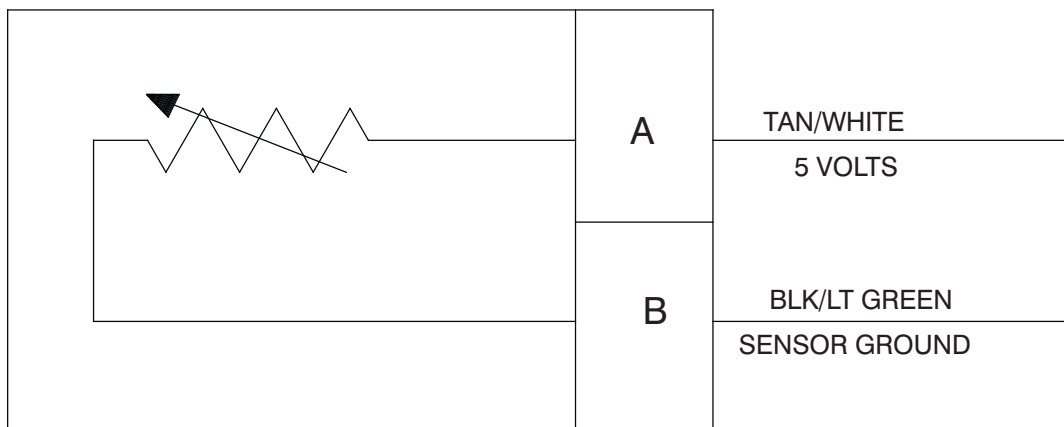
TEMPERATURE DEGREES F	TOLERANCE $\pm 10\%$ OHMS
220	153.7
200	214.6
190	255.4
180	305.5
170	367.3
160	444.1
140	660.6
120	1008
100	1582
80	2554
70	3284
60	4259
40	7357
20	13214
0	24705
-20	48300
-40	99318

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5.5-3 Throttle Actuator (3.0L GM Engine)



5.5-4 Engine Coolant Temperature Sensor (3.0L GM Engine)

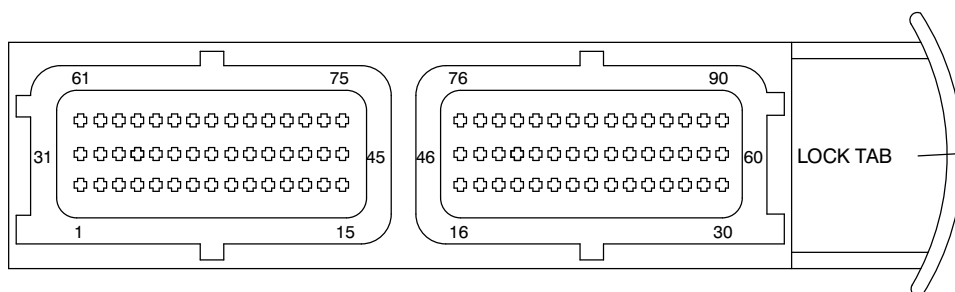


Temperature Sensor Resistance

TEMPERATURE ° F	TOLERANCE ± 10% OHMS
242.4	101
231.9	121
211.6	175
201.4	209
181.9	302
163.1	434
144.9	625
127.4	901
102.4	1,556
78.9	2,689
49.9	5,576
23.5	11,562
-5.7	28,770
-21.7	49,715
-30.8	71,589
-40	99,301

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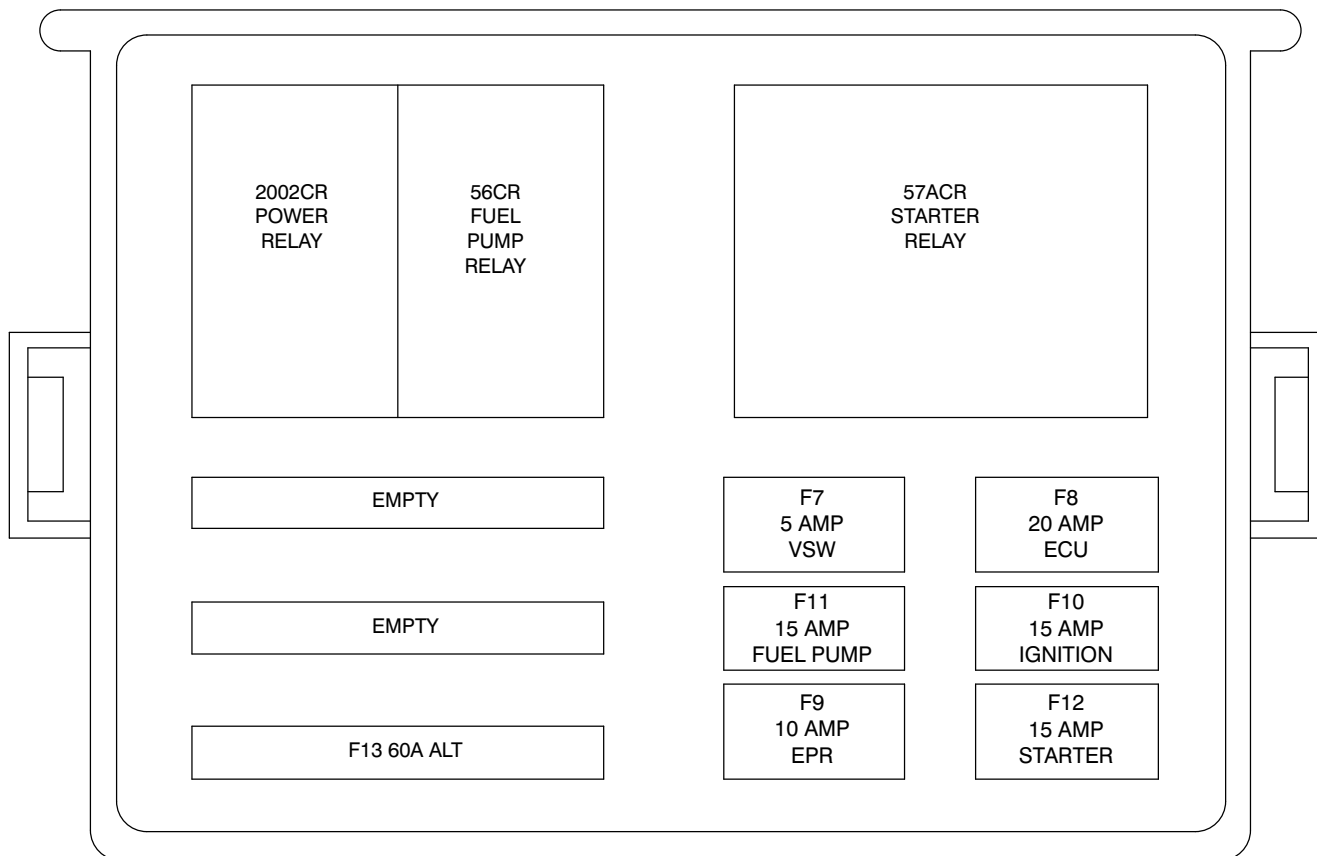
5.5-5 ECU Pin Reference Chart (3.0L GM Engine)



Diagnostics

Pin #	Wire Color	Description	Pin #	Wire Color	Description
1	DK GRN/ORN	EGO1 Signal	46	DK BLU/YEL	Not used
2	DK GRN/WHT	EGO2 Signal	47	YEL/DK BLU	Not used
3	EMPTY		48	LT GRN/WHT	Output to gasoline temp sensor
4	EMPTY		49	LT GRN/PPL	Not used
5	PPL/LT BLUE	Throttle position 1 signal	50	LT GRN/BLK	Not used
6	LT BLU/DK BLU	Throttle position 2 signal	51	GRY/DK BLU	Mid throttle input
7	LT GRN	MAP Signal	52	GRY/ORN	High throttle input
8	TAN/DK GRN	Not Used	53	LT BLU	Input from oil pressure switch
9	DK BLU/ORN	Not Used	54	WHT/LT GRN	Signal from gasoline pressure sensor
10	PPL/YEL	Not Used	55	DK GRN	To diagnostic connector (PC)
11	EMPTY		56	ORN	To diagnostic connector (PC)
12	EMPTY		57	EMPTY	
13	WHT/ORN	Connected to pin #14 below	58	GRY	Not used
14	BLU/PNK	CAN + to propane regulator	59	EMPTY	
15	BLU/WHT	CAN - from propane regulator	60	RED/TAN	Battery positive
16	EMPTY		61	BRN/LT BLU	To injector #1
17	EMPTY		62	BRN/LT GRN	To injector #3
18	EMPTY		63	BRN/YEL	To injector #4
19	LT GRN/RED	5 volt + from ECU to sensors	64	BRN/WHT	To injector #2
20	BLK/LT GREEN	5 volt - to ECU from sensors	65	EMPTY	
21	PPL/WHT	+V from crank position sensor	66	EMPTY	
22	WHT/PPL	-V from crank position sensor	67	EMPTY	
23	GRY/BRN	+V from camshaft position sensor	68	EMPTY	
24	PPL/ORN	-V from camshaft position sensor	69	BLK	Ground from engine block
25	RED/WHT	Not used	70	EMPTY	
26	RED/BLK	Not used	71	WHT/LT BLU	Negative supply to power relay 2002CR
27	EMPTY		72	BLK/WHT	EGO 1 Heater ground
28	EMPTY		73	BLK/YEL	EGO 2 Heater ground
29	EMPTY		74	EMPTY	
30	EMPTY		75	WHT/BLK	Negative supply to propane lock off
31	YEL	Output to ignition module	76	EMPTY	
32	EMPTY		77	BRN/WHT	Not used
33	EMPTY		78	WHT/BRN	Not used
34	EMPTY		79	RED/TAN	Battery positive
35	EMPTY		80	GRN/YEL	To check engine light (MIL)
36	EMPTY		81	BLK	Ground from engine block
37	EMPTY		82	PNK/WHT	Positive to throttle actuator motor
38	EMPTY		83	TAN/ORN	Negative from throttle actuator motor
39	YEL/GRY	Output to IAT (part of MAP)	84	TAN/BLK	Negative supply to fuel pump relay 56CR
40	TAN/WHT	Output to TPS1	85	PNK/YEL	Fuel pump excite wire
41	WHT/RED	Output to TPS2	86	BLK/RED	Negative supply to fuel pump
42	TAN/BRN	Propane selected	87	TAN	Not used
43	TAN/RED	Not used	88	DK BLU	Not used
44	TAN/BLK	Not used	89	PNK/BLK	Negative supply to starter relay 57ACR
45	PNK/TAN	12 volt input	90	EMPTY	

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5.5-6 Fuse Block Layout (3.0L GM Engine)

Hydraulic Tank

Maintaining the hydraulic components and hydraulic oil at the proper level are essential to good performance and service life of the aerial platform.

5.6-1 Hydraulic Oil Replacement

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Allow hydraulic oil to warm up.
3. Turn main power disconnect switch to off position.
4. Place suitable container under the hydraulic tank.
5. Remove oil drain plug and allow all hydraulic oil to drain into container.
6. Install oil drain plug with new seal ring and tighten firmly.
7. Refill hydraulic tank with new oil as per specifications. (Refer to Section 2)
8. Check for leakage.
9. Clean up any oil that may have spilled during this procedure.
10. Check hydraulic oil level. (The hydraulic oil level should be at or slightly above the top mark on the sight gauge)

NOTE

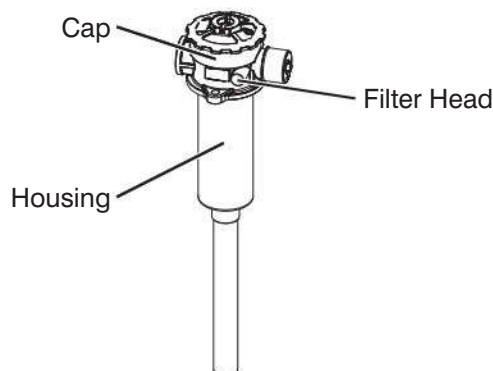
Refer to your national/local regulations on how to dispose of used filter and oil.

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. For oil specification, Refer to Section 2.

5.6-2 Hydraulic In-tank Filter Replacement

1. Ensure aerial platform is on a firm level surface, is in stowed position and engine is off.



In-tank Filter Assembly

2. Twist off the cap from the filter head and remove old filter element and spring.
3. Insert the new filter element and spring into housing and recap the filter head.
4. Clean up any oil that may have spilled during this procedure.
5. Start engine from base control console.
6. Check for leakage.

NOTE

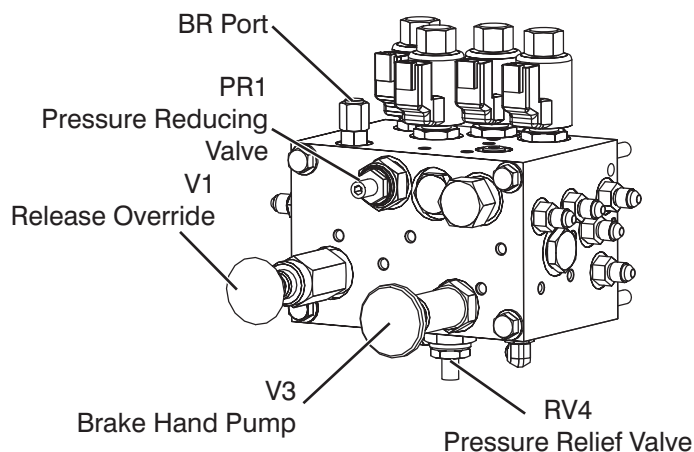
Refer to your national/local regulations on how to dispose of used filter and oil.

Manifold and Hydraulic Pumps

5.7-1 Hydraulic Brake Pressure Adjustment

Maintaining accurate hydraulic brake pressure is important when it comes to safe aerial platform operation.

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Locate BR port on the brake valve assembly.



Brake Manifold

3. Connect a pressure gauge (1000 psi) to BR port.
4. Locate brake system pressure reducing valve PR1. Loosen lock nut and turn adjustment stem gently clockwise until it bottoms out while keeping track of the number of turns.



CAUTION

Valve damage will occur if tightened too much.



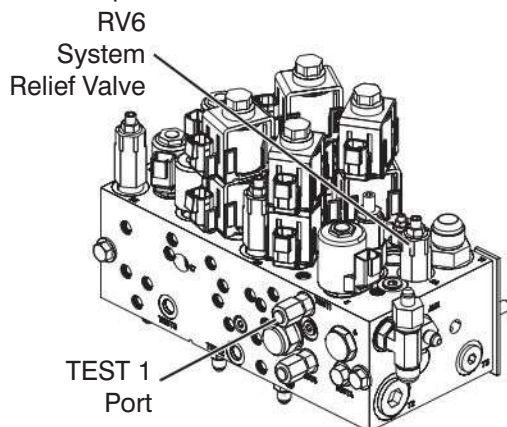
WARNING

Ensure that there are no personnel or obstructions in test area and there is sufficient room for forward or reverse travel.

5. Start engine from platform control console and extend boom slightly to achieve low speed drive.
6. Drive aerial platform forward or reverse. Pressure gauge reading should be 550 psi. Stop the aerial platform. Follow the next steps for adjusting relief valve pressure if needed. If no adjustment is required continue to step 10.
7. Locate brake pressure relief valve RV4 and loosen the lock nut.
8. Turn the adjusting stem on pressure relief valve RV4 $\frac{1}{4}$ of a revolution at a time clockwise to increase pressure or counterclockwise to decrease pressure. Drive aerial platform forward or reverse, note pressure and stop the aerial platform.
9. Repeat step 8 until brake pressure is achieved (550 psi) then tighten lock nut on brake system pressure relief valve RV4.
10. Locate brake system pressure reducing valve PR1 and turn valve gently counterclockwise to initial position.
11. Drive aerial platform forward or reverse. Pressure gauge reading should be 500 psi.
12. Stop aerial platform and adjust pressure reducing valve PR1 $\frac{1}{4}$ turn at a time by turning either clockwise to increase pressure or counterclockwise to decrease pressure.
13. Repeat step 11 and 12 until brake pressure is achieved (500 psi) then tighten lock nut on brake system pressure reducing valve PR1.

5.7-2 Hydraulic System Relief Valve**Adjustment**

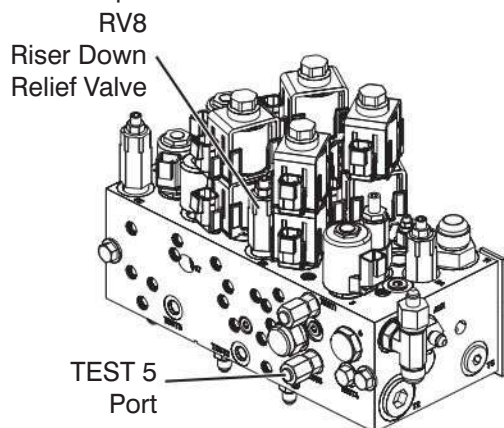
1. Locate Test 1 Port on main manifold and remove the cap.
2. Connect a pressure gauge (5000 psi) to Test 1 port.

**Main Manifold**

3. Start engine from base control console and let it run for 2-5 minutes.
4. Steer fully to one direction and then check reading on gauge. Pressure should be 3000 psi. Follow the next steps for adjusting pressure if needed.
5. Locate system relief valve RV6.
6. Loosen lock nut on system relief valve RV6. Turn the adjusting stem clockwise to increase pressure and counterclockwise to decrease pressure.
7. Tighten lock nut on system relief valve RV6 once 3000 psi is observed on the gauge. (You must steer fully in one direction to activate pressure reading on gauge.)

5.7-3 Riser Down Relief Valve Adjustment

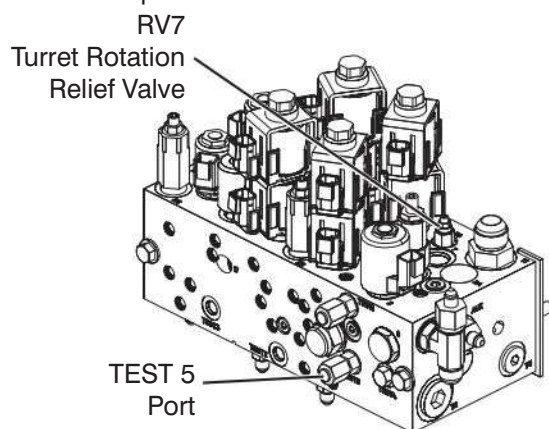
1. Locate Test 5 Port on main manifold.
2. Connect a pressure gauge (5000 psi) to Test 5 port.

**Main Manifold**

3. Start engine from base control console and let it run for 2-5 minutes.
4. Raise main boom to ensure basket will not contact the ground.
5. Fully lower riser and check reading on gauge. Pressure should be 2750 psi. Follow the next steps for adjusting pressure if needed.
6. Locate riser down relief valve RV8.
7. Loosen lock nut on system relief valve RV8. Turn adjusting stem clockwise to increase pressure and counterclockwise to decrease pressure.
8. Tighten lock nut on system relief valve RV8 once 2750 psi is observed on the gauge. (You must fully lower riser to activate pressure reading on gauge.)

5.7-4 Turret Rotate Relief Valve**Adjustment**

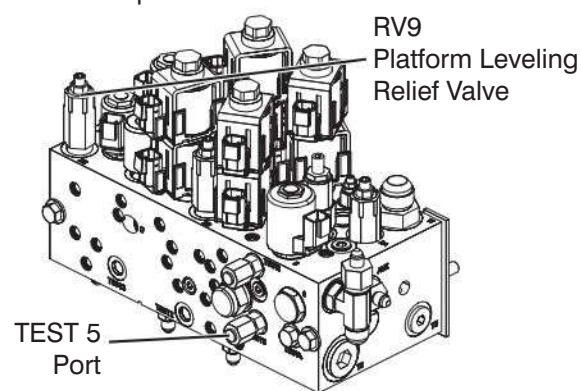
1. Locate Test 5 Port on main manifold.
2. Connect a pressure gauge (5000 psi) to Test 5 port.

**Main Manifold**

3. Start engine from base control console and let it run for 2-5 minutes.
4. Raise main boom to ensure basket will not contact the ground.
5. Engage the turret transport lock.
6. Attempt to rotate turret. Pressure should be 1400 psi. Follow the next steps for adjusting pressure if needed.
7. Locate turret rotate relief valve RV7.
8. Loosen lock nut on turret rotate relief valve RV7. Turn adjusting stem clockwise to increase pressure and counterclockwise to decrease pressure.
9. Tighten lock nut on turret rotate relief valve RV7 once 1400 psi is observed on the gauge. (You must activate turret rotate to obtain pressure reading on gauge.)
10. Disengage turret transport lock.

5.7-5 Platform Level Relief Valve**Adjustment**

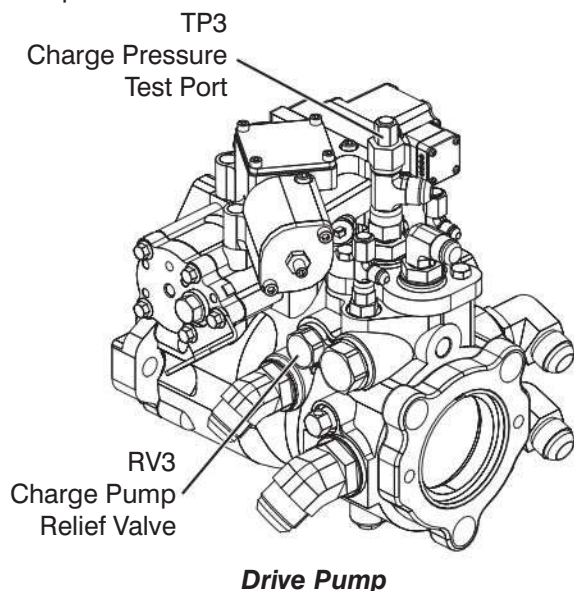
1. Locate Test 5 Port on main manifold.
2. Connect a pressure gauge (5000 psi) to Test 5 port.

**Main Manifold**

3. Start engine from base control console and let it run for 2-5 minutes.
4. Raise main boom to ensure basket will not contact the ground.
5. Fully raise or lower platform level and check reading on gauge. Pressure should be 2750 psi. Follow the next steps for adjusting pressure if needed.
6. Locate platform leveling relief valve RV9.
7. Loosen lock nut on platform level relief valve RV9. Turn adjusting stem clockwise to increase pressure and counterclockwise to decrease pressure.
8. Tighten lock nut on platform level relief valve RV9 once 2750 psi is observed on the gauge. (You must fully raise or lower platform level to activate pressure reading on gauge.)

5.7-6 Test Charge Pump Pressure on Drive Pump

1. Locate test port TP3 on drive pump.
2. Connect a pressure gauge (600 psi) to test port.



3. Start engine from base control console.

**WARNING**

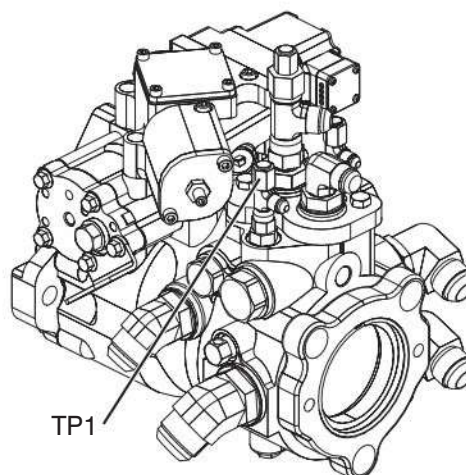
Do not activate any controls during procedure to protect gauge.

4. Check reading on gauge (standard pressure should be $313 \pm 10\%$ psi.)
5. Replace charge pump relief valve RV3 if pressure is not achieved.
6. Repeat steps 2, 3, and 4 after charge pump relief valve is replaced.
7. If pressure still not in range, repair or replace the pump as necessary.

5.7-7 Test Forward Drive Pressure on Drive Pump**NOTE**

Make sure charge pump pressure test is completed first.

1. Locate test port TP1 on the drive pump.
2. Connect a pressure gauge (10000 psi) to test port TP1.



Drive Pump

3. Start engine from platform control console.
4. Unplug brake solenoid power cable (26) on brake valve.
5. Activate drive function slowly forward with engine at high speed. Wheels should not turn.

NOTE

Activating drive function too fast will stall the engine.

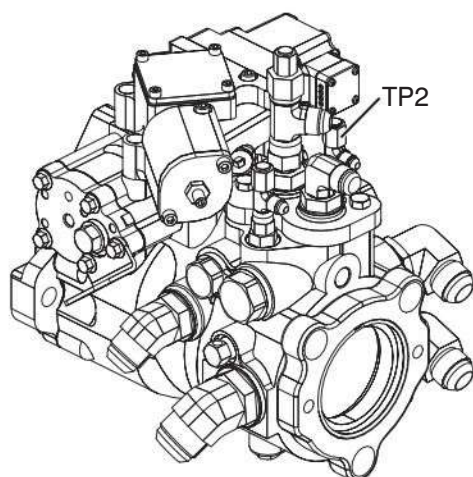
6. Check reading on gauges Standard pressure should be 5000 psi. Go to step 8 if pump pressure is achieved.
7. Replace pump if pressure is not achieved.
8. Turn engine off.
9. Remove pressure gauge from port, cap the port and re-plug brake solenoid power cable.

5.7-8 Test Reverse Drive Pressure on Drive Pump

NOTE

Make sure charge pump pressure test is completed first.

1. Locate test port TP2 on the drive pump.
2. Connect a pressure gauge (10000 psi) to test port TP2.



Drive Pump

3. Start engine from platform control console.
4. Unplug brake solenoid power cable (26) on brake valve.
5. Activate drive function slowly reverse with engine at high speed. Wheels should not turn.

NOTE

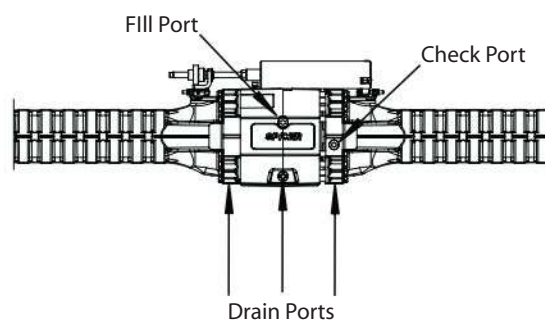
Activating drive function too fast will stall the engine.

6. Check reading on gauges Standard pressure should be 5000 psi. Go to step 8 if pump pressure is achieved.
7. Replace pump if pressure is not achieved.
8. Turn engine off.
9. Remove pressure gauge from port, cap the port and re-plug brake solenoid power cable.

Axles

5.8-1 Rear Axle Oil Replacement

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Turn main power disconnect switch to off position.
3. Place suitable container under the axle
4. Remove fill plug.
5. Remove all three drain plugs to allow oil to drain into container.



Rear Axle (shown)

6. Reinstall all drain plugs.
7. Remove check plug.

NOTE

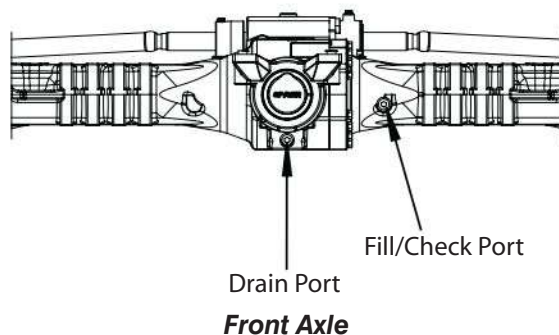
Axle is filled when oil is leaking from the check port.

8. Refill axle with new oil as per specifications. ([Refer to Section 2](#))
9. Reinstall both fill and check plugs.

5.8-2 Front Axle Oil Replacement (4WD)

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Turn main power disconnect switch to off position.
3. Place suitable container under the axle.
4. Remove fill plug.

5. Remove drain plug to allow oil to drain into container.



6. Reinstall drain plug.

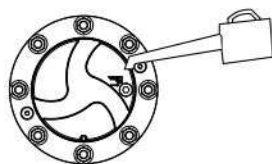
NOTE

Axle is filled when oil is leaking from the check port.

7. Refill axle with new oil as per specifications. (Refer to Section 2)
8. Reinstall fill/check plug.

5.8-3 Check Torque Hub Oil Level

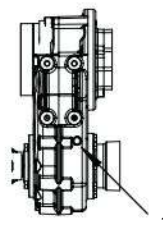
1. Drive the aerial platform to rotate the hub until the plug is located at 90 degrees.
2. Remove the plug and check the oil level. The oil level should be even with the bottom of the plug hole. Add oil if needed. For oil specification, Refer to Section 2.



Drive Torque Hub

5.8-4 Check Axle Gearbox Oil Level

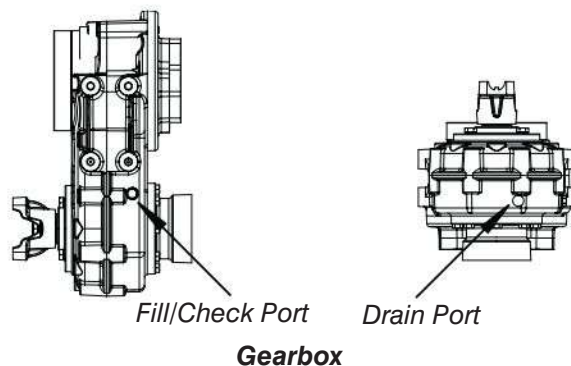
1. Remove plug 1 from gear box.
2. Check oil level. Oil level should be even with the bottom of plug hole 1. Add oil if needed. For oil specification, Refer to Section 2.



Gearbox

5.8-5 Axle Gearbox Oil Replacement

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Turn main power disconnect switch to off position.
3. Place suitable container under the gearbox.
4. Remove fill plug.
5. Remove drain plug to allow oil to drain into container.



Gearbox

6. Reinstall drain plug.

NOTE

Gearbox is filled when oil is leaking from the check port.

7. Refill gearbox with new oil as per specifications. ([Refer to Section 2](#))
8. Reinstall fill/check plug.

5.8-6 Bleeding Oscillating Axle Cylinders

If the axle oscillation system is not operating properly, the stability of the aerial platform is compromised and it may tip over.

Items you will need before starting:

- oil container
 - hose lines (to reach from bleeders to bucket)
1. Locate a bleeder on either side of the axlelock cylinder.
 2. Connect a hose line to the bleeder nipple.
 3. Start the engine and slowly open the bleeder to allow the oil to flow in a continuous stream.
 4. Close and cap the bleeder nipple.
 5. Repeat procedure with the other axlelock cylinder.

5.8-7 Pin Brake Adjustments

1. To manually release the brake give a light blow to the external ring of the check unit.



2. To adjust the idle elimination loosen jam nut and back out adjustment stem a few turns.



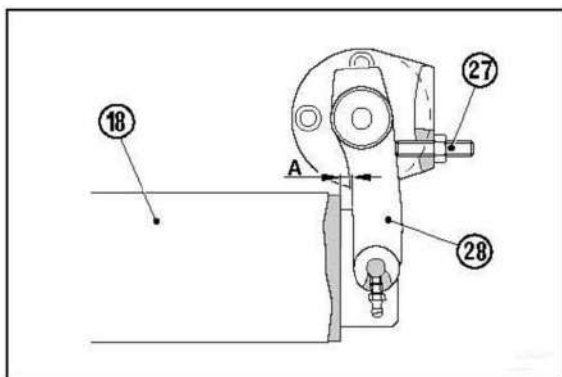
3. Apply a 2lb. force (1Kg) in the direction of brake application and turn adjusting stem so that it touches the stop.



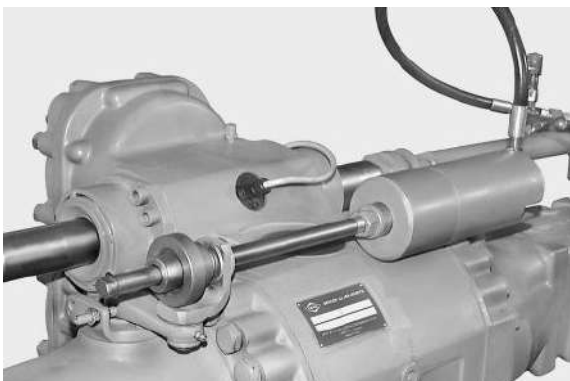
4. Tighten the Jam nut. Repeat this procedure for the other side.



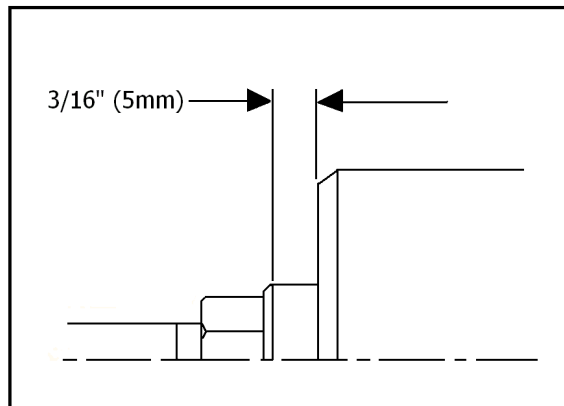
5. On the Cylinder side ensure that there is some clearance between the cylinder and the lever "A" with the lever against the stop.



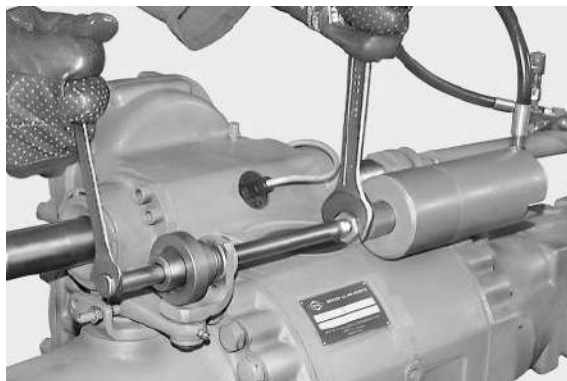
6. Introduce pressure into the cylinder and ensure that the check unit engages.



7. Release the pressure from the cylinder and check that the rod returns and stops in a position where it projects out from the cylinder head by 3/16" (5mm).

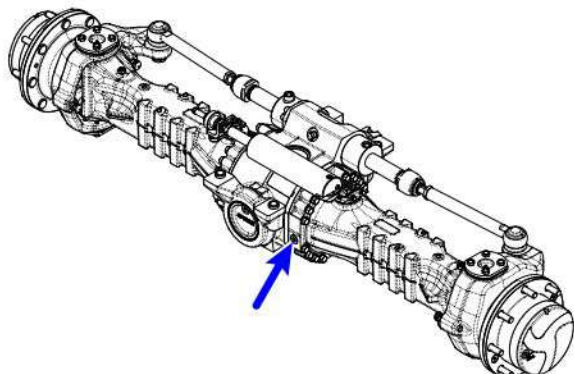


8. If adjustment is needed loosen the jam nut, pressurize the cylinder and turn the adjustment stem. Repeat step 7 and tighten jam nut when correct adjustment is obtained.

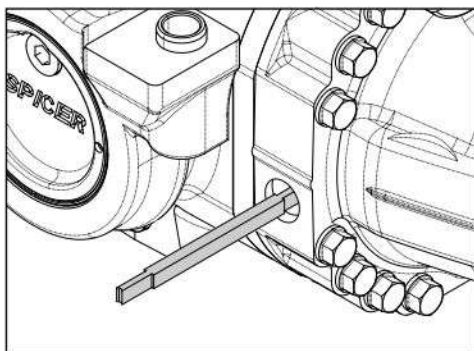


5.8-8 Brake Inspection

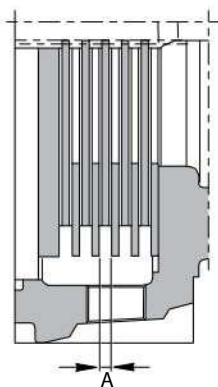
1. Remove the oil level plug from one of the braking axle arms, as shown below.



2. Insert a 4.5 mm feeler gauge into the drain port.



3. Use the gauge to check the gap between the disks (A). The minimum distance allowed is 4.5 mm. Reinstall the oil level plug.



4. Repeat the inspection on the other axle arm. If the gap is smaller than 4.5 mm between the disks of either arm (i.e. the gauge doesn't fit), the brake disks must be replaced on both arms.

Grease Points

5.9-1 Lubrication

Maintaining proper lubrication is essential for good performance and service life of the aerial platform. If the bearing and gear of the aerial platform are improperly greased, it could result in component damage.



WARNING

Ensure that there are no personnel or obstructions in maintenance area and there is sufficient room for boom to swing.

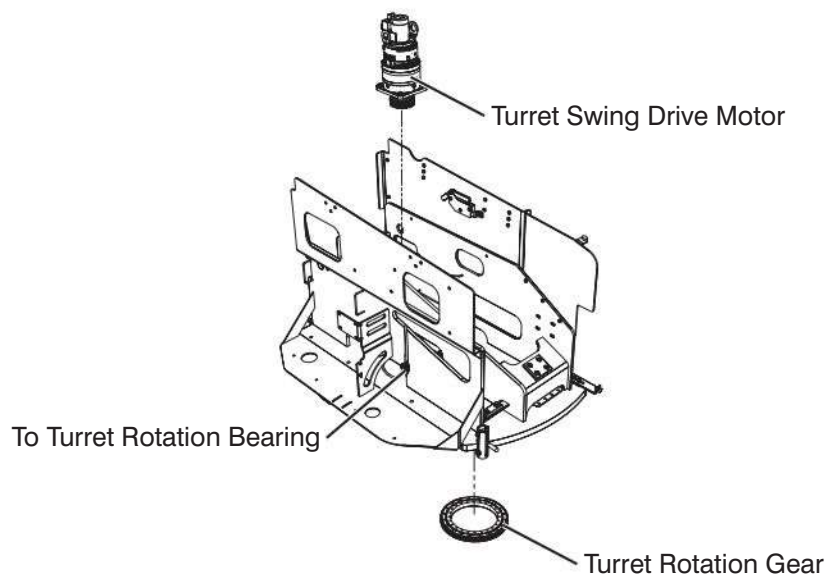
Grease Turret Rotation Bearing

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Raise the Riser and Main boom to access the grease line located near turret lock pin.
3. Pump grease into the turret rotation bearing and continue pumping until new lube appears continuously around the grease seal lip. (Refer to the Race column in the Table below)
4. Rotate the turret in increments of 4 to 5 inches (10 to 13 cm) at a time, and repeat step 3 until the entire bearing has been greased.

Grease Turret Rotation Gear

1. Apply grease to each tooth of the drive gear, located under the turret. (Refer to the Gear column in the Table below)

GREASE		
Model	Recommended Grease Type	
	Race	Gear
SJ40T & 45T SJ61T & 66T SJ46A/AJ & 51AJ	Mobil Mobilux EP2	Mobil Mobiltac C
	Texaco Multifax EP2	Texaco Crater 2X or 3X
	Sun Prestige 742 EP	Sun Gear Compound 407
	Shell Alvania EP2	Shell Cardium EP
	Exxon Ronex WB	Exxon Surret Fluid 30



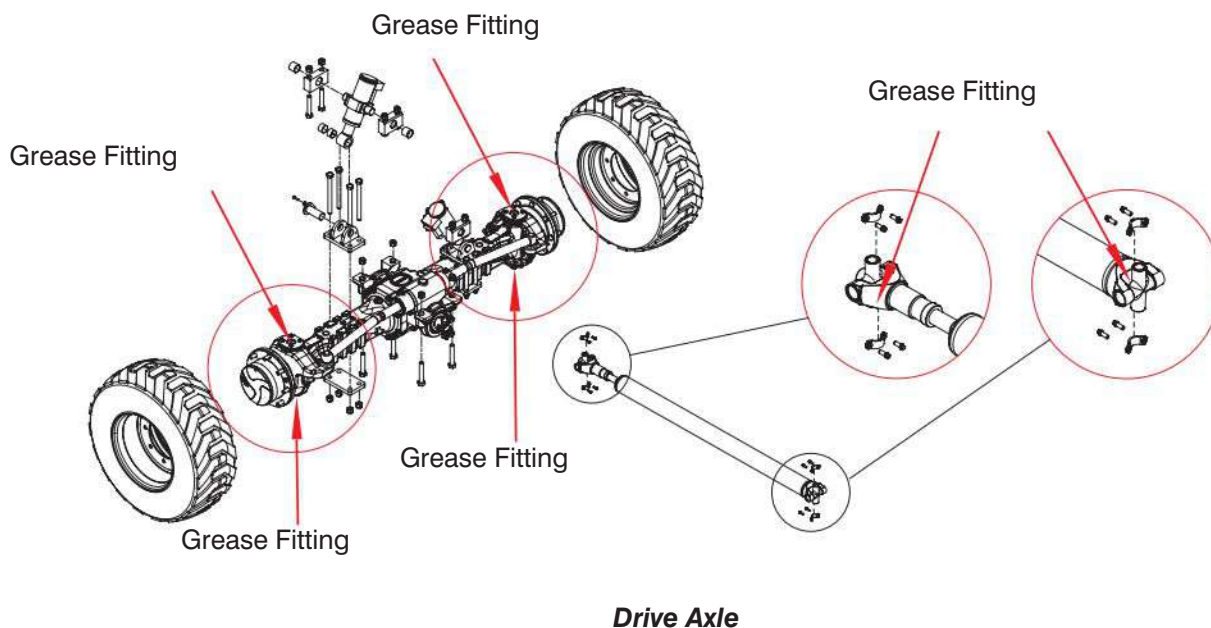
Grease Drive Axle

1. Ensure aerial platform is on a firm level surface and is in stowed position.
2. Open axle cover plate and locate grease fitting. (see diagram below)
3. Pump grease into the grease fittings. ([Refer to the Table below](#))

Grease Drive Shaft

1. Locate the grease fittings on the drive shaft and pump grease. ([Refer to the Table below](#))

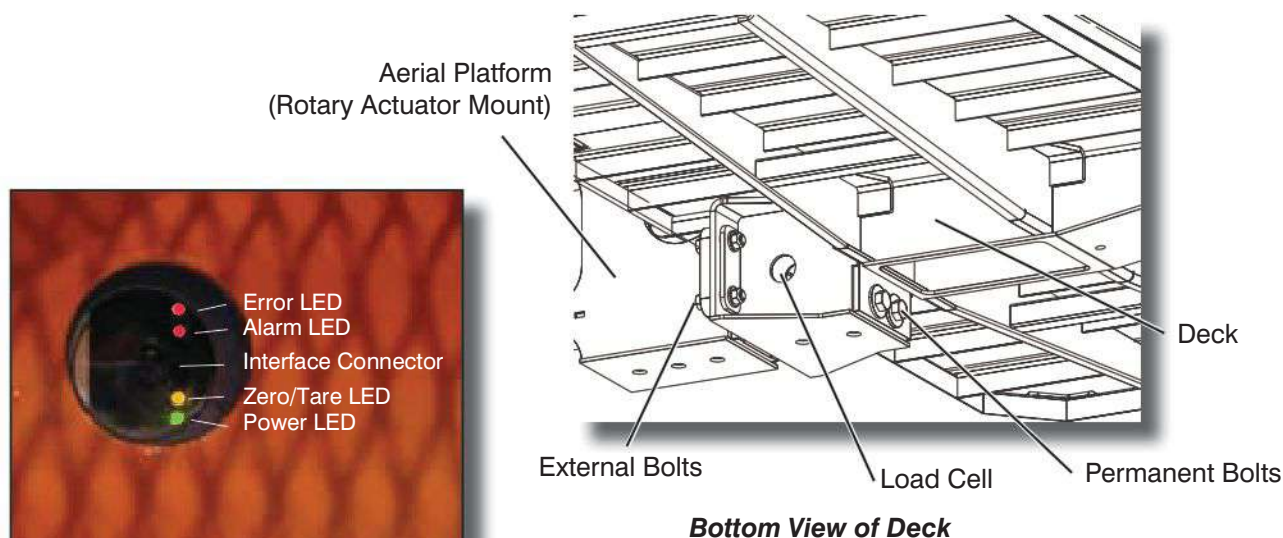
*GREASE	
Model	Recommended Grease Type
SJ40T & 45T SJ61T & 66T SJ46A/AJ & 51AJ	Mobil Mobilux EP2
	Texaco Multifax EP2
	Sun Prestige 742 EP
	Shell Alvania EP2
	Exxon Ronex WB



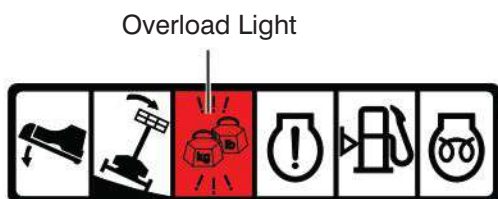
Options

5.10-1 Load Sensing System - CE

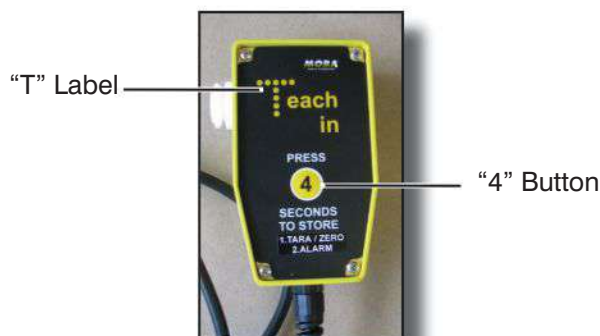
The Skyjack boom platform overload sensing system is based on load cell or electronic scale technology. The deck steel structure is isolated from the aerial platform. The load cell is permanently bolted between the deck and the rotary actuator mount. The load cell will only respond to the vertical component of the load in the platform. There are four external bolted connections that serve as a redundant back up system for the load cell connection. The system is first calibrated with an empty platform to set the tare weight to zero. The following steps of the process set the overload limit as regulated by applicable safety standards for Mobile Elevated Work Platforms.



**Load Cell
LED Display**



**Platform Control Console
Indicator Module**



**"Teach in" Handset
(Service only)**

Error LED - Continuously on when system error

Alarm LED - Continuously on when platform is overload or has base contact

Interface Connector - Storage of limit valve ("Teach in" handset connects here)

Orange LED - Continuously on when tare value is zero $\pm$ 15kg

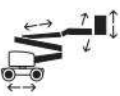
Green LED - Flashes slowly on when system powered and calibrated

NOTE

When power is turned on and after a four second time period elapses, the overload light and audible alarm will pulse two times. This indicates the system is active and there are no faults.

Verify Proper Operation of the Load Sensing System

Overload Status Chart

Weight	Indicator Light	Load Cell LED Display	Audible Alarm	Aerial Platform Functions
 (Zero)	 OFF	● Error - OFF ● Alarm - OFF ● Zero/Tare - ON (orange) ● Power - FLASHING (green)	 OFF	 ENABLED
 (Work Mode @ 244+)	 FLASHING	● Error - OFF ● Alarm - FLASHING (red) ● Zero/Tare - OFF ● Power - FLASHING (green)	 PULSING	 DISABLED
 (Travel Mode @ 244+)	 FLASHING	● Error - OFF ● Alarm - FLASHING (red) ● Zero/Tare - OFF ● Power - FLASHING (green)	 PULSING	 ENABLED

1. Ensure aerial platform is on firm level ground.

2. Fully  retract and  lower boom.

3. Turn engine  off.

4. Ensure both  emergency stops are pulled out and platform engine enable switch is in “” on position.

Result: Overload indicator light and audible alarm will pulse two times.

5. Ensure platform is unloaded and is free from any surface contact.

Result: Green power LED is flashing, orange LED is ON, red alarm LED is OFF and red error LED is OFF.

6. Place a 244kg load on platform.

Result: Platform indicator light is flashing, load cell red alarm LED is ON, and audible alarm is pulsing.

7. On base control console, start engine and extend boom by > 300mm.

Result: All drive and boom function are disabled.

8. Remove load from platform.

Result: All drive and boom function are enabled and all warning indicators are OFF.

NOTE

Refer to [section 4](#) for load sensing system troubleshooting.

Calibration of Load Sensing System (with “Teach In” Handset)**WARNING**

Do not interrupt system power and rest your hand or foot on platform during this procedure.

1. Ensure aerial platform is on firm level ground.
2. Fully  retract and  lower boom.
3. Turn engine  off.
4. Ensure both  emergency stops are pulled out and platform engine enable switch is in “ | ” on position.

Result: Overload indicator light and audible alarm pulse two times.

5. Ensure platform is unloaded and is free from any surface contact.
6. Remove cap from load cell interface connector.
7. Connect “Teach in” handset to interface connector.

Result: The “T” label on handset will flash at a high frequency of 5Hz. If not, recheck that power is on and handset is properly connected.

**WARNING**

Do not disconnect handset at any point of the following steps until instructed.

8. On “Teach in” handset, depress “4” button for four seconds.
Result: The “T” label on handset will light on constantly and then flash at a lower frequency of 1.25Hz.
9. Add a test load of 244kg onto the center of platform.
10. Depress “4” button for four seconds.
Result: The “T” label on handset will go from flashing to constantly on.
11. Disconnect “Teach in” handset from interface connector.
12. Wait for four seconds and then add a test load exceeding 244kg to test load sensing system.
Result: On platform control console, the overload light will flash and an audible alarm will pulse.
13. Remove test load from platform.
Result: Green power LED is flashing, orange LED is ON, red alarm LED is OFF, audible alarm is OFF and red error LED is OFF.
14. Re-cap interface connector and place provided “calibrated” label over interface connector.



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